

PILOT'S HANDBOOK OF  
**FLIGHT OPERATING INSTRUCTIONS**

FOR

***Xtreme  
Prototypes***

**X-1A, B, C & D  
ADD-ON ROCKET AIRCRAFT**

SERIAL NO'S 48-1384, 48-1385 & 48-1386

FOR MICROSOFT® FLIGHT SIMULATOR X

POWERED WITH ONE MODEL XLR-II-RM-5 TURBOROCKET ENGINE



***REVISION***

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*All images appearing in this document are actual screenshots of the Xtreme Prototypes X-1 SG virtual aircraft and panels captured in Microsoft® Flight Simulator X, except where otherwise noted. Portions of this manual are inspired or adapted from the original "Bell X-1A, B & D Pilot's Handbook of Flight Operating Instructions" published during the 1950s by the U.S. Air Force and Bell Aircraft Corporation. This manual is no longer classified and is in the public domain. Xtreme Prototypes is not affiliated with NASA, Bell Aircraft (today, Bell Helicopter Textron), the U.S. Air Force or any other company, entity or government organization related to the X-1 research program. Software platform logo (TM and ©) IEMA 2007. This product is neither sponsored nor endorsed by NASA.*

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# FOREWORD

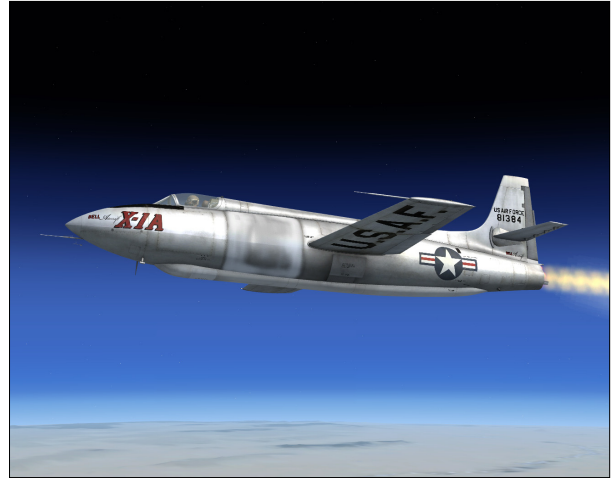
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## READY FOR MACH 2!

We thank you for purchasing your copy of the Xtreme Prototypes X-1 Second Generation add-on rocket aircraft package for Microsoft® Flight Simulator X.

This document contains the necessary information for the installation and operation of the X-1 SG virtual aircraft, 3D virtual cockpits and instrument panels.

Our development team is again extremely proud to bring to your desktop another milestone of extreme flight with this legendary research aircraft. This version of the X-1 SG is a genuine FSX add-on aircraft, especially designed and optimized to benefit from the advanced features of the latest version of Microsoft® Flight Simulator. The add-on package contains six variations of the four X-1 SG rocket planes, with three different and fully functional virtual cockpits and many other exciting features.



*Spot plane view of the Xtreme Prototypes X-1A for Flight Simulator X in flight. (FSX screenshot)*

The Bell X-1 “Second Generation” was an advanced version of the original X-1, the first aircraft in history that broke the sound barrier with captain Charles E. “Chuck” Yeager, in October of 1947.

The second generation of X-1s, built in the late 1940s and early 1950s, were designed to double the speed of sound and set new altitude records in excess of 90,000 feet. The new X-1s were similar to the original (orange) aircraft but were about five feet longer, 2500 pounds heavier and had a conventional glass canopy. The new airplanes also had a more advanced version of the XLR-11 four-chambered liquid-fuel turborocket engine.

For the serious flight simulation enthusiast and X-1 fan, the Xtreme Prototypes X-1 Second Generation is a chance to relive important moments of the history of flight and experience the performance of a series of aircraft whose new rocket systems, cockpit ergonomics and flight controls were quite a challenge for the test pilots who flew them more than fifty years ago. Your X-1 SG add-on package will allow you to fly at very high altitudes at more than twice the speed of sound in four different variations of the aircraft, simulate virtually all the procedures required during an actual research mission (including emergency procedures such as extinguishing an engine fire or jettisoning the canopy to bail out), and even try a fictitious version the never-built X-1C that was to be equipped with the Sperry A-12 Propilot (autopilot) system and a .50 caliber Browning machine gun in the nose to test high-speed armaments.

As a bonus, we have included a light version of a modified B-29 “Superfortress” carrier aircraft with this package to simulate high-altitude launches over the Mojave Desert in the specially-equipped X-1A and X-1D models. Taxiing and taking off from the ground is also possible, as attempted once by captain Yeager with the original X-1 in January 1949 (the only time a rocket-powered research aircraft took off conventionally). An unlimited fuel mode and an automatic ignition sequence button are provided, as well as optional radio navigation instruments to allow for (fictitious) long-duration flights and travelling around the world at beyond Mach 2 in the simulator.

Although we consider this product as a **game** (and we do not pretend it is one hundred percent historically or technically accurate), we tried our best to develop a high quality add-on aircraft that looks and behaves as realistically as possible. Virtually all the custom systems of the real X-1 SG rocket aircraft have been simulated in this version of the software.

For historical accuracy and in an effort to recreate what it was like to operate the real X-1 SG, portions of this document

have been inspired or adapted from the original “X-1A, B & D Pilot’s Handbook of Flight Operating Instructions”. We also wanted to give this manual a look and feel from the 1950s by using presentation templates similar to those found in the original manual. All images appearing in this document are actual screenshots of the Xtreme Prototypes X-1 Second Generation virtual aircraft and panels captured in Microsoft® Flight Simulator X, except where otherwise noted.

The software and the manual have been designed to evolve with time, according to the feedback we receive from the flight simulation community and X-1 fans around the world. Please let us know your comments, ideas and suggestions.

We invite you to visit our web site to get more information about this product and other exciting add-on products, available patches and upgrades, and technical support: <http://www.xtremeprototypes.com>

You can also be made aware of updates and other product news by subscribing to our RSS feeds.

We hope you will enjoy the X-1 Second Generation for Flight Simulator X experience as much as we enjoyed developing this exciting product.

### **The Development Team at Xtreme Prototypes**

# FLIGHT MANUAL SUPPLEMENT

## XTREME PROTOTYPES

# X-1 SG

## ADD-ON ROCKET AIRCRAFT

This publication supplements XP-X1SG-V1R1-E. Reference to this supplement will be made on the title page of the basic manual by personnel responsible for maintaining this add-on software documentation in current status.

## ABOUT ROCKET ENGINES AND THE FLIGHT DYNAMICS IN FLIGHT SIMULATOR X

### 1. PURPOSE

To provide additional information about rocket engines in Microsoft® Flight Simulator X.

### 2. GENERAL

As you are probably aware, Microsoft® Flight Simulator X still does not allow for the true simulation of rocket engines. Your X-1 SG add-on rocket aircraft uses a model based on the standard Flight Simulator turbojet. As a result, low-altitude realism is compromised somewhat in order to allow full performance in altitude and top speed.

A turbojet engine loses a substantial amount of thrust as altitude increases, due to the decreasing air density. Flight Simulator accounts for this quite well (even more so with the Acceleration Expansion Pack or FSX Gold). Rocket engines, on the other hand, are immune to this as they carry (liquid) oxygen in addition to the fuel. In fact, rocket engines operate quite well in a vacuum, whereas a turbojet will flame-out when it runs out of oxygen.

In order to simulate very high-altitude rocket flight, a turbojet must have lots of excess thrust to mitigate the effects of altitude. The drawback to this is exaggerated thrust and acceleration at low altitudes (below 30,000 feet) and full throttle, which are sure to give the pilot some sweaty palms!

### 3. INSTRUCTIONS

To avoid this unrealistic situation with the X-1 SG virtual aircraft:

- A. Use an air-launch at or above 30,000 feet.
- B. Use low throttle settings up to 30,000 feet for conventional takeoffs from the ground. Trim stabilizer 5 degrees down from neutral (“climb” on indicator) before takeoff.  
**Note:** Although the real XLR-11 rocket engine could not be throttled, your joystick throttle is still active in the simulator.
- C. Avoid exceeding 40 degrees nose up.

# INTRODUCTION AND PRODUCT DESCRIPTION

## SECTION 1

### THE SECOND GENERATION X-1s

*Source:*

*NASA Facts*

*Dryden Flight Research Center*

*Document number: FS-2003-07-0082 DFRC*

The second generation X-1s (X-1A, B, C and D) were designed to double the speed of sound and set altitude records in excess of 90,000 feet.

Four of the second generation X-1s were originally to be built by Bell Aircraft: the X-1A for dynamic stability tests; the X-1B for air load research; the X-1C for armaments tests using a .50 cal. machine gun in the nose and a gun sight for the pilot; and the X-1D for heat transfer research. The X-1C, which was designed to test high-speed armaments, was cancelled while in the mockup stage.



*The Xtreme Prototypes X-1D for Flight Simulator X under a modified B-29 carrier aircraft. (FSX screenshot)*

The X-1D (USAF serial number 48-1386) was the first of the second generation aircraft to be delivered, arriving at Edwards Air Force Base in July 1951. The first glide flight was made on July 24, by Bell test pilot Jean Ziegler. The flight was successful, but after touchdown the nose gear was damaged, requiring several weeks of repair. The aircraft was then turned over to the Air Force, and Lt. Col. Frank Everest was assigned as project pilot. Its first powered flight was scheduled for August

22, 1951. The launch was aborted, however, due to the loss of nitrogen pressure. Everest attempted to jettison the propellant, triggering an explosion and fire. The X-1D was jettisoned and destroyed on impact.



*The Xtreme Prototypes X-1A for Flight Simulator X. (FSX screenshot)*

The X-1A (USAF serial number 48-1384) was not delivered to Edwards until January 7, 1953. Ziegler made the first glide flight on February 14, 1953. After a second glide flight six days later, he made the first powered flight on February 21. The Phase I contractor flights continued through April, when the aircraft was returned to Bell for modifications.

The aircraft was returned to Edwards in October 1953, and began a series of flights at higher Mach numbers. Maj. Charles E. "Chuck" Yeager reached a speed of Mach 2.44 at 74,200 feet on December 12. The aircraft began to roll to the left as it reached maximum speed. Yeager tried to counter with right aileron and rudder, but the X-1A began to roll to the right. The aircraft then tumbled out of control, throwing Yeager around in the cockpit, and rendering him unconscious. He finally revived at about 29,000 feet, with the X-1A in an inverted spin. Despite being groggy, Yeager was able to recover and land back at Edwards, without the help of chase planes.

The Air Force decided not to make any additional high Mach flights with the X-1A, due to the instability.

Rather, the X-1A would be used for very high altitude flights by Maj. Arthur Murray. A series of flights were attempted during the spring and summer of 1954, but only four were successful. On two of these flights, including the record-setting flight of August 26, 1954, which reached 90,440 feet, similar instability occurred. This was not as severe as on Yeager's flight, due to the lower speed and higher altitude. The loss of control was traced to a decrease in directional stability, which allowed inertial coupling to occur.

The X-1A was turned over to the National Advisory Committee for Aeronautics (NACA) for high-altitude/high-Mach flights in September 1954, and were sent to Bell Aircraft for modifications. The X-1A returned to Edwards in mid-1955, and made its first NACA flight on July 20. Test pilot Joe Walker reached a speed of Mach 1.45, and landed safely. The next NACA X-1A flight was scheduled for August 8. During the countdown, an explosion occurred in the aircraft. The B-29 launch aircraft could not be landed with the damaged X-1A aboard, so the rocket plane was jettisoned and destroyed on impact.



*The real Bell X-1B. (NASA photo)*

The X-1B (USAF serial number 48-1385) made several Air Force pilot checkout flights, and was then turned over to the NACA on December 3, 1954. Like its sister ship, the X-1B underwent modifications for its research role.

The X-1B which had returned from modifications only a week before the loss of the X-1A, was parked next to the debris. When the X-1B's liquid oxygen (LOX) tank was examined, tricresyl phosphate (TCP) was found in both the LOX tank and the LOX lines to the engine. TCP was used to treat the leather gaskets in the tank and LOX lines. Tests indicated that when the leather gaskets were

in contact with LOX, the TCP was impact sensitive. The shock of the tanks pressurizing would, under certain conditions, cause it to explode. A reexamination of the (X-1D and X-1A) accidents indicated that TCP explosions were responsible in each case. The leather gaskets were removed from the X-1B, and no further explosions occurred.



*The Xtreme Prototypes X-1B for Flight Simulator X. (FSX screenshot)*

With the cause of the explosion identified, work on the X-1B resumed. A total of 300 thermocouples were installed on the aircraft for data on aerodynamic heating. The first NACA flight in the X-1B was made on August 14, 1956 by John B. McKay. By January 1957, a total of two checkout flights and four heating flights had been made by McKay. The data was considered representative of what future Mach 2 aircraft might encounter.

The aircraft then undertook a series of research flights for high-Mach number stability and control data. These were made beginning in May 1957 and continuing through August. A total of seven flights were made in the series. The X-1B was then modified for tests of a reaction control system (RCS). Several hydrogen peroxide rockets were mounted on a wingtip, the aft fuselage and the tail to provide control when the dynamic pressure was too low for conventional aerodynamic controls. This was to gain experience for the upcoming X-15 program.

McKay made the first RCS checkout flight on November 27, 1957. Two more flights were made in January 1958, before rains closed the lakebed until spring. The plan was to resume flights at low aerodynamic pressures. A pre-flight inspection found cracks in the LOX tank, which would require a new tank be built. This would have been too expensive, and the aircraft was grounded. The RCS rockets were transferred to an F-104, while the X-1B was





*Xtreme Prototypes' fictitious version of the never-built X-1C. Note the large yaw-damping surfaces on the wing, the retractable ventral fin and the .50 caliber machine gun in the nose. (FSX screenshot)*

sent to the U.S. Air Force Museum.

### HISTORICAL DATA

- ❑ **Arrival at Edwards AFB:** July 1951 (X-1D), January 1953 (X-1A), June 1954 (X-1B). The X-1C was never built.
- ❑ **First X-1D glide flight:** July 24, 1951 (pilot: Jean Ziegler, Bell Aircraft)
- ❑ **First X-1A glide flight:** February 14, 1953 (pilot: Jean Ziegler, Bell Aircraft)
- ❑ **First X-1B glide flight:** September 24, 1954 (pilot: Jack Ridley, Lt. Col., USAF)
- ❑ **First X-1D powered flight:** None
- ❑ **First X-1A powered flight:** February 21, 1953 (pilot: Jean Ziegler, Bell Aircraft)
- ❑ **First X-1B powered flight:** October 8, 1954 (pilot: Arthur Murray, Maj., USAF)
- ❑ **Last X-1D flight:** July 24, 1951 (pilot: Jean Ziegler, Bell Aircraft). The aircraft was lost on August 22, 1951, following an explosion and fire before launch.
- ❑ **Last X-1A flight:** July 20, 1955 (pilot: Joe Walker, NACA). The aircraft was lost on August 8, 1955, following an explosion during countdown.
- ❑ **Last X-1B flight:** January 23, 1958 (pilot: Neil Armstrong, NACA). Aircraft sent to the U.S. Air Force Museum at Wright-Patterson AFB.
- ❑ **Number of flights:**

X-1D: 1  
 X-1A: 14  
 X-1B: 27  
 X-1C: 0

- ❑ **Highest Mach number:** Mach 2.44 (X-1A, December 12, 1954; pilot: Chuck Yeager, Maj., USAF).
- ❑ **Highest altitude:** 90,440 feet (August 26, 1954; pilot: Arthur Murray, Maj., USAF).

### THE XTREME PROTOTYPES X-1 SECOND GENERATION FOR FLIGHT SIMULATOR X



The Xtreme Prototypes X-1 Second Generation add-on package for Flight Simulator X contains six variations of the four Bell X-1 Second Generation research rocket planes and one light variation of a modified B-29 “Superfortress” carrier aircraft for simulating high-altitude launch in the X-1A and X-1D:

- ❑ **Three variations of the Bell X-1A (USAF serial number 48-1384):**
  - “Bell-USAF” orange version
  - “Bell-USAF” aluminum version
  - “Bell-USAF-NACA” white version
- ❑ **One variation of the Bell X-1B (USAF serial number 48-1385):**
  - “Bell-USAF-NACA” aluminum version
- ❑ **One fictitious variation of the (never built) Bell X-1C (USAF serial number 48-1386):**
  - “USAF” aluminum version with front machine gun, yaw-damping surfaces on wing and retractable ventral fin
- ❑ **One variation of the Bell X-1D (USAF serial**

number 48-1386):

- “Bell-USAF” aluminum rollout version
- One “light” variation of a modified Boeing B-29 “Superfortress” carrier aircraft (USAF serial number 52-1800, exterior model only, visible when the specially-equipped X-1A/D model is airborne).

The aircraft package includes highly detailed exterior models, fully functional 3D virtual cockpits, spectacular visual effects and sounds, several camera views, a 85-page user manual (PDF format) and a number of saved flights inspired by real X-1 SG research missions.

The flight model allows the airplane to accelerate to Mach 2.5 and reach altitudes up to 90,000 feet.

The Xtreme Prototypes X-1 Second Generation for Flight Simulator X is compatible with FSX SP2, FSX Acceleration Expansion Pack and FSX Gold. See section 2 for compatibility issues.

### FULLY DETAILED MODELS OF THE REAL-WORLD SECOND GENERATION X-1s



Each add-on aircraft is fully detailed with over 500 parts and 40 animations, and has been carefully modeled based on available drawings, flight manuals, government photographs, movies and other archive material in order to conform as closely as possible to the real-world second generation Bell X-1s.

The airplanes feature different high resolution reflective textures with bump maps, unique markings, movable control surfaces (horizontal stabilizer with an all-moving tail and elevator, vertical stabilizer/rudder, ailerons and

flaps), extendable landing gear, front machine gun, yaw-damping surfaces and a retractable ventral fin (X-1C), movable canopy with cockpit details, pilot and animated sticks and levers.

All aircraft feature a dozen of animated visual effects with sound, such as XLR-11 rocket engine igniter and flame effects, rocket engine contrail effects, engine smoke and fire, machine gun effect (X-1C), wing vortices, liquid oxygen bleed effect, propellant jettison effects and cold vapor around the LOX tank when filled.

The X-1 Second Generation for Flight Simulator X is equipped with one Reaction Motors XLR-11-RM-5 four-chambered liquid-fuel turbo-rocket engine, capable of delivering more than 5,900 pounds of thrust.

### FULLY FUNCTIONAL 3D VIRTUAL COCKPITS WITH ADVANCED ROCKET AIRCRAFT SYSTEMS



Each aircraft comes with a fully functional virtual cockpit which contains over 800 parts and more than 200 animated gauges, switches, levers, light indicators and flight instruments. Each virtual cockpit has been meticulously created to conform as closely as possible to the cabin of the real second generation Bell X-1.

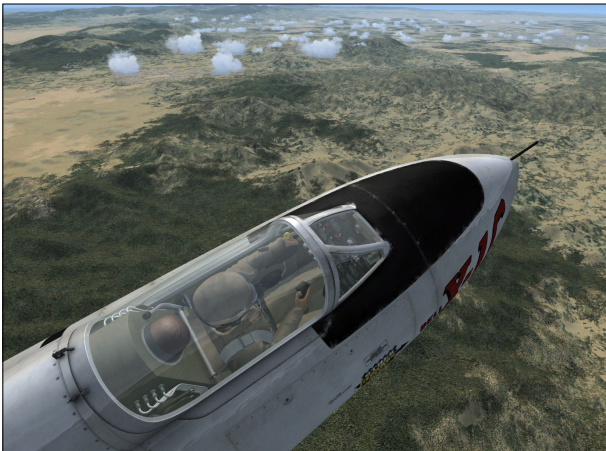
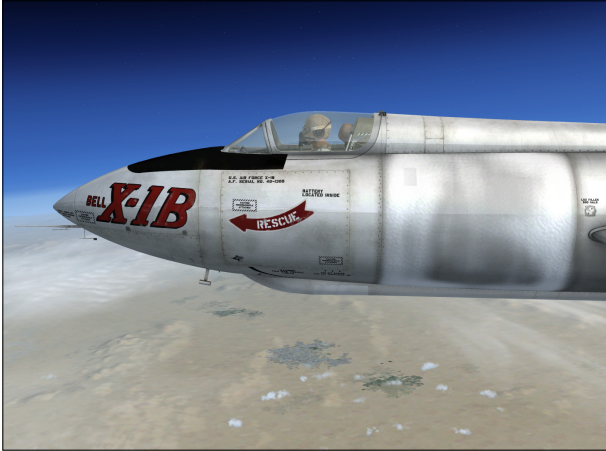
The full 3D gauges have been carefully designed and programmed based on the original analog instruments found in the real X-1 SG during the 1950s. Virtually all gauges, switches, lights and instruments found on each panel are functional and behave like the original ones found in the real aircraft. Custom rocket aircraft systems present in the real X-1 SG are also simulated (see section 4).

Three different VC configurations are available for the X-1 SG for Flight Simulator X (see section 5 for details).

## OTHER FEATURES

**Rocket aircraft sounds** — The X-1 SG comes with her own custom sound package.

**Aircraft camera views** — The X-1 SG has several external camera views showing different parts of the aircraft such as the vertical rudder, the all-moving tail, the ailerons and landing gear. In addition, the model has



both left and right canopy views, a rear engine view, a front top view and virtual cockpit views. Users can cycle forward or backward the different camera views using the S and A keys.

**High-altitude launch from a modified B-29 carrier aircraft (specially-equipped X-1A and X-1D models with B-29 carrier only)** — A light version of a modified B-29 “Superfortress” carrier aircraft is included with this package to simulate high-altitude launches over the Mojave Desert in the X-1A and X-1D. Activating the drop switch on the center pedestal in the cockpit will initiate a ten-second countdown after which the X-1 SG will detach from the B-29 carrier aircraft. This can only be done once



during a particular flight. The best way to simulate a high-altitude drop in the simulator is to position the aircraft at about 40,000 feet and 300 KIAS by using the map (see sections 5 and 6 for complete details).

**Canopy jettison animation** — The canopy emergency release handle on the left side of the cockpit can be used to jettison (eject) the X-1 SG glass canopy in event of an emergency. This will immediately depressurize the cabin and can be done only once during a particular flight.

**An automatic ignition sequence button** — The X-1 SG can be started automatically at the touch of a single “magic” red button located on the main panel. This is similar to pressing CTRL+E with conventional FS aircraft. However, the red button initiates all X-1 custom systems, including her three-propellant rocket fuel management system. You can use this button instead of CTRL+E to properly start the engine without going through the normal procedures and check list described in section 6.

**.50 cal. machine gun (X-1C only)** — The X-1C is equipped with a functioning nose-mount .50 cal. Browning machine gun and a gun sight for the pilot, mounted above the main instrument panel. The machine gun can be fired by clicking on the center stick black handle with the mouse.

**Sperry A-12 Propilot (X-1C only)** — The X-1C is also equipped with the classic Sperry A-12 Propilot, providing basic autopilot modes such as heading hold, altitude and attitude hold, and wing leveler. The unit also has controls for aileron trim, elevator trim and turn.

**Functioning fire detection and extinguisher system** — The X-1 SG is equipped with a functioning fire detection and extinguisher system to allow for the automatic

or manual extinguishing of fire during flight (refer to the *Learning Center* in FSX for details on how to program or set an engine fire or failure in the simulator prior to or during a flight).



**Saved flights based on actual X-1 SG research missions** — It is easy to prepare the X-1 SG for takeoff or a high-altitude launch over the Mojave Desert by loading one of the included saved flights (see appendix 2 for details).

**85-page user manual** — The Xtreme Prototypes X-1 Second Generation rocket aircraft package comes with a comprehensive 85-page user manual (the present document) in a printable PDF format, inspired from the original “Bell X-1A, B & D Pilot’s Handbook of Flight Operating Instructions”.





The Xtreme Prototypes X-1 Second Generation for Flight Simulator X is an **add-on** software package which requires **Microsoft® Flight Simulator X with Service Pack 2 (or FSX Acceleration Pack or FSX Gold)** to be installed on your computer in order to function. Make sure Flight Simulator X has properly been installed according to the instructions provided by the manufacturer before you proceed.

### COMPATIBILITY

The Xtreme Prototypes X-1 Second Generation for Flight Simulator X add-on rocket aircraft package is designed and optimized for Microsoft® Flight Simulator X SP2, FSX Acceleration Expansion Pack and FSX Gold.

The current version of the software is not compatible with Microsoft® Flight Simulator 2004 or earlier versions. If the X-1 SG package is installed in FSX only (no Acceleration Expansion Pack/FSX Gold), make sure Service Pack 2 has been installed. The X-1 SG package will not work/display properly if SP2 is not installed.

The software is compatible with Windows® Vista™ and DirectX® 10.

As a rule of thumb, if Microsoft® Flight Simulator X SP2 runs properly on your computer, you should be able to fly the X-1 Second Generation for Flight Simulator X with-

out problems.

The 3D virtual cockpit advanced features, special visual effects and/or multiple window views might reduce your frame rate on slower processors and video cards. Adjust your Flight Simulator display parameters to correct this problem if necessary. Reducing the traffic and weather settings in Flight Simulator before flying the X-1 SG might also improve the overall system performance.

Consult the documentation included with Microsoft® Flight Simulator X (or FSX Acceleration Expansion Pack/FSX Gold) for information about minimum system requirements and how to optimize your display settings.

Check our web site regularly for frequently asked questions, fixes, patches and upgrades. See appendix 4 for more information about technical support and known issues.

If you need additional support, please visit our web site: [www.xtremeprototypes.com](http://www.xtremeprototypes.com)

### MINIMUM SYSTEM REQUIREMENTS

**Flight Simulator:** Microsoft® Flight Simulator X with Service Pack 2 (Service Pack 2 required, FSX Acceleration Expansion Pack or FSX Gold optional)

**Operating System:** Windows® XP SP2 (256 MB RAM), Windows® Vista™ (512 MB RAM)

**Processor:** 1.0 GHz

**Hard Drive:** 15 GB (space required to install Flight Simulator X SP2)

**Available Disk Space:** 300 MB (space required to install the X-1 SG add-on software and documentation)

**Video Card:** 64 MB (128 MB or more recommended), DirectX® 9.0 or later

**Other:** Sound card and speakers, joystick, wheelmouse, Adobe® Reader® 8.0 or later

**NOTE:** Xtreme Prototypes addons are complex and require more processing power and RAM than other more conventional add-on aircraft packages. Increased performance will be noticed on more powerful systems. FSX SP2 minimum system requirements strongly recommended.

## PILOT'S HANDBOOK OF FLIGHT OPERATING INSTRUCTIONS (MANUAL)

This package contains the X-1 SG Pilot's Handbook of Flight Operating Instructions, available in a printable PDF format (Adobe® Reader® 8.0 or later required).

To download Adobe® Reader®, visit:  
[www.adobe.com/products/acrobat/](http://www.adobe.com/products/acrobat/)

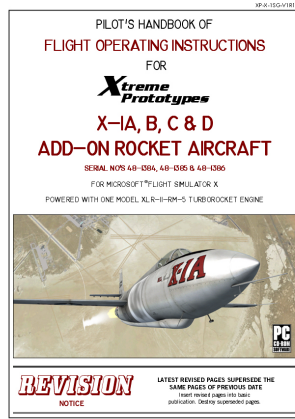
The 85-page manual contains the necessary information for the installation and operation of the X-1 SG add-on rocket aircraft, 3D virtual cockpits and associated instrument panels in FSX.

The end-user is authorized to print copies of the manual for his/her own use, in conjunction with the enclosed add-on simulation software. The best way to keep the manual handy for easy reference during flight is to organize it in a durable presentation binder.

### PACKAGE DESCRIPTION

The installation disk (or the downloaded package) contains the following:

- ❑ A “**read me**” file (readme.txt) that contains the present installation instructions and other important (last-minute) information.
- ❑ A copy of the **end-user license agreement** (eula.rtf).
- ❑ English and French versions of the present **X-1 SG Pilot's Handbook of Flight Operating Instructions** (XP\_X-1SG\_manual\_en\_v1r0.pdf and XP\_X-1SG\_manual\_fr\_v1r0.pdf) in a printable PDF format.
- ❑ A self-executable **Setup program file** (XP\_X-1SG\_v1r0\_setup.exe) that is launched automatically when the disk is inserted into your computer disk drive. This program can also be launched manually by double-clicking the Setup icon.



If you have downloaded the software, the manuals and the documentation are included in the Setup program file.

The Setup program file contains the necessary software components to be installed on your computer:

1. The **six variations of the X-1 SG add-on rocket aircraft** and associated 3D virtual cockpits\* and the **B-29 carrier aircraft**:
  - ❑ **Three variations of the Bell X-1A** (USAF serial number 48-1384)
  - ❑ **One variation of the Bell X-1B** (USAF serial number 48-1385)
  - ❑ **One fictitious variation of the Bell X-1C** (USAF serial number 48-1386)
  - ❑ **One variation of the Bell X-1D** (USAF serial number 48-1386)
  - ❑ **One “light” variation of a modified Boeing B-29 “Superfortress” carrier aircraft** (USAF serial number 52-1800)
2. The **system gauges** for the X-1 SG rocket aircraft.
3. The **special visual effects** for the X-1 SG rocket aircraft.
4. The X-1 SG **sound package**.
5. The **saved flights**.

\*: The X-1 SG add-on package contains three different virtual cockpits. Note that there are no more 2D panels included with Xtreme Prototypes' addons for Flight Simulator (see section 5).

### INSTALLATION INSTRUCTIONS

The Xtreme Prototypes X-1 SG for Flight Simulator X is installed like any other add-on aircraft package in your default “Microsoft Flight Simulator X” folder.

### DOWNLOAD

If you have downloaded the software, simply run the Setup program (XP\_X-1SG\_v1r0\_setup.exe) and follow the instructions that appear on screen. Enter

your product registration key when asked. You must accept the end-user license agreement and enter a valid registration key before you can install and use this product. The installation program will copy the necessary files into their default locations in the "Microsoft Flight Simulator X" folder(s) on your computer.

### **CD-ROM**

**If you have purchased the CD-ROM package, insert the enclosed disc into your CD-ROM drive and follow the instructions that appear on screen.** Enter your product registration key when asked. You must accept the end-user software license agreement and enter a valid registration key before you can install and use this product. The installation program will copy the necessary files into their default locations in the "Microsoft Flight Simulator X" folder(s) on your computer.

(If your computer does not support automatic installation, click Start on the Windows® taskbar and select **Control Panel**. Double-click the **Add/Remove Programs** icon and click **Add New Programs**. Follow the instructions that appear on screen.)

Once the X-1 SG add-on aircraft are installed, they will be available on the **Select Aircraft** page in Flight Simulator X.

Refer to section 6 for normal operating instructions. Refer to section 7 for emergency operating instructions.

### **FILE STRUCTURE**

The X-1 SG aircraft, virtual cockpits and sounds are installed in your "Microsoft Flight Simulator X\SimObjects\Airplanes" folder, under different names and folders. The X-1 SG system gauges are installed in your "Microsoft Flight Simulator X\Gauges" folder, the special effects are installed in your "Microsoft Flight Simulator X\Effects" folder, special sound files are installed in your "Microsoft Flight Simulator X\Sound" folder and the saved flights are installed in your "...My documents\Flight Simulator X Files" folder on your computer.

**NOTE:** The FSX saved flights are installed in your "...My documents\Flight Simulator X Files" folder and and not in your "Microsoft Flight Simulator X\Flights" folder.



*FSX "Select Aircraft" page.*

Note that the X-1 SG manual is copied by default in the "C:\Program Files\Xtreme Prototypes\X-1 SG Documentation" folder for your convenience and future reference. It is available in the "Start\Programs\Xtreme Prototypes" section of the Windows® taskbar.

# AIRCRAFT DESCRIPTION AND SPECIFICATIONS

## SECTION 3



### AIRPLANE

The Bell X-1A, X-1B, (X-1C) and X-1D were high altitude, high speed midwing research aircraft. The mission of these aircraft was piloted, high-altitude, high-speed flight testing of various research components. They were designed for air launching from a modified Boeing B-29 or B-50 carrier airplane.

**Note:** The Xtreme Prototypes X-1 Second Generation rocket aircraft for Flight Simulator X can take off from the ground. The only time this was accomplished in the real world by a rocket-powered research aircraft was on January 5, 1949, when Chuck Yeager took the X-1 (first generation) off from Muroc Army airfield and climbed to 23,000 feet in about 100 seconds.

The second generation X-1s used the same wing, horizontal tail, and XLR-11 rocket engine as the first generation aircraft, with a new cylindrical fuselage about 4.5 feet longer than the original design. This was the maximum length that could be carried by a B-29 or B-50 aircraft.

The cockpit design was also changed to a “stepped” canopy, allowing the pilot to enter from the top, instead of the side hatch on the original X-1. The new aircraft was equipped with a conventional glass canopy that could be jettisoned in event of an emergency.

A more significant change was the fuel system. The new

aircraft used a low-pressure turbopump, which eliminated the heavy spherical liquid oxygen (LOX) and alcohol tanks. The new, larger tanks now conformed to the fuselage shape. As a result, the airplane’s calculated maximum performance had increased to Mach 2.47 at 70,000 feet.

### POWER PLANT

Power is furnished by a bipropellant liquid rocket engine utilizing a water-alcohol mixture (WALC) as the fuel, and liquid oxygen (LOX) as the oxidizer. The fuel and oxidizer are forced under low inert gas pressure (nitrogen) to a turbine-driven pump which delivers the propellants to the engine at operating pressures.



The engine is a Reaction Motors model XLR-11-RM-5 four thrust chamber unit, incorporating injectors and igniters, the engine control, and the turbopump assembly.

### ROCKET ENGINE PROPELLANTS

- 570 gallons of **water-alcohol** (fuel)
- 500 gallons of **liquid oxygen** (oxidizer)
- 37 gallons of **hydrogen peroxide** (engine turbopump monopropellant)





### AIRPLANE DIMENSIONS

The over-all dimensions of the second generation X-1 airplane were:

- ❑ **Length:** 426.58 inches (35.55 feet)
- ❑ **Wingspan:** 366 inches (30.5 feet)
- ❑ **Height (top of vertical fin to ground):** 128.37 inches (10.7 feet)
- ❑ **Wing area (inc. fuselage area):** 130 sq. feet
- ❑ **Wheel base:** 161.13 inches (13.43 feet)
- ❑ **Tread:** 51 inches (4.25 feet)

### WEIGHT

- ❑ **Gross weight:** 16,487 pounds
- ❑ **Empty weight:** 7,266 pounds

### LIMITATIONS

- ❑ **Maximum speed:** Mach 2.5 at 70,000 feet
- ❑ **Ceiling:** 60,000-90,000 feet
- ❑ **Rocket engine burn time (approx.):** 4 minutes 40 seconds
- ❑ **Maximum vertical acceleration:** +/- 18 g's

See appendix 1 (or the reference tab of the kneeboard) for full aircraft reference information.

### SERIAL NUMBERS

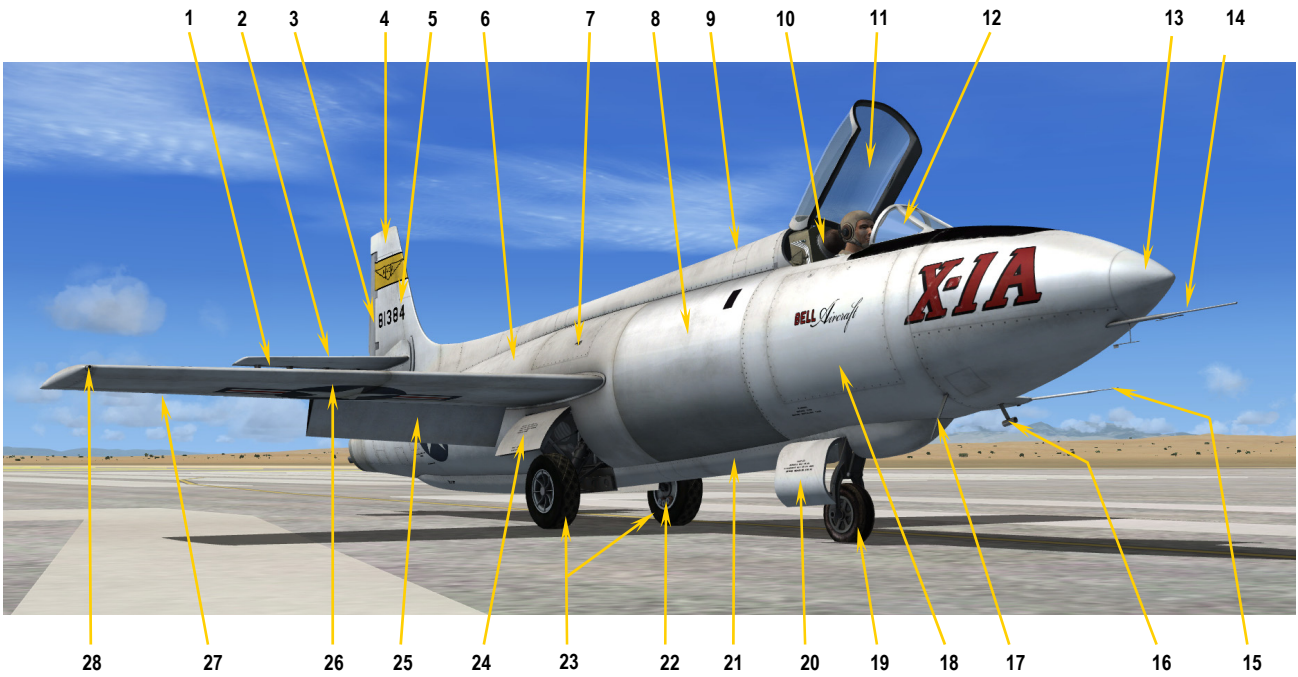
The U.S. Air Force serial numbers for the second generation X-1 airplanes were:

- ❑ **X-1A:** 48-1384
- ❑ **X-1B:** 48-1385
- ❑ **X-1C:** 48-1386 (never built)
- ❑ **X-1D:** 48-1386



# BELL X-1 "SECOND GENERATION"

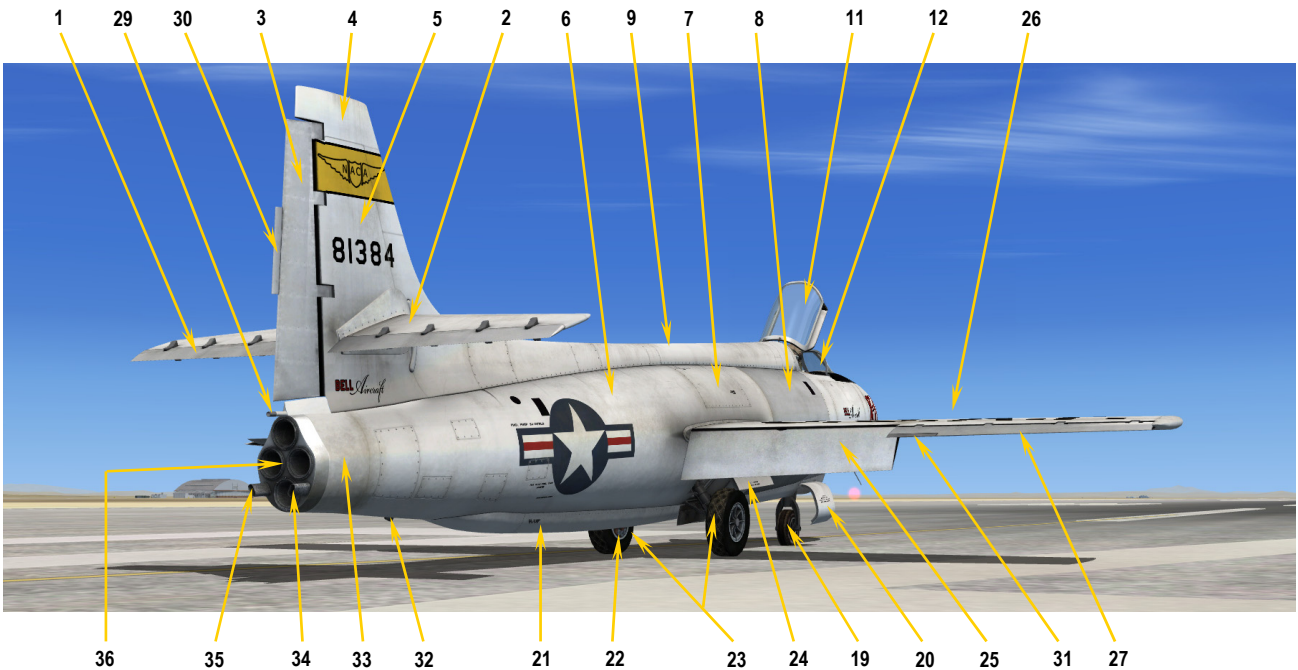
# GENERAL ARRANGEMENT



- 1. ELEVATOR
- 2. ALL-MOVING TAIL (ELEVATOR TRIM)
- 3. RUDDER
- 4. PICK-AXE ANTENNA COVER
- 5. VERTICAL STABILIZER
- 6. FUEL TANK
- 7. HYDROGEN PEROXIDE TANK
- 8. LIQUID OXYGEN TANK
- 9. UPPER FAIRING
- 10. SEAT
- 11. GLASS CANOPY
- 12. WINDSHIELD

- 13. NOSE COVER
- 14. VANE-TYPE RESEARCH BOOM
- 15. PITOT TUBE
- 16. PITOT TUBE
- 17. ANTENNA
- 18. BATTERY COMPARTMENT
- 19. FRONT GEAR WHEEL
- 20. FRONT GEAR DOOR
- 21. LOWER FAIRING
- 22. DIFFERENTIAL BRAKES
- 23. MAIN GEAR WHEELS
- 24. MAIN GEAR DOOR

- 25. FLAP
- 26. WING
- 27. AILERON
- 28. PROBE MOUNTING
- 29. HYDROGEN PEROXIDE JETTISON TUBE
- 30. RUDDER TRIM TAB
- 31. AILERON TRIM TAB
- 32. TURBOPUMP EXHAUST
- 33. ENGINE COMPARTMENT
- 34. FUEL JETTISON TUBE
- 35. LOX JETTISON TUBE
- 36. XLR-11 4-CHAMBERED ROCKET ENGINE





### AIRCRAFT SYSTEMS

This section contains information about the aircraft systems included with the Xtreme Prototypes X-1 Second Generation add-on rocket aircraft for Flight Simulator X.

Except where otherwise noted, the following real aircraft systems are simulated to conform as closely as possible to the operation of the real second generation X-1 rocket aircraft, within the present limitations and capabilities of the simulator:

- Power plant system (XLR-11 rocket engine)
- Turbine-driven propellant pump
- Fuel system
- LOX system
- Hydrogen peroxide system
- Nitrogen system
- Motor hydraulic system\*
- Electrical system
- Flight control system
- Landing gear system
- Fire detection system
- Fire extinguisher system
- Instruments and rocket aircraft custom gauges and controls, including dome loading pressure regulators and spill valves
- Emergency jettison system
- Pilot's oxygen system
- Droplight system (countdown and launch from a B-29 carrier aircraft, on selected models)
- Communication and navigation systems (fictitious)
- Radar\*
- Cabin pressurization system
- Defrosting system\*

\*: These systems are partly or not simulated in the current version of the software.



gas generator, thus varying the flow of propellants to the engine.

If the turbine overspeeds, a switch controlled by a centrifugal mechanism closes the  $H_2O_2$  emergency cut-off control valve, thus stopping the pump. In addition a second circuit is closed, shutting off the nitrogen to the  $H_2O_2$  valve through the governor. This circuit also lights the "TURBINE OVERSPEED" light on the main instrument panel, and holds the system in the overspeed condition until the "TURBINE OVERSPEED RESET" button on the panel is held in momentarily, which returns the system to an operating status.

## FUEL SYSTEM

The fuel used in this aircraft conforms to a mixture of specially denatured alcohol and water (WALC). The system is serviced from the right side of the aircraft and the nominal capacity is 570 U.S. gallons.

The fuel system consists of the fuel tank, fuel tank relief and magnetic pop-on valve assembly, the pressurizing and vent valve assembly, the fuel flowmeter generator and indicator, shut-off valve, jettison valve, fuel pump unit of the turbine-driven pump, fuel manifold and the fuel system components of the motor control.



Fuel is forced from the tank by low pressure inert gas (nitrogen) through the flowmeter generator and shut-off valve to the pump; the pump delivers fuel to the manifold. When a chamber is fired, fuel flows from the manifold, through the igniter fuel control valve, into the igniter fuel manifold, where it is diverted to the four igniter feed lines. The fuel flows through the check valve into the igniter orifice and screen assembly, and is then injected into the throat of the venturi mixing tube of the igniter, where it is mixed with gaseous oxygen prior to burning in the igniter chamber. As pressure increases to 45 psi as a result of combustion, a series of controls opens the fuel propellant valve allowing fuel to flow through the main metering orifice, around the chamber (for cooling purposes), to the injector, and then into the thrust chamber to burn with the liquid oxygen. When combustion pressure reaches approximately 155 psi, the igniter fuel control valves close and normal operation ensues.

## LIQUID OXYGEN SYSTEM

The liquid oxygen (LOX) used in this aircraft is commercially pure. The system is serviced from the left side of the aircraft and the nominal capacity is 500 U.S. gallons.



The liquid oxygen system consists of the supply tank, tank pressure and vent valve, auxiliary vent valve, flowmeter generator, jettison valve, shut-off valve, the LOX unit of the turbine pump and the LOX components of the motor control.

Liquid oxygen is forced from the tank by low pressure inert gas (nitrogen) through the flowmeter generator and shut-off valve to the pump. The pump delivers the LOX to the engine manifold at operating pressure. A continuous overboard bleed is maintained whenever the LOX shut-off valve is open to rid the main line of air and gaseous oxygen and to cool the line, pump and manifold to prevent vaporization.



During a start, LOX flows from the manifold through evaporator coils which encircle the main fuel line of each chamber. Warm atmosphere vaporizes the LOX into gaseous oxygen which is utilized in the igniter oxygen propellant manifold and individual feed lines to provide a smooth immediate start. The oxygen passes through the igniter oxygen valves and check valves into the igniter venturi mixing tube where it is mixed with fuel prior to burning in the igniter chamber. When combustion occurs

and pressure increases to 45 psi, the main oxygen propellant valve is opened and LOX flows to the chamber to burn with the fuel.

### HYDROGEN PEROXIDE SYSTEM

The hydrogen peroxide used in this system is 90% pure. The system is serviced from the upper right side of the fuselage and the capacity is 37 U.S. gallons.

The H<sub>2</sub>O<sub>2</sub> system consists of the supply tank, pressurizing vent relief valve and bursting head assembly, jettison valve, propellant valve, emergency shut-off valve, gas generator and the turbine section of the turbine-driven propellant pump.



The supply tank is pressurized by the nitrogen system at approximately 415 psi to force the H<sub>2</sub>O<sub>2</sub> through the propellant valve, emergency shut-off valve, and the gas generator, where the H<sub>2</sub>O<sub>2</sub> decomposes and becomes

oxygen and superheated steam to drive the turbine. The flow of H<sub>2</sub>O<sub>2</sub> is controlled by the pump governor. A thermal bulb in the tank and another in the line of the propellant valve are connected to temperature indicators on the main instrument panel.

### NITROGEN SYSTEM

The nitrogen (N<sub>2</sub>) system consists of a series of interconnected tube bundles (or tanks in later versions of the aircraft), shut-off valve, strainer, reducing regulators and valves, and suitable tubing, fittings and connections. The system is charged to 4800 psi through the filler connection on the right side of the fuselage. A 5500 psi frangible disc protects the system against overcharging.

The N<sub>2</sub> pressure from the tube bundles (or tanks) is reduced by the first stage regulator to approximately 415 psi to pressurize the H<sub>2</sub>O<sub>2</sub> tank, the LOX and fuel tank pressure regulators, the flap



actuator, the down side of the landing gear actuators, the stabilizer actuator pressure regulator, the motor control, the "FUEL TANK", "LOX TANK" and "TURB. GOV. BAL. PRESS" adjusting valves, the anti-G suit regulator (not simulated), the canopy seal regulator, the turn-and-bank and gyro orifices, the windshield defroster and the various control valves.

The source (nitrogen) pressure is also piped to the landing gear pressure regulator, where the pressure is reduced to 1500 psi to operate the up side of the landing gear actuators.

In the motor control, the 415 psi pressure flows through the engine nitrogen manifold and check valves to the igniter oxygen bleed orifice, the igniter check valve, the igniter chamber and into the thrust chamber. The gas also flows through to the main oxygen check valve, thrust chamber head, the oxygen injectors and the thrust chamber, thus bleeding the lines and chambers.

To cool the spark-plugs, the gas flows through the four spark plug bleed orifices, to the igniter plug chamber, cooling the plugs, then into the chamber. This line transmits chamber pressure to the 45 and 155 psi chamber pressure switches on the motor control box.



### MOTOR HYDRAULIC SYSTEM

The motor hydraulic system (transparent to the user, not simulated) is a closed system consisting of four accumulators, lines and orifices. Nitrogen pressure actuates the pistons of the accumulator forcing hydraulic fluid through the metering orifice, thereby actuating the piston in the fuel propellant valve. In this manner, the fuel valves are slowly opened, allowing the turbopump govern-

ing system to supply the increased fuel demand when chambers are started, without reducing fuel manifold pressure and starving the operating chambers.

### ELECTRICAL SYSTEM

The electrical system is a single wire, 24-volt DC system supplied by three batteries, and protected by manual reset circuit breakers on the switch panel (center pedestal).

An inverter and a transformer supply AC current for the various components of the aircraft. The inverter supplies 250VA, 400-cycle, single-phase power at 115 volts for the fuel and LOX quantity indicator circuits, and the transformer supplies 400-cycle, single-phase power at 26 volts to the transmitters and indicators for the pump outlet pressures, chamber pressures, and the LOX and fuel tank and dome pressures.



### LANDING GEAR SYSTEM

The tricycle-type landing gear is retracted and extended by pneumatic pressure supplied by the nitrogen system of the aircraft. An air bottle, charged on the ground, supplies 160 psi pressure to the open side of the main wheel door actuators (not simulated). As the main wheels reach their retracted position, a sequence valve is operated which supplies the 1500 psi up landing gear pressure to the close side of the door cylinders. A hydraulic (differential) brake on each main wheel is operated by the toe plates of the rudder pedals.

### FIRE DETECTION SYSTEM

Three fire detection circuits are installed in the fuselage: one circuit in the engine area; one in the turbine area;

and one in the hydrogen peroxide tank area.

### FIRE EXTINGUISHER SYSTEM



The fire extinguisher system consists of the two dibromodifluoromethane ( $CF_2Br_2$ ) bottles in the left instrumentation compartment, pressure gauges, external discharge indicators, relays,  $H_2O_2$  tank section discharge tubes, turbine pump section distributor ring and the engine section discharge tube.



The system is designed to operate manually or automatically in conjunction with the fire detection system. When operated automatically, if one of the fire detectors is activated, the extinguisher system will be discharged, the fuel and LOX shut-off valves will close and the engine will shut off. The system is charged through the filler to approximately 1200 psi.

The X-1 SG for Flight Simulator is equipped with a functioning fire detection and extinguisher system to allow for the automatic or manual extinguishing of fire during flight (refer to the *Learning Center* in FSX for details on how to program or set an engine fire or failure in the simulator prior to or during a flight).

### INSTRUMENTS

The (nitrogen) source pressure, first stage line pressure, first stage dome pressure, turbine governor balance pressure, landing gear line pressure,  $H_2O_2$  tank pressure, anti-G suit supply pressure (not simulated), and emergency jettison pressure gauges are direct reading.

The fuel tank and dome pressure, LOX and fuel quantity, pump outlet pressure, the chamber pressure gauges and the stabilizer position indicator are connected to their respective transmitters and operate on AC current. The H<sub>2</sub>O<sub>2</sub> tank and line temperature gauges and their transmitters operate on DC current.



The bank-and-turn indicator and attitude gyro operate from the first stage line pressure; the exhaust from the gyro instruments is utilized to pressurize the cabin.

The air speed indicator and machmeter are pitot-static operated. The aircraft altimeter is a standard type C-19.

The pilot's oxygen cylinder pressure gauge denotes the supply pressure and the flow indicator ("blinker") shows when oxygen is being consumed by the pilot.

### EMERGENCY JETTISON SYSTEM

The emergency jettison system consists of the supply



tank, shut-off valve and tubing to the jettison valves. The system is designed to jettison the fuel, LOX, and H<sub>2</sub>O<sub>2</sub> simultaneously in case of an emergency such as an electrical or nitrogen failure.

### PILOT'S OXY-GEN SYSTEM



The low pressure oxygen system consists of four type D-2 cylinders (two mounted under the cabin floor, and two in the right equipment compartment), the pressure gauge, flow indicator (oxygen "blinker") and the type A-14 "diluter demand" regulator.

### DROPLIGHT SYSTEM

The droplight system consists of the light and switch (on the center pedestal) which are connected in series with a light adjacent to the drop handle in the carrier aircraft.

The switch is turned **ON** prior to a drop, and if, for any reason, the drop is not to be made, the pilot turns the switch **OFF**, thereby notifying the mother airplane not to complete the drop.



Turning the drop switch to **ON** in the Xtreme Prototypes specially-equipped X-1A or X-1D models will initiate a 10-second countdown which can be interrupted at any time by turning the switch to **OFF**. The X-1 SG will separate from the B-29 carrier aircraft at the end of the countdown (see sections 5 and 6 for complete details).



## COMMUNICATIONS EQUIPMENT

The communications equipment is an AN/ARC-5 VHF command set, consisting of a R-28/ARC-5 receiver, a T-23/ARC-5 transmitter, a MD-7/ARC-5 modulator, a headset and microphone (partly simulated).

The four Xtreme Prototypes X-1 SG virtual aircraft are equipped with a modified (fictitious) ARC-5 radio for use with civilian frequencies in Flight Simulator X. The set has two VHF communication transceivers (COM1 and COM2), an automatic direction finder (ADF) and a radio-navigation receiver (VOR). ADF and VOR indications can be read on the optional (fictitious) radio-magnetic indicator (RMI) on the main panel. An optional (fictitious) magnetic compass is provided for adjusting the RMI, if needed. The default Flight Simulator Garmin GPS unit is also available.



The RMI, the magnetic compass and the GPS, as well as the map and the kneeboard, are displayed or hidden by pressing a series of (fictitious) push buttons located in the center section of the main instrument panel.

## RADAR INSTALLATION

The radar beacon (not simulated) consists of a receiver-transmitter, a dynamotor unit, a "BIRD" tilter and the transmitter and receiver antennas. The set receives signals from an interrogating ground station within the range of 2700 to 2900 MHz. When interrogated, the set transmits a signal preset within the range of 2800 to 2920 MHz to the interrogating station, enabling the ground station to establish the range and azimuth of the aircraft up to 50,000 feet in the radar line of sight to approximately 150 miles.

## CABIN PRESSURIZATION SYSTEM

The cabin is pressurized by the exhaust from the gyro instruments. The Xtreme Prototypes X-1 SG virtual aircraft has a functional dump valve lever to equalize the cabin pressure with the outside pressure. The "GYRO

VENT SELECTOR SWITCH" has no effect and is permanently set to **CABIN** to pressurize the cabin when the canopy is closed and the dump lever is set to **CLOSE**.



## DEFROSTING SYSTEM

The defrosting system consists of defrosting tubes clamped to the inside of the windshield, the control valves, and tubing to the nitrogen first-stage line. Opening the valves will allow nitrogen gas to flow across the inside of the windshield from holes in the tube, thereby defrosting the windshield. A dehydrating canister piped to the pilot's oxygen mask prevents fogging (not simulated). Note that the defrosting system consumes nitrogen.

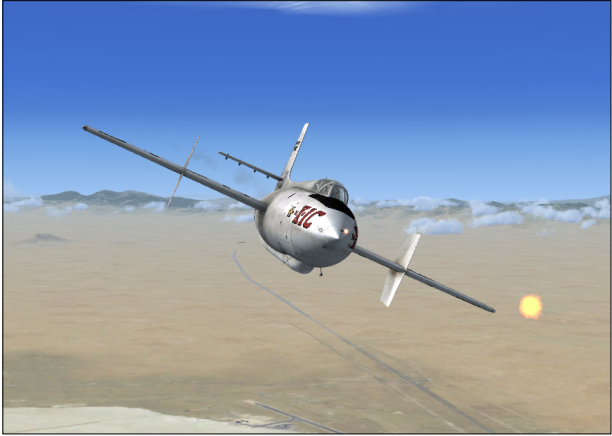
## SPERRY A-12 PROPILOT (X-1C ONLY)

The X-1C is equipped with the classic Sperry A-12 Propilot, providing basic autopilot modes such as heading hold, altitude and attitude hold, and wing leveler. The unit also has controls for aileron trim, elevator trim and turn.



### **.50 CALIBER MACHINE GUN (X-1C ONLY)**

The X-1C is equipped with a nose-mount .50 cal. Browning machine gun and a gun sight for the pilot, mounted above the main instrument panel. The machine gun can be fired by clicking on the center stick black handle with the mouse.



Refer to sections 5 and 6 for more details and complete normal operating instructions. Refer to section 7 for emergency operating instructions.

# INSTRUMENT PANELS (3D VIRTUAL COCKPITS)

## SECTION 5



What makes the Xtreme Prototypes X-1 Second Generation for Flight Simulator X especially exciting and unique are the **fully functional** 3D instrument panels and systems that have been recreated for the desktop pilot to simulate almost every step and procedure required during a typical X-1 research mission.

Over 200 custom systems, gauges, flight instruments, light indicators, switches and levers have been developed for the different variations of the Xtreme Prototypes X-1 SG for Flight Simulator X. Virtually all of them are functional and behave like the original analog devices installed in the real-world second generation X-1 aircraft during the 1950s.

X-1 instrument panels are not particularly complex but they are different from those found in conventional jet

aircraft. To help the desktop pilot familiarize him/herself with the rocket aircraft panels, special “tooltips” have been integrated within each flight instrument, gauge, switch, light indicator and lever. Simply move the cursor over a cockpit item with the mouse and its name and actual reading will display.

### 3D VIRTUAL COCKPITS

The virtual cockpits allow total 3D immersion into the X-1 SG flying environment. The Xtreme Prototypes X-1 SG package contains three different virtual cockpits for the different variations of the aircraft.

Each virtual cockpit contains over 800 parts and has been meticulously created to conform as closely as possi-

ble to the cabin of the real second generation X-1 aircraft.

The VC comes with a number of switches, control sticks, handles and levers. All the switches in the VC are clickable and most of them perform real simulator functions.



The VC has (fictitious) cockpit spotlights that are lit when the cockpit lighting switch is turned on (the real X-1 did not have cockpit lighting). This will allow you to fly the X-1 SG even at night.



The virtual cockpit is available in FSX from the “Views” menu in the main Flight Simulator menu bar at the top.

Some VC camera views are provided to help the pilot access switches and other items in areas of the cockpit that are difficult to reach when in the default VC view. Users can cycle forward or backward through the different views using the “S” key and the different camera views using the “A” key.



**IMPORTANT**  
**PLEASE READ CAREFULLY!**

There are no more 2D panels included with the Xtreme Prototypes add-on aircraft, following an industry trend since the launch of Flight Simulator X.

**HOW TO ACTIVATE THE SWITCHES, BUTTONS AND KNOBS IN THE VC**

All **toggle switches** can be alternately turned “on” and “off” by a simple left click with the mouse. Turning the mouse wheel up will turn the switch to “on”, turning the mouse wheel down will turn the switch to “off”.

**Note:** When the mouse cursor becomes a hand over an object and the tooltip is displayed, the 3D part can usually be activated by left clicking with the mouse.

**3-position switches** can be turned to their “up” position from their “middle” (or neutral) position by turning the mouse wheel up. Turning the mouse wheel down will move the switch lever down one position at the time (“up”, “mid”, “down”). Turning the mouse wheel up will move the switch lever up again one position at the time



(“down”, “mid”, “up”).

**Push-button switches** are animated and can be activated with a single left click.

Most **levers** can be activated with left mouse clicks or with the mouse wheel. Simply move the cursor over the lever handle with the mouse and turn the mouse wheel up or down (or click) to activate the lever.

Some handles and levers can also be dragged with the mouse. Simply click on the handle with the left mouse button, drag the handle to the desired position, and release the mouse button. Refer to the following pages for more details on how to activate specific levers and handles.



The **control stick** cannot be dragged with the mouse but is synchronized with the movements of your joystick (pitch and roll).

The **rudder pedals** are synchronized with the rotation movement of your joystick or your flight sim pedals (yaw).

Most **knobs** can be rotated by turning the mouse wheel left or right. Some knobs, such as the “radio frequency tuning knob”, may also respond to mouse clicks. Refer to the following pages for more details on how to activate specific knobs.

**MAIN INSTRUMENT PANEL**

Refer to fig. 5-2 to 5-4 for the location of the different instruments, gauges, light indicators, switches and levers described below:

**Cabin Altimeter** – The cabin altimeter [1, fig. 5-2, 5-3,

5-4] is a standard type.

**Aircraft Altimeter** – The aircraft altimeter [2, fig. 5-2, 5-3, 5-4] is a standard type C-19.



**Windshield Defroster Control Valves** – The defrosting system consists of the defrosting tube clamped to the left side of the windshield, the control valves [3, fig. 5-2, 5-3, 5-4], and tubing to the nitrogen first-stage line. When the aircraft windshield becomes foggy, opening the valve will allow nitrogen gas to flow across the inside of the windshield from holes in the tube, thereby defrosting the windshield (not simulated). A dehydrating canister piped to the pilot's oxygen mask prevents fogging. Note that the



defrosting system consumes nitrogen (simulated).

**Tank Vent and Pressurizing Switches** – The “FUEL TANK” vent switch [4, fig. 5-2, 5-3, 5-4] opens the tank vent valve to vent the tank when moved to **VENT**. Moving the switch to **PRESS** closes the valve to permit pressurizing the tank. The “LOX TANK” vent switch [4, fig. 5-2, 5-3, 5-4] opens the vent valve to vent the lox tank when moved to **VENT**. Moving the switch to **PRESS** closes the valve, permitting pressurization of the tank. The switch marked “H<sub>2</sub>O<sub>2</sub> TANK” [4, fig. 5-2, 5-3, 5-4] opens the vent valve of the tank to vent the tank when moved to **VENT**. Moving the switch to **PRESS** closes the valve, permitting the tank to be pressurized.

**Landing Gear Warning Lights** – The lights marked “WHEELS” [5, fig. 5-2, 5-3, 5-4] indicate the position of the landing gear. When the light marked “DOWN AND LOCKED” is lighted the gear is in a safe landing condition. The light marked “UNLOCKED” lights when the gear is in transit or in unsafe landing condition. Both lights are out when the gear is up and locked. The green and red indicator lights are the press-to-test type.

**Fuel and LOX Shut-Off Valve Switches** – The switch marked “FUEL SHUT-OFF VALVE” [6, fig. 5-2, 5-3, 5-4] opens or closes the fuel shut-off valve, establishing or terminating fuel flow to the turbine pump. Switch positions are **OPEN** and **CLOSE**. The switch marked “LOX SHUT-OFF VALVE” [6, fig. 5-2, 5-3, 5-4] establishes flow of LOX to the LOX unit of the turbine-driven pump when moved to **OPEN**. Moving the switch to **CLOSE** terminates the flow.

**Accelerometer** – The accelerometer [7, fig. 5-2, 5-3, 5-4] is a standard type.

**H<sub>2</sub>O<sub>2</sub> Temperature Gauges** – The gauges marked “H<sub>2</sub>O<sub>2</sub> TEMPERATURES” [8, 11, fig. 5-2, 5-3, 5-4] indicate the temperature of the H<sub>2</sub>O<sub>2</sub> in the tank and in the main line. Both temperature gauges and transmitters operate on DC current. The tooltip in the simulator also indicates the ambient (external) temperature.



**H<sub>2</sub>O<sub>2</sub> Line Temperature Warning Light** – The “LINE” warning light [9, fig. 5-2, 5-3, 5-4] will light if the temperature of the H<sub>2</sub>O<sub>2</sub> in the line drops near the freezing point, warning the pilot to jettison a portion of the supply to purge the H<sub>2</sub>O<sub>2</sub> thereby raising the tem-

perature. After the line temperature returns to normal, the “H<sub>2</sub>O<sub>2</sub> Temperature Relay Reset Button” [10, fig. 5-2, 5-3, 5-4] is pressed to reset the line temperature relay and turn the light off. The red indicator light is the press-to-test type.

**H<sub>2</sub>O<sub>2</sub> Tank Temperature Warning Light** – The “TANK” warning light [12, fig. 5-2, 5-3, 5-4] will light if the temperature of the H<sub>2</sub>O<sub>2</sub> in the tank rises rapidly to an abnormally high temperature, warning the pilot to jettison the supply. After the temperature returns to normal, the “H<sub>2</sub>O<sub>2</sub> Temperature Relay Reset Button” [10, fig. 5-2, 5-3, 5-4] is pressed to reset the H<sub>2</sub>O<sub>2</sub> temperature relay and turn the warning light off. The indicator light is the press-to-test type.

**H<sub>2</sub>O<sub>2</sub> Temperature Relay Reset Button** – After the H<sub>2</sub>O<sub>2</sub> temperatures return to normal, the “H<sub>2</sub>O<sub>2</sub> Temperature Relay Reset Button” [10, fig. 5-2, 5-3, 5-4] is pressed to reset the H<sub>2</sub>O<sub>2</sub> temperature relay and turn the “H<sub>2</sub>O<sub>2</sub> Temperature Warning Lights” off.

**Chamber Pressure Indicators** – The chamber pressure indicators [13, fig. 5-2, 5-3, 5-4] denote the operating pressures in the thrust chambers. The upper indicator

registers the pressure in number one and two chambers (pointers “1” and “2”), and the lower indicator registers the pressure in number three and four chambers (pointers “3” and “4”). The chamber pressure gauges are connected to their respective transmitters and operate on AC current.

**Emergency Jettison Valve** – The valve marked “EMERGENCY JETTISON FUEL, LOX AND H<sub>2</sub>O<sub>2</sub>” [14, fig. 5-2, 5-3, 5-4] allows the pressure from the emergency supply tank to open the jettison valves of the fuel, LOX and H<sub>2</sub>O<sub>2</sub> systems when moved from **OFF** to **JETTISON**.

**Important:** The emergency (N<sub>2</sub>) supply tank must be filled for the system to function. Click on the “Emergency Jettison Tank Pressure Gauge” [27, fig. 5-1; 4, fig. 5-7] to refill the tank to approximately 450 psi.

**Chamber Selector Switches** – The four chamber selector switches [16, fig. 5-2, 5-3, 5-4] are wired in series with the throttle in such a manner that any of the chambers may be turned on or off in conjunction with throttle movement. If chamber switches one and four are turned **ON** and switches two and three are turned **OFF** when the throttle is moved full forward, only chambers one and four will fire.

**Oxygen Blinker** – The flow indicator or “BLINKER” [17, fig. 5-2, 5-3, 5-4] shows when oxygen is being consumed by the pilot.



**WARNING**

Use 100% oxygen at all times. The cabin is pressurized by N<sub>2</sub> (nitrogen) gas from the gyro vent, and in the event of regulator malfunction the pilot would breathe N<sub>2</sub> gas.

**Oxygen Cylinder Pressure Gauge (clickable in the simulator)** – The pressure gauge [18, fig. 5-2, 5-3, 5-4] indicates the pressure in the oxygen system. Click on this gauge in the simulator to fill the pilot’s oxygen system to 425 psi.

**Landing Gear Line Pressure** – The landing gear line pressure gauge [45, fig. 5-2, 5-3, 5-4]



indicates the pressure in the up side of the landing gear system.

**Fuel Quantity Reset Button (modified in the simulator)** – The “FUEL RESET” button [24, fig. 5-2, 5-3, 5-4] is pressed to reset the gauge after the fuel tank is filled. Use this button in the simulator to fill the fuel tank with 570 gallons of water-alcohol. Note that clicking the fuel and LOX quantity gauge [22, fig. 5-2, 5-3, 5-4] performs the same function (see below).

**LOX Quantity Reset Button (modified in the simulator)** – The “LOX RESET” button [19, fig. 5-2, 5-3, 5-4] is pressed to reset the gauge after the LOX tank is filled. Use this button in the simulator to fill the LOX tank with 500 gallons of liquid oxygen. Frost will appear on the outer fuselage when the LOX tank is filled. Note that clicking the fuel and LOX quantity gauge [22, fig. 5-2, 5-3, 5-4] performs the same function (see below).



**H<sub>2</sub>O<sub>2</sub> Quantity Reset Button (fictitious)** – Use the “H<sub>2</sub>O<sub>2</sub> RESET” button [46, fig. 5-2, 5-3, 5-4] in the simulator to fill the H<sub>2</sub>O<sub>2</sub> tank to 37 gallons of hydrogen peroxide. Note that clicking the fuel and LOX quantity gauge [22, fig. 5-2, 5-3, 5-4] performs the same function (see below).

**Source Pressure Gauge (clickable in the simulator)** – The source pressure gauge [20, fig. 5-2, 5-3, 5-4] is direct reading and indicates the nitrogen pressure in the N<sub>2</sub> tube bundles (or tanks). Click on this gauge in the simulator to fill the nitrogen system to 4800 psi.

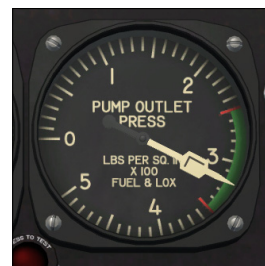
**Windshield De-icing Pump (animated but not simu-**

**lated)** – This handle [21, fig. 5-2, 5-3, 5-4] is used to pump de-icing fluid on the windshield and control surfaces.

**Fuel and LOX Quantity Gauge** – The fuel quantity gauge (“F” pointer) [22, fig. 5-2, 5-3, 5-4] denotes the amount of fuel remaining in the tank. The LOX quantity gauge (“L” pointer), denotes the amount of liquid oxygen in the tank. The fuel and LOX quantity gauges are connected to their respective transmitters and operate on AC current. The tooltip in the simulator also denotes the amount of H<sub>2</sub>O<sub>2</sub> in the tank. Clicking this gauge with the mouse in the simulator will fill the three propellant tanks simultaneously.

**Fire Warning Lights** – Three fire detection circuits are installed in the fuselage: one circuit in the engine area; one in the turbine area; and one in the hydrogen peroxide tank area. The red indicator lights [23, fig. 5-2, 5-3, 5-4] are the press-to-test type.

**Pump Outlet Pressure Indicator** – The pump outlet pressure indicator [25, fig. 5-2, 5-3, 5-4] registers the pressure of the propellants (fuel and LOX) delivered to the (engine) manifolds from the turbine-driven pump. The “F” pointer indicates the fuel manifold pressure and the “L” pointer indicates the LOX manifold pressure. The pump outlet pressure gauge is connected to its transmitter and operates on AC current.



**Optional Radio Magnetic Indicator (fictitious)** – The optional RMI can be displayed in the simulator by clicking the “SHOW/HIDE RMI” button [47, fig. 5-2, 5-3, 5-4] on the main panel.



**Optional Magnetic Compass (fictitious)** – The optional magnetic compass can be displayed in the simulator by clicking the “SHOW/HIDE MAGNETIC COMPASS” icon [47, fig. 5-2, 5-3, 5-4] on the main panel.

**H<sub>2</sub>O<sub>2</sub> Tank Pressure Gauge** – The H<sub>2</sub>O<sub>2</sub> tank pressure gauge [26, fig. 5-2, 5-3, 5-4] registers the N<sub>2</sub> pressure ap-



plied to the hydrogen peroxide in the tank. The H<sub>2</sub>O<sub>2</sub> tank pressure gauge is direct reading.



**Attitude Gyro** – The attitude gyro [27, fig. 5-2, 5-3, 5-4] operates from the first stage line pressure; the exhaust from the gyro instruments is utilized to pressurize the cabin (not simulated).

**Turbine Overspeed Warning Light** – The light marked “TURBINE OVERSPEED” [28, fig. 5-2, 5-3, 5-4] lights when the turbine overspeed and the overspeed control shuts the turbopump off. The light will stay on and the pump will be inoperative until the “TURBINE OVERSPEED RESET” button is pressed, returning the pump and overspeed control to operating status. The red indicator light is the press-to-test type.

**Clock** – The clock [29, fig. 5-2, 5-3, 5-4] indicates local time and can be set by turning the knob. Left or right clicking the knob will set the hour. Turning the mouse wheel up or down will set the minutes.

**Turn and Bank Indicator** – The turn-and-bank indicator [30, fig. 5-2, 5-3, 5-4] operates from the first stage line pressure.

**Stabilizer Position Indicator** – The indicator marked “STABILIZER POSITION” [31, fig. 5-2, 5-3, 5-4] indicates the position of the stabilizer (all-moving tail) in regard to the longitudinal axis of the aircraft. The stabilizer position indicator is connected to its transmitter and operates on AC current.

**Turbine Overspeed Reset Button** – The button marked “TURBINE OVERSPEED RESET” [32, fig. 5-2, 5-3, 5-4] is pressed to return the governor to an operating

status by releasing the overspeed interlock and relay after turbine overspeeding has occurred (for example, after pump cavitation).

**Turbine Governor Balance Pressure Indicator** – The turbine governor balance pressure indicator [33, fig. 5-2, 5-3, 5-4] registers the N<sub>2</sub> pressure at the turbine governor. The turbine governor balance pressure gauge is direct reading.

**Turbine Governor Balance Pressure Regulator and Spill Valve** – The valve marked “BAL. PRESS” [34, fig. 5-2, 5-3, 5-4] regulates the N<sub>2</sub> pressure on the pump governor, resulting in the control of pump output and manifold pressures. Use the mouse wheel in the simulator to open or close the valve (this will increase the pressure on the pump governor). Click the “SPILL” button on the front of the valve to release the pressure. The turbopump can be turned on and off by using this valve.

**Note:** The valve cannot be turned if the spill button is pushed. The spill button cannot be pushed if the valve is turned.

**Machmeter** – The machmeter [35, fig. 5-2, 5-3, 5-4] is pitot-static operated.

**LOX Tank and Dome Loading Regulator and Spill Valve** – The valve marked “TANK” [36, fig. 5-2, 5-3, 5-4] regulates the N<sub>2</sub> pressure on the LOX dome regulator, resulting in the control of LOX pressure in the tank. Use



the mouse wheel in the simulator to open or close the valve (this will increase the pressure on the LOX dome regulator). Click the “SPILL” button on the front of the valve to release the pressure. The LOX tank pressure can be adjusted by using this valve.

**Fuel Tank and Dome Loading Regulator and Spill Valve** – The valve marked “TANK” [37, fig. 5-2, 5-3, 5-4] regulates the N<sub>2</sub> pressure on the fuel dome regulator, resulting in the control of fuel pressure in the tank. Use the mouse wheel in the simulator to open or close the valve (this will increase the pressure on the fuel dome regulator). Click the “SPILL” button on the front of the valve to release the pressure. The fuel tank pressure can be adjusted by using this valve.

**First Stage Dome Loading Regulator and Spill Valve** – The valve marked “STAGE” [38, fig. 5-2, 5-3, 5-4] regulates the N<sub>2</sub> pressure on the first stage dome regulator, resulting in the control of nitrogen pressure in the first stage. Use the mouse wheel in the simulator to open or close the valve (this will increase the pressure on the first stage dome regulator). Click the “SPILL” button on the front of the valve to release the pressure. The first stage (N<sub>2</sub>) pressure can be adjusted by using this valve.

**First Stage Dome Pressure Gauge** – The first stage dome pressure gauge [39, fig. 5-2, 5-3, 5-4] is direct reading.

**LOX Tank and Dome Pressure Gauge** – The LOX tank and dome pressure gauge [40, fig. 5-2, 5-3, 5-4] is connected to its transmitter and operates on AC current. The “D” pointer indicates the dome pressure. The “T” pointer indicates the pressure in the tank.

**First Stage Line Pressure Gauge** – The first stage line pressure gauge [41, fig. 5-2, 5-3, 5-4] is direct reading.

**Fuel Tank and Dome Pressure Gauge** – The fuel tank and dome pressure gauge [42, fig. 5-2, 5-3, 5-4] is connected to its transmitter and operates on AC current. The “D” pointer indicates the dome pressure. The “T” pointer indicates the pressure in the tank.

**Gyro Vent Selector Switch (animated but not simulated)** – The cabin is pressurized by the exhaust from the gyro instruments. The “GYRO VENT” switch [43, fig. 5-2] directs the instrument exhaust overboard when moved to **OUTSIDE**, and into the cabin for pressurization when moved to **CABIN** (this switch is animated but its effect is not simulated). A dump valve controlled by the lever [26, fig. 5-1; 5, fig. 5-7] dumps the pressure when actuated (simulated).

**Airspeed Indicator** – The airspeed indicator [44, fig. 5-2, 5-3, 5-4] is pitot-static operated.

**Flight Simulator Push Buttons (fictitious)** – Flight Simulator buttons [47, fig. 5-2, 5-3, 5-4] are provided on the main panel for showing or hiding the GPS window, the map, the optional RMI and magnetic compass, and

the kneeboard.

**Automatic Ignition Sequence Button (fictitious)** –

Clicking the automatic ignition sequence (red) button on the main panel [15, fig. 5-2, 5-3, 5-4] initiates the automatic ignition sequence and will start the XLR-11 engine after a normal delay of about 30-40 seconds. This is similar to pressing CTRL+E with conventional FS aircraft. However, the red button reinitializes all X-1 custom systems, including her three-propellant rocket fuel management system.



You can use this button instead of CTRL+E to properly start the engine without going through the normal procedures and check list described in section 6. Simply click the red button and you can sit and relax and watch all the switches and gauges move all by themselves in the cockpit while the auto ignition sequence executes the procedures for you and ignites the rocket.

**Note:** The 30-second delay is due to the fact that Flight Simulator sees the X-1’s XLR-11 thrust chambers as a jet engines with conventional starters (see manual supplement on page 6). Instant ignition of rocket engines is still not possible in FSX.

**CENTER PEDESTAL (SWITCH PANEL)**

Refer to fig. 5-5 for the location of the different switches and light indicators described below:



**Aileron Trim Tab Switch** – The switch marked “AILERON TRIM TAB” [1, fig. 5-5] will actuate the tab on the right aileron to trim the aircraft laterally. Switch positions are **RIGHT WING DOWN** and **LEFT WING DOWN**.

**LOX Auxiliary Vent Switch** – The “AUX LOX VENT” switch [2, fig. 5-5] opens the auxiliary vent valve in the ventral fairing area when moved to **VENT** to facilitate filling and venting during climb. The vent closes when the switch is moved to **CLOSE**.

**Radio Switch (modified in the simulator)** – The “RADIO” switch [3, fig. 5-5] turns the radio **ON** or **OFF**. The Xtreme Prototypes X-1 SG virtual aircraft features a modified ARC-5 radio for use with civilian frequencies in Flight Simulator X. Turning the radio switch **ON** also turns on the FS aircraft avionics and the GPS (see “Radio channel selector switch” below).

**Battery Switch** – The battery switch [4, fig. 5-5] disconnects the batteries from the aircraft’s electrical circuits when moved to **OFF**. When moved to **ON**, the battery relay is energized, completing the circuit. The switch is moved to **OFF** when external power is applied (not simulated) to prevent by-passing the external power to the batteries.

**Pitot Heat Switch** – The pitot heat switch [5, fig. 5-5] is functional and can be turned **ON** or **OFF**.

**Radar Switch (not simulated)** – The radar beacon (not simulated) is turned **ON** or **OFF** by the “RADAR BEACON” switch [6, fig. 5-5].

**Interphone Switch (modified in the simulator)** – The interphone (not simulated) is turned **ON** or **OFF** by the “INTERPHONE” switch [7, fig. 5-5]. Turning the switch to **ON** in the simulator will turn off the sound from the COMM/NAV radios.

**Inverter Switch** – The inverter switch [7, fig. 5-5] energizes the inverter circuit when moved to **ON** if the “BATTERY” switch [4, fig. 5-5] is **ON** or external power (not simulated) is applied. The inverter provides AC power to the aircraft and must be turned **ON** for normal operation.

**Igniter Test Switch** – The igniter test switch [9, fig. 5-5] enables the pilot to test the operation of the four thrust chamber igniters, and the turbine pump control components, independently of the thrust chambers



when moved from **OFF** to **ON**. Make sure the switch is turned **OFF** for normal engine operation.

**Drop Light and Switch (modified in the simulator, on specially-equipped X-1A and X-1D models with B-29 carrier only)** – The droplight system consists of the light and switch [16, 17, fig. 5-5] which are connected in series with a light adjacent to the drop handle in the B-29 carrier aircraft. The switch is turned **ON** prior to a drop, and if, for any reason, the drop is not to be made, the pilot turns the switch **OFF**, thereby notifying the mother airplane not to complete the drop. The green indicator light is the press-to-test type. The switch and light are electrically powered by the B-29 carrier.



In Flight Simulator, the droplight system is used to simulate the high-altitude launch of X-1A or X-1D (specially-equipped models only) from a light variation of a modified Boeing B-29 “Superfortress” carrier aircraft (included with your X-1 SG package).

The X-1A or X-1D with the B-29 carrier must first be selected in the “**Select Aircraft**” page in FSX. Drops from a B-29 carrier are not possible with the other X-1 SG models.

Because of the limitations of the simulator and some landing gear issues, takeoffs with the X-1 SG mated to the B-29 are not possible in the current version of the software (FSX does not allow for truly flying two mated and powered aircraft at the same time). The supplied B-29 exterior model is an extension of the X-1 SG model and cannot be self-powered nor flown independently in the simulator for the above reason.

The best way to simulate a high-altitude drop in the simulator is to load one of the high-altitude saved flights (see appendix 2) or to manually position the mated B-29/X-1A/D aircraft at about 40,000 feet and 325 KIAS **by using the map provided in Flight Simulator.**

The drop switch [16, fig. 5-5] is turned to **STANDBY** (or MID position) as soon as the flight is loaded to make the B-29 carrier visible. The B-29 carrier is only visible when the X-1 SG is airborne and the drop switch is set to **STANDBY** or **ON**.

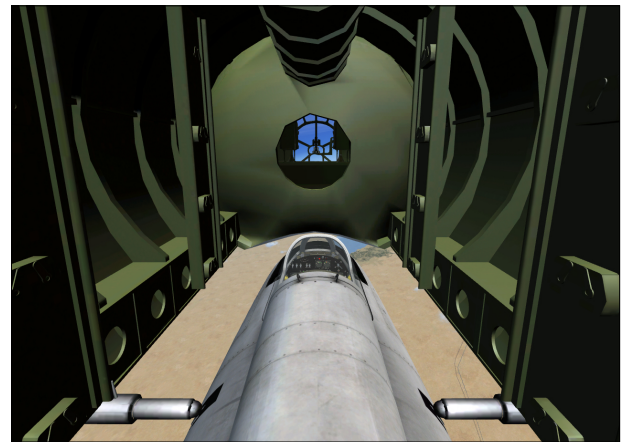
When the X-1 SG is mated to the B-29, the carrier bay will be visible from inside the VC and will obstruct most of the front view. A small front view window (main 2D panel) can be opened to compensate for the limited forward view.



Because the B-29 is not self-powered (even if the illusion is present), the mated aircraft will decelerate very rapidly after the flight is loaded. The X-1 SG must be powered as soon as the drop is made to maintain speed and resume normal flight.

This can easily be accomplished by clicking the automatic ignition sequence button on the main panel [15, fig. 5-2, 5-3, 5-4] as soon as the flight is loaded and **before** the drop. When ready for launch (usually, after the chamber switches have been turned on by the automatic ignition sequence), the drop switch will be turned **ON** (UP posi-

tion) to initiate a 10-second countdown after which the X-1 SG will separate from the B-29.



This can only be done once during a particular flight. The countdown can be stopped and resumed at any time by turning the drop switch to **STANDBY** (MID position) and back to **ON** again. If interrupted before zero count, the countdown can be reset to 10 seconds by turning the drop switch to **OFF** (DOWN position) and back to **STANDBY** again.

After the countdown is over and the X-1 SG is launched, the X-1 SG can no longer be mated to the B-29 until the next flight (or the aircraft reloaded).

After the drop, the pilot will maintain speed by lowering the nose of the free-falling X-1 SG aircraft until the rocket engine starts.

**The drop switch has three positions in the simulator:**

- When the switch is set to **OFF** (DOWN position), the B-29 is not visible and the X-1 SG is stand-



ing alone.

- When the switch is set to **STANDBY** (MID position), the B-29 is visible if the X-1 SG is airborne. This option is used in preparation for a high-altitude simulated launch from the B-29 mother aircraft.
- Turning the drop switch to **ON** (UP position) will light the drop light and initiate a 10-second countdown (visible in the light or switch tooltips) which can be interrupted at any time by turning the switch back to **STANDBY** or **OFF**. The X-1 SG will separate from the B-29 at the end of the countdown. When at a certain distance from the X-1 SG, the B-29 will become invisible, simulating a high-altitude drop and leaving the X-1 SG by herself.

**Jettison Switches** – The “JETTISON” switch [15, fig. 5-5] marked “FUEL” opens the fuel jettison valve when moved from **OFF** to **ON**, thereby jettisoning a portion or all the fuel from the aircraft. When only the fuel is jettisoned, the aircraft will assume a nose-heavy attitude. The “JETTISON” switch marked “LOX” opens the jettison valve of the liquid oxygen system when moved from **OFF** to **ON**, thereby expelling the LOX overboard. When only the LOX is jettisoned, the aircraft assumes a tail-heavy attitude. The “JETTISON” switch marked “H<sub>2</sub>O<sub>2</sub>” opens the jettison valve of the system when moved from **OFF** to **ON**, thereby expelling a portion or all the H<sub>2</sub>O<sub>2</sub> overboard.

**Note:** Because of the limitations of the FSX special effects system, there is no effect associated with H<sub>2</sub>O<sub>2</sub> jettison in the X-1C.



**Circuit Breakers** – All circuit breakers [10, fig. 5-5] are functional and will disable their associated electrical bus if set to **OFF** (pulled).

**Fire Extinguisher Selector Switch (modified in the simulator)** – The three-position fire extinguisher selector switch [11, fig. 5-5] will discharge the fire extin-

guisher system when moved to **MAN** (UP position) and will connect the system to the fire detection system for automatic operation when moved to **AUTO** (DOWN position). The system is set to **OFF** when the switch is in the **MIDDLE** position (fictitious).

When operated automatically, if one of the fire detectors is activated, the extinguisher system will be discharged, the fuel and LOX shut-off valves will close and the engine will shut off.

The X-1 SG for Flight Simulator is equipped with a functioning fire detection and extinguisher system to allow for the automatic or manual extinguishing of fire during flight (refer to the *Learning Center* in FSX for details on how to program or set an engine fire or failure in the simulator prior to or during a flight).

**Important:** The fire extinguisher system must be charged to approximately 1200 psi by clicking on the “extinguisher system pressure gauge” [1, fig. 5-1; 2, fig. 5-6] for the extinguisher system to function. Manually or automatically discharging the system will consume dibromodifluoromethane in the bottles and the pressure can be read on the gauge. The system can be recharged by clicking on the gauge (see below). External discharge indicators (flags) on the left forward fuselage provide an external indication whether the system has been discharged (see below).



**Radio Output Control (not simulated)** – The control knob marked “INCREASE OUTPUT” [12, fig. 5-5] controls the audio strength of the radio signal.



**Radio Channel Selector Switch (modified in the simulator)** – The four Xtreme Prototypes X-1 SG virtual aircraft feature a modified ARC-5 radio for use with civilian frequencies in Flight Simulator X. The set has two VHF communication transceivers (COM1 and COM2), an automatic direction finder (ADF) and a radio-navigation receiver (VOR) that can be selected by turning the radio channel selector switch [13, fig. 5-5]. The frequency for each “channel” can be selected using the “radio frequency tuning knob” [14, fig. 5-5].

ADF and VOR indications can be read on the optional radio-magnetic indicator (RMI) on the main panel. An optional magnetic compass is provided for adjusting the RMI, if needed. The default Flight Simulator Garmin GPS unit is also available.



The RMI, the magnetic compass and the GPS, as well as the map and the kneeboard, are displayed or hidden by pressing a series of (fictitious) push buttons located in the center section of the main instrument panel [47, fig. 5-2, 5-3, 5-4].

**Radio Frequency Tuning Knob (fictitious)** – The radio frequency tuning knob [14, fig. 5-5] can be used to select the desired frequency for each radio “channels” mentioned above (COM1, COM2, ADF, VOR). Left or right clicking the knob with the mouse will decrease or increase the wholes. Turning the mouse wheel up or down will increase or decrease the fractions.

## COCKPIT – LEFT SIDE

Refer to fig. 5-6 for the location of the different cockpit items described below:

**Landing Gear Control Lever** – The lever [2, fig. 5-6] on the left side of the cockpit extends the gear when



moved down and retracts the gear when moved up. Movement of the lever operates the mechanical locks and actuates the switches which control the solenoid valves. The lever is locked in the down position and is released by moving it inboard. In the event of pressure failure, the gear falls free and locks in the down position when the lever is moved down. When the lever is moved down, the tank vent valves are opened (not simulated).

**Harness Release (not simulated)** – This lever [3, fig. 5-6] fastens or releases the pilot’s harness.

**Stabilizer Manual Control Lever** – In the event of an electrical failure the actuator control valve may be operated by this lever [4, fig. 5-6] on the left side of the cockpit. The “all-moving tail” can be trimmed 5 degrees up and 10 degrees down from neutral. The indicator marked “STABILIZER POSITION” on the main panel [31, fig. 5-2, 5-3, 5-4] indicates the position of the stabilizer in regard to the longitudinal axis of the aircraft.



**Flap Switch** – The flaps are raised or lowered when the “FLAP” switch [5, fig. 5-6] is moved to **UP** or **DOWN**.



**Throttle** – The X-1 SG “throttle” [6, fig. 5-6] operates four electrical switches which are connected to the four thrust chambers through the motor control, in series with the four chamber selector switches on the main panel [16, fig. 5-2, 5-3, 5-4], and the emergency cut-off switch [7, fig. 5-

7]. Progressive movement of the throttle from its **OFF** position will result in (position 1) 25%, (position 2) 50%, (position 3) 75% and (position 4) 100% increments of rated thrust, when the four chamber selector switches are **ON**. The button on the throttle is held in to radio transmit (PTT).

**Important:** The throttle inside the X-1 SG virtual cockpit has a different function and is independent from the simulator (joystick) throttle. For example, the VC throttle will not move according to the movement of your joystick throttle. The VC throttle is used as a multi-position switch to select which thrust chamber(s) can be fired and throttled by your joystick throttle. Although the real XLR-11 rocket engine on the X-1 SG could not be throttled, your joystick throttle is still active in the simulator and can be used to adjust the thrust of selected chambers (fictitious).

**Canopy Lock Indicator** – This flag [7, fig. 5-6] indicates if the canopy is locked.

**Canopy Locking Lever (modified in the simulator)** – Click on this lever [8, fig. 5-6] in the simulator to close and lock (or unlock and open) the canopy. Click on left canopy handle first for normal canopy lock. Click on right canopy handle first for normal canopy release.

**Canopy Emergency Release Handle** – Pull this handle [9, fig. 5-6] to release (jettison) the canopy in the event of an emergency.

**Extinguisher System Pressure Gauge (modified and clickable in the simulator)** – The pressure gauge [1, fig. 5-1; 2, fig. 5-6] indicates the pressure in the  $CF_2Br_2$  (dibromodifluoromethane) bottles. Click on the gauge to recharge the extinguisher system to approximately 1200 psi. See also “Fire Extinguisher Selector Switch” [11, fig. 5-5] above.

## COCKPIT – RIGHT SIDE

Refer to fig. 5-7 for the location of the different cockpit items described below:

**Canopy Locking Lever (modified in the simulator)** – Click on this lever [1, fig. 5-7] in the simulator to close and lock (or unlock and open) the canopy. Click on left canopy handle first for normal canopy lock. Click on right canopy handle first for normal canopy release.

**Canopy Pressure Seal Valve (animated but not simulated)** – Turn this valve [2, fig. 5-7] to inflate the canopy seal.



**Canopy Lock Indicator** – This flag [3, fig. 5-7] indicates if the canopy is locked.

**Emergency Jettison Tank Pressure Gauge (clickable in the simulator)** – The gauge [4, fig. 5-7] registers the ( $N_2$ ) pressure available in the emergency jettison system supply tank. The emergency jettison pressure gauge is direct reading. Click on the gauge to fill the tank to approximately 450 psi.



**Cabin Pressure Dump Valve Control Lever** – A dump valve controlled by the lever [5, fig. 5-7] dumps the cabin pressure when actuated.

**Stabilizer Actuator Switch** – The switch [6, fig. 5-7] on the control stick will energize the stabilizer actuator when moved fore or aft. Moving the switch forward will trim the aircraft nose down; moving the switch aft will trim the aircraft nose up.



**Note:** The switch can be activated in the simulator by using the trim buttons on your joystick (or the “1+7” keys).

In the event of an electrical failure, the actuator control valve may be operated by the lever [4, fig. 5-6] on the left side of the cockpit (see above). The “all-moving tail” can be trimmed electrically 5 degrees up and 10 degrees down from neutral. The indicator marked “STABILIZER POSITION” on the main panel [31, fig. 5-2, 5-3, 5-4] indicates

the position of the stabilizer in regard to the longitudinal axis of the aircraft.

**Emergency Cut-Off Switch** – The (red) emergency cut-off switch on the control stick [7, fig. 5-7] shuts off all the chambers when actuated in the event of an emergency. A latching relay holds the circuits in an inoperative condition until the battery switch [4, fig. 5-5] is momentarily turned **OFF**, which returns circuits to an operating status.

**Oxygen Regulator** – The type A-14 diluter demand aircraft oxygen regulator [8, fig. 5-7] when set at **NORMAL** regulates the flow of oxygen in accordance with the pilot's needs. When set at **100% OXYGEN**, no dilution occurs and pure oxygen is supplied. The supply is depleted much more rapidly with the regulator at **100%**.



### WARNING

**Use 100% oxygen at all times.** The cabin is pressurized by N<sub>2</sub> (nitrogen) gas from the gyro vent, and in the event of regulator malfunction the pilot would breathe N<sub>2</sub> gas.

**Note:** The flow indicator or “BLINKER” [17, fig. 5-2, 5-3, 5-4] on the main panel shows when oxygen is being consumed by the pilot. The pressure gauge [18, fig. 5-2, 5-3, 5-4] indicates the pressure in the oxygen system. The pilot's oxygen system is filled to 425 psi by clicking on this gauge in the simulator.

**Pilot's Flight Suit Heater (modified in the simulator, animated but not simulated)** – The heater temperature knob [13, fig. 5-7] can be turned from position 0 to 5.



**Instrumentation Control Box (modified in the simulator, animated but not simulated)** – The knob and switches on the right side instrumentation control box [12, fig. 5-7] can be activated.

**Cockpit Lighting Switch (fictitious)** –

The cockpit lighting switch on the right side instrumentation control box [11, fig. 5-7] can be turned **ON** to lighten the two (fictitious) canopy spotlights located on each side of the cockpit [10, fig. 5-6, 5-7], to provide cockpit lighting at dawn, dusk or night.

### SPERRY A-12 PROPILOT (X-1C ONLY)

The (never built) X-1C was to be equipped with the classic Sperry A-12 Propilot, providing basic autopilot modes such as heading hold, altitude and attitude hold, and wing leveler. The unit also had controls for aileron trim, elevator trim and turn.



A modified Sperry A-12 autopilot unit is installed in the Xtreme Prototypes X-1C for Flight Simulator X (see fig. 5-4). Most of the following autopilot levers and switches on the unit are self explanatory:

**AP Autopilot Master Switch** – Self explanatory [52, fig. 5-4].

**AP Dual Elevator Trim Wheels** – Turning either wheel [57, fig. 5-4] up or down with the mouse wheel will command the plane's nose up or down.

**AP Turn Knob** – Turning the AP turn knob [54, fig. 5-4] with the mouse wheel will command a turn with a bank proportional to knob position. To roll out of the turn and level the wings, simply return the turn knob to its center position.

**AP Trim Conditions Indicator** – The indicator [53, fig. 5-4] displays rudder, aileron and elevator trim conditions.

**AP Altitude Hold Switch** – Self explanatory [56, fig. 5-4].

**AP Aileron Trim Knob** – Turning the AP aileron trim knob with the mouse wheel [55, fig. 5-4] will actuate the



tab on the right aileron to trim the aircraft laterally.

**AP Compass Hold (FS AP Heading Hold) Lever** – Self explanatory [58, fig. 5-4].

**AP Pitch Hold (FS AP Attitude Hold) Lever** – Self explanatory [59, fig. 5-4].

**AP Roll Hold (FS AP Wing Leveler) Lever** – Self explanatory [60, fig. 5-4].

### **.50 CALIBER MACHINE GUN (X-1C ONLY)**

The (never built) X-1C, which was designed to test high-speed armaments, was to be equipped with a brown-ing .50 caliber machine gun in the nose and a gun sight for the pilot, above the main instrument panel, in the cockpit (see fig. 5-4).



A functioning machine gun is installed in the nose of the Xtreme Prototypes X-1C for Flight Simulator X. A basic gun sight is also installed in the cockpit.

The **machine gun can be triggered by clicking** the black handle on the center stick [9, fig. 5-7].

### **OTHER**

**Extinguisher System Discharge Indicators (modified in the simulator)** – The three extinguisher system discharge indicators provide an external indication whether the system has been discharged. The indicators are located on the left forward fuselage (exterior model).



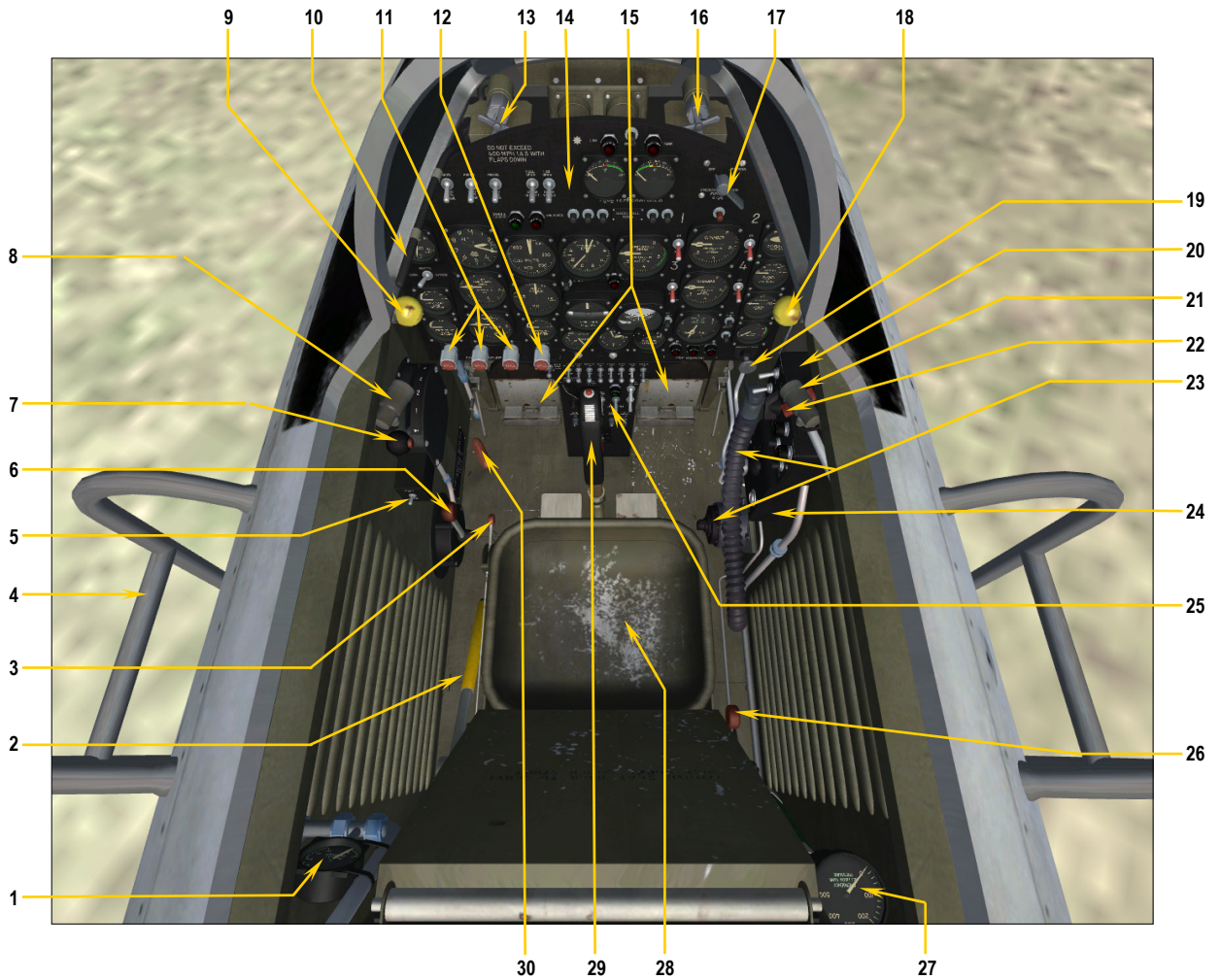


Figure 5-1

- |   |   |   |
|---|---|---|
| <ul style="list-style-type: none"> <li>1. FIRE EXTINGUISHER SYSTEM GAUGE</li> <li>2. LANDING GEAR CONTROL LEVER</li> <li>3. HARNESS RELEASE (NOT SIMULATED)*</li> <li>4. LADDER</li> <li>5. FLAP SWITCH</li> <li>6. STABILIZER MANUAL CONTROL LEVER</li> <li>7. THROTTLE AND MICROPHONE PTT SWITCH</li> <li>8. CABIN SPOTLIGHT (FICTITIOUS)</li> <li>9. LEFT CANOPY LOCKING LEVER</li> <li>10. WINDSHIELD DEFROSTER TUBE (NOT SIMULATED)</li> <li>11. DOME PRESSURE REGULATORS AND SPILL VALVES</li> <li>12. TURBINE GOVERNOR BALANCE PRESSURE</li> </ul> | <ul style="list-style-type: none"> <li>REGULATOR AND SPILL VALVE</li> <li>13. WINDSHIELD DEFROSTER VALVE (NOT SIMULATED)</li> <li>14. MAIN INSTRUMENT PANEL</li> <li>15. RUDDER PEDALS AND BRAKES</li> <li>16. WINDSHIELD DEFROSTER VALVE (NOT SIMULATED)</li> <li>17. EMERGENCY JETTISON VALVE (LOCATED ON LEFT SIDE OF CABIN IN X-1B AND X-1C)</li> <li>18. RIGHT CANOPY LOCKING LEVER</li> <li>19. WINDSHIELD DE-ICING PUMP (NOT SIMULATED)</li> <li>20. RIGHT CONTROL BOX (INSTRUMENTATION, NOT SIMULATED)</li> </ul> | <ul style="list-style-type: none"> <li>21. CABIN SPOTLIGHT (FICTITIOUS)</li> <li>22. CANOPY PRESSURE SEAL VALVE (NOT SIMULATED)</li> <li>23. OXYGEN REGULATOR</li> <li>24. PILOT'S FLIGHT SUIT HEATER (NOT SIMULATED)</li> <li>25. CENTER PEDESTAL (SWITCH PANEL)</li> <li>26. CABIN PRESSURE DUMP VALVE CONTROL LEVER</li> <li>27. EMERGENCY JETTISON TANK PRESSURE GAUGE</li> <li>28. CONVENTIONAL SEAT</li> <li>29. CENTER STICK</li> <li>30. CANOPY EMERGENCY RELEASE HANDLE</li> </ul> |
|---|---|---|

\*: Non-simulated items are animated in the VC to simulate normal procedures described in section 6.

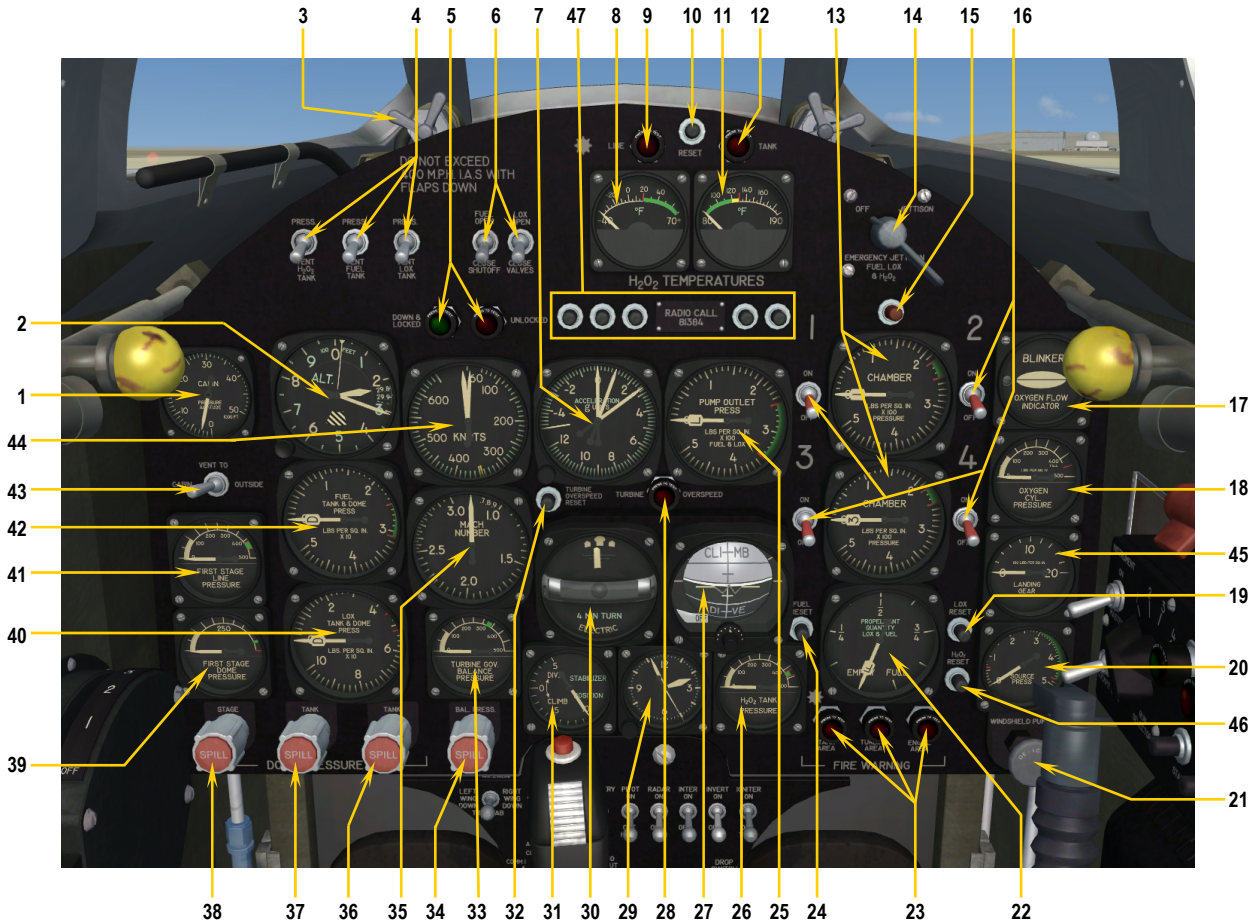


Figure 5-2

- |  |   |   |
|--|---|---|
| <ul style="list-style-type: none"> <li>1. CABIN ALTIMETER</li> <li>2. AIRCRAFT ALTIMETER</li> <li>3. WINDSHIELD DEFROSTER CONTROL VALVE (NOT SIMULATED)*</li> <li>4. TANK VENT AND PRESSURIZING SWITCHES</li> <li>5. LANDING GEAR WARNING LIGHTS</li> <li>6. FUEL AND LOX SHUT-OFF VALVE SWITCHES</li> <li>7. ACCELEROMETER (OR OPTIONAL MAGNETIC COMPASS, FICTITIOUS, NOT SHOWN)</li> <li>8. H<sub>2</sub>O<sub>2</sub> LINE TEMPERATURE GAUGE</li> <li>9. H<sub>2</sub>O<sub>2</sub> LINE TEMPERATURE WARNING LIGHT</li> <li>10. H<sub>2</sub>O<sub>2</sub> TEMPERATURE RELAY RESET BUTTON</li> <li>11. H<sub>2</sub>O<sub>2</sub> TANK TEMPERATURE GAUGE</li> <li>12. H<sub>2</sub>O<sub>2</sub> TANK TEMPERATURE WARNING LIGHT</li> <li>13. CHAMBER PRESSURE INDICATORS</li> <li>14. EMERGENCY JETTISON VALVE</li> <li>15. AUTOMATIC IGNITION SEQUENCE BUTTON (FICTITIOUS)</li> <li>16. CHAMBER SELECTOR SWITCHES</li> <li>17. OXYGEN BLINKER</li> </ul> | <ul style="list-style-type: none"> <li>18. OXYGEN CYLINDER PRESSURE GAUGE</li> <li>19. LOX QUANTITY RESET BUTTON (MODIFIED)</li> <li>20. SOURCE PRESSURE GAUGE</li> <li>21. WINDSHIELD DE-ICING PUMP</li> <li>22. FUEL AND LOX QUANTITY GAUGE</li> <li>23. FIRE WARNING LIGHTS</li> <li>24. FUEL QUANTITY RESET BUTTON (MODIFIED)</li> <li>25. PUMP OUTLET PRESSURE INDICATOR (OR OPTIONAL RADIO MAGNETIC INDICATOR, FICTITIOUS, NOT SHOWN)</li> <li>26. H<sub>2</sub>O<sub>2</sub> TANK PRESSURE GAUGE</li> <li>27. ATTITUDE GYRO</li> <li>28. TURBINE OVERSPEED WARNING LIGHT</li> <li>29. CLOCK</li> <li>30. TURN AND BANK INDICATOR</li> <li>31. STABILIZER POSITION INDICATOR</li> <li>32. TURBINE OVERSPEED RESET BUTTON</li> <li>33. TURBINE GOVERNOR BALANCE PRESSURE INDICATOR</li> <li>34. TURBINE GOVERNOR BALANCE PRESSURE</li> </ul> | <ul style="list-style-type: none"> <li>REGULATOR AND SPILL VALVE</li> <li>35. MACHMETER</li> <li>36. LOX TANK AND DOME LOADING REGULATOR AND SPILL VALVE</li> <li>37. FUEL TANK AND DOME LOADING REGULATOR AND SPILL VALVE</li> <li>38. FIRST STAGE DOME LOADING REGULATOR AND SPILL VALVE</li> <li>39. FIRST STAGE DOME PRESSURE GAUGE</li> <li>40. LOX TANK AND DOME PRESSURE GAUGE</li> <li>41. FIRST STAGE LINE PRESSURE GAUGE</li> <li>42. FUEL TANK AND DOME PRESSURE GAUGE</li> <li>43. GYRO VENT SELECTOR SWITCH (NOT SIMULATED)</li> <li>44. AIRSPEED INDICATOR</li> <li>45. LANDING GEAR PRESSURE GAUGE</li> <li>46. H<sub>2</sub>O<sub>2</sub> QUANTITY RESET BUTTON (FICTITIOUS)</li> <li>47. FLIGHT SIMULATOR PUSH BUTTONS (FICTITIOUS)</li> </ul> |
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\*: Non-simulated items are animated in the VC to simulate normal procedures described in section 6. The X-1D panel is almost identical to the X-1A panel, so the same panel is used in both virtual aircraft.

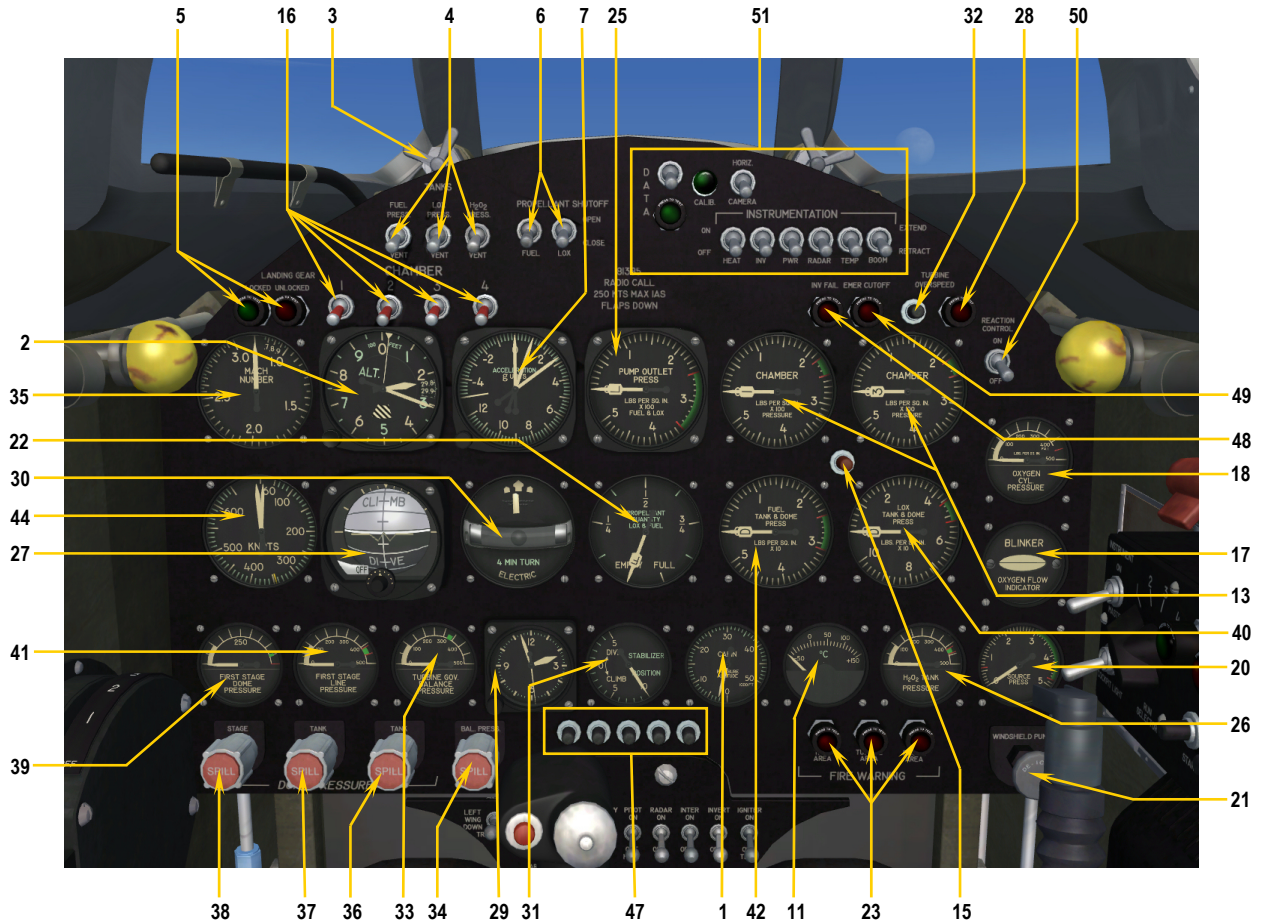


Figure 5-3

- |   |   |  |
|---|---|--|
| <ol style="list-style-type: none"> <li>1. CABIN ALTIMETER</li> <li>2. AIRCRAFT ALTIMETER</li> <li>3. WINDSHIELD DEFROSTER CONTROL VALVE (NOT SIMULATED)*</li> <li>4. TANK VENT AND PRESSURIZING SWITCHES</li> <li>5. LANDING GEAR WARNING LIGHTS</li> <li>6. FUEL AND LOX SHUT-OFF VALVE SWITCHES</li> <li>7. ACCELEROMETER (OR OPTIONAL MAGNETIC COMPASS, FICTITIOUS, NOT SHOWN)</li> <li>8. N/A</li> <li>9. N/A</li> <li>10. N/A</li> <li>11. H<sub>2</sub>O<sub>2</sub> TANK TEMPERATURE GAUGE</li> <li>12. N/A</li> <li>13. CHAMBER PRESSURE INDICATORS</li> <li>14. EMERGENCY JETTISON VALVE (ON LEFT SIDE OF CABIN, NOT SHOWN)</li> <li>15. AUTOMATIC IGNITION SEQUENCE BUTTON (FICTITIOUS)</li> <li>16. CHAMBER SELECTOR SWITCHES</li> <li>17. OXYGEN BLINKER</li> <li>18. OXYGEN CYLINDER PRESSURE GAUGE</li> </ol> | <ol style="list-style-type: none"> <li>19. N/A</li> <li>20. SOURCE PRESSURE GAUGE</li> <li>21. WINDSHIELD DE-ICING PUMP</li> <li>22. FUEL AND LOX QUANTITY GAUGE</li> <li>23. FIRE WARNING LIGHTS</li> <li>24. FUEL QUANTITY RESET BUTTON (MODIFIED)</li> <li>25. PUMP OUTLET PRESSURE INDICATOR (OR OPTIONAL RADIO MAGNETIC INDICATOR, FICTITIOUS, NOT SHOWN)</li> <li>26. H<sub>2</sub>O<sub>2</sub> TANK PRESSURE GAUGE</li> <li>27. ATTITUDE GYRO</li> <li>29. CLOCK</li> <li>30. TURN AND BANK INDICATOR</li> <li>31. STABILIZER POSITION INDICATOR</li> <li>32. TURBINE OVERSPEED RESET BUTTON</li> <li>33. TURBINE GOVERNOR BALANCE PRESSURE INDICATOR</li> <li>34. TURBINE GOVERNOR BALANCE PRESSURE REGULATOR AND SPILL VALVE</li> <li>35. MACHMETER</li> <li>36. LOX TANK AND DOME LOADING REGULATOR</li> </ol> | <ol style="list-style-type: none"> <li>AND SPILL VALVE</li> <li>37. FUEL TANK AND DOME LOADING REGULATOR AND SPILL VALVE</li> <li>38. FIRST STAGE DOME LOADING REGULATOR AND SPILL VALVE</li> <li>39. FIRST STAGE DOME PRESSURE GAUGE</li> <li>40. LOX TANK AND DOME PRESSURE GAUGE</li> <li>41. FIRST STAGE LINE PRESSURE GAUGE</li> <li>42. FUEL TANK AND DOME PRESSURE GAUGE</li> <li>43. N/A</li> <li>44. AIRSPEED INDICATOR</li> <li>45. N/A</li> <li>46. N/A</li> <li>47. FLIGHT SIMULATOR PUSH BUTTONS (FICTITIOUS)</li> <li>48. INVERTER FAILURE WARNING LIGHT</li> <li>49. EMERGENCY CUT-OFF WARNING LIGHT</li> <li>50. REACTION CONTROL SYSTEM SWITCH</li> <li>51. INSTRUMENTATION SWITCHES (NOT SIMULATED)</li> </ol> |
|---|---|--|

\*: Non-simulated items are animated in the VC to simulate normal procedures described in section 6.

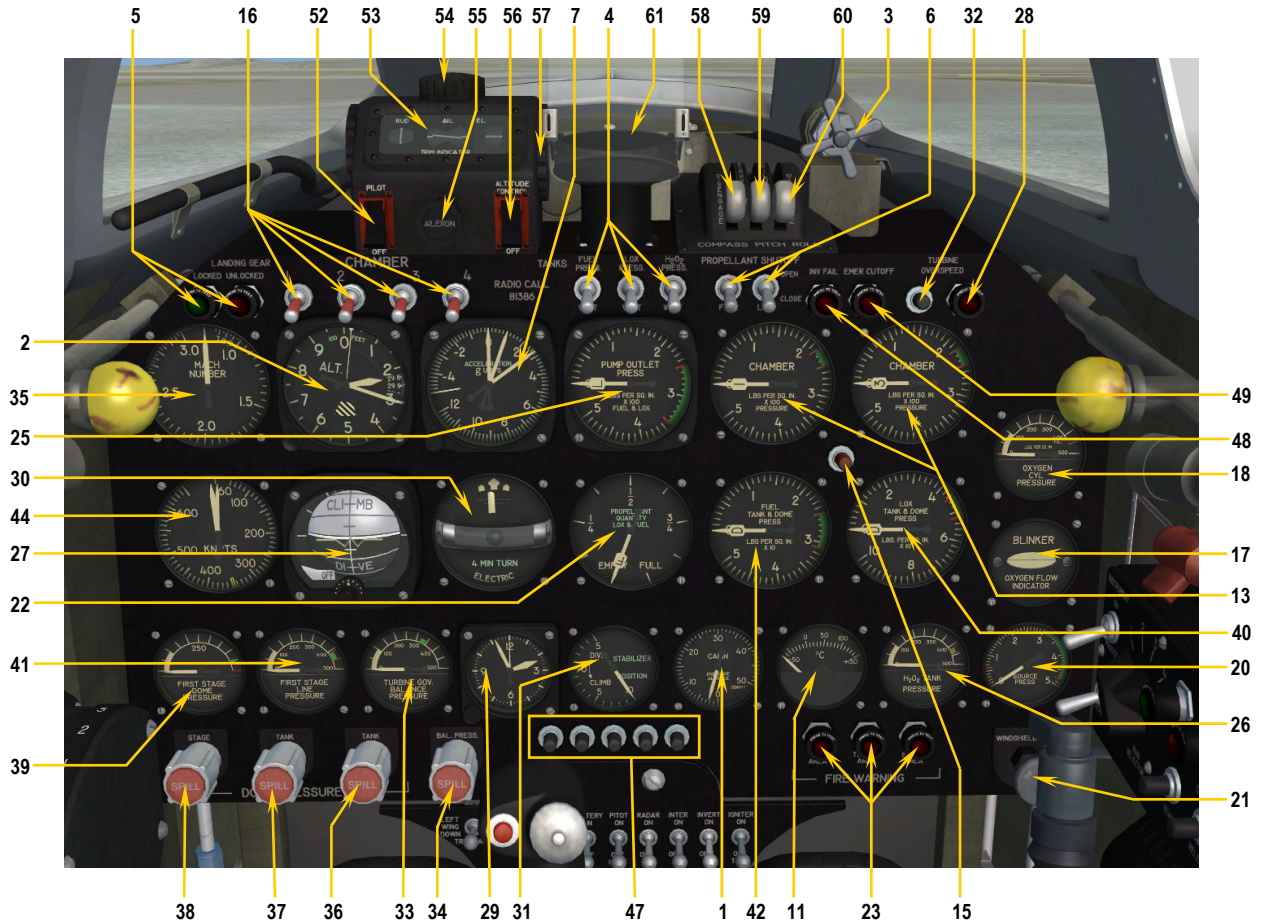


Figure 5-4

- |   |   |
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| <ol style="list-style-type: none"> <li>1. CABIN ALTIMETER</li> <li>2. AIRCRAFT ALTIMETER</li> <li>3. WINDSHIELD DEFROSTER CONTROL VALVE (NOT SIMULATED)*</li> <li>4. TANK VENT AND PRESSURIZING SWITCHES</li> <li>5. LANDING GEAR WARNING LIGHTS</li> <li>6. FUEL AND LOX SHUT-OFF VALVE SWITCHES</li> <li>7. ACCELEROMETER (OR OPTIONAL MAGNETIC COMPASS, FICTITIOUS, NOT SHOWN)</li> <li>8. N/A</li> <li>9. N/A</li> <li>10. N/A</li> <li>11. H<sub>2</sub>O<sub>2</sub> TANK TEMPERATURE GAUGE</li> <li>12. N/A</li> <li>13. CHAMBER PRESSURE INDICATORS</li> <li>14. EMERGENCY JETTISON VALVE (ON LEFT SIDE OF CABIN, NOT SHOWN)</li> <li>15. AUTOMATIC IGNITION SEQUENCE BUTTON (FICTITIOUS)</li> <li>16. CHAMBER SELECTOR SWITCHES</li> <li>17. OXYGEN BLINKER</li> <li>18. OXYGEN CYLINDER PRESSURE GAUGE</li> <li>19. N/A</li> <li>20. SOURCE PRESSURE GAUGE</li> </ol> | <ol style="list-style-type: none"> <li>21. WINDSHIELD DE-ICING PUMP</li> <li>22. FUEL AND LOX QUANTITY GAUGE</li> <li>23. FIRE WARNING LIGHTS</li> <li>24. FUEL QUANTITY RESET BUTTON (MODIFIED)</li> <li>25. PUMP OUTLET PRESSURE INDICATOR (OR OPTIONAL RADIO MAGNETIC INDICATOR, FICTITIOUS, NOT SHOWN)</li> <li>26. H<sub>2</sub>O<sub>2</sub> TANK PRESSURE GAUGE</li> <li>27. ATTITUDE GYRO</li> <li>28. TURBINE OVERSPEED WARNING LIGHT</li> <li>29. CLOCK</li> <li>30. TURN AND BANK INDICATOR</li> <li>31. STABILIZER POSITION INDICATOR</li> <li>32. TURBINE OVERSPEED RESET BUTTON</li> <li>33. TURBINE GOVERNOR BALANCE PRESSURE INDICATOR</li> <li>34. TURBINE GOVERNOR BALANCE PRESSURE REGULATOR AND SPILL VALVE</li> <li>35. MACHMETER</li> <li>36. LOX TANK AND DOME LOADING REGULATOR AND SPILL VALVE</li> <li>37. FUEL TANK AND DOME LOADING REGULATOR AND SPILL VALVE</li> <li>38. FIRST STAGE DOME LOADING REGULATOR AND SPILL VALVE</li> <li>39. FIRST STAGE DOME PRESSURE GAUGE</li> <li>40. LOX TANK AND DOME PRESSURE GAUGE</li> <li>41. FIRST STAGE LINE PRESSURE GAUGE</li> <li>42. FUEL TANK AND DOME PRESSURE GAUGE</li> <li>43. N/A</li> <li>44. AIRSPEED INDICATOR</li> <li>45. N/A</li> <li>46. N/A</li> <li>47. FLIGHT SIMULATOR PUSH BUTTONS (FICTITIOUS)</li> <li>48. INVERTER FAILURE WARNING LIGHT</li> <li>49. EMERGENCY CUT-OFF WARNING LIGHT</li> <li>50. N/A</li> <li>51. N/A</li> <li>52. AUTOPILOT (AP) MASTER SWITCH</li> <li>53. AP TRIM INDICATORS</li> <li>54. AP TURN KNOB</li> <li>55. AP AILERON TRIM KNOB</li> <li>56. AP ALTITUDE HOLD SWITCH</li> <li>57. AP ELEVATOR TRIM WHEEL (ON BOTH SIDES)</li> <li>58. AP COMPASS HOLD LEVER (HEADING HOLD)</li> <li>59. AP PITCH HOLD LEVER (ATTITUDE HOLD)</li> <li>60. AP ROLL HOLD (WING LEVELLER)</li> </ol> |
|---|---|

\*: Non-simulated items are animated in the VC to simulate normal procedures described in section 6.

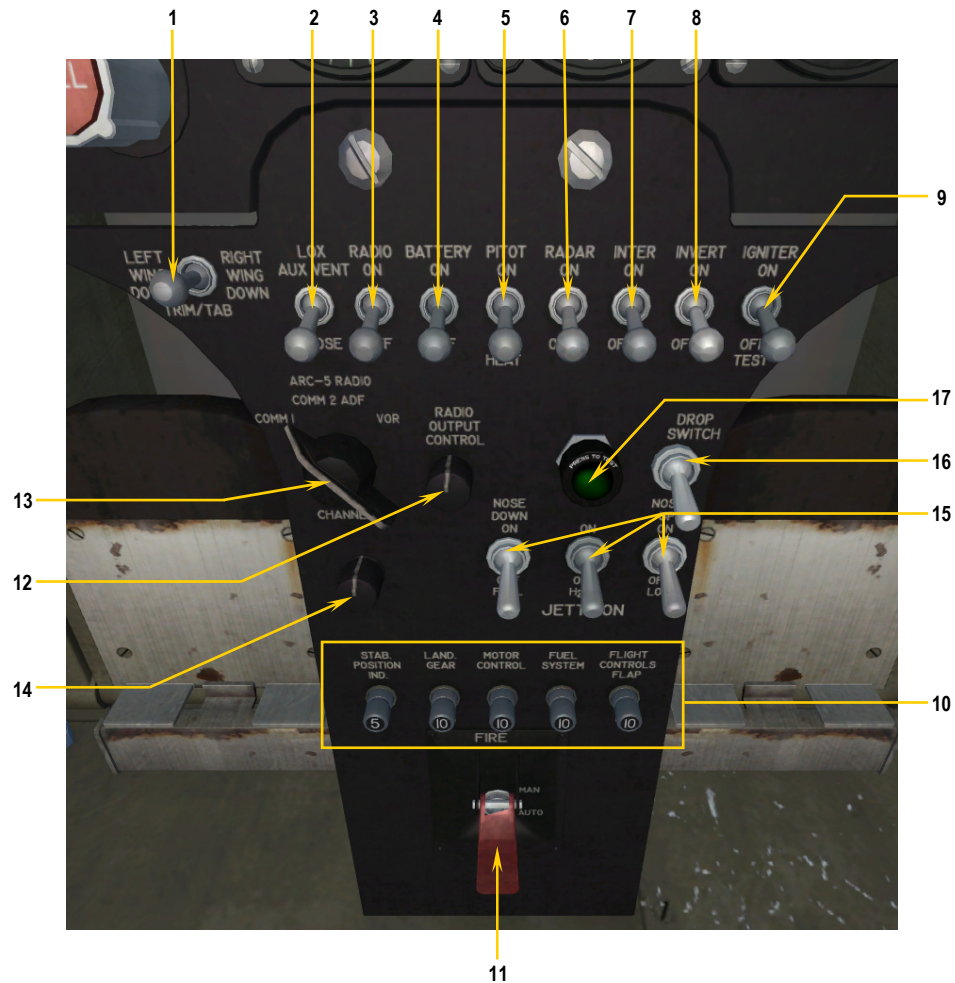


Figure 5-5

1. AILERON TRIM TAB SWITCH
2. LOX AUXILIARY VENT SWITCH
3. RADIO SWITCH (MODIFIED)
4. BATTERY SWITCH
5. PITOT HEAT SWITCH
6. RADAR SWITCH (NOT SIMULATED)\*
7. INTERPHONE SWITCH (MODIFIED)
8. INVERTER SWITCH
9. IGNITER TEST SWITCH
10. CIRCUIT BREAKERS
11. FIRE EXTINGUISHER SELECTOR SWITCH (MODIFIED)
12. RADIO OUTPUT CONTROL KNOB (NOT SIMULATED)
13. RADIO CHANNEL SELECTOR SWITCH (MODIFIED)
14. RADIO FREQUENCY TUNING KNOB (FICTITIOUS)
15. JETTISON SWITCHES
16. DROP SWITCH (MODIFIED)
17. DROP LIGHT (MODIFIED)

\*: Non-simulated items are animated in the VC to simulate normal procedures described in section 6.

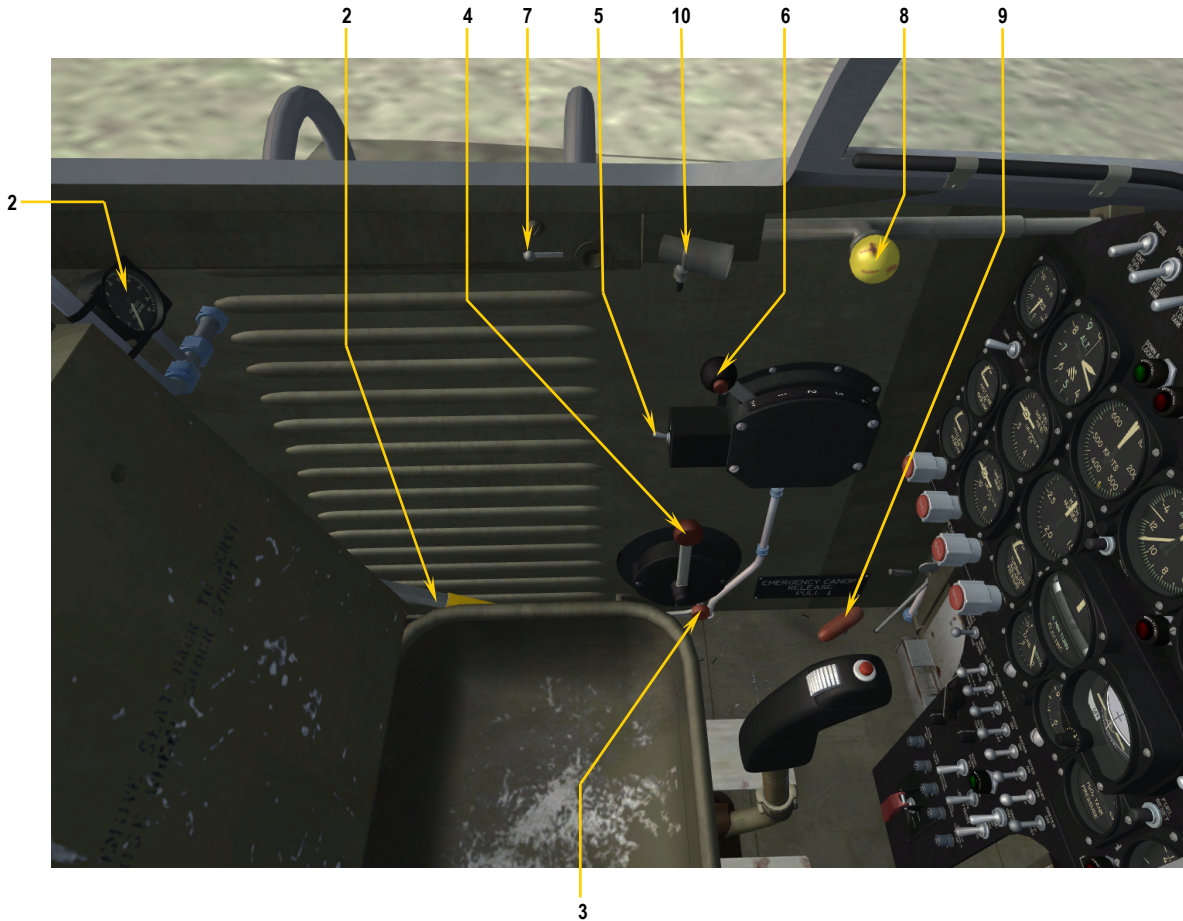


Figure 5-6

1. N/A
2. LANDING GEAR CONTROL LEVER
3. HARNESS RELEASE (NOT SIMULATED)\*
4. STABILIZER MANUAL CONTROL LEVER
5. FLAP SWITCH
6. THROTTLE AND MICROPHONE PTT SWITCH
7. CANOPY LOCK INDICATOR
8. CANOPY LOCKING LEVER
9. CANOPY EMERGENCY RELEASE HANDLE
10. CABIN SPOTLIGHT (FICTITIOUS)
11. FIRE EXTINGUISHER SYSTEM GAUGE

\*: Non-simulated items are animated in the VC to simulate normal procedures described in section 6.

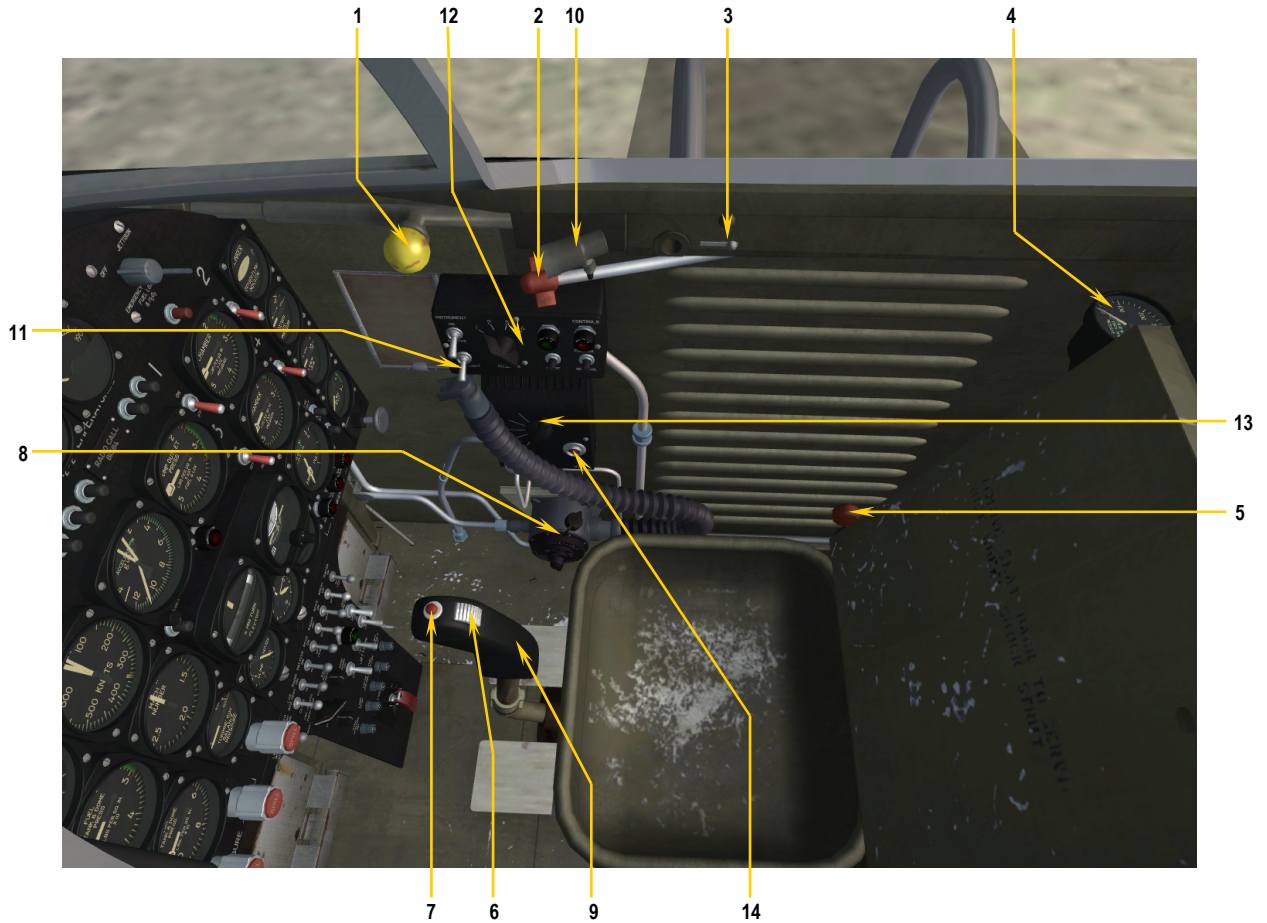


Figure 5-7

1. CANOPY LOCKING LEVER
2. CANOPY PRESSURE SEAL VALVE (NOT SIMULATED)\*
3. CANOPY LOCK INDICATOR
4. EMERGENCY JETTISON TANK PRESSURE GAUGE
5. CABIN PRESSURE DUMP VALVE CONTROL LEVER
6. STABILIZER ACTUATOR SWITCH
7. EMERGENCY CUT-OFF SWITCH
8. OXYGEN REGULATOR
9. CENTER STICK HANDLE (MACHINE GUN TRIGGER IN X-1C)
10. CABIN SPOTLIGHT (FICTITIOUS)
11. CABIN LIGHTING SWITCH (FICTITIOUS)
12. RIGHT CONTROL BOX (INSTRUMENTATION, NOT SIMULATED)
13. FLIGHT SUIT HEATER TEMPERATURE KNOB (NOT SIMULATED)
14. RELOAD AIRCRAFT BUTTON (EASTER EGG)

\*: Non-simulated items are animated in the VC to simulate normal procedures described in section 6.



# NORMAL OPERATING INSTRUCTIONS

## SECTION 6



This section contains the complete normal procedures and check list for the operation of the Xtreme Prototypes X-1 Second Generation add-on rocket aircraft for Flight Simulator X. A condensed version of these procedures is provided in the checklist tab of the kneeboard.

Aircraft reference information is provided in appendix 1. The same information is available in the reference information tab of the kneeboard.

### INTRODUCTION

In an effort to recreate the second generation X-1 experience as realistically as possible and for historical and technical accuracy, the following procedures are inspired or adapted from the original "Bell X-1A, B & D Pilot's Handbook of Flight Operating Instructions".

Following each step presented in this section will allow you to recreate a typical X-1 SG research mission in Flight Simulator X and will make your overall experience more realistic and enjoyable.

The operation of the add-on aircraft is very similar to the operation of the real-world aircraft. Reading this section before your first flight is highly recommended and will help you in understanding the operation of this remarkable airplane.

### TYPICAL MISSION

In a typical X-1 mission, the research aircraft would be attached under a modified B-29 "Superfortress" and carried to an altitude of about 38,000 feet. Then, at a scheduled launch time, it would be dropped and the pilot would ignite the airplane's rocket engine to propel the X-1 at more than twice the speed of sound to new altitude and speed records.



Several experiments would be conducted during the mission to get as much information as possible about high-speed and high-altitude flight and about the effects of such flight conditions on the aircraft and on the pilot.

After the airplane propellants were exhausted or the engine was shut off by the pilot, the X-1 would begin its

descent and glide its way back to a dry lakebed in the California desert.

The X-1 SG for Flight Simulator can either be launched from a high altitude like the real X-1 or take off from an airport runway like any other Flight Simulator aircraft.

### BEFORE CREATING A FLIGHT

At this time, you can either decide to create a new flight and take off from the runway **or** try a launch at high altitude from a B-29 carrier aircraft. The best option to simulate either is to load one of the saved flights included with this package (see appendix 2).

Once a saved flight has been loaded in the simulator, you can either click the automatic ignition sequence (red) button on the main panel [15, fig. 5-2, 5-3, 5-4] to start the engine automatically **or** proceed with the normal procedures on page 6-6 to prepare the X-1 SG for takeoff or launch.

### LOADING A SAVED FLIGHT

You can load one of the saved flights included with your X-1 SG add-on package as a template for a new flight. This has the advantage of reinitializing all X-1 custom systems and positioning the aircraft ready for taxi or takeoff on the runway (or already in flight, depending on the mission). In addition, the “cold start” saved flights will shut down the engine and turn off all electrical power to the aircraft.

The X-1 SG saved flights can be loaded from the **Free Flight** page in FSX (click the **Load...** button).

**NOTE:** X-1 SG saved flights must not be confounded with FSX missions. The FSX saved flights are installed in your “...My documents\Flight Simulator X Files” folder **and not** in your “Microsoft Flight Simulator X\Flights” folder. Refer to appendix 2 for complete information about the X-1 SG saved flights.

### CREATING A NEW X-1 SG FLIGHT IN FSX

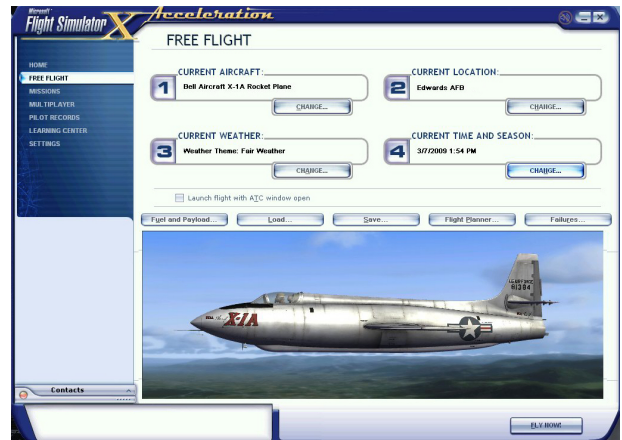
Refer to the documentation provided with Flight Simulator X for complete instructions on how to create a new flight in Flight Simulator X.

The procedures presented here are for a typical flight, and do not cover any specific experimentation.

### INITIAL FLIGHT SIMULATOR CONFIGURATION

For your first X-1 SG flight, let’s suggest a hypothetical takeoff from Baker airfield, California (002), runway 15 and a landing near Rogers Dry Lake at Edwards Air Force Base (KEDW), runway 22. During your approach, you can decide whether you prefer to land on the lakebed like the real X-1, or on the runway like a conventional FSX aircraft.

1. Make sure the Xtreme Prototypes X-1 SG for Flight Simulator X add-on rocket aircraft and all its components have been properly installed in your “Microsoft Flight Simulator X” folder according to the instructions provided in section 2.
2. Make sure your joystick, or yoke and pedals are properly connected to your computer and have been previously tested in Flight Simulator X. (A joystick is recommended to fly the X-1 SG for Flight Simulator X aircraft. Pedals are optional.)
3. Start Microsoft® Flight Simulator X.
4. Select the **FREE FLIGHT** option in the menu at left.



*Flight configuration page in Microsoft FSX.*

5. In the “Free Flight” page, click **CHANGE** under “Current Aircraft” (1) to open the “Select Aircraft” page.
6. In the “Select Aircraft” page, select **XTREME PROTOTYPES, INC.** in the “Publisher” pull-down menu.
7. Select the following:  
**BELL AIRCRAFT**

## **X-1A ROCKET PLANE SILVER VERSION**

(or any other variation of the X-1 SG)

**Note:** High-altitude drops from a B-29 mother aircraft can only be performed with the specially-equipped variations of the X-1A or X-1D. Select one of these models in the “**Select Aircraft**” page in FSX. Other aircraft variations can only take off from the ground like conventional FSX aircraft (see section 5 for details).

**IMPORTANT:** Make sure the “Show all variations” option at the bottom of the page is selected!

8. Click **OK**.
9. On the “Free Flight” page, click **CHANGE** under “Current Weather” (3) to open the “Weather” page.
10. On the “Weather” page, select **USER-DEFINED WEATHER**, then click the **CUSTOMIZE WEATHER** button.
11. On the “Customized Weather” page, enter the following conditions:
  - a. Clouds – **FEW**.
  - b. Precipitation – **NONE**.
  - c. Visibility – **40 MI / 64 KM**.
  - d. Wind Speed – **LIGHT (8 KTS)**.
  - e. Wind Direction – **150°**.
12. Click **OK** twice to return to the “Free Flight” page.
13. On the “Free Flight” page, click **CHANGE** under “Current Time and Season” (4).
14. On the “Select Time and Season” page, set “Local Time” to: **13:35:00**.
15. On the “Select Time and Season” page, set date to: **AUGUST 27, 1954**.
16. Click **OK**.
17. On the “Free Flight” page, click on the **FLIGHT PLANNER** button.
18. On the “Flight Planner” page, select:
  - a. Departure location – **BAKER (002), RUNWAY 15** (Baker – 002, California, United States, Runway 15).
  - b. Destination – **EDWARDS AIR FORCE BASE (KEDW)** (Edwards AFB - KEDW, California, United States).
  - c. Flight plan type – **VFR**.
  - d. Routing – **Direct-GPS**.
19. On the “Flight Planner” page, click the **FIND ROUTE** button.
20. On the “Find Route” page, enter: Cruising Altitude – **50,000 feet**.
21. Click **SAVE** to save your route.
22. Click **OK**. Answer **YES** when asked if you want Flight Simulator to move your aircraft to the departure airport listed on the flight plan.
23. On the “Free Flight” page, click the **SAVE** button to save your flight. Name this flight: **X-1A Silver – Baker to Edwards** (or any other name of your choice).
24. On the “Free Flight” page, click the **FLY NOW** button to start your flight.



## **X-1 SG CUSTOM FUEL MANAGEMENT SYSTEM**

Conventional aircraft in Microsoft® Flight Simulator X use only one type of fuel (either aviation gasoline or jet fuel). Propellant consumption is automatically calculated and managed by the game engine.

Like the real-world rocket airplane, the X-1 SG for Flight Simulator X uses at least three different types of propellants: water-alcohol (WALC) as the engine fuel, liquid oxygen (LOX) as the oxidizer and hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) as a monopropellant for the engine turbopump.

The airplane's pneumatic controls, the cabin and the propellant tanks in the X-1 aircraft, among other systems, are all pressurized with gaseous nitrogen (N<sub>2</sub>).

In order to recreate these systems and simulate as closely as possible the true operation of the X-1 rocket aircraft, custom built-in systems have been integrated into the X-1 SG for Flight Simulator X instrument panels. These systems partially bypass Flight Simulator's fuel management system.

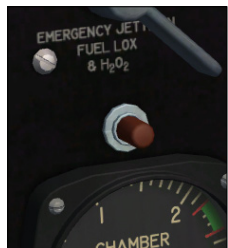
Because of the rocket aircraft's high fuel consumption, the typical engine burn time of a X-1 SG mission is less than 5 minutes (which is normal for a realistic rocket-powered flight in that type of vehicle). In order not to be concerned about fuel consumption, for example if you intend to travel around the world in your X-1 at Mach 2, we recommend the following setting:

1. Under the "Aircraft" menu in the main Flight Simulator X window, select **REALISM SETTINGS**.
2. On the "Settings – Realism" page, under "Engines", select the **UNLIMITED FUEL** option.

### ABOUT "CTRL+E" (AUTO-START COMMAND IN FSX)

The X-1 SG is no ordinary aircraft! **We do not recommend the use of the standard engine auto-start command in Flight Simulator X (CTRL+E)**. If you press CTRL-E, some of the X-1 SG rocket aircraft custom systems will not be initialized properly and the airplane might operate erratically. This is due to the limitations of FSX with regard to rocket engine operation, the special behavior and characteristics of the X-1 SG custom fuel management system, and the XLR-11 rocket engine ignition sequence.

Follow the normal procedures described in this section or click the **automatic ignition sequence red button** located on the main instrument panel [15, fig. 5-2, 5-3, 5-4]. This is similar to pressing CTRL+E with conventional FS aircraft. However, the red button reinitializes all X-1 custom systems, including her three-propellant rocket fuel management system. You can use this button instead of CTRL+E to properly start the XLR-11 engine without going through the normal procedures and check list described below.



## **IMPORTANT** **PLEASE READ CAREFULLY!**

1. **Do not use CTRL+E** — The engine auto-start command in Flight Simulator X (**CTRL+E**) **must not be used** to start the X-1 SG engine to allow for the true simulation of the XLR-11 rocket engine ignition sequence procedures. For a quick start, **use the automatic ignition sequence red button** located on the main instrument panel instead [15, fig. 5-2, 5-3, 5-4].
2. **All systems are reset when a new X-1 SG aircraft is loaded** — The correct initialization and ignition sequence procedures (or clicking the automatic ignition sequence button) must be performed before flight each time a new X-1 SG aircraft is loaded in the simulator. This is because the add-on X-1 SG aircraft uses its own proprietary internal variables in addition to the system (FSX) variables. Unfortunately, Flight Simulator still does not record the custom variables in saved flights. If the instruments or the aircraft appear "frozen" or seems to operate erratically after a pause or after a new aircraft has been loaded **while in flight**, simply end the current flight and **start a new flight to reinitialize all the systems**.

### ABOUT THE X-1 SG SPECIAL VISUAL EFFECTS (AIRCRAFT "LIGHTS")

Because of the limitations of the effects system in FSX, the X-1 SG for Flight Simulator X special visual effects such as rocket engine flames or the turbopump exhaust effects still need to be associated with FS aircraft lights and the smoke system. These effects (or "lights") are internally triggered by the X-1 SG custom systems. For example, when the turbopump is operating, the X-1 SG turbopump system triggers the FS aircraft beacon lights to display the turbopump exhaust (steam) effect.

There were no external lights or smoke system on the real-world X-1 airplane, so we can use all the available Flight Simulator aircraft lights and the smoke system to



display X-1-specific visual effects in order to make the simulation more realistic.

Note that these effects **should be off** at the beginning of any flight. If such effects are visible, do the following procedures to turn off the unwanted effects:

1. Under the “Aircraft” menu in the main Flight Simulator X window, select **REALISM SETTINGS**.
2. On the “Settings – Realism” page, under “Instruments and Lights”, select the **PILOT CONTROLS AIRCRAFT LIGHT** option.
3. Return to the game and press the “**L**” key (All Lights On/Off command) on your keyboard as necessary, until the effects disappear.

The following is a list of Flight Simulator aircraft lights (and the smoke system) and their corresponding X-1 SG special visual effects:

For all X-1 SG aircraft equipped with the XLR-11 rocket engine (except where otherwise noted):

- ❑ **Aircraft smoke system:** XLR-11 rocket engine chamber 1 ignition and combustion (flames) effects.
- ❑ **Cabin lights:** XLR-11 engine igniter test effect (all chambers).
- ❑ **Wing lights:** XLR-11 rocket engine chamber 3 ignition and combustion (flames) effects.
- ❑ **Recognition lights:** XLR-11 rocket engine chamber 2 ignition and combustion (flames) effects.
- ❑ **Taxi lights:** Fuel jettison effect.

- ❑ **Strobe lights:** LOX bleed effect, frost on the fuselage and condensation vapor effect around the liquid oxygen tank when filled.
- ❑ **Navigation lights:** Hydrogen peroxide jettison effect (or machine gun effect on X-1C).
- ❑ **Landing lights:** LOX jettison effect.
- ❑ **Beacon lights:** Turbopump exhaust effect.
- ❑ **Logo lights:** XLR-11 rocket engine chamber 4 ignition and combustion (flames) effects.
- ❑ **Cockpit lights:** VC cockpit lighting effect.

All other custom X-1 SG effects are integrated into the standard FSX special effects system.



### OPTIONAL SETTINGS

The following optional settings are to make your flight in the X-1 SG more enjoyable:

1. Under the “Aircraft” menu in the main Flight Simulator window, select **REALISM SETTINGS**.
2. On the “Settings – Realism” page, under “Instruments and Lights”, select the **PILOT CONTROLS AIRCRAFT LIGHT** option (if not already selected).
3. On the “Settings – Realism” page, under “Engines”, select the **UNLIMITED FUEL** option (if not already selected).
4. On the “Settings – Realism” page, set the following:

- a. All “Flight Model” settings – **50%** (cursor in the middle).
  - b. Enable gyro drift – **SELECTED**.
  - c. Display indicated airspeed – **SELECTED**.
  - d. Ignore crashes and damage – **SELECTED**.
5. Click **OK** to close the “Settings – Realism” page and return to the game.

(typical).

**CAUTION**

THESE LIMITATIONS AND RESTRICTIONS ARE SUBJECT TO CHANGE AND LATEST SERVICE DIRECTIVES AND ORDERS MUST BE CONSULTED.

**NORMAL OPERATING INSTRUCTIONS**



At this time, the X-1 SG has not yet been serviced and the engine should be shut off. If the engine has been ignited by the simulator and has not been shut off automatically by the X-1 SG built-in systems, do the following procedure to shut off the engine:

1. Simultaneously press the **CTRL-SHIFT-F1** keys on your keyboard.

No visual effects (associated with aircraft lights or systems) should be observed around the airplane at this time. If such effects are visible, do the following procedure to turn off the unwanted effects:

1. Press the “**L**” key (All Lights On/Off command) on your keyboard as necessary, until the effects disappear.

**RESTRICTIONS**

- ❑ Do not lower flaps over 345 knots.
- ❑ Do not lower landing gear over 250 knots.
- ❑ Calculated gross weight for flight is 16,805 lbs on X1-A and X-1D and 16,816 lbs on X-1B and X-1C

**EXTERIOR CHECK**

An exterior description of the X-1 SG for Flight Simulator is available on page 3-3. It is recommended to familiarize yourself with the general external arrangement of the aircraft before proceeding.

1. Select the **SPOT PLANE** view, either with the appropriate button on your joystick, by depressing the “**S**” key on your keyboard several times, or on the “View Options” page (under the “Views” menu in the Flight Simulator X main window, click “**View Options**” and select **SPOT PLANE** view).

This will allow you to inspect the exterior of the X-1 SG. You can use the appropriate button on your joystick (or the arrow keys on your numeric keypad) to move around the aircraft. Use the “**+/=**” or “**\_/-**” keys on your keyboard to zoom in and out.

To open or close the canopy, simultaneously press the **SHIFT-E** keys on your keyboard.



It is possible to observe the movement of the **control surfaces** at this time. Check control surfaces for damage, security of mounting and general condition:

1. Use your joystick (and/or pedals) to control and

observe the movement of the vertical stabilizer (rudder), of the elevator and of the ailerons.

2. You can see the movement of the horizontal stabilizer (“all-moving tail”) by actuating the trim buttons on your joystick. The all-moving tail was a key element for successful supersonic flight. Make sure to return the stabilizer to **neutral** before launch or to **5 degrees down** (“climb”) before takeoff.
3. Check the flaps by pressing the “**F7/F6**” key on your keyboard or the flap buttons on your joystick.

### CAUTION

When the aircraft is ground tested and loaded while resting on the landing gear, the tires must be inflated in accordance with instructions on the lower main wheel door. Main wheels should be on greased plates while loading.



Other checks (from the original X-1 SG manual, not required in the simulator):

1. Check aircraft for security of mounting in shackle and sway braces.
2. Check electrical, radio, LOX top-off, oxygen, vent tubes, and N<sub>2</sub> connections (to mother airplane).
3. Check that fuel manifold and governor have been bled (by the ground crew).
4. Check for loose, damaged or open access doors and cowling.
5. Check vent tubes and fuel, LOX, and hydrogen per-

oxide jettison tubes between aircraft and mother airplane for security of mounting and general condition.

Return to the **VIRTUAL COCKPIT** view.

### SERVICING

In the real world, propellants and gases were loaded onto the X-1 by the ground crew before flight.

To simulate the servicing of the X-1 rocket plane, buttons and clickable gauges are provided in the cockpit of the virtual aircraft.

Make sure the X-1 SG has been properly serviced before flight for accurate simulation and instrument readings. For example, forgetting to fill the nitrogen tube bundles will prevent the first stage and the propellant tanks from being pressurized and the propellants to circulate through the engine feed lines. Unless the unlimited fuel option has been set in the simulator, the engine will not start under these conditions.

### IMPORTANT

Check that fuel, LOX, H<sub>2</sub>O<sub>2</sub>, N<sub>2</sub>, emergency jettison, fire extinguisher and oxygen systems are serviced for flight, and all plugs, tape or covers are removed from tank vents:

1. Click the fuel reset button on the main panel to fill the fuel tank with **570 gallons** of water-alcohol (the FSX aircraft fuel page, available from the Aircraft menu in the main FSX window, can also be used for this operation).



If reset buttons are not available (X-1B and X-1C), clicking the fuel and LOX quantity gauge with the mouse will fill the three propellant tanks simultaneously.

**Note:** The pointers on the gauge will not move at this time because AC current is not yet available in the cockpit. To check if the propellant tanks have been filled,

simply move the cursor over the fuel and LOX quantity gauge with the mouse to display the tooltip.

2. Click the LOX reset button on the main panel to fill the LOX tank with **500 gallons** of liquid oxygen. Frost will appear on the aircraft fuselage,



around the cold LOX tank, to indicate that the tank contains liquid oxygen.

3. Click the  $H_2O_2$  reset button on the main panel to fill the  $H_2O_2$  tank with **37 gallons** of hydrogen peroxide. Check the tooltip for  $H_2O_2$  quantity.
4. Click the source pressure gauge on the main panel to fill the nitrogen tube bundles (or tanks) with **4800 psi** of  $N_2$  gas. The gauge is direct reading.
5. Click the pilot's oxygen pressure gauge on the main panel to fill the pilot's oxygen tanks with **3500 psi** of pure oxygen. The gauge is direct reading.



6. Click the emergency jettison tank pressure gauge on the rear top right side of the seat to fill the emergency jettison tank with **450 psi** of  $N_2$  gas. The gauge is direct reading.
7. Click the fire extinguisher system pressure gauge on the rear top left side of the seat to recharge the fire extinguisher bottles with **1200 psi** of  $CF_2Br_2$ . The gauge is direct reading.

### ON ENTERING PILOT'S COMPARTMENT

1. Connect oxygen mask, anti-G suit connection and radio cordage.
2. Check oxygen regulator **100%**.
3. Radio switch **ON**. Check radio operation on proper channel.
4. Cockpit lights **ON** (fictitious).
5. Close and lock canopy.
6. Check landing gear control lever **UP**.
7. Check "SOURCE PRESSURE", "FIRST STAGE DOME" and "FIRST STAGE LINE". Adjust "FIRST STAGE DOME" pressure as necessary (using the







first stage dome loading regulator and spill valve on the main panel).

**Note:** The regulator valve cannot be turned if the spill button is pushed. The spill button cannot be pushed if the regulator valve is turned.

8. Check "FUEL TANK", "LOX TANK", and "TURB. GOV, BAL. PRESS" regulator valves closed and domes spilled (push front red button on valve to release pressure).
9. Check all circuit breakers in.
10. Check "JETTISON" switches **OFF**.
11. "IGNITER TEST" switch **OFF**.
12. "H<sub>2</sub>O<sub>2</sub> TANK", "FUEL TANK" and "LOX TANK" switches **VENT**.
13. "AUX LOX VENT" switch **VENT**.
14. "FUEL SHUT-OFF VALVE" switch **CLOSE**.
15. "LOX SHUT-OFF VALVE" switch **CLOSE**.
16. "EMERGENCY JETTISON" valve **OFF**.
17. Chamber switches **OFF**.
18. Throttle **OFF**.
19. "FIRE EXTINGUISHER" switch **AUTO**.
20. "BATTERY" switch **ON**.
21. Turn radar beacon switch **ON**.

## **BEFORE DROP-AWAY**

1. Check source pressure.
2. Check "FIRST STAGE LINE" pressure **415-425 psi**.
3. "INVERTER" switch **ON**.
4. Check "RADAR BEACON" switch **ON**.
5. "FLAP" switch **DOWN**.
6. Check stabilizer position on indicator (launch: **neutral**; takeoff: **5 degrees down** or "climb").
7. Check aileron trim tab position.
8. "GYRO VENT" switch **CABIN (X-1A/D)**.
9. Check fuel dome pressure zero.
10. "FUEL TANK" switch **PRESS**.
11. Check with operator in carrier for LOX top-off, N<sub>2</sub> and oxygen lines disconnected.
12. "AUX LOX VENT" switch **CLOSE** and "LOX TANK" switch **PRESS**.
13. "H<sub>2</sub>O<sub>2</sub> TANK" switch **PRESS**.
14. Check H<sub>2</sub>O<sub>2</sub> tank and line temperatures.
15. "FUEL" and "LOX" shut-off switches **OPEN**.



16. Check and/or reset LOX and fuel (and H<sub>2</sub>O<sub>2</sub>) quantity gauges.
17. Slowly pressurize the fuel tank (using the fuel dome loading regulator and spill valve on the main panel).
18. Slowly pressurize the LOX tank (using the LOX dome loading regulator and spill valve on the main panel). A continuous overboard LOX bleed can be observed at the back of the aircraft.
19. Load the turbine governor balance line to the desired pressure to start the turbopump (using the governor balance pressure regulator and spill valve



on the main panel). Steam should be observed coming out of the turbopump exhaust pipe.

20. Perform quick jettison test for each system (fuel, LOX and H<sub>2</sub>O<sub>2</sub>). Have observer in mother airplane confirm jettison test.



### CAUTION

When making jettison test, move in sequence “FUEL”, “LOX” and “H<sub>2</sub>O<sub>2</sub>” “JETTISON” switches to **ON** and immediately return to **OFF**.

21. Pitot heat as necessary.
22. **Specially-equipped X-1A or X-1D models with B-29 carrier only (mated aircraft already airborne and ready for launch):** Droplight switch **STANDBY** (or MID position). See section 5 for complete instructions on how to use the droplight system and simulate a high-altitude launch from a B-29 carrier aircraft in FSX.



### DROP-AWAY AND FLIGHT

1. “INTERPHONE” switch **OFF**.
2. “FLAP” switch **UP** at 260-300 knots.
3. **Specially-equipped X-1A or X-1D models with B-29 carrier only (mated aircraft already airborne and ready for launch):** Droplight switch **ON** (or UP position). This will initiate a 10 second countdown after which the X-1 SG will separate from the B-29 mother aircraft. See section 5 for complete instructions on how to use the droplight system and simulate a high-altitude launch from a B-

29 carrier aircraft in FSX.

4. If for any reason the drop is not to be made, return the droplight switch to **STANDBY** or **OFF**. This will stop the countdown which can later be resumed by turning the switch **ON** again.

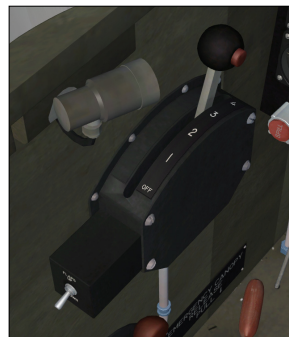


#### **To start the engine:**

1. All chamber switches **ON**.
2. Click and drag the virtual cockpit throttle to fire the four chambers in sequence (full forward).

**Important:** The throttle inside the X-1 SG virtual cockpit has a different function and is independent from the simulator (joystick) throttle. The VC throttle is used as a multi-position switch to select which thrust chamber(s) can be fired and throttled by your joystick throttle. Although the real XLR-11 rocket engine on the X-1 SG could not be throttled, your joystick throttle is still active in the simulator and can be used to adjust the thrust of selected chambers (fictitious).

If a chamber fails to fire as indicated by a lack of a chamber pressure gauge reading and no noticeable acceleration, return the chamber switch to the **OFF** position, isolate and correct the problem, and try again.



If LOX pump cavitation is the cause, this will be detected by an abnormally low LOX manifold pressure. If LOX pump cavitation causes the turbine pump to overspeed, the overspeed warning light will light and the turbine reset button must be held in momentarily before attempting another start (simulated).

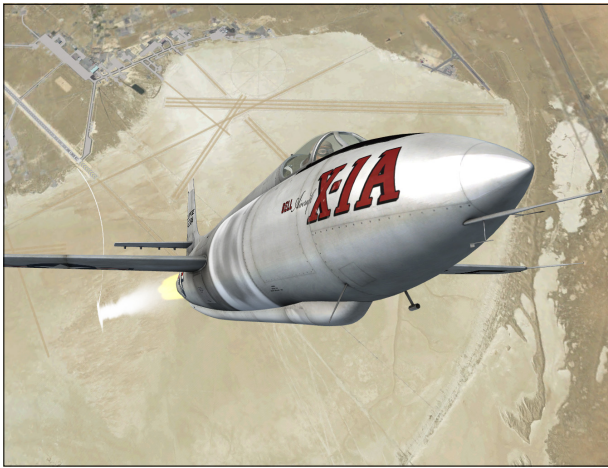


3. Check chamber pressure gauges **220-250 psi**.
4. Adjust governor balance pressure as necessary to maintain pump outlet pressures in desired range (**250-350 psi**).

**WARNING**

LOX pressure must never be higher than fuel pressure. Like in the real aircraft, the governor balance pressure affects both pressures equally; it cannot change individual pressures.





and move the VC throttle to **OFF**.

2. Release governor balance pressure by pressing button on valve.
3. Jettison remaining fuel, LOX and H<sub>2</sub>O<sub>2</sub> by moving "JETTISON" switches **ON**.
4. Vent tanks as soon as propellants are exhausted to conserve source pressure (N<sub>2</sub>).

**During flight:**

1. Adjust stabilizer and aileron trim tabs as necessary.

**Shutting off the engine:**

1. Turn chamber switches **OFF** at two second intervals when propellants are nine-tenths consumed





### APPROACH AND LANDING

1. Move landing gear control lever **DOWN** at 220-250 knots.
2. Move "FLAP" switch **DOWN**.
3. Make approach glide at 180-200 knots.
4. Land at 130-145 knots.



## **BEFORE LEAVING CABIN**



1. “INVERTER” switch **OFF**.
2. “RADAR” switch **OFF**.
3. “PITOT HEAT” switch **OFF**.
4. “RADIO” switch **OFF**.
5. “FLAP” switch **UP**.
6. “FUEL TANK”, “LOX TANK” and “H<sub>2</sub>O<sub>2</sub> TANK” switches **VENT**.
7. Shut-off valve switches **CLOSE**.
8. Check chamber switches and throttle **OFF**.
9. Release first stage pressure by pressing button on valve.
10. “BATTERY” switch **OFF**.

# EMERGENCY OPERATING INSTRUCTIONS

## SECTION 7



### THRUST CHAMBER BURNOUT

1. Turn chamber switch **OFF** if chamber pressure drops while manifold pressures remain within desired range.
2. Continue to operate on remaining chambers if operation is normal.

In the event there is a possibility of exhausting the propellants, with the possible resultant burnout of all chambers, shut off all the chambers by pressing the emergency button on the control stick.

### ENGINE FAILURE

Abnormal engine operation, rough running, manifold pressure pulsation or automatic shutdown may be caused by pump cavitation, pump output not within desired ranges, propellant manifold pressure differential too great, chamber pressures or tank pressures not within desired ranges, governor balance pressure or governor supply pressure incorrect.

### TURBOPUMP CAVITATION



1. Turn chamber switches **OFF**.
2. Hold "TURBINE OVERSPEED RESET" button in.
3. Turn chamber switches **ON** at five second intervals.

### FIRE

#### ON GROUND

#### **WARNING**

Use a water foam or water when fighting an H<sub>2</sub>O<sub>2</sub> fire. Never use carbon dioxide or carbon tetrachloride.

1. "FIRE EXTINGUISHER" switch **MAN**.
2. "SHUT-OFF VALVE" switches **CLOSE**.

#### DURING FLIGHT

If any of the "FIRE WARNING" lights light, the fire extinguisher will discharge, the shut-off valves will close and the motor control will shut down the motor.

1. Immediately contact chase pilot for reading.
2. Abandon the aircraft at your discretion if fire is confirmed.

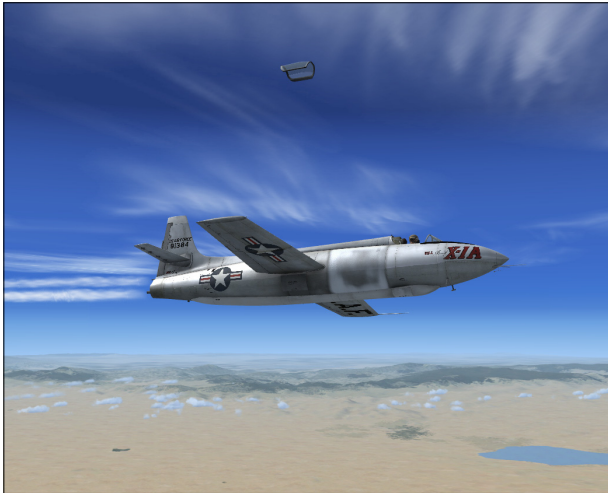
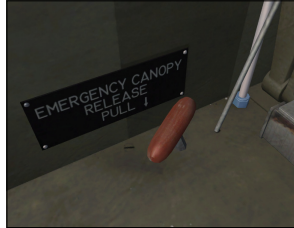


3. If chase pilot does not confirm fire, and lights go out after motor shuts down, jettison propellants and make a normal landing.
4. Abandon the aircraft at your discretion if lights stay on.

**BAIL OUT**

In the event it becomes necessary to abandon the aircraft:

1. Pull up to decelerate to a safe speed if control is available.
2. Jettison the canopy.



3. Roll over, release safety belt and shoulder harness and kick free.

**ELECTRICAL SYSTEM FAILURE**

**COMPLETE FAILURE**

In the event of a complete failure of the electrical system, some of the controls and much of the equipment will be inoperative. The flaps, aileron trim, stabilizer stick switch and the solenoid operated valves will be inoperative. However, the stabilizer may be trimmed by the use of the manual control lever on the left side of the cockpit.

1. “EMERGENCY JETTISON” valve **JETTISON**.



2. All electrical switches **OFF**.
3. Trim stabilizer with manual lever.
4. Land approximately 30 knots above normal speed.

**PARTIAL FAILURE**

When a partial failure occurs, turn off all electrical units to conserve remaining battery power for landing operations.

1. “EMERGENCY JETTISON” valve **JETTISON**.
2. “INVERTER” switch **OFF**.
3. “RADAR BEACON” switch **OFF**.
4. “PITOT HEAT” switch **OFF**, unless icing conditions prevail.
5. “RADIO” switch **OFF**.
6. Make a normal landing.

**NITROGEN SYSTEM FAILURE**

If the nitrogen system fails, the failure may be isolated by observing the instruments on the panel and operating the adjustable valves.



# APPENDICES

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# Appendix 1: FS AIRCRAFT REFERENCE INFORMATION

**NOTE:** The following information is also available in the reference information tab of the aircraft kneeboard.

## XTREME PROTOTYPES X-1 SECOND GENERATION FOR FLIGHT SIMULATOR X REFERENCE INFORMATION

For detailed instructions on how to fly this aircraft, refer to section 6 of the Pilot's Handbook of Flight Operating Instructions. For condensed procedures, see the checklist tab of the kneeboard.

Gross Weight (MTOW)	16,487 lbs
Empty Weight	7266 lbs

### Speed Limitations (FS aircraft)

**NOTE:** The highest Mach number attained by the real-world X-1 SG was Mach 2.44 (X-1A, December 12, 1954. Pilot: Chuck Yeager, Maj., USAF).

M <sub>MO</sub> – Maximum Aircraft Operating Speed (Mach)	2.5 Mach
V <sub>LO</sub> – Maximum Gear Operating Speed	250 KIAS
V <sub>LE</sub> – Maximum Landing Gear Extension Speed	250 KIAS
V <sub>FE</sub> – Maximum Flaps Extension Speed	345 KIAS
Maximum Vertical Acceleration	18 g's

### Mach Limitations vs Altitude

26,000 feet	0.4 Mach
34,000 feet	0.8 Mach
42,000 feet	1.2 Mach
50,000 feet	1.6 Mach
58,000 feet	2.0 Mach
66,000 feet +	2.4 Mach

### Takeoff (FS aircraft, standard temperature, sea level pressure altitude)

V <sub>R</sub> – FS Aircraft Rotation Speed	140 KIAS
---	----------

### Altitude Limitations (FS aircraft, typical)

**NOTE:** The maximum altitude attained by the real-world X-1 SG was 90,440 feet (X-1A, August 26, 1954. Pilot: Arthur Murray, Maj., USAF).

FS Aircraft Operating Altitude	60,000-70,000 feet
FS Aircraft Ceiling (maximum) Altitude	90,000 feet

### Landing (FS aircraft)

V <sub>REF</sub> - Landing Approach Speed (gear down)	180-200 KIAS
Flare Completed	1000 feet, 150 KIAS
Touchdown	130-145 KIAS
FS Aircraft Stalling Speed	120 KIAS

**NOTE:** This aircraft's real-world reference information has been modified for use with Flight Simulator X. For explanations of speeds used on this tab, see "V-speeds" in the Learning Center Glossary.

Xtreme Prototypes X-1 Second Generation for Flight Simulator X Reference Tab  
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## Appendix 2: X-1 SG SAVED FLIGHTS

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### X-1 SG SAVED FLIGHTS

You can load one of the saved flights included with your X-1 SG rocket aircraft add-on package as a template for a new flight. This has the advantage of reinitializing all X-1 custom systems and positioning the aircraft ready for takeoff on the runway (or already in flight, depending on the mission).

Once a saved flight has been loaded, you can proceed with the normal operating instructions in section 6 to prepare the X-1 SG for takeoff or for a high-altitude launch. You can also click the automatic ignition sequence button on the main panel [15, fig. 5-2, 5-3, 5-4] to start the engine automatically without going through the normal procedures.

The X-1 SG saved flights can be loaded from the **Free Flight** page in FSX (click the **Load...** button).

**NOTE:** X-1 SG saved flights must not be confounded with FSX missions. The FSX saved flights are installed in your "...My documents\Flight Simulator X Files" folder.

There are two categories of X-1 SG flights: the "TAKEOFF" flights and the "HIGH-ALTITUDE" flights. Each category contains fictitious flights inspired from real historical X-1 SG test flights.

### THE "TAKEOFF" FLIGHTS

You can load one of these flights to simulate a conven-



tional takeoff from the ground. Follow the normal operating instructions in section 6 or click the automatic ignition sequence button [15, fig. 5-2, 5-3, 5-4] to start the engine. Don't forget to trim the horizontal stabilizer 5 degrees down from neutral ("climb" on the indicator) before takeoff.

Taxiing is possible with the X-1 SG virtual aircraft with only one chamber ignited and the FS throttle at idle. Taking off from the ground is also possible, as attempted once by captain Yeager with the original X-1 in January 1949 (the only time a rocket-powered research aircraft took off conventionally).

**Note:** Clicking the automatic ignition sequence button or following the complete normal operating instructions to start the engine after a saved flight has been loaded is necessary because the add-on X-1 aircraft uses its own proprietary internal variables in addition to the system (FSX) variables. Unfortunately, Flight Simulator still does not record the custom variables in saved flights.

#### **X-1A Flight No. 11 (Cold Start)**

**X-1A Ready for Takeoff at Edwards AFB**  
*December 12, 1953.*

#### **X-1B Flight No. 52 (Cold Start)**

**X-1B Ready for Takeoff at Edwards AFB**  
*November 27, 1957.*

#### **X-1C Flight No. 1 (Cold Start, Fictitious)**

**X-1C Ready for Takeoff at Edwards AFB**  
*January 28, 1958.*

#### **X-1D Flight No. 1 (Cold Start)**

**X-1D Ready for Takeoff at Edwards AFB**  
*July 24, 1951.*

### **THE "HIGH-ALTITUDE" FLIGHTS**



You can load one of the following flights to simulate a high-altitude flight already in progress or a drop from a B-29 "Superfortress" carrier aircraft with the specially-equipped X-1A and X-1D models. Simply load one of the following flights and click the automatic ignition sequence button [15, fig. 5-2, 5-3, 5-4] to start the engine automatically.

If the selected aircraft is equipped with a B-29 carrier, turn the drop switch [16, fig. 5-5] to **STANDBY** (MID position) to make the B-29 visible. When ready for launch (usually, after the chamber switches have been turned on by the automatic ignition sequence), turn the drop switch to **ON** (UP position) to initiate a 10-second countdown after which the X-1 SG will separate from the B-29. Maintain speed by lowering the nose of the free-falling X-1 SG aircraft until the rocket engine starts.

**Note:** Clicking the automatic ignition sequence button and drop switch or following the complete normal operating instructions to start the engine after a saved flight has been loaded is necessary because the add-on X-1 aircraft uses its own proprietary internal variables in addition to the system (FSX) variables. Unfortunately, Flight Simulator still does not record the custom variables in saved flights.

#### **X-1A Flight No. 26 (Drop from B-29)**

**X-1A High-altitude drop from B-29 carrier**  
*August 26, 1954.*

#### **X-1B Flight No. 40 (High-altitude)**

**X-1B High-altitude flight**  
*September 7, 1956.*

#### **X-1C Flight No. 1 (High-altitude, Fictitious)**

**X-1C High-altitude flight**  
*January 28, 1958.*

#### **X-1D Flight No. 1 (Drop from B-29)**

**X-1D High-altitude drop from B-29 carrier**  
*July 24, 1951.*

# Appendix 3: PRODUCT SPECIFICATIONS



## MINIMUM SYSTEM REQUIREMENTS

**Flight Simulator:** Microsoft® Flight Simulator X with Service Pack 2 (Service Pack 2 required, FSX Acceleration Expansion Pack or FSX Gold optional)

**Operating System:** Windows® XP SP2 (256 MB RAM), Windows® Vista™ (512 MB RAM)

**Processor:** 1.0 GHz

**Hard Drive:** 15 GB (space required to install Flight Simulator X SP2)

**Available Disk Space:** 300 MB (space required to install the X-1 SG add-on software and documentation)

**Video Card:** 64 MB (128 MB or more recommended), DirectX® 9.0 or later

**Other:** Sound card and speakers, joystick, wheelmouse, Adobe® Reader® 8.0 or later

**NOTE:** Xtreme Prototypes addons are complex and require more processing power and RAM than other more conventional add-on aircraft packages. Increased performance will be noticed on more powerful systems. FSX SP2 minimum system requirements strongly recommended.

## GENERAL FEATURES

Contains six variations of the four Bell X-1 Second Generation research rocket planes and one light variation of a modified B-29 “Superfortress” carrier aircraft for simulating high-altitude launch:

- ❑ Three variations of the Bell X-1A (USAF serial number 48-1384):

- “Bell-USAF” orange version
- “Bell-USAF” aluminum version
- “Bell-USAF-NACA” white version

- ❑ One variation of the Bell X-1B (USAF serial number 48-1385):
  - “Bell-USAF-NACA” aluminum version
- ❑ One fictitious variation of the (never built) Bell X-1C (USAF serial number 48-1386):
  - “USAF” aluminum version with front machine gun, yaw-damping surfaces on wing and retractable ventral fin
- ❑ One variation of the Bell X-1D (USAF serial number 48-1386):
  - “Bell-USAF” aluminum rollout version
- ❑ One “light” variation of a modified Boeing B-29 “Superfortress” carrier aircraft (USAF serial number 52-1800, exterior model only, visible when the specially-equipped X-1A/D model is airborne).

## FLIGHT MODEL FEATURES

Custom X-1 flight model to simulate rocket-powered high-speed and high-altitude flight in FSX:

- ❑ One Reaction Motors XLR-11-RM-5, 5900-pound four-chambered liquid-fuel turbo-rocket engine
- ❑ High-altitude flight up to 90,000 feet
- ❑ Supersonic flight up to Mach 2.5
- ❑ Ground takeoff or high-altitude launch
- ❑ Good maneuverability at supersonic speeds
- ❑ Excellent gliding capabilities
- ❑ Compatible with FSX SP2 and FSX Acceleration Expansion Pack (or FSX Gold)

## CUSTOM X-1 ROCKET AIRCRAFT SYSTEMS

The following rocket aircraft systems are simulated to conform as closely as possible to the operation of the real second generation X-1 rocket aircraft, within the present limitations and capabilities of the simulator:

- ❑ XLR-11 power plant system and control
- ❑ Turbine-driven propellant pump and control
- ❑ Fuel system
- ❑ LOX system
- ❑ Hydrogen peroxide system
- ❑ Nitrogen system
- ❑ Electrical system (with DC-AC conversion)
- ❑ Fire detection/extinguisher system
- ❑ Custom rocket aircraft instruments, controls and gauges, including dome loading pressure regulators and spill valves
- ❑ Emergency jettison system
- ❑ Pilot's oxygen system
- ❑ Droplight system (countdown and launch from a B-29 carrier aircraft on selected models)
- ❑ Cabin pressurization system

### **3D MODEL FEATURES**

- ❑ Genuine FSX models, compatible with Windows Vista and DirectX® 10
- ❑ Highly detailed (X-1 SG) exterior models based on archive material, with more than 500 parts and 40 animations
- ❑ One light variation of a B-29 "Superfortress" carrier aircraft with animated propellers and control surfaces (see description above)
- ❑ Reflective high-resolution textures with bump maps
- ❑ Emissive (night) textures
- ❑ Unique (historical) markings and liveries on each aircraft
- ❑ Movable aerodynamic control surfaces:
  - X-1 all-moving tail (elevator trim)
  - Elevator
  - Ailerons with trim tab
  - Flaps
  - Vertical stabilizer/rudder with trim tab
  - Retractable ventral fin (X-1C)
- ❑ Yaw-damping surfaces on wings (X-1C)
- ❑ Highly detailed steerable front gear
- ❑ Highly detailed main landing gear
- ❑ Movable glass canopy (with jettison animation)
- ❑ Cockpit details including seat, pilot and animated sticks, levers and parts
- ❑ Functioning nose-mount .50 cal. machine gun (X-1C)
- ❑ Antennas, pitot tube and research probes
- ❑ Rear propellant jettison tubes and engine turbopump exhaust pipe
- ❑ XLR-11 rocket engine combustion chambers (4)

### **3D VIRTUAL COCKPITS**

- ❑ Three (3) highly detailed 3D virtual cockpits (X-1A/D, X-1B and X-1C) with over 800 parts and 200 3D animated gauges, switches, levers, light indicators and flight instruments with "tooltips"
- ❑ Advanced fully functional instrument panels with custom X-1 rocket aircraft systems
- ❑ Center pedestal (switch) panel
- ❑ Highly detailed seat, side controls, levers, pedals, oxygen regulator, hoses and pipes, and other cockpit items (many animated and functional)
- ❑ Modified ARC-5 VHF radio for use in Flight Simulator (COM1, COM2, ADF, VOR)
- ❑ Navigation instruments (fictitious, optional)
- ❑ Cockpit lighting (fictitious, optional)
- ❑ Sperry A-12 autopilot (X-1C)
- ❑ Gun sight (X-1C)

### **SPECIAL VISUAL EFFECTS**

#### **X-1-specific animated special visual effects, some with sound, including:**

- ❑ Rocket engine ignition, combustion flames and shockwaves effects
- ❑ Rocket engine smoke and contrail effects
- ❑ Igniter test effects
- ❑ Propellant jettison effects (fuel, LOX and H<sub>2</sub>O<sub>2</sub>)
- ❑ Engine turbopump exhaust effect
- ❑ N<sub>2</sub>/LOX bleed effect
- ❑ Condensation, frost and vapor effect around the cold LOX tank when filled
- ❑ VC lights
- ❑ Wing vortices and vapor trails
- ❑ Machine gun effect (X-1C)
- ❑ B-29 contrail effect

### **MISCELLANEOUS**

- ❑ Automatic ignition sequence button
- ❑ X-1 custom sound package for FSX
- ❑ Camera views (external and internal)
- ❑ Fictitious saved flights inspired from real X-1 SG test flights
- ❑ X-1 SG aircraft kneeboard reference tab and check list (from within Flight Simulator)
- ❑ A comprehensive 85-page user manual inspired from the original "Bell X-1A, B & D Pilot's Hand-

book of Flight Operating Instructions”, in a printable PDF format

***NOTE:** Specifications are subject to change without notice. Check our web site for available patches and upgrades.*

# Appendix 4: TECHNICAL SUPPORT

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## FREQUENTLY ASKED QUESTIONS AND TECHNICAL SUPPORT

We invite you to visit our FAQ section on our website to find answers to most questions you might have and solutions to most issues you may encounter while flying the Xtreme Prototypes X-1 Second Generation in Flight Simulator X:

[www.xtremeprototypes.com](http://www.xtremeprototypes.com)

If you need additional technical support, please visit our customer service section. **We try our best to answer most queries within one business day.**

Our products are designed to evolve with time, according to the feedback we receive from our users or from anyone interested in our products or in flight simulation or aviation in general. Please let us know your comments, ideas and suggestions.

## KNOWN ISSUES

**The engine is running (and/or the aircraft is moving by itself on the runway) at the beginning of a new flight** — If the engine has been ignited by the simulator and has not been shut off automatically by the X-1 custom systems integrated in the virtual cockpit, simultaneously press the **CTRL+SHIFT+F1** keys on your keyboard to shut off the engine. By default, FSX loads previously saved (or default) flights with the engine of the aircraft running. In the case of the X-1, it takes a split second for Flight Simulator to “realize” that the engine is

shut down. Because the four XLR-11 rocket engine chambers are ignited at the same time, the initial split second of thrust is enough to move the aircraft along the runway. The aircraft should come to a halt on its own or the brakes can be applied. To avoid this, you can load one of the X-1 SG saved flights included with your add-on package as a template for your flight. This has the advantage of reinitializing all X-1 SG custom systems and preventing the engine from being ignited at the beginning of a flight because the engine was running in the previous flight, in the last saved flight or in the default flight.

## **Unwanted special effects at the beginning of a new flight and before the aircraft has been serviced** —

No special visual effects (associated with the aircraft lights and smoke system) such as engine flames, turbopump exhaust steam or frost on the fuselage should be observed around the exterior model of the aircraft at the beginning of a new flight. If such effects are visible, simply press the “L” key (All Lights On/Off command) on your keyboard as necessary, until the effects disappear. These effects appear because some of the aircraft lights were turned on during a previous flight. You can load one of the X-1 SG saved flights included with your add-on package as a template for your flight. This has the advantage of reinitializing all X-1 SG custom systems and preventing unwanted special visual effects from appearing around the aircraft at the beginning of a flight.

**The X-1 SG aircraft has no 2D panel** — There are no more 2D panels included with the Xtreme Prototypes add-on aircraft, following an industry trend since the launch of Flight Simulator X. Users must switch to the virtual cockpit mode to access and initialize the instrument panels.

## **The six X-1 SG aircraft variations are not available in FSX, only four aircraft seems to be installed** —

Make sure the “Show all variations” option is selected in the “Select aircraft” page in FSX.

**X-1 SG saved flights cannot be found** — X-1 SG saved flights must not be confounded with FSX missions. The X-1 SG saved flights can be loaded from the Free Flight page in FSX (click on the Load... button). The FSX saved flights are installed in your “...My documents\Flight Simulator X Files” folder and not in your “Microsoft Flight Simulator X\Flights” folder, like in FS2004.



# Appendix 5: OTHER PRODUCTS by Xtreme Prototypes

[www.xtremeprototypes.com](http://www.xtremeprototypes.com)

**X-1 SECOND GENERATION**

**EXTREME FLIGHT SIMULATION**

**GLJ 20 Series**

**ARROW** Add-on High-altitude Interceptor for Microsoft® Flight Simulator

**EXTREME FLIGHT SIMULATION**

**X-15** Add-on Rocket Aircraft for Microsoft® Flight Simulator

**Xtreme Prototypes** [www.xtremeprototypes.com](http://www.xtremeprototypes.com)

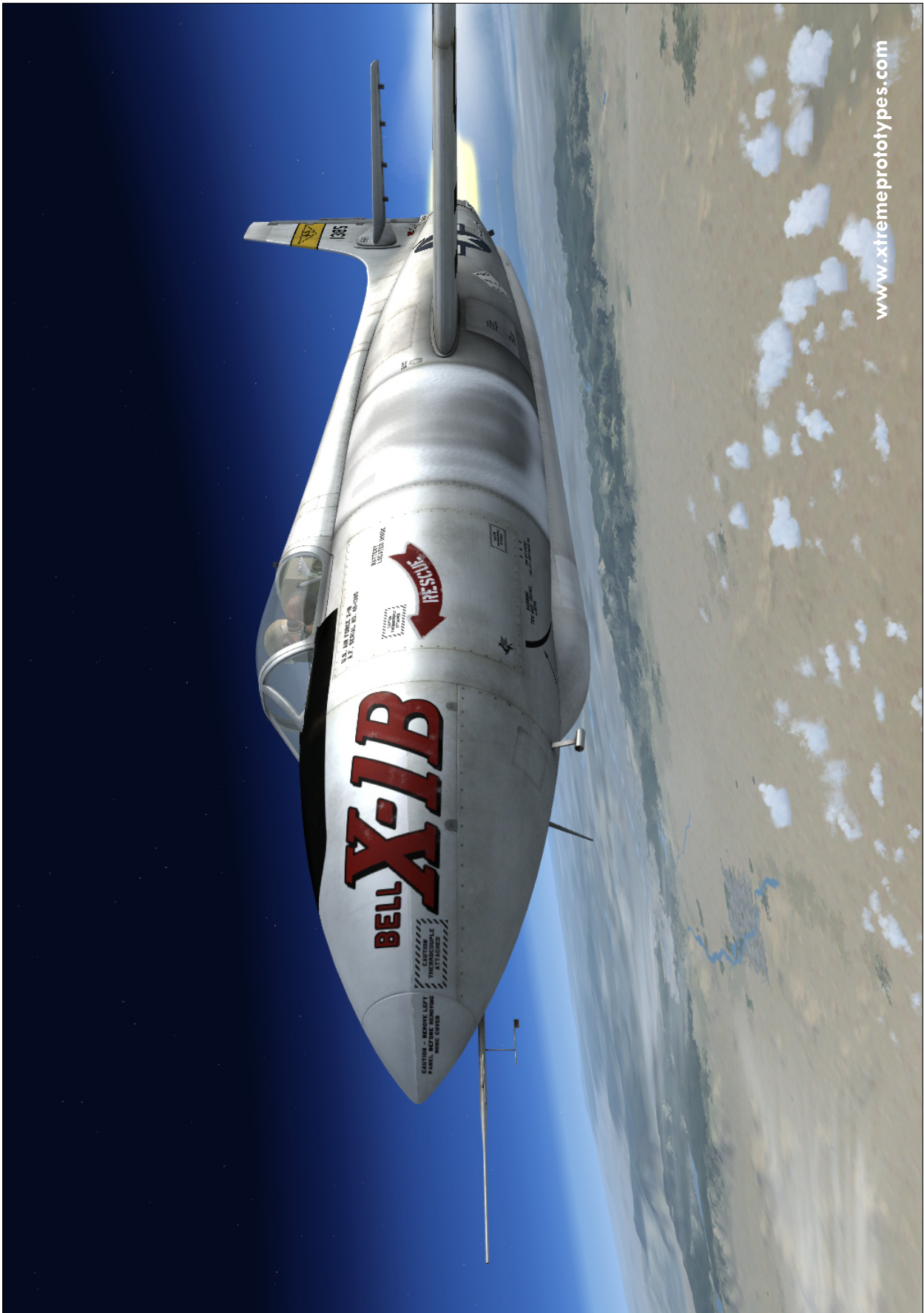
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Spectacular FSX screenshot of the Xtreme Prototypes X-1 Second Generation add-on rocket aircraft for Flight Simulator X (X-1A) above Edwards Air Force Base.



The Xtreme Prototypes X-1D for Flight Simulator X about to be launched at high altitude from a modified B-29 carrier aircraft.



The Xtreme Prototypes X-1B for Flight Simulator X igniting her XLR-11 rocket engine.



The Xtreme Prototypes X-1A add-on rocket aircraft for Flight Simulator X (orange version) after being dropped over the Mojave Desert.



The Xtreme Prototypes X-1C add-on rocket aircraft for Flight Simulator testing her supersonic armament system (fictitious).



The Xtreme Prototypes X-1D add-on rocket aircraft for Flight Simulator (rollout version).



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All images appearing in this document are actual screenshots of the Xtreme Prototypes X-1 SG virtual aircraft and panels captured in Microsoft® Flight Simulator X, except where otherwise noted.

Portions of this manual have been inspired or adapted from the original “Bell X-1A, B & D Pilot’s Handbook of Flight Operating Instructions” published during the 1950s by the U.S. Air Force and Bell Aircraft Corporation. This manual is no longer classified and is in the public domain. Xtreme Prototypes is not affiliated with NASA, Bell Aircraft (today, Bell Helicopter Textron), the U.S. Air Force or any other company, entity or government organization related to the X-1 research program. Software platform logo (TM and ©) IEMA 2007. This product is neither sponsored nor endorsed by NASA.

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