



PILOT'S OPERATING INSTRUCTIONS

CF-105 ARROW

**ADD-ON HIGH-ALTITUDE INTERCEPTOR
FOR MICROSOFT® FLIGHT SIMULATOR X
AND FLIGHT SIMULATOR 2004**

ENGLISH VERSION 1.0



- RL-201 Mark 1
- RL-202 Mark 1
- RL-203 Mark 1
- RL-204 Mark 1
- RL-205 Mark 1
- RL-206 Mark 2

**LATEST REVISED PAGES SUPERSEDE
THE SAME PAGES OF PREVIOUS DATE**

Insert revised pages into basic publication.
Destroy superseded pages.

Contains full product description
and specifications, installation instructions,
normal procedures and check list.

***Xtreme
Prototypes***

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PILOT'S OPERATING INSTRUCTIONS CF-105 ARROW

ADD-ON HIGH-ALTITUDE INTERCEPTOR FOR FLIGHT SIMULATOR X AND FS2004

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AND ACCOMPANYING USER MANUAL
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All images appearing in this document are actual screenshots of the Xtreme Prototypes CF-105 Arrow virtual aircraft and panels captured in Microsoft® Flight Simulator X or Flight Simulator 2004 game environments, except where otherwise noted. Portions of this manual have been inspired or adapted from original Avro Aircraft utility flight manuals published during the 1950s by the RCAF and A.V. Roe (Avro) Canada Limited. Xtreme Prototypes is not affiliated with Avro Canada, the Canadian Air Force, or any other company, entity or government organization related to the Arrow program. Software platform logo (TM and ©) IEMA 2007.

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FOREWORD

FLY THE LEGENDARY ARROW!

We thank you for purchasing your copy of the Xtreme Prototypes CF-105 Arrow add-on aircraft for Microsoft® Flight Simulator X and Flight Simulator 2004.

This publication contains the necessary information for the installation and operation of the CF-105 Arrow virtual aircraft, 3D cockpits and instrument panels.

The Avro Arrow was a revolutionary aircraft and certainly one of the most advanced of its time. It used computer control and “fly by wire” and was capable of flying over Mach 2. In the late 1950s, the Arrow was probably the fastest jet aircraft in the world.

The Arrow is still a legend years after the Canadian government ordered its development to stop and the prototypes destroyed before the aircraft could fulfill its intended role as a new type of all-weather, high-altitude interceptor against Soviet long-range bombers during the Cold War.

For the Flight Simulation enthusiast, the Xtreme Prototypes CF-105 Arrow is a chance to experience first hand the sheer performance of an aircraft whose advanced systems, cockpit ergonomics and visibility were quite a challenge for the test pilots who flew them fifty years ago. Your CF-105 Arrow addon will allow you to fly at high altitudes at twice the speed of sound, simulate the procedures required during test flights or reconnaissance and interception missions, and even test the anticipated performance of the mighty Orenda PS-13 “Iroquois” engine that was being installed in the Arrow Mark 2 (RL-206) at the time the Arrow program was cancelled.

Although this product is a **game** (and we do not pretend it is one hundred percent historically or technically accurate or that it truly reproduces all the systems and flight characteristics of the real Arrow interceptor), we tried our best to develop a high quality add-on aircraft that looks and behaves as realistically as possible.

For historical accuracy and in an effort to recreate what it was like to operate the real Avro Arrow, portions of this document have been inspired or adapted from the original Arrow “Flight control system pilot’s manual” and from other Avro aircraft flight manuals of the same era. 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 manuals. All images appearing in this document are actual screenshots of the Xtreme Prototypes CF-105 Arrow virtual aircraft and panels captured in Microsoft® Flight Simulator X or Flight Simulator 2004 game environments, 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 Arrow 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>

For those interested in knowing more about the real Avro Arrow, we have included some interesting Internet links and a selected bibliography at the end of this manual (see appendices 5 and 6).

We hope you will enjoy the Avro Arrow for Flight Simulator experience as much as we enjoyed developing this product.

The Development Team at Xtreme Prototypes



Spot plane view of the Xtreme Prototypes CF-105 Arrow for Flight Simulator (FSX screenshot).

INTRODUCTION AND PRODUCT DESCRIPTION

SECTION 1

THE AVRO ARROW STORY

In early 1952, North-American allies Canada and the United States were increasingly concerned by the growing threat of soviet long-range high-altitude bombers crossing over from the north pole. In March of that year, the Royal Canadian Air Force (RCAF) issued a requirement for an all-weather interceptor aircraft.



The real Avro Arrow. (Canada's Air Force)

By April of the following year and after months of discussions, proposals and studies with the A.V. Roe Aircraft Company of Canada (Avro Canada), the RCAF published specification "AIR-7-3" which calls for a two-man crew, twin-engined jet aircraft with a cruise speed of Mach 1.5 at FL500 and a maneuverability of 2 g at these flight conditions. After some thorough researching of the then-available offerings, it was concluded that such a platform did not yet exist and would have to be developed entirely from scratch.

By the summer of 1953, the Soviet Union had successfully tested the hydrogen bomb and introduced the M4 Bison jet bomber. These combined threats motivated massive funding for the development of the Arrow. By that time, however, the intended engines (Rolls Royce RB.106) were no longer available for their development was cancelled in Britain. Also, the RCAF now insisted on an entirely new weapons fire and control system that was also under development: the RCA-Victor ASTRA 1.

The aerospace industry usually accepts the time-tested cardinal rule that one does not mate a new engine to a new airframe, let alone a new weapons system. In the case of the Arrow, it was decided to take the bold step of mating not two but three new and untested components, for Avro Canada undertook the development of its own engine, the Orenda PS-13 "Iroquois", capable of delivering over 26,000 pounds of thrust.

The development of the Avro Arrow was met with relative success and new technological breakthroughs were achieved in the process. Worth mentioning were the thin shoulder-mounted delta wing with toothed leading edges, the area-ruled fuselage, the fly-by-wire system with artificial force feedback, the multi-axis stability augmentation system, the miniaturized high-pressure hydraulic system and the flight computer whose vacuum-tube components required an air-conditioning capacity well capable of cooling a large office building.



The Xtreme Prototypes CF-105 Arrow for Flight Simulator (Mk.1, RL-205, FSX screenshot).

All these features had to be tested one by one before production for the Arrow broke yet another industry rule of the time: no prototypes were to be built in order to save time —that is, the first aircraft to fly would be built using production tooling which meant that the design had to be right the first time. Today, thanks to computer-aided design, most aircraft are made this way, but at the time, it was a huge gamble.

On March 25, 1958, the Arrow first took to the air in the hands of Avro test pilot Janusz Zurkowski using Pratt & Whitney J-75 engines, for the Orenda Iroquois was still not ready. The aircraft showed promising performance, passing the sound barrier on only the third flight. The aircraft eventually flew at Mach 1.86 with the P&W engines and it was obvious to everyone that the Iroquois-powered Arrow Mk. 2 would easily meet its internal Mach 2 specification. Flight testing concentrated mainly on fine-tuning the flight computer's parameters.



The Xtreme Prototypes CF-105 Arrow for Flight Simulator (Mk.1, RL-201, FSX screenshot).

In the meantime, the ASTRA weapons fire-control system was proving far more difficult and costly to develop than originally planned. Also, there were increasing fears that the Soviets might not use bombers at all to attack North America, but rather would do so using long-range rockets. Sputnik's first orbital flight in 1957 did nothing to appease these fears.

These changing defense scenarios prompted authorities to question the very concept of the manned interceptor. Worse, the Avro Arrow was to be compatible with the American Semi-Automatic Ground Environment (SAGE) system which allowed an aircraft's autopilot to be controlled from the ground according to a ground computer's predictions of the enemy's track. It was only a matter of time before the entire concept of high-altitude manned interceptions was deemed obsolete and the job was handed over to guided missiles.

In view of these evolving military and technological realities, the RCAF and the newly-elected Conservative government in Ottawa decided to cancel the entire Arrow program, just as the Iroquois engine was being prepared for its first flight. It never got to show its potential in the

air, despite 7,000 encouraging ground-testing hours.

A total of five Arrows were built before the project was cancelled in 1959. Cost overruns, competing new defence systems such as the SAGE system and the Bomarc missile program, and the election in Canada of a new government all likely contributed to the cancellation of the Arrow project.

The RCAF ordered all the Arrow-related documents destroyed by fear of Soviet spies and the five aircraft were to be sold in a last-minute deal to friendly interests who would have used them for research purposes, but the cost and complexities involved proved too much for the British and Canadian prospects and so two months after the program cancellation, all the Arrows were cut into sad chunks of scrap metal, later to be sold by the pound.

Along with the cancellation of the program came the predictable death of Avro Canada and the loss of some 40,000 jobs. Many of the laid-off Avro Canada engineers (and their Canadian taxpayer-funded knowledge) went to work for NASA's space program and various international supersonic transport programs including the Concorde.

It would take 40 years for Canada to re-establish itself as a major aerospace player.



RL-201 about to take off with full afterburner (FSX screenshot).

To this day, the Avro Arrow remains the stuff legends are made of, and there is no shortage of romance surrounding its story, ranging from wild conspiracy theories involving the American government of the time, to what-if scenarios foreseeing Canada as a superpower of the future had the Arrow been allowed to fly. In any case,



The Xtreme Prototypes CF-105 Arrow for Flight Simulator (Mk.1, RL-201, FSX screenshot).

brought back to its historical context, the Arrow was an advanced airframe incorporating many technological innovations that today are taken for granted.

While all of the original Arrow aircraft were destroyed, several replicas have been created over the years. A full-size replica is currently on display at the Toronto Aerospace Museum, in Ontario, Canada. It was built by volunteers with commercial assistance.

Portions of the forward fuselage of the first Mark 2 Arrow (RL-206) as well as other rare artifacts were saved and are currently on display at the Canada Aviation Museum in Ottawa.

There are many excellent books, publications and movies about the Arrow program. Pictures and movie clips are also available on a number of web sites. See appendices 5 and 6 for details.

HISTORICAL DATA*

- ❑ **Rollout (RL-201):** October 4, 1957 (first Arrow prototype unveiled at the Avro plant in Malton, Ontario, Canada).
- ❑ **First powered flight (RL-201):** March 25, 1958 (pilot: Janusz Zurakowski).
- ❑ **Last flights (RL-201 and RL-204):** February 19, 1959 (pilot: Wladek “Spud” Potocki).
- ❑ **Number of flights:**
 - RL-201: 25
 - RL-202: 22

- RL-203: 12
- RL-204: 6
- RL-205: 1
- RL-206: 0

- ❑ **Highest Mach number with two Pratt & Whitney J75-P-5 engines (RL-202):** Mach 1.86 (September 14, 1958; pilot: Janusz Zurakowski).
- ❑ **Highest altitude (RL-202):** 50,000 feet (September 14, 1958; pilot: Janusz Zurakowski).

*: Based on available data.



RL-202 during her initial test flight (Arrow Mk. 1, FSX screenshot).

THE XTREME PROTOTYPES CF-105 ARROW FOR FLIGHT SIMULATOR



Cockpit view (Mk.1, RL-203, FSX screenshot).

The Xtreme Prototypes CF-105 Arrow add-on package contains six variations of the Avro CF-105 Arrow:

- ❑ Five variations of the Avro CF-105 Arrow Mk. 1 equipped with two Pratt & Whitney J75-P-5 engines (RL-201 to RL-205);
- ❑ One variation of the Avro CF-105 Arrow Mk. 2 equipped with two Orenda PS-13 “Iroquois” engines (RL-206).

The add-on aircraft package includes highly detailed exterior models, fully functional 3D virtual cockpits, custom special effects and sounds, several camera definitions for FSX, a 60-page user manual (PDF format) and a number of saved flights inspired by Arrow test flights and anticipated interception and reconnaissance missions.

The flight model allows the airplane to accelerate up to approximately Mach 2.3 and reach an altitude of 60,000 feet.

The Xtreme Prototypes CF-105 Arrow for Flight Simulator is compatible with FSX, FSX Acceleration Expansion Pack and FS2004 (FS9). See section 2 for compatibility issues.

FULLY DETAILED MODELS OF THE REAL-WORLD AVRO ARROW



Wing camera view (FSX screenshots).

Each add-on aircraft in the series is fully detailed with over 600 parts and 60 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 Avro Arrow.

The airplanes feature different reflective textures, unique markings, movable control surfaces (horizontal stabilizer,

vertical stabilizer/rudder and speed brakes), fully animated jet engines, extendable landing gear with lights, movable canopies with cockpit details, pilot, navigator and animated sticks and levers.

All aircraft feature a number of animated visual effects such as engine flame and contrail effects, engine smoke and afterburner effects, as well as lighting effects.

The Mk. 1 airplane is available with two Pratt & Whitney J75-P-5 engines. The Mk. 2 airplane is available with two mighty Orenda PS-13 “Iroquois” engines, each capable of delivering more than 26,000 pounds of thrust.

FULLY FUNCTIONAL 3D VIRTUAL COCKPITS WITH ADVANCED SYSTEMS



Virtual cockpit view (FSX and FS2004 screenshots).

Each aircraft comes with a fully functional virtual cockpit which contains over 900 parts and about 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 CF-105 Arrow.

The full 3D gauges have been carefully designed and programmed based on the original analog instruments found in the real Arrow 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-world Avro Arrow.

Two different VC configurations are available for the Arrow for Flight Simulator (see section 5).

OTHER FEATURES

Arrow sound sets — The Arrow comes with her own custom sound sets for both FSX and FS2004.



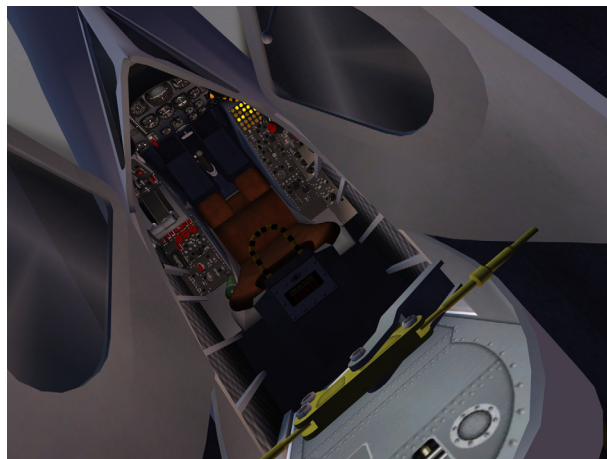
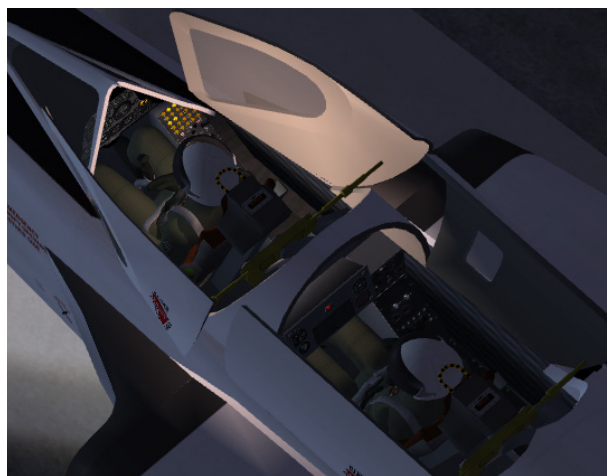
14 aircraft camera definitions or views (FSX only)

— The Arrow has ten camera views showing different parts of the aircraft such as the vertical rudder, speed brakes, ailerons and landing gear. In addition, the model has both left and right canopy views, a rear engine view, a top view and four VC (side consoles) views. Users can cycle forward or backward the different camera views using the S and A keys (or SHIFT+S/SHIFT+A) or a joy-

stick button. The aircraft camera views are also available from the main FS top menu bar.

Cockpit spotlights and backlit instrument panels —

The VCs and external models feature cockpit spotlights and backlit instrument panels that are lit when the cockpit and/or panel lighting switches on the right side panel are turned on. Try flying the Arrow at night, dusk or dawn to see how the VC is beautifully lit.

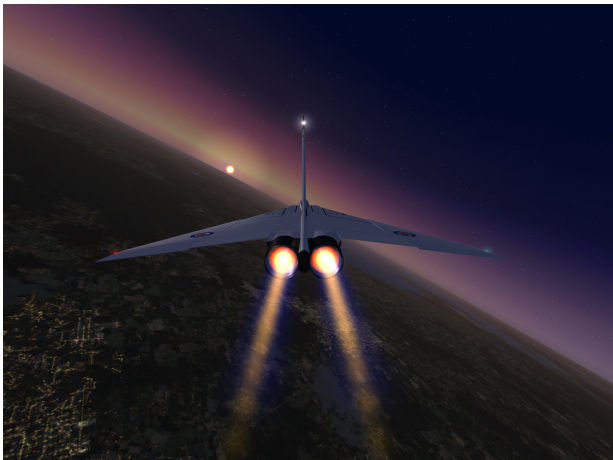




“Invisible” VC canopy mode — The black and yellow canopy emergency release lever on the right side of the cockpit can be activated and will allow for flying the Arrow add-on aircraft from within the VC without the clam-shell-type canopy on. The canopy emergency release lever does not open the canopy. It simply makes it “invisible” for the virtual pilot. The canopy is still present on the external model.

Ten saved flights based on actual Arrow historical test flights and fictitious reconnaissance flights —

It is easy to prepare the Arrow for takeoff or simulate a reconnaissance mission over the great Canadian North by loading one of the included saved flights. See Appendix 2 for details.



60-page user manual — The Xtreme Prototypes CF-105 Arrow aircraft package comes with a comprehensive 60-page user manual (the present document) in a printable PDF format, inspired from original Avro aircraft manuals. The manual is available in both English and French languages.



RL-203 before takeoff. Note the open clam-shell canopy and the “vane-type” flight test probe on the nose.

The Xtreme Prototypes CF-105 Arrow for Flight Simulator is an **add-on** software package which requires **Microsoft® Flight Simulator X (FSX)** or **Microsoft® Flight Simulator 2004 (FS2004/FS9)** to be installed on your computer in order to function. Make sure either version has properly been installed according to the instructions provided by the manufacturer before you proceed.

COMPATIBILITY

The Xtreme Prototypes CF-105 Arrow for Flight Simulator add-on aircraft was originally designed and optimized for Microsoft® Flight Simulator 2004. The software is now compatible with Microsoft® Flight Simulator X (Service Pack 2 recommended), FSX Acceleration Expansion Pack, and Windows® Vista™ but some aircraft features may not behave or look exactly the same in the different environments.

Note to Windows® Vista™ with DirectX® 10 users: The DirectX® 10 Preview option box in FSX display settings must be unchecked for proper aircraft display. The current version of the software does not support certain DirectX® 10 features.

As a rule of thumb, if Microsoft® Flight Simulator runs properly on your computer, you should be able to fly the

Arrow for Flight Simulator without problems. Some FSX features (such as the aircraft camera views) are not available in FS2004. Flight models and add-on aircraft operation, procedures and check list, as described in the manual, are generally the same on all platforms.

The VC features and some special visual effects such as engine flames and exhaust contrails 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 Arrow might also improve the overall system performance.

Consult the documentation included with your version Microsoft® Flight Simulator for information about minimum system requirements and how to optimize your display settings.

NOTE: If the “Light bloom” option is selected in the FSX display settings, the Arrow add-on aircraft may not appear in the aircraft preview window and during flight with the screen becoming all white. To avoid this problem, unselect the “Light bloom” option in the FSX display settings page. This might also improve your frame rate. This is a model-related issue and cannot be corrected in the current version.

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

MINIMUM SYSTEM REQUIREMENTS

Flight Simulator: Microsoft® FSX (FSX SP2 recommended, Acceleration Expansion Pack optional), FS2004

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)

Available Disk Space: 300 MB (space required to in-

install the Arrow add-on software and documentation)
Video Card: 64 MB (128 MB or more recommended),
DirectX® 9.0

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

NOTE: Xtreme Prototypes CF-105 Arrow addons are quite 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 recommended.

PILOT'S OPERATING INSTRUCTIONS (MANUAL)

Included with the software are the English and French versions of the present **Arrow Pilot's Operating Instructions**, both available in a printable PDF format (Adobe® Reader® 8.0 or later required).

To download Adobe® Reader®, visit:
www.adobe.com/products/acrobat/

The 60-page manual contains the necessary information for the installation and operation of the CF-105 Arrow add-on aircraft, 3D virtual cockpits and associated instrument panels.

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 **Arrow Pilot's Operating Instructions**

(XP_Arrow_manual_en_v1r0.pdf and XP_Arrow_manuel_fr_v1r0.pdf) in a printable PDF format.

- ❑ A self-executable **Setup program file** (XP_Arrow_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 Arrow add-on aircraft** and associated **3D virtual cockpits***:
 - ❑ **Five variations of the Avro CF-105 Arrow Mk. 1** equipped with two Pratt & Whitney J75-P-5 engines (RL-201 to RL-205);
 - ❑ **One variation of the Avro CF-105 Arrow Mk. 2** equipped with two Orenda PS-13 “Troquois” engines (RL-206).
2. All the **special visual effects** for the Arrow aircraft (e.g.: engine flame and afterburner effects).
3. The **Arrow custom sound package**.
4. The **saved flights**.

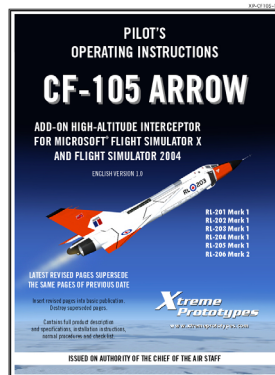
*: The Arrow package contains two different versions of the VC. Note that there are no more 2D panels included with Xtreme Prototypes' addons for Flight Simulator (see section 5).

INSTALLATION INSTRUCTIONS

Refer to the FSX section for installation in Flight Simulator X or FSX Acceleration Expansion Pack (AEP). Refer to the FS2004 section for installation in Flight Simulator 2004.

INSTALLATION IN FSX

The Xtreme Prototypes CF-105 Arrow for Flight Simulator is installed like any other add-on aircraft in your default “Microsoft Flight Simulator X” folder.



DOWNLOAD

If you have downloaded the software, simply run the Setup program (XP_Arrow_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. If FS2004 is also installed on your computer, select if you want the Arrow add-on aircraft to be installed in FSX (or FSX AEP) and/or FS2004. The installation program will copy the necessary files into their default locations in the "Microsoft Flight Simulator X" and/or "Flight Simulator 9" 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. If FS2004 is also installed on your computer, select if you want the Arrow add-on aircraft to be installed in FSX (or FSX AEP) and/or FS2004. The installation program will copy the necessary files into their default locations in the "Microsoft Flight Simulator X" and/or "Flight Simulator 9" 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 add-on aircraft are installed, they will be available on the **Select Aircraft** page in Flight Simulator.

Note that the Arrow manual is copied by default in the "C:\Program Files\Xtreme Prototypes\CF-105 Arrow Documentation" folder for your convenience and future reference. It is available in the "Start\Programs\Xtreme Prototypes" section of the Windows® taskbar.

Refer to section 6 for complete procedures and check list.

FILE STRUCTURE

The Arrow aircraft, virtual cockpits and sounds are installed in your "Microsoft Flight Simulator X\SimObjects\Airplanes" folder, under different names and folders. The Arrow special effects are installed in your "Microsoft Flight Simulator X\Effects" folder and the Arrow 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 not in your "Microsoft Flight Simulator X\Flights" folder, like in FS2004.

INSTALLATION IN FS2004

The Xtreme Prototypes CF-105 Arrow for Flight Simulator is installed like any other add-on aircraft in your default "Flight Simulator 9" folder.

DOWNLOAD

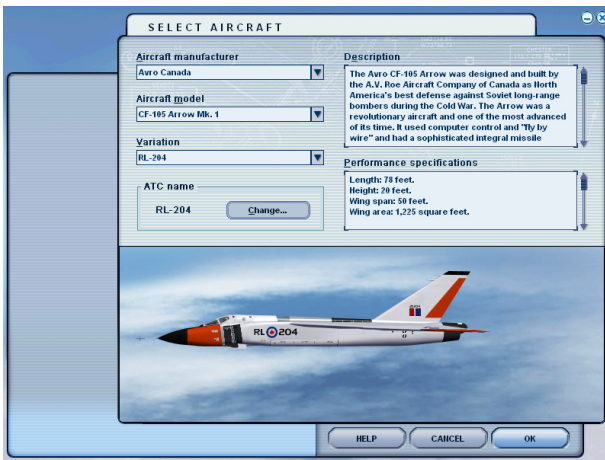
If you have downloaded the software, simply run the Setup program (XP_Arrow_v1r0_setup.exe) and follow the instructions that appear on screen. Enter your product registration key when asked. You must accept the end-user license agreement and enter a valid registration key before you can install and use this product. If FSX (or FSX AEP) is also installed on your computer, select if you want the Arrow add-on aircraft to be installed in FS2004 and/or FSX (or FSX AEP). The installation program will then copy the necessary files into their default locations in the "Flight Simulator 9" and/or "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. If FSX is also installed on your computer, select if you want the Arrow add-on aircraft to be installed in FS2004 and/or FSX (or FSX AEP). The installation program will then copy the necessary files into their default locations in the “Flight Simulator 9” and/or “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 add-on aircraft are installed, they will be available on the **Select Aircraft** page in Flight Simulator.

Note that the Arrow manual is copied by default in the “C:\Program Files\Xtreme Prototypes\CF-105 Arrow Documentation” folder for your convenience and future reference. They are available in the “Start\Programs\Xtreme Prototypes” section of the Windows® taskbar.

Refer to section 6 for complete procedures and check list.

FILE STRUCTURE

The Arrow aircraft, virtual cockpits and sounds are installed in your “Flight Simulator 9\Aircraft” folder, under different names and folders. The Arrow special effects are installed in your “Flight Simulator 9\Effects” folder and the Arrow saved flights are installed in your “Flight Simulator 9\Flights” folder.

AIRCRAFT DESCRIPTION AND SPECIFICATIONS

SECTION 3



The Xtreme Prototypes CF-105 Arrow Mark 1 for Flight Simulator (RL-201, equipped with two Pratt & Whitney J75-P-5 engines, FSX screenshot).

AIRPLANE

The Arrow was a two-seat, twin-engine jet aircraft. It featured a delta wing design that had the advantage of allowing for the wing's leading edge to remain behind the shock wave created by the aircraft's nose when flying at supersonic speeds.

The Arrow (Mk. 1) was capable of reaching Mach 2 with her two Pratt & Whitney J75-P-5 engines. The aircraft was expected to break all speed records when the more powerful Orenda PS-13 "Iroquois" engines were installed.

Armament was to consist of guided missiles and un-guided nuclear rockets. Guns were not in the plans as the aircraft was designed to engage targets at distance rather than dogfight.

AIRPLANE DIMENSIONS

The overall dimensions of the airplane (in-flight configuration, with gear up) were as follows:

- ❑ **Length:** 78 feet.
- ❑ **Span:** 50 feet.
- ❑ **Height:** 20 feet.
- ❑ **Wing area:** 1,225 square feet.

AIRPLANE GROSS WEIGHT

The approximate gross weight of the airplane (including full internal load and pilots) was approximately 56,920 pounds. However, this could vary a few hundred pounds, depending on the engine configuration and on the type of instrumentation or weapons systems carried.

- ❑ **Gross weight (MTOW):** 62,430 lbs.
- ❑ **Empty weight:** 43,960 lbs.

LIMITATIONS

- ❑ **Maximum speed:** Mach 2.3 at 60,000 feet.
- ❑ **Cruise speed:** Mach 0.91 at 36,000 feet.
- ❑ **Range:** 360 nautical miles.
- ❑ **Service ceiling:** 53,000 feet.

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

SERIAL NUMBERS

The Royal Canadian Air Force serial numbers for the Avro Arrow airplanes covered by this manual are 25201 to 25205 (Arrow Mk. 1) and 25206 (Arrow Mk. 2). The "Roe Limited" (RL) tail numbers for the aircraft are RL-201 to RL-206.



The Xtreme Prototypes CF-105 Arrow Mark 2 for Flight Simulator (RL-206, equipped with two mighty Orenda PS-13 Iroquois engines, FSX screenshot).

AVRO CF-105 "ARROW" Mark 1

GENERAL ARRANGEMENT

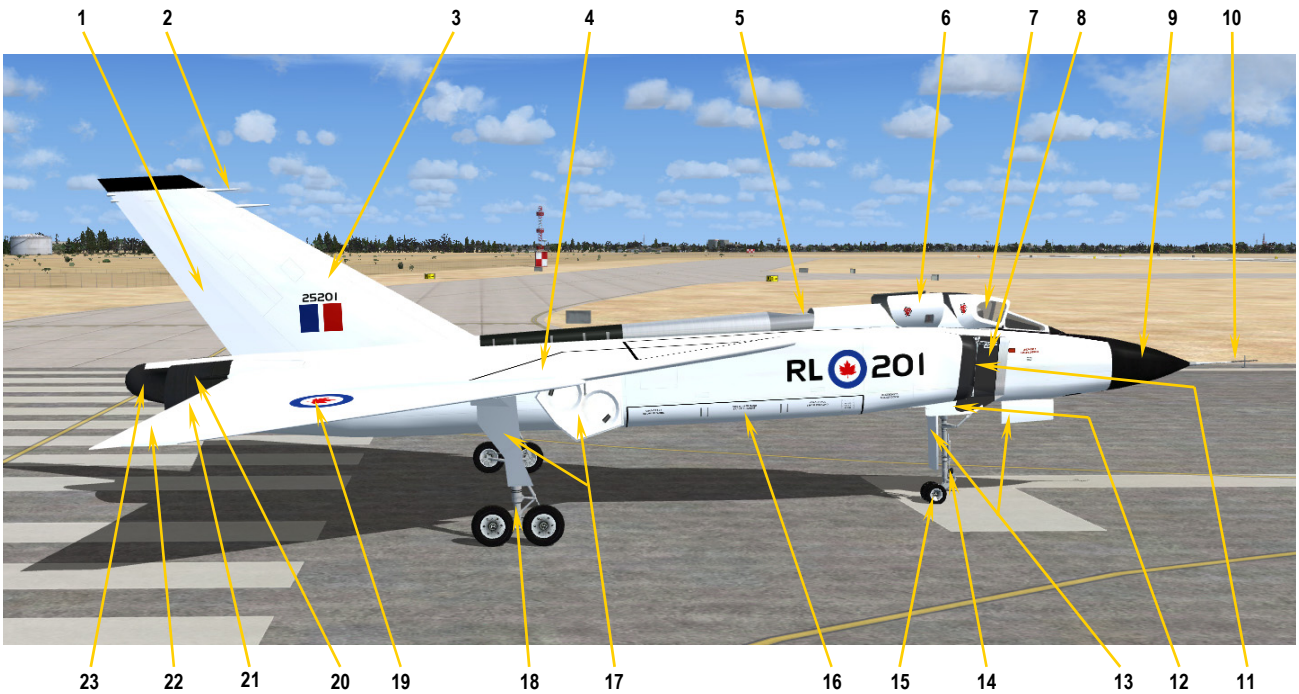


Figure 3-1

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. RUDDER 2. ANTENNAS AND/OR PROBES 3. VERTICAL STABILIZER 4. WING DEFLECTOR 5. AIR CONDITIONING HOT AIR EXHAUST 6. NAVIGATOR CANOPY 7. PILOT CANOPY 8. ENGINE INTAKE BOUNDARY LAYER SPLITTER PLATE 9. RADOME 10. BOOM PROBE 11. ENGINE INTAKE LIP 12. ENGINE INTAKE BOUNDARY LAYER EXTRACTOR | <ol style="list-style-type: none"> 13. NOSE GEAR DOORS 14. LANDING AND TAXI LIGHTS 15. NOSE GEAR 16. PAYLOAD 17. MAIN GEAR DOORS 18. MAIN GEAR 19. WING 20. ENGINE TAILCONE 21. ELEVATOR 22.AILERON 23. TAILCONE FAIRING |
|--|---|





This section contains information about the aircraft systems included with the Xtreme Prototypes CF-105 Arrow add-on aircraft for Flight Simulator. These systems are intended to replicate as closely as possible the actual systems found in the real Avro Arrow.

Almost every Arrow internal system has been integrated into the Xtreme Prototypes CF-105 Arrow for Flight Simulator virtual cockpits:

- Electrical System
- Pneumatic System
- Environmental System
- Fuel System
- Hydraulic System
- Oxygen System
- Caution and Warning System
- Navigation and Communications System
- Automated Flight System
- Damping System

NOTE: Complete instrument panels information can be

found in section 5.

AIRCRAFT SYSTEMS

FUEL SYSTEM

The fuel system consists of two fuselage tanks and six wing tanks per side for a total capacity of 2,897 imperial gallons of jet fuel.

Two of the forwardmost wing tanks act as collectors for the entire system. The forward fuselage tank is associated with the left wing tanks while the rearward fuselage tank is associated with the right wing tanks.

The tanks are pressurized by bleed air regulated to 19 psi. A sensor and valve system ensure correct fuel transfer between tanks as levels decrease.

Under normal operation each engine is fed from its respective wing. In case of an engine failure, a crossfeed

valve and two isolation valves are provided as well as a low-pressure cock (firewall shutoff valve) for each engine.

The isolation valves and the crossfeed valve are controlled by means of a single switch on the pilot's left-hand console. A pressure refuelling/defuelling valve is fitted on either side of the aircraft.

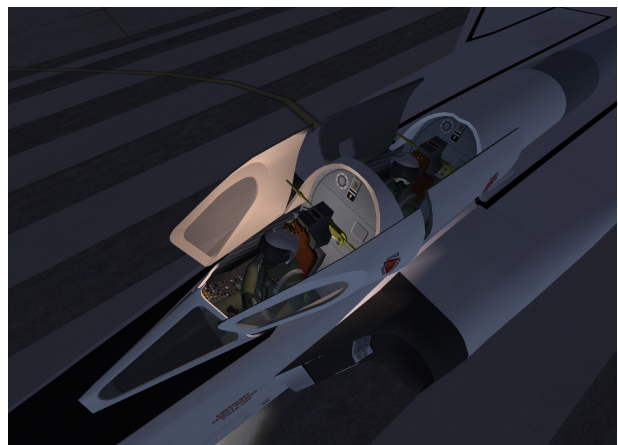
Two fuel quantity indicators are installed on the main instrument panel and provide an indication of total fuel remaining in both systems.

One low fuel quantity warning light is installed on the annunciator panel along with one fuel pressure warning light for each engine.

Refer to section 6 for operating instructions.

ELECTRICAL SYSTEM

The electrical system is a dual 115/208V 400 Hz AC-type with one engine-driven alternator per engine and an associated transformer-rectifier unit to provide 28 VDC power. One alternator provides power to aircraft services while the other powers the electronic systems.



Two warning lights on the master warning lights panel provide indication of alternator status.

An hydraulically-powered emergency alternator is also provided in case of a loss of all generators. Emergency power is provided by a 15A-h 24V battery.

The electrical system supplies power to the following aircraft services:

- Starting and ignition
- Engine services

- Landing gear actuation and indication
- Fuel control and indication
- Fire protection
- Canopy actuation
- Damping system
- Air conditioning
- Flight services and indication
- Master warning system (annunciator panel)
- Cockpit lighting
- External lights
- Duct de-icing
- Windshield and canopy de-icing

Refer to section 6 for operating instructions.

PNEUMATIC SYSTEM

This section refers to the high-pressure pneumatic system. The low-pressure (pitot-static) system is not covered in this manual.



Low-pressure air is derived from the air-conditioning system to supply the canopy seals, anti-g suits, radar

systems and radome de-icing fluid reservoir.

High-pressure air is bled continuously from the engine compressors. Air is then channelled to a modified air-cycle machine to lower its temperature sufficiently to cool the aircraft's electronic equipment.

Conditioned air is also used to pressurize the cockpit.

Airflow for equipment cooling is 122 lbs/min while airflow for the cockpit is 80 lbs/min.

Pilot-selected cockpit air temperatures range from 40 deg. F to 80 deg. F.

Equipment cooling air temperature is 70 deg. F.

Refer to section 6 for operating instructions.

HYDRAULIC SYSTEM

The Avro Arrow has three separate and independent hydraulic systems. Operating pressure is 4,000 psi and fluid temperature is 250 deg. F (maximum 275 deg. F). One 20-gpm hydraulic pump per engine powers the flight controls while two other similar pumps power the utility hydraulic system.



The flight controls hydraulic systems power the following equipment:

- Ailerons
- Elevators
- Rudder
- Radar antenna drive

The utility hydraulic system powers the following equip-

ment:

- Landing gear
- Wheel brakes
- Nose wheel steering
- Speed brakes
- Emergency alternator
- Armament equipment (Arrow Mk. 2)

Refer to section 6 for operating instructions.



INSTRUMENT PANELS (3D VIRTUAL COCKPITS)

SECTION 5



What makes the Xtreme Prototypes CF-105 Arrow for Flight Simulator exciting are the **fully functional 3D** instrument panels that have been designed for the desktop pilot to simulate almost every step and procedure required during a typical Arrow test flight or anticipated reconnaissance or interception mission.

Each Arrow for Flight Simulator add-on aircraft comes with one main instrument panel and a number of secondary panels located on the side consoles in the virtual cockpits (see figure 5-1). In addition, the default Flight Simulator Garmin GPS (2D) panel is available to the desktop pilot.

Over 200 full-3D gauges, flight instruments, light indica-

tors, switches and levers have been developed for the different variations of the Xtreme Prototypes CF-105 Arrow for Flight Simulator. Virtually all of them are functional and behave like the original analog devices found in the real-world Avro Arrow during the late 1950s.

Arrow instrument panels are complex. In order for the desktop pilot to familiarize him/herself with the many different panels, special “tooltips” (or captions) have been integrated within almost every flight instrument, gauge, switch and light indicator. Simply move the cursor over a cockpit item with the mouse and its name and applicable instrument reading will appear. Therefore, each panel can be used as a learning tool for understanding the dif-

ferent panel configurations and the complex operation of the Avro Arrow aircraft.

3D VIRTUAL COCKPITS



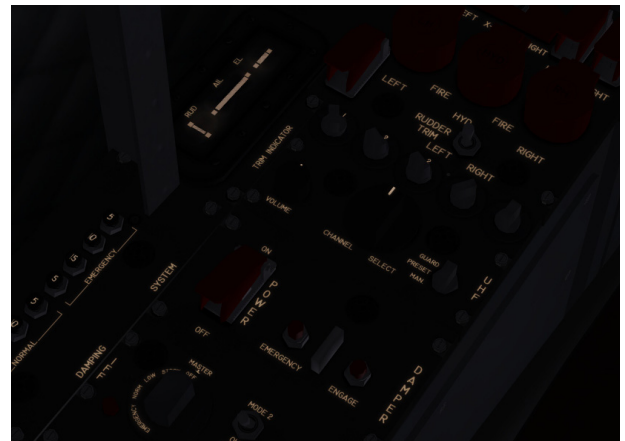
The main center of interest of the current software version are the fully functional virtual cockpits that allow a total 3D immersion into the Avro Arrow flying environment. The Xtreme Prototypes CF-105 Arrow package

contains two different virtual cockpits for the different variations of the aircraft.

Each virtual cockpit contains over 900 parts and has been meticulously created to conform as closely as possible to the cabin of the real Avro Arrow aircraft.

The VC comes with a number of switches, control sticks, handles and levers. All the switches in the VC are clickable (except for the circuit breakers on the left console).

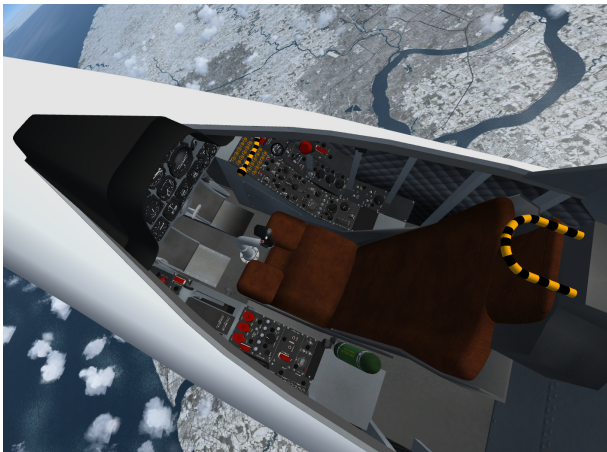
The VC has cockpit spotlights and backlit instrument





panels that are lit when the cockpit and/or panel lighting switches on the right side panel are turned on. Try flying the Arrow at night, dusk or dawn to see how the VC is beautifully lit.

Another interesting feature of the VC is the possibility to render the canopy “invisible” to create the impression that the aircraft is equipped with a “bubble” glass canopy. Though not very realistic in the case of a real Arrow mission, the “invisible” canopy gives more visibility to the pilot, especially during landing.



To render the canopy “invisible”, simply pull the large black and yellow canopy emergency release lever on the right side of the cockpit. Note that the black and yellow lever does not open the canopy. It simply makes it “invisible” for the virtual pilot in the VC. The canopy is still present on the external model.

The virtual cockpit is available in both FSX and FS2004 environments from the “Views” menu in the main FS menu bar at the top. Users can cycle forward or backward the different views using the S key (or SHIFT+S) or

a joystick button.

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. The CF-105 Arrow is no exception. The custom Arrow systems are integrated in the advanced 3D virtual cockpits. FS2004 users must switch to the virtual cockpit mode to access and initialize the instrument panels.

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 cursor positioned over the actual 3D part. Turning the mouse wheel up will turn the switch to ON, turning the mouse wheel down will turn the switch to OFF.

NOTE: Tooltips have been integrated into every clickable parts in the VC. When the mouse cursor becomes a hand and the tooltip is displayed, the 3D part can normally be activated by left clicking with the mouse.

3-position switches can be turned to their UP position from their middle (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 can be activated with a single left click.

Most **levers** can be moved with the mouse wheel to the desired position. Simply move the cursor over the lever handle with the mouse and turn the mouse wheel up or down to activate the lever.

Control sticks cannot be dragged with the mouse but are synchronized with the movements of your joystick or with the keyboard arrow keys (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 clicking with the mouse. Turning the mouse wheel will also turn some knobs left or right. Refer to the following pages for more details on how to activate specific knobs or buttons.

INSTRUMENT PANELS

Refer to fig. 5-1 to 5-6 for the location of the different instruments, gauges, light indicators, switches and levers described below.

FLIGHT INSTRUMENTS

Airspeed/Mach indicator [33, fig. 5-2a; 7, fig. 5-2b] — White needle displays indicated airspeed in knots (KIAS). Small window displays Mach numbers.

Altimeter [29, fig. 5-2a; 6, fig. 5-2b] — Standard sensitive altimeter with barometric setting knob.

Artificial (gyro) horizon [7, fig. 5-2a; 16, fig. 5-2b] — Can be caged for aerobatic maneuvers (RL-201-202).

Gyro compass remote indicator [9, fig. 5-2a; 31, fig. 5-2b] — Rotating card indicates gyro heading. Single needle (1) points to selected VOR station. Double (ADF) needle (2) points to selected NDB station.

Vertical accelerometer [6, fig. 5-2a; 5, fig. 5-2b] — Indicates number of “g”s pulled in the vertical plane.



Sideslip indicator (beta) [8, fig. 5-2a; 9, fig. 5-2b] — Indicates the angle of sideslip in degrees.

AoA indicator (alpha) [10, fig. 5-2a; 15, fig. 5-2b] — Indicates angle-of-attack in degrees.

Navigator bail-out annunciator [13, fig. 5-2a; 11, fig. 5-2b] — Indicates that the pilot has given the ejection order to the navigator.

Red master warning annunciator [15, fig. 5-2a; 13,

fig. 5-2b] — Indicates a situation that requires immediate action (refer to the caution and warning system on page 5-7; see also fig. 5-6).

Yellow master caution annunciator [14, fig. 5-2a, 5-2b] — Indicates a situation that requires attention (refer to the caution and warning system on page 5-8; see also fig. 5-7).

Magnetic compass [16, fig. 5-2a] — Non gyro-stabilized, subject to acceleration and turn errors (RL-201-202 only).

Left and right fuel quantity indicators [17-18, fig. 5-2a; 23-24, fig. 5-2b] — Available fuel in Imperial gallons.

Skin temperature indicator [4, fig. 5-2a; 32, fig. 5-2b] — Indicates skin temperature in degrees C at high Mach numbers.

Vertical speed indicator [1, fig. 5-2a; 17, fig. 5-2b] — Indicates rate-of-climb in feet per minute.

Turn indicator [32, fig. 5-2a; 18, fig. 5-2b] — Indicates rate of turn.

Left and right RPM indicators [26, 28, fig. 5-2a; 25, 28, fig. 5-2b] — Primary power setting instruments.



Left and right exhaust gas temperature (EGT) indicators [24-25, fig. 5-2a; 26-27, fig. 5-2b] — EGT is a limiting factor for engine operation.

Left and right engine pressure ratio (EPR) indicators [21-22, fig. 5-2a, 5-2b] — EPR gives a good indication of actual thrust being produced.

Cabin altitude indicator [23, fig. 5-2a; 19, fig. 5-2b] — Indicates the pressure altitude inside the cabin.

AVIONICS

Damping System

The aircraft is equipped with a full-time control-surface damper. It can be disengaged anytime with a switch on the pilot's left console.



Navigation

The original CF-105 specification called for navigation through a dead-reckoning computer and remote control from the ground, to be directed against its strategic targets in the polar regions, where regular nav aids were



almost non-existent. This ambitious system never saw the light of day due to the program's cancellation in 1959.

In order for your CF-105 Arrow addon to be as enjoyable as possible while retaining some level of historical accuracy, the navigation system on your aircraft consists of both a period-standard J4 radio compass and both a VHF NAV receiver and an ADF receiver.

The VHF NAV receiver is only capable of receiving VOR frequencies (108.0-117.9 MHz) and as such does not provide ILS capabilities. Non-precision instrument approaches are however quite possible providing DME is not required. Marker beacon signals (audio only, no lights) are also received.

Both ADF and VOR bearings are indicated by an RMI head on the pilot's main instrument panel. The RMI compass card is subject to normal gyro drift and can be realigned with the J4 compass control panel on the pilot's right console.



Operation of the VHF NAV radio: Left and right mouse clicks adjust whole frequency units while the mouse wheel adjusts fractions. Frequencies are read in the band window. 50 KHz increments appear in the tooltip. Station identification signals may be heard by toggling the VHF/NAV ID switch to ON.

Operation of the ADF radio: The mouse can be either on the band selection knob or the tuning crank. Frequencies are read in the band window. Left and right mouse clicks adjust whole frequency units while the mouse wheel adjusts fractions. Station identification signals may be heard by toggling the ADF ID switch to ON.

Communications

As Microsoft® Flight Simulator does not provide facilities for military UHF communications, the Xtreme Prototypes CF-105 Arrow addon is equipped with civilian VHF communications. However, in order to preserve as much historical accuracy as possible, the VHF COM panel is physically modelled after a UHF military radio.



Frequencies are selected with the mouse on the channel selector knob but will actually move the discrete UHF frequency selector knobs. Left and right mouse clicks adjust whole frequency units while the mouse wheel adjusts fractions.

Audio Panel

An audio panel is provided in the form of a standard military intercom panel. In order to hear VOR and NDB station ID signals, the appropriate switch must be in the ON position. Marker beacon audio as well as VHF COM radio can also be switched on this panel. The TACAN switch is inoperative.

Fire Detection and Extinguishing System

In the unlikely event of an engine fire, the appropriate annunciators will light up (annunciator panel, master warning light and fire annunciator/extinguisher switches). To discharge extinguishing agent, simply activate the respective guarded fire switch with the mouse wheel.

Autopilot

Your CF-105 Arrow is equipped with a basic autopilot typical of the period. It provides a single mode which may be controlled using the pitch wheel and the turn knob.

Toggling the ENGAGE switch to ON will hold the present pitch attitude and level the wings.

Turning the pitch wheel up or down with the mouse wheel will command the plane's nose up or down. As the autopilot has no altitude hold mode, the pilot is responsible for monitoring altitude and airspeed while the autopilot is engaged.



Turning the turn knob 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. As the autopilot has no heading select mode, the pilot is responsible for initiating and terminating the turns.

Pneumatic System

The aircraft's pneumatic system is fully automatic in its normal operation. Equipment air conditioning and anti-ice are fully automated.

In case of an engine failure, the bleed air valve of the failed engine must be shut OFF with the bleed air switch.

The cabin air supply switch must be ON for the cabin to pressurize. Of course, the cabin dump switch must be at CLOSE and the canopy closed as well.

Oxygen System

Your CF-105 comes with a full oxygen cylinder every time you reload the aircraft. Oxygen will flow when the aircraft leaves the ground and consumption increases with altitude. The pilot is responsible for managing his oxygen supply. The cylinder can be refilled at any time by clicking on the oxygen pressure gauge.



Caution and Warning System

Your CF-105 is equipped with a comprehensive caution and warning system which consists of an annunciator panel, a push-to-test button, a (red) master warning annunciator, a (yellow) master caution annunciator, a reset button and miscellaneous (yellow) annunciators. For a detailed description of the conditions that cause the different annunciators to light up, refer to figure 5-6.



Some situations are considered to require immediate action. These are referred to as warnings and will light up the (red) master warning annunciator as well as the appropriate (yellow) annunciator(s) on the annunciator panel. The (red) master warning annunciator is located at the top center section of the main instrument panel so as to attract attention. The pilot then refers to the



right annunciator panel to identify the cause. Once the cause has been addressed and appropriate action has been taken, the (red) master warning annunciator may be turned off by clicking the reset button.

Other situations warrant immediate attention but not immediate action. These are referred to as cautions and will light up the (yellow) master caution annunciator. As with the (red) master warning annunciator, the (yellow) master caution annunciator can be reset once the situation has been addressed and appropriate action has been taken.

Fuel System

Normal operation of the fuel system requires no special attention once the engines are running stable.

In case of an engine failure, the engine must be isolated from the fuel system by closing the high-pressure fuel valve (clicking on the thrust lever once it is in the IDLE position).

The CF-105 Arrow, along with other military aircraft, allows isolation of either left or right fuel tanks by means of the crossfeed switch. The selected side will feed both engines through the crossfeed valve.

J4 Compass

Your CF-105 Arrow is equipped with the period-standard J4 radio compass. The J4 system consists of a control panel, a remote magnetic indicator (RMI) and the associated gyroscope and magnetic sensors.



In the default condition, the RMI will not be gyro stabilized and will read magnetic heading. It is the responsibility of the pilot to select the DG position on the J4 con-

trol panel's slave selector knob.

The J4 is subject to gyroscopic drift. The RMI card can be jogged left or right with the J4 control panel drift correction knob. As an added feature, by clicking on the knob, the RMI card will re-align itself with the aircraft heading.



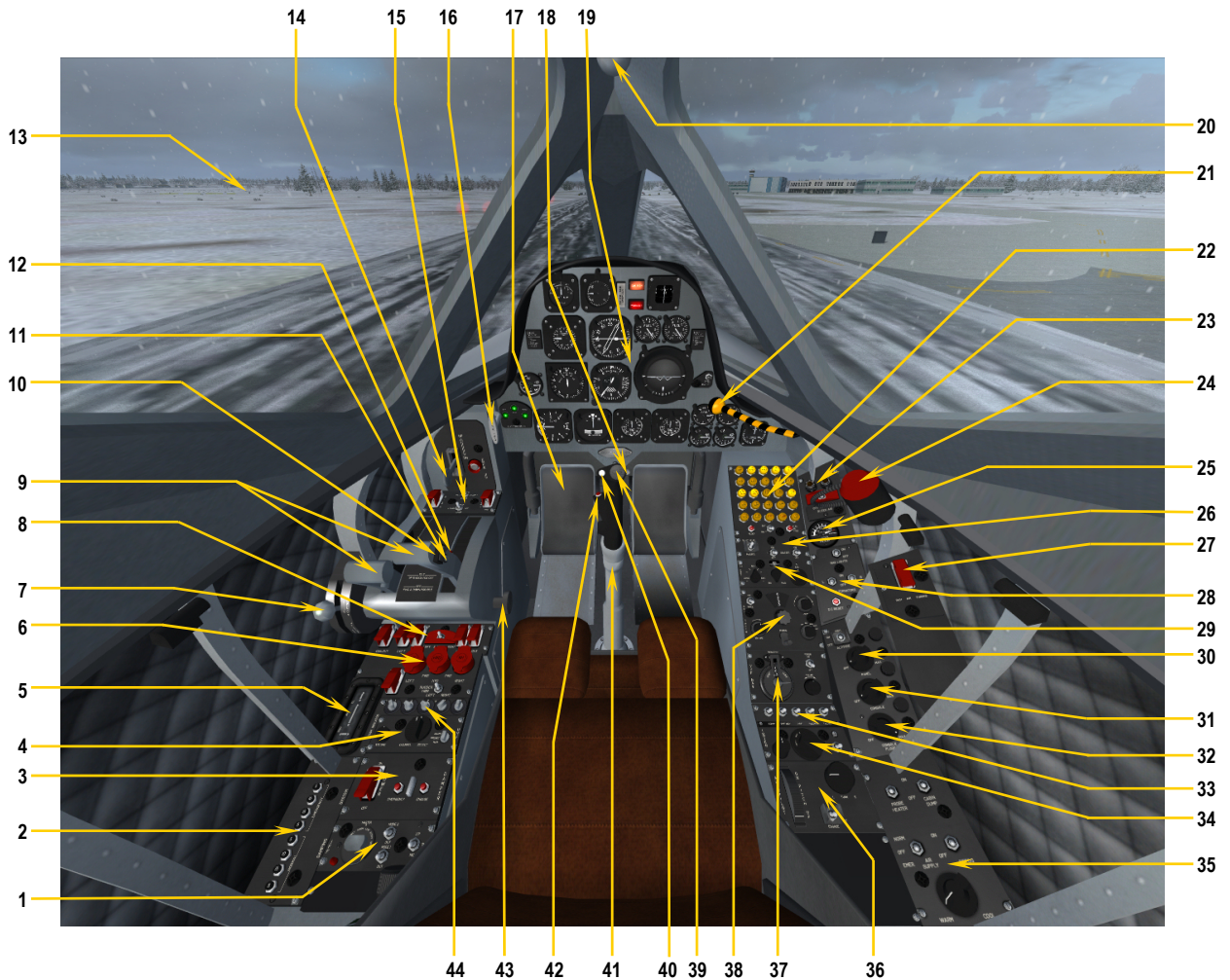


Figure 5-1

- | | | |
|--|-------------------------------------|---|
| 1. IFF PANEL | 12. ENGINE IN-FLIGHT RELIGHT SWITCH | 28. ALTERNATORS PANEL |
| 2. DAMPING SYSTEM BREAKER PANEL | 13. CANOPY | 29. RADIO COMPASS GYRO/SLAVE PANEL |
| 3. DAMPING SYSTEM PANEL | 14. LANDING GEAR LEVER | 30. MAIN INSTRUMENT PANEL LIGHTING KNOB |
| 4. UHF COMMUNICATIONS PANEL (SIMULATES VHF COMMUNICATIONS) | 15. CANOPY/LANDING LIGHTS PANEL | 31. SIDE CONSOLES LIGHTING KNOB |
| 5. CONTROL SURFACES TRIM INDICATORS (AILERON TRIM NOT INDICATED, INDICATES AILERON MOVEMENT INSTEAD) | 16. PARKING BRAKE LEVER | 32. COCKPIT LIGHT KNOB |
| 6. FIRE EXTINGUISHER CONTROL INDICATORS/ SWITCHES | 17. RUDDER/BRAKE PEDALS | 33. AUDIO PANEL |
| 7. PARABRAKE HANDLE | 18. PEDAL ADJUST LEVER | 34. INTERCOM PANEL |
| 8. FUEL MANAGEMENT PANEL | 19. MAIN INSTRUMENT PANEL | 35. ENVIRONMENTAL CONTROL PANEL |
| 9. LEFT AND RIGHT HIGH PRESSURE COCKS AND THRUST LEVERS | 20. CANOPY MANUAL OPERATION LEVER | 36. AUTOPILOT PANEL |
| 10. SPEED BRAKES SWITCH | 21. CANOPY EMERGENCY RELEASE LEVER | 37. VHF NAV PANEL |
| 11. PUSH-TO-TALK SWITCH | 22. ANNUNCIATOR PANEL | 38. ADF RECEIVER PANEL |
| | 23. BLEED AIR PANEL | 39. CONTROL STICK TRIM SWITCH (TOP HAT) |
| | 24. COCKPIT FLASHLIGHT | 40. AUTOMATIC MODE DISENGAGE SWITCH |
| | 25. OXYGEN QUANTITY GAUGE | 41. CONTROL COLUMN |
| | 26. ENGINE START PANEL | 42. EMERGENCY DAMPER ENGAGE SWITCH |
| | 27. RAM AIR TURBINE SWITCH | 43. POWER QUADRANT FRICTION KNOB |

NOTE: Non-simulated items can be animated in the VC to simulate normal procedures as described in section 6.

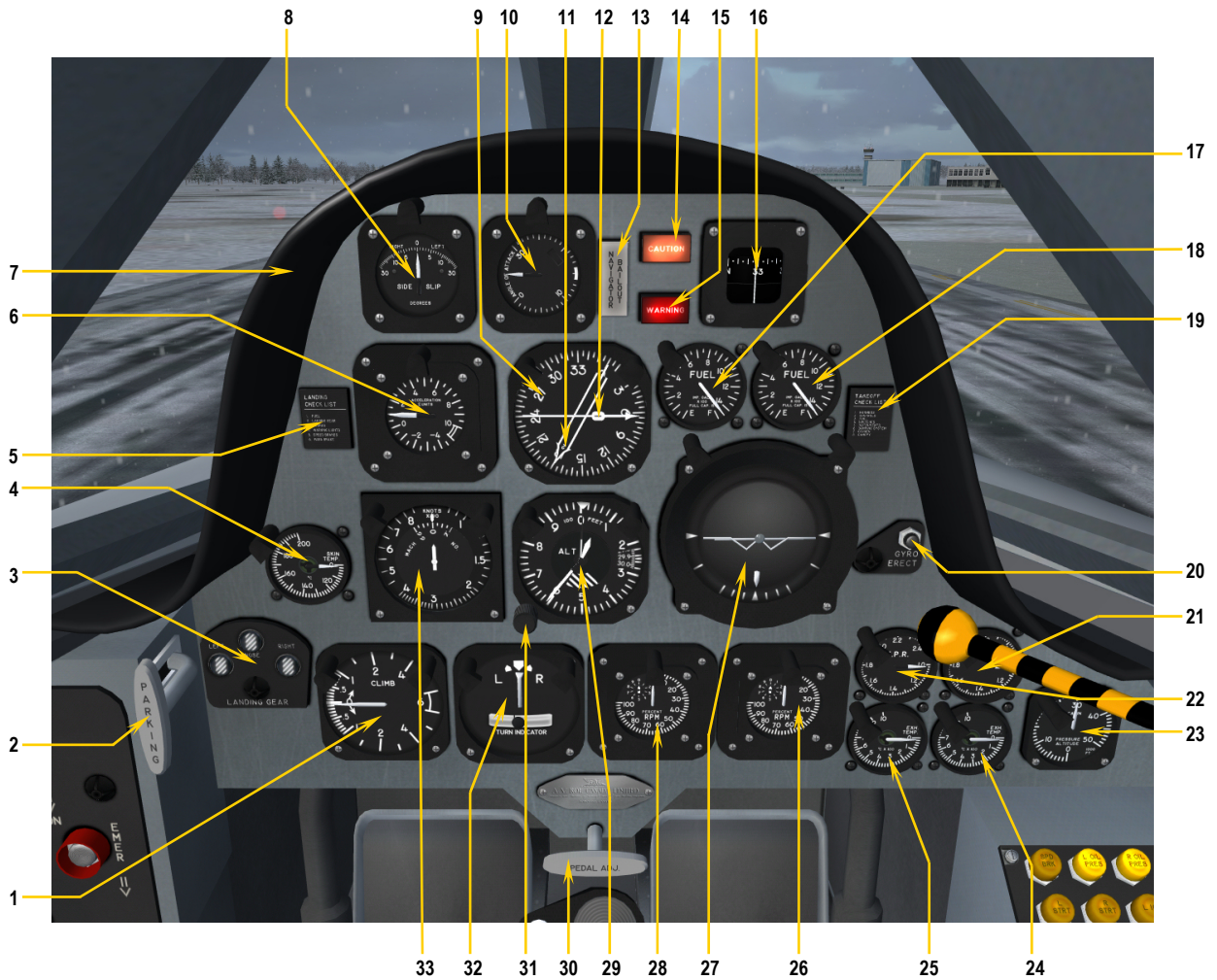


Figure 5-2a

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. VERTICAL SPEED INDICATOR 2. PARKING BRAKE LEVER 3. LANDING GEAR INDICATORS 4. SKIN TEMPERATURE GAUGE 5. LANDING CHECKLIST 6. "G" METER 7. GLARESHIELD 8. SIDESLIP (BETA) INDICATOR 9. SLAVED RADIO COMPASS INDICATOR 10. ANGLE OF ATTACK (ALPHA) INDICATOR 11. ADF POINTER 12. VOR POINTER | <ol style="list-style-type: none"> 13. NAVIGATOR BAILOUT ANNUNCIATOR 14. MASTER CAUTION ANNUNCIATOR 15. MASTER WARNING ANNUNCIATOR 16. MAGNETIC COMPASS 17. LEFT TOTAL FUEL QUANTITY GAUGE 18. RIGHT TOTAL FUEL QUANTITY GAUGE 19. TAKEOFF CHECKLIST 20. GYRO ERECT (CAGE) BUTTON 21. RIGHT ENGINE PRESSURE RATIO (EPR) GAUGE 22. LEFT ENGINE PRESSURE RATIO (EPR) GAUGE 23. CABIN ALTITUDE GAUGE 24. RIGHT EXHAUST GAS TEMPERATURE (EGT) GAUGE 25. LEFT EXHAUST GAS TEMPERATURE (EGT) GAUGE 26. RIGHT ENGINE RPM GAUGE 27. GYRO HORIZON 28. LEFT ENGINE RPM GAUGE 29. ALTIMETER 30. RUDDER PEDAL ADJUSTMENT KNOB 31. BAROMETRIC PRESSURE KNOB 32. TURN INDICATOR 33. AIRSPEED/MACH INDICATOR |
|--|--|

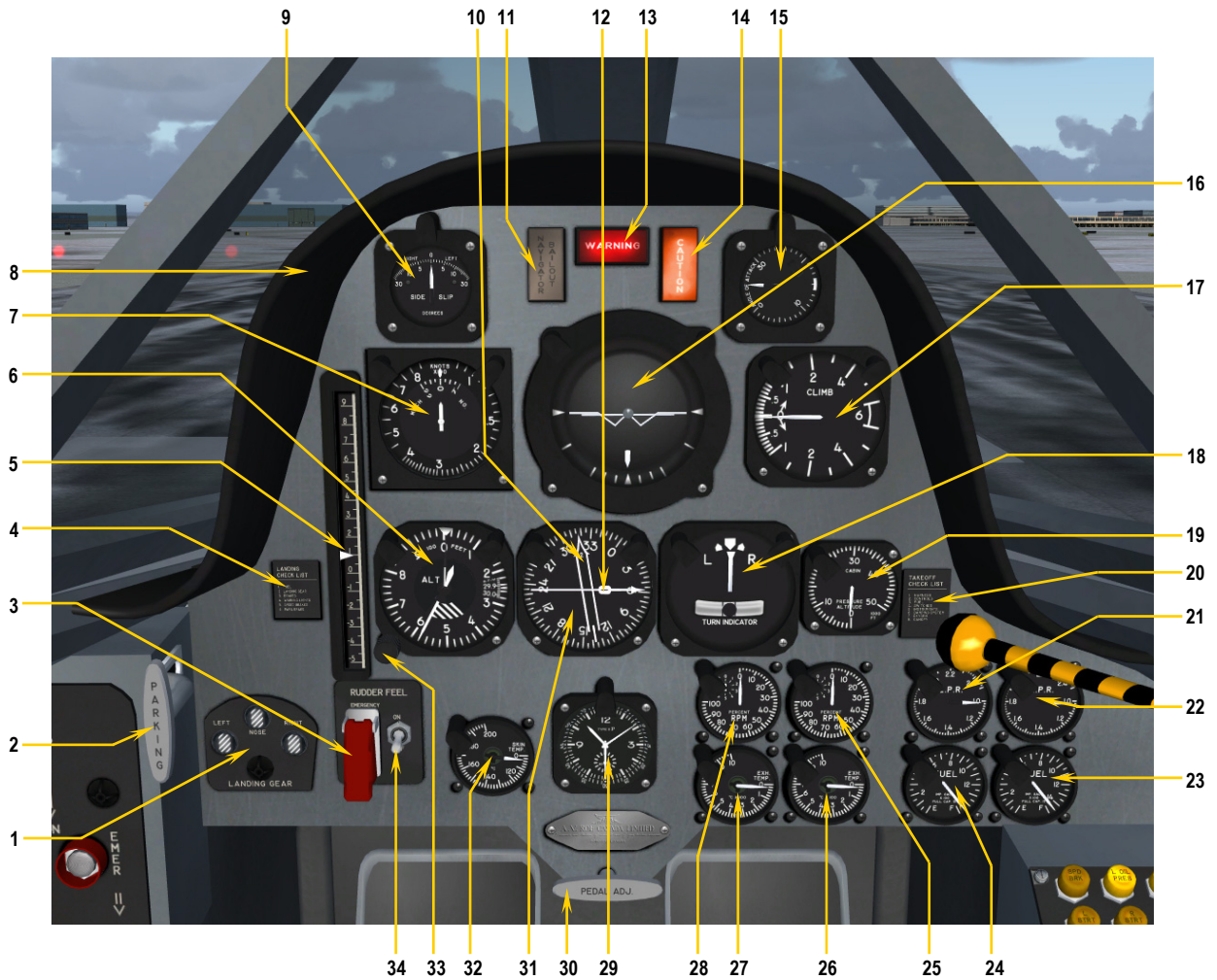


Figure 5-2b

- | | | |
|----------------------------------|---|---|
| 1. LANDING GEAR INDICATORS | 13. MASTER WARNING ANNUCIATOR | 25. RIGHT ENGINE RPM GAUGE |
| 2. PARKING BRAKE LEVER | 14. MASTER CAUTION ANNUCIATOR | 26. RIGHT EXHAUST GAS TEMPERATURE (EGT) GAUGE |
| 3. RUDDER FEEL EMERGENCY SWITCH | 15. ANGLE OF ATTACK (ALPHA) INDICATOR | 27. LEFT EXHAUST GAS TEMPERATURE (EGT) GAUGE |
| 4. LANDING CHECKLIST | 16. GYRO HORIZON | 28. LEFT ENGINE RPM GAUGE |
| 5. "G" METER | 17. VERTICAL SPEED INDICATOR | 29. CLOCK |
| 6. ALTIMETER | 18. TURN INDICATOR | 30. RUDDER PEDAL ADJUSTMENT KNOB |
| 7. AIRSPEED/MACH INDICATOR | 19. CABIN ALTITUDE GAUGE | 31. SLAVED RADIO COMPASS INDICATOR |
| 8. GLARESHIELD | 20. TAKEOFF CHECKLIST | 32. SKIN TEMPERATURE GAUGE |
| 9. SIDESLIP (BETA) INDICATOR | 21. LEFT ENGINE PRESSURE RATIO (EPR) GAUGE | 33. BAROMETRIC PRESSURE KNOB |
| 10. ADF POINTER | 22. RIGHT ENGINE PRESSURE RATIO (EPR) GAUGE | 34. RUDDER FEEL SWITCH |
| 11. NAVIGATOR BAILOUT ANNUCIATOR | 23. RIGHT TOTAL FUEL QUANTITY GAUGE | |
| 12. VOR POINTER | 24. LEFT TOTAL FUEL QUANTITY GAUGE | |

* **NOTE:** This panel is also used for the Xtreme Prototypes CF-105 Arrow Mk. 2 (RL-206) add-on aircraft although a different panel was designed for the real-world Arrow Mk. 2 still under assembly at the time the Arrow program was terminated.

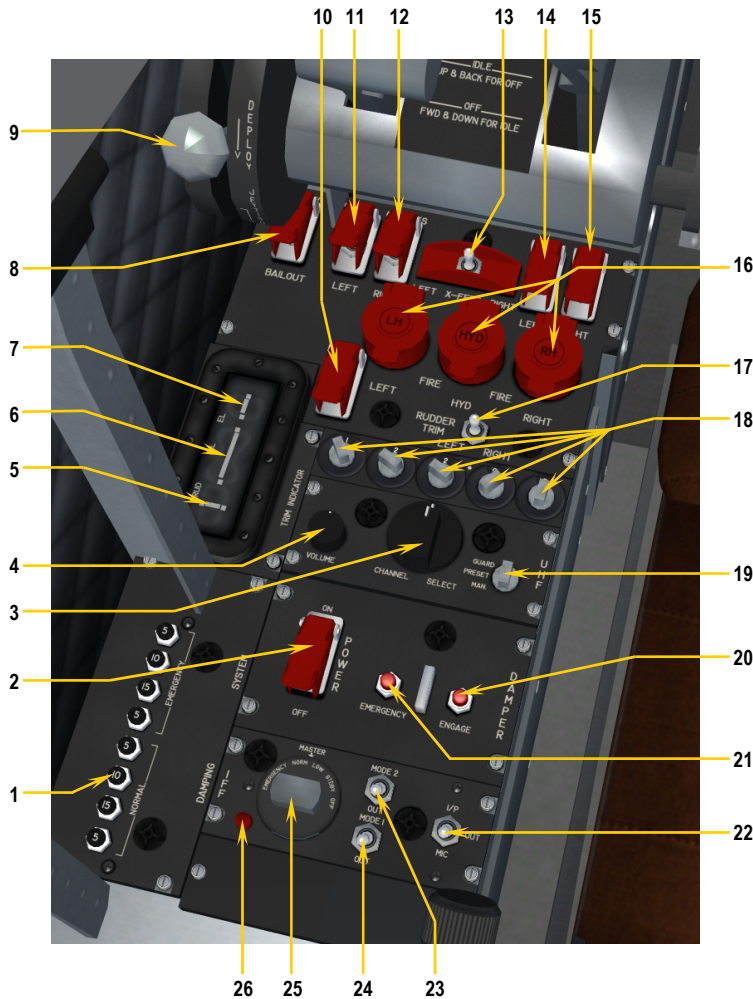
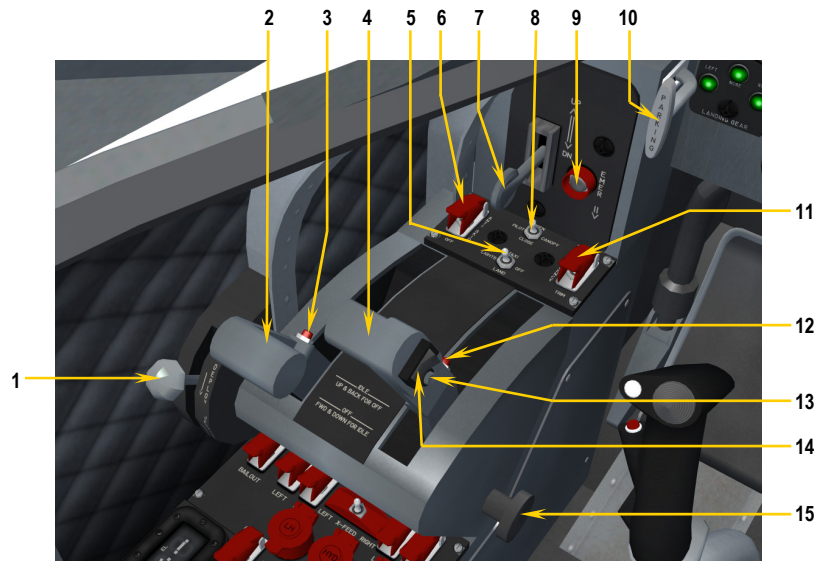


Figure 5-3

1. DAMPING SYSTEM BREAKER PANEL
2. DAMPING SYSTEM POWER SWITCH
3. UHF CHANNEL SELECT KNOB (VHF COMM SIMULATED)
4. UHF RECEIVER VOLUME KNOB
5. RUDDER TRIM INDICATOR
6. AILERON TRIM INDICATOR (AILERON TRIM NOT INDICATED, INDICATES AILERON MOVEMENT INSTEAD)
7. PITCH TRIM INDICATOR
8. NAVIGATOR BAILOUT COMMAND SWITCH
9. PARABRAKE LEVER
10. FIRE EXTINGUISHER SECOND SHOT SWITCH
11. LEFT FIREWALL FUEL SHUTOFF VALVE (LOW-PRESSURE COCK) SWITCH
12. RIGHT FIREWALL FUEL SHUTOFF VALVE (LOW-PRESSURE COCK) SWITCH
13. FUEL CROSS-FEED SWITCH
14. LEFT L.P COCK RESET SWITCH
15. RIGHT L.P COCK RESET SWITCH
16. FIRE INDICATORS/EXTINGUISHER DISCHARGE SWITCHES
17. RUDDER TRIM SWITCH
18. UHF FREQUENCY SELECTOR KNOBS (VHF COMM SIMULATED)
19. UHF MODE SELECTOR KNOB
20. DAMPING SYSTEM ENGAGE SWITCH
21. DAMPING SYSTEM EMERGENCY ENGAGE SWITCH
22. IFF INPUT SELECTOR SWITCH
23. IFF MODE 2 SELECTOR SWITCH
24. IFF MODE 3 SELECTOR SWITCH
25. IFF SELECTOR KNOB
26. IFF IDENT BUTTON

Figure 5-4

1. PARABRAKE LEVER
2. LEFT HIGH-PRESSURE FUEL VALVE (H.P. COCK)/THRUST LEVER
3. LEFT ENGINE IN-FLIGHT RELIGHT SWITCH
4. RIGHT HIGH-PRESSURE FUEL VALVE (H.P. COCK)/THRUST LEVER
5. LANDING/TAXI LIGHT SWITCH
6. ANTI-SKID SWITCH
7. LANDING GEAR LEVER
8. CANOPY OPENING MOTOR SWITCH
9. LANDING GEAR EMERGENCY SWITCH
10. PARKING BRAKE LEVER
11. ELEVATOR TRIM DISENGAGE SWITCH
12. RIGHT ENGINE IN-FLIGHT RELIGHT SWITCH
13. MICROPHONE PUSH-TO-TALK SWITCH
14. SPEED BRAKES SWITCH
15. POWER QUADRANT FRICTION KNOB



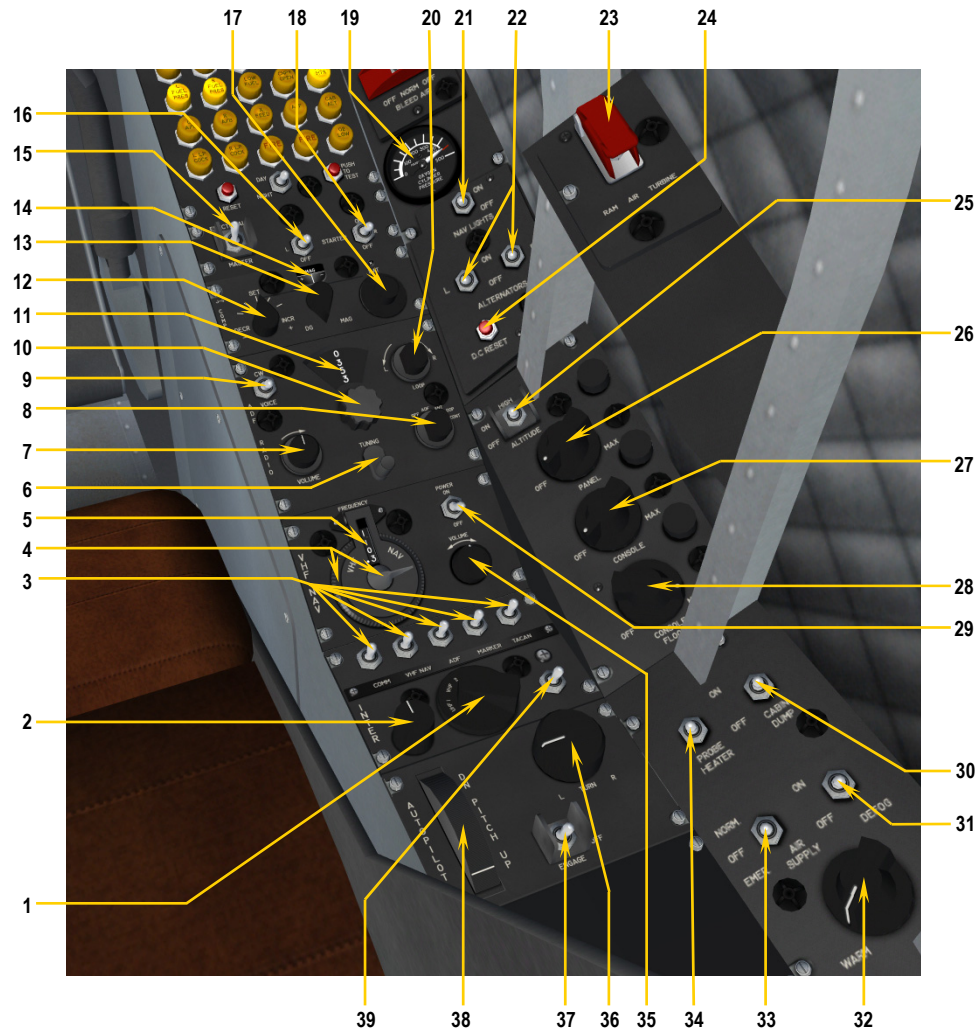


Figure 5-5

- | | | |
|---|--|---|
| 1. AUDIO PANEL TRANSMIT SELECT KNOB | 13. RADIO COMPASS SLAVE SELECTOR KNOB | 26. MAIN INSTRUMENT PANEL LIGHTING KNOB |
| 2. AUDIO PANEL VOLUME KNOB | 14. RADIO COMPASS DRIFT INDICATOR WINDOW | 27. SIDE CONSOLE LIGHTING KNOB |
| 3. AUDIO PANEL SOURCE SELECTOR SWITCHES | 15. ELECTRICAL MASTER SWITCH | 28. COCKPIT LIGHTING KNOB |
| 4. VHF NAV FREQUENCY SELECT LEVER/WHEEL | 16. LEFT ENGINE START SWITCH | 29. VHF NAV RECEIVER POWER SWITCH |
| 5. VHF NAV FREQUENCY DISPLAY WINDOW (50 KHZ INCREMENTS DISPLAYED ONLY IN TOOLTIP) | 17. RADIO COMPASS LATITUDE SELECTOR KNOB | 30. CABIN PRESSURE DUMP SWITCH |
| 6. ADF TUNING CRANK | 18. RIGHT ENGINE START SWITCH | 31. CANOPY DEFOG SWITCH |
| 7. ADF VOLUME KNOB | 19. OXYGEN QUANTITY GAUGE | 32. COCKPIT TEMPERATURE SELECTOR KNOB |
| 8. ADF MODE SELECTOR KNOB | 20. ADF LOOP ROTATION KNOB | 33. COCKPIT AIR SUPPLY SELECTOR SWITCH |
| 9. ADF VOICE SELECTOR SWITCH | 21. NAVIGATION LIGHTS SWITCH | 34. PROBE HEATER SWITCH |
| 10. ADF BAND SELECTOR KNOB | 22. LEFT & RIGHT ALTERNATOR SWITCHES | 35. VHF NAV VOLUME KNOB |
| 11. ADF FREQUENCY DISPLAY WINDOW | 23. RAM AIR TURBINE SWITCH | 36. AUTOPILOT TURN KNOB |
| 12. RADIO COMPASS DRIFT ADJUSTMENT KNOB | 24. DC RESET SWITCH | 37. AUTOPILOT ENGAGE SWITCH |
| | 25. HIGH/LOW ALTITUDE COCKPIT LIGHTING SELECTOR SWITCH | 38. AUTOPILOT PITCH WHEEL |
| | | 39. INTERCOM SWITCH |

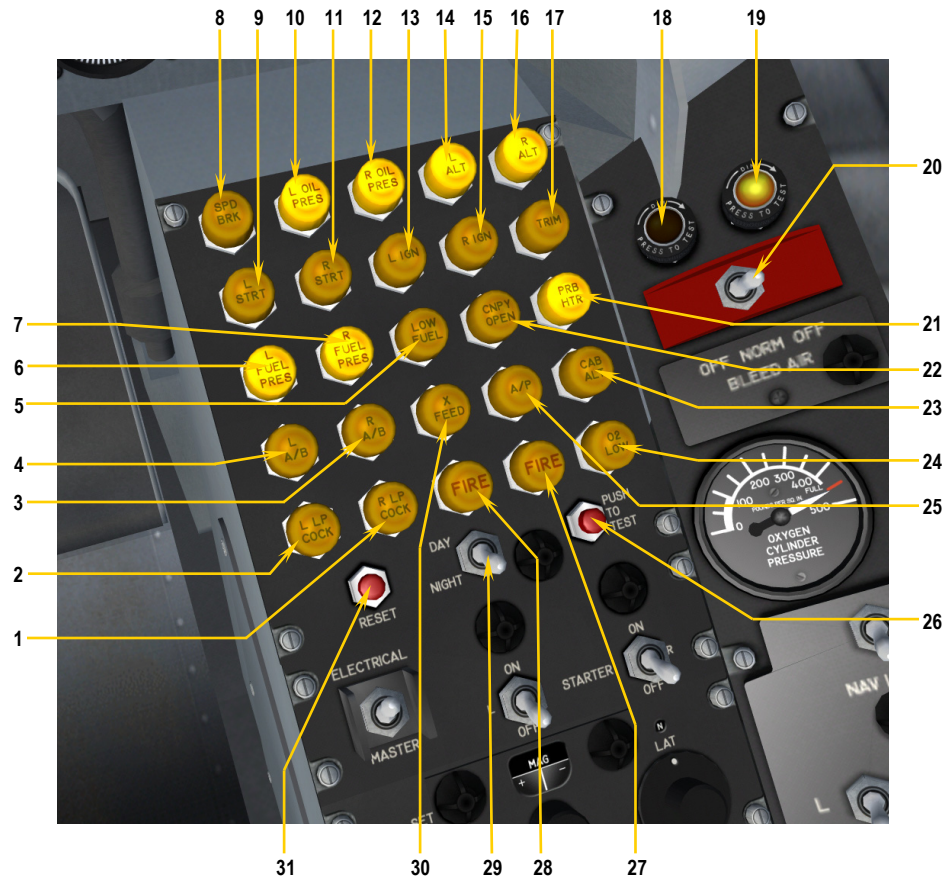


Figure 5-6

IMPORTANT: The following descriptions refer to the “light ON” condition.

- | | | |
|---|--|---|
| <ol style="list-style-type: none"> 1. RIGHT FIREWALL FUEL SHUTOFF VALVE (LOW-PRESSURE COCK) CLOSED 2. LEFT FIREWALL FUEL SHUTOFF VALVE (LOW-PRESSURE COCK) CLOSED 3. RIGHT AFTERBURNER ON 4. LEFT AFTERBURNER ON 5. FUEL QUANTITY LOW 6. LEFT FUEL PRESSURE LOW 7. RIGHT FUEL PRESSURE LOW 8. SPEED BRAKES DEPLOYED 9. LEFT STARTER ENGAGED 10. LEFT OIL PRESSURE LOW | <ol style="list-style-type: none"> 11. RIGHT STARTER ENGAGED 12. RIGHT OIL PRESSURE LOW 13. DAMPING SYSTEM OFF 14. LEFT ALTERNATOR OFF 15. CABIN PRESSURIZATION OFF 16. RIGHT ALTERNATOR OFF 17. PITCH TRIM OUT OF TAKEOFF RANGE 18. LEFT BLEED AIR SELECTED 19. RIGHT BLEED AIR SELECTED 20. BLEED AIR SELECTOR SWITCH 21. PROBE HEATER OFF 22. CANOPY UNSAFE OR OPEN | <ol style="list-style-type: none"> 23. CABIN ALTITUDE GREATER THAN 20,000 FT. 24. OXYGEN QUANTITY LESS THAN 20% 25. AUTOPILOT ON 26. ANNUNCIATOR SYSTEM TEST BUTTON 27. RIGHT ENGINE FIRE 28. LEFT ENGINE FIRE 29. ANNUNCIATOR DIMMER SWITCH 30. CROSSFEED VALVE OPEN 31. MASTER CAUTION/WARNING LIGHTS RESET SWITCH |
|---|--|---|

NORMAL PROCEDURES AND CHECK LIST

SECTION 6



This section contains the complete normal procedures and check list for the operation of the Xtreme Prototypes CF-105 Arrow add-on aircraft for Flight Simulator. A condensed version of these procedures is provided in the checklist tab of the FS aircraft Kneeboard (**F10**).

Aircraft reference information is provided in appendix 1. The same information is also available in the reference information tab of the FS aircraft Kneeboard (**F10**).

INTRODUCTION

In an effort to virtually recreate the Arrow experience as realistically as possible and for historical and technical accuracy, most of the following procedures are inspired or adapted from the original Arrow “Flight Control System Pilot’s Manual” and from other Avro aircraft flight manuals of the same era.

Following each step presented here will allow you to recreate a typical Arrow test flight or anticipated reconnaissance or interception mission in Flight Simulator 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.

BEFORE CREATING A FLIGHT

At this time, you can either decide to create a new flight and immediately take off from the runway or follow the normal procedures to simulate a true “cold & dark start” (all engines, lights and systems turned off).

The best option to simulate a cold start is to load one of the “cold start” saved flights.

LOADING A “COLD START” SAVED FLIGHT



You can load one of the ten saved flights included with your Arrow add-on package as a “template” for a new flight. This has the advantage of presetting all Arrow internal systems and positioning the aircraft ready for taxi or takeoff on the runway (or already in flight, depending on the mission).

The “cold start” saved flights (flights no. 1, 4 and 6; see appendix 2) will also shut down the engines and turn off all electrical power to the aircraft.

The Arrow saved flights can be loaded from the **Free Flight** page in FSX (click on the **Load...** button) or the upper window of the **Select a Flight** page in FS2004.

NOTE: Arrow saved flights must not be confused 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, like in FS2004. Refer to appendix 2 for complete information about the Arrow saved flights.

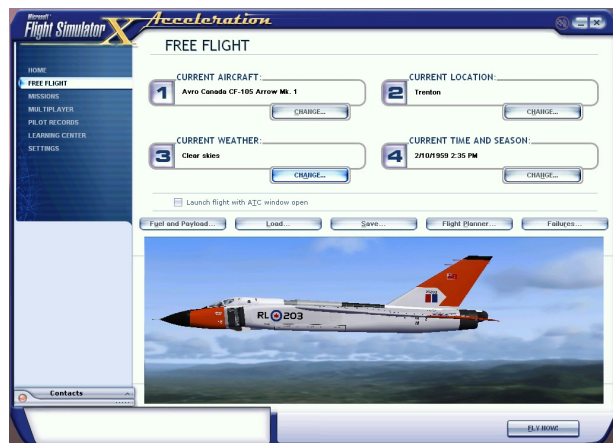
Once a “cold start” saved flight has been loaded, you can proceed to the **NORMAL PROCEDURES** section on page 6-4, to prepare the Arrow for takeoff.

CREATING AN ARROW FLIGHT

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

For your first Arrow flight, let’s suggest a hypothetical flight from CFB Trenton, Ontario, Canada (CYTR), runway 24, to Sudbury airport (CYSB), runway 22.

CREATING A FLIGHT IN FSX



Flight configuration page in Microsoft FSX.

1. Make sure the Xtreme Prototypes CF-105 Arrow for Flight Simulator add-on 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 Arrow for Flight Simulator aircraft. Pedals are optional.)
3. Start Microsoft® Flight Simulator X.
4. Select the **FREE FLIGHT** option in the menu at left.

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:
AVRO CANADA
CF-105 ARROW MK. 1
RL-203
(or any other variation of the CF-105 Arrow)

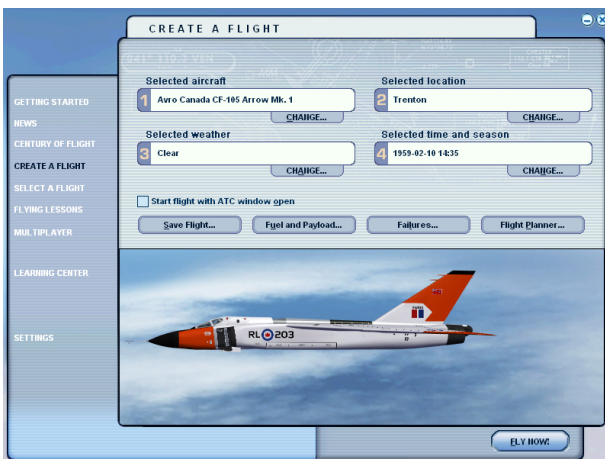
IMPORTANT: Make sure the “Show all variations” option is selected.

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 **CLEAR SKIES**, then click **OK** to return to the “Free Flight” page.
11. On the “Free Flight” page, click **CHANGE** under “Current Time and Season” (4).
12. On the “Select Time and Season” page, set “Local Time” to: **14:35:00**.
13. On the “Select Time and Season” page, set date to: **FEBRUARY 10, 1959**.
14. Click **OK**.
15. On the “Free Flight” page, click the **FLIGHT PLANNER** button.

16. On the “Flight Planner” page, select:
 - a. Departure location – **CFB TRENTON (CYTR), RUNWAY 24** (Trenton – CYTR, Ontario, Canada, Runway 24).
 - b. Destination – **SUDBURY AIRPORT (CYSB)** (Sudbury – CYSB, Ontario, Canada).
 - c. Flight plan type – **VFR**.
 - d. Routing – **Direct-GPS**.
17. Click the **FIND ROUTE** button.
18. On the “Find Route” page, enter: Cruising Altitude – **40,000 feet**.
19. Click **SAVE** to save your route.

20. Click **OK**. Answer **YES** when asked if you want Flight Simulator to move your aircraft to the departure airport listed on the flight plan.
 21. On the “Free Flight” page, click the **SAVE** button to save your flight. Name this flight: **My first Arrow Flight, Trenton to Sudbury** (or any other name).
 22. On the “Free Flight” page, click the **FLY NOW** button to start your flight.
- c. Variation – **RL-203** (or any other variation of the CF-105 Arrow).
 7. Click **OK**.
 8. On the “Create Flight” page, click **CHANGE** under “Selected Weather” (3) to open the “Weather” page.
 9. On the “Weather” page, select **CLEAR SKIES**, then click **OK** to return to the “Create Flight” page.
 10. On the “Create Flight” page, click **CHANGE** under “Selected Time and Season” (4).
 11. On the “Time and Season” page, set “Local Time” to: **14:35:00**.
 12. On the “Time and Season” page, set date to: **FEBRUARY 10, 1959**.
 13. Click **OK**.
 14. On the “Create Flight” page, click the **FLIGHT PLANNER** button.
 15. On the “Flight Planner” page, select:
 - a. Departure location – **CFB TRENTON (CYTR), RUNWAY 24** (Trenton – CYTR, Ontario, Canada, Runway 24).
 - b. Destination – **SUDBURY AIRPORT (CYSB)** (Sudbury – CYSB, Ontario, Canada).
 - c. Flight plan type – **VFR**.
 - d. Routing – **Direct-GPS**.
 16. Click the **FIND ROUTE** button.
 17. On the “Find Route” page, enter: Cruising Altitude – **40,000 feet**.
 18. Click **SAVE** to save your route.
 19. Click **OK**. Answer **YES** when asked if you want Flight Simulator to move your aircraft to the selected airport.
 20. On the “Create Flight” page, click the **SAVE FLIGHT** button to save your flight. Name this flight: **My first Arrow Flight, Trenton to Sudbury** (or any other name).
 21. On the “Create Flight” page, click the **FLY NOW** button to start your flight.

CREATING A FLIGHT IN FS2004



Flight configuration page in Microsoft FS2004.

1. Make sure the Xtreme Prototypes CF-105 Arrow for Flight Simulator add-on aircraft has been properly installed in your “**Flight Simulator 9**” 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. (A joystick is recommended to fly the Arrow for Flight Simulator aircraft. Pedals are optional.)
3. Start Microsoft® Flight Simulator.
4. Select the **CREATE FLIGHT** option in the menu at left.
5. In the “Create Flight” page, click **CHANGE** under “Selected Aircraft” (1) to open the “Select Aircraft” page.
6. Select the following:
 - a. Aircraft Manufacturer – **AVRO CANADA**.
 - b. Aircraft Model – **CF-105 ARROW MK. 1**.

RECOMMENDED FLIGHT SIMULATOR INITIAL SETTINGS

The following optional settings are to make your flight in the Arrow more enjoyable:

1. Under the “Aircraft” menu in the main Flight Simulator window, select **REALISM SETTINGS**.
3. On the “Settings – Realism” page, under “Instruments and Lights”, select the **PILOT CONTROLS AIRCRAFT LIGHT** option.
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.

IMMEDIATE TAKEOFF OR “COLD START”



At this time, it is assumed that the Arrow has been serviced automatically by the simulator when first loaded and that the engines are running. You can either take off immediately or shut down the engines and go through the entire **NORMAL PROCEDURES** to simulate a true “cold start” (all engines, lights and systems turned off).

To shut down the engines and turn off electrical power, do the following procedures:

1. Simultaneously press the **CTRL-SHIFT-F1** keys on your keyboard (this will shut down the engines).

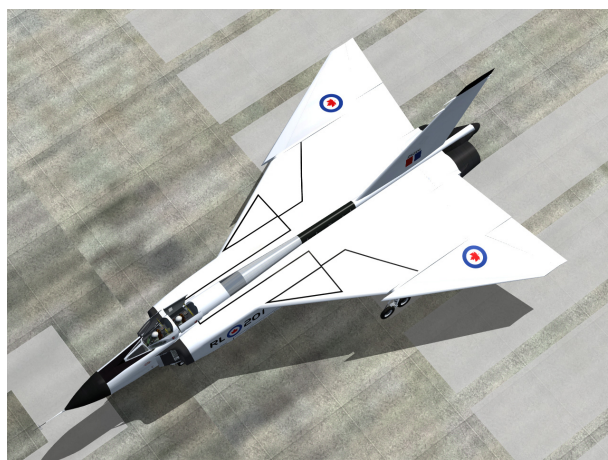
2. Simultaneously press the **SHIFT-M** keys on your keyboard (this will turn off electrical power).

No lights or visual effects 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.

NORMAL PROCEDURES

EXTERIOR INSPECTION



An exterior description of the CF-105 Arrow for Flight Simulator is available in section 3 (fig. 3-1). 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 main window, click “**View Options**” and select **SPOT PLANE** view).

This will permit you to inspect the exterior of the Arrow. 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.

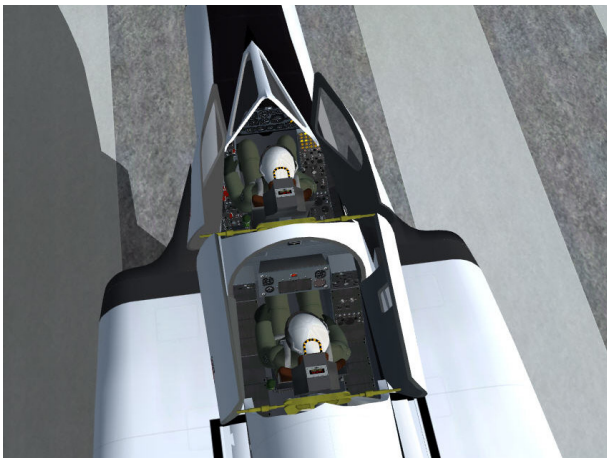
To open or close the canopies, simultaneously press the **SHIFT-E** keys on your keyboard.

To open the pilot’s and navigator’s helmet visors, simulta-



neously press the **SHIFT-Y** keys on your keyboard (Concorde nose command in FS2004 only). To close the pilot's and navigator's helmet visors, simultaneously press the **CTRL-Y** keys on your keyboard.

Take a look inside the cockpit and observe how the movement of the center stick corresponds to the movement of your joystick.



It is possible to observe the movement of the control surfaces, including the speed brakes, at this time.

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. Note that there are no flaps on the Arrow.
2. To deploy or retract the speed brakes, press the “ / ” key on your keyboard. The speed brakes can also be deployed or retracted by using the speed brakes switch located on the right throttle handle (left console in the VC).

Make sure the canopies are closed (**SHIFT-E** on your keyboard) and return to the **VIRTUAL COCKPIT** view.

BEFORE START AND COCKPIT PREPARATION CHECKS



1. Rudder pedals – Adjust.
2. Probe heat switch – **OFF**.
3. Electrical master switch – **ON**.
4. Cabin dump switch – **OPEN**.
5. Air supply switch – **OFF**.
6. Trims – Set to neutral.
7. Landing gear lever – **DOWN** and **LOCKED**.
8. Fuel quantity – Check sufficient.
9. Low-pressure cocks (firewall shutoff valves) – **OPEN** (check L.P. cock annunciators **OFF**)
10. Annunciator push-to-test button – Press and check all lights & annunciators **ON**.
11. ATIS – Received.
12. Altimeter – Set.
13. Oxygen supply – Check full (**3200-3500 psi**).
14. Electrical master switch – **OFF**.

ENGINE START PROCEDURES

1. Starting clearance – Received.
2. Parking brake – **ON**.
3. Electrical master switch – **ON**.
4. Annunciator panel test – Perform.
5. Navigation lights – **ON**.
6. Thrust levers – **FUEL CUT-OFF** position (click on each lever while in the **IDLE** position).

7. L.P. cocks – **OPEN**.
8. Bleed air switch – **NORMAL**.



5. J4 compass DG/Mag knob – Set to **DG**.
6. J4 compass gyro drift knob – Align with A/C heading.
7. Trims – Check neutral.
8. Cabin lighting – As required.
9. COM, NAV & ADF radios – Set.
10. Audio panel – As required.
11. Taxi light – **ON**.
12. Damping system power switch – **ON**.
13. Rudder feel switch – **ON** (RL-203-206 only).
14. Anti-skid switch – **ON**.
15. Flight controls – Check **FREE**.

Engine No. 1 (it is recommended to switch engine starting order on alternating flights):

1. Starter switch – **ON**.
2. RPM monitor – **20%**.
3. Thrust lever – Move forward to **IDLE** (by clicking on the lever).
4. Fuel pressure – Check fuel pressure annunciator **OFF**.
5. EGT – Check light-off and monitor rise.
6. Oil pressure – Check oil pressure annunciator **OFF**.
7. Starter switch – **OFF** when stable RPM attained.
8. Alternator switch – **ON** and check alternator annunciator light **OFF**.
9. Master warning reset – As needed.

Engine No. 2 (it is recommended to switch engine starting order on alternating flights):

Repeat previous procedures (1 to 9, same as for the other engine).

BEFORE TAXI

1. Cabin dump switch – Check **OPEN**.
2. Canopy – **CLOSED**, check canopy unsafe annunciator **OFF**.
3. Air supply switch – **NORM**.
4. Artificial horizon – Uncaged (RL-201-202 only).

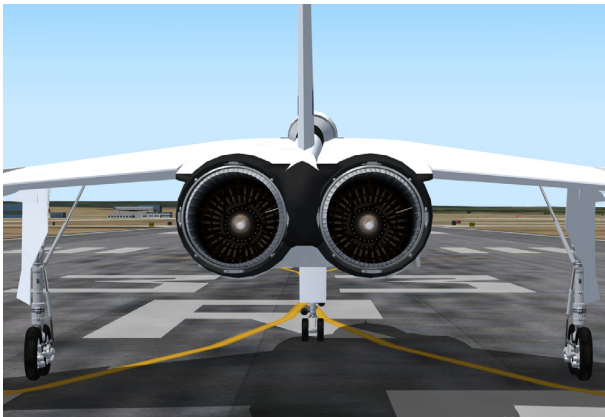


BEFORE TAKEOFF CHECKS

1. Speed brakes switch – **ON**, check for annunciator **ON**.
2. Speed brakes switch – **OFF**, check for annunciator

OFF.

3. Elevator trim – Check neutral for takeoff.
4. Fuel quantity – Check sufficient for flight.
5. X-feed switch – **NORMAL.**
6. Artificial horizon – Check uncaged (RL-201-202 only).
7. Oxygen supply – Check **FULL.**
8. J4 compass – Check aligned and slaved.
9. Probe heat switch – **ON.**
10. Cabin dump switch – Check **OPEN.**



11. Damping system – **ENGAGED.**

TAKEOFF PROCEDURES



1. Taxi light – **OFF.**
2. Landing light – **ON**, as needed.
3. Nose wheel – Check straight.
4. Brakes – **ON.**
5. Caution and warning system – Check lights **OFF.**
6. Thrust levers – Advance smoothly to **75% RPM.**
7. EGT gauges – Check below 900 degrees.
8. Thrust levers – Advance to **FULL.**
9. Afterburner lights – Check **ON.**
10. Brakes – Release.
11. Center stick – Pull to rotate at 150 KIAS.
12. Positive climb – Gear **UP** before 250 KIAS.
13. Gear indicators – Check **OFF.**

AFTER TAKEOFF PROCEDURES

1. Accelerate until climb speed (300-350 KIAS) attained.
2. Thrust levers – Back until afterburner lights **OFF**.
3. Climb angle – Establish as needed.
4. Engine parameters – Monitor.
5. Cabin dump switch – **CLOSE**.

6. Air supply switch – Check **NORM**.

7. Landing light – **OFF**.

APPROACH AND CIRCUIT

1. Enter downwind leg – 250 KIAS or slower.
2. Speed brakes – As needed.
3. Turn base leg – 200 KIAS.





4. Landing gear (lever) – **DOWN** and **LOCKED**. Check **DOWN** and **LOCKED** indicators.
5. Final leg – 180 KIAS.
6. Thrust levers – Adjust for 1000 ft/mn rate of descent.
7. Expect touchdown at 160 KIAS.

BEFORE LANDING CHECKS

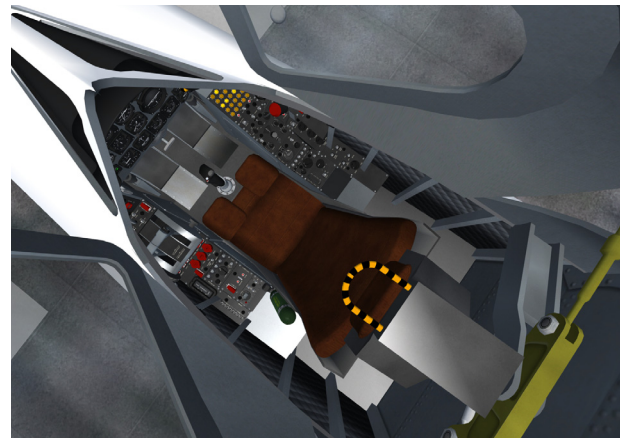
1. Parking brake lever – Check **OFF**.
2. Landing gear (lever) – Check **DOWN** and **LOCKED**.
3. Landing light – **ON**.
4. Shoulder harness – **LOCKED**.
5. Speed brakes – Retracted.
6. Cabin dump switch – **OPEN**.
7. Touchdown – 160 KIAS.
8. Brakes – Apply as needed.

AFTER LANDING CHECKS

1. Air supply switch – **OFF**.
2. Probe heat Switch – **OFF**.
3. Landing light – **OFF**.
4. Taxi light – **ON**.
5. Damping system – **DISENGAGED**.

ENGINE SHUTDOWN

1. Thrust levers – **IDLE**.
2. Parking brakes – **ON**.
3. Anti-skid switch – **OFF**.
4. Thrust levers – **FUEL CUT-OFF**.
5. Damping system power switch – **OFF**.
6. Rudder feel switch – **OFF**.
7. All lights – **OFF**.
8. Alternators – **OFF**.
9. Canopy – Open.
10. Electrical master switch – **OFF**.



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 FS aircraft Kneeboard (F10).

XTREME PROTOTYPES CF-105 ARROW FOR FLIGHT SIMULATOR REFERENCE INFORMATION

For detailed instructions on how to fly this aircraft, refer to section 6 of the Pilot's Operating Instructions (flight manual). For condensed procedures, see the checklist tab of the Kneeboard (F10).

Gross Weight (MTOW)	62,430 lbs
Empty Weight	43,960 lbs

Speed Limitations (FS aircraft)

NOTE: The highest Mach number attained by the real-world Avro Arrow was Mach 1.86 (RL-202, Pratt & Whitney J75-P-5 engines, 37,000 lbs thrust, September 14, 1958).

M _{MO} – Maximum FS Aircraft Operating Speed (Mach)	2.3 Mach
V _{LO} – Maximum Gear Operating Speed	230 KIAS
V _{LE} – Maximum Landing Gear Extension Speed	230 KIAS

Mach Limitations vs Altitude

10,000 feet	0.8 Mach
20,000 feet	0.9 Mach
30,000 feet	1.0 Mach
45,000 feet +	2.3 Mach

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

V ₁ – FS Aircraft Takeoff Decision Speed (56,920 lbs)	145 KIAS
V _R – FS Aircraft Rotation Speed	150 KIAS
V ₂ – FS Aircraft Takeoff Safety Speed	200 KIAS

Altitude Limitations (FS aircraft, typical)

NOTE: The maximum altitude attained by the real-world Avro Arrow was 50,000 feet (RL-202, Pratt & Whitney J75-P-5 engines, 37,000 lbs thrust, September 14, 1958).

FS Aircraft Operating Altitude	50,000 feet
FS Aircraft Ceiling (maximum) Altitude	65,000 feet

Landing (FS aircraft)

NOTE: Refer to section 6 of the Pilot's Operating Instructions (flight manual) for complete landing procedures. For condensed procedures, see the checklist tab of the Kneeboard (F10).

Flare Completed	1000 feet, 170 KIAS
Touchdown	160 KIAS
V _{REF} - Landing Approach Speed (gear down)	180 KIAS
FS Aircraft Stalling Speed	130 KIAS

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

Xtreme Prototypes CF-105 Arrow for Flight Simulator Reference Tab – English Version 1.0
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Appendix 2: THE SAVED FLIGHTS

THE SAVED FLIGHTS

You can load one of the ten saved flights included with your Arrow add-on package as a “template” for a new flight. This has the advantage of presetting all Arrow internal 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 (flights 1, 4 and 6) will shut down the engines and turn off all electrical power to the aircraft. Once a “cold start” saved flight has been loaded, you can proceed to the **NORMAL PROCEDURES** section on page 6-4, to prepare the Arrow for takeoff.

The Arrow saved flights can be loaded from the **Free Flight** page in FSX (click on the **Load...** button) or the upper window of the **Select a Flight** page in FS2004.

NOTE: Arrow saved flights must not be confused 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, like in FS2004.

There are two categories of Arrow flights: the “**takeoff**” flights and the “**high-altitude**” flights. Each category contains a number of flights that are based on Arrow test flights (real or imaginary) or fictitious but anticipated reconnaissance and interception missions.

THE “TAKEOFF” FLIGHTS

There are six “takeoff” flights included with this version



of the software. These flights enable the Arrow to take off from Avro Canada’s test runway (today, Toronto Pearson International Airport) and from different RCAF bases located across Canada:

Arrow Flight No. 1 (Cold Start)

Arrow 201 Ready for Takeoff at Toronto Intl

RL-201 (first Arrow Mark 1 prototype) preparing for takeoff from runway 6L at Toronto Pearson Intl Airport, Ontario (CYYZ). This flight can be loaded to recreate the Avro Arrow 201 initial flight. *March 25, 1958, 14:00.*

Arrow Flight No. 2

Arrow 202 Ready for Takeoff at Toronto Intl

RL-202 preparing for takeoff from runway 6L at Toronto Pearson Intl Airport, Ontario (CYYZ). This flight can be loaded to recreate the Avro Arrow 202 initial flight. *August 1, 1958, 10:15.*

Arrow Flight No. 3

Arrow 203 from CFB Cold Lake to CFB Fort Nelson

RL-203 preparing for takeoff from runway 31L at Canadian Force Base Cold Lake, Alberta (CYOD). This flight can be loaded to simulate a fictitious reconnaissance flight from CFB Cold Lake, Alberta, to CFB Fort Nelson, British-Columbia (CYYE). *June 17, 1960, 12:15.*

Arrow Flight No. 4 (Cold Start)

Arrow 204 from CFB Bagotville to CFB North Bay

RL-204 preparing for takeoff from runway 29 at Canadian Force Base Bagotville, Québec (CYBG). This flight can be loaded to simulate a fictitious reconnaissance flight from CFB Bagotville, Québec, to CFB North Bay, Ontario (CYYB). *January 18, 1961, 13:25.*



Arrow Flight No. 5

Arrow 205 from CFB Goose Bay to Kuujjuaq

RL-205 preparing for takeoff from runway 26 at Canadian Force Base Goose Bay, Newfoundland (CYYR). This flight can be loaded to simulate a fictitious reconnaissance flight from CFB Goose Bay, Newfoundland, to Kuujjuaq, Québec (CYVP). *March 20, 1962, 14:00.*

Arrow Flight No. 6 (Cold Start)

Arrow 206 Ready for Takeoff at Toronto Intl

RL-206 (unfinished Arrow Mark 2 prototype) preparing for takeoff from runway 6L at Toronto Pearson Intl Airport (CYYZ). This flight can be loaded to simulate the fictitious Avro Arrow Mark 2 initial flight to test the mighty Orenda PS-13 “Iroquois” engines. *April 18, 1960, 12:30.*

THE “HIGH-ALTITUDE” FLIGHTS

There are four “high-altitude” flights included with this version of the software. These flights enable the Arrow to

fly at a high altitude over different locations in northern Canada for fictitious but anticipated interception or reconnaissance missions:

Arrow Flight No. 7 (High Altitude)

Arrow 201 in flight near Kuujjuaq, northern Québec (CYVP). This flight can be loaded to simulate a fictitious but anticipated high-altitude reconnaissance or interception mission over the Canadian North (FL450, 1.2 Mach, LAT N58° 37.74', LONG W67° 42.76', HEADING 325). *February 22, 1961, 8:25.*

Arrow Flight No. 8 (High Altitude)

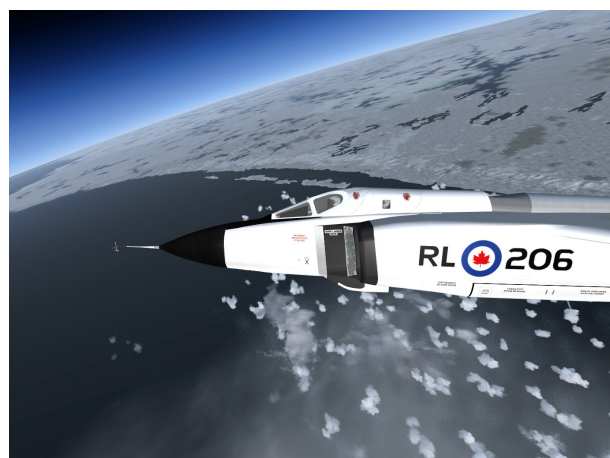
Arrow 203 in flight over Cambridge Bay, Nunavut (CYCB). This flight can be loaded to simulate a fictitious but anticipated high-altitude reconnaissance or interception mission over the Canadian North (FL350, 0.9 Mach, LAT N68° 57.10', LONG W104° 34.71', HEADING 298). *July 18, 1961, 13:40.*

Arrow Flight No. 9 (High Altitude)

Arrow 205 in flight near Zubko, Northwest Territories (CYEV). This flight can be loaded to simulate a fictitious but anticipated high-altitude reconnaissance or interception mission over the Canadian North (FL500, 1.3 Mach, LAT N68° 15.24', LONG W133° 15.34', HEADING 270). *May 23, 1960, 16:10.*

Arrow Flight No. 10 (High Altitude)

Arrow 206 in flight over Mould Bay, Northwest Territories (CYMD). This flight can be loaded to simulate a fictitious but anticipated high-altitude reconnaissance or interception mission over the Canadian North (FL480, 2.2 Mach, LAT N76° 7.39', LONG W119° 0.93', HEADING 269). *March 5, 1962, 14:25.*



Appendix 3: PRODUCT SPECIFICATIONS



MINIMUM SYSTEM REQUIREMENTS

Flight Simulator: Microsoft® FSX (FSX SP2 recommended, Acceleration Pack optional), FS2004

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)

Available Disk Space: 300 MB (space required to install the Arrow add-on software and documentation)

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

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

NOTE: Xtreme Prototypes CF-105 Arrow addons are quite 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 recommended.

Note to Windows® Vista™ with DirectX® 10 users:

The DirectX® 10 Preview option box in FSX display settings must be unchecked for proper aircraft display. The current version of the software does not support certain DirectX® 10 features.

GENERAL FEATURES

Contains six variations of the Avro CF-105 Arrow all-weather, high-altitude jet interceptor for Flight Simulator:

- ❑ Five variations of the Avro CF-105 Mk. 1 (RCAF serial numbers 25201 to 25205; RL-201 to RL-205);
- ❑ One variation of the Avro CF-105 Mk. 2 (RCAF serial number 25206; RL-206).

FLIGHT MODEL FEATURES

Custom Arrow flight model to simulate supersonic flight at high altitude in FSX and FS2004:

- ❑ Two Pratt & Whitney J75-P-5, 18,500-pound turbojet engines (Arrow Mark 1)
- ❑ (or) Two Orenda PS-13 “Iroquois”, 26,000-pound turbojet engines (Arrow Mark 2)
- ❑ High-altitude flight up to 60,000 feet in FSX and FS2004
- ❑ Supersonic flight up to Mach 2.3 in FSX and FS2004
- ❑ Compatible with FSX Acceleration Expansion Pack
- ❑ Functioning afterburners
- ❑ Delta wing flight characteristics
- ❑ Autopilot
- ❑ Good maneuverability at supersonic speeds

AIRCRAFT 3D MODEL FEATURES

- ❑ Highly detailed models based on archive material, with more than 600 parts and 60 animations
- ❑ Reflective textures
- ❑ Unique markings and liveries (on each aircraft)
- ❑ Movable aerodynamic control surfaces:
 - Elevator
 - Ailerons
 - Vertical stabilizer/rudder
 - Extendable ventral speed brakes
- ❑ Steerable front gear with landing and taxi lights
- ❑ Main landing gear
- ❑ Fully animated engine turbine and compressor disks
- ❑ Animated engine exhaust nozzles (petals)
- ❑ Two movable canopies
- ❑ Cockpit details including pilot/navigator and animated sticks, levers and parts

3D VIRTUAL COCKPITS

- ❑ Two fully functional and highly detailed 3D virtual cockpits with over 900 parts and nearly 200 3D animated gauges, switches, levers, light indicators and

- flight instruments with “tooltips”
- Advanced main instrument panel
- Left console
- Right console
- Radio/ADF panel
- Autopilot panel
- Fully functional warning (annunciator) panel
- Back/Front-lit instrument panels
- Cockpit spotlights (VC and exterior model)
- High-altitude (red) lighting
- “Invisible” canopy mode to fly the Arrow without her clamshell-type canopy on for more visibility during landing and a spectacular view from the VC

SPECIAL VISUAL EFFECTS

- Engine smoke effects
- Engine afterburner (flame and shock waves) effects
- Navigation lights
- Extendable landing light (on front gear)
- Extendable and steerable taxi light (on front gear)
- VC lights (main white and high-altitude red lights)
- Wing vortices

MISCELANEOUS

- Arrow custom sound sets for FSX and FS2004
- 14 camera definitions or views (FSX only)
- Ten saved flights based on Arrow test flights (real or imaginary) and fictitious but anticipated reconnaissance and interception missions
- Arrow aircraft kneeboard reference tab and check list (from within Flight Simulator)
- A comprehensive 60-page user manual inspired from original Avro flight manuals, in a printable PDF format (English and French language versions are included with the software)

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



Appendix 4: TECHNICAL SUPPORT



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 CF-105 Arrow in Flight Simulator:

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

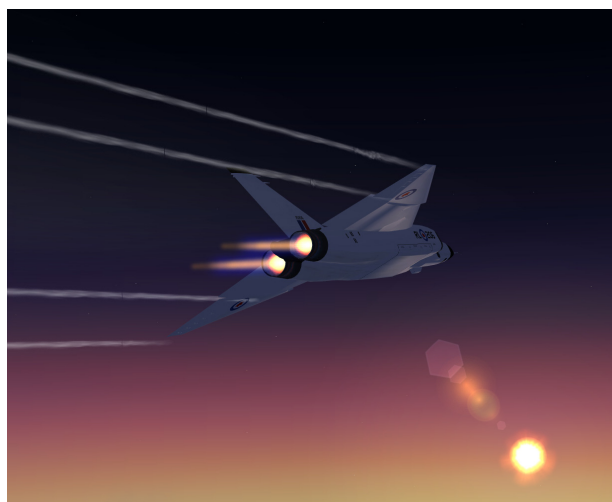
Screen becomes white with the “Light bloom” display option selected in FSX — If the “Light bloom” option is selected in the FSX display settings, the Arrow add-on aircraft may not appear in the aircraft preview window and during flight with the screen becoming all white. To avoid this problem, unselect the “Light bloom” option in the FSX display settings page. This might also improve your frame rate. This is a model-related issue and cannot be corrected in the current version of the software (1.0 for FS9 and FSX).

Aircraft and VC display problems encountered in Windows® Vista™ with DirectX® 10: The DirectX® 10 Preview option box in FSX display settings must be unchecked for proper aircraft (and VC) display. The current version of the software does not support certain DirectX® 10 features. No such display problems have been reported with DirectX® 9.

The engine is running (and/or the aircraft is moving by itself on the runway) at the beginning of a new flight — By default, FSX and FS2004 load previously saved (or default) flights with the engine of the aircraft running. To avoid this situation, you can load one of the many Arrow saved flights included with your add-on package as a “template” for your flight. This has the advantage of presetting all Arrow internal 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.

The Arrow aircraft has no cockpit — 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. The CF-105 Arrow is no exception. The custom Arrow systems are integrated in the advanced 3D virtual cockpits. FS2004 users must switch to the virtual cockpit mode to access and initialize the instrument panels.

Some Arrow aircraft variations are not available in FSX, only one aircraft seems to be installed — Make sure the “Show all variations” option is selected in the “Select aircraft” page in FSX.



Arrow saved flights cannot be found — Arrow saved flights must not be confused with FSX missions. The Arrow saved flights can be loaded from the Free Flight page in FSX (click on the Load... button) or the upper window of the Select a Flight page in FS2004. 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: **SELECTED INTERNET LINKS**

INFORMATION ABOUT THE AVRO ARROW

CBC Arrow Documentary (CBC website)

CBC's documentary "The Avro Arrow: Canada's broken dream". Watch it online:
http://archives.cbc.ca/science_technology/aeronautics/topics/275/

Avro Arrow (The Canadian Encyclopedia)

A brief summary of the Avro Arrow in an article from The Canadian Encyclopedia.
<http://www.thecanadianencyclopedia.com/index.cfm?PgNm=TCE&Params=A1SEC890552>

Avro Arrow Movie Clips (Historica Minutes)

Video clips of the Avro Arrow movie with a film synopsis.
<http://www.historica.ca/minutes/minute.do?id=10220>

Avro CF-105 Arrow Mk. 1 (Canada's Air Force website)

A series of historical images of the Avro Arrow with some description.
http://www.airforce.forces.gc.ca/site/equip/historical/arrowlst_e.asp

Avro CF-105 Arrow Mk. 2 (Canada Aviation Museum)

A description of the Arrow artifacts on display at the Canadian national aviation museum in Ottawa, Ontario, Canada.
<http://www.aviation.technomuses.ca/collections/artifacts/aircraft/AvroCanadaCF-105Arrow/>

Avro CF-105 Arrow Replica Project (Toronto Aerospace Museum)

Details about the full scale replica of the Avro Arrow on display at the Toronto Aerospace Museum (Ontario, Canada).
<http://torontoaerospacemuseum.com/home17.html>

Wikipedia article about the Arrow (Wikipedia)

Wikipedia article describing the Avro Arrow's history, specifications, characteristics, performance and more.
http://en.wikipedia.org/wiki/Avro_Arrow

Arrow Recovery Canada (www.avroarrow.org)

Interesting information about various Avro projects (independent website).
<http://www.avroarrow.org/>

Keeping the Memory Alive (The Avro Arrow Homepage)

An independent website dedicated to the Avro Arrow.
<http://www.avro-arrow.org/>

**The Avro CF-105 Arrow
(Vectorsite.net)**

Technical information about the Avro Arrow (independent website).

<http://www.vectorsite.net/avarrow.html>

Visit our web site for an updated list of interesting Avro Arrow links. If you know of any Arrow websites that are not listed above, please submit them to us:

www.xtremeprototypes.com

Internet links are subject to change without notice. Xtreme Prototypes is not responsible for contents or opinions found in external web sites. This list is not restrictive and does not constitute an endorsement by Xtreme Prototypes.

Appendix 6: **SELECTED BIBLIOGRAPHY**

BOOKS ABOUT THE AVRO ARROW

Avro Arrow: The Story of the Avro Arrow From Its Evolution To Its Extinction

The illustrated memoir of one of the most advanced jet fighter-interceptors of the 1950s.

Authors: The Arrowheads

Publisher: Boston Mills Press (2004)

Paperback: 180 pages

ISBN-10: 1550460471, ISBN-13: 978-1550460476

Requiem for a Giant: A.V. Roe Canada and the Avro Arrow

In A.V. Roe Canada and the Avro Arrow, Palmiro Campagna supplies us with new information to help dispel the myths surrounding the company. With an array of recently declassified documents, Campagna investigates the star projects of A.V. Roe Canada.

Author: Palmiro Campagna

Publisher: Dunrun Press (2003)

Paperback: 226 pages

ISBN-10: 1550024388, ISBN-13: 978-1550024388

Arrows to the Moon: Avro's Engineers and the Space Race (Apogee Books Space Series)

Author Chris Gainor tells the story of the Canadian and British engineers who played key roles in putting Americans on the Moon and in building the United States' space program.

Author: Chris Gainor

Publisher: Apogee (2001)

Paperback: 296 pages

ISBN-10: 1896522831, ISBN-13: 978-1896522838

Storms of Controversy: The Secret Avro Arrow Files Revealed

New documents clarify the American government's role in the decision to scrap the Avro Arrow. Not since the Spitfire of World War II has an aircraft single-handedly captured a nation's imagination, and no one has uncovered more new insights into this legendary aircraft than Palmiro Campagna. For this edition, Campagna has done just that, turning up new documents that further clarify John Diefenbaker's role in the Arrow cover-up.

Author: Palmiro Campagna

Publisher: Stoddart (1998)

Paperback: 320 pages

ISBN-10: 0773759905, ISBN-13: 978-0773759909

Arrow Through the Heart: The Life and Times of Crawford Gordon and the Avro Arrow

Written in co-operation with the Gordon family, with access to his private papers, photos, and corporate documents, award-winning author Greig Stewart uncovers the colourful, charismatic, controversial and ultimately tragic life of the man who touched the lives of thousands of Canadians.

Author: Greig Stewart

Publisher: McGraw-Hill Ryerson (1998)

Paperback: 216 pages

ISBN-10: 0075601028, ISBN-13: 978-0075601029

MOVIES

The Arrow: The Right Stuff, The Wrong Time

The Arrow movie (1997) starring Dan Aykroyd, Sara Botsford, Ron White, Aidan Devine, Nigel Bennett, Christopher Plummer, Michael Moriarty and Michael Ironside. Based on the true story of the Avro Arrow. Produced for CBC Television. Contains two documentaries about the Avro Arrow.

Studio: CBC Home Video/Morningstar Entertainment

DVD Release Year: 2006

Run Time: 180 min. (main feature), 107 min. (bonus)

PLASTIC MODELS

1:48 Avro CF-105 Arrow

A Hobbycraft Canada 1:48 plastic scale model of the Avro Arrow. Includes a test pilot figure and authentic water-slide decals.

Most items are available from Amazon.com. Visit our web site for an updated list of interesting Arrow books, movies and items:

www.xtremeprototypes.com

Xtreme Prototypes is not responsible for contents and opinions found in the books, movies and other products presented herein nor for product availability. This list is not restrictive and does not constitute an endorsement by Xtreme Prototypes.

Appendix 7: OTHER PRODUCTS by Xtreme Prototypes

STICK and RUDDER. REDEFINED.

X-15-1
Add-on Rocket Aircraft for Microsoft Flight Simulator

X-15A-2
Add-on Rocket Aircraft for Microsoft Flight Simulator

X-15-2/3
Add-on Rocket Aircraft for Microsoft Flight Simulator

NOW WITH A 3D VIRTUAL COCKPIT
Free upgrade available online for registered users

X-15
Add-on Rocket Aircraft for Microsoft® Flight Simulator
(FSX and FS2004 compatible)

Actual FSX screenshot

Xtreme Prototypes
www.xtremeprototypes.com

EVERYONE
E
Visit www.esrb.org for more rating information
ESRB CONTENT RATING www.esrb.org

PC
CD-ROM
SOFTWARE

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XTREME PROTOTYPES X-15 FOR FLIGHT SIMULATOR SERIES

Relive high-speed research missions at the edge of space* with the legendary North American X-15 rocket plane, available in a series of three exciting add-on packages for Microsoft® Flight Simulator X and Flight Simulator 2004**.

Each package contains highly detailed 3D models based on the real aircraft, fully functional instrument panels*** with over 200 gauges, spectacular visual effects, a custom X-15 flight model to simulate rocket-powered high-speed and high-altitude flight, and a 100-page utility flight manual available in English and French (PDF format).

For more information: <http://x15.xtremeprototypes.com/en/>

*: Speed is limited to approximately Mach 4.65 in FS2004 and FSX. The maximum altitude in FS2004 is 100,000 feet.

** : Designed and optimized for FS2004, FSX compatible. Now compatible with FSX Acceleration Expansion Pack.

***: X-15-1 and X-15-2/3 add-ons are currently available with fully functional 3D virtual cockpits (version 1.1). X-15A-2 VC coming soon.





RL-202 over Lake Ontario near Toronto, Ontario, Canada (FSX).





www.xtremeprototypes.com

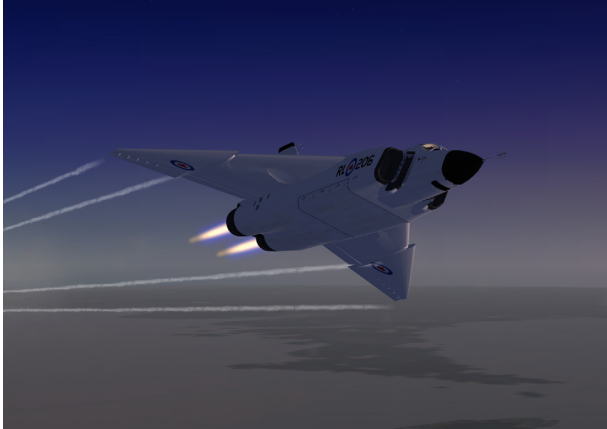
Beautiful screen capture of the Xtreme Prototypes CF-105 Arrow for Flight Simulator during a reconnaissance mission somewhere over northern Canada (FS2004).



www.xtremeprototypes.com

Night takeoff (RL-201, FSX screenshot).

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WE THANK YOU FOR PURCHASING YOUR COPY OF THIS ADD-ON SIMULATION SOFTWARE.

Developing high-quality add-on aircraft for Flight Simulator such as the Xtreme Prototypes CF-105 Arrow requires the contribution of a dedicated and passionate team of professionals including artists, programmers, aviation specialists, writers, project managers and marketing experts. These products take many months of research and hard work and are aimed at a relatively limited market of flight simulation enthusiasts. By purchasing your copy of the software, you are encouraging its creators, supporting a young industry and contributing to the making of high-quality add-on products for your favourite hobby.

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All images appearing in this document are actual screenshots of the Xtreme Prototypes CF-105 Arrow virtual aircraft and panels captured in Microsoft® Flight Simulator X or Flight Simulator 2004 game environments, except where otherwise noted.

Portions of this manual have been inspired or adapted from original Avro Aircraft utility flight manuals published during the 1950s by the RCAF and A.V. Roe (Avro) Canada Limited. Xtreme Prototypes is not affiliated with Avro Canada, the Canadian Air Force, or any other company, entity or government organization related to the Arrow program.

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