

Canadair CT-114 Tutor



Introduction:

My name is Donald Radke and I am the one that started the 3D model work on the Canadair CT-114 Tutor jet trainer. This project started in the beginning of 2004 when I purchased FSDS2 to make a Tutor jet. I tried requesting other designers to build one with no luck, so went about the process to make my own.

During the learning/building of the Tutor, I soon found that there was a lot that went into making an airplane for Microsoft Flight Simulator. So I started to look for some help. One of the first to respond was Tony Goodale. Tony didn't have anything to offer other than he too really liked the Tutor, but his dad on the other hand was really good at tweaking air and config files.

Next came the job of finding a texture artist. A Chris Baird joined Tony, Ken, and myself (the now formed VCDG – Virtual Canadian Design Group) to work on the Tutor. He made some really nice pre-release Tutor textures that I couldn't use as my first attempt at texture mapping was not the easiest to work with. Sometime during the summer, I lost contact with Chris and really needed a new texture person. I have download almost every Canadian military re-paint that Shane Strong had done, so figured I would ask. The worst he could do is say no. He came on board and has worked many hours to make me happy. At the same time, he has pushed me to fix this or that with the Tutor that he wasn't that happy with.

My first attempt into gauges and panels was like going back to FS2000. So another person offered to help. Herbert joined after I saw his A-6 panels and the results are well

worth it. He also helped me learn a little XML along the way. So I did some of the gauge programming as well, not much but a little.

Others have joined on (mentioned later in this document or in the other external documents) to assist me in their own ways, from information about performance of the Tutor to beta testing flight models. If I have left anyone out, I publicly apologize for the oversight. There have been so many e-mails and questions about the project, that I lost track of.

If anyone reading this knows about Chris Baird, please let me know at VCDG@sympatico.ca. I would really like to know what happened to him. He gave VCDG web space on his account to show off our work, which too has disappeared. There was times during this project we talked on MSN on a daily basis. I hope everything is fine.

Background History:

In the late 1950's, the Royal Canadian Air Force was looking forward to a jet trainer that would help their pilot's move into the Jet era. They needed something that could be as reliable as the venerable Harvard, but give the next step of training.

In anticipation of this need, Canadair (now Canadair, Bombardier Inc) began an in house look at this need. By 1957 Canadair had a mockup of what would become the Tutor. It was a side-by-side seating arrangement, with a single jet engine.

After being evaluated by the Air Force, the order was placed to begin construction of the Tutor in 1961. True to the mock up, it was built as a side-by-side, single engine turbo jet aircraft designed for training pilots for the transition from propellers to jets. It is a pressurized, all metal design, utilizing electrics for the majority of onboard equipment, the exceptions being the flaps, landing gear, nose wheel steering, wheel brakes, and speed brakes. The Tutor is certified for IFR, and carries all necessary equipment for long cross country navigation, poor weather, and night flying.

The RCAF took delivery of 190 airframes, between the years of 1963-1967. It is powered by the General Electric J-85 jet engine built under license by Orenda Ltd, in Toronto. This was the same engine used to power the F-5 and T-38. It provided a maximum continuous static thrust at sea level under standard atmospheric conditions of 2700 pounds.

The Malaysian Air Force also took delivery of 20 airframes, known as the Teuban that were used for radar and armaments training.

The Tutor played its role as the primary jet trainer for many a RCAF pilot in the near 40 lifespan it enjoyed, until its retirement in 2000. In the years leading up to its retirement, it also served as the NATO lead in fighter training at Moose Jaw, Saskatchewan. Sadly, it was to be replaced by the CT 156 Harvard II and the CT 155 Hawk.

As much as many pilots still flying today have a fond memory of the CT-114 for their first introduction to jet flying, the public out there knows little of the expansive training role this little bird enjoyed. The public is of course more familiar with the Canadian Forces Snowbirds. This demonstration outfit flies 9 plane aerobatic formations using a slightly pepped up version of the CT-114.

CT-114 Tutor Specifications:

<i>Manufacturer:</i>	Canadair: designed and built
<i>Crew/passengers:</i>	2 crew in ejection seats, left seat for solo only
<i>Power Plant:</i>	Orenda J-85 CAN-49 Turbojet with 2,700 lbs thrust
<i>Performance:</i>	Max speed: 486 mph (782 kmh) Service ceiling: 42,200 ft (12863 m) Range: 940 mi (1563 km)
<i>Weights:</i>	Empty 4895 lbs (2220 kg) Gross: 7397 lbs (3335 kg)
<i>Dimensions:</i>	Span: 36 ft 6 in (11.13m) Length: 32 ft 0 in (9.75 m) Height 9 ft 4 in (2.84m)
<i>Armament:</i>	None, but provisions for under fuselage tanks
<i>Cost:</i>	\$425,000 (the real Tutor, not our simulation...on the other hand, if anyone is willing to pay me that much, I won't turn it down...)



CT-114 Tutor Simulator

Simulator Panel Usage



Left Main Panel

Left Side Panel (main view for Even numbered planes):

- A.) When activating “Smoke” switch, you will hear the Snowbird lead saying: “Snowbirds, smoke on now”.
- B.) Pressing “Test” button has two affects, one all lights should turn on and two, the Snowbird lead should say: “Snowbirds check in – (followed by 2 – 9)”.
- C.) Up/Down arrows switches to landing view. Right arrow switches to the right seat.
- D.) To open canopy, other than using shift+e, press the “Activate” button first. This will display the “Unlock” warning light. The flip the red switch to open canopy. To close, flip switch followed by pressing “Activate” button.



Right Main Panel

Right Side Panel (main view for Odd numbered planes):

- A.) Clicking within this area will flip thru some of the Snowbirds formations.
- B.) Clicking this icon, will display the engine gauges that are on the left side panel.

Of course the Tutor has a full working VC and can be flown from either seat. The Snowbirds release has been divided into two folders, Snowbirds_RT and Snowbirds_LT. This allows me to have the pilot fly from the correct seat without the user modifying any files.



Left Landing View



Right Landing View

Take-off Procedure



The Tutor is a pretty simple jet to take-off in. Set one notch of flaps. Set trim to take-off (Elev T/O will light up green when in range). Note, within the simulator this is between 2-4 on the trim gauge. Apply full power and use rudder to adjust for wind (if any).

Around 70-75 KIAS, apply a little gradual back pressure on the control column until nose wheel is just off the ground. Maintaining this attitude, the aircraft will become airborne at approximately 95 KIAS.

Raise landing gear when airborne. When airspeed reaches about 110 KIAS, raise flaps.

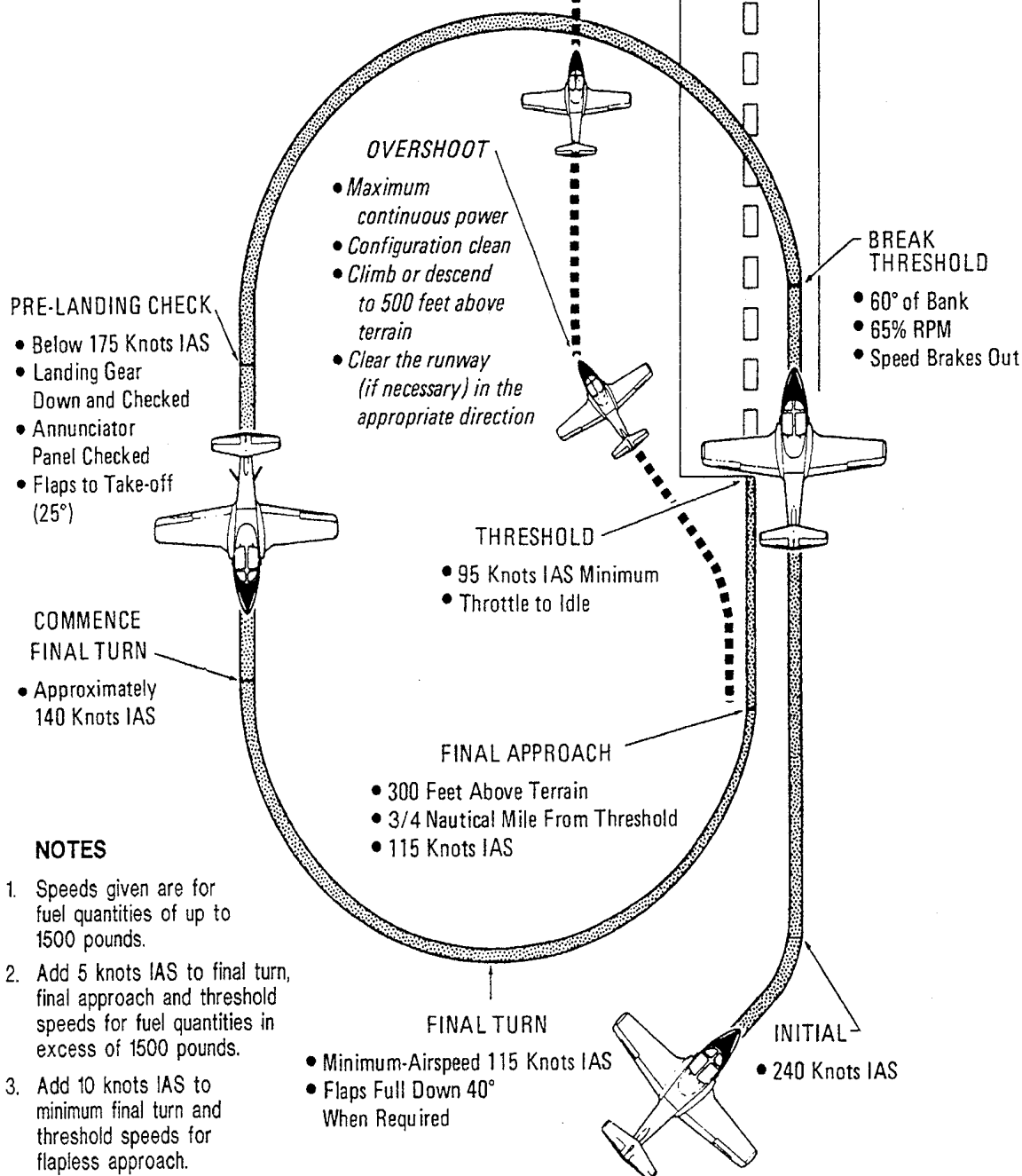
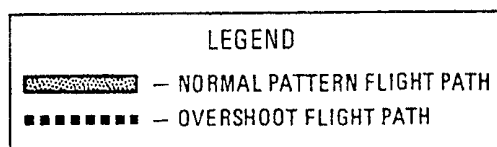
Adjust trim as required.

That is about it. This is a simplified version taken from the “CT-114 Tutor – Aircraft Operation Instructions”.

Landing Procedure



To land the Tutor, follow the included diagram below. The simulation of the Tutor comes pretty close to what is published in the diagram. It should be noted that the first notch of flaps is at 20 degrees and not 25 degrees. Not sure when the change was made, but according to the Snowbird Techs, the Tutor is setup with 20 & 40 degree of flap settings.



NOTES

1. Speeds given are for fuel quantities of up to 1500 pounds.
2. Add 5 knots IAS to final turn, final approach and threshold speeds for fuel quantities in excess of 1500 pounds.
3. Add 10 knots IAS to minimum final turn and threshold speeds for flapless approach.
4. Diagram not shown to scale. Specific points shown are for average wind conditions (10 knots IAS headwind component).

Canadian Armed Forces

Snowbirds

Introduction:

<http://www.snowbirds.forces.ca/>

Welcome to the first release of a VCDG and Mapleleaf Imaging project. The project is of the Canadair CT-114 Tutor, which you must have figured out by now from the above documentation.

This package we have released is of the 2004 Canadian Snowbirds Team. The pilots and crew names are from the 2004 season, including tail numbers. I would like to thank the Snowbirds for all their support during this project. A special thank you to Capt. Hugo Pellerin, Capt. Jayson Miles-Ingram, and Sgt. Dave Scharf for all the work they did to help me out.

Included with the 12 jets from the 2004 season, is a special number 5 jet flown by Capt. Jayson Miles-Ingram in 1998. Capt. Miles-Ingram volunteered to be a test pilot for our project. Okay, not sure if Capt. Pellerin forced him to “volunteer” or just asked him, but he still did the job when time allowed. Also added to the number 5 jet is Sgt. Dave Scharf’s name, even though he was not crew chief then, he was the first to offer help with the project and was an excellent host to my family during the 2004 Brantford Airshow.

Background History:

Back in 1929, a Canadian team called the Siskins flew five Siskin IIA biplanes till 1932. This was to be the beginning for the Canadian Forces 431 Air Demonstration Squadron, called the Snowbirds. It was until the late 50’s early 60’s that Canada put another squadron together to do air demonstrations. This team was to be called the Golden Hawks and flew seven gold F-86 Sabre jets.

The Canadian Forces 431 Air Demonstration Squadron was formed in 1971 at CFB Moose Jaw. The team consists of the 9-plane formation, of which two aircraft also fly opposing solo. The team was preceded by the Golden Hawks, and the Golden Centennaires, which also flew a 9 plane formation, but in golden Tutors, in 1967 to celebrate Canada’s 100th birthday.

The Snowbirds are the only jet aerobatic team in the world that does not rely on support aircraft. The crew chief flies in the right seat to and from all the air shows, carrying any spares needed to make sure the show will go on. Though they may not have the speed of some of the other formation aerobatic teams, people who have watched their graceful maneuvers will still rank them among the best in the world.

To read a more in depth history of the Snowbirds, please visit their Squadron history at: http://www.snowbirds.forces.ca/history2_e.asp.

Squadron Quick Facts:

Motto: *The Hatiten Ronteriios* (Warriors of the air)

Badge: An Iroquois Indian's head

Battle Honours:

- 1943-1944 – English Channel & North Sea
- 1943-1944 – Baltic
- 1943-1944 – Fortress Europe
- 1944-1945 – France & Germany
- 1943-1944 – Biscay Ports
- 1943-1945 – Ruhr
- 1943-1944 – Berlin
- 1943-1945 – German Ports
- 1944 – Normandy
- 1943-1944 – Rhine, Biscay



431 Squadron Colours

Quick History: On 11 November 1942, 431 Bomber Squadron formed at Burn, England. They were in England for the duration of the war and moved to RCAF Station Dartmouth, Nova Scotia, after V-E Day, disbanding there on 5 September 1945. 431 Fighter Squadron formed at RCAF Station Bagotville on 18 January 1954 in order to display the Sabre to the public at airshows. They were disbanded on 1 October 1954. They were re-activated on 1 April 1978 as 431 Air Demonstration Squadron, more commonly known as the Snowbirds, flying the CT-114 Tutor. On 15 October 1999, 431 Sqn was presented their Squadron Colours, for 25 years of service.

431 has flown these aircraft:

- Vickers Wellington
- Handley Page Halifax
- Avro Lancaster
- Canadair (North American) F-86 Sabre
- Canadair (Lockheed) CT-33 Silver Star
- Canadair CT-114 Tutor

Credits:

Please refer to other text files and documents for a listing of all those involved.

I hope you enjoy this package, and please keep an eye out for the training versions of the CT-114 Tutor. These will include two model types, one with external fuel tanks and a clean version. There will also be a bunch of textures and an included paint-kit for the flight simulator artist.

This document written by Tony Goodale and Donald Radke with added screenshots provided by Donald Radke (panel images) and Shane Strong (CT-114 Tutor within FS9).

Questions can be answered at VCDG@sympatico.ca, thank-you and please enjoy.