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Avro Canada CF-100

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(Redirected from Avro CF-100)

The **Avro Canada CF-100 Canuck** (affectionately known as the *Clunk*) was a Canadian jet fighter serving during the Cold War. It was the only Canadian-designed fighter to enter mass production.

The CF-100 is not considered to be truly supersonic since it could not exceed the speed of sound in level flight. However, on 18 December 1952, S/L Janusz Żurkowski, the Avro company chief development test pilot, broke the sound barrier flying the CF-100 Mk 4 prototype in a dive from 30,000 feet.

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CF-100 Canuck



A CF-100 Mk 3 painted as the CF-100 prototype, on display at the Calgary AeroSpace Museum

Role	Interceptor
Manufacturer	Avro Canada
Designed by	John Frost
First flight	19 January 1950
Introduced	1952
Retired	1981
Primary users	Royal Canadian Air Force Belgian Air Force
Number built	692

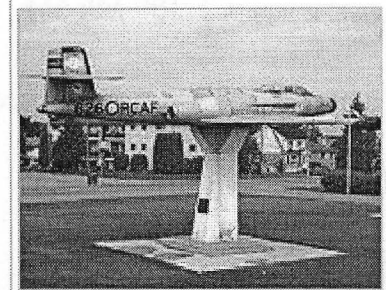
Design and development

In the early 1950s, Canada needed an interceptor (fighter) able to patrol the vast areas of Canada's north and operate in all weather conditions. The two-seat fighter crewed by a pilot and navigator, was designed with two powerful engines and an advanced radar and fire control system housed in its nose that enabled it to fly in all-weather or night conditions. For its day, the CF-100 featured a short takeoff run and high climb rate, making it well suited to its role as an interceptor.

Design of the XC-100 to meet a RCAF specification for an all-weather fighter was initiated at Avro Canada in October 1946. Chief Engineer Edgar Atkin's work on the CF-100 was subsequently passed to John Frost formerly of de Havilland who, along with Avro's Chief Aerodynamacist Jim Chamberlin, reworked the original fuselage design. The **CF-100 Mark 1** prototype, "18101," emerged out of the factory, painted gloss black overall with white lightning bolts running down the fuselage and engines. The CF-100 prototype flew its maiden flight on 19 January 1950 with Gloster Aircraft Company Chief Pilot S/L Bill Waterton at the controls. Waterton was on loan from the

against Soviet intruders. Canucks flying at home retained natural metal finish, but those flying overseas were given a British-style disruptive camouflage scheme - dark sea gray and green on top, light sea gray on the bottom.

During his Avro Canada years, the Chief Development Pilot, S/L Żurkowski, continued to fly as an aerobatic display pilot, with spectacular results, especially at the 1955 Farnborough Airshow where he displayed the CF-100 in a "falling-leaf." He was acclaimed again as the "Great Żura" by many aviation and industry observers who could not believe a large, all-weather fighter could be put through its paces so spectacularly. His performance led to Belgium purchasing the CF-100.



A CF-100 is on permanent display in North Bay's Lee Park

In its lifetime, a total of 692 CF-100s of different variants were produced, of which 53 aircraft were delivered to the Belgian Air Force. Although originally designed for only 2,000 hours, it was found that the Canuck's airframe could serve for over 20,000 hours before retirement. Consequently, though it was replaced in its front line role by the CF-101 Voodoo, the Canuck served with 414 Squadron of the Canadian Forces at CFB North Bay, Ontario, until 1981, in reconnaissance, training and electronic warfare roles. After the CF-100 was retired, a number of aircraft still remain across Canada (and elsewhere) as static displays.

Its planned successor, the CF-105 Arrow along with the sophisticated Orenda Iroquois engine, both Canadian-designed, were cancelled in 1959 in a controversial decision by the Canadian government.

Variants

- **CF-100 Mk 1** : The first two prototypes.
 - **CF-100 Mk 1P** : Proposed photo-reconnaissance version. Not built.
- **CF-100 Mk 2** : Ten pre-production aircraft.
 - **CF-100 Mk 2T** : Two-seat training version of the CF-100 Mk 2. Two built.
- **CF-100 Mk 3** : Two-seat all-weather long-range interceptor fighter aircraft. First production version for the RCAF. 70 built.
 - **CF-100 Mk 3A** : CF-100 Mk 3 sub-type, powered by two Orenda 2 turbojet engines. 21 built.
 - **CF-100 Mk 3B** : CF-100 Mk 3 sub-type, powered by two Orenda 8 turbojet engines. 45 built.
 - **CF-100 Mk 3CT** : One CF-100 Mk 3 converted into a two-seat training aircraft. Later redesignated **CF-100 Mk 3D**.
- **CF-100 Mk 4** : Two-seat all-weather long-range interceptor fighter aircraft. One pre-production aircraft.
 - **CF-100 Mk 4A** : CF-100 Mk 4 sub-type, powered by two Orenda 9 turbojet engines. 137 built.
 - **CF-100 Mk 4B** : CF-100 Mk 4 sub-type, powered by two Orenda 11 turbojet engines. 141 built.
 - **CF-100 Mk 4X** : Proposed version of the CF-100 Mk 4. Not built.
- **CF-100 Mk 5** : Two-seat all-weather long-range interceptor fighter aircraft, powered by two Orenda 11 or Orenda 14 turbojet engines. 332 built.
 - **CF-100 Mk 5D** : Small number of CF-100 Mk 5s converted into ECM (Electronic Countermeasures), EW (Electronic Warfare) aircraft.

- Head Lake Park, Haliburton, Ontario
- Imperial War Museum Duxford, Duxford, Cambridgeshire, England, United Kingdom
- Memorial Military Museum,^[3] Campbellford, Ontario
- Nanton Lancaster Society Air Museum, ^[4] Nanton, Alberta
- National Air Force Museum of Canada, Trenton, Ontario
- Nav Canada, Cornwall, Ontario
- Reynolds-Alberta Museum, Wetaskiwin, Alberta
- Royal Canadian Legion, Cornwall, Ontario
- Royal Military College of Canada, Kingston, Ontario
- Royal Military College Saint-Jean, Saint-Jean-sur-Richelieu, Quebec
- Royal Museum of the Armed Forces and of Military History, Cinquantenaire, Brussels, Belgium
- Wildwood Park, Malton, Ontario

Specifications (CF-100 Mk 5)

General characteristics

- **Crew:** 2, pilot and navigator
- **Length:** 16.5 m (54 ft 2 in)
- **Wingspan:** 17.4 m (57 ft 2 in)
- **Height:** 4.4 m (14 ft 6 in)
- **Wing area:** 54.9 m² (591 ft²)
- **Empty weight:** 10,500 kg (23,100 lb)
- **Loaded weight:** 15,170 kg (33,450 lb)
- **Powerplant:** 2× Avro Canada Orenda 11 turbojets, 32.5 kN (7,300 lbf) each

Performance

- **Maximum speed:** 888 km/h (552 mph)
- **Range:** 3,200km (2,000mi)
- **Service ceiling:** 13,700 m (45,000 ft)
- **Rate of climb:** 44.5 m/s (8,750 ft/min)
- **Wing loading:** kg/m² (lb/ft²)
- **Thrust/weight:** 0.44

Armament

- 2 wingtip pods of 29 x 70-mm (2.75 in) "Mighty Mouse" fin-folding aerial rockets

See also

- Orléans air disaster

Comparable aircraft

- Gloster Javelin
- F-89 Scorpion

Gloster firm, another member of the Hawker Siddeley Group. The Mark 1 was powered by two Avon RA 3 turbojets with 28.9 kN (2,950 kgp / 6,500 lbf) thrust each.

CF-100 Mk 4B in a "scramble" from RCAF St. Hubert, Quebec, c. 1962

The second prototype, 18102, was also powered by Rolls-Royce Avons, although subsequent pre-production and production series aircraft used the Avro Orenda turbojet. Five pre-production **Mk 2** test aircraft were produced (18103-18107) all fitted with the Orenda 2 jet engines; one was fitted with dual controls and designated a **Mk 2T** trainer. The first production version, designated **Mk 3**, incorporated the APG-33 radar and was armed with eight 0.5 inch machine guns. The **Mk 3CT** and **Mk 3DT** were again dual control versions supplied to operational training units.

Production

In September 1950, the RCAF ordered 124 examples of the Mk 3 version; the first of these entering Royal Canadian Air Force service in 1953. These were armed with eight .50-caliber machine guns. The definitive version rocket-armed **Mk 4A** was based on prototype Mk 4 (a modified Mk 3) first flying on 11 October 1952. The nose housed the much larger APG-40 radar with wingtip pods each containing up to 30 Mighty Mouse FFAR (folding fin aerial rockets) in addition to the guns. As the last 54 of an order for the Mk 3 were changed into the **Mk 4** in 1954, total orders for the Mk.4 rose to 510. The **Mk 4B** version had more powerful Orenda 11s.

Five versions, or "marks", were produced, ending, from 1955 onwards, with the high-altitude **Mk 5** that featured a 1.06m (3 ft. 6 in.) extended wingtip and enlarged tailplane, along with removal of the machine guns. The proposed **Mk 6** was to have mounted Sparrow II missiles and been powered by afterburning Orenda 11IR engines in an effort to provide an "interim" fighter prior to the introduction of the Avro CF-105 Arrow. A projected transonic swept-wing CF-103 was built in mock-up form in 1951, but was considered obsolescent even before the CF-100's demonstrated ability to exceed the speed of sound in a dive.

Operational history

The Canuck was affectionately known in the RCAF as the "Clunk" because of the noise the front landing gear made as it retracted into its well after takeoff. Its less-attractive nickname was the "Lead Sled", a reference to its heavy controls and general lack of maneuverability, a nickname it shared with a number of other 1950s aircraft.^[1] Others included CF-Zero, the Zilch, the Beast, all references to an aircraft many pilots considered less glamorous than RCAF day fighters like the Canadair Sabre.^[2]

The aircraft operated under the US/Canadian North American Air Defense Command (NORAD) to protect North American airspace from Soviet intruders such as nuclear-armed bombers. Additionally, as part of the North Atlantic Treaty Organization (NATO), four Canuck squadrons were based in Europe with 1 Air Division from 1956–1962, and were for some time the only NATO fighters capable of operating in zero visibility and poor weather conditions.

The CF-100 served with nine RCAF squadrons at its peak in the mid-1950s. Four of these squadrons were deployed to Europe from late 1956–1962 under the NIMBLE BAT ferry program, replacing some NATO RCAF squadrons equipped with Canadair Sabre day fighters to provide all-weather defense



CF-100 Mk 3 at the Canadian Museum of Flight in July 1988

References

Notes

- ↑ Designation Systems, Lead Sled
- ↑ CF-100 Veterans Reunite
- ↑ Memorial Military Museum
- ↑ Nanton Lancaster Society Air Museum

Bibliography

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External links

- Avroland Article
- Air Vectors Entry
- Canadian Warplane Heritage Museum Article
- Specifications

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Categories: Avro Canada aircraft | Canadian fighter aircraft 1950-1959 | Royal Canadian Air Force

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- **CF-100 Mk 5M** : Small number of CF-100 Mk 5s equipped to carry the AIM-7 Sparrow II air-to-air missiles.
- **CF-100 Mk 6** : Proposed version armed with the AIM-7 Sparrow II air-to-air missile. Not built.

Operators

Belgium

- Belgian Air Force (53 Mk 5s from 1957 to 1964)
 - 11 Squadron
 - 349 Squadron
 - 350 Squadron

Canada

- Royal Canadian Air Force
- Canadian Forces

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- 409 Squadron
- 410 Squadron
- 414 Squadron
- 416 Squadron
- 419 Squadron
- 423 Squadron
- 425 Squadron
- 428 Squadron
- 432 Squadron
- 433 Squadron
- 440 Squadron
- 445 Squadron
- 448 Squadron



CF-100 badge worn by Canadian Forces crews in the 1970s and 80s

Aircraft on display

Museums or sites which have an Avro Canada CF-100 on display:

- Alberta Aviation Museum, Edmonton, Alberta
- Atlantic Canada Aviation Museum, Halifax, Nova Scotia
- Base Borden Military Museum
- Calgary Aerospace Museum
- Canada Aviation Museum, Ottawa, Ontario
- Canadian Museum of Flight, Langley, British Columbia
- Canadian Warplane Heritage Museum
- Centennial Park, Moncton, New Brunswick, Avro Canada CF-100 Canuck Mk 5 Serial Number 18488, 432 Squadron
- CFB Winnipeg
- Canadian Forces Garrison St. Hubert, Quebec
- Comox Air Force Museum, Comox, BC