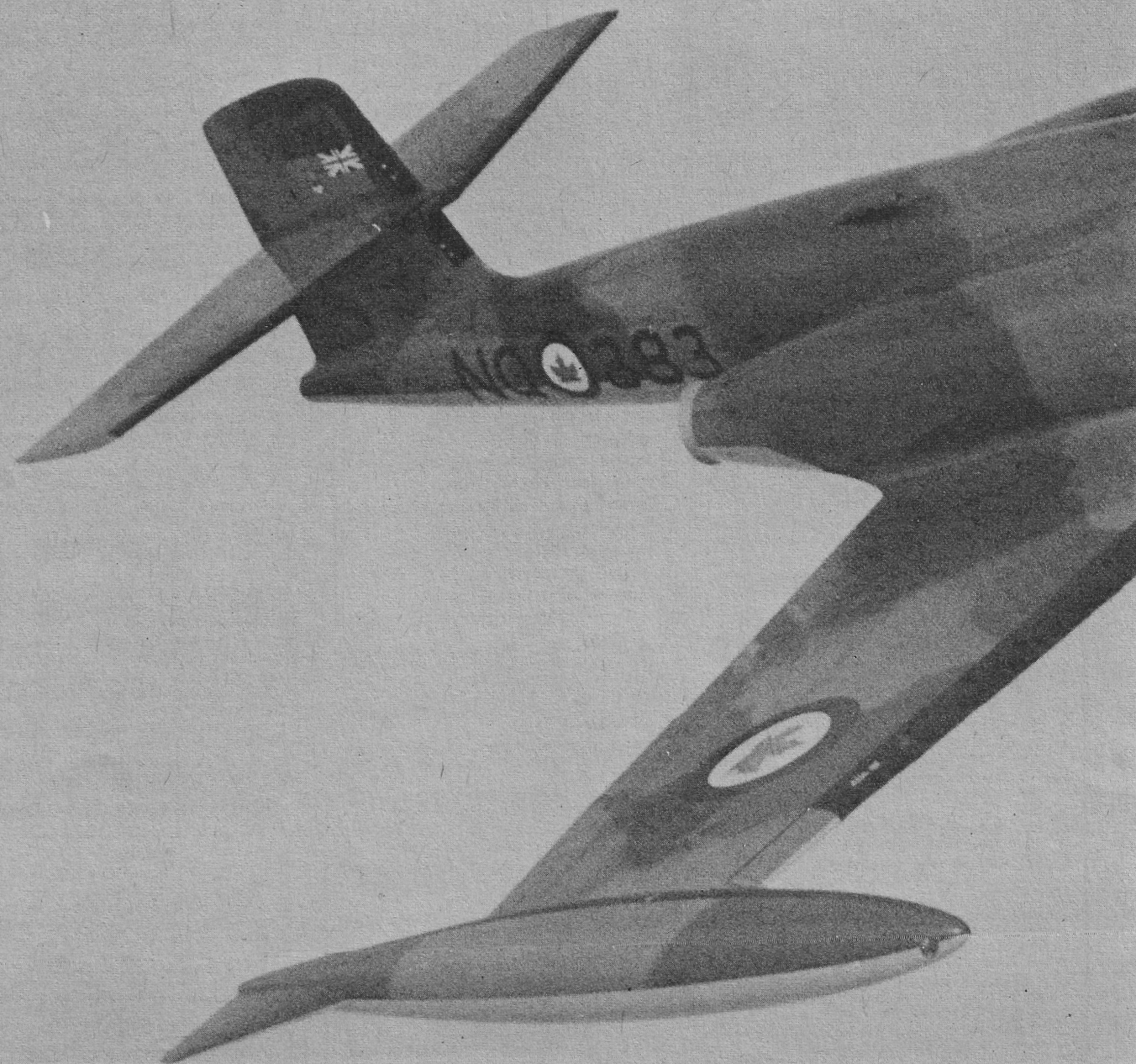


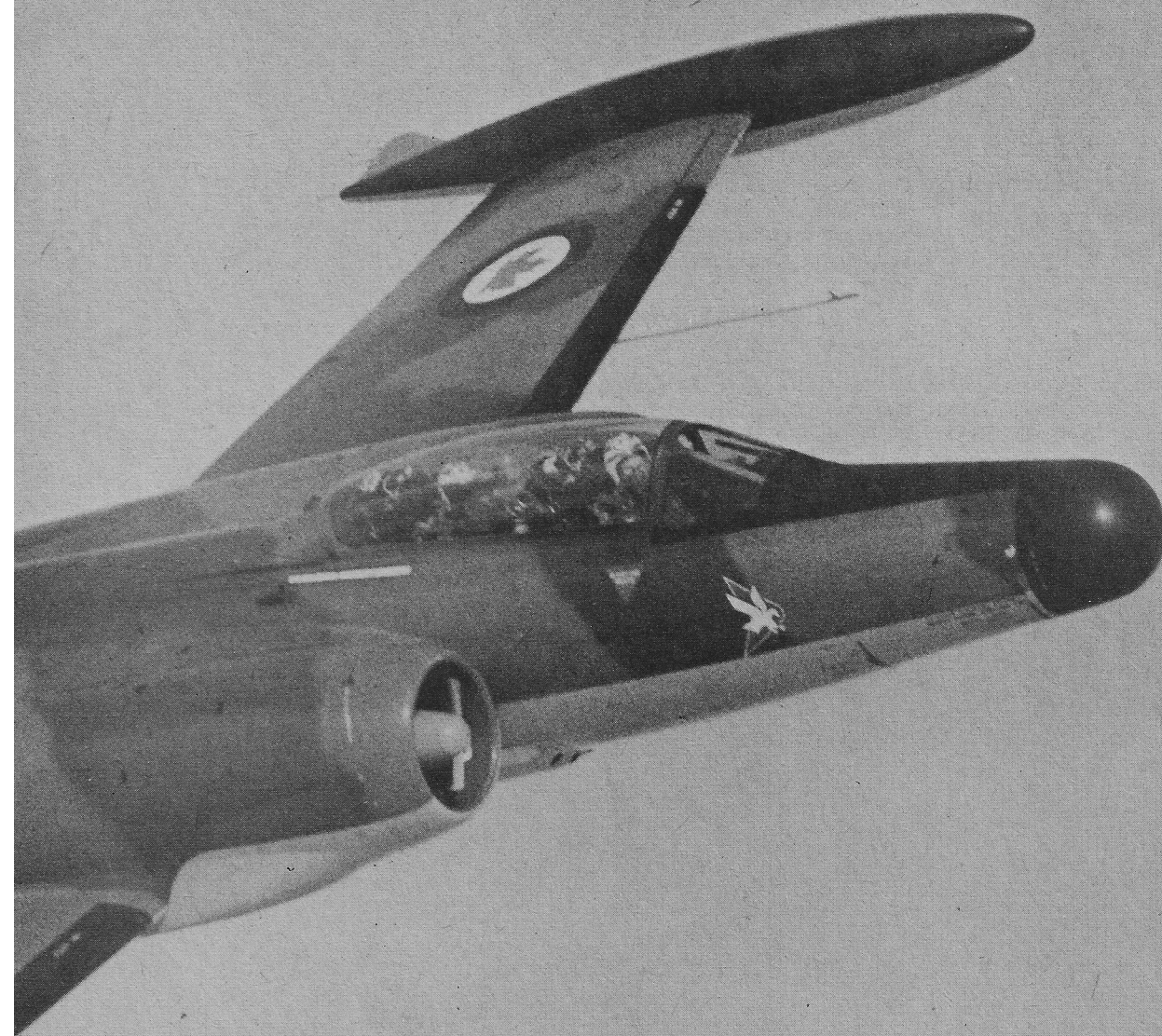
# Canada's Jet Warrior

The Avro CF-100 Arrow was a giant step forward  
for the Canadian aeronautical industry

By Tom Wilson



RK 892-002



Canadians always think of war in terms of defense. Canada is the second largest country in the world, second only to the Soviet Union in land area. Its small population of only 25 million is more than fully occupied with the challenge of wresting a good living from an inhospitable climate and has no designs on anyone else's real estate.

What is called "the War Department" in many nations is the "Department of National Defense" in Canada.

Canadians feel secured in the geographical proximity and political friendship of the United States, maintain strong family ties with the British Commonwealth and actively support collective security through the UN and NATO. Whenever it has been called upon; in the Boer War, both World Wars, Korea or anywhere a UN peacekeeping force is required, Canada has given freely of its blood and treasure, but it is not a warlike nation.

It follows quite naturally that its



armed forces should be small, highly professional, all volunteer—and very defense minded.

Defense is the word.

In January 1950 there first appeared in Canadian skies an aircraft that was defense personified. A pure interceptor that was built for only one purpose; to claw down from the skies the only threat to the security of North America

**“... It was gradually becoming obvious that the longed-for peace was not to be...”**

which could be seen at that time: Russian bombers.

That aircraft was the Avro Canada CF-100 Canuck.

In the Autumn of 1946 the Royal Canadian Air Force had just about reached the depths. The fine wartime force of nearly a quarter million had been allowed to dwindle to a disastrous

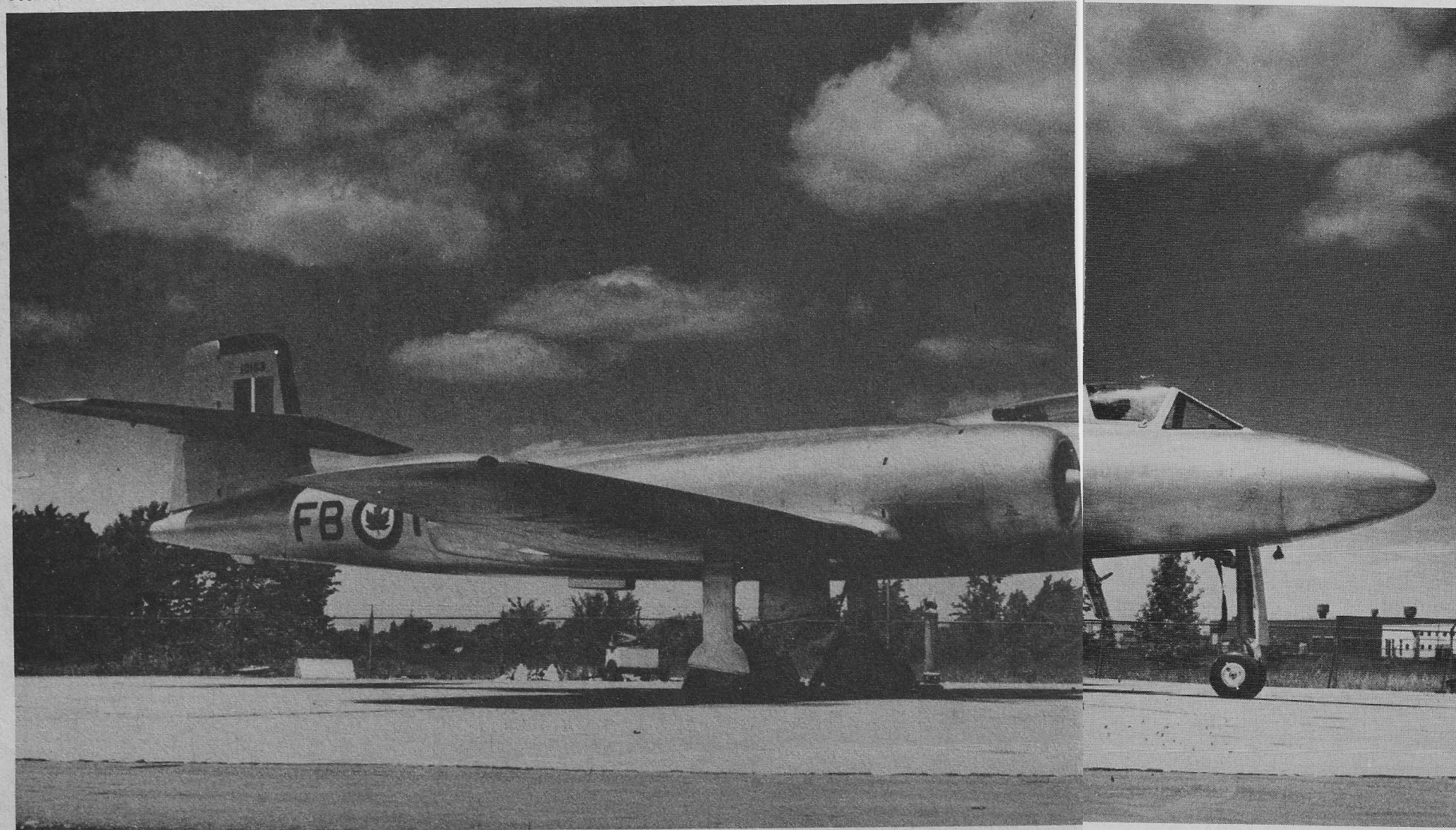
figure of only 12,735 all ranks. There were no really modern fighter aircraft in the country. Two Gloster Meteor F.Mk.III's were being evaluated (the Service would eventually decide on de Havilland Vampires), and the only aircraft available in any quantity were Hurricanes and Kittyhawks.

The Air Staff knew that this situation couldn't last. It was gradually becoming obvious that the longed-for peace was not to be. The Soviet Union was beginning to emerge as the new adversary and for the first time Canada began to look away from her Atlantic and Pacific coasts toward a new threat from the North.

The principles of strategic bombing were well known to the RCAF, both in offense and defense. No. 6 (RCAF) Group of the RAF Bomber Command had flown over 40,000 sorties against the Third Reich. No. 1 Fighter Squadron had joined the air defense of Great Britain on 26 August 1940, at the very height of the Battle of Britain and Canadian fighter squadrons had served



CF-100 Mk.1 18102 "FB-K" was finished in overall gloss black. This beautiful aircraft, seen posing for its first air-to-air photographs, crashed and was written off on the same day that it was taken on strength by the RCAF, 23 June 1951.



with great distinction all through the war.

They knew what they needed: a sophisticated early-warning radar net, pushed right across the continent and as far north as possible to give maximum reaction time; a wide-spread and well organized ground observer corps, based on the military but largely staffed by civilian volunteers, and most importantly, an all-weather, round-the-clock, heavily-armed interceptor with extreme long-range capability.

If all this sounds a little like a replay of World War Two, please remember that is exactly what it was. ICBMs and extremely sophisticated manned bombers were far in the future. The threat was seen as being a heavy bomber of a performance roughly equal to that of a B-29 or a B-50, and that is exactly what the Russians came up with: an illegal copy of the B-29 called the Tupolev Tu-4.

No aircraft in the world could meet the Canadian requirement.

There now occurred one of those fortunate coincidences which come along all too seldom in the defense game. Just as the RCAF's requirement began to take shape there arrived on the scene the very man to fill the need.

In 1942 the Canadian government had formed a Crown Company—Vic-

18103 was the first CF-100 Mk.2. These aircraft were unarmed pre-production machines using the Canadian-built Orenda 2 engines in place of the Rolls-Royce Avons that were installed in the Mark I.

tory Aircraft Limited—to take over the National Steel Car Corporation at Malton, Ontario. This factory produced 430 Avro Lancaster bombers, most of which went into action over Germany. After the war Sir Roy Dobson, Chairman of A. V. Roe in England, decided to establish a subsidiary of the company in Canada, intending to do conversion and maintenance work. A. V. Roe negotiated the purchase of manufacturing and office space from Victory Aircraft and ended up buying the entire plant.

Eventually this concern would do a lot of useful work for the RCAF and the Royal Canadian Navy, converting Mk.10 Lancasters to bomber-recon, photo-recon, air-sea rescue and maritime patrol aircraft, servicing B-25 Mitchells for the Air Force and Hawker Sea Furies for the Navy, but Sir Roy Dobson had a vision and a goal; A. V. Roe Canada Ltd., should design and produce aircraft "from the drawing board into the air."

As he made the moves which would put Avro Canada Ltd. into position to build new aircraft, the Air Staff in Ottawa, first under Air Marshal R. Leckie and then Air Marshal W. A. Curtis, were urging the government and the industry to push ahead with the development of two indigenous aircraft:



a jet trainer and a fighter capable of operating in the Arctic. The trainer was soon to be abandoned, its place taken by the Canadair-built Lockheed T-33 Silver Star, but the fighter would be the CF-100.

The RCAF specification was released and design work started in October of 1946. Even the USA and Great Britain had a hard time designing and perfecting aircraft in those days. Jet interceptors were inestimably more complex than their piston-engined predecessors of only five years before. Canada had never designed and built a jet fighter and, even with generous engineering and technical help from Britain, it was a monumental task.

The 42,000 man-hours needed to design the classic P-51 Mustang rose over ten-fold to 450,000 man-hours for the

CF-100. Ten thousand drawings were required and, once production got underway, 300 drawing changes were going through the design office every week. Even the early models needed 15,000 templates, 7,000 forming tools

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and dies, 3,000 machine tools and 125 major assembly jigs.

In addition to all this Avro Canada decided to produce its own engines! There was no American engine available at the time which could meet the

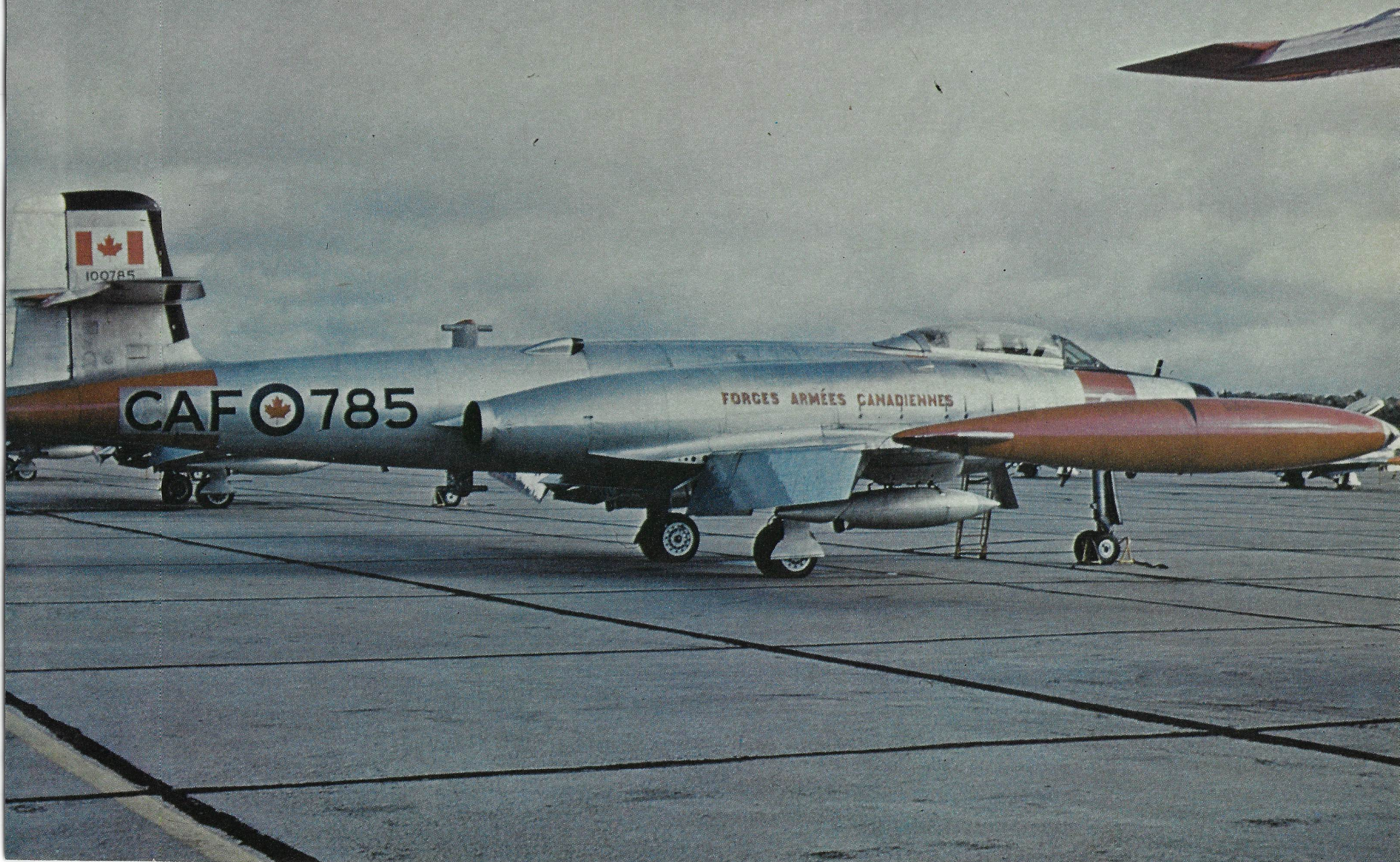
needs of the design, and although Rolls-Royce Avons would be used to power the first two prototypes there was concern that in wartime it might not be possible to get engines from across the Atlantic, so again the watchword was "build your own."

The new engine would be called the Orenda, a modern turbo-jet that would be able to "stretch" with the design from 6,000 lbs st in the Mk.2 to 7,500 in the Mk.5 and would have given 8,250 with afterburners in the projected Mk.6. It turned out to be a really excellent engine and was also used in 1,025 of the 1,815 F-86 Sabres built by Canadair Ltd. at Montreal. At the time of its inception, though, it was just one more project clamoring for people, cash and space at Malton, and one more reason why Sir Roy's "from

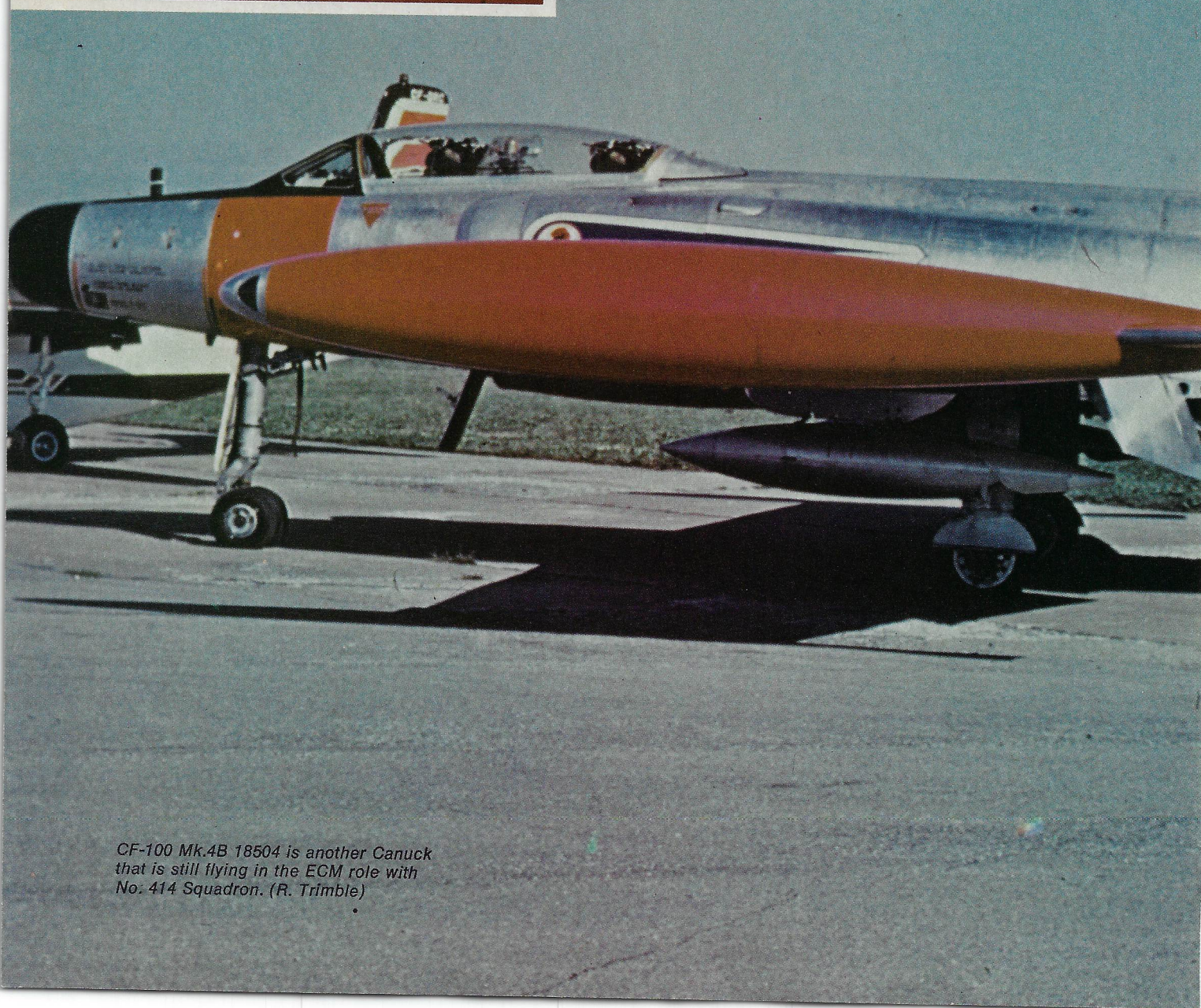




*CF-100 Mk.5 carrying the new style  
serial 100785 (instead of the previous  
18785) is seen at CFB North Bay on  
15 September 1972. Aircraft is still active  
with No. 414 Squadron. (R. Trimble)*





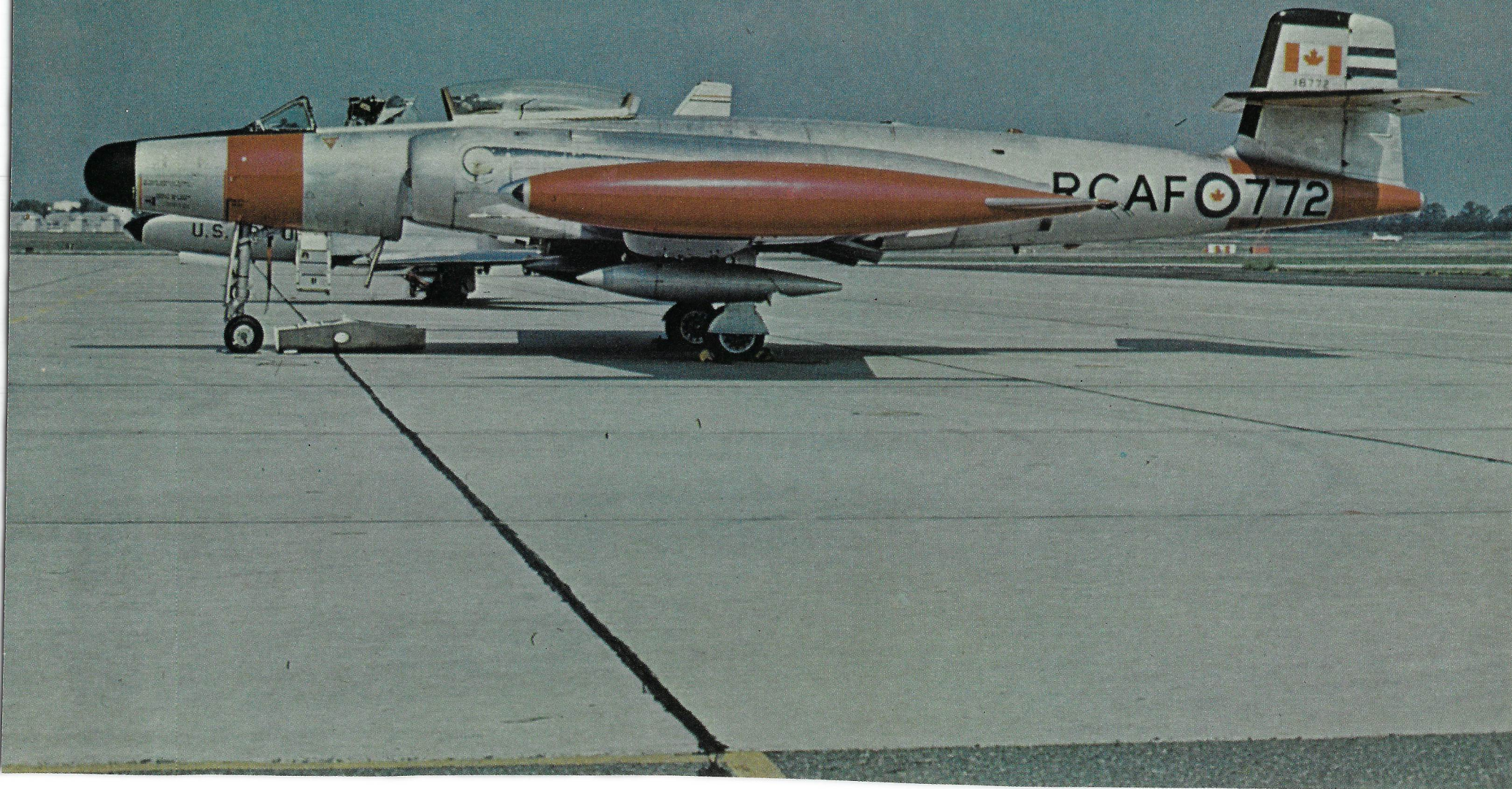


CF-100 Mk.4B 18504 is another Canuck  
that is still flying in the ECM role with  
No. 414 Squadron. (R. Trimble)

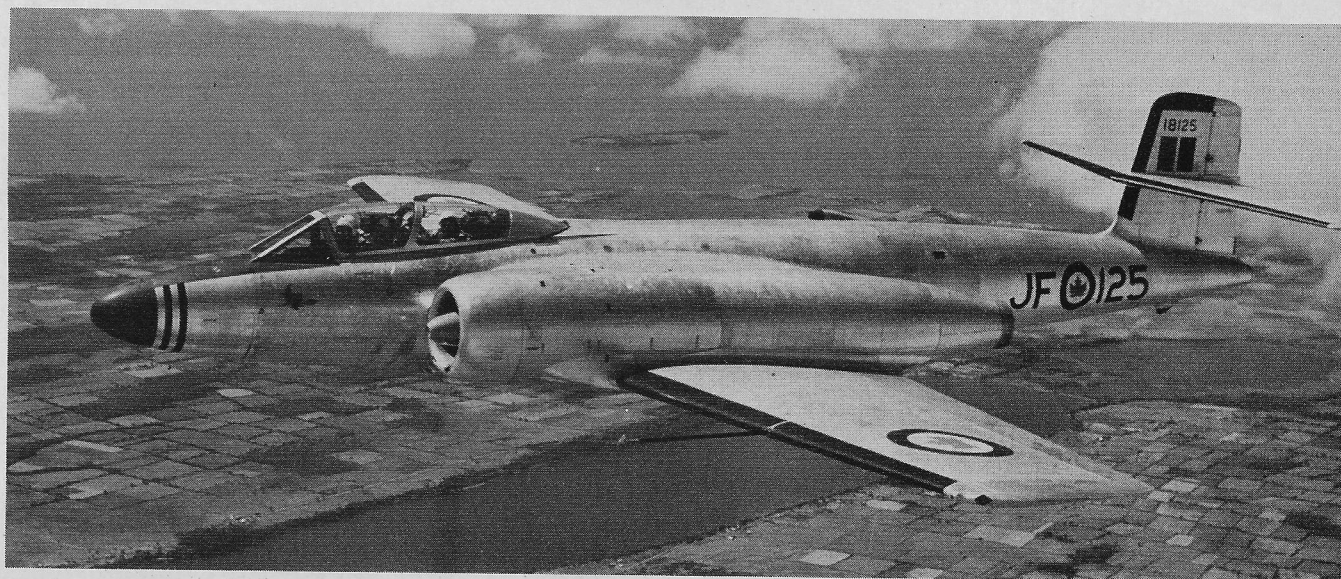




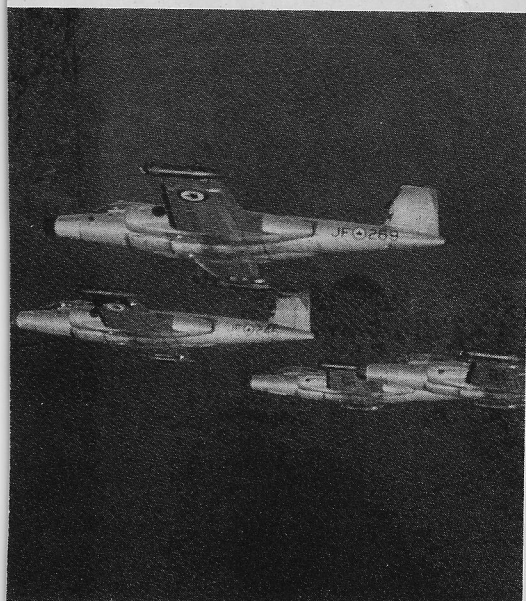
*Avro CF-100 Mk.5 18772 is also still active with No. 414 Squadron where it performs a useful ECM role. (R. Trimble)*







*This Mk.3A was operated by No. 3 (All-Weather) Operational Training Unit at North Bay, Ontario, the first CF-100 OTU. The eight .50 caliber machine guns were installed in a gun pack that can be seen just below the port engine intake.*



*CF-100 Mk.4As of No. 3 (AW) OTU doing some tight formation work. These aircraft have the eight machine gun pack plus two rocket pods, each containing 29 2.75-inch folding fin rockets.*

the drawing board into the air" took over three years.

The former Victory Aircraft plant was soon swamped and huge new production facilities had to be built. Eventually 40,000 Canadians in plants right across the country, including over 450 subcontractors, were involved in CF-100 production. By 1954, 55 per cent

*A factory-fresh Mk.5, 18473, makes a run over Niagara Falls. This aircraft spent most of its ten-year service life with Air Defense Command at North Bay. Finish is typical of home-based ADC aircraft.*

of all defense procurement funds were being allocated to the CF-100 project.

The Canadian public, not yet experienced in such matters, were aghast to hear that while a Spitfire or a Mustang could be purchased for \$50,000, \$140 million had been spent before the first CF-100 Mk.1 ever flew and the average price of the fleet would be about \$550,000.

On 19 January 1950, only five months before the outbreak of the Korean War, the first CF-100 Mk.1 number 18101, made its first flight. The Gloster Aircraft Co. in the UK had loaned one of its expert test pilots, Bill Waterton, for the big event. There were no major problems as he took the big machine into its element in the crisp winter sky over Malton. The cheers and congratulations as Waterton taxied her in were not premature. She would lead a long and happy life.

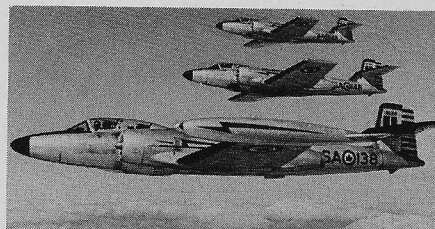
The Mk.1s were the wonder of the Canadian aviation scene. They were big, sleek aircraft, painted a glossy black, and had a general air of husky efficiency.

In those days of small fighters they seemed very large, with a wingspan of 52 feet and a length of 52 feet, three inches. The layout was not unlike modern fighters today in that the crew of two, pilot and radar operator/navigator, would sit in tandem under a long perspex canopy, and the engines were nestled right up alongside the fuselage just aft of the cockpit.

The considerable weight of just over 15 tons was carried on the ground by a burly tricycle "undercart" with dual wheels at each position. The wings and tail surfaces were straight, but that wouldn't keep her from going super-

sonic on occasion. She was going to be a very fast lady.

The production models would have every type of radar, nav-aid, de-icing and heating device known to man to make the big bird function in the hostile environment of the Arctic. Size, weight,



*The nearest Mk.3B carries the 292 U.S. gallon wing tanks which became nearly universal on the Canuck. These aircraft belong to 445 Squadron which was Canada's first all-weather, round-the-clock fighter squadron.*

power and performance would all increase as the years went by. A DND info sheet issued in 1975 gave the following general information on the type:

Length: 54 feet, 2 inches.

Span: 57 feet, 5 inches. (59 feet, 6 inches in Mk.5).

Height: 15 feet, 6½ inches.

Speed: 575 mph. (650 in Mk.5).

ower: 2X6,000 lbs.s.t. (2X7,500 in Mk.5).

Range: 1,200 miles. (1,700 in Mk.5).

Ceiling: 45,000 feet.

The two Mk.1s were powered by Rolls-Royce Avon RA3s of 6,500 lbs st, the Orenda net yet being available.✈

TO BE CONTINUED...