

The Avro Arrow

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A maritime reconnaissance version of the famed Lancaster bomber. A Crown Corporation, Victory Aircraft Limited built 430 Lancasters during World War Two. In 1945, Victory Aircraft Limited was sold and became A.V. Roe Canada Limited, the aircraft division of which was later renamed Avro Aircraft Limited.¹



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The C-102 prototype in flight and landing. In 1949, the C-102 missed being the first jet transport to fly in the world by only thirteen days. In 1952, the Liberal government shelved the project so that Avro could concentrate on the production of a military aircraft - the CF-100 Canuck. [2](#)



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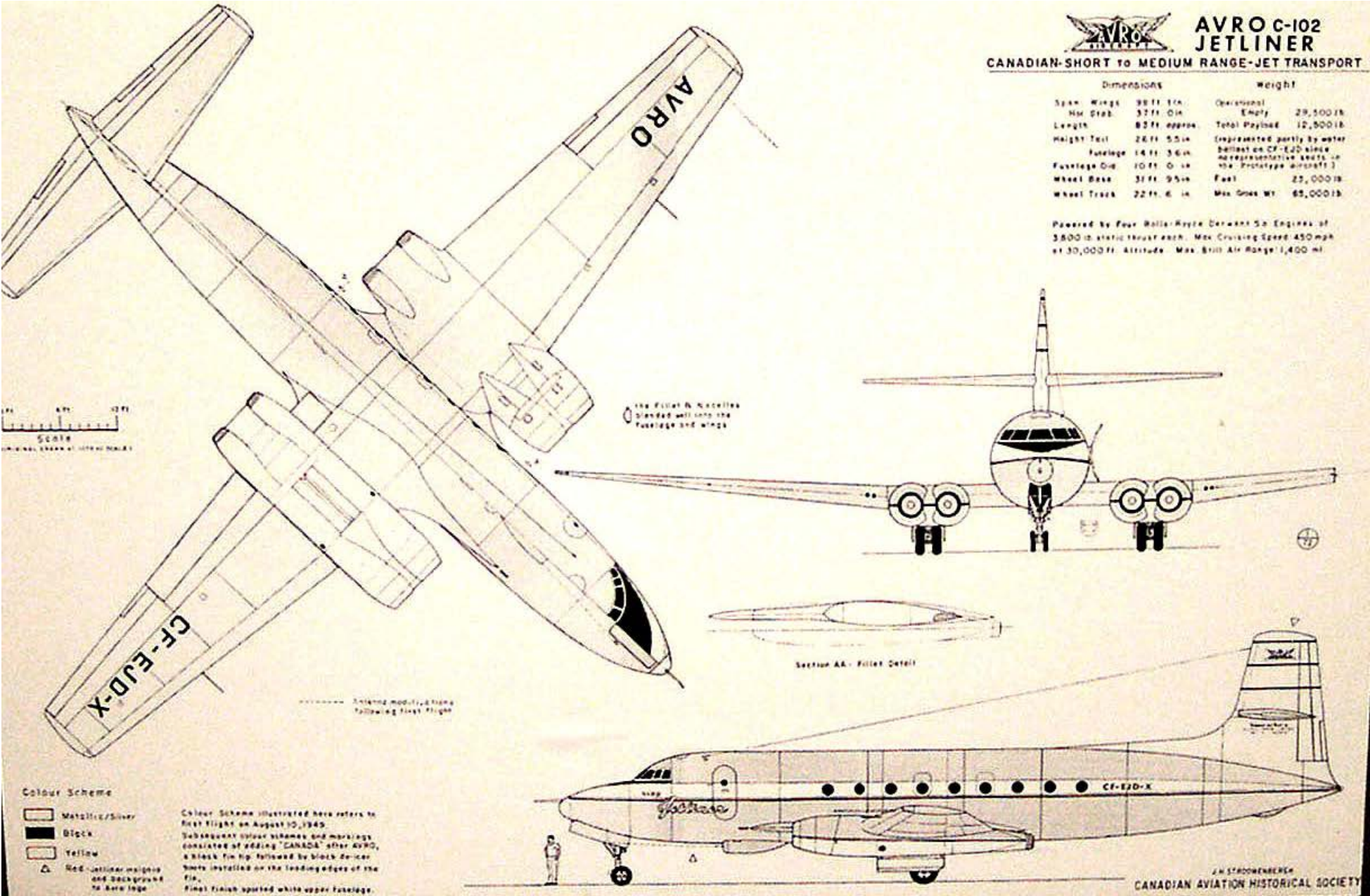
The C-102 prototype in flight and landing. In 1949, the C-102 missed being the first jet transport to fly in the world by only thirteen days. In 1952, the Liberal government shelved the project so that Avro could concentrate on the production of a military aircraft - the CF-100 Canuck. [3](#)



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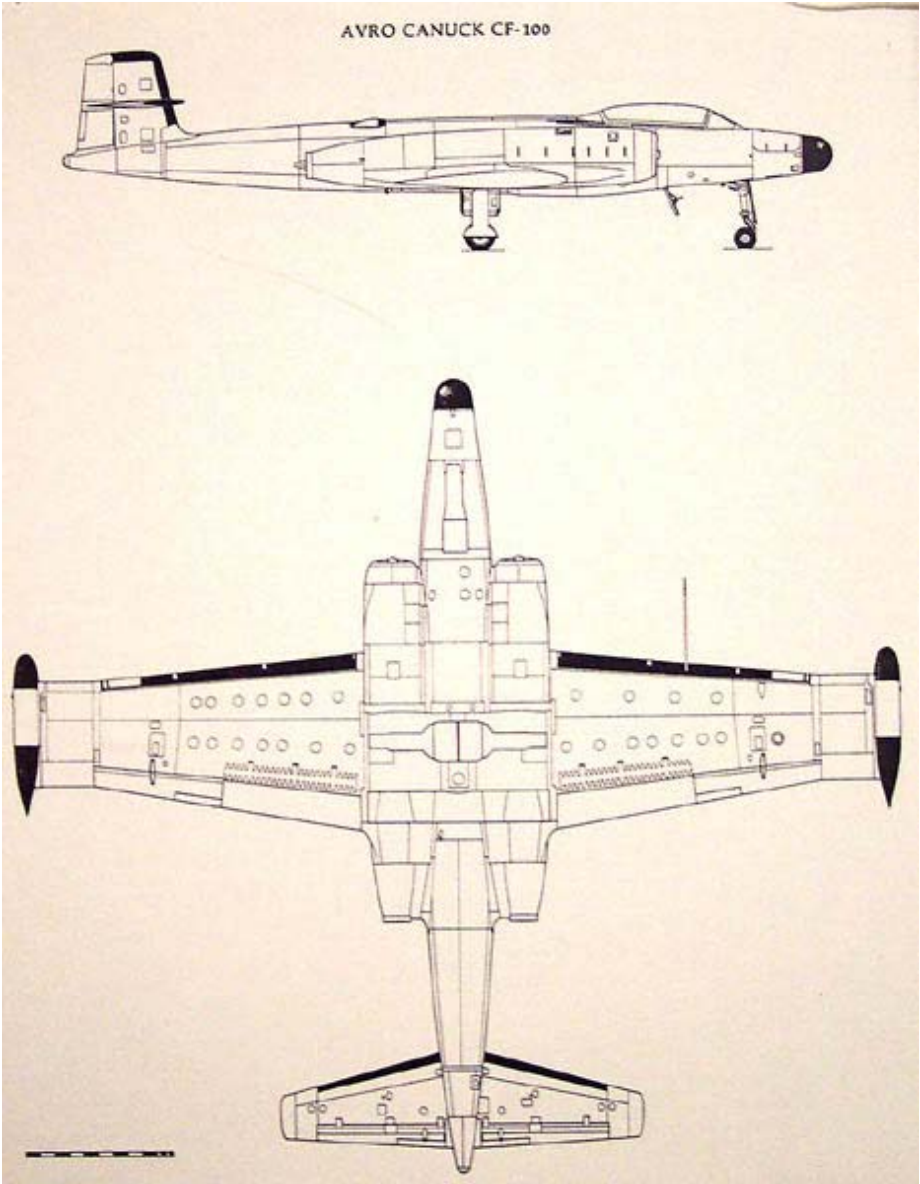




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The Avro CF-100 Canuck Mark 4, two-seat, twin-engine, all-weather interceptor. [5](#)



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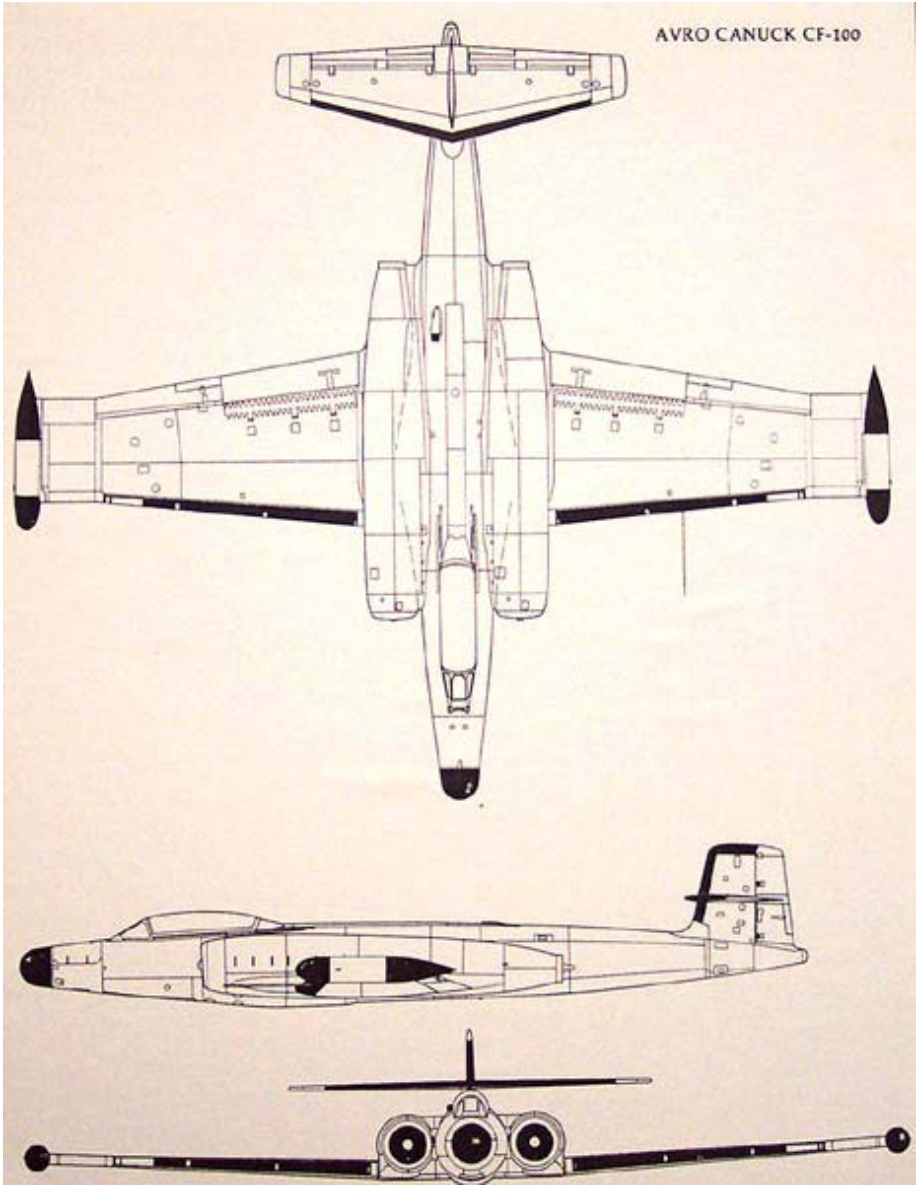
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The Avro C-102 Jetliner, a short-to-medium range jet transport. [6](#)



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A CF-100 Mark 5 over Parliament Hill.[Z](#)





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A CF-100 Mark 5, repainted in the original black and white paint scheme of the first prototype, on the occasion of the retirement of the last CF-100 from active service, 1981.^{[8](#)}





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CF-100 Mark 3 test aircraft used in the Velvet Glove air-to-air missile programme. Designed by the Canadian Armament Research and Development Establishment, Velvet Glove was deemed obsolete in 1954 and cancelled.⁹

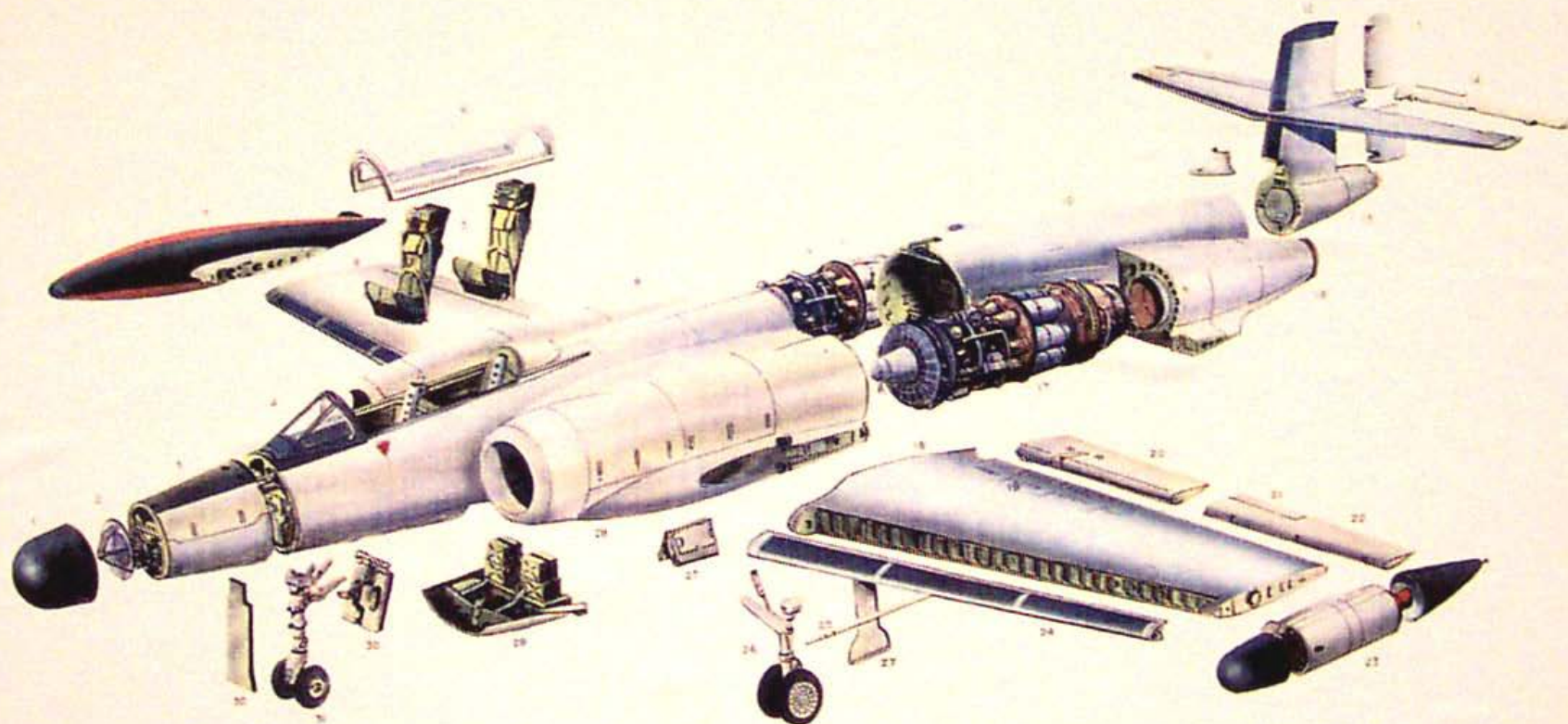


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AVRO CANADA CF-100 CANUCK



MK4

COMPONENTS

- 1 RADOME
- 2 ANTENNA DISC
- 3 RADAR NOSE—Hughes Fire Control
- 4 WINDSCREEN
- 5 EJECTION SEATS—Martin-Baker
- 6 CANOPY
- 7 WINGTIP FUEL TANK (2)
- 8 STARBOARD WING

- 9 FUSELAGE CENTRE SECTION
- 10 REAR CENTRE SECTION
- 11 HORIZONTAL STABILIZER
- 12 VERTICAL STABILIZER
- 13 RUDDER
- 14 ELEVATOR
- 15 REAR SECTION—Empennage
- 16 JET EXHAUST

- 17 ENGINES—Two Orenda 9s or 11s
- 18 PORT WING
- 19 DIVE BRAKES
- 20 FLAP
- 21 TRIM TAB
- 22AILERON
- 23 ROCKET POD (2)
- 24 LEADING EDGE & De-Icer Boot

- 25 PITOT TUBE — Airspeed Indicator
- 26 MAIN UNDERCARRIAGE—Dowty
- 27 UNDERCARRIAGE DOORS
- 28 ENGINE NACELLE
- 29 WEAPONS PACK—8 Browning Guns
- 30 UNDERCARRIAGE DOORS
- 31 NOSE UNDERCARRIAGE—Dowty

Dimensions—MK 4
Wing Span: 48' 11" Length: 54' 2"
Height: 14' 6" Track: 10' 2"
Wheelbase: 16' 9.2"

Ian H. Stroumenbergh/Avro Canada

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A CF-100 Mark 3. [11](#)





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A CF-100 Mark 4. [12](#)



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A CF-100 Mark 5. [13](#)



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The 692nd and last CF-100, a Mark 5, is rolled out of the factory. Behind it is the fourth Avro CF-105 Arrow prototype, the aircraft designed to replace the Canuck.¹⁴



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The Avro Arrow

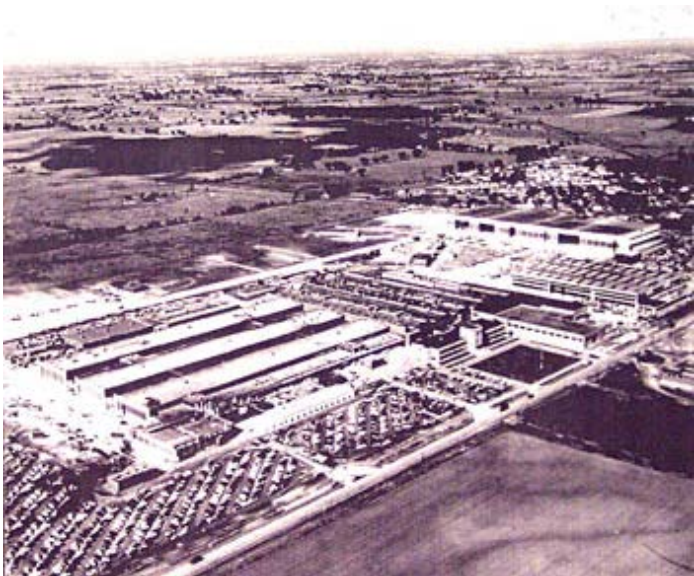
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The Avro Aircraft Limited plant at Malton, Ontario, 1957 (now Toronto's Pearson International Airport). At its peak the plant directly employed over 14,000 workers.¹⁵



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The Avro Arrow



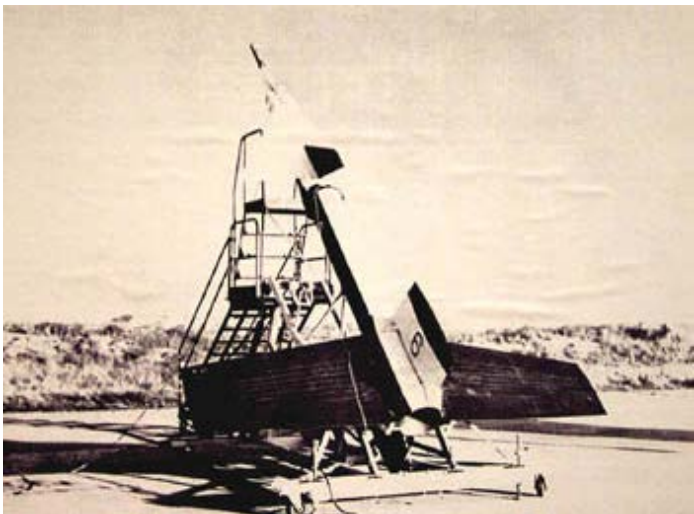
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Early aerodynamic data on the Arrow design was gathered from small wind tunnel models and larger free flight models mounted on Nike rockets.[16](#)



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The Avro plant gears up for production of the prototypes. The first Arrow, 201, can be seen in the background in the final assembly stage; in the foreground is a full-size metal mockup of the Arrow. [17](#)



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Excerpts from the minutes of the March 23, 1955 Cabinet meeting during which approval was given to proceed with the Arrow programme.¹⁸

Royal Canadian Air Force; development of CF-105

TOP SECRET

40. The Minister of Finance, referring to discussion at the meeting of March 8th, said that the Department of National Defence had now sought Treasury Board authority for the expenditure of \$40 million to proceed with the first stage in the development of the new CF-105 super-sonic all-purpose fighter aircraft. This sum would cover the cost of the first eleven aircraft as well as the cost of tooling. The overall programme would involve construction of forty aircraft, and the development and procurement of engines for them, at a total expenditure of some \$260 million.

41. The Minister of National Defence pointed out that the total expenditure of \$260 million for the completed project would be spread over a six-year period. It was anticipated that the magnitude of annual expenditure would be of the order of \$15 million the first year, \$47 million the second, \$61 million the third, \$66 million the fourth, \$40 million the fifth and \$30 million the final year.

42. In the course of discussion the following points emerged:

(a) There was no doubt that, at the drafting-board stage, the CF-105 appeared to be a very useful aircraft well suited to the long distances and severe atmospheric conditions of the Canadian north, which would serve the R.C.A.F. as an effective weapon against long range supersonic bombers flying at high altitudes. This development involved the expenditure of very substantial sums of public money and constituted what some might consider expensive insurance against an emergency which might or might not occur.

(b) Good as this aircraft might turn out to be, it was unlikely that other N.A.T.O. governments would adopt it for their own use. One of the reasons for this was that the aircraft was designed to meet conditions peculiar to northern Canada and might not be entirely suitable for use in western Europe; another was that we could not expect the U.S. and U.K. to adopt a Canadian plane rather than develop one of this importance themselves.

(c) It was understood that the \$260 million project could be fitted within total defence expenditure on the present scale; it was hoped that the long-term commitments in this development would not prevent further cuts being made in the overall defence budget during the next few years, if the international situation at that time made such reductions possible.

(d) Without questioning the desirability of proceeding with the CF-105 project, it was suggested that sufficient attention was not being paid to the abandonment of obsolete weapons, formations and strategic concepts in the light of recent developments in the field of nuclear fission. The answer to the problem was perhaps not to curtail new developments, such as the CF-105 project, but rather to make sure that long established methods and weapons were not continued through sheer force of habit and tradition even though they had become obsolete and ineffective. This might require a review of our military commitments in the light of the latest developments.

(e) It should be borne in mind that many million dollars would have to be spent before there could be any assurance that the CF-105 was as good in actual operation as it was on the drafting board.

43. The Cabinet approved the entry into a contract with Avro Aircraft, Ltd., of Toronto for the design development and supply of 11 airframes, and the supply of production tooling, for the supersonic fighter aircraft, CF-105, at an estimated total cost of \$40 million. A Treasury Board minute to be issued accordingly.

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Letter from Donald Quarles, Secretary of the United States Air Force, to Ralph Campney, Minister of National Defence re. recommendation for Arrow programme. Both the United States Air Force and the Royal Air Force consistently expressed admiration for the Arrow, but no other country was seriously interested in purchasing it.¹⁹

APPENDIX "C"

S E C R E T

DEPARTMENT OF THE AIR FORCE

Washington

Office of the Secretary

Nov. 9., 1955.

Dear Mr. Campney:

At the request of Air Marshal Slemon and Dr. Solandt, representatives of the U.S. Air Force at Toronto on October 31 and November 1, evaluated the CF-105 all weather interceptor, including its PS-13 engine.

The terms of reference of the evaluation were:

"Should the RCAF proceed with development and production of the CF-105 in the face of a firm U.S. Air Force programme for development and production of the F-102B medium range interceptor; the F-101B long range interceptor; and the LRIXI, which is being developed to replace the F-101B?"

A summary of the evaluation is attached.

It is the recommendation of the U.S. Air Force that development and production of the CF-105 proceed as now planned.

Sincerely yours,

Sgd. Donald A. Quarles

1 Encl.
USAF Evaluation of the CF-105 Acft
and PS-13 Engine

The Honourable Ralph Campney
Minister of National Defence
Ottawa, Ontario
Canada

DS 55-5223-3

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Front page of October 5, 1957 Globe and Mail newspaper announcing the launch of the world's first satellite by Russia. [20](#)



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Address by the Hon. George R. Pearkes, V.C.,

Minister of National Defence

Avro Arrow Roll Out Ceremony

Avro Aircraft Ltd. Malton, Ont.

October 4, 1957

Fifty years ago a great Canadian pioneer, John McCurdy, flew the Silver Dart, the first aircraft in Canada, in fact it was the first heavier-than-air plane to fly in the British Commonwealth. History recognizes that event as the beginning of Canada's air age. This event today marks another milestone--the production of the first Canadian supersonic aeroplane. I am sure that the historian of tomorrow will regard

this event as being equally as significant in the annals of Canadian aviation.

The supersonic era of flight is just beginning. Many of today's aircraft are regularly breaking the sound barrier, but this is done at the extreme peak of their performance. Supersonic flight is still not a routine matter. Present aircraft travel at these exceptionally fast speeds for a relatively short period of time. The Avro Arrow, however, has been designed from the outset to operate supersonically throughout as much of its mission as is deemed necessary. It will be

The Avro Arrow

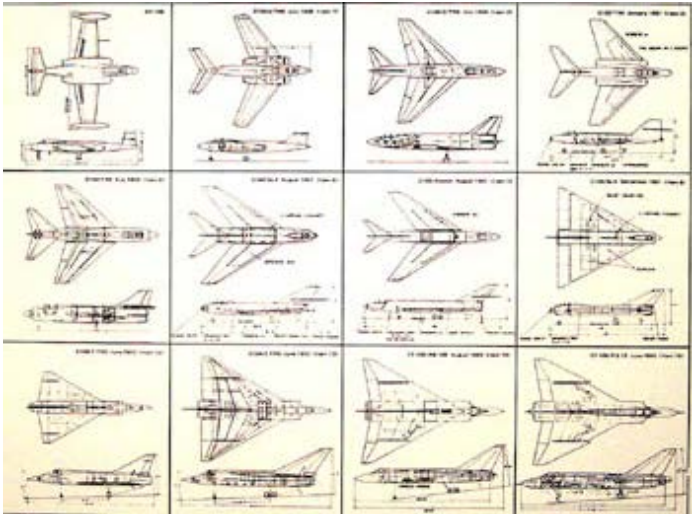
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The evolutionary design process which led to the Avro CF-105 Arrow. [22](#)



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Four key players in the Arrow story in front of a CF-100. From left to right: Crawford Gordon, President and General Manager of A.V. Roe Canada Limited; C.D. Howe, Minister of Defence Production; Air Marshal Wilf Curtis, Chief of Air Staff, Royal Canadian Air Force; and Sir Roy Dobson, Chairman of the Board of A.V. Roe Canada Limited. [23](#)



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The Arrow's creators. From left to right: Bob Lindley, Chief Engineer; Jim Floyd, Vice President, Engineering; Guest Hake, Arrow Project Designer; and Jim Chamberlin, Chief Aerodynamist. [24](#)



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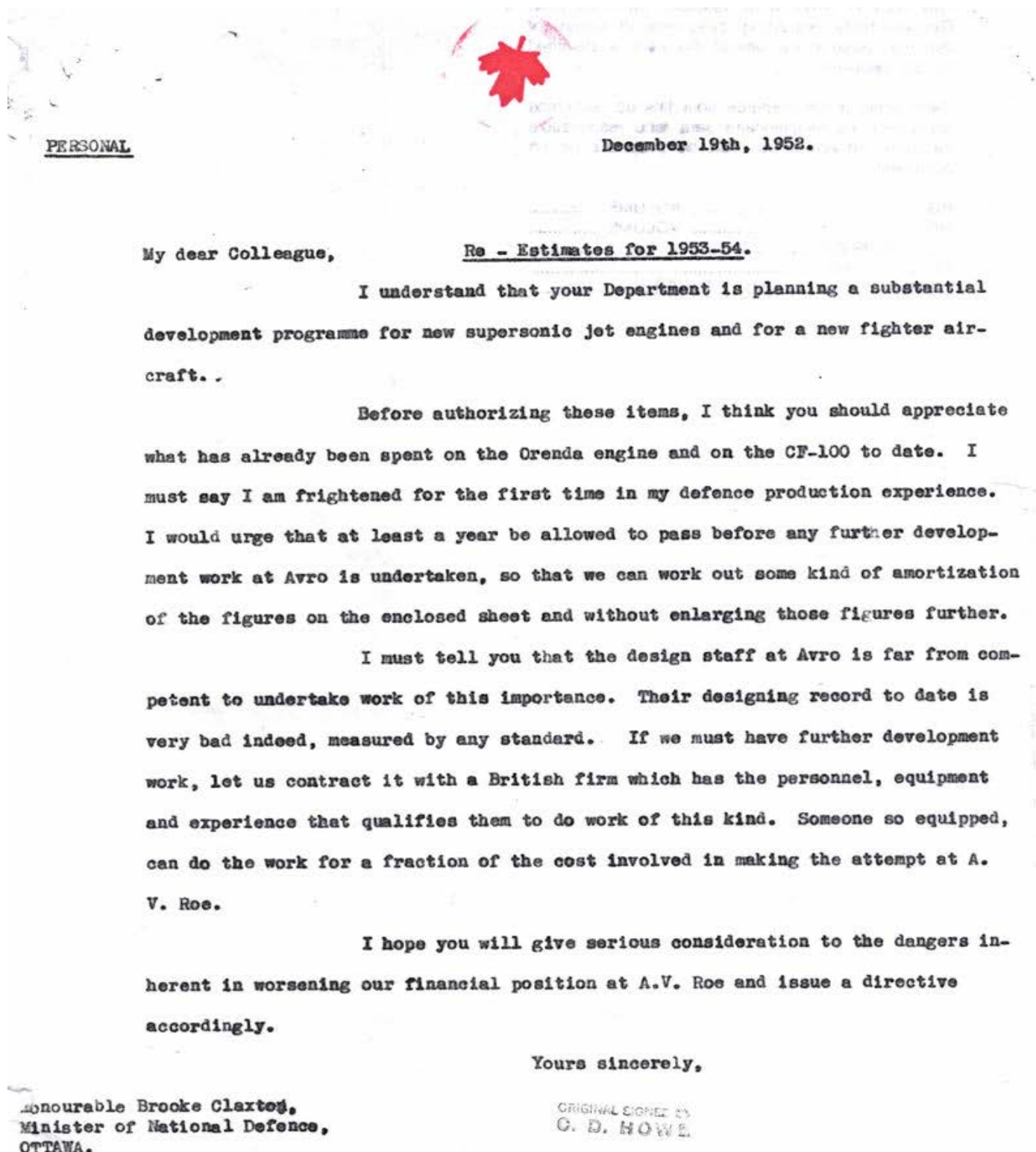
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Letter from C.D. Howe, Minister of Defence Production, to Brooke Claxton, Minister of National Defence re. apprehension over Arrow programme. ²⁵





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Not all test flights proceeded without incident. Both Arrow 201 and 202 suffered minor damage when they crashed on landing due to collapse of the landing gear.²⁶



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Not all test flights proceeded without incident. Both Arrow 201 and 202 suffered minor damage when they crashed on landing due to collapse of the landing gear. [27](#)



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Arrow 203 with drag chute deployed. The drag chute brought the aircraft to a quick stop upon landing. [28](#)



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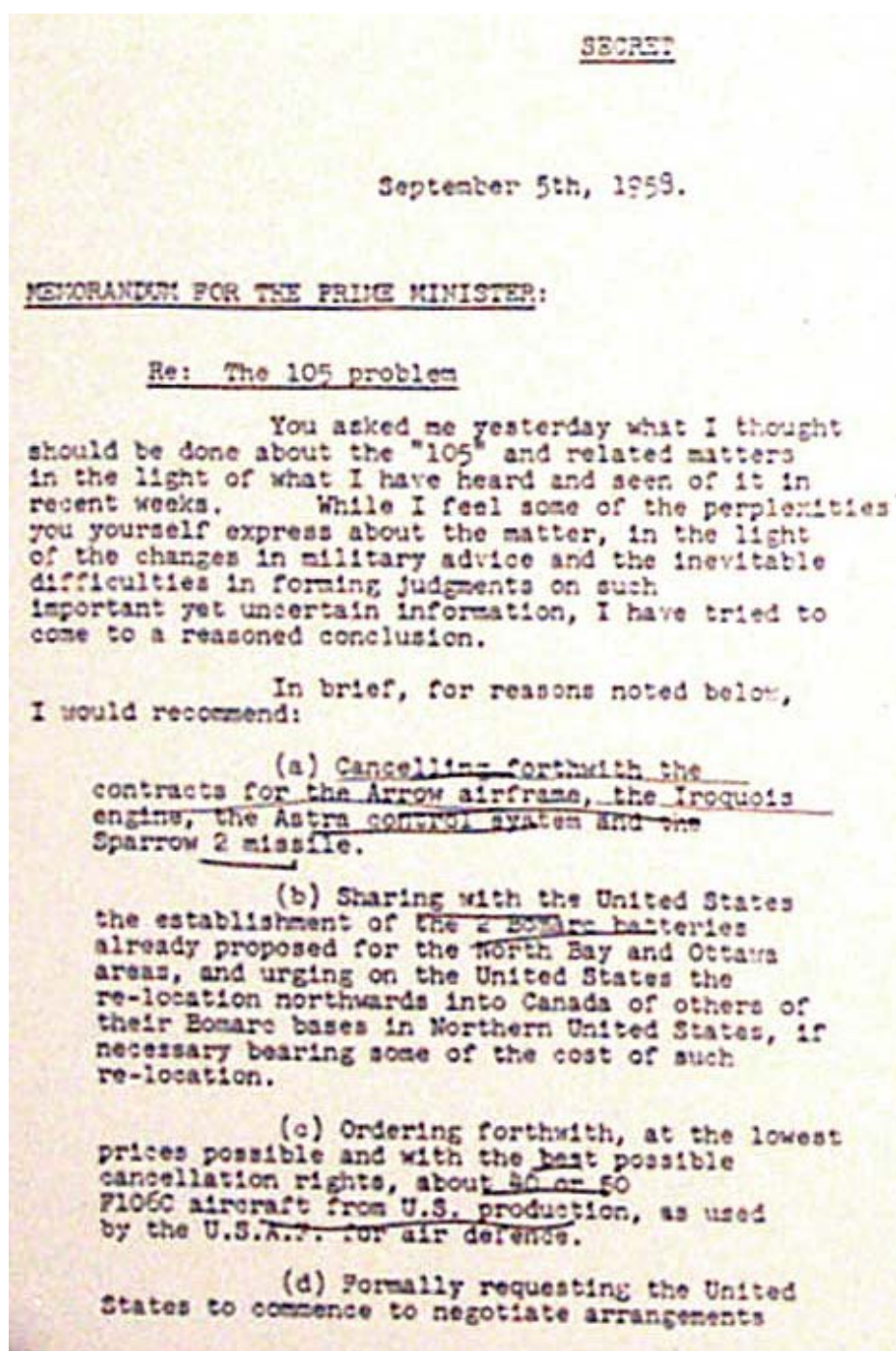
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Memorandum from R.B. Bryce, Clerk of the Privy Council, to Prime Minister John Diefenbaker re: recommendations for Arrow programme. The notations are Diefenbaker's.²⁹



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The only four experimental test pilots to fly the Arrow. From left to right: Spud Potocki, Peter Cope, Royal Canadian Air Force Flight Lieutenant Jack Woodman, and Jan Zurakowski. [30](#)



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Arrow 201 was one of five Arrow prototypes built and flown. [31](#)



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Flight line showing Arrow 201, 202 and 204. [32](#)



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Arrow 203 shown in day-glow marking. Day-glow patches were applied to make the aircraft more visible to observers during flight or in case it went down in the snow.
Note the Red Ensign on the tail: Arrow 203 was the only aircraft to have this national marking applied. [33](#)



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Avro Experimental Test Pilot W.O. (Spud) Potocki climbing into the cockpit of Arrow 204.^{[34](#)}



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The classic Arrow photograph - Arrow 205 during its first and only flight. [35](#)



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October 4, 1957. At a roll-out ceremony at the Avro plant, the first Arrow, 201, is unveiled.[36](#)



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October 4, 1957. At a roll-out ceremony at the Avro plant, the first Arrow, 201, is unveiled.[37](#)



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October 4, 1957. At a roll-out ceremony at the Avro plant, the first Arrow, 201, is unveiled. [38](#)



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Major-General George Pearkes, V.C., Minister of National Defence, addressing the crowd at the roll-out ceremony. Immediately to his left, in sunglasses, is Fred Smye, President and General Manager, Avro Aircraft Limited; immediately to his right, in hat and sunglasses, is Crawford Gordon, President and General Manager of A.V.

Roe Canada Limited. [39](#)



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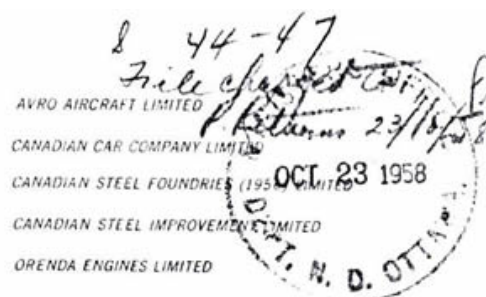
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Letter of congratulations from Prime Minister Diefenbaker to Fred Smye, President
of Avro Aircraft Limited.⁴⁰



October 21, 1958

The Hon. George R. Pearkes, V.C.,
Minister,
Department of National Defence,
Ottawa, Ontario.

Dear Mr. Pearkes:

The purpose of this letter is to confirm
some of the remarks I made during our meeting in your
office on Thursday, October 16th, to the following effect:-

That, on the basis of installing the
Hughes MAL fire control system, and the adoption of the
Falcon and/or Genie missiles, and as the result of other
substantial economies and savings proposed by the Company,
it is now estimated that we can produce and deliver 100
operational Arrow aircraft, complete in all respects
including the Iroquois engine and the MAL fire control
system, for approximately \$3,500,000. each. This excludes
the development and tooling costs, which it is assumed
would continue in accordance with existing contracts, and
the small amount of GFE presently proposed. However, the
originally estimated cost of development, that is, on the
basis of the 37 aircraft programme, would also be substan-
tially reduced, inasmuch as the last 17 of these aeroplanes
have been calculated as part of the aforementioned 100
operational aircraft.

In order to substantiate the validity of
this estimate, and on the basis that it would make a sub-
stantial contribution to the Government's deliberations
concerning the Arrow programme, it was stated that the
Company would be prepared to enter into a fixed-price type
of contract on the basis of \$3,750,000. for a complete,
operational aircraft, including the Iroquois engine and the
MAL fire control system, excluding only GFE.

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Jan Zurakowski, Avro's Chief Experimental Test Pilot, climbing into the cockpit of Arrow 201.^{[41](#)}



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March 25, 1958. Arrow 201 takes off for the first time.^{[42](#)}





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Arrow 201 during its maiden flight. [43](#)





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Arrow 201 over the Avro plant, Malton, Ontario. [44](#)



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Arrow 201 comes in for a landing.[45](#)



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Avro personnel celebrate with Jan Zurakowski after Arrow 201's successfuland historic first flight. [46](#)



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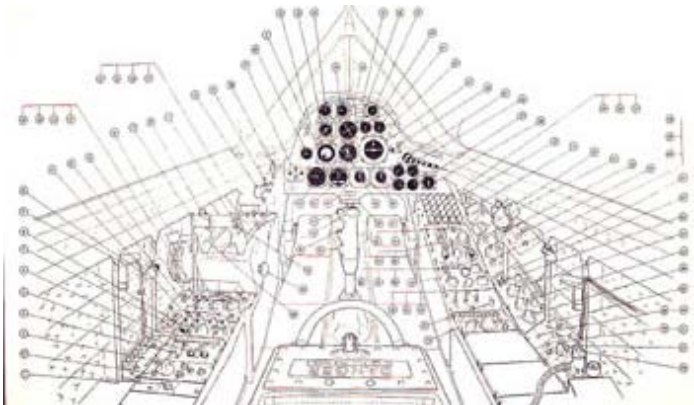
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Avro CF-105 Arrow's pilot's cockpit.[47](#)



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Cockpit Layout.[48](#)

| COCKPIT LAYOUT | |
|----------------|---|
| 1 | U/C UP MODE - DAMPER TEST Switch |
| 2 | IFF Control Panel |
| 3 | DAMPING SYSTEM Circuit Breaker Panel |
| 4 | DAMPER, POWER ON-OFF Switch |
| 5 | DAMPER, EMERGENCY Push Button Switch |
| 6 | DAMPER, ENGAGE Push Button Switch |
| 7 | Control Surface Response Indicator |
| 8 | COMM. Radio Control Panel - ARG-34 |
| 9 | High Altitude Flood Light |
| 10 | Console Flood Light |
| 11 | RUDDER TRIM, LEFT-RIGHT Switch |
| 12 | FIRE Extinguisher SECOND SHOT Switch |
| 13 | FIRE-Combined Warn., Lights and Selector Switches, LH, HYD, RH |
| 14 | NAV BAIL OUT Warning Switch |
| 15 | I. P. FUEL COCKS Switches and Guards |
| 16 | CROSSFEED, LH ONLY - NORMAL - RH ONLY Switch |
| 17 | ENGINE FUEL, EMERG-RESET Switches and Guards |
| 18 | Parachute Brake, STREAM - JETTISON Selector Lever |
| 19 | Throttle Levers, LH and RH |
| 20 | Console Flood Light |
| 21 | SPEED BRAKE, IN-OUT Switch |
| 22 | ANTI-SKID, NORM-EMERG-OFF Switch |
| 23 | LIGHTS LAND-TAXI-OFF Switch |
| 24 | CANOPY CLOSE-OFF-OPEN Switch |
| 25 | ELEV TRIM DISENGAGE Switch |
| 26 | Landing Gear Control Lever, UP-DN |
| 27 | Landing Gear EMERGENCY EXTENSION Locking Latch Push-Button |
| 28 | Parking Brake Handle |
| 29 | LANDING GEAR POSITION Indicator |
| 30 | SKIN TEMP Indicator |
| 31 | Mach/Airspeed Indicator |
| 32 | CHECK LIST, LANDING |
| 33 | Accelerometer |
| 34 | Sideslip Indicator |
| 35 | Angle of Attack Indicator |
| 36 | NAV BAIL OUT Indicator |
| 37 | Red Master Warning Light |
| 38 | Amber Master Warning Light |
| 39 | Standby Magnetic Compass |
| 40 | RADIO MAGNETIC INDICATOR |
| 41 | FUEL QUANTITY Gauges |
| 42 | CHECK LIST TAKE OFF |
| 43 | Artificial Horizon Indicator |
| 44 | GYRO ERECT Push Button |
| 45 | EMERGENCY CANOPY OPENING Lever |
| 46 | Engine PRESSURE RATIO Gauges LH and RH |
| 47 | EXH TEMP Gauges LH and RH |
| 48 | CABIN PRESSURE ALTITUDE Gauge |
| 49 | PRESS TO RESET Push Button |
| 50 | DAY - NIGHT Switch |
| 51 | PRESS TO TEST Switch |
| 52 | ENG BLEED Air Conditioning Warning Lights |
| 53 | ENG BLEED AIR LH OFF-NORMAL - RH OFF Switch |
| 54 | Map Light |
| 55 | OXYGEN Quantity Gauge |
| 56 | Console Flood Lights (2) |
| 57 | RAM AIR TURBINE Switch |
| 58 | NAV LIGHTS, FLASH-OFF-STEADY Switch |
| 59 | ALTERNATORS RESET ON-OFF LH and RH Switches |
| 60 | DC RESET Push Button |
| 61 | Console Light |
| 62 | COCKPIT LIGHTING Panel |
| 63 | HIGH ALT LIGHTING ON-OFF Switch |
| 64 | MAIN PANEL OFF-BRIGHT Selector |
| 65 | CONSOLE PANELS OFF-BRIGHT Selector |
| 66 | CONSOLE FLOOD OFF-BRIGHT Selector |
| 67 | AIR COND Panel |
| 68 | RAIN REPELLENT ON-OFF Switch (TEMP CONTROL/EMERG OFF, First aircraft) |
| 69 | CABIN PRESS DUMP Switch |
| 70 | AIR SUPPLY NORM-OFF EMERG Switch |
| 71 | DEFOG ON-OFF Switch |
| 72 | TEMP COOL-WARM Selector |
| 73 | Anti-g Valve Manual Override Button |
| 74 | INTER Control Panel |
| 75 | UHF/IFF EMERG, PRESS TO TEST Button |
| 76 | J4 COMP, AEROBATICS - NORMAL Switch |
| 77 | UHF ANT, UPPER-LOWER Switch |
| 78 | RMI NEEDLE, TACAN-UHF HOMER Switch |
| 79 | RADIO COMPASS Panel |
| 80 | J4 COMP - LAT Correction Controller |
| 81 | J4 COMP - MAG/DG Selector Switch |
| 82 | J4 COMP - DECR/INCR/SET Switch |
| 83 | J4 COMP - Hemisphere Selector Switch |
| 84 | J4 COMP - Synchronizing Indicator (Annunciator) |
| 85 | ENGINE START, START-OFF-RESET, LH and RH Switches |
| 86 | MASTER ELEG ON-OFF Switch |
| 87 | Warning Lights Panel |
| 88 | Rudder PEDAL ADJUST Handle |
| 89 | RPM Indicators |
| 90 | Altimeter |
| 91 | Rudder Pedal Adjustment Label |
| 92 | Turn and Slip Indicator |
| 93 | Rate of Climb Indicator |
| 94 | Automatic Mode Disengage Switch |
| 95 | Elevator and Aileron Trim Button |
| 96 | Emergency Damping Engage Switch |
| 97 | Noise Wheel Steering Selector |
| 98 | Press-to-transmit Push Button |
| 99 | Throttles Friction Damper |
| 100 | Engine Relight Switch, LH and RH |



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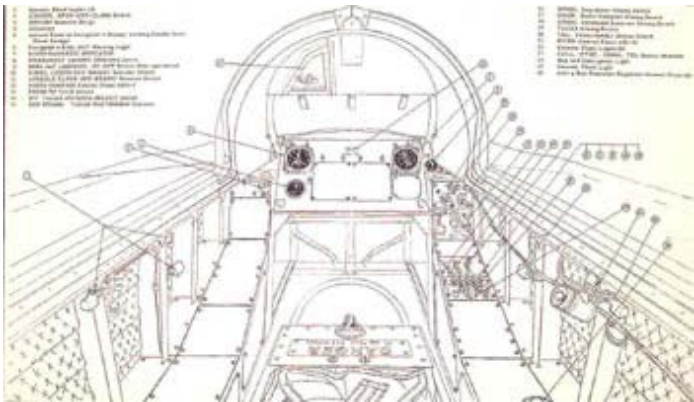
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Avro CF-105 Arrow navigator's cockpit. [49](#)



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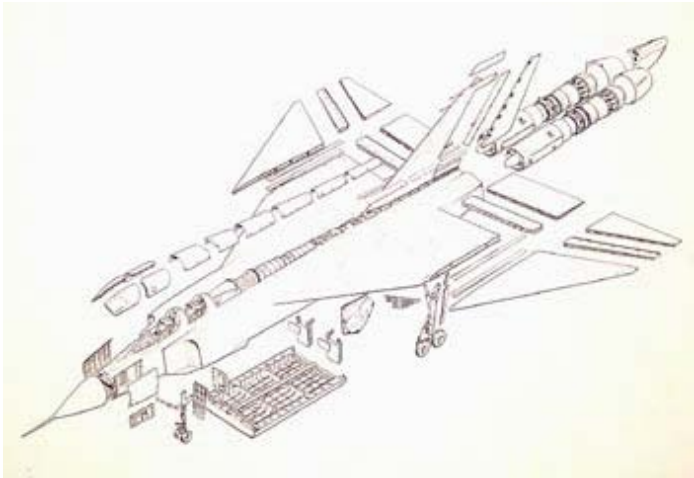
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Exploded view showing the major components of the Avro CF-105 Arrow.[50](#)



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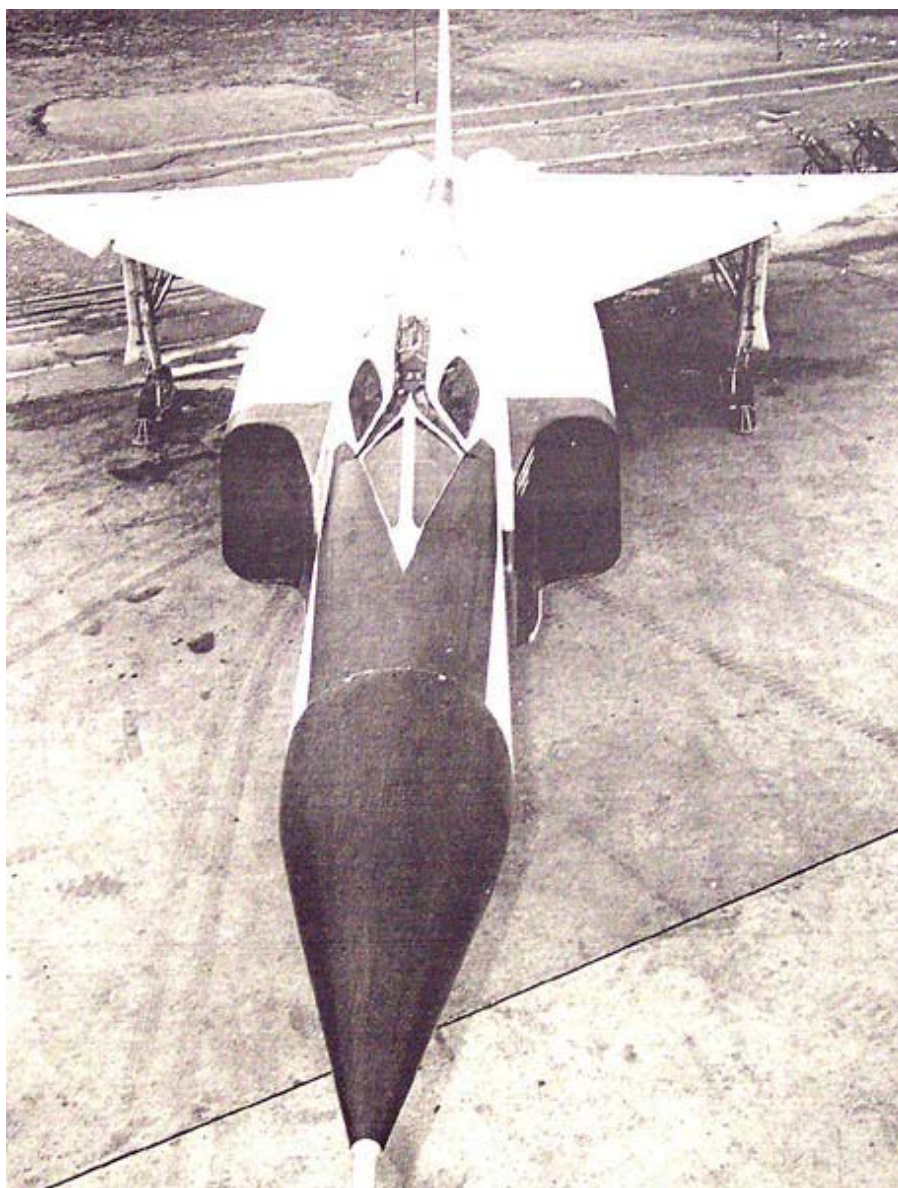
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An Arrow from above, showing the unique clamshell cockpit canopy. [51](#)



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An Arrow from below, showing the landing gear design and the outline of the detachable weapons pack. [52](#)



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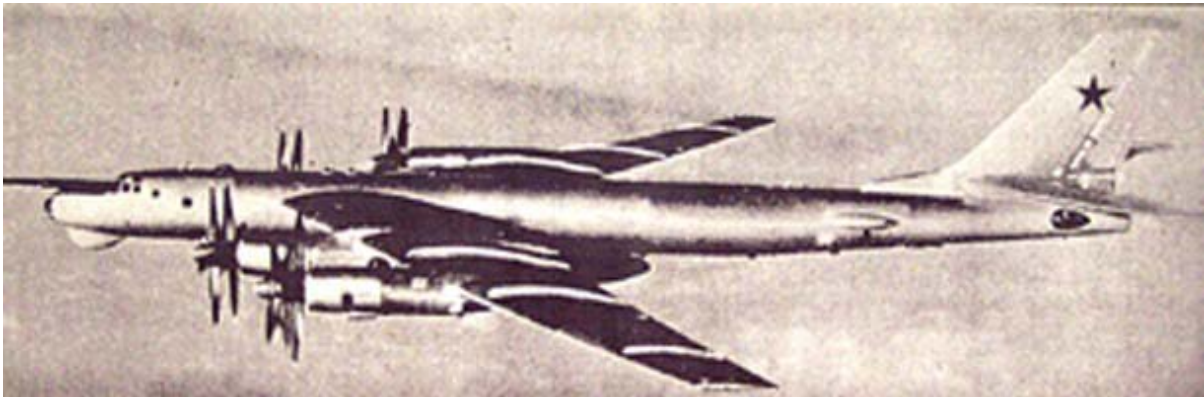
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The enemy - a Soviet Tupelov Tu-20 bomber, codenamed Bear. The Arrow's mission was to intercept and shoot down Soviet intercontinental nuclear bombers crossing the pole on their way to targets in Canada and the United States. [53](#)





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Avro CF-105 Arrow Technical Data (Estimated). [54](#)

| Avro CF-105 Arrow Technical Data (Estimated) | | |
|--|---------------------------|--|
| | Arrow I (Prototype) | Arrow II (Production) |
| Length | 80ft 10in | 85ft 6in |
| Wing Span | 50ft | 50ft |
| Empty Weight | 49 040lb | 45 000lb |
| Normal Gross Weight | 57 000lb | 62 431lb |
| Max. Gross Weight | 68 602lb | 68 847lb |
| Fuel Capacity | 2897 gallons | 3297 gallons |
| Engines | Pratt-Whitney J-75 P-5 | Orenda PS-13 Iroquois 2 |
| - base thrust | 12 500lb | 19 250lb |
| - thrust with afterburner | 18 500lb | 26 000lb |
| Max. Speed at 40 000ft | Mach 2.0 | Mach 2.0 |
| Combat Speed | Mach 1.5 | Mach 1.5 |
| Cruise Speed | Mach 0.92 | Mach 0.92 |
| Climb Rate | | |
| - from sea level | 38 450ft/min | 44 500ft/min |
| - from 40 000ft | 16 500ft/min | 20 300ft/min |
| Combat Ceiling | 53 000ft | 58 500ft |
| Combat Radius | | |
| - mission dependent, without drop tank | n/a | 200-650nm |
| - ferry mission | n/a | 1500nm |
| Armament | n/a | 4 Sparrow II radar-guided air-to-air missiles with nuclear or conventional warheads; Astra I radar fire-control system |

Courtesy Ron Page/The Boston Mills Press



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The Arrow's nuclear-tipped or conventional high-explosive air-to-air missiles would have been carried internally in an innovative detachable weapons pack. No gun was carried. [55](#)



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The Avro Arrow

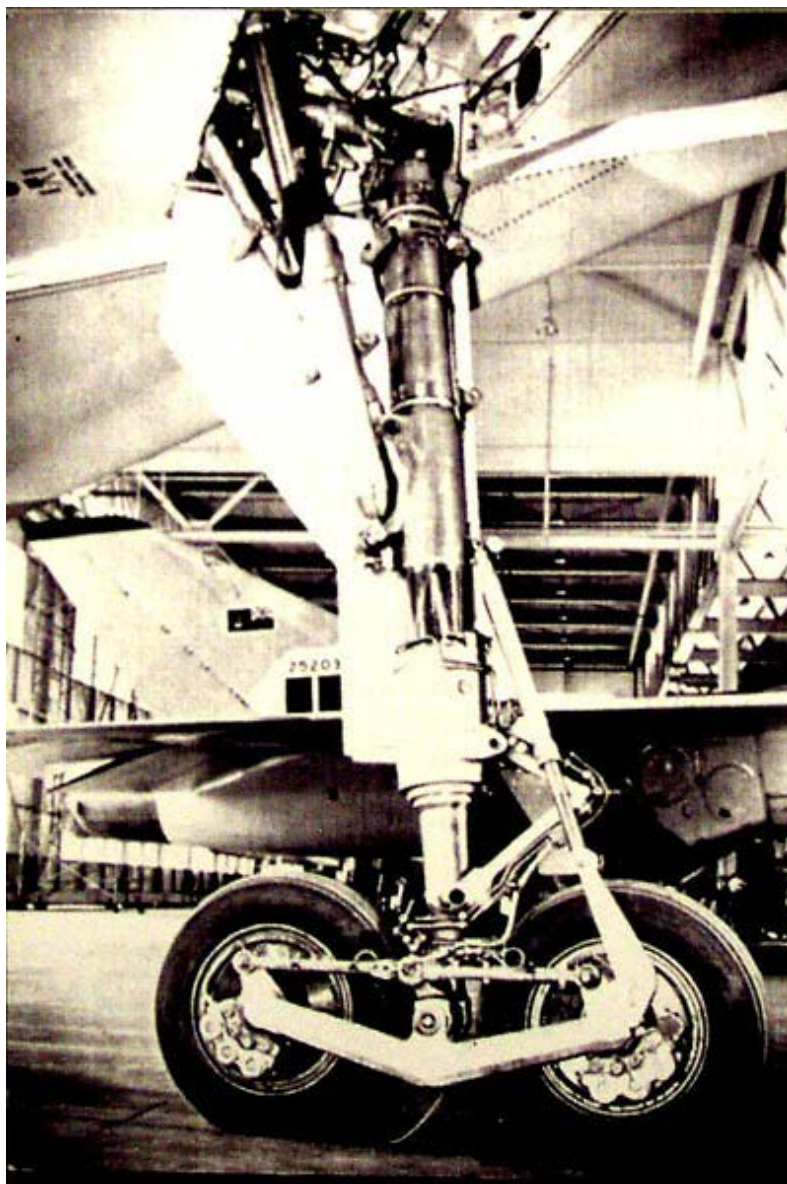
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A close up view of the complex main landing gear. [56](#)



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Arrow 201 and a CF-100 positioned for a test run of their engines. Because the Iroquois jet engine was not yet available, the first five Arrows were equipped with Pratt and Whitney J-75 jet engines.[57](#)



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The Avro Arrow

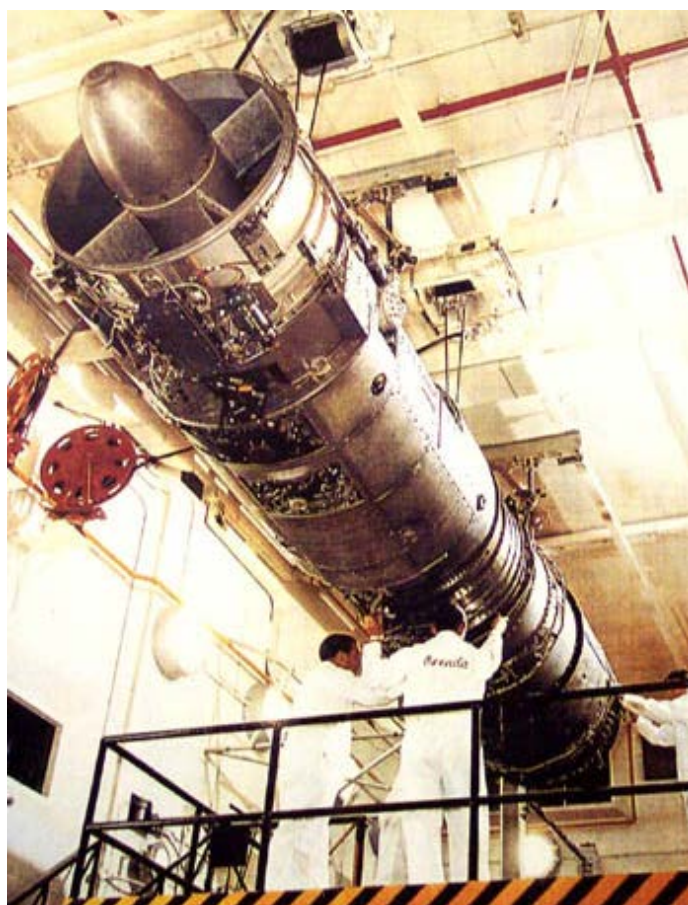
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Another subsidiary of A.V. Roe Canada Limited, Orenda Engines Limited designed the Iroquois jet engine as the intended powerplant for all production Arrows. The Iroquois remains one of the most advanced jet engines ever developed. [58](#)



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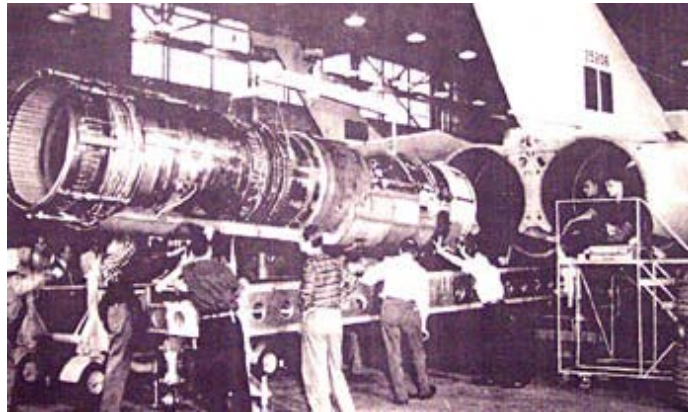
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An Iroquois jet engine being readied for installation in the engine cavity of Arrow 206. Arrow 206 was to have been the first Arrow to have flown with these engines installed. [59](#)



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The Iroquois jet engine was tested on a rear engine nacelle mounted on a B-47 bomber on loan from the United States Air Force Strategic Air Command. [60](#)



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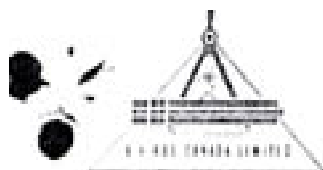
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Avro Aircraft Limited advertisement from 1959, just prior to cancellation of the Arrow programme.[61](#)



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A.V. ROE CANADA LIMITED

170 UNIVERSITY AVE. TORONTO, ONTARIO

AVRO AIRCRAFT LIMITED

CANADIAN CAR COMPANY LIMITED

CANADIAN STEEL FOUNDRY LIMITED

CANADIAN STEEL IMPROVEMENT LIMITED

ORENDA ENGINES LIMITED

OCT 23 1958

O. N. D. OTTAWA

October 21, 1958

The Hon. George R. Pearkes, V.C.,
Minister,
Department of National Defence,
Ottawa, Ontario.

Dear Mr. Pearkes:

The purpose of this letter is to confirm some of the remarks I made during our meeting in your office on Thursday, October 16th, to the following effect:-

That, on the basis of installing the Hughes MAL fire control system, and the adoption of the Falcon and/or Genie missiles, and as the result of other substantial economies and savings proposed by the Company, it is now estimated that we can produce and deliver 100 operational Arrow aircraft, complete in all respects including the Iroquois engine and the MAL fire control system, for approximately \$3,500,000. each. This excludes the development and tooling costs, which it is assumed would continue in accordance with existing contracts, and the small amount of GPE presently proposed. However, the originally estimated cost of development, that is, on the basis of the 37 aircraft programme, would also be substantially reduced, inasmuch as the last 17 of these aeroplanes have been calculated as part of the aforementioned 100 operational aircraft.

In order to substantiate the validity of this estimate, and on the basis that it would make a substantial contribution to the Government's deliberations concerning the Arrow programme, it was stated that the Company would be prepared to enter into a fixed-price type of contract on the basis of \$3,750,000. for a complete, operational aircraft, including the Iroquois engine and the MAL fire control system, excluding only GPE.

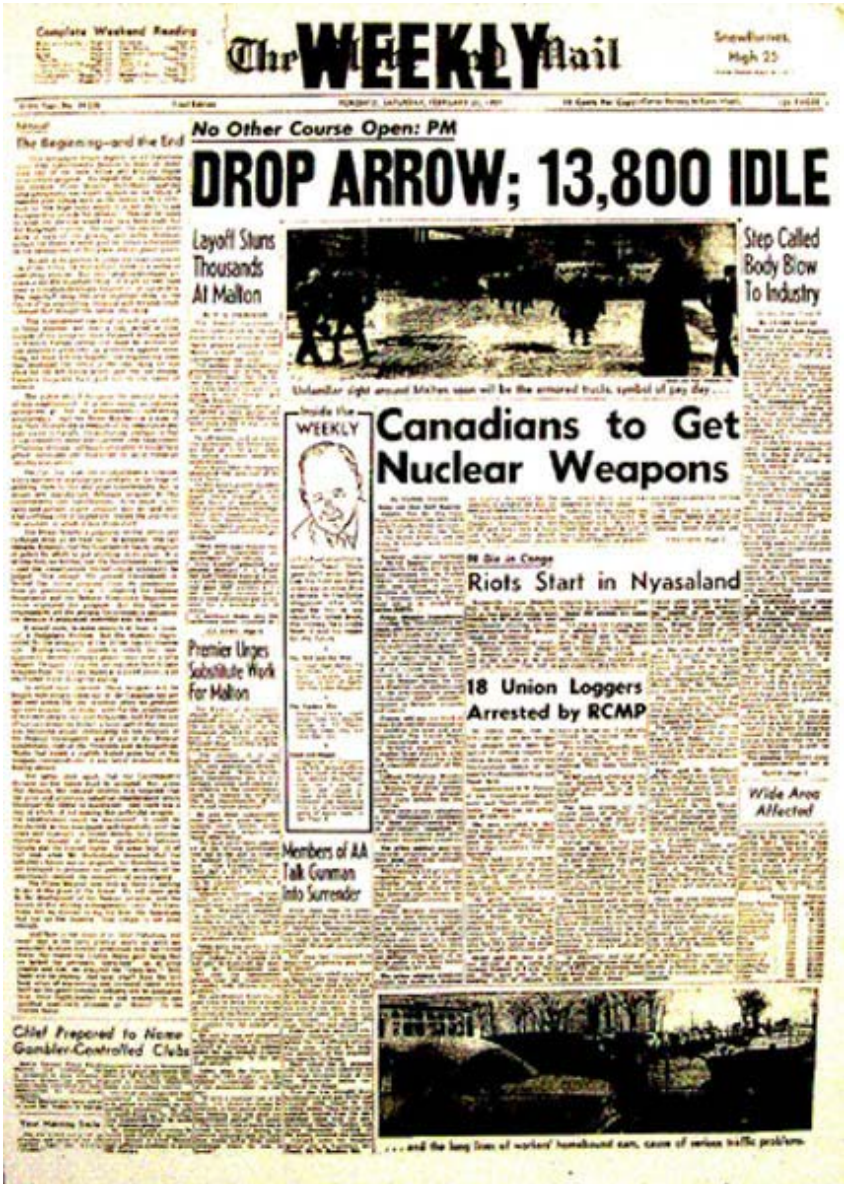
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Front page of February 21, 1959 Globe and Mail Weekly newspaper announcing cancellation of the Avro Arrow programme.⁶³



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Progressive Conservative Prime Minister John Diefenbaker with his Minister of National Defence, Major-General George Pearkes, V.C. First elected in 1957, the Diefenbaker government deferred making any decision to cancel the Arrow programme until 1959. [64](#)



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HOUSE OF COMMONS

Friday, February 20, 1959

The house met at 11 a.m.

NATIONAL DEFENCE

ANNOUNCEMENT OF GOVERNMENT POLICY ON AIR DEFENCE

Right Hon. J. G. Diefenbaker (Prime Minister): Mr. Speaker, with the leave of the house I should like to make a somewhat lengthy statement on the subject of one facet of the national defence of Canada because, after all, the effectiveness or otherwise of the measures taken for national defence until international peace under law is obtained constitutes the passport either to survival or destruction. The announcement I wish to make has to do with the decision regarding our air defence which was foreshadowed in the statement made by me to the press on September 23 last.

The government has carefully examined and re-examined the probable need for the Arrow aircraft and Iroquois engine known as the CF-105, the development of which

aircraft would be needed by the R.C.A.F., and their cost was forecast at about \$1,500,000 to \$2 million each.

From the beginning, however, it was recognized by the previous government, and subsequently by this government, that the development of an advanced supersonic aircraft such as the 105 and its complicated engine and weapon system was highly hazardous, and therefore all decisions to proceed with it were tentative and subject to change in the light of experience. This was known to the contractors undertaking the development, to the air force, and to parliament.

The development of the Arrow aircraft and the Iroquois engine has been a success although, for various reasons, it has been much behind the original schedule. The plane and its engine have shown promise of achieving the high standard of technical performance intended, and are a credit to those who conceived and designed them and translated the plans into reality.

Unfortunately these outstanding achievements have been overtaken by events. In recent months it has come to be realized

has been continued pending a final decision. It has made a thorough examination in the light of all the information available concerning the probable nature of the threats to North America in future years, the alternative means of defence against such threats, and the estimated costs thereof. The conclusion arrived at is that the development of the Arrow aircraft and Iroquois engine should be terminated now.

Formal notice of termination is being given now to the contractors. All outstanding commitments will of course be settled equitably.

In reaching this decision the government has taken fully into account the present and prospective international situation, including the strategic consequences of weapon development and the effects of the decision I have just announced upon Canada's ability to meet any emergency that may arise.

Work on the original concept of the CF-105 commenced in the air force in 1952, and the first government decision to proceed with the development and with the production of two prototypes was taken late in 1953. The plane was designed to meet the requirements of the R.C.A.F. for a successor to the CF-100 to be used in the defence of Canada. At that time it was thought some five or six hundred

that the bomber threat against which the CF-105 was intended to provide defence has diminished, and alternative means of meeting the threat have been developed much earlier than was expected.

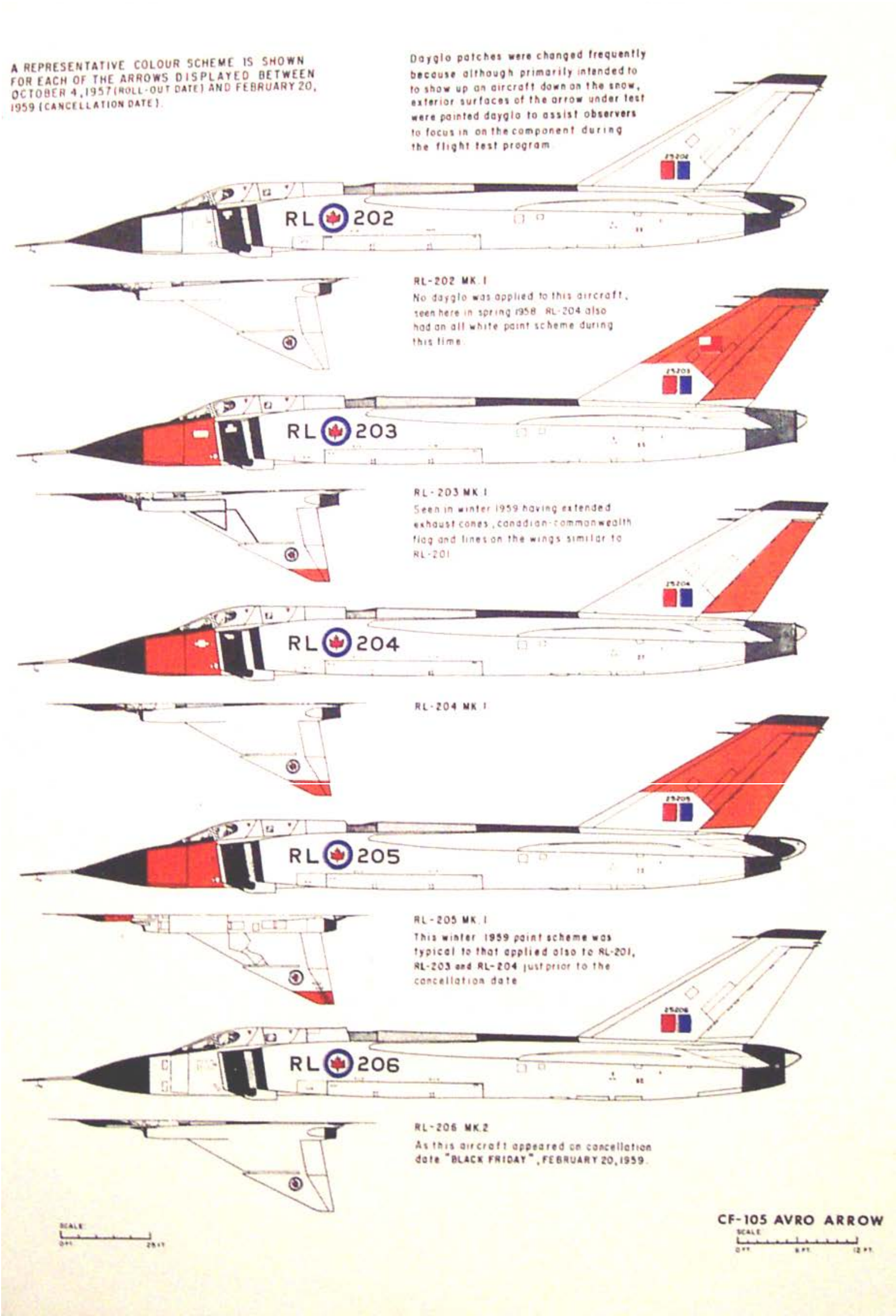
The first modern long range bombers with which Canada might be confronted came into operation over five years ago, but the numbers produced now appear to be much lower than was previously forecast. Thus the threat against which the CF-105 could be effective has not proved to be as serious as was forecast. During 1959 and 1960 a relatively small number of modern bombers constitutes the main airborne threat. It is considered that the defence system of North America is adequate to meet this threat.

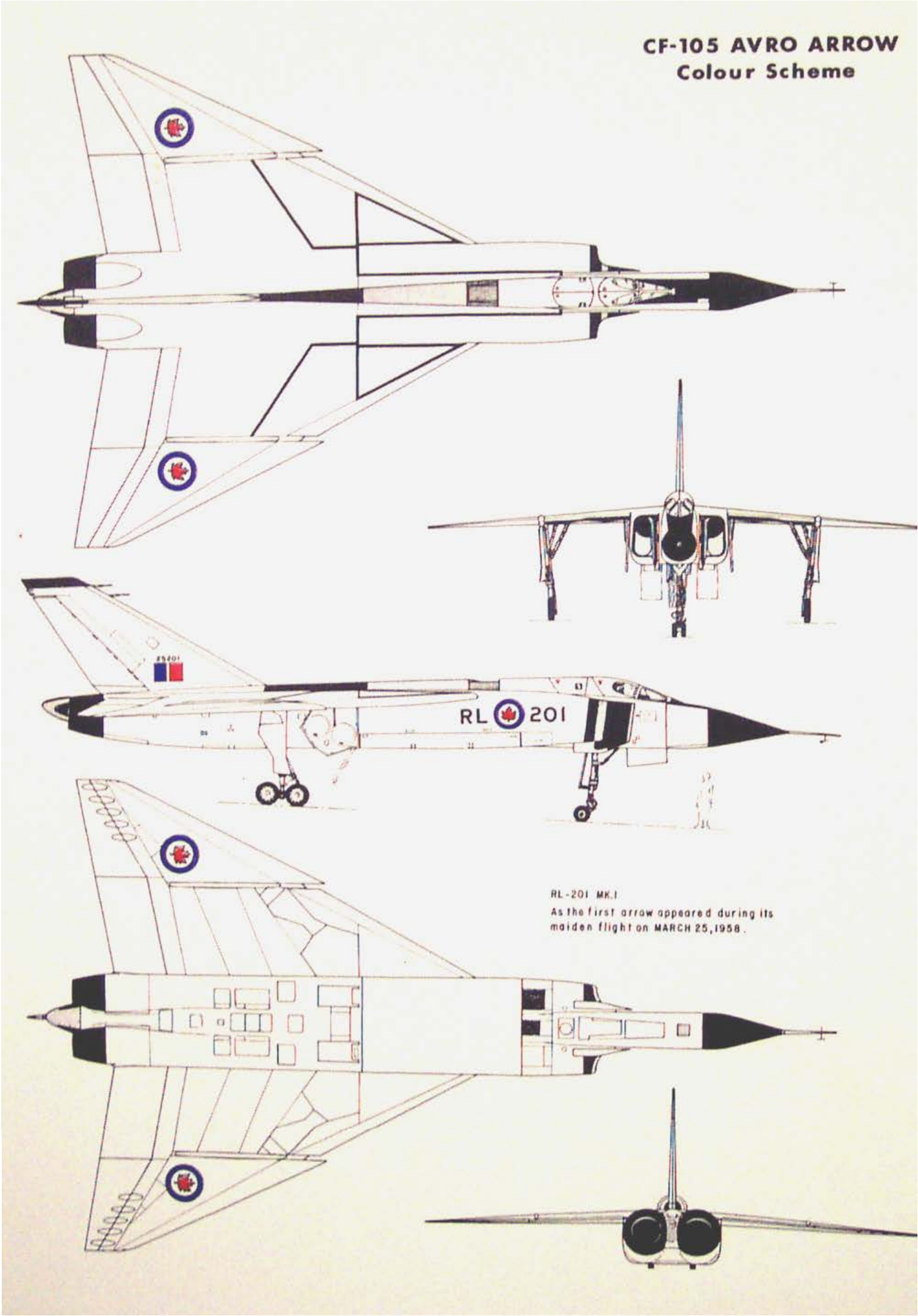
Potential aggressors now seem more likely to put their effort into missile development than into increasing their bomber force. By the middle of 1962 the threat from the inter-continental ballistic missile will undoubtedly be greatly enhanced in numbers, size and accuracy, and the I.C.B.M. threat may be supplemented by submarine-launched missiles. By the middle sixties the missile seems likely to be the major threat and the long range bomber relegated to supplementing the major attack by these missiles. It would

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The Avro CF-105 Arrow, two-seat, twin-engine, all-weather supersonic interceptor. Representative colour schemes are shown for each of the Arrows flown between October 4, 1957 and February 20, 1959.⁶⁶





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Excerpts from the minutes of the February 14, 1959 Cabinet meeting during which the decision was made to cancel the Arrow programme.⁶⁸

Arrow(CF-105) aircraft; report of Cabinet Defence
Committee; decision to terminate development
(Previous reference Feb. 14)

12. The Prime Minister said a draft announcement on the termination of the development contract for the Arrow had been prepared. It included a section on arrangements with the United States for production sharing and a section on the acquisition by Canada of nuclear weapons for defence. He had gone over the draft in great detail but it was not yet in the right form to be made that day.

13. The Minister without Portfolio (Mr. Macdonnell) reported that, the previous day in Toronto, the Premier of Ontario had spoken to him in strong terms about the effects of terminating the Arrow contract upon the municipalities in the vicinity of Malton.

14. The Minister of Finance said Mr. Frost had also spoken to him in pungent language about work on the Arrow being stopped. Mr. Frost had complained about so little notice being given to Avro, and had asked why other contracts could not be given to the company. He had replied that the matter had been exhaustively considered, that all possible alternatives had been reviewed, and that the decision would be taken in the light of the best military advice available. He had also told Mr. Frost that, right from the outset, it had never been said that actual production would proceed and that everyone understood that the matter was to be reviewed year by year.

15. During the discussion the following points emerged:

(a) The sooner the announcement could be made the better, because the decision to terminate was bound to leak out and the longer the announcement was delayed the more would be the cost.

(b) The most appropriate time for the announcement appeared to be the following Friday. This, as proposed, should refer not only to the Arrow termination but also to production sharing and to the acquisition of nuclear weapons. The Prime Minister's statement should be followed by one by the Minister of Defence Production, which would deal in greater detail with production sharing. In considering this question of timing, the possibility of a motion to adjourn the house to discuss a matter of urgent public importance should not be overlooked.

(c) It would be desirable that notes be exchanged with the U.S. to implement

the agreed arrangements on sharing the costs of the new radars, gap fillers, S.A.G.E. and the two Bomarc stations in Ontario and Quebec.

16. The Cabinet, -

- (a) agreed that the development of the Arrow aircraft and Iroquois engine be discontinued, effective as of the time of announcement;
- (b) that an announcement concerning this decision, the production sharing with the United States, and the acquisition of atomic weapons be made in the House of Commons, probably on Friday;
- (c) that the contractors be notified of the termination of their contracts at the same time; and,
- (d) that an agreement be made with the United States, in the form of an exchange of notes, for the implementation of the agreed arrangements on the sharing of the costs of Bomarc and S.A.G.E. installations in Canada and the associated extension of radar coverage.



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Stamp commemorating the fiftieth anniversary of powered flight in Canada, issued shortly after the cancellation of the Arrow programme.[69](#)



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After the cancellation, all existing Arrows were ordered blowtorched and scrapped.[70](#)



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After the cancellation, all existing Arrows were ordered blowtorched and scrapped.

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All that survived the destruction of the Arrow prototypes, on display at the National Aviation Museum, Ottawa - the cockpit and nose section of Arrow 206 and an Iroquois jet engine. [72](#)



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All that survived the destruction of the Arrow prototypes, on display at the National Aviation Museum, Ottawa - the cockpit and nose section of Arrow 206 and an Iroquois jet engine.^{[73](#)}



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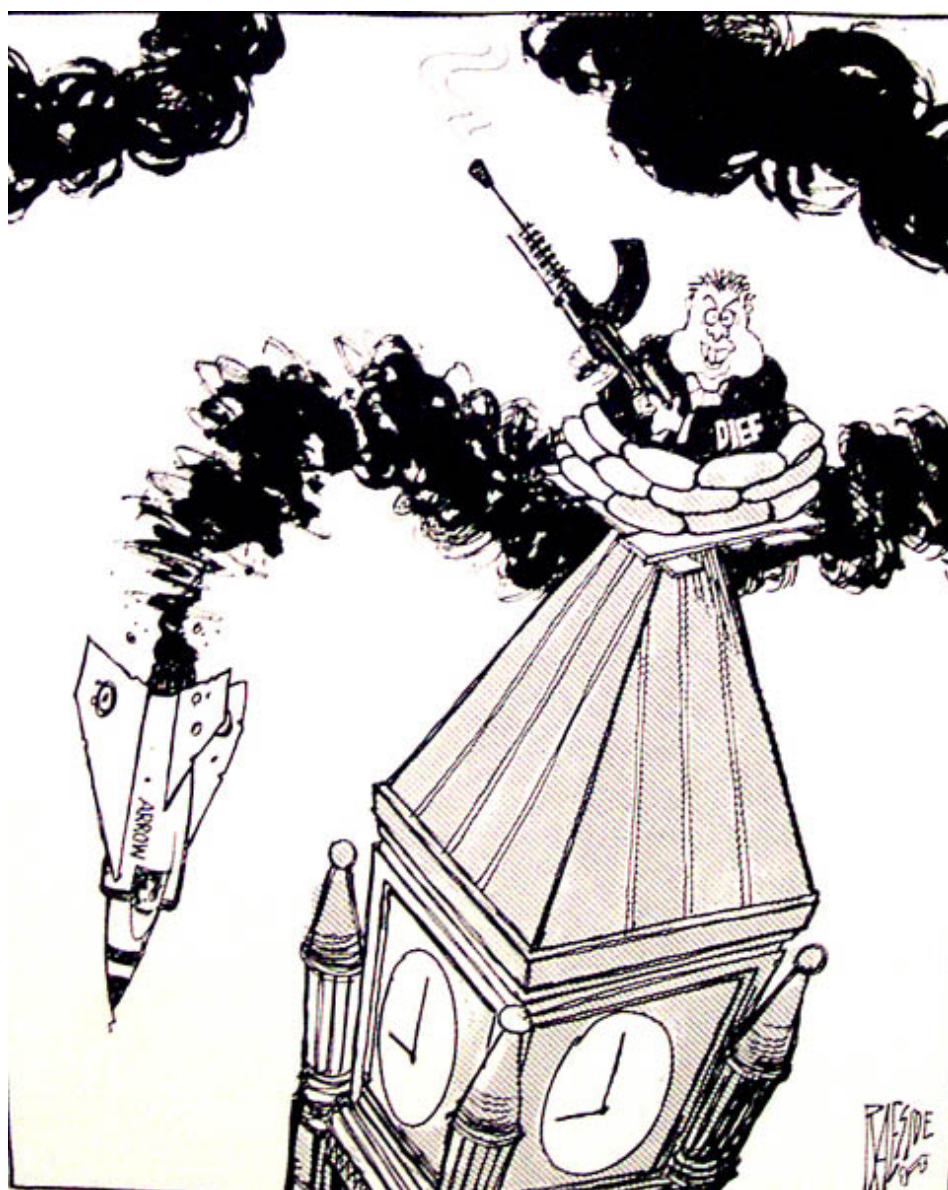
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Cartoon showing Prime Minister John Diefenbaker on top of the Parliament Building clock shooting down the Avro Arrow with a machine gun. [74](#)



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Memoranda from Air Marshal Hugh Campbell, Chief of Air Staff, Royal Canadian Air Force, and Major-General George Pearkes, V.C., Minister of National Defence re. disposal of existing Arrows.⁷⁵

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MEMORANDUM



The Minister (Through Deputy Minister)

Arrow Cancellation - Disposal of Materiel

1 In your approval to my recommendation of 13 March 1959 on courses of action to be taken in respect to disposal of materiel arising out of the cancellation of the Arrow, you desired to be informed before final action was taken on the method of disposal being considered for the disposition of the airframes and the Iroquois engines.

2 Two methods may be followed:


- (a) Declaring as surplus materiel to Crown Assets Disposal agency. This course is not recommended for the reason that this agency has the prerogative of selling this materiel in

its original state. This course could lead to subsequent embarrassment, that is, air-frame and engine could conceivably be placed on public view or even, in fact, used as a roadside stand. This, I am sure, you will agree is most undesirable.

- (b) Relinquishing any DMD interest in the air-frames and engines to DDP for ultimate disposal by that agency. In this case DDP can reduce it to scrap. This course is recommended.

3 I would appreciate being advised whether you concur in the method recommended.

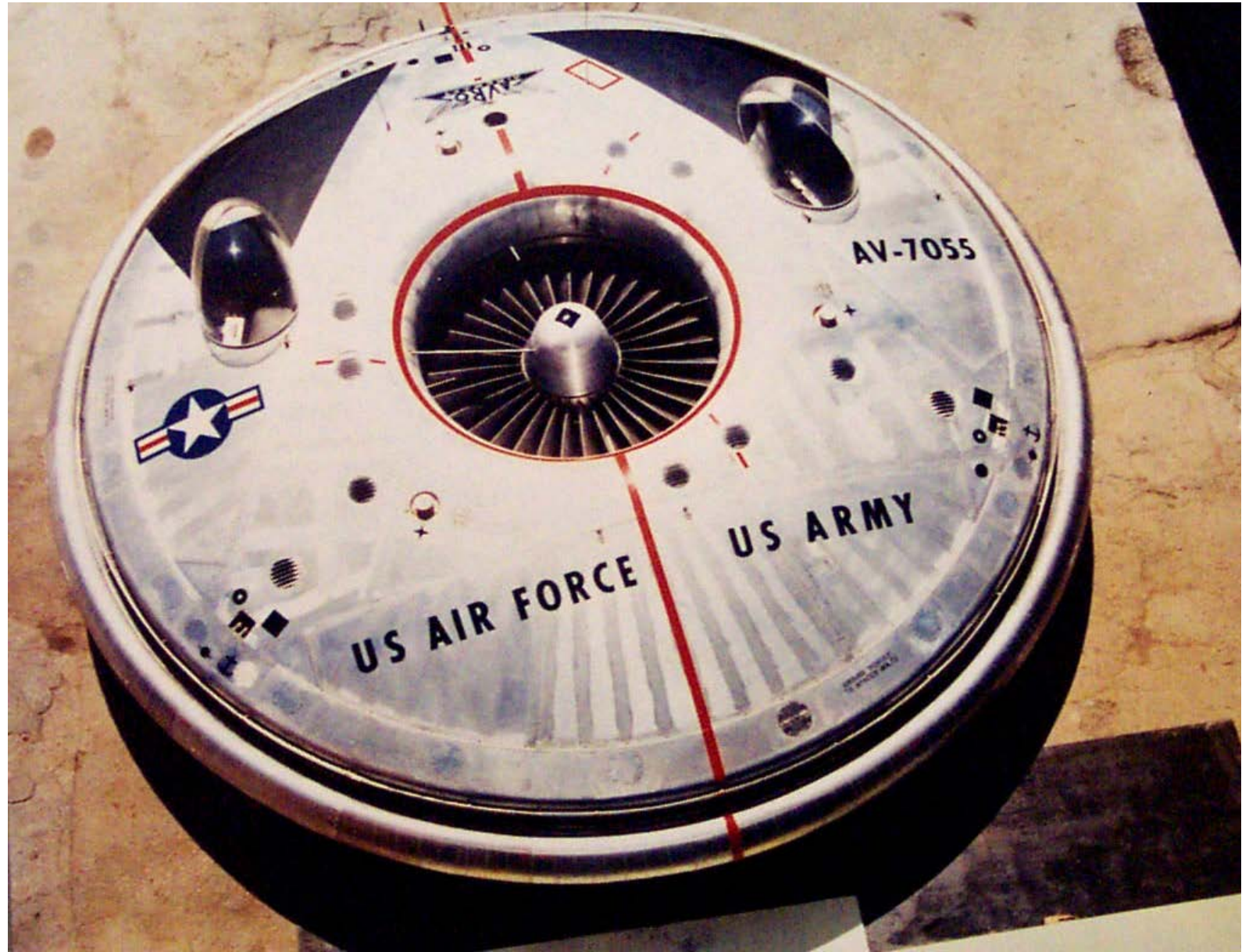
cc: Deputy Minister


(Hugh Campbell)
Air Marshal
Chief of the Air Staff.

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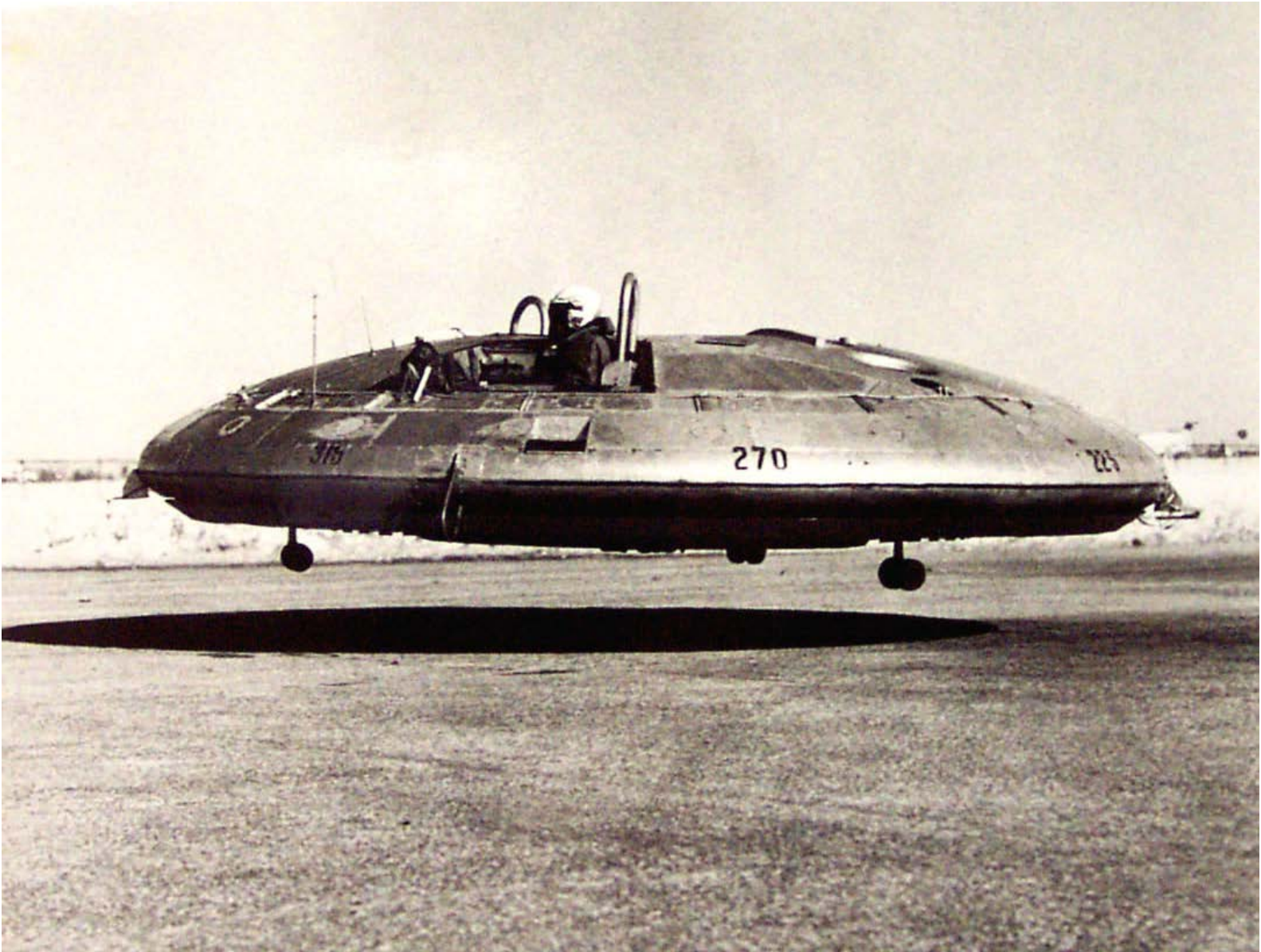
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With the termination of the Arrow programme, Avro was left with few contracts. One was for the Avrocar, a vertical take-off and landing circular-wing air-cushion vehicle. A United States Air force funded project, it too was cancelled in 1961 after ten unsuccessful years of research and development.[77](#)



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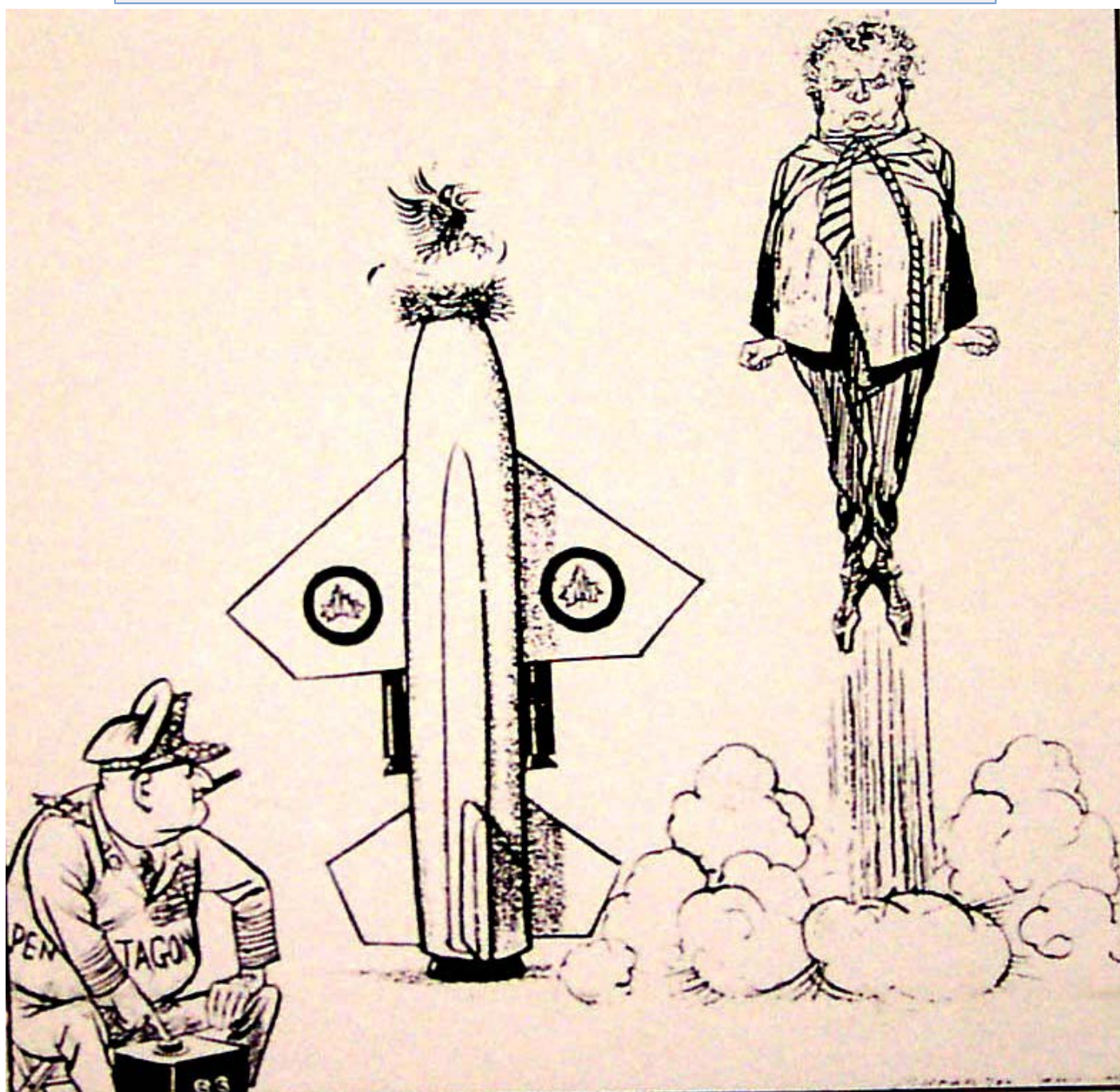
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The Bomarc-B nuclear surface-to-air missile purchased by the Diefenbaker government in 1958 to replace the Arrow. The two squadrons deployed at North Bay, Ontario and La Macaza, Quebec were phased out in 1971.^{[78](#)}





The Avro Arrow



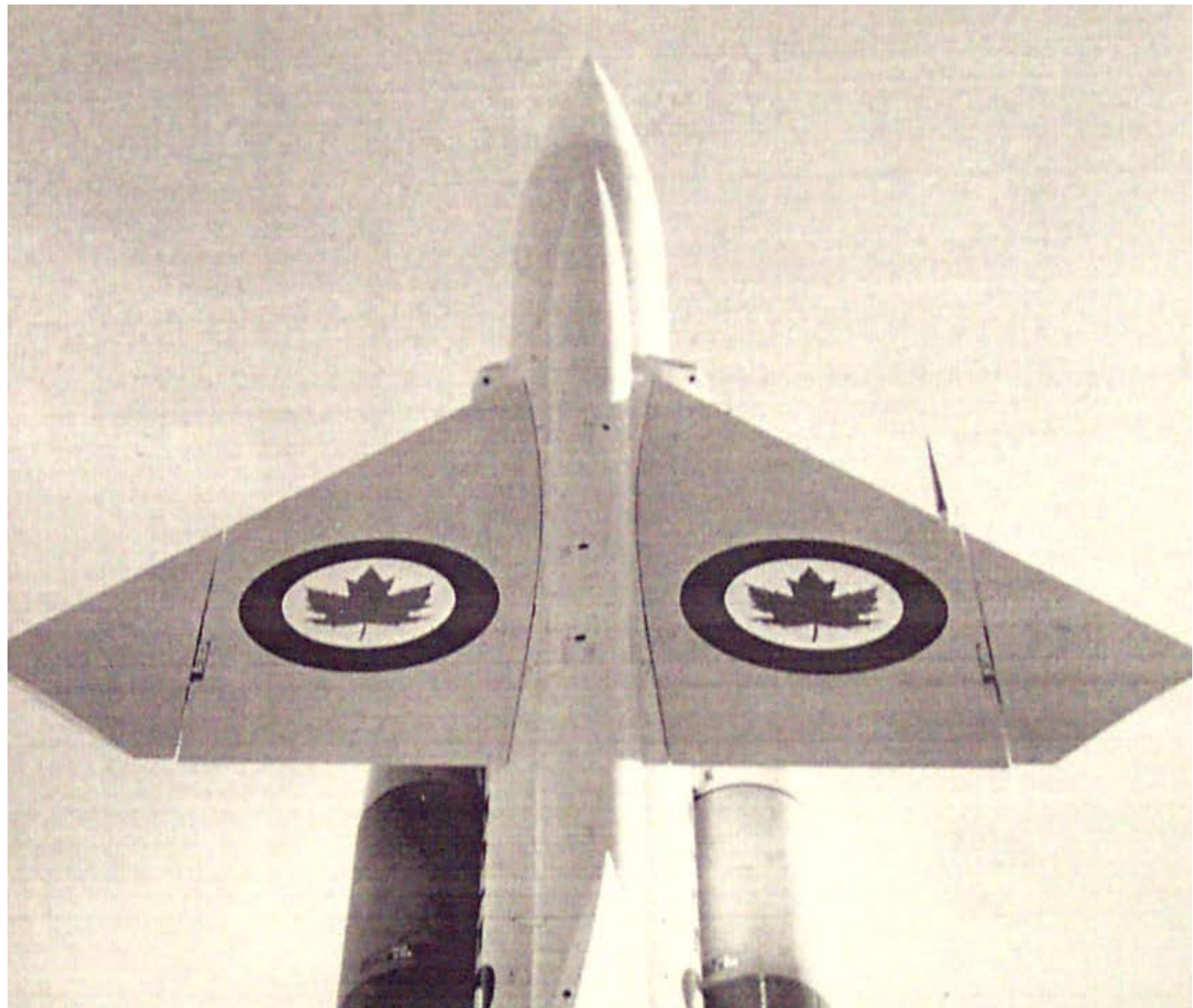
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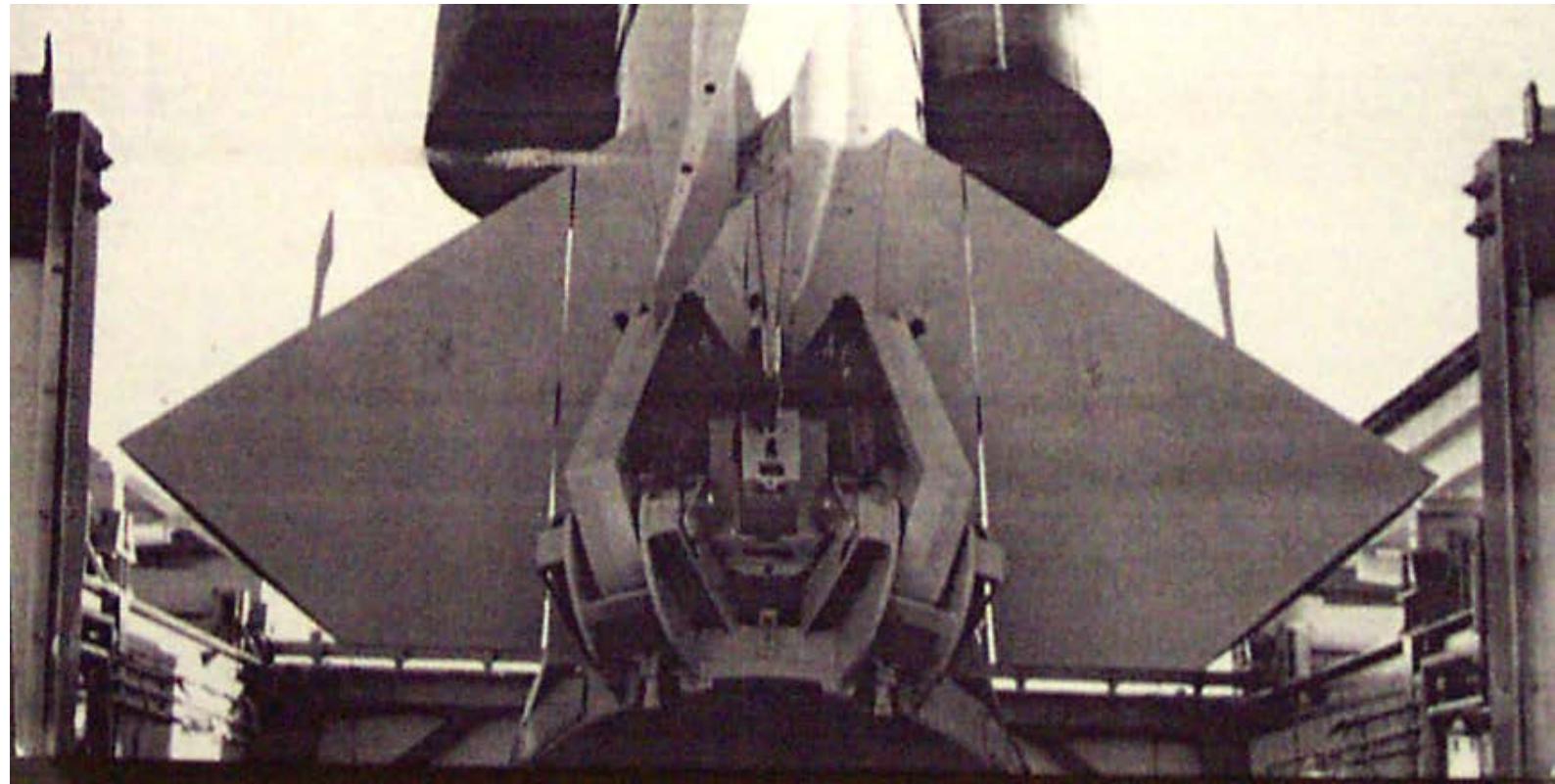
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The Bomarc-B nuclear surface-to-air missile purchased by the Diefenbaker government in 1958 to replace the Arrow. The two squadrons deployed at North Bay, Ontario and La Macaza, Quebec were phased out in 1971. [79](#)





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Two of the sixty-six American-built McDonnell-Douglas CF-101B Voodoo interceptors purchased by the Diefenbaker government in 1961 to replace the Arrow. The Voodoo continued to service until 1984 when it was replaced by the McDonnell-Douglas/ Northrop CF-18. [80](#)



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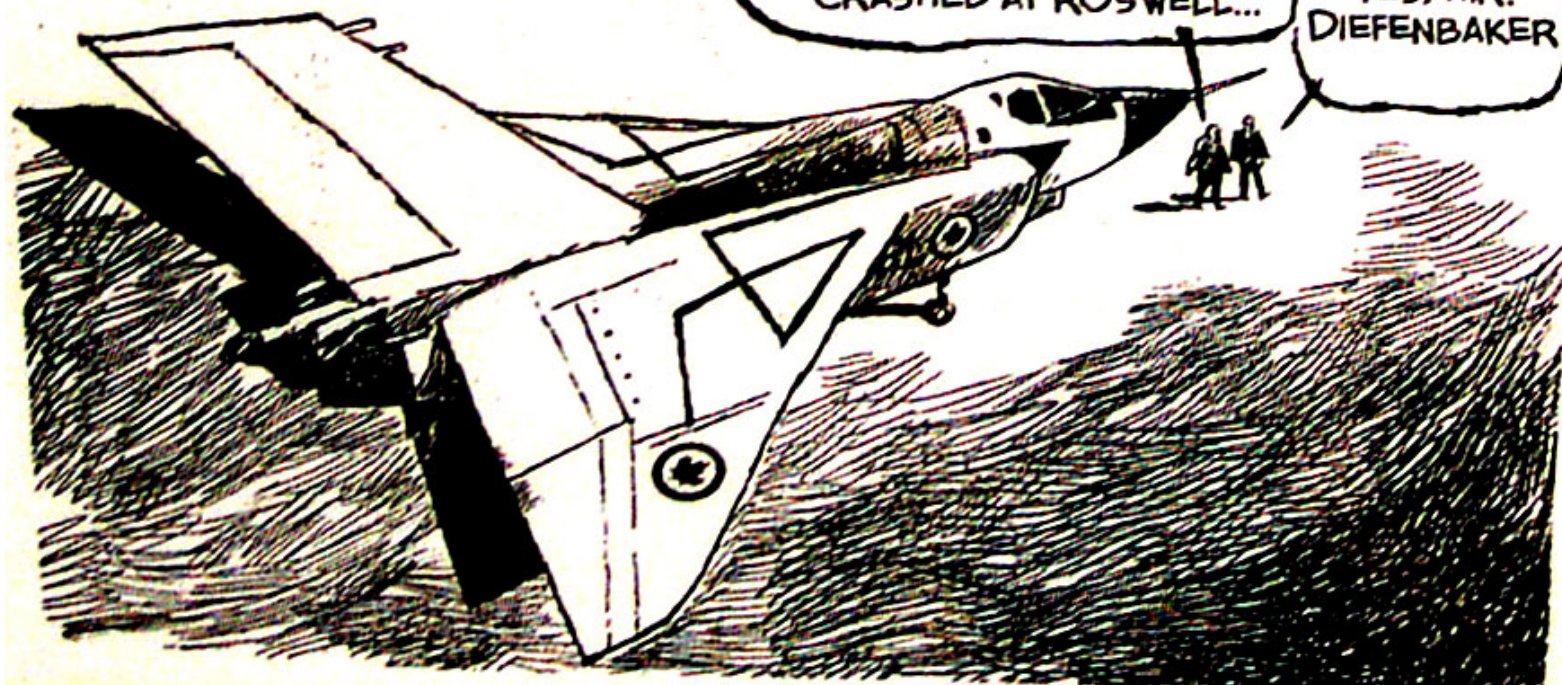
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Courtesy of the Regina Leader Post January 15, 1997. [82](#)

AVRO ARROW CONSPIRACY MYTH #2376

DESTROY THE JETS!
THE AMERICANS ARE TOO
CLOSE TO THE TRUTH
THAT THE AVRO IS NOT
FROM THIS PLANET AND
I AM THE ONLY ALIEN LEFT
AFTER OUR SAUCER
CRASHED AT ROSWELL...

YES, MR.
DIEFENBAKER



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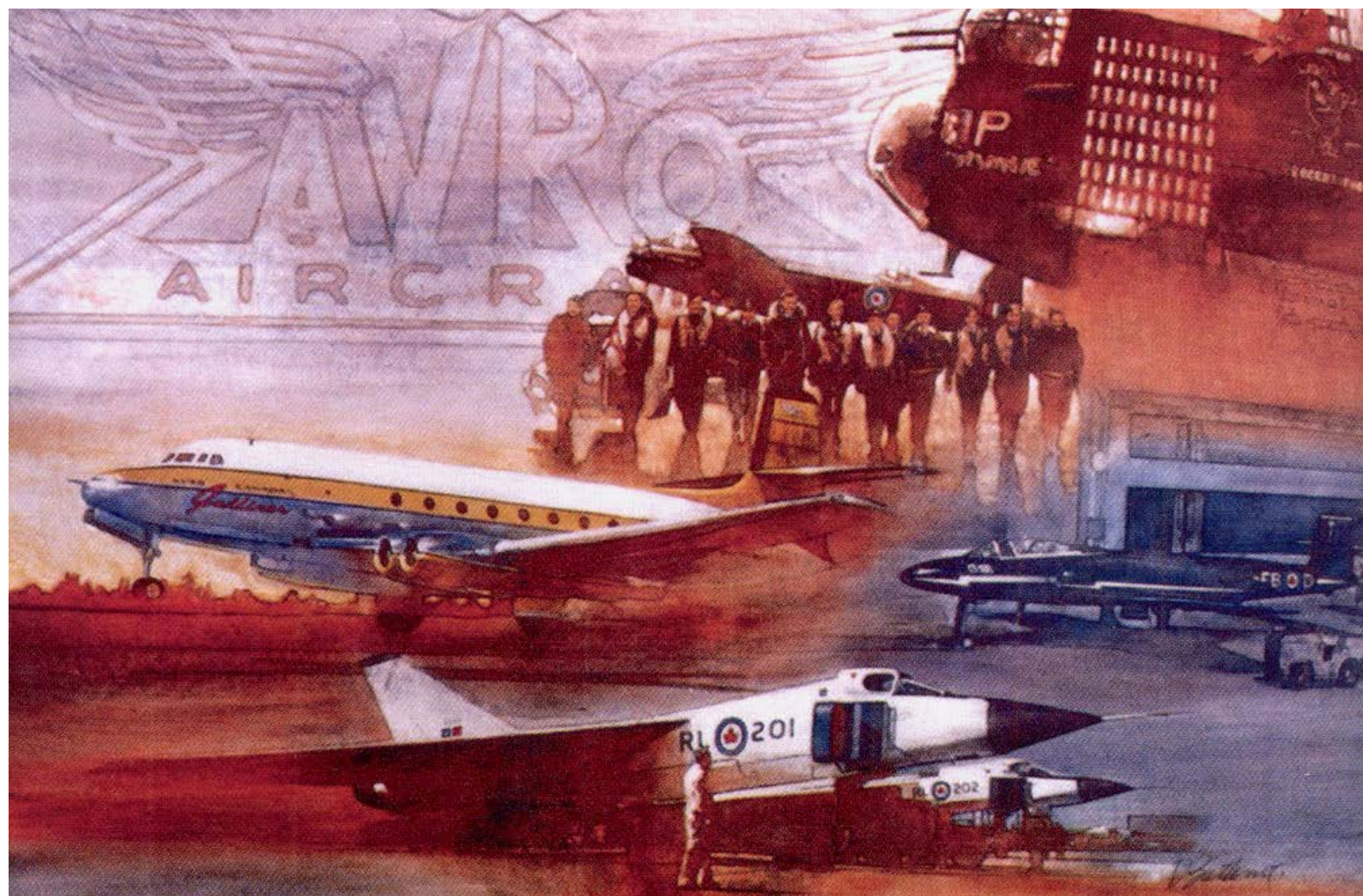
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"Half a Century of Canadian Avro Aircraft." A reproduction of a painting depicting the history of the Avro Arrow Aircraft from 1943 Lancaster MK X KB700 to the Avro Arrow. [83](#)



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Reproduction of Avro Arrow logo.[84](#)



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Avro CF-105 Arrow 205 over Malton, Ontario. [85](#)



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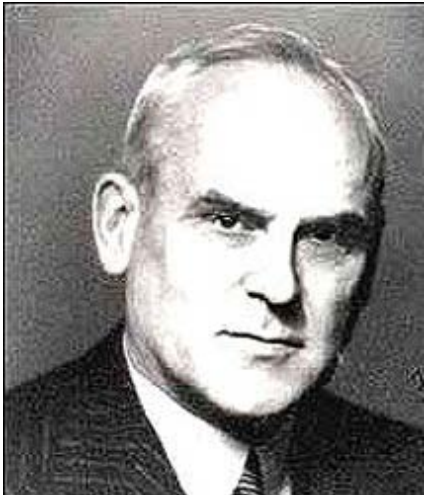
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Portrait of C.D. Howe.[86](#)



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