

# AVRO

## AIRCRAFT

**LIMITED**



5555

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## Introduction

Fifty years from now they'll be talking about today . . . about the tremendous development drive in Canada that prompted the Foreign Policy Association of the United States to declare:

"Canada is booming . . . it is likely to end in achievement of the world's highest living standard."

Canada: more than three and a half million square miles of land.

Canada: only 15 million people; but third among world trading nations; world leader in production of newsprint and non-ferrous metals; one of the world's great food-surplus countries; second largest uranium producer; massive iron-ore projects; and tremendous oil and natural gas discoveries; huge resources in water power.

Canada, a vast domain, is dependent, perhaps more than any upon the airplane for the development of her resources . . . *and upon the airplane for her defence from attack.*

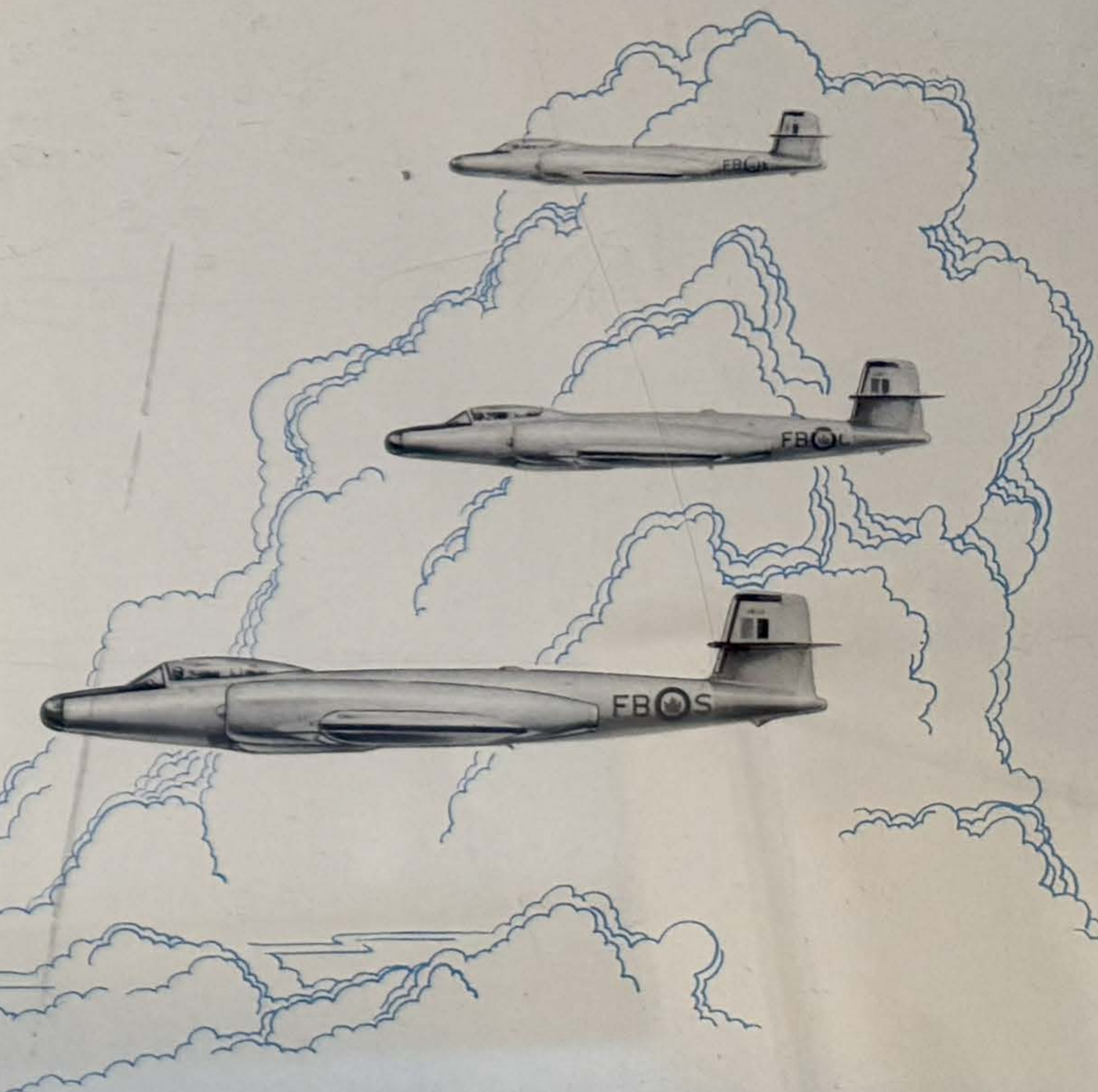
Few industries belong so completely to Canada's new jet-paced development as the nine prime contractors; 50 major sub-contractors and some 2,500 suppliers of the Canadian aviation industry. Without aviation, much of the nation's mineral wealth would still be undiscovered or inaccessible.

Total flying hours in Canada now top the half million mark per year; revenue passenger movements approximate two million hours per year.

The combined manufacturing and operating spheres of the Canadian aviation industry now gross over \$400 million a year to rank among the nation's 10 leading industries.

Defencewise, Canada's aviation industry is a billion-dollar-a-year enterprise, employing about 50,000 people—one of Canada's largest industrial employers of manpower.

The strength and vigor of Canada's aviation industry has been and is, a potent factor contributing to Canada's position as the "great middle power" in international politics and trade.





## The Company

Avro Aircraft is Canada's largest employer in the aircraft industry, with approximately 8,000 employees engaged on research, design and development and production.

The Company had its beginning in 1945 when A. V. Roe Canada Limited was established with but 300 employees. Its goal was a self-sufficient industry capable of undertaking original research and design along with manufacturing.

This was the first chapter in Canada's Jet Age. In the intervening years, A. V. Roe Canada Limited expanded into two Divisions, one concentrating on airframes, the other on gas turbines. Employment soared from 300 to a peak of 16,000 in 1954.

To meet the growing complexities and divergent airframe and aero engine demands, the two Divisions were incorporated as separate companies with A. V. Roe Canada Limited as the parent corporation. As a result, on January 2, 1955, the Aircraft Division began operating as a separate corporate entity under the name—Avro Aircraft Limited.

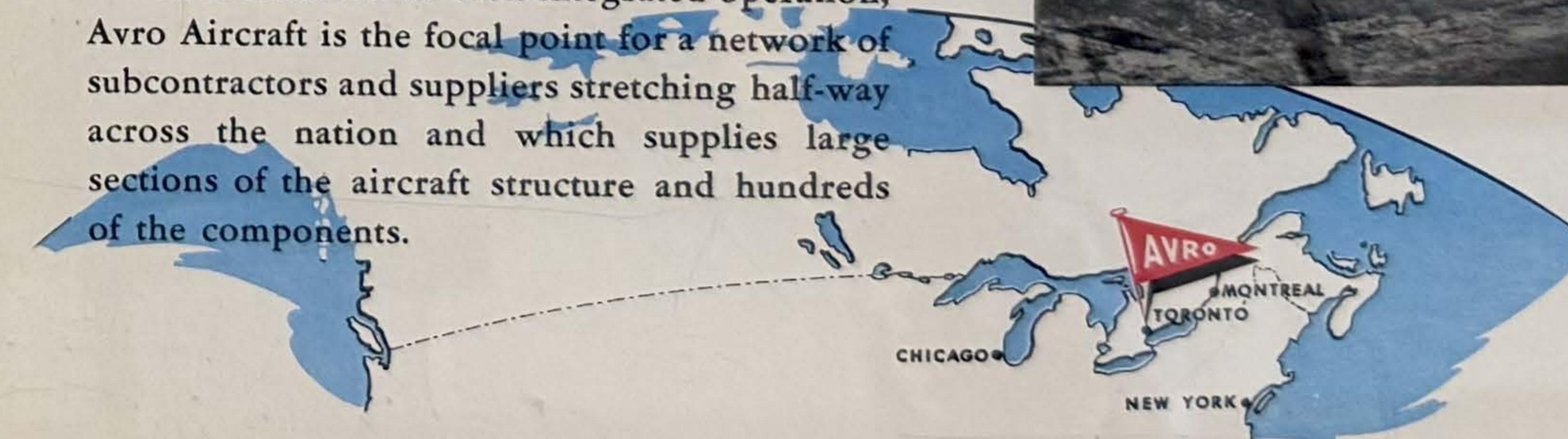
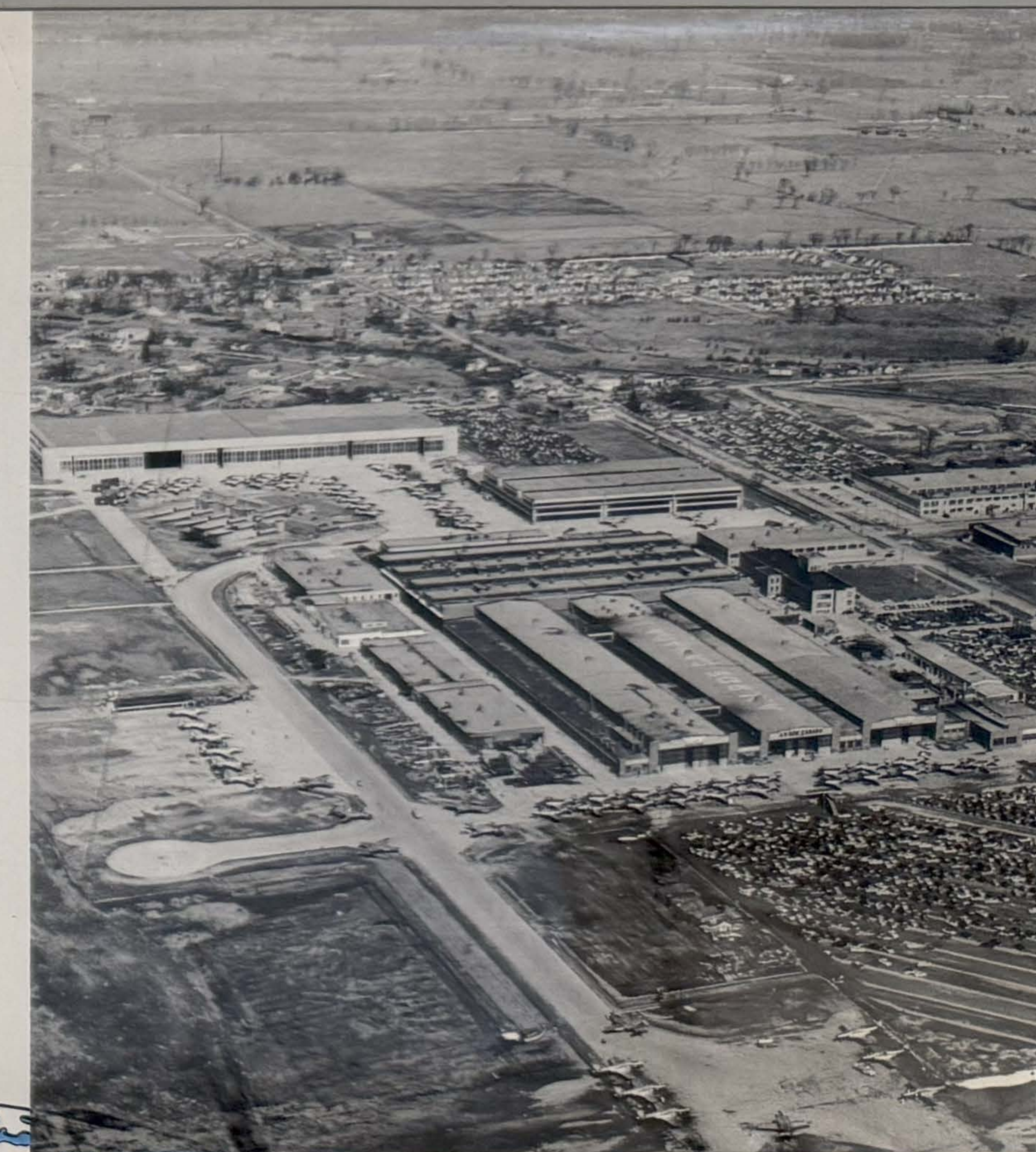
Located at Malton, near Toronto, Ontario,

with direct access to Malton Airport, Avro Aircraft is a single integrated unit with all the necessary facilities to design and manufacture an aircraft from initial conception to delivery.

Administration, engineering, production, service and overhaul and repair facilities cover a total of 1,500,000 sq. ft. Engineering and administration departments are adjacent to the main production facilities so that design and administration staffs are able to keep in constant touch with production.

Operations of the Company are carried out through the following organization: Engineering Division, Manufacturing Division, Sales and Service Division, Test Pilots' Division, Quality Control and Inspection Division, Secretary and Treasurer's Division, Industrial Relations' Division.

In addition to its own integrated operation, Avro Aircraft is the focal point for a network of subcontractors and suppliers stretching half-way across the nation and which supplies large sections of the aircraft structure and hundreds of the components.





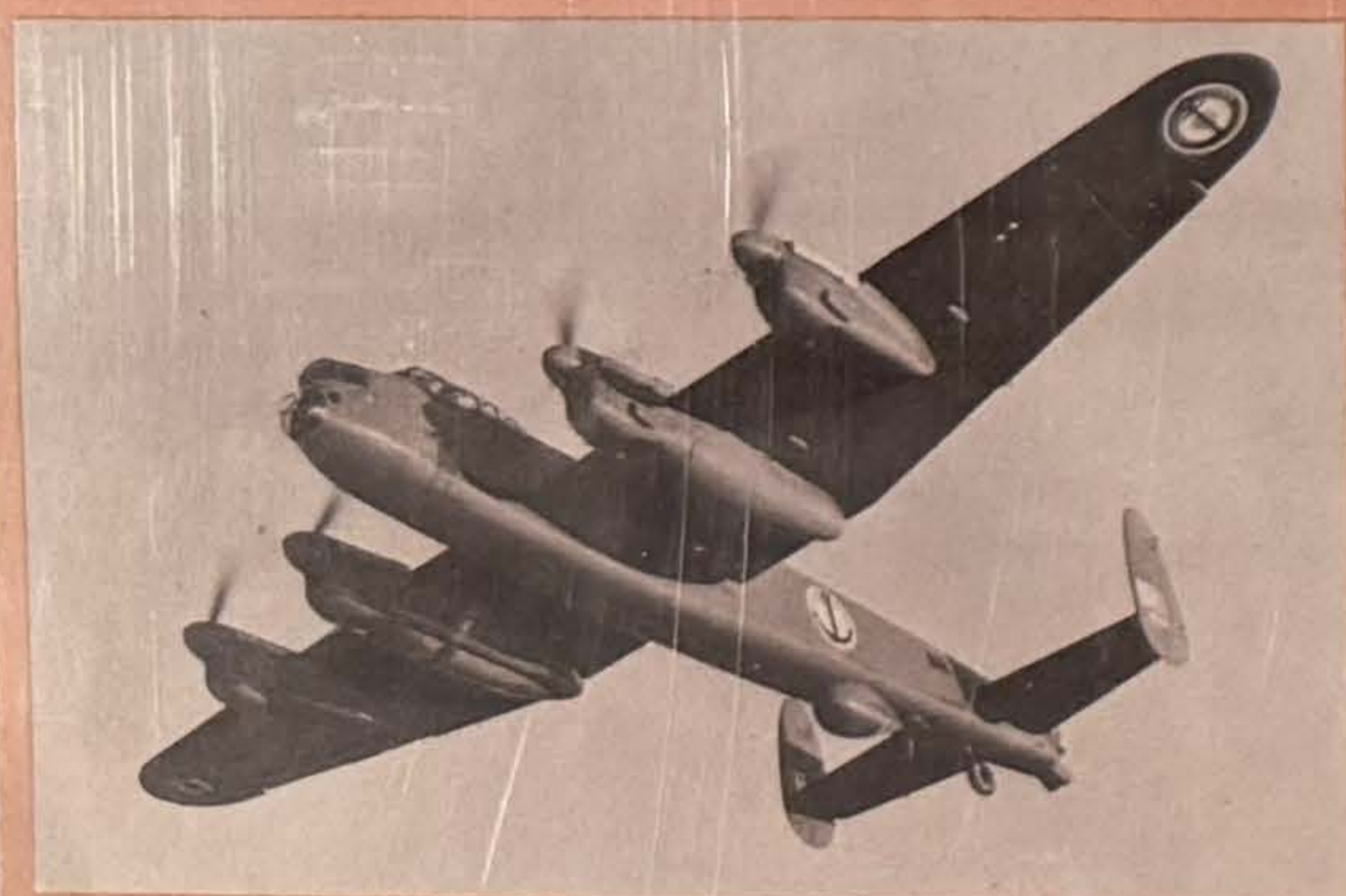
## Diversification

Avro Aircraft, although only established in 1945, has a record of diversified achievement in design, development, production, overhaul and modification, that would have taxed the resources of older, more experienced firms.

World War II aircraft were re-engineered and converted to later military and civilian uses . . . All the engineering and much of the actual reconversion of Lancaster bombers into radar-equipped Maritime reconnaissance aircraft and other variants was done by Avro Aircraft . . .

Modification programs have involved Dakotas, B. 25 Mitchells, Venturas, Sea Furies (for the Royal Canadian Navy).

In addition, Avro Aircraft has a number of miscellaneous products to its credit . . . Aircraft System Trainers which simulate various CF-100 systems for the R.C.A.F. air and ground crew training; design and manufacture of wing tip rocket pods and wing tip fuel tanks . . . design and manufacture of specialized ground handling equipment.



Conversion, modification has been an active program at Avro Aircraft, as seen above . . . a former Lancaster bomber converted to R.C.A.F. Air-Sea Rescue operations.



Operating from a Royal Canadian Navy aircraft carrier are Sea Fury fighters which have been repaired and overhauled by Avro for Canadian service.



Returned to service following the outbreak of the Korean War, World War II R.C.A.F. Lancaster bombers have been modified by Avro to guard Canada's Maritime approaches.

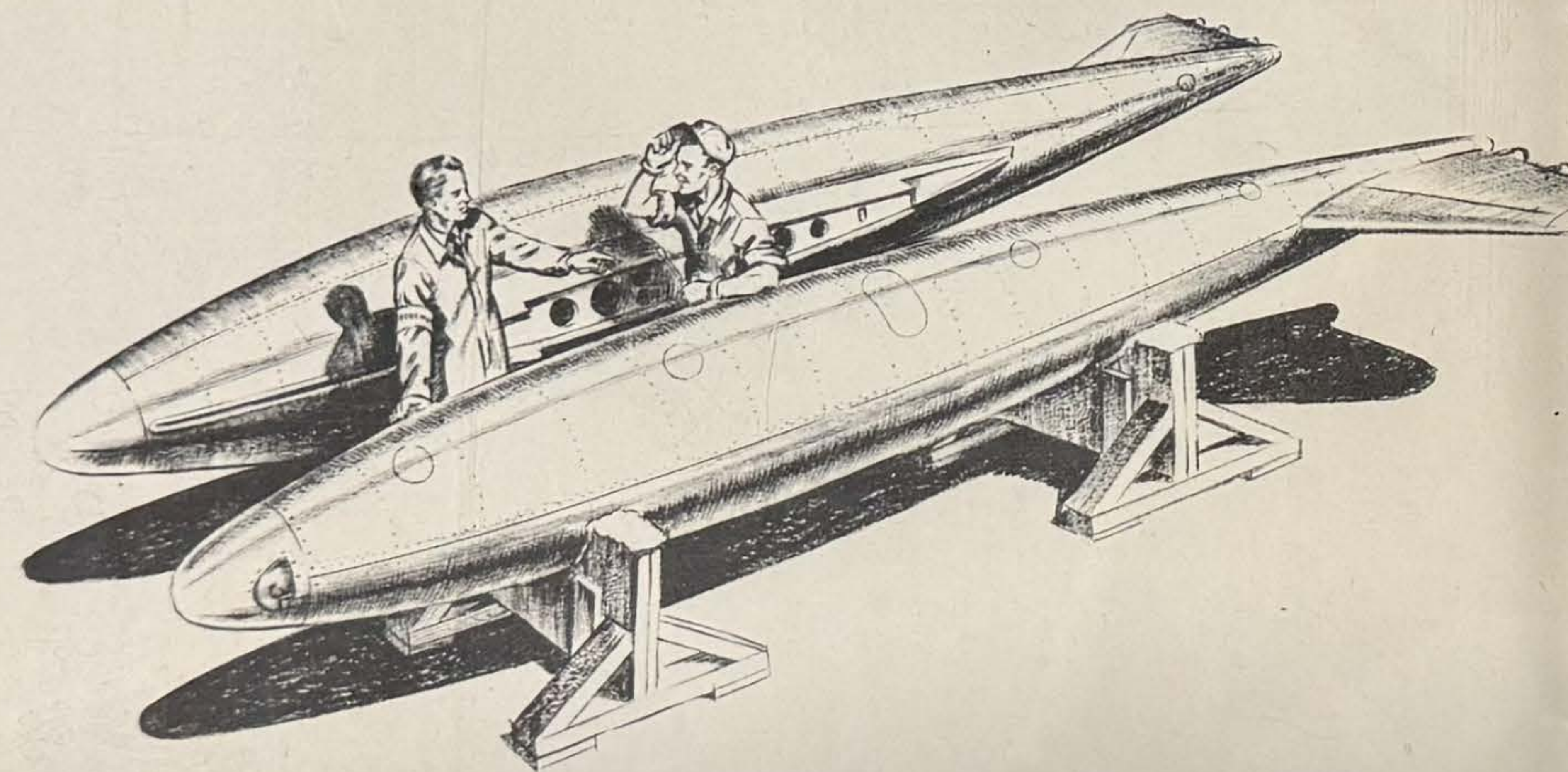


The Jetliner, first jet-powered transport built on the North American continent, is giving excellent service as an engineering-observation vehicle, but development had to give way to the urgent demands of national defence.



But Avro Aircraft's major achievements have been the design and development of two completely different types of aircraft . . . one a commercial jet-powered transport, the Jetliner . . . the other the twin-jet CF-100 all-weather interceptor for the R.C.A.F. and with it, development of various systems, such as armament (gun, rocket, guided missiles) and electronics, etc.

And to meet the challenge of the supersonic era, Avro Aircraft's next major product will be the CF-105, a supersonic delta-wing all-weather interceptor.



Wing-Tip Fuel tanks are among the many products that have been developed by the Company's Engineering Division.

## The CF-100

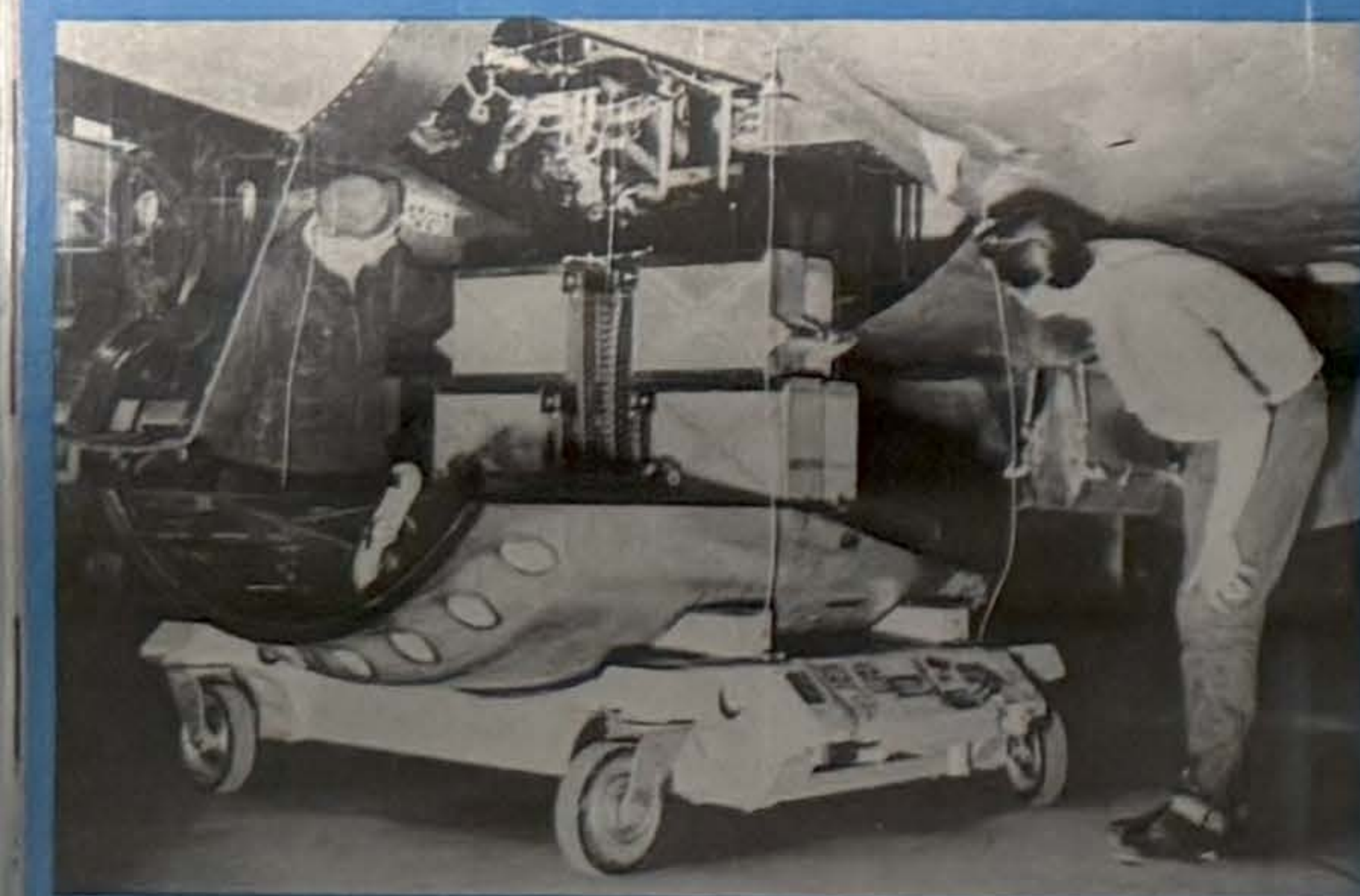
The CF-100 was designed to meet an R.C.A.F. specification for a long-range, all-weather day and night interceptor. Its prime role . . . the defence of Canada. Now in multi-squadron service, the Mark 4 rocket-firing version of CF-100 is recognized as the outstanding aircraft of its kind in service today. New variants are scheduled to follow.

The CF-100 development in Canada opened up a new era of self-sufficiency and independence for the aircraft industry of the nation. Previously, Canada had built aircraft that were designed somewhere else. In times of emergency when supplies of essential components were cut off such dependence was often disastrous.

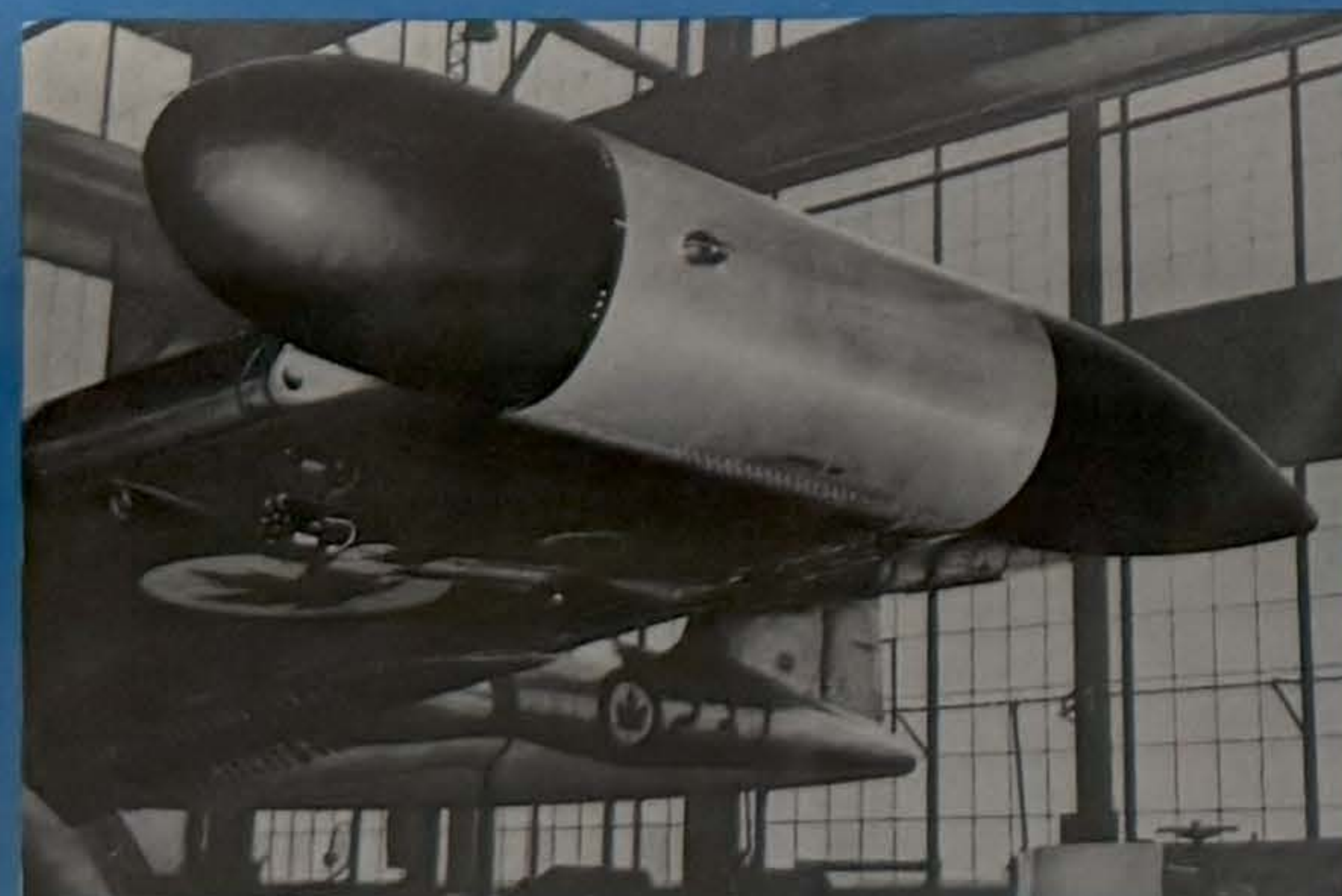
The CF-100 represented the first break with this traditional policy and is the first military interceptor aircraft designed and built in Canada. It came about after a search by the R.C.A.F. failed to find anything on the drawing boards in Britain or the United States that could meet the specification. It was then that the young

Avro organization was entrusted with the task of developing an interceptor to meet the specific Canadian needs — an interceptor capable of operation in all weather, at any time of the day or night . . . long range, radar controlled, heavily armed.

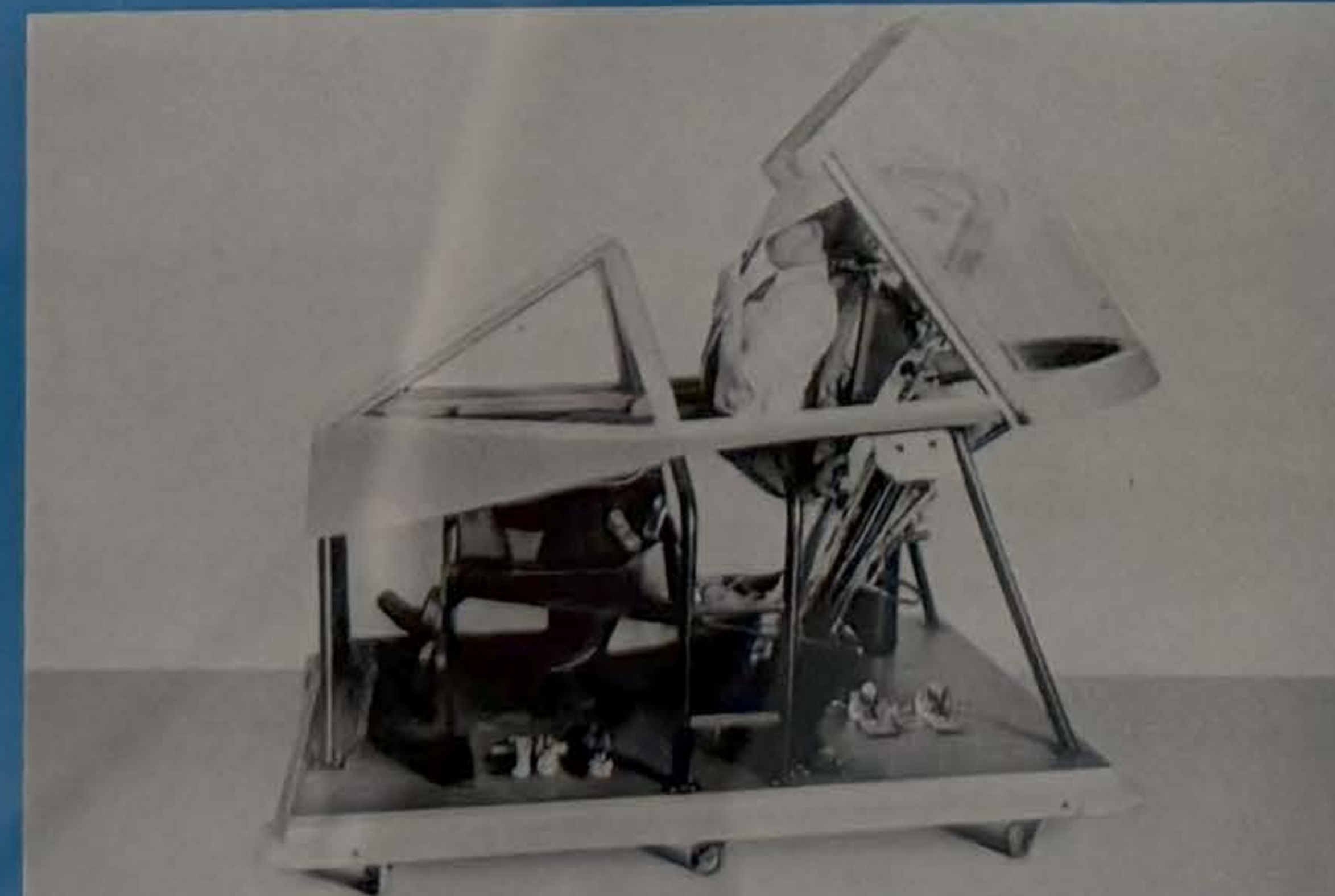
The CF-100's mark of distinction is its big plastic radome, identifying it as radar-equipped all-weather interceptor.



Development of armament systems . . . such as the gun pack seen above . . . plays an active role at Avro Aircraft.

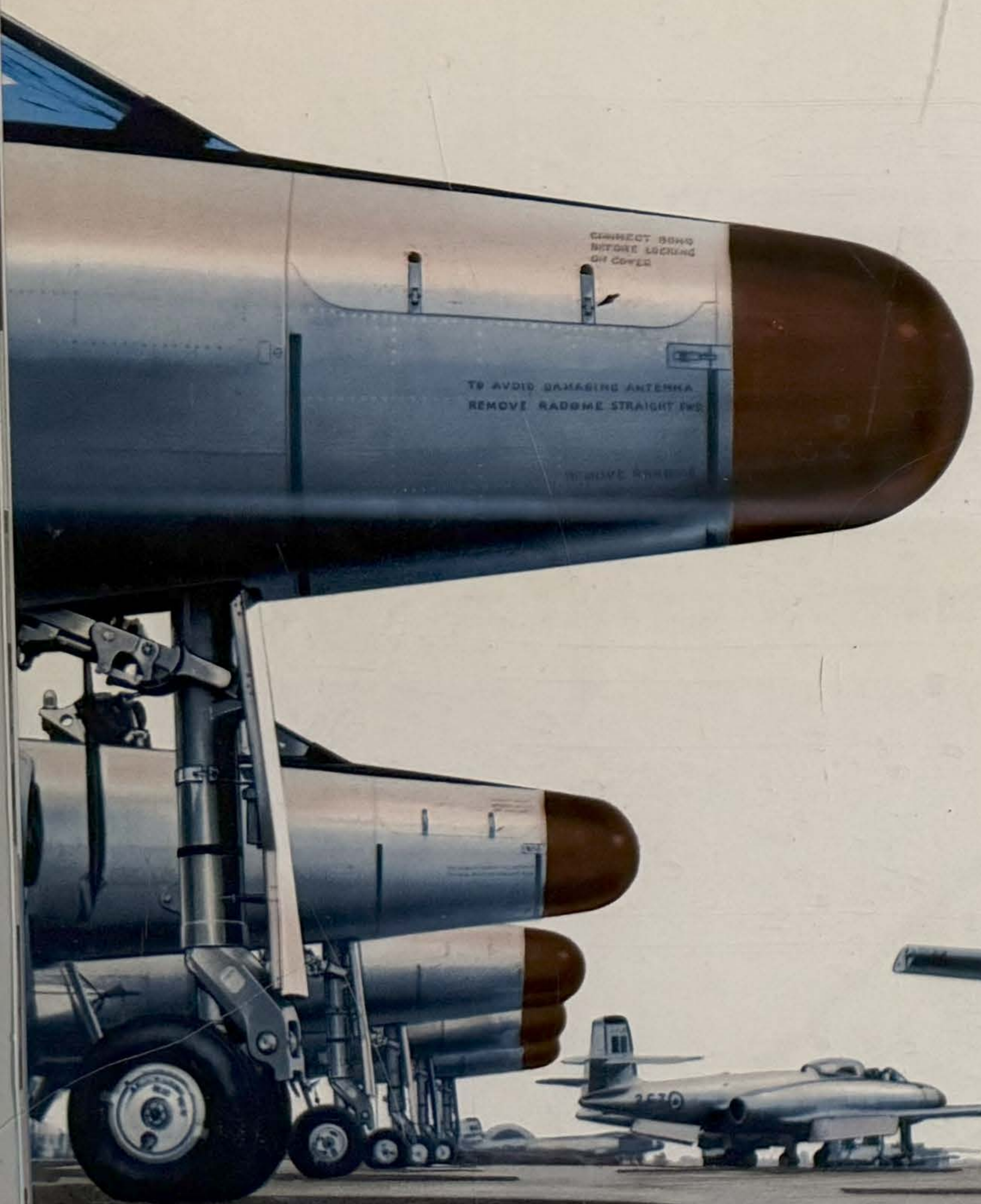


Rocket Pods for the Mark 4 CF-100 Interceptor were designed and developed by the Engineering Division.



Also designed and developed by the Company are Aircraft System Trainers, such as this ejection seat simulator.



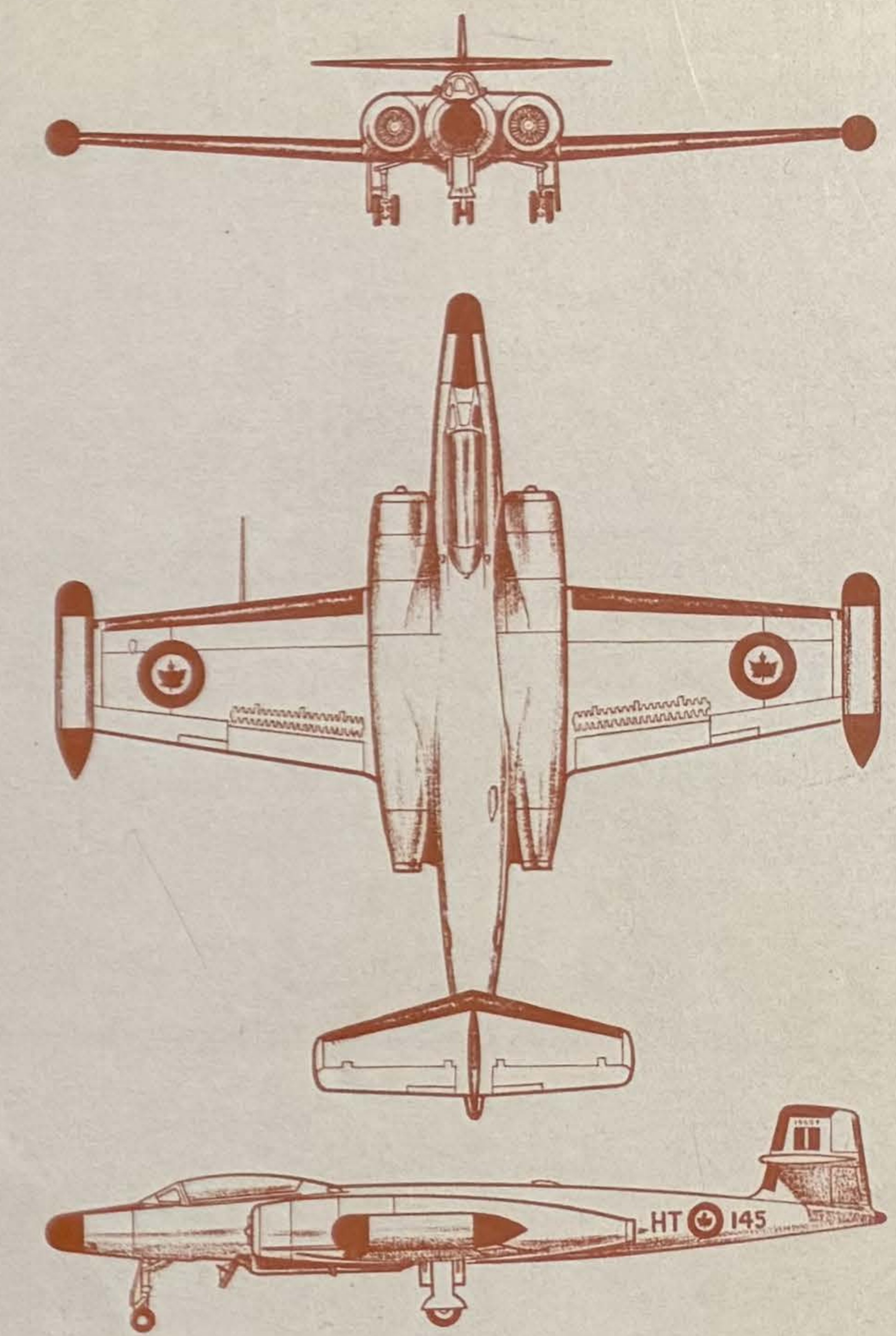


The scream of jets — Avro CF-100s — at strategic bases around the Canadian defence perimeter is constant evidence that Canada's trust in its own engineering and production skill was not misplaced.

In 1956, at the request of NATO's military committee, four R.C.A.F. fighter squadrons in its Air Division in Europe will be equipped with CF-100s replacing Sabres, to strengthen NATO's all-weather defence capabilities.

### CF-100 SPECIFICATIONS

- Weight ..... Approximately 37,000 lbs.
- Length ..... 54 feet
- Wing Span ..... 49 ft. 11 in. (excluding tip tanks and/or rocket pods)
- Operational Range .. over 1,000 nautical miles
- Ceiling ..... more than 45,000 feet
- Power Plant ..... Mark 3 — two series 9 Orenda gas turbines. (6,500 lbs. thrust)  
Mark 4 — two series 11 Orendas. (in excess of 7,000 lbs.)
- Armament: Mark 3 .. 50 cal. guns  
Mark 4 .. 50 cal. guns and rockets







## *In Service*

High over the "Rocks" . . . the mighty Rocky Mountains of Canada's Pacific West Coast, fly these CF-100 Interceptors in formation. Defence bases of the R.C.A.F., equipped with CF-100s protect Canada and the Northern approaches to the North American Continent, from the Atlantic to the Pacific.

The air defence system of North America is a joint United States-Canadian responsibility and takes the form of an integrated network of ground observers, radar chains and interceptor aircraft.

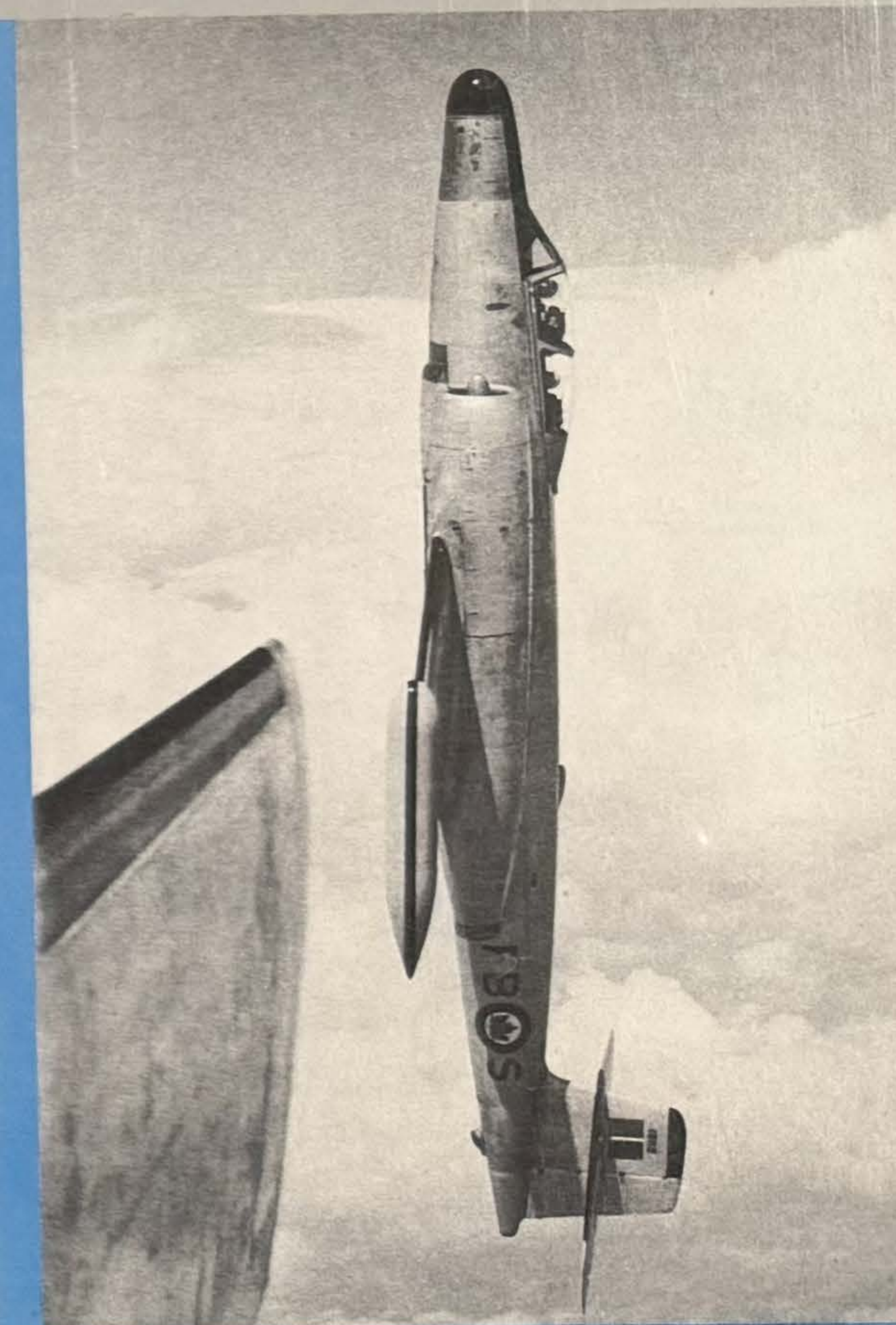
In Canada, the heart of the system is R.C.A.F. Air Defence Command which has Filter centres and CF-100 manned interceptor bases located at strategic points across Canada.

The effectiveness of the entire defence system hinges upon the ability to get aircraft into the air in all weather, good or bad, and to make successful interceptions. The CF-100 was designed for this role;

- Anti-icing and de-icing and extensive navigational equipment helps overcome the problems of all-weather flying.
- Radar is so comprehensive that visual contact with a target is unnecessary. It searches, locates, locks on and automatically fires a variety of armament.
- Pressurization permits effective operations at maximum ceiling.



Early warning reports from hundreds of ground observers are funneled into the integrated System.



Radar guides and directs CF-100s to intercept unidentified aircraft reported by radar stations and/or ground observers.



At Fort Churchill, on the rim of the frigid Arctic, special nylon coveralls like these protect CF-100 Interceptors overnight.



CF-100s take off from snow-banked runways in Quebec.



At North Bay, R.C.A.F. Air Defence Command operates an all-weather fighter unit and major Observer Filter station.



## Research, Design and Development

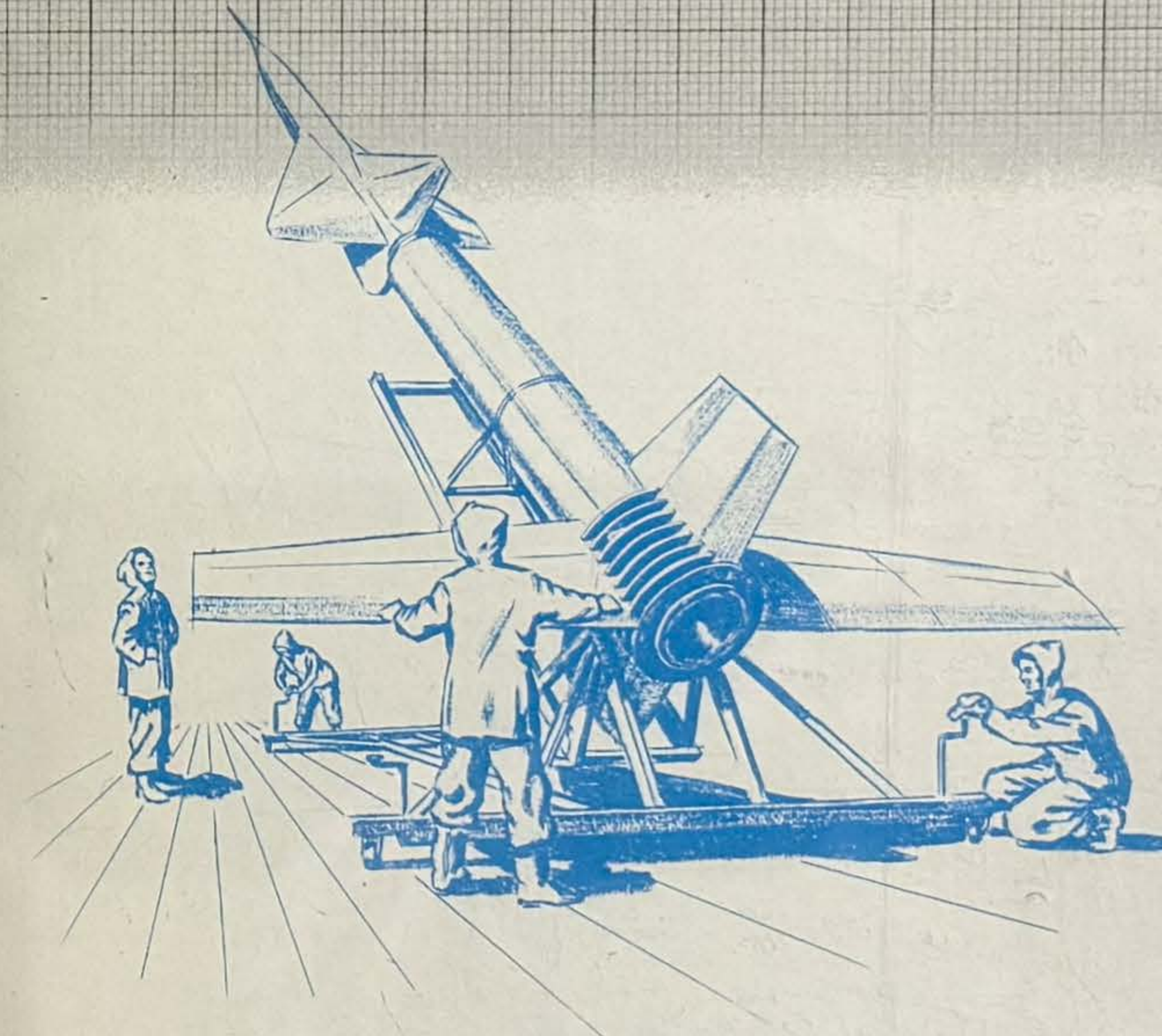
By establishing a research design and development organization, Avro Aircraft gave Canada its first fully-integrated aircraft enterprise. Until then, the Canadian industry was largely a manufacturing and assembly operation.

Today Avro Aircraft's engineering department is pre-eminent in Canada and through its past and current achievements is highly regarded throughout the world. For the future, a large staff of specialists in every phase of engineering is engaged on a variety of projects, including the most advanced fields of electronics and weapons.

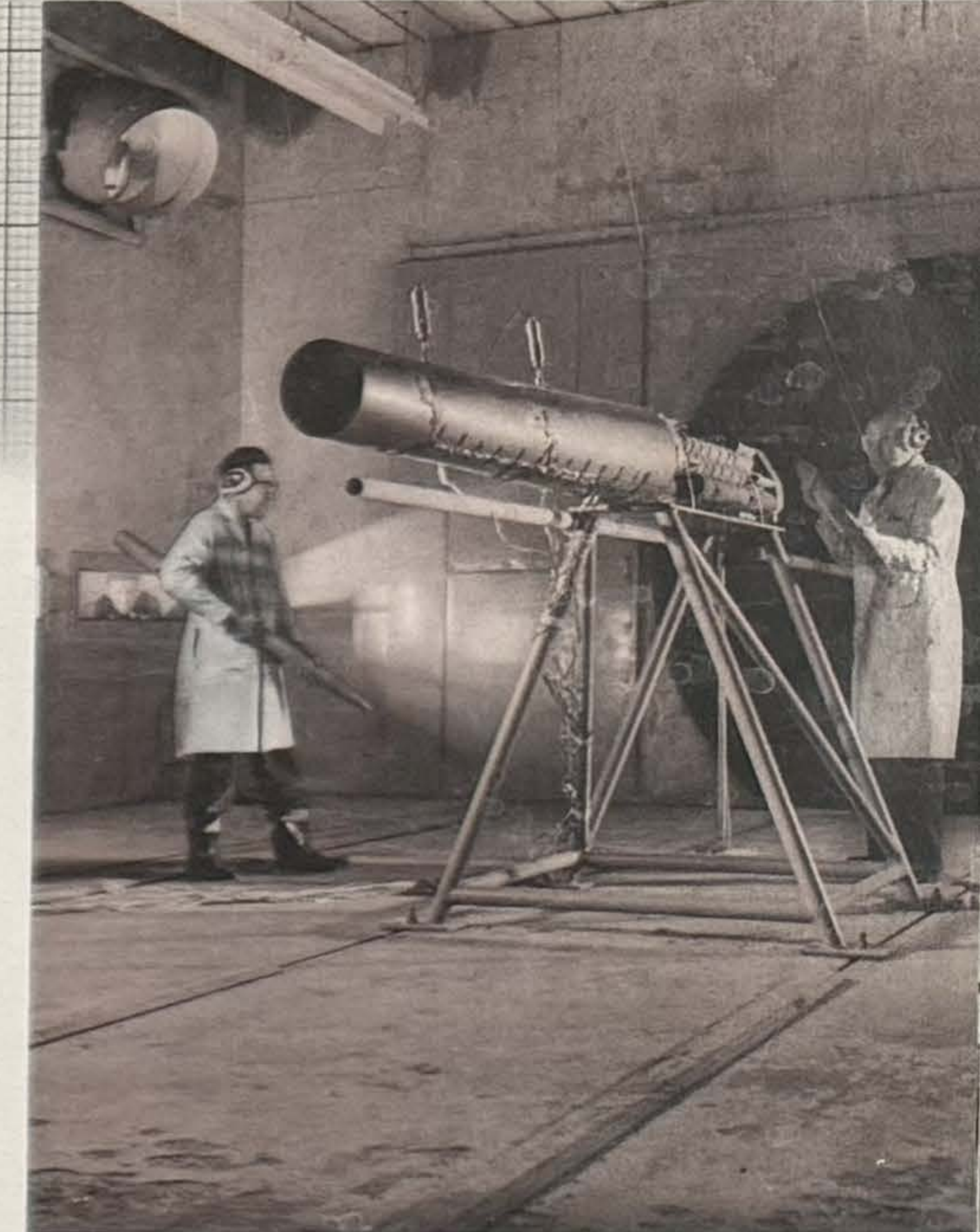
As a result, Canada's aircraft industry in 10 years has been brought from virtual obscurity

to the edge of the supersonic age and now possesses a human and physical engineering asset of immeasurable national value that offers unlimited opportunity to young Canadian engineers.

Avro Aircraft's large engineering division is all-important for the Company recognizes that the demands of the supersonic era can only be met through constant research, design and development, to obtain greater speed—higher altitude—longer range—whether through new aerodynamics, more powerful engines, new metals, improved fuels and a greater variety of electrical, mechanical, and other systems.



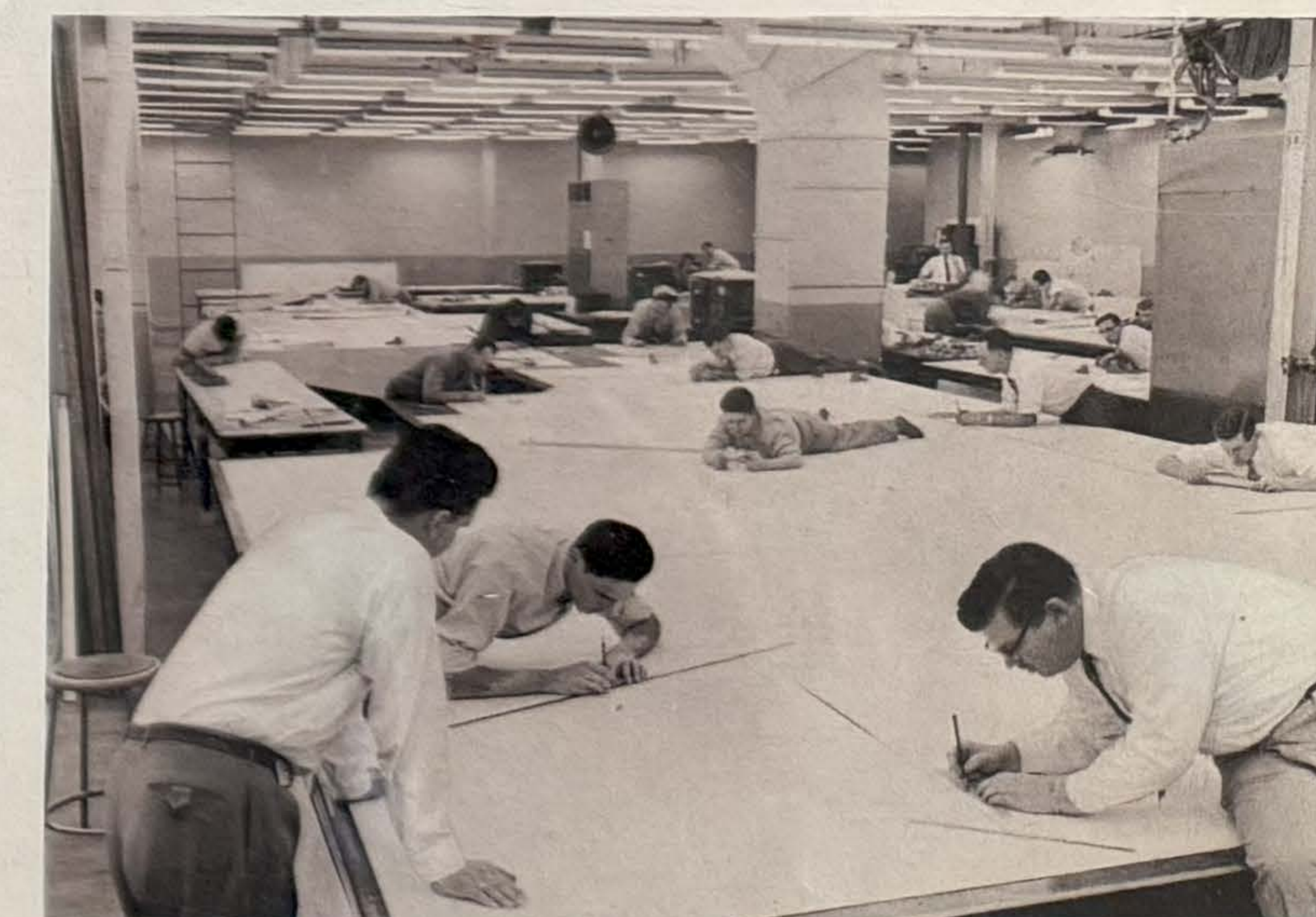
In minutes, electronic computers solve massive problems that would take humans many months.



Rocket-firing test rig is seen here in action at one of the rocket butts on the premises of Avro Aircraft.



From virtually nothing in 1945, Avro Aircraft's Engineering Division now has a total strength of 1200, of which 300 are graduate engineers or the equivalent.



By drawing directly on glass cloth — a new development — as seen above, the transfer to metal by the lofting process has been speeded up and error minimized.

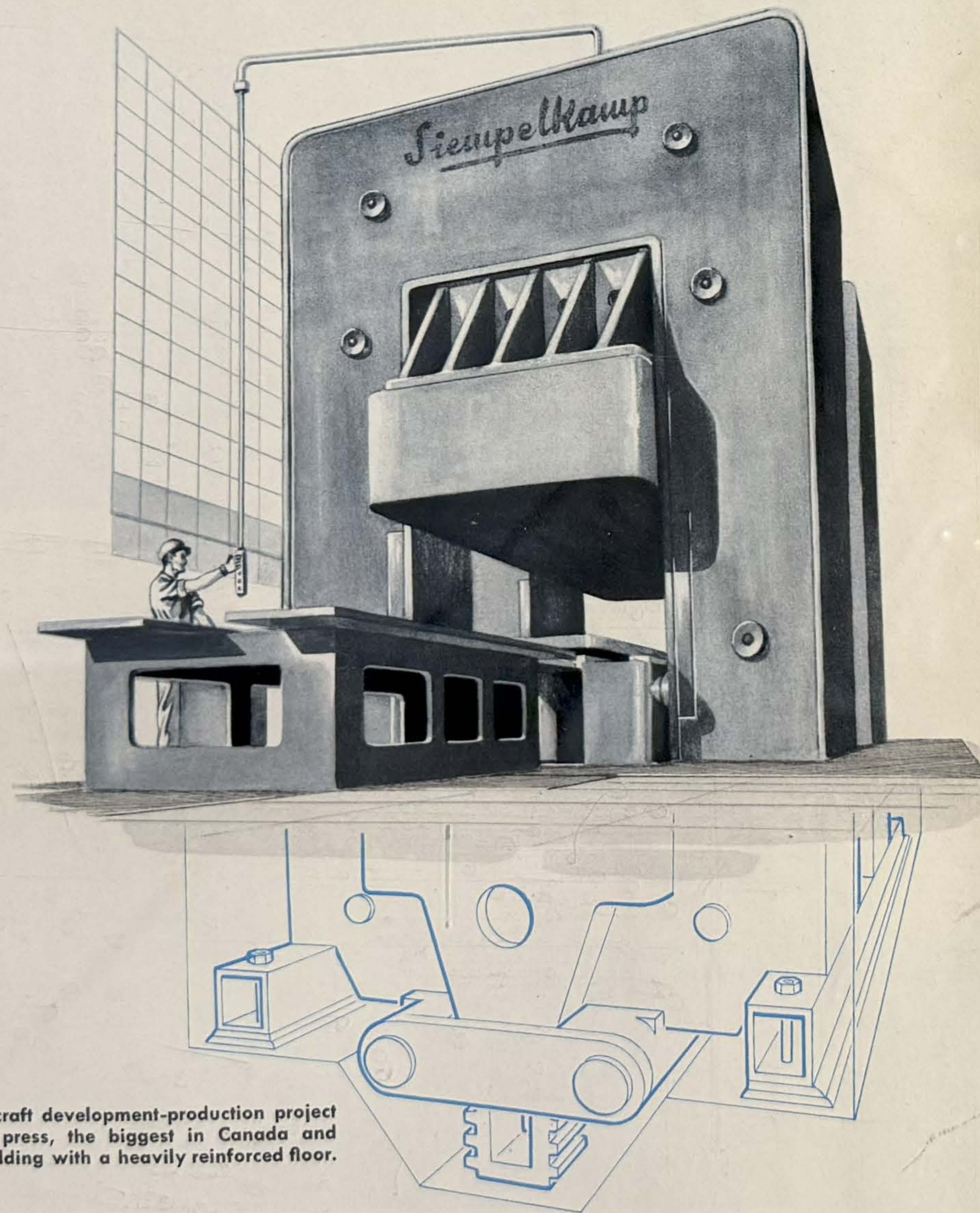


## Production

Expert management, a capable work force and modern facilities that are being constantly improved as new equipment and techniques are developed, have established an outstanding production record and earned industry recognition for Avro Aircraft as an efficient manufacturer.

Tight budget control along with continuous improvement in performance based on industry manpower learning, curves have resulted in unit costs that are consistently equal to and in many cases better than the industry average.

Production facilities include all standard equipment and to keep abreast of new developments, the latest machinery is installed as it becomes available. This along with the early application of new techniques and processes, many developed by the company itself, and by effective production engineering, planning and processing according to a single set of standards, are major factors in the company's efficient and "on schedule" production performance.



Sections for a new aircraft development-production project call for a 15,000-ton press, the biggest in Canada and housed in a special building with a heavily reinforced floor.



One view of one section of the Production Bays at Avro Aircraft with CF-100 Interceptors moving along the line.





## Sales and Service

An extensive Service Department is maintained for maximum aircraft utilization. Field Service Representatives are stationed with each Air Force squadron and wherever the Company's aircraft are flying to ensure that the correct maintenance and operating techniques are employed.

An aircraft should be more than just an efficient flying unit. It must also be simple to operate and maintain, even under the most adverse conditions. Avro Aircraft's "after sales" service policy insures a continuing interest in all its products for as long as they remain in service.

The Publication Section of the Service Department provides assistance to the customer with a constant flow of technical publications and information bulletins to operate and service the aircraft.

The Company's products are backed by a Parts Department which ensures that an adequate supply of spares is always readily available. "Provisioning" conferences are held periodically at which Air Force and Company representatives go over every single part of the airplane to ensure that correct types and quantities of spares will be provided.



Service in the field constitutes one of the principal activities of the Sales and Service Division.



Complete technical information is provided by a large staff of illustrators and writers.



Packaging and distribution of spares and parts is another Sales and Service function.

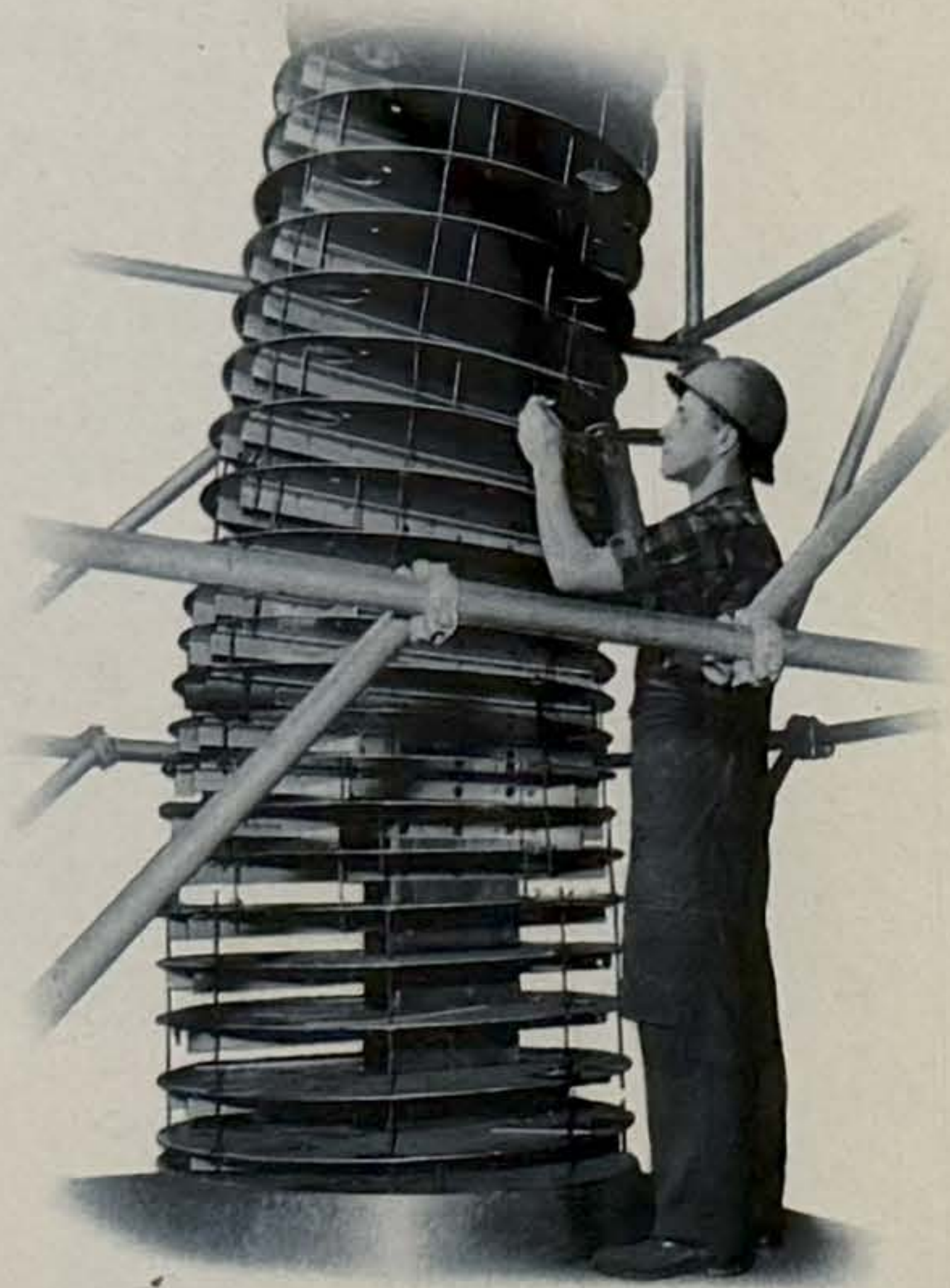


Round-the-clock delivery of spares and parts or equipment is part of Avro Aircraft Service.



## Avro People

On the foregoing pages we have attempted to record a little of the history and achievement of Avro Aircraft and point up the significance of its role in the Canadian economy and the aircraft industry. None of it would have been possible without the people who work here . . . the engineers . . . clerks . . . machine operators . . . pilots . . . supervisors . . . the thousands of single individuals who are responsible, in the end, for the success of Avro Aircraft and the contribution it is making toward Canada's defence and her peacetime development.



## Directors and Division Managers

Crawford Gordon Jr.	Chairman and President
F. T. Smye	Vice-President and General Manager
J. C. Floyd	Vice-President Engineering
J. A. Morley	Vice-President Sales and Service
H. R. Smith	Vice-President Manufacturing
A. A. Bailie	Director

Secretary and Treasurer  
 Quality Control and Inspection Manager  
 Chief Test Pilot  
 Industrial Relations Manager

J. Turner  
 W. Parish  
 D. H. Rogers  
 E. F. Alderton



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