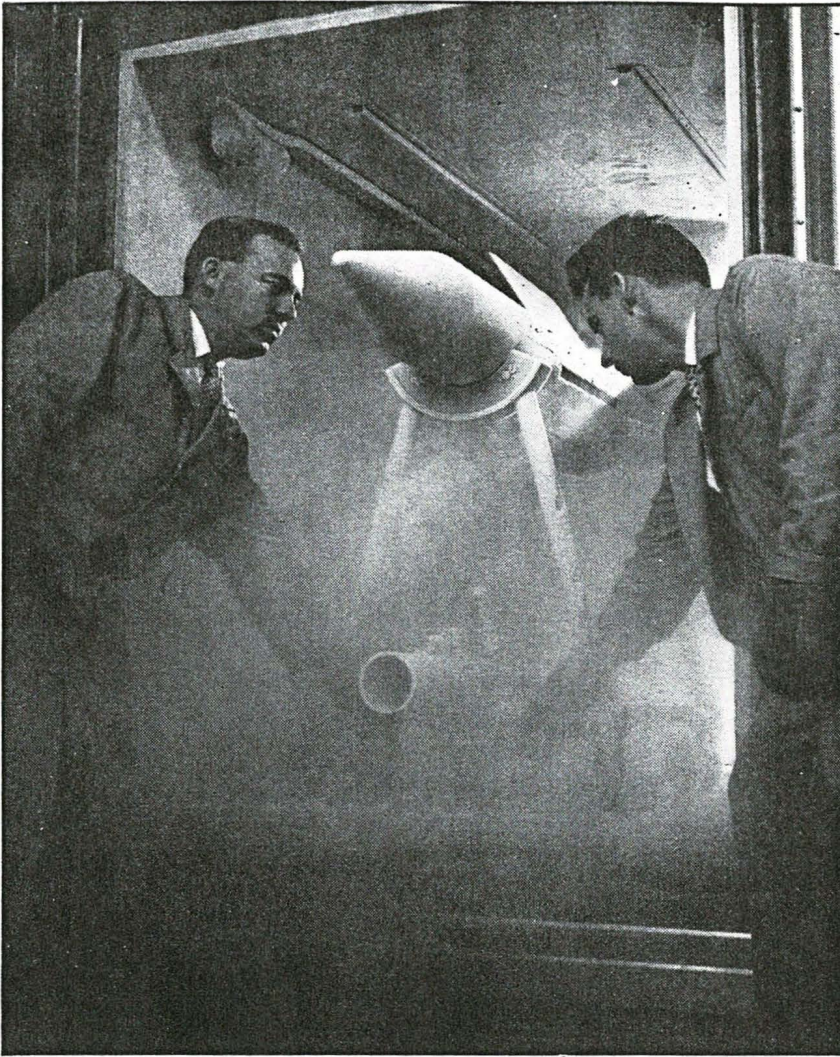
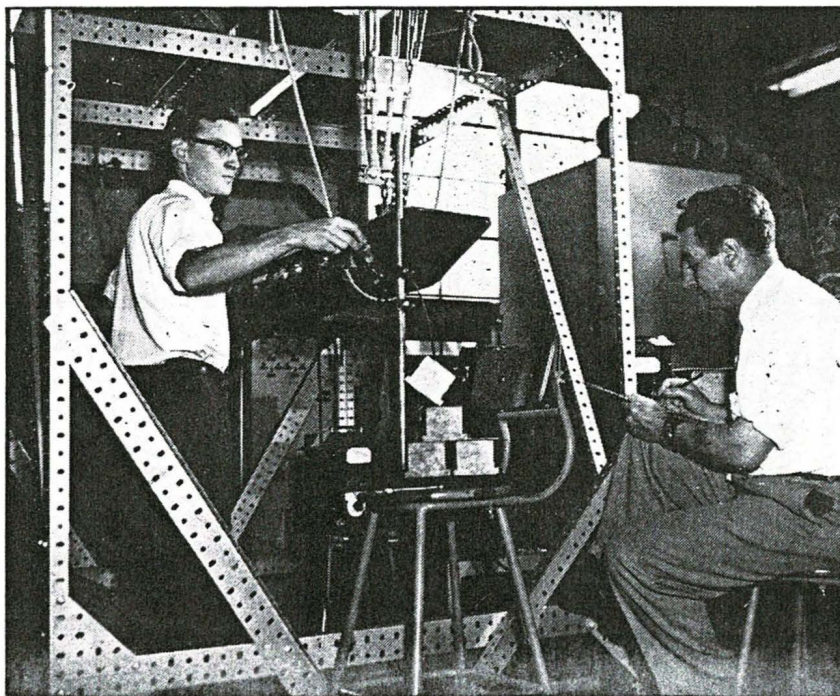


# A New Test Lab



A simulated test flight at  $-100^{\circ}$  and an altitude of 90,000 ft. covered this Velvet Glove (above) with frost. Westinghouse engineers remove the missile from the new laboratory's big Tenney stratosphere chamber. Below, a Velvet Glove airframe being used for torsional studies in the environmental laboratory's torsion rig, which can simulate stresses applied during flight.



A \$500,000 environmental test laboratory was recently opened at the Hamilton Electronics plant of Canadian Westinghouse Co. Ltd. Operated by the Air Armament Dept. of Canadian Westinghouse's Electronics Div., the new Environmental & Appraisal Laboratory is under the direction of Charles A. Mills.

Housed in a new 9,000 sq. ft. building, the laboratory has been specially designed for the testing of airborne electronic equipment, including guided missiles.

Capable of carrying out tests on equipment or components in accordance with most Current JCNAAF, JAN, MIL and other military specifications, the laboratory has a wide variety of some of the most modern environmental test equipment in Canada, including machines for vibration, impact, sustained acceleration, climatic, and altitude tests. A Canadian Westinghouse centrifuge can apply up to 60 G to units weighing as much as 40 lbs.

One of the most outstanding pieces of equipment in the laboratory is the Tenney Stratosphere Chamber (Model 160), which was built to Westinghouse's own specification. The chamber proper is thought to have a larger volumetric capacity than any other comparable unit in Canada, its measurements being 8 ft. x 5 ft. x 4 ft. Its range is from  $-100^{\circ}\text{F.}$  to  $+200^{\circ}\text{F.}$  with controlled humidity up to 95%; and from sea level to 90,000 ft. pressure altitude. Altitude tests can be carried out from sea level to 50,000 ft. at an average rate of 5,000 fpm climb. It requires 30 minutes to reach 90,000 ft.

Over the temperature range  $-50^{\circ}$  to  $+120^{\circ}$ , an average rate of change is  $28^{\circ}\text{F.}$  per min. For extreme cold test the temperature can be lowered from ambient to  $-100^{\circ}\text{F.}$  in a matter of minutes. A similar period is required to reach  $+200^{\circ}\text{F.}$  All conditions can be programmed over a 24-hr. period so that automatic cycling can be carried out.



A pack howitzer, assembled and ready for firing and (at right) a Velvet Glove missile sits ready for firing on a launch stand.

successes convinced critics at home and abroad that defence science in Canada was, in its own particular sphere, as good as anywhere else.

Those of us who grew up with the board in those early days remember with pride the development of the Heller rocket — an anti-tank missile with a unique recoilless propulsion system utilizing a Canadian breakthrough in propulsion engineering and design. In the armament field the "pack howitzer" was a credit to its research and development team. The air-to-air guided missile *Velvet Glove*, although it never entered military service, created the demand in Canada for a strong electronics industry oriented to the space age. In retrospect, as a missile it was a technical success but as a vehicle

for training engineers, designers, managers and technicians both in the military and civilian field, it was a great success. All these developments emanated from the Canadian Armament Research and Development Establishment (CARDE) as joint efforts with the Canadian Forces.

The laboratory at Halifax, the Naval Research Establishment, did not take long to earn its spurs and the development of variable depth sonar was a valuable contribution to anti-submarine warfare. Its success can be measured by the fact that the novel concept was adopted by the USA, Britain and Australia. There were other research and development successes in the maritime field, particularly in anti-corrosion programs for ships in which the work of

the Halifax teams found ready use both in the civil and military world in Canada and abroad.

Naturally, the well-established laboratories had more initial and early successes than the new. The Chemical Warfare Laboratories in Ottawa continued to lead the field in a variety of protective devices for the combat soldier, from gas masks to unique detector kits for identifying low concentrations of toxic materials. The Suffield Experimental Station assumed a more international flavor and became a Mecca for a variety of important field trials and simulated chemical operations involving American and British test teams, both civil and military.

The newer establishments, the De-

# THE AIRBORNE SERVICES

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Glove.  
Re equip.

# THE AIRBORNE SERVICES

## Neptune Deliveries

The first Lockheed P2V-7 Neptunes to go into service with the RCAF arrived at RCAF Station Greenwood, N.S., at March's end. Two aircraft were involved in this initial delivery, which will be followed by others to East Coast maritime squadrons, and later to the West Coast unit.

The RCAF's P2V-7's differ from the U.S. version in that they do not have the two underwing jet pods with which the USN model is fitted to supplement the basic two Wright Turbo-Compound powerplants. The aircraft are designed for rapid conversion to use as bombers, mine-layers, or torpedo bombers. The long grotesque tailcone houses magnetic detection equipment for spotting underwater craft. Under the belly is a large radome for the antenna of powerful airborne radar equipment. A conspicuous feature of the P2V-7 is its 70 million candlepower searchlight for surface searching.

## CF-100 Trio to U.K.

Three RCAF Avro CF-100's have gone overseas for a tour of service with the RAF's Central Fighter Establishment in England. The first CF-100's to cross the Atlantic, these aircraft are being used to check-out RAF crews for participation in normal air defence techniques being carried out by the Establishment.

Crew members for the ferry flight were: Flying Officer F. C. Black, Flying Officer W. B. Sterne, Flying Officer C. R. Stampe, Flying Officer C. R. Embury, Flight Lieutenant P. E. Etienne, and Flying Officer H. G. Meinert.

The three CF-100's made the crossing as a part of Operation Random Twelve, which involved some 27 other jet aircraft. Included were T-33AN Silver Stars and Mk. 2 Sabres, all of which are eventually destined for Turkey and Greece as part of Canada's Mutual Aid contribution. Already painted in the colors of these countries, the Sabres and T-33's first went to Manchester, England, for overhaul and installation of instruments and similar ancillary equipment, printed in the appropriate language.

The ferry flight was led by Squadron Leader R. G. Middlemiss, commanding officer of No. 1 Overseas

Ferry Unit. The unit, which is based at St. Hubert, P.Q., was formed last year to handle the ferrying overseas of all jet aircraft. Since its inception, No. 1 OFU has delivered well over 250 jet aircraft to Europe.

## 3 OTU on the Move

Now under way is the shift from North Bay, Ontario, to Cold Lake, Alberta, of the RCAF's No. 3 All-Weather Operational Training Unit. The move, which is in accordance with established RCAF plans according to AFHQ, is to be completed by about the end of June.

The shift is designed to enable the aircrews of CF-100 fighter aircraft, while undergoing their advanced training, to use the new air weapons range in the Cold Lake area, which is approximately 100 miles northeast of Edmonton.

The RCAF emphasizes that North Bay will not be closed down, but will continue as a base for all-weather fighter squadrons, in addition to technical training units related to servicing and maintenance of CF-100's.

Movement of the OTU from North Bay will mean an initial reduction of

several hundred service personnel at the station. AFHQ points out, however, that this reduction will be largely offset as long-range plans for the station develop.

No. 3 All-Weather OTU is designed to train aircrew to operational standards in all-weather fighter interceptor operations necessary to meet aircraft build-up and aircrew requirements of newly-formed CF-100 squadrons. Pilots and radio-navigators convert to CF-100's at the Unit, and practice interceptions are carried out under all-weather conditions with the aid of radar, utilizing B-25K Mitchells, T-33AN Silver Stars, and CF-100's.

RCAF Station Cold Lake was officially opened on April 1, 1954. Described as being one of the most modern of its kind in North America, the station proper covers an area 1½ miles square. It is located on the fringe of the bombing & gunnery range, which covers approximately three million acres, leased from the provinces of Alberta and Saskatchewan.

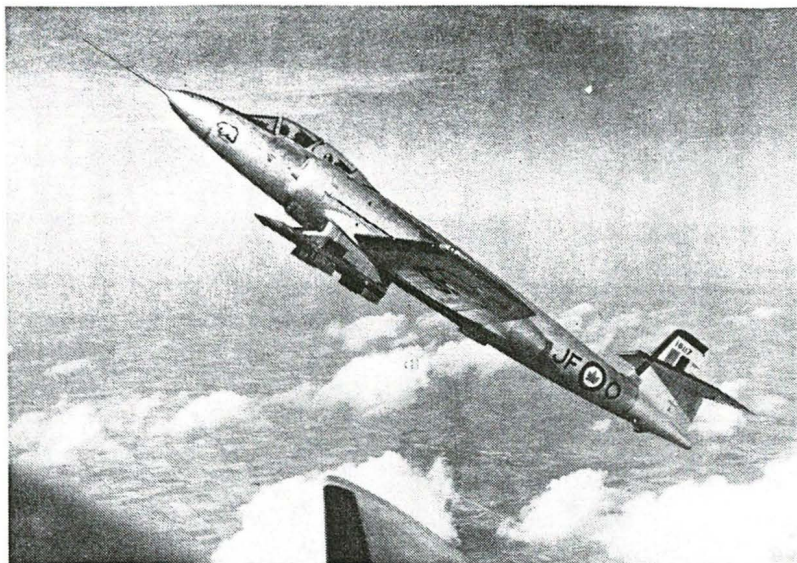
## Velvet Glove

First in a continuing series of air tests on guided missiles is being carried out at the RCAF's new air weapons range at Cold Lake, Alberta, according to an AFHQ announcement.



**RCAF NEPTUNES ON GUARD:** Deliveries have recently commenced on the Lockheed P2V-7 Neptunes which the RCAF has purchased for service with its maritime reconnaissance squadrons on Canada's east and west coasts. The first machines are now in service at Greenwood, N.S. RCAF P2V-7 does not incorporate the two Westinghouse J-34 jet pods which are a feature of the U.S. Navy's version of this aircraft.





**VELVET TOUCH:** Experimental missile carrying version of the CF-100 is shown in flight. Missile, two of which are mounted on underwing launching pylons, is the Canadian-developed "Velvet Glove". A joint project of the Canadian Armament Research & Development Establishment, and Canadair, the Velvet Glove has been cast off by the RCAF. Although the missile is said to have met its performance specification, by the time it became available, the specification was outdated.

Allied Powers Europe. General Cortlandt van Rensselaer Schuyler, SHAPE Chief of Staff, stated that, from now on, the construction of installations capable of accommodating a wing (75 aircraft, three squadrons) is being abandoned. Instead, runways accommodating only a single squadron of 25 aircraft, with their supporting elements living in tents at least six miles away, will be built. The decision to drop the wing grouping will triple the number of base sites required. This new approach is based on SHAPE's

revised thinking in connection with the potential of nuclear weapons.

### Postings & Careers

•Air Commodore F. S. Carpenter, AFC, CD, has been appointed AOC of Air Transport Command, replacing Air Commodore H. M. Carscallen. A/C Carpenter, AFC, joined the RCAF upon his graduation from Royal Military College in 1937.

•Air Commodore H. M. Carscallen, DFC, former AOC of Air Transport Command, has assumed the duties of

Chief Staff Officer, 4th Tactical Air Force, Trier, Germany, succeeding Air Commodore W. R. MacBrien, OBE. A veteran of 23 years with the RCAF A/C Carscallen flew on operations both in Canada and overseas during World War II.

•Air Commodore John MacL. Murray, CBE, has retired as the RCAF's Chief of Finance. A/C Murray's military career began with his receiving a permanent commission in the RAF in 1924. He transferred to the RCAF in 1941.

•Air Commodore Richard W. Desbarats has been appointed Chief of Finance for the RCAF. Educated at McGill University and the University of Ottawa, A/C Desbarats joined the RCAF in 1939 and was commissioned in the Supply Branch, transferring to the Accounts in 1940.

•Four senior officers of the RCAF have been selected to attend the 1956-57 course at National Defence College, Kingston. They are Group Captain Lawson H. Randall, DFC; Group Captain George H. Elms; Group Captain John J. Jourdan, AFC, and Group Captain Donald G. M. Nelson (Med/MO).

•Captain (L) Herbert George Burchell has been appointed Deputy Chief of Naval Technical Services effective August 14. In the appointment he will hold the acting rank of Commodore (L). Captain Burchell has been Assistant Chief of Naval Technical Services (Plans) since July, 1953.

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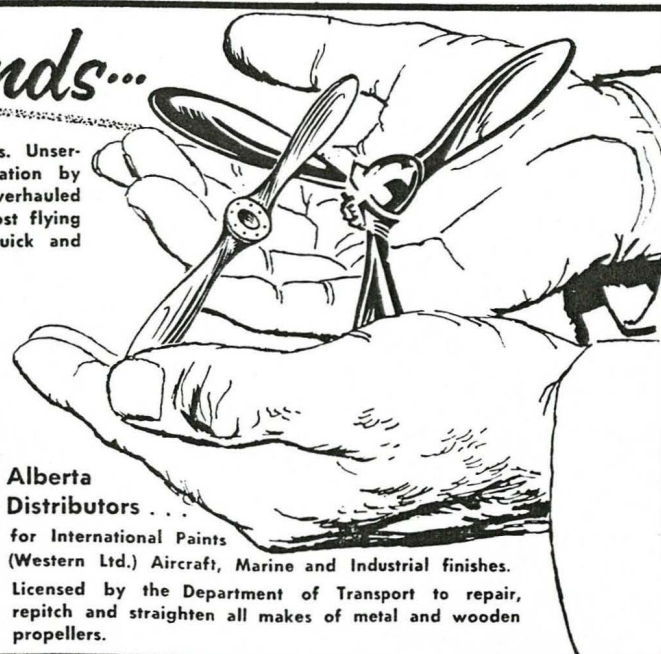
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## Comet Transfer

The RCAF last month brought one of its two Comet jet transports out of hibernation long enough to transfer it from storage at Ottawa's Uplands Airport to join its sister ship in storage at Toronto's de Havilland Airport. It covered the route, unpressurized, in less than an hour.

The aircraft were grounded nearly two years ago, following the crash of two Comets in the Mediterranean. An RCAF spokesman said no decision has been reached as to whether the \$1,544,000 airliners can or will be modified to make them safe for pressurized, high-altitude flying.

## More Sabre Aid

Canada is to provide Turkey next year with enough additional Sabres to equip a fourth fighter group, according to Herbert Moran, Canadian ambassador at Ankara. Under the Turkish-Canadian Mutual Assistance Program of 1953 Canada furnished enough aircraft for three groups.

## NATO Posting

Air Commodore S. W. Coleman, 49, Air Officer Commanding, Tactical Air Command, Edmonton, has been appointed Assistant Chief of Staff for Plans and Policy at headquarters of Allied Air Forces Central Europe, Fontainebleau, France. He succeeds Air Commodore Robert C. Ripley, 42, who will attend the Imperial Defense College in Britain next January. Group Captain H. G. Richards, 46, TAC chief staff officer, will serve as acting AOC until a replacement is named for A/C Coleman.

A/C Coleman is a 1928 civil engineering graduate of McGill University. He joined the RCAF the following year and in the early thirties participated in northern bush flying. Wartime duties carried him to various East Coast stations before being transferred to Washington in early 1945. War's end found him at Guam, in the Pacific, with the U.S. 20th Air Force.

## 412 to Uplands

The RCAF's 412 Transport Squadron, after 16 years at Ottawa's Rockcliffe Airport, moved bag and baggage last month to Uplands Airport, 10 air miles away. Uplands' longer runways

were said to be the chief motive. There, the unit will occupy a modern steel arch hangar and share with Air Defense Command a cantilever hangar.

When the squadron was formed in 1939 it had an odd collection of aircraft, Tomtits, Fleet Finches and a Grumman seaplane. Later, it acquired Lockheed 10's, 12's and Lodestars, Norsemen, Grumman Gooses and Liberators. Today it flies North Stars, Dakotas, Expeditors and the solitary Canadair Five.

## For Finer Fuel

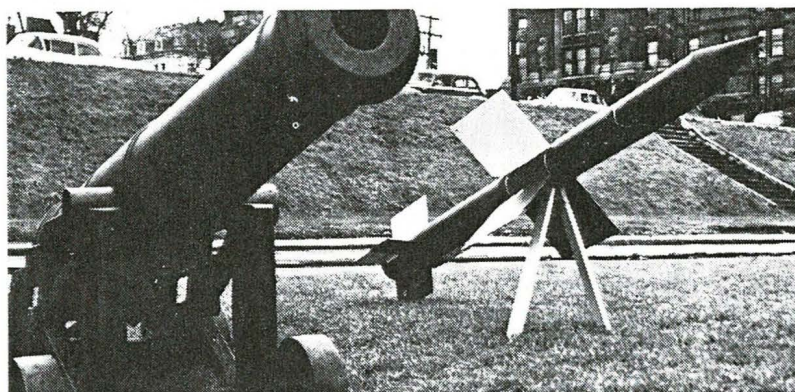
A new first in naval engineering has been achieved with the production of aviation fueling equipment for the new RCN aircraft carrier, HMCS Bonaventure, which will ensure that only pure, properly constituted aviation fuel can be pumped into the carrier's aircraft. The equipment was designed

outlet fueling stations, each complete with fuel filter/water separators, power operated hose reels and suitable tank filling nozzles. The blending apparatus is the first to be installed in a major war vessel in any navy.

## Photo Intelligence

The Photographic Interpretation Section of 408 Photo Squadron at Rockcliffe has been reorganized and redesignated as the RCAF's Air Photographic Intelligence Centre. Its function will be to provide photo interpretation for Canada's Mobile Striking Force and for 408 Squadron, which is engaged in aerial mapping in the northland. In addition, it will be responsible for interpretation of all aerial reconnaissance photos, and will prepare mosaic photographs and photographic maps for RCAF use.

Commanding officer is Squadron Leader Jack T. Arnold, 40, of St. Thomas, Ont., who formerly headed the Photo Interpretation Section. S/L



THE RAMPARTS WE WATCH: Early version of Velvet Glove air-to-air missile was shown publicly for first time at AITA convention and is shown here beside one of its ancestors at Quebec. Originally designed by CARDE, the missile is undergoing further development by Canadair, working in close association with the government agency. Also co-operating with Canadair in the Velvet Glove program are Canadian Westinghouse, Avro Aircraft, DH Canada, and Computing Devices.

and built by S. F. Bowser Co. Ltd. of Hamilton.

In planning the Bonaventure's fueling arrangements the RCN established three main requirements: equipment to transform two standard fuels into the specialized mixtures necessary for the correct functioning of turbine driven aircraft; equipment to ensure that all contaminants, particularly water, were removed from the fuel as close as possible to its entry into the aircraft; equipment to facilitate the rapidity of both underwing and overwing refueling.

The installation consists of two sets of fuel blending apparatus with 14 two-

Arnold joined the RCAF in 1940 and served on instructional and operational flying duties in Canada during the war. Since then he has been employed in flying control, administrative and flying duties. In 1954 he joined 408 Squadron.

## Radar Extension

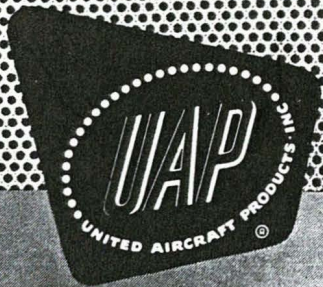
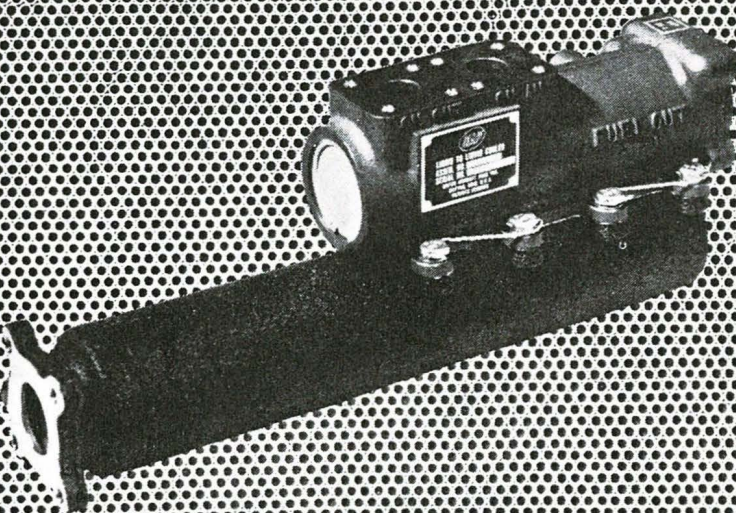
Canada and the U.S. are reported to have agreed in principle to a 600-mile east coast link-up of the Mid-Canada and Pinetree radar lines, with Canada footing one third of the bill and the U.S. the remainder.

Defence Department officials described the line as a fill-in and not an

Half a billion tubes used by UAP, represents a staggering number of safe flying hours. UAP tubular-type coolers built in 1929, are still giving every day service on reciprocating aircraft engines.

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mond, Canadian P & W vice-president, comments: "It is a natural development of our present operation. As an associate company of Sikorsky aircraft we have represented them in Canada since the outset in sales, service, and overhaul. Our overhaul experience embraces assembly and many sub-assembly operations on helicopters. We are making the engines they use, and the mechanical components of the helicopter are similar to engine components and can be made with little addition to our present machinery and equipment. Much of the initial planning for this work has already been completed."

### Alterations?

Production plans for the Velvet Glove, Canada's air-to-air guided missile, are reported to have been delayed to accommodate modifications. The nature of these modifications has not been revealed. However, the RCAF is continuing test launchings at the Cold Lake, Alta., air weapons range, using CF-100's to heft the 8 foot missile in under-wing racks.

Canadair Ltd. holds a pre-production contract under authority of the Canadian Armament Research & Development Establishment at Valcartier, Que. Other contributors to the program are Canadian Westinghouse, Avro Aircraft, de Havilland and Computing Devices of Canada.

### Collins Expands

Collins Radio Co. of Canada Ltd., after less than eight months' operations, has completed a second expansion of its Toronto plant, bringing floor space from 22,000 to 50,000 sq. ft. Personnel will increase to about 250 when necessary equipment has been installed.

### Thor Naturalized

The Etobicoke plant and all other assets of Thor-Canadian Co. Ltd., Canada's largest supplier of aircraft ejector seats, have been acquired by a group of Canadian industrialists and financiers headed by F. M. McGovern, long-time president of the company during its 29 years of U.S. ownership.

Thor has produced more than 2,000 ejector seats for the Sabre and the T-33, under contract to Canadair. It has also produced two models of radar antenna and parts for the Orenda engine. In addition, it is producing

## New Sabre Mod.

North American Aviation is currently working on a new Sabre wing modification aimed at further improving performance at altitude at the same time as it improves handling characteristics at low speeds, such as in approach and landing. It is expected that the modified wing will be fitted to RCAF Sabre 6's if tests show a significant improvement in performance.

The modification is a comparatively simple one comprising the re-introduction of leading edge slats and the addition of extended wing tips. The design of the leading edge slats is being reworked so that they will always open and close simultaneously. Apparently it was not uncommon with earlier slat-fitted models of the F-86 for one slat to open while the other remained closed.

## German CF-100s?

Reports persist in Britain that the Canadian Government intends to donate several dozen fighters to the new West German air force. There has been no confirmation from Ottawa.

One report says three squadrons, comprising 36 aircraft, have been pledged. Two squadrons would be of

CF-100's and one of Sabres.

On a recent visit to Canada, Dr. Ludwig Erhard, West Germany's Minister for Economic Affairs, inspected production facilities of Canadair Ltd.

## Labor Pains

A walkout July 11 of 1,700 production workers, members of the CIO United Auto Workers, and the subsequent laying off of 1,300 office and technical employees, brought activity to a standstill at the plant of The de Havilland Aircraft of Canada Ltd. at Downsview, outside Toronto.

Suspended by the strike were:

- Production for the U.S. military, the RCAF and civil operators of Otter utility aircraft;
- Production for the U.S. military and civil operators of Beaver utility aircraft;
- Production for the RCAF of 60 Chipmunk primary trainers;
- Manufacture of spares and provision of factory overhaul for these three types;
- Preparation for production of CS2F Sentinel anti-submarine aircraft for the Royal Canadian Navy;
- Repair and overhaul for the RCAF of General Electric J-47 jet engines

used in early models of the Sabre interceptor, and of deHavilland Goblin engines used in the second-line Vampire fighter; also Orendas;

- Repair and overhaul for the RCAF of Vampires and North Star transports;
- Research and development (the nature of which is classified) for the Defense Production Department on guided missiles;
- Development and prototype construction of a twin-engine, high-wing, Otter-size utility transport.

The 1,700 production workers, during 10 months of negotiations, demanded that their wages, ranging from \$1.44 to \$1.98 an hour, be increased by an average of 10 cents. They rejected a company compromise which would have resulted in an average increase of 2.6 cents an hour.

On July 24, members of the AFL Machinists' Union ratified a new master agreement providing an hourly wage increase averaging nearly 10 cents for some 10,000 workers of the Avro Canada Ltd. companies.

The Department of Labor, incidentally, releases figures which indicate that workers in all categories of the aircraft and parts industry received higher pay during the year ending October, 1954, than ever before. The overall increase over 1953 was in the neighborhood of 12 per cent.

## Missile Order

The Canadian Government has placed a pre-production order with an undisclosed manufacturer for an unstated number of unidentified air-to-air guided missiles, Defence Minister Campney told the Commons recently.

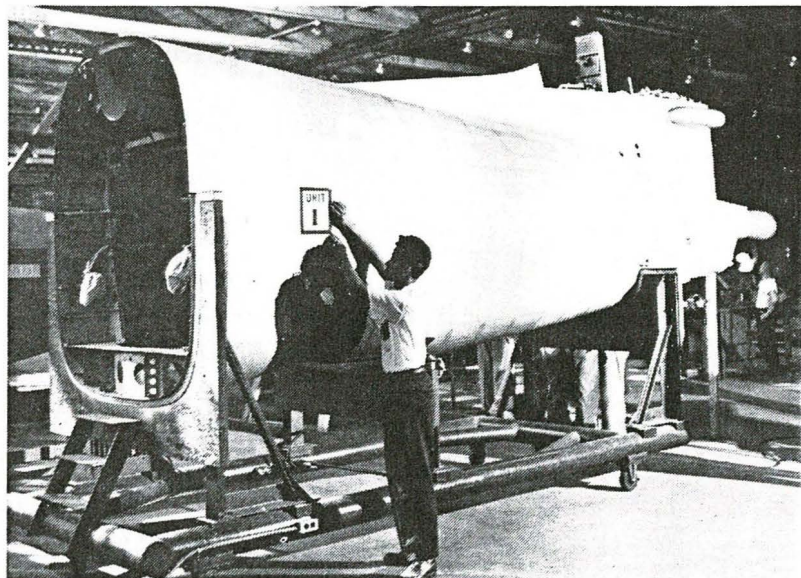
(The contractor is believed to be Canadair Ltd. and the weapon the Velvet Glove, developed by the Canadian Armament Research and Development Establishment at Valcartier, Que.)

Mr. Campney said also that a pre-production order is soon to be placed with Avro Canada Ltd. for the CF-105 supersonic interceptor.

In this connection, Mr. Campney observed:

"Once you are committed to one particular phase, it is difficult to detach yourself if you find that you have made a mistake.

"I think it is better to be careful and



CANADAIR DELIVERS FIRST CS2F REAR SECTION: Shown ready to be delivered to the prime contractor is the first CS2F-1 Sentinel rear fuselage section to be completed by Canadair, which is building these components under subcontract from The de Havilland Aircraft of Canada. DHC is building the Sentinel for the RCN. Not started until December, 1954, section number one was completed by early July, thus maintaining Canadair's tradition of on, or ahead of schedule deliveries.

French Morocco. At an official ceremony held in the Canadian Embassy, Airman First Class, Henri Thopart, of Mazingarde, Pas-de-Calais, was awarded the BEM by Jean Desy, Q.C., Canadian Ambassador to France, on behalf of Her Majesty the Queen. Representing the RCAF's No. 1 Air Division at the ceremony were Air Commodore W. I. Clements, Chief of Staff, and Flight Lieutenant G. W. Patterson, acting officer commanding the 416 Squadron at the time of the accident resulting in the death of Flying Officer J. H. Volving.

## Able-Bodied Airmen

Nine men of the Royal Canadian Navy's seaman branch who thought that their training destined them to shipboard duty for the rest of their naval careers, have taken to the air.

They are the sonar operators serving with the RCN's first helicopter anti-submarine unit, HS-50.

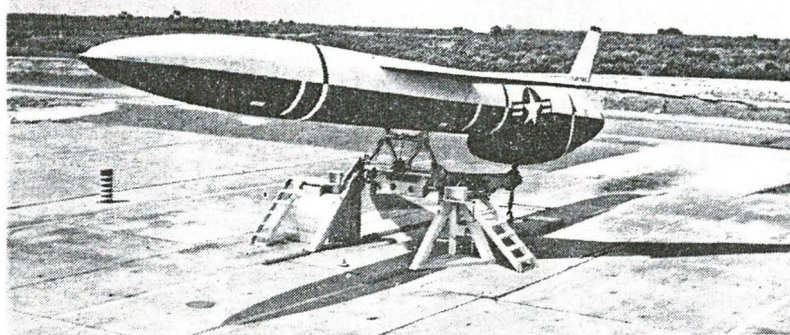
The unique feature of the anti-submarine helicopter is its sonar equipment, whose underwater "ear" can be lowered from the hovering machine, raised while the aircraft is flown to a new position, lowered again, and so on. Thus, by means of this so-called "dunking" sonar, a large area of the ocean may be rapidly searched for submarines, and their presence reported to attending warships or aircraft.

The unit itself came into existence on July 4, 1955, under the command of Lieutenant-Commander G. H. Marlow. It was allotted six Sikorsky HO4S-3 helicopters. The pilots and ground crew went to the Sikorsky plant in Bridgeport, Conn., to accept them and ferry them to the Royal Canadian Naval Air Station, Dartmouth, N.S.

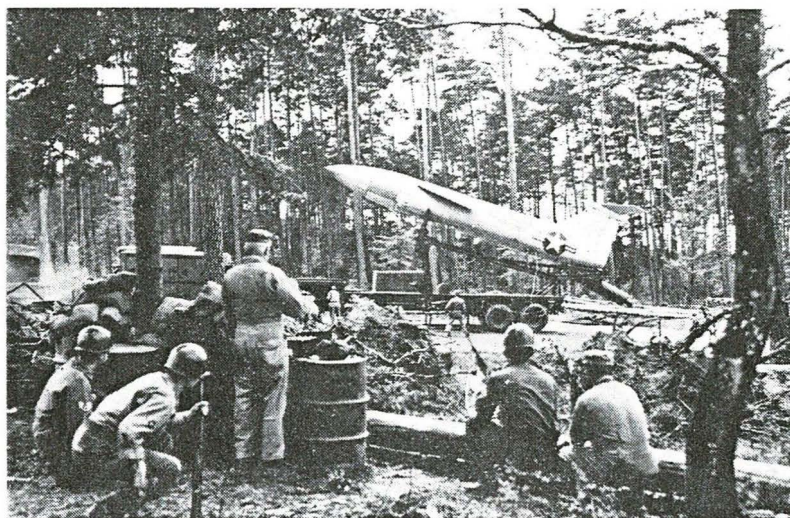
## Supreme Command Visit

General Alfred M. Gruenther, Supreme Commander Allied Powers in Europe, paid a fast-paced two-day visit to Ottawa and Montreal as guest of the Canadian Government on March 13 and 14. He was met at RCAF Station Uplands by Defence Minister Ralph Campney, Gen. Charles Foulkes, Chairman of the Chiefs of Staff, and the Chiefs of Staff, and Ambassadors of NATO countries resident in Ottawa, and then whisked away to a talk with Prime Minister Louis St. Laurent before addressing a Canadian Club luncheon at the Chateau Laurier Hotel.

Immediately following the luncheon he held a brief press conference in the



**MISSILES WITH MUSCLES:** Above is shown the first U.S. intercontinental guided missile, the USAF's Northrop Snark SM-62. One of these subsonic missiles, which are powered by conventional turbojet engines, recently flew 2,000 miles during tests, though ultimate range is said to exceed this figure. Below, the Martin Matador on operational service in Europe; personnel of a USAF pilotless bomber squadron prepare to perform a simulated launching from a secluded thicket close to Iron Curtain country. The Matador, like the Snark, is subsonic. It is powered by an expendable Allison J-33 turbojet.



Parliamentary Press Gallery, after which he called on Defence Minister Campney, and External Affairs Minister Lester B. Pearson. Later in the afternoon he was guest of honor at a reception in the RCAF Officer's Mess for senior officers of the Dept. of National Defence, followed by a dinner tendered to him by the Canadian Government.

The next morning he addressed a closed meeting of the Members of the Senate and Parliament in the Railway Committee Room of the House of Commons. At 11:00 a.m. he left Uplands for Dorval to address the Montreal Canadian Club luncheon, following which he left Dorval for Washington.

## Guided Missile Tour

Visitors from the University of British Columbia and western newspapers were recently taken on guided tour of the RCAF's 7,000-acre guided missile firing range at Cold Lake, Alta.,

where the Canadian developed "Velvet Glove" missile is being tested.

"It's time Canadians knew we have a guided missile, that it is being fired, and that Canada does not have to take a back seat to any nation in developments in this field," said Group Captain R. C. Stovel, CO of the huge RCAF station, which is 140 miles north of Edmonton.

## USAF F-100's Overseas

A flight of 12 USAF F-100 Super Sabres left for Europe early last month to mark the beginning of the conversion of the USAF fighter units there to "supersonic" status.

The Super Sabres, piloted by the men of the 1708th Ferry Wing and the 1708-12 Ferry Wing Detachment, made stops in Labrador and Iceland, prior to being assigned to the 45th Fighter Squadron in French Morocco. Because of the excellent flying weather in Mo-