THE Roundel

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NORAD ISSUE

THE Roundel

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THIS MONTH'S COVER

Two-nation defence partnership is illustrated by USAF Staff Sgt. R. G. Frashier and RCAF LAC D. Ralph, co-workers at NORAD's Grand Forks, N. D., Sector. This unique shot, seemingly taken from inside a radar scope, shows Ralph using a light gun to "call up" aircraft-track identification data from SAGE computer.

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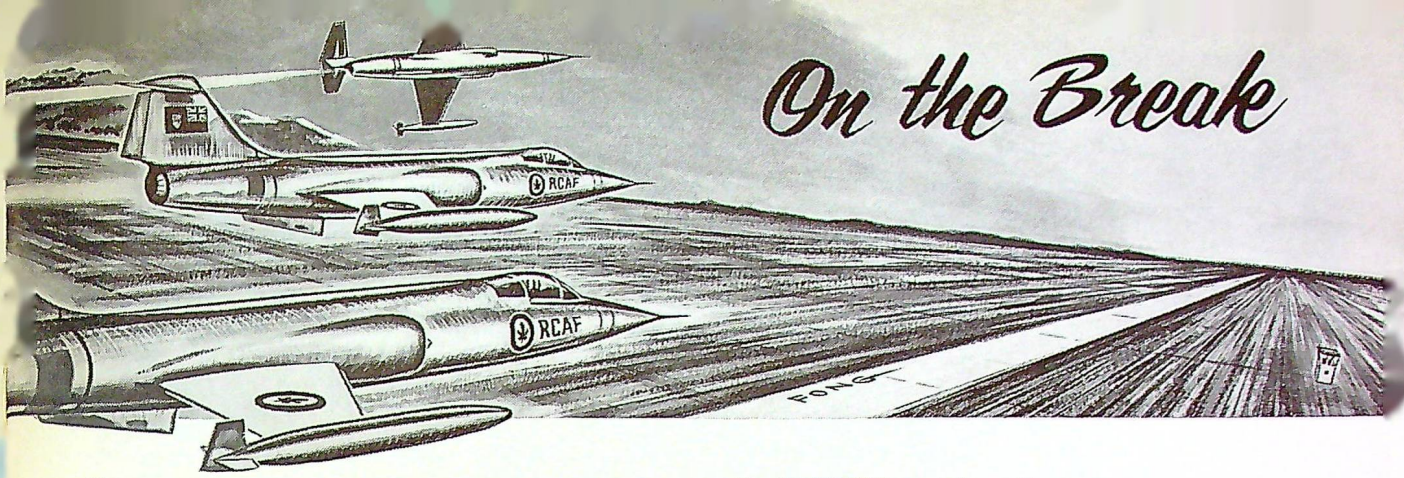


On the Break

PRODUCTION of THE ROUNDEL, especially an issue such as this one on NORAD, requires the co-operation of a great many people. Only a few are given public recognition in the form of bylines on major articles.

The co-manning picture story (beginning on page 9) is a good example. A few weeks ago S/L Joe Connolly, NORAD deputy director of information at Colorado Springs, sent our request for photos to all pertinent units. As deadline approached, a veritable flood of material began arriving in Ottawa from such widely scattered points as Tacoma in the west, Bangor in the east and Montgomery in the south. How many USAF and RCAF personnel, including subjects and photographers, were involved in this project is difficult to estimate. The net result is our three-page layout, selected from their contributions, and our sincere vote of thanks for their co-operation.

AIR Vice Marshal Murray Lister, whose concise yet comprehensive picture of NORAD begins overleaf, has been deputy chief of staff for operations at NORAD HQ since December 1960.

Born in Edmonton, educated in Calgary and at RMC in Kingston, he joined the RCAF in 1935 and received his pilot's wings the following year. He served at various training and operational centres in Canada until being transferred overseas in 1945, first with No. 84 Air Disarmament Group in Germany, then as director of personnel at RCAF London HQ. His post-war assignments include a six-year tour on the directing staff of National Defence College and AFHQ appointments as chief of plans and intelligence, chief of training and, prior to his present post, deputy vice chief of the air staff.

OUR assistant editor, F/L Tom Coughlin, had more excitement than he bargained for on his reportorial trip to the DEW Line (page 16). The *North Star* in which he was a passenger made an unscheduled (and permanent) stop on the frozen tundra, fortunately with no injury to any of those aboard. As the crash-landing survivors scrambled to safety, cool Coughlin calmly recorded the action on film — in a minus 26° temperature lashed by a 40-knot wind.

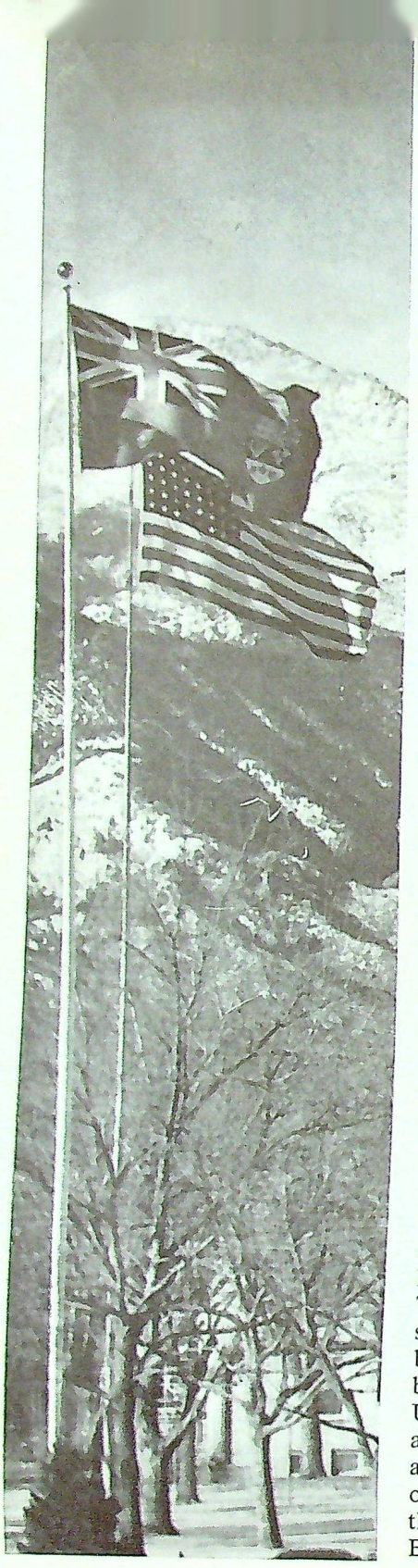
Meanwhile, hundreds of miles to the south, LAC Dale Lounsbury was writing the Mid-Canada Line article (page 22) and preparing for his transfer from Bird to Kamloops. Previous tours at Pine Tree stations Mont Apica and Edgar followed his graduation as a fighter control operator in September 1957.

AUTHOR of this month's station story (page 25), F/L George Collison is currently converting to CF-101B aircraft at Namao prior to rejoining No. 414 Sqn. and eventually returning to North Bay.

A native of Surrey, England, he was a wartime RAF pilot and joined the RCAF in 1954. His subsequent career has been almost exclusively in the all-weather fighter field — as an instructor in No. 3 OTU, and on CF-100 operational tours with Nos. 433 and 414 Sqns. — all units based at "Ontario's Gateway of the North."

A. Patou S/L

Editor



The evolution and current status of...

NORAD

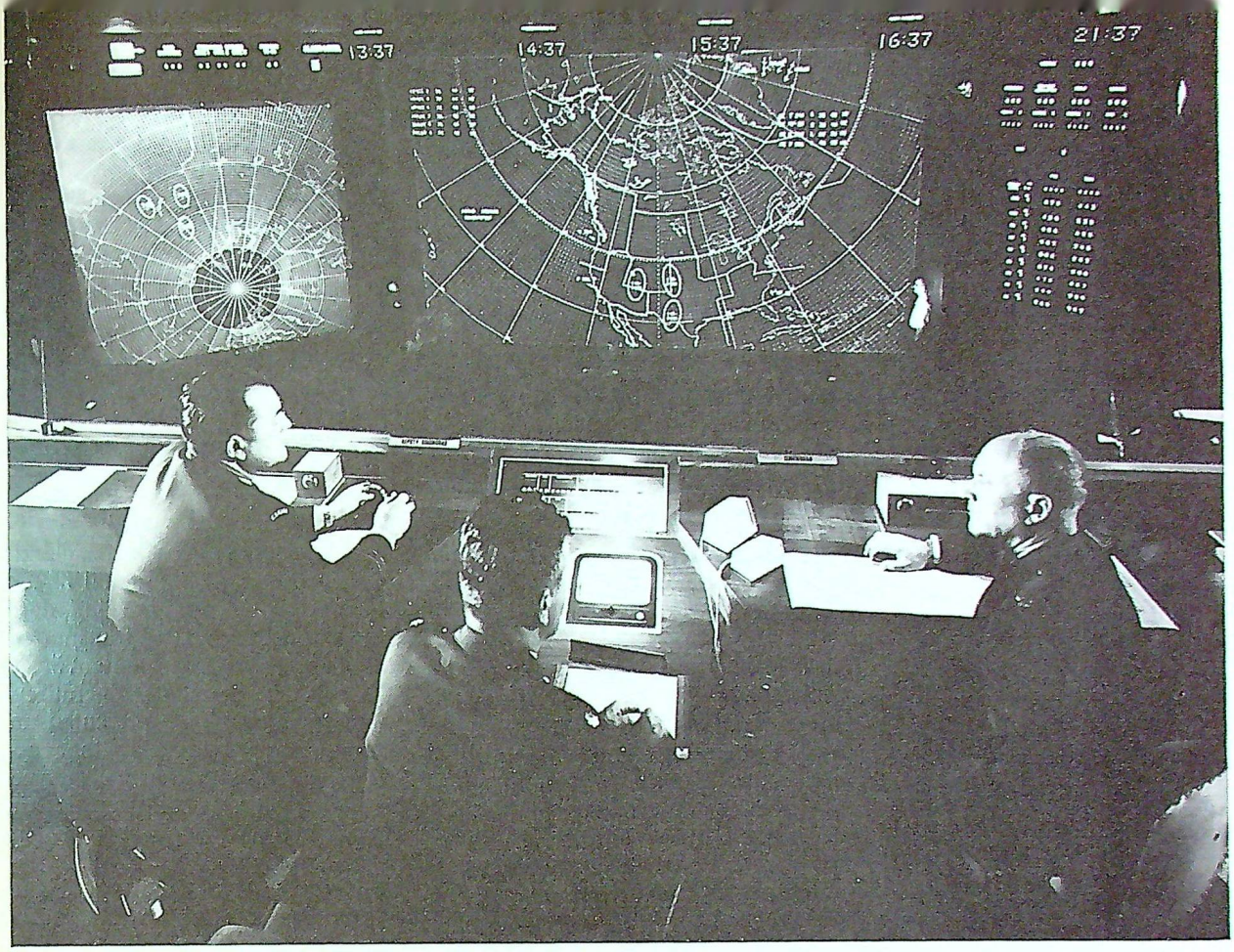
By AIR VICE MARSHAL M. D. LISTER

Deputy Chief of Staff for Operations, North American Air Defence Command

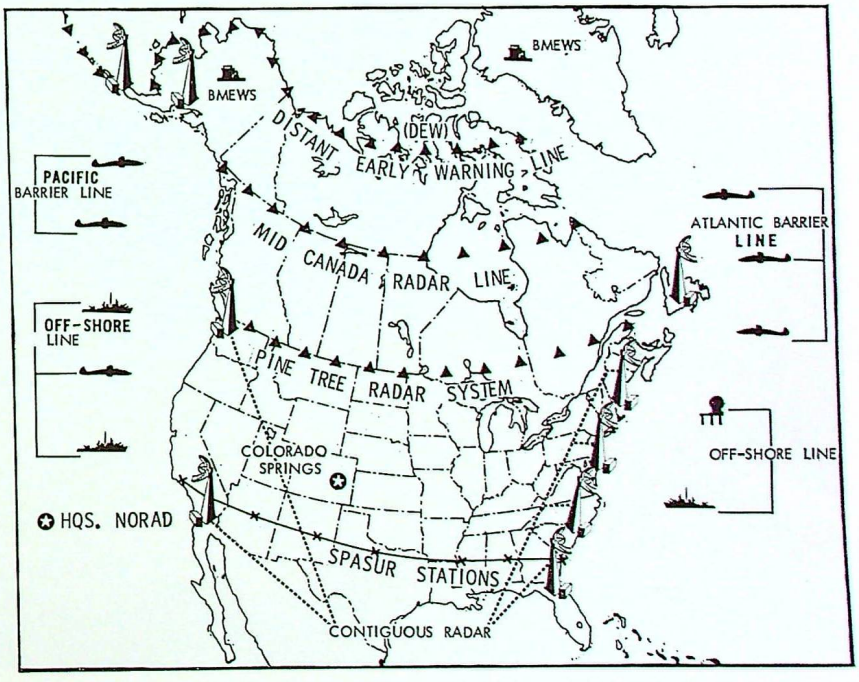
THE North American Air Defence Command, succinctly known as NORAD, was formed in September 1957. Its origin, however, goes much farther back than that.

Canada and the United States have had a close partnership in matters of defence since the early days of World War II when the Canada/United States Permanent Joint Board on Defence was established for direct consultation between the two countries on matters of mutual concern or interest related to defence. This board, which has functioned continuously since that time, has both a Canadian and a United States chairman. Each chairman reports directly and personally to the head of his government, the president in the United States and the prime minister in Canada. The board has, in the past, considered many air defence problems such as the building of the Pine Tree radar system in Labrador and southern Canada, a project in which both the financing and manning has been shared by Canada and the United States; the Mid-Canada Line, an early warning line built, financed and manned by Canada but clearly of vital importance and interest to the United States; and the Distant Early Warning Line across the northern rim of the continent in the Canadian Arctic, built and financed by the United States but with RCAF personnel participating in the manning.

In 1949 the air defence organizations in the two countries prepared detailed emergency air defence plans. Co-ordinated and reviewed by chiefs of staff in both countries, these plans provided for mutual support and co-operation in the event of an attack on North America. By 1954, however, it had become apparent to the military planners that in any future aerial attack on this continent, the two nations would stand or fall together. Neither nation was able any longer to defend itself alone within its own geographical boundaries. The greatly increased speed with which weapons could be delivered against North America made it essential that a single integrated system be created under a single over-all commander who would have under his operational control all the air defence forces of both nations. Only under such an organization could the rapid reaction required be realized. Additionally, the commander of such an organization would be in an ideal position to make timely and appropriate recommendations to the governments



NORAD Combat Operations Centre (above) is focal point for far-flung facilities diagrammatically depicted at right. An electronic display system, known as "Iconorama", permits battle staff to see, almost instantaneously, positions of airborne objects thousands of miles away.



of the two countries for improvements in the air defence system to keep it modern and effective.

In August 1957 the Canadian minister of national defence and the United States secretary of defence announced that the two countries had agreed to the setting up of the integrated North American air defence system. The joint announcements pointed out that this bilateral arrangement extended the mutual security objectives of the North Atlantic Treaty Organization to the

air defences of the Canada/United States region.

The formal government-to-government agreement provides that NORAD will be maintained for a period of ten years — or such shorter period as agreed to by both countries. The commander-in-chief of the North American Air Defence Command (CINCNORAD) is responsible to the Chiefs of Staff Committee of Canada and the Joint Chiefs of Staff of the United States. During any period of absence of CINCNORAD, command passes to the deputy CINCNORAD. The appointment of CINCNORAD and his deputy must be approved by both governments and it is stipulated that they shall not be both from the same country.

General Earle E. Partridge, USAF, was appointed the first commander-in-chief and Air Marshal C. Roy Slemon, RCAF, deputy commander-in-chief. General Partridge served until August 1959 and was succeeded by General Laurence S. Kuter, USAF, the present CINCNORAD. Air Marshal Slemon still fills the post of deputy.

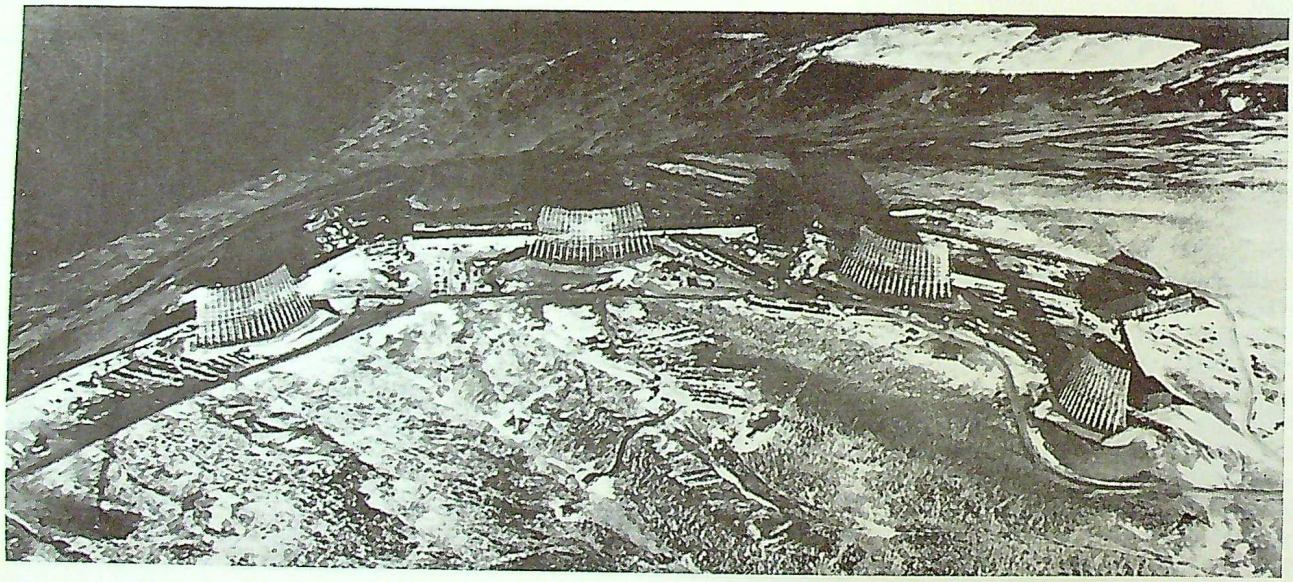
The NORAD mission is to defend Canada and the continental United States, including Alaska, against air attack. CINCNORAD exercises operational activities of these forces. Responsibility for administration, discipline, logistic support, and training, however, rests with national component commanders. For Canadian forces the air officer commanding, RCAF Air Defence Command, is the component commander; for United States forces the components are United States Air Force Air Defense Command, the US Army Air Defense Command and US Naval Forces CONAD. A special situation applies in Alaska, where the air defence forces over which CINCNORAD exercises operational control, belong to the commander-in-chief, Alaskan Command.

SURVEILLANCE NETWORK

Today NORAD must be on guard not only against a manned bomber attack but also against the ballistic missile and space threat. Very literally a watch must be maintained over the whole North American continent from just above the ground to well beyond the atmosphere. It is no longer just air defence but is now aerospace defence. This surveillance is provided by three separate surveillance systems, each of which feeds information to the NORAD combat operations centre at Colorado Springs.

One of these detection systems is the Ballistic Missile Early Warning System (BMEWS). Two BMEWS sites are now operating: one at Thule, Greenland, and the other at Clear, Alaska. The third BMEWS site is being built at Fylingdales Moor in northern England, and will become operational in the near future. Missile warning data from these sites are transmitted automatically and instantaneously to the NORAD combat operations centre where they are presented on a large visual display; simultaneously this same information is displayed at the headquarters of Strategic Air Command, the joint war room in Washington and the national defence headquarters in Ottawa. The huge radars in the BMEWS sites can detect an object as far as 3,000

BMEWS radar screens, like these at Thule, Greenland, measure 400 ft. long and 165 ft. high. Data from the system are fed back to NORAD COC to provide warning of missile attack.

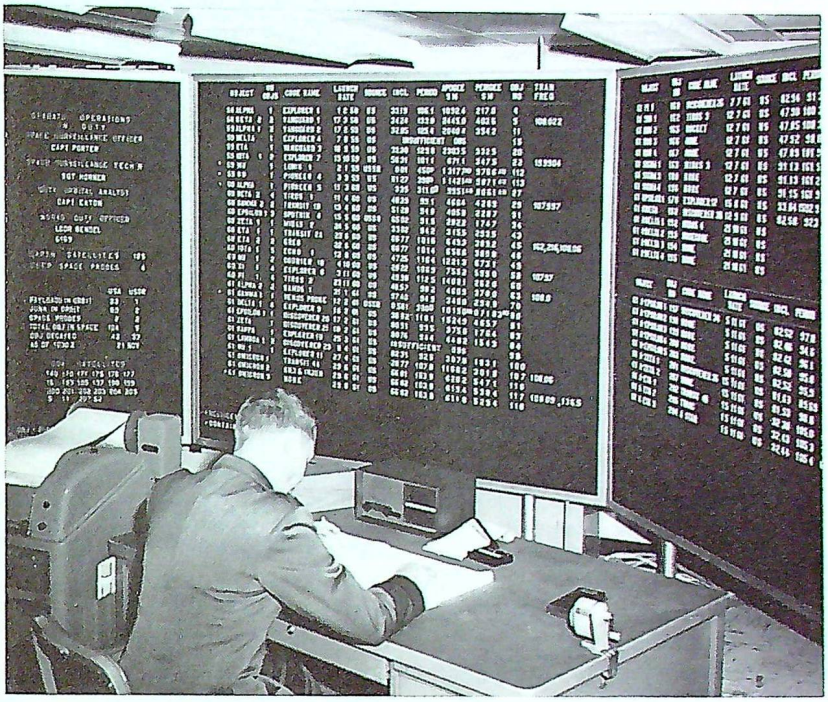


miles away and the system will provide warning of 20 to 25 minutes of a missile attack on North America.

Another element of the detection and warning system is the Space Detection and Tracking System (SPADATS). SPADATS embraces the US Air Force space track system and the US Navy space surveillance system, plus a number of co-operating sensors which have the capability of observing objects at great distances in space. Two of these co-operating sensors are located in Canada — the Baker Nunn Camera at Cold Lake, Alberta, and the Prince Albert Radar Laboratory in Saskatchewan. Data from both of these facilities are being passed to the NORAD SPADATS Centre in Colorado Springs.

The function of the Space Detection and Tracking System at this time is simply to maintain a complete catalogue of all man-made objects in space. This includes, of course, not only capsules carrying payloads in orbit but also the many pieces of space junk circulating in space — such things as old booster motors and pieces of satellites which have disintegrated in space. Only by knowing exactly what is in space and constantly keeping track of all objects can new objects in space be detected, identified and tracked.

The deployment of the manned bomber surveillance network might best be described in terms of the ever-widening ripples caused by a stone dropped in a pool. At the centre, the populated areas of Canada and the United States are covered by a massive radar network. This coverage is extended for a considerable distance out to sea off both coasts by large radar-equipped aircraft operated by the United States Air Force and picket ships operated by the United States Navy. In addition, off the east coast there are two radar platforms called Texas Towers.



Status boards in NORAD's SPADATS Control Centre at Colorado Springs display tracking information on all man-made objects in earth orbit.

North of this solid radar coverage of the populated areas is the Mid-Canada Line. This is a doppler detection system which provides highly reliable information on any aircraft crossing it, from ground level to very great heights. The reliability of this line is such that tactical action can be initiated upon its penetration before the bombers have reached the contiguous radar coverage.

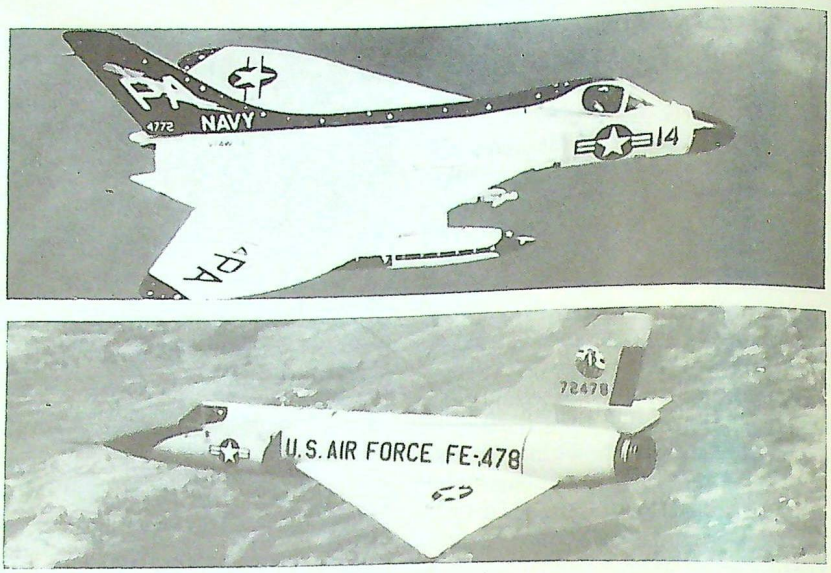
Six hundred miles further north, on the edge of the continent is the Distant Early Warning (DEW) Line. This line ties in to the radar coverage in Alaska and has sea wings extending on the west far out into the Pacific to Midway Island. To the east the line crosses Greenland and Iceland and ties in to a radar in Britain which is part of the NATO warning system in Europe. These Pacific and Atlantic extensions of the DEW Line are operated by the United States Navy.

Detection of aircraft must be followed by rapid and accurate identification. Because the enemy can choose the time and place of an attack and might use the normal friendly air traffic as a screen, NORAD must know the identity of aircraft over or approaching the continent at all times.

For this reason, Air Defence Identification Zones (ADIZ) have been established around the coasts, borders and northern extremities of the NORAD area. Stringent rules have been imposed to facilitate identification of all air traffic penetrating or operating within these zones. The principal method of identification is based on flight plan correlation. Information derived from a ground-filed flight plan, updated by information obtained from in-flight amendments and position reports, is compared with an actual radar track of an airborne object. If the information on the flight and

the track correlate within established criteria, the track may be identified as "friendly". If the flight plan information and the track do not match, or if there is any doubt, an interceptor may be scrambled to make visual identification.

There are futher safeguards for use in an emergency. A plan called SCATER (Security Control of Air Traffic and Electro-magnetic Radiations), provides for the immediate grounding or diverting of all civil and nontactical military aircraft within the boundaries of the United States. SCATER can be put into effect by NORAD in co-operation with the Federal Aviation Agency. In Canada, a similar plan called ESCAT (Emergency Security Control Air Traffic) would be invoked in co-operation with the Department of Transport.



Top: F4D *Skyray*, armed with Sidewinder missiles and Mighty Mouse rockets. Bottom: F-106 *Delta Dart*, armed with Falcon missiles and Genie rockets.

THE WEAPONS

As with the detection and warning system, a defence in depth concept has been carried out in the weapons system. The aim is to subject an invading aircraft to continuous attack from as far out as possible, as it approaches a target area. An enemy bomber would first be attacked by long-range manned interceptors, next by pilotless interceptors of the BOMARC type, and finally, if it still survived, the bomber would come within the range of the missiles of the NIKE family.

NORAD's current interceptor force includes the USAF's F-101B, F-102, F-106, the USN's F-4D and the RCAF's CF-101B. In all, there are more than 40 regular fighter-interceptor squadrons in the NORAD system, of which five are the recently re-equipped RCAF CF-101B squadrons. In an emergency, these forces would be augmented by available fighter aircraft of the US Navy and the Royal Canadian Navy, US Marine Corps, US Air Force, the Air National Guard, and the interceptor training units of the RCAF Air Defence Command.

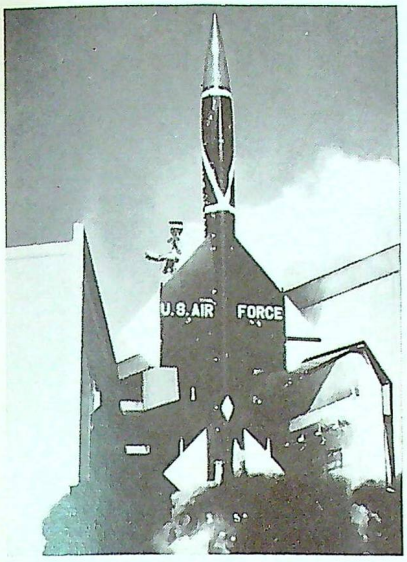
The MB-1 atomic air-to-air rocket Genie and GAR-11 Falcon atomic guided missile, now utilized by NORAD aircraft in the United States, tremendously increase the kill capability of the fighter-interceptor. Described as the "most important aerospace defence development since the introduction of radar," the Genie was first successfully fired in 1957. The GAR-11 joined the NORAD inventory in the summer of 1961. When detonated in a formation of enemy bombers, either weapon would wreak havoc on the attacking aircraft. More important, however, is the fact that an atomic air defence weapon has the capability of killing an atomic bomb — that is, it will render it harmless whereas conventional weapons will bring the bomber down but the weapon it is carrying can still detonate with devastating results.

Among the surface-to-air missiles employed by NORAD, the BOMARC has the longest range. The BOMARC A became operational within NORAD in 1959 and a longer-range version, the BOMARC-B, became operational in 1961. Both weapons employ nuclear warheads. An RCAF BOMARC-B squadron is now deployed at North Bay and a second squadron will be available shortly. At the time of writing, however, no decision has been announced by the Canadian government with respect to the acquisition of warheads for these Canadian-based defensive missiles.

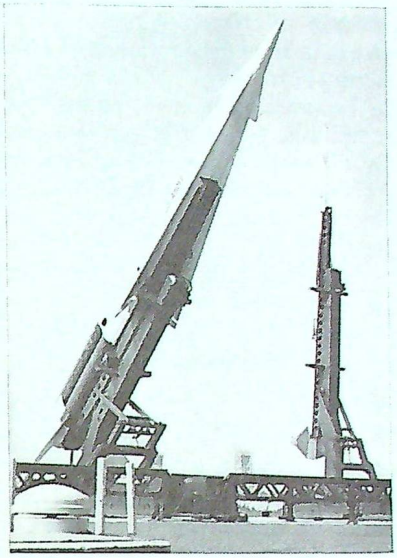
There are two members of the NIKE family of surface-to-air missiles in the NORAD arsenal: the NIKE-AJAX which has been employed since 1953 and the NIKE-HERCULES which became operational in 1958. NIKE-HERCULES is manned by regular US Army forces while NIKE-AJAX is manned by on-site Army National Guard forces on air alert status. The NIKE-AJAX uses conventional warheads while the NIKE-HERCULES weapons may be armed with conventional or atomic warheads.

COMMUNICATIONS AND CONTROL

Tying the whole detection and weapons system of NORAD together is a vast communications net-



BOMARC missiles home on targets in excess of Mach. 2.5 and at altitudes of more than 80,000 ft.



NIKE HERCULES (left) and AJAX missiles are manned by US Army units defending key targets.

work. Information from the detection system must be transmitted rapidly to control centres located all over the continent, where it can be assessed and evaluated. Instructions must be passed quickly to the interceptor pilots and missile crews. This information must be processed and displayed rapidly and accurately so that the commander can make continuous estimates of the situation and, if his area is attacked, direct the air battle.

Prior to July 1958 a manual system of receiving, plotting and transmitting information was used. This was simply a development of the World War II system; it was slow and cumbersome and its capacity to handle mass raids and modern supersonic interceptors quickly and effectively was limited.

NORAD now has an electronic data-processing system. This is the Semi-Automatic Ground Environment (SAGE) system. SAGE has added high-speed digital computers to the control process. It is able to receive, process, and display aerospace surveillance information and, as directed, send guidance instructions or information to weapons.

SAGE direction centres and control centres are now operational throughout the United States. The first SAGE installation in Canada will become operational in the Northern NORAD Region next year, in a hardened underground site at North Bay.*

OPERATIONS

The nerve centre and hub of the whole system is the NORAD Combat Operations Centre (COC) in Colorado Springs where information from the entire network is received and evaluated. This centre is linked by the communications system to all NORAD subordinate commands and command posts and all key agencies throughout the continent. From here an attack warning would be given to the air defence system, to Ottawa and Washington, D.C., to the Strategic Air Command and the civil defence agencies of both countries.

*See page 26.

The NORAD system is manned and ready to operate 24 hours a day every day of the year. The COC is fully manned with a senior officer on duty at all times. CINCNORAD, or in his absence the deputy, and all members of the battle staff are on telephone alert and can be contacted within minutes. This capability is exercised once a week. Similar manning and alerting procedures exist at all regional and sector headquarters throughout both countries. A percentage of aircraft armed with their weapons and with crews standing by are at five-minutes alert throughout the system. Surface-to-air weapons are armed and at almost instant readiness. Should international tension increase or if for other reasons it was thought that an attack were imminent, CINCNORAD can increase the readiness posture of his command by placing more weapons on an advanced state of alert, deferring training, calling personnel back from leave and similar measures. Such action is rarely required but the capability is exercised from time to time.

TRAINING

To be able to defend North America against a surprise attack, NORAD must keep all elements of the air defence system in top condition. This is achieved by constant training of both the parts and the system as a whole in realistic exercises. The service commanders of the component commands are responsible for the individual training of their forces, but the over-all joint training of the system is the responsibility of the NORAD commander-in-chief. Accordingly, in addition to many smaller-scale exercises, NORAD holds a continent-wide training exercise each year known as SKY SHIELD. So far there have been two such exercises.

In this exercise a realistic large scale attack is conducted against North America by the forces of

Strategic Air Command augmented by many aircraft from other commands such as operational training units of the RCAF, Tactical Air Command in the United States, and others. Even the RAF participates with V-bombers operating from bases in Britain. Extensive use is made of electronic counter measures (ECM) and low level attacks in an attempt to confuse and disorganize the defences. For this reason it has been necessary in the interests of safety to ground all civil air traffic during the SKY SHIELD exercises. Provision can be, and is, made during the exercises for flights of an emergency nature. For example, last year there were a number of mercy flights conducted in Canada and a considerable number of flights to fight forest fires in southern California. The co-operation of the public and of the airline operators has been outstanding and indicates a broad-based understanding by the people of North America of the tremendous importance of these annual exercises.

In conclusion two points need emphasis. First, NORAD is a purely defensive force. NORAD weapons can only be launched within the North American environment and will only be launched against forces which are clearly hostile in intent.

The second and more important point is the part which NORAD plays in the deterrence to global war. So long as a potential aggressor realizes that he cannot overwhelm the retaliatory forces in North America by surprise or by any other means, and that in addition North America can provide a significant level of protection for its population and industry, he will be deterred from launching an attack which will surely bring massive retaliation and destruction to his own country.

"Hale and hardy" at NORAD HQ is the message from G/C E. B. Hale, COC deputy director, and S/L K. J. Hardy, assistant director of protocol.

In the heart of Cheyenne Mountain near Colorado Springs hard rock miners are excavating the site of NORAD's new combat operations centre. This view shows the central access tunnel from which branches a series of chambers designed to house a three-storey building.

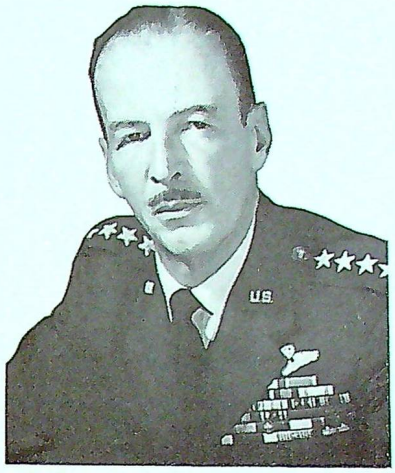
CO-MANNING FOR MUTUAL DEFENCE

DURING the past four years an increasing number of RCAF personnel have taken up residence in the United States, located mainly at bases close to the Canadian/U.S. border. These RCAF members, ranging in rank from air commodore to aircraftman, occupy staff and operational positions on the NORAD region and sector levels.

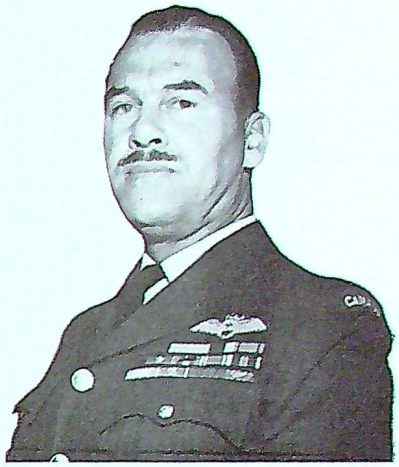
"Co-manning" is the term applied to this air defence operational control integration. It is a logical extension of the situation at the top, where Gen. L. S. Kuter is commander-in-chief and A/M C. R. Slemon occupies the position of deputy commander-in-chief at NORAD HQ in Colorado Springs. Manning of the regions and sectors has been established according to mutually-agreed principles.

Four region and ten sector headquarters in the United States are co-manned by USAF and RCAF personnel. They are, located from west to east, the 25th NORAD Region and its Seattle and Spokane Sectors; the 29th Region, comprising the Grand Forks, Great Falls and Minot Sectors; the 30th Region, with its Detroit, Duluth and Sault Ste. Marie Sectors; and the 26th Region, including the Syracuse and Bangor Sectors.

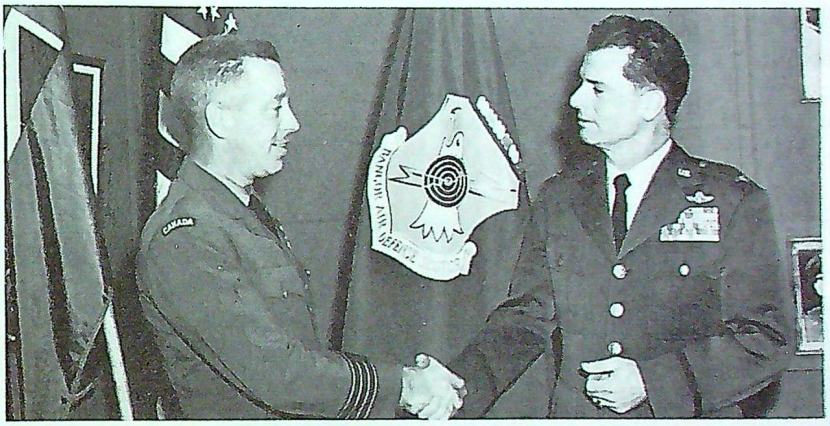
The accompanying photographs illustrate better than could be done in words how servicemen of both Canada and the United States work side by side at these various locations.



General L. S. Kuter,
Commander-in-chief
North American Air Defence Command

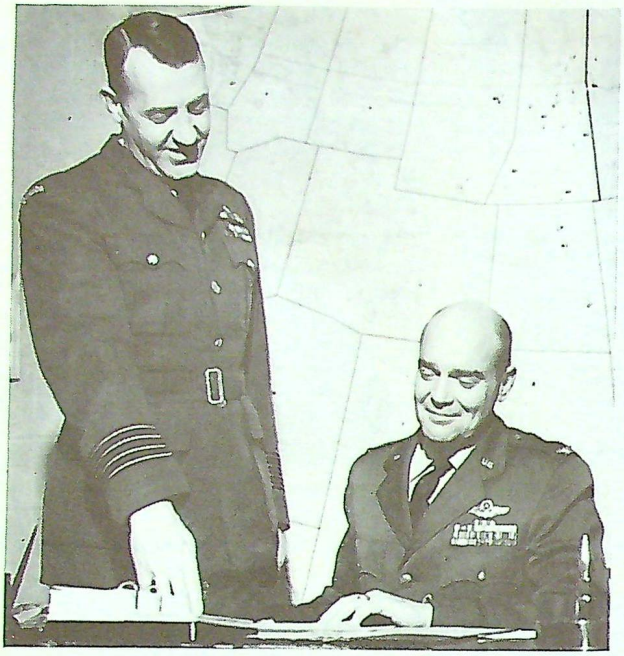


Air Marshal C. R. Slemon,
Deputy commander-in-chief
North American Air Defence Command



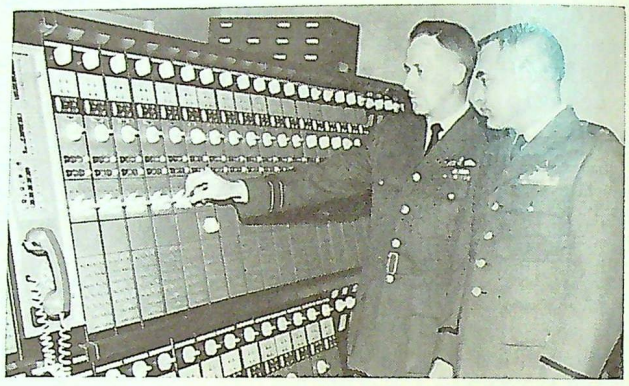
G/C N. S. Anderson and Col. E. A. Doss, deputy and commander of Bangor Sector, 26th NORAD Region.

"Look-alikes" SSgt. F. Williams and Cpl. P. Whitred received promotions to equivalent ranks same day at Sault Ste. Marie Sector.



G/C E. J. McLeod and Col. L. W. Stocking, deputy and commander of Grand Forks Sector, 29th NORAD Region.

G/C N. L. Magnusson and Maj. W. G. Sutterfield in the command post at Minot Sector, 29th NORAD Region.



S/L B. A. Prudhomme, chief of maintenance and facilities division, and Maj. J. H. Kavanck, maintenance control chief, check SAGE computer at Detroit Sector.

In 25th NORAD Region's Seattle Sector weapons room W/C D. Ramsay supervises team of (l. to r.) F/L G. Young, Maj. J. Martin and FS R. Clermont.

G/C A. L. Bocking congratulated by Col. H. R. Thyng after being checked out in F-106 *Delta Dart*. They are deputy and commander, respectively, of Duluth Sector.

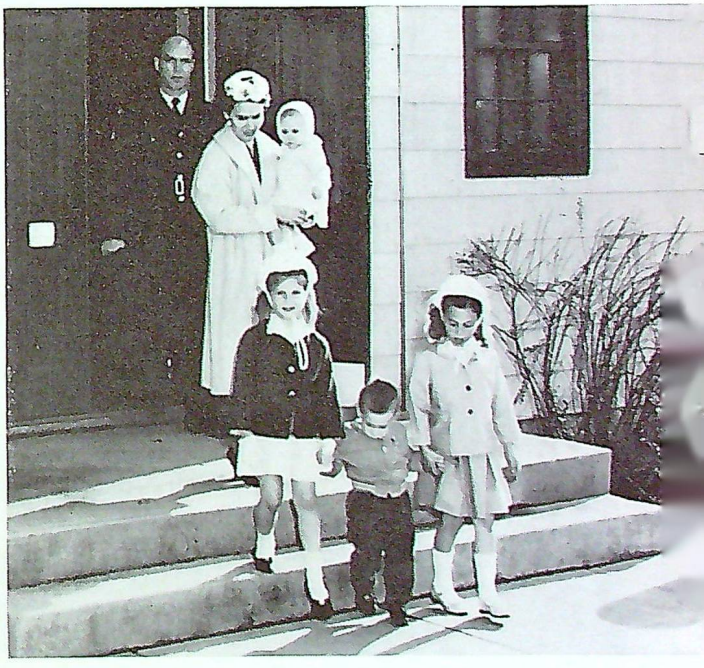
F/L M. G. Blaney, deputy intelligence officer at Detroit Sector, is first RCAF officer to hold position of flight safety officer at US-based NORAD unit. Here he reviews emergency procedures with Capt. A. Fisher.

F/O W. Rae, public information officer at Grand Forks, interviews AIC J. Wojtysiak on his twice-weekly TV show "Scramble".

Mrs. John Cucheran, wife of RCAF intelligence officer at Sault Ste. Marie Sector, entertains her American neighbours at K. I. Sawyer AFB.

S/L W. J. Stacey and Maj. L. Kral observe BOMARC test mission at Montgomery Sector. S/L Stacey is in Alabama to help integration of missile system with SAGE control facility.

FS D. Holloway, wife Rose and family leave Larson AFB chapel after Sunday service. He is a tracking supervisor in the Spokane Sector at Moses Lake, Wash.

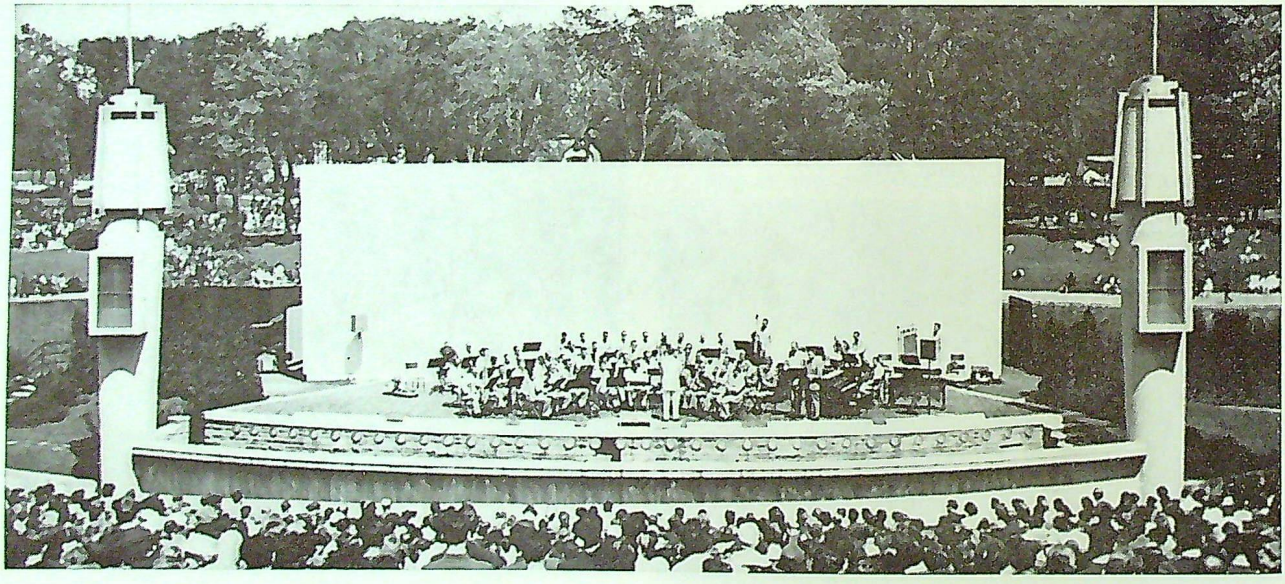


MUSIC FROM NORAD

At Colorado Springs airport the NORAD Band renders a musical salute to visiting dignitaries.

To Be Featured At Canadian National Exhibition This Year

At the CNE in Toronto this summer the band will play public concerts similar to this one last year at Montreal's LaFontaine Park.



THE 90-piece NORAD Command Band, which in three years has become one of the most sought-after musical aggregations in North America, will lead the Warriors' Day Parade and play twice-daily concerts at the Canadian National Exhibition in Toronto this summer.

Organized in April 1959, this first multi-service international band (including 10 RCAF musicians) was primarily designed to render honours to civilian and military dignitaries visiting NORAD Headquarters at Colorado Springs. Additionally, it provides music for festive military occasions while presenting to the American and Canadian public evidence of the unanimity of purpose of over 200,000 servicemen and women in the North American Air Defence system.

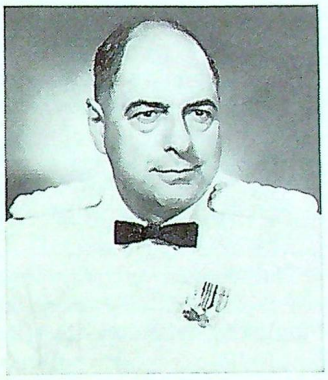
The band made its Canadian debut in Montreal last year. It has appeared on several coast-to-coast television shows, most recent of which was The Bell Telephone Hour. Last month it played a concert in Carnegie Hall. On radio the band is currently heard in a weekly network program called "Partners in Defence".

The NORAD Commanders dance orchestra, composed of musicians from the band, was awarded the title "Honorary Best Dance Band" in 1960 — the only military orchestra ever to receive this award from the American Federation of Musicians.

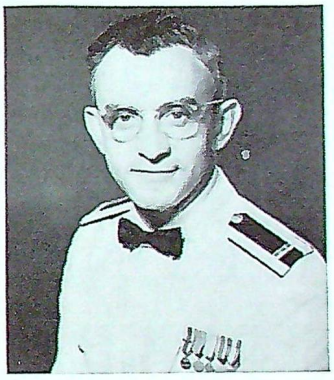
Conductor and officer-in-charge of both band and orchestra is Lt. Col. Mark Azzolina, USAF, a veteran of 20 years as a composer-conductor-vocalist. Associate conductors are CWO E. R. Bearman, USA, and CWO L. A. Ebersole, USAF, both of whom previously conducted their own service bands.

Lt. Col. M. S. Azzolina, USAF, Conductor and officer-in-charge.

Sgt. R. Herriot, RCAF, Assistant bandleader and trumpet soloist.

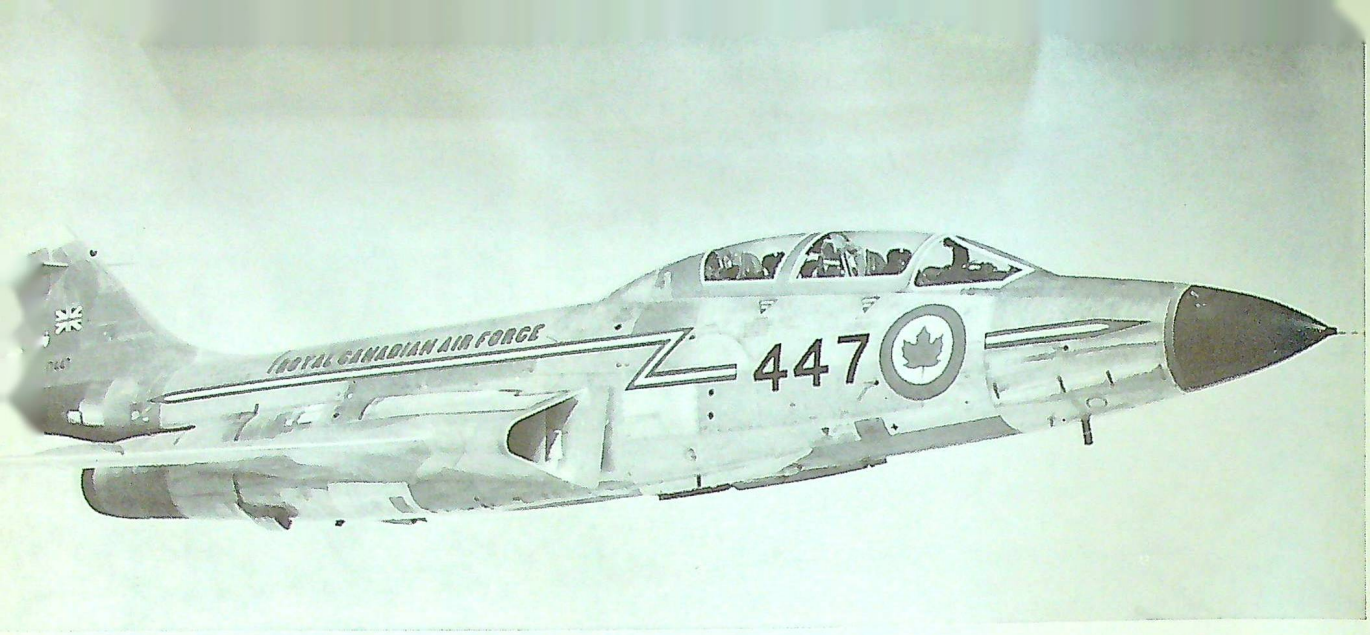


CWO-3 E. R. Bearman, USA, Associate conductor and assistant o-i-c.



CWO-2 L. A. Ebersole, USAF, Associate conductor and executive officer.

NORAD Commanders dance orchestra and conductor Lt. Col. Azzolina who is also featured vocalist.



An RCAF CF-101B on an interception exercise somewhere over Canada.

SUPERSONIC SERVICE

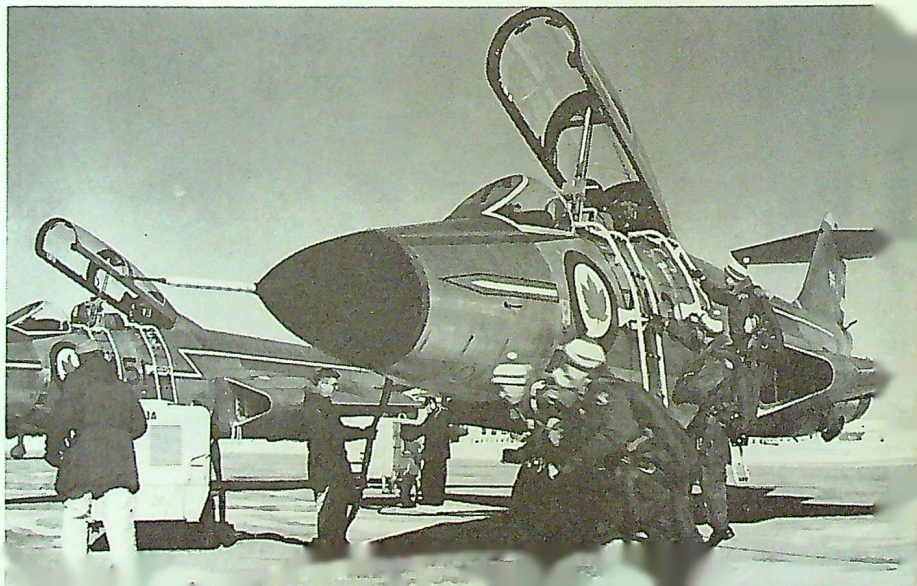
FIVE RCAF squadrons now fly the CF-101B, first supersonic interceptor to become operational in Air Defence Command. Soon to be dispersed across Canada from B.C. to the Maritimes, they take their places in the vanguard of NORAD's northern defensive shield.

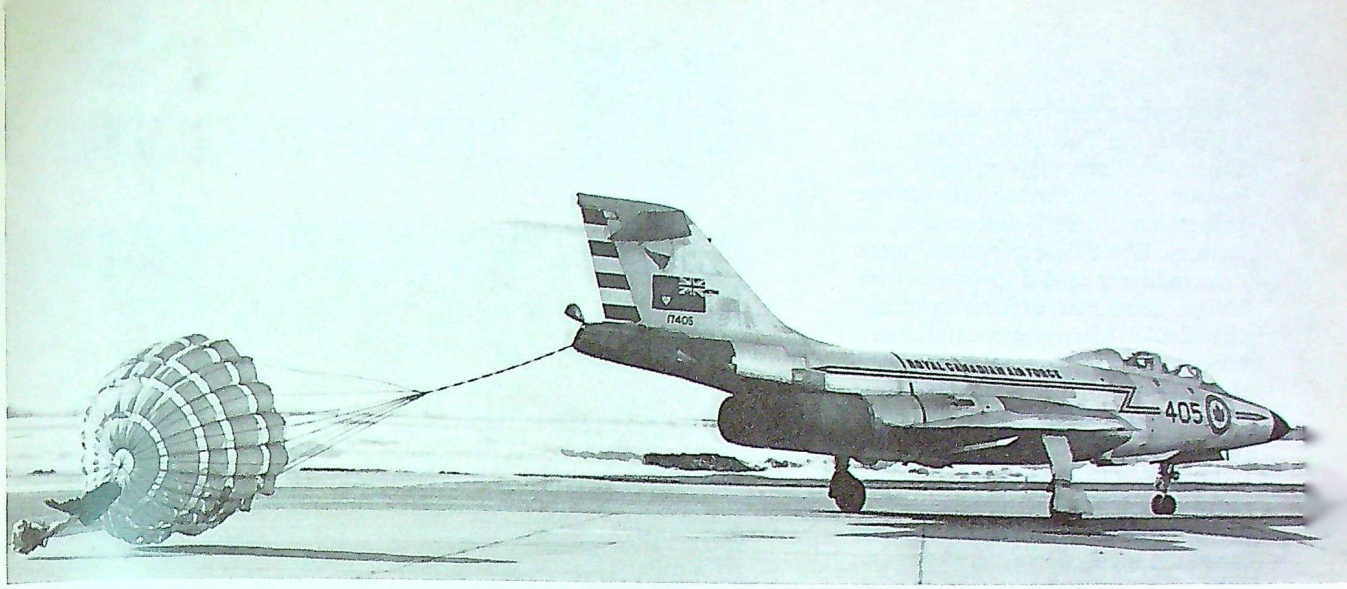
The conversion program began last fall at RCAF Station Namao. First to be re-equipped was No. 425 Sqn., whose crews have since trained members of four other squadrons at the Alberta base. Eventual deployment is as follows: No. 409 (Night Hawk) Sqn., Comox; No. 410 (Cougar) Sqn., Uplands; No. 414 (Black Knight) Sqn., North Bay; No. 416 (Lynx) Sqn., Chatham; No. 425 (Alouette) Sqn., Bagotville. Replacement aircrew will be trained at Bagotville in future.

A two-man, all-weather fighter interceptor, the CF-101B is the latest

F/O G. M. Ferraby, F/O L. A. Nakashima and F/L J. R. F. Jolley prepare for training mission.

Aircrews "scramble" as groundcrews make CF-101Bs ready for fire up.





Drag chute helps the supersonic craft come to a safe landing.

version of the McDonnell Aircraft Corporation's F-101, which for the past three years has been one of the main USAF air defence aircraft. It is powered by two Pratt and Whitney J57 turbojet engines that together, with after-burners, develop over 30,000 pounds thrust and a speed of over 1200 mph. It can reach operational altitudes of over 50,000 ft. at an exceptionally high rate and can overtake all known bomber aircraft.

The CF-101B has been designed with a high safety factor. Two other versions of the basic aircraft, the F-101A and the RF-101, had the lowest accident rate of any operational aircraft in the history of the USAF during their first year of squadron service. The former at one time held the world's speed record, while the latter model underscored the aircraft's long range and dependability by winning — with the aid of mid-air refueling — the U.S. transcontinental speed record in 1957.

Besides being the first supersonic aircraft in RCAF service, the CF-101B is the first to use the "drag chute" method of landing. On command of the pilot after touchdown, a small parachute pops from the tail to act as a brake. When speed has been reduced, the parachute is dropped on the runway by a flick of a switch in the cockpit.

Up they go into supersonic mount, nicknamed the "Voodoo one-o-wonder"

LACs R. N. Levesque and A. D. McLean ensure F/O Nakashima and F/L Jolley are plugged in and strapped in for take-off.

MANNING THE D

A THREE-MILE road links Cape Parry on the DEW Line to the local Eskimo village. Going from one end of that road to the other is like going from the stone age to the 21st century. The Eskimos live and work as primitively as did their ancestors before them. In striking contrast, the DEW Line personnel have brought to this frozen frontier all the marvels of the electronic era. These two widely diverse groups have, however, one thing in common: they are both hunters. Eskimos go in pursuit of furred, finned or feathered creatures which inhabit the arctic areas; Dewliners hunt for "blips" of light which indicate that aircraft have entered their Distant Early Warning Identification Zone.

The surveillance, detection and reporting of these blips is the prime purpose in life for hundreds of personnel who live north of the Arctic Circle in some 60 sites scattered across more than 3,000 miles of Canadian territory. In addition to the four Canadian segments of the DEW Line (called Pin, Cam, Fox and Dye), there are two American sectors in Alaska which, together with the four Canadian sectors, make up NORAD's first line of defence against surprise attack.

Togetherness is the keynote of the entire enterprise. At each site the Canadian red ensign and the American stars and stripes fly together as a symbol of the partnership formed by these two nations for their mutual defence. This international co-operation is exemplified in a unique partnership between military and civilian organizations. Western Electric built the DEW Line; Federal Electric maintain it; Transair and Nordair supply it; RCAF and USAF plus civilians from both countries man the line. On paper it looks complicated; in practice the system works extremely well. Each agency has an area of responsibility and these areas dovetail to form an efficient defence operation.

Sunset over Station Fox heralds the s

At each of the main sites along the Canadian section of the DEW Line there are seven military personnel, five RCAF and two USAF with the military commander being an RCAF squadron leader. Their job is the operational control of DEW Line equipment. To ensure that the equipment is operational, and remains so, is the task of Canadian and American civilians. Much of the outdoor work, such as driving vehicles, is done by local Eskimos who have proved quite adept at both driving

LINE

By FLIGHT LIEUTENANT T. G. COUGHLIN
Assistant Editor, THE ROUNDEL

of a long Arctic night in late February.

and servicing the trucks and snowmobiles. Both USAF and RCAF personnel serve a one-year tour of duty with an occasional extension of several months being applied to a Canadian airman's tour because of the exigencies of the service. Civilians serve an 18-month tour of duty initially, then as many one-year tours as they desire. The Eskimos, of course, work at the sites indefinitely.

The eyes of the DEW Line, and its reason for being, are the radar scopes. Seated in darkened rooms, operators watch narrow bands of light relentlessly sweep around the scopes in cadence with rotating radar antennae housed inside huge plastic domes. The actual capability of the equipment is, of course, classified information. But, it can be said that even the presence of birds is known to those whose profession is the surveillance of Canada's northland. Birds can come and go as they please but no other air traveller has that privilege.

Every aircraft operating across or along the DEW Line must be identified. The majority of these aircraft are commercial aeroplanes which are quickly identified through their flight plans. Others, having failed to file flight plans, are identified by contacting various air traffic control agencies to the south. The identity of still others, such as aircraft wandering off course, can be established by voice contact with the aircrew. There are additional ways to reclassify aircraft from unknown to friendly. Speed is the keyword since the most crucial element in air defence is time. But, in spite of everything, there are always a few blips on the radar screen which cannot be positively identified. These are the ones that light up the combat operations centre board thousands of miles south at NORAD headquarters.

Cape Parry, most western site of the Canadian sector of the DEW Line, is a typical station. Located some 240 miles north of the Arctic Circle, the camp site is situated on a hill overlooking the all-important airstrip. As at the other units, the station personnel are RCAF, USAF and Federal Electric employees. Typical of the RCAF personnel who man the line is F/L R. J. Barnett, a fighter controller, who spent the first years of his air force career at the opposite end of the radar business. Flying as a jet pilot overseas, F/L Barnett in his *Sabre* cre-

ated blips on radar scopes for other people to watch. For F/L Barnett and his colleagues along the line, the sites offer the maximum of comfort. Inside the buildings, or "trains" as they are called, it is hard to believe that you are north of the Arctic Circle. Individual bedrooms, tile floors, fluorescent lights, hot and cold running water, libraries and hi-fi music somehow seem incongruous, albeit highly appreciated, on the frontier.


F/L Barnet

For recreation there are the inevitable card games, dart board, pool table, beer call on Saturday and Sunday and movies three times a week. The fact remains, however, that all these amenities cannot make up for the separation from families. To alleviate this situation RCAF personnel are allowed a week's leave every three months. USAF and civilian personnel also get leave under different arrangements.

In addition to its prime purpose of detection, the DEW Line has such secondary functions as assisting air traffic, by giving headings to steer and radar fixes; sending out weather information and, when necessary, assisting in search and rescue operations. In the latter field the RCAF military commanders have, for instance, diverted aircraft to pick up sick Eskimos and injured seamen. To civilian pilots, the DEW Line is a blessing. Before its inception aircrew who flew in the northland used mainly skill and daring to cross the featureless barren lands. Now, as a result of the DEW Line, they "home" from beacon to beacon along the 70th parallel of latitude; they can call the sites for information or assistance and, instead of landing on frozen tundra, they land on gravel strips equipped with landing lights. Having civilian aircraft constantly moving through their area is also a good thing for the DEW Line radar operators since it gives them additional practice in tracking. Another agreeable feature of the commercial air carrier operations is that for a brief period on each stopover attractive stewardesses can be seen in an otherwise all-male world.

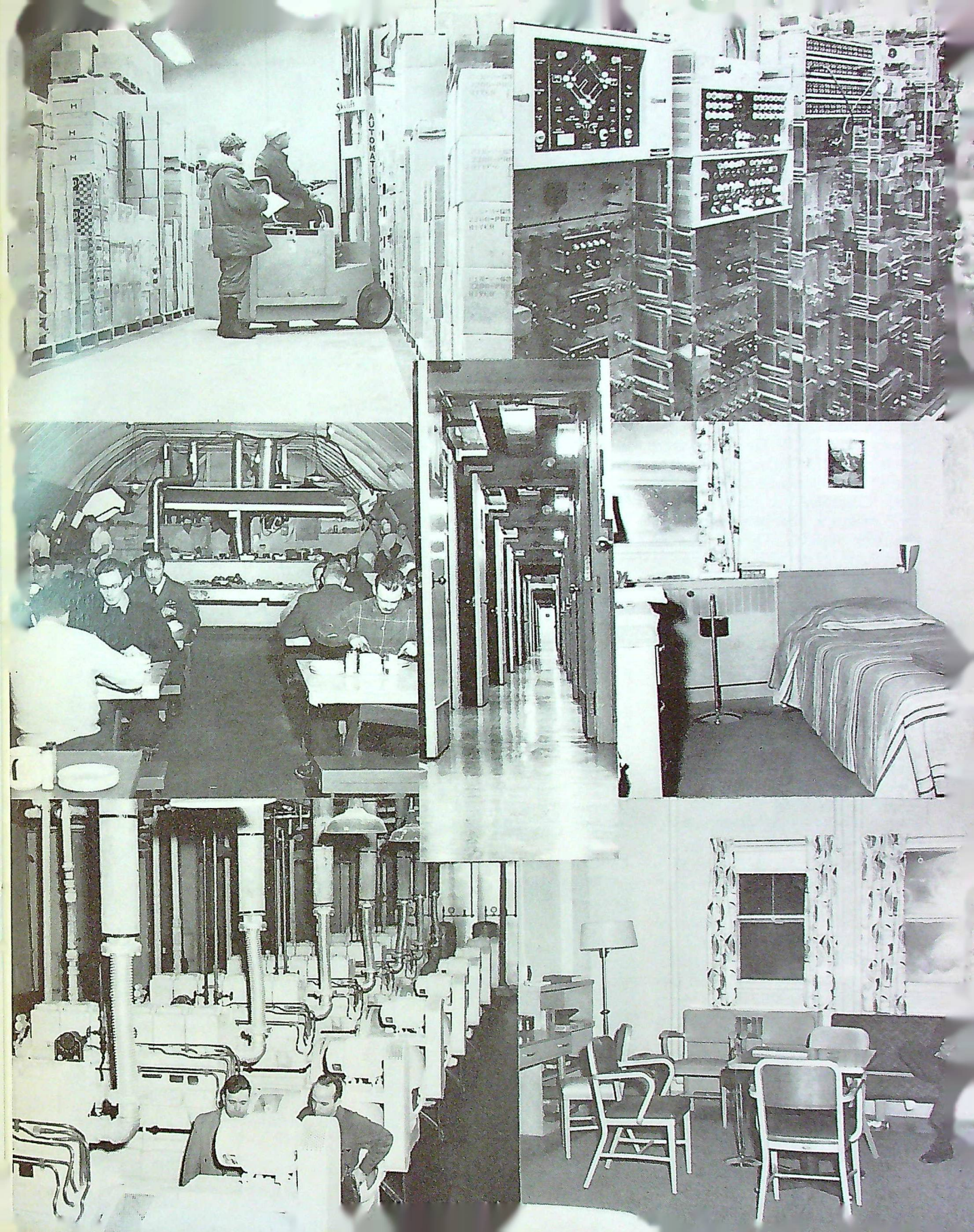
Cambridge Bay is the metropolis of the central Arctic. In addition to the DEW Line site several government agencies have set up shop in the area. The Department of Northern Affairs has established an Eskimo townsite and they sell Eskimo products such as soap-stone carvings and parkas. The Department of Transport now operates the DEW Line airport and has substantial facilities, including a modern airline terminal. The ubiquitous RCMP have a detachment and, in keeping with the size of the settlement, the Hudson Bay Company has a large modern store containing most of the merchandise to be found in a southern Canadian supermarket.

The site itself is responsible for the central section of the DEW Line. Along with the main station, Cambridge has a number of auxiliary and intermediate sites which give overlapping electronic coverage over many miles. Cambridge also has the dubious honour of being one of the coldest places in the Arctic with temperatures of minus 72°F being recorded. In the summer, however, the landscape around Cambridge is carpeted with a variety of grass and moss and more than 20 different types of flowers. But summer or winter the work at Cambridge never ceases. Canadian and American servicemen and civilians gather, assess, then forward information to Northern NORAD at St. Hubert and to NORAD Headquarters, Colorado Springs. During the long arctic nights when life seems a bit tedious they can always listen to their radio for amusement; Radio Moscow comes in loud and clear.


R. Koblogina

Among the many Eskimos employed at Cambridge is 33-year old Ross Koblogina. The DEW Line has brought about a radical change of life for Ross and his friends. Born and raised in Coppermine, NWT, Ross started his working life in traditional Eskimo fashion as a hunter. With his wife and three children he lived in a tent except when he was out on the trail. On these occasions Ross and his companions spent their nights in igloos. In February 1959 Ross was hired as a labourer for the DEW Line. He began driving vehicles but became so adept at servicing them that he was re-classified as semi-skilled. Now, instead of depending on the luck of the hunt for his living Ross draws a monthly cheque. His family lives in a neat three-room, oil-heated frame house. For entertainment they can listen to the CBC's Northern Service Eskimo language radio broadcasts or to the station in Thule, Greenland. In the latter case, however, the broadcasts are not of much interest to Ross or his wife since the Eskimo dialect in Greenland is not readily understood by Eskimos in the Canadian Arctic.

Station Fox, located on a wind-blown piece of real estate adjacent to the equally wind-blown Hall Beach, would seem an unlikely place for people to visit. In actual fact, however, there is a steady stream of traffic coming and going from this DEW Line site. In addition to the airlift from the south which brings in weekly mail and the horizontal


AUTOMATIC

The igloo, traditional home of the Eskimo, has been replaced at places like Cambridge Bay by neat frame houses constructed by the Dept. of Northern Affairs.

airlift which shuttles back and forth between the DEW Line sites, there are a number of other visitors. The Air Officer Commanding, Air Defence Command, or his representative, makes a quarterly visit to all the main sites. USAF and Federal Electric personnel arrive on a monthly inspection tour. National Defence College, the Imperial Defence College and Canadian and American joint chiefs of staff also visit Station Fox as they make their way along the Line on official tours. Owing to restricted accommodations at DEW Line sites overnight visitors pose something of a problem. Occasionally it is necessary for some DEW Line personnel to fly to auxiliary sites so that visitors can have their rooms for the night.

The main buildings at DEW Line sites are called "trains" but on the inside they resemble ships. The long narrow halls with rooms on each side look like passageways and passenger cabins. The illusion is further heightened by the public address system which is forever calling somebody for something. To at least one of the civilians employed at Fox, the ship-like atmosphere is made to order. Ray Bernier of Deschenes, Quebec, who is a civilian employed in the communications room, served five years as a radio operator on a merchant ship. Now he teletypes signals to the various military headquarters. In the early 1950s Bernier got his first taste of the north when he served as a combined weather observer/radio officer for the DOT at Indian House Lake, about 120 miles from Fort Chimo. He liked the northland so decided to go all the way. In 1956 he worked on the construction phase of the Line then, after a few months of living in southern Canada, he returned to the DEW Line. He feels that Station Fox is something like his old ship because he sees the same faces every day and he works on shifts. But Station Fox has one great advantage over his merchant ship: it doesn't rock or roll.

It is a long way from the burning deserts of Texas to the frozen tundra of the Arctic but Capt. W. J. Coulombe of the USAF has made the trip. Assigned to the DEW Line in December 1961, Capt. Coulombe works as a controller in the data centre at Cape Dyer. On the occasions when he ventures outside into the biting arctic cold his thoughts turn to his days at Randolf Field at San Antonio, Texas, some thousands of miles and more than 100 degrees of temperature away.

Capt. Coulombe

Cape Dyer, at the eastern end of the DEW Line, is unique in several ways. It is the largest of the DEW Line sectors, having a frontage of some 900 nautical miles including the Baffin Island portion and the DEW-east segment located in Greenland. Dyer can also lay claim to being the busiest sector. Not only are there heavy military penetrations of the area but there is also a substantial amount of commercial traffic including over-the-pole flights. One claim to fame, which Dyer would gladly relinquish, is the doubtful distinction of having the worst weather on the Line.

The most spectacular feature of this weather are the fierce winds of hurricane force that lash the headlands during the 10-month winter. Not infrequently the region experiences winds in excess of 100 knots and the majority of storms average 50 to 60 knot winds. Blowing snow associated with these strong winds reduces visibility to zero. These conditions combine to render the Cape Dyer area the most hazardous terminal of all the DEW Line sites.

The topography of Cape Dyer also provides a striking contrast to

the other DEW Line sectors. Unlike the central and western arctic regions which have extremely flat and monotonous terrain, the Cape Dyer area is characterized by rugged mountains and deep gorges formed by the action of glaciers many years ago. The coastline is marked by abrupt and craggy capes, headlands of solid rock formations, and is indented by numerous fjords. In the immediate area, within 25 nautical miles westward the Penny Highlands, with their eternal ice-cap, reach altitudes in excess of 8,000 feet.

The Dye sector recently acquired operational control of the surveillance sites located in Greenland. Terrain in the area of the coastal sites is somewhat similar to that encountered in the Cape Dyer area. However, the inland stations are located on the Greenland ice-cap, at altitudes of 8,500 feet and the implications of this engineering feat can well be imagined.

Capt. Coulombe, F/L Barnett, and their military contemporaries, Ross Koblogina, Ray Bernier and their civilian colleagues are men with a mission. They are doing a difficult, and sometimes, dangerous, job. But they are the men with the background and the skills needed for this vital task. As long as this need exists these men, or men like them, will continue to man the Line.

Sealift Supply of DEW Line Uses $6 Million Shopping List.

(NORAD News Service)

THIS spring, for the fifth successive year, a shopping list 750 pages long, calling for 45,000 tons of supplies in 5,000 categories at a cost of six million dollars, was compiled for outposts on the rim of the Arctic. This staggering accumulation is the annual supply requirement of the Distant Early Warning (DEW) Line, brought in by sea. It includes such items as 60,000 lbs. of coffee, 1,000 boxes of paper clips and 30,000 tons of petroleum products.

Supplementing the DEW Line sealift is a year-round airlift of perishable foods, electronic equipment and vehicle parts, mail, movie film, etc. This is a separate $8 million operation.

The sealift is divided into four operational segments — the DEW Alaska, McKenzie River, Foxe-Baffin and DEW East (Greenland) areas. The first area supplies sites via 200-foot barges leaving Seattle around 1 July, travelling through the northern Pacific, around Alaska and through the Bering Strait. This journey is completed around mid-September.

The 25 sites in the second area are supplied via the McKenzie River. Barges are loaded at Waterways, Alberta, in April and May each year. They proceed to the mouth of the McKenzie River, where they are unloaded and the cargoes transferred to LSTs (landing ship tank) and AOCs (tanker craft). These take the water route through Amundsen Gulf and Coronation Gulf. Sites involved begin with BAR 1 on the Canadian-Alaskan border and stretch to CAM 3 in the Shepherd Bay area. This operation began about 1 June and lasts through August, covers about 2,000 miles and costs around $2 million.

The third segment includes 17 installations of the Foxe-Baffin area. Canadian Department of Transport vessels load at Montreal about 1 July through 10 August. They go down the St. Lawrence River, through the Gulf of St. Lawrence and the Strait of Belle Isle into the Davis Strait. Some of these supplies travel through the Hudson Strait and hence to FOX Main and on by airlift to sites which are inaccessible by water. The rest proceed through the Davis Strait to DYE Main and four additional FOX sites. Delivery to these begins about mid-August and ends early in September.

Summer sealift at Resolute Bay in 1961.

The last phase of DEW Line supply by sea goes to Sondrestrom Air Base and DEW East sites DYE 1 and 4, on the east and west coasts of Greenland. This operation, the annual resupply of the entire northeast area, is the only all-military phase of the four. Cargo is loaded at Hampton Roads, Va., and Brooklyn Army Base, N.Y., around 15 July. The route leads through ocean water. This phase is usually terminated around the end of August. DYE 2 and 3, which are on the Greenland ice cap, are supplied by airlift from Sondrestrom.

Aside from its sheer size, the most impressive features of the DEW Line supply are the race against time, due to the short summer shipping season, and the staggering co-ordination problems.

A bird's-eye view of Bird.

BIRD ON THE MID-CANADA LINE

By LEADING AIRCRAFTMAN DALE LOUNSBURY

ADJACENT to the 56th parallel, running from Hopedale on the coast of Labrador to Dawson Creek in northern British Columbia, a series of isolated RCAF units dot the virtually uninhabited landscape. Each a link in the electronic fence that forms the Mid-Canada Line, these stations are an integral part of the vast NORAD complex. Northernmost of these units is RCAF Station Bird, situated on the banks of the Limestone River in the muskeg of northern Manitoba, almost 400 air miles from Winnipeg where the section's parent unit is located.

Opened officially on 27 April 1957, Bird has continuously filled the role assigned it — watchdog and celestial guide. Twenty-four hours a day, 365 days a year, Bird stands ready to raise an alarm in case of enemy attack. Incidental to that vital function, but equally valuable, is the secondary role assigned the station — that of flying control agency for the service and civilian aircraft that fly the invisible and lonely routes across our arctic and sub-arctic tundra.

Composed of the main station and far-flung doppler sites scattered across muskeg and mountain, lake shore and sandy flat, Bird could be said to extend for over 300 miles. Through these doppler sites, com-

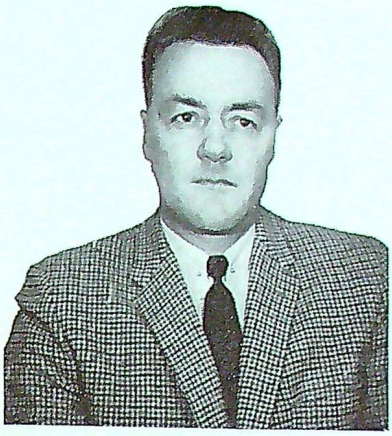
Arctic fox stalks Bird.

pletely automatic and unmanned save for periodic maintenance checks by men from the parent unit, flows an electronic shield extending far above the desolate "Land of the Little Sticks". While the sites are widely separated, the equipment in them is maintained in so sensitive a state that not even a flock of geese can touch the sprawling line undetected. The impulse of anything crossing the MCL is immediately relayed to the operations building located on the main or control station where the airmen on duty analyse, correlate, and classify whatever has broken through the links. At their fingertips are radio-communications, telephone, landline, and teletype facilities linking them to sister units, the many stations encompassed by the NORAD organization and the Department of Transport. Into the operations room

flows a continuous sequence of flight, weather, and tactical information enabling Bird to maintain a constant watch not only on the area for which the station is responsible, but most of North America as well.

Commanding officer of Bird is S/L G. L. Sheahan, responsible to the AOC Air Defence Command, and charged with the operational effectiveness of this section of the Line. Directly under S/L Sheahan are a small group of airmen in the fighter control operator trade. These men, comprising less than eight percent of the working force at Bird, maintain surveillance of our northern skies. To them falls the responsibility of assessing and dispersing the information relayed to them via the various facilities at their disposal, and the administrative and operational maintenance of service matters affecting them as well.

Prime contractors at Bird are the Canadian Marconi Company and Okanagan Helicopters Limited. Under Mr. J. G. Kerr, section superintendent and overall administrator of civilian personnel, the Marconi members supply the supporting maintenance and supply vital to the station function. To the technical staff falls the responsibility of maintaining the hair-trigger accuracy of the doppler equipment throughout the station's area of responsibility, as well as the allied equipment employed in the operations building — the brain centre of the entire complex which is a miracle of electronic engineering.



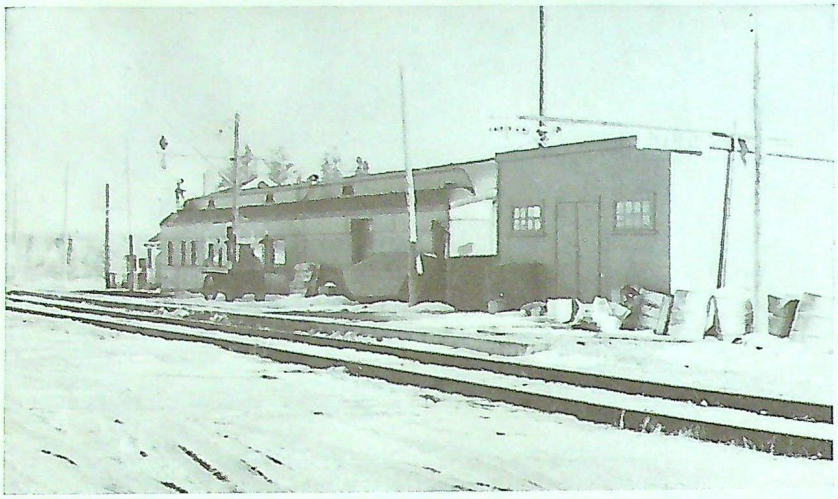
Mr. J. G. Kerr,
Section Superintendent, CMC

S/L G. L. Sheahan,
Commanding Officer, RCAF

The doppler sites are automatic and self-contained. In each building are located the main electronic consoles and a set of duplicate or "stand-by" gear. Should any malfunction appear in any part of the main gear, the site automatically switches over to the associated part in the stand-by unit and informs the control board at Bird what it has done. Then, depending on the circumstances and conditions surrounding the change over, the technician can take appropriate action; either correct the malfunction remotely from the control board or dispatch a technician to the site to right it.

For those who have to go out to the sites for either special maintenance or periodic preventive maintenance, being away from Bird offers no hardships. Each building has areas set aside for electronic and mechanical equipment, also a complete kitchen kept stocked with an amazing array of food served by a chef accompanying each crew, and a separate room with sleeping accommodation. Mail and additional sup-

After a trip to a far-flung doppler site such as the one pictured at left, the "workhorse" returns to the barn at Bird.



Improvised railway station between The Pas and Churchill.

Nimrods take trout, pickerel, northern pike from nearby Limestone River.

plies as well as replacement parts and equipment are delivered periodically by helicopter. "Hot lines" link each site to the parent station and adjacent units for instant telephone communications so that a constant liaison is maintained.

Thus, through a program of planned preventive and rapid emergency measures the many links in the chain forming the MCL are kept at peak efficiency.

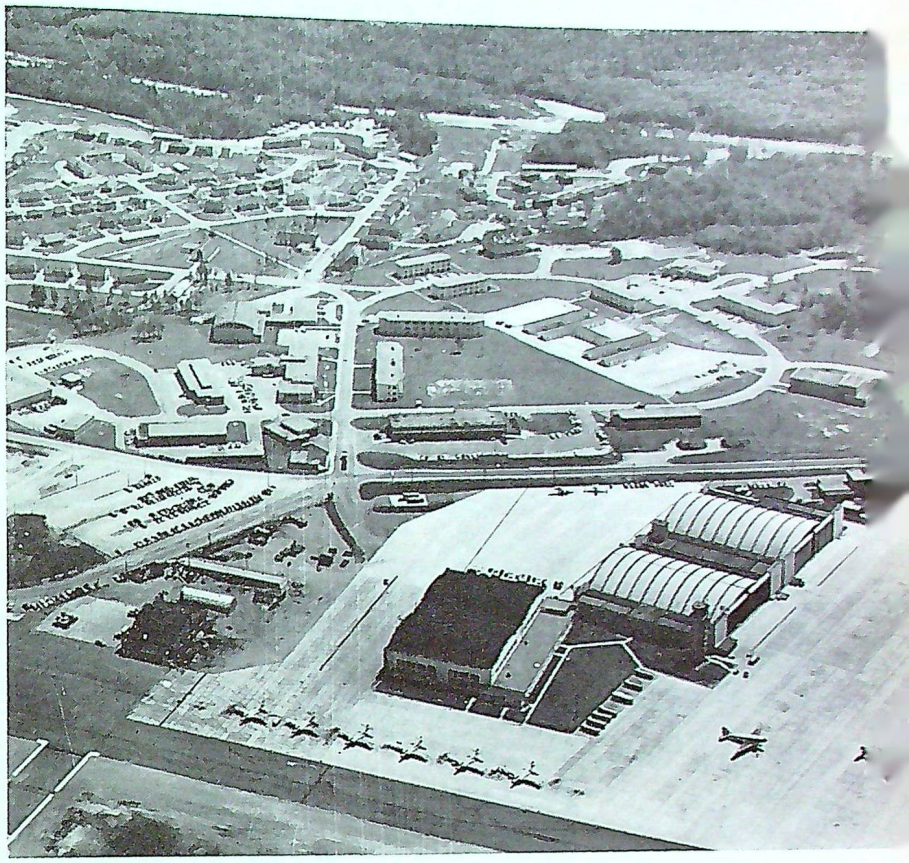
Sub-contractors to Marconi are the Crawley and McCracken Co. Ltd., responsible for the catering, and Consolidated Engines and Machines Co. Ltd., charged with the operation and maintenance of all diesel electric power plants both on site and at Bird.

To Okanagan Helicopters Ltd. falls the task of logistics support. Supplied by the Department of National Defence with Sikorsky S-55 helicopters, the Okanagan staff keeps a constant shuttle of men and materials going from station to site and return. The "chopper" pilots fly over terrain where what would normally be a minor mishap could easily turn into tragedy.

This, then, is RCAF Station Bird — an important unit in a vast and unique system, ministered by a select group of personnel with many talents who bind the station into a cohesive, well-run entity. Through their efforts, and the efforts of men like them situated across Canada, the silent vigil of our northern skies is maintained.

Bird's "life line" is the CNR's Hudson Bay Railway.

Stations of the RCAF: NORTH BAY



By
FLIGHT LIEUTENANT G. H. COLLISON

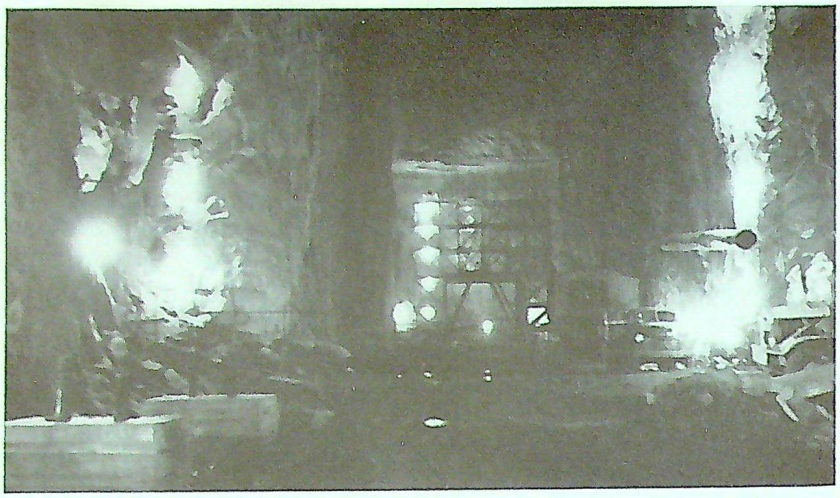
ACCORDING to historians, Champlain passed through North Bay on his voyages of discovery over 300 years ago. Today, North Bay is still in the vanguard of discovery and development. Situated near this city, which calls itself (Ontario's) Gateway of the North, is RCAF Station North Bay, latest components of which are Canada's only SAGE centre and its first BOMARC squadron.

The SAGE (Semi Automatic Ground Environment) centre, still under construction, will provide the air defence control function for that segment of Northern NORAD Region known as Ottawa SAGE Sector. The brains of SAGE are high speed digital computors which absorb incoming information of aircraft movements gathered from radar stations, ground and air early warning units, picket ships, adjacent combat and direction centres. The data received are stored, evaluated and displayed to give the air battle commander an instantaneous picture of the situation in his sector. When manned fighters are scrambled, SAGE can be used to automatically direct the aircraft to targets. Also, surface-to-air missiles can be fired and directed by remote control from SAGE. The system provides an extremely rapid and effective means of control and direction of the defence forces.

What makes this particular installation at North Bay unique is that it is the only SAGE unit in North America to be housed completely underground. The project started in 1959 and by the time the smoke from the blasting had died down, 300,000 cubic yards of rock had been removed from the inside of Reservoir Hill. This amount of rock, if placed evenly on an average football field, would extend over 200 feet into the air.*

The other new installation is the BOMARC site. Administratively part of Station North Bay, this unit lies a few miles north of the airbase. Manned by No. 446 (SAM)** Sqn., it is the first of two such units to be created in Canada. The IM-99B missiles are housed in individual concrete and steel launcher shelters. When the signal is received, the shelter roof slides apart and the BOMARC is raised to the vertical position and launched. The whole operation is fully automatic and carried out in a very short time. After launching, this rocket-boosted,

* THE ROUNDEL. Vol. 13, No. 5.
** Surface-to-air-missile.



ram-jet powered missile is guided to the immediate target area by electronic commands from SAGE.

A provincial highway bisects Station North Bay, with the operational area on one side and the administrative and domestic site on the other. The RCAF has always had a close association with the nearby city, as illustrated by the station's new badge which bears a replica of the city's gateway emblem.

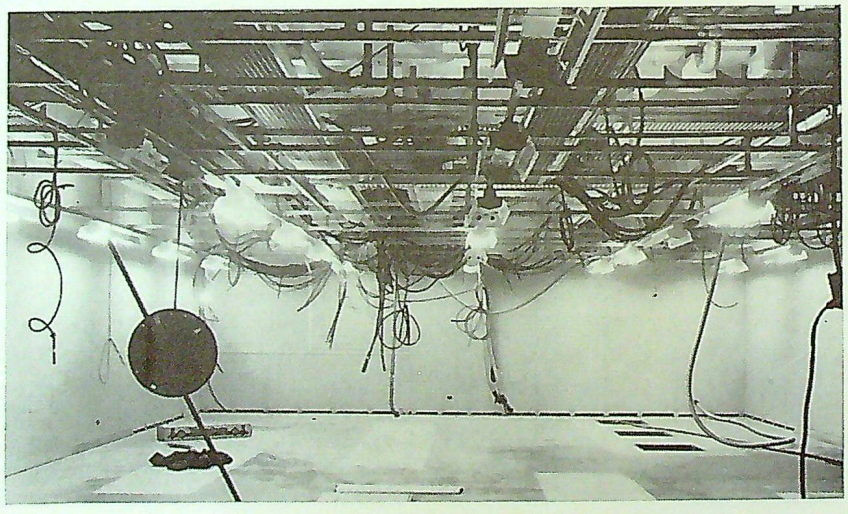
The airport's history goes back some 25 years. During the period of rapid expansion in Canadian aviation just prior to World War II, the Department of Transport constructed numerous airfields across

SAGE STORY

1960: Deep inside Reservoir Hill a gantry crane is used to erect steel supports in one of the main chambers.

1961: Excavation completed, the buildings begin to take shape (photo courtesy North Bay DAILY NUGGET).

1962: As this year progresses, more and more electronic equipment is installed for North America's only underground SAGE centre

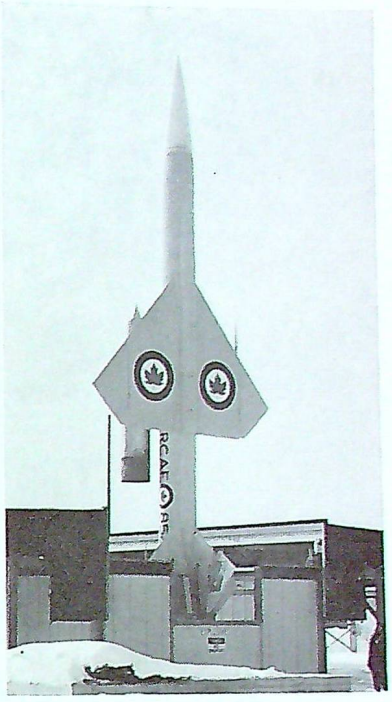


Canada, including what is now RCAF Station North Bay. Located on high ground north of the city, the airfield was commissioned in 1938 and began providing service to the area. Extensive use of the facility was made by commercial companies as well as many private aircraft owners.

The outbreak of war brought many changes. In 1942, the first military unit arrived to take over part of the airfield. This unit, part of RAF Ferry Command, used the field as an auxiliary training base. Later an RCAF ferry detachment was based at North Bay. Their aircrews flew both *Liberators* and *Lancasters* across the Atlantic. The end of the war saw the departure of the RCAF and civilians once again became the predominant users of the airport.

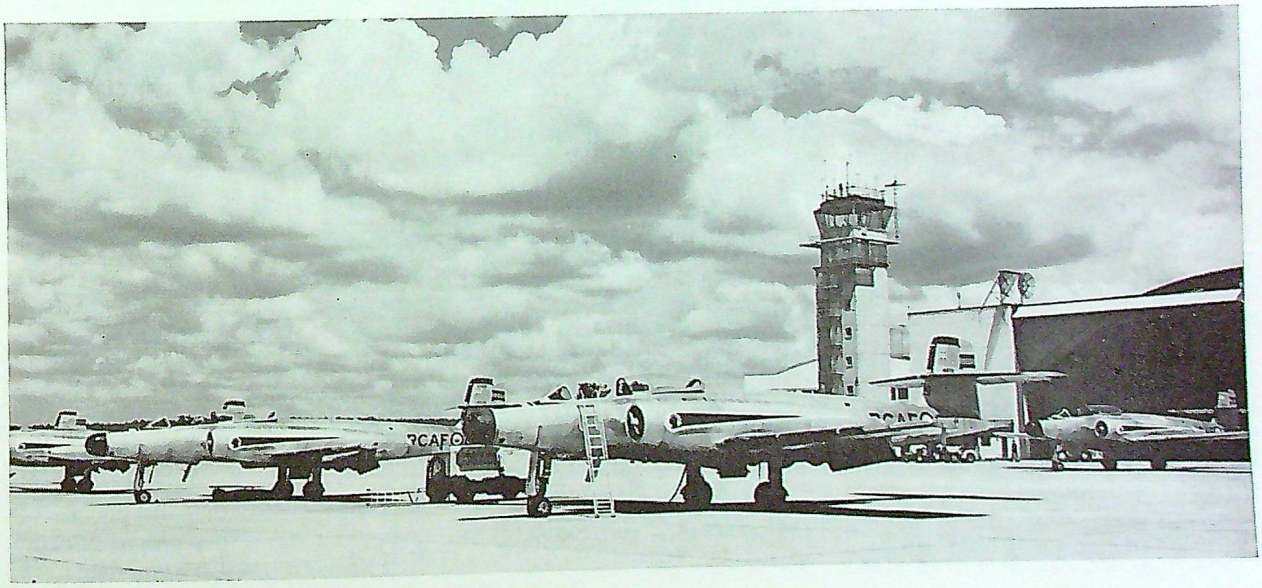
The RCAF returned, following the outbreak of hostilities in Korea, when North Bay was chosen to become a regular force station. The runways and facilities, which had been adequate for the World War II type of aircraft, were obviously not suitable for the new high performance jet aircraft destined to use the airfield. The airbase underwent a major face lifting. Runways were extended and strengthened, new tarmacs constructed and hangars, control tower, living quarters and a multitude of other necessary buildings were built.

By November 1951, before much of the program was completed, a *Sabre* squadron was based at the airfield. No. 430 (Silver Falcon) Sqn. trained at North Bay for eight months before proceeding overseas to No. 1 Air Division. During 1952 No. 3 (All-weather Fighter) OTU also began operations from North Bay. This operational training unit



BOMARC in launching position at North Bay.

CF-101Bs will soon replace the CF-100s on this tarmac.



G/C R.L. Denison, DFC,
CO Stn. North Bay.

W/C H.A. McKay,
OC No. 414 Sqn.

W/C F. Colosimone,
OC SAGE

W/C A. G. Lawrence,
DFC, AFC,
OC No. 446 (SAM) Sqn.

was formed to train pilots and navigators on the new CF-100 aircraft. Basic training was carried out in radar-equipped *Mitchell* aircraft after which aircrew converted to the CF-100. Graduates then manned the newly-formed all-weather squadrons, one of which was No. 419 (Moose) Sqn., re-activated at North Bay in March 1954. During the summer of 1955, the OTU departed for RCAF Station Cold Lake and No. 433 (Porcupine) Sqn. came from there to North Bay. To fill the NATO requirement for all-weather fighters No. 419 was posted to Europe in August 1957 and No. 414 (Black Knight) Sqn. was re-formed to fill the gap.

From 1954 onward the CF-100 squadrons based at North Bay provided 24-hour stand-by, becoming part of Canada's contribution to North American air defence when NORAD was formed in 1957. On numerous occasions aircraft were scrambled to investigate unidentified aircraft that had been spotted by Pine Tree radar stations. Fortunately these "unknown" tracks all turned out to be friendly — generally aircraft that had strayed off course or had not filed a flight plan. At least once the "enemy" turned out to be a flock of high flying geese. The aircraft operated in all kinds of weather and thousands of training missions were flown. When technological advances in air warfare made a requirement for more specialized and higher performance air defence equipment, the CF-100s were phased out of service. No. 433 Sqn. was disbanded in July 1961 and No. 414 was converted to CF-101Bs.

The Black Knight and No. 414 Sqn. friend.

As the air traffic controlling agency at North Bay, and owners of the airfield, DOT must not be left out of the picture. Many civil aircraft still use the airport for business and pleasure and TCA has run a continuous service through the Bay since 1938. In use for many years, the old terminal is soon to be pensioned off and replaced by a large new building now under construction at the south-west end of the airport. Mr. Lorne Hicks, who has been the DOT airport manager here since 1942, once remarked years ago, "It's one of the best airports in Canada". And so it is. It also has become one of the most important military airbases in Canada.

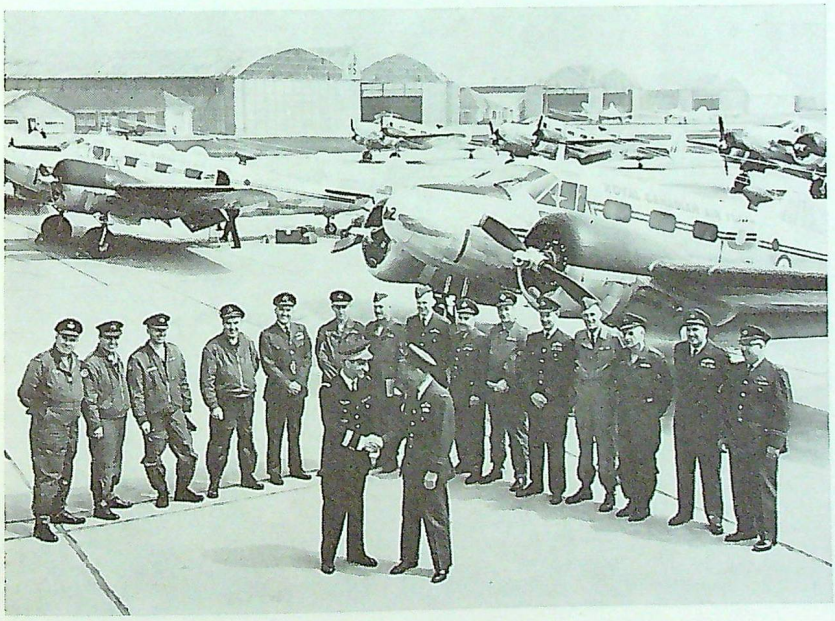
1962 RED KNIGHT

FLYING Officer D. J. Barker, a flying instructor at No. 2 AFS, Portage la Prairie, has been chosen as Red Knight for the 1962 season. For the past two years F/O Barker had been the assistant Red Knight.

The Red Knight and his colourfully-painted T-33 aircraft will appear at various airshows across Canada and, on at least one occasion, in the U.S. For the most part the Red Knight or the assistant Red Knight, F/O W. C. Fraser, will be a one-man airshow but at the Canadian National Exhibition, Toronto, the National Air Show at Ottawa and the Red River Exhibition at Winnipeg they will share the air display with the Golden Hawks.

While serving overseas in the Air Division F/O Barker was several times a member of the RCAF team which won the Guynemer shooting championships.

CANADA GIVES MORE AIRCRAFT TO FRANCE



Ten C-45 seven-passenger *Expeditor* aircraft of the RCAF were turned over to the French Air Force under Canadian mutual aid arrangements on 26 April at Chateaudun, France, after being flown across the Atlantic. Colonel Jacques Henri Fourcourt, commander of the French base, is shown greeting S/L James Fewell, officer commanding No. 129 Acceptance and Ferry Flight, Trenton. Other pilots who took part in the ferry flight and some of the aircraft are shown in the background.

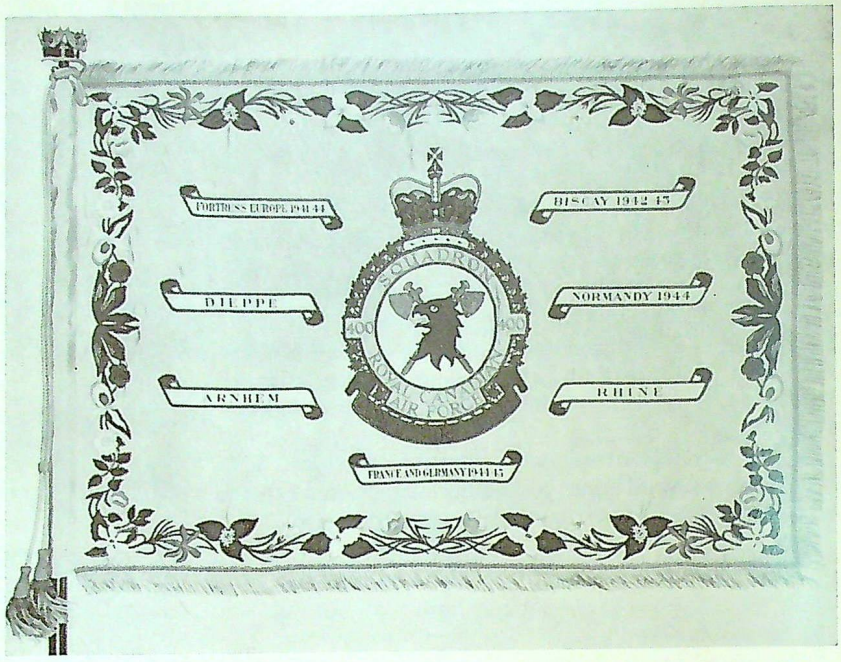
Four additional flights of mutual aid aircraft are being undertaken. A total of 50 T-33 aircraft will be flown overseas, 40 of them being given to France and the remaining 10 to Greece. The first of these ferry flights took place last month and the final one will be flown in July.

SQUADRON QUARTER-CENTURY CLUB

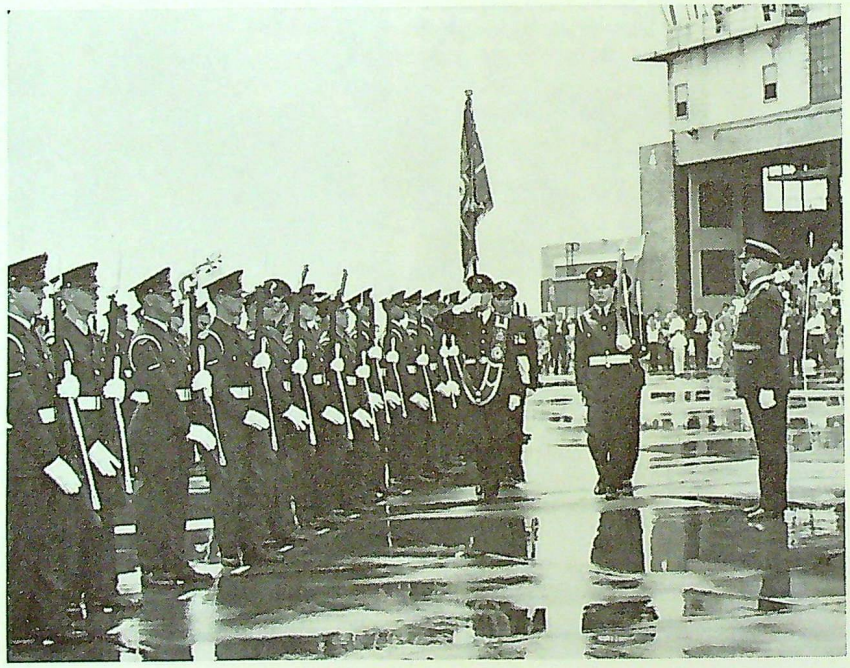
FIVE RCAF units have been presented with squadron standards during the past year, signifying the fact that they have reached their 25th birthdays. Charter member of this "quarter-century club" is No. 400 Sqn., Toronto; latest to receive their standards were Nos. 401 and 438 Sqns., at a joint ceremony in Montreal last month.

In 1943 His Majesty, the late King George VI, graciously observed the 25th birthday of the Royal Air Force by announcing his intention of awarding a ceremonial flag to be known as The Standard to RAF squadrons which had existed for 25 years or had earned appreciation by virtue of specially outstanding operations. The honour was extended in April 1958 to include squadrons of the RCAF.

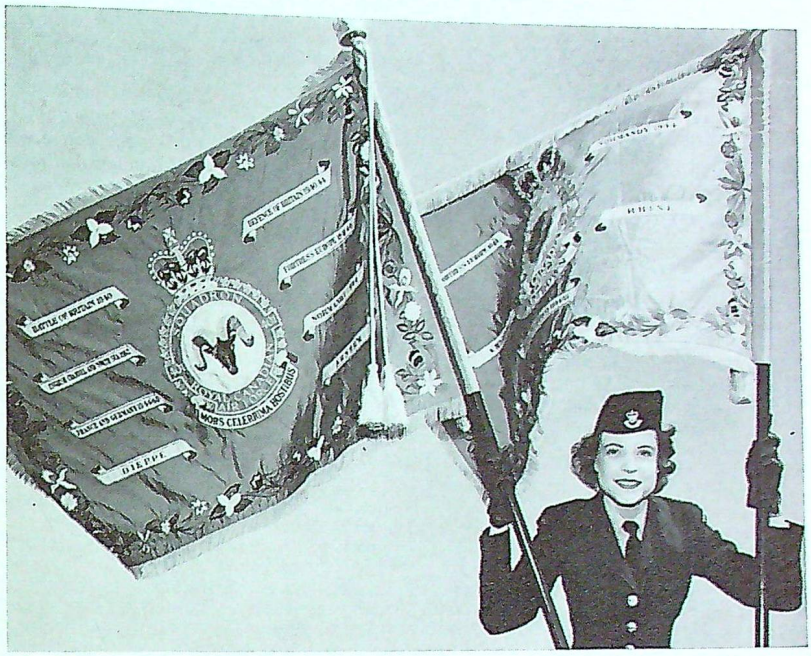
The squadron standard of the RCAF is a rectangular silk flag, double silk embroidered on both sides, two feet eight inches on the staff and four feet in the fly. Light blue in colour, it has a border composed of the floral emblems of the ten Canadian provinces in coloured silks. In the centre is the unit badge, flanked by white scrolls on which the squadron's battle honours are inscribed in black. The staff is eight feet one inch in length, surmounted by an astral crown.



No. 400 Sqn., which now is an RCAF auxiliary unit in Toronto, was the first to receive its own squadron standard. At a ceremony at RCAF Stn. Downsview on 10 June 1961 Ontario lieutenant governor, the Hon. J. K. MacKay, formally presented the standard pictured above to this famous formation.

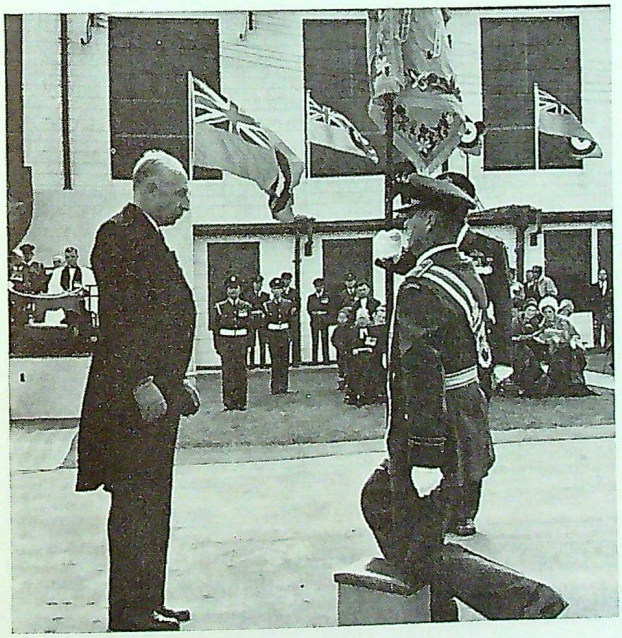


No. 400 Sqn. saluted its standard for the first time a year ago this month.

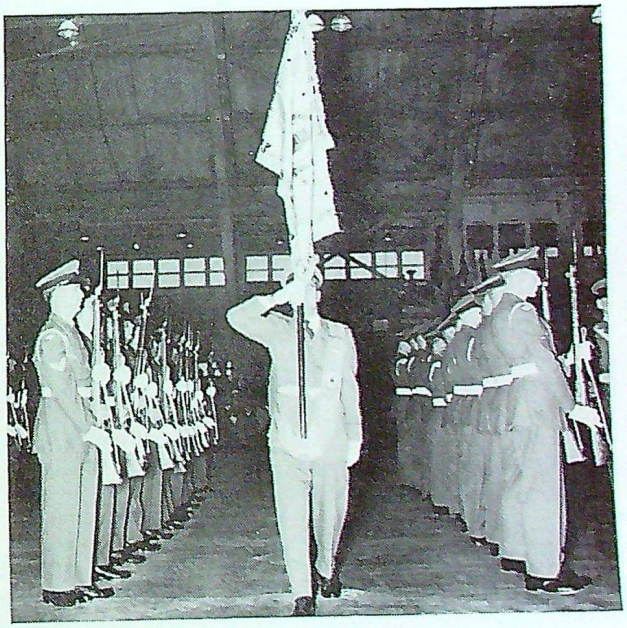


The Hon. Paul Comtois, lieutenant governor of Quebec, presented standards to No. 401 and No. 438 Sqns. at RCAF Stn. St. Hubert on 5 May 1962. He is seen, at left, flanked by A/M Hugh Campbell, chief of the air staff, and A/V/M W. R. MacBrien, AOC, ADC. At right, F/O Pattie Doy of No. 11 Wing (Aux.) HQ displays the two standards.

On 21 Oct. 61 No. 424 Sqn., now Hamilton's auxiliary squadron, received its standard. Here Lt. Gov. MacKay formally presents it to F/L C. E. Campbell.



No. 402 (Aux.) Sqn. in Winnipeg received its standard on 25 Nov. 61. Manitoba lieutenant governor, the Hon. Eric Willis, presented it to F/O R. A. Henderson.



Letters to the Editor

CANSO OR CATALINA

Dear Sir:

The picture of the *Canso* "*A*" in your Mar. 62 issue was greatly appreciated. However, the caption did not clarify the difference and similarity of *Canso* and *Catalina* aircraft.

The original RCAF aircraft called a *Canso* was a seaplane and a similar aircraft used by the RAF was named a *Catalina*. Both were almost identical to the U.S. Navy PBY. The RCAF later received amphibious aircraft manufactured in Canada by Boeing and Vickers. This aircraft was designated a *Canso* "*A*".

WO1 M. A. Westell,
RCAF Station Camp Borden,
Ont.

(*You are correct, WO Westell, when you say that the RAF and the U.S. Navy had an aircraft which they called the Catalina. But you are incorrect when you say that the original RCAF version was a seaplane called the Canso. Eight RCAF squadrons in Canada plus No. 413 Sqn. overseas had the Catalina seaplane. The amphibious version of the Catalina was, of course, called the Canso. Nos. 416 and 417 Sqns. on the east coast were first equipped with Catalinas and later with Cansos. — Editor.*)

LYSANDER LEGEND

Dear Sir:

I was disappointed that you had overlooked a good deal of Canadian history in the caption for the Westland *Lysander* photo (Apr. 62).

Almost all the *Lysanders* used by the RCAF were built in Canada by the National Steel Car Corporation and later by Victory Aircraft Company at Malton, Ontario. The initial order was for 28 *Lysander* IIs. The Canadian Mark II was identical to the English aircraft except that the sheet metal components were covered with larger skin panels which eliminated many lap joints.

It became apparent that the aircraft canopy was unsatisfactory for Canadian winter operations. The cockpit heating as originally designed was also unsatisfactory so both components had to be redesigned to Canadian standards.

The Bristol Mercury-powered Mark III T was produced in greater quantity in Canada. Equipped with an electrically-operated target winch and improved heating system, it was used as an RCAF target tower.

During the invasion of the Low Countries and the fall of France 12 *Lysanders* were boxed for shipment overseas in an extremely short period of time. Employees of National Steel Car worked around the clock to get the job completed. However, only six of these aircraft were ultimately shipped abroad.

K. M. Molson,
Curator,
National Aviation Museum,
Ottawa.

4 ATAF COMMENT

Dear Sir:

Thank you very much for a copy of THE ROUNDEL containing the article on Fourth ATAF (Apr. 62.) Although it doesn't make as exciting reading as the wartime history of the "Elephants", I'm sure it will give your readers a better idea of why we're here.

A/V/M J. G. Kerr,
Headquarters, 4th ATAF,
CAPO 5055,
Canadian Armed Forces Europe.

MISS CORRY VISITS CANADA

Dear Sir:

Any piece of news which is of interest to hundreds of Canadian veterans of World War II should be brought to your attention; therefore, I am taking the liberty of writing this letter.

The news concerns the Canadian visit of Miss Elsa Corry, former hostess of the YMCA Service Club at Queen's Gardens and Leicester Terrace during the 1941-1946 period. Miss Corry provided much appreciated musical entertainment at the club and, in addition, acted as "big sister" to hundreds of our servicemen.

Miss Corry arrived in Canada early in April and is travelling by train across the country visiting many old friends. She will be in our country until some time in August.

Through THE ROUNDEL, let us extend a warm welcome to this remarkable person.

Robert G. McNeil,
RR 1,
Pugwash, N.S.

(*We hope that as news of Miss Corry's visit appears in various newspapers across the land, RCAF members who knew her during wartime will contact her and renew old acquaintances. — Editor.*)

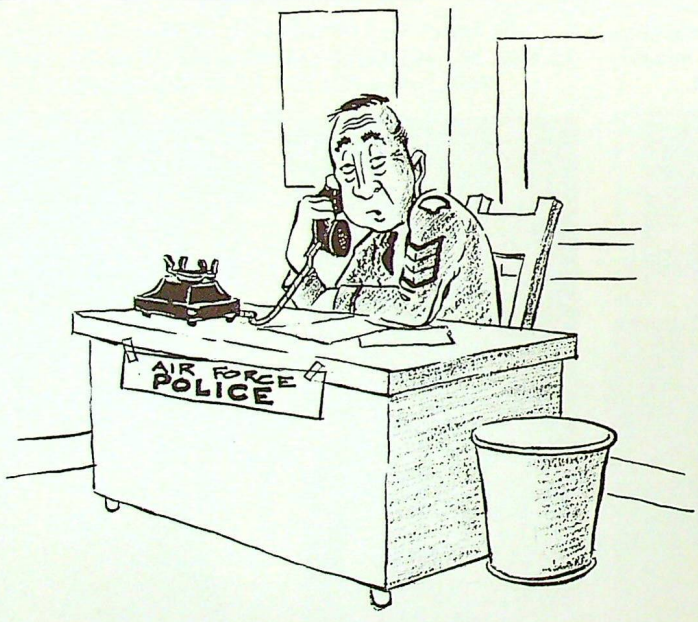
●

Imagination: something that sits up with a wife who sits up waiting for her husband.

Good turn: one that gets the blankets back on your side of the bed.

On the Line

by LAROUCHE '62



"BESIDES 'WEARING A BLUE UNIFORM', MISS, ISN'T THERE *ANYTHING* ELSE YOU CAN TELL US TO HELP IDENTIFY HIM?"

Aircraft Album: The Supermarine Spitfire

First flown in March 1936, the *Spitfire* is famous as the leading British fighter of World War II. A total of 20,351 were built, excluding naval variants — more than any other British warplane. The *Spitfire* was first flown on Canadian operations by No. 403 Sqn. in March 1941, and a total of 14 RCAF squadrons eventually were flying the type. Of these, 10 were fighter and fighter-bomber squadrons based in Britain, three formed an RCAF fighter-reconnaissance wing, and one, No. 417, flew fighter-bombers in North Africa, Sicily, and Italy. The first Me. 262 jet fighter to be shot down fell to a *Spitfire* of No. 401 Sqn.

Oddly enough, only four *Spitfires* were operated in Canada during the war. One, on loan from the RAF, was used in 1940 to test the first Franks' "G" suit. The *Spitfire* V pictured above arrived at Rockcliffe in February 1943 and was used for high altitude tests.

Roger Duhamel

The Queen's Printer — L'Imprimeur de la Reine

OTTAWA

ROYAL CANADIAN AIR FORCE