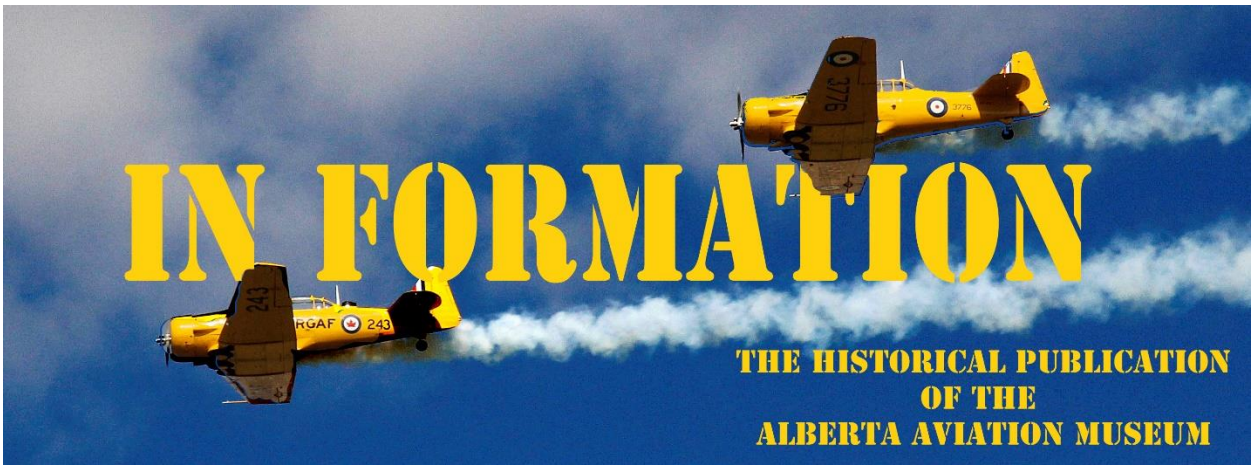

January – February 2017 Issue

Blatchford Field: The Emergence of Aviation as a National Fact During the 1920s

By Ken Tingley

The history of aviation in Edmonton began in 1909 when Edmonton carpenter Reginald Hunt flew his self-designed and hand-built aircraft for 35 minutes over the provincial capital. In 1911 two American daredevils, Hugh Robinson and "Lucky" Bob St. Henry, flew their plane at the Spring Horse Show. But it was not until after the Great War of 1914-1918 that returning veterans with wartime experience in the Royal Flying Corps really began to establish Edmonton as the Gateway to the North. From this time on aviation would play a central role in the opening and development of the northern Canadian resource frontier.

In February 1918 Walter Sporle's St. Albert Stock Farm buildings, located south of the Edmonton, Dunvegan and British Columbia railway station, and a landmark on the St. Albert Trail for a decade, burned down. This location would become the future site of the first "air harbour" in Canada. In 1919 brothers Wilfrid "Wop" and Court May, with George Gorman, began flying out of a grassy air strip on the Walter Sporle farm in their wartime Curtiss "Jenny", the "City of Edmonton." The following year John "Jock" McNeill and Captain Keith Tailyour incorporated the Edmonton Aircraft Company, having built a hangar on the Hagmann Estate in the Summerwilde neighbourhood.

Figure 1 - 1919 First Commercial Flight by George Gorman (Alberta Aviation Museum Collection)

During the 1920s the federal government was becoming more involved in the development of Canadian aviation, and by 1924 aircraft were prohibited from landing anywhere except on federally licensed aerodromes. In 1924 “Wop” May and Harry Adair approached Mayor Ken Blatchford, requesting a proper airport to accommodate their Curtiss Jenny. City Engineer A.W. Haddow wrote to the Department of National Defense Air Service on 23 June 1924, informing them that Edmonton "has under consideration the establishment of a Civic Aerodrome...." This would be on land located on a brushy quarter section of grazing land about two miles from the city centre. The old McNeill hangar remained on the site in a dilapidated condition.

Figure 2 - 1920 Edmonton Aircraft Co. at Hagmann Estate, Edmonton (Alberta Aviation Museum Collection)

The proposal did not come before City Council until 10 May 1926. The City already owned the Hagmann property, having come into possession when it was relinquished by the failed Edmonton Airplane Company for non-payment of taxes, common during the 1920s when many land speculators from the pre-war boom were left holding the bag when the real estate market crashed. City Council decided in 1926 to upgrade the facility.

Mayor Blatchford applied for a license for the "air harbour" on 28 May 1926. City Council then authorized construction of three runways. License No. 72, for the first municipal Air Harbour in Canada, was issued to the City of Edmonton on 16 June 1926.


Figure 3 - Blatchford Field Hangar, circa 1929 or 1930 (Alberta Aviation Museum Collection)

City Council passed a resolution on 22 November 1926 to name the air harbour "Blatchford Field", in honour of Mayor K. A. Blatchford, who had played such an important part in having the airport established. The Geographic Board of Canada accepted the name in January 1927.

In the years that followed, Blatchford Field would become an important jumping-off point for the north.

Heroic rescue flights, historic explorations, ambitious commercial endeavours, and the

opening of the northern resource frontier all would benefit from its establishment, as would Edmonton. While bush flyers did not initiate the opening of the northern resource frontier, as is sometimes suggested, it is important to acknowledge that they certainly accelerated the process considerably.

"The example by your City in establishing this flying field is one which I trust will be followed by every other city in the Dominion," G. J. Desbarats, Deputy Minister, Air Service, had written in December 1926. As the aviation age progressed rapidly during the following decades this proved to be an accurate prediction.

Historical Introduction

It is important to bear in mind that the story of the Edmonton airport remains part of a broader national story. At the end of the First World War little infrastructure existed in Canada to accommodate the first tentative penetration of the vast northern regions to improve the scale of natural resource extraction. At first, there were only two "air harbours" in Nova Scotia, for "flying boats," and seven in central and southern Ontario used for Royal Air Force training. None of these bases were established for northern bush flying.

Many young flyers back from the war bought surplus Curtiss Jenny aircraft and began to introduce the public to flight through barnstorming. These "dollar a minute" pilots led the government to the conclusion that aeronautics would need regulation, and it introduced such legislation into Parliament. *An Act to Authorize the Appointment of an Air Board for the Control of Aeronautics*, also known as the Air Board Act, received Royal Assent on 6 June 1919. It provided for appointment of an Air Board with representation from the Department of Militia and Defence, and the Department of Naval Services. The Air Board was given many responsibilities, which included aeronautical research, construction of air stations, regulation of aircraft, and the negotiation of international air rights. Its powers extended to regulations for the licensing of pilots, aircraft and air bases; conditions under which passengers, freight and mail could be carried; prohibition of flying over certain areas; establishment of air routes; and safety rules. The Air Board Act was typical of laws granting broad powers being adopted around the postwar world.

The beginning of air transportation into the Canadian north began on 15 October 1920, when Hector Douglas and Frank Ellis piloted a 500-mile "bush flight" from Winnipeg to The Pas. Further west, Imperial Oil was the earliest firm to appreciate the value of aircraft in the western Arctic and sub-Arctic regions, as it launched its exploration in the Mackenzie River Valley using two Junkers JL-6 all-metal monoplanes piloted by George Gorman and Elmer Fullerton. Their first expedition, the 1921 tale of G-

Figure 4 - "Wop" May with Imperial Oil's Junkers-Larsen JL-6 G-CADP (Alberta Aviation Museum Collection)

CADP, has been told many times, with its dangerous winter flight, forced landings at Fort Simpson (damaging the propellers of both aircraft), the manufacture of a replacement propeller using local materials and a departure from Fort Simpson just ahead of spring. Imperial Oil Geologist W. Waddell also was flown from Peace River to Fort Norman by Edmonton pilots George Gorman and Elmer Fullerton, with air engineers Pete Derbyshire and William Hill. The search for oil in the Mackenzie River basin during 1921 also led a pair of Vancouver and Los Angeles entrepreneurs to suggest using a 32-passenger dirigible to connect Edmonton and Fort Norman. F.G. Erickson also was reported to be planning a regular flying boat service throughout the Mackenzie area, beginning in May 1921. The north seemed on the verge of an airborne invasion.

By 1922 more extensive aerial forestry patrols were under way in Quebec and Ontario, to survey and photograph vast, otherwise inaccessible tracts of their northern hinterland. N.R. Anderson, who was an Air License Inspector for the Board in western Canada, reported the state of the nascent industry's self-regulation in the west that year, lamenting the lack of the most basic maintenance of log books:

The majority of commercial aviation firms operating in Western Canada do not keep their log books up to date, and in many instances have no information whatsoever about repairs or replacements to aeroplane and engine during the previous flying season. The practice of keeping flying time in rough note books and on separate pieces of paper is mainly responsible for this neglect. Such note books and bits of paper usually appear to be of no importance if left scattered about and are, therefore, lost, or if kept in a safe place, the accumulation is so great at the end of the flying season that it is a very weary task to copy the whole into the log books and usually it is left undone. If log books were carried in the machine and entered up after each day's flying it would only be a five minute task, and the information about repairs and replacements would be accurately remembered and put down. In case the machine was being left out overnight the logbooks could easily be carried to his room by the pilot, instead of being left out to perhaps get rained on, or taken away as souvenirs by some prowler in the night. The importance of having available for inspection, a detailed history of the aeroplane and engine, both in regard to flying time and repairs, is absolutely necessary - for at the present time commercial aviation personnel seem very reluctant to give the Examiner any information which could be of assistance to him in carrying out his inspection.

Despite the general *laissez-faire* attitude of the early flyers, the grander promise of the future began to emerge among early planners and visionaries. As early as January 1919 Major K.E. Clayton Kennedy, involved in transport flying between London and Paris, identified the important air routes still to be developed in Canada. He correctly guessed that Edmonton and Winnipeg would be the hubs of these routes.

Bush flying was a national endeavour, and many of the pioneering efforts into the northern reaches of Canada were carried out in Ontario and Quebec. For example, Elwood Wilson and Stuart Graham began with a handful of flying boats and veteran pilots operating in the St. Maurice - Lac St. Jean areas in Quebec. Their Laurentide Air Service, chartered in 1922, soon was the largest commercial air operator in Canada, flying in both Ontario and Quebec. Its most important aircraft was the Curtiss HS2L flying boat, but it also tried using a Loening Air Yacht,

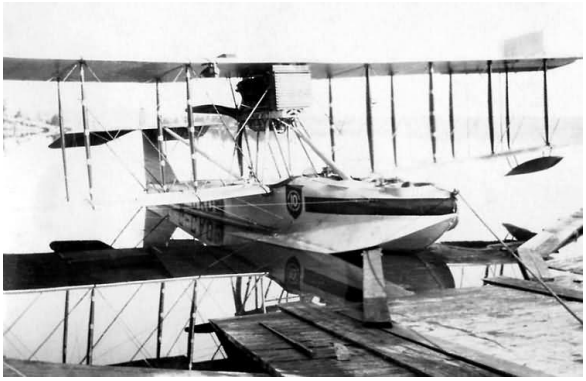

Figure 5 - Curtiss HS-2L Ontario Provincial Air Service circa 1924 or 1925 (Aubry Gratton Collection, 1000aircraftphotos.com)

Vickers Viking, Westland Limousine and a de Havilland DH.9. At its largest in 1923, the firm had 12 aircraft, 10 pilots and 8 to 10 air engineers. Laurentide Air Services suffered a heavy blow in 1924 when it lost its forestry patrol contracts in Ontario; the Department of Lands and Forests organized its own air service; and the Ontario Provincial Air Service and a professional RCAF were both established on 1 April 1924. Laurentide struggled on, but went bankrupt attempting to give winter services to the Rouyn gold fields. This pioneering effort preceded any on this scale in Alberta at this time.

The most notable forestry service in the private sector in 1920 involved Price Brothers and Company, a Quebec-based pulp and paper company. They established a summer service, first with a float-equipped JN-4 and then with three Martinsyde Type A aircraft. The firm used aircraft to support their forestry operations in the Lac. St. Jean - Saguenay area. Price Brothers disbanded its aerial arm in 1923, purchasing flying services from specialized firms instead.

Jurisdiction over air services was also a significant early issue. Of course, the British North America Act (1867) had not anticipated this question. The Maritime Provinces, Ontario, Quebec and British Columbia all had jurisdiction over their own natural resources. The Prairie Provinces, however, had no such authority until 1930. Thus, the survey, protection, and administration of those forests were a federal responsibility. The Air Board's forestry work in Quebec and Ontario only lasted from 1920 to 1922. Air Board and RCAF operations in Manitoba, Saskatchewan and Alberta began as experiments but continued as core operations until the Depression.

Once the federal government surrendered its control of western resources to the provinces, aerial protection continued under new masters. The handover coincided with the large federal budget cuts of 1932, during the Great Depression, which saw the RCAF budget drastically reduced. It is not surprising to find that the Manitoba Government Air Service, formed in 1932, very closely resembled its RCAF predecessor, using the same bases, Vedette aircraft carrying civil registry rather than air force markings, and many of the same people who the RCAF had let go.

In 1921 forestry operations were carried out from the Vancouver Air Station (fire patrols, photography, survey), Kamloops, British Columbia (fire patrol), High River, Alberta (fire patrols and some reconnaissance work in Jasper Park), Victoria Beach, Manitoba (fire patrols between Lake Winnipeg and the Ontario border and around the northern ends of Manitoba's largest lakes), Sioux Lookout, Ontario (mainly surveys) and Roberval, Quebec. The Forestry Branch also was anxious to extend coverage in British Columbia, Manitoba and Alberta.

In 1922 the Air Board carried out several photographic surveys of the Alberta forests. In Manitoba, Squadron Leader B.D. Hobbs directed a force of 37 men in aerial forestry operations. The F.3 flying boats employed, however, were unwieldy to handle when mooring on small lakes

or rivers. The establishment of temporary bases at The Pas and Norway House proved very successful in extending aerial coverage, and the idea of the detachment soon was accepted in photographic and forestry patrols. Early operations clearly demonstrated the value and practicality of aerial forestry patrols. In 1923 Ontario and Quebec took on all responsibility for such operations within their jurisdictions. The federal government then concentrated on the western forests for which it was still responsible.

Figure 6 - DH4 from High River flying over the Rocky Mountains, early 1920s
(Directorate of History & Heritage Collection at DND)

When the federal government handed over natural resources to Alberta, Saskatchewan and Manitoba during 1930-1931, Manitoba soon organized its own air service, modeled on the Ontario Provincial Air Service [OPAS]. Aviation historian Hugh Halliday describes the chores of early fire patrols such as occurred over Alberta lands during the period:

The aerial fire patrols of the 1920s and early 1930s were much more complex than the term suggests. Whether it was the RCAF, OPAS, or a private firm, the fire spotters were not limited to locating and reporting fires. Often the pilots became involved in fire suppression as well. Until the appearance of water bombers about 1947, this could be done only by men on the ground. Suppression flying entailed getting a handful of fire fighters with equipment (pumps and hoses plus food) to a lake close to an outbreak. That was simple enough, but some pilots went further. Fred Stevenson, in his OPAS days, was reported to have moored his HS2L and personally joined the firemen battling a blaze. In 1929 the RCAF attempted (unsuccessfully) to have Flight Lieutenant Frederick Mawdesley awarded the McKee Trophy; among his exploits cited were numerous flights to transport and resupply fire crews; in some instances he landed a wheeled aircraft on ice pans in the middle of lakes to get the men to their destinations.

Figure 7 - Ken Tingley

By the late 1920s aviation in Canada had evolved to the point that it was becoming an indispensable part of national life. The creation of Blatchford Field in 1927 would be at the cutting edge of this development.

EDITOR'S NOTE: Ken Tingley became the first municipal Historian Laureate in Canada when he was named to the position in April of 2010. During his two-year tenure, Tingley published "Ride of the Century: The Story of the Edmonton Transit System" and "My Heart's in the Highlands: The Building of a Historic Edmonton Community".

Maurice “Moss” Burbidge: Teaching Edmontonians to Fly

By Neil Taylor

Figure 8 - Maurice "Moss" Burbidge (Denny May Collection)

Many of Canada’s most famous aviation pioneers had their start in the industry flying for the Royal Flying Corps during the First World War. Maurice “Moss” Burbidge was no exception, but while he honed his flying skills in the skies over France and Germany, he had a gift in his ability to teach others how to fly. It was this latter important skill that earned him a place in Edmonton’s aviation history.

Maurice “Moss” Burbidge was born in Brough, Yorkshire, England on April 15, 1896. At the age of nineteen, he joined the Royal Flying Corps. After a brief stint as an instructor, Moss was posted to No. 115 Squadron where he flew the Handley Page O/400 twin-engined bomber on strategic bombing operations over Germany.

While in No. 115 Squadron, “Moss” met Captain James Bell who was later to become the Manager of Edmonton’s Blatchford Field. Captain Burbidge was posted to India immediately following the war, then returned to England to take instructors’ courses at the Central Flying School.

Captain Burbidge became the instructor for the first class of officer pilots in the Fleet Air Arm in 1925, and he continued instructing until he left the Royal Air Force in 1929.

Captain Burbidge then came to Canada and in March 1929 became the chief flying instructor for the Edmonton and Northern Alberta Aero Club, taking over from “Wop” May who left the club to start Commercial Airways.

While he spent the majority of his time instructing at the Aero Club, “Moss” Burbidge also took on occasional assignments for Commercial Airways. In December 1929 he was called upon to assist “Wop” May in instituting air mail service along the Mackenzie River Valley. Burbidge flew Lockheed Vega CF-AAL as far as Fort Resolution before returning to Fort McMurray.

Back in Edmonton, “Moss” Burbidge continued as chief flying instructor with the Edmonton and Northern Alberta Aero Club. By 1932 he had already trained 105 pilots seeking their private and commercial licenses and had amassed nearly 5000 hours of flight time.

In recognition of his accomplishments as chief instructor with the Aero Club, Maurice Burbidge was awarded the prestigious 1932 Trans-Canada Trophy, also known as the McKee Trophy. This award is presented annually for meritorious service in the advancement of aviation in Canada. Previous winners with an Edmonton connection included Clennell “Punch” Dickins in 1928 and Wilfrid Reid “Wop” May in 1929.

Burbidge continued working in Edmonton as an instructor with the Aero Club until April 1938 when he left for a position with Trans-Canada Air Lines in Winnipeg. At the time of his departure, Burbidge had trained over 700 students, flown 32 different types of aircraft and had logged over 15,000 hours of flight time, but even more importantly during his tenure none of his students had sustained a flying injury.

Many great Canadian aviators learned to fly under Burbidge's tutelage, including, but not limited to: Carl Agar, noted helicopter pilot; Russ Bannock, WWII Mosquito pilot, test pilot and President of de Havilland Aircraft Co. of Canada; Grant McConachie, founder of Yukon Southern Air Transport and later President of Canadian Pacific Airlines; Alf Caywood, pilot with Canadian Airways Ltd., then Canadian Pacific Airlines before establishing the Air Division of Eldorado Mining and Refining; George Campbell "Dal" Dalziel, the "Flying Trapper" of the Yukon; Margaret Fane Rutledge, founder of the Flying Seven, an elite group of Vancouver female pilots; and Maurice D'Arcy Allen Fallow, himself a top-notch flight instructor and Secretary-Manager of the Edmonton Flying Club.

Burbidge's time with Trans-Canada Air Lines was brief. In 1939 he took a refresher course for flying instructors at Camp Borden and was then reappointed as flying instructor at the Edmonton and Northern Aero Club. As part of the war effort, flying clubs across Canada were recruited by the Department of National Defence to provide elementary flying instruction to new pilots as part of the British Commonwealth Air Training Plan. The Edmonton and Northern Alberta Aero Club formed the Edmonton Flying Training School Ltd. to operate No. 16 Elementary Flying Training School (EFTS) based at Blatchford Field. "Moss" Burbidge became chief instructor at No. 16 EFTS and tutored a whole new set of students.

While No. 16 EFTS remained in operation until July 17, 1942, Burbidge left the organization on January 1, 1942 to become Airport Manager of the Lethbridge Airport, a post he held for nineteen months. In 1944 he joined Transportes Aereos Centro-Americanos, an airline operating throughout Central America. He was an operations manager with the company when he left the aviation sector, but he then went on to become Master of a Boys School on Vancouver Island before finally retiring. He died in 1977.

Figure 9 - Connie & Moss Burbidge (Denny May Collection)

"Moss" Burbidge's contributions to Canadian aviation have been well recognized. In 1974 he was inducted into Canada's Aviation Hall of Fame, and he was also made a Companion of the Order of Flight (City of Edmonton). Perhaps his greatest legacy is the generations of pilots who received their flying instruction from him. A born instructor who knew how to get the most out of his students, "Moss" Burbidge made a lasting impact on the growth of aviation in Edmonton.

Remembering the Arrow Air Crash at Gander

By Peter Pigott

The history of Arrow Air could have been lifted directly from a Nicholas Cage movie. Supposedly, the Miami-based charter air carrier flew covert operations for the CIA in South America and in the Middle East. In March 1984, when the Federal Aviation Administration (FAA) conducted an inspection of the airline, its inspectors discovered that Arrow Air's operating policies and procedures had not kept pace with growth. Company manuals were out of date, there was poor record keeping and no formal maintenance training program in place. For an airline that had just won a U.S. Department of Defense contract to move troops around the world, the FAA report was disconcerting.

Figure 10 - An Arrow Air DC-8-63 Identical to N950JW (Pedro Aragão Collection)

One of those military flights was to transport the 101st Airborne (the U.S. component of the Multinational Force and Observers), their personal effects, and some military equipment from peacekeeping duties in the Sinai Desert back home to Fort Campbell, Kentucky. The Arrow Air DC-8-63 (N950JW) left Cairo, Egypt on December 11, 1985 at 2035 Greenwich Mean Time (GMT) for Fort Campbell via Cologne, Germany, and Gander, Newfoundland. On board were 8 crew members and 248 passengers. It arrived at Cologne at 0121, December 12th, where a complete crew change took place. When the DC-8 landed at Gander on early Thursday morning, passengers were deplaned, the aircraft refueled, trash and waste water removed, and catering supplies boarded. After five months of service in the Sinai Peninsula, the soldiers (all in civilian clothing) were on their way home for Christmas. There were line-ups for telephones as they made last minute calls to loved ones, and the airport gift shop was flooded with servicemen buying last minute gifts and (poignantly) "I survived Gander" T-shirts."

The flight engineer was seen to conduct an external inspection of the aircraft in the early morning darkness. There was freezing drizzle mixed with snow grains – so that surfaces were covered by what the airport's meteorological observer thought resembled a texture of "medium grit sandpaper". Ground de-icing facilities were available in Gander that morning but the Arrow Air crew did not request any.

The aircraft began its take off at 1015 on Runway 2202 which had been 'treated' because of the freezing rain. It was seen to proceed down the runway and rotate in the vicinity of taxiway "A" gaining altitude. Then inexplicably to onlookers, it began to descend. The Flight Data Recorder (FDR) later showed that the aircraft accelerated for 2 seconds after lift-off – then decelerated, stalling within 10 seconds after takeoff.

The Trans-Canada Highway runs just beyond the end of runway 2202, and several drivers who were on it testified later that the aircraft flew over the highway at a very low altitude and went into a right bank. Three of them saw a yellow/orange glow emanating from the aircraft. For two, the glow was bright enough to illuminate the interior of the truck cabs they were driving. The DC-8's pitch angle was also seen to increase, the aircraft continuing to descend until it struck some trees and an unoccupied shed 3,000 feet beyond the end of the runway.

The DC-8 was completely destroyed by the impact and a severe fuel-fed fire, killing all 256 of its occupants. Those not killed outright were cremated by a huge fireball that vaporized and melted a large portion of the DC-8. The Airport Crash Fire Fighting Rescue (CFR) vehicles arrived at the site 10 minutes after the accident. It took the better part of 21 hours to extinguish the largest fire, and smaller fires continued to flare up where bodies had been soaking in jet fuel. Firemen were busy for three hours, dragging fire hoses around the site, to extinguish these.

Figure 11 - Swath through Trees Created by the Crash of the Arrow Air DC-8 (Transportation and Safety Board Archives)

For the Canadian Aviation Safety Board (CASB), barely a year old, investigating the Arrow Air crash was an opportunity to demonstrate on the world stage that it warranted the confidence that the Canadian government had in it. Suspicion initially centered on a bomb in the soldiers' luggage which had been flown to Cairo from the Sinai by Egyptian aircraft and then was left unattended at the airport before loading.

The CASB staff arrived on Thursday afternoon and handled media relations, using both a public information officer and their chief investigator, Peter Boag. They also decided who would be issued passes to the site, although the RCMP maintained control of who actually was granted access, and when. They sought military help in organizing two formal searches: one starting at the end of runway 2202 where the plane had taken off, and the other through the bush, from the top of the hill toward the area of first impact. Both searches were organized to determine if anything might have fallen off the aircraft before the crash. Because heavy snow was forecast, all searches had to be completed quickly. When the flight recorders were found, an RCMP officer took them to Ottawa where they could be examined in the NRC laboratories. The RCMP also took plane parts to a forensic laboratory in Ottawa to determine whether sabotage was involved. The tests proved to be negative.

While emergency agencies were still trying to control the fire and the oil spill, the grim task of identifying bodies and body parts and marking them had begun. Many, charred beyond recognition, were scattered all over the crash site. Some were still strapped in their seats, their

hands brought up to cover a face no longer there. One soldier was found clutching a bible to his chest. Another was wrapped around a tree, still in his seat. The pilot was found near the cockpit wreckage, his hands on the controls. Only a few of the bodies were not disfigured. One victim was found with his body in perfect condition, except for a broken neck.

The Investigation

An extensive examination of the wreckage was conducted by the CASB team of investigators with the initial help of the U.S. Army and the RCMP. Over a period of several months, all wreckage was recovered from the site and moved to a secure hangar at the Gander Airport, where it was arranged in a grid pattern which matched the grid pattern established at the site.

A major setback to the investigation was the inoperative microphone of the cockpit voice recorder. As a result, there was no recording of the flight crew conversation from pre-flight checks to the actual crash.

Figure 12 - Part of the Instrument Panel at the Crash Site (Transportation Safety Board Archives)

The possibility of foul play was always present. Motorists on the highway testified to seeing a fire prior to the main explosion - "there was a second burst" one said, "of flame that shot up in the air as well. It would appear … that there was a second explosion". The crew of an aircraft in the vicinity of Gander airport also saw "the sky light up" a few seconds before the fireball of the main explosion.

Arrow Air's shady reputation didn't help – it had been known to fly clandestine contracts for the CIA. The aircraft was overweight and rumors abounded that there had been Stinger missiles in the hold being returned by the Iranian government. Also, before being loaded on at Cairo, the passengers' luggage had been left unattended or worse, in the care of Egyptian security. Then there was also unaccompanied baggage in the hold - not unusual in pre-Lockerbie years. Finally, on December 13th, the CASB received a phone call from Lebanon. The caller, claiming to be from the Islamic Jihad, took responsibility for planting a bomb on the aircraft.

The decisive element that this was sabotage was evidence of "pre-impact explosive damage" to the aircraft fuselage. This was discovered by a consultant employed by Arrow Air that the CASB had allowed to examine the wreckage. The hole, roughly elliptical in shape, was in a section of fuselage wall just aft of the right side forward door. A second larger hole was found in another section of fuselage. His observations were enough for the two sections of fuselage to be examined at the Royal Canadian Mounted Police Central Forensic Laboratory and the CASB Engineering Laboratory. But no evidence was found to support the consultant's view that the holes had been caused by a pre-impact explosion.

A public inquiry into the Arrow Air crash was held by the CASB in Hull, Quebec beginning April 8, 1986. Making the Gander report public created a major rift within the Board and embarrassed the federal government. Credibility and public respect are the cornerstones of every investigative organization and at the news conference called to release the board's findings, both were absent. Two factions within the CASB team fought it out openly, each accusing the other of distorting or ignoring key evidence in the Gander crash. For Chairman K.J Thorneycroft, Board members W. MacEachern, A. Portelance, B. Pultz and F. Thurston, the Arrow Air DC-8 crashed because it failed to achieve a normal rate of climb. Shortly after lift-off, it experienced an increase in drag and reduction in lift and then stalled at an altitude from which recovery was not possible. The most probable cause of the stall, in their estimation, was ice contamination on the leading edge and upper surface of the wing. Although the flight engineer was seen to make a pre-flight inspection, without the cockpit voice recorder, the Board could not determine whether the crew knowingly or unknowingly attempted to take off with ice contamination on the wings. "Finally," the official report stated, "the performance of the aircraft was not consistent with a sudden and catastrophic event such as an explosion."

Dissenting from the official conclusion were Board members N. Bobbitt, L. Filotas, D. Mussallem and R. Stevenson. In their judgment, the wings of the DC-8 were not contaminated by ice — certainly not enough for ice contamination to be a factor in the crash. In their opinion, the aircraft did not stall. "The evidence shows," they wrote, "that the Arrow Air DC-8 suffered an on-board fire and a massive loss of power before it crashed. But, we could not establish a direct link between the fire and the loss of power. The fire may have been associated with an in-flight detonation from an explosive or incendiary device".

Figure 13 - Cockpit Debris at the Crash Site (Transportation Safety Board Archives)

The FAA temporarily grounded all 10 of Arrow Air's DC-8s on February 8, 1986 but wisely chose not to enter into the Canadian family feud. "There is no conclusive answers" the NTSB/FAA Accident Investigation Brief summed it up: " ...as to why the Arrow Air DC-8 crashed. There are numerous theories, however, at this point there are no facts to support the various theories." This seeming inattention of the NTSB, the FAA and the U.S. military toward the crash only encouraged conspiracy theorists.

The Aftermath

The credibility of an accident investigating agency is of prime importance and with the infighting within the CASB played out before the media, the professionalism of the Board was called into question. This prompted Transport Minister Don Mazankowski to ask Justice Willard Estey, formerly of the Supreme Court of Canada, to conduct a review of the entire record of the Gander crash. Estey found insufficient evidence for the majority conclusion -- that ice on the wings was a probable cause – but even less for the minority view that an explosion or fire occurred before

the crash. Estey added in his review: “There is almost no evidence which supports any of the conclusions of the minority”. Noting references in the media to possible terrorist involvement, he summed it up, “Surmise and speculation inside and outside these proceedings abound, factual evidence does not. Nothing indicates any hope of uncovering explanations of this accident in those areas”.

Set up with such high hopes, by the late 1980s, the CASB was enduring the winter of its discontent. After the very public embarrassment over the Arrow Air dissension, it then mishandled the Air India bombing. What was needed was a pristine, apolitical accident investigation agency and Prime Minister Brian Mulroney's government expedited the legislation to create one. Assented to on June 29, 1989, “The Canadian Transportation Accident Investigation and Safety Board Act” (CTAISB Act) gave birth to the Transportation Safety Board (TSB) on March 29, 1990.

Figure 14 - Silent Witness Memorial at Gander Lake (Courtesy of Wikimedia Commons)

Arrow Air continued to be awarded troop carrying contracts during the Gulf War and survived for years after as a cargo carrier. What eventually killed the airline was the economic climate, and it ceased operations on June 30, 2010.

The tragedy is commemorated by a memorial on the crash site which features a sculpture of an American soldier standing atop a massive rock holding the hands of two civilian children carrying olive branches. Behind them are three tall staffs bearing the flags of Canada, the United States, and Newfoundland and Labrador. There is also the 22-foot-high Cross of Sacrifice crafted from the remains of the DC-8’s emergency exit door. It bears the inscription “Rendezvous With Destiny” — the motto of the 101st Airborne Division. The cross is surrounded by 256 native trees planted as a tribute to the crash victims.

EDITOR’S NOTE: Peter Pigott was born in England and grew up in India and Canada. After a career in the Department of Foreign Affairs, he became Canada’s most prolific aviation author and among his accomplishments are the histories of Trans-Canada Air Lines and Canadian Airlines. His latest book is “Brace for Impact: Air Crashes and Aviation Safety”. He lives in Ottawa.

Figure 15 - Peter Pigott

Canada's Aviation Hall of Fame to Induct Four New Members and Honour a *Belt of Orion* Recipient in 2017

Canada's Aviation Hall of Fame (CAHF) will induct four new Members, and bestow its Belt of Orion Award at its 44th annual gala dinner and ceremonies, to be held Thursday June 15, 2017, at Vancouver International Airport.

The new Members are:

- **James Erroll Boyd**: First Canadian to fly a trans-Atlantic flight
- **Robert John Deluce:** Founder of Porter Airlines
- **Daniel A Sitnam;** Founder of Helijet International Inc.
- **Rogers Eben Smith**: Test pilot for RCAF, NRC and NASA
- **RCAF Golden Hawks:** Belt of Orion Award for Excellence

Rod Sheridan, CAHF chairman of the board of directors, said, "Our 2017 inductees come from backgrounds that span the width of Canada's unique aviation industry. Aviation has brought Canadians together as a country, unlike any other form of transport. Our new inductees reflect that cohesion through their pioneering activities and spirit."

Figure 16 - Erroll Boyd

Erroll Boyd (1891-1960) was an early entrant into the Royal Naval Air Service from the Canadian Infantry, flew anti Zeppelin operations over the UK and coastal patrols from Dunkirk during the First World War. Postwar, he flew mail along the St Lawrence and graduated to long distance over water, in record-setting flights to Bermuda and Haiti. His west to east trans-Atlantic flight was flown in October 1930 in the Bellanca WP-2 *Columbia/Maple Leaf*. It was the first crossing by a Canadian and completed in the hazardous autumn season, a feat not repeated again until made necessary by the demands of war ten years later. He co-founded the Air Scouts of Canada that laid the foundations for the Air Cadet organization. Upon the outbreak of war in 1939 he became a central figure in the Clayton-Knight Committee whereby young Americans were recruited to join the RCAF prior to Pearl Harbor. Erroll's story is told in *The Lindbergh of Canada: The Erroll Boyd Story*, by biographer Ross Smyth.

Figure 17 - Robert Deluce

Robert Deluce has been engaged in the aviation industry all of his life since he began working for his parents' White River Air Services as a teenager in the 1960s. His subsequent career has taken him through a succession of positions in a host of Canadian aviation companies operating mainly in central Canada. Chief among them are norOntair, Austin Airways, Air Creebec, Air Manitoba, Air Alliance and Canada 3000. In 2000 he began discussions which culminated in the launch of a new concept in regional air travel from the then Toronto Island Airport in October

2006, using 20 new Bombardier Q400 aircraft and providing service at modest fares. Porter has grown to become a power in the heavily travelled eastern Canada area and has expanded into US destinations. A former Minister of Transport credits Bob Deluce with saving the Island Airport, now named Billy Bishop Toronto City Airport, from ultimate failure.

Figure 18 - Daniel Sitnam

Daniel Sitnam has amassed an outstanding record as an entrepreneur in rotary flight operations in British Columbia and as one of the industry's most progressive and admired company leaders. Thirteen years after a chance encounter led to his first experience with helicopters, he, and partner Alistair MacLennan launched Helijet Airways offering two-crew, twin-engine IFR harbour to harbour services between Vancouver and Victoria. Thirty years later he is still president and CEO of the company now known as Helijet International Inc. and its subsidiary, Pacific Heliport Services. In addition to guiding this company to success where many others failed, Danny Sitnam is legendary for his proactive mentoring and development of staff, especially female flight crew, and his insistence on core company values of safety, customer dedication, mutual respect and trust and professionalism. His accomplishments have been recognized by the Helicopter Association International and the BC Aviation Council.

Figure 19 - Rogers Smith

Rogers Smith is recognized internationally as a renowned test pilot. He received aeronautical degrees from the University of Toronto, following which he served as a fighter pilot in the RCAF. Then at the National Research Council's National Aeronautical Establishment he was involved with automated stability trials on helicopters. Dual citizenship allowed him to accept an offer from NASA to join its test pilot program and then the Cornell Aeronautical Laboratory where he was heavily engaged in developing fly by wire systems. A return to the NAE as Chief Test Pilot was followed by 18 years at NASA Ames from which he retired as Chief Pilot and Director of Flight Operations. His experimental test flying there has been characterized as being at the frontiers of knowledge. Known as one of the "Canadian mafia" among test pilots worldwide, Rogers went on to work for SAAB, EADS and Dornier and to lead the Society of Experimental Test Pilots.

Belt of Orion Award for Excellence:
Royal Canadian Air Force "Golden Hawks" aerobatic team

The RCAF Golden Hawks aerobatic team was formed in March, 1959 to celebrate the 50th anniversary of flight in Canada and the 35th anniversary of the Royal Canadian Air Force. Its mandate was to showcase RCAF capabilities to the Canadian public. The Golden Hawks were to operate Canadair F-86 Sabre Mk 5 aircraft from RCAF Station Chatham and to exist for one year. Under the leadership of S/L Fern Villeneuve (CAHF 2006

Figure 20 - Golden Hawks

Inductee) the team developed a brilliant program featuring new formations and routines in a successful 1959 season. Though stood down at the end of the season, popular demand resulted in the team's reinstatement and it embarked on an unparalleled record of success until disbanded in 1964. The team symbolized the professionalism, skill and daring needed to be a fighter pilot in the RCAF and its legacy lives on 50 years later in the metallic gold and red livery of the Golden Hawks Sabres.

The 2017 Hall of Fame induction ceremonies and gala dinner will be held on Thursday June 15, 2017, at Vancouver International Airport. For information and tickets, contact: Canada's Aviation Hall of Fame, P.O. Box 6090, Wetaskiwin AB T9A 2E8. Tel. 780 -312-2084. *cahf2@telus.net*

A Brief Overview of Canadian Military Air Traffic Control History

By Paul R. Hussey

Canadian Military Air Traffic Control history, like so much else in our Air Force heritage, is about the evolution of professional people and changing technologies, mingled with many hair-raising and sometimes, at the opposite end, amusing stories. But those stories are for another time perhaps. This article will provide a brief overview of that history.

Modern aviation must start in December 1903 at Kitty Hawk, North Carolina with the flights of the Wright Flier and in Canada on February 23, 1909 with J.A.D. McCurdy's first flight at Bras d'Or Lake, Baddeck Bay, Nova Scotia. These flights were of very short duration, at low altitudes and speeds, hardly of any concern in terms of Air Traffic Control.

Canada lacks a lot of historical data on aviation prior to 1915: as F.H. Ellis comments in *Canada's Flying Heritage*, "one reason for the dearth of historical data on the pioneer period of Canadian Aviation is that until 1915 there were no flying fields in the country where organizations could be formed whose records would furnish historical data".

A "Flying Field" refers to a field used for early experimental, exhibition, or passenger flying during the ten years following McCurdy's first flight. These fields fell into four main groups: cow pastures (often with cows!), race tracks, polo parks and exhibition grounds. In essence, the early flying field was a good-sized meadow, rough and dusty with a poor grade of grass. There was usually some sort of primitive wind-direction indicator, but few, if any, surfaced runways, no lighting, no air traffic control to worry about and no weather bulletins. It suited the age of aviator goggles and riding jodhpurs since aviation was viewed as a pastime for daredevils.

In spite of this climate of fear and distrust, aviation pioneers began to demonstrate the usefulness of their primitive flying machines. As early as 1911, the first mail was carried by air. Each month of the 1914-1918 War saw a constantly increasing demand for more aircraft - first for observation, then to fight off enemy observation planes and, finally, for bombing military

objectives. The Royal Flying Corps established their training bases in Canada to enlarge their field of recruitment and supplement UK overcrowded training establishments. Camp Borden, Leaside, Armour Heights, Desoronto, Mohawk and Beamsville were all active flying training schools with Toronto University as the main Ground Training Centre. None of these flying schools had any method of control nor was any ATC requirement deemed to be necessary. Indeed, during the conflict, the need for concentration on military efforts prevented any developments toward a system of control.

In Canada, in 1919, the Air Board Act was passed with the aim of administering and controlling civil aviation. In June, 1920, the government recognized the need for a Military Air Force and thus organized the Air Force on a wholly non-permanent basis. The first rules for prevention of collision between aircraft were prescribed by the International Commission for Air Navigation (ICAN) held in Europe in 1922. This Commission was charged by the League of Nations to prescribe some method of control for the increase in aircraft flights which were the result of the phenomenal expansion of aviation engendered by WW I. The Royal Canadian Air Force became a reality on April 1, 1924 when the formation was approved by the Order-in-Council no. 935. For several years, the fledgling RCAF was primarily engaged in support to civil air operations.

Prior to the 1930's, there was little need to organize air traffic as aircraft flew under the "see or be seen" rules of Visual Flight. Thus they flew only in good weather and never at night. But by the late 1930's the capability of aircraft to fly at night and in bad weather had taken a quantum leap. With instruments that allowed the pilot to control the aircraft without visual reference to the ground and ground-based navigational aids (radio ranges) being installed, pilots could take-off, cruise and land in weather conditions which would not allow them to see and avoid other aircraft. Air Traffic Control as we call it today began to emerge - quite out of necessity.

Figure 21 - Camp Borden Control Tower, July 1940
(Courtesy of Canadian Forces Joint Imagery Centre)

Because all these planes had to land eventually, it was inevitable that the airspace around airports would become congested and some form of local control would be needed. But the airport of that era only slightly resembled the airport of today. The 1920's airport rarely had designated runways and usually consisted of a large rectangular plot of land covered with sod or cinders.

After flying over the airport, the arriving pilot would observe wind direction, local traffic and runway conditions. He would then decide in what direction he would land. Others would follow the first arriving aircraft, allotting sufficient time for the previous plane to land, brake to a stop and taxi clear prior to their landing. Additionally, pilots needed to continuously scan the airport area for aircraft taxiing for take-off. Usually, of course, aircraft took-off into the wind. But on calm days, aircraft could be seen departing from all directions of the compass. It was immediately apparent some form of control would be needed around airports or the accident rate would be increasing alarmingly.

The earliest method of air traffic control required a person to stand in a prominent location on the airport and use coloured flags to communicate with the pilot. If the controller waved a green flag, it meant that the pilots were to proceed with their planned take-off or landing. But, if the

controller waved a red flag, then the pilots were to hold their position until the controller had determined that it was safe to continue. At that time, the controller would wave a green flag advising the pilots that they could continue. The first airport to hire such a controller was St. Louis, Missouri in 1929; that controller was Archie League who controlled traffic from a wheelbarrow on which he had mounted a beach umbrella. He would daily wheel his equipment to the approach end of the runway, where he would use his flags to advise the pilots whether to continue their approach or hold until the traffic was clear. Other large cities soon saw the advantages of this system and began to employ controllers at their airports. On the civilian side, in Canada, in 1936 the Canadian Government created the Department of Transport and construction of control towers at major airports began between 1939 and 1942.

On the military side a section then known as Flying Control within the Royal Air Force came into being in March 1941, as a result of an experiment in coordination of procedures formerly used by Operations rooms, Station Signal Officers and Duty Pilots. This formation had as its primary aim the establishment of a unit of personnel, trained and proficient in controlling movements of aircraft to ensure them the greatest degree of safety. This same organization and reasoning was applied to No 6 RCAF Group overseas. Formal training was initiated here in Canada - and upon successful completion – personnel were sent overseas for a period of 2-4 months understudy and familiarization, then followed by a 6 week course. ATC in the RCAF officially began in April 1943 with sign-off on CAP 343 which defined the organization and duties of the Flying Control Service in the Home War Commands of the RCAF.

Here we have the early beginnings and rationalization that the world of aviation was going to require - the formation of a professional body to ensure the safe, orderly, expeditious flow of air traffic. These same principles and drive for professionalism remain in effect today – only the people, the equipment, the aircraft and the degree of complexity have changed.

That is indeed the central thread of Canadian Military Air Traffic Control history: one of evolution and increasing professional requirements as the complexity, speed and consequences of error increased. So ATC and Air Traffic Controllers were woven into the very fabric of RCAF and Air Force history; most times however, hidden behind aircraft fleets and aircrew exploits. In fact one could say that ATC's very success can be measured by the lack of sensational incidents!!

Figure 22 - Airwoman Working in an Unidentified Control Tower, May 1955
(Courtesy of Canadian Forces Joint Imagery Centre)

In the beginning, Military Air Traffic Control was considered an "old" occupation, which meant it was populated by grounded aircrew and "experienced people" who had transferred in from other trades to apply their skills to "Flying Control" and Coordination. But things were becoming much more complex with advances in technology affecting aircraft and ground equipment capabilities and the speed at which information and control instructions were required to be disseminated. This "flying control and coordination" demanded younger, well trained people and so by the early 1970's people were drawn directly into ATC (Officers) and Air T Con (Non-Commissioned Members) occupations.

The courses were revamped, and the bar of professional engagement was raised once again. Canadian Military ATC/AirTCon was one of the first pair of Air occupations to accept women - which of course doubled the RCAF's chances of attracting quality young Canadians as ATC and Air T Con professionals.

Figure 23 - Cold Lake Control Tower, 1950s or 1960s (Courtesy of Canadian. Forces Joint Imagery Centre)

At the end of the 1970's and into the early 1980's - again out of necessity – Military ATC went through a major equipment modernization program – TRACS – (Terminal Radar and Communications System) – long overdue as the occupation struggled with aging WW II technologies while tending to the needs of military and civil aviation that had upgraded and turned over several fleets of aircraft types by this time. The challenge for the people in ATC was to maintain flight operations and flight safety while commissioning a completely new suite of Radar and Communications equipment. To quote Dickens, "it was the best of times it was the worst of times" but the record speaks for itself, and it was accomplished on the backs of professional people working long hours without complaint.

The end of the 1990's saw Military ATC in the midst of a new challenge – the amalgamation of ATC and Air Weapons Control (AWC) occupations into one Branch. The four occupations and trades involved were leading the way through the great swamp of Canadian Forces Personnel policies - which of course had no precedent for this kind of change. Needless to say, this effort, and the revamping of our training and career development, took and perhaps still is taking some considerable effort. Equally significant, by the late 90's the ATC and AWC Occupations had solidified their proper place in Air Operations within the Air Force, and a great many ATC and AWC personnel where showing their "air ops expertise."

History should tell us that the future holds many more challenges but as professionals the men and women of what is now known as Aerospace Control (AEC) and Aerospace Control Ops (AC Ops) can call upon a proud heritage to meet that future with confidence. The men and women of Canadian Military ATC have risen to the challenge, despite perhaps being taken for granted at times, but that in itself may be an indicator of professional success. People and personalities, coupled with the rapid evolution of technology in aviation, form a major part of Canadian Military ATC heritage, and there are many tales to tell. They have a proud history, and their story has only been briefly touched upon in this article.

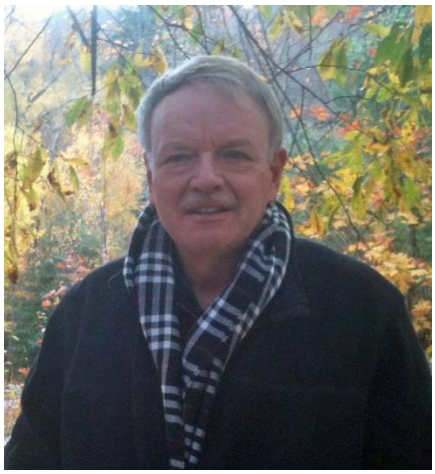

Figure 24 - Paul R. Hussey

EDITOR'S NOTE: Major-General (ret'd) Paul Hussey joined the Canadian Forces in 1969. He completed air traffic control training in 1975 and went on to a full career in all military air traffic control positions and Aerospace Control command appointments. He has served as a Director on the Board of the National Air Force Museum and is the Chairman of the Canadian Military Air Traffic Control Heritage Association. He and his wife Nicole live in Kingston, ON.

Who shares the hangar? EAHS Member Organizations

Air Cadet Museum & Archives
Civil Air Search & Rescue Association
Edmonton Homebuilt Aircraft Association
504 Blatchford Field Royal Canadian Air Cadets
180-20th Field Regiment Royal Canadian Army Cadets
700 (Edmonton) Wing Air Force Association of Canada
Alberta Aviation Museum
Edmonton Soaring Club
Ex-RCAF Air Alliance
Ex-RCAF Women's Association
418 RCAF Squadron Association
Ventura Memorial Flight Association

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