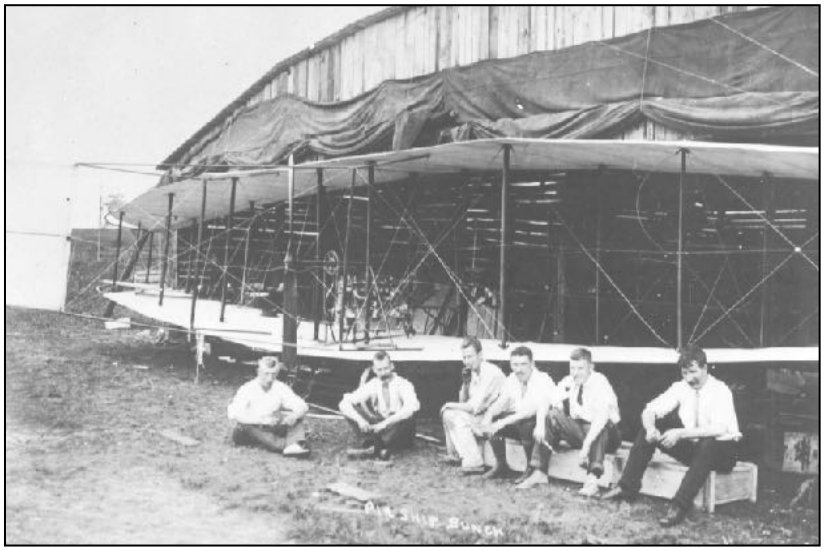
KESTREL PUBLICATIONS

A PRIMER ON CANADIAN MILITARY AIRCRAFT MARKINGS

Pre-War Aircraft (1909 – 1914)

From austere beginnings on 23 February 1909 on *Bras-d'Or* Lake with J.A.D. McCurdy piloting Alexander Graham Bell's *Silver Dart* through to the present-day, Canada has rightfully been proud of her aviation history. But Canada's military interest in aviation was very slow in starting. The first demonstration put on for the Department of the Militia and Defence (now the Department of National Defence) was at Camp *Petawawa* in August 1909, when J.A.D. McCurdy demonstrated both the *Silver Dart* and the *Baddeck No. 1* (another aircraft from A.G. Bell). However, after wrecking one aircraft and crashing the other during the demonstration, the Department of the Militia and Defence did not show any further interest in this new "fad".

As was the case in all other countries, pioneer aircraft in Canada such as the *Silver Dart* and *Baddeck I* carried no identification markings and it was not until after the end of World War I that the Canadian Government adopted a standard marking system for both its civil and military aircraft.

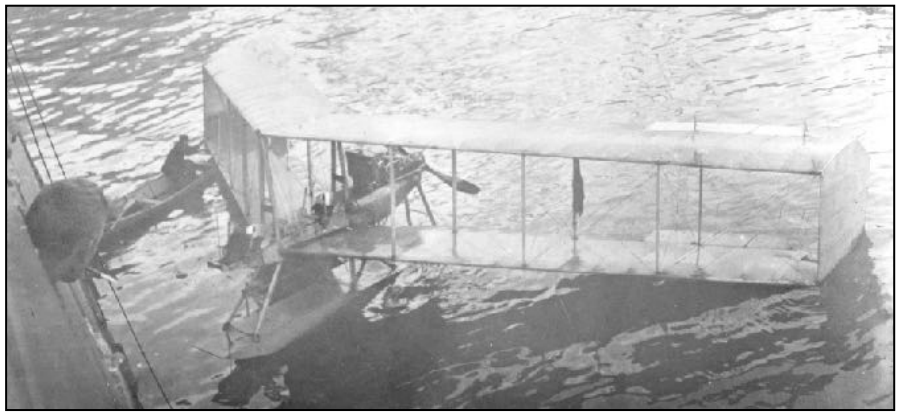


The *Silver Dart* shown here along with members of the Aerial Experiment Association was demonstrated for the Canadian military in Petawawa, Ontario. It was devoid of markings - (CF Photo)

World War I - (1914- 1918)

Canadian Aviation Corps 1914-1915

On 16 September 1914 (while the original Canadian Expeditionary Force was forming up in Valcartier), Col Sam Hughes, Minister for the Militia and Defence, authorized the creation of the Canadian Aviation Corps (CAC). This corps was to consist of one mechanic and two officers. E.L. Janney of Galt, Ontario, was appointed as the "Provisional Commander of the CAC" with the rank of Captain. The expenditure of an amount not to exceed five thousand dollars for the purchase of a suitable airplane was approved. The aircraft selected was a float-equipped *Burgess-Dunne* biplane from the Burgess Aviation Company of Massachusetts. Captain Janney flew the aircraft back to Canada. The *Burgess-Dunne* like its predecessors was devoid of any national or military markings. Upon his arrival in Sorel, Quebec, Captain Janney was arrested by Customs officials and the aircraft was impounded. After Canada Customs received notification from the Department of the Militia and Defence, Captain Janney and the aircraft were released. As it turned out, this was to be the only flight of Canada's first military aircraft.



Canada's first military aircraft: the ungainly looking Burgess-Dunne floatplane; again devoid of markings - (CF Photo)

Immediately after Captain Janney and the *Burgess-Dunne* were released from Customs, the aircraft was crated for shipping, and the CAC sailed on the S.S. *Athena* with the First Canadian Contingent of the Canadian Expeditionary Force. After landing at Plymouth, England, the aircraft was off-loaded and shipped to Salisbury Plain were it was considered unsuitable for military service. It was placed in storage, where it eventually rotted and was written off.

Royal Canadian Flying Corps - 1916

During 1916, there was a renewed interest in aviation within the Department of the Militia and Defence. The War Council and the Canadian Headquarters overseas thought that Canada should have their own air services supporting the war effort. Considerable effort was placed on realising this dream, but the Cabinet would not support this concept and the second attempt to create a national air force was unsuccessful.

Royal Canadian Naval Air Service - 1918

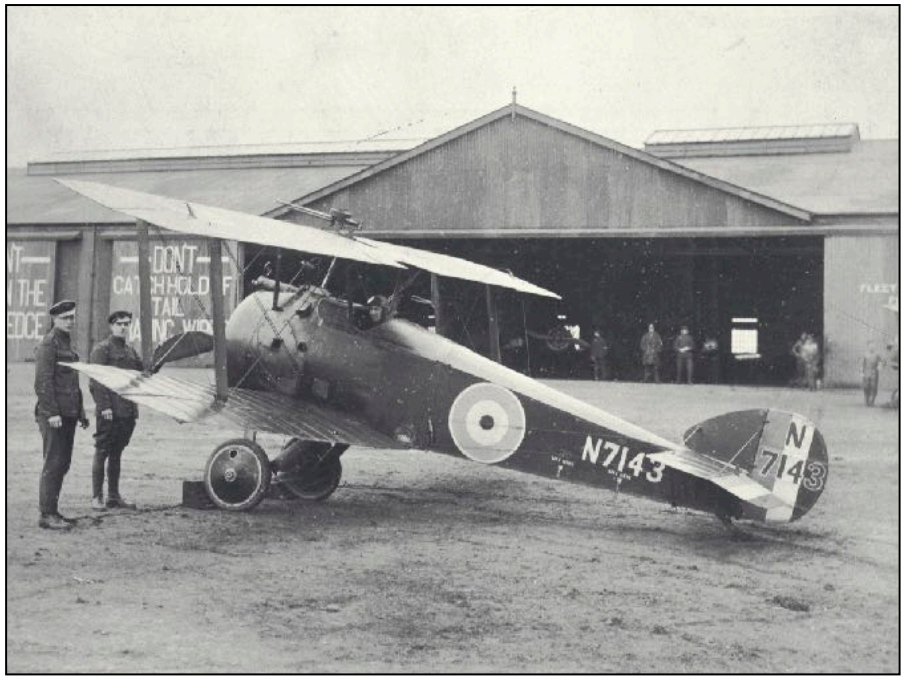
Because of the importance of Halifax to the war effort and the threat posed by German submarines, the British Admiralty suggested the establishment of two air stations on the east coast; one at the Eastern Passage (Dartmouth) and one at Sydney, both in Nova Scotia. However, the Admiralty expressed regret that they could not provide any assistance in this endeavour and suggested that Canada create her own air service. Initially the Americans rendered assistance by providing two flying boats to patrol the area around Halifax and the Bedford Basin. On 5 September 1918, the Canadian government approved the Royal Canadian Naval Air Service. Personnel were to be trained on lighter-than-air airships (dirigibles) and heavier-than-air airships (aircraft). By the signing of the armistice, the RCNAS had 81 cadets of whom 60 were under going training in the United States, with 13 in the United Kingdom and eight in Canada awaiting training. Additionally, six coxswains had enlisted for airship duties and were serving in the United Kingdom. On 5 December 1918, the RCNAS was disbanded and all the cadets and coxswains were demobilized.

Canadians in the RFC / RNAS 1914 - 1918

Because Canada did not have a national air service during World War One, many Canadians served with distinction in the Royal Flying Corps (RFC), the Royal Naval Air Service (RNAS) and later the Royal Air Force (RAF). This early link with British military aviation is where a great many of the current Air Force's customs, traditions and aircraft markings originated.

First World War Colour Schemes

Camouflage for combat aircraft developed as a result of the First World War. The original military aircraft employed on both sides of the conflict were both slow and fragile; they were not camouflaged, simply because few personnel actually saw the need for it. Early military aircraft, just like pre-war machines, uniformly appeared to be a pale yellow, an effect created by the application of translucent dope and varnish on the cotton or linen fabric used to cover their wooden structures. By 1916, however, with the introduction of new, improved fighter aircraft, and with the increasing number of raids, losses became so great that both sides had to devise camouflage schemes. In Great Britain, the Royal Aircraft Factory experimented with pigmentation compounds primarily designed to protect aeroplane fabric from the damaging effects of the sun's rays. The generic name used to describe these pigmentation compounds was "protective covering," or PC. A mixture known simply as "PC-10" offering the best compromise between protection and camouflage was adopted in April 1916. Depending on the dopes and the pigments in it, and the proportions used, PC-10 could vary from greenish ochre to chocolate brown.[1]

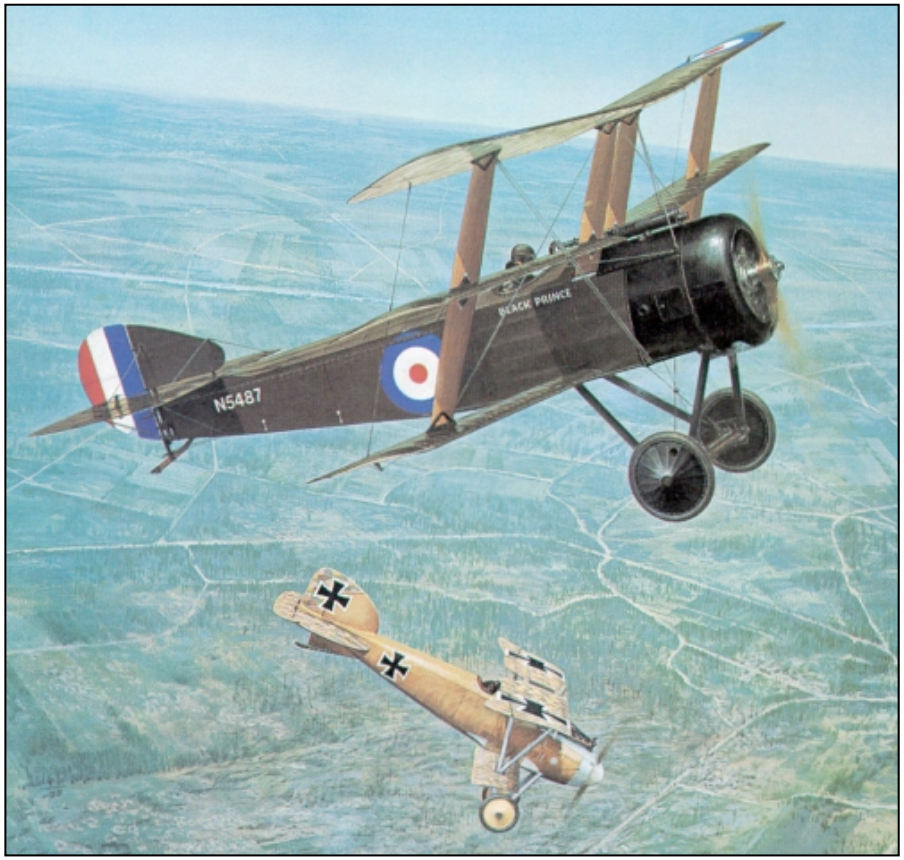


A Sopwith *Camel* from the Royal Naval Air Service. The dark PC pigment colouring is apparent - (CF Photo # DND 65-90)

Personal Markings

As the air war progressed, both the camouflage and personal markings on aircraft on both sides of the conflict became more flamboyant. Canada produced large numbers of pilots and aces. As with their counterparts, their aircraft were, in some cases, distinctively marked either with personal symbols and / or names and paint schemes. In terms of Canadian examples from the First World War, perhaps none is more famous than the "Black Flight" commanded by Canadian ace, then Flight

Lieutenant Raymond Collishaw who was a member of the RNAS. Upon returning to the front on 26 April 1917, Collishaw was posted to Naval Squadron No. 10 equipped with the new Sopwith *Triplane.* With three wings it possessed an incredible rate of climb, good visibility above and a small turning radius. Collishaw shot down an enemy plane in his first day flying the *Triplane* in combat. In the next few weeks, he downed four more aircraft. Then Naval 10 was moved to Droglandt, near Belgium. Preparations for the Messines offensive were underway and the RFC needed assistance in providing protection for reconnaissance and bombing flights.



An excellent rendering of the *Black Prince* from the Canadian Black Flight of Naval 10 Squadron by Canadian artist Bob Bradford.

Collishaw, now commander of "B' Flight of Naval 10, personally hand-picked four other Canadian pilots to work with him. They were Flight Sub-Lieutenants Ellis Reid of Toronto, John E. Sharman of Winnipeg, Gerald Nash of Hamilton, and Melville Alexander, also of Toronto. All these pilots were in their early twenties. The personnel in Naval 10 had painted the cowlings of their *Triplanes* different colours to identify the various flights in the air. Collishaw's flight had black noses, so, in an effort to further boost morale and solidarity they painted more of their *Triplanes* black and then added names to each. Consequently, Collishaw flew "Black Maria", Ellis Reid flew "Black Roger", Gerald Nash piloted the "Black Sheep", John Sharman was in "Black Death" and Mel Alexander flew "Black Prince". Thus they became Naval 10's "Black Flight". The unit went went to claim 87 German aircraft in three months while equipped with the Sopwith *Triplane*. Collishaw himself scored 33 victories in the type, more than any other pilot.

First "Canadian" Markings – 1917

The De Havilland DH4 (De Havilland Model No. 4) was a day bomber first introduced into service in 1917. No 55 Squadron of the Royal Flying Corps was the first to be equipped with this type of aircraft inn France. Aircraft No. A 2140 was assigned to a young Canadian pilot, Lieutenant Robert A. Logan. Another Canadian, observer Lieutenant Reginald Henry then joined the squadron. Both he and Logan had been classmates at the University of Alberta, Edmonton – the observer's home town and it was only logical that they should be assigned to the same airplane. They each had memories of marching many miles on the cold streets of Edmonton in that winter of 1914-15 when both had been privates in the Canadian Expeditionary Force; the observer in the 49th Battalion and the pilot in the 51st Battalion.

At that time each pilot was assigned and retained his "own" airplane, and consequently, he could decorate it as he wished. In this case, with the two members of the crew affiliated with Edmonton, it was decided to paint large red symbols of the Cree Indian syllabic system of writing, the original Cree Indian name of the city of Edmonton, Alberta (pronounced "amisk-watshee-waska-heekan" and meaning "Beaver Hill House") on the fuselage of No. A 2140. At one end of this inscription was painted an Indian's head in a war bonnet, and, at the other end, was a large red maple leaf that would later become the central part of the roundel carried on all Canadian military aircraft. This is also believed to have been the first aircraft bearing a North American Indian name actually to engage in combat with an enemy.[2]

Royal Flying Corps in Canada 1917-1918

The British War Office and the British Admiralty viewed Canada primarily as a potential source of recruits for their respective air services. In 1917 the Royal Flying Corps (RFC) decided to establish a training organisation in Canada. The original plan called for four training stations with one or more aerodromes at each station and up to five training squadrons per station. After consultation with Canada, the revised plan called for three stations: RFC Station *Camp Borden*, RFC Station *Deseronto*, and RFC Station *North Toronto*. RFC Station *Camp Borden* was the main training site and was accepted on 2 May 1917. In very little time, all five squadrons and a school for aerial gunnery were operating at full capacity. RFC Station *Deseronto* consisted of aerodromes at Mohawk and Rathburn, and it was operating with five training squadrons by the end of May 1917. RFC Station *North Toronto* consisted of aerodromes at *Long Beach*, *Leaside*, and *Armour Heights*, and by the end of June 1917 there were three training squadrons operating.

With America's entry into the war in April 1917, a reciprocal agreement was established between the RFC and the U.S. Army's Signal Corps. This agreement brought Americans to Canada for training, and it allowed the RFC to train in a snow free environment. Fort Worth Texas was selected as the training centre, and the school of aerial gunnery and the wings from *Camp Borden* and *Deseronto* ceased training in Canada in November 1917 and moved to the Fort Worth area. RFC Station *North Toronto* remained open in Canada to test the feasibility of training personnel in a Canadian winter. This test was in fact so successful that the training for the winter of 1918-19 was subsequently planned to be in Canada. Meanwhile, the other RFC training units proceeded on their 1600-mile rail-trip to Texas. Their winter of 1917-18 was spent in Texas.

In April 1918, the RFC, now the RAF (by Royal decree on 1 April 1918), returned to Canada and re-established their stations. In addition, it was decided to establish several advanced flying training units in Canada. By the time the armistice was signed on 11 November 1918, the RAF establishment in Canada had a total strength 11,928 all ranks. It was staffed by 993 officers and 6,158 other ranks and had 4,333 cadet pilots and 444 other officers under training.

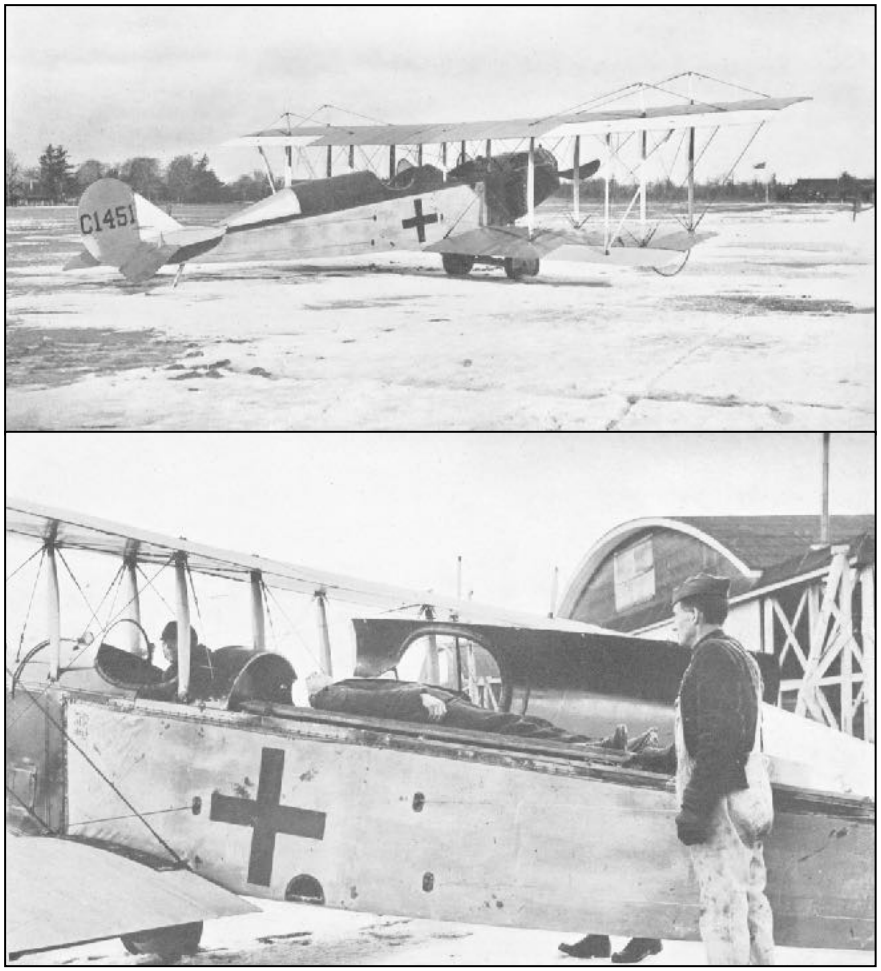
The RFC had begun its training program in Canada in 1917 using Canadian built Curtiss JN4 aircraft for instructional purposes. A total of 2,289 these aircraft were supplied by Canadian Aeroplanes Ltd., in Toronto, Ontario and Nos 78-97 (Reserve) Squadrons of the RFC (Canada), later RAF (Canada), were formed as the training squadrons in this year.

Curtiss JN-4 (CAN) or JN-4A (CAN) *Jenny* aircraft: These aircraft were delivered in clear finish with the usual pale yellowish result from the doped and varnished Irish linen. Later aircraft deliveries had a cotton fabric processed in Quebec, which gave a more greyish tone. The aluminum engine cowlings were either in natural finish or painted brown to match the dark varnish used on all the woodwork. The aircraft carried no national markings. However each aircraft was allocated a serial number by Canadian Aeroplanes Ltd. and this was carried on each side of the rudder. Serial numbers were initially only on each side of the rudder in black 8" characters. The "C" prefix stood for Canada and numbers were allotted consecutively.[3] These numbers started with C101on the prototype Canadian JN-4 and, continued until about C1460. It should be noted however that not all these numbers were used for Canadian aircraft as 680 Canadian JN-4's were exported to the United States for use by the Army Air Corps.[4]

JN-4 #C1346, is devoid of national markings and insignia. It is, however, an early example of a "commemorative" aircraft. This particular aircraft was donated by Colonel Merritt and it commemorates the battle of Queenston Heights which occurred on 13 Oct 1812 during the war of 1812.[5] – (RAF Photo)

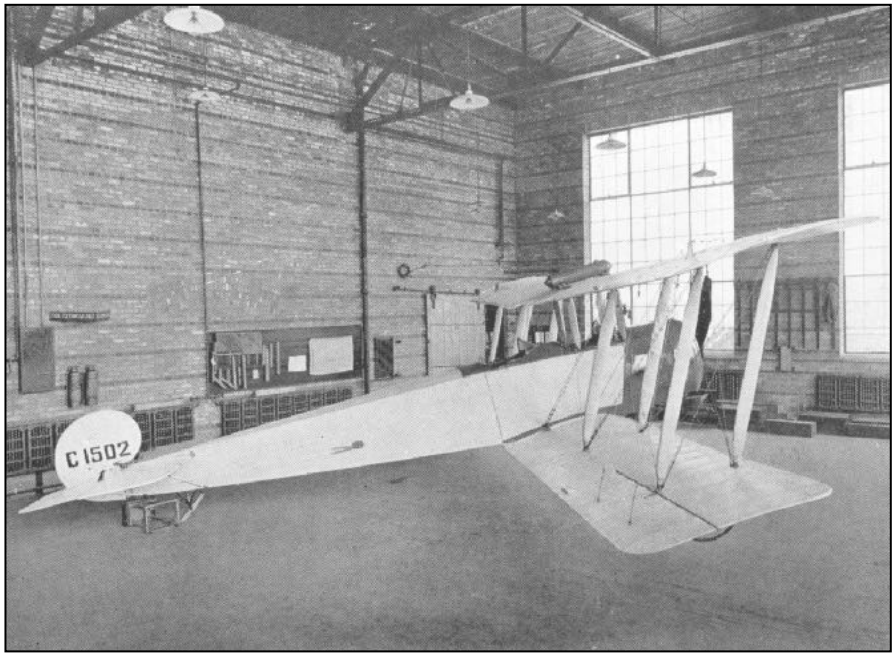
As already mentioned, national insignia was not installed by the contractor, nor were instructions issued concerning such markings. The precise reason for the absence of national markings is not known but it is apparent that some units thought national markings should be used since there is photographic evidence of some aircraft being painted with small roundels on the fuselage or on the tail only. Other units or individuals produced more unorthodox schemes.[5]

"Rescue" markings were also pioneered by the RFC in Canada. In order to aid spotting of aircraft that had force-landed in this spacious and sparsely-populated dominion, it became usual for wing-tips on the upper mainplane to be painted red up to one foot inboard.



A further example of early markings: JN-4 #C1451, which had been modified to carry a stretcher, bore a large Red Cross of Geneva on the fuselage sides, and was probably the first aircraft to be so marked.[6] – (RAF Photos)

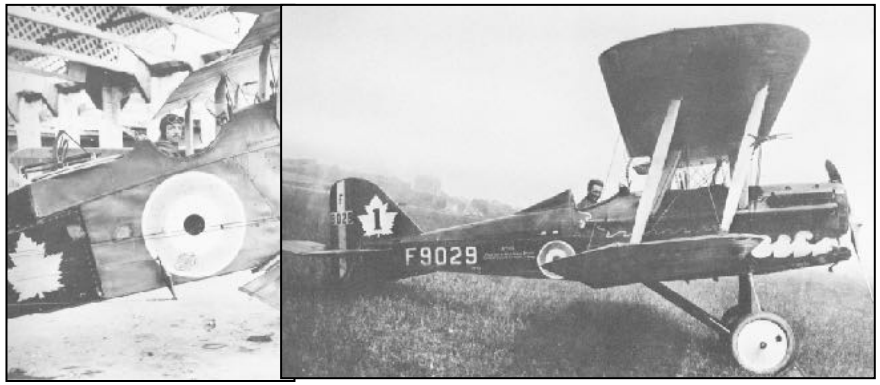
Avro 504K aircraft: The JN-4 was not the only training aircraft to be used by the R.F.C. A new series of numbers starting at C1501 was allocated for Canadian Aeroplanes Ltd.'s production of the Avro 504 trainer aircraft but only the first two numbers were used. Squadron markings often appeared on the sides of the fuselage and individual pilots sometimes had their own distinctive markings added.



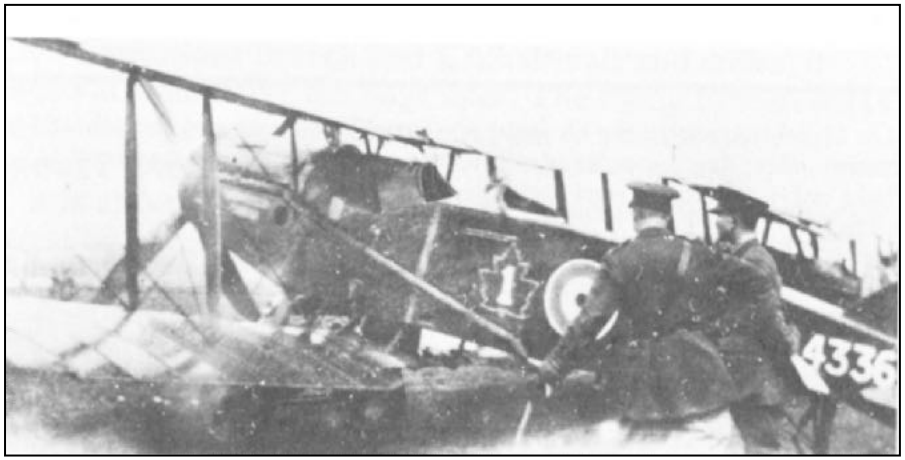
A pristine example of the Avro 504K #C1502 built by Canadian Aeroplanes Ltd for the RFC. It is devoid of any markings except for the registration number – (RAF photo)

THE CANADIAN AIR FORCE (1918 –1919)

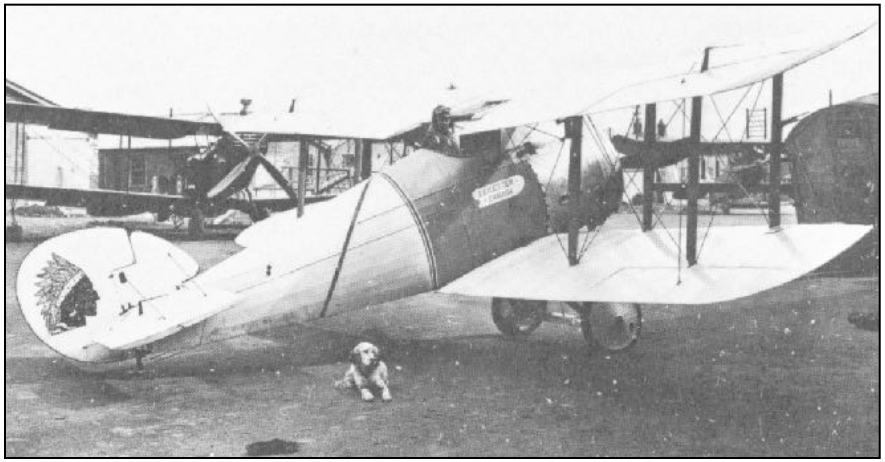
The Canadian Air Force (CAF) finally came into being in the latter part of 1918 and consisted of Nos. 1 and 2 Squadrons based at Upper Heyford and later at Shoreham in England. No.1 (Fighter) Squadron was equipped with S.E. 5A's originally and later with Sopwith *Dolphin*s, and No. 2 (Bomber) Squadron with D.H.9A's. In addition, No.1 also had one Bristol F2B, which was probably considered the personal property of its C.O., Major McKeever. The CAF overseas adopted the roundels and rudder markings of the RAF as their own and the registration numbers remained unchanged from their original British numbers but with a large maple leaf emblem was added on each side of the fuselage.[6]



The Commanding Officer, Capt W.B. Lawson, of No.2 (CAF) Bomber Squadron in a D.H. 9 and a S.E.5A fighter that originally equipped No. 1 (CAF) Fighter Squadron and belonging to Captain W.R. Kenny both prominently display their maple leaf markings – (Molson Collection Photos)



This No. 2 (CAF) Sqn Bristol *Fighter* displays another variation of the maple leaf– (Molson Collection Photo)



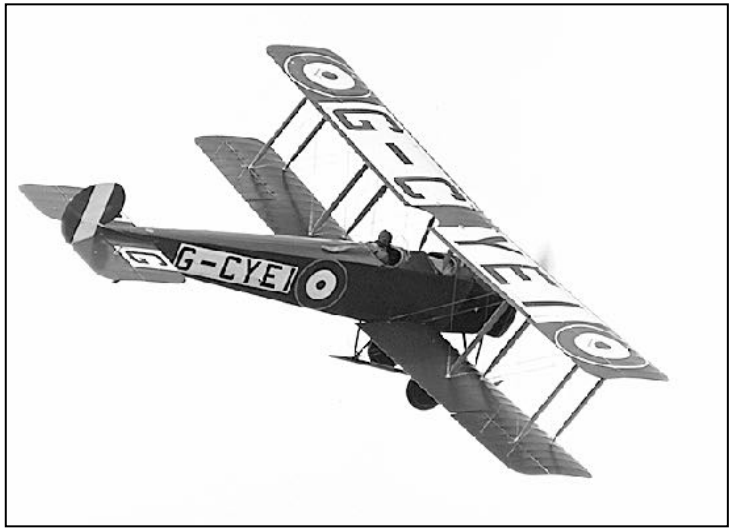
A Sopwith *Snipe* from No. 1 (CAF) Fighter Squadron in Shoreham, England wears an Indian Head and the inscription "Leicester - Canada"– (Molson Collection Photo)

A line-up of Sopwith *Dolphins* from No. 1 (CAF) Fighter Squadron in England – (CF Photo)

In the post war period Canada also subsequently from received some aircraft from the England for its military inventory as part of an "Imperial Gift" granted to England's former colonies. Canada's Imperial Gift aircraft (consisting of 11 S.E. 5A fighters, 1 Sopwith *Snipe* fighter, 12 D.H.4 bombers, 12 D.H.9A bombers, 58 Avro 504K trainers, 3 Felixstowe F3 flying boats, 2 Curtiss H.16 flying boats and several non-rigid airships) were delivered in their wartime RFC and RNAS finishes, but in Canadian service gradually this gave way to a general all-silver finish except for some trainers which were painted in overall yellow.[7]

AIR BOARD MARKINGS (1920-1922)

For about eighteen months after the Armistice, there were no requirements imposed for any identification numbers on aircraft in Canada. However, in the spring of 1920, the Air Board, which had been set up to control both military and civil flying in Canada, required that all aircraft being registered to comply with the convention relating to International Air Navigation which was drawn up at the Versailles Peace Conference in 1919. For identification markings Canada adopted a peculiar system based on civil registration. Two separate registers were set up, one with the prefix letters, "*G-CA-",* for civil aircraft and the other, "*G-CY –*", for Government owned aircraft. The latter were primarily aircraft used for refresher training by the Canadian Air Force, which was the extent of military operations at that time. The "*G-CY –*" registrations were displayed in full and normally appeared as large as possible on a white panel on the fuselage sides and on the upper surface of the top wing and on the lower surface of the bottom wing. In addition, the nationality marking letter *G* appeared on the rudder and on the horizontal tail. Other aircraft on "*G-CY –*" register only displayed the last two letters along with roundels and rudder stripes, which were displayed in a similar manner to the RAF.[8]



This restored Avro 504K trainer (used for 1967 Centennial demonstrations) clearly displays Air Board markings featuring the large registration letters on white panels – (CF Photo)

However many variations from these standards may be seen in photographs which suggests that the standards were not rigidly enforced. For example, a photograph of the Avro 504K, *G-CYBK*, shows the requisite white panel being omitted on the fuselage as another example of the variations.[9]

In 1922, civil registrations *G-CYAA* to *G-CYZZ* were allotted for service aircraft, which displayed the last two letters only, as large as fuselage or hull sides would allow. It was placed toward the rear of the fuselage (or hull), aft of the roundel, although it sometimes replaced a roundel on the fuselage or wing positions. Again, there appeared to be no set rule. Examples of machines in service were: AT-Avro 504K, UT- D.H. *Puss Moth*, ZL- Vickers *Vedette* and ZZ- Vickers *Vista*, the last of this series.[10]

Note the variation in the Air Board markings of this Bristol F2B Fighter, *G-CYBC*, with comparatively small fuselage letters placed well aft and the wartime markings and roundels still being displayed. - (CF Photo)

The sole Canadian Vickers *Vista* in RCAF colours displaying its "ZZ" coding - (CF Photo)

A Fokker *Super Universal* aircraft used for the Hudson Strait Expedition and flown by RCAF crews - (CF Photo)

Before leaving the "*G-CY–*" series, a further unusual allocation at registration may be noted in the case of the six Fokkers and one *Moth* purchased for the Hudson Straits Expedition. In this case, while the aircraft were registered in the name of the Dominion Government and flown by RCAF officers, they were given civil markings in the "*G-CA-"* series.[11]

THE CIVIL "TAKE-OVER" (1922 – 1924)

Late in 1922, the civil operations of the Air Board were taken over by the CAF and all the Board's aircraft then conformed to the CAF marking practice of roundels, blue, white and red rudder stripes and the last two-letters of the registration markings being displayed.

A re-organization of the Canadian Air Board and the Canadian Air Force was completed on 1 April 1924, and the "Royal" prefix was granted by the Crown and added to the CAF. The now Royal Canadian Air Force was originally made up of three branches: a Permanent Active Air Force, a Non-Permanent Active Air Force and a Reserve Air Force. The original establishment for the RCAF was set at just 62 officers and 262 airmen. This early RCAF was unique amongst world air forces, as the majority of its work was non-military in nature. It performed the duties that today are often performed by civil agencies: photo-survey, casualty evacuation, airmail delivery, fisheries and border patrol, utility transport for government officials, etc. The RCAF assumed control of the original six stations of the Civil Operations Branch of the Air Board at *Camp Borden* (Ontario), Winnipeg (Manitoba), Vancouver (British Columbia), High River (Alberta), Ottawa (Ontario) and Dartmouth (Nova Scotia), and the headquarters was established in Ottawa.

By 1927, however, there was strong opposition to the military continuing to perform these civil operations. In July 1927, the Civil Government Air Operations were again separated from the RCAF and placed under a separate directorate in the Department of National Defence. RCAF aircraft now exchanged their former letter identification for numbers while aircraft engaged in civil air operations retained their previous markings.

THE ROYAL CANADIAN AIR FORCE (1924-1938)

As previously mentioned, in these early days, the RCAF was tasked primarily with civilian duties, which included surveying and forestry patrols, and it therefore had a majority of civilian bush flying types of aircraft on strength. The early RCAF was more "station conscious" than "squadron or unit conscious" and the individual letters and later numbers served as identifiers both for unit and station identification.[12]

When a numerical identifications system was first introduced into the RCAF the aircraft were simply numbered in the sequence in which they were acquired. However, about 1934, the numbers were then allocated in a block system by type of aircraft. These blocks were set aside as follows: 1-300 = Trainers (i.e. # 13 for a

Avro 504K, #117 for a D.H. *Gipsy Moth*, #184 for an Avro *Tutor*); 301 - 400 = Fighters (i.e. #303 for a *Siskin*); 401-600 = General Purpose / Army Cooperation (i.e. # 508 for a *Wapiti*); 601-700 = Transports (i.e. #621 for a Fairchild 51), 701-800 = Bombers (i.e. #740 for Douglas *Digby*); 801-900 = single-engined flying boats (i.e. #803 for a *Vedette*); and 901-1000 = twin-engined flying boats (i.e. #903 for a *Vancouver*). Numbers were marked in large size on the sides of training aircraft, but on other machines, position and size was as for RAF aircraft. These numbers were located on the sides of the fuselage and on the top surface of the upper wing and on the bottom surface of the lower wing in a similar manner to the earlier two-letter registration.[13]

A Vickers *Vedette* flying boat featuring a white (upper) and red (lower) hull with yellow flying surfaces with two letter registration, rudder stripes, and roundels. – (CF Photo # RE-13716)

RCAF Inter-War Period Colour Schemes

The bulk of the RCAF's aircraft fleet in the inter-war period consisted of flying boats, float planes and training aircraft. Consequently, there was an emphasis on high visibility colour schemes and virtually no camouflage except for that left over on World War I machines. The RCAF's livery on flying boats in particular evolved into a smart overall white and yellow scheme. The hulls were predominately white with the lower hull painted in marine red similar to boat schemes of period. The wings and horizontal / vertical stabilizers were yellow and the rudder was usually painted in traditional blue, white and red stripes. Trainer aircraft evolved into overall yellow schemes and many of the bush planes and utility aircraft designs were also painted overall yellow to improve their visibility in wilderness areas. The metal cowlings, floats and other components were often left in bare metal or in the case of nose cowlings were painted black to reduce glare. Later more military aircraft such as the Armstrong Whitworth *Siskin* fighters and *Atlas* army cooperation aircraft were delivered and maintained in overall silver doped skins. Rudder stripes were more or less consistently used. From the inception of the numerical series, standardized roundels in the usual positions were invariably marked. As always, however, there were variations and exceptions. For example, for unknown reasons, on the top wing of *Siskin* RCAF # 23, the outside diameter of the starboard roundel was one foot greater than that of the port side roundel.[14] As the need for camouflage became apparent however it was not long before the rudder stripes were abandoned. For a while the registration numbers were left on the rudder but again prior to World War II they were omitted and rudders were left unmarked.

The Armstrong Whitworth *Siskin* was Canada's front line fighter for a dozen years. The finish is overall silver doping. Note the reversed serial number (20) on the lower wing. – (CF Photo)

Events in Europe led in 1937 to Canada placing an order in Great Britain for 25 front-line Hawker *Hurricane* fighters. These were the first camouflaged aircraft to enter RCAF service. They were received in then standard British shadow-shading having been diverted from RAF contract as numbers L1759-63, L1878-88, L1890, L2121-3 and L2144 respectively.[15] On reaching Canada, however, they were re-numbered in the RCAF series in numbers circa 309-333. Indeed, it was not until the eve of war in Europe, that RCAF aircraft, in many cases such as *Hurricanes* or *Goblin* fighters, were either delivered or were re-painted in RAF style camouflage colours. Photos of the period for Westland *Lysander* army cooperation aircraft also show a mixture of both all silver and camouflage machines.

A lineup of Westland *Lysander* army cooperation aircraft displaying both camouflaged and overall silver finishes. – (CF Photo)

R.C.A.F. IN WORLD WAR II (1939-1945)

From the modest force at the outbreak of World War Two, the RCAF grew to be the fourth largest air force in the world. On the eve of the outbreak of World War Two, the RCAF now had twenty squadrons on strength (eight Permanent Force and twelve Non-Permanent Force) with authority to form three more Permanent Force squadrons. These squadrons had a total of 270 aircraft of twenty different types; but, of these, only 124 could be termed operational service types and even then only twenty-nine could be deemed first-line equipment (consisting of nineteen *Hurricanes* fighters and ten *Battle* bombers). From this start, the RCAF expanded into three major elements: the Home War Establishment, the British Commonwealth Air Training Plan, and the Overseas War Establishment with separate elements in Western Europe, the Mediterranean and the Far East.

RAF Colour Schemes

At the eve of war, the Royal Air Force reintroduced camouflage paints for the vast majority of its aircraft. In the European theatre, the basic scheme was a two-tone, dark green/dark earth, disruptive pattern applied in large, curved patterns. For the lower surfaces, the RAF opted for a light greenish-blue or, in the case of night bombers, a matte black. From 1941 onward, as the RAF assumed a more offensive role bombing targets in Germany and occupied Europe, new camouflage patterns had to be devised. Aircraft flying in the daytime were painted in dark green/sea grey or dark slate grey/extra dark sea grey two-tone camouflage schemes. These new colours offered an increased measure of protection for the increasing number of aircraft crossing the Channel. To protect its night bombers, the RAF gradually increased the amount of matte black covering the aircraft with the green and earth tones covering little more than the very upper surfaces.[16] As the war expanded in other theatres of operation around the world, numerous other camouflage schemes were specifically developed for environments (i.e. desert schemes) and / or roles (i.e. coastal patrol, night fighter, etc.)

The Hawker *Hurricane* served in both home-based and overseas RCAF units. This colour photo illustrates the RAF style standard two-tone, dark green / dark earth, disruptive pattern camouflage – (CF Photo)

Home War Establishment

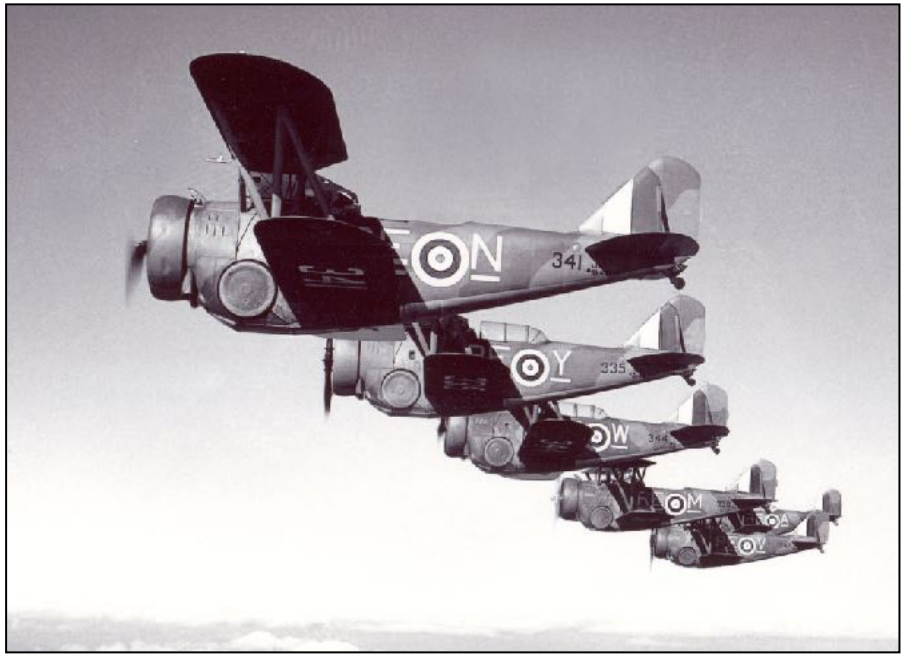
When the war began in 1939, the RCAF had two operational commands (Eastern and Western Command) and seven under-strength squadrons equipped with a variety of obsolete aircraft. Because of the importance placed on the sea link between Canada and the United Kingdom, Eastern Air Command was given top priority for re-equipping and upgrading. When Japan entered the war in December 1941, the priority was reversed and the Western Air Command became the higher priority.

In November 1943, the Home War Establishment reached its peak with 37 operational squadrons: 19 in Eastern Air Command and 18 in Western Air Command. Eastern Air Command's primary concern was the eastern sea approaches and the U-boat threat. As the war effort would depend largely on the ability of the allies to ship the required supplies from North America to the U.K. or to other theatres, the North Atlantic was an essential roadway/seaway to victory. Eastern Air Command based their planning on this premise and accordingly equipped the bomber-reconnaissance squadrons with *Hudson*, *Bolingbroke* and *Catalina* aircraft and later with *Liberators*. During the early stages of the Battle of the Atlantic, Eastern Air Command had to be satisfied with patrols and escort out to several hundred miles over the Atlantic; it was not until 1944 when they were able to fly patrols and escort convoys across the Atlantic. Their primary targets were the German U-boats that were attacking allied shipping; some were actually venturing into the Gulf of St. Lawrence to sink vessels. The most critical period was from early 1942 to mid-1943 when submarine activity reached its peak. Although aircraft from Eastern Air Command had only six confirmed U-boat kills, this cannot be the sole measure of the contribution of the command. Because of the patrols flown, the U-boats were always on their guard. Therefore, many opportunities were lost that otherwise would have been taken and many more allied ships would have gone down; this in itself might have jeopardized the war effort and delayed victory.

In contrast, the Western Air Command generally was a quieter area. The first eighteen months of the war were spent flying patrols and identifying boats. When Japan attacked Pearl Harbour on 7 December 1941, things changed rapidly. Because of the seriousness of the situation and the lack of reinforcements in Alaska, Canada agreed to assist in the defence of Alaska. In May 1942, two squadrons were sent to Prince Rupert to defend this important seaport. In June 1942 a second formation was sent to Anchorage, Alaska to assist in the defence of Alaska. After the Japanese forces landed on *Kiska* Island in the Aleutian chain, this formation started flying offensive operations against the Japanese. On one of these missions Squadron Leader K.A. Boomer became the only member of a home unit to score a confirmed victory against an enemy aircraft. With the total withdrawal of the Japanese forces in the summer of 1943, the Canadian squadrons moved back south to British Columbia.

Home Establishment Markings & Colour Schemes

With the beginning of WW II, camouflage coloring regularly appeared on some RCAF aircraft. Their roundels and fin-flashes followed the RAF practice for each type of aircraft. Registration numbers went to four and then five numbers and in the case of training aircraft were applied in large sizes.



The Grumman *Goblin* was a stop-gap fighter acquired in haste at the outbreak of the Second World War by the RCAF. They served exclusively in Canada. The *Goblins* shown here again display the RAF style standard two-tone, dark green / dark earth, disruptive pattern camouflage, type A1 roundels, large fin flashes and a unique to Canada method of underlining the unit code letters– (CF Photo)

Two basic colour schemes prevailed in the home-based RCAF: either bare metal or overall silver or white for communications and reconnaissance aircraft and a British temperate land scheme for operational fighters and bombers. The adoption of a British scheme was probably influenced by the numbers of RAF aircraft

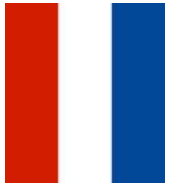
constructed in the Dominion and finished in standard RAF schemes. The Canadian Department of Defence accepted the basic RAF Temperate Land Scheme two-colour upper surface camouflage although not necessarily always using the exact Dark Green / Dark Earth colouring and changing the undersurface finish for both land and water-based aircraft.

The marking of roundels followed RAF lines as regard their composition and proportions, but they were positioned as a rule further outboard on the wings than on RAF aircraft where one-sixth of the span inboard was the ruling. The roundel colours were of the 'bright' form, though these colours were darker than those of the RAF and such colours used on training aircraft were to remain for most of the war period. The change to dull identification colours was only made on certain home-based operational units.[17]

Unit codes were allotted to operational squadrons or flights and were marked yellow or white in RAF fashion. One noticeable distinction for RCAF codes from the RAF method with was that the letters were underlined in the same colour as the coding. Goblin #341 of No. 118 Squadron above for example was coded as RE N. These already obsolete biplane fighters had an upper surface in temperate land scheme including the fuselage sides; original undersurfaces in British 1939 style were port side black and starboard side white, applying to both main planes. Under the lower wing reading in opposite directions in black (starboard side) and white (port side) was the serial number in 2 ft. figures. Roundels were not marked on the undersurface and Type "A" on fuselage sides gave way in 1940 to Type "A1". The complete fin was striped in red, white and blue.[18]

Type "A" Roundel

Type "A1" Roundel



"A" type fin-flash

A change-over to Type "C" roundels in 1942 was applied in the RCAF, but not with immediate effect. It was compulsory only for aircraft moving to an operational area. The prime reason was that it would have meant scrapping many "A" type roundels already manufactured. Many of these roundels were actually made of plastic and affixed to the fabric. The white of the roundel in these cases actually bore a trademark.[19]

Type "C" Roundel

Type "C1" Roundel

Type "B" Roundel

Serials were a unique feature of RCAF aircraft; they invariably appeared on the underside of the wings half chord size. On the fuselage sides, most operational aircraft had normal sized serials, but on training and communications aircraft it was often as large as practicable, usually just aft of the fuselage roundel. Compared with RAF serials of the period, perhaps the most noticeable thing was the absence of any prefix letters. Hundreds of RAF aircraft were built in Canada and the U.S.A. and many more were being shipped from Britain for use in Canada. This basic difference, *prefix or no prefix to the serial,* could be used to differentiate between RAF and RCAF property. This was, however, complicated by some transfers, e.g. *Hurricanes* built in Canada for the RAF as AG299 and AG310 became 1378 and 1362 respectively in the RCAF. Some 25 others in the AG batch were similarly diverted.[20]

Fighter aircraft initially followed the RAF style in having the same special black and white recognition markings, and operational aircraft of all classes used a similar unit identification code letter scheme, with each letter, as previously mentioned, being underlined with a short horizontal stroke.

The RCAF's coastal patrol force of seaplanes and flying boats started with a mixture of aged biplanes and the newer all-metal monoplanes of British and American origins respectively, and their original land-based colours soon gave way to more appropriate colouring of the blue-grey and light grey or eventually combinations of overall gloss and flat white.

A "SEAC" Roundel

Following the commencement of hostilities with Japan, there was some modification of the roundels to eliminate the red centre in the roundel to avoid confusion with Japanese markings. These roundels were affiliated with South East Asia Command (SEAC). A few aircraft stationed in Western Canada such as *Liberator* bombers at the Operational Training Unit in British Columbia also bore these SEAC type roundels.

This RCAF Lockheed *Ventura* displays a late-war predominately flat-white colour scheme used on Canada's west coast – (CF Photo)

Material Differences

The RCAF Inspecting Authority prepared long lists of equivalent alternatives for paints grouped suitably for non-operational; internal Canadian operational; and overseas operational use.

A keen eye was kept on all incoming changes in colours and markings received from the British Directorate of Operational Requirements, and only those with any particular significance were passed on to the relevant RCAF command or unit. For example, an operational change in roundel form because of a European situation did not really apply to training aircraft based in the Canadian mid-west, although it could be relevant to aircraft operating the Atlantic Ferry Service. Similarly, such changes were perhaps not essential for any of the units of the three RCAF Home Commands, though additional but separate changes might be made due to the close co-operation with the USAAF in the north-west of Canada.

Finally, it should be noted that towards the end of the war, stripping of paint from non-combat aircraft primarily to save weight and to improve performance (speed) and appearance through polished metal surfaces became a consistent practice. Stripping the paint from airframes could save as much as a hundred pounds and this approach was therefore applied to many Canadian transport aircraft in particular.

The British Commonwealth Air Training Plan (BCATP)

On 10 October 1939, it was announced that Canada, Australia, New Zealand and the United Kingdom had agreed in principle to a combined and co-ordinated training plan based in Canada, similar to the World War One plan. Aircrew training would be conducted far from the battle zone. On 17 December 1939, the British Commonwealth Air Training Plan agreement was signed; Canada would be turned into a giant training ground.

Under the BCATP agreement the RCAF would administer 40,000 trained personnel and instruct (and provide ground crew for) 20,000 aircrew annually in 74 training schools. At the time the RCAF had only 4,061 officers and airmen (including the Non-Permanent Force) and had only trained 45 pilots in 1939. The BCATP was to become a major undertaking, as the first schools were to be open by 29 April 1940, a mere four months away.

To meet the demand, the RCAF called upon the seventeen civilian flying schools in Canada to provide the elementary flying training for the plan and a group of commercial and bush pilots were assembled to train observers. The Department of Transport assumed the responsibility for selecting suitable sites and for contracts for the construction of these stations.

The first schools were opened as planned on 29 April 1940 and training began. By the end of September 1941, seven months ahead of schedule, all but three schools were opened. The first students from the plan were not expected to graduate until early 1941, but because accelerated training was possible in Canada, on 27 October 1941, the first 39 graduate pilots passed out of *Camp Borden*, followed by the first observers from *Trenton* and the first air gunners from *Jarvis*.

The plan was expanded in June 1942 to include 67 training schools (including 21 double schools, stations that had two schools) and ten specialist schools. The RCAF was still responsible for the administration of an additional 27 RAF schools in Canada. By the close of 1943, the BCATP had reached its peak with four training commands, operating 97 schools and 184 ancillary units on 231 sites. It was now graduating an average of 3,000 students a month.

The program was so successful that, on 16 February 1944, the signatories agreed to begin a gradual reduction in the plan. Because of a backlog of trained aircrew the RCAF in June 1944 ceased recruiting aircrew and by October the closure of schools was stepped up. As an example of the excessive number of aircrews, during 1944 and 1945, it was common practice for aircrew to receive an Army commando course prior to proceeding overseas and as a result of a shortage of

flight engineers, a second pilot course (pilots were in short supply as late as 1943) with flight engineer training was supplied. On 31 March 1945 the British Commonwealth Air Training Plan came to an end having produced 49,707 pilots, 29,963 various navigators, 15,673 air bombers, 18,696 wireless operator/air gunners, 15,700 air gunners and 1913 flight engineers. The grand total trained aircrew from the BCATP was 131,552. The BCATP was credited for being a major contributing factor to winning air superiority in Europe.

BCATP Markings & Colour Schemes

The four main training types are detailed further below but the general finish for virtually all training aircraft was yellow overall, A-type roundels in all positions and an anti-glare black section forward of the cockpit or cabin. In training units, codes were not used and individual letters or numbers were not always necessary as many schools had the serial numbers presented in large black letters on the fuselage sides. Trainers were to be finished in overall Yellow Type No.56, which was a slightly brighter yellow than the RAF version. Later, the same overall yellow finish but with large diagonal black stripes was adopted for target towing aircraft.[21]

This example of a Fairchild *Cornell* trainer illustrates the classic BCATP colours: yellow overall with prominent registration numbers, A-type roundels in all positions and an anti-glare black section forward of the cockpit – (CF Photo)

A pristine example of a Fairey *Battle* trainer in BCATP colours: yellow overall with prominent markings and registration – (CF Photo)

Yet another example of a Fairey *Battle* trainer but this time in target towing colours: yellow overall with diagonal black stripes – (CF Photo)

The ubiquitous *Tiger Moth* was represented by the D.H.82C, the Canadian built version, usually found with a black enamelled cowling. Some of the early *Ansons*, e.g. 6153 were in temperate land scheme camouflage, but later machines almost always had the standard yellow trainer finish. Early *Harvards* diverted from British

contracts in 1939 had RAF style trainer camouflage of that year, but from 3,001 onwards standard yellow overall prevailed. They were supplemented by hundreds of RAF *Harvards* built for use under the Empire Air Training Scheme in Canada. *Cornells* were used to supplement and eventually replace the *Tiger Moths* as primary trainers. 1,642 were built in Canada to a standard finish, and a large number came from the United States.[22]

A nice colour example of an Avro *Anson* trainer in standard BCATP colours: yellow overall with prominent markings and large registration numbers – (CF Photo # PC-2492)

The RCAF Overseas

When the war began, the Royal Canadian Air Force was represented in England by a small liaison staff in London and various personnel attending training courses. As early as 1939, senior RCAF officers were pressing for the formation of overseas units, and in November the Chief of the Air Staff wrote a memorandum to the Minister of National Defence stating it was essential that the RCAF take more affirmative action in the war effort in addition to the British Commonwealth Air Training Plan. His proposal was to establish an overseas command to operate under RAF headquarters; the command would operate two major air groups in England, a bomber group, and a fighter group, each containing three wings of two squadrons.

This proposal, when presented to the British Air Ministry, was received with mixed emotion. The bomber group was well received, but because of the organizational make-up of the U.K. (it was divided into RAF Fighter Command defence sectors with an associated air group assigned), the fighter group was not supported. However, Canadian fighter squadrons were welcome to come over and become an integral part of the RAF fighter team. Under an amendment to the BCATP agreement signed on 17 December 1939 and a supplemental agreement (7 January 1940), it was agreed that the RCAF would form 25 overseas squadrons in the U.K.

The first RCAF squadrons overseas were Nos. 1, 110 and 112 Squadrons. Of these, No 1 was a fighter squadron and Nos. 110 and 112 were army co-operation units. The two army co-operation squadrons were to support the 1st Canadian Division in France, but, by the time they arrived in England, the Canadian Army had returned to England after a failed excursion to France to support the British Expeditionary Force (BEF), then evacuating from Dunkirk.

Because of the large number of Dominion squadrons that were expected to form-up in the U.K., there was a great potential for mass confusion; imagine having command of five squadrons, all numbered No. 1 from each of the RAF, RCAF, RAAF (Australia), SAAF (South Africa) and RNZAF (New Zealand). To alleviate this confusion, the British Air Ministry assigned blocks of squadron numbers to the Dominions: 400-445 to Canada, 450-467 to Australia and 485-490 to New Zealand. The original three RCAF squadrons were then renumbered: No. 1 became No. 401 Sqn, No. 110 Sqn became No. 400 Sqn and No. 112 Sqn became No. 402 Sqn. Eventually, the RCAF had 44 of the "400 block" squadrons, along with three Army Air Observation Post squadrons (Nos. 664, 665 and 666 Sqns) and one Home Defence Establishment squadron (No. 162 Sqn on detachment from Eastern Air Command), for a total of 48 squadrons serving overseas. These squadrons served on all fronts and in all theatres, and consisted of 15 bomber squadrons, 11day-fighter squadrons, three fighter-bomber squadrons, three fighter-reconnaissance squadrons, three night-fighter squadrons, one intruder squadron, six coastal patrol squadrons, three transport squadrons and three army cooperation (AOP) squadrons.

The RCAF Overseas contributed many units and personnel directly to the war effort in Europe. The RCAF also provided transport and coastal patrol squadrons in the South East Asian Theatre of operations. And although the RCAF only

formally contributed 48 overseas squadrons to the war effort, the actual contribution by Canada was far greater. Of the RCAF personnel who served overseas, only about 40 percent actually served on Canadian squadrons, the remaining 60 percent served in RAF units. For a country the size of Canada with a population of only 16 million, it was quite an impressive contribution: 249,662 personnel served with the RCAF during the war, of which a total of 93,844 served overseas.

Overseas Colour Schemes

Deployed Canadian squadrons inevitably followed the British pattern of camouflage and marking styles in use by the RAF in the various theatres of operation.

A Canadian flown Mk IX *Spitfire* forward deployed in Europe in standard RAF camouflage of the timeframe – (CF Photo)

Personal Markings

As with the First World War, Canadian crews routinely "personalized" their aircraft with artwork and names reflective of their Canadian origins. In particular, "Maple Leaf" emblems, assorted "Indian head" and "Totem Pole" designs and other "Canadian" motifs and names appeared on RAF and RCAF aircraft around the globe. Nose art evolved into a virtual "cottage industry" for some of the talented artists sprinkled amongst the Canadian contingents. The most elaborate designs could probably be found on Canadian bomber aircraft in No. 6 Bomber Group stationed in the United Kingdom but fighters, bombers, transports in all theatres were suitably adorned. Perhaps the most fearsome designs were those shark mouth designs that originated primarily on P-40 Curtiss fighters but also found their way onto numerous other fighters and bombers and sometimes even the occasional trainer aircraft such as a Fairey *Battle* trainer.

This Canadian *Halifax* bomber displays not only nose art but crew names for the various positions – (CF Photo)

This P-40 *Kittyhawk* at Umnak Island in the Aleutians in 1943 wears the famous sharkmouth design – (CF Photo)

A Unique Accomplishment by Wing Commander R.P. Davidson

Wing Commander Robert P. Davidson was the only Canadian fighter pilot to have kill markings on his aircraft (a *Typhoon* fighter-bomber) against all three of the Axis powers: Japan, Germany and Italy.[23]

The Maple Leaf roundel became a popular adornment on aircraft piloted by Canadian personnel as seen on this *Spitfire* above and the Halifax below – (CF Photos)

THE ROYAL CANADIAN NAVY (1939 -1945)

Although Canada did not have a formal naval aviation division during World War Two, the RCN did man two RN escort carriers, HMS *Nabob* (commissioned September 1943) and HMS *Puncher* (commissioned February 1944). HMS *Nabob* was torpedoed in August 1944 and, although she made it back to *Scapa Flow,* was paid off while HMS *Puncher* served through to VE Day.

And although the RCN did not possess its own aircraft, there are certainly examples of RN aircraft sporting personalized Canadian artwork, motifs, cartoons and names.

Lt D. Foley and Sub-Lt Burns (RN) pose with a *Swordfish* at Dartmouth, NS in February 1942. The *Swordfish* is sporting *Donald Duck* cartoon complete with naval garb. (RCN Photo)

This wartime photo of various types of Royal Navy aircraft including a *Seafire, Corsair, Martlet* and *Barracudas* gives a good idea of the type of camouflage being used in the European theatre. – (CF Photo)

CANADIAN ARMY AVIATION (1944 -1945)

The Canadian Army decided to form Air Observation Post (AOP) Squadrons based upon British lines late in war. Similar British squadrons were, however, on the order of battle of the RAF with RAF administration and ground crew but with pilots and squadron commanders drawn from the Royal Artillery. The Canadian war cabinet consequently decided to follow the same approach and three squadrons Nos. 664, 665 and 666 were authorized as RCAF units in September 1944.

The first squadron 664 formed on 1 December 1944 at RAF Station *Andover*. The squadron adjutant was a RCAF Administrative Officer. On 8 December 1944, the advance party of Royal Canadian Artillery arrived with a full complement of motor transport equipment, and on 9 December 1944, the main party of RCAF ground crew, some 54 personnel; mainly airframe, and aero-engine technicians with a scattering of cooks, instrument mechanics and nursing orderlies. The squadron was roughly half army and half air force and was billeted together. By the 31 December, the squadron's strength included nine officers (one of which was RCAF), eight senior NCOs (two of which were RCAF), and 72 other ranks, (65 of which were RCAF). On the 6 January 1945, the squadron received its first *Auster* aircraft from 29 Maintenance Unit and the rest followed shortly thereafter.

On 2 February 1945, the squadron moved from *Andover* to RAF *Parkhurst* in Kent, a satellite field of *Kenley*. They formed a separate servicing flight and carried out squadron level operational training formally commencing operations at the end of March 1945. By the middle of April 1945 the squadron had accumulated 434 operational hours and 266 hours of non-operational flying. The war came to an end before the squadron had gained much experience. After a short period of time, all aircraft were returned to the maintenance unit on 20 May 1946 and all personnel were struck off strength by the 31 May 1946.

665 Squadron was formed on 5 February 1945 and followed a similar evolution to 664 Squadron. The aircraft arrived at *Leis* in Holland on 15 April 1945 and commenced operations. When the war ended the squadron changed from an AOP role to a military services and communications role. Ten volunteers for the Far East remained and the squadron continued to do good work until early October 1945 when it disbanded. 666 Squadron started up on 3 March 1945 and had a very short life, being disbanded on 31 October 1945.

The Canadian Auster aircraft not surprisingly followed the British approach to camouflage and markings. They were painted in overall camouflage with black codes.

Top - A Canadian *Auster* being adorned with nose art while in the fleld – (LAC Image)

Bottom -An *Auster* Mark I in standard British markings - (RAF Photo)

THE ROYAL CANADIAN AIR FORCE (1946-1968)

At the cessation of hostilities the RCAF had 164,846 all ranks (the peak was in 1944 with 215,200) serving; this was to be reduced to an authorized strength of 16,000 all ranks. This demobilization was to take place over a two-year period. On 6 February 1946, the Cabinet approved a peacetime RCAF of four components: a Regular Force, an Auxiliary, a Reserve and the Royal Canadian Air Cadets. On 30 September 1947, when this organization came into affect, the RCAF was stood down from "active service".

The post-war Regular Force RCAF was not all that different from the pre-war RCAF. Eight squadrons were authorized, but only five stood-up. These were to form the professional nucleus of the air force. Their primary tasks were once again: aerial photography, air transport and communications (utility) missions. One new task that the RCAF assumed was search and rescue work. Finally, Air Force Headquarters decided that the squadrons that did stand-up would retain the 400 series “overseas” block of squadron numbers.

By 1947 the post-war world was not the utopia that everybody had hoped for. The relationship between the democratic western nations and the communist eastern bloc cooled very rapidly. So, after the post-war rush to demobilize, there came a further resurgence of the RCAF.

Immediate Post-War Colour Schemes (1946-1950+)

In the immediate post-war period overall silver or bare-metal finishes were common throughout the Commonwealth Air Forces, using again primarily British specifications for finishing schemes. Gradually, colourful unit markings began appearing on RCAF aircraft to denote squadron identities. A prime example first appeared in 1949, when RCAF *Vampires* of No. 442 (City of Vancouver) Reserve Squadron, coded BU, had very colourful “bat's head” markings on the nose, rivalling the flamboyant “sharks teeth” markings of wartime fighters.

Post-War Identification Markings

During the Second World War, all of the Commonwealth Air Forces initially displayed red, white and blue roundels to show their affinity with Britain.

Following the Second World War, RCAF aircraft returning from overseas and those that remained in Canada, maintained their RAF style markings until an indigenous system could be developed. Canada was the very first Commonwealth country to adopt its own unique national insignia in 1946 with the substitution of a red maple leaf for the red "disc" in the center of the roundel, which first took place in 1946. On 17 January, Air Vice Marshall G.V. Walsh’s proposal for a maple leaf centred roundel was finally instituted. Two versions were actually approved. The first Canadian roundel roundel authorized was a “Type B-like” roundel, which consisted of a solid blue disc with a red maple leaf centre. This version was intended for uncamouflaged or yellow paint schemes. The second design, similar to a Type “A” British roundel, was intended for camouflaged aircraft and featured a red (silver maple design) maple leaf on a white disc with the whole being surrounded by a blue ring. In practice, however, the first design did not last long and by 1948 the now more traditional red, white and blue Canadian roundel predominated in use for many years no matter what the paint scheme. The style of the maple leaf used has changed over the years and between services (i.e. RCN vs. RCAF vs. CAF) British

style “fin” flashes were also common to all Commonwealth Air Forces. Ironically, despite have being the first to adopt new roundels, Canada retained these “C” type fin flashes which were given up by most other Commonwealth Air Forces by 1947. These British pattern fin flashes were not superceded in Canadian service until the mid-1950s.[24]

Type “A” Cdn Roundel

Type “C” Cdn Roundel

“C” type fin-flash

The first formal appearance of the lettering “ROYAL CANADIAN AIR FORCE” appears in the 1946 time frame with Dakota aircraft from 437 (Transport) Squadron being re-painted from their wartime RAF livery into a more Canadian appearance with both the RCAF legend and a maple leaf on the fuselage but retaining British style roundels and fin-flashes.

A 437 (T) Squadron *Dakota* in Germany displays early RCAF titles. Note the maple leaf above the fin-flash – (CF Photo)

A post-war P-51 *Mustang* at *Rockcliffe* displaying the "Type B" like Canadian roundel – (CF Photo)

Following World War Two, each Commonwealth Air Force has its own system of identification markings. The RCAF originally used a wartime code letter system, e.g. *Sabre* F86E 19152 was BT.C, with the radio call sign VR-BRC marked under the wing in accordance with a post-war policy. Then the RCAF began looking for a distinctive method of marking its diminishing fleet of aircraft to replace the RAF system. Concurrent to that search, came the introduction of the new International Civil Aviation Organization (ICAO) system of assigning a series of letters to users, including each air arm of a given country.

Between 1947 and unification in 1968, the RCAF transitioned through four distinct markings "eras":

The "VC" Era (1947 –1951)

Starting on 9 May 1947, a five-letter registration was assigned to each aircraft in RCAF service. The RCAF was assigned the letters "VC", the Royal Canadian Navy "VG" and Canadian civil aircraft "CF". The third and fourth letters combined were to designate a unit, followed by the fifth letter was used as an individual aircraft code.
Effective 1 June 1947, fuselage markings were to consist of the last three letters of the "VC" code, with a roundel separating the last letter, reading left-to-right on both sides of the airframe. Roundels were to be applied to both upper wings and the fuselage sides. The full "VC" code was to be applied on the under wing surface with "VC" under the starboard wing and the remaining three letters under the port wing. The last three letters were also carried on the upper wing surfaces, inboard of the roundels, with the two-letter unit identifier on the upper port wing and the last letter on the upper starboard wing. Spacing details varied, depending on the wing shape, number of engines and drop tank configuration.

Tail markings generally consisted of the full serial number centered above the tri-colored fin-flash, with the red portion always leading in the direction of flight.

This system worked well in theory; however it became a major refinishing problem during transfers of aircraft between units. The third and fourth letters would have to be removed and the two-letter identifier of the new unit applied above and below the port wing and on both fuselage sides. It would also, most likely, result in the removal and re-application of the fifth letter, to fit the aircraft into the new unit's sequence. This usually resulted in the re-application of each fuselage roundel as the roundel position was not symmetrical due to the fuselage string reading left-to-right on each side.

An example of the VC era markings: This post-war *Lancaster* has been converted to the Mk 10 MR (Maritime Reconnaissance) variant. The aircraft is coded AF*A and its registration under ICAO system was therefore VC-AFA. - (CF Photo)

On 19 November 1951, Canada dropped the entire ICAO system. It appears that RCAF had probably been the only Air Force that had been abiding by the ICAO regulations which, in fact, had not been made compulsory.[25]

The RCAF in Korea

Because the RCAF was rebuilding her fighter forces at the time of the Korean conflict (four wings of three squadrons each for NATO), it did not contribute any fighter squadrons. However, the RCAF did make significant contributions to the war effort sending a contingent of exchange fighter pilots and also by making other commitments.

The United Nations Flag

Soon after the outbreak of hostilities in Korea, Canada committed her primary transport squadron (No. 426 Squadron) to United Nations (UN) service. In July 1950 the RCAF ordered.426 Squadron stationed at RCAF Station *Lachine* (Dorval) up to wartime strength (12 *North Star* aircraft) and in late July its personnel were detached to *McChord* AFB Washington. From 25 July 1950 until 9 June 1954, No. 426 (T) Squadron provided outstanding service to the UN in Korea, completing 599 missions for a total of over 34,000 flying hours. This particular effort also was the first time that Canadian military aircraft displayed UN markings; 426 Sqn aircraft having displayed the United Nations flag / emblem above the fin-flash and serial number. This practice continued and further evolved into more elaborate colour schemes for Canadian military aircraft deployed on UN missions.

The "AB +3" Era (1951-1958)

As early as September 1948, it had become evident that the ICAO system was not satisfactory for the RCAF, especially within Air Transport Command. A list of new two-letter unit codes was issued on November 19, 1951, effectively ending the "VC" system.[26]

Fuselage marking features for this period included the retention of a two-letter unit identifier, a roundel and then, as a new feature, the last-three digits of the aircraft serial number. These were installed in this sequence, reading left-to-right, regardless of which side of the aircraft was viewed. A non-symmetrical roundel position therefore continued because of the retention of this sequence. As in the earlier "VC" Era, all three components on the fuselage, including the roundel position could change when the aircraft was transferred between units as the unit letters changed in width. The only exception to this rule was the *Chipmunk* trainer aircraft.[27]

A standard "ROYAL CANADIAN AIR FORCE" title in full red letters outlined with black shadowing was used on larger aircraft. Tail markings continued as before with the aircraft serial number centered above the fin-flash. In Europe, the Canadian Red Ensign was introduced in place of the fin-flash around mid 1955, in both left-handed and right-handed versions. The aircraft serial number was moved to below the ensign, though many examples existed with the serial maintained above during the conversion period.[28] By 1957, all Canadian military aircraft were employing the Red Ensign until the introduction of the new Canadian flag in 1965.

The Red Ensign Flag

A Sikorsky S-5 Base Flight Rescue helicopter displays the "AB+3" era markings – (CF Photo)

Air Transport Command continued with the policy of not carrying unit identifiers and not including the last-three of the serial in large numbers on the fuselage. To clarify the issue, the Chief of the Air Staff issued a letter on 18 December 1956 to this effect and including the *Boxcar, Comet, Dakota, Expeditor* and *North Star* transport aircraft. The Bristol *Freighter* did however carry unit codes and last-three of serial on the fuselage, but also carried improvised full red titles while in aluminum (unpainted) and camouflaged finishes. What seems to have made this type an exception was, although a transport, they were assigned to 1 Air Division and thus were not part of Air Transport Command. The same approach to markings also applied for the camouflaged *Dakota* transport aircraft assigned to the Air Division in Europe.[29]

The under wing surface markings could be noted in two variations and were not finalized when fuselage markings were standardized in late 1951. But on 18 February 1952, a new policy came into effect requiring all RCAF aircraft to have roundels on upper and lower surfaces of main planes. In addition, on trainingaircraft, the under-surface of the main planes of *Chipmunk, Harvard, Mitchell, Expeditor* and T-33 aircraft (except for those aircraft deployed overseas) were to be marked with the unit identifier and the last three figures of the aircraft registration number. Thus, trainer aircraft listed within the above would have the two-letter unit identifier, roundel and last three digits of the aircraft serial, applied to under surface of each wing. The port wing application faced the direction of flight while the starboard wing was towards the rear.[30] It was intended that leaving the full aircraft identification (i.e., a squadron code and last-three of the serial) on the under surfaces of Training Command aircraft, would act as a deterrent to any student pilot possessing the idea of carrying out unauthorized low flying.[31]

But, as usual, there were many variations to this standard. The *Anson* fleet, which served until September 1954, was not included in the above list and maintained the "VC" Era markings.[32]

In addition, the *Neptune* fleet was also noted with unit codes and last three under each wing. And, instead of a bare metal finish, the maritime patrol *Neptunes* used by the RCAF were initially retained in overall U.S. Navy midnight blue.

The de Havilland *Comet* was the first military jet transport and was attractive in RCAF livery – (CF Photo)

This C-45 *Expeditor* displays standard Transport Command markings of the era – (CF Photo)

The *Neptune* first entered service with 2(M) Operational Training Unit (OTU) for training at RCAF Station *Summerside* in March 1955. Initially these aircraft were delivered and maintained in overall midnight blue which later gave way to a white and grey paint scheme. – (CF Photo)

The "RCAF +3" Era (1958-1965)

On 10 January 1958, an aide to the Chief of the Air Staff was asked about the feasibility of putting the "**RCAF**" abbreviation on smaller aircraft not carrying the full shadow titles. This was in response to the suggestion from several sources that markings should be clearer. It was also noted that the RCN aircraft carried a large "NAVY" on assigned aircraft and the USAF used "U.S. AIR FORCE" on the side of its aircraft (not to mention "USAF" on wing surfaces). The idea was to replace

the two-letter unit code with the abbreviation "**RCAF**". Approval of this new marking scheme by the Air Council took place on 30 July 1958.

The new standard fuselage marking string was: "**RCAF**", roundel and last-three of serial on the port side and the inverse on the starboard fuselage. Transport aircraft maintained the basic fuselage markings of the previous era, though refined with use of the ensign, full shadow titles, lightning bolt accent lines, white tops for the fuselage and continued omission of the large last-three of serial on the fuselage. The common feature that identifies aircraft painted in this era was the abbreviation "**RCAF**" under the starboard wing and last-three of serial under the port wing replacing the roundels.[33]

For aircraft not fitting the full shadow titles, the abbreviation "**RCAF**" was used to replace the two-letter unit identifier. Thus, the fuselage marking string read, "**RCAF**", roundel and last-three of serial on the port side, with the same on the starboard fuselage side. The letters "**RCAF**" took more horizontal space than any last-three of any serial. Thus the spacing for both the letters "**RCAF**" and longest length possible for the last-three of the serial, i.e., "**444**" was considered when specifications were prepared. This system had the added bonus of not requiring repainting on transfers between units.[34]

Depending on spacing requirements, as in the previous era, there were two methods of fuselage markings. The difference was with the size and spacing available on the aircraft for the application of full shadow titles on the fuselage. The process to re-paint all types, either way, took 15 months to complete with a change to smaller aircraft halfway through the process.[35]

Halfway through the new process in April 1959, another policy change was made for non full shadow titled aircraft to amend the starboard string to read last-three of serial, roundel and "**RCAF**". The new standard for all, non-full shadow title aircraft was to have the "**RCAF**" forward of the roundel in the direction of flight on both sides. All these changes took considerable time to apply to airframes.[36]

Tail markings continued with the left and right-hand red Ensigns on aircraft based in Europe while those based in Canada followed with trainers last. Serials were maintained centered below the Ensign.[37]

The larger transport aircraft types continued, or were introduced with, the full red colored black shadow spelling of "**ROYAL CANADIAN AIR FORCE**" on the fuselage. Thus, there was no need for the "**RCAF**" abbreviation on the fuselage of these aircraft. The same exemption of the large last-three of serial from the fuselage from the previous era was supposed to continue. Other non-transport aircraft not only carried the full shadow titles but also the last-three of the serial number in large letters on the fuselage.[38]

An early example of the CT-114 *Tutor* in standard RCAF +3 era markings – (CF Photo)

A common feature of the RCAF+3 era were the markings applied to wings. On all types, each upper wing surface was to have a roundel, outboard of, but not overlapping any applicable search markings. The under wing surfaces changed from the previous era, with the last-three digits of the serial applied under the port wing and the abbreviation "**RCAF**" under the starboard wing facing the direction of flight or forward.[39]

The "New Leaf" Era (1965-1968)

With the introduction of the new Canadian flag in place of the Red Ensign, the fourth era of RCAF markings had begun. The marking placement essentially remained as per the RCAF+3 Era. Changes were generally restricted to just two areas: the flag/roundel design and the elimination of troublesome fluorescent anti-collision markings.

The removal of the Red Ensign and the replacement of the "Silver Maple" roundel with a more stylized maple leaf design from all RCAF aircraft was distinct and in the rush to achieve a new look, shortcuts were taken. The supply of new flags was not a problem, but roundels were another matter. The insertion of a smaller leaf cut from the flag decals, or applied from stencils resulted in a variety of roundel appearances. The new roundel was to have a wider blue band plus new standard colours. The end result was a lengthy transition period of inconsistent markings, not only between different aircraft types, but also between aircraft of the same type.[40]

Initial revised Cdn Roundel

Later standardized Roundel in 1965 with smaller maple leaf

The Canadian Flag introduced

This C-119 *Box Car* illustrates a mixture of older markings with the new Canadian Flag – (Author's Collection)

RCAF Colour Schemes (late 1950 & 1960s)

The RCAF's colour schemes of the 1950's and 1960's developed into a wide variety of standard and sometimes complex colour schemes depending on the role and theatre of operation. Canadian aircraft deployed to Europe with Canada's NATO contribution were painted in camouflage schemes whereas Canadian-based aircraft remained predominately in bare metal. Larger aircraft including transport, maritime patrol and utility aircraft evolved to having their tops painted in overall reflective white to enhance the cooling of their interiors. A "lighting bolt" demarcation line became another standard feature both of these aircraft types and even fighter aircraft such as the CF-101 Voodoo. Another colour scheme was prompted by the introduction of three different types of helicopter used to support the construction of the Mid-Canada radar chain. Flying in remote parts of the country, the H-21B, S-55 and H-34 helicopters all wore a spectacular overall red, white and blue series of high visibility paint schemes.

This Vertol HU-21 illustrates the high visibility paint scheme adopted on RCAF helicopters – (Author's Collection)

THE ROYAL CANADIAN NAVY (1946-1968)

With wartime aviation experienced personnel available, the RCN decided to start a naval aviation division immediately after World War II. Initially two fleet carriers were considered by the RCN and after accepting the use of HMS/HMCS *Warrior* it was decided, because of cost, that the RCN would operate only one carrier. HMS *Warrior* was returned to the RN and after HMCS *Bonaventure* (ex-HMS *Powerful*) was purchased and while "Bonny" was being finished to Canadian specifications, HMS/HMCS *Magnificent* was borrowed by the RCN. As with most Commonwealth Navies, the Royal Canadian Navy (RCN), followed Royal Naval (RN) patterns and colours for general finishes on both ships and aircraft.

Therefore Canada's aircraft carriers were in order of service:

HMCS *Warrior* on loan to Canada from the United Kingdom (in Canadian service from January 1945 - February 1947),

HMCS *Magnificent*, again on loan to Canada (from April 1948 - April 1957) for operations, had a straight flight deck and no mirror landing system; and

HMCS *Bonaventure*, the hull of which was laid down at the same time as that of *Magnificent* but was not completed; Canada then bought her and she was completed as a modern carrier in the *Harland & Wolfe Shipyards*, Belfast. She had an angled flight deck and stabilized mirror landing system. She was commissioned on 17 January 1957 and remained in service until 1969.

Early in 1945, four Royal Naval Air Flying Squadrons were formed in the United Kingdom for service in the Canadian carrier then under construction. These Squadrons were Nos. 803, 825, 826 and 883. On 15 May 1947, the 18th Carrier Air Group (CAG), consisting of 826 and 883 Squadrons, was formed at Royal Canadian Naval Air Station (RCNAS) *Dartmouth*, N.S. and on 1 May 1951, VF 803 and VS 825 Squadrons were re-designated VF-870 and VS-880 respectively and formed the 31st C.A.G. while 826 and 883 became VS-881 and VF-871 respectively and formed the 30th CAG.

It was decided that the interests of the service would best be served by renumbering the air squadrons to give them a Canadian identity within the Commonwealth system. Also it was intended to provide a logical means of identifying additional squadrons and air groups in the event of expansion. Thus the allocation of squadron numbers 880 to 889 for antisubmarine squadrons and 870 to 879 for fighter squadrons and the subsequent re-designation of existing squadrons in June 1951. These squadrons remained in being until 7 July 1959 when VS-880 and VS-881 were amalgamated to form VS-880; the largest air unit in the RCN. Further manpower cutbacks resulted in the amalgamation of VF-870 and VF-871 into VF-870 shortly thereafter.

The first actual flying unit of the RCN was in fact the Fleet Requirements Unit (FRU) 743, a fleet refresher unit, tasked with refresher training for some of the

wartime aviators who were returning to the RCN or recruited from the ranks of demobilized RCAF pilots. In the post-war period, however, the primary role of the aviation division of the RCN was anti-submarine warfare.

HMCS *Shearwater* was the shore station home of Canadian Naval Air Operations since 1948 and was the largest naval establishment in Canada. It was home to: VS-880 and VS-881 Anti-Submarine squadrons which flew *Firefly, Avenger* and *Tracker* aircraft; and VF-870 and VF-871 Fighter squadrons which flew *Seafire*, *Sea Fury* and *Banshee* aircraft.

There were also 5 auxiliary Naval Air Squadrons formed in order to maintain the operational efficiency of the reservist who would be of vital importance to the RCN in time of war:

VC-920 HMCS *YORK* in Toronto, ON; VC-911 at Kingston, ON; VC-922 HMCS *MALAHAT* in Victoria, BC; VC-923 HMCS *MONTCALM* at Quebec City, QC; and VC-924 HMCS *TECUMSEH* in Calgary, AB.

Naval Air Squadron HU-21 was also formed at HMCS *Shearwater* in November 1952. This squadron had the following aircraft on its inventory: Bell HTL-4 & 6, Sikorsky HO4S-2 & 3, Piasecki HUP-3 and CHSS-2 *Sea King* Helicopters.

VT-40 - All Weather Training Squadron was amalgamated with VU-32 Utility Squadron on 4 May, 1959. They flew Beechcraft 18 (*Expeditors*), *Harvard*, *Avenger*, *Sea Fury* and T-33 *Silver Star* aircraft.

VU-33, a Utility Squadron, operated from *Patricia Bay*, Vancouver Island, B.C. with *Avenger*, Piasecki HUP-3 helicopter, T-33 *Silver Star* aircraft and *Tracker* aircraft.

VX-10, the Naval Experimental Squadron, while based at *Shearwater* but responsible to NDHQ Ottawa, had a least one of each type of naval aircraft in use at any time and tested for acceptance all aircraft and products utilized in naval air.

HS-50, an Anti-Submarine Helicopter Squadron, formed at *Shearwater* on 4 July 1955 to operate Sikorsky HO4S-2 and 3, later converted to CHSS-2 *Sea Kings* and operated first from HMCS *Bonaventure* and later from destroyers.

In 1951 as their primary ASW platform, the RCN selected an updated version of the USN *Avenger* aircraft and the *Sea Fury* continued as the fighter. These aircraft served with 880 Sqn (RCN) and 870 Sqn (RCN) on board HMCS *Magnificent* (825 and 803 Sqns reverted to the RN). In 1952, the RCN adopted the USN designators for her squadrons, so "V" was heavier than air and "S" was anti-submarine and "F" was fighter. In 1955, the RCN expanded their aviation division and created VS 881 as their Airborne Early Warning unit, VF 871 (another fighter squadron) and HS 50 the RCN's first helicopter squadron (in 1974 HS 50 was split and HS 423 and 443 were created). As the follow-on ASW aircraft, the RCN selected a Canadian-built version of the Grumman S-2F *Tracker*; VS 880 and VS 881 were equipped with this aircraft type. The arrival of these aircraft coincided with the acceptance of HMCS *Bonaventure* (commissioned January 1957). The "Bonny" had been modified from her original plans and included many new innovations, steam catapults, angled deck and mirror landing system to name a few. These advances meant higher performance aircraft could be carried as part of the ship's compliment. To replace the piston-engined *Sea Furies* from "Maggy's" day's ex-USN *Banshee* jet fighter aircraft were selected and then VF 870 and VF 871 Sqns were equipped with this aircraft type.

However, by the early 1960s budgets were becoming tighter and it was decided that the RCN would be strictly an ASW force; therefore, the two fighter squadrons were reduced to nil strength and the *Banshees* were mothballed. As another austerity measure, the two ASW squadrons were amalgamated into VS 880 Sqn. In 1970, after a major refit, it was decided that HMCS *Bonaventure* would be paid off. This was not the end of naval aviation in Canada, because in the early 1960s Canada had been working on a helicopter destroyer (DDH), a destroyer capable of landing, securing and supporting helicopter operations. These were to be the future of naval aviation in Canada. From the mid-1960s through to the present, naval aviation has been primarily helicopter-based ASW.

On 1 February 1968, the RCN's naval aviation division was absorbed into Maritime Air Group, a part of Maritime Command, and in September 1975, MAG became a part of Air Command.

RCN Colour Schemes

The RCN's World War II aircraft markings and colour schemes were virtually identical to the RN's Fleet Air Arm. After the war, the RCN then transitioned to national markings similar to that of the RCAF (i.e. a roundel with a maple leaf and British style "fin flash). The Navy roundel was, however, to differ from the Air Force version in that the former was patterned after the "Sugar Maple" while the RCAF's roundel took its form from the leaf of the "silver maple". Another

difference was the addition yellow outer border to the RCN roundel similar to the RAF Type "C1" design.

In terms of aircraft serials, it was not uncommon for many of the RCN's original *Seafires*, *Fireflies* and *Sea Furies* to be seen with their original serials as allotted in the U.K., but simply modified by the 4-inch wording ROYAL CANADIAN NAVY (the last word forming a second line), placed above.

As with the RCAF, starting on 9 May 1947, a five-letter registration was assigned to each aircraft in RCN service. The RCN was assigned the starting code letters "VG". The third and fourth letters in the code were then combined to designate a unit, followed by the fifth letter was used as the individual aircraft code.

Fin code letters were not always used but identification letters, following RN practice were marked on the fuselage side, balanced on the other side of the roundel by the word **NAVY** in up to 36-inch letters, e.g. **NAVY** * 132 (* = roundel) on the fuselage side. Instead of serials, these markings were marked on the wing undersurfaces in the manner **NAVY** t 132 (t = fuselage and direction of travel).[41]

This Grumman *Avenger* displays the standard RCN markings and later colour scheme – (CF Photo)

Just as the RCAF transitioned to the Red Ensign in place of the British style fin-flash, so did the RCN. In the RCN's case, however, instead of the Red Ensign the Canadian Naval Ensign was used.

In the post-war period, the RCN's aircraft further transitioned from the predominately overall dark blue paint schemes to a combined extra dark sea grey (upper surfaces only) and light sea grey (all other surfaces) arrangement. Prior to integration, the RCN changed once again to an overall light grey finish on many of its aircraft and this basic colour scheme remained as the final transition to the CAF was completed.

A Hawker *Sea Fury* resplendent in full RCN markings – (CF Photo)

CANADIAN ARMY (1946 – 1968)

The AOP squadron approach was again part of the post war structure of the Army. The AOP squadron was again organized on the same basis as the wartime overseas AOP squadrons, the army providing the pilots and the RCAF providing the ground support. The AOP squadron relied upon the central maintenance facilities at the Canadian Joint Air Training Center (CJATC) in *Rivers*, Manitoba.

Manitoba and army aviation were synonymous terms in the beginning days. The Canadian Army's first direct involvement with aviation took place at *Shilo*, Manitoba in September 1942 with the start of Canadian Paratroop Parachute training. After the war, a joint air school was established at *Shilo* on 3 May 1947 and this school moved to *Rivers* on 1 April 1949 where it formed the initial cadre of CJATC. CJATC was commanded by an RCAF Group Captain with an army Lieutenant Colonel as second in command. There were several components to the school at *Rivers*. These included a transport support school, which taught the theory and practice of moving armed forces by air, and consisted of a transport support section, an air portability section and an air supply section, an offensive support school, a joint air photo interpretation school and an air training wing. Initially the air training wing was known as No. 20 Tactical Wing and consisted of a flying control section, a met section, 417 (Fighter) Squadron, 416 (Bomber) Squadron, 122 (Transport) Flight, and 444(AOP) Squadron. On 1 April 1949, the tactical wing was renamed the Air-Training Wing. 417 Squadron became the Fighter Tactical Flight, 112 (T) became the Air Transport School, 444(AOP) the Light Aircraft and Helicopter Conversion School. The Transport School had eight *Dakotas* and eight *Horsa* gliders, and the Tactical Flight was equipped with *Mustangs* and *Harvards*. It was involved in Operation *Sweetbrier*. The AOP consisted of one squadron at *Rivers* on a reduced scale, and one flight attached to the artillery school at *Shilo*. The AOP was equipped with *Chipmunk*, and Auster fixed wing aircraft, and a few Bell and Sikorsky helicopters. There was an Air Support Signal Unit and the entire operation was mobile in trucks.

Canadian army pilots had been flying Bell 47 type helicopters from late 1948. As part of CJATC, a helicopter school was established at *Rivers* and became the initial training ground for both army and air force helicopter pilots and maintainers.

By 1950, there were 230 people in the central maintenance organization with an average strength of 42 aircraft. In addition to their powered aircraft, the center had six *Horsa* gliders, which were used for a variety of roles and exercise trials until the early 1950s.

During the later 1950's the Canadian Army recognized the need for a heavy lift helicopter unit. The DND estimates for 1957 included three requirements for heavy helicopters; ASW machines for the RCN; SAR helicopters for the RCAF; and transport helicopters for the Army. Government officials tried very hard to get the three services to agree to a common type and were partly successful by getting the Army and Air Force to agree to a common variant of the Vertol Model 107 *Voyageur / Labrador* helicopter. In due course, 12 aircraft were bought to support the army requirement. This was the largest aircraft every procured by the Canadian Army having a 5,000 pound lifting capacity. The Army then activated number 1 Transport Helicopter Platoon Royal Canadian Army Service Corps as an elite unit of the field force and in typical military shorthand, the unit became known as 1 THUMP. It was the largest and most complex aviation unit organized by the Canadian Army.

By the mid-1960s, then Mobile Command initiated a project to design their own Army Aviation Corps. The design goal seemed to be the US Air Calvary division model then being used in Southeast Asia. Several new equipment programs were started and an emphasis placed on air mobile operations which can be traced to this global thinking including the purchase of close-support fighters (F-5 / CF-116 *Freedom Fighters*), utility helicopters (CH-135 *Twin Hueys*), light observation helicopters (CH-136 *Kiowas*), heavy lift helicopters (CH-147 *Chinooks*) and transport aircraft (CC-115 *Buffalo*). There were even later plans for attack helicopters and *Mohawk*-type reconnaissance aircraft. The helicopter squadrons were located in *Edmonton, Petawawa, Valcartier* and *Gagetown*. The fighter squadrons were located at *Cold Lake* and *Bagotville*. The squadron of *Buffaloes* was originally intended for *St. Hubert* however the assignment of transport aircraft to Mobile Command proved very transitory. With integration all of these tactical aviation units and squadrons were absorbed into Air Command.

Army Colour Schemes

In the immediate post-war period, the Army's AOP Auster aircraft could be found in an overall yellow paint scheme. Later, more typically, Army aircraft could be found in one of two basic colour schemes; either bare metal or in overall olive drab green finish with either white or black codes. Liaison aircraft such as the Cessna 172 aircraft might be found in bare metal but the Auster's replacement the Cessna L-19 *Bird Dog* and the *Labrador* helicopter fleet were uniformly painted in overall Olive Drab.

An Army Auster AOP aircraft in post-war VC-era markings – (Author's Collection)

A Cessna 172 liaison aircraft in full Army markings – (Author's Collection)

The CH-113 was bought in two versions; one for the Army and one for the RCAF – (CF Photo)

Initially, the Army's registration system basically mirrored the RCAF's approach. Auster aircraft could be seen in "VC era" coding. Then similar to the Navy, the Army approach evolved into an "**ARMY**" plus the last three numbers of the aircraft serial number in large black or white lettering.

THE CANADIAN ARMED FORCES (1968 – present)

It was argued in 1964 that the command, logistics, administration and training functions of the three services of Canada could be streamlined and unified. In April 1964 the government introduced bill C-90 "Integration of the Headquarters Staff" into the house. On 1 August this bill created a single commander of the armed services of Canada, the "Chief of the Defence Staff"; all element commanders reported to him instead of directly to the Minister of National Defence. This brought the functional command of the entire armed forces under one headquarters: Canadian Forces Headquarters (CFHQ). The Canadian Armed Forces were now broken down into six functional commands: Mobile Command was formed to maintain a combat ready land and air force capable of rapid deployment; Maritime Command embodied all sea and air maritime forces on the Atlantic and Pacific; Air Transport Command would provide strategic airlift capability; Air Defence Command would contribute squadrons for the defence of North America; Training Command was responsible for all individual training; Material Command was to provide the necessary supply and maintenance support to the other functional commands.

Additionally, there were two other elements: Communications Systems (in 1970 elevated to command status), and Canadian Forces Europe which was an independent organization reporting directly to CFHQ.

On 6 November 1966, bill C-243 "The Canadian Forces Reorganization Act" was introduced to the house. This bill would amend the National Defence Act to reflect the unification process. Under the previous National Defence Act, Canada supported three separate forces (the Canadian Army, the Royal Canadian Navy and the Royal Canadian Air Force); under the amendment there would be only one force. The Canadian Forces Reorganization Act came into effect 1 February 1968. Unification brought many external and internal changes. The most visible change was the move to all green uniforms by most personnel and the standardization of ranks with the air element adopting army style nomenclature for ranks. The post-unification period, however, also brought continuous changes in structure and evolution/devolution of responsibilities.

Some of the significant changes over the following years included: Air Command was formed in September 1975. This change brought Air Transport and Air Defence Commands (both had became groups), Tactical Air Group and Maritime Air Group under overall command of Air Command. The formation of Air Command also brought changes to Training Command with a name change to Training Systems and an associated move to Trenton. 1988 saw the re-introduction

of distinctive environmental uniforms (DEU) and the Air Force returned to light blue uniforms. In 1994 Canadian Forces Europe closed its doors marking in part the end of the Cold War era.

The basic organizational structures and nomenclature of Canada's military aviation were first established in WWI. With the formation No. 1 Canadian Wing RAF in 1918, the wing became standard in air operations, along with commands, groups, squadrons and flights. In using this structure, Canada followed the well-established Royal Air Force model.

When the Royal Canadian Navy, the Canadian Army and the Royal Canadian Air Force integrated in February 1968, the RCAF structure, including wings, disappeared. The Canadian Armed Forces adopted a new organization structured on the Base concept. Nos. 1, 2, 3 and 4 Air Reserve Wings were re-established in the 1970s and No. 3 (Fighter) Wing, *Lahr*, and No. 4 (Fighter) Wing, *Baden* were also re-established in the late 1980s to meet NATO air force command and control requirements.

Finally, beginning in 1993 the Air Force re-established the wing structure and nomenclature across the entire organization. Each of the existing bases then received a numerical designation ranging from 1 to 22 (i.e. 19 Wing *Comox*) in some cases based on the previous historical affiliations of the base.

The latest change in structure for the Air Force was brought about in 1997. Previous studies had established the need to eliminate at least one layer of headquarters in the overall establishment, which had gradually shrunken with periodic budget cutbacks and personnel reductions. The Air Force decided to eliminate the existing Air Command Headquarters in Winnipeg along with each of the Group Headquarters. In the their place, the Chief of the Air Staff (CAS) amalgamates the strategic level functions of each of the five previous HQs. 1 Canadian Air Division (1 CAD) in Winnipeg amalgamates the operational level functions of AIRCOM, 10 TAG, MAG, ATG and FG. In addition, 1 CAD assumed the responsibilities for Canadian NORAD Region (CANR) Headquarter functions and is officially known as 1 CAD/CANRHQ. The nomenclature for both CAS and 1 CAD re-introduces historical terminology in that both these entities previously existed in the RCAF/CF.

On 2 August 1990 Iraq invaded Kuwait. This act of aggression precipitated the Persian Gulf War. The world in unison reacted to this act of violence and a coalition of forces was formed to liberate Kuwait. Diplomacy failed and the United Nations Security Council issued an ultimatum to Sadam Hussein: leave Kuwait by 15 January or suffer the consequences. Shortly after mid-night, 17 January 1991, the coalition forces opened their strategic bombing campaign. This campaign lasted until the cease-fire on 28 February 1991. The ground assault started on 24 February 1991 after the most successful air assault in history. This ground assault swept through the Iraqi defensive lines and turned the battle into a rout.

Canada joined the coalition in condemning Iraq and committed her forces. Initially Canada's contribution was two helicopter destroyers (DDH) and a supply ship (AOR) to assist in the blockade in the Persian Gulf (Operation *FRICTION*); included in this task group were the ships compliment of *Sea King* helicopters. These aircraft flew many missions to investigate unknown sea traffic. To protect her men-of-war, Canada committed a squadron of 18 CF-18s (Operation *SCIMITAR*). After a long recce of the in-theatre airfields, Doha in Qatar was selected as the deployment base. The deployment to Doha started on 4 October 1990 from the available forces in Canadian Forces Europe, and the first operational missions were flown on 9 October 1990. The commitment later increased to 24 and then 28 CF-18s. The original task for Canadian Air Task Group Middle East's (CATGME) was Combat Air Patrol (CAP) for the fleet in the Persian Gulf; this changed later to a coalition CAP of the Persian Gulf. This task continued until 24 January 1991 when sweep and escort missions were authorized and flown by the Canadian Forces, and then finally on 24 February 1991 air-to-ground missions were authorized and flown.

Included in the CF air commitment to the coalition was an air-to-air tanker. This arrived in-theatre on 8 January 1991 and joined the other tanker resources of the coalition. Their first mission was flown on 9 January 1991 and continued until the cease-fire.

In January 1991 it was decided to bring all of the Canadian Forces units deployed to the Persian Gulf under one Canadian Commander. The headquarters were set up in Bahrain and they were provided with a light transport/utility CC144 *Challenger*. Operational command of all Canadian resources was assigned to the Canadian commander, while operational control was delegated to the coalition. After the cease-fire, Canada quickly repatriated her forces back to their original bases and the deployment bases in Bahrain and Doha were closed out in March 1991.

Through the rest of the 1990s, in the face of ever decreasing budgets and resources, the Canadian Air Force remained extremely busy, with operational deployments of every kind around the globe: Airlift missions involving CC130 *Hercules*, CC137 *Boeing*, CC150 *Airbu*s and CC144 *Challenger* aircraft into the former Yugoslavia, into Central America, African, Russia, the Persian Gulf and many other parts of the world were a frequent occurrence in support of both operational deployments and humanitarian assistance.

CF-18 *Hornets* were deployed operationally to NATO bases in support of missions in Bosnia and the former areas of Yugoslavia. Then, on 24 March 1999, just before midnight Adriatic time, four CF-18 *Hornets* of Task Force "Aviano" launched from their Aviano Air Base in Italy en-route to a pre-planned target located in Kosovo. These Canadian tactical fighters were four of sixteen dedicated bombing aircraft situated in the centre of a much larger strike package of NATO aircraft. This mission, conducted on Day One of the Balkan air campaign, represented the first Canadian air combat mission in Europe since the end of the Second World War, and the beginning of the most extensive Canadian Air Force combat operation since the Persian Gulf War of 1991. Over the ensuing 78 days and nights, the six, then twelve, and eventually eighteen Canadian CF-18s from Aviano flew a total of 678 combat sorties over nearly 2600 flying hours. They delivered 532 bombs — nearly half a million pounds of high explosive munitions — including 361 laser-guided five-hundred and two-thousand-pound bombs on a variety of targets throughout Kosovo and the Federal Republic of Yugoslavia, without loss to participating Canadian aircrew and aircraft.

CH146 *Griffon* helicopters were subsequently deployed on tactical aviation missions flown in Haiti in support of the UN and in Bosnia in support of SFOR. CP-140 *Aurora* maritime patrol aircraft also deployed to Italy in support of the UN maritime embargo on the former Yugoslavia and to the Gulf region as part of Canada's contribution to the war on terrorism. As part of their naval contingents, CH124 *Sea King* helicopters have also flown into "harm's way" in diverse locations such as Somolia, East Timor and the Gulf Region. Closer to home, within Canada, Air Force missions in support of relief for various disasters such as the Manitoba and *Saguenay* region floods, the Quebec/Ontario ice storms and the Swiss Air crash, the response the 9/11 terror attacks to name a few also added to the operational tempo.

Air Force personnel, particularly from the support echelon, have themselves been increasingly committed to CF operational deployments around the world. More recently regular deployments to Afghanistan by both Canadian Air Force aircrews and support personnel are now the norm. CC150 *Polaris*, CC130 *Hercules* and CU-161 *Sperwer* UAVs are regularly seen in these Middle East skies.

The "CAF" Era - Post Unification (1968-1983) Marking Schemes

Many changes were introduced in 1968 with the unification of the three services into the Canadian Armed Forces. Since unification, the Canadian Armed Forces have had a further three distinct periods in which markings have been amended and changed:

First, as mandated by unification itself, changes had to be made to all aircraft owned and operated by the newly titled Canadian Armed Forces. The sizes of the flags, letters, numbers, roundels and titles remained relatively constant with previous standards and generally all markings positions were maintained as during the separate RCAF, RCN and Army years. All aircraft would however now use the CAF roundel, with the flag-style maple leaf instead of the RCAF or RCN roundels. All aircraft also began carrying the asymmetrical fuselage markings of **CANADIAN ARMED FORCES** on the port side, and **FORCES ARMÉES CANADIENNES** on the starboard in red/black shadow lettering style on uncamouflaged aircraft or in black on camouflaged aircraft instead of the legends RCAF, NAVY or ARMY. This remained in effect until the advent of the "CANADA" scheme in the early 1970s.[42]

Naval aircraft were repainted from their Dark Sea Grey/Light Sea Grey scheme into overall light grey; the NAVY markings replaced by the post-unification markings described above. In contrast, Army aircraft retained their olive drab finish but also had their Army coding replaced by post-unification markings. During the transition period, it was still be possible to see aircraft flying with the old RCAF style roundel used in conjunction with CAF markings.[43]

The CC-129 Dakota aircraft fleet saw many changes of markings over its years of service. This example displays post-unification markings. – (CF Photo)

The “Symmetrical” / “CANADA” Era (1973 –1983)

By the 1970s, it was then pointed out to the Canadian Armed Forces that its markings did not meet the ICAO regulation of maintaining standard markings on both sides of all military aircraft. This, coupled with the requirement of displaying some sort of French language equivalent was the challenge. The solution came in two parts. The first was to replace the previous port side fuselage " **CANADIAN ARMED FORCES** " and the starboard side fuselage " **FORCES ARMÉES CANADIENNES** " with the single word "**CANADA**". Secondly, the previous fuselage string of CAF, roundel and last-three of serial was replaced by a new roundel-identification system. The CAF and the numbers were removed from beside the fuselage roundels, to be replaced by the words ARMED FORCES and FORCES ARMÉES. The result was a standard roundel flanked with small titles that could be read in both official languages horizontally and vertically. The last-three numbers of the aircraft serial on the fuselage were repositioned, usually closer to the nose. Wing and tail markings remained the same as were not affected by the ICAO rule.[44]

This 409 Squadron example of the CF-101 *Voodoo* illustrates the “symmetrical Canada” style of markings – (CF Photo)

The “FIP” Era (1983 - Present)

Beginning in the 1980s, as part of the new government policy, all departments were to adopt a common method of identification. This program began with other departments adopting common markings for equipment, vehicles, aircraft and even for post office boxes. This became know as the "Federal Identity Program" or “FIP”. The Canadian Armed Forces was not exempt from this policy and, commencing in 1983, the **CANADA** and **CAF** were replaced with new markings. The **CANADA** and **ARMED FORCES / FORCES ARMÉES** were removed from the fuselage, along with the CAF used as part of the underwing buzz number. A Canada “Wordmark” replaced the **CANADA** on the fuselage side, and a Departmental “signature” was also added. The “Wordmark” consists of the word Canada with a small flag over the final “a”, and the signature is the Federal Government's “half-a-flag” logo followed by two lines of type, in this case reading **CANADIAN FORCES** over top of **FORCES CANADIENNES**. A roundel replaced the letters **CAF** underwing, and the roundel is removed from the top of the right wing, being replaced by the “last three” numbers of the aircraft serial number.

Canada

The Canada “Wordmark” Logo

The second component introduced was a departmental signature. This consisted of a small "half" flag (later changed to a full flag) and the name of the government department in both languages. In this case, "**Canadian Forces**" and "**Forces Canadiennes**" could be read left to right or top to bottom.[45]

This 604 Model of the CC144 *Challenger* VIP fleet displays full FIP era markings – (CF Photo # SU2005-0558-01a)

Letter and Number Styles

There seem to have been only two major styles in letters and numbers for RCAF / CAF aircraft since WW II. The older was less formalized, and it was apparently more difficult to maintain a constant style, judging from the variations seen on older photos. At some point, it is not clear when, the style seen today on CAF aircraft started being used. It is a much more repeatable and consistent style, using straight lines and constant radii to form the letters and numbers. It does not seem to have taken effect as a changeover, but rather as a 'repaint when necessary' project. It is not unusual to see photos of aircraft carrying the old, the new, or a mix of styles, all on the same day on the same flight line, going back to the 1950s or early 1960s. Within that era it was also not unusual to find a few items done in the American 'chipped corner' style also, but this is usually confined to the small nose numbers. Today, the lettering is pretty much the second style mentioned, but, as always, exceptions have been seen. For example, variations were seen on the CH-139 *Jet Ranger* fleet and the CP-121 *Tracker* fleet in the later dark grey camouflage, with the latter fleet appearing to utilize a commercial Helvetica typeface for all the numerals and lettering.[46]

This CP-121 *Tracker* aircraft has been repainted with low visibility markings – (Author's Collection)

Modern Camouflage Schemes

As the Air Force moved into the 1980s and 1990s, particularly with the introduction of new aircraft fleets, many new camouflage schemes were introduced on the operational aircraft types in and CF aircraft have become far less colourful as a result. The first stage in toning down consisted of simply removing all the white from the national markings, resulting in a red flag and red/blue roundel sitting on a camouflaged background. Later it was decided to change all the markings to black (seen mostly on helicopters), or to a low-contrast grey (dark or light, depending on the scheme). This same basic approach is where the markings / schemes stand today.[47] Most modern combat aircraft fleets can be found either in shades of grey or in combinations of green and grey. The same was / is true for unmanned aerial vehicles (UAVs) such as the *Sperwer* fleet. Camouflage colours have been predominately in a matt finish but difficulties in maintaining clean surfaces has resulted in some combat and most non-combat fleets more often being painted in gloss grey finishes which are easier to maintain.

Low Visibility Roundel (with white removed)

Grey Roundel

Latest Changes [48]

In 2011, to recognize Canada's military heritage, the historic names of Canada's three military services were restored: the Royal Canadian Navy (RCN), the Canadian Army (CA) and the Royal Canadian Air Force (RCAF). Under these designations, Canadians emerged victorious from the Second World War and later defended Canadian interests throughout the Cold War and the Korean War. The RCAF received its new insignia in 2013, followed by changes to members' uniforms and the re-designation of the rank private as "aviator". As of 2018, the next step in the restoration process was to bring RCAF aircraft livery – that is, aircraft paint schemes – in line with the earlier changes. The new aircraft livery includes the bilingual designation "RCAF" and "ARC" (for Aviation royale canadienne) on either side of an updated roundel. The changes are to made in a way that minimizes any additional cost and does not take an operational aircraft out of service unnecessarily. The changes are expected to take four to five years.

Aircraft will receive their new livery when they are already undergoing scheduled routine maintenance, which includes any necessary repainting.

The RCAF's aircraft fleets are in transition to the new RCAF /ARC lettering as seen on the photos to the left and above – (RCAF Photos)

SPECIAL MARKINGS

Throughout each of the decades and eras of Canadian military aircraft markings, there have consistently been special markings and paint schemes that have stood out. These special markings can basically be divided into six broad categories: Air Display, Commemorative, High Visibility, VIP, Test and Evaluation, and / or Unit / Personal Marking colour schemes. Aircraft with combinations of colour schemes from one or more of these categories are also not uncommon.

Air Display Teams

Special paint schemes for air display aircraft and air demonstration teams have a long and varied history in Canada.

Lieutenant Colonel William Barker, one of Canada's much decorated air aces of the First World War, founded his own flying team of four captured German “war trophy” Fokker D VII scout planes. Based at *Leaside*, Lt Col Barker’s team put on the first public exhibition of formation flying in Canada. A premier attraction at the 1919 Canadian National Exhibition (CNE), this demonstration team was the forerunner of all Canadian military aerobatic teams to follow.

The first official air display team formed by the RCAF were the "Siskins" in 1934 to celebrate the 25th anniversary of aviation in Canada. This team flew three *Siskin* fighter aircraft in close formation at many festivals and events throughout the summer season of 1934. The RCAF would not see another air demonstration team until after World War Two.

The first post-war jet demonstration team was formed at St Hubert in 1949. This team, known as "The Blue Devils", was formed from members of No. 410 "Cougar" Squadron. They flew air demonstrations throughout the 1949 season.

In 1954, the Air Division in Europe decided to create an air demonstration team. The concept was each wing would provide a team on a rotational basis. The first wing selected was No. 3 Wing *Zweibrucken* and the team was the "Fireballs". In their distinctly painted bright red *Sabres*, this team dazzled crowds across Europe. The following year, 1955, No. 2 Wing was selected to provide a team. This Air Division team was now called "The Sky Lancers". Approximately 20 shows were flown during the 1955 season. In 1956, No. 4 Wing provided the members of "The Sky Lancers". Unfortunately on 2 March 1956, while practising their routine over the Rhine valley, "The Sky Lancers" crashed near the *Vosges* mountains south west of Strasbourg killing four of the five-team members. This accident put an end to RCAF aerobatic teams for several years.

959 was, however, the "Golden Anniversary" of aviation in Canada along with the 35th anniversary of the RCAF. These anniversaries were not to go unrecognized by the RCAF. A team was formed and they were to fly specially gold-painted *Sabres* with a large red and white hawk painted on each side. These were the famed "Golden Hawks". After a two-month work up at RCAF Station *Chatham*, N.B., they flew 69 shows across Canada. Although the "Golden Hawks" were formed for only one year, they were so popular that they flew for several more years. The team continued their sterling performances until 1963 when they were transferred from Chatham to Trenton and then, after a total of 317 displays, on 7 February 1964, the "Golden Hawks" were disbanded. The reason given was to save $750,000 a year in operating costs.

The *Sky Lancers* aircraft had their team markings superimposed over standard NATO colours / markings – (CF Photo)

A F-86 *Sabre* in full *Golden Hawks* aerobatic team markings – (CF Photo)

Between 1962 and 1964 a RCAF Station *Moose Jaw* based team called "The Goldilocks" was formed and flew air demonstrations across Canada. They were formed as a parody of "The Golden Hawks" and flew *Harvards* in some of the craziest formations every seen by the public. The team disbanded when the *Harvards* were replaced by the *Tutors*.

To celebrate Canada's Centennial year, another single year-only team was formed and they were a part a large aerial demonstration. The formation team was called the "Golden Centennaires" and were formed at *Portage la Praire*, Manitoba. The plan was to perform 100 demonstrations across the country during the centennial year. The other aircraft for the special centennial demonstration included a solo CF-104 *Starfighter*, a solo CF-101 *Voodoo* and two restored AVRO 504s.

The *Goldilocks* were famous for unusual formations in their aerobatic routines – (CF Photo)

The *Golden Centennaires* had an attractive paint scheme that incorporated the Centennial logo – (CF Photo)

The "Snowbirds" Canada's longest running air demonstration team started in early 1970, when the base commander at CFB *Moose Jaw* noted that the Ex-*Centennaire Tutors* were painted all white. This new team was composed of pilot instructors from 2 Canadian Forces Flying Training School who practised after hours and on weekends and their demonstration was close formation flying only. Officially they were the 2 CFFTS demonstration team; it was not until 1971 that the name "Snowbirds" was used (the name was suggested by a seventh grade student in Saskatchewan). In 1974 they officially became the Canadian Forces Air Demonstration Team and in April 1978 they received squadron status, becoming 431 Air Demonstration Squadron. The "Snowbirds" have continued through to the present day as Canada's Air Ambassador to the world.

Ex-*Golden Centennaires* aircraft were repainted in an all-white paint scheme, which precipitated the formation of the S*nowbirds* – (CF Photo)

A solo Royal Canadian Air Force demonstration aircraft that flew the Canadian airshow circuit for many years was the bright red T-33 of "The Red Knight". Between 1958 and 1969 the "Red Knight" performed solo jet demonstrations across North America. The last years of the "Red Knight" were spent in a CT114 *Tutor*. The "Red Knight" was officially phased out in 1970 after a series of fatal crashes.

The Red Knight solo aerobatic demonstration aircraft initially employed the CT-133 *Silver Star* – (CF Photo)

This solo demonstration tradition, however, continues to the present day, through the use of specially painted CF-18 *Hornet* aircraft which are used to put on aerobatic demonstrations at airshows across North America.

The two CF-188 *Hornet* demonstration aircraft shown here flew during 1999 & 2000 – (CF Photo # CKC-2000-0045-46)

Commemorative Paint Schemes

Painting aircraft to commemorate certain events, campaigns, anniversaries is also a practice that dates back to the First World War. There are examples of the RFC JN-4 *Canuck* aircraft being painted in special schemes for this purpose. The same was true in the Second World War particularly for those aircraft that had been "purchased" by various organizations in fund raising drives. In the post-war period, Canadian aircraft carried special markings denoting Canada's 1967 "Centennial" and subsequently various crests and markings for significant anniversaries (i.e. 60th, 75th, 80th, etc.) of the Air Force as a whole. Similarly, commemorations of significant squadron anniversaries, disbandments, or re-activation activities have also become the norm. Similarly, it has been a common practice to re-paint aircraft types in original or distinctive colour schemes as a fleet approaches retirement.

The last Boeing 707 was repainted just prior to retirement by 437 (Husky) Squadron – (CF Photo)

High Visibility Colour Schemes

Search and Rescue. The evolution of high visibility paint schemes with Canada's military air elements is an interesting study. As was previously mentioned, "Rescue" markings were pioneered by the RFC in Canada. In order to aid spotting of aircraft that had force-landed in this spacious and sparsely-populated dominion, it became usual for wing-tips on the upper mainplane to be painted red up to one foot inboard. This approach continues to the present day on some fleets. And, as with the RFC first air-ambulance paint scheme, high visibility paint schemes became synonymous with aircraft involved in rescue operations. Search and Rescue aircraft evolved from standard unit markings with "RESCUE" lettering and red or fluorescent red or orange panels to overall white or yellow high-viz schemes.

This CC-138 illustrates a modern Search and Rescue colour scheme – (CF Photo)

Target Towing. Similarly, the use of special schemes for target towing aircraft was a common practice. This included black and yellow striped target towing aircraft (i.e. *Lysander*, *Bolingbroke*, and *Battle*). In the post-war period, target towing aircraft such as the Dakota and T-33 *Silver Star* tended to used fluorescent-painted orange or red panels to emphasize their roles.

This CT-133 is equipped with the *Delmar* tow-target system, hence the high-visibility colour scheme – (CF Photo)

NFTC & Combat Support Schemes. By 2000, there was a recognition that overall yellow and/or other "light-coloured" finishes were perhaps not as visible against certain backgrounds and that overall gloss black or midnight blue assisted significantly with faster recognition and overall visibility. Consequently, Combat Support Squadrons flying CT133 aircraft transitioned to overall black and various trainer fleets and both trainer and utility aircraft fleets were repainted in an attractive midnight blue scheme that became known as the NFTC (NATO Flying Training in Canada) scheme.

These two CT-155 *Hawk* aircraft from 15 Wing Moose Jaw illustrate the NFTC colour scheme – (CF Photo #CK2004-0065-18d)

Although based in Winnipeg, this CC-142 (Dash 8) Navigation Trainer also displays a high-visibility NFTC-like colour scheme – (CF Photo # WG2002-0544-01c)

Similarly ,while based in Ottawa, this CC-144 utility aircraft also displays a high-visibility NFTC colour scheme – (CF Photo)

Just prior to being retired, portions of the CT-133 combat support fleet were repainted in this high-visibility all black paint scheme – (CF Photo # AE2003-0133-002d)

United Nations Markings. With Canada historically involved in many peacekeeping missions, many different types of aircraft were eventually refinished in UN markings. For aircraft directly contributed to UN missions, this almost invariably consisted of an overall white finish solely with UN markings in place of national insignia.

This CC-108 *Caribou* and CSR-123 *Otter* display the all-white UN colour scheme – (CF Photo)

VIP Markings

Aircraft used to transport Very Important Persons (VIPs) have traditionally received special attention while in Canadian service. In this regard, this tradition is similar to that of other nations. The earliest examples of VIP transports were finished in polished bare metal. This gave way to more standard upper white fuselage with "lightning bolt" accents with either bare metal or silver or gray paint. Later aircraft such as the CC144 *Challenger* aircraft have been painted in a smart overall gloss white paint scheme. The largest VIP transport aircraft currently in use, *Polaris* CC150001 is however painted in a special one-off paint scheme

dissimilar to the rest of the Airbus fleet with “Government of Canada” insignia.

VIP aircraft CC150-001 wears a smart three-tone white, red and blue colour scheme – (CF Photo # TN2013-0238-02)

Because of their VIP status, these aircraft normally received additional care and attention with respect to their external appearance, cleanliness, and polishing of surfaces. Similarly, interior configurations were to a higher standard and different arrangement as compared to their more utilitarian cousins.

Test & Evaluation or Exercise Markings

Test Establishments. Inevitably aircraft undergoing periods of test and evaluation acquired various special markings and/or complete paint schemes. Sometimes these markings were to assist with overall visibility and sometimes they were intended to assist with photographic points of reference. Unit markings for the various test units (i.e. Central Experimental Proving Establishment (CEPE), Winter Proving Establishment, VX 10, Aerospace Engineering Test Establishment (AETE), etc.) were normal; often incorporating “X” for “experimental”. Additionally, aircraft now belonging to the Aerospace Engineering Test Establishment have acquired an elaborate overall paint scheme to denote their “test” role.

This F-86 *Sabre* belongs to CEPE and sported high visibility panels – (CF Photo)

AETE CF116702 wears various black and white markings which serve as photographic reference points; in this case the markings have also been extended to the underwing stores under test – (CF Photo)

Temporary Camouflage or Exercise Markings. For test or exercise purposes, it has not been uncommon to paint aircraft in special temporary paint schemes. A good example was a series of camouflage trials CF-116 aircraft used by 419 Squadron at CFB Cold Lake in the mid-1980s. There were five distinct schemes used, to be evaluated against the standard scheme of the time. All the CF-116s used carried Soviet style nose numbers in red and yellow. This eventually resulted in the adoption of a standard grey "Ghost" scheme which was eventually applied to CF-116A and CF-116D aircraft minus the colourful numbers. Temporary markings were also common for exercise purposes. F-86 *Sabres* in Europe were routinely painted with various stripes and markings to denote their role as "enemy" aircraft in wargames and later bare metal CF104 *Starfighter* and silver painted CF101 *Voodoo* aircraft were painted in temporary water soluble camouflage paint to assist with their participation in *Maple Flag* exercises.

This F-86 *Sabre* in full NATO camouflage wears yellow "X"s on the tail and wing surfaces to denote an "enemy" aircraft for exercise purposes– (CF Photo)

Unit and / or Personal Markings

Unit markings for Canadian military aircraft are another consistent approach through the various eras and services. They have ranged from elaborate to subdued and have featured both official crests and / or standard squadron markings to less than standard markings. Personal markings are, however, more rare. In more modern times, aircrew are rarely assigned their own aircraft. Personal markings for Commanding Officers are perhaps the more normal exception to this and sometimes personal markings have appeared "without authorization". The same is true with squadron markings. Some spectacular, if short-lived, paint schemes have appeared on squadron aircraft "without approval from higher headquarters."

Above - This CF-188 *Hornet* from the Aerospace Engineering Test Establishment illustrates the most flamboyant of unit markings. Below - Unit markings also extend to drop tanks and luggage pods as seen with this 409 Sqn example – (CF Photox AE2004-0051-011a & BN2013-0376-227)

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