



CANADA AVIATION AND SPACE MUSEUM AIRCRAFT

CANADAIR CL-13B SABRE MK 6
RCAF GOLDEN HAWKS SERIAL 23651



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Introduction

In August 1949, Canadair Limited, located at the Cartierville Airport facilities near Montreal, and the Department of National Defence (DND) signed a contract for the manufacture under license of 100 of the most advanced swept-wing day fighter aircraft of the time, the North American Aviation (NAA) F-86 *Sabre*. Assigned the Canadair model number CL-13, this order led to the largest aircraft production run in Canadair's history. From 1949 to October 1958, Canadair Limited went on to produce some 1,815 examples of the famed fighter, in models ranging from the *Sabre* Mark (Mk) 1 up to the ultimate *Sabre* Mk 6 series, with a few special experimental models emanating from the production batches.

The Royal Canadian Air Force (RCAF) was the prime customer for the majority of these aircraft, but the power and reputation of the Canadian-built examples had other nations sit up and take notice, eventually culminating in numerous orders to North Atlantic Treaty Organization (NATO) and non-NATO countries. Canadair delivered versions of the CL-13 *Sabre* to the United States, Britain, Greece, Turkey, Italy, Yugoslavia, Germany, Columbia, and South Africa. RCAF variants served domestically training pilots and crews, and performed an important role in the Canadian commitment to provide a European air contingent for NATO operations.

Some of the Canadian-based RCAF units wished to proudly show off their shiny new jet mounts to the general public, seeing as they were paying for them in one way or another, and permission was eventually granted for limited public expositions. These shows went on to highlight the capabilities of the new aircraft and the pilots destined to fly them; whether domestically, in the MiG filled skies over Korea, or potentially into European combat during the early years of the dramatic Cold War era.

As a youngster in the early 1960s, I was privileged to have witnessed the brilliant majesty of seven golden-coloured *Sabre* aircraft as they performed a farewell and thank you mini-performance in a salute to all of the employees and the company that produced their gleaming machines. My father worked at Canadair during these times and when the annual goodwill visit of the *Golden Hawks* to Canadair occurred, my family, and numerous others who knew what magnificence was going to occur, made a special trip to the edge of the Cartierville airfield to witness their special departure show. There, we all would watch spellbound the goodbye performance of sight, smell and sound as the *Hawks*' went through their repertoire of formations, sometimes with streams of smoke tracing their movements against the sky. To the 'wee-ones' in the group, the "Crazy Formation" was just silly, and some giggling was heard, but the grownups were buzzing with oohs and aahs, realizing and appreciating the gleaming performance and the coordination of man and machine as the team bore through the sky in close formation. Later, the 'wee-ones' would understand and appreciate too.

As the years passed by, the legacy of the *Golden Hawks* could be found in subsequent Canadian precision display teams like the *Golden Centennaires* and the *Snowbirds*, with untold numbers of inspired 'wee ones' having themselves become members of these prestigious, and awe inspiring teams.

Cover Photo Caption:

The 1963 edition of the Golden Hawks are led in the "Arrow Formation" by S/L Lloyd Hubbard in his Sabre Mk 6, RCAF serial 23651 "GH", during a cross-country transit to another air display venue. (CF Photo PCN-7029)

F-86 Sabre Development History

The origins of the iconic *Sabre* were based primarily on the somewhat portly-looking, straight-winged NAA XFJ-1 *Fury* fighter produced for the US Navy, itself a jet-inspired offshoot of the popular P-51 *Mustang* piston-engined fighter of the Second World War. In 1944, the USAAF wanted a 966 km/h (600 mph), medium range day fighter for escort and dive bombing duties. NAA submitted a few concepts resulting in a promising design of a fat, straight-winged airplane that eventually became the XFJ-1. It did not satisfy the USAAF requirements for their fighter due to the straight wing design limiting its top speed. After V-E Day, NAA engineers acquired wind tunnel transonic data on German swept wing research and on the aerodynamic characteristics of the feared Messerschmitt Me 262 jet fighter. As a bonus, a captured Me 262 furnished physical data on the swept wing configuration leading NAA to modify its *Fury* into a new swept wing, high-performance jet fighter design for the USAAF as the North American P-86.



The first of three XP-86-NA prototypes, serial number 45-59597, had an Allison J35-C-3 engine installed, and carried no armament. (NAA via Bill Upton Collection)

The first flight of the prototype XP-86 was carried out on 1 October 1947, with NAA test pilot George Welch at the controls, and in a dive, it exceeded the speed of sound for the first time, “officially”, on 26 April 1948, becoming America’s first supersonic fighter aircraft. Production orders for the new jet soon followed, with the first flight of a P-86A occurring on 20 May 1948. It was only after the new airplane entered squadron service in early 1949 that the now familiar moniker “*Sabre Jet*” was bestowed upon it, and universally adopted by all users. Much later, NAA flight research data surfaced from some of the early XP-86 prototype test flights that portends to show Welch had most probably broken the sound barrier during the initial company trials, even before Chuck Yeager had done so in the experimental Bell

X-1 research aircraft. Due to a lack of certain recording equipment during the NAA test flights this was not known until the exact same tests were performed later at Muroc, California, with more sophisticated equipment recording definitively the XP-86 exceeding Mach 1.

Canadair CL-13 Sabre Production Series



When it was determined that the diminutive British de Havilland *Vampire* jet would not meet future fighter needs of the RCAF, nor would any other existing British aircraft, the search for a better performing replacement was begun. With good relations between the RCAF and the USAF, the choice was narrowed down to an existing American jet aircraft. Eventually a cooperative arrangement with the United States was reached, and in mid-August 1949, a licence agreement was signed with North American Aviation Inc. for Canada to produce their F-86 *Sabre* jet. The formal contract to build an initial batch of 100 F-86A aircraft was issued within days to have the fighter jets manufactured by Canadair Limited. Within a short time the RCAF decided to adopt the newer and more capable NAA F-86E series model, limiting the Canadair-built F-86A batch to just one aircraft completed. From the start, the initial Canadian *Sabres* were intended to be powered by an *Orenda* turbojet engine, designed and built by the Gas Turbine Division of A.V. Roe, Canada, Ltd., in Malton, Ontario. However, until A.V. Roe completed performance and suitability tests with an *Orenda* powered, North American Aviation-built *Sabre*, the Canadair-produced aircraft would remain powered by General Electric J47 engines.

CL-13 Sabre Mk 1 (c/n 1)

The first prototype CL-13 *Sabre* for Canada, known officially as the *Sabre* Mk 1, was assembled at Canadair from supplied components of a NAA F-86A-5-NA received from the United States in 1949. Assembly tooling had to be newly manufactured by Canadair due to North American being unable to supply any production or assembly tooling with their own *Sabre* production line in full swing. This aircraft, powered by a 23.13 kN (5,200 lbf) thrust General Electric J47-GE-13 turbojet engine, came off the new assembly line at Canadair's Plant 2 facility on 28 July 1950, just a year after the production contract had been signed. It soon had full RCAF markings applied, but for some reason it initially bore the unusual arrangement of the RCAF serial number on the tail as 191-010 (later changed correctly to 19101), and had the National Research Council (NRC) unit code, CK-R, on the wings and sides of the fuselage.



The F-86A-5 fuselage and components from NAA arrived in Canadair's receiving area in late November 1949. "CANADA" was inked by hand ahead and below the quarter-panels of the windscreen.



For this premiere assembly task the learning curve went remarkably smooth. Here, in front of Canadair's Plant 2 Building B202, the unmarked prototype Sabre is seen following its simple rollout.

With Cartierville Airport's main runway being extended due to the forethought and necessity of future jet aircraft operations at the aerodrome, the new *Sabre* Mk 1 jet was trucked in the early morning hours to nearby RCAF Station *Dorval* next to Montreal's Dorval Airport for its premiere flight.



Canadair's Alexander J. (Al) Lilly, sitting in the cockpit of the sole North American Aviation / Canadair Sabre Mk 1, RCAF serial number 191-010 CK-R, prepares for the first flight of the aircraft from Dorval Airport.



Pilot Al Lilly gives an impromptu post-flight briefing to Defence Minister Hon. Brooke Claxton and Air Marshall Wilf Curtis immediately following his successful first flight in the Canadair-built Sabre Mk 1.

The singular Mk 1 aircraft, piloted by Canadair's chief of aircraft operations, Al Lilly, performed its first flight on 8 August 1950. Two days later, Lilly became the first person to exceed the speed of sound in Canada, breaking Mach 1 in this same aircraft while flying a demonstration over the Cartierville facilities with many Canadair employees standing outside watching their new fighter jet perform.



Canadair's Mk 1 Sabre, 191-010 CK-R, reposes for a photo shoot on the Dorval tarmac following its successful first flight.



Sabre 19101 CK-R was officially taken-on-strength by the RCAF on 11 August, and was soon assigned to the National Research Council at Arnprior, Ontario, being tested with the Central Experimental and Proving Establishment (CEPE) Detachment also located there. Wing flow studies were performed in the early 1950s with this very highly polished Sabre during low and high-speed stalls by photographing wing tufts on the flat black-painted right wing and control surfaces. This prototype Canadian Sabre, later bearing the CEPE fuselage unit code PX-101,

remained attached to the NRC and followed with the detachment during subsequent relocations to RCAF Station *Rockcliffe*, Ontario in 1952, then on to Uplands Airport in 1953.

This first of an unprecedented, and unparalleled line of Canadair-produced aircraft, and the first Canadian-built aircraft to break the sound barrier was retired from all flying duties by October 1955. It was soon placed in storage at RCAF Station *Lincoln Park* in Alberta, notably being designated for future use as a museum aircraft. By August 1965, it was officially struck-off-strength, sold to No. 700 Wing (City of Edmonton) RCAF Association and put on long-term outdoor display at the Edmonton Airport, Alberta. In an effort to preclude further weathering ravages by Mother Nature, it currently resides within the safe confines of the Alberta Aviation Museum, Edmonton.

CL-13 Sabre Mk 2 (c/n 2-99 and 101-352)



The CL-13 Sabre Mk 2, of which 350 examples were produced for the RCAF and NATO countries, was the equivalent of the USAF F-86E featuring the new “all-flying” tailplane (first used on the early experimental Bell X-1 research aircraft) and modified flight control systems. The first aircraft of this production series, RCAF serial 19102 AM-N first flew, with Canadair test pilot William (Bill) Longhurst at the controls, on 31 January 1951, just four months after the American counterpart. In 1952, in order to meet Korean War shortages, sixty examples of this soon-to-be MiG-killer variant were delivered to the USAF designated as the F-86E-6-CAN, and were assigned the USAF serial

numbers 52-2833–52-2892. Some of these were flown in air-to-air combat by Canadian exchange pilots, as well as their American brethren. A few known F-86E-6-CAN Mikoyan Gurevich MiG-15 killers included aircraft 52-2833, 52-2834 and 52-2855. Later, many of the Sabre Mk 2 aircraft were diverted from the RCAF to Greece and Turkey with the designation F-86E(M), “M” for modified.

CL-13 Sabre Mk 3 (c/n 100)

In August 1949, North American Aviation had initiated Project NA-167, involving the installation of a prototype Canadian *Orenda* turbojet engine in a USAF F-86A-5-NA for comparisons against the standard General Electric J47-GE-13, towards determining its suitability for operation in Canadian Sabre jets. This one-off conversion project resulted in the aircraft acquiring the new designation F-86J-NA. Ground tests and flight trials at the A.V. Roe Canada Limited facilities near Toronto produced data that encouraged Canadair Limited to proceed with the Sabre Mk 3 *Orenda* engine installation and test programme preparatory to employing the *Orenda* 10 version of this engine in subsequent CL-13 production models.



F-86J Orenda engine test bed, USAF serial 49-1069, taxiing at Malton in October 1950. Avro Canada performed the new engine installation and flight tests. (Hawker Siddeley Canada Photo via CAVM Collection)



Unpainted, the Canadair Sabre Mk 3 serial 19200, was known as the Experimental Orenda Prototype (E.O.P.) following the installation of the Avro Orenda 3 powerplant in 1952.

The sole CL-13 Sabre Mk 3 example was initially completed as a fully configured Sabre Mk 2, the 100th CL-13 off the Canadair production line. On 13 September 1951, this “Century Sabre” was officially handed over, in a public ceremony, to the RCAF with serial number 19200 assigned. By December, it was back on the assembly line undergoing preliminary modifications to convert it to the prototype test bed for the proposed *Orenda* 10-powered variant of the Canadair CL-13 Sabre. Earlier in the year, engine-mounting components were manufactured and tested under the programme designation F-86E-O.

19200 first flew, still with the original G.E. J47 engine, on 14 June 1952. Following installation of a 26.69 kN (6,000 lbf) thrust *Orenda* 3 prototype engine, the unpainted aircraft acquired the project name "Experimental Orenda Prototype", shortened to the stenciled letters "E.O.P" on the tail. In this new configuration it was first wrung out by Canadair test pilot Bill Longhurst, on 25 September 1952. After nearly 70 test flights at Canadair, the E.O.P. programme was deemed completed. Beginning in April 1953, a new test venture began, with 19200 being ferried cross-country in a series of legs, by Canadair's Bill Longhurst, to the Air Force Flight Test Center located at Edwards Air Force Base, California.



Now renamed with "Sabre Mk 3" stenciled on the nose, and the RCAF fin flash added to the tail, 19200 undergoes some of the G.E. J47 engine test runs at Canadair in February 1953.



At Edwards, Canadair crew chief Art Childs checks things over with Jackie Cochran sitting in the cockpit. The dull area around the nose is high visibility red paint. (Photo via Lewis Chow)

Once at Edwards, a series of test flights were performed by Longhurst and USAF Major Charles (Chuck) Yeager in an effort to establish airspeed position error limits of this airplane towards calibrating accurately the speeds of other aircraft. In this 'pacer aircraft' test guise, the *Sabre* Mk 3 was also being prepped to establish various aviation record attempts by renowned American aviatrix, Miss Jacqueline Cochran, who wanted to better records recently set by her French rival, Jacqueline Auriol, and USAF Colonel Fred Ascani. Jacqueline Cochran had wanted to fly a supersonic military jet aircraft to establish a series of world speed records, but after approaching her high-ranking military and political contacts in the United States she was refused the loan of a USAF aircraft with which to attempt the records. Her husband, Lloyd Odlum, had very good connections within the General Dynamics Corporation, who also happened at the time to own Canadair Limited. Through his efforts, she managed to be appointed an employee of Canadair, where, as a company pilot, she was allowed to train to fly jets, under the tutelage of test pilot Bill Longhurst, on Canadair's new T-33AN *Silver Star* trainer aircraft.

By early May 1953, the Mk 3 *Sabre*, the Canadair support crew led by Lewis Chow, and pilots Longhurst with Jackie Cochran were at Edwards preparing for setting a series of records. This particular experimental prototype test engine was now flight time-limited to only 10 hours of running. Cochran trained for all of the record flights first in a T-33 until she had the routes, speeds and altitude requirements down pat. Then, on 12 May 1953, she performed her first ever *Sabre* flight, in 19200, with her close friend and mentor, Chuck Yeager flying off her wing in a USAF *Sabre*. In May and June, she went on to set an unprecedented series of accomplishments in the Canadair *Sabre* Mk 3: 17 May, the first woman to break Mach 1; 18 May, 100 km closed course World Speed Record; 23 May, 500 km closed course World Speed Record; 24 May, 14,417 m (47,300 ft) woman's altitude record and Mach 1 dive in formation with Yeager; and on 3 June, 15 km World Speed Record, and her last flight in this aircraft.

Following the unparalleled success of this particular airplane at Edwards, it was returned to Montreal and from August 1953 to June 1954, became somewhat mired in the mundane, day-to-day, flight testing with the Experimental flight test programme at Canadair, and after its formal transfer to the RCAF, at CEPE Rockcliffe. It is now preserved and on display at the Reynolds-Alberta Museum in Wetaskiwin, Alberta.

CL-13 Sabre Mk 4 (c/n 353-790)



It was seen during the Korean War that the best British-built jet fighter of the time, the famed Gloster *Meteor* F.8, could not match the capabilities of the MiG-15s in-theater. In the subsequent early years of the Cold War era, Britain was still left with a lack of a suitable swept-wing jet fighter to go up against the potent Soviet-produced MiG-15. By 1951, the Hawker *Hunter* and Supermarine *Swift* fighters were still far from entering squadron service with Britain's Royal Air Force (RAF), so a proven design was soon chosen, the North American F-86 *Sabre* to bolster Britain and Western Europe's air defenses. Due to the high volume of work necessary to keep the USAF supplied

with its own F-86 *Sabre* orders, it was suggested that Canadair supply the necessary aircraft. Similar to the CL-13 *Sabre* Mk 2, a total of 438 *Sabre* Mk 4s were delivered to the RAF, on behalf of the United States, as part of the Mutual Defense Assistance Programme (MDAP), Canada supplying the airframes, with the engines coming from the USAF. Once in RAF squadron service these aircraft were designated as the *Sabre* F.4. While awaiting the delayed availability of the improved *Orenda*-powered *Sabres*, the RCAF had 71 examples of the Mk 4 variant diverted temporarily for their own use in the interim.

CL-13A Sabre Mk 5 (c/n 791-1160)



In 1953, a new production run was started at Canadair with the CL-13A *Sabre* Mk 5 being manufactured as originally envisioned, a Canadian produced airframe married to a Canadian-designed jet engine, the powerful 28.27 kN (6,355 lbf) thrust *Orenda* 10 powerplant. Due to significant modifications to the rear fuselage to accommodate the new engine installation, this *Sabre* series received the revised model designation CL-13A. The first of the new *Sabre* Mk 5s, RCAF serial 23001, had its premiere flight on 30 July 1953. Basically similar to the USAF F-86F model, modifications to the Canadian variant included a major change to the wing design for much improved

maneuverability at high speeds. This particular "mod" became known as the "6-3 wing" extension, incorporating an increase in the wing chord by 15.3 cm (6 inches) at the root and 7.65 cm (3 inches) at the tip. Small vertical wing fences were installed on the front upper wing surfaces to help counteract the deletion of the leading edge slats. On 20 April 1954, a significant milestone was reached with the completion of the 1,000th Canadair-built *Sabre*, the first, and only time in Canada's history that an aircraft company had produced 1,000 frontline jet military aircraft. At a special ceremony, all Canadair employees were invited to personally sign their names on that significant aircraft that they had helped produce.

CL-13B Sabre Mk 6 (c/n 1161-1815)



The final and definitive Canadair *Sabre* version, the CL-13B *Sabre* Mk 6, was also roughly equivalent to the American F-86F model, albeit equipped with the more powerful 33.09 kN (7,440 lbf) thrust *Orenda* 14 engine. The “6-3 wing” of the Mk 5 series was retained for this variant and wing leading edge slats were re-introduced. The Mk 6 was considered to be the best overall performance rated *Sabre* variant produced. First flight of a Mk 6 aircraft, RCAF serial 23371 was performed by Canadair’s Bill Longhurst on 19 October 1954. Delivered in a dark, two-tone camouflage paint scheme to the RCAF overseas-based squadrons, this ultimate *Sabre* model quickly proved its superiority

over every other fighter in the NATO inventory. Export orders saw numerous Mk 6s go to Columbia, South Africa and Germany. Engine power, speed, climb rate and altitude were superior to the American F-86F *Sabre* jets and gave it a definite advantage over the early Soviet MiG variants. A Canadian aviation epoch ended on 9 October 1958, when the Canadair *Sabre* production line closed down for good following the much-publicized rollout of *Sabre* Mk 6 c/n 1815. The last of an export order, it was destined for the West German Luftwaffe. This aircraft later went on to fly in Iran, then served with the Pakistan Air Force. The last of the Canadair-built *Sabres* was eventually repatriated to Canada in 1996, then was placed on static display in the Western Canada Aviation Museum, Winnipeg.

CL-13C (c/n 1334) and CL-13E (c/n 811)

Two Canadair *Sabre* aircraft were modified under the auspices of the Uplands-based CEPE and the NAE for research and test purposes of thrust augmentation and aerodynamics improvements. The first modification went to former RCAF *Sabre* Mk 5 serial 23021. From May to July 1955, Canadair heavily modified the exterior contours of this aircraft with sonic drag reducing fairings made out of wood and aluminum, to produce Richard Whitcomb’s area-rule or “Coke-bottle” shape. Now designated the CL-13E, numerous flight tests were performed by the NAE in 1956 without showing any major performance improvements. The second aircraft modified was RCAF *Sabre* Mk 6 23544, becoming the CL-13C, to investigate the incorporation of a short afterburner, employed to help boost engine power, via the pre-turbine injection (PTI) method, located uniquely at the forward turbine disk of the *Orenda* 14 engine. High altitude flight tests conducted with the NAE in 1958 went well with a definite improvement in thrust noted through all altitude ranges, but changes were not incorporated for any of the production aircraft.



CL-13C Sabre 23544 was flown by test pilot F/L Norm Ronaason while with the NAE at Uplands. (CF PCN-313)



CL-13E Sabre 23021 displays its forward cockpit and fuselage side area-rule bulges at Canadair.

Canadair Sabre Derived Proposals

CL-13D

This proposal was for a heavily modified *Sabre* Mk 6 equipped with an *Orenda* 14 engine, incorporating the addition of an Armstrong-Siddeley *Snarler* liquid fuel rocket engine installed under the aft fuselage.

CL-13G

A modified and stretched *Orenda* 14-powered Mk 6, it was to be a tandem two-seat training version based on the USAF TF-86F *Sabre* transonic trainer, of which only two were produced.

CL-13H

This proposed Mk 6-fighter variant was to have an all-weather capability, with airborne intercept radar housed in a modified nose, somewhat similar to the USAF F-86D model.

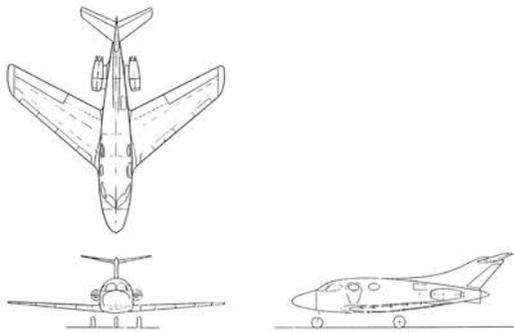
CL-13J

Like CL-13C, *Sabre* Mk 6 / *Orenda* 14 combo with the addition of a simplified Bristol-Siddeley afterburner.

CL-13K

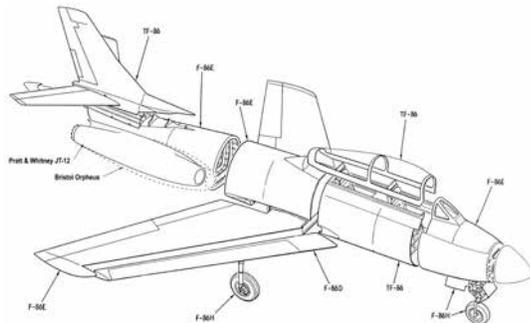
This was a May 1958 proposal for a Mk 7 version of the Canadair-built *Sabre* series. It was to have an improved *Orenda* 14R engine and a rocket engine installation in the ventral fuselage, to be employed as a high altitude missile (*Sidewinder*) armed interceptor, similar to the Korean War tested USAF F-86F(R).

CL-53



The CL-53 preliminary design proposal was conceived in 1956 in anticipation of a possible USAF requirement for a crew readiness trainer and small jet transport. The design concept could also be readily adaptable for a small business jet type of transport. The basic CL-53 design would utilize many of the major components and tooling from the F-86 *Sabre* aircraft, still being manufactured at the time. Parts commonality with the CL-13 *Sabre* jet included the complete wings, “all-flying” horizontal tail, landing gear, the hydraulics and some electrical systems.

CL-76



In November 1958, a proposal was put forth per RCAF specifications towards design studies of three variants of a low-level tactical bomber with high subsonic strike performance. Assigned the basic Canadair Model number CL-76, the tandem-seat configurations embraced an efficient utilization of a maximum of existing F-86 components from all American *Sabre* models for minimum development expenditures. The CL-76 was to be powered by two Pratt & Whitney Canada (P&WC) JT-12 engines with afterburners, mounted in pods on the rear fuselage, and carrying weapons stores externally under the aircraft. The CL-76A was of a similar configuration having two, more powerful Bristol *Orpheus* powerplants. The CL-76B version had shoulder mounted wings with the dual P&WC JT-12 engines mounted internally as were the weapons stores.

RCAF Sabre Demonstration Teams

Many of the Canadair CL-13 *Sabre* models were deemed perfect to demonstrate the capabilities of the RCAF's latest fighter to public audiences fascinated with the capabilities of the fast jets. Numerous RCAF units managed to identify and acquire the skilled manpower and resources necessary to set up some form of *Sabre* demonstration team. In a manner, unit pride and public relations hinged on the competitive aspects of the performances, the aircraft and the crews. Some of those teams included:

- | | |
|---|---|
| 1 (F) Wing Aerobatic Team (1954) | 416 (F) Squadron <i>Sabre Team</i> (1952) |
| 2 (F) Wing <i>Sky Lancers</i> (1955) | 431 (F) Squadron Aerobatic Team (1954) |
| 3 (F) Wing <i>Fireballs</i> (1954) | 439 (F) Squadron Aerobatic Team (1953-1954) |
| 4 (F) Wing <i>Sky Lancers</i> (1956) | 441 (F) Squadron Aerobatic Team (1953) |
| 410 (F) Squadron Aerobatic Team (1952-1953) | No. 1 (F) OTU <i>The Lancers</i> (1955) |
| 413 (F) Squadron <i>Sabre Team</i> (1952) | RCAF <i>Golden Hawks</i> (1959-1964) |

The RCAF's *Golden Hawks*

The most popular *Sabre* display team was formed in 1959 as part of the RCAF Air Display Unit to commemorate the 50th Anniversary of Powered Flight in Canada (also known as Canada's Golden Jubilee of Flight), as well as to honour the 35th Anniversary of the formation of the RCAF.



Official Golden Hawks patch (graciously loaned by Bill Briggs)

The first edition of the world famous *Golden Hawks* team performed their premiere public show with their *Sabre* Mk 5s on 17 May 1959 during an Air Force Day celebration at Torbay, Newfoundland. With S/L Fern Villeneuve as Lead, the rest of the team consisted of F/L Jim McCombe in the No. 2 position, F/O Ed Rozdeba in No. 3, F/L Jeb Kerr in No. 4, F/L Ralph Annis and F/O John Price as Solos, with F/O Bill Stewart and F/O Jim Holt as Stand-by. During this celebratory year, they crisscrossed the country, with some demonstrations in the northern United States, until the season ended on 25 September. Due to the overwhelming popularity and distinguished efforts of the team, the *Golden Hawks* were resurrected annually with some team members rotated in and others out to suit their RCAF service commitments.



The full 1959 *Golden Hawks*' team, led by S/L Fern Villeneuve in *Sabre* Mk 5 23066, formates for the first series of official PR photos with a RCAF North Star camera ship on 19 May 1959. (CF Photo PCN-164)



Later in the display season, this four-flight includes at top, *Sabre* 23066, then 23037, 23042 and 23135. Note the lettering on the "Hawk" is in a stencil style format and other markings are seen to be a bit worn.



S/L Fern Villeneuve wearing his signature red flight jacket in Golden Hawks Sabre 23066, leads his blue-suited flock in the "Diamond Formation" during a public relations photo shoot over New Brunswick in June 1960. The team's flight suits for 1959 were the standard issue dark blue. For the 1960 to 1964 seasons they adopted a distinctive light blue version. Here we see the Left and Right Wing pilots still in the original dark suits with the Slot already wearing the new light blue variant. (Bill Upton Collection)



At Canadair, the 1960 Golden Hawks' pilots pose with team support and Canadair reps at Plant 1. Back row L-R: Scotty McLean, F/O George MacDonald, F/L Dan McKinnon, Bill Kidd, W/C Jack Allan, Don Freeborn, F/L Rocky Van Vliet (PR). Front row L-R: F/L Ed Rozdeba, S/L Fern Villeneuve, F/L Dave Tinson, F/O Bill Stewart, F/L J.T. Price, F/L Jim McCombe, F/L Ralph Annis.



The 1960 Golden Hawks' team taxis their Mk 5 Sabres out for their departure show display for the Canadair employees and their families over the Cartierville facilities in October 1960. This event became an annual affair following the team's busy show season as an appreciation to the hard working personnel who built their famous aircraft.



The 1961 Golden Hawks' team pose by their mounts following their arrival at Canadair on 20 September 1961. Back row L-R: F/L Lloyd Hubbard, S/L Jim McCombe, F/L B.R. Campbell, F/L Ed Rozdeba. Front row L-R: S/L Russ Bowdery (PR), F/L John Frazer, F/O Bill Stewart, F/L Alf McDonald.



This late afternoon silhouette shot of the 1961 Golden Hawks' Mk 6 Sabres lined up on the tarmac at Canadair also showcases their newly acquired Canadair-built T-33 Silver Star support aircraft, RCAF serial 21500. It too was painted in the famed golden colours and markings of the team.



S/L Jim McCombe in his Sabre Mk 6 leads the full 1961 Golden Hawks' team (plus the team's Spare aircraft) through a very low-level pass in the renowned "Crazy Formation" back home at RCAF Station Chatham, New Brunswick, in September 1961. The team had trained initially with their stalwart Sabre Mk 5s back in January before transitioning to the ultimate Sabre, the Mk 6, in April. (CF Photo PL-131120)

The 1962 *Golden Hawks*' team retained the powerful and more maneuverable Mk 6 *Sabre* variant. For this display season S/L Lloyd Hubbard led the team with fellow '*Hawks* pilots F/L B.R. Campbell, F/L Norm Garriock, F/L Jack Frazer, F/L Alf McDonald, F/L George Miller, and F/L Ed McKeogh. This would also be the last year that the team would be home-based at RCAF Station *Chatham*. They would move the complete organization for the 1963 and 1964 display seasons to their new base of operations at RCAF Station *Trenton*, Ontario. An added benefit of this relocation was the close proximity of the No. 6 Repair Depot (No. 6 RD) where all of the *Golden Hawks*' aircraft had been modified and painted.



In March 1962, this pre-season group photo of the seven 1962 *Golden Hawks*' aircraft and pilots shows L-R: F/L Jack Frazer, F/L Norm Garriock, F/L B.R. Campbell, S/L Lloyd Hubbard, F/L Alf McDonald, F/L George Miller, and F/L Ed McKeogh. (CF Photo PCN-2075)



1962 *Golden Hawks* formation banks over the Rocky Mountains at the start of their fourth transcontinental tour. For this year they have incorporated position numerals on the tails and on the nose gear doors of the aircraft. (CF Photo PL-131413)



From 10 – 16 September 1962, the *Golden Hawks* found themselves paying honour to the Seattle World's Fair in Washington, performing seven shows over Lake Washington during the Canada Week celebrations. Here, during one of the Lake Washington passes, they overfly a Royal Canadian Navy ship anchored there. (CF Photo PCN-7003)



The revered pilots of the 1963 edition of the Golden Hawks pose for their team portrait in April 1963. They are L-R: F/L Dave Barker, F/L Ed McKeogh, F/L Bill Grip, S/L Lloyd Hubbard, F/L Al Young, F/L C.B. Lang, F/L Norm Garriock. Starting with this year's team, new stylized red "GH" markings would soon be added to the tails of the team's seven aircraft seen lined up behind the pilots. An eighth golden-painted Sabre (Spare) is positioned just out of view at the right of the photo.

This fifth edition of the team comprised pilots Lloyd Hubbard as Lead, Norm Garriock at Left Wing, Al Young at Right Wing, C.B. Lang in the Slot, Ed McKeogh as Lead Solo, Bill Grip as Second Solo, and Dave Barker as the Solo. For the initial 1963 team workup, F/L Barker had just come off his stint as the popular *Red Knight* solo aerobatics performer during the 1961 and 1962 air display seasons. Flying a Canadair-built T-33 *Silver Star* trainer, painted in a brilliant crimson scheme, the *Red Knight* helped to fill in the gaps at the many display venues where the *Golden Hawks* were not scheduled, or could not appear. The team performed 66 shows across Canada, and as far south as Texas near the end of the year. With this successful season, personnel looked forward towards a sixth demonstration-packed year.



Unknowningly, this would be the final Golden Hawks' team visit to Canadair, seen on 2 October 1963. At center is Canadair Limited President Mr. Geoff Notman.



The last ever Golden Hawks' team lineup on the tarmac at Canadair with lead 'GH' aircraft, serial 23651 parked off to the right of the line. (Canadair via Robert St-Pierre)

The last official public display of the famous *Sabre* Mk 6 equipped *Golden Hawks*' team had been carried out in September 1963. On 2 October 1963, when this edition of the *Golden Hawks* bid their signature thank-you departure show for the Canadair employees and other lucky people in the vicinity of the Cartierville facilities, little could any of them know that this was to be their final public display performance.

During that same month, the first Canadair designed production jet aircraft that would later become the principal participant in the subsequent two major Canadian aerobatics teams of this, and the next century, was christened and rolled out from the main Canadair plant – the RCAF's CL-41A (later CT-114) *Tutor*.

Amid much political debate, and to the utter disappointment of all team, service and support personnel, as well as the general public, after 317 magnificent public shows all across North America, the *Golden Hawks* were suddenly and officially disbanded without any forewarning or fanfare on 7 February 1964. The legacy *Hawks*' demonstration teams had maintained a remarkable achievement of never having an airshow appearance missed or cancelled due to aircraft maintenance or other problems – except political.

Culled from several listings, pilot's Log Books, and numerous photographs, below are listed some of the many Canadair *Sabre* Mk 5 and Mk 6 aircraft that were assigned and participated with the *Golden Hawks*' teams over the years. Included here also are some of the aircraft from the *Sabre* No. 1(F) OTU, based at RCAF Station *Chatham*, used specifically for the formation and aerobatics training of many of the selected *Golden Hawks*' pilots. These *Sabres* bore the RCAF serial numbers:

23001, **23034**, 23037, 23042, 23043, 23066, 23073, 23079, 23080, 23083, **23096**, 23100, **23129**, **23133**, **23135**, 23142, 23164, **23195**, **23202**, **23205**, **23206**, **23208**, **23215**, **23227**, **23259**, 23276, 23279, 23301, **23309**, 23313, 23314, **23315**, **23320**, 23330, **23339**, **23347**, **23351**, 23353, 23355, **23358**, 23359, 23410, 23424, 23426, 23433, 23435, **23454**, 23457, 23465, 23470, 23485, 23487, 23510, 23551, 23600, 23636, 23641, 23649, 23651.

Aircraft serial numbers shown above in **bold** later went on to somewhat different lives after their tenures with the *Golden Hawks* were completed. While a few *Golden Hawks*' machines had been written-off in crashes, the majority of the remaining airframes were ferried to Mountain View, Ontario, for storage and eventual disposition. In the early 1970s, a few of these *Sabres* found their way to Moncton, New Brunswick where Dave McEwen had acquired them from Crown Assets Disposal with a view towards a co-operative conversion project with Bob Laidlaw of California. McEwen's company would overhaul and modify the airframes, then crate and transport them in kit form to California, where Laidlaw would receive, assemble and complete the conversion process of the *Sabres* for a novel new endeavor. These particular F-86s eventually became assets of Flight Systems Incorporated (FSI) of Mojave, California, as well as the US Army's large fleet of QF-86E full-scale aerial targets (FSAT), also more commonly known as pilotless drones, assigned to the 6585th Test Group based out of Holloman AFB, New Mexico.



For some of the ex-*Golden Hawks*' aircraft, life took a somewhat different turn, as they were to be put to arduous and dangerous work once again in a new type of endeavor for the civilian and US military markets. Acquired for new service duties by FSI, most of the chosen aircraft underwent a rigorous conversion process for the US Army and became commonly known as unmanned radio controlled drone targets. These examples, designated as the QF-86E, were generally unpainted except for high visibility red markings and sported their former RCAF serials or US Army titles and civilian registrations on the tail. Most did not survive the experience, being fated to be destroyed during remote controlled flight by a variety of missiles and guns during numerous armament effectiveness evaluations. Some of the other, more fortunate *Sabres* were relegated to the tasks of target towing, chase and other contractor's test programmes support. These latter aircraft were painted in the distinctive FSI white and blue corporate house colours with US civilian registered markings schemes.



Ex-Golden Hawks' Sabres as FSI Target Tows and US Army Target Drones



Following its duty with the Golden Hawks, this Mk 6 Sabre was retired to a Calgary Museum bearing Canadian civil registration CF-AMH. In the early 1970s, when Bob Laidlaw first established flight test operations of FSI at Mojave, his first acquisitions were a Canadian-built Sabre and ex-RCAF/CAF T-Birds that were formerly owned by Flight Test Research Inc. of Long Beach, California. This first Sabre for FSI was ex-RCAF 23454, here re-registered as N186F. (Bill Upton Collection)



After first serving with RCAF's 434 Squadron, and then with the Golden Hawks, Sabre Mk 5 aircraft 23320 was purchased in 1974 by Laidlaw of FSI, to be based out of facilities at Mojave Airport, California. Once there, it was assigned the US civil registration N74170 and had the somewhat fanciful name "Bessy" painted on the sides of the fuselage. She then underwent a modification programme to become the first prototype of the QF-86 production drone series. (Bill Upton Collection)



Ex-Golden Hawks' Mk 5 Sabre 23133 is seen here at Mojave, unpainted except for some minimal red and with black US Army markings. Later, in May 1978, civil registered as N96120, it crashed landed at the White Sands Missile Range during a Patriot missile mission. (Bill Upton Collection)



In full US Army FSAT regalia, former Golden Hawks' machine 23315 rests on the tarmac at the FSI facilities in Mojave. The black area below the aft section of the cockpit is the aircraft destruct status panel. In August 1985, this aircraft met its end when it was shot down by a Standard missile. (Bill Upton Collection)



Unpainted QF-86 Sabre Mk 5, RCAF serial 23208 is seen on the FSI drone ramp at Holloman AFB in October 1989 with uncorroded remnants of its former RCAF service shining on the aft fuselage. It once served with the Chatham OTU as a stand-in for Golden Hawks' pilot training. With some levity, the "Air Mail" envelope, painted panel below the cockpit, date stamped August 16 1989, is addressed to "TFSI, Holloman AFB, New Mexico", from "RATS, Las Vegas". (Bill Upton Photo)

Preserved and Displayed F-86 Golden Hawks

Although many Sabres served with the renowned team, some were written off in crashes, others went to serve with new owners, many scrapped, with only a few kept preserved to commemorate and honour their team's legacy. So popular was the brilliant paint and markings scheme that even some 'regular' retired Sabre airplanes were similarly painted up simply to represent the mystique of being a member of the Golden Hawks. Some of the actual Golden Hawks' aircraft preserved and displayed in Canada are:

Sabre Mk 5 23301 at Picton, Ontario; Sabre Mk 5 23355 at the Atlantic Canada Aviation Museum, Nova Scotia; Sabre Mk 6 23649 at Brockville, Ontario; and Sabre Mk 6 23651 at the Canadian Warplane Heritage Museum, Hamilton, Ontario, on temporary loan from the National Aviation Museum, Ottawa.



At Brockville, this Sabre Mk 6 example, from the final years of the team, was one of the few real Golden Hawks' machines to be preserved and displayed. It still has the aircraft's smoke system display's dual oil spray pipes coming from the oil storage tanks in the lower Gun Bays to the engine exhaust running along each side of the upper fuselage. (Bill Upton Photo)



This Sabre, serial '23053', a Mk 5, was not a Golden Hawk, but Sabre Mk 6 23641 had been, and this latter aircraft has long been reported to be this re-marked as '053 pylon display near Belleville, Ontario. Note the lack of wing fences, the non-standard size of the Maple Leaf in the RCAF roundel as well as the overly large unpainted area around the exhaust. (Bill Upton Photo)



Another Sabre Mk 5 from the famed team is 23355 at the Atlantic Canada Aviation Museum. (CF CMC78-324-25)



Sabre 23257 GH is just a Golden Hawks' wannabe. This static display article is at CFB Trenton (Bill Upton Photo)



No longer a glorious gold colour, but now a cream yellow scheme adorns ex-Golden Hawks' Sabre Mk 5 23096 as Boeing's chase plane from 1962 to 1974. Here it is in tight formation with the prototype B-747 in 1969. (Boeing via Canadair)

To commemorate the 100th anniversary of powered flight in Canada during 2009, a classic Canadair Sabre Mk 5, formerly RCAF serial 23314, was flown in to the Vintage Wings of Canada (VWoC) complex at Gatineau, Quebec, in September 2007, for a unique opportunity. There it was stripped, inspected, and refitted by the dedicated staff for its next important task, that of being the flagship for the anniversary year, painted in the glorious metallic gold livery of the legendary precision aerobatics team, the *Golden Hawks*. Officially designated "*Hawk One*", and flying with the Centennial Heritage Flight, this aircraft flew with the famed *Snowbirds* team around the country, celebrating our proud Canadian flying heritage. Its first official performance, flown by Canadian astronaut Chris Hadfield, was at Baddeck, Nova Scotia, in February 2009, celebrating the centennial of the flight of the Aerial Experiment Association's *Silver Dart*.



On 20 September 2008, Sabre C-GSBR was rolled out, resplendent in the "Hawk One" interim paint and RCAF markings scheme. The fortunate pilots that were selected to fly the aircraft across Canada are seen in their distinctive light blue flight suits, emulating those of the 1960 Golden Hawks' team. They are L to R: Tim Leslie, Paul Kissman, Dan Dempsey, Steve Will and Chris Hadfield. The founding Golden Hawks' team leader, S/L Fern Villeneuve, wearing his original Hawks' red jacket and shoulder crests, is centered as the guest of honour. Then, "Hawk One" gleams in its famous paint scheme as a waving Paul Kissman performs a clean pass over the VWoC home at Gatineau in September 2009. (Bill Upton Photos)



This was the last formal formation display of the Centennial Heritage Flight, held at Gatineau Airport on 19 September 2009. "Hawk One" Sabre C-GSBR was joined by CF-18 "Century Hornet" 188719 and CT-114 Tutor 114019, painted to commemorate the Golden Centennaires' team of 1967. This much gold on display was priceless. (Bill Upton Photo)

The Museum's Aircraft

This particular F-86 article (c/n 1441), from the first produced batch of the ultimate Canadair CL-13B *Sabre* Mk 6 fighter series, was completed on 5 January 1956. Subsequently, following the typical contractor's ground, and flight tests over the next few months, this aircraft was flown and accepted by RCAF test pilot F/O A.H. Hoogen, then taken-on-strength in May 1956 bearing the duly assigned RCAF serial number 23651.



Its first obligation had it being sent immediately overseas in June 1956, to serve with the NATO forces of No. 2 (F) Wing, and assigned to No. 421 "*Red Indian*" Squadron, coded AX-651, based at Grostenquin, France. In December 1958, it was seen deployed with the "*Red Indians*" on the gunnery range at Decimomannu (commonly shortened to just Deci), Sardinia. This

aircraft, as were most Mk 6 *Sabres*, had been painted in a two-tone camouflage scheme before flying to Europe. Later, in 1960, following maintenance and refurbishment at Scottish Aviation Limited in Prestwick Scotland, *Sabre* 23651 was transferred to No. 1 (F) Wing, to serve with No. 439 "*Sabre Tooth Tiger*" Squadron, located at Marville, France, before finally returning home to stay at the end of December 1960. While at Marville, RCAF pilot S/L R. MacGarva of No. 441 (F) Squadron flew this aircraft on three separate occasions as part of his regular service duties.

Following its European service commitments, final maintenance and rework was provided by No. 3146 TSD based at the Scottish Aviation Limited facilities in Prestwick, Scotland. While there, a special team of *Golden Hawks'* pilots was on a mission to find low-time, well maintained and suitable *Sabre* airframes for immediate shipment back to Canada, and 23651 was one of the aircraft selected. A total of twelve Mk 6 *Sabres* were chosen as the best of the lot from the overseas squadrons and were airlifted back to Canada via RCAF C-130 *Hercules* transports. Once back home in Canada in December 1960, *Sabre* 23651 was checked out by No. 6 RD at Trenton, Ontario, and prepared for modifications and painting towards an exciting new makeover. When it was eventually rolled out and flown back to Chatham, it was now a gleaming member of the 1961 edition of the RCAF *Golden Hawks* aerobatics team, based at the original home of the famed organization.

When all of the aircraft and pilots were marshaled together at Chatham, the new and returning *Golden Hawks'* pilots performed an intensive series of final flight test and acceptance flights of the twelve chosen *Sabres*. Each pilot had the opportunity to fly all of the *Sabres* during the pre-season warm-up to find the right one that had the proper 'feel' to suit their personal satisfaction. Thus they were assigned that aircraft for the year. For the 1961 display season, aircraft 23651 officially made its debut with the acclaimed team, having being chosen by newly selected pilot F/L Lloyd Hubbard for his duties as the 'number 3', at the Left Wing position of the formation. This particular *Golden Hawk Sabre* remained with Hubbard for the duration of his tenure with the team.



F/L Hubbard in Sabre 23651 (nearest the camera) maintains perfect formation with his leader, S/L Jim McCombe, in this 4-plane "Box Formation" flight sometime during 1961. At Right Wing is F/L Borden Campbell and hanging tight in the Slot is F/L Ed Rozdeba. (Photo via Bill Briggs)



Canadair and RCAF officials watch as the 1961 Golden Hawks demonstrate the "Crazy Formation" as they salute the company during their annual season-ending visit. Many employees and general onlookers, some with their 'wee ones' in tow, were also watching the performance from nearby Bois Franc Road.

Sabre '651 remained the personal mount of now Squadron Leader (S/L) Lloyd J. Hubbard, in its new role of leading the other esteemed members of the world famous *Golden Hawks* during the 1962 display season. Since he knew and was familiar with all of this aircraft's particular quirks and handling characteristics, Hubbard again retained it as Lead aircraft for the last formal edition of the later Trenton-based team during 1963. F/L Jack Folkins, F/L Bill Grip and S/L Fern Villeneuve recorded some of the post-maintenance flight tests of 23651 in 1962 and 1963. As Lead in 1962, this Sabre sported the large numeral "1" painted in blue on the tail and a smaller version on the nose gear door. These particular numbers, ranging from "1" to "8", denoted the pilot's flight position on the team, with number "7" allocated for the team's Spare aircraft. Although eight Sabres were officially painted in the *Golden Hawks*' colours and markings for the season, the number "8" was not applied to the tail of the eighth aircraft. The team painter added the numerals after the new team's workup, just prior to the official start of the display season, and then, if necessary, following a maintenance inspection. During the 1963-1964 seasons, a re-branding took place with all of the assigned *Golden Hawks*' aircraft sporting a large, stylized red painted "GH" monogram on the fin. For these latter seasons, the special tail markings were usually not applied for the early team group photos and some of the first PR photo sessions.



South of the border, a truly special celebration showcased the 1962 Golden Hawks, led by Sabre 23651, "1" flying over the iconic Space Needle at the Seattle World's Fair in September. (CF Photo PCN-7002)



In the popular Golden Hawks' 4-ship "Box Formation", Sabre 23651, with S/L Lloyd Hubbard at the helm, leads the pack through the spectacular Canadian Rockies during August 1963. (Photo via Bill Briggs)

On the morning of 7 February 1964, the latest team members were busy preparing for another series of practice flights preparatory to the start of the official 1964 display season, when the days of this glorious display team came to an abrupt end. As crews were heading out to their aircraft, the word came down from HQ that they were to stand down and that no aircraft wheel was to turn. A formal meeting was convened later that day for all *Golden Hawks*' members confirming the worst. The *Golden Hawks* were officially disbanded. Scrapping the world recognized team was popularly thought to be mainly due to government budgeters' decree of supposed major maintenance requirements of the aircraft type, an assumed shortage of spares notwithstanding the number of low flight time aircraft available, and the ever so popular financial reasons. However, times were changing, and in the ever-increasing paranoia of the Cold War era, reality came to the fore, dramatically reiterated by the Cuban missile crisis in the fall of 1962. An urgent requirement for newer, faster, more capable aircraft, weapons and systems, burdened with their ever increasing costs, were needed to help in protecting the Western World assets from potential harm. For its part, Canada, starting in 1962, in order to honour its newly defined NATO commitments (from air defence to strike), began to supplant the older RCAF F-86 *Sabres* in European service with the more modern and nuclear-capable Canadair-built CF-104 *Starfighter*. Other equipment upgrades and replacements were also being made for the Royal Canadian Navy and the Canadian Army. Domestic and overseas defence expenditures rose quickly and dramatic budget cuts across the board had to be made, with the end result that the support of the famed *Golden Hawks* demonstration team could no longer be sustained.



Seen on 7 February 1964, Lead Sabre 23651 forms the backdrop to the last members of the Golden Hawks. The announced flight team pilots included, front row L to R – F/L Dave Barker, F/L Beau Warrion, F/L Al Young, S/L Lloyd Hubbard, F/L Bill Grip, F/O Brian Grover and F/L C.B. Lang. The team's CO, W/C Frank Hatton stands between Young and Hubbard. Some of the often-called unsung heroes of the display teams, the Maintenance Crew and Crew Chiefs, rarely publicly seen, flank W/C Hatton. Deservedly acknowledged the Crew Chiefs are, L to R – LAC Gerry Horner, LAC Albert Pardy, LAC John Elmose, LAC Marc Marceau, LAC Pierre Racine, LAC J.G.V. Richard, LAC Dick Clements, Cpl E. McEathron, and LAC Bill Briggs. (Photo and information via Bill Briggs)

Following the dire announcement, all team members gathered in the hangar for an impromptu commemorative photo session with two of their prized *Sabres* positioned as backdrops. These were the only known photos taken of the 1964 team. Unfortunately, no photographs had been taken during the team's workup sessions as had been done during the past.



The Maintenance Crew, Snag Crew, Crew Chiefs, Pilots and the Commanding Officer of the final Golden Hawks' team are seen together for the last time, posed with GH Sabres 23651 and 23649, just after they were informed of their untimely and unexpected cancellation. No one dared to ask them to smile for the camera. (Photo via Bill Briggs)

With the sudden demise of the *Golden Hawks*, the Lead aircraft of 1962 to 1964, *Sabre* 23651 "GH", was officially retired, with a total flying time of 1066.15 hours accumulated, and turned over to the No. 6 RD to prepare it for an honorable static display. A relatively unique work task had some of the original aircraft skins and panels on the port side of the fuselage removed and replaced with clear Plexiglas panels in an effort to display the interior of the armament and engine bay areas. Previously, a similar task was undertaken at the US Air Force Museum in Dayton, Ohio, when they completely Plexiglas skinned a USAF F-86H *Sabre* for a truly informative display piece of the interior arrangement of the famed fighter.



(Bill Briggs Photo)

Still resplendent in its 1963-1964 era *Golden Hawks'* colours and markings, aircraft 23651, complete with its Orenda 14 engine, serial number 2066, was donated to the National Aviation Museum (NAM), newly located at the former RCAF Station *Rockcliffe* Aerodrome facilities, on 8 April 1964. This *Sabre* was seen there, statically displayed, during the last official Air Force Day celebration held at RCAF *Rockcliffe* on 4 June 1964. It soon formally became one of the distinguished exhibits in the hangars of the renamed National Aeronautical Collection in May 1965 alongside another Mk 6 *Sabre*, serial 23455, decked out in full European NATO colours and markings of No. 444 "*Cobra*" Squadron of No. 4 (F) Wing. This was an auspicious start towards fulfilling a post-war decision to have two of every operational type of RCAF aircraft put on public display at this renowned site.

From September 1967, this aircraft was publicly displayed as the centerpiece in the National Museum of Science and Technology (NMST) in Ottawa, and reigned supreme at the official grand opening of that museum on 15 November 1967. In June 1986, a reorganization of the Museum's aircraft and related assets meant that Sabre 23651 was once again to be packed up, transported, and put back on static public display at the NAM Rockcliffe facilities. There it remained until 29 July 1998, being pulled outdoors occasionally for an Open House or commemorative event display.



Golden Hawks Sabre 23651 dominates the NMST central floor display area. (Bill Briggs Photo)



Sabre 23651 is seen with the Apollo 7 spacecraft and a Black Brant sounding rocket. (NMSTC Photo)



The port side of the aircraft was partially modified for display by having large transparent panels installed at the nose and rear fuselage areas, replacing some of the original metal skins, to readily display the interior structure and components of the F-86. The nose Armament Bay area highlights the normal arrangement of three Browning Mk.2 machine-guns, although during service with the Golden Hawks, the lower gun on each side was removed and replaced by smoke oil storage tanks. The rear cutaway section allows viewing of the installation of the powerful Orenda 14 powerplant. The 1963 Golden Hawks' team was the first time they sported the stylized "GH" on the tail. Previously, during the 1962 display season, this aircraft bore the position numeral "1" on the fin. Interestingly, the RCAF small leaf roundel, seen here on the fuselage, did not make an official appearance on Canadian military aircraft until 1965, well after the retirement of this aircraft. (CAVM Photo)



At left, 23651 has been rolled out and parked for outside static display for the annual NAM Canada Day Open House celebrations on 30 June 1995. The paint-worn, port side intake area, ahead of the blast port panel, commemorates the three leaders and lists all of the pilots of the Golden Hawks' teams in alphabetical order. (Bill Upton Photos)

With two immaculate Canadair Mk 6 Sabres in the collection of the National Aviation Museum, a request from the Canadian Warplane Heritage Museum at Port Hope Airport, Hamilton, Ontario, was made for a long-term loan of one of these aircraft for their interior static display purposes. The *Golden Hawks' Sabre* of the 1961-1964 teams was offered and accepted, and it has been on static public display there since 1999. During the celebrations of the 100th anniversary of powered flight in Canada at this museum, Sabre 23651 was rolled out and seen posed on the tarmac next to the "Hawk One" Sabre - the old and the new.



Golden Hawks' Sabre Mk 6 serial 23651, with its left wing removed and packed away, rests on a trio of jack stands during preparations for shipping it to the Canadian Warplane Heritage Museum in Hamilton on 29 July 1998. (CAvM Photo)

Canadair Sabre Mk 6 Specifications:

Length:	11.43 m (37 ft 6 in)
Wing Span:	11.32 m (37 ft 1.5 in)
Height:	4.49 m (14 ft 9 in)
Weight, Empty:	4,825 kg (10,637 lb)
Weight, Gross:	7,965 kg (17,560 lb)
Speed, Cruise:	480 knots (888 km/h / 552 mph)
Speed, Max.:	607 knots (1,123 km/h / 698 mph) – could exceed Mach 1 in a dive
Service Ceiling:	16,490 m (54,100 ft)
Range:	2,391 km (1,486 mi)

RCAF Ranks and Abbreviations:

Wing Commander	(W/C)	Flying Officer	(F/O)
Squadron Leader	(S/L)	Leading Aircraftman	(LAC)
Flight Lieutenant	(F/L)		

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