



LIVING IN A MAD WORLD

The F-104 Starfighter was conceived, developed and became an operational weapon systems during the height of the Cold War. Closely following the trauma of the Second World War, this was also a time of intense political, financial, economic, social and technical change. But overarching all was the 'Cold War' state of bi-polar political and military tension between the two nuclear-armed Superpowers – the United States (with its NATO allies plus Australia, New Zealand and several Asian countries including Japan) and Soviet Union (and its allies within the Warsaw Pact). Thus any discussion or analysis of the CF-104 aircraft and its nuclear and conventional weapon systems must be seen in its Cold War setting and in the context of the military strategic thinking, the technological limitations which constrained aircraft and missile development during this time.

While the two Superpowers never engaged in direct open armed combat, each armed heavily in preparation for an all-out nuclear war. Each side had strategic long-range nuclear weapons and short-range tactical nuclear weapon systems. Each side saw the other's forces as a potential first-strike threat and their own force's as retaliatory or a weapon of deterrence. Throughout the Cold War, both sides considered their nuclear retaliatory ability to be the dominant factor to deter the other side from launching a first strike. Given the number of nuclear weapons and delivery systems available to both sides and the ongoing rhetoric that an attack by one side would result in an 'overwhelming nuclear response', to initiate a first strike would be MAD. The doctrine of Mutually Assured Destruction (MAD) during the Cold War years maintained the balance of power in Europe.

While MAD curtailed open warfare, the USSR consolidated its control over its occupied states of Eastern Europe. The United States under the Marshall Plan began to rebuild Europe, extend military and financial aid to Western Europe, create the NATO Alliance and support anti-Communists in Greece. The Berlin Blockade in 1948 – 1949 was the first crisis of the Cold War. It triggered a struggle for dominance expressed by proxy wars

around the globe, with psychological warfare, propaganda, espionage and such technological competitions as the Space Race. Competition intensified with; the Korean War (1950 – 1953), the Chinese Communist triumph in their own Civil War (ending in 1950), Hungarian Uprising and Suez Crisis (1956), the Berlin Crisis (1961), and the Cuban Missile Crisis (1962). This was followed by the Sino-Soviet Split (1961), the Prague Spring (1968), Vietnam War (1955 – 1975) and the Soviet Afghanistan campaign (1979 – 1989).

The Cold War years were also a time of great technological change. Vacuum tubes were being replaced by solid state electronics, analogue devices became digital, aircraft were going supersonic and a real game changer – computers were emerging. Yet, this was also a time where technology failed to keep up with political and military expectations. The missile revolution failed. The fighter-bombers still failed to hit targets and weather could still bedevil aircraft systems and operations. So this was also a time in military affairs when little consensus existed on key strategic or tactical aspects of the utilization of Air Power. Old rivalries between the advocates of bomber versus fighter continued, fighter advocates fought over heavy versus light weight and the effectiveness of every missile under development became the subject of intense debate.

Since the 1991 fall of the Berlin Wall and dissolution of the Soviet Union, the United States remained as the only superpower. While seemingly long ago, the Cold War and its MAD nuclear stand were very real. Millions died in the so called 'proxy wars' and thousands more attempting to cross the Iron Curtain during failed uprisings. MAD did work, as the world would have become an entirely different place, had the Superpowers actually gone to nuclear war.

△ **Tiger CF-104 104796, in formation with CF-104 104862 and 104749 (foreground) above Germany during August 1982.**

▽ **Starfighter 104762 streaks across the German countryside. The aircraft is finished in variegated camouflage, with standard Symmetrical Era markings. Photo: DND BAC88-41-7.**



run on the following day, the aircraft did a 'skip-off', lifting off to a height of five feet. The first full-fledged flight was on March 4, which gave some tense moments when the gear would not retract. This restricted the first flight to a 20-minute slow speed flight. After repairs were made a second flight was attempted with the same result. Though the problem was traced to a low pressure in the hydraulic system, the aircraft would not fly again until March 26 due to weather.

XF-104 53-7786 was not supersonic in level flight when powered by the non-afterburning J65-B-3 turbojet. It could reach Mach 1 during a slight decent. In July 1954, an afterburning J65-W-7 turbojet was installed. The engine was rated at 7,800 lbs thrust dry or 10,200 lbs thrust with the afterburner engaged. Once the afterburning engine was installed, the performance envelope expanded. A speed of Mach 1.49 was achieved in level flight at 41,000 feet, and Mach 1.6 could be attained in a dive. On March 15, 1955, the prototype achieved a type record speed of Mach 1.79 at 60,000 feet with Lockheed test pilot J. Ray Goudey. After testing by Lockheed, the aircraft was handed over to the USAF in November 1955. It was lost when an uncontrollable tail flutter was encountered while monitoring an F-104A test flight on July 11, 1957, from Palmdale AP (AF Plant 42), California. The tail assembly separated and the Lockheed test pilot, Bill Park successfully departed the 'office'. The tailplane was located atop the vertical fin to give it clearance from air flowing over both fuselage and wings. This flow of air could be disruptive at certain angles of attack. It moved as a complete unit without elevator or trim tabs.

The second XF-104 prototype 53-7787 was completed with the afterburning J65-W-7 turbojet and first flew on October 5, 1954. The aircraft was scheduled to serve as the armament test aircraft. It was fitted with the port side Vulcan cannon and the associated AN/ASG-14T-1 fire control system. During a December 17 air firing, an explosion was felt by pilot LeVier, followed by a rough running engine. The engine was shut down and the aircraft glided back to Rogers Dry Lake at Edwards AFB for a successful landing. A 20mm shell had exploded in the breech, with the firing bolt blown back through the rear of the gun and into the forward fuselage fuel cell on the port side. Fuel poured forward into the gun bay and leaked through gun bay doors into the port intake, flooding the engine. The same repaired aircraft was lost on April 14, 1955, when abandoned during further gun-firing trials at 50,000 feet. The Vulcan ceased firing and a severe vibration began which resulted in the loss of the downward ejection hatch and cabin pressure. The pilot, Herman 'Fish' Salmon found his pressure suit pumped up, including his face, leaving him unable to see forward and successfully ejected. The fire control trials were switched to a test Lockheed F-94C Starfire, until production aircraft took up the testing role.

YF-104

The soundness of the basic F-104 design had been demonstrated to the USAF with the two XF-104 prototypes. The next step for the USAF was to order 17 YF-104, matching the F-104 design with the promising J79 engine. The YF-104A 'pre-production' aircraft (Lockheed Model 183-92-02) c/n 183-1001 to 1017, were given USAF serials 55-2955 through 55-2971. The USAF had a 'fly-before-you-buy' philosophy, to test designs before any large-scale production decisions were made. If refinements were necessary, they would be incorporated into F-104A production, with remaining YF-104A modified to full production standards.

As the J79 was considerably longer than the J65 used in the XF-104, the airframe had to be lengthened from 49 feet 2 inches (14.99 m) to 54 feet 8 inches (16.66m). In addition, the air intakes were redesigned to include half-cone centre bodies. The fixed-geometry central intake cone also had an internal bleed slot to vent some intake air through the fuselage for engine cooling. The previous forward-retracting nose wheel was replaced with a rearward-retracting unit, to increase the downward ejection seat clearance.

The T-tail was also raised, to a new height of 13.39 feet (4.08 m), in an attempt to resolve the pitch-up problems associated with the T-tail unit. These would take until December 1956 to resolve. There was also a yaw deficiency that was solved by installing a rudder-centering device starting in 1957. Space was found for two additional fuel cells within the fuselage. The AN/ASG-14T1 fire control system was installed along with an AN/ARN-56 TACAN. There were provisions for tanks or missiles to be carried on the wing tips, one pylon under each wing and one under-fuselage stores pylon.

All of these features, including the engine change from the J65 to the J79, increased the basic aircraft empty weight from 12,000 to 12,561 pounds, while the maximum takeoff weight (clean) increased from 15,700 pounds to a maximum takeoff weight of 24,584 pounds. The engine development was not complete, but early YF-104A production examples would be available for service testing.

The first unveiling of the F-104 was at the Burbank plant on February 16, 1956, when the second YF-104A 55-2956 was used for the official rollout ceremony. Prior to this event only rumours and speculative drawings had been seen in the press. But even at the gala event, the air intakes were covered with temporary fairings to deceive the viewers. Photographs were released in the spring of 1956, displaying the first XF-104

▽ In its second planning stage, the F-104 was thought of as a light weight replacement for the F-100, which was serving with numerous wings in the USAF and with allied nations. F-100D 55-2823 is serviced at RAF Lakenheath in May 1965. Photo: Adrian Balch collection.





THE CANADIAN REQUIREMENT

Canada was one of the original dozen signatories establishing NATO on April 4, 1949. Twice in the previous thirty-five years Canada had sent military forces to Europe to aid Britain, France and other allies. Following such events as the Berlin Blockade in 1948 and the Korean War starting in 1950, Soviet expansionism had to be held in check. If a future conflict could be averted or avoided with a combined show of strength, at least in Europe, then it was in Canada's interest. The nation had a vested interest in providing peace and security in Europe – at least the western side of it. As the Soviet communist expansion aims were being demonstrated globally, the free countries of Western Europe prepared their deterrent against possible invasion.

Starting in the early fifties, Canada's Navy, Army and Air Force would be re-equipped to meet the growing eastern menace. The Royal Canadian Air Force was expanded from its post-war draw-down. For fifty years it would help counter Soviet naval threat, ready to guard the supply line from North America to

Europe once again. The Canadian Army would establish a brigade strength force in Northern West Germany.

The Royal Canadian Air Force would be equipped with the licence-built F-86 Sabre, acquired just for European operations. The first Sabre wing initially settled in late 1951, into North Luffenham in the UK bringing with it a very advanced aircraft compared to those in service with other nations. This was followed by another full wing of Sabre Mk.2 in France and two more in West Germany to serve in the day fighter role. Following the Mk.2, the improved Sabre Mk.5 equipped the '1 Air Div' or 'Air Div' as the RCAF's 1 Air Division was known, with two wings

△ Sabre Mk.6 12395 from 444 Squadron in the northern dispersal at Baden-Soellingen with Hügelsheim beyond. *Photo: Jet Johnson.*

▽ By 1961 the 450 F-84F and 105 RF-84F had equipped eight wings in the Luftwaffe. F-84F 53-7189 from JaboG 32, departs Baden-Soellingen in the winter of 1961 – 1962. The last F-84 aircraft were withdrawn by the end of 1967. *Photo: Jet Johnson.*





CANADAIR PRODUCTION

The late fifties had been a very busy time for the manufacturing of military aircraft in Canada. The aerospace firms of Canada, namely Avro Canada (Malton, Toronto), Canadair (Montreal) and de Havilland of Canada (Downsview, Toronto), were well established and were currently producing large production runs of military aircraft. All three would tender their services to produce the Starfighter following the July 2, 1959, selection announcement.

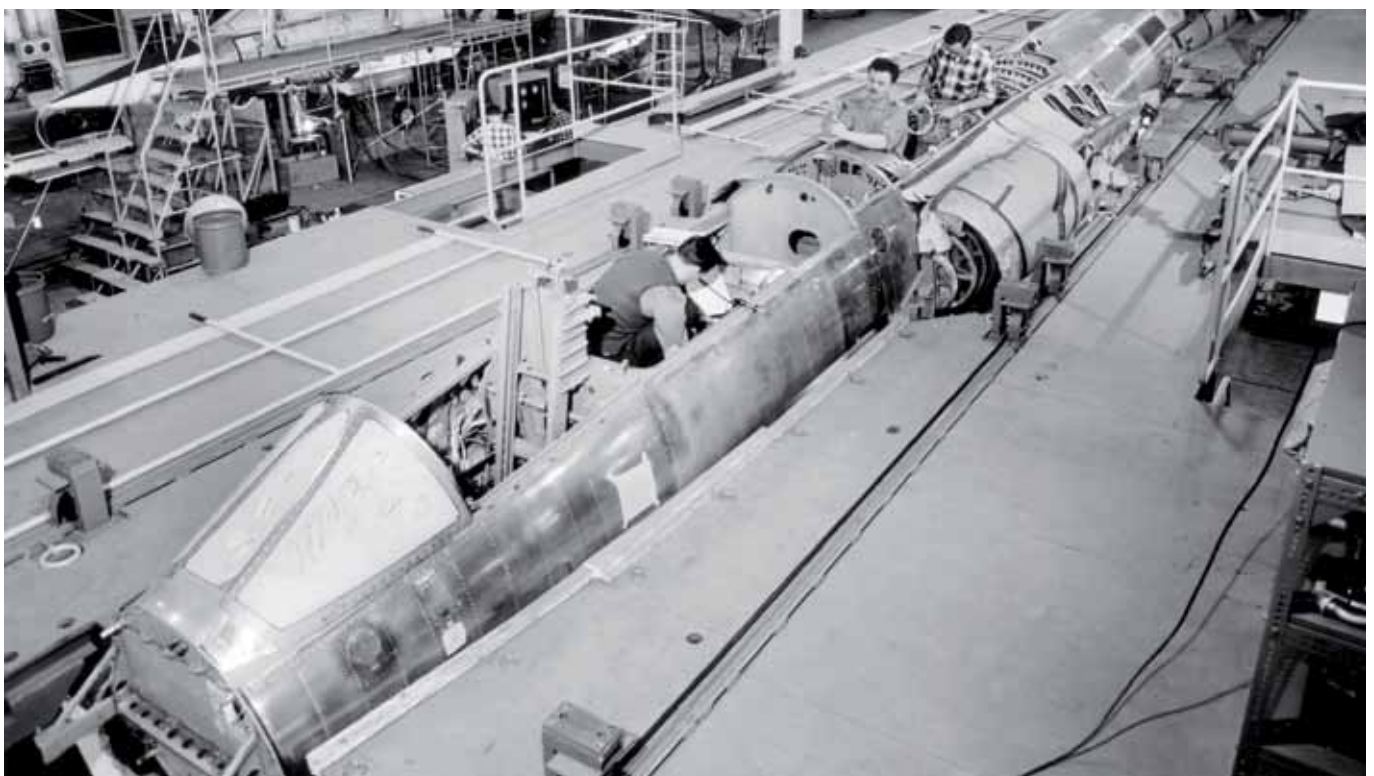
Avro Canada had just completed some 692 CF-100 interceptors for the RCAF and the Belgian Air Force. The Belgian aircraft had been paid for with US MAP funds. Avro's associated 14,000 work force had been looking forward to producing the mighty CF-105 Arrow until cancelled on 'Black Friday' February 20, 1959. This date has long been seen as the

watershed moment where support for the Canadian military establishment, especially the air force, was to begin a long decline. The death of the Arrow resulted in the death of Avro Canada within three years.

At Canadair, the last of 1,815 Sabre fighters had its maiden flight in November 1958. The last of 656 Canadair built T-33 Silver Star trainers would be handed over to the RCAF in the beginning of February 1959. By mid 1959, Canadair was in the middle of delivering 33 large maritime-patrol Argus aircraft,

△ **The two fuselage halves of CF-104 12701 come together on October 26, 1960. Photo: Canadair via Bill Upton Collection.**

▽ **May 10, 1961, Starfighter 702, 703 and 704 on the assembly line. Photos: Canadair via Bill Upton Collection.**





with the follow on CL-44/Yukon transport and CL-41 jet training aircraft in design (named Tutor ten years later). Canadair was employing over 10,000 workers to keep up with design and production orders.

De Havilland was producing the DHC-2 Beaver and DHC-3 Otter STOL transport aircraft, and had started manufacturing the twin-engine DHC-4 Caribou transport in 1958. De Havilland would go from strength to strength with its line of propeller aircraft, eventually to be absorbed by Bombardier Aerospace along with Canadair.

The contract to manufacture 200 CF-104 Starfighter aircraft was given to Canadair on August 14, 1959, 43 days after the type selection date. The aircraft were to be manufactured at Canadair's Carterville, Montreal facility, along with many components for the European consortium and Lockheed production lines. The agreement with Lockheed was signed on September 17. Initially the single seat aircraft would be designated as CF-111, though this changed before implementation to CF-104 to have 'F-104' in the designation to

△ **Starfighter 12703 in the process of being fitted out on June 21, 1961. Photo: Canadair via Bill Upton Collection.**

▽ **CF-104 12764, 12765, 12766, 12767, 12768 and 12769 are attended to on the Carterville production line. In the centre, an Orenda built J79-OEL-7 awaits installation in 12765. Photo: Canadair via Bill Upton Collection.**

avoid confusion as several other nations that were to join the 'F-104 club'.

CF-104 PRODUCTION

A conference was held at Lockheed's Burbank location in the fall of 1959, attended by Canadian Government officials to work out details of the upcoming production. Lockheed had prepared a wooden mock-up, complete with RCAF markings and 11444 serial. The official Canadair Model Number for the CF-104 production was CL-90. Canadair was also to have a follow-on contract with the USAF to produce the USAF/MAP F-104G under its own title of CL-201. Engineering drawings





Two CF-104 aircraft were lost by 6 ST/R OTU in, 1965, 12725 and 12727; two in 1966, 12745 and 12746; and two in 1967, 12736 and 12768. The losses continued; in 1968 with three from 417 Squadron two CF-104, 12724 and 12741 and a single CF-104D, 12635; and three further CF-104, 12726, 12765 and 12782, in 1969.

THE CONVENTIONAL ROLE

The Canadian government decided to further decrease the number of squadrons by half. It was also announced the Strike (nuclear) role would be given up at the end of 1971. The new main role for the three remaining squadrons would be Attack (conventional), with a limited reconnaissance role for one squadron. This would further reduce the number of squadrons, aircraft, along with air and ground crews required to be trained. The role and training syllabus for future pilots would change, with the emphasis shifting to the conventional attack role, with

△△ **Starfighter 12769 loaded with four tanks and a 2,000 lbs concrete CBU. Apart from the simulated weapon, this is the configuration aircraft would sit in the QRAs of Air Div. Photo: Bill Turnbull.**

△ **Starfighter 12710 at Cold Lake with an early 1968 conversion fuselage roundel. The aircraft carries an MN-1A on the centre pylon. Photo: Bull Turnbull.**

new air to ground weapons in the pipe-line. After completing the conventional weapons re-training courses which brought pilots back from Europe, 417 Squadron OTU would operate at a greatly reduced level. The HRP clearance would also no longer apply. After Course 36 with eleven graduates was completed in January 1970, the next new course would not commence until January 1971. When the flow of pilots resumed, the dozen graduates in 1971 would have conventional weapon delivery skills. The role for 417 was to train Limited Combat Ready (LCR)





△ The only CF-104 in Canada to be painted in the overall (well almost) green finish was 104792. The aircraft had previously served as the gun prototype for the fleet. For this Maple Flag exercise, the natural metal tail and tip tanks were mopped with green to reduce visibility. *Photo: John Kimberley.*

◁ CF-104 104783 taxis back into Nellis AFB on November 25, 1979, during a Red Flag deployment. *Photo: Kirk Minert.*

▽ AETE Starfighter 104652 on a cold January 16, 1980 morning. *Photo: AirDOC Collection via Günter Grondstein.*

return visit by the Phantoms came in August. The last Starfighter pilot course, Course 75 would commence in November 1982.

The first CF-18 was rolled out at St. Louis, Missouri, on July 28, 1982, and was flown to Ottawa for the acceptance ceremony on October 25, 1982. The following day it was flown to Cold Lake. The Hornet training squadron was to be 410 Tactical Fighter (Operational Training) Squadron, the former Voodoo operational training unit, established at Cold Lake on June 11, 1982. Six months later the squadron would have six two-seat CF-18B Hornet aircraft on its ramp as the pace of graduates and deliveries picked up. The Starfighter and Voodoo communities were set to phase out with the introduction of the CF-18 Hornet.

With graduation approaching of the final flying course, 'Dolly's Folly', the last NASARR equipped Dakota in service, made its final flight on January 14, 1983. The number of Starfighter aircraft required also fell and the first aircraft departed Cold Lake on April 19, 1983, for storage and disposal at Mountain View, Ontario. 417 Tactical Fighter (Operational Training) Squadron would receive its Standard on June 4 and was disbanded on July 1, 1983 (officially on October 15, 1983). The squadron did go out with a splash of colour, painting 104763 in a splendid red, white and blue finish scheme as part of the festivities. Between 6 ST/R OTU and 417 Squadron, over 750 pilots had graduated on the Starfighter.





EUROPE – 1 AIR DIVISION

Four Lockheed C-130B Hercules transports had been purchased to transport disassembled Starfighter aircraft across the Atlantic to Europe. The four were taken on strength between October 5 and November 24, 1960 and after crew training, the Hercules began providing an aerial bridge to transport Canadair CF-104 and Lockheed CF-104D from the Cartierville plant to Europe. The aircraft were kept busy under operation 'Rho Delta' (104 in Greek) flying back and forth across the Atlantic delivering aircraft to the four bases in Europe. These initial deliveries were:

2 Wing	12713, 12833, 12843, 12845-854, 12856-12869, 12887-12894, 12896-12899. (39)
3 Wing	12721, 12792-12802, 12804-12813, 12815-12827, 12829, 12895, 12900. (38)
4 Wing	12714-12720, 12814, 12828, 12830-12832, 12834-12842, 12844, 12870-871 and 12873-12885. (37)

It should be noted that 1 Wing deliveries would not be the 'brand new' aircraft that 2 Wing, 3 Wing and 4 Wing would receive. Over 20 of the initial deliveries to 1 Wing at Marville were aircraft that had seen service at Cold Lake with 6 ST/ROTU and with CEPE at Uplands, prior to being returned to Canadair for packing and a Hercules ride to Europe. These included: 12703, 12708, 12730, 12733, 12735, 12737, 12739, 12740, 12743, 12747, 12749, 12751, 12755, 12756, 12757, 12758, 12759, 12760, 12761, 12762, 12770, 12781, 12791 and 12886. Others were transfers were from the other three wings.

The initial distribution of the two-seat CF-104D Mk.1 differed considerable from the Mk.2. In general, the Mk.1 stayed in Canada with some exceptions. There were few exceptions, for example 12635 and 12642 were sent to Air Div, but returned to Cold Lake by early 1965. The CF-104 Mk.2s were all sent to Air Div near the end of 1964 and assembled at Scottish Aviation Limited at Prestwick, Scotland. Use of the aircraft with the centre line pylon was invaluable 'converting' incoming pilots to low level flying in Europe and dropping BDUs at ranges.

Each of 1 Air Division's four bases had operated three squadrons of Sabre day fighters since the fifties, generally working through fleets of Sabre Mk.2, Mk.5 and Mk.6. In 1956 the lowest numbered Sabre squadron at each base was disbanded to be replaced by an incoming CF-100 Mk.4b night/all-weather squadron. On the first day of 1962, Air Div operational squadrons were:

1 Wing		
439 (Fighter) Squadron	Marville	Sabre Mk.6
441 (Fighter) Squadron	Marville	Sabre Mk.6
445 All-Weather Fighter Squadron	Marville	CF-100 Mk.4b
2 Wing		
421 (Fighter) Squadron	Grostenquin	Sabre Mk.6
430 (Fighter) Squadron	Grostenquin	Sabre Mk.6
423 All-Weather Fighter Squadron	Grostenquin	CF-100 Mk.4b
3 Wing		
427 (Fighter) Squadron	Zweibrücken	Sabre Mk.6
434 (Fighter) Squadron	Zweibrücken	Sabre Mk.6
440 All-Weather Fighter Squadron	Zweibrücken	CF-100 Mk.4b
4 Wing		
422 (Fighter) Squadron	Baden-Soellingen	Sabre Mk.6
444 (Fighter) Squadron	Baden-Soellingen	Sabre Mk.6
419 All-Weather Fighter Squadron	Baden-Soellingen	CF-100 Mk.4b



nations attended flying F-100D, F-104G, CF-104, F-4D, G.91 and Lightning.

430 Squadron sent CF-104 104703, 104819, 104823, 104845 and 104863 to the KLu Starfighter base at Leeuwarden for a two-way exchange with 322 Squadron between September 23 and November 1. Between September 30 and October 10, 439 Squadron held a two way exchange with 306 Squadron of the KLu based at Volkel AB, The Netherlands. 439 Squadron sent CF-104 12715, 12730, 12749, 12781, 12799, 12817, 12818 and 12887, north to Volkel, while six reconnaissance RF-104G aircraft moved south to Lahr.

The seemingly annual announcement of yet another budget cut came in September, this time reducing the number of CAF squadrons in Europe by half and Lahr would cease to fly the Starfighter. It was not just a cut, but also a change of role for the Starfighter fleet. The strike – nuclear role was to be abdicated at the end of 1971. The remaining units would all convert to the conventional attack role.

The B43 was withdrawn from both wings by October, after being in 'use' for less than a year, being replaced by additional B28.

In Europe during 1969 three CF-104 aircraft, 12709, 12781 and 12854, were lost in flying accidents with 1 Wing; and three, 12831, 12877 and 12881, were lost with 4 Wing. In addition,

△ **Tiger 12833 at Lahr before departing for the 1969 Tiger Meet. Photo: DND.**

▽ **Tiger 12833 at RAF Woodbridge, near the end of the first day, before the aircraft had been covered with zaps from several units. Roundels were the old RCAF style with the Silver Maple leaf painted out and the small new-leaf imposed on top. Photo: Patrick Martin collection.**

104863 was involved in a 'B crash/incident' at Lahr on November 21, 1969, but with a scrapping date of June 12, 1970.

1970 430 disbanded on May 1, 1970, at Lahr. One source notes 441 Squadron took over the QRA until July 1, 1970. If this was so, it must have been a 're-badging' of former 430 Squadron 'strike' qualified personnel and aircraft for the two months in question, and/or pilots from Baden-Soellingen maintained the vigil. As with Zweibrücken, when the Lahr QRA folded, the nuclear weapons in the SAS site were removed by the USAFE within 48 hours by air.

The 1970 Royal Flush XV at Deelen, The Netherlands, in May, was attended by 439 Squadron with CF-104; 12758, 104792 (new serial applied) and 12862. Also attending were: RF-84F, F-104G, RF-4C, Hunter FR.10 and Mirage IIIR.

Starting on June 2, 1970, in theory, all CAF Starfighter aircraft were given new serial numbers with the '104' prefix,





◁ Tail and starboard wing drop tank details of the TAM 1976 markings are displayed by CF-104 104899 at Twenthe on May 6. *Photo: AirDOC Collection via Günter Grondstein.*

▽ Starfighter 104839 arrives back at Twenthe, The Netherlands, during the 1976 TAM on May 6. *Photo: AirDOC Collection via Günter Grondstein.*

▽▽ CF-104 104835 is towed at the KLu Twenthe Air Base at during the 1976 TWM. *Photo: Patrick Martin collection.*



others were noted only with the rear-facing receivers. These new fittings were not added to the CF-104D.

The 1976 Tactical Weapons Meet was held at Twenthe Air Base, The Netherlands between April 29 and May 15. Eight teams participated equipped with: F-104G, CF-104, F-4D/E, Phantom FGR.2, Mirage V and NF-5A. The five 1 CAG CF-104s had similar rudder markings to the 1974 team, with white wing tip tanks, complete with a red maple leaf, '1 CAG' title and a stylized forward facing arrow. This was during the tenure of the overall green finish for the Starfighter. The five painted CF-104 aircraft sent by 1 CAG were: 104733, 104762 (white stabilizer), 104835, 104839 and 104899. Also attending was non-descript CF-104D 104658.

439 Squadron hosted the 1976 Tiger Meet at Baden-Soellingen from 31 May to 4 June. Starfighter 104756 was fully painted in tiger livery. Eight units from six nations attended flying F-104G/S, CF-104, F-111E Aardwark, F-4D Phantom II, RF-4E, Fiat G.91 and Super Mystère B.2. Eight Jaguars from 17 Squadron at RAF Brüggen visited starting on May 18, with a

return visit also made in June by 421 Squadron. Six F-104G from the German Marine, MFG1 at Schleswig-Jagel arrived at Baden-Soellingen on June 22 for a week stay. 441 Squadron returned the visit between August 3 and 12. 421 Squadron hosted 433 Squadron with CF-5A from Bagotville in October. RAF Harrier GR.1s from 3 Squadron arrived to visit 421 Squadron in October.

In 1976, a single CF-104, 104714 was lost in a flying accident with 1 CAG.

After the overall green had been in use for several years, the Starfighter and T-Bird fleet would again change its external appearance with the introduction of the variegated two-tone upper camouflage and grey lower surfaces (see Finish and Markings Chapter).

The 1977 Tiger meet was held in conjunction with the IAT at RAF Greenham Common between June 22 and 28. The IAT was becoming a huge (odd-year) event. For the 1977 event, 439 Squadron would bring along tiger painted 104838. Other attending 1 CAG aircraft were: CF-104 104751, 104843, 104848, 104865, CF-104D 104661 and CT-133 133393. Eleven units from





August 26 and 31. The hosting helicopter squadron flew the Puma HC.1. 439 Squadron attended with tiger painted CF-104 104796 decked out in yellow and black attire. CF-104s from Baden-Soellingen seen on the field during the event included 104747, 104824, 104837, 104843 and 104868. Eleven units from nine nations attended flying F-104G/S, CF-104, F-111E, RF-4E, F-5A, F-15A, F-16A, Alpha Jet, G.91, Mirage F.1C and Puma HC.1.

In 1982, a single CF-104, 104827, was lost in a flying accident with 1 CAG.

WINDING DOWN IN EUROPE

At the start of 1983, there were 55 CAF Starfighter airframes left in Europe, several non-DLIR aircraft were nearing the end

as they were running out of flying hours. By mid-year three aircraft had been lost in accidents. The ranks were replenished with the arrival of eleven aircraft flown over from Canada under operation 'Starleap' (Hog Hop), which arrived on July 7 (see Cold Lake chapter).

The 1983 display season ended during the second performance at Rhein-Main AB, with the loss of 104813 during the performance on May 22, with five fatalities on the ground. This was the last display of the Canadian Starfighter in Europe as a travelling act.

In 1983, for the third time, and second at Baden-Soellingen, 439 Squadron was to host the Tiger Meet. Between June 10 and 16, the base became the lair for the feline event. Once

△ The 1982 Tiger, CF-104 104796 in formation with two other 439 Squadron aircraft in August. Photo: AirDOC Collection via Günter Grondstein.

▷ Returning from flying in formation with most 1 CAG aircraft during the 40th anniversary event on June 22, 1983, two-seat 104634 carries grey wing tanks noted on several two-seat aircraft. Photo: Patrick Martin collection.

▽ Starfighter 104733, operated by 439 Squadron taxis out at Baden in June 1983. Of note is the Luftwaffe Est61 badge under the cockpit. Photo: Patrick Martin collection.



INDIVIDUAL AIRCRAFT HISTORIES

Much of the information listed below comes from RCAF/CAF aircraft inventory cards. The dates written on cards are the order to do something – not the date of movement. For example ‘November 3, 1964’ is used over a dozen times for the air freighting of CF-104D to Scottish Aviation Limited at Prestwick, when only four Hercules aircraft were used. Or years later, when eleven aircraft were flown to Europe the order date on cards was May 2, 1983, when the ferry flight actually occurred between July 3 and 7, 1983. Also, when Starfighter aircraft were sent away for work at Scottish Aviation Limited, North West Industries or Messerschmitt-Bölkow-Blohm, the ordered date is also repeated as the return to base date. When real dates are known, they are substituted. A total of 22 of the 239 record cards are missing.

‘To Cold Lake’ means transfer to 6 ST/R OTU up to March 23, 1968, then after 417 Squadron; and CEPE up to May 4, 1967 and after to AETE. ‘To 1 Wing’ means Marville up to April 1, 1967 and after Lahr. ‘To Baden’ means 4 Wing up to July 1, 1970 and after 1 CAG. ‘To Trenton’ generally means for work (i.e. gun installation etc) at 6 RD until 1970 and then the AMDU, in later years it was for storage (which includes the nearby satellite field of Mountain View). ‘11 TSU’ was the RCAF Technical Support Unit at the Canadair Cartierville, plant. In the very early years CF-104 transfers to Air Div were listed by squadron number, but as wings had joint maintenance only the wing is given to ease reading.

Entries for the repetitive and sometimes very short periods spent with Canadair, Scottish Aviation Limited, North West Industries, Messerschmitt-Bölkow-Blohm or 6 RD/AMDU at Trenton are omitted, if the aircraft returned from whence

it came. Entries for foreign transfers are shown as direct avoiding all the paper-work dates such as ‘CCC Ottawa,’ ‘APDAL’ (a category of disposal after desirable items were removed – stripping an airframe), and Crown Assets Disposal Corporation entries which are all but meaningless paper dates. Some entries that ought to have been recorded were simply not done on the cards. For example several cards ought to have a ‘cannon installation’ but do not. The ‘strike off’ dates really do not mean much as the aircraft in question was usually destroyed long before yet another ‘paper’ date. For example 104868 was destroyed during a hangar fire on March 2, 1984 at Baden but not written off until August 29, 1984.

Aircraft withdrawn from use and placed into long-term storage, or ‘no longer going to be flown’ airframes, were given Maintenance Airframe numbers. These were painted on aircraft and became their ‘new identity’. The three digit number would also have either a prefix of ‘A’ or a suffix of ‘B,’ ‘C’ or ‘D’. Those given an ‘A’ prefix were considered to be repairable after storage and maybe (could) return to flying status, ‘B’ numbers were assigned to the ground trainable role, ‘C’ to aircraft that have been sectioned and ‘D’ for aircraft set for use in demolition or Aircraft Battle Damage Repair (ABDR). All these airframes, generally had their metal wheel hubs painted red – meaning: not for flight!

Thirty-nine CF-104 and seven CF-104D Mk.1 aircraft had the entry June 19, 1970 to SR ADCSU and stored in Lahr’s northern dispersal. This was for aircraft in short term storage as operations at Lahr closed and nearly all went off to long term storage with SAL at Prestwick. Of these 29 were later sold to Denmark and Norway and twelve returned to service.

F-104A	
770 / 700	November 13, 1957 accepted by USAF as 56-0770, served in test role for one year; assigned on November 26, to the 3241 Test Group based at Eglin AFB, Florida, involved with the testing of interception concepts rather than individual aircraft; May to November 1958 78th Consolidated Aircraft Maintenance Squadron – 78th Fighter Group, Air Defense Command at Hamilton AFB, California; November 1959, storage at the Sacramento Air Material Area; November 1958 to Lockheed for modification as aerodynamic prototype for F-104G; February 17, 1961 to Lockheed Palmdale ‘No.1 RQU’ and CEPE Cold Lake; June 10, 1963 RCAF Lockheed at Cold Lake; July 11, 1963 serial changed to 12700; June 30, 1964 to CEPE Det. Cold Lake; August 10, 1965 Canadian National Exhibition, through CEPE Uplands; June 7, 1968 to Rockcliffe for transfer preparation; February 25, 1969 transfer to National Museum of Canada.

CF-104D Mk.1	
631	Served as weapons trials aircraft with Lockheed Palmdale; April 17, 1962 to Cold Lake; June 11, 1973 to Trenton; July 18, 1973 to Cold Lake; November 7, 1974 flying with 417 Squadron when lost, engine failure due to Foreign Object Damage (FOD), double successful ejection.
632	March 23, 1962 to Cold Lake; September 11, 1972 to SAL; May 23, 1973 to RNoAF as 4632 until wfu November 19, 1982; civil register USA, flying with Starfighter Inc. Florida as N104RB.
633	March 23, 1962 to Cold Lake; March 9, 1966 to 1 Wing; May 17, 1967 to Cold Lake; September 11, 1972 SAL; May 23, 1973 to RNoAF as 4633 until wfu December 9, 1982; civil register USA, flying with Fuel Fresh Inc. as N104.

CF-104 12899, 1 WING, LAHR, GERMANY, 1966

This CF-104 carries the new Canadian Flag introduced in 1965, with new leaf converted Silver Maple Leaf roundels. Most of the Lahr CF-104 fleet would have carried the Vicom reconnaissance pod.



CF-104D MK.1 12633, 1 WING, LAHR, GERMANY 1966

This dual aircraft carries the new Canadian Flag and new leaf converted Silver Maple Leaf roundels introduced in 1965, maintaining the old serial range until mid 1970.



CF-104 12769, 6 ST/R OTU, COLD LAKE, ALBERTA, CANADA, 1965

The only nuclear shapes for the Starfighter in Canada were the BDU practice shapes including the droppable concrete filled white BDU-12A/B. Canadian Starfighter aircraft standing alert in Europe would have one nuclear store and four drop tanks.



CF-104 104842, 421 SQUADRON, 1 CAG, BADEN-SOELLINGEN, GERMANY, 1973

This 421 Squadron Starfighter 842 has the first variation of overall green finish giving an olive-green appearance and carrying markings from the CAF Era. Aircraft with this finish and markings later added the black radome and gun installation.



CF-104 104704, AETE, COLD LAKE, ALBERTA, CANADA, 1983

Markings are standard for the Symmetrical Era, with the addition of the AETE 'X'. Only AETE assigned CF-104/CF-104D used the black radome with natural metal finish. This test aircraft served its life with CEPE and AETE.

