

# RCAF Phantom & Phoenix Fleets

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We tend to think of the procurement of modern Royal Canadian Air Force (RCAF) military aircraft fleets to be mired in politics and controversy. The sad reality is that the politics of procurement and the many problems of the procurement process in general have been around since before the RCAF even existed. A look of at the RCAF's "phantom and phoenix" fleets of the past provides numerous examples of issues associated with both the complicated procurement and service introduction of various types of aircraft planned for the Canadian military aircraft inventory.

## The Martinsyde *Buzzard*

The first example pre-dates the RCAF and instead belongs to the fledgling Canadian Air Force (CAF) in England in 1918-1919. At Upper Heyford, No. 81 Squadron was being equipped with Sopwith *Dolphins* after its formation on November 20, 1918, when it was renamed No.1 (Fighter) Squadron of the CAF. Forward wartime planning to June 1919 had expected replacement of these *Dolphins*, beginning in April 1919, to be re-equipped with Martinsyde *Buzzards*. But the Armistice intervened with these plans and this proposal never materialized. Indeed, the original Canadian expectation, and that of the Canadian Air



*Above - The Martinsyde F4 'Buzzard' was powered by a 300hp Hispano-Suiza 8 engine. The prototype F4 was tested in June 1918, and proved easy to fly and manoeuvrable, as well as being very fast for the time. Large orders were placed, and deliveries to the RAF for Home Defence squadrons had just started when the Armistice was signed. Martinsyde was instructed to only complete those few aircraft which were partially assembled, while all other orders were cancelled. This aircraft type was originally the preferred choice to equip the Canadian No. 1 (Fighter) Squadron but the order cancellation resulted in Sopwith Dolphins being provided. - (Unknown photo credit)*

Force Commander, LCol W.A. Bishop, VC, was that No. 81 Squadron would immediately change over to *Buzzards*. The *Buzzard*, however, was never issued to any front-line squadrons and the new CAF unit had to make do with its Sopwith *Dolphins*.

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<sup>1</sup> This article first appeared in *Airforce Magazine* Volume 47 No. 2 in October 2023

## The P-39 Airacobra

In 1939, as war clouds brewed over Europe and the Far East, Canada was ill-prepared for the Second World War on the home-front. The RCAF, in particular, was very reluctantly relying on a handful of obsolete Grumman *Goblin* biplanes as front-line fighters, although Canada Car and Foundry in Fort William had already started the production of a small run of Hawker *Hurricanes*. Eventually 1,300 *Hurricane* Mk X series were manufactured, but the vast majority of the orders were intended for RAF use.



**Above - This is a rare colour view of the sole Bell P-39 Airacobra #AH621 as tested by the RCAF. - (Photo courtesy of US National Air & Space Museum)**

Consequently, Canada was aggressively looking into obtaining Seversky or Curtiss fighters off US contracts, since the supply of British aircraft did not look promising at that time. After No. 1 (F) Squadron went overseas with its *Hurricanes* in mid-1940, the government started looking again, this time at acquiring the Vultee Model 48 (P-66) *Vanguard* or at manufacturing the Lockheed P-38 *Lightning* in Canada. However, the "most available" fighters were the Bell P-39 *Airacobra* or the Curtiss P-40 *Kittyhawk*.

In November 1940, the United States Army Air Corps (USAAC) advised Canada that the P-40 would be superior to the P-39, however, W/C Larry Dunlap apparently instead advised that the P-40 was "very poor" compared to the P-39! Dunlap was the RCAF's Director of Armament from 1939 to 1942, and his opinions were generally accepted. Based on Dunlap's recommendation, Canada decided in December 1940 to seek a production agreement to build P-39s in Canada, using American engines. A total of 144 P-39s were needed for RCAF home defence squadrons. However, the timing of any deliveries was only going to be possible if these aircraft could be obtained from within existing British orders. If they had to be obtained after the British and US production orders were completed, as a separate RCAF order, then this would be too late for the RCAF's projected need.

By March 1941, the RCAF was advised that they could not get P-39s until 1943, and that they should look at Canadian-built *Hurricanes* instead. That same month, Canada therefore asked for 50 *Hurricanes* but still requested 144 *Airacobras* (later reduced to 110 *Airacobras* in April 1941). In April 1941, it had

become apparent that P-39 production was delayed, due to Allison engine problems, and also it became clear that British and US needs would again use up all production capacity until 1943. However, after all this, the RAF finally did offer 72 of their lot of P-39s to Canada, for delivery before 1943.



*Above - The RCAF was pressed to consider early model Curtiss P-40 Tomahawks similar to this example. - (RCAF Photo)*  
*Below - The RCAF eventually settled for Curtiss P-40 Kittyhawks for home defence purposes as seen here. - (RCAF Photo)*



Within a few days, it became apparent that the supply of 50 *Hurricanes* was also in doubt, and it was suggested that Canada take 50 early-model P-40 *Tomahawks* instead. Canada countered by offering to



take 50 more P-39s. By June 1941, the total P-39 requirement was back up to 144, but with no *Hurricanes*. However, the UK advised that the RCAF could have none of these until late 1942, and should still consider taking the P-40 instead.

By August 1941, Canada advised that they would take 72 P-40s, but only if they could eventually be traded for 72 P-39s later, plus a further 72 P-39s to come later. All of this was happening about the same time that the RAF concluded that the P-39 wasn't such a great performer after all.

In September 1941, the RCAF negotiated to get 12 P-40s per month, starting immediately. The total number to come would depend on the P-39 situation, and the RAF did agree to replace P-40s with P-39s as they came available.

In November 1941, RCAF staff advised the Chief of Air Staff that Canada should take the additional 72 P-40s as well, and not wait for P-39 production to catch up. At the time, the decision was deferred, since the RCAF actually lacked both the aircrew and ground crew to handle them. Finally, by April 1942, the RCAF had taken delivery of all 72 P-40s, and, by May 1942, had finally dropped the bid for 144 P-39s and asked for the full 144 aircraft requirement to be fulfilled by P-40s instead. By that time, the RCAF had taken delivery of 72 Kittyhawk Mk. I aircraft plus another 12 Mk. IA (P-40E-1) aircraft.



***Above - These are the accident remains of Bell P-39 Airacobra #AH621 as tested by the RCAF. - (RCAF Photo)***

Ironically, the RCAF actually briefly had one *Airacobra* on strength. This was a RAF P-39 #AH621 and it was tested at Rockcliffe in 1941. The RCAF Accident Card shows that the aircraft crashed at 11:00 hrs, November 26, 1941, 2.5 miles from Rockcliffe. The pilot, who was F/L R. B. Middleton of 12 Communications Squadron, was slightly injured. The accident record card says that the aircraft suffered a forced landing in a field, with the undercarriage up, following "engine failure due to gasoline stoppage". The crashed aircraft was a Category "A" write-off.

## The Gloster Meteor

In the post-Second World War period, the RCAF looked to the United Kingdom to procure its first jet fighter. Wartime RCAF pilots already had experience with the twin-engine Gloster *Meteor*. By August 1945, a *Meteor* Mk III (#EE311) had been shipped to Montreal. Ex-No. 616 Squadron pilots F/L's McKenzie and Ritch were both detailed to fly it, along with S/L Everett L. Baudoux, a Canadian graduate



**Above - This is Gloster Meteor #EE311 on ramp at RCAF Station Rockcliffe on September 18, 1945 for a VIP demonstration . - (RCAF Photo)**

of the UK's famed Empire Test Pilot School. Once the jet had been taken out of its crate, reassembled and test flown, Baudoux flew it to Ottawa in just 15 minutes. At the Test & Development Establishment, it became the centre of intense interest, being inspected by VIP's of many different backgrounds. On its first official flight in Ottawa, on September 18, 1945, #EE311 provided a demonstration for Air Minister Colin Gibson along with the air attachés from the United States, Russia, Norway, Belgium, France and Peru. Virtually all of the spectators were awed by the *Meteor*. Hugh Kemp, writing on the first Ottawa demonstration for the November 1945 issue of *Canadian Aviation* magazine described how, on application of power, the engine noise changed from a whine to a roar. "*It sounded like a huge blow-torch.*" Acceleration was impressive, although the length of the takeoff run was also noted. Describing its speed, Kemp wrote, "*My previous concept of speed was entirely violated.*" However, it was the rate of climb that made the greatest impression. "*The Meteor crossed the field almost on the deck and then pulled out slowly and headed upwards in an almost vertical climb. One second it was a life-sized aircraft flashing in front of us; and the next it was a small silver silhouette banking gracefully against a cloud.*" But in addition to the *Meteor*, by April 1945, there was yet another British jet fighter which became available. The De Havilland *Vampire* jet, which had been test-flown as a prototype on Sep 20, 1943, was now in mass production, and soon the RCAF would acquire one example (#YG372) also for winter trial purposes.

Again, in a harbinger of things to come, the RCAF's jet fighter procurement program was soon caught up in Canadian politics, conflicting internal military opinions and funding issues. The proposed quantity to be

purchase fluctuated greatly, and the final acceptance of 85 aircraft in total was essentially driven by the limit on available funding, rather than the RCAF's projected operational requirement. The RCAF's subsequent adoption of the *Vampire* as opposed to the *Meteor* for its first postwar jet fighter was also bound up in a combination of politics, finance and operational considerations. The RCAF's post-war jet aircraft acquisition plan was tied directly to financial credits, which Canada had secured from Britain in complex financial adjustments negotiated after the end of the war. Although the RCAF had originally hoped to obtain both *Vampires* and *Meteors*, the total number of aircraft was, in the end, limited by the imposed credit ceiling. There simply was insufficient credit funding available for two types, so ultimately the RCAF had to choose between the two fighters.

At the end of the war, the RCAF had accumulated credits when surplus operational aircraft and equipment were returned to the RAF from disbanded RCAF overseas squadrons. The RCAF was entitled to retain these aircraft, but had instead opted to take a credit against future orders. The amount available was £3,999,500 (approximately \$16M (Cdn) at the time), but fighter aircraft were not the only draw on those funds. The agreement with Canada was that only £2,193,000 could be used for new production in the UK, and the other £1,806,500 had to be spent on surplus aircraft or other material, which the RCAF considered an unlikely prospect.

The initial RCAF plan for these credits was to obtain 265 Mk.14 Supermarine *Spitfires*, 36 *Auster* AOP aircraft along with some de Havilland *Mosquito* conversion kits. Soon, however, the preference turned to jet fighters as opposed to piston-engined aircraft. The earliest correspondence seen was from March 1946, at which time it was proposed that the RCAF be supplied in 1947 with the *Vampire* Mk. IV (a *Nene*-powered variant that never reached the production stage)

In the spring of the 1946, RCAF operational requirement called for for seven Auxiliary squadrons, each with eight *Vampires*, and one Regular squadron, each with 12 aircraft. The proposed Auxiliary locations were Victoria, Vancouver, Calgary, Regina, Toronto, Montreal and Halifax, with Edmonton as a possible base for the Regular squadron, to be part of a mobile tactical wing. The first post-war Auxiliary squadrons had just been formed, in Vancouver and Montreal, flying North American *Harvards*. The British Ministry of Supply gave the RCAF a tentative delivery schedule covering 183 *Vampires*, a figure based on the above Unit Establishment (UE) of 68 aircraft, plus two for the Test & Development Establishment, and a balance of 113, which assumed a high attrition rate over a very short expected service life of just three-years.



**Above - Eighty-five de single-engine Havilland Vampire jets (instead of the twin-engine Gloster Meteor) were purchased using wartime credits from the UK government for Canada's post-war home defence purposes. - (RCAF Photo PC-251)**

By late May 1946, the Ministry of Supply was pressing the RCAF to place its order to guarantee the delivery schedule. A/V/M Slemon proposed reducing the number to 150, so that *Austers* and photo reconnaissance *Mosquito* modification kits could also be provided, without overdrawing the available credit. Once the total remaining RCAF credit was sorted out, it might be possible to increase the order to 183.

The RCAF senior echelon was effectively split by the choice between the *Vampire* and / or the *Meteor*. Some clearly preferred the *Meteor* because its two engines meant it was both faster and possessed a higher ceiling. Its all-metal construction also meant it was easier to maintain. Others preferred the *Vampire*, which offered better cockpit visibility and a longer range. But the *Vampire*'s primary advantage was its cheaper price; the available credits would allow the acquisition of 85 *Vampires* as opposed to just 66 *Meteors*. And ultimately, this was the plan that was carried out.

### **The Avro Arrow / Iroquois Demise & the F-105 Thunderchief Option**

Although the cancellation of the CF-105 Avro Arrow and its aftermath is well documented, less well known are the fortunes of the *Iroquois* engine that was intended to power the operational CF-105. The *Iroquois* engine, which had completed thousands of hours of test running, was clearly superior to all of its contemporaries, and interest in licensed production had been expressed by several foreign companies. Had the engines been exempted from the program's cancellation destruction order, and sales abroad more actively pursued, it is possible that something valuable might have been salvaged from the program. At the time of cancellation, fourteen development Iroquois engines had been built and had these had completed 6,700 hours of test running. A further 96 engines were on order and in various stages of completion.



**Above - This is a screenshot of a flight simulator model illustrating what an Orenda Iroquois powered F-105 Thunderchief might have looked like in RCAF colours. - ( Unknown image credit)**

Acting on media speculation that the *Iroquois* engine program was also in jeopardy of being cancelled, the French government, whose original intention was to place a major order for 300 Iroquois engines for the Dassault Mirage IV bomber, chose to end negotiations with Orenda in October 1958 and opted instead for an upgraded version of the indigenous SNECMA *Atar* turbojet engine. Apart from an attempt to sell the Iroquois to France, a last ditch attempt was made by Orenda to sell the *Iroquois* to Republic Aviation in the United States in order to re-engine Republic's F-105 *Thunderchief*. The intent was to market the *Thunderchief* as Canada's next strike fighter in NATO as the USAF had just selected the type



for this same role. When the Canadian government showed no interest at all, the project was shelved. The CF-104 *Starfighter* went on to fulfill this Canadian requirement, with the contract going to Canadair Ltd.

### **Comet 4C / C-135 Stratotanker / Boeing 707**

The de Havilland D.H.106 *Comet* was the first production commercial airliner. Developed and manufactured by de Havilland Company at Hatfield, Hertfordshire, in the United Kingdom (UK), the *Comet* Mark 1 prototype first flew on July 27, 1949. It featured a very aerodynamically clean design with four de Havilland *Ghost* jet engines buried in the wings, a pressurized fuselage and large square windows. In comparison to noisy propeller-driven airliners of the same era, this new design offered a quiet and comfortable passenger cabin and consequently showed signs of already being a commercial success at its 1952 debut. But not only were commercial airlines interested, various militaries around the world also took notice. The RCAF had formulated a requirement for two aircraft for high-speed transport and VIP use. An inspection of the *Comet* by the RCAF in 1952 culminated in an order for two aircraft. When



**Above Top** - This is an example of the larger de Havilland Comet 4c model that was considered by the RCAF as a reciprocal purchase. - (Bill Upton Collection Photo) **Above Bottom** - This is an artist conception of the C-135 VIP Stratotanker variant was also briefly considered by the RCAF. - (RCAF Image)



the de Havilland *Comet* was introduced into RCAF service in early 1953, it gave the RCAF the distinction of being the first air force in the world to operate jet transports. The useful life of the Mk1XB was based on a 7,000 hr life of the wing (mainplane) and calendar life of 6 years for the fuselage; the RCAF *Comets* were projected to be time expired by Sep 1963. In 1958, the RCAF submitted a request to TB to procure one additional Mk 1 as of 1 July 1958 for the sum of \$1.25M in order to better exercise the *Pinetree* and *Mid-Canada* radar chains since Canada has no (jet) bomber aircraft. This request was later cancelled. In 1961, the RCAF next briefly considered the acquisition of four *Comet* 4C aircraft (to be delivered in 1963 at approximately \$3.1M per a/c) to replace their Mk 1XB aircraft, in exchange for the purchase of 21 DHC *Caribou* transports by the RAF. After this deal fell through, the RCAF then briefly considered the Boeing KC-135 *Stratotanker* for the role by planning to convert the tanker to the VIP and passenger role. The *Stratotanker* conversion costs (adding passenger windows and compartments among other changes), however, proved to be cost-prohibitive.

### **C-141 Starlifter**

After the selection of the CF-116 (CF-5) *Freedom Fighter* and the commitment of Canadian CF-5 Squadrons to NATO's northern flank, the issue rapidly became how to effectively deploy it's CF-5 fighters overseas without an aerial refuelling capability. Canada in 1967 tried to place an order for 4 new Lockheed C-141 *Starlifter* aircraft for conversion to tanker aircraft. At the time, the RCAF reserved the designation CC-141 for the aircraft type and issued a re-touched photo of a C-141A showing aerial refuelling pods on the wing tips with two CF-5's plugged in. The CC-141 *Starlifter* serial numbers were to be: #14101 to #14104 The problem was that Lockheed turned down the order as uneconomical as they were switching to C-5 *Galaxy* production, and the USAF also rejected a Canadian request for 8 of its "surplus" C-141's because of its ongoing commitments in Southeast Asia. Fortunately, at the same time, five Boeing 707-347C's suddenly became available. This allowed the Canadian Armed Forces to avoid the problem of the order for C-141A's. The 707's were purchased and re-designated as CC-137 in Canadian military service. Few will remember that the Boeing 707 was also a losing ASW competitor to the Lockheed CP-140 *Aurora* in the long-range patrol aircraft competition



**Above - This is an artist conception of the C-41 Starlifter tanker variant was sought after by the RCAF but that was out of production by the time an order was actually placed. - (RCAF Image)**



*Above - The Starlifter was instead replaced by the Boeing 707-320C. The Boeing 707 (a proposed ASW variant as seen here) was also considered and shortlisted for Canada's LRPA project ultimately won by the Lockheed CP-140 Aurora) - (RCAF Image)*

### **Vickers Viscount**

In the late 1950's, after a series of catastrophic accidents, the RCAF began searching for a new VIP aircraft intended to replace the war-weary C-47 Douglas *Dakotas* and the North American B-25 *Mitchells* in light transport duties. The RCAF originally began pursuing a purchase of the turbine-powered Vickers *Viscount* in conjunction with a planned purchase of the same type of airliner by *Trans-Canada Airlines*. Press reports from that timeframe suggest that the RCAF was negotiating with Vickers in order to obtain a fleet of up to 15 *Viscounts* at a cost of \$20M (Cdn). In the Canadian press, the first mention of a possible purchase of a new Canadair-built CL-66 airliner appeared in the Canadian Press report of December 6, 1957. This news report reported that the UK firm English Electric had disclosed to a visiting Canadian trade commission that it was trying to interest the RCAF in CL-66 aircraft powered by the new Napier *Eland* turboprops. Obviously, there were back-channel discussions underway about trying to shore up and or salvage the program upon which Canadair had invested and embarked upon. Canadair's contract building T-33 *Silver Stars* and F-86 *Sabres* for the RCAF was winding down. On January 6, 1958, in order to keep its workforce busy, Canadair made a proposal to the government to build in Canada, ten Canadair CL-66's (to be named *Cosmopolitans*) for the RCAF at cost with no profit based



*Above - An order for 10 Vickers Viscounts (similar to this Trans-Canada Air Lines example) for RCAF VIP aircraft was overturned by the federal government in favour of the Canadair-built CC-106 Cosmopolitan. - (Photo courtesy of British Columbia Aviation Museum)*



**Above - This is an example of the Canadair-built CC-106 Cosmopolitan in its original Napier-Eland engine configuration that proved highly unsatisfactory in terms of performance and reliability. - (RCAF Photo PCN-995)**

upon the free use of Convair tooling and the omission of licence fees. The cost of these aircraft was estimated at \$1.35M each without spares support and also excluding duty, sales tax, escalation, autopilot and radar. In March 1958, despite strong protestations from the RCAF and from *Air Canada* (who had just officially ordered their own *Viscounts*), the government cancelled the RCAF *Viscount* order and announced a new contract for Canadair-built CL-66 aircraft.

During the contract negotiations however, it soon became apparent that Canadair had intended to supply a commercial type aircraft whereas the RCAF expected one more tailored to the military environment and based more upon the Convair C-131E model already in service with the USAF. For over a year, this controversial matter was the subject of many meetings and negotiations between the government and Canadair. Finally, Air Specification 19/12 was resolved and a firm estimate of the program was then obtained. The required modifications to the interior of the aircraft, the installation of a cargo door, changes to the fuel system and to the instrument, electronic and navigation systems to adapt the aircraft to the military role were estimated to increase the cost of the program by \$2.59M. At the same time Canadair asked for an additional \$2.8M to cover escalation on materiel, labour rates, overhead rates and certain unforeseen expenditures.

The government subsequently approved the increase of \$2.59M for aircraft modifications but rejected the additional amount claimed by Canadair for escalation. The total cost of the CC-109 program therefore became \$23,590,000. Eventually the cost for the production of the ten aircraft plus additional supporting items was further increased to \$24M (Cdn). Two of the CL-66C demonstrators were then leased to the RCAF for performance testing and crew training.

The ten *Cosmopolitan* aircraft were delivered quickly between April 1960 and February 1961, and RCAF serial numbers were allotted to the aircraft from #11151 to 11160 inclusive. A further proposal was then received from Canadair Ltd to sell the three commercial CL-540 aircraft powered by the Eland 504A engine at a reduced cost along with a limited range of spares. One of these aircraft was the company CL-66B demonstrator and the other two the CL-66C's formerly operated by *Quebecair* in the 52-seat passenger configuration. In March 1962, the government gave approval for the purchase of the three aircraft (plus a range of spares) at a cost of \$900,000 each. These three *Cosmopolitan* 540 aircraft, which were allotted RCAF serial numbers #11161 to #11163, were accepted by the service as of March 30, 1962. These aircraft were accepted in their original non-military configuration until a planned phased modification program could be developed in house by the RCAF. The CL-66C's were distinguishable by



having eleven cabin windows on both sides. Other than training duties with 4 (T) OTU, the *Cosmopolitan* fleet was primarily used by No. 412 Squadron.

After introduction, however, not only did the Napier *Eland* engines not deliver the expected power, they continued to be wholly unreliable. Some RCAF pilots derisively called the *Cosmopolitan* aircraft "the best single-engine transport in the RCAF fleet". In addition, along with increasing maintenance requirements, the *Eland* was further plagued by spares shortages from Napier. The three unmodified CL-66C's in the RCAF inventory were subsequently phased out of service and sold as surplus. The RCAF then instituted an engine upgrade for the remaining fleet in 1966 / 1967, by contracting with PacAero Engineering Corporation of Santa Monica, California to install civil certified Allison 4,050 eshp 501-D36 engines with Hamilton Standard propellers (comparable to the C-130E). After eight airframes had been re-engined, the PacAero company phased out any further work on the type, "orphaning" the remaining final two RCAF *Eland*-powered aircraft (#11155 & #11158 ), which subsequently then also had to be struck off strength and reduced to spares. The re-engined aircraft then served safely and efficiently for 34 years without any other major operational flying accidents for their remaining RCAF / Canadian Forces career.

## **The New Shipborne Aircraft (NSA) Saga**

### **CH-124 *Sea King* Shipborne and CH-113 *Labrador* Search & Rescue Helicopters**

The *Sea King* helicopters that operated from the Royal Canadian Navy (RCN) destroyers, frigates and other warships had originally entered into service in 1963. Designed primarily for anti-submarine warfare (ASW), the *Sea Kings* also provided Canadian warships with surveillance and transportation capabilities and occasionally participated in search and rescue operations. More over its roles were further expanding, the *Sea Kings* were now being tasked with providing over-the-horizon situational awareness and as well as serving in anti-piracy, disaster relief and various humanitarian operations. By the mid-1980's, the operational lifespan of the *Sea King* helicopter fleet had been exceeded and in the press, they were now being described as "ancient," "geriatric," and /or "venerable". *Sea King* operations were suffering because of a lack of spare parts, aging systems, structural wear and tear forcing constantly increasing maintenance hours which, in turn, were producing lower availability rates, along with concerns over the rise in the number of accidents. The result was a replacement project known as the New Shipborne Aircraft (NSA) project. But the selection of a replacement for the *Sea Kings* was also influenced by another factor, the need to simultaneously replace the equally old CH-113 *Labrador* search and rescue helicopters. Like the *Sea Kings*, the *Labradors* had entered service with the Canadian military in the early 1960s and the Department of National Defence also began searching for a replacement during the mid-1980s. This latter program was known as the New Search and Rescue Helicopter (NSH) project.

### **Adding a New SAR Helicopter Requirement to the NSA Project**

In 1991, the decision was made to combine the NSA and NSH projects into one requirement. Belatedly tacking on a search-and-rescue aircraft to the New Shipboard Aircraft requirement had definite economic benefits, including a lower unit price per aircraft (and for spare parts) which accompany larger orders. The training of maintenance personnel and flight crews was to be simplified, and the associated logistics and maintenance headaches reduced. But, this added SAR requirement also encouraged the ratcheting up of airframe size since more requirements generally meant a larger size requirement. There was also another compounding effect. Adding the SAR requirement also pushed up the total bill for the New Shipboard Aircraft order dramatically. DND's joint 'New Shipboard Aircraft Project / New SAR Helicopter

Project' now called for 50 helicopters – 35 ASW *Sea King* replacements plus 15 SAR airframes – at a total cost of \$5.8B (Cdn).



**Above - This is an EH-101 test aircraft in Halifax, NS for icing tests. It was intended to become the the CH-148 Petrel. - (Author's Photo)**

In July 1992, the Canadian government (then led by Prime Minister Brian Mulroney of the Conservative Party) placed an order for 50 EH-101s with a consortium of the Anglo-Italian EH Industries (providing the basic airframe, engine and systems) and the Montreal-based Paramax Systems of Canada (providing the avionics and mission systems). A concern during the selection of the EH-101 was that, at the time, it was not yet deployed in any other country's military. Specifically, the concern was that if Canada purchased the unproven helicopter, the risk of various issues needing resolution after the aircraft entered service would be high. These concerns then abated when the Royal Navy signed a contract for the first production line of the EH-101 in October 1991.

The planned *Sea King* replacements were designated CH-148 *Petrel* and the SAR variant was to be known as the CH-149 *Chimo*. The CF's ASW helicopters were to be mechanically similar to those bought for Italy's *Marina Militaire* but their complex suite of avionics and other ASW equipment were to be distinctly Canadian. The first CF CH-148 *Petrel* was expected to enter squadron service in 1995.

All of these plans were changed by the federal election of 1993. The high \$5.8B cost of the new helicopters was an issue for the government during an era of fiscal constraints and conflicting priorities. The Liberal leader of the Opposition, Jean Chrétien, smelled an opportunity, attacking the NSA selection as an unnecessary "Cadillac". In damage-control mode, the Conservative Prime Minister, now Kim Campbell, cut the NSA order to 43 helicopters (reducing the order to 28 ASW and 15 SAR variants) bringing the cost down to \$4.4B (Cdn). But, politically, the harm was already done and, during the ensuing election, the public turned a jaundiced eye on the NSA. The characterization of the EH-101 by the Liberal opposition as the "Cadillac" of maritime helicopters was perhaps an accurate analogy to the extent that it was larger and more powerful than the other candidates. However, the Liberals' criticism focused on the \$4.4 billion cost of the EH-101s during a time that called for fiscal restraint and they succeeded in making this a significant election issue. In 1993, the Liberals were elected on a campaign

platform that included cancelling the EH-101 contract. Prime Minister Jean Chrétien lived up to his promise, cancelling the procurement contract within hours of taking office.

On October 31, 1994, the Special Joint Committee on Canada's Defence Policy tabled a report recommending, among other things, quick action on the purchase of new shipborne and rescue helicopters. Following the completion of the parliamentary review, the Minister of National Defence presented the *1994 Defence White Paper* outlining Canada's new defence policy. This "White Paper" indicated that there was an urgent need for new shipborne helicopters and that the *Sea Kings* would be replaced by the end of the decade. It stated that the Labrador search and rescue helicopters would also be replaced as soon as possible. While the same type of helicopter might be bought for both the shipborne and rescue roles, other possibilities were also being explored, such as different forms of partnership with the private sector for maintenance and even alternative financing arrangements for the purchase of replacement aircraft.

By July 1995, news reports indicated that the Cabinet was considering departmental proposals for the acquisition of new military equipment, including new shipborne and rescue helicopters. But the Minister of National Defence (MND) indicated that a final decision on both projects would not be made before the end of the 1995-1996 fiscal year. But it was not until January 5, 1998, that the MND and the Minister of PWGSC announced that the government had selected the AW520 *Cormorant* helicopter proposed by Augusta-Westland to replace the *Labradors*. The announcement stated that the maximum project cost would be \$790 million for the delivery of 15 CH-149 *Cormorants*. The project cost included a maximum of \$593 million to be paid to E.H. Industries and approximately \$200 million for training, spare parts, and logistics support.

On April 23, 1998, the Department of National Defence announced that the contract with Augusta-Westland had been signed and that the acquisition costs had been reduced to \$580 million from \$593 million. Much of the reduction in costs was due to the decision to take delivery of the new helicopters at the final assembly line in Italy rather than in Canada.

The decision in favour of the AW520 *Cormorant* was controversial because of the similarities between that helicopter and the previous fifteen rescue versions of the EH-101 (CH-149 *Chimo*) which had been ordered along with the maritime versions in 1992 only to be cancelled in late 1993 by the Liberal government. Government officials of the day argued that the *Cormorant* was not the EH-101. (It should be noted that the previous CF designation was retained (i.e. CH-149) but the name was changed from *Chimo* to *Cormorant*. They stated that the *Cormorant* was essentially a "civilian" aircraft; a fully-certified, off-the-shelf helicopter. It was supposed to be simpler, less expensive, without the system ruggedness and redundancy of the previous military specifications for the naval ASW EH-101 variant.

### **The F-18E/F *Super Hornet* & F-35 *Lightning II* Selections**

In November 2016, the Canadian Government announced that it intended to purchase 18 Boeing *Super Hornet* F-18E/F fighter jets as an "interim measure" to supplement the existing legacy CF-18 *Hornet* fleet. The Liberals had promised during the election campaign to purchase a replacement aircraft for the CF-18 jet fleet, pointing out that it would go for a cheaper alternative to the controversial F-35 stealth fighter previously selected sole-source by the Conservative government in 2010. It then launched an all-new fighter competition.

According to a US State Department release, this planned purchase was extensive including ten F/A-18E *Super Hornet* aircraft, with F414-GE-400 engines; eight F/A-18F *Super Hornet* aircraft, with F414-GE-400



engines; eight F414-GE-400 engine spares; twenty AN/APG-79 Active Electronically Scanned Array (AESA) radars; twenty M61A2 20MM gun systems; twenty-eight AN/ALR-67(V)3 Electronic Warfare Countermeasures Receiving Sets; fifteen AN/AAQ-33 *Sniper* Advanced Targeting Pods; twenty Multifunctional Information Distribution Systems–Joint Tactical Radio System (MIDS-JTRS); thirty Joint Helmet Mounted Cueing Systems (JHMCS); twenty-eight AN/ALQ-214 Integrated Countermeasures Systems; one hundred thirty LAU-127E/A and or F/A Guided Missile Launchers; twenty-two AN/AYK-29 Distributed Targeting System (DTS); twenty-two AN/AYK-29 Distributed Targeting Processor (DTP); one hundred AIM-9X-2 Sidewinder Block II Tactical Missiles; thirty AIM-9X-2 *Sidewinder* Block II Captive Air Training Missiles (CATM); eight AIM-9X-2 *Sidewinder* Block II Special Air Training Missiles (NATM); twenty AIM-9X-2 *Sidewinder* Block II Tactical Guidance Units; sixteen (16) AIM-9X-2 Sidewinder Block II CATM Guidance Units. Also included in this sale were AN/AVS-9 Night Vision Goggles (NVG); AN/ALE-47 Electronic Warfare Countermeasures Systems; AN/ARC-210 Communication System; AN/APX-111 Combined Interrogator Transponder; AN/ALE-55 Towed Decoys; Joint Mission Planning System (JMPS); AN/PYQ-10C Simple Key Loader (SKL); Data Transfer Unit (DTU); Accurate Navigation (ANAV) Global Positioning System (GPS) Navigation; KIV-78 Duel Channel Encryptor, Identification Friend or Foe (IFF); CADS/PADS; Instrument Landing System (ILS); Aircraft Armament Equipment (AAE); High Speed Video Network (HSVN) Digital Video Recorder (HDVR); Launchers (LAU-115D/A, LAU-116B/A, LAU-118A) and all associated engineering, technical, and logistics support for the program. The estimated total case value was \$5.23 (US) billion.



**Above - An order for 18 Boeing F/A-18E/F Super Hornets (upper aircraft) to bolster the legacy CF-18 fleet (lower aircraft) was eventually cancelled by the government in a trade dispute. - (Photo courtesy of Boeing)**

Some at the time questioned the “interim” plan, suggesting the Liberals were trying to find a way to lock Canada into the *Super Hornet* without opening itself up to a legal challenge from Lockheed Martin or any other aircraft manufacturers. But the Liberal government then abruptly cancelled the F-18 E/F plan after Boeing had launched a trade dispute with the Montreal aerospace firm Bombardier over the sale of the latter's C-Series airliners in the US. The government also later introduced a penalty clause into the fighter competition for any firms seeking a federal contract, who had previously entered into a trade dispute with Canada. The F/A-18E/F was subsequently, perhaps not surprisingly, eliminated from the fighter competition.

On March 28, 2022, after five years of intense deliberation, the Canadian government selected the Lockheed Martin F-35 *Lightning II* as the replacement for the ageing CF-18 *Hornet* fleet. This announcement also confirmed that 88 F-35As were required for the program. It would be interesting to know how this number was actually determined?

### **Summary**

These are only some of the examples of RCAF aircraft procurement “challenges” and aborted programs. Sadly, there are many more cases that could have been mentioned but have not been documented here for the sake of space. The 15+ year Fixed Wing Search & Rescue (or FWSAR) project, for example, is another classic modern tale of protracted acquisition. It is perhaps unfair to blame government's exclusively for the problems therein. Suffice to say, there is plenty of blame to go around from the government / military officials and politicians involved to the commercial companies themselves. Aircraft fleet procurements are an expensive, complex, challenging and often polarizing process that need careful consideration on behalf of all the parties involved. Add in the politics and economic factors of the day, and it can be a direct recipe for protracted and / or aborted acquisition projects.