

# History of Aviation in the BC Forest Service

A pictorial account for the BCFS Centennial

November 2011

## Part 2 : Air Tanker Operations



This is a pictorial account of the history of the fixed wing air tanker program with the British Columbia Forest Service and includes notable seasons, events and milestones over the past half century.

### **The Beginning**

By May, Forest Service personnel realized there might be trouble. The weather and lightning activity during June and July confirmed it. The 1958 fire season would be the worst in history in terms of damage. By the end of the season over 2 million acres had burned. Up to this point in B.C., aircraft had not been used to deliver suppressants on fires. This would change early in the fire season, as circumstances presented themselves to some aircraft operators:

- The year before, the Ontario Provincial Air Service had developed a fire bombing system for their Beaver and Otter aircraft. The system consisted of external "roll" tanks mounted on the aircraft floats. The tanks could be filled with probes while skimming on the water and discharged over the fire by the pilot. The payload of the 2 tanks for the DHC 2 Beaver totalled 90 gallons.
- A re-engined Fairchild Husky F11 was fitted with an internal 150 gallon water tank also with external pick up probes. The conversion by Husky Aircraft at Vancouver Airport took only eight days and the aircraft was ready for firebombing services.



Figure 1: Demonstrating the Beaver "roll" tank system - summer 1958



Figure 2: DHC2 Beaver "roll" tank drop. BC Archives NA-19703



Figure 3: Fairchild Husky F11 registration CF-EIM operated by North Coast Air Services. This is the same aircraft that was earlier tanked in 1958

- Skyway Air Services Ltd. Of Langley B.C. operated a number of Boeing Stearman and 5 Grumman TBM Avengers. The Avengers, surplus Royal Canadian Navy anti-submarine aircraft, had been purchased in the fall of 1957 and converted to spray configuration by Fairey Aviation of Victoria. Four of these aircraft took part in the annual spring spraying of spruce budworm in New Brunswick. On their return to B.C., in anticipation of their new role as fire bombers, Skyway had tank gating systems installed to allow for the dropping of water or other suppressants.

By the end of the season, all these aircraft accounted for nearly 900 flight hours bombing fires – approximately 700 hours in the Vancouver District, 200 in the Nelson District and a minor amount in the Prince George and Prince Rupert Districts. The Husky (flying 85 hours over a 15 day period) was paired with a Beaver with the roll tank system and worked successfully in tandem on fires in the southeast area of the province.

A group of Boeing Stearman aircraft worked from the Bear Creek airstrip on Harrison Lake and the four Avengers from the Hope / Flood airport. The Avengers worked the Omicron fire in the Coquihalla Pass (30 miles from the airport) for approximately two weeks and a total of 106 flight hours.

The majority of drops were straight water; however another product – sodium calcium borate or “Firebrake” was trialed as well. While effective as a retardant, it was found in the U.S. and Canada that Borate was a soil sterilant and not acceptable environmentally.

Due to the success of the operations in 1958, by the spring of 1959 operators had equipped up to 18 aircraft with firebombing tanking systems including 5 Beavers, 5 Avengers, 5 Stearman, 2 Junkers and 1 Husky.



Figure 4: Skyway Air Services TBM-3E Avenger Tanker 601



Figure 5: Skyway Air Services Boeing A75N1 Stearman

The 1959 season was much quieter in comparison and only a small number of fires were actioned with air tankers. There were however, a couple of notable events this year:

- The coastal logging industry was actively searching for a suitable bombing aircraft to protect their forest interests, especially after the devastating events the year before. A Grumman Goose was fitted with two 50 gallon external roll tanks and tested in May of 1959 but effectiveness was found lacking. Bigger things were soon to come though.



Figure 6: Grumman Goose CF-IOL "Dryad" May 1959

- Skyway Air Services was looking into water scooper aircraft and expressed interest in the Husky. They decided however, on the Junkers JU 34 and purchased 2 machines previously owned by Pacific Western Airlines. They were registered as CF-AQB and CF-AQW. Early in 1959 the pair was sent to Fairey Aviation in Victoria for conversion. Probes and internal 150 gallon tanks were installed. In early August, while actioning a fire near Nelson, CF-AQW flew into power lines over the Kootenay River. The aircraft crashed and sank but the pilot escaped with minor injuries and was helped to shore by a pair of fishermen. Both aircraft were struck off the aircraft registry by October 1959 and the Junkers was not to be used in the firebombing role in B.C. again.



Figure 7: Skyway Junkers 34 CF-AQW at Fairey Aviation in Victoria awaiting conversion Spring 1959



## **The 1960s**

The 1960 fire season showed up in force in the Southern Districts in mid July following a severe lightning storm on July 13<sup>th</sup>. By the 18<sup>th</sup> the Kamloops District had 4 TBMs, 4 Stearman, 1 Beaver, 1 Husky and a B17. These aircraft were operating from Kamloops, Blue River, Sicamous and Kelowna and were hired from B.C., Alberta and the U.S. The Boeing B17 registered as N17W was brought in from Phoenix Arizona. The firebombing conversion of this WWII bomber had just been completed in May.

Two contracted Beavers were released to the Nelson District around the same time and an ex-military B25 Mitchell was hired from Washington State to cover the Cranbrook area. Registered as N7946C, this aircraft was operated by Wenatchee Air Services of Wenatchee Washington.

With the addition of the land-based (wheeled) tankers, managers introduced Bentonite clay to the bombing arsenal. Pits were dug from the ground and bags of clay were mixed with water by injector type mixers at a ratio of one pound of clay to one gallon of water. Separate pumps were used to load the "slurry" into the aircraft.



Figure 8: Biegert Bros. B17 N17W at Kamloops August 1960. This aircraft has been restored to military configuration and is currently on display at the Boeing Museum of Flight in Seattle Wash. – BC Archives NA-20242



Figure 9: B25 Mitchell N7946C being loaded from a Bentonite "mud pit" at Cranbrook 1960. This aircraft has also been fully restored and is presently flown and displayed as "Old Glory" in the US.

1960 was to be the first year using a “birddog” aircraft and “Birddog Officer” in B.C. (and possibly Canada). While not physically directing each bombing run, the birddog crew would recce fires and set priorities for attack. Up until that season bombing success relied on pilot discretion or direction from the ground if available or possible. The first aircraft to be used in this role was the Piper Super Cub.



Figure 10: Piper PA18 Super Cub birddog

On the forest industry front, a consortium of 5 logging companies headed by MacMillan Bloedel purchased 4 military surplus Martin JRM Mars aircraft in California to be operated as giant water bombers under the company “Forest Industries Flying Tankers” (F.I.F.T.). The aircraft were flown to Vancouver Island in August and September of 1959 and conversion work completed on the Marianas Mars CF-LYJ over the winter by Fairey Aviation. This Mars worked on the 13,000 acre Dean Fire near Merritt in 1960.



Figure 12: Marianas Mars dropping on Dean fire 1960 – BC Archives NA-20179



Figure 11: Marianas Mars CF-LYJ - drop trials at Pat Bay March 1960 - BC Archives NA-19806

Air tankers accounted for over 2100 flight hours in 1960, primarily in the Kamloops District. The program this season however, did not escape mishap. Several landing accidents occurred at the Kamloops airport including an Avenger, Stearman and the B17, resulting in damage to aircraft only. On July 22, while actioning a fire near Kelowna, a Stearman operated by Airspray Limited of Westaskiwin struck trees and crashed into a ravine killing the young pilot from Alberta. This was the first fatal firebombing accident in Canada.

1961 saw only half the flying of the previous year and took place mainly in the Prince Rupert and Prince George Districts.

On June 23<sup>rd</sup>, while actioning a fire 20 miles west of Nanaimo, the Marianas Mars collided with trees and crashed killing all 4 crew members. Once it was determined that the cause was not with the aircraft or its systems, the Mars program was continued.



Figure 13: An essential part of the team - Mixer / Loaders and Mixmaster load Skyway Tanker 615 at Prince George August 1961. This aircraft was later restored and is on display at the Imperial War Museum in Duxford England.

1962 was certainly a pivotal season with the program. The British Columbia Forest Service entered into the first firebombing contract with Skyway Air Services. This was for the provision of 12 Avengers and 4 birddogs to be based equally at Smithers, Prince George, Kamloops and Cranbrook. The Avenger could carry a 500 gallon load and cruise at 160 knots. Paradoxically the fire season throughout the province was very light and allowed Districts to focus on bases, equipment and organization. The contract tankers and birddogs flew just over 500 hours provincially.



Figure 14: 3 contract Avengers and Cessna 180 birddog - Prince George Tanker Base 1962



In preparation for the initial contract season, the first Birddog School was held at the Green Timbers Training facility at Surrey in the spring. The week long course supervised by A.J. (Art) Kirk, involved Protection Officers, Birddog Officers and supervisors as well as pilots and executive personnel from Skyway. Mr. Kirk was British Columbia's (and arguably Canada's) first Birddog Officer. Flight exercises were also conducted from Skyway's base at Langley.



Figure 15: Birddog School trainees being briefed at the Green Timbers facility spring 1962



Figure 16: Group picture with Cessna 180 birddog. Art Kirk (far left); pilot and future Conair president Les Kerr (3rd from the right) at Langley 1962



The next 2 years resulted in light fire activity, which led to an interesting 1965 season. The two northern Districts, especially Prince George, were concerned about the effectiveness of land based air tankers on fires with long dispatches. Back in Victoria, Alex Davidson, a long time test pilot with Fairey Aviation saw an opportunity to provide the province with larger scooper aircraft. In partnership with Bill Harrison the pair formed The Flying Fireman Ltd., leased two PB Y Cansos and entered into a

contract with the B.C. Forest Service to operate them from Prince George. Canso #1 registered as CF-NTL was a standard machine with an 800 gallon capacity. It arrived in Prince George on June 3<sup>rd</sup>. Canso # 2, an American aircraft registered as N609FF, was a re-engined "super" PB Y with a capacity of 1200 gallons and arrived June 19<sup>th</sup>. By the end of the summer both aircraft had logged a total of over 350 hours on 72 fires – 64 in Prince George, 7 in Prince Rupert and 1 in the Kamloops District. A short term hired Canso operated by Kenting Aviation Ltd. of Sudbury Ontario also worked in the Rupert District. Personnel in both Districts reported good success and versatility with all three aircraft. The same Flying Fireman tankers worked out of Prince George during 1966.

A Trans Provincial DHC 3 Otter equipped with a 225 gallon internal tank also operated from Prince George during these seasons.



Figure 17: Canso #1 CF-NTL near Ootsa Lk. 1966



Figure 18: "Super" Canso #2 N609FF Nazko 1966



Figure 19: Trans Provincial Otter demonstration drop 1966

Skyway Air Services moved their main base from Langley to the much more spacious facility at the Abbotsford airport in 1965.



Figure 20: Harvard CF-NSN Birddog #1 with TBMs 606 and 607 - Terrace 1966

The 1967 season was the heaviest for the use of all aircraft to date with over 20,000 hours of flight time logged. Contracted Cansos and TBMs accounted for nearly 725 hours and non contract bombers over 3000 hours. The Cansos worked in all five Forest Districts. The non contract aircraft included three spare TBMs and two Ontario Air Services DHC 3 Otters with internal float tanks.



Figure 21: Canso tanker #3 working a fire over the Malahat on Vancouver Island 1967



Figure 22: Ontario Air Services Otter with Field conversion float tanks totalling 210 gallons



Long term retardants were first trialed in 1964 in Kamloops. 1966 saw increased use and further work on mixing systems and ratios. The busy 1967 season gave the opportunity for greater operational use as fire staff throughout the province were encouraged by the effectiveness on fire compared to Bentonite clay. Firetrol and Phos-Chek products were both used.

1968 was a somewhat quieter season with 4 Cansos, 11 TBMs and 5 birddogs on contract.

1969 was interesting on a number of fronts. The air tanker component of Skyway Air Services became Conair Aviation Ltd. at the end of April. The company would work closely with the B.C.F.S. to find suitable aircraft to supplement the TBM. Two Snow Commanders were trialed briefly in May but found to be too slow with insufficient payload. Three Douglas A26's were evaluated at Kamloops for a 12 day period in June. Despite the project being curtailed by weather, the aircraft worked on 30 fires and results were positive.



Figure 23: Crewmen mixing bags of Firetrol retardant with a 500 gallon "batch mixer" - Kamloops 1968



Figure 24: Mercury Flights Snow Commander Tanker 4 - Kamloops May 1969



Figure 25: A26 CF-PGF displayed at Victoria 1969 - BC Archives NA 25185



Other trials / demonstrations that summer included the Canadair CL 215 and DeHavilland Twin Otter conversion.

### **The 1970's**

The decades associated with B.C.'s air tanker program provided interesting events and milestones and the 1970s did not disappoint. The success of the short evaluation the previous year resulted in the first contract for the A26 type in 1970. Three A26 Invaders joined three Cansos, five TBMs and six birddogs to form the provincial fleet and spare TBM aircraft were soon added.

1970 accounted for over 4000 fires, a record number up to that time. Originally destined for Prince George, the A26 group included Tankers 21 and 22 acquired from Aero Union of Chico California and Tanker 55 leased from Aero Union. They spent most of the season operating from Kamloops and Kelowna and worked over 200 targets for just under a combined total of 600 flight hours (which is rather fine for a first year). By 1971 Conair had deployed five A26s: a group of 3 in Prince George and a pair working part of the season in the Yukon.



Figure 26: T21, T22 and T55 join 7 TBMs at Kamloops July 1970



Figure 27: Douglas A26 registration CF-BMS Tanker 22 during the summer of 1970 piloted by Al Mehlhaff. T22 was delivered to the B.C. Aviation Museum in Victoria in 1989 and is currently on display there.

A couple of interesting events occurred in 1972. Realizing that the province was leaning more toward the land-based type tankers with increased speeds and payloads, Flying Fireman introduced a Lockheed P2V-7 tanker for consideration in British Columbia. Tanker 8, registered as CF-MQW, was a 4 engine mid-wing type powered by two piston and two jet engines offering excellent speed and payload. The former anti-submarine aircraft was fitted with a 2400 imperial gallon six door tank. This allowed for fourteen different drop combinations available to the birddog officer.

A formal evaluation commenced on June 2<sup>nd</sup> at Smithers and continued throughout the province ending in the Vancouver District in early September. Despite a positive result, the company could not obtain a Certificate of Airworthiness (C of A) from the Ministry of Transport for this type and the Neptune was not used in B.C. again.

Early that year Conair purchased two Douglas DC-6Bs formerly operated by Pacific Western Airlines. CF-PWA and CF-PWF were flown to Abbotsford in mid April and fitted with aerial spray equipment. They worked the month of May spraying spruce budworm in Quebec. Once they returned to Abbotsford PWF (later tanker 42) was flown to Chico California for conversion and fitted with an 8 door 2,500 imp. gallon firebombing tank. On it's return to B.C it underwent certification trials and performed a number of demonstrations including the Abbotsford Airshow.



Figure 28: Neptune CF-MQW Tanker 8 at Prince George June 1972



Figure 29: Neptune test drop Tranquille Creek near Kamloops - July 19th 1972



Both British Columbia and the N.W.T. expressed interest in the performance and capabilities of the “6” and Conair constructed a tank for PWA (later tanker 41) at Abbotsford over the winter.

PWA (T41) operated on contract from several bases in B.C. in 1973 while PWF (T42) worked in the Northwest Territories.

Up to 1973 the province had used the following aircraft in the birddog role: Piper Super Cub, Cessna 180 / 182, Harvard, Cessna 195 (FIFT), DeHavilland Beaver and Otter, Grumman Goose (FIFT), Piper Comanche, Cessna 210, Commander 500, and Cessna 337.

One milestone in 1973 was Conair’s acquisition of a new birddog type for

the northern part of the province. The Ted Smith Aerostar 600 (later Piper), based in Prince George, was a fast mid-wing aircraft with excellent visibility from the cockpit. Able to match the speeds of the faster tanker types, this solved the longstanding problem of the long fire dispatches. As of this writing the Aerostar is still in use, making it the longest serving contract aircraft type in the history of firebombing in British Columbia at 39 years.



Figure 30: DC-6 CF-PWF drop demonstration at Kamloops August 9th 1972



Figure 31: DC-6 CF-PWA Tanker 41 at Kamloops 1973



Figure 32: Piper Aerostar C-FEFO Birddog 3



By this time British Columbia was fully committed to landbased retardant tankers. The use of the PBY Canso would come to an end as a contracted machine but use would continue on a casual basis.

1974 would prove to be the darkest in the history of the program. On August 2<sup>nd</sup>, while actioning a fire eight miles southeast of Ashcroft, DC-6 Tanker 41 crashed killing the three crewmembers onboard. Within the next nine days two more A 26s would be lost, also killing the pilots.

New base facilities were established at Kamloops and Williams Lake that year.

The TBM Avenger ended service in B.C. in 1975 after eighteen seasons. Conair would continue to search for a replacement for it, and ironically the A26, for future years.



Figure 33: Another essential part of the team - an engineer works on an A26 engine circa 1974.



Figure 34: TBM group with Cessna 337 birddog - Grand Forks tanker base mid 1970's



Figure 35: A large group of A26's at the new Kamloops Tanker Base - 1974



Figure 36: Construction of the new Williams Lake Tanker Base (old base at the top of the photo) - 1974

Air tanker activity during the mid 1970's was below average to average with the provincial fleet consisting of A26 and DC6 types. A formal evaluation of the Canadair CL 215 water bomber was undertaken in 1977. This was to determine whether modern scooper aircraft could supplement or replace landbased tankers in certain areas of the province and reintroduce the "gallons per hour" suppressant delivery on fires. The evaluation took place between August 15<sup>th</sup> and September 10<sup>th</sup>. Tanker 49 C-GUKM worked 28 fire missions mainly in the Cariboo and Kamloops Districts. Results were mixed as the aircraft performed well in a support role but would likely be too expensive to supplement the existing land based fleet.



Figure 37: Tanker 49 C-GUKM at Williams Lk. Aug. 1977

By 1978 the contract fleet consisted of ten A26s and 2 DC6s with Cessna 210 and Aerostar birddogs.

By the mid 1970's Conair was looking for a replacement tanker that would be as manoeuvrable as the TBM with a payload comparable to the A26. At this point we have to back up a bit. In the fall of 1970 the Ontario Dept. of Lands and Forests purchased an ex-military DeHavilland (Grumman) CS2F Tracker for use as an air tanker. Working with Field Aviation and DeHavilland, Air Services completed the conversion over the next year. In November the next year the newly converted Tracker was demonstrated for the



Figure 38: Firecat Tanker 61 C-GHQZ with DC6 T46 and A26 T32 at Kamloops summer 1978

B.C. Forest Service and Conair at Kamloops. In 1975 Conair was sold on the Tracker as that replacement and purchased two former Canadian Navy Trackers and registered them as C-GHQZ and G-HQY. Over the next few years the company highly modified the Tracker to the new firebombing role and named it the Firecat after the Grumman line of aircraft. An operational evaluation of the new Tanker 61 took place in the Cariboo between May 23<sup>rd</sup> and July 8<sup>th</sup> 1978 flying 17 fire missions with good results. On July 25<sup>th</sup>, while conducting a demonstration flight at the Castlegar airport, Tanker 61 (flown by a replacement pilot) was destroyed in a stall/spin accident.



The Firecat program continued through the busy 1979 season with converted Tanker 62 C-GHQY. Tankers flew over 3000 hours this season delivering over 15 million litres of retardant from 18 bases.

### **The 1980's & 90's**

By 1980 Tanker 62 was joined by T63 and Conair was able to purchase the remaining Ontario Tracker fleet which were delivered to Abbotsford in the late summer. France's Sécurité Civile also placed orders for the Firecat and Conair delivered the first one (designated T1) in 1982.



Figure 39: Tankers 62 and 63 at Abbotsford late summer 1980 - joined by OMNR T58 (later Conair T69) and T59 (later France's T1)

In 1982 B.C.'s provincial fleet included 7 A26s, 5 Firecats and 3 DC6s with birddogs - based at seven locations throughout the province.

In 1983 Conair introduced the 12 door microcomputer controlled DC6 tank. Providing the same volume as the original 8 door version, the 12 door system delivered a more than 200 % improvement in retardant line lengths at lower coverage levels. The tank was fitted to Tanker 50 and operated in Kamloops that season. The majority of the company's DC6s were eventually fitted with this system.



Figure 40: Tanker 50 demonstrating the 12 door tank at Abbotsford 1983





Figure 41: Conair's air tanker and birddog fleet at Abbotsford 1983 - providing services to British Columbia, Northwest Territories and Alberta

A number of events worth noting occurred in 1985. This was to be the 16<sup>th</sup> and last season of use for the A26 in B.C and also the Cessna 210 birddog. A spare group of three A26s operated in the south of the province during an extremely busy season. This year also saw the introduction of the advanced Firecat retardant tank. The new tank was free of many of the internal obstructions of the original system, allowing a smoother drop pattern and, like the newer DC6 tank, door sequences were also computer controlled giving a multitude of different drop options to the Air Attack Officer. Tanker 69 was the first aircraft to be fitted with this system.



Figure 42: Firecat T69 over Douglas Lake piloted by Captain Al Kydd. (photo taken from Piper Aerostar birddog).

Certified in 1986, Conair's Fokker F27 Firefighter (Tanker 27) was soon available for operational trials in B.C. With a cruise speed of over 225 knots, the twin engine turboprop aircraft carried an eight door 6730 litre (1400 imp. gal.) tank with the microcomputer door control system. The aircraft arrived in the field at the end of July. It was, unfortunately, a very slow season but the aircraft did work on 38 fires with mixed results. The type did not see further action in B.C. and later began operations in France with the Sécurité Civile.



Figure 43: Tanker 27 at Kamloops July 30th 1986

The period between 1987 and 1991 saw normal fluctuations in fire numbers and air tanker resources remained relatively static, with the backbone of the fleet continuing to be the Firecat and DC6.

Let's back up again..... In August of 1987 Conair won a proposal with Sécurité Civile for the development of a turboprop Firecat. The aircraft was soon delivered from France to Conair and work continued throughout the winter. The prototype Turbo Firecat (T 16) was first flown in August of 1988 and delivered to France toward the end of the month. This led to a program to convert the entire fleet of Sécurité Civile Firecats. Back in Canada final Transport Canada certification of



Figure 44: Flight trials Turbo Firecat T16

the Turbo Firecat was received in late winter of 1991. An operational trial of Turbo Firecat C-FKUF (Tanker 77) took place in the Cariboo in July and August of 1992. Despite improved flight performance over the piston model, the type was not produced for use in B.C.



Figure 45: "Turbocat" T77 at Williams Lake August 1992



Around the same time the B.C. Forest Service was searching for a replacement for the DC6 which had successfully served the province for two decades. The replacement aircraft should have superior performance and equal or greater tank capacity. One concept proposed was the Boeing 737. Early in 1993, engineering modifications and tanking system options were considered and later flight performance trials conducted in a flight simulator at Vancouver airport. This culminated with an actual flight performance trial with a chartered Pacific Western Airlines cargo 737 on August 20<sup>th</sup>. Approach flights were conducted over Puntzi airport and simulated bombing runs near the Klinaklini River to the west. The program continued for a time but was curtailed due to issues with aircraft air conditioning equipment versus tank location and the rising costs and numbers of suitable B737 airframes.

The same search through Request for Proposal in 1993 yielded interest in converting a large turboprop aircraft to an air tanker role. The Lockheed L188 Electra was proposed with the then state of the art constant flow retardant delivery system. The closest firebombing aircraft to this type was the Lockheed P3 Orion – the ex-military cousin of the civilian Electra. A number of P3 air tankers were being operated by Aero Union of California. Arrangements were made with the U.S. Forest Service to bring a contracted P3 to B.C. for flight evaluations. Tanker 25 arrived in Victoria in early September and flight and performance evaluations began.

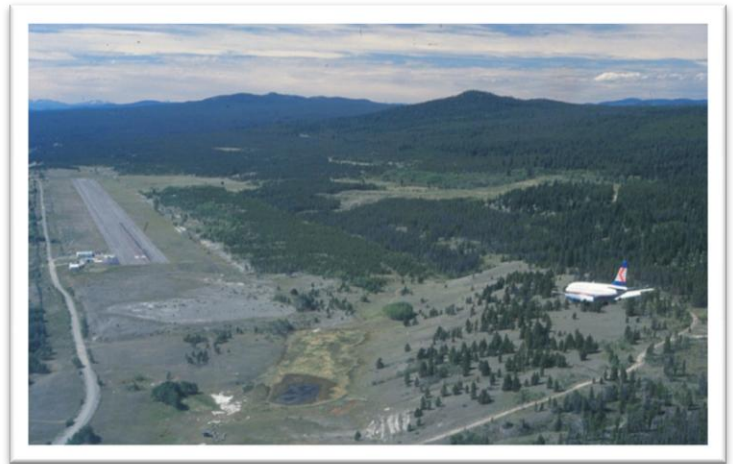


Figure 46: Boeing 737 approach test at Puntzi August 20th, 1993

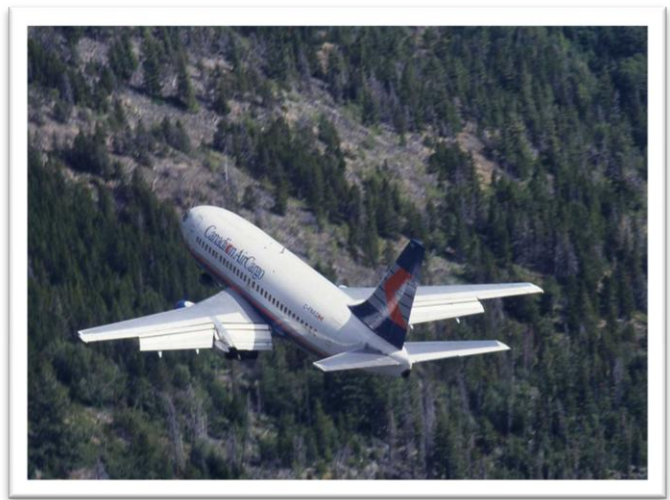


Figure 47: B737 simulated target runs Klinaklini River



Figure 48: Aero Union P3 Tanker 25 at the Pat Bay Tanker Base Sept. 4th 1993



The P3 was introduced to Air Operations staff across the province in conjunction with the continuing evaluation. Results of the evaluation were very positive with respect to performance and flight characteristics in the low level role in British Columbia. The Electra program continued with Alberta Based Airspray 1967 Ltd. into 1994. Conversion and tank development was done by Aero Union at Chico in the spring and the Tanker 88 was operationally ready in Prince George in early July with an Aerostar birddog.



Figure 49: Wringing it out - Tanker 25 flight evaluation Jordan River Sept. 5th 1993



Figure 50: L188 C-FQYB conversion and tanking - Chico Calif. spring 1994

Figure 51: Prototype Tanker 88 drop grid tests at Yuba California



1994 was a busy season in the south part of the province, especially in the Kamloops and Nelson Regions. One innovation that season was the establishment of centralized air tanker dispatch for the southern three regions of B.C. The "South Zone", headquartered at the Kamloops Tanker Base, took advantage of improved communications and the introduction of computerized resource tracking for air tanker and birddog aircraft. In addition to landbased tankers, CL215's from Ontario, CL215's /215T's from Quebec and the Martin Mars were brought on line to assist. The centralized air tanker dispatch concept was a success and the next season it encompassed the entire province.



Figure 52: "South Zone" summer 1994

In early July of 1993, flight tests were undertaken with a Govt. Air Services Cessna Citation 550 twin jet. Results were very positive in the low level birddog role. By 1995 Airspray had proposed the use of their company Citation 500 for use with Tanker 88 in the Prince George Region. Initial concerns regarding single pilot operation and ingestion of smoke into the turbofan engines were soon alleviated. The aircraft was introduced to the Air Attack crews at Williams Lake in late April of that year. Birddog 50 continued in the birddog role for a number of seasons in B.C.



Figure 53: Ontario CL215 T262 departs Penticton for action on the Garnet fire (in the early stages) late July 1994



Figure 54: Pilot Graham Stroud (center) with Birddog 50 and flanked by B.C. Air Attack Officers - Williams Lake April 1995.



Conair also introduced the Turbo Commander to the B.C.F.S. that season. In mid September a U.S. registered Jet Prop 840 was flown to Abbotsford and Kamloops for flight demonstrations in the birddog role. Similar to the Turbo Commander 690, the aircraft performed very well in the low level role with excellent cruise speed and visibility from the cockpit. Today the Commander 690 remains the backbone of B.C.'s birddog fleet.



Figure 55: Jet Prop 840 at Kamloops Sept 19th 1995

Fire numbers for the next two seasons were half of the 10 year average. In 1997 Conair proposed substituting two Firecats with a pair of Air Tractor 802F's for trial. The turboprop 802 has a constant flow 3025 (666 imp. gal.) tank. It's performance allowed it to operate from shorter airstrips where it could work with mobile retardant bases. Tankers 78 and 79 joined the two Kamloops Firecats that season and the 802s also worked from the Lillooet forward base in early August.



Figure 56: AT802F Tanker 78 Abbotsford August 1997

The AT802 continues to be a part of the provincial fleet today.



Figure 57: 802 Tanker 79 Lillooet Forward Air Tanker Base August 1997



The highlight of the 1998 season was the first operational use of the Canadair CL415 scooper in B.C. Following increased fire activity in the Kamloops Fire Centre area, a pair of Quebec CL415's arrived in Kamloops in late July. Providing fire support in the Shuswap lake area, the pair were teamed with an Aerostar birddog and initially day-based at the Salmon arm Airport. They eventually remained in Kamloops and by mid August had actioned 14 fires in the Kamloops, Kelowna, Shuswap and Revelstoke areas flying over 200 hours and nearly 1000 loads. They were joined by the Martin Mars in early August which was based for a period of time on the west end of Shuswap Lake.

Hawaii Mars  
LYL flew an  
additional 120  
hours  
providing  
support on  
several fires  
in the Kamloops  
and Salmon  
Arm area.  
1998 was to  
be the last  
season for the  
DC6 contract in B.C.



Figure 58: CL415's T240 & T242 with Aerostar birddog 21 and F.I.F.T. Grumman Goose birddog C-FVFU - August 3<sup>rd</sup> 1998, Salmon Arm Airport



Figure 60: Hawaii Mars LYL drops on the top of Greenstone Mt. near Kamloops protecting a host of communication towers and equipment - August 5th 1998



Figure 59: Tanker 242 "on the scoop" Shuswap Lake

In the fire world, the decade closed with a whimper. Fire numbers and area burned in 1999 were less than half of the 10 year average. Events in B.C.'s air tanker world however, rolled along.

Conair, in joint venture partnership with the B.C.F.S., also developed an L188 Electra with a 12 door compartmented tank. Tanker 53 was online that summer based out of Abbotsford. Also that year Conair, partnered with Kelowna Flightcraft Ltd., proposed the development of the twin engine Convair 580 air tanker. A flight evaluation with a non-tanked 580 was undertaken by the Forest Service, Conair and Kelowna Flightcraft in September. Results were very encouraging and the program continued through the fall and winter with the development of the new RADS II constant flow tank.



Figure 61: Conair L188 C-FZCS Tanker 53 Abbotsford 1999

### **2000's – the Rest of the Story**

The introduction of the Convair 580 into B.C.'s fleet in 2000 solidified the province's aircraft types for the next decade and beyond. Tankers T44 and T55 were online that summer and provided assistance in a busy period in the Southeast. Ownership of Electra T 53 transferred to Airspray in March and assisted there as well, now as T87 - still with the compartmented tank.



Figure 62: CV 580 flight testing over the recently burned Mt. Ida near Salmon Arm - Sept. 10th 1999



Figure 63: CV580 Tanker 44 and Airspray Birddog 51 - Castlegar Aug. 2000



B.C.'s contract fleet in 2002 included 3 Electras, 2 CV580's, 6 Firecats and a pair of AT802's. If there were major trends that developed through the 2000's they would arguably include the effects of climate change, global warming and pine beetle on fire behaviour and suppression. An agency's resources and fire suppression capability could quickly become severely taxed. This decade saw a marked increase in interagency exchange of ground and air resources in Canada.

The 2003 season would go down as one of the worst in the province in terms of cost and damage to property. Fixed wing air tankers and birddogs flew over 8,300 hours delivering over 26 million litres of long term retardant and 34 million litres of various suppressants on fires. Eight different tanker types were active in the province that season. CV 580, Firecat, DC6, CL415, AT802 and A26 types were brought in to assist from out of province. Both Martin Mars scoopers flew a total of 272 hours for the Forest Service.

One new tanker type was trialed that year. The amphibious Air Tractor 802 Fireboss was introduced in mid-July and worked mainly in the Revelstoke / Kamloops area in the landbased retardant and scooper roles.



Figure 64: New Brunswick F.P.L. AT802 Tanker 21 being loaded at Abbotsford July 2002



Figure 65: Yukon DC6 Tanker 50 - Penticton 2003



Figure 66: Fireboss Tanker 82 loading at Revelstoke Aug. 19th 2003



At the peak of the season 39 aircraft were operational in a firebombing role in the province. As a result, the B.C.F.S. was able to supplement the contracted fleet with an additional two CV580's and birddog in 2004. Air tankers from Ontario, New Brunswick, Alberta and Quebec also assisted in B.C. that season. With the exception of 2006, the next several years were relatively quiet. The B.C. fleet configuration remained the same through 2009. That year was the final one for the contracted Firecats which served the province admirably for three decades. The six aircraft were replaced by an Electra and two AT802's in 2010.



Figure 67: Conair CV580 Tanker 54 containing a fire near a satellite communications site at Lake Cowichan - April 2004



Figure 68: Alberta AT802 Fireboss crew at Quesnel Aug. 2009



Figure 69: Firecat T76 drop Cariboo 2006

Conair's "new" L188 Tanker 460 initially arrived with a standard 12 door drop system while a new tank concept was being developed. By July 2011 the tank was complete and on line at Abbotsford.

The unique RDS (Retardant Delivery System) constant flow tank is a 12,500 litre (2750 imp gal) four door system providing exceptional flow rates and increasing volume by 10%.

By 2011 the B.C. Air Tractor group consisted of four new generation AT802 aircraft with upgraded power plants (increase of 175 hp). An improved tank gating

system also increased flow rates and retardant coverage levels.



Figure 70: Conair L188 T460 with new RDS tank – Dewdrop Kamloops Sept. 2011



Figure 71: New generation AT802 T97 returning to Castlegar from a target near Cranbrook. Pilot Tom Zurowski at the helm – August 2011

The 2011 season was one of the quietest in history. The Provincial Air Tanker Centre may have set a record with the number of air tanker practices conducted during the season. Activity did pick up somewhat in early September in the Southern Interior.



Figure 72: Airspray's Electra T89 departs Penticton for a target to the north - Sept. 10th 2011



## **Appendix**

### **About the author**

Gord Bell started with the B.C.F.S. in 1972, retiring after 35 years in 2007. He spent 25 of those years dedicated to aviation programs as Air Attack Officer in Kamloops and Superintendent Flight Operations and Aviation Management with the Protection Branch / Program in Victoria. He has been involved with aviation history and a member of the British Columbia Aviation Museum for a number of years. He remains active as an Air Attack Officer with the Provincial Air Tanker Centre.

### **Acknowledgements**

Photos: The majority of the photos used were from the author's collection. Figure 3 is courtesy of the collection of Charles Ford. Chuck flew with B.C. Airlines and is a coastal aviation historian. Figures 3, 8, 11, 12, and 25 identified by a call number such as NA - ##### are courtesy of the British Columbia Museum, B.C. Archives. Figure 70 courtesy of Ed Lussier – Provincial Air Tanker Centre.

Individuals: (verbal and written information): Dave Langridge (B.C.F.S. Protection Program - retired), Jeff Berry (Superintendent Air Tanker Operations - Provincial Air Tanker Centre), Ray Horton (Director of Operations – Conair Group Inc).

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## **Dedication**

This paper is dedicated to the 31 crewmembers who lost their lives in 19 accidents between 1960 and 2010 in B.C. associated with the air tanker program. The names, dates and other details can be found on the Canadian Fallen Firefighters Foundation (CFFF) website <http://www.cfff.ca/>