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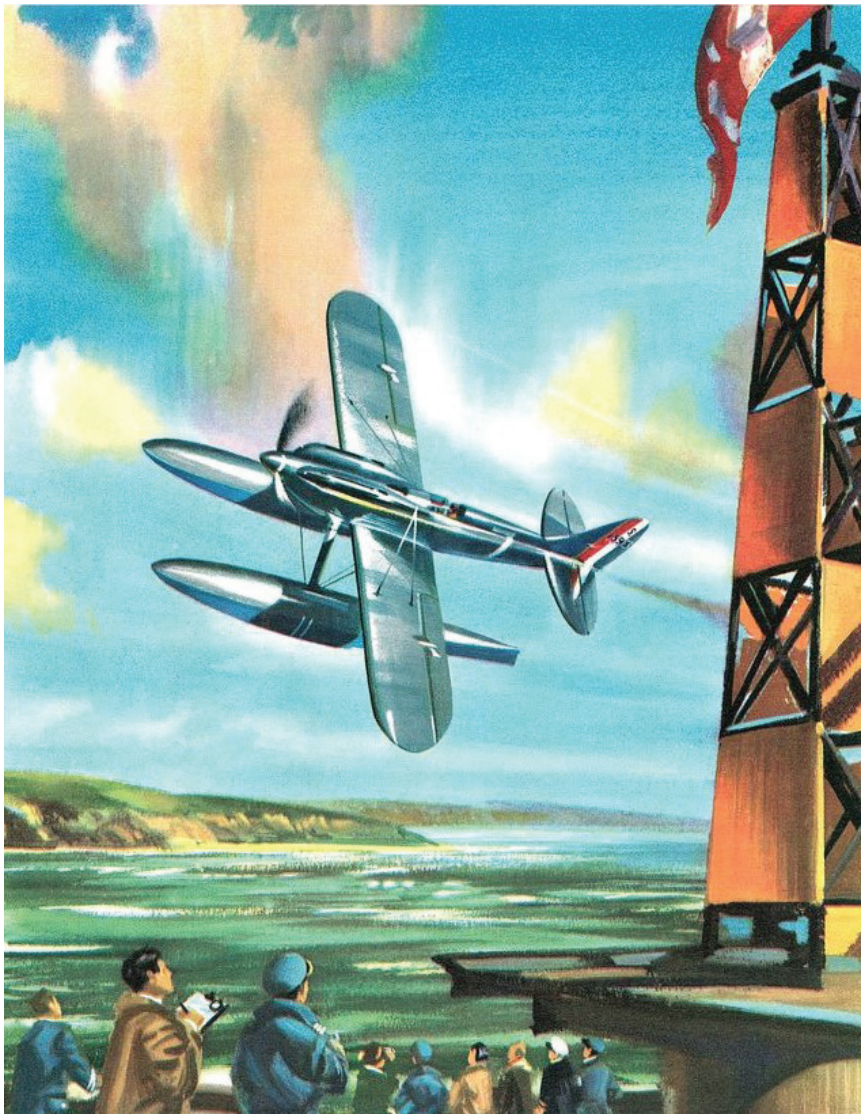
Flypast

Newsletter of the CAHS Toronto Chapter
A division of The Canadian Aviation Historical Society
www.cahs.ca/chapters/toronto

CAHS Toronto Chapter Meeting

Saturday March 3, 2018
1:00 PM



CANADIAN FORCES COLLEGE

215 Yonge Blvd. at Wilson Avenue, Toronto
(Lt. – Gen Guy Simonds Auditorium – Ground Floor)

Speaker: Martin Keenan, Historian

Topic: *The Golden Age of Seaplane Racing*

Illustration Courtesy - Wikipedia

February 3, 2018 Meeting

Speaker Ken Swartz
Photo Credit -www.gusair.com

Topic: *Canadian Aircraft Manufacturing in the Modern Era*
Speaker: Ken I. Swartz
Reporter: Gord McNulty

It was a pleasure to introduce a friend and colleague in the Toronto Chapter. Ken Swartz, a native of Vancouver, is an award-winning corporate communicator, international marketer and one of Canada's leading aerospace photojournalists. Ken has reported on the Canadian aerospace and helicopter scene for leading aviation magazines since the mid-1970s. His stories have appeared in trade publications in Canada, the U.S. and Europe. Ken's business career has included senior international marketing and corporate communications positions at Bombardier Aerospace, Air Canada Regional – Air Toronto, and EXPO '86, the World's Fair of Transportation and Communications. A marketing and communications expert, he has a strong track record for developing creative programs. In 2010, Ken received the Helicopter Association International's Excellence in Communications Award in Houston, Texas. The award recognized lifetime achievement in creative dissemination of news and information on the international helicopter industry. Ken's comprehensive presentation featured many PowerPoint slides and video clips to showcase the impressive aircraft and aviation milestones that have made Canada a world leader in aerospace. Focusing mainly on the period from 1980 until today, Ken underlined the diversity and scale of our state-of-the-art aircraft industry.

The success stories are exemplified by Viking Air. Based in B.C. with manufacturing facilities at Victoria and Calgary international airports, Viking has prospered as a legacy builder of the Twin Otter Series 400 utility turboprop. Some of the fabrication is done in Victoria, with final assembly in Calgary at the former Dome Petroleum hangar. Components arrive from multiple places, with the wings coming from Victoria and some fuselage parts from Wichita. Original metal parts are substituted with composite parts such as doors. Entrepreneur Sherry Brydson, a member of the Thomson family, is the main financial backer of Viking.

Bombardier CS100 at Mirabel Airport
Photo Courtesy - Patrick Cardinal - Bombardier

Bombardier's C Series, the most expensive civil aircraft program ever undertaken in Canada, likewise features a diversified component and production chain. Final assembly is at Mirabel. Wings come from Belfast while parts of the fuselage come from China, with a second line at the Cartierville plant until the Chinese get up to speed. The landing gear is supplied by Liebherr Aerospace in Germany. The engines are Pratt and Whitney 1500G turbofans, a program involving Pratt and Whitney operations in both Canada and the U.S. There is a large engine assembly facility at Mirabel adjacent to the Bombardier complex. There are currently three operators of the C Series: Swiss, Air Baltic, and Korean Airlines. The production rate for this year is 60 aircraft. Of course, Bombardier recently had a major victory in the trade dispute with the US, but they are opening a second fabrication line in Mobile, Alabama.

Whether it's a Bombardier or a Viking factory, you don't hear the once -familiar rivet guns. Riveting is mostly done at sub-contractors.

A Twin Otter using the beach at low tide as a runway at Barra Island Scotland

Ken noted the aircraft industry on the West Coast basically died at the end of the Second World War when Boeing of Canada closed production of the Canso. Trident Aircraft was formed in 1970 at Vancouver to build the Trigull amphibian as a Republic Seabee replacement, but never achieved production. Canada's most widely produced aircraft in the past 30 years, the Bombardier CRJ family, is now approaching sales of more than 1,900 aircraft in four different models. It has exceeded the de Havilland DHC-2 Beaver, of which 1,657 were built. The CRJ family included 1,100 Challengers originating with the CL-600 series. Lesser known, but significant, are more than 1,500 Bell 407 helicopters built by Bell Helicopter Textron Canada at Mirabel, and more than 1,000 DA20 light composite aircraft produced by Diamond Aircraft based at London, ON. Our industry has prospered with Canadian/American collaboration since the early days of the Aerial Experiment Association with leaders such as Alexander Graham Bell, J.A.D. McCurdy, Casey Baldwin, Thomas Selfridge and Glenn Curtiss. In the 1980s, major international corporations established operations in Canada, such as Texas-based Bell Helicopter, German helicopter manufacturer Messerschmitt Bolkow-Blohm and then Austria-based Diamond Aircraft. One manufacturing complex that has stood out through the decades is the Downsview site of Bombardier Aerospace, which purchased de Havilland Canada in 1992. In March, Bombardier will celebrate the 90th anniversary of Havilland at Downsview.

Our current industry was shaped by the fact that both de Havilland and Montreal-based Canadair Ltd. were foreign controlled in the 1970s. Neither Hawker Siddeley, owner of DHC, nor General Dynamics, owner of Canadair, invested in new aircraft. Canadair became the core of Bombardier when it was sold in 1986. Canada's industry would evolve to get a new lease on life with next-generation aircraft, reflected in a stream of business aircraft and regional aircraft. De Havilland began to focus on the inter-city and short-haul commuter market with the Dash 7 and Dash 8 series of turboprops. The Dash 8 prototype first flew in May 1983. As Canadair's fighter jet production lapsed, the company concentrated on the Challenger as a long-range, high speed business jet. The regional market that Canadian companies entered was highly competitive. The presence of government-funded rivals such as Fokker, SAAB and ATR created pressure to offer prices at rock-bottom prices to attract sales.

In the 1990s, the Found Brothers FBA-2 utility aircraft re-emerged as the FBA-2C Bush Hawk. However, greater success was achieved in B.C., when Viking Air took over the hangars at Victoria Airport in the 1960s and began servicing Grumman flying boats. In the 1970s, it picked up all of the de Havilland Beaver and Otter original tooling and spare parts and became a supplier on the Twin Otter. In 2006, it acquired the type certificates for the production of all DHC designs and restarted production of the Twin Otter Series 400 in 2007. The first prototype for the Twin Otter Series 400 was a rebuild of a wreck. The Series 400 is the best-selling utility turboprop on the market today. More than 125 have been sold to 29 countries

worldwide, building on the achievement of the original Twin Otter, of which 844 were built. A very interesting use of the Twin Otter Series 300 and 400 is by Loganair in scheduled service from Glasgow to the offshore Scottish Island of Barra. Carrier Loganair has 1400 flights annually to the island carrying 10,000 passengers by using the beach as a runway when the tide is out. When a strobe light flashes from the control tower… it means clear the beach! In 2016, Viking acquired Bombardier's CL-215T and CL-415 water bomber programs. There are 170 water bombers operating worldwide and Viking is actively marketing the CL-215T.

Eurolot.com Q400 *Photo Credit - Bombardier*

De Havilland, for its part, prospered with the efficient, widely popular Dash 8 regional turboprop airliner. After 1997, the aircraft was marketed with cabin noise suppression and the next-generation Q designation. Production of the Q100, Q200 and Q300 ended in 2008 and 2009. Fuel prices rose, some supplier relationships went astray and union issues were a factor. Bombardier exited the under 60-seat market and the floor space at Downsview was devoted to the Bombardier Global business jet and the Q400. Originally, the Q400 fuselage and tail were built by Mitsubishi Heavy Industries in Japan but they left the market. Today, the fuselage and tail come from China. The wings and the nose are built at Downsview. The production rate is relatively low, at under 30 aircraft. However, in September, the Indian airline, SpiceJet, ordered up to 50 high-density, 90-seat Q400s. The extra seating compares favourably with the rival ATR 72, which has 16 fewer seats. In January, Abbotsford, B.C.-based Conair ordered six Q400s to be converted into water bombers for the French Civil Defence Agency. The Q400 is also flown in Africa by operators such as Ethiopian Airlines.

DHC-8 Q400 Company Demonstrator Aircraft *Photo Credit - Bombardier*

Another huge success, the Bombardier Challenger business and commuter jet, has undergone many revisions to upgrade performance and comfort since the first flight of the original Canadair CL-600 prototype in 1978. The latest version, the Challenger 650, features a completely redesigned interior cabin, enhanced flight deck and other upgrades. The Canadair Regional Jet evolved as a derivative of the Challenger 600 and 601. It was a difficult market initially, because of the higher costs of a jet versus a turboprop. Funded by Bombardier, it was first delivered in 1992 to Lufthansa. The first customers in the U.S. were SkyWest and Comair, both prosperous, family-owned businesses and affiliated with Delta. Ken described the CRJ as a marriage of the airframe with the General Electric CF34 turbofan engine, which was progressively upgraded to allow stretched versions. However, as much as airlines and Bombardier might like to move higher capacity aircraft, they face seating capacity restrictions mandated by mainline airline pilots' unions in the U.S. market. As a result, any regional aircraft in North America today is a 76-seat aircraft. The CRJ 1000, first flown in 2009, has a capacity of 100 seats but can be flown only in Europe and Indonesia to date due to capacity restrictions mandated by union agreements outlined previously. Current production is primarily the CRJ900. The CRJ 1000 has been sold to three customers. A technical

innovation on the CRJ 1000 is the use of a fly by wire rudder. Bombardier is developing a new interior that will have larger overhead bins to increase the appeal of the CRJ series, a tremendous success around the world.

Bombardier CRJ900 in SAS Colours
Photo - Bombardier

Ken briefly described Bombardier's next generation C Series jetliner, first flown in 2013. Swiss, the launch customer, initially bought the CS 100 and has also bought the larger CS 300, of which Air Baltic was the launch customer. Just prior to Ken's presentation, Skies magazine published an excellent article by Ken: "On-time departure: The C Series in service." Bombardier's project strategy, outlined in 2011, focused on being first to market a 100- to 150- seat jetliner with the next generation geared turbofan engine. It was largely the new engine triggering a new clean sheet jetliner. None of the rival companies --- Boeing, Airbus or Embraer --- were interested in a re-engined aircraft at that point.

As with the Challenger and the Regional Jet, Bombardier's Global Express long-range business jet has undergone avionics upgrades since its first flight in 1996. The latest version, the Global 7000, is longer than the Global 5000 and 6000 models and has greater range and more cabin space. The fifth and final Global 7000 test vehicle completed its first test flight in January. The aircraft is sold out to 2021.

Meanwhile, Diamond has built more than 2,000 aircraft at London. During the Second World War, its plant was used to build de Havilland Mosquito fuselages. Diamond opened in 1993 as a Canadian unit of a company based in Austria that originally began with motor gliders. In Canada, production started with the single engine, two-seat DA20 Katana with a Rotax engine. Some flying schools weren't used to the slightly complex Rotax, so the DA20 was upgraded to a Continental engine. It also builds the four-seat DA40 Twin Star, makes airframes for the Dornier Seastar 12-passenger amphibian, and in the fall it began building the new twin-engine, seven seat DA62.

Describing helicopter manufacturing, Ken noted Canada is the second largest market for helicopters in the world. We traditionally imported more choppers than we produced and by the late 1970s, imports were growing by up to 18 per cent annually. In the 1980s, the federal government decided to focus on building light twin-engined helicopters in Canada. That brought two helicopter manufacturing facilities with Bell in Montreal and MBB in Fort Erie, both funded by various partners. In January, Bell achieved its 5000th delivery from Mirabel, a Bell 407 GXP. Those aircraft are sold all over the world. MBB became Eurocopter Canada and subsequently Airbus Helicopters Canada. The Fort Erie factory, located across the street from the original Fleet plant, has largely assembled broken-down aircraft in kit form from Germany, France and now the Airbus plant in Columbus, Mississippi. They also feed the supply chain with composite production. French helicopter sales in Canada began in 1958 with Aerospatiale Alouette turbine helicopters. MBB's Fort Erie production began with the MBB Bo 105 for the Canadian Coast Guard, just retired last year. The plant also assembled the twin-engined BK 117 utility transport helicopter jointly developed by MBB and Kawasaki of Japan and still in widespread use. At Fort Erie, regularly seen are aircraft such as the single-engined Airbus EC130 in service with the Ontario Ministry of Natural Resources and the EC120, production of which recently ended. The most advanced aircraft assembled at Fort Erie is the highly successful twin-engined EC135, in service with the OPP at Orillia since 2011.

OPP Airbus EC-135 Helicopters \
Photo Credit - OPP Headquarters

For its part, Bell made its very first helicopter sale, a Model 47, in Canada in 1946 to Toronto geophysicist Hans Lundberg. Bell established its Mirabel facility in 1986. Production peaked around 1993 when the company produced 275 helicopters in one year. Initial production, up to the Bell 412, focused on U.S.-produced aircraft. Production lines at Fort Worth, Texas, were physically transferred to Mirabel. Bell was ramping up on the V-22 Osprey and needed the factory space at Mirabel. Since then, production has included various models such as the Bell 230 twin-engined light helicopter --- a derivative of the Bell 220; the Bell 430 --- a stretched 230; and the very popular Bell 407, a four-blade, single-engine derivative of the 206 LongRanger. There is a developing market for the 407 as an Unmanned Aerial Vehicle for the U.S. Navy. The twin-engined Bell 429 Global Ranger can carry much heavier payloads and can serve as an air ambulance. The Canadian Coast Guard ordered 15 429s to replace its MBB Bo 105s.

Bell's latest aircraft, the 505 Jet Ranger X, the B206 Jet Ranger replacement, was certified in Canada last year. The company hopes to build 200 annually at Mirabel. Production of the Bell 212 twin-engined medium helicopter ended in the 1990s but the upgraded 412 remains in production. The Canadian Coast Guard is currently replacing its Bell 212s with more versatile, state-of-the-art Bell 412EPI helicopters featuring digital glass cockpits and carrying up to 13 passengers. Ken noted that as much as 98 per cent of the production at Mirabel --- except for the military CH-146 Griffon --- has been for export. Canadian companies tend to buy used helicopters or, possibly, higher performance Airbus products. Future projects at Bell may include development of an electric-powered aircraft, a concept that's also being watched closely by numerous companies. Last but certainly not least, Pratt and Whitney Canada is an important part of the story, supplying renowned engines for decades in partnership with Bombardier and DHC, Bell and MBB.

To highlight the diversity of aircraft manufacturing in Canada, Ken mentioned kit aircraft companies. Zenair, based in Huronia, began in the mid-1960s and has a secondary company in the U.S., Zenith. The Chilliwack-B.C.-based Murphy Company is also building kit airplanes for amateur construction.
Ken, in closing, expressed concern that many of the prototype aircraft developed in Canada are not in Canadian aviation museums. The CAHS, he suggested, should consider urging the Canadian aerospace industry to ensure that prototypes are preserved in collections as opposed to being shipped out of the country or scrapped. Ken received a gift on behalf of the Chapter in appreciation of his outstanding presentation.

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Chapter News & Views March 2018

One Hundred Flypasts!
As of January 100+ previously issued Flypasts have been posted to the Chapter website. Enjoy reading or downloading them at www.torontoaviationhistory.com/flypast-newsletters/

Notice to Members
If your Flypast Expiry Number ends in "17" your membership dues are in arrears. Please notify the Membership Secretary of your intentions. Thank you.

CAHS Moments in History *by Contributing Editor Geoff Pyne*

A new feature in "Flypast". In each issue 2- 3 months of moments in Canadian aviation history will be recognized. In this issue, a few highlights from the months of February and March are remembered.

The crew of the record-breaking Buffalo after completing the climb-to-height record on February 16, 1976. Barry Hubbard, Tom Appleton and Bill Pullen. (DH 43343)

On February 16, 1976, a de Havilland Buffalo (s/n 60) C-GBUF-X entered the history books by breaking six FAI "Time to Height" records.It took only 2 minutes 12.75 seconds to climb to 3,000 metres (9,800 feet), 4 minutes 27.5 seconds to 6,000 metres (19,700 feet) and 8 minutes 3.5 seconds to reach 9,000 metres (29,500 feet). Two of those records still stand today.

This flight broke 3 records in each of two categories: turbo-prop "unlimited class" and turbo-props in the 12,000 - 16,000 kilogram class.The complete flight, from brakes off to touch-down, took a total of only 17 minutes! The flight was crewed by Tom Appleton (Pilot), Bill Pullen Sr. (Co-pilot) and William Barry Hubbard (Flight Engineer).

February 21, 2001 was the date of the first flight of the Bombardier CRJ-900. The CRJ900 is a stretched 76–90 seat version of the CRJ700. The airplane is loosely based on the CRJ200 series with a few major improvements. The first CRJ900 (C-FRJX) was modified from the prototype CRJ700 by adding longer fuselage plugs fore and aft of the wings. Mesa Air Group was the launch customer for the CRJ900 painted in America West livery. The FAA Type Certificate designation of the CRJ900 is the CL-600-2D24. (ref: Wikipedia)

A date remembered by so many - March 25, 1958, the historical first flight of the Avro CF-105 Arrow with Jan Zurakowski at the controls. Flight testing began with RL-201 and the design demonstrated excellent handling and overall performance, reaching Mach 1.9 in level flight. Much has been written about this controversial project, which will not be repeated here, except to recognize this impressive feat of advanced aeronautical engineering.

Another Canadian innovation, a 4-engined STOL 50 seat airliner, the DHC-7 "Dash 7" first flew on March 27, 1975, as C-GNBX-X in a vivid red and yellow colour scheme. Piloted by Bob Fowler and Mick Saunders, with Jock Aitken and Bob Dingle at the flight test engineer stations, the aircraft soon demonstrated the remarkable short take-off and landing capability. The first customer, Rocky Mountain Airways, used the performance extensively on their scheduled operations. However, due to the changing market requirements and the cost of operating with four engines, only 113 Dash 7s were produced, but many remain in service today. The prototype is on display, in a later colour scheme, at the Canada Aviation and Space Museum, Ottawa.

More next month…..!

Bell 505 JetRanger X, the B206 JetRanger replacement, was certified last year
Photo Courtesy - Bell Helicopter

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Contacts

President: cahsnatmem67@sympatico.ca
Tel: (416) 923-3414

Websites: www.cahs.ca/chapters/toronto
www.torontoaviationhistory.com

Canadian Aviation Historical Society - Toronto Chapter

Mailing Address: Canadian Aviation Historical Society,
Toronto Chapter
65 Sussex Avenue
Toronto, Ontario
M5S 1J8