

# Aerospace

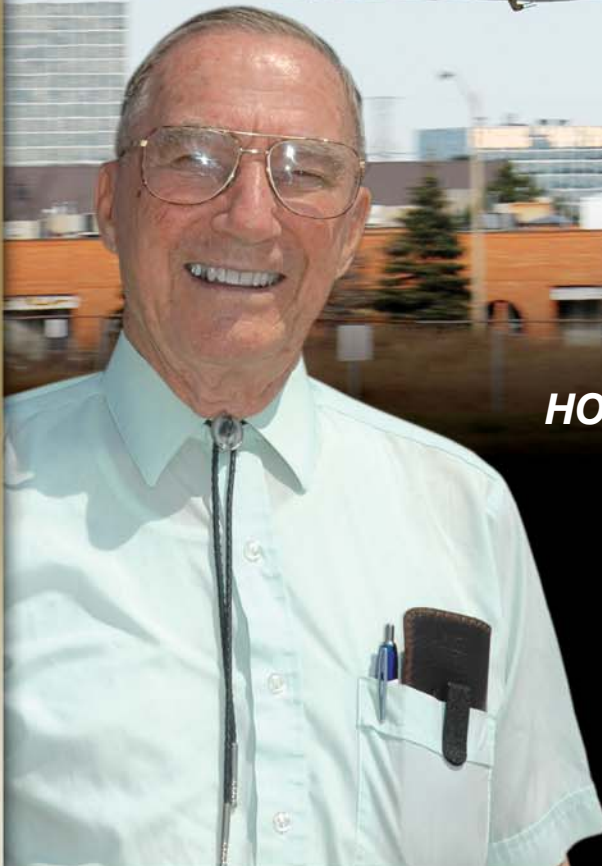
\$3.50

## Newsletter

Fall 2008



**VIKING  
DHC-6 TWIN OTTER  
FIRST FLIGHT**



**1937 D.H. 87B  
HORNET MOTH ARRIVES**

**George Neal  
Celebrates  
90<sup>TH</sup> Birthday**

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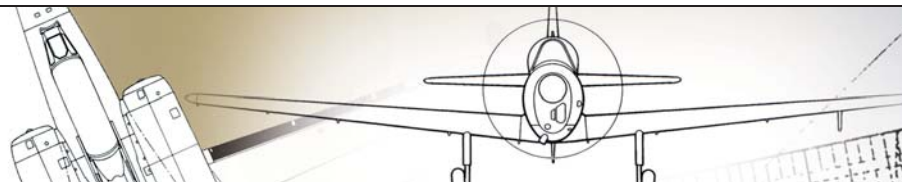
AVRO ARROW  
EJECTION SEAT



TORONTO  
**AEROSPACE**  
MUSEUM  
DOWNSVIEW PARK

Toronto Aerospace Museum,  
Downsview Park, 65 Carl Hall Road,  
Box 1, Toronto, Ontario M3K 2E1

[www.torontoaerospacemuseum.com](http://www.torontoaerospacemuseum.com)



## NEW MEMBERS JUNE - OCTOBER 2008

Bora Akar, Harvey Bisgould, Christopher Bosy, Ka Yip (David) Chan, Werner Cleminson & Irene Ketelsen, Raymond Connors, Gustavo Coryo, Derlick Family, Murray Duncan, Edwin Echavarria, Steven Forsys, Winston Fullinfaw & Caroline Taylor, Peter Juhasz, Sophia Kaznadiy, Mobeet Khan, Heon Ju Lee, Jason Lorbetkskie, Barry Lubek, Yonatan Lubensky, Wilf Mandel, Joseph Marianayagam, L. Masou, Christine, Duncan & Andrew McEwan, Martin, Kirby & Sarah McLean, Greg Mozesson, Alex Norton, Sean, Frances, Paul & Patricia O'Ryan, Mr. Perch, H. Garth Perkins, David Reppen, Tom Richmond, Barbara Sadegur, Jeremy Santos, Cheryl Ann & William Scott, Donald Shehy, Leo Simard, David Surry, John Walmsley, Dan Willison, John Wong, and Emilia Ziemba.

**Cover Photo:** Hornet Moth C-FEEJ lands at Downsview on Nov 1, photo Eric Dumigan. George Neal photo by Ken Swartz. Twin Otter photo by Viking Air.



*Kenneth Swartz, Editor*

### NEWSLETTER EDITORIAL COMMITTEE:

Wayne Barrett, Richard Banigan, Sue Douglas, Robert Cohen, Claude Sherwood and Kenneth Swartz.

### PHOTOGRAPHERS:

Eric Dumigan, Andrew Cline, Don Lawrence, Brian Quan, Kenneth Swartz, Gary Tahir and Parr Yonemoto.

### DESIGN AND PRODUCTION:



[altitudegraphics.com](http://altitudegraphics.com)

## CORPORATE MEMBER



## MUSEUM INFO

Toronto Aerospace Museum  
 Downsview Park  
 65 Carl Hall Road, Box 1  
 Toronto, Ontario M3K 2E1  
 Tel: **416-638-6078**  
 Fax: **416-638-5509**  
 Web site: [www.torontoaerospacemuseum.com](http://www.torontoaerospacemuseum.com)  
 E-mail: [tam@bellnet.ca](mailto:tam@bellnet.ca)



### HOURS

- Wednesday 10 a.m. to 8 p.m.
- Thursday through Sunday 10 a.m. to 4 p.m.
- Open Holiday Mondays 10 a.m. to 4 p.m.
- Closed Christmas Day and New Years Day
- Closed Monday & Tuesday during winter except by appointment

### ADMISSION PRICES

- TAM Members FREE
- Adults (+18) \$8.50
- Seniors (+60) \$6.50
- Students (with ID) \$5.50
- Family (2 adults & 2 students) \$21
- Children under 5 FREE
- School Groups and Groups of 10 or more, please contact John Harper, Education Director at Tel: 416-638-6078, Fax: 416-638-5509, or E-mail: [tam@bellnet.ca](mailto:tam@bellnet.ca)

### MUSEUM MEMBERSHIP

- INDIVIDUAL**  
 One Year \$30 – Two Year \$50
- FAMILY (2 ADULTS & 2 CHILDREN)**  
 One Year \$50 – Two Year \$80
- SENIOR (65+)**  
 One Year \$25 – Two Year \$40
- STUDENT**  
 One Year \$15 – Two Year \$25



## BOARD OF DIRECTORS 2008 - 2009

### PATRONS

The Honourable David C. Onley  
 Lieutenant Governor of Ontario

### ELECTED BOARD:

Wayne Barrett, Chairman  
 Frank Gaspar, Vice Chairman  
 Lyle Abbott  
 Richard Banigan  
 Marvin Cohen  
 Bill Killough  
 Barry Lubek  
 James Montgomery  
 Albert Peres  
 Kenneth Swartz



Robert Murphy, Past Chairman

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Tom Bozanin  
 Representing de Havilland Retirees' Association

Lance Kessler  
 Representing Bombardier Aerospace (Downsview)

Tim Patten  
 Representing Aerospace Heritage Foundation of Canada (AHFC)

Bob Singleton  
 Representing Parc Downsview Park Inc. (PDP)

George West  
 Representing for Canadian Armed Forces

### MUSEUM MANAGEMENT 2008 - 2009:

Claude Sherwood, Chief Executive Officer  
 Greg Mozesson, Treasurer  
 Paul Cabot, Manager/Curator  
 Sue Douglas, Director of Fundraising and Marketing  
 John Harper, Director of Education Programs  
 Natasha Bowes, Museum Administrator  
 George West, Administrative & Safety Officer  
 John Kozak, Gift Shop Manager

### COMMITTEES - CONTACTS

**EXECUTIVE COMMITTEE:**  
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**FINANCE COMMITTEE:**  
 Ed Rotman, Treasurer

**COLLECTIONS MANAGEMENT COMMITTEE:**  
 Paul Cabot, Manager/Curator

**EDUCATION COMMITTEE:**  
 John Harper, Director of Education Programs

**DISPLAYS COMMITTEE:**  
 Claude Sherwood, CEO

**FUNDRAISING COMMITTEE:**  
 Lyle Abbott & Richard Banigan

**MARKETING COMMITTEE:**  
 Robert Cohen

**NEWSLETTER COMMITTEE:**  
 Kenneth Swartz & Richard Banigan

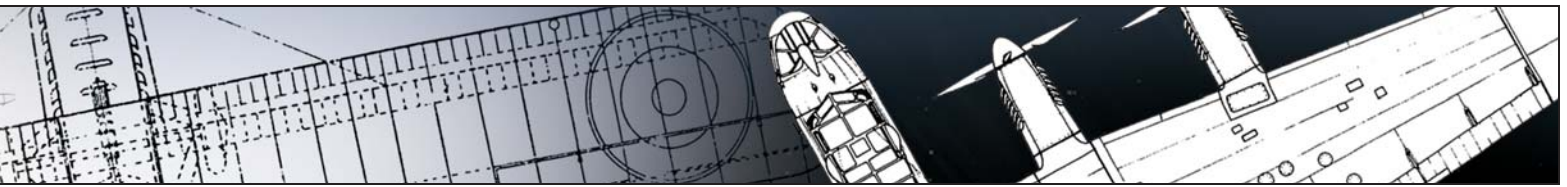
**MEMBERSHIP COMMITTEE:**  
 TBD (Volunteer opportunity)

**OPERATIONS COMMITTEE:**  
 Peter Uus, Member

**DATA & SYSTEMS COMMITTEE:**  
 Brian Quan & Ken Dugdale

**VOLUNTEER COMMITTEE:**  
 Natasha Bowes

**HEALTH, SAFETY & SECURITY COMMITTEE:**  
 Mike Holland



## CHAIR'S MESSAGE



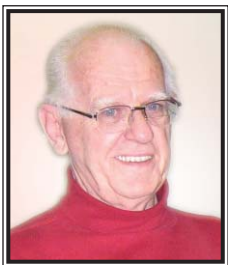
As we pass the mid-point of the 2008-2009 fiscal year, I'm proud to report that the Museum Board of Directors is pushing forward with a number of major development initiatives.

The core of any museum is its collection. Recently, the museum purchased a 1937 de Havilland D.H. 87B Hornet Moth from local aviation pioneer George Neal. We're honored that Mr. Neal selected our museum to showcase this rare aircraft. Similar to Hornet Moths assembled at Downsview in the 1930s, C-FEEJ was lovingly restored in the 1970s.

Another exciting recent acquisition is one of the very few surviving Martin Baker Mk. 5 ejection seats built for the Avro Arrow. As most readers know, the Museum isn't flush with money, so additional funds must be raised to complete the acquisition of these artifacts.

A number of fundraising initiatives are underway, celebrating the 50th anniversary of the Avro Arrow, including an recreation of an official 1958 Arrow model created by Avro for presentation to VIPs in 1958, and a new commemorative AGS automatic watch. Both these programs are led by Rob Cohen and his company.

## CEO REPORT



The Toronto Aerospace Museum is moving forward with a growing membership, increased museum visits and Runway 33 gift shop sales.

The biggest challenge we face today is filling the many volunteer positions essential for day-to-day operations and upcoming special events and projects.

Please consider becoming more active in your Museum as a volunteer. Your hands-on contribution will make a huge difference, even if you have only a few hours to spare each week. The time to volunteer is NOW!

For those Arrow fans interested in something different, we also have specially inscribed bricks recovered from the original Avro Administration building that was demolished at Malton two years ago.

As of March 31, 2009, the Museum's Strategic Alliance Agreement with Parc Downsview Park Inc. (PDP) will come to an end. While the alliance provided the museum with a unique opportunity to build its business, it has also limited the Museum's ability to tap into provincial grants and private funding that would have facilitated even greater growth during the past six years.

Negotiations are now underway with PDP to craft a lease for our facility which is both manageable for the Museum and fair for the Park. Failure to reach a lease agreement is not an option.

The Board recognizes that moving to a full lease will bring some financial pressure to our organization. In preparation, considerable management time is being directed to streamlining day-to-day operations and improving on all revenue opportunities.

It has long been recognized that a capital fundraising campaign is essential to sustain the Museum and build for the future. To kick-start these efforts, in October we contracted Susan Douglas, a seasoned marketer and fundraiser. Her background includes 25 years in advertising, marketing and fundraising. Please join me in welcoming Sue to the Museum team!

Canada was the third country in the world to place a satellite in orbit, and Canadians have long played a leading role in the development of space technology and advancing space exploration. To give the Space theme of the Museum a much greater profile, the

In 2009, the Wings and Wheels Heritage Festival will celebrate Canada's Centennial of Flight. It is our goal to mount a major aviation exhibition, but we need a strong volunteer team in the cockpit to take this exciting event to new heights.

The Festival simply cannot reach its potential without greater participation from the membership. Our paid staff is fully-engaged in daily operations, so we need a volunteer team to manage the 2009 Festival. Please contact Paul Cabot Curator/Manager if you can play a leadership role.

As mentioned in the Chair's Report, the Museum was privileged to contract Sue Douglas to launch our first capital fundraising campaign. Her many skills and talents will be fully employed by the Museum for the next six months. The Fundraising Committee, Board and consultants have identified her priority projects and fundraising targets.

Year-end donations support important educational programs, new exhibits and on-going operations. Please make a generous donation to the Museum and receive some tax relief for 2008. A donation card and return envelope is enclosed with this newsletter.

Board is pleased to announce the appointment of Robert Godwin as our new Space Curator.

Robert is the owner of CG Publishing of Burlington, which through its imprint Apogee Books, is the world's number one publisher of Space books. He is a publisher of the autobiographies of many astronauts and space pioneers and has appeared on dozens of radio and television programs in Canada, the USA and the UK as an expert on space exploration. We look forward to Robert's leadership guiding the development of our Space galleries and theme.

In October, we filled the two vacancies on the Board with the appointment of Barry Lubek and Marvin Cohen as new Directors. One of these vacancies was created when Billy Lowe stepped down as a Director in the summer for personal reasons. We thank him for his contributions.

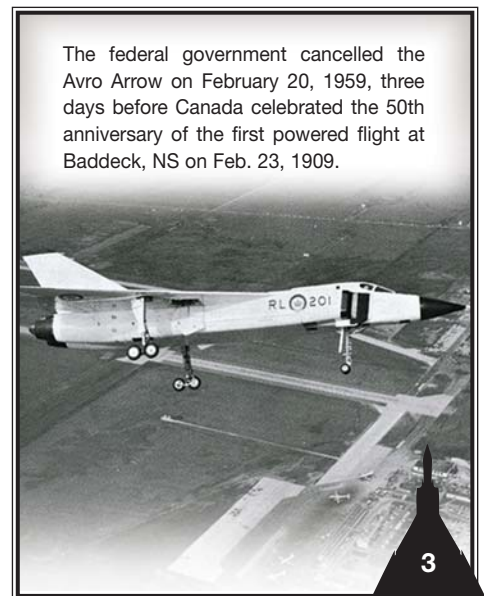
On behalf of all members, I would like to extend a very sincere thanks to Ed Rotman who retired in November as the Museum's long-serving Treasurer. Ed made a major contribution to the professionalism of the museum. We wish him our very best wishes as he begins a new life adventure with a new bride.

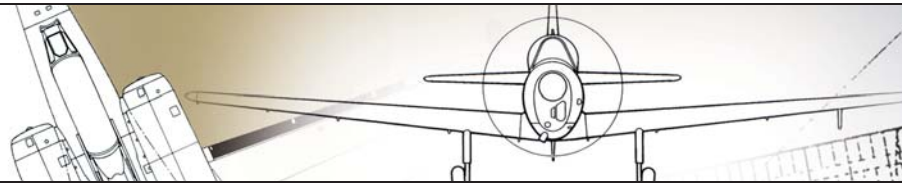
Greg Mozesson is the Museum's new Treasurer. He is a Chartered Accountant presently working at Chief Accountants Division at CIBC. In the past, Greg has extensive experience in audit and advisory capacity at several major Canadian financial institutions. His interest in aviation began at an early age, fueled by his grandfather's airplane modeling hobby.

**WAYNE BARRETT, CHAIRMAN**

I hope to see many of you at the Members' Holiday Party and Christmas Dinner on December 10th.

**CLAUDE SHERWOOD, CEO**





# MUSEUM ACQUIRES RARE D.H. 87B HORNET MOTH



The first Canadian D.H. 87A Hornet Moth, CF-AVH, on skis with the original tapered wings, circa 1935. Jack McNulty Photo

De Havilland's 1933 D.H. 87 Hornet Moth was intended to be an improvement on the open cockpit D.H. 60 Gipsy Moth, featuring an enclosed and heated cabin with side-by-side seating.

This cockpit layout was considered superior for use (add in) private planes, trainers and light airliners, although producing slightly more drag.

The Hornet Moth was smaller, lighter, slower, and less expensive than the earlier de Havilland D.H. 80 Puss Moth and D.H. 85 Leopard Moth high wing cabin monoplanes, with the same 130 hp Gipsy Major engine. The first D.H. 87 was test flown by Geoffrey de Havilland on May 9, 1934 at Hatfield, England.

Prototype testing revealed some problems with the rounded wingtip design, so a new longer, tapered wing was introduced for the D.H. 87A production model. This new wing gave a better cruise speed of 111 mph, but tended to drop a wing near the stall. Consequently, by 1936 a safer third wing design was introduced for the D.H. 87B. Model 87A owners were offered this final wing design as a retrofit. All versions had folding wings.

An unusual feature of the Hornet Moth (also found on the Puss Moth and Leopard Moth) was a streamlined fairing on both independent undercarriage legs that could be rotated 90 degrees to act as an air brake. Since these aircraft had no flaps, the movable fairings were needed to steepen the glide for landing. The aim was to achieve a general aviation aircraft design for novice pilots that would have excellent handling characteristics. The seaplane version had enough drag and did not need this feature.



A centrally mounted control column was split into a V so that each pilot had a control. Construction of the fuselage was mixed steel tube and wood, with doors on both sides. The wings

and tail were all wood, fabric covered. There was enough spare room for luggage or a limited amount of cargo. A 36 gallon fuel tank behind the cockpit gave the aircraft a range of 620 miles.

Cruising speed for the D.H. 87B was 105 mph (95 mph for the seaplane), top speed 124 mph (105 mph for the seaplane).

The Great Depression and imminence of war certainly limited Hornet Moth production in the mid-1930s. Another factor, very well known to de Havilland engineers, was that the age of the biplane was over.

Only 165 Hornet Moths were built and they were sold all over the world. At least five D.H. 87 Hornet Moths are still flying in England, and a handful more in other countries.

### Canadian Service

Ten Hornet Moths (two D.H. 87A models and eight D.H. 87Bs) were sent by ship and rail in crates to the de Havilland Canada factory at Downsview between 1935 and 1938, initially listed for only \$4,500 (floats and skis extra).



D.H. 87 Hornet Moth, CF-AVH, now with square wings, seen in Hamilton January 20, 1939. Jack McNulty Photo

One of the first, CF-AYI, was sent to Fairchild Aircraft Ltd. at Longueuil on the south shore of the St. Lawrence opposite Montreal for seaplane float development. Airports were still nonexistent in most regions of Canada and floatplanes had greater utility.

The demonstrator seaplane CF-BFJ sank at its moorings in Toronto Harbour in 1937, but was recovered, rebuilt and offered up for sale.

The largest Canadian customer was the Consolidated Mining & Smelting Company (Cominco) of Trail, BC which bought four Hornet Moths (CF-AYG, -BBE, -BFG and -BFH) to help search for mineral deposits in Northern Canada. Others flew with Brett Tretheway Mines (CF-AYI) and with Windsor-Chatham-London Coach Lines (CF-AYJ).

The Hornet Moth remained a superb little seaplane trainer for its time. Early in 1939, the British Air Ministry scooped up four (CF-AYI, -BFJ, -BFN and another still in its crate) and shipped them to Felixstowe, England to serve as seaplane trainers with the Royal Navy.

These aircraft received Ministry registrations P6788, P6785, P6786 and P8134 respectively. The Hornet's folding wings facilitated storage on a variety of ships. Two ex-Canadian Hornet Moths survived the war,

entering the British civil registry as G-AHBL (ex-CF-BFJ), and G-AHBM (ex-CF-BFN).

Another seaplane (CF-BKF) was drafted into the Royal Air Force as 5600 after the war broke out, serving with RAF Transport Command at North Bay, Ontario. After the war it became CF-DIP.

The last of Canada's original pre-war Canadian Hornet Moths were retired in the 1960s.



CF-AYI was the first Hornet Moth fitted with floats by Fairchild. It is pictured in Toronto Harbour on July 18, 1937. Jack McNulty Photo

An original Cominco DH 87A, CF-AYG, is preserved at the Reynolds-Alberta Museum in Wetaskiwin, Alberta.

### George Neal's Hornet Moth

D.H. 87B Hornet Moth, serial no. 8092, was built in England in 1937 and flew in the UK as G-AEET for more than 30 years.

A Second World War veteran, it became X9319 for a brief career in the RAF as a communications aircraft before being returned to de Havilland in 1942. Postwar, G-AEET had several private owners in the UK from 1948 to 1969.

George Neal, a de Havilland Canada test pilot, bought G-AEET in England and had it crated and shipped to Downsview where it was registered C-FEEJ in November 1969.



George Neal lands Hornet Moth C-FEEJ at Downsview on Nov. 1, 2008. Eric Dumigan Photo

Between 1972 and 1982, The Hornet Moth was completely overhauled, restored and painted green and cream. George Neal flew thousands of hours in the aircraft.

On Nov. 1, 2008 he took off in the aircraft from its long-time home at Brampton Airport and flew to Downsview Airport to deliver C-FEEJ to the Toronto Aerospace Museum collection.

The museum is honoured to be the permanent home of this rare and historically significant aircraft.

*Richard Banigan*



# GEORGE NEAL CANADIAN AVIATION PIONEER TURNS 90

George Neal is one of Canada's most distinguished test pilots and vintage aircraft restorers.



George Neal made the first flight of the DHC-3 Otter in 1951 and DHC-4 Caribou in 1958. Both were flown by the RCAF in the Sinai for the United Nations, circa 1962.

In 1995, he was inducted into Canada's Aviation Hall of Fame, which recognized "his contribution to the testing, development and promotion of Canadian designed and built short take off and landing (STOL) aircraft has gained world-wide recognition and respect for the Canadian aviation industry and all Canadians."

On December 12, 1951 George Neal made the first flight of the prototype DHC-3 Otter bush plane, and on July 30, 1958, the first flight of the prototype DHC-4 Caribou, de Havilland's first twin-engine design. He also piloted the first de Havilland-built CS2F-1 Tracker anti-submarine aircraft on May 31, 1956.



George Neal's cameo appears on a \$20 silver coin designed by Neil Aird

The Royal Canadian Mint recognized George Neal with an engraved cameo on the 1999 \$20 silver coin that depicts a de Havilland DHC-6 Twin Otter aircraft.

## Aviation Career

Born on November 21, 1918, George Neal grew up on a farm just east of the airport de Havilland Aircraft of Canada established at Downsview in 1929. A frequent visitor by bicycle, in 1937 the company hired Mr. Neal from Langley Park Garage at Bathurst & Wilson to work as a mechanic overhauling Gipsy engines for such aircraft as the D.H. 60 Moth.

In 1937, de Havilland won an order for a made-in-Canada version of the D.H. 82 Tiger Moth for the RCAF, and he worked on this contract which marked DHC's transition from an aircraft assembly plant to a true aircraft manufacturer.



George Neal and his Chipmunk.  
Andy Cline photo

George Neal learned to fly at Downsview at the Toronto Flying Club which had a grass airport at the south end of today's Downsview airport. He earned his Private Pilot's Licence in 1936.

After work on the wartime Tiger Moth and Anson II assembly lines, in 1941 he decided to pursue a flying career as a civilian RCAF flying instructor, logging 2,000 hours at No. 1 Air Observer School (AOS) in Malton and No. 10 AOS in Chatham, New Brunswick.

In January 1946, George Neal rejoined de Havilland Canada in the engine shop as the company was building D.H. 83C Fox Moths and launching development of its first original Canadian aircraft design, the DHC-1 Chipmunk.

After a year he became a test pilot, delivering Fox Moths, test flying new Chipmunks and twin-engine Doves, and even delivering a Dragon Rapide biplane to South America. In 1947, he took over the float certification of the DHC-2 Beaver bush plane from Russ Bannock, the Beaver's original test pilot. His convincing demonstration of STOL with the Beaver led to sales throughout the world. The Beaver became one of the most famous Canadian aircraft designs of all time.

George Neal became Chief Test Pilot at DHC in 1948 and was involved in several flight test programs that were unique for that time. In 1948, with the introduction of the de Havilland Vampire into RCAF service, he became one of the first civilian pilots in Canada to become jet qualified. In addition to the extensive technical testing of the Vampire, he did a considerable amount of demonstration and development testing of the aircraft.

In the early 1950s, he also test flew Avro Lancaster FM 104 which was being modified for RCAF maritime patrol use. This same Lancaster is now under restoration at the Museum.

George Neal's testing and demonstrations of the Beaver, Otter and Caribou aircraft allowed them to be successful around the world.

In 1975, George Neal was made Director of Flight Operations of de Havilland Canada where he became responsible for flight standards and flying discipline. He was also responsible for and active in production testing, flight instruction, flight demonstrations, and aircraft deliveries throughout the world. He retired in 1983 but was called back to assist in the production testing of the Dash 7 and Dash 8 programs.

## Vintage Aircraft Pilot & Restorer

While working at de Havilland, George Neal began restoring vintage aircraft including a D.H. 60 Moth and D.H. 87B Hornet Moth. In 1967 he built a Sopwith Pup replica that went to the Canada Aviation Museum in 1973. He won the Keith Hopkinson Award from the Canadian Owners and Pilots Association for this aircraft in 1967.

He also restored to airworthy condition a 1937 Hawker Hind biplane donated by the Government of Afghanistan for the national museum, but a change in Museum policy denied him the opportunity to fly it.

He was Chief Pilot of the Canada Aviation Museum and made airshow appearances across Canada from the 1970s through the early 1990s, flying a First World War Avro 504K, Nieuport 17 and Sopwith Pup.

He holds an Airline Transport Rating, an M Licence and has accumulated almost 15,000 hours on well over 100 different aircraft.

In 1989 George won Canada's most prestigious aviation award, the Trans-Canada McKee Trophy, awarded by the Canadian Aeronautics and Space Institute.

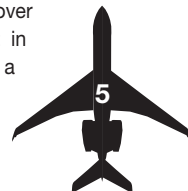


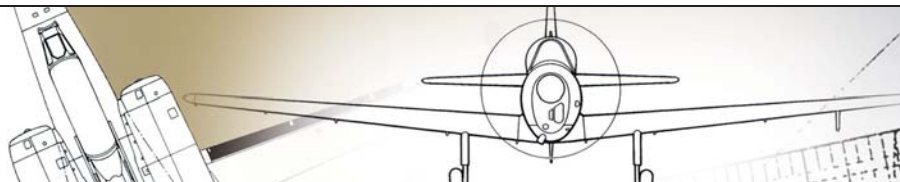
George Neal and his Hornet Moth.  
Don Lawrence photo

On November 1, 2008, George Neal flew his Hornet Moth C-FEEJ into Downsview Airport on delivery to the Toronto Aerospace Museum. He was later honoured with a 90th birthday party at the Museum on Nov. 22.

His current shop project is a flying replica of a Hawker Fury biplane similar to those flown by a precision RAF aerobatic team over the Toronto Flying Club airport in 1934. He also continues to fly a DHC-1 Chipmunk, C-FJAG.

Kenneth Swartz





# AVRO LANCASTER MK. X FM104 UPDATE

The Lancaster Restoration Team has slowly come back up to full strength after the usual summer slowdown, and progress on the aircraft is now continuing at its usual steady, dogged pace.

The major structural repair to the center section of the Lancaster is progressing, with the web plates for the wing spars receiving the bulk of attention. This is a critical load bearing area, and repairs are being made to the highest standard possible, while retaining the maximum amount of original material. The repairs will be invisible externally, and detectable to only the trained eye inside. Once completed, the repairs will allow the aircraft to be structurally strong enough to be placed on its main landing gear at last.

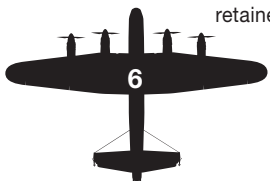
The cockpit canopy has benefitted from attention as well. Newly formed Plexiglas panels have supplemented the only two factory clear panels on the aircraft. This area requires a great deal of work, as it was a frequent target of rocks while the aircraft was displayed on the Toronto lakeshore prior to its arrival at the museum in 1999. A number of nonstandard repairs performed by City of Toronto maintenance crews over the years are being addressed as well, with many new metal formers and strips in production.

The restoration of the pilot's seat riser and rudder pedals are the focus of another intense project. The pedals themselves were missing from FM104 when the museum took possession of her. The pedals we now have were recovered from a Lancaster crash site, but sadly, the details of the crash and the aircraft they came from are unknown.

Progress on the side panels of the bomb bays is continuing, and extensive use is being made of material salvaged from Avro Lancaster FM 118, which spent most of its postwar life on the CFB Shilo weapons range until recovered to support the restoration of Lancasters in Alberta and Toronto.

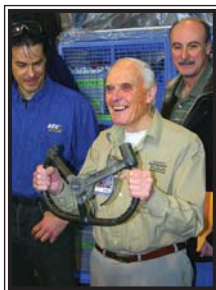
Many new components have been fabricated for the bombay panels. These have all been hand formed in-house and are almost indistinguishable from the originals. Like all our reproduction parts, they will be subtly marked to ensure that they can be identified by future historians and conservators.

The forward gun turret is nearing the point where it will be painted. This piece is enormously complicated and has taken incredible effort to bring to the stage it is now. Virtually all of the original components (except rivets) have been retained after being cleaned, chemically treated and repaired where necessary.



The aircraft's No. 3 engine recently had its propeller shaft remounted to the reduction case. This was no small task, as it was a first for the team and was accomplished with special tooling built solely in-house. The work went flawlessly, and was a great demonstration of the kind innovation the museum draws from its members.

Work on one of the propellers is now approximately 40% complete. These components have suffered extensive corrosion from exposure to the elements, and a substantial amount of material had to be removed to excise all the corrosion from the blades. Once chemically treated to ensure long term durability, the blades will be filled and profiled to return them to their original shape.



Phillip Gray with a genuine Lancaster yoke and a cast replica. Photo: Bob Bourke



Recently, Ms. Bernice Ellis paid FM104 a visit. Ms. Ellis was a genuine "Rosie the Riveter" on the production line at Victory Aircraft Limited at Malton. She may well have helped build FM104, although this cannot be confirmed. Left in our possession was a wartime photo of Ms. Ellis and small box of unused rivets right from the 1945 Lancaster assembly line. These were of particular interest to the entire Lancaster Restoration Team, since they are of a type of rivet seldom seen and no longer available, but used extensively in the construction of Canadian Lancasters. Now if only we could find another 30,000 to 40,000 more!

The project always has a long list of needs, ranging from original wartime components, tools, equipment, supplies, and funding. We need almost anything one can think of and always welcome the support of individual and corporate donors.

One item recently deleted from our "want list" is a fresh air pump, which has now been acquired. This piece of equipment pumps fresh breathing air to a hood and mask as team members blast the interior/exterior of the aircraft with glass and plastic beads to remove corrosion. This is an essential piece of protection gear which will allow us to safely clean large external surfaces of the aircraft.

### Lancaster Volunteer Team

There is a large team of volunteers working on the Lancaster Wednesday evenings and during the day on Saturday. The following are the volunteers working on the specific projects highlighted in this update.

#### Fuselage:

Bob Bourke, Joe Foster, Len Fox, Jack Ratnik and Paul Spiar.

#### Turret:

Joe Burtinsky and Greg Thomas

#### Engine No. 3:

Steve Harrison, Bob Salte and John Wozney

#### Propellers:

Wilf Manfredel and Jozef Winter

### Your Help is Needed!

The restoration team is seeking a number of specific Lancaster artifacts to help accelerate the restoration of FM104: or donations to facilitate their purchase:

- Martin 250 mid-upper turret parts, manuals
- Lancaster cockpit instruments for the instrument panel, including ASI, tachometers, manifold pressure... in other words, almost anything!

Donations to purchase missing original parts, material and supplies are also appreciated and tax deductible.

**ANDREW WALZ**

## A LASTING MEMORIAL

During the Second World War, Victory Aircraft Limited at Malton Airport (today's Lester B. Pearson International Airport) built 430 four-engine Avro Lancaster Mark X bombers which were delivered to the RCAF bomber squadrons of No. 6 Group in England.

Avro Lancaster Mk. X, serial no. FM104 was built in 1945. It has been on loan from the City of Toronto to the Toronto Aerospace Museum since 1999 when it was removed from outdoor display on the Toronto waterfront.

The long-term restoration project is a centerpiece of the Museum's conservation work. After decades of suffering from outside elements, the Lancaster is undergoing a complete restoration to its 1945 combat-ready state.

As one of less than 20 serving Lancasters, FM104 stands as a continuing memorial to those aircrews that made the ultimate sacrifice.





# MUSEUM & COLLECTIONS NEWS

## New fundraising initiatives launched to celebrate the 50th anniversary of the Avro Arrow

A rare desk top model of the CF-105 Arrow produced by Avro Aircraft in the 1950s for VIPs and test pilots has been magnificently recreated for the Museum. Packaged in an attractive presentation box, the 1:72 scale reproduction of the supersonic interceptor is an attractive gift for any Arrow fan.



The model is approved by former Avro VP Jim Floyd and has the blessing of Magellan Aerospace, holder of the Avro trademark. It's a Limited Edition 201 series with only 1,000 produced, and each model is numbered and has a Certificate of Authenticity.

The first Avro Arrow "Rollout Pilot Watch" program was a rapid sell out, generating over \$25,000 for the museum. Now the new "First Flight" Pilot wrist watch series is available in time for the holidays. The "First Flight" Pilot Watch has a Seiko Epson AGS power system, day/date display, large luminous hands and numbers with a commemorative numbered case back.

It is available in two styles: Stainless Steel or Silicon Rubber Strap, with only 200 of each are available. Both these programs are being lead by Rob Cohen and his company Wrist Watch Concepts. See the back cover of the Aerospace newsletter for product details and pricing.

## All Members Invited to Holiday Party on Dec 10



All Museum members and volunteers are invited to attend the 2008 Holiday party on December 10, 2008 that this year will include a traditional sit down Christmas Dinner. The party starts at 6:30 pm and there will be a cash bar, door prizes and a few surprises.

At the volunteer party on October 1, Bob Byrnes, was recognized as our Outstanding New Volunteer, and Andrew Walz, Terry Ward, Robert Geoghegan, and Jim Mores were recognized for their recent volunteer contributions.

## Original Avro Arrow Ejection Seat Acquired

In January, 2008, our Curator/Manager Paul Cabot was contacted by Chris Wilson of England who wanted to share the news that he was restoring a rare Martin-Baker Mk. C5 ejection seat made for the Avro CF-105 Arrow. Chris owns a company called Jet Art Designs and sells rebuilt ejection seats to collectors. He told Paul that after the seat was restored it would be auctioned to the highest bidder in Canada.

During the summer, the seat was shipped to Empire Auctions of Toronto. Once it arrived, Michael Rogozinsky, owner of Empire Auctions (and an active member of the Electric Model Flyers of Southern Ontario) alerted us to the date of the upcoming auction.

From the outset, it was clear that if the Museum wanted this artefact for its collection, we had to purchase it. The museum immediately contacted donor that had previously expressed an interest in helping us acquire various Avro Arrow artefacts. They immediately pledged \$5,000 to the cause. After much discussion, the Museum committed to raising an additional \$10,000 so that a total of \$15,000 was available to bid.

Volunteer Terry Ward attended the auction on behalf of the Museum. The bidding started at \$15,000 and went up from there. Terry reported that the seat sold for \$25,000. We were disappointed, but not surprised given the popularity of Arrow artefacts.

The real surprise came three weeks later when Mr. Rogozinsky called to say that the seat had not sold and that he thought he could obtain it for the Museum for our original bid price!



Avro Arrow ejection seat and 1958 data plates

Mr. Rogozinsky was true to his word and our \$15,000 bid was accepted. Knowing that we had spent our entire budget he kindly waved his commission.

The seat was constructed by Martin-Baker (Aircraft Company Limited) at Collingwood, Ontario. A metal data plate on the rear of the seat has the serial number 14, dated 15/9/58. All major structural components are original to the seat and have "MBEUAVR" (Martin-Baker / Avro) part numbers.

Soft furnishings (parachute, survival pack, harness, seat cushion) are not original but they are a very accurate representation of the correct period, and are dated circa 1958. It comes with a Letter of Authentication from Martin-Baker. No one associated with the seat knows how it got to England.

The seat is now at the Museum, but has not yet been placed on display. Work will start immediately to build a display case. We still need to raise funds to support our \$10,000 payment.

## Help Wanted!

The museum is seeking volunteers to staff the Runway 33 Gift Shop during the day, and we urgently require "on-call" volunteers who can lend a hand on special projects or non-routine tasks. The museum has prepared a volunteer recruitment poster for distribution at seniors' centres, libraries, etc.

## Fundraising Committee Seeks Volunteers

The Fundraising Committee is looking for enthusiastic volunteers to be actively involved in the research, cultivation and execution of fundraising strategies to help the Museum reach its future goals.

The committee will meet once a month to discuss opportunities, design strategies, prepare written documentation, and interpret and activate on the needs of the Museum. We are looking for energetic, passionate, creative and visionary volunteers who have strong communication skills and enjoy a challenge. Please contact Natasha Bowes at the Museum to join the team.

## New Museum Staff

Sue Douglas has been hired as the Museum's full-time Director of Marketing & Business Development at the beginning of November.

Joybeth Volpe is the Museum's new Librarian. She grew up near North Bay and moved to Toronto six years ago to attend university. She is currently studying Library Techniques at Seneca College. Joybeth also has a background in business administration and accounting.

The Museum is pleased to welcome three co-op students this winter from Toronto-area schools. They are Katherine Petazzi, Alex Perlamutrov and George Triantos.

## First Twin Otter Series 400 Flies

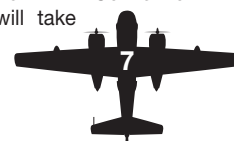
The DHC-6 Twin Otter developed by de Havilland at Downsview has re-entered production at Viking Aircraft in Sidney, British Columbia after a 20 year break in production. The new Proof of Concept Series 400 (serial no. 434) flew for the first time on Oct. 1, 2008, at Victoria International Airport.



First Twin Otter Series 400 takeoff from water

A total of 844 Twin Otters were built at Downsview between 1965 and 1988, when production ended. The last Twin Otters off the production line were produced next door to the Toronto Aerospace Museum in Bay 3 of The Hangar.

Viking has received more than 45 orders for the new Twin Otter Series 400 which was showcased with a Turbo Beaver at the NBAA Convention in Florida. Final assembly will take place at Calgary airport.



## The de Havilland Aircraft of Canada Limited Prototype Aircraft – 1937 - 1947



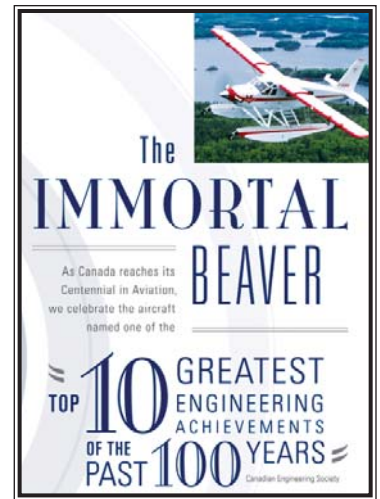
D.H. 82/C Tiger Moth - 1937  
The prototype all-Canadian D.H. 82 Tiger Moth, RCAF 239, was flown at Downsview on Dec. 21, 1937 by Philip C. Garratt, the company's General manager.  
Photo: Don Long Collection



DHC-1 Chipmunk - 1946  
The prototype DHC-1 Chipmunk military trainer was manufactured in 1946 in the workspace that is now the central display hall of the Toronto Aerospace Museum. Pat Fillingham made the first flight of CF-DIO-X, on May 22, 1946.  
Photo: de Havilland Canada



DHC-2 Beaver - 1947  
The prototype DHC-2 Beaver was built in the building that is now home for the museum. On Aug. 16, 1947 Russell Bannock departed from the apron east of the Museum's main hangar door to make the first flight of CF-FHB-X.  
Photo: de Havilland Canada



**This superb DVD on the history of the DHC-2 Beaver is now available through the Museum's Runway 33 Gift Shop**

## UPCOMING EVENTS 2008-2009

- Dec. 10 – Museum Member & Volunteer Holiday Party with a Traditional Christmas Dinner
- Dec. 20 – Canadian Aviation Historical Society (CAHS) Guest Speaker Program, 1 p.m. *Broadcaster Dave Cook recalls the History of Malton Airport.*
- Feb. 14, 2009 – CAHS Guest Speaker Program, 1 p.m. *Carl Mills speaks on the 100<sup>th</sup> anniversary of the flight of the Silver Dart at Baddeck, Nova Scotia on Feb 23, 1909.*
- Feb 20, 2009 – 50<sup>th</sup> Anniversary, "Black Friday" marking the cancellation of the Avro Arrow.
- Mar. 14, 2009 – CAHS Guest Speaker Program, 1 p.m.

- Mar. 21, 2009 – Brunch with the Directors
- Apr. 11, 2009 – CAHS Guest Speaker Program, 1 p.m.
- May 9, 2009 – CAHS Guest Speaker Program, 1 p.m.
- May 23-24, 2009 – Wings & Wheels Heritage Festival

### Other Regular Monthly Activities at Museum

- Wed. and Sat. Lancaster FM 104 Restoration Team  
CONTACT: Andrew Walz, maxwedge413@hotmail.com
- Wednesdays *Open Door* Volunteer Committee meetings, 7 p.m.
- First and third Tuesdays Marketing Committee meeting  
CONTACT: Robert Cohen  
robcohen@rogers.com



## EDUCATIONAL PROGRAMS

The Toronto Aerospace Museum has a rich variety of programs for elementary and secondary school students, children and families. All special programs run from 10:00 a.m. - 3:30 p.m., and cost \$45 plus 5% GST. For further information and bookings, contact, John Harper, Educational Director. Tel. 416-638-6078 or e-mail [education.tam@bellnet.ca](mailto:education.tam@bellnet.ca). Here is a look at our upcoming events for 2008-2009:

- **FUTURE PILOTS' DAY LEVEL I - (AGES 10-14)**  
**DATES: DEC. 6, FEB. 21, MAR. 16, JULY 4, AUG. 8, and OCT. 17**  
Meet pilots, pilot a glider simulator, learn about flight controls, instruments, view aviation videos, etc.
- **FUTURE PILOTS' DAY LEVEL II - (AGES 10-14)**  
**DATES: DEC. 11, FEB. 22, MAR. 17, JULY 11, AUG. 15, and OCT. 18**  
An extension of Level I, plus navigation, engines, weather, and pilot our real aircraft flight simulator.
- **FUTURE PILOTS' LEVEL III FLIGHT DAY - (AGES 10-14)**  
**DATES: DEC.14, FEB. 28, MAR. 18, JULY 12, AUG. 16, and OCT. 24**  
This is an extension of Level II, which includes a flight in the right cockpit seat of a Cessna aircraft over Toronto with a fully-qualified instructor. (Please Note: Subject to weather conditions. Flights are booked on individual basis, and will be individually re-scheduled if required by poor weather). Price \$115, plus 5% GST.
- **FUN WITH FLIGHT - (AGES 7-9)**  
**DATES: JAN. 24, MAR. 19, MAY 2, JULY 25, SEPT. 20, and NOV. 14**  
Two sessions a day, from 10 a.m. to 12 noon and 2 p.m. to 4 p.m.  
Price: \$25 per session, plus 5% GST
- **ASTRONAUT FOR A DAY:**  
**DATES: JAN. 31, MAR. 20, JULY 8, SEPT. 19, and NOV. 8**

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