

FLY NORTH

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NEWSLETTER OF THE NORTHWESTERN ONTARIO AVIATION HERITAGE CENTRE

Preserving and celebrating the diverse history of aviation in the northwest, through the collection and preservation of artifacts and stories of the persons and events that made this region unique in aviation history

NOAHC News -----

Jim Milne: Following NOAHC's 2015 AGM, Jim Milne stepped down from his position as the President of the organization. He was one of NOAHC's founding members and has served as President since the Centre was incorporated in 2008. Although he has stepped down as President he will continue to be a valuable member of the board. At a recent board meeting, Jim's contribution to the organization was marked with the presentation of gift certificates followed by cake and coffee.



This picture of a Republic Seabee, which appeared in *Fly North*, vol7n2, was wrongly attributed. It was thought to have come from the Wieben Collection, but was in fact donated to the Centre by Brian Wright, whose father, Harry Wright, in the centre of the picture was the pilot of the Seabee. It was owned by Superior Airways and shown here at Meba Lake.



Reunion of Giants: On Remembrance Day, the local Silver City movie theatre screened the documentary, *Reunion of Giants*, which recorded the trip made by the Canadian Warplanes Heritage (CWH) Lancaster to the UK in the summer of 2015 to link up with its Battle of Britain Memorial Flight counterpart. That trip allowed the last two airworthy Lanes to fly together for the first (and probably last) time. Many members of NOAHC were in the large and appreciative audience, perhaps recalling the 2010 visit of the CWH Lancaster to Thunder Bay.

The DVD of the tour can be ordered at <http://www.warplane.com/reunion-of-giants.aspx>, the CWH website.

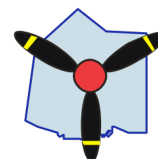
Displays: NOAHC members have taken our displays to a number of community events over the past month or so. On November 8, Denise Lyzun and Mary-Alice Isaac set up a Remembrance Day display at St Peter's Church. On the following weekend, November 14, Gerry Bell, David Bryan and Dave Kemp set up a table displaying the Lakehead's military aircraft at the 4th Annual Military Symposium in the O'Kelly Armoury.



courtesy Gerry Bell

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Former northwestern Ontario Norseman finds new home in the Netherlands

On May 10, 2015, the Noorduyn Foundation took possession of a Norseman UC-64A. It arrived in the Netherlands by sea from Canada, where it had last flown in 2010. It was originally built in 1944 and delivered to the USAAF as 43-5374. Now, more than 70 years later, it is to be restored to flying condition by the Vliegtuig Compagnie at Zaandam, north-west of Amsterdam.

It is appropriate that the restoration, which is expected to take two years, is taking place in the Netherlands since the plane's designer, Robert B.C. Noorduyn, was born there in 1893. After working at Sopwith Aviation in Britain and with Fokker in both the Netherlands and the United States, he moved to Montreal and in 1933 he established Noorduyn Aircraft Ltd. There he started to design the Norseman. Between 1935, when the prototype first flew and 1959, when production ceased, 903 aircraft were built and delivered. Canadian Car and Foundry (CCF) obtained rights to the design in 1947 and built 51 Mk Vs, the civilian version of the UC-64A. CCF also designed the Mk VII, which featured an all-metal wing instead of the wooden, fabric covered wings of the original. However, that version did not go beyond the prototype stage and was lost in a hangar fire in 1951. The Norseman was the mainstay of many small bush airlines in northern Canada, including those in north-western Ontario. Forty-two remain registered in Canada, more than 50 years after production ceased, a testament to the utility and strength of the original design.

The machine now being restored had a checkered history. Originally built for the USAAF it spent a little more than a year in military service before being declared surplus and sold to Aero Service in Los Angeles, California in 1945. It arrived in Canada in 1951 when it was bought by Queen Charlotte Airlines a local BC airline that operated on the west coast between 1946 and 1955. It was registered as CF-GLI. From BC it moved east to northern Ontario, where for 40 years, between 1953 and 1993, it was operated by a number of airlines, including Air Dale of Sault Ste. Marie, Chapleau Air Services and Kyros (Albany River) Airways. In 1993 it was purchased by Red Lake Airways, before being sold on in 1994 to Gogal Air Services of Shoal Lake, Manitoba. On June 10, 2010 it was damaged during a hard landing on water and was placed in storage, where it remained until the Noorduyn Foundation acquired it this year. Despite having spent most of its working life as a bush plane CF-GLI will be restored as a World War Two flying ambulance, expected to be flying in airshows in Europe within the next 2-3 years.

While in Red Lake it was flown by NOAHC Vice-President Gerry Bell. By then it was nearly 50 years old and had acquired what Gerry refers to as "unique quirks and flying characteristics". For example, it flew nose heavy so that on landing it required full nose-up trim accompanied by hard pulling back on the control column, and it sometimes needed a shot of power to bring the nose up to prevent digging the floats in. Other idiosyncrasies resulting from GLI's age and perhaps insufficient maintenance included a compass frozen between 90 and 100 degrees because of the magnetization of the airframe; multiple leaks along the windshield requiring the pilot to wear waterproof pants when flying in rain; no fuel gauge for the belly tank; low fuel pressure light that only came on after the engine had quit. Presumably some of these issues were dealt with for the aircraft flew on for another decade, and as Gerry notes, "Once one became familiar with GLI's quirks and idiosyncrasies, and became her friend, she was both a challenge and delight to fly. Together we moved people, freight, boats, did rescue flights etc. throughout the endless skies of northwestern Ontario and Manitoba and over countless miles of forests and lakes - times I shall cherish forever".



***CF-GLI
at
Red Lake***

When carrying a boat as in this picture, rudder trim on CF-GLI was insufficient to cancel out the extra drag provided by the boat and heavy opposite rudder was required during the entire flight to keep it straight.

courtesy G.F. Bell

***Gerry Bell at Red Lake in the early 1990s
at about the time he was flying CF-GLI***

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Bulge Forming: An ingenious method for producing CF-104 fuel tanks

In the early 1960s, the Can-Car Division of Hawker-Siddeley received a contract to produce wing tip and pylon fuel tanks for the CF-104 Starfighter which was being built by Canadair in Montreal. The tanks were streamlined with conical front and rear sections, and their production required the development of a technique called Bulge Forming. The tank skins were made from annealed aluminum alloy stock, the annealing allowing the stretching of the metal produced by the process. Flat stock was rolled and welded into a cylindrical shape before being placed in a mould, which had the shape of the final cone. A rubber bag inserted within the metal cylinder was then inflated to 560 psi under hydraulic pressure, causing the metal to stretch and to take on the conical shape of the mould. The finished cones were then age hardened and trimmed before nose, tail and mid sections were welded together to form the completed tank.

Can-Car designed and manufactured all of the tooling for the Bulge Forming process, including the manufacture of the rubber bags, and the moulds, which were fabricated and welded from steel, lined with pouring epoxy, contour matched to a plaster master. The tanks were built to very tight tolerances, but the rejection rate was low. A sure sign of the quality of the work was the extension of the original contract to allow the fabrication of additional tanks for export to the United States and to Europe, where the Starfighter had been widely adopted.

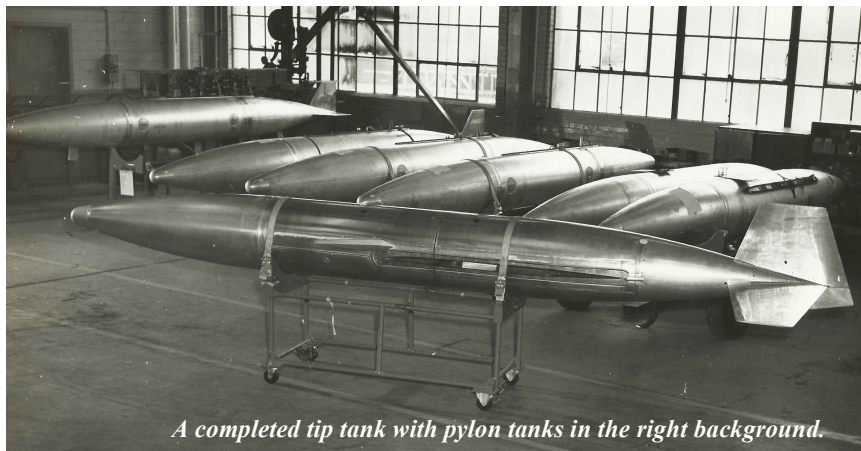
One of the moulds used in the bulge forming process



Can-Car and the CF-104 Starfighter

The CF-104 was the Canadian version of the Lockheed F-104, Starfighter, built under license by Canadair in Montreal. The plane was designed by Lockheed's noted aeronautical engineer, Kelly Johnson after Korean War, Sabre pilots told him they needed something that would fly higher and faster so that they could better compete with the Russian Migs. The result was a sleek, streamlined interceptor capable of supersonic speeds – as much as Mach 2. The Starfighter first flew in 1954. In 1962 it was adopted by the RCAF as a replacement for the F-86 Sabre and Canadair was given a license to build 200 machines, some of which were flown by the RCAF until 1987.

Can-Car's contribution to the aircraft was the fabrication of wing-tip and pylon fuel tanks plus the building and wiring of the nose and cockpit sections. The tanks consisted of three parts, which were shaped using a technique called bulge forming (see page 3) before being welded together



A completed tip tank with pylon tanks in the right background.

On Thursday, November 19, David Dowhos gave a presentation entitled, "Can-Car and the CF-104". As a young engineer he worked on the design of components being produced at Can-Car for Canadair, which was building the CF-104 Starfighter, a supersonic interceptor, for the RCAF. He talked about the innovative methods required to fabricate these components, and introduced us to the little known role that photo-reconnaissance Starfighters carrying Can-Car designed components played during the Cuban missile crisis.

This page is based mainly on material introduced in the presentation



An RCAF CF-104 Starfighter showing the ventral reconnaissance pod equipped with four Vinten Vicom cameras. This variant was flown by two tactical reconnaissance squadrons. Can-Car designed a modified camera pod which was used by USAF Starfighters at the time of the Cuban Missile crisis in 1962 to provide low level aerial photography of the missile sites.



A bulge formed cone being removed from a mould

Canadair CF-104 Starfighter

Crew: 1

Length: 54 ft 6 in (16.7 m)

Wingspan: 21 ft 9 in (6.63 m)

Height: 13 ft 5 in (4.08 m)

Max. takeoff weight: 29,038 lb (13,171 kg)

Powerplant: 1 × Orenda J79-OEL-7
afterburning turbojet

Maximum speed: 1,146 mph (996 kn, 1,844 km/h)

Range: 1,630 mi (1,420 nmi, 2,630 km)

Service ceiling: 50,000 ft (15,240 m)



A pair of Starfighters takes to the air