



Aviation in the North: A Maintainer's Historical Perspective

by Roger Beebe

I grew up in a small northern Saskatchewan town where Norseman aircraft hauled fish summer and winter. The sight of ski- and float-equipped Norseman planes coming and going was an exciting part of life. Later, I spent summers working in Yellowknife and was permitted to accompany the pilots around the barrens. In recent years I have attended excellent NATA conventions at which I met many fine northerners and listened to their challenges and accomplishments. The North is a fascinating place for maintainers to work and live. Aviation maintenance in the North has its own culture and heritage quite distinct from that in other places.

The words "north" or "northern" may evoke ideas of "cold," "barren," "challenging" and "lonely" to name a few. There are many stories of early aviation and maintenance in the north: propellers handmade from local wood; animal skins boiled down to make glue; temporary aircraft-recovery apparatus constructed from trees; ingenious float repairs, and others. Some of my favourites are found in *Voyageurs of the Air* by J. R. K. Main, *The Max Ward Story* by Max Ward and *The*

Arctic Fox by Don C. Braun. I had the privilege of working for Wardair in the summers in Yellowknife (*in - dates - or when I was - age?*) and met both Mr. Ward and Mr. Braun. Mr. Main had a long and distinguished career in Canada's Department of Transport after serving in World War I as a pilot.

Early aviation and maintenance

From kayaks, skinboats and dogsleds, to longboats and tall ships, to snowmobiles and pickup trucks, nothing has changed travel in the North as much as aviation. Today, large areas of northern Canada are entirely dependant on aviation to bring most of the necessities of life. Road and marine transport can reach some areas in some seasons but people and goods must be carried into the most remote areas in the north by air.

Some of the challenges of early aviation in the North related directly to the state of the art of aircraft, navigation and facilities. Early aircraft had neither the reliability nor the endurance of modern aircraft. In addition, the lack of navigation equipment and aerodrome facilities made most

flying very difficult. Much of the maintenance was done by the pilots themselves and many who entered aviation in those early days had a very good technical and practical education obtained either by aviation-related studies or by apprenticing in mechanical fields other than aviation. Dealing with early automobiles and farm machinery produced a population that was very competent in repairing machinery. Pilots like Max Ward and Don Braun of Wardair were very competent air engineers (in today's terms, Aircraft Maintenance Engineers).

The invention of the internal combustion engine with many subsequent improvements in weight reductions and power increases allowed powered flight to begin. Aerial warfare in World War I forced much development of aircraft and equipment, which in turn allowed much of the early exploration in Canada's north. Canada's northern topography with its large expanses of water and ice easily accommodated the use of floats in summer and skis in winter. Aviation feats in the North could not have been accomplished without courageous pilots, who were supported by the early Air Engineers and maintenance technicians.

The story of aviation maintainers in the North is one of overcoming the challenges posed by immense distances, brutally cold winters, hordes of insects, ice and numbingly cold water, and the lack of readily available equipment. Canadians know that large parts of our ten provinces also exhibit some of the same environmental conditions as those "north of 60" (The 60th parallel is the usual boundary of "the North.") These similar areas were used to test and perfect some of the technology and techniques that were used to take aircraft all the way to the North Pole.

Especially significant were operations conducted out of Winnipeg, Edmonton and northern Saskatchewan as well as northern Ontario and Quebec. Operations in northern Quebec led to many early trips up into the eastern Arctic area. As well, there were many pioneering

flights in the Labrador area out of Newfoundland before it joined Canada in 1949. All of these missions were supported by maintenance personnel and facilities. Air Engineers in many cases accompanied the aircraft or went ahead by land, usually in summer, to set up fuel and spare-part storage areas along proposed routes. Sometimes rudimentary shelters (tents) were set up for both crews and aircraft.

After World War I, the federal government recognized the need to license Air Engineers. Many of the early Air Engineers had acquired experience on military machines, many of which became "surplus" and were used to open up the North.

Early challenges

During the summer the North becomes, at times, very warm, creating ideal conditions for vast numbers of black flies and mosquitoes. If you have ever lived or worked in the northern areas of Canada, you know the difficulties of trying to work while being plagued by insects.

Since most of the aircraft are float-equipped during the summer flying season, maintainers work off floats and docks, with the attendant danger of falling, or dropping aircraft parts and tools, into the water. (Large magnets can be very handy.) Regular aircraft problems are increased by issues relating to float operations. There is a constant need of repairs to floats damaged by hitting rocks or deadheads. Leakage is a constant concern. Float-repair work carries on back at the shop into the winter, while aircraft operate on skis.



Above: A DC3 engine change beside the runway in Dawson City in the early '80s. In this photo, the failed engine has just been removed while the overhauled engine awaits installation. On the right another DC-3 takes off.

Opposite page: DC3 on display (with sundogs) at YXY, Whitehorse, Yukon The DC3 has been a workhorse of aviation in the north for more than 60 years; working aircraft can still be found, not just on pedestals.

Photos courtesy of Gunnar Still

Feature

Avi-Nation

*On the ramp at Whitehorse on a very cold winter day: the cowlings have not yet been installed because the engine has just been started for the first time; ice fog caused by the extreme cold has obscured almost all scenery.
Photo courtesy of Gunnar Still*



General reliability then was not as good, especially relating to engines and accessories. Engine changes were frequent and sometimes meant the construction of temporary hoists from whatever local timber was available. That challenge became extreme north of the tree-line.

During the change-over seasons, spring and fall, one can really enjoy the beauty of the north with the annoyance of insects. For me, though, winter was the most challenging season. Extreme cold causes parts to break, metal to crack easily and human flesh to freeze easily to metal parts. Everything takes more time and attention. Starting and operating piston engines becomes much more difficult. With any luck the engine starts on first try. If not, you have to find a way to warm the oil or the engine again and hope that the battery holds up.

Early technicians had to drain the engine oil and bring it into their cabins or tents to keep it warm overnight. Batteries required the same protection. Later, portable gasoline-powered heaters were used to keep aircraft warm. Canadians invented the method of oil dilution, which, along with the use of heaters, changed that part of northern maintenance work. My own experience with working in cold weather was in northern Saskatchewan at -59°F, and in Cold Lake and Edmonton, Alberta at -40°F or colder. We had access at times to warm hangars but imagine the challenge of doing all winter work either outside or in temporary engine shelters or nose hangars.

The north today

Pioneer maintenance technicians and Air Engineers could not have imagined the facilities of today: large maintenance hangars complete with shops heated to comfortable working temperatures and equipped with all the modern crew comforts. Conditions outside remain the same but now aircraft can be moved inside for maintenance and repair procedures. Float operators now have more modern facilities at the docks. The larger size and modernization of towns together with reliable air transport has made the north more appealing for families to live and work there. Native-born northerners can also find more opportunities to work in the North.

Certainly there are human-resource challenges to be met, mainly in salary competition from booming resource industries. The strong emphasis on safety in northern operations has led to the adaptation of modern management systems in the industry. To encourage recruitment and retention of personnel in the North, the Northern Air Transport Association (NATA) encourages the development of technical training in the North. Many Community Colleges in southern Canada also supply technical training to northerners.

Maintainers today are working in the north on some of Canada's most modern aircraft as well as some vintage machines from the 1940s. Their skill and dedication to keep them flying safely has led to a reliable air transport system across the north. Looking back, some of the best advances have been turbine-powered aircraft, better avionics and airports, which have allowed the nearly all-weather operations that are so vital to the northern communities that depend on air transport for medevacs, food and other necessities. ■

*Now retired as Regional Director, Prairie and Northern Region, Transport Canada after 10 years in the position, **Roger Beebe** also held other positions in his Transport Canada career, including Director, Airworthiness Western region, and positions at Ottawa HQ and in Ontario Region. His civil aviation experience includes Air Canada and Wardair. He also served six years in the Royal Canadian Air Force, mostly in Europe at 1 Wing Marvell, France, and Lahr, Germany. His aircraft experience includes B747, L1011, DC-8 series, DC-9 series, B707, B727, Twin Otter, Single Otter, Bristol 170, Viscount, and many 1960s military Fighter Aircraft, especially the CF-104. He holds an AME licence in the categories M1 and E, and CAMC certification as both an Avionics Maintenance Technician and an Aircraft Maintenance Technician. Roger now lives in Manitoba where he is President of **Plane Talk Consulting**: 204-232-8819. Author's note: Thanks to my wife Gerry for proof reading and assistance. Thanks for comments to Guenther Moellenbeck, long-time northerner, Wardair AME and manager; and to Don Douglas, Executive Director, Northern Air Transport Association. Thanks as well to Gunnar Still for the photographs.*