

NATO Flying Training in Canada



The vast airspace over the sparsely inhabited prairies of the Canadian province of Saskatchewan – combined with mostly excellent weather conditions – creates an ideal setting for military aircrew training. For this reason, the Canadian air force has trained its pilots at CFB Moose Jaw for decades. Beside this, a large number of foreign student pilots have earned their wings here.

Text and photos: Emiel Sloot

Since the early days of aviation, several NATO countries have sent military student pilots to Canada for their training. This international attention started when the British Royal Flying Corps had set up a flight school in Ontario in 1917. The US Army moved 10 of their squadrons to Canada the same year, to prepare their pilots for action over Europe in World War I.

In April 1940, the British Commonwealth Aircrew Training Plan (BCATP) was established to train much needed crews in World War II. When the BCATP was deactivated in March 1945, no less than 130,000 crew members have been trained here. After international tensions arose following the Korean war in 1950, Canada again offered their pilot training capacity to their NATO partners, resulting in the NATO Air Training Plan. Between 1950 and 1959, over 4,000 pilots completed their training in this programme. After 1959, the Canadian government signed bilateral agreements with many nations, covering pilot training.

A large number of different aircraft and units were involved in this education. From the 1970s,

elementary flying training started at CFB Portage la Prairie, Manitoba on the Beech Musketeer (Canadian designation CT-134) with 3 CFFTS (Canadian Forces Flying Training School). Graduates moved to Moose Jaw-based 2 CFFTS for basic and advanced training on the Canadair CL-41 (CT-114) Tutor jet trainer.

Joint venture with Bombardier

In 1992, the CFB Portage la Prairie airfield was sold and subsequently a pilot training centre was installed here by the Canadian company Bombardier, under contract with the Canadian air force. The ageing Musketeers were retired and replaced by Slingsby T67C Fireflies, which on their turn are currently being replaced by the Grob 120As. In December 1994, a conglomerate of companies lead by Bombardier presented a business plan to establish a modern military jet pilot training school. This plan demonstrated that if a certain degree of international participation could be achieved, the costs for Canada to train their pilots could be lowered. On May 1, 1995, an official offer to NATO

was forwarded to train aircrews for their allies from 2005: the NATO Flying Training in Canada (NFTC) programme came into existence. In April 1997, Canada announced that they had already collected sufficient international interest in the programme from countries such as the United Kingdom and Denmark, and started final negotiations with Bombardier. On November 4, 1997 a 20-year contract was signed worth CAD 2.85 billion. As laid down in the contract, Bombardier and its subsidiaries supply the aircraft and maintenance, education hardware including flight simulators, ground school and simulator training and certain ancillary services such as firefighting and catering. The Canadian air force and partners in the programme deliver flight instructors and air traffic control, while the government made available sufficient airspace to train in. The first NFTC instructors started training in December 1999, followed by the first students in June 2000. The very close and therefore unique cooperation between government and industry has led to a military effective and commercially efficient programme. The exchange of international experiences in pilot training further increased overall quality.

Four phases

The NFTC training programme recognises four phases. Phase I covers the selection of new pilots and, in some cases, elementary flying training. Phase II is the basic flying training part, during which it is decided if the new pilot will continue his or her career on jets, transports or helicopters. Advanced jet flying training is learned in Phase III, and Phase IV comprises tactical, fighter lead-in training. When successfully completed all phases, the graduated pilot is ready to enter the operational conversion unit of the type of fighter aircraft operated by the respective air force.

Each individual participating country is responsible to take care of Phase I at home. The Canadian air force trains pilots at Southport Aerospace Center, the former CFB Portage la Prairie, in a 28-flying hour selection on the Grob 120A, under contract with Bombardier. (Another Phase I example – Denmark – is covered separately at the end of this report). Phases II, III and IV are offered by the NFTC at CFB Moose Jaw and CFB Cold Lake, Alberta.

International

As mentioned, the NFTC has international participation which was a prime condition to start it in the first

place. Beside Canada, pilots from Denmark, Hungary, Italy, the United Kingdom, Singapore and the United Arab Emirates are being trained. The latter two indicate that the NFTC's name is somewhat overdue, since NATO-friendly air arms can now join as well. Apart from the mentioned countries, France, Germany, Sweden and the United States deliver flight instructors. During Phase II and III, all pilots join the Moose Jaw-based 2 CFFTS – nicknamed both '*the Big 2*' as well as '*the Best in the West*' – that is part of 15 Wing since 1993, when the Canadian air force adopted a wing structure.

Each member country detaches a representative to the programme, being an instructor acting as point-of-contact between the NFTC and the respective air arm. According to the contract, a participant has to supply flight instructors to cut costs. Another advantage is having more influence on the training syllabus by direct feedback from their instructors. The ratio is such, that for each two to three students in the programme, a country has to provide one instructor.

Both instructors and students are assigned to one of four flights within 2 CFFTS. These flights are called



Apache, Bandit, Cobra and Dragon. New instructors first undergo a course in the Flight Instructor School (FIS) that is also part of 2 CFFTS. An instructor is generally assigned to two students within the flight. Beside this, each student has two instructors: a primary with which some 80 percent of the missions are flown, and a secondary acting as backup. By keeping instructor and student together, continuity in training is well maintained.

When starting the course, each student receives a laptop, preprogrammed with all necessary information like all syllabi and ground school training courses. Log-on stations to the air base intranet with access to a large database containing all kinds of relevant information are located all over the base, such as class and briefing rooms.

training platform for today's modern air force. The digital fuel control unit to the PT6A-68 turboprop engine simulates jet-type engine handling, while an OBOGS onboard generator supplies oxygen for flights up to the ceiling of 31,000 ft.

Bombardier bought 26 aircraft, of which two are used as spares source. Although owned by a civil company, the Canadian air force has given the aircraft a military type designation (CT-156) while the aircraft all wear military registrations and markings.

Building blocks

All crews involved in Phase II training are divided between the *Apache, Bandit* and *Cobra* flights. The course is split into two parts. Phase IIA covers basic

flying training in some 90 flying hours in 100 missions, and has a so-called building block approach. During each mission, a certain aspect such as visual, instrument or formation flying is trained. The missions of each block run through each other, e.g. a VFR mission can be followed by an IFR training sortie etc. By a check flight at the end of each block, a student has to show his or her proficiency on it. When, at the end of



Harvard II

Phase II is carried out on the Raytheon T-6A Harvard II. During the 1990s, both the US Air Force and Navy issued a requirement for a new basic training aircraft, after which the Joint Primary Air Training System (JPATS) competition to select a suitable platform was established. In cooperation with Pilatus Aircraft from Switzerland, Beechcraft entered the race with a modified PC-9, and subsequently won the contract. This aircraft is now produced by Raytheon (which took over Beech) as T-6A Texan II for the US Forces, while the aircraft has been exported to both Greece and Canada so far, the latter calling it Harvard II, however. With its excellent performance like a maximum speed of 320 kt., g-forces limitations of +7 and -3.5, and fitted with a digitalised cockpit, the aircraft is a state-of-the-art

the phase, all results have met a certain overall standard, the student will move on to Phase IIB, dependent on the country's requirement for new jet pilots. In this part of training, advanced handling is practised during 45 flying hours such as formation landings and basic tactical manoeuvres including dogfights. No exams are done during this phase, but the student's progress is regularly checked at certain stages. At Moose Jaw, the NFTC has three Harvard II flight simulators, mainly for training emergency procedures and instrument flying, taught by instructors of CAE, the Canadian simulator company.

After Phase IIA, future transport and helicopter pilots go to Southport Aerospace Center for either multi-engine training on the Beech King Air C90B or rotary wing training on the Bell 206 Jet Ranger and Bell 412 Griffon.

Low flying area

A large airspace of approximately the size of Belgium is located just south of the base, called the Moose Jaw Military Flying Area (MJFTA), which is available exclusively to 2 CFFTS. Apart from this, an even larger area is situated around the base for low flying training. In number of flights, Moose Jaw is the third busiest airport in Canada following the international airports of Toronto and Vancouver. Like in civil aviation, departure slots are allocated to flights for take-off from one of the two parallel runways.

Flying operations from Moose Jaw encounter two seasonal disadvantages. During the generally cold winters, flying is sometimes restricted or even impossible due to icing conditions, as the NFTC training aircraft do not have de-icing capabilities. Furthermore, twice a year, large flocks of birds migrate through the base's airspace. On May 14, 2004, a birdstrike just after take-off resulted in the loss of a Hawk trainer. Fortunately, the Canadian instructor and British student pilot ejected to safety.

Hawk

Future fighter pilots stay at Moose Jaw for advanced training, and are allocated to *Dragon* flight. The syllabus of Phase III takes some 65 flying hours to complete, and is carried out on the BAe Systems Hawk 115 (Canadian designation CT-155). Like the Harvard II, the Hawk has a glass cockpit built around multi-function displays (MFD), a head-up display (HUD) and HOTAS (hands-on-throttle-and-stick) controls. Bombardier bought 22 Hawks, including two for spares. Unfortunately, two have been written off in accidents so far.

Phase III covers various aspects on how to fly high-performance jets, including tactical manoeuvres. All missions are recorded on video and audio for debriefing purposes. Unlike most trainees, British NFTC students only enter the training program during Phase III for a short type conversion since they have done their basic flying training in the United Kingdom including flying the previous generation Hawk T.1 with 4 FTS at RAF Valley. Together with their graduated fellow students from

the other participating countries, they then move to CFB Cold Lake, Alberta to run Phase IV. This is a 65-hours fighter lead-in training course. The 419 TFTS (Tactical Fighter Training Squadron), that is part of 3 Wing, also uses the Hawk 115 eliminating the need for an extra conversion course. Phase IV takes place completely over the Cold Lake Air Weapons Range (CLAWR), the same area used during the annual Maple Flag exercises. During each mission, an ACMI pod is carried on the wing tip that records flight data such as airplane attitude, speed, altitude and position for debriefing purposes. The system also records weapon selections and points of release. Beside a dummy air training missile (DATM) – an empty missile casing carried for balance on the other wingtip – no practice munitions or other external load is carried apart from a centreline fuel tank. The Hawk does have IFF (identification friend or foe), and in the near future an RWR (Radar Warning Receiver) will be added. A Hawk flight simulator is located at both Moose Jaw and Cold Lake. Due to the Hawk's capacities, certain tactical tasks that are generally trained during the operational conversion course can now already be training during NFTC's Phase IV. After completion of the training, the pilot is ready to enter into the operational conversion unit for the fighter type in use with his or her air arm.

New standard

Beside training pilots, 15 Wing also controls the 431 Air Demonstration Squadron, also known as the *Snowbirds* team. The squadron consists of 85 personnel to present and support the 60 annual demonstrations flown over North America. The team still uses the CT-114 Tutor, and celebrated its 35th anniversary in 2005.

Until the time of writing, nearly 1,000 students of seven nationalities have completed flying training with NFTC, while another 112 are in training. When the French chief of air staff visited the NFTC recently, he remarked that "NFTC had set the benchmark for military jet pilot training." This quote is quite appreciated and used frequently in various public relations material on the program. ■



NFTC Phase I selection – the Danish way



All countries participating in the NFTC programme select their own trainee pilots that will be sent to Canada. In Denmark, for example, the Karup-based Flyveskolen (FLSK – Flying School) is responsible for this Phase I selection process.

Following preselection, a class of *ab initio* pilots, of which the number depends on the requirement for new pilots, enters a theory course of 355 hours. This consists of lessons such as aerodynamics, meteo, navigation, and English language. Simultaneously, the flying syllabus on the T-17 Supporter starts. After 12 sorties, the student receives a solo check flight followed by the first solo flight. When successful, the selection process continues with 18 more sorties, during which additional aircraft handling (four sorties), navigation (four) and basic instrument flying (six) is taught while four more solo flights are flown. Then, the student has to pass the final check ride. The whole syllabus lasts for some 35 flying hours, with a focus on stress resistance, confidence and failure management. Furthermore, the student has to demonstrate good planning skills and the ability to multi-task.

On average, some 35 percent of each class passes the final test. These will continue their training at the air force officer's school for two years, after which the student pilot returns to the FLSK for some 10 to 15 additional hours on the T-17 for continuation training. Then, he or she will enter Phase IIA training

with the NFTC at CFB Moose Jaw. An extraordinary situation arose in July 2006, when class 01-06 passed with a success rate of 69 percent. Possibly, some of these students will join the Euro-NATO Joint Jet Pilot Training (ENJJPT) at Sheppard AFB, Texas. Denmark also participates in ENJJPT but has not sent new trainee-pilots to the United States after they entered the NFTC programme.



Supporter

In 1976, Denmark bought 32 Saab MFI Supporters, locally designated as T-17. Beside the FLSK, these aircraft were also used by the various base flights for liaison duties as well as the Royal Danish Army Flying Service (Haerens Flyvetjeneste) at Vandel for

observation and reconnaissance flights. A few years ago, the cockpits of the remaining 28 aircraft were modified. The aircraft received a Garmin GPS and a new attitude indicator, and a standby horizon was added. Furthermore, the stores panel was deleted. By means of this panel, external stores to be carried on two wing-mounted pylons could be selected and fired, however the Royal Danish Air Force has never used this feature. Finally, a new emergency

electrical bus was built in, able to power essential instruments and systems from a battery for two hours, since the T-17 had suffered several generator failures. More recently, strobe lights were added to the wing tips. The air force is considering to replace the IO-360-A1B6 piston power plant by a diesel engine, to make operation of the aircraft more efficient and reliable. ■

The article on NFTC has been published in various magazines, including Onze Luchtmacht (Netherlands - Vol.58 No.6), Aranyas (Hungary - May 2008) and Koku-Fan (Japan - No.654). Furthermore, images have been used for our article on Pilatus trainers, completed for International Air Power Review (UK/USA - Vol.21), as well as for internal NFTC presentations.

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