COLD LAKE

WHERE FIGHTER PILOTS ARE MADE

The NATO Flying Training in Canada programme was launched in 2000 and 419 Tactical Fighter Training Squadron became responsible for Phase IV training – the last step before the cockpit of a frontline fighter. **Dirk Jan de Ridder** investigates.

"You are friends, but as soon as the fight is on, he is my worst enemy and I am doing everything I can to defeat him. That is a lot of fun!" Lt Caleb Robert

***Above:** The area north of Cold Lake is very scarcely populated, making it ideal for all types of air-to-air and air-to-ground training. All the squadron's sorties are flown with an Air Combat Manoeuvering Instrumentation (ACMI) pod on the left wing-tip station, a centreline fuel tank and an inert Sidewinder missile on the right wing-tip.* All photos Dirk Jan de Ridder

The sun rises over Canadian Forces Base Cold Lake, Alberta, as a group of young Canadian, Hungarian and Singaporean pilots walk out to their CT-155 Hawk jets. With several years of pilot training behind them and already cleared solo on the Hawk, this is a new chapter in their careers. Here at Cold Lake they will be taught to wear the aircraft like a suit, manoeuvre it to the limit in combat and kill bandits while staying alive themselves. After years spent in a relatively benign training environment, this is the first time they are part of a squadron. The pressure is on to demonstrate they are not just pilots, but fighter pilots.

Lt Caleb Robert of the Royal Canadian Air Force (RCAF) is one of those students in Phase IV of NATO Flying Training in Canada (NFTC), the final phase before hopefully converting to the Hornet. He told *AFM*: "Once you come here it's single-minded focus. This is the fighter community. I was definitely a bit intimidated by that and I think a lot of students are a little unsure if this is really going to be for them when they get here. I really do think it's one way or the other. Either you think this is too much and not exactly what you thought it was going to be, or you think this is awesome. I was definitely in that [second] camp! After my first flight here, I was convinced. That one hour of the first fighter flight was better than the 200 [previous] hours of flying."

Squadron boss

Lieutenant Colonel (LCol) Colin 'Moose' Marks is the first 419 Tactical Fighter Training Squadron commanding officer (CO) to have originally been trained on the Hawk as part of NFTC's fighter lead-in training (FLIT) programme. He explained what students get to do during their short time with the squadron: "The syllabus is a building-block approach. There is two to three weeks of ground school training and then they go right into dogfighting. We start with the basics, 1-v-1 basic fighter manoeuvres and then into 2-v-1. After that we move into the ACT [advanced combat tactics] phase and, once that's complete, the air-to-ground phase where they'll do an academic bombing pattern. After that, we put it all together and they will do a self-escort strike phase. They take themselves out to the combat training area, push out on time, fight their way in, drop bombs and fight their way out, followed by a thorough debrief where the instructors reconstruct the mission and highlight all of the critical lessons learned."

With some 2,300 hours on the Hornet, both at CFB Bagotville and Cold Lake as well as with the US Navy on the 'legacy' and Super Hornet, the CO knows exactly what his students need. And the requirement has changed a lot since he was a student: "The syllabus has gotten better over the last 15 years. When I went through ▸

***Above:** A couple more switches to turn and this Canadian student will be ready to go. The Hawk's cockpit becomes considerably more cramped once pilots don their exposure suits for winter flying.*

***Above:** To mark the 75th anniversary of 419 Squadron in 2016, CT-155 serial 155217 was painted in a camouflage scheme similar to that worn by the unit's aircraft in World War Two. The 'VR-W' code was once worn by a Wellington flown by Wg Cdr John 'Moose' Fulton, the unit's first commanding officer, in 1941.*

as a FLIT student, we never used to do close air support at all. Now we have a robust close air support phase to help us better support our ground forces engaged in the land battle below. We did do self-escort strike, but at that time we didn't do time-sensitive targeting or dynamic targeting. These are all things that you're doing every day in the modern battlespace, so the training has changed to reflect what is being done [in the] real world. That is very exciting. A lot of the comms and the tactics have changed to reflect what is really going on. It's a building-block approach, yes, but we are as close to the front line as you can possibly be, but still giving them the developmental learning, entry-level examples, and increasing the intensity from there.

"Everything we do here should be as close to the front line as we can possibly make it," LCol Marks continued. "We focus on developing the 'warrior's spirit' and like to think of the Hawk as more of an 'F/A-155' fighter than a CT-155 trainer. We are trying to make a course that will best prepare them for the operational training units. Whether that is here in Cold Lake at 410 Squadron, in Hungary or in Singapore, we want to make sure that the students are well prepared. The failure rate has traditionally been between ten and 20%. If it's too easy and the students pass through here, but then fail at the next level where it is more expensive to train, then we are not doing our job. It has to be efficient, effective and representative training of what they are going to get at the next phase. When [RCAF student pilots] go over to the F/A-18 school, they know how to walk, talk, fly fighters and they are just transitioning to a more sophisticated aircraft. Ideally, all they should really need to do is take the Hawk patch off and put a Hornet patch on. The foundation is already there."

Dogfighting duels

Lt Robert spoke to *AFM* just after completing the basic fighter manoeuvres (BFM) phase. He described the progress made so far: "The foundational 1-v-1 dogfighting principles are kind of the hardest to get. Once you have that, then you build upon it. You will start the set with one aircraft behind the other. If I start defensive, my job is to neutralise, get offensive or get out; but if I'm offensive, I'm trying to kill that bandit – not get neutral and definitely not get defensive. The last four flights [during the BFM phase], you start neutral and meet each other in the middle. You are flying against the other student's instructor, because he is the one who can present you with the high-aspect sight pictures he knows you need to see. And then you'll switch.

"Against an instructor you definitely have that fighter spirit, but in the back of your head is that voice saying, 'he has a lot more experience than me, he is probably going to beat me'. Once we get into the phase that I just finished, they introduce a student versus student. That's the first time you do that, so once the other student is flying, that is your chance to really prove yourself. You are friends, but as soon as the fight is on, he is my worst enemy and I am doing everything I can to defeat him. That is a lot of fun!"

Canadian, Hungarian and Singaporean students are currently being trained at Cold Lake. Instructors come from those same countries plus Germany and the United Kingdom. Foreign instructors typically sign up for three years, but many extend their stay by one or two years. With an annual total of some 3,000 flying hours, 419 Squadron's Hawks are among the most active anywhere in the world. The course takes an average of six months, consisting of 37 sorties and 45 flight hours per student, but it may last as long as eight months if winter weather makes it difficult to fly. LCol Marks said: "The winter is very cold here, it's why they call it 'Cold Lake'! It is so cold that we have to wear full winter exposure flying gear. It makes the cockpit very small when you have all those layers on. Sometimes we hit the limit where it is too cold to fly, where if you were forced to eject you would freeze to death in the parachute before you hit the ground. The amount of cloud cover, the cold temperatures and icing within the clouds can make it challenging for us to run our daily operations."

California deployments

To mitigate these challenges, the squadron has deployed to Naval Air Facility El Centro, California, in winter during the last two years. LCol Marks said: "Winter can slow down our training significantly, so the best thing we can do is chase the good weather. El Centro is an amazing place to train. I came to love it during US Navy exchange tours with VFA-125 and VFA-122. We have built a great relationship with CAPT Brent Alfonzo [NAF El Centro's base commander] and the facility staff. The weather is always fantastic, the airspace is literally right there and everyone is so accommodating. You take off and you are basically in the airspace, which cuts down on transit time and fuel costs and allows for more tactical training. We can conduct every mission that we need there."

The squadron usually takes three or four courses down with them to California. Some students will be at the beginning, others will be at the middle or the end of the course, so all aspects of Phase IV training will typically be carried out during these few weeks. A Hawk simulator isn't available at El Centro, so simulator flights for each student's specific phase will be 'front loaded'. Students carry them all out, sometimes with one or two trips at the Cold Lake local area ranges, before heading south. The airspace around El Centro has more traffic, making the deployment a great opportunity to train in an unfamiliar environment.

Nothing beats the training opportunities at Cold Lake though, due to its enormous amount of largely unrestricted airspace, firing ranges and targets. And it is no coincidence that one of the world's premier fighter exercises, Maple Flag, takes place here. LCol Marks commented: "We are very lucky in Cold Lake to have this amazing airspace. The training range itself is immense. I think it's the best in the world in terms of air-to-air and air-to-ground training. At FLIT, we don't drop any live weapons off the aircraft. It is all simulated, but from an operator's perspective it is seamless, using the targets on the CLAW [Cold Lake Air Weapons] range. We are spoilt with hundreds of targets that are real vehicles, real tanks, real surface-to-air missile sites, barracks, bridges and an urban training complex that allows us to train for modern-day scenarios where eliminating collateral damage is our primary concern."

Future fighter, future trainer?

LCol Marks believes that a new jet is probably needed to train future pilots in the best possible way. In 2017, the RCAF extended the NFTC contract with Canadian training services supplier CAE until at least 2023, with an option to extend it for an additional year (*see accompanying boxed item*). This will reportedly allow the government the time necessary to determine its future pilot training requirements.

After successfully completing the FLIT course with 419 Squadron, students will have completed their training at NFTC and will be ready to truly make their dream come true. Canadian students remain at Cold Lake to fly the CF-188 Hornet with 410 Tactical Fighter (Operational Training) Squadron. Hungarian pilots complete their Gripen conversion training in Sweden, while Singaporean students move to the United States for conversion training on the F-15 or F-16.

Meanwhile, Lt Robert still has some way to go. He concluded: "It is tough, but at this point in the game there is a lot of reward from the work that you are putting into it. I'm not saying previous training wasn't rewarding, but we were just taking off, landing, doing some basic aerobatics and stalls, which is all a lot of fun, but then you get back on the ground and do the same thing the next day. Now every single flight is different. You're fighting against a friend and even if you lose you still feel pretty good about it, because you're dogfighting. How cool is that?" AFM

Students arrive at Cold Lake for the fourth and final phase of the NATO Flying Training in Canada syllabus, after completing most of their tuition at Moose Jaw. This photo shows a trio of Phase III Hawks, which lack the ACMI/Sidewinder 'fit'.

***Above:** Two Canadian students prepare for their BFM sortie with the familiar 'fighting sticks'. The squadron is currently training Canadian, Hungarian and Singaporean students. **Left:** A student and his instructor head out to the Cold Lake Air Weapons Range in CT-155 serial 155207. While students are cleared to fly solo on the Hawk, it's the instructor's job to dogfight against the other student in the formation.*

NATO Flying Training in Canada

NFTC is a multinational joint programme designed by the Canadian Department of National Defence and an industry team led by Bombardier. In October 2015, CAE took over the programme from Bombardier. CAE's employees support primary flying training (at Portage La Prairie, Manitoba), basic flying training, advanced flying training (both of which at Moose Jaw, Saskatchewan) and lead-in fighter training (at Cold Lake, Alberta).

Foreign countries to have taken part in the programme so far include Austria, Denmark, Germany, Hungary, Italy, Saudi Arabia, Singapore, the United Arab Emirates and the United Kingdom.

All in-aircraft flying instruction is given by military pilots from Canada and other participating countries. The RCAF oversees the training standards, provides the airspace and dictates the syllabus. The aircraft are owned by an independent non-profit organisation, then leased to CAE on behalf of the Department of National Defence. Academic and simulator instruction is given by CAE employees who have previous military flying instruction experience. The company is also responsible for providing the aircraft, ground operations, facilities, fixed training devices, food services and maintenance.

Future fighter pilots go through the following phases of flying training at NFTC:

Flying traing at NFTC

Phase	Role	Type	Location
Phase I	Primary flying training	Grob G 120A	Portage La Prairie
Phase II	Basic flying training	CT-156 Harvard II (T-6 Texan II)	Moose Jaw
Phase III	Advanced flying training	CT-155 Hawk (Hawk Mk115)	Moose Jaw
Phase IV	Fighter lead-in training	CT-155 Hawk	Cold Lake

Helicopter and multi-engine pilots are divided halfway through Phase II. Foreign students typically receive primary flying training in their own country, before joining Phase II and III training at Moose Jaw.