

MAKING LEARNING fun!

training in preparation for an upcoming "moon mission". In co-operation with staff at the Challenger Centre, squadron instructors participated in a 'teachers' program. Documentation and study material provided by the Challenger Centre is mission specific; however it comes with additional general aeronautical subjects that compliment cadet training.

As space exploration continues, cadets focus on the next logical stepping stone in astronautic endeavours, a journey to Mars. In software trials conducted at our local headquarters, cadets used the off-the-shelf educational software *Destination Mars*. Although not as sophisticated as current 'shoot 'em up' video games, this program can run on basically any IBM compatible computer with keyboard, sound and mouse.

The software contains a desktop space simulator, database and archival library. It lets young cadets hone their skills in eye-hand coordination, problem solving, and computer research. Cadets are confronted with in-flight emergencies, operational tasking and experiments in aeronautics, navigation, mathematics, science, chemistry, geography, geology, medical and human behavior. At the end of each session the computer retains a record of the cadet's progress and achievements.

Making excellent use of the mission control launch facility and space vehicle simulator at the Challenger Centre, cadets fly their final mission to Mars. During the three hour flight the crew must perform the duties of all those employed in the space launch program.

The navigation team continually calculates trajectory changes. The medical team monitors the health and behaviour of the crew. Scientific teams carry out experiments on board the spacecraft and operate remote controlled robotic arms while ground control teams monitor all systems.

In mid-flight a technical team, working in the clean room, assembles and launches space probes while the life support team ensures the availability of clean air and a constant healthy environment. The communication team maintains constant voice communication and data links as the lifeline between earth and space.

ROCKETRY — IT'S A BLAST!

The latest addition to our aerospace program is the study of rocket design and construction. As a support tool, we have selected SpaceCad, a software package, which cadets use to create their own rocket. They design all technical aspects of the rocket from the size of the fins, engine, body diameter, length and recovery mechanism. This information is input as data into a desktop computer where the cadets can then simulate the launch of their rocket. Through computer calculations they can observe the rocket's flight prediction results in text and graph form.

The computer can determine the proper size of engine, thrust characteristics, launch speed achieved, height of travel, rate of acceleration, centre of gravity, centre of power and trajectory. From this information the cadets modify their



Mission director Pauline Kishimoto gives 822 Squadron cadets a pre-launch briefing before their Mars mission onboard the Challenger Centre's space vehicle simulator.

design prior to building an actual rocket. Under supervision of a qualified instructor they will conduct a live launch.

With the addition of three flight simulators using computer-based programs 822 Squadron provides regular flight experience for cadets at all levels. This is an extremely cost-effective method of giving cadets some 'stick' time. The program is hands-on learning of airmanship, theory of flight, navigation, radio communications, airport facilities and air traffic control. The cockpit becomes the classroom.

Coupled with the flight simulator is our air traffic control simulator. Cadets learn the skills and develop the tenacity required to control multiple arrivals, departures and ground movement of aircraft under very realistic conditions. We use an older but very viable *Tower* software package that utilizes both visual "out the window" control along with radar plots and

instrument flight rules traffic. Voice communication between the controller and the aircraft has been added to create a very realistic environment.

Technology is only a tool. The degree of success in using technology is limited only by the users' imagination and innovation. Someone once said, **"What the mind of man can conceive and perceive the mind of man can achieve."** ✨

— Maj Gowing is the commanding officer of 822 Squadron.



Mission flight director Sgt Alycia McQueen at her work station in mission control.

OUT OF REACH ?

By Maj Ron Gowing

IF YOU'RE THINKING THAT OUR AEROSPACE PROGRAM IS BEYOND YOUR REACH, THINK AGAIN. FOR ANY AIR CADET SQUADRON, "IMAGINEERING" — NOT MONEY — IS THE KEY.

Breslau is a small village of 900 people, within a township of 12,000 people. Our squadron is self-sponsored. We do our share of fund-raising because we don't have a lot of money and we are not handed things on a silver platter.

You can do what we did. Here's how.

Cadets themselves can design and build a table-top housing that looks like any aircraft's cockpit instrument panel, hiding an 'everyday' computer monitor inside. It costs less than three pizzas and a case of Coke.

The software, *Microsoft Flight Simulator*, is available at Staples or Future Shop for the price of two music CDs. In our case, the cadet detachment commander provided every air cadet squadron in his area with a copy of the software.

You can acquire old (not broken) computers for about a dime a dozen. We acquired 10 obsolete Pentium 100s and 233s when a local grocery chain upgraded their computer hardware.

Squadrons within driving distance of Toronto can use the Challenger Centre for Space Science Education at less than \$10 per cadet, but it

must be booked through their education department. Squadrons in Metro Toronto can get there for the price of a subway token. The 'teachers' program' is free.

The software, *Destination Mars*, is a made-for-education software, available for about \$59 (US). It can be used on any old 486 or better computer with a mouse and an audio board. These computers cost from \$20 to \$30 at your local flea market.

It's the same story for air traffic control (ATC) software. *Tower* is an old software package that runs on anything with a capacity for Windows. I'm talking a dozen doughnuts and three cups of Tim Horton's double-double. The cadet instructor for our ATC program was assisted by his dad in building the console for our ATC monitor.

The robotic arms are available in kit form for a little over \$100. They come complete with manuals. The OWI Robotics Training curriculum can be purchased for \$39. The interface for any Windows-operated computer is the biggest investment at about \$250.

Space data and information is available on the Internet or

from the Canadian Space Agency in St-Hubert, QC.

Complete rocket kits can be purchased in educational bulk packs for about \$7 per kit. We use an authorized and licensed launch field operated by the local rocket club about 15 kilometres away.

When 822 Squadron moves in to its new Cadet Youth Development Centre, built and financed completely by volunteers and community donations, aerospace will be only one of the optional programs offered. We hope to offer other squadrons in the area the opportunity to participate in our programs and use our hardware.

A little imagination can carry you a long way in satisfying the visual and perceptive needs and wants of young cadets. We are trying to take cadets out of the chalk and blackboard classrooms and create an atmosphere where they think and believe they are involved in something new, something big and something that has practical application in their world.

For more information, call me at (519)653-6065 or send an e-mail to co822@hotmail.com. ✨



Sgt Corey Kaune controls several aircraft on his radar simulator during air traffic control training. Sgt Kaune and his father assembled the ATC simulator for the squadron's optional training program.