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IN THIS ISSUE:

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THE CANADIAN AIR FORCE JOURNAL is an official publication of the Chief of the Air Staff and is published quarterly. It is a forum for discussing concepts, issues and ideas that are both crucial and central to aerospace power. The *Journal* is dedicated to disseminating the ideas and opinions of not only Air Force personnel, but also those civilians who have an interest in issues of aerospace power. Articles may cover the scope of Air Force doctrine, training, leadership, lessons learned and Air Force operations: past, present or future. Submissions on related subjects such as ethics, technology and Air Force history are also invited. This *Journal* is therefore dedicated to the expression of mature professional thought on the art and science of air warfare and is central to the intellectual health of the Air Force. It serves as a vehicle for the continuing education and professional development of all ranks and personnel in the Air Force as well as members from other environments, employees of government agencies and academia concerned with Air Force affairs. ■

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THE CANADIAN AIR FORCE JOURNAL

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THE CANADIAN AIR FORCE JOURNAL welcomes the submission of articles, book reviews and shorter pieces (which will be published in the Letters to the Editor, Points of Interest and Pushing the Envelope sections) that cover the scope of Air Force doctrine, training, leadership, lessons learned and Air Force operations: past, present or future. Submissions on related subjects such as ethics, technology and Air Force history are also invited.

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Item	Word Limit*	Details
Letters to the Editor	50-250	Commentary on any portion of a previous *Journal*.
Articles	3000-5000	Written in academic style.
Book Reviews	500-1000	Written in academic style and must include: • the book's complete title (including sub-title); • the complete names of all authors as presented on the title page; • the book's publisher, including where and when it was published; • the book's ISBN and number of pages; and • a high resolution .jpg file (at least 300 dpi and 5 by 7 inches) of the book's cover.
Points of Interest	250-1000	Information on any topic (including operations, exercises and anniversaries) that is of interest to the broader aerospace audience.
Pushing the Envelope	250-2000	Forum for commentary, opinions and rebuttal on *Journal* articles and/or issues that are of interest to the broader aerospace audience.

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CF Photo: Sgt Matthew McGregorn

EDITOR'S MESSAGE

With the draw-down of Canadian aerospace forces in Afghanistan yet to take place, the Air Force finds itself engaged in another theatre of conflict—this time over Libya. Canadian air and maritime elements are acting as part of an effort led by the North Atlantic Treaty Organization (NATO) in support of United Nations (UN) Security Council (SC) Resolution 10200 enforcing a "no-fly" zone over Libya and authorizing "all necessary measures" to protect civilians. It is a broad and complicated mission, but it is also the type of mission that the Air Force does well.

However, there is one important difference with this particular mission: the overall commander is a Canadian, Lieutenant-General (LGen) Charles Bouchard, an Air Force senior officer. As the overall "head" of NATO's Operation UNIFIED PROTECTOR, LGen Bouchard is responsible for all NATO and coalition forces assigned to enforce the UN mandate. This includes approximately 650 Canadian Forces personnel divided up into a headquarters element (Task Force Naples) of 50 personnel, Her Majesty's Canadian Ship (HMCS) CHARLOTTETOWN (Task Force CHARLOTTETOWN) with an embarked Sea King detachment (250 personnel), and Task Force Libeccio with 350 personnel.

Task Force Libeccio is an example of the expeditionary aerospace "punch" that the Air Force can bring to a fight. Comprised of seven CF188 Hornets, one CF150 Polaris air-to-air refuelling tanker, two CC130 Hercules transport aircraft, and two CP140 Aurora maritime patrol aircraft, Task Force Libeccio, under the command of Colonel Alain Pelletier, is capable of providing a wide gamut of aerospace capabilities. Ranging from air superiority to precision strike to maritime surveillance, and ably supported by indigenous lift and refuelling assets, it is a small but potent mix. And, when the Sea King on board CHARLOTTETOWN is included, the only combat capability missing from the equation is tactical aviation and unmanned aerial vehicles, which are heavily engaged in Afghanistan.

From a Canadian aerospace power perspective, the ongoing operations in Afghanistan and in Libya will need to be examined in great detail. These operations should be examined not only for the lessons and insights that will come from direct combat operations (of which there will no doubt be many), but also from the not-so-glamorous areas such as organization, sustainment, support, and training. With a cursory glance at the two operational theatres, the generalization could be made that the different Air Force communities are engaged in their "own fight": fighters in the skies over Libya, maritime patrol / rotary-wing in the waters off Libya, and tactical aviation in Afghanistan. Nothing could be further from the truth, but each of these communities does have specific roles and responsibilities upon which to focus. Not so with the supporting elements of the Air Force.

The remainder of the "Big Blue," be it administration, transport, supply, maintenance, military police, intelligence, staff personnel, et cetera, are required to support both missions. And, lest we forget, all of the day-to-day routine missions back home (such as North American Aerospace Defence Command [NORAD], northern deployments, support to Canadians, and training) continue unabated, creating demands on both support and operational elements. It is an impressive effort and one that comes not only with a sense of pride and accomplishment, but also with built-in stresses and strains on the organization, personnel, and resources.

How do we manage to get the job done? How can we do it better? How are we impacting our future with the current operational tempo? These are just three of the questions that we need to ask ourselves when we examine the Air Force in Afghanistan and Libya. Finding the answers to questions like those above will take a lot of work, and may be a long time coming, but they are a necessary part of the job.

Sic Itur Ad Astra

Major William March, CD, MA
Senior Editor

List of Abbreviations

LGen	**lieutenant-general**
NATO	**North Atlantic Treaty Organization**
UN	**United Nations**

LETTERS TO THE EDITOR

Dear Editor,

Thank you for Colonel Todd Balfe's excellent summary of "Vigilant Eagle 2010: Ground Breaking Engagement with Russia (Volume 4, Number 1). For the record, I would like to offer some additional background regarding this historic exercise, which may be of some interest to your readers. Specifically, the genesis for Vigilant Eagle 2010 (VE 2010) in fact goes all the way back to December 2005 when Russian General-Lieutenant (Gen-Lt) Igor Khvorov, then Commander of 37th Air Army and Long-Range Aviation (LRA), visited Headquarters North American Aerospace Defence Command (NORAD) and United States (US) Northern Command in Colorado Springs. Apart from the noteworthy fact that no such visit had ever previously been made to these headquarters, our commander, Admiral Tim Keating, wanted to offer the Russians tangible proof of our transparency and a willingness to go much further in this regard, as well as a practical opportunity to train together in pursuit of a common cause—counterterrorism.

Subsequently, in what was supposed to be a 20-minute brief proposing a NORAD-Russia cooperative air exercise, the undersigned spent nearly 90 minutes helping to clarify our training objectives amidst a charged atmosphere that clearly reflected both the great promise of this historic meeting as well as half a century of cold war tensions. For his part, Gen-Lt Khvorov, gregarious and animated throughout, shocked everyone in the room when he suggested that instead of leasing a commercial business jet (simulating a Boeing 757 airliner) as an exercise target, that we consider instead the possibility of using one of his "Bear" bombers as the simulated hijacked aircraft. To this day, I doubt that anyone really knows how serious Khvorov was or whether he himself was aware of the implications of such a curious suggestion; however, it was agreed that planning should and could proceed without prejudice to any future decision on the actual aircraft to be employed in the exercise.

In the event, NORAD did establish a Russian Initiatives Working Group in January 2006 to help carry forward a number of initiatives related to this visit. The first of these involved establishing a secure telephone link for the purpose of information sharing and (if required) coordination between Commander NORAD (CDRNORAD) and the Russian Ministry of Defence. The fact that unclassified commercial phone lines were (eventually) installed at Russian and NORAD command centers in support of VE 2010 is clearly an excellent first step towards achieving these original strategic communications objectives.

The second goal was the aforementioned NORAD-Russia cooperative air exercise which was to be developed in three parts: a table-top planning exercise (to be held in Ottawa), a command-post exercise, and ultimately a live-fly exercise. A third goal and one of Admiral Keating's overarching objectives was the pursuit of transparency regarding Russian LRA training flights in the High Arctic. By initiating such cooperation in anti-terrorism and counterterrorism, it was hoped that eventually the Russians would one day provide advance notification of those military air activities they intended to conduct in areas of the Arctic adjacent to US and Canadian airspace. Needless to say, this type of cooperation held and still holds the potential for significant cost savings should US and Canadian alert forces have such information in advance of applicable Russian flights.

In pursuit of all these ambitious objectives, a NORAD planning team visited the Russian Ministry of Defence in May 2006. However, the great promise arising from the Khvorov/Keating meetings was not to be realized, at least in the short term, as evidenced by the very cool reception received by the NORAD interlocutors in Moscow. In fact, the general impression was that the cold war may have been over, but that cold war suspicions were still the order of the day. Moreover, Russian enthusiasm for the counterterrorism exercise appeared to have diminished significantly, and therefore subsequent planning was impacted accordingly. More ominously, as Colonel Balfe noted, the Russian invasion of Georgia two years later would set back all of these initiatives even further, although remarkably for less than one year.

LETTERS TO THE EDITOR

Finally, I would hasten to add that the NORAD transparency initiative was originally conceived in the spirit of a similar effort underway in the North Atlantic Treaty Organization (NATO) at the time called the Cooperative Airspace Initiative (CAI). This CAI was itself a historic decision of the NATO-Russia Council in 2002, a confidence building measure which envisioned an exchange of civil/military air traffic information between NATO nations and the Russian Federation. In fact, the CAI was endorsed again by foreign ministers this past April at a meeting of the NATO-Russia Council in Berlin and is expected to be operational later this year. Specifically, Ministers have agreed to develop "an information exchange system… fostering cooperation on airspace security issues aimed, in particular, at strengthening the capabilities against terrorist air threats." In this context, ideally, NORAD should also find ways to duplicate key provisions of this initiative in its own area of responsibility, and I look forward to hearing more about this subject in future issues of the CAFJ (*Canadian Air Force Journal)*.

In summary, the successful execution of VE 2010 is not only a tribute to the foresight of Admiral Tim Keating, but to the perseverance of NORAD leaders at every level since then, and to the remarkable efforts of countless exercise planners during the nearly five years it took to bring this all together. Well done. Hopefully the next chapter in this worthy endeavour is already being written.

Sic itur ad astra.

Patrick M. Dennis
Colonel (Retired)
Adjunct Professor
Department of Political Science
Wilfrid Laurier University
Waterloo, Ontario

Dear Bill,

It was a pleasure to meet you on Saturday at the Palm Springs Air Museum's tribute to the Royal Canadian Air Force (RCAF). As I mentioned to you, I am still very proud to have served in the RCAF in my youth from 1965 to 1968.

After I completed my basic training at St-Jean, Quebec, I was very fortunate to be selected to attend the radar air training facilities in Clinton and Camp Borden. After graduating from these training facilities, I was stationed in Canadian Forces Base Trenton, where I worked on radar systems for the Hercules, Buffalo, and Yukon. The subsequent training that I received at Trenton on the search radars was a tremendous benefit to my "after the Air Force" opportunities. From Trenton, I was posted to Rivers, Manitoba, to work on the T33 and various Army helicopter avionics systems.

While in Rivers, the Air Force was integrating and downsizing. I volunteered to leave the Air Force and was released in late 1968. As you are aware, Rivers was closing down and personnel were being sent to Cold Lake, Alberta, to work on the CF5, the latest fighter jet at the time.

After my time in the Air Force I worked for a communications manufacturing company called Northern Radio. They were situated in Ottawa and their primary product was repeater equipment used by the railroads. This was a good opportunity to put into practice much of the transistor and integrated circuit knowledge I had acquired while in the RCAF. Subsequently, I moved to Vancouver where I worked first as a technician for the British Columbia Telephone Company (BC Tel) and later as a network services manager.

At that time, the cable television business was starting to take hold and I was recruited by a large cable company to move from BC Tel after 13 years of service. Once again I determined that destiny held positive opportunities for me and I started work as Vice President (VP) Operations for Rogers. Five years later, a smaller, private multi-system operator (MSO) partially owned by Rogers, offered me a job as their VP and general manager. I accepted that position and was delighted to

LETTERS TO THE EDITOR

work within a family-owned environment. Rogers subsequently acquired that company; however, this presented an opportunity to respond to an opportunity at Shaw with whom I have now worked for over 21 years. As the President of Shaw we have experienced tremendous growth within our company. Last year, you may have read that we acquired Canwest/Global for just over $2 billion. That acquisition has added content to our portfolio of distribution companies, including cable television, satellite, Internet, and telephone.

I will always be grateful for the personal growth and development that occurred for me having served in the RCAF. I couldn't recommend more strongly to our youth of today the benefits of serving in the Air Force, or for that matter any of the branches of the armed forces. The discipline, development, and pride of ownership that come with this experience are priceless.

In conclusion, the reason that I sought you out at the Air Museum event was to express my gratitude for all that the RCAF did for me.

Kindest regards,

Peter Bissonnette
President and Director
Shaw Communications Incorporated

EDITOR'S RESPONSE:

Peter: It was a pleasure to meet you in Palm Springs. I only wish that we had had more time to chat, but such is the way of a reception.

I am so very glad that your experience in the RCAF was both rewarding and memorable. I share the same feelings—which probably explains why I've remained in the Air Force for over thirty-three years. I like the life and the challenges that come my way each and every day.

Mind you, the brief summary of your career showed me that you are no stranger to challenges as well. All I can say, as a Canadian, is that individuals such as yourself deserve our appreciation and respect, for to me, you have contributed so much to the fabric of this country. The jobs that you and your company have created have supported countless families throughout the land, permitting them to grow and prosper and build what I truly believe to be one of the greatest countries in the world. It may sound corny, but it is what I feel. And if your stint in the Air Force was one of the factors that contributed to your success and your ability to give back to Canada, then I guess the Air Force got it right.

Letters to the editor are welcomed and must include the author's name, rank and position. Include a phone number for verification. We reserve the right to edit while preserving the main objective of the writer. We cannot guarantee that any particular letter will be printed. Mail, e-mail or fax to the *Journal*'s Senior Editor.

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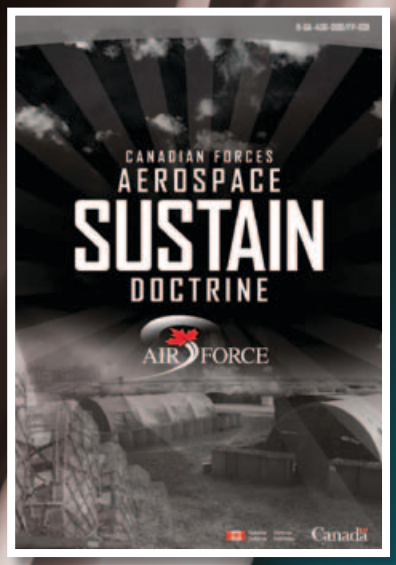

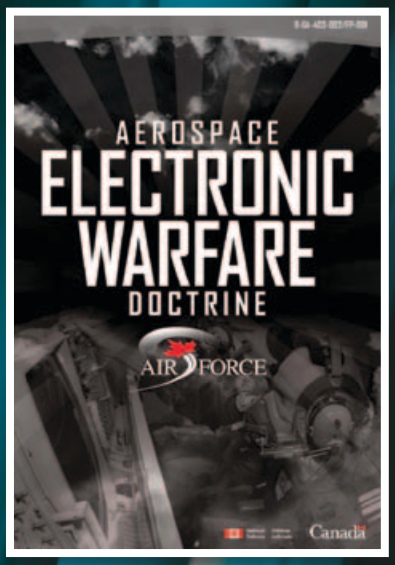

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WHO OWNS YOUR E-MAILS? :(

By Major François Dufault, CD

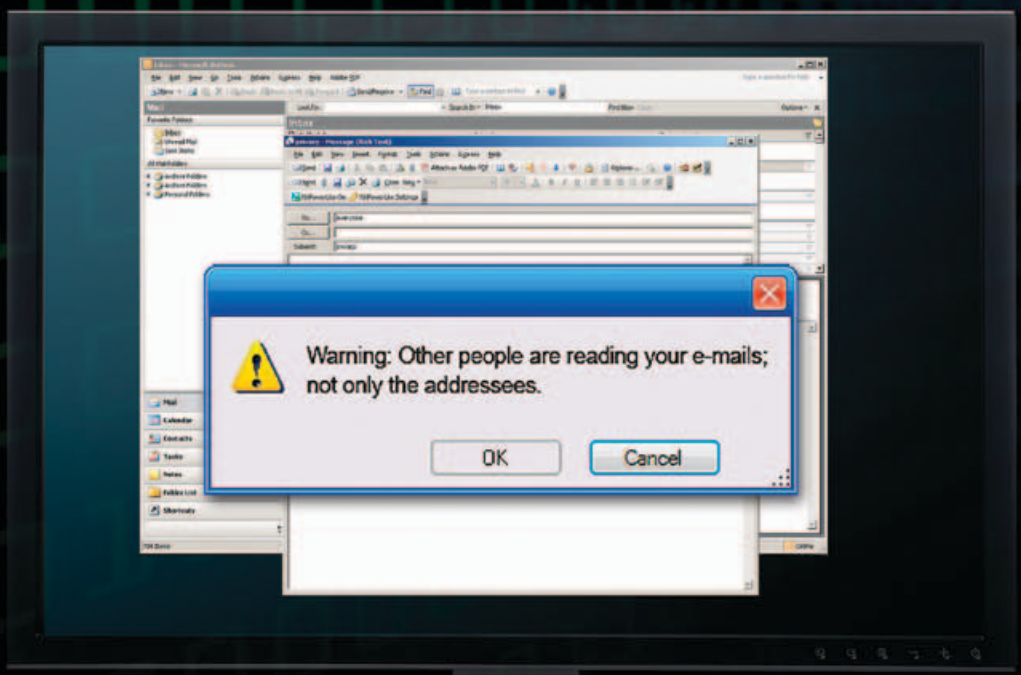


Photo composite by CFAWC

In today's world, stating that e-mail is essential is an understatement. Without e-mail, a lot of businesses, including government affairs, would quickly come to a grinding halt. We are now highly dependent on this method of communication and many times rely solely on it for our day-to-day operation. E-mail is a great staff tool that gets things done quickly and efficiently. We also use it at home for communicating with family and friends. Sometimes, the line between official and personal use gets blurred, and we use our work e-mail for personal reasons. This article provides a look at the formality of this tool that we use everyday. We will look at the legality and accountability of e-mail.

The first aspect to consider is the legality of e-mail communication within a business context; in other words, are e-mails legally binding documents in a business relationship? Within Canada, the *Uniform Electronic Commerce Act* was recommended for adoption in September 1999 by the Uniform Law Conference of Canada (ULCC). This act is modeled on the United Nations Model Law on Electronic Commerce.[1, 2] It essentially states that in Canada, electronic communications are considered functionally equivalent to their respective paper counterparts.[3] In order for this to be enforceable, the electronic documents need to follow certain rules that are summarized here:[4]

Documents are not invalid or unenforceable by virtue of being electronic.

Documents need to be accessible and retainable by the parties involved.

The display of information shall be recognizable as being in the form required by law.

The integrity of the information shall be reliable.

An electronic signature, which has to be reliable in identifying the person making it, satisfies the legal requirement for an original signature.

For example, if a project manager within a government department or agency accepts an engineering change that was requested by a contracted organization by responding to his e-mail, this e-mail becomes just as legally binding as if the government's project manager had signed an official paper form. In this respect, e-mail is far from being an informal communication tool.

Now, what about personal e-mails of a non-business nature between co-workers; is that considered informal? Documented examples in the United States (US) by Womack *et al* in 2004 clearly show that personal e-mails have been used by employers to terminate employment of individuals.[5] In all cases, the employers used information contained in company e-mails as basis for employment termination. The employees all maintained that the company invaded their privacy. Some individuals even had their "personal" e-mails password protected in an attempt to create a barrier between business- and work-related e-mails. In all cases, the courts favoured the employers by stating that because the employees had voluntarily communicated these e-mails over the company e-mail system, they no longer were considered private. Although these cases occurred in the US, the arguments may be similar in Canada. Therefore, even in personal or non-business-related matters, e-mail is still not to be considered an informal communication tool.

Similarly, e-mails from individuals within an organization can render the entire organization liable and accountable. And the sender does not need to be a high-level executive in the organization for this to happen. In a well-publicized case in the US, in 1995, female employees of Chevron filed a sexual harassment suit against their employer stating that the company created, or failed to prevent, a toxic workplace for women. One of the main pieces of evidence involved an e-mail giving 25 reasons why beer is better than women, which was circulated amongst 25 men in the company. Chevron settled the lawsuit for US$2.2 million.[6] Yet another example of where e-mails are far from informal.

How can an organization manage the risks associated with e-mail from or to its employees?

Most organizations have established codes of conduct with regards to the use of e-mail. These usually include one or more of the following:[7]

restrictions limiting the personal use of e-mail and the Internet;

policies forbidding harassing, offensive, threatening and other illegal communications, including those that violate privacy law or copyright law;

monitoring of e-mail and Internet use;

blocked access to personal web-based e-mail; and

blocked access to external blogs and certain Internet sites (e.g., pornographic, sexist or racist, personal networking, gambling, or shopping sites).

Let's now look into the e-mail management policy within the Government of Canada as an example.[8] In this policy, e-mails are considered records when they pertain to the business of the government and must be kept as records of the Government of Canada. The policy states that "they must be kept to ensure the integrity of the corporate memory of government."[9] The policy also states that transitory e-mails and those of a personal nature should be deleted once they have served their purposes.

Finally, Neil Sherratt, in a 2007 article, proposes the following ten aspects of e-mails that should be considered by anybody using e-mail:[10]

Other people are reading your e-mails; not only the addressees.

Other people have copies of your e-mails.

You are legally and financially exposed and liable.

It is easy for someone else to alter your e-mails.

It is very easy to pretend to be you.

E-mail delivery is unreliable.

Password protections are easily broken.

Your business is at risk; the United Kingdom reports suggest that up to 70 percent of security breaches are committed by staff.

Anti-virus, anti-spam, and firewall systems are not security.

Staff accidents can have severe consequences, such as a using the "reply to all" button and sending proprietary information to an individual outside the organization.

To conclude, it is wise to take the following approach with e-mail. E-mails should never be considered as an informal method of communication. When you hit the "send" button, you lose the ownership of that e-mail and could be held accountable and liable for its content. Moreover, your e-mail could end up in the inboxes of individuals you could not imagine. Therefore, caution should always be exercised when using e-mail. ■

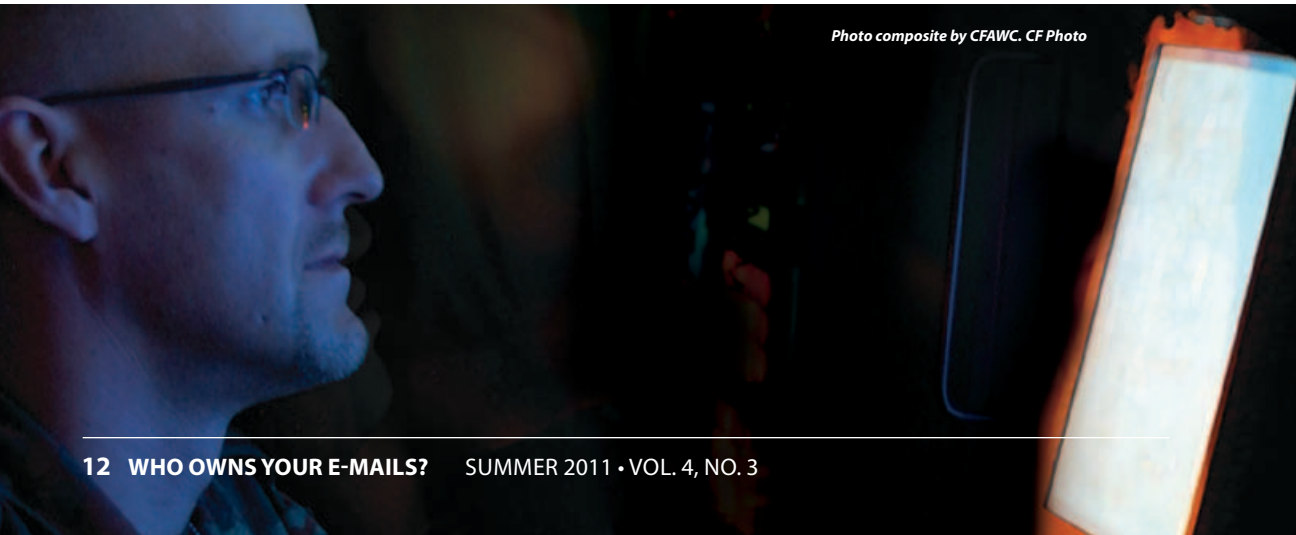


Photo composite by CFAWC. CF Photo

Major François Dufault joined the Canadian Forces in 1994, is a graduate of the Royal Military College of Canada in Civil Engineering, and a CH146 Griffon pilot. Major Dufault currently works in the Directorate of Aerospace Requirements 9, looking after the CH146 Griffon helicopter requirements. He is also a part-time student in the Engineering Management programme at the University of Ottawa.

Abbreviation

US	United States

Notes

1. Canada, Depository Services Program, *Facilitating Electronic Commerce Through The Development Of Laws To Recognize Electronic Documents And Transactions,* Margaret Smith (Law and Government Division, 20 November 2000), http://dsp-psd.tpsgc.gc.ca/Collection-R/LoPBdP/BP/prb0012-e.htm (accessed June 3, 2011).

2. Fraser Milner Casgrain LLP, *Doing Business in Canada* (FMC Law, May 2010), 70, http://www.fmc-law.com/upload/en/publications/2009/DBIC_March2009.pdf (accessed June 3, 2011).

3. It should also be noted that certain documents and contracts cannot be formed electronically. These include wills and contracts for the sale or purchase of real estate. See Fraser Milner and Casgrain LLP, 72.

4. Ibid., 71.

5. L. Womack, D. E. Braswell, and W. K. Harmon, "Email Policy Enforcement: Techniques and Legality," *Journal of Accounting and Finance Research* (Summer 2011): 102–108.

6. R. Zambroski, "Think before you send…," *Communication World* (May, 2006), http://www.thefreelibrary.com/ (accessed June 3, 2011).

7. J. M. Moore, "Your E-mail Trail: Where Ethics Meets Forensics," *Business and Society Review* 114:2: 273–293.

8. Canada, Library and Archives Canada, "Email Management in the Government of Canada," www.collectionscanada.gc.ca/government/002/007002-3008-e.html (accessed June 3, 2011).

9. Ibid.

10. N. Sherratt, "The dos and don'ts of email," *NZ Business* 21, no. 3: 21–22.

EXPOSING THE TRUE COST OF DISTANCE EDUCATION

(and what should be done)

BY MAJOR BERNIE THORNE, CD, MSc

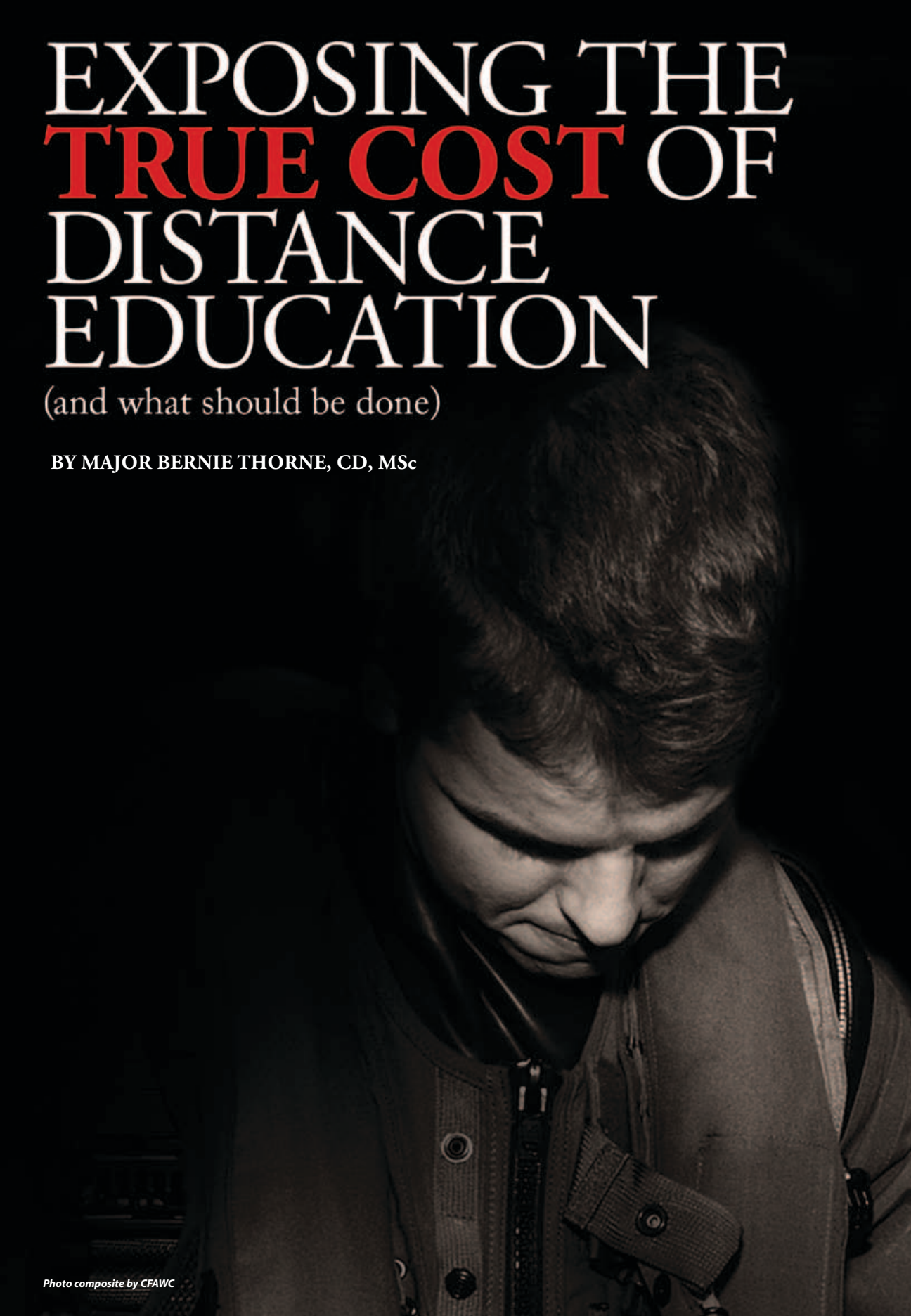


Photo composite by CFAWC

The following article is informed by the author's Master's thesis. This thesis sought to identify the reason why some military personnel succeed in part-time learning, while others do not. The thesis discovered that, paradoxically, the most motivated and driven people were those who tended not to complete. When a full workload, family life, personal time, and the school work compete for the attention and effort of highly driven individuals, those who do not lower their workload may burn out if the programme is longer than their endurance. Walking the path to burnout incurs significant costs to the member and also to the organization. So, this article could have been written to educate students of the dangers of burnout, and what skills/supports may be employed to help prevent it; however, discussion with the editor clarified the need to inform policy makers of the deleterious impacts of and ways to enhance part-time distance learning programmes.

INTRODUCTION

The demand for ever-increasing levels of education within the Canadian Forces (CF) continues to mount. From our very beginnings as a professional military, there was wide acceptance of the need for a liberally educated officer corps. With the increasing pace of technology, the CF must also depend on advanced education to access specialized skills. Ever-increasing complexity of bureaucratic control mechanisms demand solid understanding of the underpinning theories, as well as the application of those controls to work within and shape the mechanisms as required. The target audience has expanded beyond the officer corps to include the entire CF, grown in span to include the CF at large, and broadened to include a range of programmes often not available from within military training systems.

The CF has facilitated and encouraged members to undertake educational programmes. There has been a myriad of ongoing sponsorship programmes aimed at delivering advanced education: Advanced Degree Completion Plan, Educational Reserve, et cetera. There have also been initiatives to increase the formality of high-level military training to achieve, where possible, equivalency with civilian universities. Programmes that have been proven popular include the Officer Professional Military Education (OPME), which provides university credits, and the Staff College, which when coupled with supplemental work, offers a master's degree.

There is also an increasing value placed on advanced education qualifications with certain positions, trades, and rank levels, requiring educational accreditation. Weighting of education on merit boards for promotion, postings, and access to highly sought courses is spreading at a sedate but steady pace. The civilian workforce also values academic qualifications, and the potential for access to a better second career is often another motivation, as is the desire to prove/improve oneself.

As the CF is unable to deliver the desired levels of education to all members during working hours, several programmes have been created to partially sponsor members willing to undertake education on their own time. The author completed his master's degree under the Advanced Degree Completion Programme, and a newer programme called the Educational Reserve is now in place. These programmes offer monetary sponsorship while participants continue to work and complete education on their own time. In an environment where postings and deployments often occur with little warning, many members lean towards distance learning to ensure opportunity for completion.

Risks

The desire for education is shared by both the CF as an organization and the individual members who wish to have access to it. Access to the fully sponsored (time and costs) programmes is normally strongly contested, with a large number of members vying for the opportunity. Work is laid aside for a year or two to allow concentration on education, and it is usually expected that the educational knowledge and skills obtained will be put into use on return to work. The current operational tempo, along with ongoing personnel shortages, have made it difficult to provide members the time away from their occupation necessary to "go back to school." Financial sponsorship, alone, is much easier to obtain, but advanced education obtained via distance learning—while remaining engaged in a professional work and family life—is such a

costly endeavour that the risks and costs must be considered before committing.

The risk of not completing is much higher for distance learning as compared to physical classroom attendance. The author's review of the literature revealed that the most optimistic results showed an attrition rate only 10–20 per cent worse than traditional classroom education.[1] Most studies have a more pessimistic outlook. Sparks and Simonson showed attrition rates of 40 to 50 per cent higher.[2] Menager-Beeley identified 20 per cent attrition for regular versus 50 per cent for distance.[3] The most damning study tracked a pass rate of only 44.2 per cent for distance learning.[4] Taken together, these results show a non-completion rate of between 20 to 50 per cent for distance learning, which is significantly worse than that for traditional classroom study.

Unfortunately, none of the above studies considered a critical factor in this discussion; which is: what is the difference between professionals who remain working and study only in their free time versus people who do not work at all or who work limited hours while attending school? One study did consider this factor and found that 68 per cent of career workers who studied nights/weekends were at substantial risk of not completing education as compared to only 18 per cent for students who worked only to support school.[5] Those with careers were 3.8 times more likely not to succeed than students without careers. If we merge these study results, we see a grim picture. A generic distance learning programme will see a total dropout rate of between 20 and 50 per cent, and the working professional is 3 to 4 times more likely to be one of the students who does not succeed. Canadian Forces members who continue to work and enter distance learning are at a significant risk of not completing their course of study.

The costs incurred by any member who participates in distance learning while remaining at work are significant. Sponsorship funding may have to be returned (up to $25,000) if unsuccessful. Compulsory service is incurred in some programmes regardless of success or failure. Canadian Forces students who were interviewed by the author were almost uniform in how they obtained time for study. First, they lost personal time (for hobbies, relaxing, fitness, and sleep) and then, their family time was taken. In several cases, this "stealing of time" was so serious and damaging that the term "cannibalizing" was used. As these programmes normally last from two to five years, there are often postings, promotions, deployments, and new family members to deal with at the same time. The resulting stress maintained for years can cause long-term effects on motivation and even health.

> Most of the time that I did my school work was after they had gone to bed... working from eleven to two o'clock or eleven to three in the morning and then getting up at six or seven to go to work the next day... It weighs on me every day that I haven't finished that. It literally pains me every day.[6]

Although time was rarely taken from the job, it is not unreasonable to assume that the amount of physiological and psychological stress may have resulted in reduced performance at work (although this measurement was outside the scope of the author's study). As the members become aware of the costs that they and their families are paying, resentment towards the CF is a reasonable expectation. This level of stress maintained for years can result in burnout that has no short-term remedy, even when acknowledged, and can cause multiple detrimental effects on performance.

THE STUDY

Background

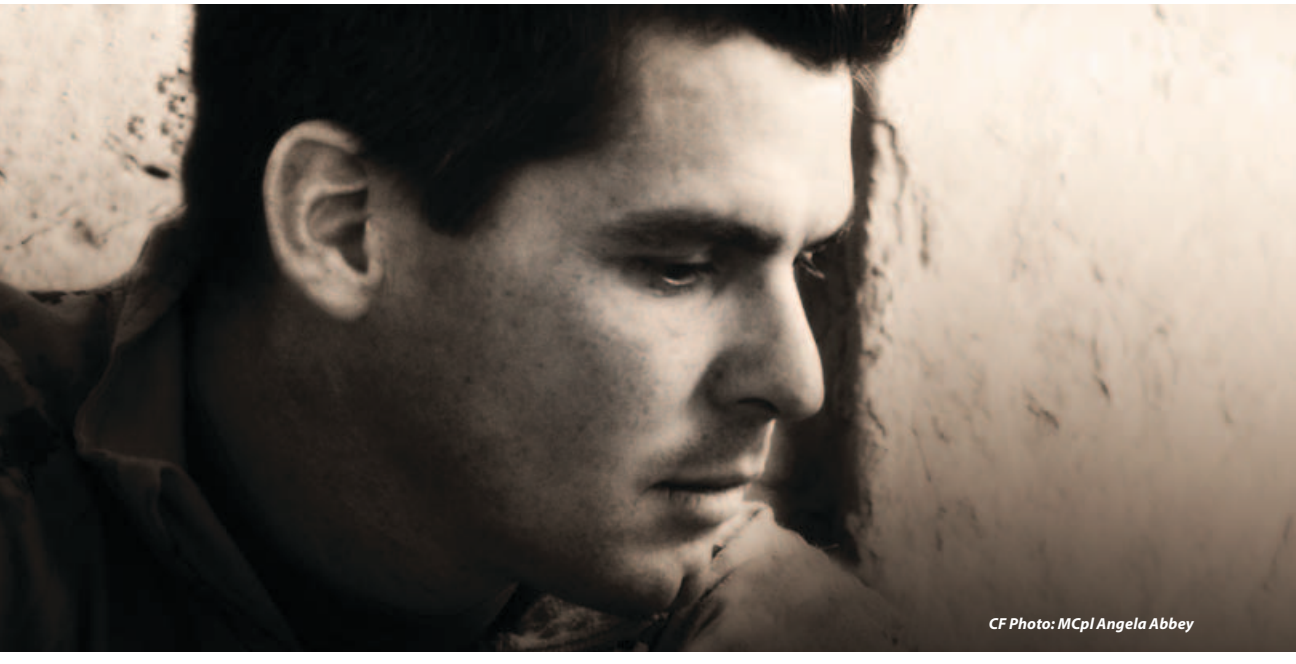
The author's study strove to identify what enables some working adults to complete significant distance educational endeavours while others are thwarted. It was identified that working adults who decide to undertake education are at great risk of not completing, so the import of this study is apparent for the individuals themselves. However, the CF and the educational institutions should have an acute interest in the question as well. In addition

to the moral concern of the organization to the individual, the CF has a vested interest in its members successfully seeking higher skills and qualifications. Many of the motivational elements (a sense of competence, as example) are also very likely to carry over to all of the activities and goals undertaken by the individual, potentially improving (or damaging) job performance. Educational institutions seek to improve their reputations and thereby gain and educate more students. Back to the question: What enables some working professional adults to complete significant distance educational endeavours where others are thwarted?

Methodology

To answer the study question, we had to find which of the theories of motivation best explained the path to success or failure to allow us to identify when, where, and how to intervene to provide the best chance of success. Given the hundreds of theories and sub-theories within each of these schools, it could seem like an impossible task to narrow down these theories or to pick one out from all the others for testing.

Fortunately, most of the theories are similar. They have largely the same elements that are explained, or interact, in slightly different ways,



CF Photo: MCpl Angela Abbey

There are two major schools of motivation theory. Needs (or content) theories emphasize the wants and needs that motivate people, and Maslow's hierarchy of needs is a well-known example. The other major branch is the cognitive (or process) school that tries to explain how we think, decide, act, respond, change, et cetera. In order to have a complete picture of motivation, both schools must be considered. Each of the hundreds of motivational theories holds truth, but we need to find the one that is the best "fit" if we are to explain what is happening to these students and how we can improve results.

or with stress on one area over another. A study that assesses all potential elements and discusses how these elements interact for each subject through in-depth interviews should allow the paring down to a few theories that best explain how success is achieved in this unique group.

When studying motivation, it is best to conduct purposeful sampling; that is, to randomly pick from within a desired study group. The reason for this is that those whose motivation has been most adversely affected are much less likely to volunteer. Approval from the Social Sciences Review Board was required to

conduct a study within the CF population, and privacy concerns prevented direct access to the files and individuals. The staff at the Canadian Defence Academy kindly assisted this study by sending volunteer requests to approximately 200 students. Of almost 40 personnel who volunteered, 13 were acceptable subjects. This loss of purposeful sampling could not be avoided, and it is important to note that the worst cases were unlikely to have been heard.

Results

The prediction that significant motivational elements were damaged and resulted in dropping out turned out not to be true. The needs remained outstanding (payback, qualification, recognition, etc.) by those who were unsuccessful, and the parts of their thought processes, or cognition, most important to motivation (sense of competence, control, etc.) remained strong.

The subject group felt highly efficacious and competent, and even the lack of success following educational endeavours of several years did not make this waiver. Control of the learning process certainly showed to have positive motivational benefit, but lack of control of learning was not voiced as a significant detractor of motivation in the group. Lack of ability to maintain balance between goals was cited as a larger source of lost feelings of control. The commitment to the goal of education resulting from the needs of the individuals was evoked considering both costs and benefits. The rapid and unexpected life changes thrown at these individuals contributed to the difficulty in keeping the desired balance between work, education, and family. These life changes were not, however, cited as the major source of lost balance.

More interesting is that some individuals were very strongly committed to the goal of education and seemed to have a need to perform far beyond the level required to receive the benefit. They incurred cost for no reason other than for the desire to prove themselves. Whatever the cause, a portion of the subject group was at risk of exerting such effort and accepting such stress for extended periods that the author was forced to consider "burnout" as the cause of lost persistence.

Assessing all the elements of motivation did allow a tentative identification of what caused the most at risk of burnout. Achievement goal Orientation (AO) refers to the individual's natural tendency towards what goals are selected and pursued and is a very stable trait. There are three types of AO: learning, performance-avoid, and performance-prove. Both learning and performance AOs may be held at the same time to varying degrees of strength. A learning AO drives individuals to seek opportunities to develop and grow; as could be expected, all the subjects who volunteered for education had a very strong learning AO. The performance AOs (prove/avoid) relate to the individual's motivation in terms of others. A performance-avoid AO causes the individual to avoid situations where they may compare badly or where there is risk; the subjects understandably showed absolutely neutral on the performance-avoid AO. The performance-prove AO was the one characteristic that varied.

> I knew that if I applied for post-graduate studies full-time, that it was going to take me out of that stream for promotion for a bit of time. And it would probably have cost me to have my promotion to major delayed… you want to come out as high as you can so it's not wasted effort. There were "eyes on." I ended up 1st of 9,000 in the entire master's field at AMU.[7]

A stronger performance-prove AO causes individuals to seek challenging opportunities to compare with others, to show their competence and demonstrate growth. A combination of strong learning and strong performance-prove AO is theoretically the best mix to drive performance and growth. These individuals are the ones whose traits also cause them to set for themselves challenging and risky tasks at work. In this study, however, it was revealed that this combination caused the individuals to set more challenging goals in work and in study and to refuse to back down, even when they were cannibalizing their own lives over several years.

Burnout

That people are strongly motivated and exert massive effort to achieve deeply held needs is what

leads to burnout. We want to be challenged, to have a valuable outlet for our abilities and energy. If we only did what we were told and then went home, there would be no burnout. Burnout can become a vicious cycle once started. The cynical detachment from goals and activity, and the chronic exhaustion make it very difficult to recover because the resources required to escape are disappearing without any change in the conditions that caused the burnout.[8]

> As I look back on it, I just can't believe that I got through it. I got down physically, I have to say. I got sick at one point.[9]

"MY WIFE REALLY TRIED TO BE SUPPORTIVE, BUT I BASICALLY ABANDONED MY FAMILY FOR THAT TWO YEARS. IT WAS TERRIBLE AND I'D NEVER DO IT AGAIN."

Burisch detailed a model of burnout with a basic unit of analysis being an action episode or AE. The AE could be considered a specific action with a purpose, a beginning, and an end. The AE is unspecified in duration, and in practice, it ranges from minutes to decades. AEs can be hierarchically nested, and most people find themselves in several AEs at any given time. An AE begins when motives are activated by perception of a given situation and results in a commitment to an incentive or goal. The actor engages in planning, forms expectations of need, time, resources, likely benefits, and the risks of negative side effects. If the action succeeds and the incentive or goal is attained without investing more resources than planned, then the AE is considered an undisturbed AE. This is unlikely for any but the simplest incentives.[10]

When things do not run as smoothly as planned, the AE is disturbed. The goal can be blocked (motive thwarting), unplanned obstacles can call for unexpectedly high investments (goal impediment), the goal can be attained with the results not living up to expectations (insufficient reward), or unexpected negative results can offset some or all of the gains (unexpected negative side effects). These disturbances result in stress that Burisch refers to as first and second order. When an AE is disturbed, first-order stress appears initially, and the actor attempts to remedy the situation. Second-order stress and then burnout can occur when repeated attempts to fix the disturbed AE do not result in success, and there are no remaining outs or buffers. This second-order stress usually results in feelings of loss of control. In some cases, where the actor's world picture was not in accord with reality, this may lead to enhanced competence once internalized. Coping can fail, however, and this can trigger burnout. Unsuccessful coping can trigger large changes in motive, with such possible results as: planning becoming excessively perfectionist, planning becoming inadequate because of panic, planning being replaced by reaction, and aspiration levels decreasing. Feelings of self-efficacy can be lost. Some people may be burnout prone, and it is possible that burnout-prone people systematically overestimate their ability or happiness generation of successful AEs while underestimating or overlooking the costs.[11]

Grasha and Savickas both distinguish between defensive (frustration or maladaptive) and coping mechanisms (constructive or adaptive) to stress.[12] They consider that defensive mechanisms always involve some amount of distortion or self-deception and are unhealthy in the long term; examples being regression, fixation, or withdrawal. Coping mechanisms include gaining information, seeking help, problem solving, recognizing own feelings, and setting new goals. These mechanisms and strategies are trainable and therefore offer possibility of successful intervention.[13]

When in a situation leading to the potential for burnout, it is critical for individuals to employ effective coping tools early on. Unfortunately, many distance learning programmes do not provide the relationships and support networks necessary to seek help. In addition, the individuals are usually far ahead (in the given academic area) of those around them. The only effective coping mechanism remaining available to an individual

standing alone is to recognize the true situation and set reduced goals (vice self-deception and fixation). A strong performance-prove AO makes the subjects less willing to ask for time off or to request a reduction in workload because they are driven to prove themselves capable of the challenge. It is deeply unfortunate that those individuals who are most likely to take on many and challenging goals are those least willing to use effective coping methods. Instead, fixation becomes the norm, and achieving the goals becomes a question of endurance.

> "My wife really tried to be supportive, but I basically abandoned my family for that two years. It was terrible and I'd never do it again."[14]

Those who walk this path and suffer the pathology towards burnout suffer greatly. The damage to self-respect, quality of life, and willingness/ability to give extra efforts to the CF are significant within those who are the most driven. Several of the subjects had begun or were seriously considering release. Most of the subjects had stated how they were going to shift balance back to their families and themselves; they were much less likely to accept significant new demands from work. This problem is as serious to the CF as it is to the individual. Fortunately, something can be done to reduce burnout; effective coping is a skill that has been proven to be trainable, and education policy can be adjusted to help provide the most critical supports.

As an aside, the author was deployed for six months to Kandahar and paused study for that period. The reduction in stress and pressure made it feel relatively like a vacation despite the challenges of the deployment—a good chance to "recharge the batteries." The CF cares about quality of life and protects personnel from repeated deployments without adequate "home time" in between. Advanced education, done part-time, can last two to seven years without pause, and is as bad as or worse than deployment in many ways to the individual and family. Yet there is no oversight or protection for the individual involved in education.

RECOMMENDATIONS

It is critical that policymakers understand the threat to individuals and to the CF when encouraging significant education while the members remain working. Although difficult to gauge the costs, as the individual changes gradually over several years, the changes are significant. Following the recommendations below should reduce the incidence and severity of burnout, but not prevent it in all cases. As there is risk involved, the programme must be of worth to both the individual and the organization to justify the risk.

If the programme deals explicitly with the work of the individual, not only is the value clear, but also the education is greatly improved. A tenet of adult education is the importance of applying theory as soon as possible. A workplace closely aligned with an area of study also provides a rich base of experience to make the education better and lets the student discuss learning with peers, thereby potentially improving the workplace. A support network (an important part of effective coping) is much more likely as well.

Training Before Beginning

Training the potential students prior to and during education is perhaps the most critical element in preventing burnout. Each region already conducts educational conferences and relationships with a personnel selection officer (PSO), who is required to complete individualized learning plans and to apply for the various programmes. These conferences and relationships may be leveraged to deliver required training and offer an opportunity for graduates to brief their work, for students to seek/discuss thesis ideas, et cetera. If the conference is outside the PSO realm, the students would likely be quite willing to organize on a regional basis—if they were authorized.

Most subjects in the study miscalculated the effort and time required for education and the costs they and their families would incur. Some of this was certainly from unsophisticated decision-making skills, but some was also from misinformation—it is amazing how many

schools say that 10 hours a week for two years can give a real master's degree. Schools need to sell their "product." Most full-time students who have no other distractions and access to all required resources and support at their fingertips require 40 to 60 hours a week over several years. Stories from previous students and especially testimonials from recent graduates would help clarify the likely costs and encourage better decision making.

Most bases already offer learning skills such as speed reading, effective writing, et cetera. To have been away from the academic world for a number of years poses a significant initial hurdle to returning students. Not only are the old habits and skills rusted or lost, many of them have become outdated. Anyone who last did academic research looking though the card files and microfiche is in for a surprise! It is important, therefore, to encourage would-be students not only to access the means to brush up on or acquire these core skills, but also to encourage them to take a university course or two to "warm up" before jumping into the education stream with both feet.

Perhaps the most important training is to encourage adoption of effective coping methods that will help solve the stresses likely to be faced and to recognize those that are unlikely to help. Effective coping methods include seeking help (time off from work, someone to spend time with kids, etc.) and goal revision (accepting lower standards in work, delaying a project or term, etc.). Using real-life examples will be important to make people who have yet to be exposed to these stresses understand the danger of ineffective behaviours such as fixation (increasing effort by taking time away from sleep or family, or planning to an obsessive degree), reaction taking over from self-regulation, and withdrawing from the activity without consciously making the decision to change goals. Measuring the levels of achievement orientation will let the students who are most likely to experience burnout understand why and be better prepared to respond effectively.

CF Photo: Sgt Eileen Redding

Having a community of people who are going through the same thing provides not only a social support network, but also a set of people who have faced or may face similar difficulties. The different students learn to overcome specific problems, and in turn their problems become a source of learning for the others. Having a facilitating local PSO allows for the rapid identification of problems in policy, school, programme, or within a unit. Identification of problems is the first part of continuous improvement.

Policy Supports

There are sections of education policy that are currently quite unfair. Residency requirements are currently not sponsored for travel or living expenses. This limits selection of programmes for those who do not wish to personally bear the associated costs. Postings can also result in students incurring unexpected

residency costs if they must return to what had been a local school. Some commanders recognize this unfairness and authorize temporary duty for work so that the student is paid to travel and live, and does not take leave or takes some leave in combination with paid travel. A fair level of support for sponsorship in residency should be set and enforced equally across all personnel.

It is also up to the commander's discretion whether or not to give educational leave in a given year. Twenty days per year is the maximum authorized, but some commanders give even more time, such as a day a week to study through the year. Distance learning Staff College is one common example of some commanders providing significant time off, while others provide none at all. Those who are in the busiest jobs and need support the most are least likely to get time off. Even when agreements are made with commanders, postings ruin many agreements. A fair level of support must be identified as a hard entitlement for both educational leave and residency sponsorship. As with maternal leave, it need not all be taken, but should not be denied. Moreover, educational leave may have to be encouraged, as those individuals who have the strongest desire to prove themselves and are most likely to burn out are the ones least likely to ask for time off.

Another area of policy that is unfair is that different programmes have different rank requisites. The Advanced Degree Completion Plan, for example, was only for officers. If we truly wish to be a learning organization, to be replete with life-long learners, we must consider or reconsider a few things. Adults seek the education they need to grow and perform. Blocking access to desired training is a significant de-motivator in a knowledge-based workforce. The specialized skills delivered in advanced programmes are increasingly needed at all levels. Finally, as the external job market tightens in the coming years, the CF will be well served by learning to better develop and to advance in-house our best and brightest.

The restricted release and payback rules can be quite unbalanced in some sponsored programmes. That there is one month restricted release for every $2,000 is quite normal; however, the restricted release for some programmes does not begin until graduation. For part-time learning, that can be two to seven years after having begun. The CF gained the advantage of the newly acquired skills throughout while the individuals largely gave up their own time and family time for study. This was recognized, and some programmes, such as the Educational Reserve Programme, have no restricted release provision. This is a good step; however, the various programmes must be fair across the board. I talked with some people who had not finished their education and were pretty certain they would never finish even after years of study and work. At this point, they were considering cancelling their school, just so they could complete their mandatory service and retire. To lose all that work and the qualification when coming up to retirement is a shame.

Military life includes postings to new jobs (some much more challenging than others), promotions to new levels of responsibility, deployment to war and peacekeeping missions, surge periods at work, et cetera. These life changes can cause disruption in educational endeavours. Most distance learning programmes are willing to accept a certain amount of leeway in completion time. What poses greater difficulty is the loss in momentum for the individual. If the person is burning out, to be pulled from the educational goal for military reasons can easily lead to subconscious withdrawal from the education plan without consciously admitting it and/or cancelling the programme. The added stress of payback of sponsorship funds, restricted release rules, being seen as a failure, et cetera, all make it very easy to ignore the problem. However, that is not an effective method in dealing with stress. That "ball of worry" will remain, taking a piece of that person away from family, the CF, and themselves. The CF should be willing to accept delays and cancellations on programme completion. Payback of sponsorship funds and restricted release periods should be abolished for part-time learning programmes. Also, the administrator for the sponsorship programme should actively track programme delays. Allowing a member to sit inactive in a

programme for a year or more is not helping the member. Intervention is required either to break the inertia or to recommend revision of goals—normally to drop education.

CONCLUSION

Military members who undertake significant distance education while remaining at work are at great risk of damage to self and family. The CF risks the burnout of those who are some of the most driven, and who epitomize the values that we espouse. At a time when formal qualifications grow in demand by the organization and by the individual, we will likely continue to encourage our members to take education. A chosen few will be fully sponsored to receive training on military time, while the rest will do so on their family's time.

The best education helps individuals grow along their career path, and increases options for good employment within the CF and on departure. Good education also offers better performance from the individual in their current and future jobs, provides a stronger cadre for senior positions, and shows the larger Canadian population that the CF is a good place to learn and grow. Our challenge is to deliver the best education in the best way. A blend of learning and policy supports can lift some of the worst barbs from the road to life-long learning. The key points for improvement include helping students improve their decision-making and coping skills through conferences and training at the Base/Wing level, and to level programmes to ensure fairness, especially as regards time for study to those who need it most. Discretion of the commander is likely the worst way to implement educational leave.

Part-time education will remain a challenging endeavour that will pose great risk to quality of life. When the costs are being paid by their families, knowing that members are being treated fairly as compared to other part-time learners in the CF is also very important. The members will be hard put to find appropriate balance between their goals and responsibilities, but hopefully, they will soon be better armed to face those challenges. When found, the balance will enable and encourage life-long growth.

Anyone with questions or wishing to read the thesis may contact the author at bernie_thorne@yahoo.com. ■

Major Bernie Thorne joined the Canadian Forces in 1987 from Newfoundland/Labrador. Graduating from the Royal Military College, Saint Jean, Quebec, with a BSc in 1992, he carried on to air navigator training in Winnipeg. Posted to Greenwood to fly on the CP140 Aurora, he flew all navigator (now air combat systems officer [ACSO]) seats, finishing as Tactical Navigator and Crew Commander. Flying operationally for six years at 405 Squadron (Sqn), training five years at 404 Sqn, and operational test & evaluation (OT&E) for four years at Maritime Proving and Evaluation Unit (MPEU), he has flown in support of many other government departments, including over several major disasters. While on tour at Kandahar Airfield, he received his current posting to lead the Air Force Experimentation Centre (AFEC), a section of CFAWC, where the team works to identify, assess, and push the potential of new technologies to improve the effectiveness and/or efficiency of the Air Force mission. He recently completed his MSc from Leicester, United Kingdom, through the Advanced Degree Completion Plan.

List of Abbreviations

AE	action episode	CF	Canadian Forces
AO	Achievement goal Orientation	sqn	squadron

Notes

1. M. Herbert, *Staying the Course: A Study in Online Student Satisfaction and Retention* (Online Journal of Distance Learning Administration, vol. 9, no. 4, winter 2006), http://www.westga.edu/~distance/ojdla/winter94/herbert94.htm (accessed June 3, 2011).

2. K. Sparks and M. Simonson, eds., "Annual Proceedings of Selected Research and Development Papers" presented at the National Convention of the Association for Educational Communications and Technology [AECT] 22nd, Long Beach, California, February 16–20, 2000 (Washington, DC: Association for Educational Communications and Technology, 2000), 213.

3. R. Menager-Beeley, "Student Success in Web Based Distance Learning: Measuring Motivation to Identify at Risk Students and Improve Retention in On-Line Classes," in Webnet 2001, World Conference on the WWW and Internet Proceeding, Orlando, FL, October 23–27, 2001, 1.

4. G. Lauri, "Barriers to Learners' Successful Completion of VET Flexible Delivery Programmes," In *Research to Reality: Putting VET Research to Work* (proceedings of the Australian Vocational Education and Training Research Association (AVETRA) 4th Conference, Adelaide, Australia, March 28–30, 2001), http://www.avetra.org.au/PAPERS%202001/grace.pdf, 4. (link no longer active).

5. A. Berker, et al, "Work First, Study Second: Adult Undergraduates Who Combine Employment and Postsecondary Enrolment" (U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics), http://nces.ed.gov/pubs2003/2003167.pdf (accessed June 3, 2011).

6. Member of Canadian Forces, anonymous interview with the author, n.p., n.d.

7. Ibid.

8. C. Maslach and M. Leiter, *The Truth About Burnout: How Organizations Cause Personal Stress and What to do About It* (San Francisco: Jossey-Bass Publishers, 1997).

9. Member of Canadian Forces, anonymous interview with the author, n.p., n.d.

10. Wilmar B. Schaufeli, Christian Maslach, and Tadeusz Marck, eds., *Professional Burnout: Recent Developments in Theory & Research* (Philadelphia, PA: Taylor & Francois, 1996).

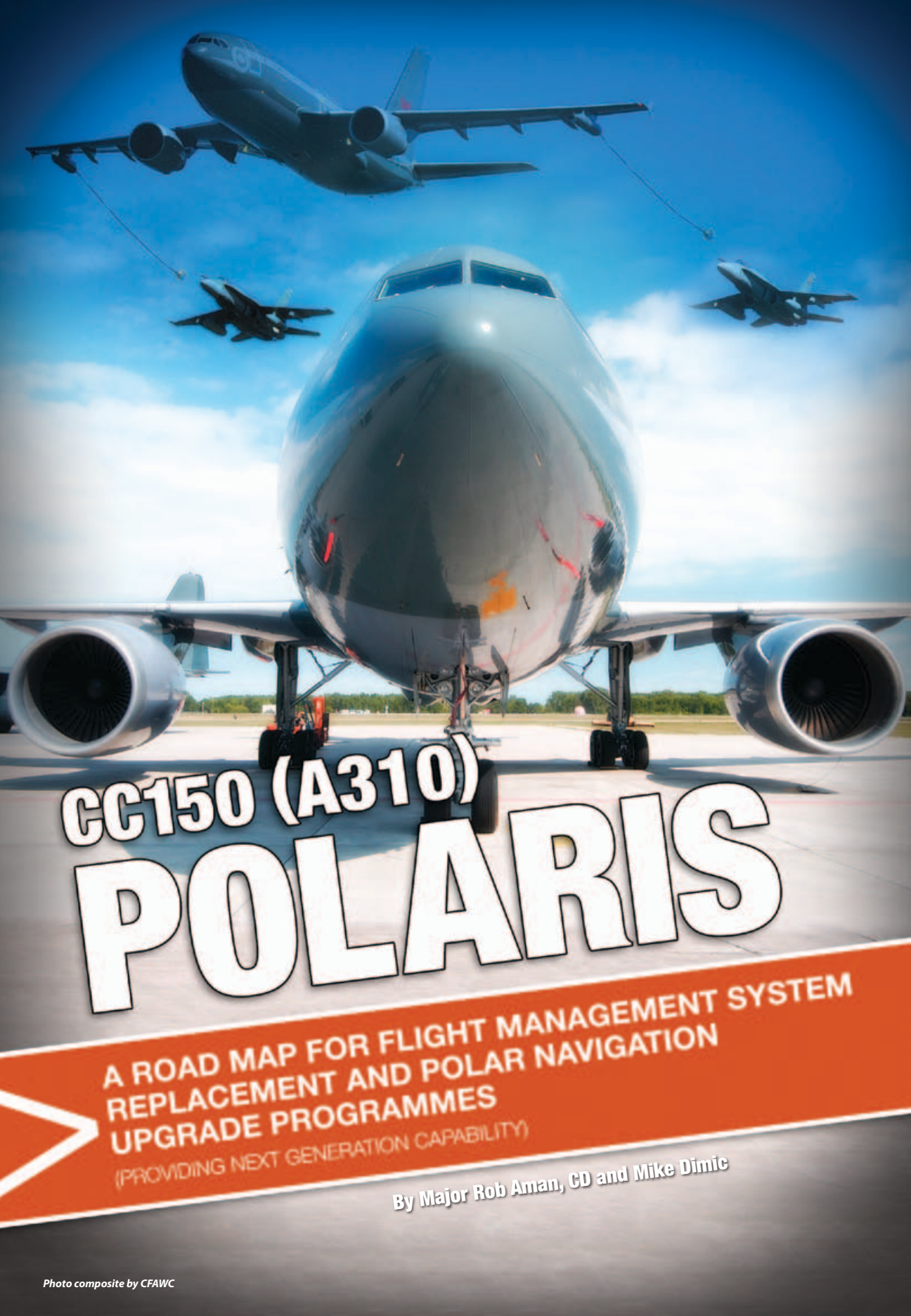
11. Ibid.

12. University of Leicester: Centre for Labour Market Studies (CLMS), "Stress," in *CLMS, MSc in Training*, version 9.2, module 1, unit 3, 15–25.

13. L. J. Mullins, "The Nature of Work Motivation," in *CLMS, MSc in Training*, version 9, reading 355, 421.

14. Member of Canadian Forces, anonymous interview with the author, n.p., n.d.

CF Photo: Cpl Jackson Yee



CC150 (A310) POLARIS

A ROAD MAP FOR FLIGHT MANAGEMENT SYSTEM REPLACEMENT AND POLAR NAVIGATION UPGRADE PROGRAMMES

(PROVIDING NEXT GENERATION CAPABILITY)

By Major Rob Aman, CD and Mike Dimic

Photo composite by CFAWC

Legacy A310 Airbus with Problems

Two distinct problems were identified in the 1995 A310 Airbus, and in 2005, two statements of capability deficiency (SOCDs) were filed for the CC150 Fleet. Attempts began in 2005 to provide a solution to these problems. Finally, after the third try beginning March 2010, a solution was approved for implementation on December 10 for both. In March 2010, a working group was formed to identify the requirements, consider options, and mitigate the risk. This group included Director Aerospace Requirements (DAR), Director Aerospace Equipment Program Management (Transport and Helicopter) DAEPM(TH), Transport Operational Test and Evaluation Flight (TOTEF), 437 Squadron (Sqn), and Aveos Fleet Performance Inc. This team identified options and selected the one to enable Airbus performance vertical coupling to ensure the present certification for the aircraft is retained and to enable future growth for next generation (gen) avionics, including Future Air Navigation System 1 Boeing first stage A Airbus (FANs 1A) and global positioning system (GPS) Wide Area Augmentation System (WAAS). These problems (SOCDs) will be described further on in the article.

The purpose of this article is to detail the certification process, intended to be used in the flight management system (FMS) replacement and GPS WAAS upgrade on the three-passenger / cargo configuration of the CC150 aircraft fleet.

It will also detail a separate polar navigation (nav) upgrade on the two multi-role tanker transport (MRTT) CC150T special mission fuel tankers that will be done through an identical process which also includes an FMS replacement as part of an integrated avionics solution for this functionality. This modification will remove the present Flight Manual Limitation on these two aircraft and certify them to allow flight above Latitude 72 degrees (°) North and below 60° South, including their ability to navigate in the polar regions using a new FMS, true north labels from the inertial navigation systems (INS), and WAAS GPS as an additional navigation sensor.

Fleet Description

The Department of National Defence (DND) operates a total of five CC150 aircraft that are being maintained by Aveos under a Public Works and Government Services Canada (PWGSC) contract. They are responsible for all aspects of maintenance, airworthiness, and configuration control of the aircraft through DAEPM(TH). The Airbus A310 aircraft is a wide-body, twin-engine, low-wing monoplane with a pressurized fuselage and normal configuration tail. They were manufactured by Airbus Industries in approximately 1986, hold a Transport Canada (TC) Approval of the Type Design Certificate, and were bought by DND around 1992.

THE PURPOSE OF THIS ARTICLE IS TO DETAIL THE CERTIFICATION PROCESS, INTENDED TO BE USED IN THE FLIGHT MANAGEMENT SYSTEM (FMS) REPLACEMENT AND GPS WAAS UPGRADE ON THE THREE-PASSENGER / CARGO CONFIGURATION OF THE CC150 AIRCRAFT FLEET.

The five aircraft are built and certified to Federal Aviation Administration (FAA) Federal Aviation Regulations Part 25 (FAR 25) standards, which also include supplemental requirements in amendment 45 to cover the Damage-Tolerant Design specifications for commercial civilian aircraft that include failsafe design and system redundancy. The aircraft are operated by 437 Sqn out of Trenton, Ontario, to the approved limitations of each model type that are specified within the latest revision of the TC Approval of the Type Design Certificate and approved flight manuals from Airbus. The mission role of three of the aircraft is presently within the original type design and mission profile for this aircraft, which consists of transportation for government officials, DND personnel, cargo, and medical evacuation (MEDEVAC) missions as required.

The two remaining aircraft have been converted to add MRTT in-flight refueling mission capability for the CF18 fleet; however, when in the CC150T is in the P3 normal configuration (non-refueling), it maintains the civilian "Type Design" certification/approvals for the A310 aircraft, and could also be used for transportation of passengers, cargo, and MEDEVAC missions as required.

The Director Technical Airworthiness & Engineering Support (DTAES) / DND has accepted the TC Type Certificate data sheet and its limitations for the CC150 aircraft as the basis for its DND registry and airworthiness of the CC150 / Airbus A310-300 aircraft.

Aircraft details for each model related to the approved engines, operational limitations, which include power management, configuration airspeeds, TO weights, centre of gravity limits, and references to instructions required for continuing airworthiness and the approved publications are all listed within the A310 Type Certificate data sheet.

The legacy Honeywell FMS as originally integrated, installed, and certified in the aircraft by Airbus contains specific A310 aircraft performance data provided by Airbus that can be vertically coupled to the aircraft power and flight control systems in all flight modes as required.

Defining the Problems (Statement of Capability Deficiency)

Two distinct problems were identified and SOCDs filed for the CC150 Fleet:

1. the severely limited navigation data base memory and processing power of the Honeywell FMS that was originally installed in 1986; and

2. the two MRTT fueling tankers have a present aircraft flight manual limitation based on its Type Certificate approval of not being able to operate above North Latitude 72° or below South 60°, and not be able to navigate in the polar regions, which is required as part of this new mission capability.

Flight Management Systems Issues

The present Honeywell FMS is heavily integrated with the aircraft auto-flight system by Airbus, and includes aircraft performance data that is based on its predicted weight, power, climb, and descent capabilities in present ambient atmospheric conditions. In addition, the aircraft is also presently certified for reduced vertical separation requirements, extended twin engine operations, and Category (CAT) III reduced visual landing operations that includes auto pilot and throttle coupling.

As the worldwide required navigation performance (RNP) has increased over the last 25 years due to the number of aircraft flying, incorporation of the GPS satellite system, new enroute navigational abilities, GPS WAAS vertical navigation guidance, and multiple new system runway approach overlays, it has reached the point where the present legacy Honeywell flight management system can no longer hold one quarter of the present world navigational data available.

The existing 25-plus-year-old FMS is at the end of its technological life cycle with no planned upgrade path by Honeywell. Its computer memory for the Jeppesen world navigation data base (presently at eight megabytes) is limited to approximately two megabytes maximum requiring that the present navigation data base is broken up into four separate disks that need to be loaded and unloaded as required to complete trip planning and actual worldwide flying navigation. In many cases, the four disks also have had certain data omitted to allow room for essential navigational waypoints at the expense of missing emergency alternative airports. Crews have had to compensate by manually entering waypoints, a system which is subject to human error. The added workload is one issue, but the errors made during manual entry of waypoints have become a serious safety concern.

The FMS replacement project will need to ensure all present aircraft Type Certificate approvals/limitations for the A310 are taken into consideration to maintain its original

functionality and certifications. The Esterline Technologies Corporation's Canadian Marconi Company (CMC) Electronics' retrofit FMS solution is the only one presently available on the market that can provide the CC150 with vertical coupled performance through its software, using Airbus performance data to control the auto-flight/auto-throttles and flight control systems that will have a TC Technical Standing Order (TSO) approval for its internal software so that it can be used in the Airbus A310 to maintain this functionality.

use the true north data labels provided from the inertial reference system (IRS) while the aircraft is in its true north navigation mode so that FMS will properly align the map displays and navigation information waypoints it has in its data base with the radio magnetic indicator (RMI) true north direction being displayed on the pilot's and co-pilot's primary flight displays.

The FMS software for polar operations also needs the ability to set direction heading and compensate using waypoint information in

CF Photo: Sgt Gaetan Racine

Polar Navigation Issues

As previously noted, the A310 aircraft under its original type design certification is not approved for flight above North Latitude 72° or below South Latitude 60°. New aircraft that are designed and certified to fly in the polar areas have the ability to switch and use true north direction reference labels available from the INS while flying in this area. They can also use the true north directional information when selected for the aircraft's navigation cockpit displays, FMS, and auto-flight systems. Within this integrated design, the FMS will be required in order to

its navigation database, where it will cross the closely converging lines of latitude of the North Pole, and because of its original heading selection at some point it would only see south and try to turn the aircraft back around if not properly programmed to fly in this airspace. The polar nav upgrade, like the FMS replacement project, will also need to ensure that all the present aircraft Type Certificate approvals/limitations are taken into consideration to maintain its original functionality and certifications. Once again, CMC is the only company offering an FMS retrofit solution on the market today supported by Airbus that can provide the CC150 aircraft

with vertically coupled performance to the auto-flight/auto-throttles and control systems through its software, using specific aircraft performance data for the A310 MRTT tanker. The FMS software in the polar nav aircraft will also have a TC TSO to maintain this functionality.

On the two MRTT tankers, the Airbus performance data in the FMS will be different from the passenger (pax)/cargo versions because of the modifications that have been done to the aircraft for its in-flight refuelling capability. There will actually be two different sets of data for the P3 and tanker configurations loaded in the FMS that the CC150T aircraft can change into.

Solution(s) Identified

Canadian Marconi Company has already integrated this FMS solution with performance data vertically coupled to an A310 CAE (formerly Canadian Aviation Electronics) Level D Simulator in Montreal for the purpose of a flight-test program and TC Certification. Canadian Marconi Company has also integrated the same process with Lufthansa's simulator in Frankfort (end November 2010) that closely matches DND's aircraft configuration with General Electric Company (GE) engines installed for the same purpose.

A Flight Management System Replacement

Canadian Marconi Company is offering its FMS CDU-9000 with new GPS WAAS receivers as a retrofit FMS replacement of the legacy Honeywell unit. The FMS unit will be integrated, installed, and certified as a TC Supplementary Type Certificate (STC) for the A310 aircraft as a fixed-price turnkey solution. At a minimum, the aircraft will retain all the original type design approvals/limitations of the A310 when it was manufactured as well as add some new next generation GPS functionality, including GPS approaches, required navigation performance (RNP) .3 nanometre (nm) navigation performance certification, and GPS-guided radius to fixed approach approvals to be identified in the flight manual limitations. Other capabilities that are in the FMS will be limited by the primary flight displays presently installed in the aircraft at this time, which are not soon being replaced.

Canadian Marconi Company will ultimately be responsible for the project management related to the FMS replacement STC and TC approvals by oversight of two other groups in their consortium as identified in the proposal. The engineering/integration and installation will be done by Mid-Canada Mod Center (MC2) from Toronto, which is a TC approved maintenance organization (AMO) specializing in legacy aircraft integrated avionics upgrades, with the physical work on the aircraft to be done at Trenton.

Transport Canada submission and airworthiness approvals for the STC will be done by Bob Gow, President and DAR of Avionics Design Engineering (ADS) out of Midland, Ontario, who has also done many of these types of legacy aircraft avionics total midlife retrofits and STCs. He will also be using Decca Engineering out of Toronto for all structural and damage tolerance requirements to complete the engineering approvals for this STC. Bob Gow will also be responsible for writing all the ground tests and flight tests required for the modification, and making arrangements with TC to witness these tests or use his own delegation of authorities as decided by the Toronto TC airworthiness regional office. Airbus has also requested to witness the flight test certification program, which is to take place out of Trenton and is expected to be between 10 to 20 hours of flying time.

The witnessed certification flights will consist of standard flight profiles for the aircraft (takeoff, climb, enroute, approach, landing) related to each approval that is already listed on the A310 Type Approval and validation of any approved new functionality that will be listed on the STC, such as GPS-guided radius to fixed approaches to the runway at an accuracy of RNP .3. These will be done to the standard procedures listed in the Jeppesen approach


CF Photo: Cpl Tom Parker

charts with dynamic coupling of the auto-flight control systems to insure system and FMS software integrity.

It is the intention of DAEPM (TH) 2-3 and DAR 2-3 to do this CMC contract proposal through Aveos, which is the company ultimately responsible for the maintenance and configuration control of DND's CC150 Fleet through a PWGSC contract presently in place. There is a clause within the present AVEOS contract to do project management and contract airworthiness oversight on DND's behalf for this type of situation.

The TC STC and work completed will be signed out by the CMC group and Aveos will release the aircraft back to service under its approved DND operating policy and procedures. AVEOS will be responsible for integrating all the contents of the TC STC data package received from CMC into all the relevant manuals (Chapter 5 Inspection Regulations), flight manuals supplements, minimum equipment lists (MEL), and so on.

Arranging for maintenance training with CMC in Montreal for personnel who are responsible for maintaining the airworthiness of this installation will also be the responsibility of Aveos. Pilot training and certification issues will be the responsibility of A3 in Winnipeg and Transport and Rescue Standardization and Evaluation Team (TRSET) in Trenton. The approved TC STC for this FMS/GPS installation on the A310 will be held by MC2 in Toronto, which makes them ultimately responsible for the continuing airworthiness of this installation on any A310 aircraft that is under TC airworthiness control in terms of any airworthiness directives, service bulletins, or other problems that may arise in the future with this installation.

A Polar Navigation Upgrade (The Making of a Global Tanker)

Canadian Marconi Company is offering a separate integrated solution for the two MRTT tankers under a different TC STC, which will remove the present flight manual limitation of the A310 aircraft to be able to fly north of Latitude 72°, south of Latitude 60°, and navigate in the polar regions. This will be accomplished by replacing the present three Litton INSs with production Honeywell Laseref IVs, which have the ability to self-monitor both true and magnetic data labels outputs for validity through their internal software.

Electronic data label switching will be done through three Skylight Avionics units to be able to select from the cockpit the use of true or

magnetic labels from the initial reference units and modify them as required. This is so that the legacy aircraft electronic flight instruments system (EFIS) and other systems can understand and display the true information on the primary flight displays and feed the aircraft navigation systems such as auto-flight and FMS. It also includes replacing the Honeywell legacy FMS with the CMC-9000, but with a different internal software level. This will give it the ability to accept true north, and IRS data labels, and be able to use this information with its Jeppesen world navigation database to properly feed map information in true for heading and runway approaches to the RMIs while the aircraft is in its true north navigation mode.

Airbus A310 aircraft performance data specifically related to the two configurations of the MRTT tanker version of the CC150T will be loaded into the FMS with the ability to vertical couple it to the auto-flight/auto-throttle control systems. For heading information, the FMS software for this installation will also have the ability to navigate in the polar region with its rapidly converging longitudinal lines and fly over the pole without any adverse effects. The WAAS GPS will also be added to the aircraft navigation sensors, which will eliminate the need for GPS required available integrity monitoring (RAIM) predictability, allow the aircraft to hold airport alternates that have published GPS approaches, and enable certification for RNP .3 nm navigation accuracy to do GPS-guided radius-to-fixed approaches.

To remove the present A310 flight manual limitation and certify the aircraft for flight north of 72° and south of 60°, the flight test program will be specific for this installation in regards to using Jeppesen charts, the navigation database in the FMS, and validating the aircraft's performance to be able to navigate in the polar regions using true headings, and the ability to do auto-flight MRTT performance coupled runway approaches in true. The remaining certification flights will also consist of standard flight profiles for the aircraft selected in magnetic north mode (takeoff, climb, enroute, approach, landing) related to each approval already listed on the A310 Type Approval, and validation of other new approved functionality that will be listed on the STC, such as GPS-guided radius-to-fixed approaches at an accuracy of RNP .3 nm.

All other responsibilities for the engineering, installation, certification, airworthiness oversight, and contract project management for the polar nav program will be identical to the FMS replacement program and TC STC as previously identified. The DND has operated its fleet of A310/CC150 Polaris since 1992, and with an estimated life expectancy (ELE) of 2026, that could be extended to 2050 if DND pursues the FANS 1/A upgrade in 2012, and the full state-of-the-art EFIS upgrade after 2015 that will enable the scaling required for RNP .3 nm. ■

CF Photo: Sgt Serge Gouin

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A pilot, Major Robert Aman graduated from the University of Alberta with a BSc in math and physics. He also has an MBA from Oklahoma City University, Meinders School of Business. He has 25 years in the Canadian Forces and is a Qualified Flying Instructor (A2) on the T114 Tutor. Operationally, he was the first Canadian Aircraft Commander on United States Air Force Airborne Warning and Control (AWACs) aircraft with over 60 combat missions flown during the First Gulf War). He has extensive experience on the CC150 Polaris in both a training and operational capacity and is currently with the Director of Aerospace Requirements, Ottawa, as the subject matter expert for the Polaris.

List of Abbreviations

°	degrees
CMC	Canadian Marconi Company
DAEPM(TH)	Director Aerospace Equipment Program (Transport and Helicopter)
DAR	Director Aerospace Requirements
DND	Department of National Defence
DTAES	Director Technical Airworthiness and Engineering Support
EFIS	electronic flight instruments system
FAA	Federal Aviation Administration
FANS 1A	Future Air Navigation System 1 first stage A Airbus
FAR 25	Federal Aviation Regulations Part 25
FMS	flight management system
GPS	global positioning system
INS	inertial navigation system
IRS	inertial reference system
MC2	Mid-Canada Mod Centre
MEDEVAC	medical evacuation
MRTT	multi-role tanker transport
nm	nanometre
nav	navigation
PWGSC	Public Works and Government Services Canada
RMI	radio magnetic indicator
RNP	required navigation performance
SOCD	statement of capability deficiency
sqn	squadron
STC	Supplementary Type Certificate
TOTEF	Transport Operational Test and Evaluation Flight
TSO	Technical Standing Order
WAAS	Wide Area Augmentation System

THE AIR HISTORIAN

BY HUGH HALLIDAY

PART I

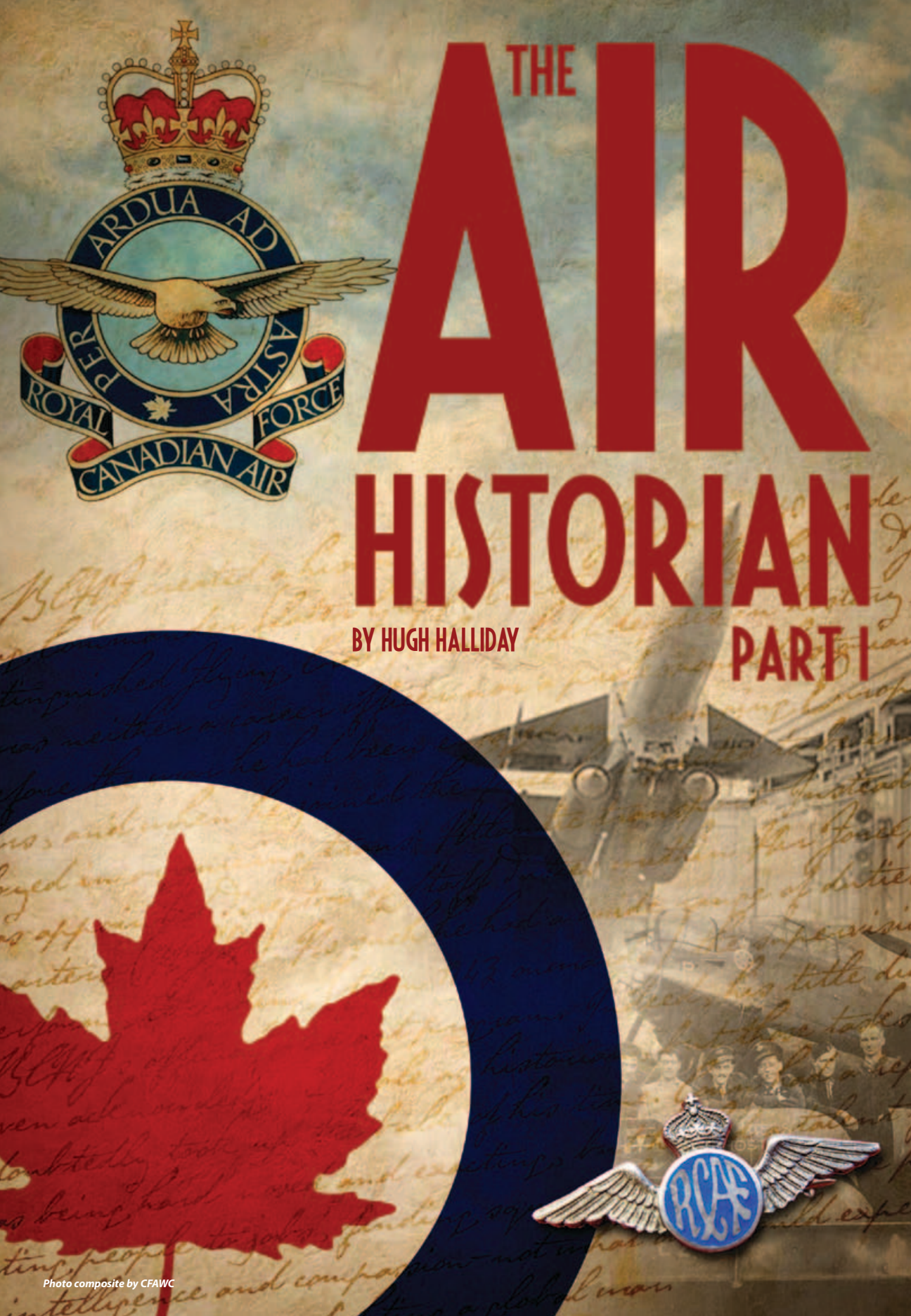


Photo composite by CFAWC

This is adapted from a paper presented by Hugh A. Halliday at the joint meeting of the Air Force Historical Conference and the Canadian Aviation Historical Society annual meeting, Winnipeg, June 2006. Further insights on the subject may be gained by consulting a recent work by Tim Cook, *Clio's Warriors: Canadian Historians and the Writing of the World Wars* (Vancouver, University of British Columbia Press, 2006).

WHY SERVICE HISTORIES

Members of the armed forces themselves may regard history and the historical process as a bureaucratic bother. One might therefore harken to Wing Commander Kenneth B. Conn who, on 20 August 1942, urged that a Royal Canadian Air Force (RCAF) historical section should aim to produce

> a complete, fully documented history of the RCAF and of the RCAF personnel in the [Royal Air Force] RAF, which, by its later dissemination to the Canadian public, could also be used as insurance against a recurrence of the general apathy which invariably sets in after a war and which, in the period 1918-1939, had such a disastrous effect upon the RCAF.[1]

THE RCAF RECORD TO 1939

The small interwar RCAF had no official historian. Indeed, the force operated as virtually a branch of the Army, with the Senior Air Officer (SAO) reporting to the Chief of the General Staff until 1938, when the SAO became Chief of the Air Staff, reporting directly to the Minister of National Defence.

Nevertheless, in the 1920s and 1930s, efforts were made to collect information on Canadians in the British flying services, 1914–1919, as part of a general history of the Canadian Expeditionary Force. It is difficult to say how far this went, or how extensive an air history was envisaged. It may have been only one chapter in a larger narrative.

CREATION OF HISTORICAL SECTIONS AT HOME AND OVERSEAS

The RCAF created a history section in January 1940 under Wing Commander (later Group Captain) K. B. Conn, DFC (Distinguished Flying Cross). Conn held degrees in history, but he was neither a career officer nor a professional historian. Before the war he had been engaged in arranging European tours, and when he joined the force he expected to be employed in organizing trans-Atlantic transport. Instead, he was appointed Director of Staff Duties within Air Force Headquarters (AFHQ). As such he had a wide range of duties

WING COMMANDER KENNETH B. CONN
Photo : Public Domain

to perform, including (from 1943 onwards) the supervision of the RCAF's official war art program. Indeed, his title did not even acknowledge his role as historian, but those tasks undoubtedly took up the bulk of his time. Conn had a reputation as being hard-nosed and exacting, but he had a talent for fitting people to jobs, finding square holes for square pegs with intelligence and compassion—not what one would expect in a large bureaucracy fighting a global war.[2]

It should also be noted that in 1940–41, Conn received valuable advice from a British civil servant who had been despatched to Ottawa

on liaison duties. This was H. A. Jones, who had authored five volumes of the six-volume *The War in the Air*, the official British history of the First World War air war. In recognition of his services, he was appointed an honorary air commodore. By a curious twist of fate, Jones was killed in an air crash on 29 March 1945 while en route to Canada for ceremonies attendant upon the termination of the British Commonwealth Air Training Plan.

On 24 October 1941, the diary of RCAF Overseas Headquarters reported the arrival of (then) Flying Officer (F/O) F. H. Hitchins. His appearance marked the inauguration of an overseas section. A research group was established in Wales to prepare material for an air history for the First World War, which Conn described as "a runway from which the history of the RCAF could take off."[3] He was followed in November by Squadron Leader H. R. Thompson, whose talents were more administrative than scholarly. It might be noted that Hitchins was one example of Conn's talent for finding the right jobs for the right people. Although Hitchins had described his background as a historian and teacher when applying to join the RCAF (1940), the Air Force had initially classified and trained him as link trainer instructor. By the autumn of 1941, he had been rescued from this backwater and assigned to his proper trade.

Subsequently, numerous operational and squadron narratives were prepared for future use. The sub-section in Wales had a particularly happy war. In 1946, Air Marshal G. O. Johnson (Air Officer Commanding-in-Chief, RCAF Overseas) reported a touching and curious event:

> On the 15th May I presented two oil paintings by F/L [Flight Lieutenant] Patrick Cowley-Brown, Official War Artist, to the National Library of Wales, Aberystwyth. These paintings were a token of appreciation for the hospitality and the many courtesies extended to the RCAF Historical Detachment stationed at the Library from November 1941 to March 1946. The presentation ceremony, attended by members of the Library Council, the Mayor and the Lady Mayoress of Aberystwyth, and RCAF Historical Officers, took place in the Library Council Chamber. The paintings were accepted on behalf of the Library by the President of the Council, Sir George Fossett Roberts. On completion of the ceremony, tea was served, following which the RCAF party was taken on a tour of inspection of the Library by the Librarian, Sir William L. Davies.[4]

As of 23 July 1942, Conn drew attention to the need for an enlarged historical section. The collection and organization of records and reports from RCAF units, at home and abroad, including general reports to the Minister and Air Staff, was expanding the material at hand. Even so, the section was looking abroad for more records (particularly on Canadian and RCAF personnel serving with the Royal Air Force). Conn also recognized the need to review old files in Ottawa relating to aviation in Canada and the early Canadian Air Force / RCAF history. He urged that work should begin on the first volume of an RCAF history "with a view to its publication at an early date."[5]

Conn noted that an RCAF officer overseas (Hitchins) had already assembled enough data to write an air force history for the period 1914–1918, and he confidently predicted that this first volume could be ready for submission to the Air Council by 1 July 1943. He recommended two further volumes, covering the Air Board period and the RCAF from 1924 to 1939.

In laying out the first plan for an RCAF history, Conn also proposed formal establishment of two historical sections, one in Canada and one overseas. The Ottawa-based section would have a liaison officer at each of the two Home War commands (Eastern Air Command and Western Air Command); the overseas section would have liaison officers attached to Air Ministry. It would also have field historians attached to a bomber group and to as many RCAF overseas stations as was practical.[6]

It appears that assigning officers to RCAF stations was deemed impractical, but it was

feasible to attach them to various commands (Coastal Command, Fighter Command, Bomber Command, Army Cooperation Command). A detailed report dated 22 July 1944 listed the following staff (excluding four war artists) employed in overseas historical work:

RCAF OVERSEAS HEADQUARTERS

Squadron Leader (S/L) W. R. Thompson (Historian 1)

(F/L) L. H. Jenkins (Historian 2)

F/O V. K. Barrow (Historian 3)

F/O F. H. C. Reinke (Historical Liaison Officer)

HISTORICAL DETACHMENT, ABERYSTWYTH

F/L H. H. Coulson (Narrator)

Flight Officer F. A. Service (Narrator)

Flight Officer K. L. Ball (Narrator)

OPERATIONS RECORDS OFFICERS, COMMANDS

F/L H. H. Lindsay (Bomber Command)

F/L J. E. L. Newbold (Allied Expeditionary Air Force)

F/L L. G. Latchford (Air Defence Great Britain)

F/O J. G. Smart (Tactical Air Force)

F/L R. R. Wall (Coastal Command)

F/L R. P. Klombies (No. 6 Group)

F/L W. H. Bilbrough (Middle East)

These staffs were busy with various tasks, from checking operational record books of RCAF squadrons overseas to compiling draft narratives. It is obvious that close tabs were kept on operational record books, and when they were deficient or unclear, a letter was bound to go out to the offending unit asking that contents be improved. The section at Aberystwyth was also engaged in assembling records of Canadians in the RAF, collecting combat reports, and compiling records of honours and awards.

A report prepared about 7 May 1943 examined the operational record books being kept by RCAF squadrons at that time. There were numerous problems, though they varied from unit to unit. The use of code words and operational slang was accepted as picturesque but needing explanation. Few units were consistent as to the spelling of names or proper initials, and often one part of a diary contradicted another part.

Some units had very good men writing fine reports; Flight Lieutenant R. N. F. Whalley, the Adjutant of No. 407 Squadron, was singled out for diversified material and bright writing. No. 422 Squadron was also praised ("Excellent R541 detail when there have been operations. The R540 appears as a sincere attempt to keep a comprehensive record. A carefully kept diary which just misses being excellent by being a shade dull.")[7]

Other units came in for scathing criticism. No. 412 Squadron's diary was described as "anaemic." No. 413 Squadron's was "woefully unimaginative and colourless. Entries are painfully brief, even for the two historic occasions when squadron personnel warned Ceylon against Japanese attacks... One feels that a skeleton is masquerading in the rightful place of robust life."[8] Nos. 400 and 418 Squadrons had failed to mention their role in Dieppe operations.

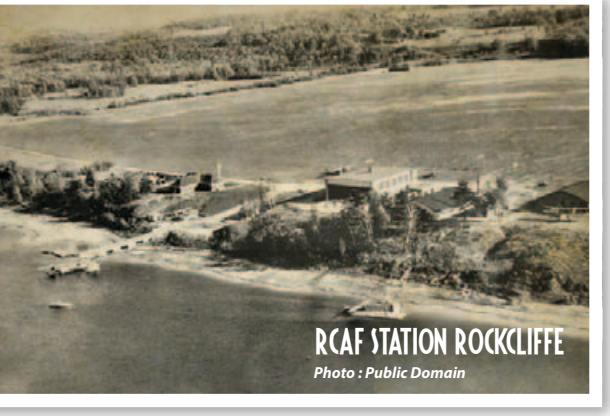
SUPERMARINE SPITFIRE, NO. 412 SQUADRON
Photo : Library of Archives Canada

The overseas historical section aspired to collect reports of evaders and escapees compiled by British Military Intelligence Section 9 (MI.9), but the highly secret nature of these documents

meant that MI.9 would retain them until the end of hostilities, when they were to be handed over to RCAF Overseas Headquarters. In June 1945, some such reports were indeed turned over to the RCAF. Unhappily, this task seems to have been short-circuited soon afterwards, for the bulk of MI.9 reports remained in Britain where they are now open at the Public Record Office (WO 208 documents).

The historical section also recognized the need for human interest, as shown in a report of activities in July 1944:

> For some time the Section has felt that there is lacking a very important side of unit activities in official records. While the majority of RCAF Operations Record Books are of a comparatively high calibre and provide a fairly complete picture, it has been felt that the record of unit life tends to remain incomplete in some respects, as in most instances no description is given regarding customs and superstitions which gradually grow into legends and traditions, location and layout of units, messing and recreational facilities, surrounding countryside, relations to nearby communities and many other similar interesting factors. It was therefore decided that an officer should be appointed to compile generally descriptive articles about each unit. These articles will supplement the Operations Record Books and constitute a background against which the daily entries will appear in true perspective.[9]



RCAF STATION ROCKCLIFFE
Photo : Public Domain

Flying Officer Reinke was detailed to collect this information through visits to units, commencing on 10 July 1944, with No. 6 Group. It is not clear how much this project was pursued, although much of it seems to have found its way into detailed articles prepared by the press relations staff overseas.

As the war drew to a close, the historical staff was either tasked or volunteered to undertake several "odd jobs," including compilation of lists of German war material which might be sent to Canada for museum purposes.

It was inevitable that the end of the war would see the general running down of the overseas historical section. By October 1945, it was losing clerks/stenographers who were being repatriated to Canada and not replaced. Women personnel followed in the autumn of 1946. Some contraction also occurred when historical officers were withdrawn from Bomber Command, followed by other formations. Increasing emphasis was placed on preserving files and shipping them to Canada.

Reorganizations overseas were also crowding the historical section out of its quarters, both in Wales and London. Attrition accelerated as various officers who had applied to serve in the Interim Force were rejected, repatriated, and released. In October 1946 alone, the section lost three veteran members.[10]

MEANWHILE, BACK ON THE HOME FRONT

Things were not going as well at home. As of 14 November 1943, Conn was urging that narratives of Eastern and Western Air Command be prepared. He pointed out that the Army was well ahead in writing up their own home war histories.

It is difficult to determine exactly how many people were employed in the historical section (as distinct from the Directorate of Staff Duties), but as of November 1943, it appears that in Ottawa at least 14 personnel were assigned to it, including civilian typists and clerks. It was frozen about that level in late 1943. A return dated 17 July 1944 gave the officer strength as nine (three short of authorized establishment),

but this included two war artists. Conn himself was signing as "DSD" (Director of Staff Duties) in December 1943, but as "AH" (Air Historian) in June 1944.

On 6 December 1944, Conn reported:

> Nine specialist officers have recently been posted supernumerary to RCAF Station Rockcliffe, to write various phases of the history of the RCAF. These officers work under the jurisdiction and supervision of the RCAF Historian and the manuscripts prepared by them are typed in AH Orderly Room.[11]

These specialists were further identified in a report by Conn dated 27 February 1945. They were:

a. Wing Commander (W/C) R. J. Beaumont, who had completed a narrative of the Technical Training School (St. Thomas), pre-entry training schools, and the School of Aeronautical Engineering;

b. W/C F. M. Buchanan, who had completed (or was nearing completion) a narrative dealing with air force construction and engineering in Canada;

c. W/C H. W. Aslin, who had completed a narrative about recruiting and manning;

d. S/L R. C. Tiplady, working on a history of aeronautical engineering;

e. F/O E. Shields (retired 14 February 1945) had completed a history of air navigation training;

f. Flight Officer M. Quentin (replaced by S/L G. Manning) working on a history of early medical services in Canada;

g. F/L A. Duggan (reported 17 January 1945) working on a narrative of "General Organization and Training Operations" as it affected the pre-war RCAF;

h. W/C R. M. Parkinson (reported 11 January 1945) nearing completion of a narrative of accounts and finances;

i. F/L C. S. Burchill had completed a narrative on synthetic training (instrument and visual Link training); and

j. F/L C. S. Burchill (succeeding W/C Lighthall), writing a history of pre-war flying training.

Conn estimated that the Rockcliffe detachment had turned out about 250,000 words of narrative, and by 30 June 1945 he set the figure at 1,000,000 words. However, as of June 1945, the permanent section in AFHQ was taking the first of many serious cuts. Conn was in the process of returning to civilian life. He either failed to protect a minimum establishment or did not bother to attempt this task.

He may have thought there was more support for an RCAF history than was the case. Overseas, Air Marshal G. O. Johnson was writing memos stressing the need for a comprehensive history, even citing how the German General Staff had mobilized scholarship in its planning. Yet Johnson was far removed from Ottawa. The Air Council, meeting on 6 September 1946, generally endorsed the concept of an RCAF history, but was vague as to who should do it or how. The rundown of the Air Force Historical Section continued. By February 1947, it was down to three officers, one non-commissioned officer (NCO) and three civilian clerks in AFHQ (and the Air Historian had to fight to keep even the NCO, arguing that he was needed to handle parliamentary and ministerial inquiries). There were still two RCAF historians and two or three clerks in London, but even these had to be let go in 1947. ■

Editor's Note: Part II of this article will appear in the Fall 2011 issue of *The Canadian Air Force Journal*.

Hugh Halliday is a former member of the RCAF, a historian and author with numerous books and articles to his credit. One of his more recent works, entitled *Valour Reconsidered: Inquiries into the Victoria Cross and Other Awards for Bravery* (2006), examined how major gallantry awards were bestowed.

List of Abbreviations		RAF	Royal Air Force
AFHQ	Air Force Headquarters	RCAF	Royal Canadian Air Force
F/L	flight lieutenant	S/L	squadron leader
F/O	flying officer	SAO	senior air officer
NCO	non-commissioned officer	W/C	wing commander

Notes

1. W/C K. B. Conn, memorandum to Air Officer Commanding-in-Chief, RCAF, "Overseas Historical Organization," in RCAF file 19-15-37, "RCAF Historical Section - Organization and Establishment," National Library and Archives of Canada, Record Group 24, Volume 5231.

2. Conn's most obvious success in fitting people to jobs was his having F. H. Hitchins transferred from link trainer instructional duties to historical work. Another instance occurred in 1943 when he discovered that an air gunner had been returned from overseas suffering mental problems and was about to be discharged. The man was also a skilled artist. Conn declared that, if released, the gunner would become a charge on the public purse within months. He asked to have the gunner transferred to the Air Historian, and rapidly harnessed the man's talents, first as a service artist and subsequently as an official war artist.

3. K. B. Conn, "The RCAF Historical Section," *Canadian Historical Review* (September 1945).

4. Monthly Report No.13 (Month of May), 18 June 1946, in RCAF file 24-13-16, "Monthly Personal reports from Liaison Officers, London and Washington," National Library and Archives, Record Group 24, Volume 5263.

5. W/C K. B. Conn, memorandum to Air Member for Organisation, 23 July 1942, in RCAF file 895-DAFH, "Organization and Establishment, Director of Air Force History," Library and Archives Canada, Record Group 24, Series E-1-c, Accession 1983–84/216, Volume 2967 (hereafter referred to as File 895-DAFH).

6. Ibid. Curiously, Conn was proposing attachment of a field historian to a bomber group five months before the formal establishment of No. 6 (RCAF) Group.

7. The comments respecting the various squadron diaries comprise a six-page appendix to a memo, Squadron Leader C. H. Link to Director of Staff Duties (i.e., Conn), 7 May 1943, in RCAF file 19-15-37, "RCAF Historical Section, Organization and Establishment," Library and Archives Canada, Record Group 24, Volume 5231. It was only six pages long because at that time RCAF overseas squadron numbers did not run past No. 431.

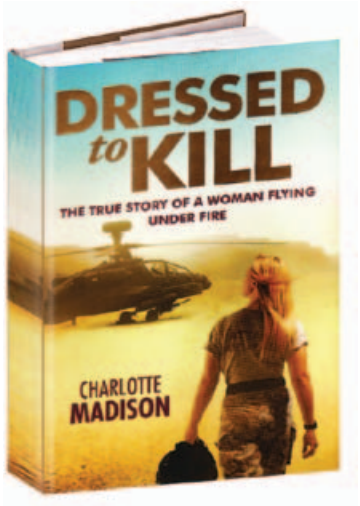
8. Ibid.

9. RCAF file 24-13-10, "Overseas Historical Section - Monthly Résumé," in Library and Archives Canada, Record Group 24, Volume 5263. "Monthly Résumé - Overseas Historical Section - July 1944," in RCAF file 24-13-10, Library and Archives Canada, Record Group 24, Volume 5263.

10. Ibid.

11. File 895-DAFH (Note 5).

BOOK REVIEWS



DRESSED TO KILL:
THE TRUE STORY OF A WOMAN FLYING UNDER FIRE

BY CHARLOTTE MADISON

LONDON:
HEADLINE REVIEW, 2010
314 PAGES
ISBN 978-0-7553-1960-2

Review by **Lisa Moulton**

My fingers close around the cold trigger. I pause for a split second to think about the gunfire I am about to spray across the battlefield…. After today, I'll no longer be the new girl.[1]

Dressed to Kill is the autobiography of the British Army's first female Apache pilot. In telling her story, Madison[2] highlights three major themes: how her view on her role in Afghanistan changes over her three tours, what it is like to be the only female in this role, and the difficulties she has reintegrating at the end of each tour.

Madison touches on her time with the Combined Cadet Force[3] and Short Service Limited Engagement[4] with the Royal Marines before deciding that she wants to make a career of the army. She had not enjoyed her time with the Royal Engineers enough to want to join them, and explains that her service with the Royal Engineers only brought back "images of the shitting tree, the stinky tank… and then the amazing helicopter and Persil[5]-fresh pilots. [She]… decided to take a leap into the unknown: try for selection for the Army Air Corps."[6] On completion of her basic helicopter course and without having submitted her posting preference, Madison is selected to fly Apaches.

Her first encounter with the enemy "seem[s] so natural after almost two years of training."[7] However, after shutting down the engines and walking away from the flight-line she has a "creeping sense of unease about what [they're] really here for. Now [she] is a killer."[8] Madison, then, realizes that thinking too hard on a human level about what they are doing would make it impossible for her to do her job. She continues with: "I create a heavy trapdoor deep in my consciousness where I will hold everything from now on; anything that disturbs me I will push inside and lock it down. I have to cut away and feel nothing."[9] At the end of her third tour, she reflects on how much her attitude has changed. At the beginning, she thought it was cool, but with close to 11 months in theatre, she almost feels soiled, and more so with each mission.[10]

Madison speaks frankly about her experience of being the only female. With the exception of the Apache conversion course, her gender does not prevent her from fitting into the group. However, on her deployment she understands that her gender is an issue and states: "I desperately hope I'll walk away from this tour as well regarded as they are…. My squadron all seem to be welcoming, but I'm still aware that, as I am the first girl, all eyes will be on me…."[11] She describes the differing viewpoints between herself and the male pilots. For example, when watching the gun tapes, feelings of nausea wash over her, and she wonders why she does not get as

excited about it as the boys do.[12] On her last tour, there is a second female Apache pilot at Camp Bastion. Madison quickly discovers that, for her, "female company is the best antidote to war."[13]

Throughout her career, reintegration issues abound. Madison discovers during her flight training that it is very difficult to describe to her friends what she is doing, so, instead, she asks them questions or swaps gossip.[14] What she does not realize at this point is that sharing what she does with family and friends will only become more difficult. After her first tour, Madison is not ready to talk about her experiences or to open up to anyone. She wants to return to her old life, as if she'd been on a long holiday; she then admits that: "I'm terrified that my experiences won't let me be the same person I was before."[15] The only time that Madison discusses receiving a post-traumatic stress disorder (PTSD) briefing is at the end of her third tour. The psychiatric nurse explains that no one knows how the Apache pilots will fare or what kind of stress they may experience.[16] After her second tour, Madison sums up her reintegration issues by saying: "The truth is that, while you are away, all you can think of is getting home and getting back to normal, but when you get home, you realize that normal doesn't exist any more."[17]

The novel speaks clearly to the reader. Military personnel (pilots or otherwise) will be able to easily visualize what the author describes. Those who do not wear a uniform are not left behind, as she explains terms and procedures very clearly. On first opening the book, I was impressed with the list of abbreviations. With only a couple of exceptions, all abbreviations are written out on first use and are included in the list at the front of the book. It was not until I was a little ways into the book that I realized that it is not divided into chapters or sections. With the exception of the date and title on the first page, the book does not have any headings. This lack of headings and very few dates makes it difficult for the reader to understand the timeline involved. There are some colour pictures in the centre of the book, and they help to convey the story. Maps, however, are not included and would have been a bonus. The author served three tours in Afghanistan, and as she mentions several times, the situation changes quickly. Therefore, one or more maps showing the country with Kandahar Airfield, Camp Bastion, and the relevant forward operating bases for each of her deployments would have helped the reader to understand the locations that are mentioned. ■

Lisa Moulton graduated from the Royal Military College in 1985 with a Bachelor of Engineering and served as an Electrical and Mechanical Engineering officer in the Canadian Forces until 1994. More recently, she has worked as an editor, first in-house at the Canadian Forces Aerospace Warfare Centre and currently freelance. She lives in the United Kingdom with her husband, the Canadian Air Force Liaison Officer to the United Kingdom Air Warfare Centre.

Notes

1. Charlotte Madison, *Dressed to Kill: The True Story of a Woman Flying Under Fire* (London: Headline Review, 2010), 3.

2. According to an article in *The Times*, the British Army insisted that the author use a pseudonym "to protect her from any extremists who think someone who once flew an Apache is fair game." See Hilary Rose, "'I pull the trigger and the missile strikes... We can see bodies in the rubble and they are perfectly still,'" *The Times*, March 13, 2010, http://women.timesonline.co.uk/tol/life_and_style/women/the_way_we_live/article7053796.ece (accessed March 15, 2011).

3. Similar to Army Cadets in Canada.

4. In the British Army, a Short Service Limited Engagement consists of four weeks' training at Sandhurst and then serving for ten months as a junior officer in a regular Army unit. Madison, 9.

5. A brand of laundry soap in the United Kingdom.

6. Madison, 18.

7. Ibid., 93.

8. Ibid.

9. Ibid., 94.

10. Ibid., 309.

11. Ibid., 65.

12. Ibid., 223.

13. Ibid., 307.

14. Ibid., 23.

15. Ibid., 167.

16. Ibid., 304–5.

17. Ibid., 203–4.

THE BATTLE OF BRITAIN:

FIVE MONTHS THAT CHANGED HISTORY, MAY-OCTOBER 1940

BY **JAMES HOLLAND**

LONDON, UNITED KINGDOM:
BANTAM PRESS, 2010
677 PAGES ISBN 978-0-593-05913-5

Review by **Lieutenant-Colonel Doug Moulton, CD, MBA**

As a member of the Royal United Services Institute[1] here in the United Kingdom, I have been privileged to meet and discuss military issues with a wide variety of personalities. Not long ago, I had the opportunity to meet and hear a presentation given by Mr. James Holland, a historian and a member of the Guild of Battlefield Guides, about his recently released book *The Battle of Britain: Five Months that Changed History, May–October 1940*. An outstanding and easy read, I recommend the book to anyone with an interest in air power or the events of the Second World War (WWII).

The book, written in a chronological fashion, interweaves the life experiences of a number of Allied and German personalities to tell the story of this famous battle. Delivered in four parts, the book examines the period from the invasion of Belgium, Holland, and France, to the miracle of Dunkirk, and onward until the last significant attacks against the island nation in October 1940.

An extensively researched book, Holland has taken the opportunity to rationalize the hype of the era with the actual archives of German and Allied forces to provide insight into the differences between the perceptions of the day and the reality of the events surrounding this battle. Whether exposing the inflated accounts of enemy aircraft losses reported in the media and through the chain of command, to the actual industrial capacities of both nations to execute this engagement, Holland has succeeded in providing the reader a sense of balance in his telling of the story. As a result, the reader is left not only with an objective understanding of the battle, but also with an awareness of the importance that perception played in the outcome of the events. The use of individual experiences within the greater military context provides an important human face to the events surrounding 1940; they also identify/quantify the physical and emotional toll experienced by those involved. The personal accounts assist readers in immersing themselves in the events of this epic battle as they follow several families through it.

Holland's examination of the events leading up to the actual Battle of Britain is essential for understanding the conflict and its participants. This approach provides significant insights into the decisions that were being made, whether it was the Luftwaffe's constantly changing aerial tactics or the inability of the German High Command to bring an effective joint approach to the battle. Additionally, a full understanding of the British political upheaval in the run-up to war provides some real insights into Winston Churchill's political position and fortitude.

The addition of appropriate maps, figures, and photographs adds to the completeness of Holland's effort in the retelling of this turning point in WWII as they allow the reader to

contextualize the events. Holland also takes the time to provide orders of battle and the disposition of Allied and German air forces prior to the battle. The introduction of Luftwaffe terminology in the "Note on the Text" introduces the reader to the German equivalents of Royal Air Force terms. The use of these terms is intended to avoid confusion between Allied and German units within the text of the book.

The Battle of Britain: Five Months that Changed History, May–October 1940 is a well-researched and well-written book that will prove an enjoyable and easy read for the air power enthusiast. ■

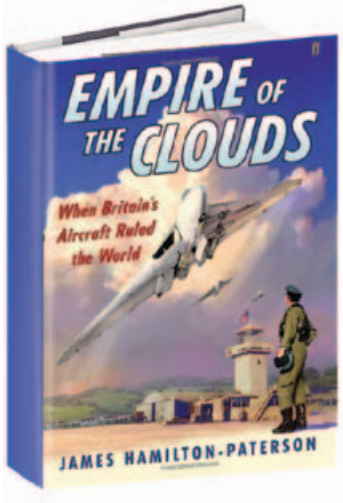
Lieutenant-Colonel Doug Moulton, a Sea King pilot, is currently the Canadian Forces Liaison Officer to the United Kingdom Air Warfare Centre, Royal Air Force, Waddington.

Abbreviation

WWII	Second World War

Note

1. Royal United Services Institute, http://www.rusi.org/ (accessed January 20, 2011).



EMPIRE OF THE CLOUDS:

WHEN BRITAIN'S AIRCRAFT RULED THE WORLD

BY **JAMES HAMILTON-PATERSON**

UNITED KINGDOM:
FABER AND FABER, 2010
376 PAGES
ISBN 9780571247943

Review by **Sean M. Maloney, PhD**

If one word can be used to encapsulate this work, it would be "zeitgeist." Capturing a generalized social feeling is incredibly difficult for any historian, but Hamilton-Paterson has successfully conveyed to those of us from a different generation what it was like to be part of the cutting edge of not only British but also world-class aviation. On this side of the Atlantic, we are inundated with American popular culture in the form of "The Right Stuff," with Chuck Yaeger breaking the sound barrier, yet how many have heard of the Miles M.52, an almost identical British aircraft that pre-dated and even influenced the Bell X-1? Or the Fairey Delta-2, a stunningly beautiful delta-winged machine that captured the world air speed record in 1956? Who now remembers Peter Twiss? Or Geoffrey DeHavilland? Or the fact that prototype jet aircraft designs were flown for the public every year and not hidden away because doing so was considered vital to national security?

The zeitgeist surrounding 1950s British and Commonwealth aviation was one of intense optimism, the pushing of physical limits and technological boundaries, particularly by the young. The limits of design were pushed as well—what sculptor created such amazingly graceful machines as the Avro Vulcan, or the Handley-Page Victor? Or the science fiction-like Avro 730? And what kid in the 1950s did not flock to watch silver jet fighters like the Gloster Javelin or the British Aircraft Corporation Lightning whip by at Mach 1+ over the moors and dream about joining the Royal Air Force (RAF)? The sky was, quite literally, the limit.

Hamilton-Paterson takes the reader on a chronological journey through this period, almost aircraft by aircraft type. One of the strands that holds the narrative together is the story of Bill Waterton, a Canadian test pilot who was a member of the High Speed Flight unit set up by the RAF at the end of the Second World War and eventual bête noir of the British aviation industry in the 1950s. Lost in time, Bill Waterton was one of a legion of forgotten heroes whose sacrifices have ensured that all of us can fly commercially at greatly reduced risk.

Hamilton-Paterson and other young men of his generation idolized test pilots when they were growing up. They were celebrities in their own right at the dawn of the Jet Age, and their exploits, including Waterton's, were front-page news on a regular basis. Waterton, an intensely principled and blunt man, publicly took on British aircraft corporations whom he felt were pushing the boundaries for the wrong reasons. And people were getting killed: the deadly Farnborough air crash of 1952, the various Comet airliner disasters, let alone the deaths of several hundred pilot trainees. As a Canadian in class-conscious England, Waterton learned (as did Canada) the limits of what a mere "colonial" could accomplish in the larger scheme of Empire. He returned to obscurity in Canada while his rival Jan Zurakowski test flew the CF105 Arrow for Avro Canada. Waterton could break the sound barrier, but not the class barrier.

What is striking about *Empire of the Clouds* is how it inadvertently contextualizes the whole Arrow affair without actively discussing it. In Canada, we have an extensive literature (mostly anti-American and conspiracy-based) on the collapse and obliteration of a single aircraft programme. Hamilton-Paterson describes multiple British "Avro Arrows," where the schema is the same. A project dies; the government moves in and destroys everything related to the aircraft, including the prototypes themselves. The Miles M.52, a jet aircraft that would have outperformed the rocket-propelled Bell X-1 if it had been allowed to, is one example. The Avro 720 Viper delta-winged supersonic interceptor, cut up and destroyed the day it was completed, is another. The Saunders-Roe P.177 suffered a similar fate. The advanced strike aircraft, the TSR-2, though not broken up at the end, was in the same category. We were not alone.

Equally compelling is how *Empire of the Clouds* examines the virtual collapse of the British aircraft industry in the 1960s. It would have been easy to play *J'accuse,* but the book presents in sober language how hide-bound and in many cases greedy aircraft companies, together with bureaucrats and politicians crippled by an astounding lack of vision, threw it all away. To read Hamilton-Paterson's depiction of the Fairey Delta (FD) 2 visit to France, and to know that Dassault (a French aircraft manufacturing company) sold Mirages based on the FD-2 layout to all and sundry for 30 years, employing thousands of workers, while those in power in the United Kingdom dithered and chose a handful of problematic air defence missiles over an array of manned aircraft, is nothing short of astounding. The bureaucratic delays over a plethora of British jet airliners are nearly heart-rending, a whole series of "what ifs."

The only real issue with the book is that there are not enough illustrations for those of us not *au fait* with some of the more esoteric designs (penny-pinching publishers take note). Derek Wood's now-out-of-print *Project Cancelled: The Disaster of Britain's Abandoned Aircraft Projects* is fully illustrated, and it is useful to read the two books in tandem, or to have concurrent access to the net. Neither supplement can, however, provide us with the zeitgeist found in *Empire of the Clouds*. Hamilton-Paterson has given us a book that requires reflection on several fronts. One day a Canadian should write an equivalent work on our parallel national experiences before those vital spirits are lost to time. ■

Dr. Sean Maloney serves as the Historical Advisor to the Chief of the Land Staff and is an Associate Professor of History at Royal Military College of Canada. He is the author of *Learning to Love the Bomb: Canada's Nuclear Weapons and the Cold War*.

List of Abbreviations

FD	Fairey Delta
RAF	Royal Air Force

AIR COMPONENT COMMANDER

COLLECTIVE TRAINING SEMINAR

BY LIEUTENANT-COLONEL JOHN ANDERSON, CD

Photo composite by CFAWC

In September 2010, the Canadian Forces Aerospace Warfare Centre (CFAWC) was asked by 1 Canadian Air Division (1 Cdn Air Div) to develop and deliver specialty training to ensure Air Force senior officers are prepared to fill air component command / headquarters positions in exercises and operations. The immediate focus of the subject specialty training was training the identified air component commanders (ACCs) and staffs for Exercise (EX) MAPLE GUARDIAN 2011 (MG11) and Operation (Op) NANOOK. The specialty training was to provide an interactive learning and networking opportunity for all parties in preparation for employment in air component command / headquarters.

To address this requirement, a collective training seminar was developed by CFAWC that consisted of a pre-reading package and a five-day, in-house symposium. The seminar covered a variety of topics such as command and control at the joint and air component level, responsibilities of a joint force ACC (JFACC) and ACC, rules of engagement, battle rhythm, and the operational planning process (OPP) and its resulting products. Each topic included an academic portion discussing current documented procedures and a perspectives portion where subject matter experts (SMEs) illustrated the practical application of that topic in the field. Several operational level commanders attended to provide their perspectives and experiences on command and control. The seminar concluded with the participants dealing with a typical ACC tasking in a practical session.

The inaugural ACC Collective Training Seminar (Serial 1101) was held 28 March to 1 April 2011 at CFAWC in 8 Wing Trenton. There were 23 participants at the seminar and initial feedback indicates that it was very well received overall by the participants. They felt it was pitched to the correct level, and the ratio of academic/practical was considered appropriate. Additionally, the participants felt that the use of SMEs to provide perspective after the academic lectures was very effective, and the ACC-designates felt that the exclusive time with the current JFACC was essential to the success of the seminar.

Now that the first serial of the ACC Seminar is complete, CFAWC is pursuing several follow-up activities. Additional participant feedback on the seminar will be sought following the completion of EX MG11 and Op NANOOK. Seminar revisions will be performed based on participant and staff feedback. Guidance from 1 Cdn Air Div is being sought to determine if additional ACC seminars are desired, and the timelines for future serials. Finally, coordination between CFAWC and the Canadian Forces School of Aerospace Studies will outline how to efficiently transfer ACC Seminar material into Air Force Officer Development (AFOD) program, Blocks IV and V. ■

Lieutenant-Colonel John Anderson is an Air Combat Systems Officer (ACSO) with two tours flying fighters and electronic warfare (EW) aircraft and three tours flying tactical airlift on CC130s. He has experience as a project director for a variety of EW projects and is currently the Branch Head for EW and Education and Specialty Training at CFAWC.

List of Abbreviations

1 Cdn Air Div	1 Canadian Air Division
ACC	air component commander
CFAWC	Canadian Forces Aerospace Warfare Centre
EX	Exercise
JFACC	joint force air component commander
MG11	MAPLE GUARDIAN 11
Op	Operation
SME	subject matter expert