THE ROYAL CANADIAN

AIR FORCE JOURNAL

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PREMIERE ISSUE

ROYAL CANADIAN AIR FORCE RESTORED

CANADIAN FORCES AIR COMMAND

RCAF NURSING SISTERS

EARLY COLD WAR RCAF WRITING

THE POSITIVE PSYCHOLOGICAL EFFECTS OF AIR POWER

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THE ROYAL CANADIAN AIR FORCE JOURNAL is an official publication of the Chief of the Air Force Staff (C Air Force) 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 Royal Canadian Air Force (RCAF) 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 RCAF. It serves as a vehicle for the continuing education and professional development of all ranks and personnel in the RCAF as well as members from other environments, employees of government agencies, and academia concerned with air force affairs. ■

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THE ROYAL CANADIAN AIR FORCE JOURNAL

SUBMISSION REQUIREMENTS

THE ROYAL 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.

JOURNAL SECTIONS

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.

* Exclusive of endnotes

AUTHORS ARE ASKED TO NOTE THE FOLLOWING GUIDELINES

- Submissions may be made in either official language.
- Authors must include a brief (one paragraph) biographical sketch which includes current appointment /position, telephone number, and email address. Please include all professional and academic designations as well as military decorations.
- Selected articles that have been peer reviewed have a  to the left of the title or at the beginning of the text of the article.
- The Senior Editor will notify contributors on the status of their submission. It may not be possible to publish all submissions.
- All text submissions must be digital, in Microsoft Word, or rich text format. Files must not be password protected and must not contain macros. Files may be submitted by mail or email at the addresses provided below.
- All supporting tables, images, and figures that accompany the text should be sent in separate files in the original file format (i.e., not imbedded in the text). Original vector files are preferred; high resolution (not less than 300 dpi) .psd, or .jpg files may be submitted.
- Copyright permissions are required for all material that is not Department of National Defence or author originated. It is the author's responsibility to obtain and submit the necessary written permissions which must include the author's/artist's name as well as the publisher's name and location. Any material not meeting these requirements may be omitted from the article.
- The Senior Editor may select images or have graphics created to accompany submissions.
- Authors should use *Oxford English* or *Petit Robert* spelling. When required, reference notes should be endnotes rather than footnotes and formatted in Chicago style. For assistance refer to *The Little, Brown Handbook, Le guide du rédacteur,* or CFAWC Production Section at Francoise.Romard@forces.gc.ca
- Acronyms and abbreviations should be used sparingly:
  - If they are required in the text, the term is to be written out in full the first time it is used and then followed by the abbreviated form in brackets.
  - If they are required in tables or figures, each table and figure will contain a list of abbreviations.
  - A list of all abbreviations (and their terms) used in the text will be included at the end of each submission.
- The Senior Editor reserves the right to edit submissions for style, grammar, and length, but will not make editorial changes that will affect the integrity of the argument without consulting the author.

CALL FOR SUBMISSIONS

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ARTICLES

POINTS OF INTEREST

PUSHING THE ENVELOPE

BOOK REVIEWS

EDITOR-IN-CHIEF'S MESSAGE

Welcome to the first issue of the *Royal Canadian Air Force Journal*!

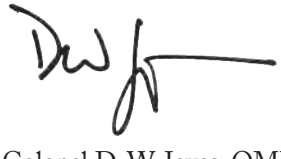
When I first donned Air Force blue many years ago, I never dreamed that someday I would be a member of the RCAF. To me, the RCAF was part of the tapestry of our glorious past, woven with stories of bush pilots in uniform, Bomber Command, the F-86 Sabre in Germany, and the so-called Golden Days of the 1950s and '60s, and stitched together with the deeds of individuals such as Bishop, Barker, McLeod, and Hornell. It was a history that we were proud of, in a distant sort of way, and one that was only formally recognized during mess dinners, Battle of Britain parades, Remembrance Day, and the occasional squadron reunion. If you were fortunate like I was, you had the opportunity to meet gentlemen like Flight Lieutenant Jerry Fultz (Retired). My squadron mates and I had the chance to live the glory days of the RCAF vicariously through Honorary Colonel Fultz's stories as a Pathfinder on 405 Squadron in Bomber Command during the Second World War.

What I remember the most about those events when the "old" RCAF was brought to the fore was the sense of belonging and the pride in an institution that was reflected in the eyes of the RCAF veterans. For them, whether they served in peace, or war, or both, there was an understanding that they had been part of something that was bigger than any one individual; an organization that, while never perfect, welcomed Canadians from all walks of life and instilled in them a belief in service before self. They were justifiably proud of "their" RCAF. And to a large extent, this is the legacy that the individuals who lobbied so long and hard over the years wanted to pass on to a new generation of airmen and airwomen.

The "new" RCAF is not the old. The Air Force in Canada continues to evolve, incorporating the history and accomplishments of our naval and army aviation brethren, and writing our own stories as the Air Element and Air Command of the Canadian Forces. We have defined new traditions and added to the laurels of Canadian military aviation with an unparalleled level of service to Canadians at home, abroad, and in combat in the skies over Iraq, Kosovo, Afghanistan, and Libya. As with our predecessors, service before self will continue to be the hallmark of the 21st-century RCAF.

The Royal Canadian Air Force Journal (*RCAFJ*) will continue in the same vein as air force publications that have gone before: *The Roundel*, the "new" *Roundel*, and *The Canadian Air Force Journal*. It will provide a mechanism through which to encourage professional discussion amongst an aerospace-minded audience with a distinctly Canadian flavour. To this end, we will continue to welcome your articles, book reviews, opinions, and observations on current military aviation issues and the future of aerospace power. And of course we will not ignore our shared history.

Which brings me to the main focus of this particular issue—our heritage. It seemed appropriate that the first issue of the *RCAFJ* take a look back through the dusty corridors of time. Enjoy the read as you examine the formal introduction of women into the RCAF via the Women's Division and Nursing Sisters, take a look at some of our air force traditions, learn about early RCAF air power "thinkers" and see how a nuclear war might have been fought in the early sixties. Finally, you will have the opportunity to read about the formation of Air Command from the leader who orchestrated the rebirth of the air force after the demise of the old RCAF—Lieutenant-General Bill Carr (Retired), the first Commander of Air Command. As to why the emphasis on history in the first issue of the *RCAFJ*, we should always remember where we came from because, as it says on every new car that rolls off the assembly line, "objects in the mirror may be closer than they appear."



Colonel D. W. Joyce, OMM, CD
Editor-in-Chief

LETTERS TO THE EDITOR

Bill:

I was not involved in any way in the decision made to reinstate the "Royal" titles to Canada's Navy and Air Force. In taking the decision, though, I suggest a bit more homework should have been done.

The impact of the name change on the morale of thousands of personnel serving, and who have served since 1968, may have been overlooked. The *Canadian Forces Reorganization Act* was passed into law on 1 February 1968 and the RCN [Royal Canadian Navy], the Canadian Army and the RCAF [Royal Canadian Air Force] were abolished and unified to become the Canadian Armed Forces. Thus, for 43 years (only one year less than the lifespan of the RCAF!) Canadian military personnel have honoured and honed an image of excellence at home and abroad, which is totally befitting their Canadian military heritage. So the heartstrings of not one of today's serving Air Force personnel could yearn for his personal "good old RCAF days."

The RCAF was a clone of the RAF [Royal Air Force] (i.e., officers' rank titles, uniform, structure, motto, and ceremonial processes). However, the new RCAF is not the reincarnation of the old RCAF. *Sic Itur Ad Astra* was approved by Her Majesty to be the motto of the Canadian Air Force on 10 September 1975. *Per Ardua Ad Astra* is the motto of the RAF. The new RCAF has a commander, not a CAS [Chief of the Air Staff], and he is a lieutenant-general, not an air marshal. And most importantly, today's Canadian Air Force includes, with great pride, what once was the Fleet Air Arm and the one-time Canadian Army Aviation branch. When Air Command was created in 1975, the reasons why it purposely avoided trying to become a reincarnated RCAF are spelled out in detail in Catherine Ayres' official report, "The Organization of Air Command 1973–1975."

The Commander of the new RCAF has confirmed the new title of Canada's Air Force implies absolutely no change whatsoever to current extant organizational structures, operational roles, or policies.

While I personally am honoured to say I served in peace and war in the old RCAF for 28 years, I am just as proud to say I served with the same kinds of professional airmen and airwomen in the Canadian Air Force for a further 10 years.

Conclusion? Someone should have given this Royal reincarnation idea a bit more thought. I'm a dyed-in-the-wool Royalist, but in this instance, and assuming Royal protocols have been followed, I suspect Her Majesty would not be too offended were the decision to be rescinded.

Sincerely,
Lieutenant-General Bill Carr (Retired)

To the Editor:

If this were a flying operation, we wouldn't be in business for long. My first reaction to Major Thorne's article, "Exposing the True Cost of Distance Education," was: been there, done that. I completed both a master's and a doctorate on a part time basis ... well almost. Without really recognizing it, work on the PhD caused me to take my release. Despite the fact that I had been using a number of Thorne's coping strategies to mitigate the personal and family impacts of the extra work, I "flamed out" halfway through the doctorate. Ironically, my day jobs during this period (1993–2004) were at the Canadian Forces College (CFC), and then at Canadian Defence Academy (CDA) headquarters where I was personally involved in establishing the very programmes which now provide part-time advanced professional and academic qualifications on the one hand, and personnel stress (let's call a casualty a casualty) casualties on the other.

I use the word casualty advisedly, because while many people I know, myself included, have found ways of continuing to contribute to the operational effectiveness and well-being of the Canadian Forces (CF), there are also those who, as Major Thorne points out, are burned out and lost to the service, even if they stay in uniform. This is not really what part-time programmes are meant to do, but there have been concerns for many years that we, those developing the policies and then the programmes, were transferring an unmanageable burden from the institution onto the backs of those brave enough to take on part-time learning. But we were "convinced" that this was the way to go because, heck, that's what was going on in the civilian sector with part-time MBAs (Master's of Business Administration) and MPAs (Master's of Public Administration), and other advanced management and arts programmes. We did not like the data that suggested that distance learning (DL) was a sub-optimal learning strategy, and that it was largely popular because it gave people, particularly fast climbers, a way to get the degree without leaving the workplace (a real problem in the civilian sector, which does not have an advanced training list [ATL]) and for companies looking for the enhanced performance associated with advanced degrees without the cost of sending employees to school. But with no apparent means of increasing full-time advanced professional education in the CF, there was not much choice if we were to meet the growing need for staff college graduates and other advanced qualifications. And so in the past decade, we have increased the Staff College throughput with a distance learning version of the Joint Command and Staff Programme (JCSP).

Oddly enough, during this period there was actually a growth in full-time residential professional education, and as Major Thorne points out, the introduction of advanced degrees in conjunction with this professional

education. This was done through an expansion of residential capacity for the JCSP and the introduction of various programmes for colonels/captains (Navy), the current version being the National Security Programme. These programmes, however, and their associated master's degrees, are very much focused on professional requirements and so there really is not much opportunity to embark on broader higher learning without either finding that rare sponsored Postgraduate slot or rolling up the sleeves and diving into the "stress pond" which Major Thorne has described so well.

The disturbing thing from my perspective is that these advanced studies are not generally seen by senior leadership as an investment either in the individual or the service, but more often as a waste of time and effort.[1] In my own case, on both occasions when I sought to do a Master's in War Studies, I was told that it would be a career-stalling decision. Good heavens—studying the central tenets of the profession is a dead end![2] Things have not gotten better in recent years, despite what we hear. True, there have been operational tempo concerns, but this has not stopped other nations from investing in higher learning. But it is also true that they, like us, have come to rely on DL.

[I]n the 21st century, knowledge and an ability to think innovatively to deal with ambiguous circumstances are essential attributes.

This brings us back to DL as the cure-all—the panacea—for those seeking advanced degrees. From an Air Force perspective, I would offer two observations. Bomber Harris (Air Marshal Sir Arthur Harris, the commander of Bomber Command of the Royal Air Force during much of the Second World War) was not much on "panacea mongers"—those who offered the ideal target sets for guaranteed war-winning bombing. But Harris was well aware of the ineffectiveness of area bombing and at the same time of the loss rates among his crews. He could not manage a sustained five per cent loss rate and would have been amazed at any activity with a twenty to fifty per cent failure rate—particularly if it was associated with stress casualties. The same should be true if we look at part-time education from a flight safety perspective. Those numbers are quite simply unacceptable, and a flight safety style investigation would likely reveal that it is not bad flying or shoddy maintenance that is the primary cause factor, but one where policy and management do not seem to be sufficient to prevent losses. If we want advanced education so that our middle and senior leaders, both commissioned and non-commissioned, can do their jobs more effectively, then it would seem that, particularly in this period of relative operational calm, we need to revisit just how we put these policies into practice. By early 1945, Harris had reduced his loss rate to around one percent. Perhaps we should aim for the same return on human resources.

So how might we do this? The first thing I believe we need to do is confirm that we want senior leaders with advanced education. This should be a short exercise confirming that in the 21st century, knowledge and an ability to think innovatively to deal with ambiguous circumstances are essential attributes. While some of the senior cohort should and will get these from the Staff College programmes, others should be heading for other institutions so that the leadership as a whole has not only a broad range of knowledge, but also has learned and worked alongside leaders and learners from other professions and workforces. Second, we must admit that if we want senior leaders to have advanced degrees other than what can be had from the Staff College, then we need to provide time for study. There are two ways that this can be achieved. First, we

can send more people to university on a full-time basis. We seem quite able to put people on second-language training, so why not add a few additional ATL credits—say 20 a year for advanced degrees. This would allow the Air Force to produce 10 master's degrees annually (based on a two-year programme). If we cannot find the ATL credits, then perhaps we need to do what the Army has done with some of its staff education (Army DP 2) and actually let students work at home during normal working hours. We can send folks off on all manner of tasks and service courses, so why can we not task them to complete a semester's worth of work between September and Christmas?

If advanced education is important, then we should get on with it. If not, then let's just turn off the anti-collider and kill the battery.

Colonel Randall Wakelam (Retired)

Dr. Randall Wakelam, a retired colonel (Tactical Helicopter pilot), is currently the Acting Head of the Writing Centre and an Assistant Professor of History at the Royal Military College, Kingston.

ABBREVIATIONS

ATL	advanced training list
CDA	Canadian Defence Academy
CF	Canadian Forces
DL	distance learning
JCSP	Joint Command Staff Programme

NOTES

1. There have been exceptions, both in the past and currently. Three Chiefs of the Defence Staff, General J. V. Allard in the late 1960s, and recently Generals Hillier and Natynczyk, have spoken of the value of getting advanced degrees in a range of subjects as a means of giving the senior leadership cadre a broad knowledge base as well as enhanced thinking skills.

2. A recent opinion piece by Colonel Bernd Horn at the CDA speaks eloquently to the value of advanced education and the study of the profession of arms and the broader domains of security and defence. Bernd Horn "A Rejection of the Need for Warrior Scholars," *Canadian Military Journal* 11, no. 2 (Spring 2011): 48–53, http://www.journal.forces.gc.ca/vo11/no2/08-horn-eng.asp (accessed November 21, 2011).

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, email, or fax to the *Journal*'s Senior Editor.

For further information please contact the Senior Editor at: William.March@forces.gc.ca

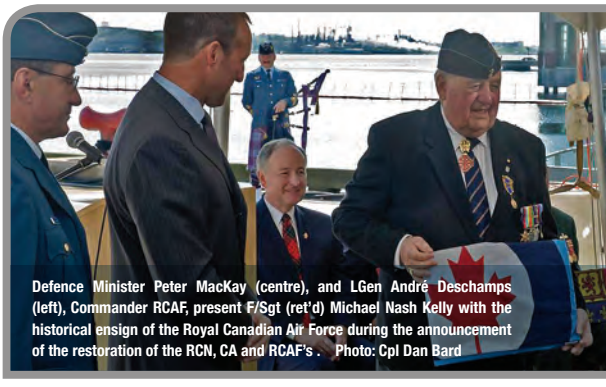
ROYAL CANADIAN AIR FORCE RESTORED

BY JOANNA CALDER

Defence Minister Peter MacKay announces the return of the historic titles Royal Canadian Navy, Canadian Army and Royal Canadian Air Force.

Photo: Cpl Dan Bard

"The three elements of the Canadian Forces will have their historic names restored: Maritime Command will now be known as the Royal Canadian Navy, Land Force Command will be the Canadian Army and Air Command will be the Royal Canadian Air Force."



Defence Minister Peter MacKay (centre), and LGen André Deschamps (left), Commander RCAF, present F/Sgt (ret'd) Michael Nash Kelly with the historical ensign of the Royal Canadian Air Force during the announcement of the restoration of the RCN, CA and RCAF's . Photo: Cpl Dan Bard

With these words from Defence Minister Peter MacKay on Aug. 16, the Royal Canadian Air Force returned to its historic name, which was first granted on April 1, 1924 – the date the Air Force still celebrates as its anniversary.

"In 1968 the government of the day passed a Canadian Forces Reorganization Act which unified the Royal Canadian Navy, the Canadian Army and the [Royal] Canadian Air Force into a single service, the Canadian Forces," said Minister MacKay during the announcement in Halifax. "An important element of Canadian military heritage was lost when these three former services were required to relinquish their historic titles.

"Restoring these historic identities is a way of reconnecting today's men and women in uniform, and the proud history and traditions that [they] carry with them as members of the Canadian Forces."

The name changes take effect immediately. "You can now proudly say you are a member of the Royal Canadian Air Force," said Lieutenant-General (LGen) André Deschamps, Commander of the Royal Canadian Air Force, told Air Force members.

He emphasized, however, that the return to the historical names for the three services does not undo or change the 1968 unification of the forces. "This does not represent a divergence from the unification of our Canadian Forces," he said. "We continue to be a tri-service, unified force with no change to our organization."

Reaction to the change was greeted positively by members of the Canadian Forces, veterans, and many Canadians. While some expressed concerns about the potential costs and the return to the designation "royal," others were plainly delighted.

"It's a proud moment," said Lieutenant-Colonel (ret'd) David Bashow, a former fighter pilot and associate professor of history at Royal Military College in Kingston, ON. "My flying training course (6907) was the last to get issued RCAF pilot wings for wear on the (old) blue flying suits!"

The reintroduction of the historical names is intended to be carried out at minimal cost and with no impact to the activities of the Canadian Forces.

"The reintroduction of the RCAF as our official name will be carried out in a phased approach, and will have no impact on our capabilities, rank structures or rank insignia, command relations, organization or operations," said LGen Deschamps.

"Over the coming months, we will, however, make necessary changes to documentation and staff titles, and adjust the current insignia, motto and colours, which were specifically designed for Air Command.

"As we move forward, I will keep you informed of further developments," he said.

CANADIAN FORCES AIR COMMAND: Evolution to Founding

By Lieutenant-General W. K. (Bill) Carr (Retired)

Formal integration of Canadian military activities took firm root on 1 August 1964, and unification, the completion of the thrust to consolidate, became fact with the passing of the *Canadian Forces Reorganization Act* on 1 February 1968. The Royal Canadian Navy (RCN), the Canadian Army and the Royal Canadian Air Force (RCAF) were abolished and unified to become a single service called the Canadian Armed Forces (CAF).

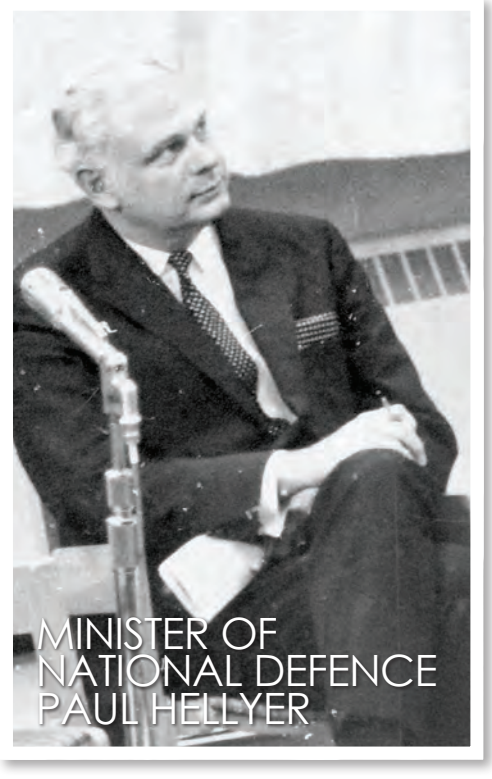
Before these events occurred, and increasingly by 1960, funding levels had fallen, public perceptions of military needs had waned, and some of Canada's senior military leaders already recognized the need to integrate many of the three services' support activities. Some of these, however, such as procurement and supply, were separately organized and firmly protected from change by historic and emotional single-service blinkered leadership. Admittedly, some activities, such as aircrew training and dental and legal functions, had already been integrated to some degree, but much more would have to be done to reduce overhead costs and to release funds for operations and new equipment.

Budgetary shortfalls had increasingly eroded the re-equipment and operations accounts to the point where nearly 90 per cent of the funds voted were being expended on non-capital functions such as pay and allowances and logistics in all its forms. There was little money left to replace old and worn out equipment. The Forces were rusting out, and increasing sums were wasted merely trying to keep the machine from breaking down completely.

It was into this disorganized and fractured Department of National Defence (DND) that the new Liberal Minister of National Defence (MND), Paul Hellyer, was parachuted in 1963. He quickly became frustrated with the "Rule by Committee" within National Defence Headquarters (NDHQ), the lack of coordination between the three service chiefs, the impotency of the Chairman of The Chiefs of Staff Committee, and the obvious triplication of many support activities. Not surprisingly, it struck him as absurd and unacceptable. While his subsequent moves to resolve the problem and introduce some semblance of good management, accountability, and leadership were often denigrated as being politically motivated, there is much evidence to suggest many logical steps were indeed taken at a time of very tight budgets and an apparent public disinterest in things military. The only fair criticism of what he did—caused by his enthusiasm in a new job coupled with his incredulity at what he had inherited—was going too far too fast.

In due course and after much publicity—much emotional and some logical—Hellyer's new unified organization of 1968 evolved to consist of a NDHQ and six functional commands. This structure replaced the previous three separate national HQs and eleven field commands. The RCAF's five functional commands—Air Defence, Air Transport, Air Division, Air Training, and Air Materiel—disappeared, as did the office of the Chief of the Air Staff (CAS).

From then forward, Air Defence and Air Transport Commands continued more or less as before, except they had no superior air authority to whom they could respond or appeal. The rest of the former RCAF, the Navy's Fleet Air Arm and the Army's helicopter and light, fixed-wing air resources were distributed, as seemed functionally sensible, between the new Mobile (MOBCOM) and Maritime (MARCOM) Commands.


MINISTER OF NATIONAL DEFENCE PAUL HELLYER

The resultant lack of a real air authority in the new structure persisted for several years, and history shows it was a costly deficiency. The senior air environment officer identified as such was the Director General of Air Forces, an air commodore slot that I filled for a year or so. It was a staff appointment in the Vice Chief of the Defence Staff (VCDS) organization, with no operational authority whatsoever. Indeed, even the Director of Flight Safety, a key appointment, preserved after much debate about its need, reported

directly to the VCDS with no formal tie to the environmental chief.

In the new unified structure, which survived unchanged for a couple of years, MOBCOM was a three-star general, while MARCOM, Air Defence Command (ADC), Air Transport Command (ATC), and Canadian Forces Training Command (CFTC) remained two-star appointments. Within NDHQ, the Chief of Operations and Reserves was a two-star, but the VCDS was a three-star, and everything went through that office until 1971.

It soon became obvious that the access to the four-star Chief of Defence Staff (CDS) enjoyed by the Commander of MOBCOM was automatic when he chose to disagree with the Vice Chief, as he often did. However, access to the Chief by the two-star commanders was often stymied by a turf-protecting Vice Chief. The inherent weakness of the new command structure, though, wherein no single Head could speak for Air became increasingly obvious, and its adverse impact on operational efficiency could not be hidden nor denied.

Air operational support to all the activities of MOBCOM and MARCOM were as essential as ever. However, with tactical air transport, close air support fighters, and tactical helicopters now organic to MOBCOM and split away from a central doctrinal and operational air standards authority, as was also the case with MARCOM's fixed- and rotary-wing air resources, many problems surfaced, accident rates increased, and morale suffered severely.

By early 1974, it was obvious that the dismembered and abused state of the Canadian Force's (CF) military air assets could no longer be ignored. Aircraft were being misused, and some units were even failing to maintain acceptable levels of proficiency. Part of the reason for this was the forced reduction in flying hours caused by the shortage of aviation fuel. In numerous instances, it was discovered that local commanders had grounded aircraft so as to use their budgeted aviation petroleum, oils, and lubricants (POL) money for purposes they viewed to more aptly fit other preoccupations and priorities. This self-inflicted lack of POL automatically reduced the amount of support which the air operation units could provide their commander. While finger pointing was rampant, the MARCOM and MOBCOM bosses could not deny the causes.

BY EARLY 1974, IT WAS OBVIOUS THAT THE DISMEMBERED AND ABUSED STATE OF THE CANADIAN FORCE'S (CF) MILITARY AIR ASSETS COULD NO LONGER BE IGNORED. AIRCRAFT WERE BEING MISUSED, AND SOME UNITS WERE EVEN FAILING TO MAINTAIN ACCEPTABLE LEVELS OF PROFICIENCY.

On my appointment to the Deputy Chief of the Defence Staff (DCDS) three-star slot in 1973, and even though my predecessor had avoided facing up to the problem, it was clear I could not delay tackling it. The DCDS was the focal point of all CF's operational activities. The Vice Chief's function, on the other hand, was oriented toward the overall management of the Forces. Both of us reported on an equal basis to the CDS. As clear-cut as this may sound, in fact it often led to having the CDS mediate many issues.

Colleagues, not only airmen, were not shy to remind me that I could now do something to solve some of the air operations problems. Those with whom I discussed prudent plan development agreed that the main challenge would be to ensure that the timing of any moves to change things would be precisely orchestrated to ensure we avoided making our logic vulnerable to emotionally generated and subjective objections. Paying attention to who sat in what chair in the hierarchy would be important. Also, we had to ensure that we did not raise questions that might generate

a premature high-level veto that could easily stall further progress (as with Prime Minister Diefenbaker's admitted political strategy, we had to be sure of the answer before we formally asked the question).

While the organizational structural changes we were to develop had to be not only logical and valid in their own right, they also had to be clear in their benefits besides the improvements in the management of our air resources. For example, with the then budget pressures, which among other things would result in a force reduction from 83,000 to 79,000, any personnel reductions we could come up with to support our case would be an added bonus.

We were convinced that showing how our recommended improvements could result in personnel and cost reductions would make attempts to derail our efforts a much tougher job. We rationalized that it would be doubtful the CDS and the Deputy Minister would wish to be seen to accept arguments that might cancel potential personnel and dollar savings, along with improved operational efficiencies and capabilities. Having weighed these factors, and before tackling the command-level problem, it was our opinion that it would be necessary to pull together the disparate and competing staff agencies within the environmental chiefs' organizations in NDHQ.

The now two-star environmental chiefs, the Chief of Land Operations (CLO), Chief of Maritime Operations (CMO), and the Chief of Air Defence Operations (CADO) reported through the DCDS, and they each had a separate air staff. This staffing anomaly had caused confusion and sometimes conflicts between the environmental chiefs. Accordingly, I quietly (or so I thought) moved all three to the CADO. This consolidation of staff positions produced some emotion but quickly fell into place with telling improvements. This action had been discussed previously with my predecessor as DCDS, an Army lieutenant-general, and was rejected out of hand because he saw it as an underhanded attempt to weaken the control that the MOBCOM commander exercised over his fixed- and rotary-wing tactical air components.

The airmen staff of all stripes in this reorganization were openly enthusiastic about the change, even though their environmental chiefs were not necessarily so. There was some flak also from on high, but after being scolded for implementing the move before bringing him into the picture, the CDS gave me his quiet support on condition that I avoid open confrontation with those who were uneasy about the decision and where it might be heading.

My neck was out, but I doubted I could be fired so soon after my publicized appointment. I also knew I had the Chief's tacit support. After I briefed the VCDS, as I had been directed to do by the CDS, I had the clear impression the VCDS might try to find ways to forestall further moves to resolve the air operations problems. He was justifiably suspicious that behind it all there was a sneaky plan that could lead to a major change in the CF's command and control structure. From then on, I "watched my back," and I was not totally forthcoming to him as we moved ahead. However, I never misled him, and I always provided him the information he sought whenever he asked.

As the dust settled over this air staff realignment, we were able to think seriously about the next step, which would affect how air operations were to be organized and controlled in the future. My background of recent unified service in MOBCOM as Chief of Staff (COS) Operations and Training and later as Commander of Training Command helped me anticipate where much of the opposition would come from and why. In MOBCOM, the senior airman, a group captain, and the Army combat chiefs and combat support chiefs were part of my staff, and I got to know them personally and came to know their preoccupations and "hobby horses." For

example, I was surprised to learn that a unified Army did not exist as I had understood it, and indeed, corps and regimental affiliations seemed to take precedence over all other considerations. The gap between armour and artillery branches over direct versus indirect fire was an eye-opener.

Later, from 1978 to 1981, as Commander of Training Command, I not only had the aircrew training empire under my wing, but also the two fleet schools of the Navy, the Combat Arms School, the Artillery School at Shilo, the Chilliwack Royal Canadian Engineer School, the complex of support schools at Borden and elsewhere, and even the Recruit School at St-Jean. All the associated bases were also part of this empire.

The luck factor in this is that this background had provided me the opportunity to meet and work for and with a large number of first-class officers and non-commissioned officers from the other services. In many situations, I was the spokesperson and "engine driver" for activities which had nothing whatever to do with air operations. They knew me and I them.

At this stage, it was obvious that there were now three major hurdles to be overcome before we moved on. First, we had to convince the CDS that the time was ripe to make a major organizational structure move. Second, we had to get acceptance of the need from the other two elements—both Land and Sea. And third, we had to engineer government approval of a major step in the reorganization of the CF by whatever means we could find, and without pointing fingers at the extent of the Hellyer/Liberal revolution.

After much quiet discussion and undercover planning by our small inner circle, in mid-1974, the CDS, General Jimmie Dextrase, agreed privately that Major-General Ken Lewis, the Commander of Transport Command (one of the most articulate briefers in the CF hierarchy), and Major-General Hugh McLaughlan (the incumbent Chief of Air Operations, and the most astute and politically sensitive officer in CFHQ), could be assigned part-time to the project. They would quietly develop the goals and establish the timetable for the ultimate implementation of a unified Air Command.

"Jadex," as the CDS was affectionately known, was very clear in his direction to me: the project was to be handled discreetly and without attracting emotional criticism from those who could be forecast to try to prevent any major change in the current command and control structure of the CF. There were many potential roadblocks. However, we believed that if we did our homework well, studied our opponents, and anticipated their arguments, we could avoid premature conflict by avoiding their hobby horses. At the outset, we would focus first on the matters that even the most biased of them could not argue against.

For starters, the putting together of ADC, ATC, and the aircrew training from ATC into an Air Command, of sorts, would cause little stir from either of the two major environmental commands. Indeed, we were pleasantly surprised by gaining their open support. The reason was that both the Army (MOBCOM) and the Navy (MARCOM) had long voiced views about airmen having two commands (Air Defence and Air Transport), while the Army and the Navy each had only one. It seems childish in retrospect, and almost unbelievable, but it is true.

From the outset, our team agreed that our preferred method of operation would be to ensure that "the opposition" knew where we were heading. At the same time, knowing that information is power not to be given away too freely, we handled much of the "inside dope" with discretion, and kept our final plan closely controlled among a very few key players. While our agenda was available for all to see, how we planned to achieve our goals was revealed only as each piece of the puzzle slipped firmly into place. My personal preference—to

avoid prolonged discussions at conferences—proved useful, and we were able to rebut many objections in one-on-one discussions.

Our strategy was to move ahead on a block-by-block basis, essentially one step at a time. At the outset, we would stay away from those emotional subjects of command and control, uniforms, rank structure and nomenclature, and the airman's (and RCAF Staff College's) much loved principles of air power. We would instead concentrate on those areas in obvious need of repair, and those that without correction would continue to waste money and adversely impact operations. For example, even the Commander of MOBCOM knew that a bad air accident rate reflected poorly on how the organization was run, and such image deflators were inexcusable, regardless of their basic causes.

Timing was equally important; and, as noted above, who occupied what senior slots in the hierarchy, their preoccupations about things air force, and their relationships to each other, could make or break our project. On the one hand, if we avoided addressing the views of some who were our potential critics, or, on the other hand, failed to exploit the views of those who agreed in principle with where we planned to go, we could be vulnerable to confrontation by a strong and noisy coalesced voice that would draw unwanted attention and debate at this early stage of our work.

I also firmly believe that personal credibility with some who could create obstructions to what we hoped to do, while difficult to measure, probably helped to reduce the potential problems which could have arisen. Many of my other environment colleagues remembered and reminded me how totally exposed I had been to obstructive forces when I commanded CFTC as a Major-General from 1968 to 1971. In the late sixties and early seventies, CFTC was not an admired formation for two reasons. First, it was the CF's biggest command in personnel and budget terms; and, second, it was modeled on the old RCAF Air Training Command. A look back at Training Command was worthwhile in developing the thesis that personal credibility could be a major factor in the ultimate achievement of our goal.

On assuming command of CFTC in the summer of 1968, I became the team leader who had to consolidate training resources for all three environments and eliminate the overlap which existed between the traditional trades and professional schools (i.e., amalgamate schools). For example, three schools for cooks, three for military police, three for administration, three for supply, and others, were all consolidated into one for each specialty.

The CFTC also ran the military bases that hosted most of the training, including such historic locations as Cornwallis, St-Jean, Chilliwack, Shilo, Rivers, Gimli, Portage, Moose Jaw, Winnipeg, Cold Lake, and so on. The combat arms schools of the Army at Camp Borden, as well as the fleet schools of the Navy on both the West and East Coasts were also part of this empire, an empire led by a "light-blue suiter" charged with slaying the dragons of tradition and emotion.

One activity that helped establish CFTC's credibility was the manner in which the aircrew training empire was tackled. Since the Second World War II (WWII), effectively no one had taken a detailed look at how it functioned or what it cost. That it was effective was obvious, but was the current system really justified?

To the professional air trainers I was a foreigner with no air training background, and therefore could not possibly appreciate the subject. In my efforts to learn more about the set-up, my staff and I uncovered in the system the biggest closed shop in the CF. It was overblown, extravagant, old-fashioned, and subjective. Despite this, it produced an aircrew product unmatched by any other. Accordingly, it was dangerous to rock this boat, I was told, but rock it we did. In short order, we were able to tell HQ that we needed two fewer air

training bases, fewer people and aircraft, and far less money.

The non-training airmen cackled and the Army and Navy became more friendly, and indeed, seemed to drop their suspicions of a centralized Training Command run by an airman. The fact that the project head for this aircrew training exercise was of "dark-blue" lineage probably helped. The icing on this cake was thickened further by my having an infantry Brigadier-General as a Chief of Staff and two Navy captains, one Army colonel and one Air Force colonel running all the training shoulder to shoulder. Previous service in MOBCOM was an asset.

I had come to know personally and professionally many senior colleagues in MOBCOM and MARCOM; indeed, perhaps even more so than I had some of our senior airmen. I was comfortable, therefore, that I knew what would wash with them and when, and what would need to be put aside until other parts of the puzzle were put in place.

Earlier attempts to reunify Air Force assets had failed for a number of reasons, and indeed, may have delayed the Air Force's ultimate evolution. However, Major-General Dave Adamson and Major-General Norm Magnussen, in their first-class efforts, drew attention to the problems and caused many senior people to listen. Perhaps, too, it gave others the time they needed to prepare their defence against any major change.

The evidence to support an organizational change for the air elements of the CF had lacked a clear objective analysis, and in some cases was seen to be emotional rather than objective. Certainly, few politicians of the day were about to admit that the not too old unification policy was not working as well as Defence Minister Hellyer had guaranteed.

I also believed, from my personal contacts with him when I was commander of Winnipeg-based Training Command, that our current Liberal Minister of Defence, James Richardson (a WWII RCAF bomber pilot), would openly support our efforts were I first able to reveal to him on a private basis, a well-reasoned, timely, and discrete plan (which, coincidentally, would also include some benefits for The West). He could become a very potent ally. Subsequent events proved this a valid expectation. The project's potentially high visibility put an overriding control on how we did our home-work. It would have to be airtight, devoid of emotion, and totally logical and cost-effective. And, obviously, there could be no outward appearance of in-service rancour.

The CDS (who put me in the DCDS chair) and I regularly "scratched each other's backs." I knew him well, and honestly admired his outstanding record in WWII and Korea, and his charismatic leadership, and I was conscious, too, of his justified pride in his career as a professional soldier. Yet, had I not been sensitive to his hair-trigger temper, I would never have gotten off first base. His attitudes to certain policies and ideas held few mysteries or surprises for me. He trusted me and I gave him no reason ever to question my loyalty.

When I first briefed him on how thoroughly dismembered the air element was, his reactions were those of a CDS who was genuinely dedicated to the welfare and capabilities of "his" Canadian Forces. He was greatly annoyed to be informed and convinced of just how inefficiently "his" air assets were distributed and scattered, and of how the Forces' professional and very costly airmen, helicopters, and aircraft were being abused and misused.

After telling me (once again) to be careful about "wearing my heart on my sleeve," with a twinkle in his eye, he agreed we could no longer avoid facing up to the problem, and I could now bring the project into the open. As noted above, he directed me to assemble the team that was to include Lewis and McLaughlan and to prepare a course of action. We were to put together a proposal to solve

our problems and be prepared to present it to Defence Council by October 1974, the final date for presentation of the DND budget cuts proposal to meet Ministerial direction. I was to avoid in-house confrontations.

Soon after this blessing, the CDS told me that the Minister had also informally agreed to the formation of an Air Command. But, crafty as he was, the Chief then dropped the other shoe and said there was a cost for his support and for his having secured this OK from the Minister. His price for his support, believe it or not, was that I, in return, as DCDS and obviously an airman, was to put an immediate priority on getting new tanks for the Army! He was almost paranoid that he not be seen to be anything but a perfectly "green" officer. To seem to be pushing one environment's program harder than those of the other two would be unacceptable.

Thus, the Army replacement tanks project was to go to the top of my "to do" list. In the light of day these many years later, this deal sounds almost unbelievable, but it was achieved, and with little fanfare. On reflection, "the old boy net" worked to achieve goals that official channels and procedures could not. (Someone will tell this tale another time.)

With a lot of behind-the-scenes manipulation and horse-trading, both of these deals eventually fell successfully into place. Eventually, the Army got its Leopard Tanks and the airmen got their new Air Force!

In retrospect, along the way to the rebirth of an air force, there were more than a few noteworthy impediments to our progress. The two main opponents were the Commander of MOBCOM and the VCDS. Our strength in confronting the obstruction this represented rested, among other things, on our awareness of the professional antipathy each had for the other. It made both of them vulnerable to being blindsided by us.

In due course, the Commander of MOBCOM reluctantly agreed with the CDS to the need for some consolidation of the CF's air assets, but with ownership and operational control of the helicopters and F5 fighters clearly part of his command. The VCDS, on the other hand, expressed no opinion on who owned those assets, but was adamant that maritime fixed- and rotary-wing aircraft were fundamentally and inseparably parts of MARCOM—lock, stock and barrel.

As our work progressed, the personalities and the sometimes subjective preoccupations of the "dark blue" and "khaki" increasingly caused us a lot of headaches. However, their disinterest in each other's problems and their fears worked in our favor because they failed to generate a united front against the advancement of our project and its strategy. Knowing the personalities of our colleagues also affected how we developed our plan, and how we got its elements nailed down bit by bit.

The Commander of MARCOM, who, as noted, was not a bosom buddy of the VCDS, even though a fellow admiral, had already been convinced by his senior airman, Brigadier-General Al MacKenzie, that he would be well served to shuck off every aspect of maritime air except its operational employment. The VCDS was very upset that his "dark-blue" cohort would take such a position.

Our final presentation to Defence Council avoided pointing fingers but subtly made the point that some of the compromises in it, while acceptable in the short term, were not the best answer. The CDS had already detected this. At this key meeting, the Commander of MOBCOM chose to argue with the CDS that the whole idea of an Air Command was unnecessary and would only reduce the effectiveness of his command, and furthermore, would hamstring his ability to do his job. He did this despite his awareness of the Minister's and the CDS' preliminary support.

This intervention backfired when a much annoyed CDS ruled that our proposal to Cabinet would place **all** the CF's air assets into the new Air Command. The Commander of Mobile Command had unwittingly (and

much ahead of our planned schedule) given us the command structure immediately that we had hoped to acquire only eventually. Indeed, we had prepared some backup compromises for consideration if there was need.

While I could suggest we had geared the presentation to create this reaction (and Brigadier-General Jim West, a brilliant, astute, crafty, and key member of our small group had assembled the material in this way), the CDS's temper added to the lack of warmth between him and the Commander. The latter was rebuked and denied even the concessions we had been willing to make in order to keep him happy. Everyone at the meeting again realized that no one ever, not ever, argued with Jadex in an open forum, and especially not in front of a group of senior civilians that included the Deputy Minister. We departed the meeting with approval to present to the Minister an organization proposal.

CF Photo

As implied above, the VCDS was never a keen supporter of our project. He disagreed with much of the concept of an Air Command as we had conceived it, and his disagreement seemed partly to be related to a fundamental antipathy to many things air force. His motivation for this attitude may have been related to his failure to be selected for service in the Interim Air Force of 1945–47. He was more than hurt, he was insulted, and he seemingly was never able to bury what he felt was an affront to his pride and self-image.

While he had not served overseas as had most of us who were selected for the Interim Air Force, in private he brought the matter up and told me he believed his qualifications to continue to serve in the RCAF were as good or better than many of us who were kept on. I accepted this, but I could not understand how carrying a chip on his shoulder over a perceived challenge of long ago did much to help project the image I would have thought he would like, especially when holding down the second-most senior slot in the CF.

When we received the direction to prepare the final documents for presentation to the Minister, it was necessary they be coordinated across the staffs that would become involved with the implementation of the decision we

hoped for and expected. Accordingly, one of the final steps in its preparation for delivery was to have it initialed by the VCDS, who, as mentioned, was the de facto manager of all NDHQ policy-level activities.

Shortly after its hand delivery from the VCDS' office to the Minister's office, the Minister's senior military executive, (then) Brigadier-General Gus Cloutier called me. In his studying of the document preparatory to presenting it to his boss, he had detected a major change from the concept and structure for Air Command that our previous informal contacts with the Minister had proposed and with which he had agreed.

THE OUTCOME OF IT ALL WAS AN AIR COMMAND (AIRCOM), WHICH, UNLIKE ITS MUCH REVERED PREDECESSOR, THE RCAF, NOW HAD ITS OWN MOTTO, APPROVED CREST, RANK STRUCTURE, UNIFORM, AND SERVICE SYMBOLS.

Instead of all Air Force assets becoming part of the Air Command structure, someone had amended the body of the proposal to include the phrase "except that specific to Maritime Command and Mobile Command." While there is no proof as to who made the change, the VCDS had signed the version with that change incorporated into it. The CDS had not been consulted, and to top it off, the VCDS staff had forgotten to amend the Appendices which still reflected the decision and direction given us by the CDS. Cloutier's alertness and his very close friendship with West avoided what could have been a very embarrassing situation for the CDS and the CF.

As we had progressed along the route to success, it had been obvious who would support our efforts and who would hinder us. As immature as it seems in retrospect, personal relationships and preoccupations played a big role. For example, the Commander of MARCOM and the Vice Chief, both admirals, did not exhibit the warmth that one would expect of bosom buddies. Some of us had noted previously that when the admirals were involved in discussions, both wanted to have the last word.

Also, to repeat, the Commander of MOBCOM was no great buddy of the CDS. The former was an emotionally and strongly opinionated Army officer and the latter a soldier with a unique war record, who was very conscious of his position at the peak of the hierarchy. Indeed, at Defence Council meetings, the splits between the various "Senior Brass" were so obvious as to reveal to me where the "armour chinks" were, which, with planning, we were able exploit to our advantage as events unfolded.

With a Vice Chief whose ideas were often at variance with those of the field commanders, yet over whom he, as the manager of the HQs, had no real power, a CDS who under it all was a "wannabe" airman, and a Minister who was a wartime aircrew member of the RCAF whom I personally had come to know well during my stint in Winnipeg as the Commander of Training Command, it was obvious that each of these key players could be used to our advantage if we played our cards right. And, we apparently did.

The outcome of it all was an Air Command (AIRCOM), which, unlike its much revered predecessor, the RCAF, now had its own motto, approved crest, rank structure, uniform, and service symbols. The RCAF had borrowed all of these from the Royal Air Force, and as historically respected as they all were, only "The Airman's Prayer" and "The March Past" remained. Finally, also unlike the RCAF, the new organization commanded all of the air resources of the CF, including the previously separate Naval and Army aviation branches.

The document finally approved by the Minister (and noted by Cabinet) and to be effective from 2 September 1975, made the following statement: "The role of Aircom is to provide operationally ready regular and reserve air forces to meet Canadian, continental and international defence commitments and to carry out regional commitments within the prairie region."[1]

THE LAST WORD

Without a "wannabe airman" who was a charismatic, patriotic, and gutsy CDS, and a Minister who really dedicated himself to the efficacy of the CF, Air Command, as it was finally created, could never have come to pass. And, without the thoroughly objective, professional colleagues such as we had on our team, we could never have succeeded in pulling it off.

AUTHOR'S NOTE:

There are two worthwhile historical sources for detailed information of the creation of Air Command. They are: "The Formation of Air Command: A struggle for survival" by Major Stephen L. James, published by the Department of History, Royal Military College (RMC), April 1989; and, "The Organization of Air Command 1973–1976," by Catherine Eyre, issued within DND, 7 November 1979. This contains much statistical detail and organization (org) charts.

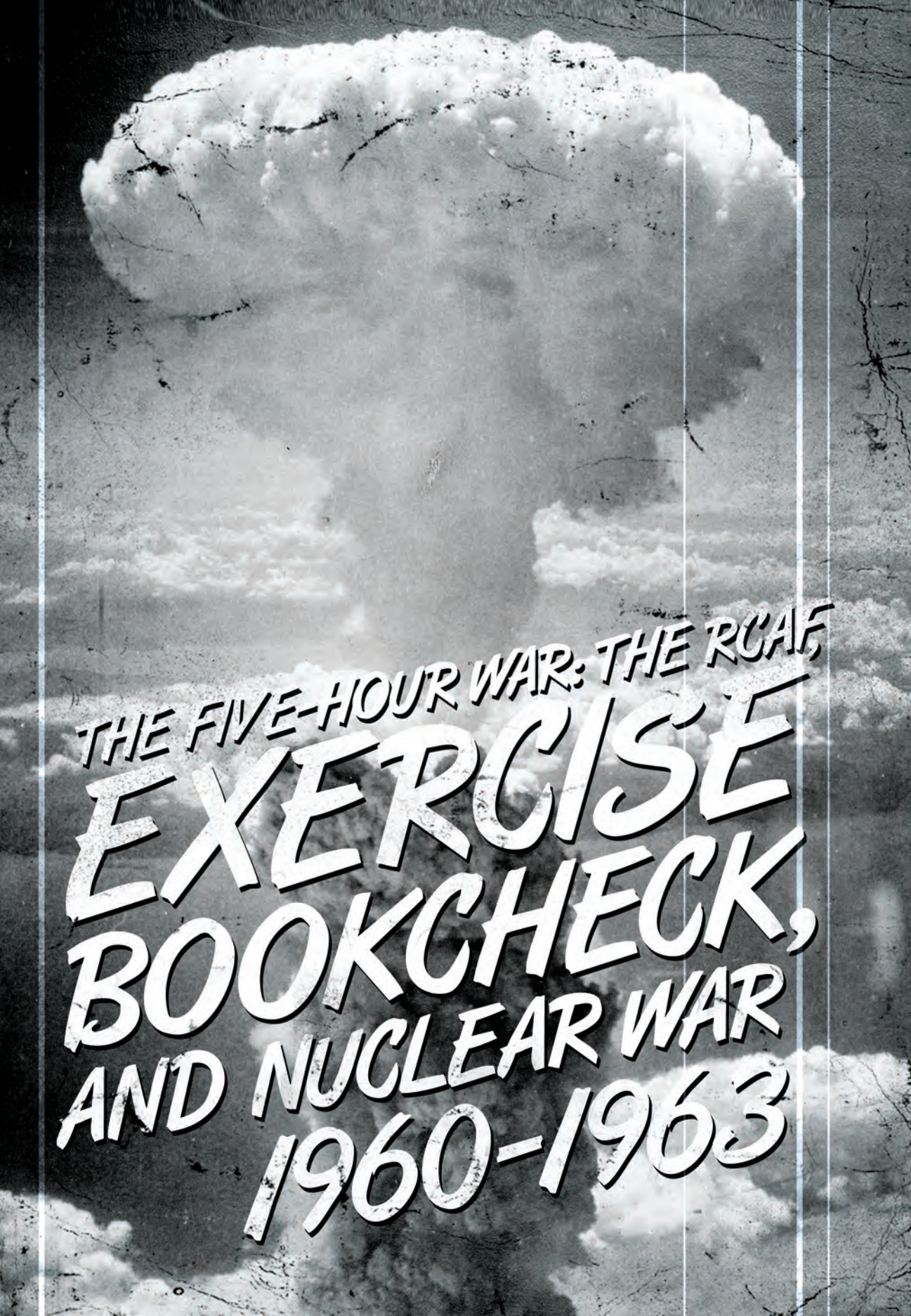
Lieutenant-General W. K. (Bill) Carr (Retired) joined the RCAF in 1941 and flew 143 photographic missions over Europe, Malta, North Africa, and Sicily in Spitfire aircraft. During the post-war years, he advanced rapidly in rank, serving as Deputy Chief of the Defence Staff from 1973 to 1975, following which he was appointed the first Commander of the Canadian Forces Air Command. He is known as the "Father of the Modern Air Force" for his work in consolidating military aviation in the aftermath of the unification of the forces. After retiring from the military in 1978, Lieutenant-General Carr joined Canadair Ltd., where he enjoyed a remarkable career in worldwide marketing of the then-new Challenger business aircraft.

ABBREVIATIONS

ADC	Air Defence Command
ATC	Air Transport Command
CADO	Chief of Air Defence Operations
CDS	Chief of the Defence Staff
CF	Canadian Forces
CFTC	Canadian Forces Training Command
DCDS	Deputy Chief of the Defence Staff
DND	Department of National Defence
MARCOM	Maritime Command
MOBCOM	Mobile Command
NDHQ	National Defence Headquarters
POL	petroleum, oils, and lubricants
RCAF	Royal Canadian Air Force
VCDS	Vice Chief of the Defence Staff
WWII	The Second World War

NOTE

1. The Prairie Region extended from Thunder Bay to Vancouver, and existed along with Atlantic, Central and Pacific Regions for purposes of assigning responsibility for national assistance by the military in events such as floods, ice storms, and forest fires where civilian resources were overwhelmed. The responsibility also included "Aid to the Civil Authority" and "Aid to the Civil Power." Regardless of who "owned" the military resources in a Region, the designated commander was authorized to use whatever military forces he needed to meet the emergency.


THE FIVE-HOUR WAR: THE RCAF,
EXERCISE
BOOKCHECK,
AND NUCLEAR WAR
1960-1963

[AS] WINSTON CHURCHILL AND OTHERS HAVE NOTED, THE HYDROGEN BOMB IS A GREAT EQUALIZER OF NUMBERS, AND A GREATER EQUALIZER OF GEOGRAPHY, TO A FAR GREATER EXTENT THAN PREVIOUS WEAPONS. THESE WEAPONS OPERATE AGAINST AREAS RATHER THAN ARMIES, MAKE CONTINENTS VULNERABLE AS WELL AS COUNTRIES. EACH ONE CAN MAKE THOUSANDS OF SQUARE MILES AN UNINHABITABLE DESOLATION, HOWEVER HEAVILY OR SPARSELY POPULATED IT MAY HAVE BEEN. THEY GIVE A NEW TWIST TO GEOPOLITICS AND DEMAND A NEW APPROACH TO MILITARY AND DIPLOMATIC STRATEGY.[1]

-LESTER B. PEARSON, 1955

BY SEAN M. MALONEY, PhD

The late 1950s and early 1960s were arguably the most dangerous years of the cold war. The 1961 Berlin Crisis, with its nearly three-year lead up, coupled with the Cuban Crisis of 1962, literally took the world to the brink of destruction. Canada was in those years an integral part of the Western alliance determined to resist the Soviet Union and its other totalitarian allies globally. In effect, Canada contributed military forces to four theatres of war. First, there were the North Atlantic Treaty Organization (NATO) forces in Western Europe, which included a powerful Canadian nuclear striking force. Second, there was the Third World, which consisted of decolonizing countries in Africa, Asia, and the Middle East. These areas generated "brush-fire wars" that could have sparked up into superpower conflagration if United Nations (UN) peacekeeping forces were not deployed quickly. Third, there was the Atlantic Ocean where Soviet submarines lurked in preparation to either to cut off shipping to Western Europe or to fling missiles at North America. Finally, there was North America itself, protected by the North American Air Defense Command (NORAD)[2] and a variety of maritime commands.

The Royal Canadian Air Force (RCAF) was responsible for deploying forces to all four geographical areas in times of "peace," be they the CF104 nuclear strike force in West Germany, Yukon transports to the Congo, Argus antisubmarine patrol aircraft over the Atlantic, or CF101 Voodoo interceptors over North America. These forces were part of a massive deterrent effort to prevent a war from starting in the first place. These forces were also prepared to escalate and fight such a war if necessary. A critical part of that deterrent posture was preparation. No deterrent was credible if the forces were not capable of carrying out the stated intent. Merely having aircraft and pilots on an airbase somewhere was not enough. There had to be an analysis

of likely courses of action, readiness, an alert procedure; and, of course, those processes had to be practiced and improved on regularly. Indeed, keeping such preparations secret was not even desirable for national morale or deterrent purposes. Both domestic and international audiences existed. Canada had to be seen to be prepared.

Exercise BOOKCHECK, an RCAF command-post exercise, was part of these preparations.[3] Issued "Under the Authority of the Chief of Air Staff" as the cover document made clear, Exercise BOOKCHECK was related to the national-level *War Book*. The *War Book* was an overarching document that outlined how Canada would react to a nuclear war at the highest levels. There was a derivative RCAF *War Book*. Both documents drew heavily on NATO and NORAD alerting systems, which were themselves reflections of NATO and NORAD strategy. Exercise BOOKCHECK was designed to test those procedures, specifically, "the dissemination of National Alerts, Attack Warnings, and Nuclear Detonation information" as well as the personnel and communications aspects of going to war while under attack.

As with all exercises, BOOKCHECK was artificial. It could not replicate the mass confusion and damage to the system that would probably occur while the country was under thermonuclear attack. The planning could only anticipate it. Indeed, with the availability of larger numbers of Soviet intercontinental and submarine-launched ballistic missiles (ICBMs and SLBMs, respectively) later in the 1960s, BOOKCHECK was obsolete and arguably irrelevant, at least by 1967. That said, however, Exercise BOOKCHECK does give us an idea of how the RCAF might have broadly reacted if North America had come under attack in a no-crisis situation, or one of less protraction than the 1962 Cuban Crisis. The exercise plan certainly gives us insight into what aspects of such a situation the RCAF leadership deemed important, and how much time they thought they had to react.

THE RCAF IN THE EARLY 1960s

For the purposes of BOOKCHECK, virtually all Canada-based RCAF formations, stations, and units were involved, most of which no longer exist today, so it is essential to provide an overview from the time. In those years, the RCAF consisted of Air Defence Command (ADC) based in St Hubert, Quebec (QC); Air Transport Command based in Trenton, Ontario (ON); Maritime Air Command (MAC) with its headquarters in Halifax, Nova Scotia (NS); Training Command headquartered in Winnipeg, Manitoba (MB); and Air Materiel Command based at Rockliffe, Ottawa. Over in Western Europe, there was No. 1 Air Division, the RCAF command dedicated to the NATO nuclear strike mission. Some commands had a separate emergency headquarters or EHQ, as some of the commands were located near large cities and might be affected by nuclear attacks on them: Air Force EHQ was in Trenton; Training Command EHQ at Combined-Joint Air Training Centre, Rivers, MB; and Air Materiel Command EHQ in Angus, ON. Northern NORAD Region was a special case: this underground facility with its semi-automatic ground-environment (SAGE) computer system was under construction at Station North Bay, ON, during this time, as were the two Bomarc missile sites that were to be connected to it.

There were the Pinetree Line and ground-controlled intercept radar stations stretching from Holberg, British Columbia (BC) to Sydney, NS. A specialized cross-country communications network consisting of 1, 2, and 3 Communications Units (CUs) were located in Vancouver, Winnipeg, and Edmonton. The 4 Communication Unit (CU) was in Rockliffe, and there were six altogether. Training Command bases at Lincoln Park, Alberta (AB); Gimli, MB; Portage, Saskatchewan (SK), and Winnipeg, MB, plus the Army-RCAF joint training centre at Rivers, MB, as well as radar and communications training facilities at Stations

Hamilton, Centralia, and Clinton, ON, show that the RCAF possessed significant dispersion beyond what we are familiar with today.

For the most part, MAC, with its Argus and Neptune patrol aircraft, was clustered on the East Coast, with a West Coast base in Comox, BC, that shared facilities with ADC fighter units. The ADC was in the process of replacing CF100 Canucks with the new nuclear-capable CF101 Voodoos across the country: these ADC squadrons were at Comox; Namao, AB; North Bay, ON; Bagotville, QC, with a dispersion site in Val D'Or, QC; Uplands, ON, and Chatham, New Brunswick (NB). Two Bomarc nuclear missile sites were under construction, one at North Bay and to the other at La Macaza, QC. There were even reserve fighter squadrons equipped with F86 Sabres operating from Vancouver as part of ADC. Air Transport Command had units in Trenton, and Lachine, QC, near Montreal. A special unit consisting of North Star transports and helicopters was situated at Rockliffe, east of Ottawa. Its purpose was to extract Canada's emergency government to dispersal sites west of Ottawa.

In addition, there were two squadrons of United States Air Force (USAF) F-106 interceptors located in Newfoundland and Labrador (NL). There were also four secret aerial tanker bases in the Canadian North. None of these organizations figured in Exercise BOOKCHECK, however, and their forces were not really "gamed" per se.

PHASED ALERTING PROCEDURES AND EARLY WARNING: THE WAR BOOK

The RCAF operated under the umbrella of a number of national and allied alerting systems, and Exercise BOOKCHECK was composed around them. It was not really feasible to keep the entire Air Force on hourly standby for a nuclear attack. Fatigue, cost, and necessity demanded that there be some form of phased alerting system. The trick in the cold war was ensuring that this phased alerting system was able to pre-empt and address any enemy action directed against Canada in a timely and effective fashion. The possibility of surprise attack was the driving motif of the cold war, and the idea that presenting an effective deterrent posture both in terms of offensive and defensive action was linked to it.

ONE OF TWO CANADIAN BOMARC SITES, THIS ONE AT NORTH BAY WAS THE ONLY ONE OPERATIONAL IN TIME FOR THE FIVE-HOUR WAR, AND ONLY AFTER IT RECEIVED ITS NUCLEAR WARHEADS.

DND photo

The RCAF had to reconcile Canadian, NATO, NORAD, and American alerting systems. In Canada, the Chiefs of Staff could ask the Minister of National Defence (or in an emergency the Chiefs of Staff Committee)

to implement the States of Military Vigilance System. This consisted of two phases: Discreet and Ready. In essence, these were a variety of "purely military measures that can be implemented without the formal declaration of an alert by the Canadian Government."[4] The Chief of the Air Staff (CAS) had delegated authority from the Chiefs of Staff Committee to implement these measures "if information of an impending attack is received by them."[5]

If the situation deteriorated, the Minister of National Defence had to determine, with Cabinet, whether or not to implement the Formal Alert Stages. Based on the NATO stages, these included Simple, Reinforced, and General. Simple Alert was "to be initiated on receipt of credible information indicating definite preparation to attack NATO or on the existence of international tension on a scale anywhere in the world that might have serious consequences for Canada." Reinforce Alert was "to be initiated when there is conclusive indication that the outbreak of hostilities is imminent." A General Alert would be declared if there was an "overt act of aggression" in the NATO area. Note that none of these states or stages was sequential at all.[6]

There was, however, the NORAD Alert System which was tied to the American defence readiness condition (DEFCON) system, and these were sequential. For NORAD, there was DEFCON 1 through DEFCON 5. Attempts were made to provide equivalencies between the Canadian, NATO, and NORAD systems. The Canadian States of Military Vigilance were equivalent to DEFCONs 3 and 4: "Delicate or strained international relations." Simple Alert for NORAD was DEFCON 2: "Reliable and credible information that the Enemy is preparing to attack." Reinforced Alert was aligned with DEFCON 1: "Definite and conclusive indications that hostilities are imminent." Finally, the NORAD "Air Defence Emergency stage—"Hostilities have commenced"— was the same as the Canadian and NATO General Alert.[7]

PATTERN OF NUCLEAR ATTACK AGAINST NORTH AMERICA, 1961–1963

Unfortunately, the Exercise BOOKCHECK documents are incomplete. The precise nature of the attack, specifically the nuclear detonation (NUDET) or NUDET time of arrival summary is no longer part of the available document files in the archives. What would such an attack have looked like? Fortunately, the pattern of Soviet attack versus North America was somewhat standardized in Canadian planning during the period and can be reconstructed from other material. The Privy Council Office (PCO) was the main Canadian agency responsible for coordinating continuity of government (COG) planning, and this included the maintenance of an agreed-to-attack scenario. The 1960 planning guide for COG in Canada presented the following assumptions:

- North America would be attacked by Soviet forces only in the event of, or as the initial step of, general war.
- Attacks on North America would only be worthwhile if nuclear weapons were used.
- No form of nuclear attack on North America was likely to leave Canada free of the direct effects of nuclear weapons.
- The basic problem would be survival and the first few days of nuclear warfare likely would be the worst.[8]

What would the Soviets employ against North American targets? From 1960 to 1961, manned bombers like the TU-16 Badger, TU-95 Bear, and possibly the M-4 Bison, "supplemented by such ballistic missiles and guided missile submarines as were available,"[9] were the primary threat, with the average warhead yield for planning purposes set at 5 Megaton (MT - an explosion equivalent to five million tons of TNT, though the PCO recognized that there were 20-MT-yield weapons in the Soviet arsenal). The estimated blast damage radii for this warhead for planning purposes was 5.5 miles (8.9 kilometres [km]),

where the target was essentially obliterated, with decreasing amounts of damage out to 17.5 miles (28 km).[10] After 1962, the planners believed that missiles would take over with manned bombers supplementing both ICBM and SLBM weapons. By 1964, the ICBM would be the primary delivery system, supplemented with missiles from submarines and then air-to-ground nuclear missiles launched from manned bomber aircraft.[11]

Canadian planners during this time generally believed that "the main weight of the attack would be against targets in the United States," specifically, "U.S. retaliatory forces,"[12] that is, the bombers, tankers, and missiles belonging to the Strategic Air Command (SAC). Once those aircraft dispersed to sites in Canada during some stage in the alert process, then those locations would most likely be targeted as well. That said, "deliberate attacks on Canadian targets would most likely be made against only the two or three largest metropolitan areas, the main centres of government, and the major ports, especially in the east."[13] And that was not all. The PCO planners noted: "An unpredictable number of random explosions of weapons of megaton size, carried by both aircraft and missiles, may be expected over Canadian territory."[14] This would involve "bombers shot down with armed bombs … weapons dumped when bombers met the defences, accidental bursts resulting from [target identification] failure...."[15]

The icing on the so-called cake was possible damage from "fallout from bombs or missiles aimed at major Canadian cities or SAC bases, US cities, or air defence installations near the Canadian border."[16] A series of SAC bases across the American North were cause for concern. There was Fairchild Air Force Base (AFB) in Washington state; Malmstrom and Glasgow AFBs in Montana; Minot and Grand Forces AFBs in North Dakota; Warren AFB in Wyoming; Ellsworth AFB in South Dakota; K. I. Sawyer, Kinchloe, and Wurtsmith AFBs in Michigan; Plattsburgh in New York (NY); and Loring in Maine (ME). There were also several SAGE air defence computer systems located in protected facilities co-located with some SAC bases. These bases, it was assumed, would be subjected to heavy bombardment from multiple thermonuclear weapons. The prevailing wind patterns would spread the fallout from these attacks over southern Saskatchewan and Manitoba, southern Ontario; and the Maritimes.[17]

By 1963, a more refined attack pattern was available for Canadian planners. The weapons yields per target varied from 1 to 2 MT, either a single 2-MT weapon or two 1-MT yield weapons, mostly assumed to be surface burst for maximum damage (and fallout) with a circular error probable (CEP) of two nautical miles. The exceptions, for some reason, were Cold Lake and Halifax, which were each going to be hit with a 300-metre airburst. The duration of the attack was estimated to last two hours, twelve minutes. The weight of the attack would occur within one hour, with 30 targets across northern North America hit. In the first half-hour period, thirty minutes after the national alert was sounded, 11 targets would be hit, followed by 11 more over the next ten minutes, then 8 targets ten minutes after that, then 3 more.[18]

The first series of strikes would be made against Station Comox; the SAC support bases at Frobisher Bay, Northwest Territories (NWT); Thule, Greenland; Goose Bay, NL; Churchill, MB; and the Distant Early Warning (DEW) Line sector control headquarters at Cambridge Bay and Fort Providence, NWT. The interceptor and tanker base at Harmon AFB, Stephenville, NL, and the anti-submarine base at Bangor, ME, would be next, probably attacked by submarine-launched cruise missiles. Station Namao and Station Cold Lake would also have been attacked at this time as both were possible SAC support facilities in addition to their RCAF functions. Destruction of the radar station located at Alsask, SK was necessary to open up access to the American Midwest.[19]

This combination of air defence roll-back and SAC tanker-base destruction would limit damage to both the next wave of attacking Soviet bombers from NORAD interceptors, open up the approach routes for attacks deeper inside North America, and limit damage to the Soviet Union itself. The B-47 and B-52 bombers in the American Midwest were dependent on their KC-97 and KC-135 tankers, and these would have been forward deployed to Canada if there was enough warning or if the crisis had a gradual build-up phase.[20]

The next "pulse" of attacks was assumed by the planners to include Station North Bay with its NORAD Headquarters; all the SAC bases from Washington state to Maine; any base housing a SAGE air defence computer; and a cluster of maritime targets, including Montreal and Halifax. After the first hour, SAC bases would be hit again with a further wave of strikes.[21]

It is notable that Canadian planners focused mostly on the pattern of strikes on the first day, indeed, the first hours, of a nuclear attack. Cities, per se, were not primary targets in their view. It was assumed that the Soviet targeting plan would focus on anything associated with SAC, and that the air defence system's destruction was merely a means to that end. The idea that there could be follow-up attacks was not really examined in any detail. It was probably a realistic assumption. The amount of disarray that this type of attack would cause would have been massive in any case, particularly the effects of the little-understood secondary-weapons effects like electro-magnetic pulse on various systems. The amount of smoke generated by firestorms in the target areas as well as the radioactive fallout would also have significantly impeded Soviet follow-up reconnaissance efforts, which would have been a sine qua non of follow-on attacks in the short term.

Follow-on attacks were not ruled out, however; therefore, the RCAF had to be able to reconstitute and prepare for later waves as well as contribute to the Army-led national survival operations. These operations involved the use of "re-entry columns," mobile units tasked to enter bombed areas and recover trapped citizens.

INTO BATTLE...

Exercise BOOKCHECK was scheduled to run three days. In real-world terms, M-Day (for Mobilization Day) was supposed to be used in the event of a real crisis as the start

SAC KC-97 TANKERS, CRUCIAL FOR GETTING THE B-47 BOMBER FLEET TO THEIR TARGETS INSIDE THE SOVIET UNION, WERE SECRETLY BASED IN CANADA AT A NUMBER OF LOCATIONS.

DND photo

date. For narrative purposes, and based on the BOOKCHECK documents, we will use E-Day and the times will be Zulu.[22]

The exercise started with the crew of a Yukon transport reporting, at 1500 hours E-day, the presence of a Soviet submarine sighted as the Canadian plane flew over the Atlantic. There was no detailed preamble or political scenario. The exercise launched right into Commander in Chief (CINC) NORAD's declaration of DEFCON 3 at 1635 hours, which was transmitted from his interim headquarters at Colorado Springs to Northern NORAD Region at North Bay and ADC HQ in St Hubert. Ten minutes later, the Chairman of the Chiefs of Staff Committee from the ramshackle "temporary" National Defence HQ building across from the Lord Elgin Hotel in Ottawa directed Canadian forces to achieve Military Vigilance-Ready once they learned that SAC was also at DEFCON 3 and that NATO's Supreme Allied Commander Europe was moving to Military Vigilance. This was approved by the Minister of National Defence. The CAS then directed the RCAF to Military Vigilance-Ready by 1700 hours. The Vice CAS ordered the Air Force HQ Operations Centre to disseminate the message to all commands.

At Station Trenton, 4 Operational Training Unit dispatched an H34 helicopter to Station Rockliffe. This machine was then held at 30-minute readiness. The crew was given their instructions verbally: "When directed by AFHQ [Air Force Headquarters], [you] shall proceed from Rockliffe to Parliament Hill and land on the east side of the grass area in front of the Peace Tower. The helicopter shall depart Parliament Hill for a relocation centre as directed by the senior government official present." There were ten spaces available on the H34.[23] At the same time, the commanding officer of 412 (Transport) Squadron at Rockliffe opened his special instructions and then placed a North Star transport at a state of 30-minute readiness. This aircraft was designated for use by the members of the emergency government who might arrive at Rockliffe by helicopter or by bus or car.[24]

At this point, the air staff and commands consulted the RCAF *War Book*. Part of the staff contacted their counterparts in the Army, Royal Canadian Navy (RCN), and the Department of Transportation to coordinate plans for the wartime movement of personnel. The Emergency RCAF HQ at Trenton was now authorized and preparations were made to action Simple Alert. Non-duty personnel were also ordered to report for duty, but to do so discretely.[25] All "serviceable operational aircraft were to be made ready for combat operations or their wartime function"[26] and all aircraft under repair were to be prepared for action. Preparations were also to be readied to evacuate military hospitals in probable target areas. Importantly, "wartime plans for the provision of meteorological services" were to be implemented. This information was crucial not only for operations but also for fallout prediction.[27]

NATO's Supreme Allied Commander Atlantic (SACLANT), as part of a conference call with the US Joint Chiefs of Staff in Washington and the Canadian Chiefs of Staff Committee in Ottawa, explained at 1745 hours that his SOSUS (Sound Surveillance System) underwater listening systems were picking up a noticeable build-up in Soviet submarine activity in the Atlantic coast off Georgia and Florida. Lacking the resources to cover the whole US eastern seaboard, SACLANT asked Canada for six Argus maritime patrol aircraft to be stationed at Naval Air Station (NAS) Norfolk, Virginia, for an indefinite period.

At 1815 hours, the Vice Chief of the General Staff (VCGS) phoned the air staff to coordinate the deployment of reinforcements for 4 Canadian Mechanized Brigade Group based in northern West Germany. Yukon and C130 transports at Station Trenton were brought to a higher state of readiness as the Army's Standby Battalion based on an airfield near Picton, ON, went to 30-minute notice to

move. The VCGS called back and requested airlift for 8000 pounds (3600 kilograms) of signals intelligence equipment from Kingston, ON, to Whitehorse, Yukon. The actual deployments were readied if Simple Alert was declared.

The MAC in Halifax provided what information they had jointly developed with the RCN on Soviet naval movements in the Atlantic to RCAF HQ around 1840 hours. It confirmed SACLANT's information. Then the Minister of National Defence conferred with the Air Staff about the feasibility of using Air Transport Command aircraft to evacuate civilian dependants from RCAF stations and Army bases in France and West Germany. The only space available, as it turned out, would be on the returning aircraft that just dropped off reinforcements to 4 Canadian Mechanized Brigade Group (CMBG).

As the situations in Western Europe and in the Atlantic generated further concern, the Minister of National Defence asked the Chairman of the Chiefs of Staff Committee "that a study be made to determine the implications of using nuclear weapons." The RCAF "was directed to limit their study to nuclear weapons for the BOMARC, CF101, and Argus aircraft."[28] At this point, the formal agreement between Canada and the US had not been signed. These three delivery systems were prepared for everything except that nuclear warheads had not been issued to them, pending agreement on suitable diplomatic language. Bomarc warheads, AIR-2A Genie air-to-air nuclear rockets, and nuclear depth bombs for the Argus were earmarked for Canadian units in American storage depots in Griffiss AFB near Rome, NY; Plattsburg AFB, NY; and NAS Bangor, ME.[29]

At 2000 hours, the key interceptor bases were queried as to whether they had enough combat stocks. Stations Comox, North Bay, Uplands, Bagotville, Summerside, Prince Edward Island, and Greenwood, NS, all replied affirmative. At the small, almost forgotten RCAF Station Mountain View south of Trenton, the maintenance staff received a message to inventory and prepare all mothballed transport aircraft for use. A squadron's worth of CC119 transports was slowly prepared through the night, the preservative material stripped off, and vital fluids replaced.

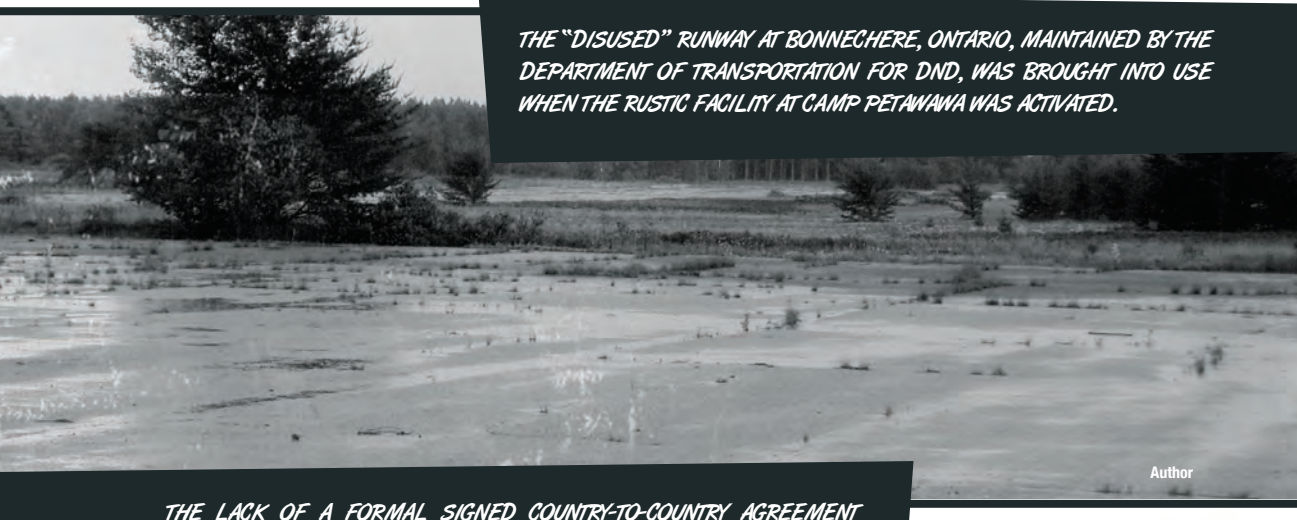
At 2300 hours, the Chairman of the Chiefs of Staff Committee declared 429 Squadron at Station Summerside active after consultation with the Chief of the Naval Staff. 429 Squadron joined MAC and was equipped with older Neptune aircraft that were being replaced with the new Argus maritime patrol aircraft.

On E+2, CINCNORAD declared DEFCON 2—Weapons Status Bravo, which was passed to Northern NORAD Region and ADC at 1345 hours. Five minutes later, the Cabinet Defence Committee declared Simple Alert for Canadian forces and by 1400 the RCAF was at Simple Alert. Communications were minimized, leaves cancelled, and key personnel were directed to depart for emergency headquarters immediately. Emergency Security Force personnel were deployed and augmented at each station.[30]At Simple Alert, operational aircraft were to deploy according to each unit's emergency defence plan while Emergency Security Force personnel secured each station.[31]

The H34 helicopter at Rockliffe launched and landed on Parliament Hill to collect the Prime Minister and his immediate advisors. Designated members of the emergency government were already arriving at Station Rockliffe and boarded the North Star transport, which then took off, piloted by the commanding officer of 412 Squadron. The Prime Minister directed the H34 pilot to fly to a site code-named RUSTIC, while the North Star flew west heading for what to casual observers believed to be a disused airfield in the woods near Bonnechere, ON.

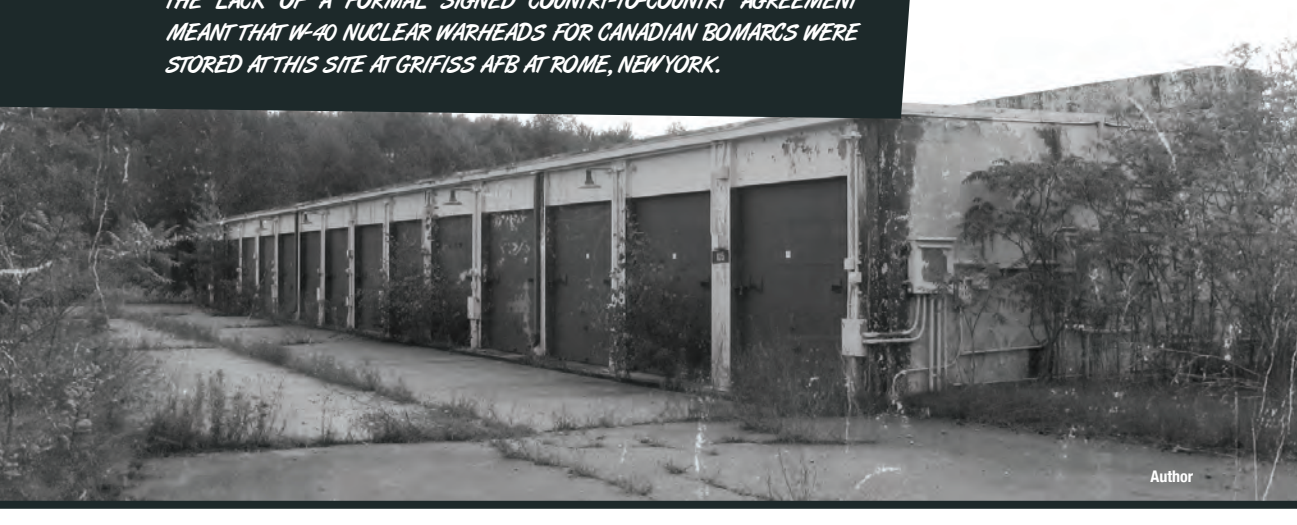
Weapons Status Bravo was part of a multi-step process readying air defence systems, including nuclear systems. At this time, Deputy CINCNORAD, Commander, ADC, called the Chairman of the Chiefs of Staff Committee, who then went to the minister and requested that immediate actions be taken to acquire nuclear weapons for the CF101 Voodoo force, the Bomarc missiles, and the Argus maritime patrol aircraft.[32]

As Canada was in the middle of negotiations for nuclear weapons custody, the BOMARCs had no warheads; the CF101 and Argus aircraft had them yet on their bases. The USAF, which had a special nuclear warhead movements wing on standby, loaded C124 Globemaster II aircraft with AIR-2A Genie rockets and W 40 Bomarc warheads from the Grifiss AFB Weapons Storage Area. The La Macaza Bomarc site was not ready, but North Bay was prepared to receive weapons. Temporary AIR-2A Genie storage areas guarded by USAF security troops were established at the CF101 bases. Over at NAS Brunswick, ME, US Navy (USN) transport aircraft moved Mk-101 nuclear depth bombs to Station Greenwood for the Argus aircraft, while the six Argus that had deployed to Norfolk underwent checks to prepare for the reception of Mk-101s.



THE "DISUSED" RUNWAY AT BONNECHERE, ONTARIO, MAINTAINED BY THE DEPARTMENT OF TRANSPORTATION FOR DND, WAS BROUGHT INTO USE WHEN THE RUSTIC FACILITY AT CAMP PETAWAWA WAS ACTIVATED.

Author



THE LACK OF A FORMAL SIGNED COUNTRY-TO-COUNTRY AGREEMENT MEANT THAT W-40 NUCLEAR WARHEADS FOR CANADIAN BOMARCS WERE STORED AT THIS SITE AT GRIFISS AFB AT ROME, NEW YORK.

Author

As for emergency defence plan deployments, some aircraft were launched to dispersal areas to lessen their chances of destruction. For example, three Argus and three Neptunes were ordered deployed to Torbay from their parent units at Station Greenwood. In earlier years, the CF100 interceptor squadrons had fifteen dispersal airfields available to them across the country, each associated with a nearby radar station.[33] With the advent of the nuclear-armed CF101 aircraft, however, tight control over these weapons meant that there was no dispersal plan in effect for them. In other cases, maritime patrol aircraft from Comox had two other fields available to them on Vancouver Island.

Murphy's Law went into effect from 1430 to 1600 hours on E+2. An armament accident at Station Comox destroyed 25 per cent of the weapons stored there, killing some 15 personnel and wounding 15 more. The subsequent fire destroyed the liquid oxygen facilities. Then the master computer at Air Material Command in Downsview went down: "There is some evidence that the damage to the computer was caused by a civil servant who recently had his application for re-categorization to a higher grouping turned down. This machine, of which there [was] only one and the logistics system is dependent upon it, [would] not be functional for 48 hours."[34]

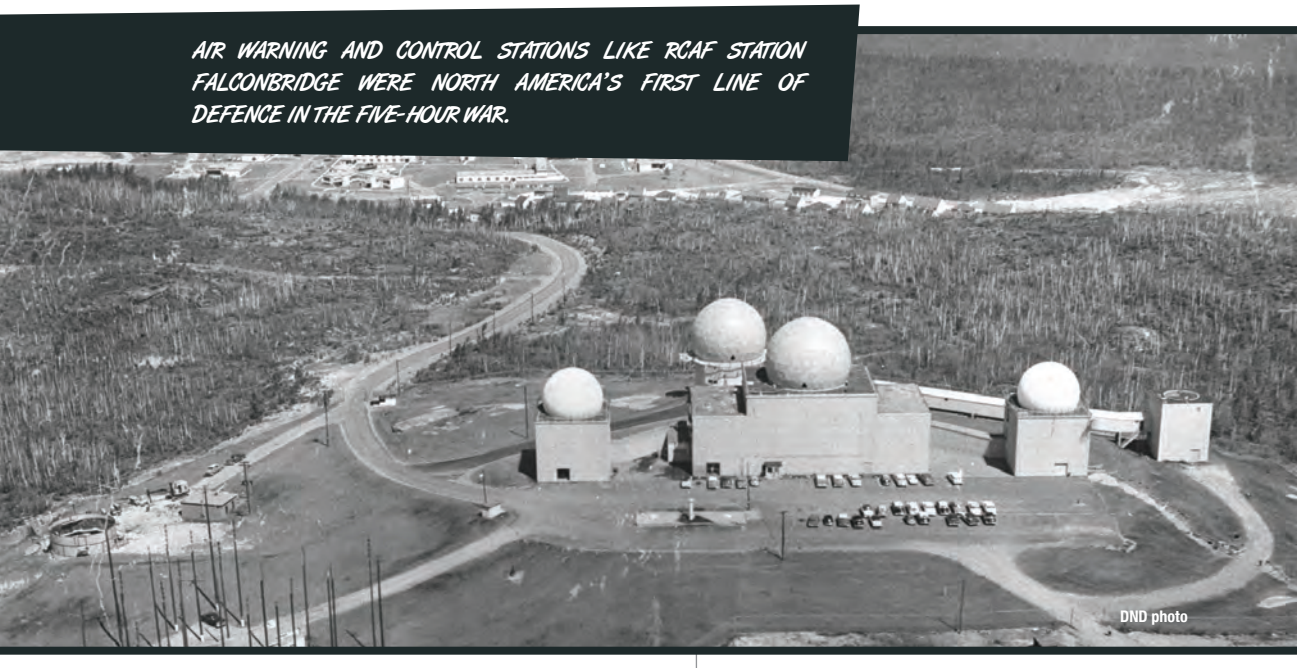
While the logisticians were sorting out the Air Material Command computer, CINCNORAD declared DEFCON 1—Weapons State Delta—at 1645 hours, E+2, at the same time SAC went to DEFCON 1. Hostilities were now imminent. The Cabinet Defence Committee directed that Reinforced Alert be implemented by Canadian forces. Thirty minutes later, at 1730 hours, the Chairman of the Chiefs of Staff Committee directed that the service chiefs move to the National Emergency Headquarters (NEHQ). The NEHQ bunker at Carp, west of Ottawa, was still under construction, so the helicopter that picked up the CAS flew him to the RUSTIC facility at Camp Petawawa. This consisted of pre-designated reinforced basements in base buildings that were pre-stocked to serve as an NEHQ until Carp was completed. When the CAS and the other chiefs arrived they were met by the Prime Minister. The emergency government members were already at work, having been bussed in from Bonnechere.

As part of its confirmation process, AFHQ requested action reports from the radar stations at Holberg, BC, St Margaret's, NB, Edgar and Falconbridge, ON, and St-Sylvestre and Senneterre, QC. The CF101 bases were then queried as to the status of the CF101 force.

At 1800 hours, the Minister of National Defence then requested that the RCAF recover the 40 Canadian members of the International Control Commission in Indochina. While this was being actioned, Northern NORAD region and ADC declared "Air Defence Emergency Warning Red." The national survival attack warning system sirens went off across Canada, blaring the "Take Cover" tone. Pairs of CF101 Voodoos, each armed with two AIR-2A Genie nuclear rockets, scrambled from their quick reaction alert shelters. The SAGE computer at North Bay, with its links to the radar systems in the area, kept a close watch for incoming bombers that might get through the CF101 intercept line. The Bomarc missiles at 446 Surface-to-Air Missile (SAM) Squadron North Bay were readied. The RCAF duty officer and the USAF duty officer inserted their release keys and contacted the command centre at North Bay. Their counterparts also gave their consent and turned their keys. The clamshell shelter roofs opened up and the missile erector arms were raised. One launcher suffered an erection failure, which prompted a maintenance crew to deploy to fix it. All the missiles needed were intercept track data.

The MAC then reported that an Argus patrol aircraft from 405 Maritime Patrol (MP) Squadron spotted a Soviet *Echo*-class

AIR WARNING AND CONTROL STATIONS LIKE RCAF STATION FALCONBRIDGE WERE NORTH AMERICA'S FIRST LINE OF DEFENCE IN THE FIVE-HOUR WAR.



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submarine off the George's Bank erecting two cruise missiles in preparations for launch. Under existing rules of engagement, the Argus commander prepared to engage the missile launching submarine. Knowing that it was a choice between his aircraft and crew and possibly hundreds of thousands of lives, the Argus commander instructed the crew to arm one of the aircraft's Mk-101 nuclear depth bombs for surface burst. The Mk-101 was usually detonated deep in the ocean so that the aircraft had time to escape the blast and water plume. In this scenario, there would be no escape. The Mk-101 detonated, destroying the submarine and its missiles. The blast tore the Argus to pieces as it valiantly tried to outrun the shock wave. (Some of the family members of the Argus crew survived

THE CP107 ARGUS, WORKING WITH OTHER RCAF AND RCN UNITS, TRACKED AND SANK SOVIET ECHO-CLASS GUIDED MISSILE SUBMARINES BEFORE THEY COULD LAUNCH. ONE SUCH ARGUS CREW RECEIVED POSTHUMOUS VICTORIA CROSSES.

DND photo

the war and were presented with posthumous Victoria Crosses at Camp Petawawa by the Prime Minister.)

At 1810 the first NUDET reports came in. The RCAF CU in Edmonton reported that Station Namao, north of the city, had been hit with a ground-burst nuclear weapon. The research station and planned SAC refueling site at Churchill, MB, reported a bright flash over Hudson's Bay. Communications with the partially manned 447 SAM Squadron at La Macaza were cut off. Soon after that, Station Goose Bay reported a nuclear detonation many miles west of the base, deep in the bush. Station Comox-based CF101 fighters successfully engaged several TU-95 Bear bombers with Genie rockets as they headed south along the western seaboard. SAGE data flowed in from the radar site at Foymont, ON, tracking the bomber that took out the nearly completed Bomarc base. This aircraft was engaged with a Bomarc missile from the North Bay site and destroyed north of Mattawa, ON.

The Cabinet Defence Committee directed a general alert at 1820 hours. In theory, this meant that aircraft belonging to enemy nations could be impounded by the RCAF and that a list of people deemed to be potential threats to Canada could be detained in camps as required. Given the situation, both actions were rather moot.

The first fallout reports came in at 1910 hours. The first strike, directed at the SAC refueling sites, had clearly been disrupted by the actions of the RCAF. However, lethal plumes of radiation were now falling on Edmonton and as far as Station Cold Lake to the east and Station Penhold to the south of the city. The northern suburbs of Edmonton were on fire. The 2 CU in Edmonton was having difficulties operating because of severe ionizing radiation, so the unit commander instructed that the remote site outside the city be activated. West of Goose Bay, there were a lot of scorched caribou as something had distracted the aim of the Soviet bombardier targeting Churchill. Radiation was now falling on Ottawa from the La Macaza strike.

At 2000 hours, an RCN CS2F Tracker from 880 Squadron based out of a dispersal strip near Sydney, tracked another Soviet submarine of unknown type. Neptune and Argus maritime patrol aircraft were directed onto the target in an attempt to engage it. This cat-and-mouse game would last for hours.

Despite the valiant efforts of 409 Squadron and its CF101s and their USAF counterparts flying F-106s out of Alaska, a pair of TU-95 Bears made it through to targets in Washington state. At 2035 hours, a number of targets were struck around Seattle, including the Boeing factory and the USN nuclear missile submarine base at Bangor, with the submarine base taking multiple hits from megaton-yield weapons. Radioactive fallout made its way to Vancouver where 1 CU reported that they now had to redeploy to a remote site near Camp Chilliwack.

At 2100 hours, a Soviet Zulu-class missile submarine launched an R-11FM missile, thus revealing itself to its Canadian pursuers in an Argus who dispatched it with an Mk-101 nuclear depth bomb. The R-11FM, inaccurate at the best of times and even less so when fired from a sea-going platform, missed its intended target—Halifax, NS—and achieved a partial detonation (fizzle) near the recruit school at Cornwallis, NS. The joint RCAF-RCN maritime headquarters reported that there was some radioactivity near the site, but that operations were otherwise unaffected.

From 2100 to 2250 hours, the climax of the air battle took place. The Soviets, exploiting their experience with ice runways on Arctic ice floes, were able to bring more TU16 Badger medium-range bombers into the fight than NORAD anticipated.[35] The first wave focused their efforts on the three SAC bases in Michigan: K. I. Sawyer, Kinchloe, and Wurtsmith. Deliberately sacrificing aircraft, the Soviets pressed the attack over Hudson

Bay. The North Bay Bomarc site eventually ran out of missiles. The SAGE center at Duluth, Wisconsin (WI) suffered an inopportune computer failure, so the Bomarc site there attempted to contact the SAGE centre at North Bay and hand off its missiles. At this point a TU-16 made it through, missed Kinchloe but hit Wurtsmith. A second TU-16, through a navigation error, dropped a 1-MT bomb on Windsor, ON. Both areas were obliterated with megaton-yield ground-burst nuclear weapons. The fallout started hitting the rest of Ontario in minutes as Station Centralia reported high levels of radiation north of Toronto. In due course, Falconbridge, North Bay, and even Foymont would be "dosed" as well.

Then the second wave came in. A new Soviet weapon, AS-4 Kitchen nuclear air-to-surface missile fired from a TU-16 Badger, debuted for a microsecond over the Mount Apica radar station north of Quebec City. With no SAM missile coverage between Duluth AFB, WI, and Dow AFB, ME, it was left up to 425 Squadron and 414 Squadron Voodoos to try and cover the gap. Numerous bombers were shot down. One TU-95 crew, either in a panicked state or incapacitated, dumped their nuclear weapons in the vicinity of the radar station at Lac St Denis, 60 miles (97 km) north of Montreal. One weapon detonated in the air while another went off on the ground, which started a forest fire in an unpopulated area.

Given the number of priority targets in northern New York, however, the Soviets threw significant numbers of planes through the gap in radar coverage. There were ten Atlas ICBM sites located west of Plattsburgh, NY, plus a large SAC base with nuclear weapons storage. In addition, there was an interceptor base across the lake in Burlington, Vermont. Running low on Genies, the Canadian squadrons had to break off. The Vermont-based interceptors were obsolete and did not have the ceiling necessary to reach the bombers. Two bombs struck Plattsburgh AFB. The Atlas silos were already empty, having been fired against Soviet targets earlier. At least two near-misses were recorded against the silos, which killed small numbers of local citizens and produced fallout plumes that reached into southern Quebec.

Around 2300 hours, a delegation of citizens approached the Emergency Security Force at Station Trenton. They demanded that authorities remove the remains of a crashed bomber, which turned out to be a TU-16 Badger with a live nuclear weapon still on board. A specially-trained explosive ordnance disposal (EOD) team was dispatched to carry out this delicate task, along with intelligence specialists to exploit the wreck.

Meanwhile, the short-ranged USAF F-106 fighters that were protecting the SAC bases in North Dakota and Montana were starting to run out of fuel. With the priority for tankers going to SAC, numbers of aircraft were diverting to Stations Gimli, Portage, Saskatoon, and Rivers. While they were refueling, the Soviets made their push against targets in Malmstrom, Wyoming, and Minot, North Dakota, at 2250 hours. With no Canadian fighter coverage in Saskatchewan or Manitoba, and with the CF101s based at Namao destroyed, Badgers and Bears got through almost unmolested. Within an hour, fallout was drifting northeastwards through southern Saskatchewan and Manitoba, prompting all RCAF stations in the provinces to report in.

The last series of NUDETs took place at 2330 hours. A pair of SSN-3C Shaddock cruise missiles launched from an unengaged *Echo*-class submarine detonated, each with a yield of 350 kilotons, one over Loring AFB, with its huge nuclear weapons storage facility, and another over Presque Iles AFB, ME, where Snark inter-continental cruise missiles were based. As with the Atlas ICBMs near Plattsburgh, these launch facilities were already empty. Fallout plumes blanketed the Maritimes.

The nuclear attack lasted for five hours, twenty minutes.

AFTERMATH

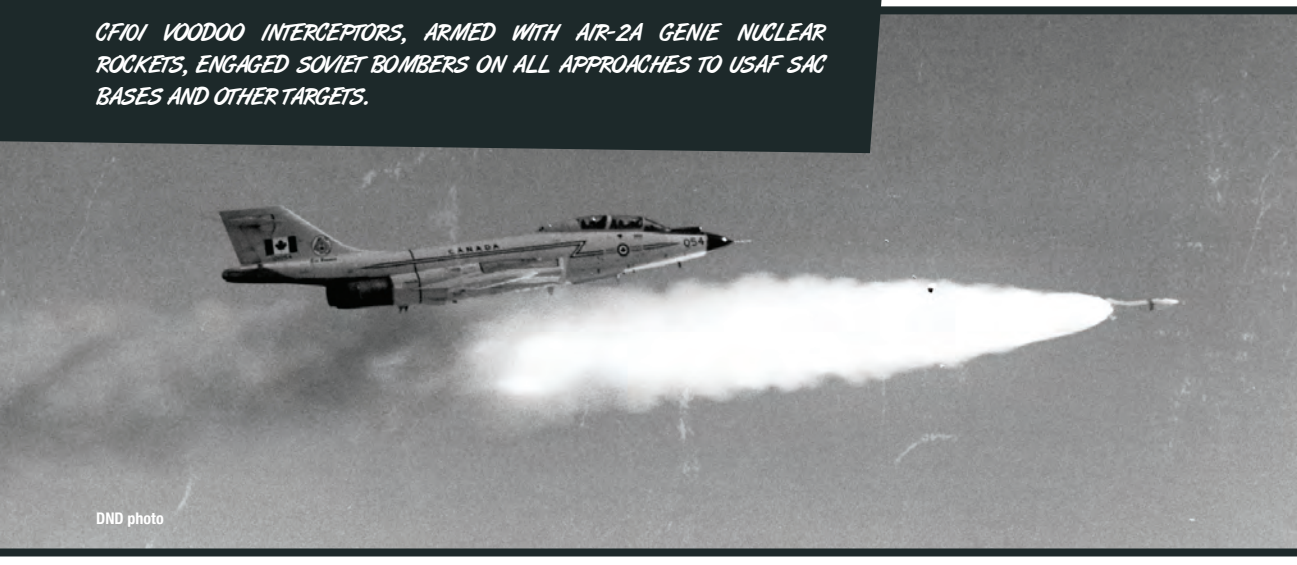
Exercise BOOKCHECK did not end with the air battle and the nuclear detonations. From 2250 hours E+2 to 1500 hours E+3, all stations were required to report on weather conditions and fallout conditions hourly. The Minister of National Defence also requested that the RCAF conduct post-strike aerial photography missions of Toronto and Windsor. A Lancaster Aerial Reconnaissance (AR) aircraft from 407 Squadron was launched to meet this request.

Station commanders and staffs were forced to reply in the exercise as to what their plans were to handle the effects of the attack. For example, the exercise controllers told the RCAF HQ players to ask questions like, "How long do you expect to be able to continue your operational mission before incurring significant loss of effectiveness through ionizing radiation?" Or, "Exposure of personnel under your command is not to exceed 25 roentgens per week or 200 roentgens in a six-week period. Give details of the measures you have taken to keep within these limitations and maintain the functional capability of your Unit." And then there was "areas where personnel will receive 100 roentgens in 48 hours will be considered as emergency risk areas … what time to you estimate that personnel in your Unit will have to be moved from their present location if the total does … is not to exceed 100 roentgens in 48 hours?"[36]

And then there was the civilian population: "As a result of radioactive fallout warnings and an actual build-up in intensities at a nearby large Canadian city, many families have left their homes and are arriving at large numbers at your base. Residentially, these people will need fallout shelter accommodation, food, water, and clothing. It can be expected that many will need medical care." Or, "Give details of the action you would have taken to provide protection for dependants at our Station…."[37] This went for every station from a small radar station to a large base. From available documentation, it appears as if the answers to these questions would be based on the policy in place at the time by each station commander and not based on any overall RCAF policy.

At 1000 hours on E+3, a decision was made to have Air Transport Command attempt

CF101 VOODOO INTERCEPTORS, ARMED WITH AIR-2A GENIE NUCLEAR ROCKETS, ENGAGED SOVIET BOMBERS ON ALL APPROACHES TO USAF SAC BASES AND OTHER TARGETS.



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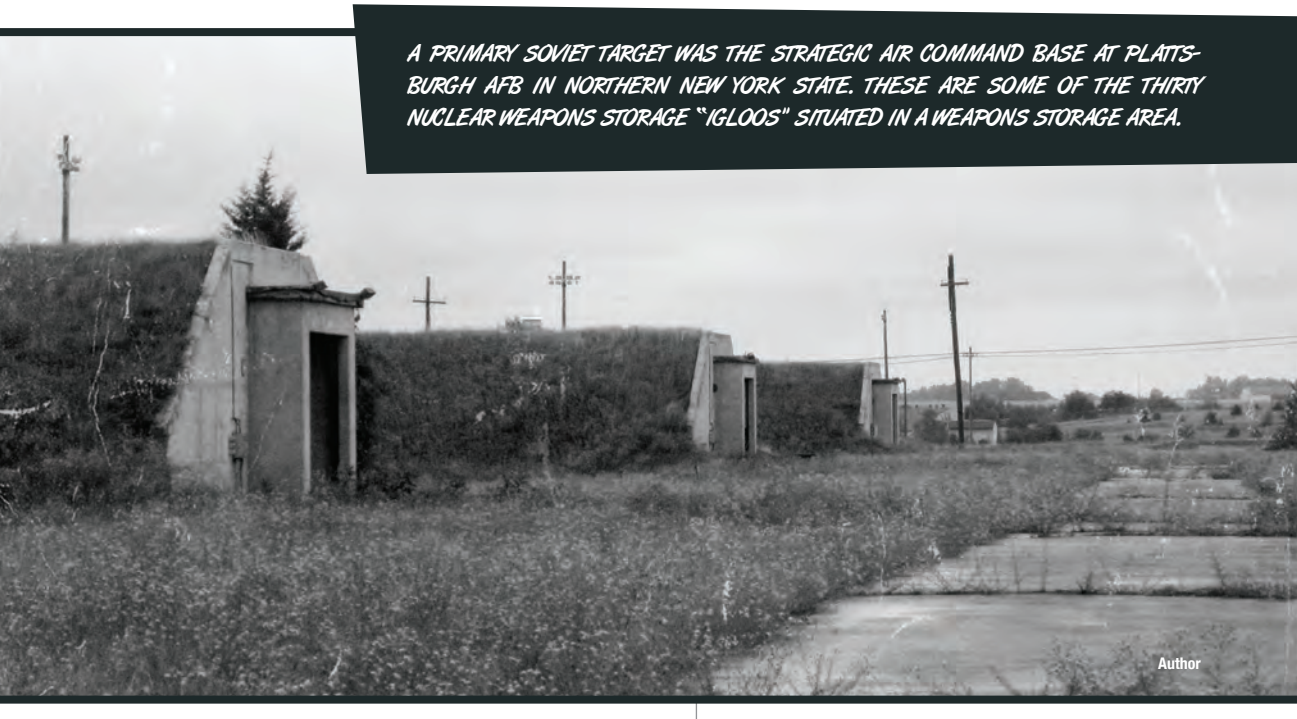

A PRIMARY SOVIET TARGET WAS THE STRATEGIC AIR COMMAND BASE AT PLATTSBURGH AFB IN NORTHERN NEW YORK STATE. THESE ARE SOME OF THE THIRTY NUCLEAR WEAPONS STORAGE "IGLOOS" SITUATED IN A WEAPONS STORAGE AREA.

Author

to relocate personnel on stations affected by fallout. Cold Lake, Uplands, Rockliffe, St Hubert, and Bagotville were able to attempt decontamination. By 1500 hours, however, the decision was made to evacuate Lincoln Park, Penhold, Cold Lake, and Winnipeg. And that is where Exercise BOOKCHECK ended.

BOOKCHECK: THE IMPLICATIONS

As far as can be determined, the RCAF did not run Exercise BOOKCHECK, although it is possible that they did. What BOOKCHECK does, however, is give us a pretty good idea on how the RCAF was prepared to approach the nuclear threat and deal with it as best it could intuitionally. The exercise also gives us an idea of what sort of attack Canada was considering during the bomber age and particularly during the vital 1959–1962 crisis years. When missiles became much more plentiful, the scenario would have been greatly accelerated in time: Soviet submarine-launched ballistic missiles and land-based ICBMs would have been landing within twenty to thirty minutes of launch, unlike this simulated bomber attack that took five hours after two hours of detection.

The reality of interpersonal interactions vis-à-vis the civil-military relationship, however, was not a part of Exercise BOOKCHECK. During the Cuban Crisis of 1962, the senior political leadership refused to permit the alert stages to be activated, thus snarling the finely-honed machinery. In the 1962 crisis, Canada was not prepared to mount the defence depicted in BOOKCHECK. The burden would have fallen on the American air defence system much closer to home, which in all likelihood would have produced a great number of "random bombs" over Canadian territory. In the end, BOOKCHECK gives us a window into a very dangerous age that the RCAF helped stickhandle Canada through.

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ABBREVIATIONS

AB	Alberta
ADC	Air Defence Command
AFB	air force base
BC	British Columbia
BOMARC	Boeing and Michigan Aeronautical Research Center
CAS	Chief of the Air Staff
CINC	commander-in-chief
CINCNORAD	Commander-in-Chief NORAD
CMBG	Canadian Mechanized Brigade Group
COG	continuity of government
CU	communication unit
DEFCON	defence readiness condition
DND	Department of National Defence
EHQ	emergency headquarters
EMO	Emergency Measures Organization
ICBM	intercontinental ballistic missile
km	kilometre(s)
MB	Manitoba
ME	Maine
MT	megaton
NAS	naval air station
NATO	North Atlantic Treaty Organization
NB	New Brunswick
NEHQ	National Emergency Headquarters
NL	Newfoundland and Labrador
NORAD	North American Aerospace Defense Command
NS	Nova Scotia
NUDET	nuclear detonation
NWT	Northwest Territories
NY	New York
ON	Ontario
PCO	Privy Council Office
QC	Quebec
RCAF	Royal Canadian Air Force
RCN	Royal Canadian Navy
SAC	Strategic Air Command
SAGE	semi-automatic ground environment
SAM	surface-to-air missile
SK	Saskatchewan
SLBM	submarine-launched ballistic missile
US	United States
USAF	United States Air Force
USN	United States Navy
VCGS	Vice Chief of the General Staff
WI	Wisconsin

NOTES

1. Lester B. Pearson, *Democracy in World Politics* (Princeton, NJ: Princeton University Press, 1955).

2. NORAD—North American Air Defence Command—was announced on 1 August 1957, and was renamed the North American Aerospace Defence Command in 1981.

3. Canada, Department of National Defence (DND), "Exercise BOOKCHECK: Directing Staff Instructions" and "Exercise BOOKCHECK: Sequence of Events," Directorate of History and Heritage (DHH) file 71/493 (hereafter cited as Exercise BOOKCHECK).

4. DND, "The Department of National Defence War Book, December 1962," National Archives of Canada (NAC) Records Group (RG) 24, acc 83-84/049, vol. 123, file 096.116.

5. Ibid.

6. Ibid.

7. Ibid., "Army War Book Annex A: Relationship of Allied Alert Systems to Canadian Alert System," NAC RG 24 acc 83-84/215, vol. 26, file 1200, pt 2, vol. 19.

8. Canada, PCO Emergency Measures Organization (EMO), "Planning Guide on the Continuity of Government Programme and Related Emergency Preparations," NAC RG 24, vol. 11, 147, file 1400-1, vol. 1, 19 September 1960 (hereafter cited as Planning Guide).

9. Ibid.

10. Ibid., "Organization and Administration: Ex TOCSIN [emergency preparedness drill] 1961," NAC RG 24, file 2001/91/T18, vol. 4, 25 July 1963.

11. Planning Guide.

12. Ibid.

13. Ibid.

14. Ibid.

15. Ibid.

16. Ibid.

17. U.S. Congress, Senate Subcommittee on Arms Control, International Organizations and Security Agreements of the Committee on Foreign Relations, "Analysis of Effects of Limited Nuclear Warfare," 94th Cong., 1st sess., September 1975, 52.

18. Canada, Economic Planning Division, Canada EMO, "Resources in Canada 48 Hours After a Hypothetical Nuclear Attack, November 1963," DHH, file 81/246.

19. Ibid. See also DND, "Canadian Army Basic Assumptions for Survival Planning and Operations," 2nd revision, "NAC RG 24, acc 83-84/215, vol. 26, file 1200, pt 2, vol. 15, 27 February 1961.

20. Ibid.

21. Ibid.

22. Exercise BOOKCHECK. Note that I have based this section on the narrative and events list supplied in Ex BOOKCHECK. I have embellished the narrative with actual historical detail where appropriate.

23. Canada, "Operation Order No. 110/62," NAC RG 24, vol. 107, file 096.103.6.

24. Ibid., "ATCHQ [Air Transport Command Headquarters] Operation Order 94/59," NAC RG 24, vol. 107, file 096.103.6, 9 September 59.

25. Memorandum to Distribution List, "Emergency Defence Planning-CMAT," NAC RG 24, vol. 568096, v.8 s.v.2, 17 April 62 (hereafter cited as CMAT).

26. Canada, "Supporting Data for the Air Council: Standardization of Alert Systems," NAC RG 24, vol. 549, file 096 103, v.5, CplansI (hereafter cited CplansI).

27. Ibid.

28. Exercise BOOKCHECK, 3 and 33.

29. See Sean M. Maloney, *Learning to Love The Bomb: Canada's Cold War Strategy and Nuclear Weapons 1951–1970* (Washington: Potomac Books, 2007).

30. CMAT.

31. CplansI.

32. Canada, "Brief for Minister of National Defence and Chiefs of Staff Committee on TOCSIN 61," NAC RG 24, acc 83-84/251, file 2001-91/T19, vol. 2.

33. Don Nicks, et al., *A History of the Air Defence of Canada 1948–1997* (Ottawa: Commander Fighter Group, 1997), 182–84.

34. Exercise BOOKCHECK, 52.

35. See Sean M. Maloney, "Arctic Sky Spies: The Director's Cut," *Canadian Military Journal* 9, no. 11, http://www.journal.dnd.ca/vo9/no1/11-maloney-eng.asp (accessed October 12, 2011).

36. Exercise BOOKCHECK.

37. Ibid.

CF Photo

RCAF Nursing Sisters

By Major William March, CD, MA (Reprint from the *Roundel* Vol. 2, No. 3, November 1994)

At the start of World War II, the Royal Canadian Air Force (RCAF) had no medical branch of its own. All medical services were provided by members of the Royal Canadian Army Medical Corps. However, by early 1940 it became apparent that such an arrangement was rapidly becoming unworkable as both the army and the air force expanded to meet the growing demands of the war.

For the RCAF, the implementation of the British Commonwealth Air Training Plan (BCATP) meant thousands of young trainees would flood the "light blue" ranks requiring medical support at a level unheard of at that time. Therefore on 18 September 1940, a separate RCAF medical branch came into being under the direction of Group Captain R.W. Ryan, a senior medical officer on loan from the Royal Air Force [RAF]. The first problem that he faced was finding the required personnel - including nurses.

Until September 1940 all of the nurses serving with the RCAF had come from the army and as RCAF stations sprang up across Canada these young women found themselves in some unusual surroundings. When the RCAF medical branch was formed there were 12 army nurses serving with the air force and they were offered the opportunity to transfer - all of them accepted. These first RCAF nursing sisters were also the last that were allowed to transfer in this manner for as of October 1940, Ottawa directed that all future nurses would enlist directly into the RCAF.

And enlist they did! Six months later there were 63 Air Force nurses in uniform and the branch would reach a peak of 395 by October 1944. By the end of the war a total of 481 nurses had worn Air Force blue.

Expansion brought with it a host of organizational difficulties with respect to the nursing service, not the least of which was questions about their official status within the Air Force. At first, it was felt that the nursing sisters should become part of the newly formed Women's Division and as such would follow the same basic training and rank structure. Many of the nurses felt that such a policy would require them to take on too many military duties to the detriment of their medical responsibilities. After all, they argued, nursing was an established and recognized profession in Canada, and despite the Air Force point of view, nurses should be first and foremost medical professionals.

The nurses won the status and recognition from the Air Force that they felt they deserved, but it took two years and intervention by the Canadian Nurses Association to achieve it. Eventually, RCAF nurses were placed in a new branch of the Special Reserve known as the Medical (Nursing Services) Branch and were commissioned as officers. The more traditional nursing titles were kept as part of the rank structure with Matron-in-Chief, Principal Matron, Matron, Nursing Sister, and Nursing Sister (Provisional) equivalent to Wing Commander, Squadron Leader, Flight Lieutenant, Flying Officer, and Pilot Officer respectively. Pay and privileges were the same as for the equivalent RCAF rank (Non-Flying List). Although RCAF nursing sisters would still be required to learn Air Force procedures and organization, they would not be required to take drill. As for the paying of compliments, in March 1944, it was stipulated that "nursing sisters were to pay and return compliments by turning the head and eyes and bowing the head in the direction indicated."

Almost immediately upon joining, RCAF nursing sisters found themselves undertaking a three-week specialist course designed to acquaint them with some aspects of aviation medicine. The Course of Aviation Nursing was first given at No. 6 Manning Depot, Toronto, and later at the School of Aviation Medicine also in Toronto. While on the course, the nurses were given lectures on service knowledge, but the vast majority of their time was taken up with clinical subjects such as air medicine, medical documentation, medical stores, hospitalization, medical proceedings, hygiene and communicable disease control, the immunization programme, venereal disease, air sickness, crash procedure, physiology and treatment of shock, burns and others.

In addition to the above course, six nursing sisters were selected to participate in a six week course at the U.S. Army Air Forces School of Air Evacuation in Louisville, Kentucky. Part of there training included rigorous physical training as it was felt that the nurses had to be prepared to service at or near the front lines. Realistic training involving casualty evacuation under simulated battle conditions were carried out both day and night. Although much of the training was similar to what had been given in Toronto, additional instruction was given on air evacuation procedure, ambulance plane loading, emergency medical treatment, tropical nursing medicine, military hygiene, sanitation, map reading and flight

discipline. Many of these subjects came in handy during the invasion of Europe.

RCAF nursing sisters found themselves serving all over Canada, as well as overseas in Europe. Most of the larger stations and BCATP training establishments had hospitals of varying sizes and in each there would be a contingent of nursing sisters.

In many cases, the nursing sisters had responsibilities and duties that were far greater then they would have undertaken in a civilian hospital. In the more remote locations such as in Newfoundland and British Columbia, RCAF medical personnel found themselves administering to not only to the military, but to the local civilian populace as well.

Overseas medical policy found Canadian doctors and nurses working primarily in RAF facilities. Nursing sisters found themselves employed at service hospitals in Northallerton, Bournemouth, and Warrington. One of the major centres of activity was at East Grinstead, Sussex, 20 miles south of London where the centre for plastic surgery, burns and jaw injuries was located. Nursing sisters assisted with some of the pioneer work undertaken at this establishment. By late 1941 a separate RCAF section had been formed at Grinstead to treat Canadian airmen with the intention of continuing their treatment on return to Canada. The Canadian section grew and by 1944 there were total of 51 medical personnel on staff including 12 nursing sisters.

Nursing sisters also made their way to the continent as part of No. 52 RCAF Mobile Field Hospital (No. 52MFH). The hospital had been organized in January 1944 to provide medical support to the Second Tactical Air Force (2 TAF) over half of which was manned by Canadians. The advanced surgical team arrived in Normandy on 8 June 1944, two days after the invasion. Two of the nursing sisters attached to the hospital arrived on the beaches at "D plus 13" and as reported by CP [Canadian Press] at the time: "Tin hats on, battledress trousers tucked into rubber boots, two R.C.A.F. nursing sisters, Dorothy Mulholland of Georgetown, Ontario, and D. C. Pitkethly of Ottawa, walked down the ramp of an assault craft on to a Normandy beach this morning, the first Canadian servicewomen to land in France."

Soon they were helping to unload vehicles and pitch tents so that the hospital would be operational as soon as possible. Throughout the hospital's travels through France, Belgium, Holland and Germany, RCAF nursing sisters continued to treat the wounded and sick from both sides of the conflict.

In total 64 RCAF nursing sisters served overseas during the war with the remainder seeing service in Canada or the United States. Two nurses were killed while on active duty and 15 were decorated for their service and devotion to duty. Although their numbers were never large, their contributions to the Air Force more than made up for the small size of their branch. Just ask any Canadian veteran, lying in a hospital bed, what it meant to hear a voice from home.

ABBREVIATIONS

BCATP	British Commonwealth Air Training Plan
RAF	Royal Air Force
RCAF	Royal Canadian Air Force

"[T]hey lived up to their motto, but they accomplished far more..."

CF Photo

RCAF WOMEN'S DIVISION

{ Reprint from the *Roundel* Vol. 3, No. 3, October 1993 }

By Major William March, CD, MA

With the Canadian declaration of war on 10 September 1939, thousands of young men came forward to enlist in the Royal Canadian Air Force [RCAF] to fight against Nazi Germany. A significant number of Canadian women sought to join the RCAF with the outbreak of hostilities but were, in most cases, politely told that there was no place for them in the air force. Undaunted, a number of them paid their own way to England and joined the Women's Auxiliary Air Force (WAAF) of the Royal Air Force [RAF]. Still others travelled farther afield as they strove to "do their bit" for the war effort. For those women who remained behind in Canada, it would be almost two full years before they would be permitted to don the RCAF blue uniform.

The MacKenzie King government had been reluctant to authorize the enlistment of women in the military services. However, by the summer of 1941 it became apparent that the services were facing a manpower shortage. Therefore, consideration was given to the possibility of women entering the service and replacing men in non-combat roles. After all, the British had been employing service women for the past two years with excellent results. The RAF's success in this program may have

inadvertently added a political dimension to the question of enlisting women in the RCAF. As the British Commonwealth Air Training Plan (BCATP) expanded, more and more British instructors and support personnel were arriving in Canada some of whom were bound to be members of the WAAF. The possibility of explaining to hostile female voters why British women could serve and not Canadian women was not something that appealed to politicians. Therefore, on 2 July 1942, an Order-in-Council authorized the formation of the Canadian Women's Auxiliary Air Force (CWAAF) and the RCAF became the first military service to actively recruit women for duties.

The first three officers recruited in the CWAAF were Flight Officer Kathleen Oonah Walker, Section Officer Jean Flatt Davey in the medical branch and in the honourary rank of Air Commandant, Her Royal Highness, the Princess Alice, Countess of Athlone, the wife of the current Governor General. It vas the responsibility of Walker and Davey to select the first 150 members this new organization and they went across the country selecting the recruits. Four members of the British WAAF were lent to Canada in November 1942 and formed the backbone of the instructional staff. Less than thirty days after these individuals stepped onto Canadian soil they were busy turning recruits into airwomen at Number 6 Manning Depot in Toronto. This establishment was formerly Havergal College, a girls' school, and was to be their first stop on a service career for many Canadian women.

On 3 February 1942, an Order-in-Council changed the name of the CWAAF to the RCAF (Women's Division) whose members would be subject to the same terms of service, discipline, and responsibilities as their male counterparts.

It was no longer an auxiliary organization but a true part of the air force. Originally there had been only nine trades open to women, however, encouraged by the success of the first intake, the number of available trades was soon expanded to sixty-nine. Eventually, a total of 17,038 women would be enrolled before recruiting ended in the spring of 1944. The Women's Division, or WDs as they were popularly called, served throughout Canada, the United States and England where they became component parts of the RCAF Overseas and 6 Group Headquarters. By the end of the war, 28 WDs had been killed or died on active duty, and many had been decorated for their dedicated service.

The WDs were pioneers in gaining recognition of the ability and skills that women had to offer the nation as a whole


CF Photo


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CF Photo

and the air force in particular. In an age when most women were expected to remain at home and wait quietly for their husbands, fathers or brothers to return home from the front, they volunteered to enter a strange new world and in effect be guinea pigs for future generations. They joined for adventure, a steady job, ties to the service, or because of what we would consider "plain old-fashioned patriotism"; in other words for the same reasons that men did. They were normally paid less than their male counterparts, the rule of thumb being that it took three women to do the work of two men and therefore, they should receive two-thirds the salary of a man.

Eventually, through questions raised in parliament, this would be raised to 80 percent. Often WD Officers were restricted to command only other WDs in areas of responsibility traditionally associated with women such as nursing or food services, but there were exceptions. Women like WO2 [Warrant officer class 2] Sylvia Simm who, as the senior NCO [non-commissioned officer] at the RCAF Records Section in Ottawa, had some 500 men and women call her "Sergeant Major" or M. E. Lawrence who in May 1945 became the only woman in the wartime RCAF to hold the rank of WO1, established a tradition of excellent leadership and service.

With the end of the war the Women Division was quickly disbanded and by December 1946 that last discharge had been administered. However, in a short five years, the RCAF responding to Cold War (*sic*) pressure would again expand and the Women's Division was reinstituted building upon its wartime traditions.

The motto of the WDs had been "We Serve That Men May Fly" and they lived up to their motto, but they accomplished far more than release men for combat duty. They created a place for themselves in the history of the Canadian air force and established the tradition of women in light blue uniforms. For them, and the thousands of women that came after them, it is most apropos that their motto is now "Per Ardua Ad Astra".

ABBREVIATIONS

CWAAF	Canadian Women's Auxiliary Air Force
RAF	Royal Air Force
RCAF	Royal Canadian Air Force
WAAF	Women's Auxiliary Air Force
WD	Women's Division
WO	warrant officer


CF Photo


Mary Allain
Courtesy of her daughter Anne Wride Pennington


CF Photo

A SNAPSHOT OF EARLY COLD WAR RCAF WRITING

ON CANADIAN AIR POWER AND DOCTRINE

BY DR. RICHARD GOETTE

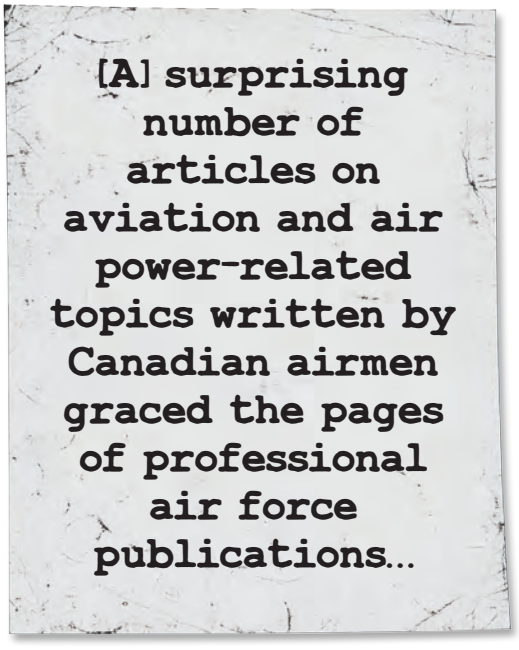
Introduction

The 1950s have been termed as the "Golden Years" of the Royal Canadian Air Force (RCAF), when the service was at its apex in terms of funding, aircraft, and profile. Yet this begs an important question for the RCAF as a professional military institution: were these also the Golden Years for thinking and writing on air power and doctrine in Canada? In other words, were there any Canadian Trenchards, Douhets, Mitchells or Wardens? Not really.

For a country that has such a rich military and civilian aviation history, it is surprising that there are no real air force thinkers of the calibre and profile of these famous air power theorists. In a recent issue of the *Canadian Air Force Journal*, Australian scholar Aaron P. Jackson noted that in the history of Canada's Air Force there has been a "cultural tendency to eschew to written theory and doctrine." Instead, Jackson explains further, Canadian airmen tended "to pragmatically focus on contemporary issues, to the detriment of broader theoretical and doctrinal development."[1]

Why has this been the case? One major factor has been the small size of the RCAF and its post-unification successor, Air Command (now again the Royal Canadian Air Force). With fewer personnel, due in part to a smaller national population, than Britain's Royal Air Force (RAF) and the American military air services (the United States Army Air Forces [USAAF] / United States Air Corps before 1947, and the independent United States Air Force [USAF] after), there were fewer people available to study the big issues facing the air force profession in Canada. Instead, as Aaron Jackson notes above, Canadian airmen had to focus on more pressing contemporary issues—especially those related to flying operations. There are, of course, many other factors involved, but the bottom line is that there were no Canadian Trenchards, Douhets, Mitchells, or Wardens.

However, during the early cold war period of the 1950s, there were at least a few RCAF officers who thought and wrote on air power and air force doctrine topics. Some of these writings were limited to the classrooms of the RCAF Staff College in Toronto. However, a surprising number of articles on aviation and air power-related topics written by Canadian airmen graced the pages of professional air force publications such as the *R.C.A.F. Staff College Journal* and *The Roundel*, and also more "mainstream" media outlets such as *Saturday Night*, *The Financial Post*, the *Toronto Star*, *The Globe & Mail*, and *Maclean's*, to name but a few.



Space restraints mean that only a snapshot of this writing can be examined in this current article. Therefore, the focus here will be on the writing of individuals who in the 1950s had a connection to the RCAF Staff College (publications by others will be dealt with in a future article). We will see that there was some Canadian thinking and writing on air power and doctrine during the 1950s, and that it focused on the use of fighter aircraft in an air superiority role, but that its main function was **in support** of the dominant American

offensive strategic bombing theories of the time. Before delving into this topic, however, it is first necessary to place Canadian thinking and writing in air power and doctrine into the strategic and doctrinal context of the early cold war period.

The Cold War Strategic and Doctrinal Situation

In the immediate post-war era it was the atomic bomb and the advocates of strategic bombing—known as the "bomber barons" or "bomber mafia"—that dominated air power.[2] The United States (US) had an early monopoly of "the bomb," but by 1949 the Soviet Union had its own atomic weapons and the aircraft—reverse-engineered B-29 bombers designated the Tu-4 "Bull"—to deliver them.[3] As a result, by the early 1950s, the cold war soon developed into a nuclear standoff between the US, led by the USAF, and the Soviet Union, as both sides built up massive nuclear-armed strategic bomber fleets.

What was Canada's contribution? Original post-Second World War (WWII) RCAF plans called for a modest, "balanced" force of bombers, fighters, maritime patrol, air transport, and tactical air power aircraft. However, the size and expense of cold war strategic bombers made their procurement prohibitive. This factor, in addition to domestic and alliance pressures, meant that by the early 1950s, the RCAF was mainly focused on fighters, both in terms of aircraft composition and identity.[4] Nonetheless, there was a national "twist" to this Canadian focus on fighters: the RCAF's actual doctrinal culture and the subsequent focus of Canadian writing on air power centred on how these fighters would support the dominant American emphasis on strategic bombing. In other words, Canada focused on fighters, but their primary role was in support of traditional strategic attack or bombing theories through the achievement of air superiority and protecting the US nuclear deterrent. According to the writing by RCAF officers and air power academics, it would therefore seem that doctrinally there is much credence to General Charles Foulkes' claim that the RCAF had become an "indentured servant" of the USAF Strategic Air Command (SAC) by the end of the 1950s.[5]

Venues for Intellectual Discourse on Canadian Air Power and Doctrine

One of the most important outlets for Canadian writing on air power and doctrine was the Air Force's primary educational institution, the RCAF Staff College. Now the site of the Canadian Forces College (CFC), the RCAF Staff College was established at Armour Heights in Toronto in 1943, and it soon became the incubator for ideas—concepts and doctrine—for the RCAF. It was a key source of air power concepts and doctrinal development, as well as the central repository for air power theory and doctrine publications by both airmen and civilian academics. At the RCAF Staff College during the 1950s, education included thinking and writing about air power and learning from various experts in the field, be it the college's uniformed and civilian faculty or visiting lecturers.[6]

The primary venue for getting the word out on RCAF doctrinal culture thus became the staff college's official publication, the *RCAF Staff College Journal*. Similar to today's *Canadian Air Force Journal*, the main objective of the *RCAF Staff College Journal* was "to encourage serious writing on topics of professional military interest."[7] As Squadron Leader D. G. Bell-Irving, the journal's managing editor, noted in one issue, the RCAF wanted to foster writing on air power and doctrine and make it accessible not only to airmen but also to the public in general:

> Military thinkers who are knowledgeable in the field of air power carry a special responsibility which can only be discharged through their ideas being made public.

> The Journal is attempting to discharge its own responsibility in acting as the medium through which these ideas may reach their audience.[8]

Several articles published in the *Journal* were consistent with the RCAF's role to protect the US nuclear deterrent. For example, there were pieces by such well-known contemporary academics as Bernard Brodie (an expert on nuclear strategy), and more technical issues such as papers by operational research officers at Air Defence Command (ADC) Headquarters (HQ).[9] But other articles included specific examinations of air power and RCAF doctrine by RCAF Staff College faculty, staff, and students, and they were key to an understanding of RCAF thinking.

This brings us to our first example of an RCAF officer writing on air power. In the inaugural issue of the *RCAF Staff College Journal*, there was an interesting short article entitled "The Wisdom of Our Air Defence Policy" written by Group Captain M. Lipton, a graduate of the Staff College and the institution's former Director of Studies. In this article, Lipton challenges criticisms in the press of large Canadian defence spending on air defence presented by recently retired Canadian Army generals.[10] Lipton outlines the importance of the RCAF's air defence mission. He explains that the RCAF's air defence role is threefold: contributing to preventing the outbreak of nuclear war by protecting the main deterrent, the USAF's SAC, from surprise Soviet attack; operating an integrated system of radars with the United States to give the civilian population adequate warning for civil defence measures to be implemented, "whether it be evacuating cities or getting underground"; and, protecting the industrial heartland of the continent (which also contained the largest population areas) by destroying a large percentage of the attacking bombers and thus minimizing the damage that the enemy could inflict on North America's war-making capacity.[11]

Although actual defence of territory and war making capabilities are significant inclusions, the ranking of priorities is clear: the protection of SAC was of primary importance. As Lipton further highlights, the RCAF, through its role in the overall continental air defence system, in fact, performed a crucial offensive as well as defensive function: "our air defence system is a significant and essential complement to the overall deterrent, and in the event of war would play a vital part in the success of offensive operations and the protection of our populated areas."[12] Again, the focus was on fighters and even the entire RCAF air defence system, but the emphasis was on supporting the main offensive air power role by protecting SAC.

Professor J. I. Jackson

The RCAF Staff College was one of the most important institutions for air power thinking and writing in Canada. Unfortunately, many of the college's records—notably student papers—were destroyed in 1976.[13] However, some material survived and is housed in the Information Resource Centre at the CFC. One of the most important pieces of writing on air power was by college faculty member Professor J. I. Jackson. An English professor by trade, Jackson served in RAF Coastal Command during WWII and was a wing commander in the RCAF Reserve during his tenure at the Staff College. He also became one of the most prolific writers on air power in Canada, authoring a number of articles, including the current affairs pamphlet *Air Power*.[14] One of his most interesting publications was an article on air power entitled, incidentally enough, "An Article on Air Power." It appeared in the RCAF training command publication *Readings in Air Power*, which consisted of RCAF Staff College qualifying examination study material. Though not explicitly stated in the publication, it appears that Jackson's article consisted of one of his lectures—or a combination of a series of lectures—at the RCAF Staff College.[15]

Although focusing primarily on the kinetic uses of air power, Jackson was careful to indicate at the outset of his article that he subscribed to the more wide-ranging definition of air power more in line with theorist Billy Mitchell,[16] stressing that it "also includes the many agencies which support air forces: the aviation industry, civil aviation, and meteorological, transportation, and communications services."[17] Nonetheless, in his writing, Jackson clearly takes the "air force side." In an overview of air power from the First and Second World Wars, he reinforced the dominant air power beliefs of the time; discussing modern warfare, he stressed that "the role of air power is central and pre-eminent, opening many new and challenging questions of organization, doctrine, and equipment."[18]

Even though he emphasized the inter-reliability aspect of joint warfare and stressed that different services must work together if they are to be successful in modern warfare, Jackson was also an advocate of the fundamental concept of the indivisibility of air power, or what he termed "strategic unity of the air war."[19] In addition, not only did Jackson emphasize the primacy of the offensive in the form of air superiority and strategic bombing, but in his discussion of tactical air power (air force support to armies), he advocated the airman's traditional preference for air interdiction, instead of the Close Air Support (CAS) doctrine favoured by the army.[20] Reading between the lines of Jackson's article, however, one can also see some veiled opposition to the controversial decision by the Americans to drop the atomic bomb: "by May [1945], Japan began seeking Russia's help as a mediator to end the war, and when in August atomic bombs were dropped on Hiroshima and Nagasaki, *Japan was already defeated*."[21] Nonetheless, in the end, Jackson comes clearly on the side of the "bomber barons" and the strategy of deterrence, arguing that "the best defence for any nation is the threat of offensive retaliation—a force of bombers equipped with H-bombs and capable of destroying the civilization of any aggressor power."[22] Significantly, though not mentioning Canada by name, he also emphasizes the importance of permanent, high quality air defences consisting of fighters, missiles, and radars to protect this deterrent by providing warning time needed for the bombers to take off on their retaliatory mission.[23] In other words, a good defence was crucial in making the deterrent effect of offensive air power credible.

Though Jackson recognized the importance of the fighter interceptor as an air defence weapon in the 1950s, he warned that in future wars this would not necessarily be the case. In a 1957 *RCAF Staff College Journal* article entitled "Air Power and Future Wars," Jackson emphasized the impending decline of the fighter aircraft's *tactical* advantages in light of the evolution of the overall *strategic* defence system. The near future would see the "demise" of what he called the "classic strategic 'air battle'": the primacy of fighters in achieving air superiority. In a future war, he predicted, "the interceptor no longer tries to impose cumulatively unacceptable losses on the bomber"; at best, "air defence weapons can … interfere and harry; they no longer defend to any effect."[24] The main purpose of air defence forces—again Canada is not specifically mentioned, but the implications to the RCAF are clear—would thus be to provide credibility to the overall strategic deterrence:

> Thus the real air defence is the thermonuclear retaliatory or counter force, supported by the radar warning system that will allow it to take off before it can be destroyed on the ground. The defensive interceptor and electronic weapons [i.e., missiles] are no longer the teeth of the air defence system, but rather comprise a subsidiary arm of the warning net, and have the same purpose in this as civil defence and defence against missile bearing submarines in helping to dissipate the casualties of the attack.[25]

In the future, fighters would thus be but a cog in the overall strategic defence system, with the same importance as civil defence measures,[26] and again reading between the lines, maritime patrol aircraft tasked with hunting down "boomer" submarines armed with intercontinental ballistic missiles. This was indeed a perceptive prediction, as the decline of the primacy of the fighter interceptor in Canadian air defence (embodied in the demise of the famous CF105 Avro Arrow in 1959), with the Soviet Sputnik satellite launch, and the increasing importance of RCAF Maritime Air Command's continental defence role during the early 1960s would indicate.[27]

Air Vice-Marshal Keith Hodson

Other examples of thinking and writing on RCAF air power and doctrine included speeches and talks given by RCAF officers that were eventually deposited into the libraries of the RCAF Staff College and other service educational institutions. One sample is the speaking notes of a speech by Air Commodore Keith Hodson that he gave to the Canadian Army Staff College in 1955. Hodson was one of the key staff officers involved in Canada-US air defence relations. He would later become the commandant of the RCAF Staff College, and in 1957 became the first Deputy Chief of Operations for North American ADC (NORAD) at the rank of air vice-marshal.[28] After his tragic death in 1960, the staff college's library was named in his memory.

Entitled "The Role of Air Power," Hodson's notes outlined the value of the air weapon to armies in joint land operations, but his main emphasis was on offensive air power. In particular, he highlighted the destructive power of strategic bombing, especially from aircraft armed with nuclear bombs, and the resulting need for greater *peacetime* air defences. These were essential, the RCAF officer argued, not only to defend the continent's vital areas, but also—echoing a common theme in the literature—to protect the deterrent provided by SAC.[29]

In another talk in London, Ontario, in December 1954, Hodson discussed 1 Canadian Air Division (1 CAD) in Europe. Here his emphasis was on Air Division's air-to-air / air supremacy role, noting that the RCAF's Canadair-built Sabres were especially needed to counter the growing number of Soviet MIGs in Europe. He also explained why Air Division was working with the Americans in their sector instead of in a ground support role with the Canadian Army brigade. For one, the Sabre was not designed as a fighter-bomber—though it was later used for this function—and instead was placed in an air superiority role. But more important was the fact that the Canadian Army North Atlantic Treaty Organization (NATO) brigade was assigned to work with the British Army in their sector. Here we see the growing influence of the USAF on the RCAF: because the Sabre was an American-designed aircraft that mainly used American equipment, it made sense for Canada's Air Force to operate with the Americans, not the Canadian Army and the RAF in the British zone.[30] Though sensible from an air force doctrinal perspective (see below), much like the example of 83 Group in Normandy, here was yet another example of a missed opportunity for the development of **Canadian** army-air force jointness.[31]

Moreover, it was also American air superiority fighter doctrine that the Canadian pilots were utilizing. As Hodson noted further, the requirement to rotate fighter crews from North America—where American air defence doctrine was dominant—was another consideration for 1 CAD's presence in the American zone. Lastly, and significantly, Hodson mentions animosity towards the RAF. In particular, he describes the RCAF's "sentimental reluctance to joining the RAF to whom we surrendered our identity in the last war" and concludes that in the American sector, "far from any RAF connection, we are recognized for what we are, and we feel pretty

happy about it."[32] With regard to equipment, aircraft, doctrine, and culture, the RCAF was moving farther from the RAF model and towards that of the USAF during the 1950s, and Hodson's writings clearly indicate this paradigm shift for Canada's airmen.

Air Marshal Clare Annis

One of the most prolific RCAF thinkers and writers on Canadian air power and doctrine during the early cold war was Clare L. Annis. A maritime aviator during WWII, Annis graduated from the RAF Staff College in London in 1945, and shortly thereafter was appointed the inaugural head instructor at the RCAF Staff College in Toronto as a group captain. He became an expert on air defence in the immediate post-war period, with postings as an air commodore as the senior staff officer with ADC from late 1953 to September 1954, at which time he took over as Acting Air Officer Commanding (AOC) ADC (until January 1955). Indeed, he was the one who gave the pivotal briefing on the importance of integrating Canada's air defences with the US to the Canadian Chiefs of Staff Committee in April 1955. This led Air Marshal Roy Slemon, the Chief of the Air Staff, to give his formal support to this endeavour, which was one of the key Canadian decisions on the eventual formation of NORAD. Annis ended his career as an air marshal in 1966, having held the senior positions of AOC Air Material Command, Vice Chief of the Air Staff, and Chief of Technical Services, Canadian Forces Headquarters.[33] As Major Steve James (Retired) has noted, during the 1950s, Annis "was an outspoken advocate of traditional air power doctrine,"[34] and he took the time to discuss it publicly and to write about it.

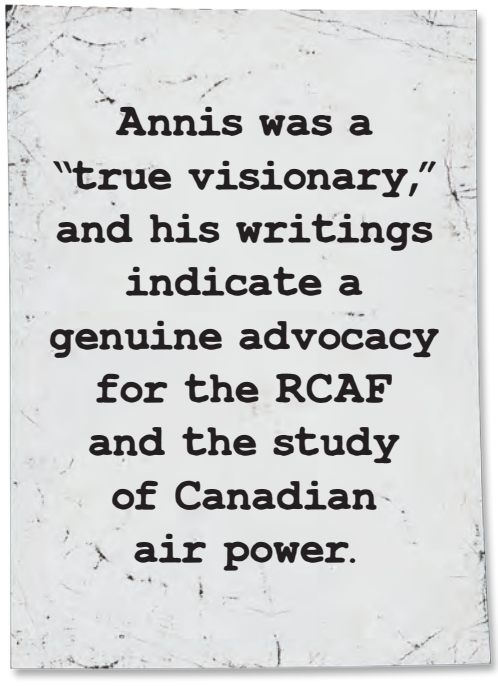
Annis actively engaged Canadian society on the subject of Canadian air power during the early cold war period, delivering numerous public addresses and publishing articles in a variety of venues. Indeed, he was the editor of the aforementioned training command publication *Readings in Air Power*, which was published as both qualifying examination study material at the RCAF Staff College and a special booklet on air power for the college.[35] Although Annis' name and his contribution to the discourse on RCAF air power and doctrine unfortunately remains largely unknown in today's RCAF, it is very appropriate that the Canadian Forces Aerospace Warfare Centre (CFAWC), the current Canadian centre of air power excellence, named their new building at Canadian Forces Base Trenton in his honour.[36]

In the words of CFAWC commanding officer Colonel Derek Joyce, Annis was a "true visionary,"[37] and his writings indicate a genuine advocacy for the RCAF and the study of Canadian air power. For instance, in a published speech in March 1952, entitled "Dilemma of Air Power," Annis freely admitted that although there was a lot of ink spilled on Army experiences during WWII—and in particular a number of memoirs—the Air Force was missing the boat in telling its story. In particular, he noted that "we airmen have fallen down in our history writing" and that as a result "there has been no real record

published yet, except for air power in a tactical form, about the roles, the compositions, the patterns of application, the strengths, the weaknesses and the language of air power as an entity."[38] Annis' work attempted to fill this void, and he relied heavily on specific examples and lessons learned from WWII to illustrate the relevance of early cold war air power in general and Canada's role in it in particular.

Though mainly discussing air defence, Annis was conscious to emphasize the crucial relationship between air superiority and strategic bombing. In one article in *Saturday Night* magazine entitled "A real air defence is possible," Annis stressed the requirement in modern warfare to recognize "the limits imposed on a strategic **air offensive** in the face of a well-organized strategic **air defensive**."[39] Using the historical example of the strategic bombing campaign of WWII, Annis reminded readers that the bomber offensive over Europe only began to show real dividends *after* Allied fighter forces had achieved air superiority by escorting the bombers and *defeating* the German strategic air defensive in air battles against Luftwaffe fighters.[40] It was thus not surprising that Annis came off in one statement sounding like a combination of the writings of Douhet and Mitchell when he wrote that "the airman believes, and cannot be persuaded otherwise, **that the first and main role of air forces is to destroy enemy air power**, and that the second stage of this main role is then to **exploit the air over the enemy's heartland**."[41] This was a clear advocacy of classic air superiority theory and doctrine that demonstrated the importance of the fighter aircraft in support of the overall strategic defensive.

Annis also had a way with words in that he had an interesting means of describing air power situations that would resonate not only with fellow RCAF airmen but with the Canadian public as well. For instance, describing a traditional land invasion by army forces, Annis noted that air forces could also accomplish an "air invasion" of an enemy through the use of strategic bombing. Put in these terms, Annis was therefore better able to explain the justification and reasoning behind the build-up of peacetime air defences in Canada: to defeat an enemy "air invasion."[42] Annis also highlighted the bilateral nature of Canada's air defence role through careful wording; for instance, he first discussed the Canadian emphasis on air power as air defence and then quickly transitioned his wording to "the North American emphasis on air power."[43] Most importantly, Annis was careful to explain what the defensive air battle would entail in the atomic age by discussing the enemy threat, doctrine, and the entire defence team of fighters and radar warning and control system. In his words, the successful integration and operation of this "team" meant that "real air defence is possible."[44]



Continuing with the language theme, Annis also capitalized on the use of metaphors to educate both airmen and civilians on some of the basics of air defence. For instance, in one article he outlined the details of the "defence

in depth" concept by comparing it to a game of rugby or football:

> The fighters are the line of the rugby game. Their duties are two-fold. It is to hold the line and prevent the enemy bombers from getting through. We know that for as long as the line holds, the enemy bombers won't get through very far or very often. The second duty of the fighters is to wear down and finally crumple the enemy line. If that is achieved our bomber backfield [i.e., SAC] can roam at will.[45]

Again, we see here the emphasis on defensive air power enabling offensive air power to do its crucial job, but described in a way that made sense to the professional airman, to the average Canadian citizen, and perhaps most importantly to the government politician who held the RCAF funding purse strings.

Conclusion

There were no Canadian Trenchards, Douhets, Mitchells, or Wardens during the early cold war period, but there were some RCAF officers and academics who thought about and wrote on Canadian air power and doctrine. The focus was mostly on fighters, but the emphasis was on supporting major air power themes, especially air superiority and how it directly supported American strategic bombing by protecting the SAC deterrent. This was the reality of the cold war environment, and it is therefore not surprising that there was a noticeable transition of Canadian air force culture from British influences to USAF ones. It could be argued, therefore, that there was no real unique air power thinking and writing in the RCAF during the 1950s. However, at the very least we have seen that Canadian air power thinkers and writers did apply a kind of national "twist" to the classic air superiority theories in order to ensure that the RCAF's focus on fighters fit doctrinally within the overall offensive strategic bombing / strategic attack and deterrence strategy of the West.

Importantly, there were outlets—public, professional, and educational—for RCAF airmen to write about Canadian air power and doctrine. Moreover, as the Jackson example demonstrates, writing was not limited to those in uniform, but also included those in the academic community. It is a legacy that is often forgotten in the twenty-first century, but it is one that is fortunately making a comeback of sorts with the advent of *The Canadian Air Force Journal* (now known as *The RCAF Journal*).

Indeed, the study of future, current, and historical thinking and writing on Canadian air power and doctrine is an important aspect of realizing CFAWC's mission "of ensuring the evolution of Canadian Aerospace Power."[46] This article has made a start in examining some historical examples, and recent works by others, such as Major Bert Fransden,[47] have made valuable contributions to the study of the subject. Nonetheless, there is still much more that needs to be done: different venues of publishing need to be explored; the writings of other individuals need to be examined; and, other time periods of Canada's air force history need to be covered. It is indeed a fruitful area of study, and the author therefore welcomes any and all suggestions in order to make the history of Canadian air power thinkers and writers as complete as possible.

Richard Goette is an air force historian specializing in command and control, leadership, maritime air power, and air defence issues. He completed his PhD in History at Queen's University in December 2009, and his dissertation is entitled "Canada, the United States and the Command and Control of Air Forces for Continental Air Defence from Ogdensburg to NORAD, 1940–1957." Richard is very active at conferences, having presented over 20 papers at academic symposia on a variety of air force topics, and others, including continental defence, air power, Canadian-American relations, naval power, and leadership and command and control.

Richard has also published extensively in the air force history, air power, and Canadian defence field, with articles appearing in a number of books and journals, such as *The Canadian Way of War: Serving the National Interest*, Bernd Horn, ed.; *Sic Itur Ad Astra, Canadian Aerospace Power Studies Volume 1: Historical Aspects of Canadian Air Power Leadership*, William March, ed.; and in the *Canadian Military Journal*; *Canadian Military History*; and *The Northern Mariner*. Some of his work has also appeared in official DND/CF publications.

Dr. Goette has worked extensively in research and writing roles for the Canadian Forces Leadership Institute, the Canadian Air Force, KMG Associates, and the Canadian Forces Aerospace Warfare Centre. He has also taught Canadian military history, war and society history, Canadian international relations history, and command and management courses for Queen's University, St. Jerome's University, the Royal Military College of Canada (RMC), and the CFC in Toronto. Additionally, he has been an advisor to Masters of Defence Studies (MDS) students at CFC.

Abbreviations

1 CAD	1 Canadian Air Division
ADC	Air Defence Command
AOC	air officer commanding
CFAWC	Canadian Forces Aerospace Warfare Centre
CFC	Canadian Forces College
HQ	headquarters
IRC	Information Resource Centre
NORAD	North American Air Defence Command
RAF	Royal Air Force
RCAF	Royal Canadian Air Force
RMC	Royal Military College of Canada
SAC	Strategic Air Command
US	United States
USAF	United States Air Force
WWII	Second World War

Notes

1. Aaron P. Jackson, "The Emergence of a 'Doctrinal Culture' Within the Canadian Air Force, Part 2," *Canadian Air Force Journal* 2, no. 3 (Fall 2009): 35, http://www.airforce.forces.gc.ca/CFAWC/eLibrary/Journal/Vol2-2009/Iss4-Fall_e.asp (accessed October 20, 2011). Lieutenant-Colonel Paul Johnston has also made a solid contribution to the study of recent RCAF doctrine in his examination of *Out of the Sun*: Paul Johnston, "Canopy Glint: Reflections on *Out of the Sun: Aerospace Doctrine for the Canadian Forces*," in *Air Force Command and Control*, eds. Douglas L. Erlandson and Allan English (Winnipeg, MB: Canadian Forces Training Material Production Centre, 2002), 83–97, http://www.cfc.forces.gc.ca/papers/otherpublications/36_2002.pdf (accessed October 20, 2011).

2. On the development of nuclear strategic bombing air power, see: Karl P. Mueller, "Strategic Airpower and Nuclear Strategy: New Theory for a Not-Quite-So-New Apocalypse, in *The Paths of Heaven: The Evolution of Airpower Theory*, ed., Phillip. S. Meilinger (Montgomery: Air University Press, 1997), 279–320; David MacIsaac, "Voices from the Central Blue: The Air Power Theorists," in *Makers of Modern Strategy from Machiavelli to the Nuclear Age*, ed., Peter Paret (Princeton: Princeton University Press, 1986), 639–42; and 21; Stephen Budiansky, *Air Power: The Men, Machines, and Ideas that Revolutionized War, From Kitty Hawk to Iraq* (NY: Penguin, 2004), 345–54.

3. On the development of the Soviet Tu-4 Bull strategic bomber, see Yefim Gordon and Vladimir Rigmant, *Tupolev Tu-4: Soviet Superfortress* (Hinkley, UK: Midland Publishing, 2002).

4. On early RCAF plans and the evolution of the service's focus on fighters, see: Randall Wakelam, "Flights of Fancy: RCAF Fighter Procurement 1945–1954," MA Thesis, War Studies, RMC of Canada, 1997; Bruce P. Barnes, "'Fighters First': The Transition of the Royal Canadian Air Force, 1945–1952, MA Thesis, War Studies, RMC of Canada, 2006; Alexander Angus Babcock, "The Making of a Cold War Air Force: Planning and Professionalism in the Post-war Royal Canadian Air Force, 1944–1950," PhD Dissertation, History, Carleton University, 2008.

5. Quoted in Joseph Jockel, *No Boundaries Upstairs: Canada, the United States and the Origins of North American Air Defence, 1945–1958* (Vancouver: University of British Columbia Press, 1987), 122.

6. Allan English and John Westrop, *Canadian Air Force Leadership and Command: The Human Dimension of Expeditionary Air Force Operations* (Trenton: CFAWC, 2007), 49, http://www.airforce.forces.gc.ca/CFAWC/eLibrary/pubs/Leadership_and_Command-2007-01-19.pdf (accessed October 21, 2011); "Half-Way House: Training Staff Officers in the R.C.A.F.," *The Roundel* 3, no. 4 (March 1951): 3–17. Upon its establishment in 1943, the college was originally called the RCAF War Staff College and reverted to the RCAF Staff College in 1946.

7. Preamble to *The R.C.A.F. Staff College Journal* 1, 1956. The journal was published once a year and the chairman of its editorial board was the Staff College's commandant. Copies of the *R.C.A.F. Staff College Journal* are held at the Keith Hodson Memorial Library Information Resource Centre (IRC) at CFC.

8. D. G. Bell-Irving, "Foreword by the Editor," *The R.C.A.F. Staff College Journal* 2 (1957): 12.

9. Bernard Brodie, "Implications of Nuclear Weapons in Total War," *The R.C.A.F. Staff College Journal* 2 (1957): 12–22; George R. Lindsey, senior operational research officer at ADC HQ, "When is Air Defence Worthwhile?" *The R.C.A.F. Staff College Journal* 1 (1956): 30–32.

10. See, for example: "Gen. Crerar's warning," *Saturday Night, vol. 66,* March 20, 1951, 15–16; G. G. Simonds, "Manpower is the Big Problem," *Canadian Business* 29 (December 1956): 42, 44; Ibid., "Where We've Gone Wrong on Defence," *Maclean's*, vol. 69, June 23, 1956, 22–23, 62–69; Ibid., G. G. Simonds, "We're wasting millions on an obsolete air force," *Maclean's*, vol. 69, August 4, 1956, 14–15, 38–39.

11. In the article, Lipton emphasizes the importance of **time**—to ensure that SAC bombers can get off the ground and the populations of Canada and the US to air raid shelters. M. Lipton, "The Wisdom of Our Air Defence Policy," *The R.C.A.F. Staff College Journal* 1 (1956): 28–32.

12. Ibid.

13. I am indebted to CFC Head Librarian Cathy Murphy for providing me with this information.

14. Jackson Biography in his "Air Power and Future Wars," *The R.C.A.F. Staff College Journal* 2 (1957): 29.

15. J. I. Jackson, "An Article on Air Power," in *Readings in Air Power: RCAF Officers' Examinations Study Material*, ed. Clare Annis (Ottawa: Training Command, 1955), Directorate of History and Heritage (DHH) 79/40. Copy also available at the Keith Hodson Memorial Library IRC, CFC.

16. Clayton K. S. Chun, *Aerospace Power in the Twenty-First Century: A Basic Primer* (Montgomery: United States Air Force Academy in cooperation with Air University Press, 2001), 45–50.

17. Jackson, "Article on Air Power," 1.

18. Ibid., 6; Jackson, "Air Power and Future Wars," 35. Quote from latter.

19. Jackson, "Article on Air Power," 7. Quote from page 7. The fundamental concept of the indivisibility of air power is that all military air assets of a nation should be under a separate service, the air force, to ensure the proper concentration and specialized use of air power in the hands of those best trained for it, air force officers. James A. Winnefeld and Dana J. Johnson, *Joint Air Operations: Pursuit of Unity in Command and Control, 1942–1991* (Annapolis, Maryland: Naval Institute Press, 1993), 7.

20. Jackson, "Article on Air Power," 2–3.

21. Ibid., 10. Emphasis added.

22. Ibid., 14. See also his "Air Power and Future Wars," 29–30.

23. Ibid., 14–15.

24. Jackson elaborates further, noting that "their prime role is performed not in battle but before, in making the attacker realize he cannot expect an easy encounter or allow himself to use obsolete equipment." Jackson, "Air Power and Future Wars," 30, 32. Quotes from page 30.

25. Jackson, "Air Power and Future Wars," 30.

26. See Andrew Burtch, "If we are attacked, let us be prepared: Canada and the failure of civil defence, 1945–1963," PhD dissertation, History, Carleton University, 2009.

27. On the demise of the Avro Arrow see Donald C. Story and Russell Isinger, "The origins of the cancellation of Canada's Avro CF-105 arrow fighter program: A failure of strategy," *Journal of Strategic Studies* 30, no. 6 (December 2007): 1025–50. On the increasing role of

Canadian maritime air power in continental defence by the early 1960s, see Peter Haydon, *The 1962 Cuban Missile Crisis: Canadian Involvement Reconsidered* (Toronto: Canadian Institute of Strategic Studies, 1993), 79–84; and John Orr, "Some Policy Aspects of Canadian Involvement in Strategic ASW, 1945–1968," in *People, Policy and Programmes: Proceedings of the 7th Maritime Command (MARCOM)*, eds., Richard Gimblett and Richard O. Mayne, Historical Conference 2005 (Winnipeg: Canadian Naval Heritage Press and 17 Wing Winnipeg Publishing Office, 2008), 183–203.

28. Richard Evan Goette, "Canada, the United States and the Command and Control of Air Forces for Continental Air Defence from Ogdensburg to NORAD, 1940–1957," PhD Dissertation, History, Queen's University, 2009, 189, 293; D. J. Goodspeed, *The Armed Forces of Canada: A Century of Achievement* (Ottawa: Directorate of History, Canadian Forces Headquarters, 1967), 226.

29. K. L. B. Hodson, "The Role of Air Power," address to the Canadian Army Staff College, Kingston, 18 April 1955. Copy in possession of the author, courtesy of A/C Hodson's brother, Ian. The author has also donated a copy of this speech to the Keith Hodson Memorial Library IRC at CFC and to the Canadian Forces Aerospace Warfare Centre in Trenton.

30. K. L. B. Hodson, "The RCAF Air Division in Europe: Address to the United Services Institute, London, ON, 15 December 1954," copy at the Keith Hodson Memorial Library IRC, CFC.

31. The best work on 83 Group is by Canadian air power historian Lieutenant-Colonel Paul Johnston. See Paul Johnston, "2nd TAF and the Normandy Campaign: Controversy and the Under-Developed Doctrine," MA Thesis, War Studies, Royal Military College of Canada, 1999; and Paul Johnston, "Tactical Air Power Controversies in Normandy: A Question of Doctrine," *Canadian Military History* 9, no. 2 (Spring 2000): 59–71.

32. Hodson, "RCAF Air Division in Europe," 3.

33. Goette, "Command and Control of Air Forces," 251. Biographical information on Annis gleaned from: Canada, Air Force, CFAWC, "Dedication of the Clare L. Annis Building," http://www.airforce.forces.gc.ca/CFAWC/Dedication_Ceremony_e.asp (accessed October 4, 2011).

34. Stephen L. James, "The Formation of Air Command: A Struggle for Survival," MA Thesis, War Studies, RMC, 1989, 111.

35. Clare Annis, ed., *Readings in Air Power: RCAF Officers' Examinations Study Material* (Ottawa: Training Command, 1955), DHH 79/40. Copy also available at CFC IRC.

36. Canada, "Dedication of the Clare L. Annis Building"; Major Isabelle Robitaille, "More Than a Building Dedication: The Overdue Recognition of an Air Force Legend," *The Contact* [8 Wing Trenton Newspaper], vol. 45, issue 36, 24 September 2010, 1, 2; Kate Everson, "Canadian Forces Aerospace Warfare Centre Dedicated," *Belleville EMC*, 23 September 2010.

37. Colonel Joyce quoted in Robitaille, 2.

38. Clare Annis, "The Dilemma of Air Power: Address delivered before The Canadian Club of Montreal, March 17th, 1952," in *Air Power 1952: Three Speeches by Air Commodore Clare L. Annis* (Toronto: RCAF Staff College, 1952), 40, 29–30. This speech was reproduced in the Fall 2008 issue of the *Canadian Air Force Journal* (pages 33–39).

39. C. L. Annis, "Real air defence is possible," *Saturday Night*, vol. 67, 12 July 1952, 7. Emphasis in original.

40. Ibid., 14.

41. Clare Annis, "The Roles of Air Forces: Address delivered before the Montreal United Services Institute, February 21st, 1952," *Readings in Air Power: RCAF Officers' Examinations Study Material* (Ottawa: Training Command, 1955) DHH 79/40. Emphasis in original.

42. Clare Annis, "The Role of the R.C.A.F.: Address delivered before the Trenton Chamber of Commerce, March 26th, 1952," in *Air Power 1952: Three Speeches by Air Commodore Clare L. Annis* (Toronto: RCAF Staff College, 1952), 5–6. Annis also used this wording in an article for a 1952 issue of the mainstream magazine *Saturday Night*. See also C. L. Annis, "Real air defence is possible," 7.

43. Annis, "Role of the R.C.A.F.," 5.

44. Annis, "Role of the R.C.A.F.," 5, 13; Annis, "Real air defence is possible," 7, 14.

45. Annis, "The Role of the R.C.A.F." Annis also utilized this football/rugby metaphor in his article for *Saturday Night*. Annis, "A real air defence is possible," 14.

46. Robitaille, "Overdue Recognition," 2; Mission Statement, Canadian Forces Aerospace Warfare Centre, http://www.airforce.forces.gc.ca/CFAWC/Index_e.asp (accessed October 4, 2011).

47. Bertram Fransden, "AVM [Air Vice-Marshal] / MGen [Major-General] Carpenter and RCAF Vision," paper presented at the CFAWC Air Force Historical Workshop, 23–25 September 2008, Ottawa, ON. See also Dean Black, "A Meeting of (Airpower) Minds," *Airforce* 29, no. 2 (Summer 2005): 54–57.

AIR FORCE TRADITIONS

(Reprint from the *Roundel* Vol. 1, No. 8, April 1994)

BY MAJOR WILLIAM MARCH, CD, MA

With the 70th Anniversary of the formation of the Royal Canadian Air Force [RCAF] now upon us, we should take a few moments to reflect on our heritage and history. Part of our heritage are the various symbols (such as the roundel, the ensign, etc.) that have come to be associated with the air force. With this in mind, what follows is a brief examination of a few of these symbols and "from whence they came".

CF Photo: WO Serge Peters

RCAF MARCH PAST:

The original score of the March Past was the work of Sir Walford Davies, and combined the rhythm of the old Royal Flying Corps [RFC] call with that of the Royal Naval Air Service call. The call appears as the introduction to the March Past and in the coda. The second part of the March Past was composed by Sir George Dyson. Alterations to the tune included a rearrangement of the rhythm to make it easier to march to. In February, 1943, authority was granted by His Majesty's Stationary Office to publish the tune in Canada under the title "RCAF March Past". In the early 1950's a special pipe band arrangement was composed by RCAF Pipe Major A. R. Howie, then a member of the CFB [Canadian Forces Base] Trenton Pipe Band.

AIR FORCE BLUE:

Blue uniforms were officially adopted for wear by members of the Royal Air Force in March 1918. Rumour attributes the adoption of blue uniforms to the Russian debacle of 1917. The Russians had ordered vast quantities of blue cloth for their cavalry. A million yards of it lay in British warehouses undelivered. It was unsuitable for dying either khaki or navy blue, so it was appropriated for air force uniforms. The blue uniforms first made an appearance in October 1919 and since then have been adopted by a large number of nations.

THE ENSIGN:

By tradition, the Admiralty in England had the right to veto the introduction of any new flag adopted for use on land or sea within the British Territories. Therefore, several of the original designs for an air force ensign introduced in the 1920s were rejected by the Royal Navy.

Preferring not to be continuously thwarted by the navy, Lord Trenchard, the Chief of the Air Staff for the RAF [Royal Air Force], presented the air force ensign, in it's (*sic*) present form, to King George V. The King approved the design and the Admiralty, although far from happy with the design, had no option but to approve the ensign since the King had already given his approval. In 1940 the ensign, incorporating the RCAF maple leaf roundel, was approved as the RCAF ensign. Officially, the ensign was to be flown only from a fixed flagstaff. Despite this regulation the ensign appeared often on parade. Traditionally, only "colours" not ensigns, should be paraded.

THE ROUNDEL:

The first Royal Flying Corps aircraft carried no national markings until the end of August, 1914, when Union Jacks were painted on the under surface of lower wings. At a distance the Union Flag was easily confused with the Iron Cross insignia of the Germans. In October 1914, the British adopted the concentric circular "target" introduced by the French, but the colours were reversed. Adoption of the RCAF roundel with a maple leaf as

the central device was authorized during the Second World War, but the new design did not appear as aircraft markings for Canadian machines until after, the war ended.

PER ARDUA AD ASTRA:

It was used for many centuries as the motto of the Irish family of Mulvany, and that family understands the motto to mean "Through difficulties to the Stars". King George V approved "Per Ardua Ad Astra" as the official motto of the RFC on 15 March 1913. It was accepted as a motto without meaning. The College of Arms confirms that "no authoritative translation is possible" - let everyone translate it as they think fit.

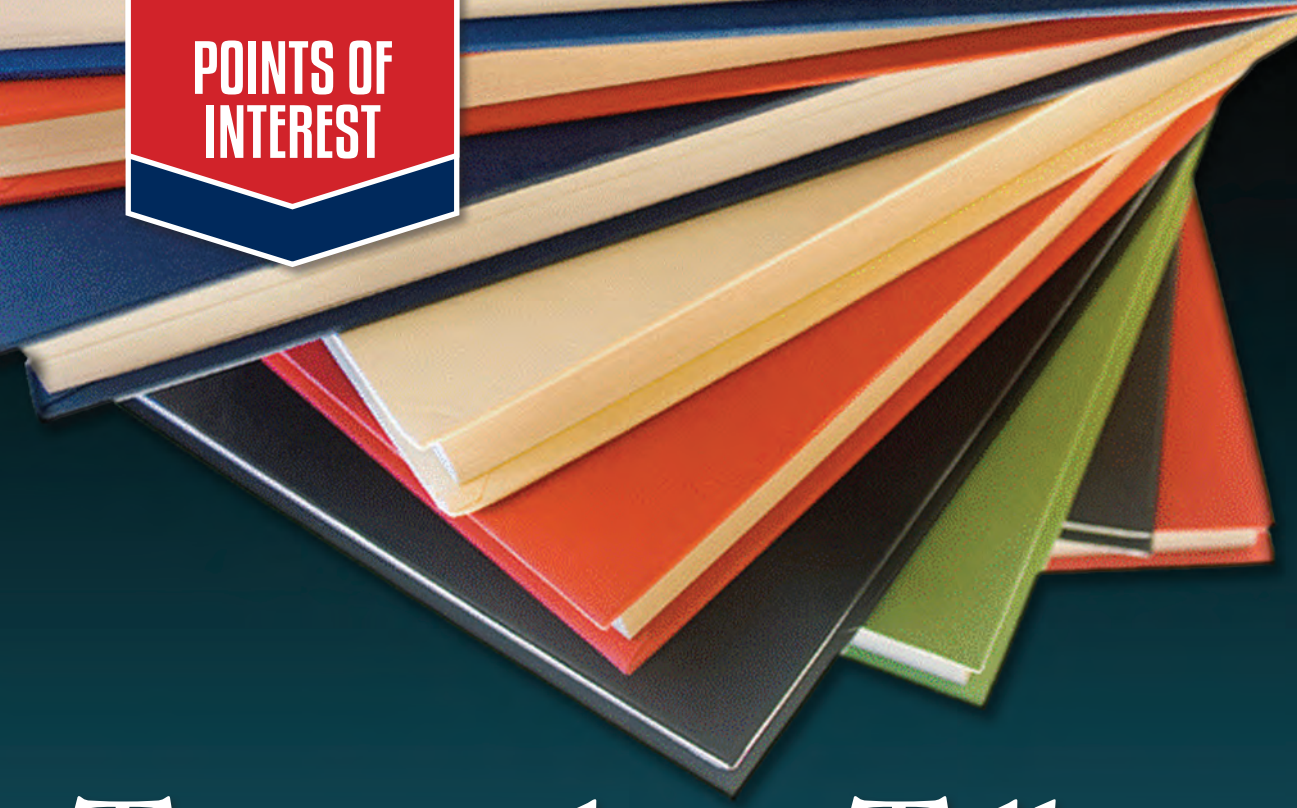
SIC ITUR AD ASTRA:

Originally adopted as the motto for the Canadian Air Force in 1918, it can be translated as "Such is the Pathway to the Stars". With the subsequent downsizing of the organization and the birth of the RCAF, the motto was dropped in favour of "Per Ardua Ad Astra". With the formation of Air Command in 1976, the motto was reinstated for the air force.

ABBREVIATIONS

RAF	Royal Air Force
RCAF	Royal Canadian Air Force
RFC	Royal Flying Corps

POINTS OF INTEREST



Terminology Talk

{Article 3}

By Major James Bound, CD, BSc (Hons)

Functions

Background

Oxford English Dictionary
(http://www.oed.com/)

> **function, n.**
>
> 3. The special kind of activity proper to anything; the mode of action by which it fulfils its purpose.

Introduction

A previous *Canadian Air Force Journal* article (Vol. 3, No. 1) described what the Air Force functions are; however, the article stated neither what a *function* actually is, nor how it relates to Air Force doctrine. This article will attempt to bridge these gaps from a terminology perspective. Using the *Oxford English Dictionary* (OED) as a reference, the term *function* appears to be straightforward in concept; to paraphrase, it is the means by which something fulfils its purpose. This is a very high-level, or strategic, view. Are functions the means by which the Air Force fulfils its purpose? Let us take a closer look.

Discussion

There are not many terms in the *Defence Terminology Bank* (DTB) that can shed light on the intended context of using *function* in doctrine. In reviewing the first two candidate terms indicated below, the concept associated with each is completely different from the other.

Record 20187

military function

The activities or operations performed in the execution of the mission of armed forces. Note: A military function provides a more detailed operational breakdown of the activities or actions than essential operational capabilities, allowing comprehensive analysis, which leads to easily identifiable and [sic] shortfalls. (North Atlantic Treaty Organization [NATO])

Record 37250

air force function

A broad, fundamental and continuing activity of an air force. (Chief of the Air Staff [CAS])

Record 26169

Shield

The operational function that protects a force, its capabilities and its freedom of action. (Department of National Defence [DND] / Canadian Forces [CF])

The definition for *military function* is sourced from NATO, and since Canada accepts all terms from NATO (unless otherwise indicated), it is approved for use across the DND/CF. This definition specifically indicates that *military function* refers to a fairly low-level activity, likely tactical level in nature. The note associated with it is rather confusing because "breakdown of the activities or actions" implies lower than operational level, but "operational" is used twice. The interpretation is that the term is an operational-level construct, which somewhat contradicts the definition because "execution of the mission" is strictly at the tactical level of conflict.

The definition for *air force function* is sourced from the Air Force (i.e., CAS), and is diametrically opposed to the NATO definition. The wording, "broad, fundamental and continuing activity," places the term squarely at the strategic level of conflict.

To muddy the waters further, the joint functions, of which Shield is highlighted, all start off with the lead-in, "The operational function that...." The problem with this lead-in is that in reality, and contrary to the Army's perspective, they are not used at the operational level at all, but rather are used at the strategic level. The definitions for the Air Force-unique, function-related terms—Shape/Move/Generate—are not phrased as being at the operational level. Capability domains, thrust advisory groups, and even the Joint Task List[1] all use the same or similar labels as the named functions, and all of them exist at the strategic level. Therefore, this is where *function* is really situated—at the strategic level.

To compare the Canadian perspective with that of our closest ally to the south, the following excerpt from the United States Air Force (USAF) *Air Warfare* doctrine manual attests to the view that *function* belongs at the strategic level:

> "[USAF Basic Doctrine] defines functions as the broad, fundamental, and continuing activities of aerospace power … Functions are the means by which Services or components accomplish the tasks assigned by the JFC [joint force commander]." [2]

The Air Force recently debated two variations on a suitable definition for *function*, as follows:

function

An activity, proper to a person or institution, by which an entity fulfils its purpose. Note: A military force fulfils its purpose by applying capabilities to complete assigned operations, activities and missions.

function (a generic version of the term *air force function*)

A broad, fundamental and continuing activity of a military force. Note: A military force fulfils its purpose by employing capabilities to complete assigned missions and tasks.

The words "broad" and "fundamental" reflect the strategic nature of this term. The note attempts to relate the term to other terms in a proposed terminology hierarchy (yet to be debated).

Is a *function* an "activity … by which an entity fulfils its purpose," or the means by which an entity fulfils its purpose? The OED definition leaves the door open on this distinction—it could be either one. In some discussions, "functions" have been directly linked to "effects." This interpretation is incorrect, and has, unfortunately, clouded the understanding of this term. A given *function* is really the means to accomplish the effect, as opposed to the effect itself. For example, Shield cannot be an effect, it is the means to accomplish the effect, with the effect being in this case the protection of a force, its capabilities, and its freedom of action. With this in mind, a variation on the second proposed definition for *function* is more suitable, as follows:

> **function**
> A broad, fundamental and continuing activity of a military force. Note: A military force fulfils its purpose by employing capabilities of various means to achieve effects and complete assigned missions and tasks.

Impact on Doctrine

The function-based, keystone CF Aerospace doctrine manuals exist at the operational level in the doctrine hierarchy. However, these keystone publications are written for a strategic-level audience; they are intended to be very brief in nature, and are supposed to cover the key terms and organizational constructs only. They are, in effect, a bridge between the strategic-level capstone manual and the numerous operational-level manuals that are subordinate to the associated keystone manuals. All of the details that certain target audiences are expecting to see are contained in the subordinate manuals.

Summary

Using the OED as a reference, the term *function* appears to reflect a strategic-level construct. In the DTB, the various terms related to *function* are inconsistent as to whether they apply to the strategic level, the operational level, or the tactical level of conflict. The Royal Canadian Air Force (RCAF) interpretation is that the OED definition is essentially correct, but that it could go a bit further to situate the term in a military context because it is so frequently used, and confused. Since CF Aerospace doctrine is organized along functional lines, a clear definition for *function* in military phraseology is highly desirable.

The seventh Air Force Terminology Panel (AFTP) meeting took place in March, 2011, with 73 terms eventually being approved for inclusion in the DTB. Where a given term has been subsequently modified at the Joint Terminology Panel or the Defence Terminology Standardization Board for any reason, only the modified version is displayed (in highlight) in order to avoid confusion when accessing the term in the DTB. A listing of the approved terms can be found on page 69.

Note: The reader is encouraged to check the CFAWC terminology management (external) website at any time to review the status of candidate Air Force terms: http://trenton.mil.ca/lodger/CFAWC/Terminology_e.asp?Type=BRIEF.

Major James Bound, CD, BSc (Hons) is a navigator with 5,200 hours on the CC130 Hercules. In addition to two line tours on operational SAR squadrons, he has also had multiple tours at the Air Mobility operational training unit as a flight instructor and aerospace systems evaluator. Major Bound is currently working in the Doctrine Development Branch at the Canadian Forces Aerospace Warfare Centre. His primary duties include the development of Air Force Move doctrine and the chairmanship of the Air Force Terminology Panel.

Notes

1. DND, Defence Planning and Management, "Canadian Joint Task List," v1.4 http://vcds.mil.ca/dgsp/pubs/rep-pub/dda/cjtl/cjtl14/intro_e.asp (accessed November 1, 2011).

2. United States Air Force, *AFDD 3-1 Air Warfare,* Air Force Doctrine Document 3-1, 17 September 2010, 5.

English Term	French Term
aerospace operations centre; AOC	centre d'opérations aérospatiales; COA
air component commander; ACC	commandant de composante aérienne; CCA
air staff; A staff	état-major Air; état-major A; EMA
air tasking order; ATO	ordre d'attribution de mission aérienne; ATO
analysis and collection plan; ACP	plan d'analyse et de compilation; PAC
approved doctrine	doctrine approuvée
capability	capacité
combined force air component commander; CFACC	commandant de la composante aérienne de la force multinationale; CCAFM
crewmember monitoring; CM	membre d'équipage surveillant
crew-performance assessment	évaluation du rendement de l'équipage
environment	armée
evidence	preuve
finding report	rapport de constatations
force enabler	élément habilitant; élément habilitant d'une force
force multiplier	multiplicateur de force
ground crew	équipe au sol
hostile environment	environnement hostile
hub-and-spoke; hub-and-spoke method	réseau en étoile; étoile
intelligence, surveillance and reconnaissance; ISR	renseignement, surveillance et reconnaissance; RSR
interim doctrine	doctrine provisoire
joint force air component commander; JFACC	commandant de la composante aérienne de la force interarmées; CCAFI
kinetic	cinétique
mission	mission
non-kinetic	non cinétique
non-permissive environment	environnement non permissif
permissive environment	environnement permissif
personnel recovery; PR	récupération de personnel; RP
pilot flying; PF	pilote aux commandes
pilot monitoring; PM	pilote surveillant
post-activity report; PAR	rapport post-activité; RPA
principles of war	principes de guerre
promulgated doctrine	doctrine promulguée
ratified doctrine	doctrine ratifiée
role	rôle
topic lesson report; TLR	rapport de leçon sur un sujet donné; RLSD

POINTS OF INTEREST

MARI AIR

CF Photo

MME

BY JOE SPEARS

Reprinted with permission:

BC Shipping News 1, issue 6, October 2011 (www.bcshippingnews.com). *BCSN* provides exclusive interviews and articles looking at all aspects of shipping on Canada's West Coast.

Note: In editing this reprint article, except for minor adjustments for the sake of clarity, the original has been retained in its entirety.

Maritime Air is an important element of Canada's ocean management. Canada, the world's second largest coastal nation, has 244,000 kilometres of coastline and 9.3 million square kilometres of ocean space under Canadian control and jurisdiction. Canada has both domestic and international obligations under the Law of the Sea Convention and its domestic maritime legislation for management of living and non-living resources in this vast ocean space. Under customary international law, Canada has obligations to protect marine resources using the precautionary principle, including the waters beyond the 200 mile outer limit of the exclusive economic zone (EEZ). The precautionary principle of customary international law holds that a coastal nation can intervene to prevent marine pollution or exploitation of living resources outside its national jurisdiction. The North Pacific driftnet fisheries enforcement program is one such example which is undertaken by Fisheries and Oceans Canada (DFO) operating in conjunction with the Department of National Defence (DND) using CP140 Auroras of the Long Range Patrol Group of the [Royal] Canadian Air Force based at 19 Wing at Comox, British Columbia outside of Canadian waters.

On Canada's West Coast, the use of space-based and air assets are central capabilities of a little-known element of Canada's ocean management regime (**Maritime Air**). Maritime Air provides government departments tasked with an ocean management responsibility, a flexible and

rapid-response sensor platform depending on the particular ocean management function. This can include surveillance, law enforcement, marine domain awareness, fisheries and anti-pollution and scientific patrols. This article provides an overview of the concept of Maritime Air, and how one Canadian company, Provincial Aerospace (PAL), founded in Newfoundland, has played a key role in Canada's ocean management for many years, starting first on the East Coast of Canada and expanding to the West Coast. PAL plays an important role on the West Coast in maritime surveillance, fisheries enforcement, law enforcement and in a secondary search and rescue role (SAR) as tasked by Victoria JRCC [joint rescue coordination centre] under the control of the SRR (SAR Region) Commander Rear-Admiral Nigel Greenwood. The aircraft is often in the air and provides initial top cover for SAR response at sea.

When we look at ocean management, people tend to think solely of ships—surface-based assets—as the only vehicle for providing an ocean management capability. On a warming planet, and in the vast melting Arctic, we need to rethink some of these ocean management concepts. Aviators are mariners too. Maritime Air is cost effective and provides a highly effective and flexible response in an integrated functional approach to Canada's ocean management which is shared by a number of federal departments. The data collected can be shared with a wide variety of end users in real time for various purposes and uses. Canada has had a long history of using aircraft for ocean management generally and on the West Coast in particular.

Canada is seen as a world leader in the development of using Maritime Air as an enforcement and ocean management tool supported by international law. This commercial activity, service delivery of Maritime Air in support of the Government of Canada, has many economic spinoffs domestically and as an awesome export opportunity for Canada. It links trade with ocean management expertise. PAL with other Canadian companies recently signed a $400 million contract for providing two Dash 8 Q300 maritime surveillance aircraft and supporting systems for the United Arab Emirates (UAE).

It is important to realize that much of the value of the shipbuilding contracts that make up the National Shipbuilding Procurement Strategy (NSPS) will involve the government vessels using a variety of air and space-based sensors to fuse the sensor data for a specific purpose. In many respects, the computer and data management systems on these vessels greatly exceed the cost of the propulsion system and the construction of the hulls combined. This data fusion and integration of various space, surface and air assets data is seen as an integral part of the use of government vessels engaged in modern ocean management and will become more important in a rapidly changing and warming world.

Maritime Air developed during World War II in the hunt for German U-boats in the North Atlantic. The RCAF [Royal Canadian Air Force] developed techniques using acoustical sensors and primitive radar for detecting surfaced U-boats. The RCAF Eastern Command was an integral part of the Battle of the Atlantic. On the West Coast, the RCAF operated seaplanes to detect Japanese submarines. To this day, an experienced aviator's Mark 1 eyeball remains an excellent sensor. During the Cold War [sic], Canada pioneered the use of large helicopters from destroyer escorts for anti-submarine warfare. Fixed-wing, long-range aircraft played an important part as the recently declassified Cuban missile crisis records show. Many commentators from other NATO countries during the Cold War held that Canada was one of the world's best sub hunters. In this writer's opinion, the [Royal] Canadian Navy [RCN] remains at the leading edge of anti-submarine warfare which utilizes a variety of subsurface, surface and air assets.

As the Cold War ended, the skills developed while hunting Soviet nuclear submarines from both fixed- and rotary-wing aircraft began to be applied to other ocean management functions. Prior to 1977, Canada's territorial sea extended 12 miles [19 kilometres] and foreign fishing fleets operated in sight of land. After 1977, Canada declared a Fishing Zone out to 200 nautical miles [370 kilometres] which eventually morphed into the EEZ when Canada ratified the Law of the Sea Convention in November 1993. This increased ocean space required a fisheries monitoring and enforcement capability that was originally undertaken by the Canadian Forces CP121 Tracker aircraft squadrons originally tasked with anti-submarine warfare from the RCN's aircraft carrier HMCS [Her Majesty's Canadian Ship] BONAVENTURE and then air fields. The Trackers were eventually retired starting in the 1970s. The Tracker loss in 1990 left a gap in Canada's Maritime Air capability which was filled by the private sector. PAL started undertaking aerial surveillance fisheries patrols for Fisheries and Oceans Canada on the East Coast off the highly biologically rich Grand Banks which extends past Canada's 200 mile [322 kilometres] limit.

This led PAL to develop a long-standing relationship with the Government of Canada to use private sector air assets with a variety of sensors and DFO enforcement personnel on board to develop a cost-effective solution to fisheries enforcement in a very harsh ocean environment operating far offshore. PAL utilized the King Air 200 twin-engine aircraft which is well suited to this work and has served the test of time to the present day.

Canada's West Coast stretches from the 49th parallel to the AB line at Dixon Entrance and in that intervening shoreline is 27,000 kilometres of mountainous coastline with 6,000 islands—most of which are uninhabited. The North to South distance is 900 kilometres. Servicing the maritime navigational infrastructure and aids to navigation on the West Coast is done by the Canadian Coast Guard [CCG] Pacific Region who maintains a fleet of eight helicopters from two bases that service a variety of remote sites and lighthouses from land as well as Coast Guard vessels on a year-round basis. These rotary-wing aircraft are a lifeline on the coast as any mariner knows.

What works on the East Coast is transferable to the West Coast. If it is salty, PAL is there. PAL presently operates on the West Coast from Comox using a King Air. This aircraft has a precision inertial navigation and GPS system that interfaces with the aircraft radar to give a precise position for enforcement purposes. The aircraft also has an AIS [Automatic Identification Systems] collection system and can collect AIS data from a 200-kilometre radius with specific vessel positions. The flights can show all the vessels in the flight path. The shore-based CCG radar has a limited range. The AIS transmitters are carried by vessels and provide a radio signal that is a unique identifier to a particular vessel. The data system and sensor operators can provide real-time information to the end-user government departments. The aircraft has an enlarged fuel system for extended range. The aircraft has a night-photography system in addition to a forward-looking infrared imaging system for evidence collection.

Transport Canada also operates the National Aerial Surveillance Program (NASP) using two dedicated Dash 8s and one Dash 7 aircraft for surveillance of vessels within waters under Canadian jurisdiction to enforce pollution prevention regulations.

One DHC-8 (Dash 8) aircraft is based in Moncton, NB, and the second is based in Vancouver, BC. During maritime patrols, the aircraft's crew normally consists of two pilots, an equipment operator, an observer, and for overnight trips or other extended deployments, a flight engineer. The Moncton-based Dash 8 is used to conduct pollution surveillance, ice reconnaissance, and maritime security surveillance in the Atlantic, Quebec and Ontario Regions. The Vancouver-based Dash 8 is used

for similar purposes in the Pacific Region with the exception of ice reconnaissance due to the nature of the climate. The DHC-7 (Dash 7) was first manufactured in 1986. During maritime patrols the aircraft's crew normally consists of the same crew compliment as the Dash 8. This aircraft is based in Ottawa, ON, and is used primarily for ice reconnaissance, pollution and maritime surveillance patrols in the Arctic. The aircraft also serves as a contingency aircraft when maintenance is being performed on the Dash 8 aircraft. It is specifically fitted with an all-round view dome in its fuselage for visual observations. It has undergone an avionics update and fitting out with the MSS6000 suite of sensors. Since 2004, each of the TC [Transport Canada] surveillance aircraft has also been modified to include a suite of remote sensors specifically designed for oil pollution detection.

The Moncton-based Dash 8 aircraft was recently used in the Gulf of Mexico during the Deep Horizon oil spill. The TC Dash 8 was the premier aircraft that was utilized to provide situational awareness by monitoring the spill movement in the Gulf of Mexico. The aircraft operated by TC air crews operated from the time of the first request in April 2010 until July 15, 2010, and greatly surpassed the surveillance aircraft operated by American agencies. It is a made-in-Canada solution that works and has been proven on the world stage. It is a tribute to Canadian firms who developed some of the sensors and integration as well as the operational readiness of the TC air crews.

PAL's global leadership in airborne maritime surveillance has flourished on Canada's solid Maritime Air foundation. PAL has expanded into intelligence, surveillance and reconnaissance (ISR) providing customized airborne maritime surveillance and search and rescue solutions from software system design and integration to mission operation, training and support. PAL has more than 35 years of fixed-wing operational experience, flying over 130,000 hours in 20,000 incident-free missions with a fleet of 10 maritime patrol aircraft and UAVs [unmanned aerial vehicles] worldwide. PAL has 750 employees and undertakes work in over 30 countries. It is a marine success story of which we can all be proud.

It is clear that Maritime Air is a cost-effective, long-established component of Canada's and the West Coast's maritime industry which will become critical as Canada expands its ocean capability in the coming years. There is much to be learned from PAL's success story. PAL's success shows that the private sector can work in partnership with the Government of Canada to provide cost-effective solutions. The Government of Canada is presently exploring alternative service delivery for a Fixed Wing Search and Rescue replacement aircraft. It is not a new concept, as the PAL story shows, stretching back 35 years. We have much to learn from the PAL story. Canada is a safer, stronger and a more secure maritime nation because of this public-private partnership on Maritime Air.

Joe Spears is the principal of Horseshoe Bay Marine Group (HBMG), and learned to fly at the East Coast Meccas of maritime aviation (Canadian Forces Base) CFB Greenwood and CFB Shearwater. He would like to thank Colonel John Orr (Retired), a Research Fellow of Dalhousie's Centre for Foreign Policy Studies (CFPS), for renewing his interest in Maritime Air as an integrated ocean management tool in a changing world.

ABBREVIATIONS

DFO	Department of Fisheries and Oceans
EEZ	exclusive economic zone
PAL	Provincial Aerospace Ltd.
RCAF	Royal Canadian Air Force
SAR	search and rescue

CF Photo: Sgt Kevin MacAulay

POINTS OF INTEREST

SEA KING

50TH ANNIVERSARY

ACTIVITIES ANNOUNCED

CF Photos

SHEARWATER, NS – Colonel John Cody (Retired), Co-chair of the Sea King 50th Anniversary Association announced plans to recognize the helicopter's 50th birthday in August 2013 during a reception at the Shearwater Aviation Museum on November 12.

Celebrations will begin on July 31, 2013 with a "Meet and Greet" reception at the New Hangar Complex at 12 Wing Shearwater, where serving and retired Sea King aviators, and maintenance and training personnel can meet to renew old friendships.

The formal activities will take place on August 1, 2013, 50 years to the day when the first Sea King flew as an aircraft in the service of the Royal Canadian Navy. A parade of 12 Wing Shearwater personnel will be accompanied by a flypast of Sea King helicopters, followed by a memorial service for members of the Sea King community killed in the line of duty.

The day will conclude with the induction of a Sea King into the Shearwater Aviation Museum.

A formal dinner that evening will feature remarks by Dr. Sergei Sikorsky, eldest son of the legendary pioneer of helicopter construction Igor Sikorsky.

Early indications are that this event will be among the largest military aviation reunions in Canada, bringing together serving and retired Sea King pilots, maintenance personnel and instructors from the 50 years of service of this venerable aircraft to Canada and the Canadian military.

As a prelude to the 50th anniversary celebrations, the Air Force Historical Conference will take place in Halifax, June 12-15, 2012.

FOR FURTHER INFORMATION, CONTACT:

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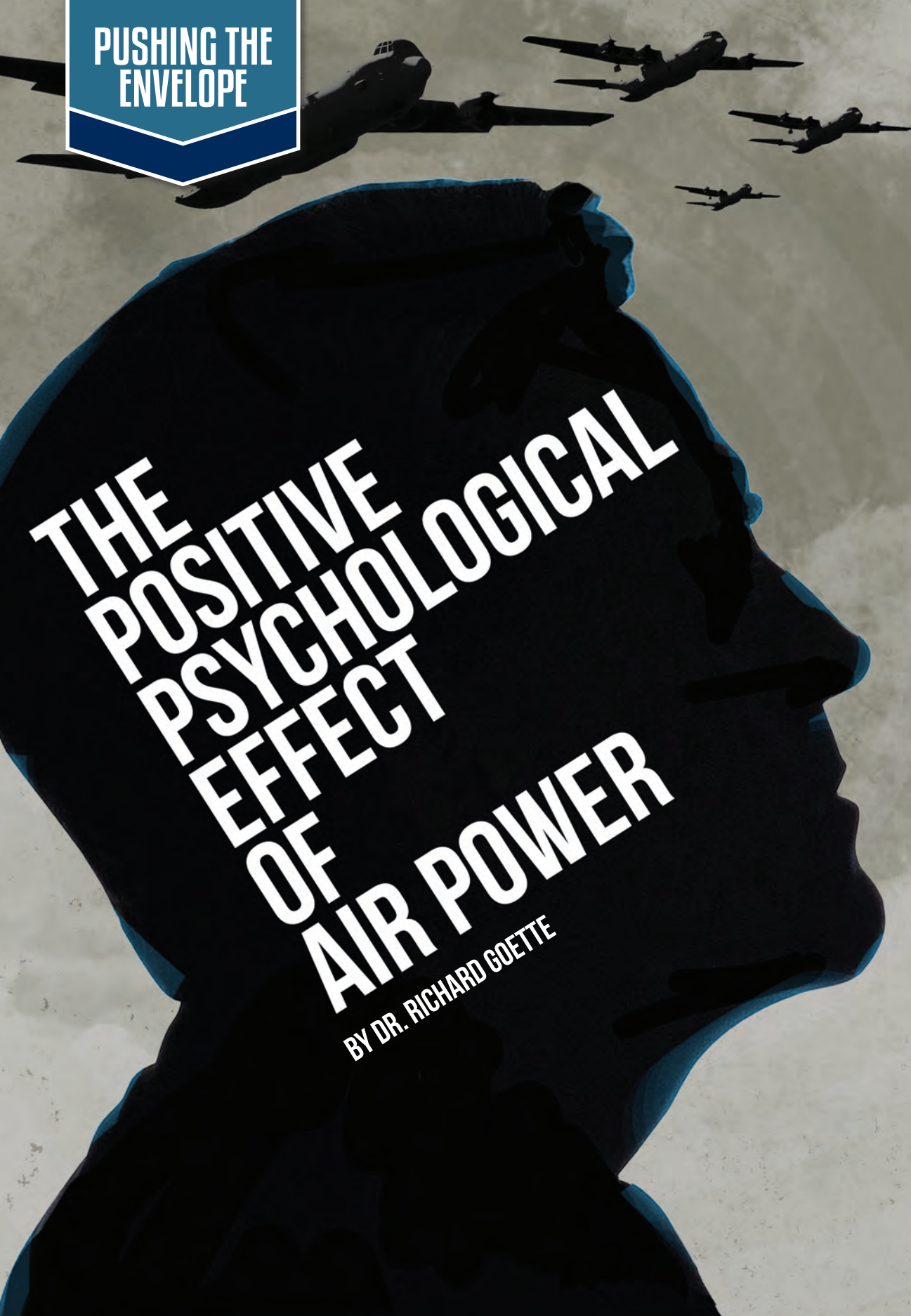
PUSHING THE ENVELOPE



THE POSITIVE PSYCHOLOGICAL EFFECT OF AIR POWER

BY DR. RICHARD GOETTE

THE POSITIVE EFFECT OF NON-KINETIC AIR POWER IS A PROUD CHARACTERISTIC OF THE RCAF THAT PERSISTED BEYOND THE END OF THE COLD WAR AND CONTINUES TODAY...

INTRODUCTION

What is meant by the words "psychological effect of air power?" Oftentimes, thoughts of massed bomber streams and bombed cities on fire come to mind. In terms of written work on the subject, academics and popular aviation writers alike usually point to "kinetic" air power roles such as the strategic bombing theories of Douhet, Trenchard, and Mitchell, the efforts by the Allied Combined Bomber Offensive to attack the morale of the German and Japanese people during the Second World War (WWII), and strategic deterrence theory of nuclear weapons during the cold war. To this grouping we can add efforts to bomb the North Vietnamese "back to the stone age" during the Vietnam War, and also the more recent theories of offensive air power articulated by those such as John Warden and David Deptula. The focus of the psychological effect of this kind of kinetic air power is quite literally on its "impact." This is the use of offensive air forces for the purpose of destroying material, property, services—and sometimes lives—to influence an enemy populace and/or leadership to surrender. In other words, the psychological impact of kinetic air power is to target an enemy's morale to demoralize or to convince that resistance is futile, leading to capitulation.

However, what is often overlooked—or at least under-studied—in the literature is that air power can also have a **positive** psychological effect on people. This includes the reassuring feelings of hope, relief, and safety experienced by allied personnel from the

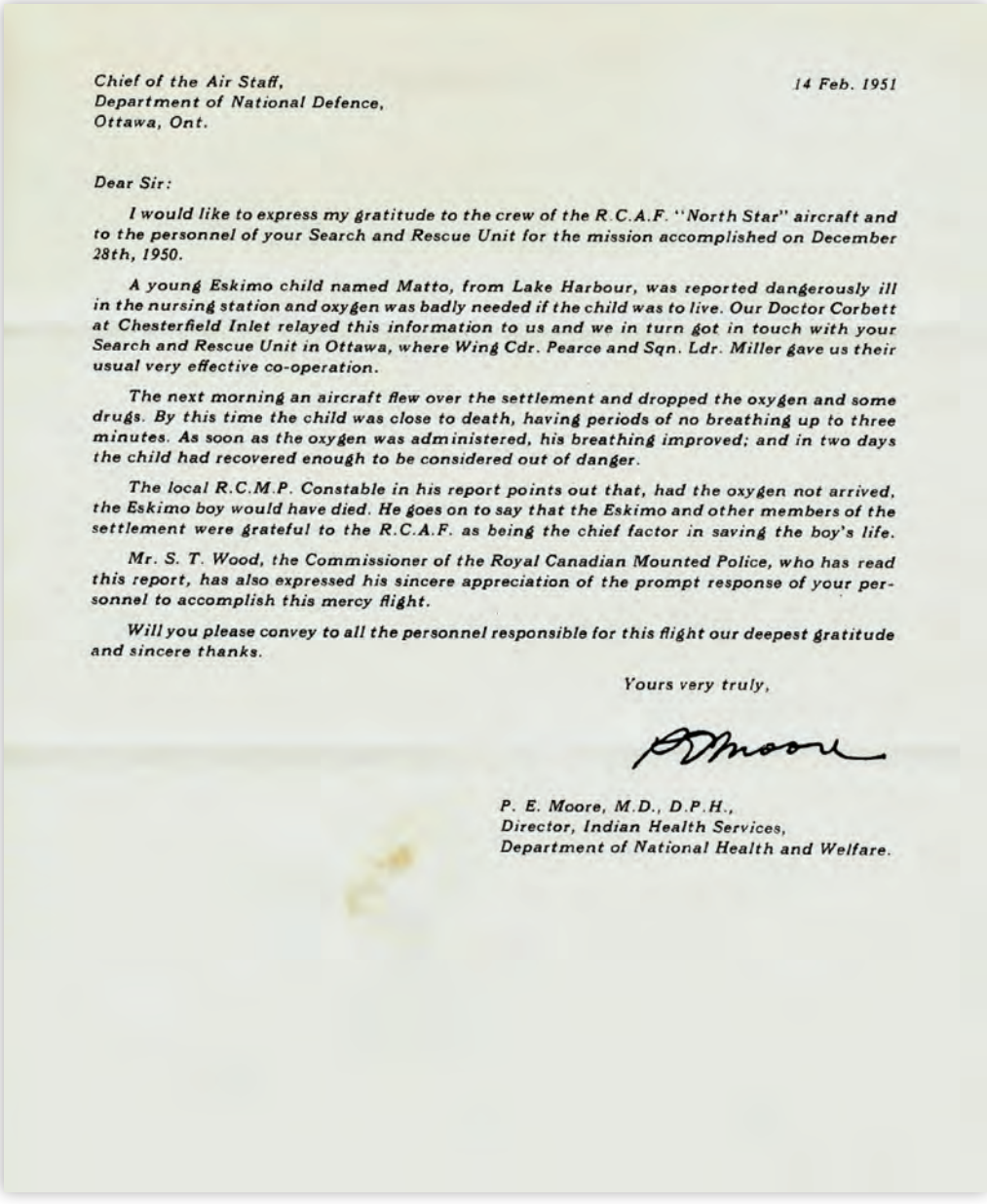
sound of a friendly aircraft during a difficult tactical situation. Most of us are familiar with Hollywood portrayals of soldiers cheering when they get their badly-needed air support, such as P-51 fighter-bombers flying over the beleaguered soldiers in *Saving Private Ryan* (1994), or the sense of relief felt by American GIs on the ground in Vietnam hearing the sound of helicopters coming to evacuate them from an untenable situation, such as in the 1986 film *Platoon*. Though these are "glorified" fictional accounts, they are based on real-life experiences of combatants who have experienced the positive psychological impact of air power. Indeed, there are other examples that we can examine.

For instance, looking at scholarship on the Battle of the Atlantic during WWII, we see that air power in the form of long-range maritime patrol aircraft played a huge role in the protection of convoys bringing supplies overseas and defeating the attack on them by German U-boats. During the dark days of late 1942 and early 1943, when shipping losses were at their highest, there was a real morale problem amongst merchant marine sailors plying the North Atlantic Run.[1] A sense of helplessness was apparent amongst these men as they did not know if the next minute would be their last thanks to a German torpedo. However, there were also a number of sailor accounts—both merchant and navy—of the huge relief that they felt when they saw a maritime patrol aircraft flying above their convoy. The ironic thing is that the aircraft were most effective in a tactical role by patrolling just out of sight of the convoy at dusk, as this is where the U-boat "wolf packs" would gather for their night attacks. Yet just the appearance of a Very-Long-Range (VLR) Liberator or a long-range Consolidated Canso aircraft over the convoy put the sailors at ease, as they knew that they were not alone and that they would get the help they needed.[2]

Nonetheless, we need not limit the positive psychological effect of air power to strictly combat situations. Indeed, there are many non-kinetic roles that air forces play which have an equally, if not greater, positive impact. This includes more "gentler" forms of air power such as search-and-rescue (SAR), air demonstration, and the delivery of supplies and emergency aid by airlift. Indeed, there are many instances in the history of the Royal Canadian Air Force (RCAF) where those in need of help have discovered the simple reassurances of hope, relief, and/or rescue from the drone of an approaching aircraft's engines.

During the cold war, for instance, the RCAF's Air Transport Command (ATC) had a significant psychological impact on people, and nowhere was this more apparent than in Canada's northern region. The ATC roles included SAR missions to assist those in downed aircraft or in medical need, and air transport missions such as delivering emergency aid, and bringing supplies, relief, and joy to numerous individuals, military personnel, government workers, and a variety of communities in the North (including indigenous peoples) who were in need of assistance.

Though listed as a secondary role, oftentimes RCAF aircraft operating in the North found themselves tasked to fly to a remote area in order to help someone in medical need. This was, of course, the mercy flight, which was to be "undertaken when the job is a life-or-death matter, and can be handled by no other normal means, including commercial flying organizations."[3] Whether these missions included evacuating a sick person and bringing them to a hospital, or delivering medicine (sometimes by airdrop) or medical personnel, a common theme was that the mercy flights provided relief and therefore had a positive psychological impact on those in need. Moreover, sometimes such missions paid important dividends for the Air Force. A good example is a 14 February 1951 letter from a Department of National Health and Welfare doctor sent to the Chief of the Air Staff that was reproduced in the RCAF's service magazine, *The Roundel*: "A Tribute to S.A.R.," *The Roundel* 3, no. 5 (April 1951): 47.



Chief of the Air Staff,
Department of National Defence,
Ottawa, Ont.

14 Feb. 1951

Dear Sir:

I would like to express my gratitude to the crew of the R.C.A.F. "North Star" aircraft and to the personnel of your Search and Rescue Unit for the mission accomplished on December 28th, 1950.

A young Eskimo child named Matto, from Lake Harbour, was reported dangerously ill in the nursing station and oxygen was badly needed if the child was to live. Our Doctor Corbett at Chesterfield Inlet relayed this information to us and we in turn got in touch with your Search and Rescue Unit in Ottawa, where Wing Cdr. Pearce and Sqn. Ldr. Miller gave us their usual very effective co-operation.

The next morning an aircraft flew over the settlement and dropped the oxygen and some drugs. By this time the child was close to death, having periods of no breathing up to three minutes. As soon as the oxygen was administered, his breathing improved; and in two days the child had recovered enough to be considered out of danger.

The local R.C.M.P. Constable in his report points out that, had the oxygen not arrived, the Eskimo boy would have died. He goes on to say that the Eskimo and other members of the settlement were grateful to the R.C.A.F. as being the chief factor in saving the boy's life.

Mr. S. T. Wood, the Commissioner of the Royal Canadian Mounted Police, who has read this report, has also expressed his sincere appreciation of the prompt response of your personnel to accomplish this mercy flight.

Will you please convey to all the personnel responsible for this flight our deepest gratitude and sincere thanks.

Yours very truly,

P. E. Moore, M.D., D.P.H.,
Director, Indian Health Services,
Department of National Health and Welfare.

Nor were the positive psychological effects of the RCAF's non-kinetic air power roles limited to SAR mercy flights: air transport missions also proved to raise morale considerably.

Every spring, the ATC conducted a series of resupply missions to replenish outposts of other government departments before the ice landing strips melted. Besides the basics such as food, medicine, fuel, and building materials, aircraft cargo also included recreational supplies to help personnel pass long periods of time at these isolated bases. No matter what they were delivering, the ATC resupply missions were a vital lifeline for those working at Arctic bases, with one author noting that the arrival of the aircraft "at these tiny outposts is heralded as the big event of the season."[4]

One of the most notable air transport roles that the cold war RCAF undertook was Operation SANTA CLAUS every December. In this annual operation, the regular deliveries of mail, parcels, spare parts, fuel, clothing, and fresh fruit were made by RCAF ATC, usually by air drop, to RCAF personnel, other government personnel at the Arctic weather stations, and even Inuit communities. However, also included was a little "something extra," whether it was a Christmas tree and decorations, a new teapot, or maybe some "liquid spirits" to keep one warm and cheerful.[5] Flying conditions, to say the least, were not the greatest—hence the air drops—so those who received the special deliveries were always grateful for the courage, versatility, and determination of the ATC aircrew who undertook them. As one station commanding officer noted, "You've given our morale a hundred-percent lift.…" An American working at a weather station echoed this sentiment, explaining, "You'd be excited too if you knew a bundle was coming down with all your mail for the past six months and perhaps a drop of something special."[6] However, it was one recipient who, calling the departing CC119 Flying Boxcar on the radio, perhaps put it best: "God bless you for coming. God bless you—and a Merry Christmas."[7] Moreover, it was not just those on the receiving end of the supplies who experienced the positive psychological effects of RCAF airlift air power missions. Indeed, it was also the ATC aircrew themselves whose morale was heightened by Operation SANTA CLAUS. As one RCAF public affairs officer captured it, "There is an incomparable thrill about dropping Christmas mail and parcels, watching the bundles parachute to the burning oil barrels below [to indicate where to drop the cargo], and knowing that you are bringing traditional Christmas cheer to lonely people."[8]

A remarkable and more recent example of the positive effect of Canadian non-kinetic air power is one experienced by retired Lieutenant-General (now Senator) Roméo Dallaire during his famous United Nations (UN) peacekeeping mission in Rwanda. Speaking to the audience at a recent Canadian Forces Aerospace Warfare Centre (CFAWC)-sponsored workshop on air power support to the UN, he recalled the uplifting feeling that "the sound of the engines" from Canadian Forces (CF) CC130 Hercules aircraft brought to him and his staff in the midst of their difficult mission. "We didn't care what was in the Hercs," Senator Dallaire noted, but just felt relieved knowing that they had not been forgotten, and that if they had wounded, the aircraft could get them out and get food and supplies in.[9]

The positive effect of non-kinetic air power is a proud characteristic of the RCAF that persisted beyond the end of the cold war and continues today, whether it is delivering supplies to beleaguered flood victims in Manitoba and Quebec, the continuous resupply of Canada's Arctic outposts, providing emergency aid to earthquake victims in Haiti during Operation HESTIA, or even simply the awe displayed on the faces of civilians watching the Snowbirds perform aerobatic demonstrations during air shows throughout the country. Like traditional kinetic air power, non-kinetic air power is also awesome, and it can prove to be very uplifting for recipients and practitioners alike for the positive psychological effects that it can have.

But the question still remains: is non-kinetic air power "real" air power or should we limit our thought on the subject to purely kinetic aspects? Essentially, this depends on one's definition of air power. While some may advocate in a more focused definition that stresses purely kinetic applications of aviation, others favour one that is more inclusive and stipulates that air power can in fact be widened to consist of "the full potential of a nation's air capability, in peace as well as war, in civilian as well as military pursuits."[10] Billy Mitchell, one classical air power theorist—and, incidentally, cousin of a former head of the RCAF[11]—also championed this wide-ranging perspective of air power. In one of the earliest definitions

of the term, he did not distinguish between military and civilian applications of the aeroplane, calling air power "the ability to do something in or through the air, and as the air covers the whole world, aircraft are able to go anywhere on the planet."[12] This "ability to do anything" emphasis, as American air power academic Clayton Chun notes, "brings to mind a strength or power to influence events."[13] The use of offensive or kinetic means such as bombing is a common means to utilize air power to influence someone, but as we have seen, so are non-kinetic roles.

It says here that kinetic air power capabilities have and must still form the principal raison d'être for air forces, as it is the air force's prerogative to carry out a nation's use of military force from the air if deemed necessary by the government. Nonetheless, non-kinetic air power roles also form part of an air force's responsibilities, and in fact form the majority of air force missions, especially in peacetime. Therefore, the positive psychological impact of non-kinetic air power should not be discounted but instead deserves greater study. What do you think?

Richard Goette is an air force historian who teaches for the Canadian Forces College and the Royal Military College of Canada. He is a Research Associate at the Laurier Centre for Military Strategic and Disarmament Studies (LCMSDS) and an Associate Air Force Historian with 1 Canadian Air Division's Office of Air Force Heritage & History. This article was written while he was a DND Security and Defence Forum (SDF) Postdoctoral Fellow at LCMSDS in Waterloo during 2010–2011.

ABBREVIATIONS

ATC	Air Transport Command
RCAF	Royal Canadian Air Force
SAR	search and rescue
UN	United Nations
WWII	Second World War

NOTES

1. See Marc Milner, "The Battle of the Atlantic," in *Decisive Campaigns of the Second World War*, ed. John Gooch (London: Frank Cass Publishing, 1990), 47–66 (especially 57–61) and also his *North Atlantic Run: The Royal Canadian Navy and the Battle for the Convoys* (St. Catharines: Vanwell, 2006).

2. See, for example, sailor accounts in J. Gordon Mumford, *The Black Pit... and Beyond* (Burnstown, ON: General Store Publishing House, 2000).

3. "RCAF Takes Lead in Opening Canada's North," *Canadian Aviation* 27, no. 10 (October 1954): 80.

4. "Arctic Airlift," *The Roundel* 19, no. 3 (April 1958): 20.

5. J. D. Harvey, Director of Public Relations, "Operation Santa Claus," *The Roundel* 6, no. 2 (February 1954): 44–46; J. D. Harvey, "Operation 'Santa Claus,'" *The Roundel* 7, no. 2 (February 1955): 16–20. Quote from former, page 44.

6. Harvey (1955), 19.

7. Harvey (1954), 46.

8. Ibid.

9. Lieutenant-General (Ret) the Honourable Senator Roméo Dallaire, "Air Power Support to the UN Mission in Rwanda," Keynote Address at the 17th Air Force Historical Workshop, "On Wings of Peace: Air Power in United Nations Operations," 15–17 June 2011, CFAWC, 8 Wing Trenton, Ontario.

10. David MacIsaac, "Voices from the Central Blue: The Air Power Theorists," in *Makers of Modern Strategy,* ed. Peter Paret, (Princeton: Princeton University Press 1986), 625.

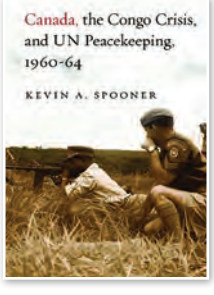
11. Mitchell's first cousin was Air Marshal George Croil, the first RCAF Chief of the Air Staff. Tom Walsh, "Air Marshal George Mitchell Croil, CBE, AFC, MiD: The Father of the Royal Canadian Air Force," *Airforce* 35, no. 1: 30–33

12. Quoted in Clayton K. S. Chun, *Aerospace Power in the Twenty-First Century: A Basic Primer* (Montgomery: United States Air Force Academy in cooperation with Air University Press, 2001), 2.

13. Ibid.

BOOK REVIEWS

CANADA, THE CONGO CRISIS, AND UN PEACEKEEPING, 1960-64



By Kevin A. Spooner

Toronto:
University Of Toronto Press, 2009
296 Pages
ISBN 978-0-7748-1636-6

Review by
Lieutenant-General W. K. (Bill) Carr (Retired)

Through meticulous research, Dr. Kevin A. Spooner has produced a very readable and authoritative story of the 1960s Congo Crisis which, to that time, was the biggest and most expensive peacekeeping operation the United Nations (UN) had ever undertaken. How Canada became involved, what we were there for, and how we fared is explored at a level of detail that has heretofore never been published.

Having been the first and founding Commander of the Opération des Nations Unies au Congo (ONUC) Air Transport Force, I was not just exposed to key air transport activities in support of the widely separated UN Military Peacekeeping units spread over the nearly one million square miles of the Congo, but also provided with the unique opportunity to participate in the ponderous decision-making process of the UN hierarchy. How ponderous this was comes through clearly in Spooner's tale. A surprise to me though was how ponderous indeed was the behind-the-scenes machinations on the political front in Ottawa as well.

At "the sharp end" in Leopoldville at ONUC Headquarters (HQ), on the other hand, we airmen never once felt reluctance from Ottawa by either the government or our Air Force to give us anything but complete and unconstrained support in how we did what we had been asked to do.

From personal experience, I knew Canadian Army and Royal Canadian Air

Force (RCAF) operating doctrines were different, even though the *National Defence Act* was the guiding policy directive for both of them. The Army believed and practiced a centralized control of activities. The Air Force, on the other hand, delegated authority as far down the pipe as could legally be done. As is clear from the author's text, in the Congo, the Canadian Army Signals Squadron seemingly had to clear virtually every decision needed with the office of the Chief of the General Staff in Ottawa. Meanwhile, RCAF involvement was spelt out succinctly in a couple of pieces of paper, and we were told to get on with the job and call if assistance was needed or insurmountable "headwinds" sprang up. My posting notice told me I was to proceed to the Congo, report to the Commander in Chief (CINC) and set in motion the machinery needed to operate and control the internal and external airlift operation for ONUC. I was provided a small core of RCAF experts to help me!

We airmen had a free hand to get things done and we really were not much involved with the Canadian Army Signals operation. There was no senior Canadian officer or HQ per se, and the Army colonel and I saw each other on occasion, but there was never a need for us to have meetings. We had different jobs and worked for different kinds of practitioners of the art of leadership back in Ottawa. My job was clearly a UN one, his was both national and UN. The accounts of the kinds of reports he had sent to Ottawa were, to say the least, surprising in their inferences. From what I saw, there was little of substance to back up some of the material he forwarded. Our reports to the Chief of the Air Staff contained quite different and more optimistic conclusions.

The only area where I think this excellent book could bear widening is in that of the air support operation, especially during the first six months. Without this support the operation could not have functioned! More than 20,000 peacekeepers from 28 nations were spread over a vast country in widely separated locations. The importance of the role played by the Canadian Signals personnel in connecting these tentacles comes through clearly. But equally important and unmentioned was the role played by the air transport crews and aircraft in feeding them, bringing them mail, and in connecting them with the rest of the world. Roads and railways were practically non-existent in many parts of the Congo and the pre-independence river infrastructure had collapsed.

There were airmen from fifteen nations flying eighty-one aircraft of eight different types in the UN Air Transport Force, and I commanded them on behalf of the Supreme Commander. I could "hire and fire" personnel and did on one occasion. (While clearly justified, my action created some diplomatic heartburn.) While I could influence how we used RCAF flights into and in the Congo, I was still very much a UN commander.

How we got the UN Air Transport Force to rise to the stage it had to is a long story, including the actual training of some of the aircrew who were not type qualified when they arrived. There were two formed C-119 Squadrons, Italian and Indian, and they were the core of our success. We also retained Air Congo DC 4s and a Scandinavian Airlines System (SAS) Convair 220 under contract.

Not only did we operate the airlift, we also inherited several main airfields and their facilities. However, we lacked the expertise to fill the necessary air traffic control slots vacated by the Belgians, so we brashly contacted the International Civil Aviation Organization HQ in Montreal. Surprisingly and fortuitously, this generated a quick supply of the several professional air traffic controllers we urgently needed.

The UN staff was charged with the responsibility to provide logistic support for the whole of ONUC. This included getting for us the bits and pieces needed to keep the

aircraft flying. The UN supply system, though, was hopelessly overloaded, out of its depth, and was virtually impotent when it came to aircraft support.

On the suggestion of an RCAF supply sergeant in our crew, via our special RCAF long-range single-side-band radio, we got Ottawa to agree we could request bits and pieces for all our aircraft directly from the RCAF's Air Materiel Command, even for the Italian and Indian aircraft, and RCAF Supply would meet our demands and then bill the UN for repayment. It worked beautifully and amazed many, including the foreign C-119 crowd and the out-of-depth UN logistics staff.

While I do not blame the author, the image with which one is left of Lieutenant-Colonel J. A. (Johnnie) Berthiaume is unfortunate. Berthiaume was one of the ablest and best officers I have ever met in the Canadian Forces. He was an incredibly supportive and loyal aide to General Carlsson Von Horn, the first commander of ONUC, who trusted him completely. Berthiaume was superbly politically sensitive and he could sway even the most ardent UN bureaucrat to act! He and Colonel Joseph-Désiré Mobuto, a central character in the chaotic Congolese political situation, became close friends.

The UN brass did not take to Berthiaume because they knew he knew more about the Congolese political situation than they did. When the Secretary-General's UN representative ordered the closure of the airports to forestall some perceived Lumumba exploit [Patrice Lumumba, the first legally elected Prime Minister of the Republic of the Congo], we of course said "yes" and ignored it. After the fact, Berthiaume told the CINC, who laughed loudly and warned us he had not heard what he had just been told! We had to feed the troops and we had to allow the in-flow of external airlift by Canada and the United States, not just "knee-jerk" react to some inane political solution to a perceived problem.

Contrary to what the UN brass believed, the only time we closed the airports, during my tenure, was the occasion when the Russians arrived with twelve IL-2 transport aircraft at Stanleyville loaded with "military" supplies for Lumumba. (What Lumumba was up to is superbly covered in the book.) The Ethiopian colonel in charge of the UN forces at Stanleyville called and passed the information to us. I spoke to CINC and Berthiaume and suggested we let them refuel, file their flight plans to Leopoldville, and then, by blocking all the runways with vehicles or gasoline barrels and so forth, close all the airports including the one they had just left. We did, and the Russians, with nowhere to land, returned to Khartoum. Not a word appeared in the press nor was heard from the Russians later.

Finally, General Von Horn does not emerge in the book as having been a particularly good CINC. I was sad to draw this inference, and I may be wrong, but to me, he was a warm, smart, and dedicated UN commander dumped into the most difficult role the UN peacekeepers had seen to date. He fought for his troops and he did well for them. The fact that he may have lacked experience that would have better equipped him for the job is a moot point. But, who is to judge, as there was no precedent for ONUC.

I liked Von Horn. I respected him and was loyal to him. I felt sad and resented the fact that his UN bosses, aided by input from a very ambitious Secretary-General Military Advisor who yearned for the CINC appointment, on occasion openly chose to ignore Von Horn's counsel. I was greatly honoured a couple of years later to help host Von Horn during his official visit to Canada and made sure he knew we thought he had done a first-class job.

Spooner's book is, to me, a particularly special one. The author's penchant for doggedly seeking out the factors behind many of the sometimes obscure decisions taken, especially during ONUC's later years, reveals a rare devotion to one's craft. No one,

to my knowledge, but Spooner has taken the time to chronicle accurately and objectively the subsequent events which led to the final "dismemberment" of ONUC.

This is a good book. It's factual, and is superbly researched. Written history can be dull, but this is one case where it is not! I recommend it as a great read!

Lieutenant-General W. K. (Bill) Carr (Retired) joined the RCAF in 1941 and flew 143 photographic missions over Europe, Malta, North Africa, and Sicily in Spitfire aircraft. During the post-war years, he advanced rapidly in rank, serving as Deputy Chief of the Defence Staff from 1973 to 1975, following which he was appointed the first Commander of the Canadian Forces Air Command. He is known as the "Father of the Modern Air Force" for his work in consolidating military aviation in the aftermath of the unification of the forces. After retiring from the military in 1978, he joined Canadair Ltd., where he enjoyed a remarkable career in worldwide marketing of the then-new Challenger business aircraft.

Abbreviations

CINC	Commander in Chief
HQ	headquarters
ONUC	Opération des Nations Unies au Congo
RCAF	Royal Canadian Air Force
UN	United Nations

EARLY CANADIAN MILITARY AIRCRAFT: ACQUISITIONS, DISPOSITIONS, COLOUR SCHEMES & MARKINGS VOLUME 1, AIRCRAFT TAKEN ON STRENGTH THROUGH 1920

By John A. Griffin and Anthony Stachiw

Illustrations by Andrew Tattersall

Kitchener, Ontario: Aviaeology by SkyGrid Publications, 2010
296 pages
ISBN 978-0-9780696-6-7

Review by
Major Andrew B. Godefroy, CD, PhD

Canadian military history tends to lag behind other nations when it comes to the publication of solid reference materials that accurately describe its people, organizations, institutions, and formations. Our official history offices are chronically under-resourced to take on the gargantuan tasks of writing and producing accurate service histories, and most other writers instead prefer to focus on either entertaining popular accounts or detailed academic scholarly works, resulting in a serious gap in the literature that must be filled by someone in order to effectively connect the two. Those who undertake the incredibly time-consuming task of presenting knowledge on a Canadian military subject with such totality are therefore to be commended for their efforts, for it is no small task to produce a work such as the one reviewed here.

Griffon and Stachiw's *Early Canadian Military Aircraft: Acquisitions, Dispositions, Colour Schemes & Markings*, is the first volume in a planned series of technical and development histories that will very likely become *the* reference on aircraft taken into Canadian service between the two world wars. Using the tremendous research archives and personal library of Royal Canadian Air Force (RCAF) pilot and aviation historian John Griffin (1922–2008), the authors, editors, and illustrators have undertaken a labour of love to give Griffon's lifelong work a permanent place in Canadian aviation history.

Volume one covers the first 7 of a total of 58 early Canadian military aircraft that will

be examined in this series. Specifically, this volume details the evolution and operational service of the Avro 504K/L, the DeHavilland DH9A, the Royal Aircraft Factory SE5a, the Curtiss HS-2L, the Bristol F.2B Fighter, the Curtiss JN-4, and the Fairy IIIC Transatlantic. The development background and particulars, service history, fleet list, and colour schemes and markings are provided for each plane, offering the reader copious amounts of detailed information in a format that is both clear and concise. Included with this information are wonderful full-colour, five-view illustrations not just of each plane, but also of every known colour scheme ever applied to that particular aircraft. So for example, the book includes no less than 26 pages of full-colour, multi-view illustrations of the Avro 504 K/L, many of which have never been produced in colour or in all five perspectives ever before. All of the schemes and markings are based upon either photographic evidence, primary-source documentation, or material artifacts, much of which has since been deposited in the John Griffin Library at the Office of Air Force Heritage and History, 1 Canadian Air Division, Winnipeg.

Reference books of this nature often have a wide appeal and this volume will undoubtedly deliver. For the historian and general reader the book offers a complete technical and development history of these aircraft; for the aviation enthusiast, there are endless seldom-seen and some never-seen-before pictures of these aircraft in service. For the museum conservationist or modeler, the colour references offer unprecedented detail regarding schemes and markings, as well as a nearly endless number of variants from which examples could be built and represented. It is a remarkable collection of historical data, fused into information in a manner that provides quality analysis of early Canadian military aviation told through the machines upon which it was built. The only minor complaint is that the book lacks a detailed bibliography of primary and secondary sources employed. Understandably, the quantity of sources consulted to produce a book of this quality would likely be enough to fill a volume of its own, so it is hoped that the editors and publishers might consider producing a companion to the series that offers other aviation historians and enthusiasts a research reference of this sort. Otherwise, this volume is a magnificent start to what promises to be one of the best Canadian military aviation references ever produced, and this reviewer looks forward to the next release.

Major Andrew B. Godefroy is presently a strategic analyst and historian with the army's Directorate of Land Concepts and Designs as well as editor-in-chief of the Canadian Army Journal. He holds a PhD in War Studies from the Royal Military College of Canada, and was recently the 2009–10 Canadian Visiting Research Fellow in the Changing Character of War Program at Oxford University.

THE BLACK FLIGHT, MEMOIR OF AIR VICE-MARSHAL RAYMOND COLLISHAW

By Raymond Collishaw, CB, DSO, DSC, DFC (with Ronald Dodds)

Ottawa:
CEF Books, 2nd edition, 2008
272 Pages
ISBN 978-1-896979-29-8

Review by
Major W. Greg Castagner, CD

The Black Flight is the memoir of one of the greatest Western fighter aces of the First World War (WWI), and the second top scorer amongst Commonwealth aces, Raymond Collishaw.[1] It was originally published in the United Kingdom (UK) in 1973, as *Air Command*; however, it was never released in Canada.

Raymond Collishaw was born in Nanaimo, British Columbia, in 1893, and joined the Canadian Fisheries Protection Service in 1908 as a stripling 15-year-old cabin boy. He transferred to the newly established Royal Canadian Naval Service in 1910 and eventually took a commission and worked his way up to first officer.

The book details his trials and tribulations with the outbreak of war in Europe to get into the fighting, and his attempts to enter pilot training. The reader will be amazed at his tenacity in the pursuit of this goal in the face of nearly insurmountable odds. Air power of the day was very new, very fragile, and very expensive; it was neither understood nor appreciated by politicians, bureaucrats, or military tacticians. Collishaw persisted in getting to England and learning how to fly (some of it at his own expense) and eventually was accepted as a military pilot. After training, he arrived on the western front in August of 1916 and immediately took the fight to the enemy. The uses of air power of the day were entirely developmental, and his first squadron, No. 3 Naval Squadron, was employed bombing industrial targets in Germany. With losses to German fighters mounting, the idea of a fighter escort came into being. Raymond Collishaw flew the first of these missions and never looked back for the remainder of the war.

Later, as a naval lieutenant, and an experienced and accomplished pilot, he served with No. 10 (Naval) Squadron of the Royal Naval Air Service as a flight commander. Each of the squadron's flights painted their aircraft a distinct colour (aerial fighting at the time depended more on coordination and de-confliction than surprise). Collishaw's flight's aircraft were all painted black and became "The Black Flight." His personal aircraft was named "The Black Maria." By the fall of 1917, the Black Flight had shot down 87 German aircraft, an amazing record for this period of the war, and easily one of the clear successes of the entire allied air effort. It is interesting to note that one of the enemy units opposing Collishaw and his comrades was *Jagdstaffel* 11, Manfred Von Richtofen's famed "Flying Circus."

During his time as a fighter pilot, Collishaw scored 61 confirmed aerial victories. Most of those victories were scored during the bleak days of spring 1917 when the Germans had firm control of the air over the western front. The reader should note that these victories were all scored in open-cockpit biplanes using guns that jammed frequently and engines and aircraft that were unreliable more times than not. At war's end, and at the ripe age of 26, he was the commander of No. 3 (Naval) Squadron (which became 203 Squadron with amalgamation) and had accepted a regular commission in the newly formed Royal Air Force (RAF).

The memoir continues through the end of WWI into Collishaw's experiences as a squadron commander in South Russia during the Russian Civil War. Western powers attempted to aid the White Russian forces with air support and a training program. The reader will be able to draw many parallels between this event and current international training initiatives. His experience in Russia was nothing less than amazing. Though there was little significant aerial opposition, ground fire was intense; the front was very fluid, and White Russian leaders were thoroughly incompetent. Collishaw was stricken with typhus during this time and nursed back from near death by a Russian aristocrat in a small cottage.

With the withdrawal of British support to the White Russians, Collishaw continued in RAF service in smaller wars in Iraq and India. In all theatres, he managed to escape from the most hair-raising adventures and integrate whatever air power was available to the needs of the day, pioneering in many ways the manner in which aerospace power is used today.

Collishaw attended Staff College and went on to command another squadron and an RAF base in England. Further service saw him in North Africa at the outbreak of the Second World War. Now an air commodore,

he was the commander of the RAF forces in North Africa and responsible for the defence of Egypt and the Suez Canal against the Italians. The Italian Air Force there enjoyed five-to-one force superiority over the RAF, a much shorter supply line, technically superior aircraft, and pilots with recent combat experience over Spain. Collishaw's force consisted of outdated or converted civilian aircraft flown by green pilots with a very long line of communication to England. Faced with a hopeless situation like this, he did what any decent commander would do: he attacked immediately! Collishaw undertook an aggressive, audacious (and sometimes comical) campaign to take the fight to the enemy. Through aggressive strikes he deceived the Italians into thinking the RAF was a very much larger force than it really was; within eight months he had completely routed the Italian Air Force in North Africa, and inflicted significant damage to their army and navy as well! While the book focuses on his activities during WWI, he was most satisfied with his performance during this time in North Africa.

Again, the bulk of the work is devoted to his time in France during the Great War, which is my only criticism. There is a great deal of detail here in both the daily routines and the missions flown, after a while it all becomes somewhat repetitive. Collishaw pauses frequently during the narrative to remember his fallen comrades in a very sombre and dignified manner. This is telling in that three of the squadrons he served with during the war were all numerically wiped out at least once, twice in one case. Collishaw saw the genesis of air power as a significant means of force application, developed tactics for the use of air power in both major combat with a peer-enemy, and in civil war and counter-insurgency. He witnessed the amalgamation of air forces from separate services, and rose to very high levels of responsibility and authority within an increasingly professional force.

The Black Flight is an incredible adventure story of an exceptional man and a great Canadian hero. Raymond Collishaw was widely respected for his skill as a pilot, his leadership abilities, professionalism, great energy, keen intellect, and humility. While the book is strictly a narrative of Collishaw's experiences throughout an incredible time in modern history, he does take the time to comment on historical and military events both from the perspective of leadership and as a direct participant. Amazingly, the reader can easily draw many parallels in the political and military climate between now and then.

I fully endorse this book. I would unreservedly recommend it to anyone aspiring to higher levels of responsibility within an air force or to anyone who desires a perspective of the life of a pilot on the western front of WWI. It is regrettable that this important piece of Canadian history was not available sooner and that this story was not more widely known.

Major W. Greg Castagner is a pilot with tactical fighter experience as well as joint combat experience as the Officer Commanding the Tactical Air Control Party with Joint Task Force Afghanistan. He is currently serving with 436 Transport Squadron as a squadron operations officer.

Abbreviations

RAF	Royal Air Force
WWI	First World War

Note

1. Depending on the source, Collishaw's ranking is listed as third behind England's Edward Mannock (73 victories attributed) and Canada's Billy Bishop (72 victories). In this book, Collishaw is given credit for 61 victories; however, given the scoring criteria of the day, totals for all three of these airmen are often disputed. What has never been questioned is their courage.