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PEACE-SUPPORT OPERATIONS

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THE RCAF AIR TASK FORCE

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THE ROYAL CANADIAN
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Item	Word Limit*	Details
Letters to the Editor	50–250	Commentary on any portion of a previous <i>RCAFJ</i> .
Articles	3000–5000	Written in academic style.
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AUTHORS ARE ASKED TO NOTE THE FOLLOWING GUIDELINES:

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EDITOR'S MESSAGE

Here we are with the last issue of 2015, and what a year it has been! Canada has a new prime minister, the Canadian Armed Forces has a new chief of the defence staff and the Royal Canadian Air Force (RCAF) has a new commander—definitely a year full of change. Yet, it sometimes seems that the more things change, the more they stay the same; the world is still a challenging place. The nation still needs to project air power in support of defence and foreign policies, and Canadians still need professional airpower practitioners to ensure the RCAF's efficiency and effectiveness. So for most of us, it will be business as usual.

Keen-eyed readers will have noticed that I employed both “air power” and “airpower” in my opening paragraph. This is not a typo. In the coming months, you will see these two terms used in varied forums in order to spark discussion on the definition of, requirement for and plan to achieve professional mastery of our chosen profession. So stay tuned, put your thinking caps on, and jump in on the discussion. And remember, as difficult as it might be to deliberate on the nuances between air power and airpower, your troubles are “minor” when compared to those who have to ensure a coherent translation of the terms in both official languages.

As well, 2016 will see Canada and the RCAF commemorate the British Commonwealth Air Training Plan (BCATP), arguably this nation's, at least from an air-power point of view, greatest contribution to victory in the Second World War. Material on the training scheme will be available via RCAF social media and in the various air museums. A commemorative issue of the *Journal* on the BCATP is planned for the summer months.

And for this issue ... enjoy the read. 🇨🇦

Sic Itur Ad Astra



Major William March, CD, MA
Senior Editor


Abbreviations

BCATP British Commonwealth Air Training Plan

RCAF Royal Canadian Air Force

As nations become more dependent on space-based assets and as the commercial sector continues to invest in outer space, the defence of space will become of increasing interest.¹

— The Future Security Environment 2008–2030



To Earth Orbit and Beyond:

Discussion Points for a Strengthened Canadian Defence Strategy in Outer Space

By Major Joshua Kutryk, CD, MSc

Introduction

Western militaries have reached an unprecedented level of dependency on space just as they are discovering the precarious vulnerabilities that space introduces to their national security. Indeed, satellite support is increasingly intertwined with military operations, specifically, and with national security, generally. So much so, in fact, that there may presently exist a discrepancy between the security and defence challenges Canada faces in space and the readiness of national strategy, civilian and defence alike, to deal with them. Even without considering the complexities of space weaponization, there remains a steadfast requirement for Canadian policy—in terms of the Canadian Armed Forces (CAF) but also the wider national-security organization in general—to recognize the present and growing militarization of space.²



Although internal Canadian defence studies have regularly concluded that “the world is at a point where falling behind in space security may prove to be fatal to a state’s sovereignty,”³ any significant policy efforts to evolve the country’s defence organizations accordingly remain difficult to discern. Clear and comprehensive strategic guidance is required for the Department of National Defence (DND) to be successful in the space environment, but such policy has been slow to promulgate. There is presently no published defence space strategy or policy (the last one being officially

published in 1998), and space as a topic continues to be under-represented in the wider national-security discussion. Accordingly, national space plans have not accounted sufficiently for either the requirements or contributions of the defence sector. That significant defence space initiatives have recently been undertaken successfully is likely due more to the pragmatism of DND leadership than to the coherent direction granted by any departmental or national space policy.

Specific to CAF, and particularly to the Royal Canadian Air Force (RCAF) within it, policy makers should accept that emergent trends are emphasizing already-existing requirements of a Canadian military space programme while generating a host of new ones. This article is a limited survey of the Canadian-defence space issue, aiming only to present certain aspects of the space environment in order to demonstrate their increasing relevance to both CAF as well as to the wider issue of national security. In doing so, it presents a case for a robust defence space strategy—guided by a clear, concise, and interdepartmental policy—not only on the basis of current military space dependencies but also on the expectation that the Canadian defence organization will soon face an expanded security role in space. Both perspectives indicate a requirement for a comprehensive and deliberate approach to DND’s space programme, one that can reliably yet efficiently ensure military capability in space while also confronting the national-security challenges that are emerging there.

Space as an enabler and its impact on military operations

More than 20 years ago, the Gulf War demonstrated to defence leadership CAF’s “near outright dependency on American space support.”⁴ Throughout the conflict, reliance on space assets was consistent: satellites detected missile launches, discovered enemy formations, provided navigational cuing, analysed the weather, and provided instantaneous communications between field commanders and strategic staffs.⁵ Years later, this dependency of military operations on space continues to accelerate. Furthermore, there is evidence to suggest that military planning processes still underestimate the full extent of satellite dependency. After a United States (US) Army–sponsored war game analysed a 2020 scenario in which an in-orbit, indiscriminate explosion electromagnetically degraded satellite capability, a report bluntly related the results: allied “military forces just ground to a halt.”⁶ Even more noteworthy, the modus operandi of Western militaries now relies on space-based assets that are in large part commercially owned. During Operation IRAQI FREEDOM, the US military witnessed a 560 per cent increase in the use of commercial satellites for military purposes.⁷ And during Operation ENDURING FREEDOM in 2003, 60 per cent of military communications reportedly passed through civilian satellites.⁸ Some studies have estimated that commercial satellites provide 80 per cent of Western military space-based functionality.⁹ Contemporary British aerospace doctrine summarizes the issue well, emphasizing the general vulnerability created

for a nation when “over ninety percent of current ... military procurement projects rely to a greater or lesser extent on space.”¹⁰ The Canadian military, certainly, is no less dependent on space, nor is it any less affected by the recent trends in space militarization and commercialization.

Many of CAF’s most sophisticated weaponry systems rely on uninterrupted access to the global positioning system (GPS) satellite array, without which, employment capability becomes significantly degraded. Such systems are increasingly designed to counter GPS-denied environments, with encrypted signals and alternate guidance modes frequently incorporated; however, and as with other examples, satellite dependency transcends the oft-cited ways in which such space assets enable military operations. The precision time and position data provided by the satellites also dictate the algorithms of many military communications and data-link networks that rely on frequency-agility techniques for security.¹¹ Even more fundamentally, military operations—especially domestic ones—assume a certain baseline functionality of civilian infrastructure, much of it also entirely dependent on GPS satellites. Basic yet critical workings of society depend on the same GPS timing signals for applications, ranging from air traffic control to cell phone time synchronization.¹²



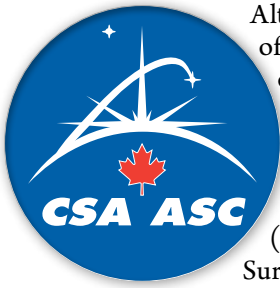
But GPS is only one of many examples demonstrating the extent to which Canadian military operations currently depend on space. Increasingly, remote-sensing data is critical to military operations, and it, too, is frequently obtained from commercially owned or operated satellites. This very issue is known to have created problems for the US military in Afghanistan where, in order to safeguard sensitive operational imagery, the Pentagon was forced to buy exclusive rights to the products of remote-sensing company Space Imaging.¹³

In Canada, a domestic—albeit similarly intriguing—example is to be found with the mostly successful evolution of the RADARSAT (Radar Satellite) programme. Although the programme has developed with DND as a main partner (and with the intent of satisfying the military requirement for remote-sensing imagery as a main objective), it actually accentuates the argument for a more robust and indigenous space programme within CAF. Contemporary military planning does not sufficiently account for civilian remote-sensing systems becoming unavailable, and cases of DND data requirements being undermined by data limits or other priorities already exist.¹⁴ In 2014, the *Ottawa Citizen* reported that DND would be at risk of utilizing its entire data allotment under the RADARSAT agreement by 2017, a date that was earlier than originally predicted due to the satellite having become so “essential, particularly for the military’s surveillance of the country’s coastline.”¹⁵ The report indicated that DND was experiencing exponential growth with the use of RADARSAT data for military applications, and it noted that RADARSAT was contractually bound to deliver on data agreements with other countries as well, including Norway, the US and China as part of its ongoing commitments.¹⁶ Such dependency of military operations on commercial remote-sensing satellites and, even more importantly, the rates at which these dependencies are expanding represent significant challenges for DND space-policy formulation. That the RADARSAT programme has obligations to supply data not only to other departments within Canada but also to other national governments and commercial companies is, in the best case, a contingency that DND space policy must account for and, in the worst case, a significant security vulnerability.

Canadian military space dependency is poised for exponential expansion if only because of the already expanding list of future applications. As the military will expectedly embrace many of these new, forthcoming satellite applications, CAF's requirements for space data may be set to accelerate at rates that will exceed the capacity of national space assets to keep pace. The Automatic Identification System (AIS) is one example of a relatively new technology promising to be a force multiplier in novel ways. Incorporation of AIS systems aboard satellites carries with it the potential for real-time data on the position and trajectory of nearly every ship greater than 300 tonnes in the world. CAF has been clear regarding its intent to rely on AIS data in maritime surveillance roles,¹⁷ proposing the system for inclusion on the RADAR-SAT Constellation Mission (RCM); however, therein lies a significant shortcoming. When space-policy decisions cannot be made within the framework of guidance or government commitment that a defence-oriented National Space Plan and/or DND Space Strategy would provide, they become adrift in the sea of national security. A pragmatic and passive "just-enough" approach to defence space issues is adopted, while space dependencies and vulnerabilities accelerate, in most cases without being properly anticipated or addressed. In this case, and despite DND's AIS plans for RCM, the government's 2012 budget did not reference the satellite constellation at all, leaving industry stakeholders to speculate whether the project would proceed. MacDonald, Dettwiler and Associates reacted by restructuring its workforce, releasing more than 100 of the engineers necessary for the project.¹⁸ In the end, the programme did advance, but the lack of government commitment to a long-term vision or strategy for CAF in space created consequential inefficiencies for industry and defence planners alike.

The development of space technologies with defence applications contributes to a user expectation within DND for real-time, priority access to space data across all scenarios. Already, military leaders in Canada likely take the availability of space-derived data for granted.¹⁹ For instance, the Canada Command lessons-learned document from the 2011 crash of First Air Flight 6560 revealed that real-time space surveillance of the crash site had not been available, and it went on to recommend that the federal government "look at expanding satellite coverage by procuring new initiatives that give 100% satellite imagery coverage of the north."²⁰ The accelerating dependency on, and expectation for, space support within DND manifests the requirement for a greater national policy prioritization of the defence space sector. In space, any dichotomy between resource availability and user expectation only heightens CAF's vulnerability there.

The promise of technological developments, then, will require Canadian defence space programmes to expand in concert, something that will demand a formal policy approach. Microsatellites stand as one example of a technology niche into which DND could reasonably advance, benefiting not only DND but also the economic situation of the entire Canadian space sector, if government policy was only oriented towards encouraging it. A Defence Research and Development Canada (DRDC) proposal recently recommended that defence microsatellites, each weighing less than 100 kilograms, be used to provide "persistent wide-area coverage" services.²¹ Such satellites would augment the capability of CAF with an economical, responsive, and flexible solution that, importantly, would be indigenous to CAF. It would further operationalize space for defence organizations, in the process providing solutions that would be more independent, secure, and responsive to defence requirements. Other nations have already expressed intent to develop defence programmes based on microsatellite technology. A 1999 United States Air Force study has recommended that the US government pursue microsatellites as a matter of priority.²² In the United Kingdom, aerospace doctrine has described microsatellites as "a potential route for the development of indigenous space capabilities as an alternative to cost-sharing or negotiating access to the space assets of allies and partners."²³ The future use of microsatellites by militaries is, to a certain extent, inevitable. For now, they serve as a useful example of the type of space capability that will likely become necessary for even relatively small-force countries like Canada.



Although cost remains a significant obstacle to defence programmes regardless of their nature, it alone should not be assumed to negate the inevitability of certain technological developments and dependencies. Canadian defence scientists estimate that, if pursued, capable microsatellite capabilities could be developed for between \$15 and \$30 million per platform, a comparatively small sum given the capability.²⁴ In Canada, such technologies have already been demonstrated, with partnerships between the Canadian Space Agency (CSA) and DRDC leading to the development of both the Near Earth Orbit Surveillance Satellite (NEOSSat) and the Maritime Monitoring and Messaging Microsatellite (M3MSat). In both cases, the involved agencies concluded that partnering had allowed them to “leverage each other’s funding, resources and expertise.”²⁵ Beyond practical applicability, such technologies are also insightful demonstrations of the organizational construct for national space-sector oversight and policy that may soon become necessary in light of future security-policy paradigms.

The dependency of Canadian military operations on space support should not be underestimated. It is persistent and pervasive throughout the entire defence organization; more importantly, it is primed for rapid expansion. In light of contemporary examples, the 1992 Space Awareness Study’s conclusion that space would shortly be identified as an operational centre of gravity²⁶ is very likely no longer a strategic prediction. It is a strategic truism, and it should be regarded as such at all levels. The Chinese military’s assessment of space having been a “battle winning advantage”²⁷ for the West during recent middle-Eastern engagements is equally valid. The Space Foundation’s 2012 report seemingly agreed, publishing similar conclusions while summarizing the extensive reliance on space that had enabled one of the most sensational, well-known military operations of the present decade: the discovery and killing of Osama Bin Laden.²⁸

Space as an operating environment and its impact on national security

The relevance of space to military operations can be extrapolated to the developing requirements for a more security-oriented national space programme in general, a programme in which DND will—by necessity—play a leading role insofar as the security of civilian space capability is concerned. Canadian government correspondence from 2000 acknowledged that certain threats to national security from space were increasing in prominence and that many of them would become DND responsibility.²⁹ Canada, therefore, requires a defence space programme that addresses space as an independent operating environment in which DND will bear increasing responsibility for the national-security concerns that exist there.

Aspirations to keep space peaceful-purposed—despite their good intentions and logic—do little to actually ensure freedom in space. Indeed, any conceptualization of space as a free, uncontested domain is erroneous even if significant (and contemporary) treaty and policy efforts continue in their endeavours to preserve the “sanctuary” of space.³⁰ The increasing societal importance of satellite capabilities is simply too great to be ignored; rather, it is directly responsible for increasing the importance of these capabilities as targets for Western adversaries.³¹

Canadian policy makers should view space as an increasingly contested operating environment if only because the technology needed to contest it is proliferating rapidly. Many examples apply, including a well-known case whereby China, in 2007, intercepted and destroyed one of its own satellites with a ground-based weapon, in the process creating an estimated 300,000 pieces of space debris.³² In doing so, China not only revealed to the world a significant strategic capability; the ensuing and foreboding debris cloud demonstrated the potential for unilateral action in space, no matter the intention, to result in potentially catastrophic problems for much more than only military operations.

Space systems are inherently vulnerable because, by virtue of their design, they are generally predictable, easily detected, and in many cases incapable of defensive manoeuvring.³³ Besides the capability of kinetic weapons, satellite technology is also vulnerable to less sophisticated threats such as jamming and spoofing, something the 2003 alleged jamming of the Telstar 12 communications satellite by Iranian agents manifested clearly.³⁴ Other countries are actively responding to such trends. United States Air Force space policy not only recognizes space as a distinct operating environment, it also asserts the requirement to “protect and defend” the nation’s space capabilities.³⁵ As other nations already have, Canada should expect that the proliferation of technology will, in the future, require space policy that more actively extends CAF responsibility into earth’s orbit. Just as the RCAF integrates into a whole-of-government approach to airspace sovereignty, DND needs to be integrated into a comprehensive, whole-of-government approach to space security.

In fact, space may be demanding an expansion to the very definition of aerospace power itself. Whereas RCAF doctrine defines aerospace power traditionally, describing it as an “element of military power applied within or from the air and space environments to achieve effects,”³⁶ the intricacies of space likely establish requirements for a broader, more inclusive definition. Societal dependency on satellite services is expanding to unprecedented levels, and the public has placed a high value on the services that satellites assure for them. For example, it is likely that mobile-satellite hybrid networks will emerge as a cost-efficient solution to providing media content everywhere because they are being driven by the powerful economics of current trends in social media.³⁷ From cell phones to banking transactions, from remote industrial-plant monitoring to emergency-response capability, satellite infrastructure has become central to the basic functioning of Canada’s general populace, never mind its military. For its part, the Canadian Council of Chief Executives has concluded that space is now vital to Canadian commerce.³⁸ More recently, the CAF lessons-learned document published following the 2009 Schriever-V war game found that “our financial system, electrical grid, telecommunications, commercial fishery, agriculture, natural resource management, and aircraft movements” all relied on space.³⁹ Such arguments have basis in real events too. In 1996, a timing error transmitted to a GPS satellite for six seconds caused more than 100 cell phone networks to be degraded.⁴⁰ More recently, problems observed in Canadian telecommunications, Internet, banking and air-traffic-control services over a 24-hour period in 2011 were jointly attributed to a failure aboard the Anik F2 satellite.⁴¹ The maintenance of aerospace power, then, is calling for more synergistic and formal relationships between Canada’s aerospace industry, its commercial space sector, its space research agencies, and DND’s space strategy itself.

Canada, therefore, requires a defence space policy that not only addresses the protection of DND space infrastructure but also anticipates the requirement to protect other national interests threatened from or within space. There is already evidence to confirm the earlier prediction that “pressures will likely build from the commercial sector for the military to provide defence for commercial assets.”⁴² The *Canada First* Defence Strategy describes ensuring the security of Canadian citizens as the “first and foremost” role of the Canadian military.⁴³ So, whereas opponents of widened DND activity in space may argue that space problems are beyond the scope of military responsibility, such reasoning ignores the very premise on which defence organizations exist.

Space assets are not, however, only threatened by deliberate action; they are also increasingly threatened by the environment itself. The mere extent of debris orbiting earth represents a threat to Canadian satellites (civil and military) of increasing significance. CAF will have to prioritize monitoring of orbital activity not only for defence purposes but also for the purposes of protecting wider Canadian interests in space from catastrophic collisions. Arguments that space-surveillance programmes actually disguise space weaponization programmes draw on the example of ballistic missile defence and the use of space-surveillance network (SSN) assets for warning and targeting.

The many applications of any SSN aside, the requirements for Canada to be centrally involved in orbital surveillance cannot be reasonably discounted. In 2009, the Cosmos 2251 satellite collided with an operational Iridium satellite in what was a “wakeup call” for the space community because it seemed to demand a new approach to the management of space traffic.⁴⁴ Now, both the European Space Agency and NASA [National Aeronautics and Space Administration] regularly perform evasive manoeuvres with satellites in order to avoid collisions. In 2007, the orbital altitude of the International Space Station had to be changed in order to avoid a collision with a Russian rocket stage that had been in orbit since 1971.⁴⁵ As such, that Canada requires a defence space programme capable of sustaining and, in fact, augmenting current allied space-surveillance efforts is but one reason why CAF should expect to take on an expanded role in earth’s orbit.

But the space-debris issue also has more subtle implications for DND because it helps illustrate why the protection of civilian satellites will become a military responsibility. Just as the RCAF, with the North American Aerospace Defence Command (NORAD), maintains responsibility for Canadian airspace sovereignty, space situational awareness will also continue to be DND jurisdiction. In the past, Canada has had access to US space-surveillance data in return for contributing to NORAD.⁴⁶ This is one way that DND collaborates with the US in order to access its space-surveillance-catalogue data. Presently, the mainstay of Canada’s contribution to this arrangement is Sapphire, an electro-optical satellite designed to track objects in outer orbits or deep space.⁴⁷ However, that Canada is presently able to rely on the US for space-surveillance data due to niche contributions like Sapphire is not a suitable argument against the need for further expenditures and policy developments in the field. Canada’s ability to benefit from American data is precariously based on its ongoing contribution to the process, something that will have to keep pace with US developments. Sapphire, in fact, demonstrates the need for long-term commitment to a Canadian space plan; it was, after all, originally scheduled for only a five-year operational mission.⁴⁸ They are equally telling points that, as of 2012, the US space-surveillance system’s operating budget was financed entirely by the Air Force Space Command budget and that the United States Air Force did not charge recipients for use of the data.⁴⁹ Recent developments in American policy may indicate changing trends, though, causing sector analysts to anticipate that the US will require Canada to invest more in military space programmes if it is to remain an active and valued partner in such partnerships.⁵⁰ The case of space surveillance, therefore, contributes to the requirement for a more robust, independent presence of DND in space, one that is capable of expanding its commitment to meet the requirements of lateral agreements while also preserving a certain level of independent capability for Canada in the field.

On the issue of international cooperation, traditional bilateral and multilateral commitments represent for Canada foreign-policy objectives that will continue to depend on having a capable defence space programme. Even without considering the growing relevance of space surveillance to security, the benefits of Canada’s membership in organizations such as the North Atlantic Treaty Organization and NORAD will continue to rely on the capability and contributions inherent in a strong Canadian defence space sector. A Canadian Council of Chief Executives document summarized:

Given the obvious vulnerabilities of the Canadian economy to attacks on Canadian satellites, and the pressing need for up-to-date satellite surveillance of the entire North American land mass for security reasons, it is inconceivable that Canada aspire [sic] to play a full role in North American defence without setting down a comprehensive Canadian policy on the “securitization” of space.⁵¹

With the relatively new issue of space security then, policy along the lines of Canada's oft-cited niche strategy may not necessarily suffice in the future; wider participation will become necessary. In the case of ballistic missile defence, Canada's 2005 decision not to cooperate with the US in the endeavour resulted in changing dynamics that may still prove detrimental.⁵² In 1985, after all, with a similar decision not to participate in Strategic Defence Initiative research, a derivative effect was the decline in Canadian access to US-military space programmes.⁵³ Space defence capability, therefore, represents a requirement not only of any national-security policy but also a requirement of importance to Canada's future bilateral and multilateral agreements with other nations.

As a concluding point, inefficiencies in the organization of Canada's space programme and, specific to this article, the placement of DND within it have resulted from a failure to evolve with changes in the relative contributions of different stakeholders. In many cases, organizational paradigms still reflect realities of the CSA's initial period of operation, a time frame during which the CSA accounted for 90 per cent of total government expenditures in space, with DND playing only a minor role. Since then, DND involvement in space has grown considerably: it is now responsible for close to 30 per cent of the total Canadian space budget.⁵⁴ So, whereas DND has historically occupied only a small portion of Canada's overall investment in space, its share is rapidly increasing. Additionally, in fulfilling their individual mandates, other government departments are increasingly reliant on the CSA. Examples include the departments of the Environment, National Resources, Agriculture, Fisheries, and Aboriginal Affairs.⁵⁵ These stakeholders are interdependent with each other and with DND when it comes to national space capability. From a military perspective, the growth in the utilization of space lends credence to the need for a strategic-level reorganization of Canada's space sector, one that will permit DND priorities to be more fully incorporated.

Conclusion

The Canadian military is dependent on space-based assets, exposing significant vulnerabilities that some experts warn could result in a "Space Pearl Harbor" for Western militaries.⁵⁶ That said, it is not sufficient to view space as merely a military enabler. To do so is to underestimate the future contributions of DND in space to Canada's national security. Canada's defence space policy must anticipate future requirements. It should view space as an operating environment in which the military will be required to take on additional roles to do with the defence of Canadian interests.

CAF requires increased government commitment to a strategic direction for its role in outer space; without it, the defence of Canada continues to be at risk. Debates on the likeliness of space weaponization are irrelevant to the immediate challenges a DND space programme faces. Of relevance are the dependencies of national security on space and the proliferation of technology that is capable of threatening these dependencies. That most countries of the world are—at least in published policy—against the weaponization of space should not detract from the nevertheless increasingly prolific trends in space militarization. Current military dependency on space-based enablers, combined with the accelerating importance of space to national security, likely indicates that DND needs to pursue a more robust space programme. The challenges to such development, however, are noteworthy, given recent trends in the prioritization of military and civilian space programmes alike, both of which have suffered under marginal levels of government interest and investment. Yet such challenges in no way lessen the evolving importance of space policy to fundamental defence requirements. Therefore, it is likely that Canada will require a new, reinvigorated approach to its objectives in space, military and otherwise. Any such approach will be wide in scope, involving a defence-oriented but interdepartmental national space strategy, combined with a more ambitious, specific, and relevant DND space policy.

The requirements of any new DND approach to space are further complicated by the breadth of national stakeholders for whom space is becoming an increasingly vulnerable dependency. Defining a military space policy for Canada is challenging because the consequences of space to national security mean that the management of a national space programme will transcend a country's traditional departmental dividing lines.⁵⁷ Government interests in space are increasingly interconnected by way of means, costs, and benefits through considerations of economic impact, technological development, and national security. In the end, analysis suggests that national defence interests in space will be best served by a truly interdepartmental approach, the full implications of which may still exceed even the best of our present strategic senses. 🇨🇦

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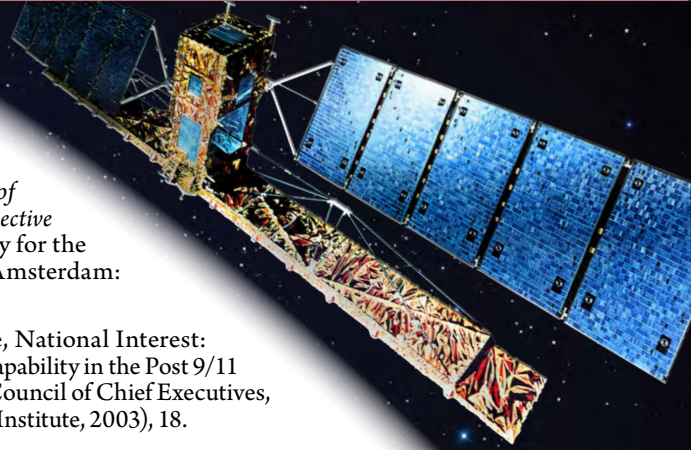
Abbreviations

AIS	Automatic Identification System
CAF	Canadian Armed Forces
CSA	Canadian Space Agency
DND	Department of National Defence
DRDC	Defence Research and Development Canada
GPS	global positioning system
NORAD	North American Aerospace Defence Command
RADARSAT	Radar Satellite
RCAF	Royal Canadian Air Force
RCM	RADARSAT Constellation Mission
SSN	space-surveillance network
US	United States

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Canadian Air Power in Peace-Support Operations:

Towards a New Definition of Air Power in Royal Canadian Air Force Doctrine

By Second Lieutenant Andrew D. McNaughton

Over the last several years, the air-power community has examined the role of aviation in counter-insurgency operations. This comes as no surprise; many Western nations have found themselves fighting during these operations over the past decade in the Middle East. Although an important role, it is only a part of the broader spectrum of peace-support operations. Many nations have deployed aircraft to support the United Nations (UN) or other organizations in these operations; however, this role has gone largely unwritten and unacknowledged by both air forces and academia alike. For 50 years, Canada's air forces have played a vital role in the country's foreign policy, as played out in UN and other peace-support missions. With governments weary of "putting boots on the ground," they have turned to the Royal Canadian Air Force (RCAF) to provide assistance.

This role is so important to Canada that it should be included in current RCAF operational doctrine. It is important to remember that air power cannot be defined as merely the offensive and defensive capabilities of an air force, but rather, it encompasses elements such as airlift, intelligence, surveillance, reconnaissance, medical evacuation, and air traffic control services, among others. These roles, like the conflicts in which they are employed, sit on a spectrum of conflict. This spectrum of peace-support operations (see Figure 1) encompasses all operations, from peacemaking to war.

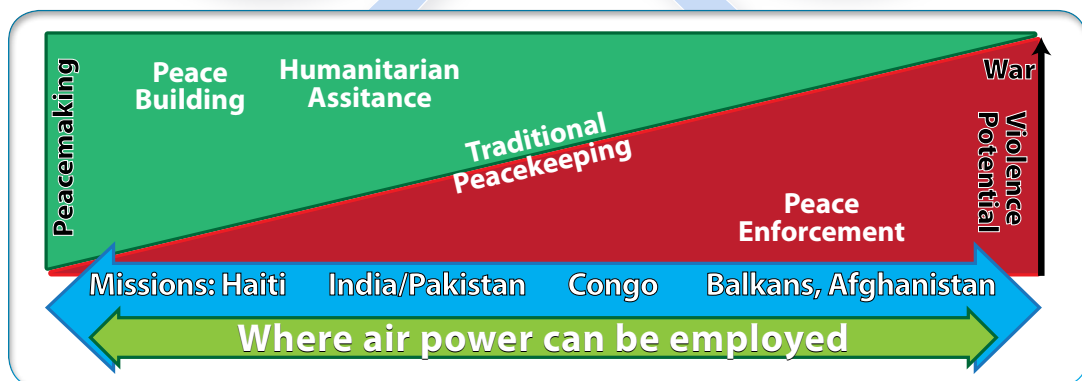


Figure 1: Air power in the spectrum of peace-support operations¹

With this in mind, the RCAF requires a more nuanced definition of air power that addresses the spectrum of peace-support operations. This article will demonstrate that there is a Canadian historical precedent for using air power in peace-support operations. It will then examine current Canadian Armed Forces (CAF) and RCAF doctrine and demonstrate that the current RCAF definition of air power is too narrow to fully include peace-support operations. Finally, it will argue that, over time, peace-support operations have become more complicated and that this trend will continue in the future. The RCAF's recent involvement in Afghanistan can be used as a model for the future, where all aspects of air power will once again be called upon to play key roles.

CANADIAN AIR POWER IN PEACE-SUPPORT OPERATIONS, 1960–2004

Arguably, the history of the post–Second World War RCAF is one of new capabilities, aircraft, and the overall arms build-up of the Cold War. While the RCAF played an integral role in the defence of North America and the nuclear deterrent in Europe, Canadian air power was also having important effects in peace-support missions around the globe. Although there are many examples, only four missions where Canadian air power was salient will be examined: the UN missions in the Congo, India and Pakistan, the Balkans, and Haiti.

Congo

Air power in peace-support operations began, arguably, with the UN mission in the Congo (more commonly known by its French name and acronym, Opération des Nations Unis au Congo or ONUC), and this is especially true for the RCAF. Prior to 1960, the Congo was a Belgian colony. When independence was granted on 30 June 1960, the country fell into disorder and Belgium deployed its military to restore law and order; however, this was without the agreement of the new Congolese government.² It was at this point that the UN became involved. Although the employment of transport aircraft in peacekeeping missions was not new to the UN, the mission in the Congo was the first time that air power was showcased on a large scale. Transport elements from both the United States Air Force (USAF) and the RCAF were utilized to get the initial response of 14,000 troops and supporting equipment into the Congo in July 1960.³ Transport aircraft were only a part of the mission, as it also incorporated many different forms of air power, including helicopters, support elements for internal airlift, and personnel to run the country's air navigation system and air traffic control.

The UN mission was unprepared for the logistical complexities that the Congo demanded. Many of the aircraft allocated for the mission were from the North Atlantic Treaty Organization's (NATO's) war reserve in Europe, obsolete and, worse still, were often manned by underqualified crew of other contributing nations.⁴ Canada's initial contribution to the mission was in the form of 13 North Star transport aircraft to provide internal and external airlift. The airlift was a key contributor to the early success of ONUC due to the Congo's lack of transportation infrastructure.⁵ The RCAF's ability in this area was unmatched, and "the USAF of the day lauded our operations as the best military air transport in the world."⁶ Unfortunately, due to economic concerns in Canada and the increasing violence of the mission, the Diefenbaker Government decided to withdraw this key component of Canadian air power from ONUC in the fall of 1962.⁷ Although the North Stars were withdrawn, RCAF personnel continued to serve in ONUC in many other critical tasks, such as air traffic control as well as the command and control functions of the remaining international air transport force.



CAF Photo: MCpl Paul MacGregor

India and Pakistan

Canadian air power in peace-support operations expanded throughout the 1960s. After Indian and Pakistani independence in 1947, the region of Kashmir was left free to accede to either state; however, it quickly became an issue. The UN stepped in with an observation mission, and by 1964, Canada had become involved with military observers. Observation stations were spread out along the Line of Control⁸ in the disputed region and were extremely difficult to access. The RCAF was called upon to alleviate this problem.⁹ This contribution began with only one Caribou aircraft and support personnel; however, after the second Indo-Pakistani war in 1965, the force (117 Air Transport Unit) was upgraded to two Caribou aircraft and CC123 Otters. The Caribou were tasked with internal airlift, while the Otters flew reconnaissance missions.¹⁰ The RCAF's contribution played a critical role in the mission; however, it was not without sacrifice. The RCAF lost one Caribou during a Pakistani air strike on an Indian airfield in 1964.¹¹

When both India and Pakistan withdrew their consent for the UN presence, the mission ended, as did the RCAF's role.¹² Although small, the Canadian contribution was critical. The mission could not have functioned the way it did without the airlift, reconnaissance, and communication capabilities that the RCAF's aircraft and personnel provided.

The Balkans

During the 1970s and 1980s, Canadian peacekeeping contributions lessened.¹³ The fall of the Soviet Union brought a new era of peacekeeping missions, many of which Canada participated in. Arguably, Canada's foremost operations in this period were the missions in the Balkans. The dissolution of Yugoslavia brought with it an unfortunate number of conflicts. From 1992 to 2001, there were 18 different UN missions that Canada was involved in, many of which had an air component.¹⁴ Most people will remember the NATO bombing campaign that occurred in 1999, which resembled more of a war than a peace-support operation. It was in this period that the definition of peacekeeping evolved into a spectrum of peace-support operations. The Canadian Air Force participated in many different aspects of the missions in the Balkans, from transport to bombing.

The first role the Canadian Air Force played in the Balkans was during the Sarajevo airlift, when CC130 Hercules aircraft flew into the city three times a day with almost 16,000 kilograms (kg) of food and other aid per trip.¹⁵ Later, when the UN's Stabilization Force was established, more aircraft fleets became involved, including CF188 Hornets and the new CH146 Griffon helicopters. The Hornets were mostly employed in the air-to-ground bombing role; however, they also flew combat air patrols. Their flexibility, as well as that of their Canadian pilots, was well noted by the air campaign's commanders.¹⁶ The Griffons had a variety of roles, including command and liaison missions, passenger and cargo transport, reconnaissance and photo missions, as well as presence overflights.¹⁷ Concurrent to these operations was Operation MARITIME GUARD, where Canadian CP140 Auroras and CH124 Sea Kings assisted in the trade embargo. Many of the Air Force's assets were involved in this operation, and even the Kosovo air campaign fits within the spectrum of peace-support operations, albeit on the far right towards all-out war.¹⁸

Haiti

These peace-support operations were not restricted to regions on the other side of the globe; some existed in North America's backyard. In particular, Canada has had a large involvement time and again in Haiti. Haiti has had a troubled history following the departure of Jean-Claude Duvalier in 1986, with civil unrest and a dictatorship under Raoul Cedras. To modernize the armed forces and create a new police force, among other tasks, the UN stepped in. From an air-power perspective, there were four main operations that saw the deployment of Canadian aviation assets. The first of these was in 1995, with the United Nations Mission in Haiti (UNMIH). In March of that year, Canada

deployed a contingent under the name of Operation PIVOT.¹⁹ This contingent involved Air Force personnel tasked with the logistics and construction support for the mission. The next year, the mission was expanded and renamed Operation STANDARD. Along with new Army units to replace Air Force personnel, 408 Tactical Helicopter Squadron and its CH135 Twin Hueys were deployed.



These aircraft greatly assisted the Canadian contingent by providing transport, reconnaissance, and an evacuation capability.²⁰ In 1997, the situation on the ground had changed such that UNMIH ceased to exist, and the new UN transition mission in Haiti was stood up. This transition also saw 408 Squadron replaced by 430 Squadron and its new CH146 Griffon helicopters, which continued performing the same role.²¹ This mission ended in November of 1997. Between 1997 and 2000, there was a UN civilian police mission; however, the Air Force did not participate. It did begin to participate again, however, in 2004, assisting with the Mission des Nations Unies pour la stabilisation en Haiti. This summertime mission saw the deployment of six Griffon helicopters from 430 Squadron, which provided transport and reconnaissance capabilities to the Canadian Army contingent. In August, the Canadian contribution was withdrawn.

Summary

Through this brief snapshot of Canadian missions, it is apparent that air power is a valuable tool for any peace-support operational commander. These missions have varied in time, place, and especially aircraft; however, many of the roles are the same. Transport is and has always been vital; internal and external airlift are the lifeblood of most of the Canadian contingents. Many missions had Canadian aircraft provide reconnaissance and photographic intelligence. Further still, in the Balkans, Canadian air power was called upon by way of using its CF188s in combat. As evidenced by the four previously discussed missions, the roles of Canadian air power evolved over time. In all, Canadian air power across the spectrum of peace-support operations is important, with many lessons having been learned.

The spectrum of peace-support operations (Figure 1) is a sliding scale, as missions and their situations on the ground change. On the left are the more peaceful disputes, where the international community is involved to facilitate peaceful resolutions. The potential for violence increases with the movement to the right of the spectrum. The more traditional peacekeeping missions—the interposition of military forces—are in the centre. Further still on the right is peace enforcement, where missions like the Balkans fit. The furthest right is all-out war. At any given time, all conflicts and peace-support missions fit somewhere on the spectrum. This spectrum also illustrates that air power can be employed throughout its range, as evidenced by the historical examples. It is important to note that the definition of air power must not be confined to individual capabilities, as showcased in missions like airlift or tactical aviation but, rather, includes these capabilities and much more. It is these other operations outside of traditional combat and domestic operations in which we have historical experience and where the RCAF employs all of its different air-power assets in varying combinations. This is not represented in current RCAF doctrine.

CURRENT CAF AND RCAF DOCTRINE

Despite the size of the RCAF during the Cold War, there were not many Air Force personnel or scholars who wrote air-power doctrine.²² Of the Canadians who did, their focus, unsurprisingly, was on the offensive and defensive roles of aircraft in a nuclear war with the Soviet Union. Today, the RCAF has created doctrine through its own institution, the Canadian Forces Aerospace Warfare Centre (CFAWC), located in Trenton, Ontario. CFAWC is the focal point for Canadian aerospace power doctrine, lessons learned and the *Royal Canadian Air Force Journal*. So far, CFAWC has produced 10 doctrine documents; from a strategic-level capstone document to specific operational capabilities. Absent, however, is a document that clearly defines the roles of the RCAF across the spectrum of peace-support operations. The focus of current doctrine lies with the traditional offensive outlook of air forces, where fighter aircraft are supported by other air-power capabilities.



The B-GA-400-000/FP-000, *Canadian Forces Aerospace Doctrine*²³ publication is a foundation document. It begins with a history of the Canadian Air Force through its many organizational changes; however, it wholly neglects the important role Canadian air power has played in peace-support operations. The document further defines the structure in which aerospace doctrine will be formed, following the model of the overall Canadian Forces military doctrine document.²⁴ Falling under this capstone publication in the hierarchy are the operational-level documents. These subordinate-level publications “describe the organization of aerospace forces and guide their employment in the context of broad functional areas, distinct objectives, force capabilities, and operational environments.”²⁵ It is at this level that a document for peace-support operations would be appropriate. Presently, the overall problem with the doctrine is not so much the lack of a peace-support document (although it would be beneficial) but the fact that the definition of air power is too focused on the offensive and defensive roles. This fighter focus leans towards a Maslowian thought process where “if the only tool you have is a hammer, treat everything as if it were a nail.”²⁶ As we know, historically, this is not true for Canada’s Air Force and should not be found in its doctrine. Very little mention is made of the roles of the many aircraft fleets, other than of what they could do in war or domestic operations. This needs to be expanded to include the many roles that all of Canadian air power, not just aircraft, can play in varying combinations across the spectrum of peace-support operations.

There is a historical trend when viewing peace-support operations through the frame of the spectrum. These missions have become more complex over time; furthermore, CAF continues to participate in UN-sanctioned peace-support missions over the entire spectrum of operations (i.e., border patrol, monitoring ceasefires, buffer zones, etc.).²⁷ This is mentioned in CAF capstone doctrine. This strategic-level document defines the role that the entire CAF can play in these operations. The RCAF’s capstone doctrine, *Canadian Forces Aerospace Doctrine*, however, is missing this key peace-support component.

Canada’s air forces have been used in simple and complex missions, with many lessons learned about how to organize and utilize aviation elements in varying situations. This trend will no doubt continue into the future. To further enforce this point, a brief case study of the RCAF in Afghanistan follows.

AFGHANISTAN AND THE NEED FOR DOCTRINAL EVOLUTION

Following the terrorist attacks on the United States (US) in 2001, the West found itself in a war on ideals. The conflict in Afghanistan was complicated. Most recent academic writing, in terms of air power, is found in books and articles dealing with counter-insurgency and the role aircraft can

play in these types of conflicts. What is missing, however, is the overall impact air power can play in a complicated peace-support operation such as Afghanistan. For Canadian air power, Afghanistan was the catalyst for an upgraded Air Force. The RCAF acquired new capabilities in strategic airlift, medium- to heavy-lift helicopters as well as improved intelligence, surveillance and reconnaissance (ISR) through the use of unmanned aerial vehicles (UAVs). This was Canada's defining peace-support operation, where most of the possible roles that air power could play were utilized.

The mission in Afghanistan began in 2001 with the deployment of Her Majesty's Canadian Ship HALIFAX with its on-board Sea King helicopter. Shortly after, Canada committed a CC150 Polaris transport to the mission and two CP140 Auroras to provide an ISR capability to assist maritime coalition forces. In 2002, the Air Force committed three CC130s to provide external airlift from Camp Mirage into Afghanistan. By 2006, it became clear that some outposts in Helmand, Zabul, Oruzgan, and Kandahar provinces needed to be supplied from the air. Thus began the first aerial resupply of beleaguered troops flown by the Air Force since the Korean War.²⁸ In the eight years these aircraft were involved, they moved 78,000,000 pounds [35,380,000 kg] of cargo, more than 244,000 passengers, and logged more than 22,000 flight hours over 4,500 flights.²⁹

In late 2008, even with three types of aircraft already committed to the mission, the RCAF saw the need for additional air power and stood up Joint Task Force Afghanistan (JTF-Afg) Air Wing. This air wing controlled all RCAF flights in and out of the theatre of operations and oversaw the deployment of RCAF aircraft in the roles of air combat support, ISR, strategic airlift, and tactical airlift. Not only did the existing Canadian air-power assets play a huge role in the mission, but the RCAF also expanded its capabilities to further prove the worth of air power. The operation in Afghanistan was the catalyst for the acquisition of the Sperwer UAV, used D-Model Chinook helicopters from the US, and four CC177 Globemaster aircraft to better provide a strategic-airlift capability. It also led to the leasing of Heron UAVs and MI-8 medium-lift helicopters. In the words of Lieutenant-General Yvan Blondin (Commander RCAF):


The establishment of the JTF-[Afg] Air Wing ushered in a new era in Canadian military air operations and underlined the importance of having an agile and expeditionary Air Force. It also underlined the importance of having the right equipment to do the job. ...

The RCAF fed a vital, comprehensive battle picture to Army commanders on the ground, and contributed to the protection of soldiers' lives from improvised explosive devices, landmines and ambushes by reducing their reliance on ground-based transportation for moving personnel and cargo.³⁰

The air wing, itself, was a major undertaking, having three of its own subordinate units: the Canadian Helicopter Force Afghanistan operating Chinook, Griffon, and MI-8 helicopters; Canadian Heron UAV detachment; and the Tactical Airlift Unit operating the CC130s for internal airlift. The air wing did its intended job, which was to save lives.³¹ By being able to move troops and supplies by air, the threat to Canadian, Afghan, coalition troops, and police was greatly diminished. This gave the Canadian and allied forces the advantage in the region, allowing other resources to be spent in the development of Kandahar province.³²

CONCLUSION

The mission in Afghanistan was a major undertaking, and it is an understatement to say that there needs to be more attention paid to the RCAF's role in this conflict. With the mission complete, it is now the job of both academia and the Air Force to look back at the lessons that were learned and improve the way the RCAF operates in missions across the spectrum of peace-support operations.

Through the brief snapshot of previous peace-support missions, it is clear that air power has played an important role. Furthermore, this role has expanded as the missions became more complex. The future will hold many more peace-support operations, some as complex as the Canadian mission in Afghanistan. A more nuanced definition of air power is needed in the RCAF, one that includes the many roles air power can play in peace-support operations. The current definition from which the doctrine is written is too narrow and too focused on the offensive role and supporting capabilities. This is not to discount the important role of offensive air power. A new definition of air power that allows room for peace-support operations will help the RCAF in the future, as it will be called upon time and time again to deploy to various regions and complicated situations. The RCAF will see itself employed in operations from one end of the spectrum of peace-support operations to the other, from humanitarian missions on one side of the world to combat-support missions on the other. It is imperative, therefore, that the RCAF ensures that it not only is prepared for future operations with its new capabilities but also has codified the lessons that were learned in the past. 

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Abbreviations

CAF	Canadian Armed Forces	NATO	North Atlantic Treaty Organization
CFAWC	Canadian Forces Aerospace Warfare Centre	ONUC	Opération des Nations Unis au Congo
DND	Department of National Defence	RCAF	Royal Canadian Air Force
ISR	intelligence, surveillance and reconnaissance	UAV	unmanned aerial vehicle
JTF-Afg	Joint Task Force Afghanistan	UN	United Nations
kg	kilogram	UNMIH	United Nations Mission in Haiti
		US	United States
		USAF	United States Air Force

Notes

1. Figure adapted from a class taught by Colonel H. G. Coombs (Retired) from a slide from the Canadian Peace Support Training Centre PowerPoint about the Changing Nature of Peace Operations Since 1990, September 2014, at the Royal Military College of Canada.

2. "Republic of the Congo – ONUC Background," United Nations, accessed March 24, 2015, <http://www.un.org/en/peacekeeping/missions/past/onucB.htm>.

3. William K. Carr, "Planning, Organizing, and Commanding the Air Operation in the Congo, 1960," in *Air Power in UN Operations*, ed. A. Walter Dorn (Surrey, England: Ashgate Publishing Limited, 2014), 42.

4. Ibid., 45.

5. Kevin A. Spooner, "A Fine Line: Use of Force, the Cold War, and Canada's Air Support for the UN Organization in the Congo," in Dorn, *Air Power in UN Operations*, 82.

6. Ibid., 52.

7. Ibid., 82.

8. The Line of Control was a separation line agreed upon by India and Pakistan in July of 1972. "United Nations Military Observer Group in India and Pakistan: Background," United Nations, accessed March 24, 2015, <http://www.un.org/en/peacekeeping/missions/unmogip/background.html>.

9. Matthew Trudgen, "Above the Rooftop of the World: Canadian Air Operations in Kashmir and Along the India-Pakistan Border," in Dorn, *Air Power in UN Operations*, 101.

10. Ibid., 105.

11. Ibid., 109.

12. Sean M. Maloney, *Canada and UN Peacekeeping: Cold War by Other Means, 1945–1970* (St. Catharines, Ontario: Vanwell Publishing Limited, 2002), 227.
13. Ibid., 241.
14. “Operations Database,” Canadian Forces Directorate of History and Heritage, Department of National Defence (DND), accessed March 24, 2015, <http://www.cmp-cpm.forces.gc.ca/dhh-dhp/od-bdo/index-eng.asp>.
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16. Dwight Davies et al., “Mission Ready: Canada’s Role in the Kosovo Air Campaign,” *Canadian Military Journal* 1, no. 1 (2000): 57.
17. Ltn. Oystein Paulsen, “472 Tactical Helicopter Squadron,” *SFOR Informer* 73 (November 25, 1999), accessed March 24, 2015, <http://www.nato.int/sfor/sfor-at-work/velika/t991115b.htm>.
18. “Details/Information for Canadian Forces (CF) Operation MARITIME GUARD,” Canadian Forces Directorate of History and Heritage, DND, accessed March 24, 2015, <http://www.cmp-cpm.forces.gc.ca/dhh-dhp/od-bdo/di-ri-eng.asp?IntlOpId=189&CdnOpId=229>. This operation was part of the larger NATO Operation SHARP GUARD.
19. “Details/Information for Canadian Forces (CF) Operation CAULDRON,” Canadian Forces Directorate of History and Heritage, DND, accessed March 24, 2015, <http://www.cmp-cpm.forces.gc.ca/dhh-dhp/od-bdo/di-ri-eng.asp?IntlOpId=287&CdnOpId=345>.
20. Ibid.
21. “Details/Information for Canadian Forces (CF) Operation CONSTABLE,” Canadian Forces Directorate of History and Heritage, DND, accessed March 24, 2015, <http://www.cmp-cpm.forces.gc.ca/dhh-dhp/od-bdo/di-ri-eng.asp?IntlOpId=309&CdnOpId=379>.
22. Richard Goette, “A Snapshot of Early Cold War RCAF Writing on Canadian Air Power and Doctrine,” *The Royal Canadian Air Force Journal* 1, no. 1 (2012): 51.
23. Canada, DND, B-GA-400-000/FP-000, *Canadian Forces Aerospace Doctrine*, 2nd ed. (Trenton, Ontario: Canadian Forces Aerospace Warfare Centre, 2010), accessed March 24, 2015, <http://rcaf-arc.forces.gc.ca/en/cf-aerospace-warfare-centre/doctrine/b-ga-400-000-fp-000.page>.
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25. Canada, DND, *Canadian Forces Aerospace Doctrine*, 4.
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27. Canada, DND, *Canadian Military Doctrine*, 6-9.
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30. Ibid.
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Tactical-Aviation Mobility



BY LIEUTENANT-COLONEL JEANNOT BOUCHER, MSM, CD, MA

INTRODUCTION

The end of every conflict initiates a reflection among militaries as to how to best prepare for the following one. While it is impossible to achieve full consensus, there is a general acknowledgement that the Canadian Armed Forces (CAF) must refocus on conventional-style operations oriented towards a near-peer enemy and relearn some of the basic skills that have eroded significantly over the last decade. This has created an interesting situation where the majority of the people who are familiar, and at ease, with conventional warfare doctrine were not intimately involved in Operation (Op) ATHENA and where only the oldest among those who participated in the operation have a basic knowledge and understanding of that doctrine. This creates a gap in the integration of doctrine and knowledge into operations.

The current challenge is for CAF to adapt the mature and still very relevant conventional warfare doctrine from the post-World War II era, along with the proven principles of war and tenets of air power, to the realities of the 21st century. This means adapting to the new constraints and limitations such as civilian long-term in-service support contracts associated with the purchase of new capabilities (i.e., the CH147F Chinook) as well as the significant information-technology requirements that have become the foundation of our command and control (C2) and are directly linked to our ability to coordinate complex and dynamic operations to maintain momentum. It also means taking advantage of both the new opportunities provided by unmanned aircraft (UA) as well as those that are stemming from a significant evolution in technology. One aspect that is particularly affected by these new realities is tactical mobility, as much within the Army as within Aviation. The purpose of this article is to initiate a dialogue on the criteria and factors surrounding tactical-aviation mobility in the 21st century within the context of the Canadian Army (CA) preparing for advanced dispersed operations (ADO) supported by tactical aviation, which is composed of the CH146 Griffon and the CH147F Chinook.

CAF Photos/Cpl/Cheung

ASSUMPTIONS

Following Exercise MAPLE RESOLVE 1501 (MR 1501), which was the culmination point on the first Road to High Readiness (RTHR) where 5 Canadian Mechanized Brigade Group (5 CMBG) was supported by integral CH146 and CH147 assets, the ongoing dialogue has reached a level of maturity that enables us to reach certain conclusions. As an institution, we are coming to grips with some of the key elements of this hybrid form of conventional warfare, and this will enable us to frame the discussion on tactical mobility.

The first key assumption is that the Royal Canadian Air Force's (RCAF's) Aviation assets are modular and are composed of a flight of 6–8 CH146, a flight of 3–4 CH147, a headquarters, a maintenance flight composed of a CH147 and CH146 element, and a logistics flight. All of these assets come from 1 Wing squadrons and are often presented as a cohesive Aviation battalion (avn bn) in support of a task force. The second assumption is that the Army intends to use the brigade as the unit of manoeuvre for integrating Aviation as an enabler and that the avn bn or parts of it can be placed under operational control (OPCON) of the brigade; furthermore, the avn bn will maintain its operational-command relationship to the RCAF through an air task force (ATF). Finally, the approach utilized to discuss tactical mobility must not be prescriptive, but rather, it will be based on descriptive and flexible criteria, thus enabling the RCAF to deploy tactical-aviation assets independently or as part of a joint task force in support of the various concept of operations (CONOPs).

KEY LIMITATIONS

A reality that must not be underestimated as a Canadian version of tactical mobility is developed is the fact that the CH147 is historically a divisional asset that comes with a significant logistics tail, which creates some real restraints. Most importantly is the maintenance requirement associated with the CH147, which comes with three different maintenance packages: a flyaway kit that supports a short (72-hour [hr]) deployment; a contingency response kit (CRK) that is intended for a short domestic deployment of 15–30 days and, finally, the pack up kit (PUK) that is intended for an extended international deployment of 6–8 months. While the amount of equipment in itself does not constitute a limitation, it is a consideration, since separating the kits increases the number of personnel required to conduct maintenance in two locations and would have second-order effects on 450 Tactical Helicopter Squadron force generation and longer-term force-employment capability.

Secondly, a hard restraint is the time required to conduct the 100-hr, 200-hr and 400-hr inspections on the CH147. A 100-hr inspection takes four days; a 200-hr inspection takes approximately three weeks; and a 400-hr inspection takes approximately five weeks to conduct and includes significant disassembly of the aircraft. It should be noted that the PUK is currently built around conducting up to 200-hr inspections only, with the option of adding significant tooling, parts and aircraft maintenance support equipment (AMSE) to conduct



CAF Photo: MCpl Shilo Adamson

400-hr inspections when deployed. The criteria affecting tactical mobility is that the main location where 200-hr inspections are conducted cannot move in less than three weeks once a CH147 is opened.

Another limitation is the amount of equipment associated with the deployment of the CH147. The best way to describe the full CH147 capability is transportable but not mobile. This means that the CH147 capability will not have integral to itself all the vehicles required to move its maintenance equipment, as it is transported more efficiently and effectively with vehicles from one location to another. The CH146 capability is able to integrate with a brigade as it bounds forward to an unprepared area, but the CH147 flight and its maintenance would move in a more staged, or administrative, manner.

Logical conclusions from the factors discussed above are that the avn bn in its entirety is most likely to be moved/transported in a more administrative way to a forward location from a seaport or airport of disembarkation (SPOD/APOD) or divisional support area (DSA) and that it is unlikely to move in its entirety at a frequency greater than once every three weeks. Nonetheless, given its modularity, the option to have the CH146 capability bound forward of the SPOD/APOD or DSA exists. This would imply that the CH147 capability would remain behind as a cohesive detachment, where it could still support forward given its endurance and be in a safe area to conduct 100-hr, 200-hr and 400-hr inspections.

TACTICAL MOBILITY

The ideal situation sees a cohesive avn bn where the tenet of centralized control and decentralized execution is maximized. Nonetheless, due to time and space in a linear battlefield, there is a point where the CH146 is forced to bound forward, often at the same time as the brigade support area (BSA),



CAF Photo: MCpl Johathan Johansen



CAF Photo: MCpl Craig Wiggins

because of its limited endurance. With more than twice the endurance of the CH146, the CH147 is able to move only with the DSA while continuously supporting the brigade. The real tactical mobility of Aviation resides in its ability to project its fighting echelon, through the deployment forward of subunits. For example, the CH146 capability can be deployed forward independently with scalable operations, logistics and maintenance capacities.

The same is true of the CH147, as long as the restraints mentioned above are respected. In the event that an aircraft requires maintenance, it is essential that Aviation have forward arming and refuelling points (FARPs) as well as mobile repair parties (MRPs); both the FARPs and MRPs must be able to deploy forward and support both the CH146 and CH147. The final essential element is the capability to conduct tactical delivery points (DPs) with the brigade service battalion when elements of Aviation are OPCON to the brigade. The CH147 makes it possible for a FARP, an MRP, a flight tactical operations centre (TOC) and some logistics to be moved forward by air if a lighter, shorter-duration footprint is required. As proven during MR 1501, operating in several locations simultaneously for 24/7 implies either a greater demand in personnel or a reduced operational capability.

The introduction of the CH147F allows for the Aviation unit to “self-serve” a complementary light-mobility concept that would see the tactically mobile portions of the unit (MRP, FARP and flight TOC) lifted and pushed forward using the CH147F. The procurement of at least one extended range fuel system (ERFS) coupled with the procurement of the forward area refuelling equipment (FARE) kit (a pump and hose assembly) would allow for the CH147F to conduct forward “FAT COW” operations and provide a FARP capability from the Chinook itself (while running), able to refuel up to eight CH146s with a total of 6,804 kilograms (kg) or 15,000 pounds (lb) of fuel at the very far reaches of the 200-square-kilometre area of operations (AO). This relatively cheap capability—which consists of three 2,268 kg (5,000 lb) internal crash-worthy and ballistic self-sealing fuel tanks—would have the effect of removing the necessity of pushing vulnerable ground convoys forward in the BSA to support sustained forward flying operations for the CH146 in support of brigade combat operations.

Further, the Medium-to-Heavy-Lift Helicopter (MHLH) Project has purchased a total of 49 transportable shelter units for a variety of roles and shops for the CH147F, 18 of which are included within each CH147F tactically sufficient unit (TSU) in its transportable role. The command post (CP) variant of these units can all be underslung and pushed forward to provide the forward flight CP/C2 node. The shelter units are self-sustaining, in that they contain internal-power-generation, lighting as well as heating, ventilation and air conditioning (HVAC) capabilities that only require regular resupply of diesel fuel to remain forward. Additionally, due to the CH147F’s modularity, the PUK, tools, parts and AMSE are easily loaded on and off the CH147F to support the flyaway MRP function for either fleet within the entire BSA. This could include the forward movement of shelter-unit workshops to assist/facilitate more in-depth repairs if required. Lastly, the CH147F can easily conduct the underslung load of a damaged CH146 back to the BSA or Aviation unit echelon if forward repairs are deemed too risky or difficult.

Several basic but important lessons were identified during the RTHR that culminated with MR 1501. The camps that Aviation units have become



accustomed to building over the last decade reflect the ideal solution—based on Op ATHENA experience—in terms of workspace and comfort. There is a trend that more personnel are required. Aviation must return to a one-soldier, one-kit mentality and an approach focused on building only what is essential to support operations. This increases mobility and security and reduces the requirement for logistical support, which quickly becomes a limiting factor on a linear battlefield. These factors must be considered based on the length and location of a deployment and must be based not prescriptively but, rather, on a sound mission analysis.

REQUIREMENTS ESSENTIAL FOR AVIATION SUPPORT TO THE ARMY

The RTHR has confirmed that there are a few elements that are essential to enable tactical mobility while maintaining effectiveness in operations. First and most important is a common information system (the CA currently uses the Land Command Support System [LCSS]) in order to be able to maintain full situational awareness (SA) on brigade operations. Maximum effectiveness will only be achieved if Aviation operations and elements deployed forward have an equivalent SA to those they are supporting. There is technology that enables this, and it is critical for Aviation to procure this capability in order to maximize its force-multiplying effect on the battlefield.

The second essential requirement is enhanced communications. In order to return to conventional operations and have the ability to deploy several Aviation elements forward in various locations to ensure concealment and a reduced footprint, Aviation requires a main command post (CP 0) as well as an alternate one for each of the following: CH146, CH147, maintenance flight and logistics flight (CPs 1, 2, 5 and 8). This means a minimum of five CPs with a minimum number of radios in order to be able to maintain SA and enable effective battlespace management. The CA has made it clear that it foresees the brigade AO in ADO to be an area not exceeding 200 kilometres (km) x 200 km in size. With this in mind, reliance on line-of-sight communications in this context is doomed to failure and will result in crippling limitations in providing timely Aviation effects across the operational environment to enable brigade combat operations. It, thus, necessitates the

procurement and integration of robust, secure beyond-line-of-sight communications options for the Griffon, Chinook and C2 nodes dispersed within this AO; wideband, ultra-high frequency (UHF), tactical satellite communications (TACSATCOM) are the proven option to achieve this effect.

The third essential requirement is security. Aviation moving tactically implies that it either is in a location where security is provided or provides its own security. Within the current construct, integral assets to ensure force protection are not accounted for. The assets required for this need to be provided either to the Aviation unit or by the brigade or ATF. Additionally, when the Aviation unit is in support of a brigade spread out over the AO, there is a significant requirement for liaison and security for the MRPs, FARPs and DP convoys. The brigade has a limited capability, and given the reduced threat in the rear area, Aviation units require, as a minimum, G-Wagons with turrets or other medium-support vehicles with crew-served weapons to be able to provide a minimum amount of security for its own resupply and liaison convoys.



CAF Photo: Cpl Jasper Schwartz

Finally, MR 1501 confirmed the continued relevance of tactical aviation's three doctrinal roles of providing reconnaissance, firepower and tactical mobility. The CH147 provided in just over two weeks the movement of over 1,600 personnel and over 124,738 kg (275,000 lbs) of equipment. The CH146, for its part, provided tactical mobility in the form of small-team inserts (sniper/recce), extensive command and liaison as well as standby casualty evacuation. The reconnaissance provided by the MX-15 sensor package became the biggest enabler that Aviation provided, as it was able to define the operational environment for brigade reconnaissance and, as the brigade advanced, complemented the brigade intelligence, surveillance, target acquisition and reconnaissance (ISTAR) plan. MR 1501 highlighted that the MX-15 with downlink would be a huge enabler. Finally, the CH146 proved relevant in the brigade rear area with its firepower (C6 and GAU 21), and its antiarmour capability proved that it could greatly enhance the safety of the brigade elements it supports. On numerous instances, the CH146 was observing enemy armoured vehicles from a distance, as the CH146 was unable to affect the vehicle, they had to rely on very limited close-air-support assets or friendly artillery. This unnecessarily increased the risk to friendly troops and friendly Aviation assets during the conduct of air-mobile and air-assault operations when the CH146 ensured landing-zone security.

KEY CRITERIA


A final aspect that deserves discussion with reference to tactical mobility is the criteria used to decide when to move the Aviation assets. As discussed earlier, there are specific factors associated with the CH147 that influence tactical mobility. During RTHR exercises, the criteria used to deploy forward were time and space in order to be able to effectively support the brigade. The 1 Wing Unit Standing Operating Procedures are proven and were used extensively and effectively to prepare for the deployment forward. In a similar vein, Aviation doctrine talks about 50 km forward for the establishment of a FARP. An educated guess would be that Aviation should remain no further than 100 km from the forward line of own troops (FLOT) or the forward edge of the battlefield (FEBA) for the CH146 to remain effective. Once the distance surpasses 100 km, an analysis must be conducted to see if the Aviation assets must bound forward based on the factors discussed this far. It should be noted that this doctrine, as it applies to the effectiveness of the CH147F, is stale, as the CH147F has a 5.3-hour endurance / 1,000-km range and could provide sustained effects at 200 kms forward from the Aviation TOC; this would, however, sacrifice CH146 protection to do so if a FARP were not available to assure CH146 sustainment.

The key criteria that have to be used to assess if the forward deployment of Aviation is required are security and the operational advantage that is gained. The most dangerous criteria are range of enemy indirect fire and its targeting cycle. On these criteria, current doctrine is very well written and remains relevant. The CH146 detachment, with its reduced footprint and ability to move rapidly to an alternate location, may allow the commander to accept greater risk, but the operational advantage gained must be very significant. It is essential that heightened air threat is taken into account. Finally, the general enemy threat must be seriously considered, as Aviation is a



high-value target and the appropriate level of force protection must be available when Aviation assets are present. Once again, sound mission analysis will dictate the best location that balances security with the operational advantage gained by the proximity of Aviation to land forces.

CONCLUSION

How does one prepare for the next war? The best a military can do is train to a standard that will allow it to adapt to the next challenge it will have to face. CAF has historically done well at training professional, effective and flexible forces. Proven tools (such as mission analysis) as well as the principles of war and tenets of air power should also guide us. Aviation must train in order to be mobile in support of land operations to remain relevant and be in the best position possible when the time comes to deploy CAF anywhere in the world. The RCAF should embrace the realities of the 21st century operational environment as they relate to tactical-aviation mobility. 

Lieutenant-Colonel Jeannot Boucher joined the Canadian Forces in 1992 and is currently the Executive Assistant to the Commander of the RCAF. He was the Commanding Officer of 430 Tactical Helicopter Squadron in Valcartier, Quebec, from 2013 to 2015. He holds both a Bachelor of Arts in Politics and Economics as well as a Master of Warfare Studies from the Royal Military College of Canada and a Master in Operational Art and Science from Air Command and Staff College in Montgomery, Alabama, where he also attended the Air War College.

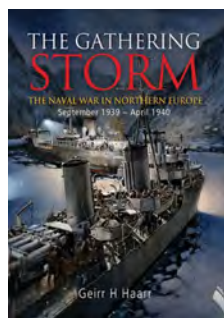
Abbreviations

ADO	advanced dispersed operations	hr	hour
AMSE	aircraft maintenance support equipment	kg	kilogram
AO	area of operations	km	kilometre
APOD	airport of disembarkation	lb	pound
ATF	air task force	MR	exercise MAPLE RESOLVE
avn	Aviation	MRP	mobile repair party
bn	battalion	Op	operation
BSA	brigade support area	OPCON	operational control
C2	command and control	PUK	pack up kit
CA	Canadian Army	RCAF	Royal Canadian Air Force
CAF	Canadian Armed Forces	RTHR	Road to High Readiness
CP	command post	SA	situational awareness
DP	delivery point	SPOD	seaport of disembarkation
DSA	divisional support area	TOC	tactical operations centre
FARP	forward arming and refuelling point		



CAF Photo: Sgt Gaétan Racine

BOOK REVIEWS



THE GATHERING STORM: THE NAVAL WAR IN NORTHERN EUROPE SEPTEMBER 1939 – APRIL 1940

By Geirr H. Haarr

Annapolis, Maryland: US Naval Institute Press, 2013

550 pages

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Review by **Major Chris Buckham, CD, MA**

The period covering the early years of the Second World War (1939–1940) is often referred to in the West as “The Phony War.” This is mainly because, from traditional history’s perspective, very little occurred in the war during this time; however, this completely ignores the one element where much was indeed happening during this period: the sea. Haarr’s book focuses exclusively on this aspect of the war and sheds a great deal of light upon it in terms of capability, technological advancement, doctrine as well as command and control.

The narrative commences with a review of the interwar period for the German and British navies, highlighting those areas of development and focus for the governments and senior staff. What is really significant here are the decisions made regarding those aspects of capability and doctrine that were not emphasized and the implications that this had for the upcoming conflict. The British, facing economic realities, could not maintain their historical degree of naval superiority and fell back on treaties as a means of offsetting the incredible cost of naval construction. They also,

however, maintained a significant degree of bias towards a more traditional doctrine of battleships and surface warfare, despite the technological advances in subsurface capability. Thus, emphasis was not placed on the doctrinal development of antisubmarine capability in terms of seamanship and ship design. Additionally, little thought or attention was given over to interservice cooperation (specifically between the air and naval arms).

For the Germans, naval development was undertaken concurrent with development and expansion in the other arms. This posed a significant challenge, as the competition for resources, control and money was extremely aggressive. Additionally, given the design and build time for ships, there was not always enough of an opportunity for test and evaluation of design concepts, resulting in flaws in ship construction that hampered overall performance. An excellent example of this was the standard-issue torpedo, which had a flaw in its pressure trigger that resulted in significant operational failures. The rebuilding of the Navy did, however, provide the Germans with a doctrinal clean slate from which they were able to develop interoperability between naval and air assets, surface/subsurface platforms, minelaying and surface-raider policies. It is the position of Haarr that while the Germans were a smaller force at the beginning of the war in terms of straight numbers, they were better positioned in terms of overall doctrine and capability.

Haarr writes extensively on the international situation in the North between the British, Soviets, Germans and the Scandinavian countries. This is a fascinating dance to follow, as the British were keen to both disrupt the German flow of iron ore from Sweden and to assist the Finns in their war with the Soviets. Germany had no interest in the North beyond ensuring the neutrality of the Scandinavian states and protecting its access to their resources. Ironically, it was, to a great extent, the activities of the British and her Allies that resulted in the German invasion. It is evident from the sources quoted in the book that it was only a matter of time before either the British or Germans occupied Norway, and it was only a few days that separated their planned invasions.

Haarr refers to this period (1939–1940) as the “Naval Battle of Britain,” and he provides a compelling argument to support this assertion. He centres his discussion on Germany’s need to push the Royal Navy from the North Sea to protect supply lines and undertake operations on the high seas (i.e., disrupting convoys supplying Britain and France). Given the flexibility of its doctrine and the modernity of its fleet, the Germans were initially very successful at knocking the Royal Navy onto its heels (at one point forcing its relocation into bases on the Irish Sea). Haarr proves conclusively that the German Navy had a very good opportunity to defeat the Royal Navy; however, shortfalls in technology (i.e., torpedo) and a failure to appreciate the capability and potential of such advances as minelaying submarines and magnetic-mine technology resulted in these opportunities being squandered. The author also asserts that another central theme was a failure of the German *Kriegsmarine* to prioritize the expansion of the U-boat fleet until it was too late and the British had developed adequate responses to its threat.

Haarr is an excellent author, tying very convoluted storylines into a lucid and engaging narrative. A particular strength of this book is the style with which Haarr layers high politics, competing operational demands and the drama of the life of the individual sailor (regardless of nationality). He provides copious footnotes and a very extensive bibliography of primary and secondary source material. Provided also are a series of appendices outlining details of losses and successes of all major combatants throughout this period. As both a source and a highly enjoyable read, this book is strongly recommended. 🇨🇦

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THE SKY THEIR BATTLEFIELD II: AIR FIGHTING AND AIR CASUALTIES OF THE GREAT WAR. BRITISH COMMONWEALTH AND UNITED STATES AIR SERVICES 1912 TO 1919

By Trevor Henshaw

High Barnet, United Kingdom: Fetubi Books, 2014

406 pages

ISBN: 978-0-9929771-1-5

Review by **Major Chris Buckham, CD, MA**

Historians undertake two main roles in the course of their studies: one is to gather first-hand recollections, information and statistics, and the other is to interpret and recount that material for future audiences. Author Trevor Henshaw has produced a reference work of enormous breadth and depth, cataloguing the losses, on all fronts, of the British Commonwealth air forces from 1912 until 1919 as well as United States Air Service casualties from 1916 onwards.


The book is structured in a very logical manner with an easy-to-follow layout, ensuring the reader can access quickly and efficiently the information that they are seeking. Commencing with a guide on how to follow the nomenclature of the book, Henshaw has incorporated in excess of 16,800 casualty (wounded, missing and killed) write-ups into the body of the book; they are broken out by year, region and circumstances (accident or combat). He has also referenced thousands of German records in order to confirm Allied losses.

Interspaced within the text is an ongoing narrative of significant events that add an additional dimension to his work. It is very easy to view these losses two-dimensionally, especially given the common structure of presentation; however, Henshaw has provided hundreds of photographs that clearly present the grim results of many an airman's dream. His interjections highlight interesting events within the chronological layout of the text; thus he identifies, for example, new aircraft introductions; air lessons learned during the Ypres battles; Hindenburg-line preparations; and myriad other information relating to the development, execution and challenges of aircraft design and combat. The central theme, however, of recognizing, as well as identifying the fate of, aircrews remains the primary focus throughout.

Added to this publication is "The Accidents Addendum" that outlines the fates of the 4,530 aircrew who were injured or killed in circumstances not directly related to enemy action. This is both very appropriate and informative, as history tends to forget about those whose sacrifices resulted from old airframes, limited experience, poor air doctrine and a host of other "behind the lines" reasons. Henshaw also incorporates those "other rank" members who were lost, but despite there being no known cause, their sacrifice is no less telling or significant.

Another aspect of this work that lends weight and credence to it as an outstanding source for future historians is the analysis undertaken by the author of the information that he has gleaned from official records. This represents the second phase of historical relevance: statistics are only as meaningful as the interpretation of what they tell you. His evaluation and presentation in table form of the operational cause factors (i.e., bombing, strafing and reconnaissance) of loss is a goldmine of information in and of itself. His appendices include: "Western Front Losses 1914–18: By Aircraft Type"; "Western Front Losses 1914–18: By Category, Nature of Operations,

& Cause”; “The Cost of Aircraft and Engines”; “Important AIR1 Files, in the National Archives, Kew: Air Casualties”; and “RFC [Royal Flying Corps] and RAF [Royal Air Force] Role of Honour Wounded Listings.” Each appendix is presented as useable raw data with emphasis placed upon key aspects and markers, such as casualty rates by aircraft type.

The amount of time and effort associated with researching and cataloguing the information within this book is staggering. The scope and depth of both the analysis and the discussion of what the statistics amount to is second to none. Henshaw has provided a treasure trove of information for the reading public and the future historian as well as a testament to the sacrifice of the personnel of the Royal Flying Corps, the Royal Air Force, Royal Naval Air Service, the Commonwealth air services and the nascent United States Air Service. One only begins to appreciate the vastness of the operations and the geographic scope of the undertaking when it is laid out in a format such as this. Henshaw is to be commended for producing a book of such richness and gravity. 

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A Different Journey:

Attending a South American (Air Force) Staff College

Introduction

By Lieutenant-Colonel Loïc Roy, CD, MSc

The aim of this article is to increase the situational awareness of Royal Canadian Air Force (RCAF) officers with respect to recognized foreign staff colleges in South America and to provide a taste of what attendance at them entails. As the number of RCAF officers that have attended a staff college in South America is fairly low, I hope this article will provide useful information to help an individual's decision-making process in considering and potentially applying to a South American staff college.

Canadian Armed Forces attendance at recognized foreign joint command and staff programme in South America

I had the privilege to attend the Argentine Escuela Superior de Guerra Aérea (Argentine Air Force Staff College) in Buenos Aires from January to December 2011. It was the first time an RCAF officer officially attended this course. There is a three-year cycle for Canadian Armed Forces (CAF) officers attending South American staff colleges, and this cycle can be summarized as follows:

- 1 x RCAF officer sent to the Brazil Air Force Staff College for a one-year course (given in Brazilian-Portuguese);
- The following year, 1 x Royal Canadian Navy (RCN) or 1 x RCAF officer sent to the Argentine Air or Naval Staff College (courses given in Spanish);
- In the third year of the cycle, 1 x RCN officer sent to the Chilean Naval Staff College (course given in Spanish); and
- The cycle starts again.

This is obviously a great opportunity that perhaps not every RCAF branch advisor, chain of command supervisor, career manager or RCAF officer is aware of. It is important to note that if the selected CAF candidate does not speak the required foreign language, some language training (usually one year) may be required at a Canadian Forces language school.

The Argentine Air Force staff-college experience

The audience

In the 2011-class serial, there were 54 air-force students, of which seven were foreigners from Brazil, Chile, Canada, Dominican Republic, United States of America and Venezuela. The students' backgrounds ranged from air-force operators (e.g., pilots, navigators and intelligence) and air-force

support trades (e.g., maintenance, logistics and communications) to specialty trades not held in our current RCAF structure (e.g., anti-aircraft artillery officers and special forces). During discussions and exercises, this occupation diversity provided the entire group with a wide range of experiences and opinions. Rank wise, students ranged from senior captains to lieutenant-colonels, while the directing staff ranged from majors to colonels.

The syllabus

Similar to the Canadian Forces College (CFC) Joint Command and Staff Programme (JCSP) in Toronto, key topics covered included air doctrine, leadership, operational and air campaign planning, geopolitics, maintenance and logistical-support concepts, just to name a few. Also, there was a requirement to write an academic paper (master's level) in Spanish on a related theme. The syllabus included syndicate work on literature analysis and reviews as well informational seminars given by recognized Argentine scholars on a variety of topics. Most exercises centred, not surprisingly, on the infamous 1982 Falkland's war.

Where this course differs from CFC's JCSP is in the Argentine / South American flavour to most discussions taking place and the fact that the focus of this course is on the Air Force, with little consideration of joint operations. This issue constantly resulted in questions from the audience, given that the principal failure in the Argentine defeat during the Falkland's war was clearly and openly attributed to the lack of "jointness" within their three services. Despite a presidential decree ordering the Argentine Armed Forces to adopt a joint posture back in 1983, there is still significant internal resistance at the higher levels to execute this badly needed internal transformation.

The Argentine / South American operational planning process

All three services of the Argentine Armed Forces use an operational planning process (OPP) called the Proceso de Planificación de Comando (PPC) or, in English, the command planning process. The essence and the sequence of this process are fairly similar to the ones of the CAF OPP with a few key exceptions.

One key structural difference is that unlike the North Atlantic Treaty Organization (NATO) or Canadian systems, most South American nations' headquarters (component or joint) are structured with a joint/air (J/A) code going from J/A 1 through J/A 5 as illustrated in Figure 1.

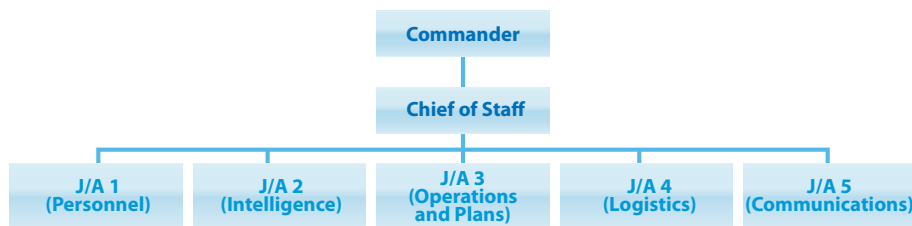


Figure 1. Typical headquarters structure: South American armed forces

The second key exception has to do with how they generate their courses of action (COAs) during their PPC process. In the step preceding the establishment of COAs, their process calls for the enumeration of all potential factors that could have an effect on the success of the mission (geographical, friendly and enemy resources and capabilities, meteorological, logistical, etc.). For the scenarios in which we were involved, this meant establishing and listing over a thousand factors. Once all factors were identified, they were combined through analysis into 10 to 15 critical factors that were briefed to the commander for approval. Once approved, these critical factors were then to be used as the basis for COA development. Of note, every single one of these critical factors needed to be accounted for in each COA. The takeaway from this when we compare their system with ours is that their process is clearly based on a situational approach versus a centre-of-gravity technique. This key difference was a paradigm shift for both the United State Air Force (USAF) officer and me, generating a lot of discussion in class. As a trial and using the same scenario, the USAF officer and I developed COAs using the NATO-standard OPP approach, while the South American officers

used the process learned in class. It was interesting to see some key differences in the final COA generated, depending on the process used. From this example, and since both approaches looked at the problem from different perspectives, we were able to assess the pros and cons and get a sense of the respective limitations of both approaches.

Final thoughts

My overall experience in Argentina was truly remarkable—from the professional experience gained as well as the new friendships and South American contacts I have made. Luckily, following my posting in Argentina (with the Spanish language in my back pocket and a fairly good understanding of South American military affairs), I was posted to Canada Command / Canadian Joint Operations Command (CJOC) in the Western Hemisphere Strategy section, an interesting and challenging job that provided the CAF, in my opinion, with an excellent return on investment. In 2014, I was posted to the Canadian Embassy in Mexico City as the Deputy Canadian Defence Attaché, a great posting and, once again, one that capitalizes on the return on investment of everything I learned in Canada Command / CJOC and, more importantly, while I was in Argentina.

I hope that this article has increased your situational awareness and provided you with a flavour of the potential South American staff college opportunities for RCAF officers and the subsequent potential postings. The skills and experience acquired during this course can lead to unusual but extremely interesting postings. 🇨🇦



Foreign JCSP 2011 (Argentina) class picture. The author is standing fourth from the right in the second row

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Abbreviations

CAF Canadian Armed Forces
CFC Canadian Forces College
CJOC Canadian Joint Operations Command
COA course of action
J/A joint/air
JCSP Joint Command and Staff Programme

NATO North Atlantic Treaty Organization
OPP operational planning process
PPC Proceso de Planificación de Comando
RCAF Royal Canadian Air Force
RCN Royal Canadian Navy
USAF United States Air Force

The RCAF Air Task Force

THE NEW KID ON THE BLOCK

By Lieutenant-Colonel Pux Barnes, CD, MA

CAF Photo: Canadian Forces Combat Camera, IS2014-5025-01

HOW MANY TWO-YEAR-OLDS DO YOU KNOW WHO CAN NOT ONLY WALK, TALK AND PLAY INDEPENDENTLY BUT CAN ALSO TRAVEL ANYWHERE ACROSS THE COUNTRY OR AROUND THE WORLD ON LESS THAN A DAY'S NOTICE, FULLY READY TO CARRY OUT A VITAL ROLE IN EVERYTHING FROM HUMANITARIAN ASSISTANCE TO FULL SPECTRUM OPERATIONS ... FOR MONTHS AT A TIME?

While many proud parents are more than happy to tell you how smart and capable their two-year-olds are, I bet their kids (while perhaps cuter) have nothing on the newest kid on the block for the Canadian Armed Forces (CAF), the Air Task Force (ATF). Lessons learned during past operations (ops) such as APOLLO / ATHENA (Afghanistan, 2003–2011), HESTIA (Haiti, 2010) and MOBILE (Libya, 2011) uncovered trends where the Royal Canadian Air Force's (RCAF's) deployable capabilities suffered somewhat from a lack of planning capability, a constantly changing command structure and the decided difficulties associated with different communities working as a whole. The ATF concept was designed to fix these problems and bring structure and predictability to the way the RCAF formed its deployable forces, all the while enhancing the contributions it made to operations.

Published in May 2014 as "Air Doctrine Note 14/01, Royal Canadian Air Force Air Task Force Commander Definitions, Roles and Responsibilities," the ATF idea has indeed helped to shape the development and delivery of air-power capabilities in support of numerous domestic and multinational expeditionary operations. But wait, I am getting ahead of myself here. In order to understand where the ATF has taken us, we need to take a quick look at how it all began.



CAF Photo: MCpl Marc-Andre Gaudreault, Canadian Forces Combat Camera, IS2013-2006-023

A Royal Canadian Air Force CC150 Polaris aircraft with members of the Canadian Armed Forces Disaster Assistance Response Team on board arrives at the Iloilo City Airport during Operation RENAISSANCE 13-1 on November 16, 2013.

A WARFARE CENTRE, C2 DOCTRINE AND A GENERAL—WHERE THE ATF BEGAN

In 2012, the Canadian Forces Aerospace Warfare Centre (CFAWC) completed a 27-month process of carefully researching, writing, collaborating and refining the RCAF's first command and control (C2) doctrine since the end of the Cold War, the B-GA-401-000-FP/001. The "401," as it is commonly known, began paying off immediately as it not only provided a framework for not only the C2 of air power but also served as a commander's guide to what the RCAF *had to do* to ensure it delivered air power effectively.

While useful doctrine in this respect, what the 401 could not do was tell commanders *how* to deliver air power. That would require another kind of guide, one that would provide some finer details on how the RCAF should organize its forces for employment; one that would require RCAF-wide agreement on how to work together as one cohesive force.

The concept of the ATF began in late 2012 in response to a challenge presented to CFAWC by Major-General (MGen) Pierre St-Amant, then Commander (Comd) of 1 Canadian Air Division (1 Cdn Air Div). When asked by the author what the Warfare Centre could do for the operational air force now that the 401 was on the street and being employed, MGen St-Amant took no time in responding. By drawing a rectangle in the air with his fingers, he suggested we could help best by defining a box that could become the key to force generating and force employing RCAF air power in a way that broke the prevailing negative cycle of ad hoc planning and execution. "Define the box, research the best way to make it work and the best way to command and control it ... most of all, provide me with options to fit any kind of operation."¹ No big deal, right?

Eighteen months later, after much development and testing through war gaming and buyin from stakeholders across the RCAF, the ATF concept was approved by the Comd of the RCAF, Lieutenant-General Yvan Blondin on 26 May 2014. The truth of the matter is that, for at least a year, the RCAF had been employing the ATF concept while it was being developed, using drafts of what became the final plan.

An ATF is “a temporary grouping of RCAF operational/tactical formations, squadrons, units or detachments formed for the purpose of carrying out a specific operation, mission or task.”² In short, an ATF can range from small and simple (a few aircraft and personnel) to large and complex. Larger ATFs can consist of flying and non-flying detachments, an ATF headquarters (HQ), and even an air expeditionary wing that provides the services of an operations-support element, mission-support element (MSE) and force-protection element. The key to understanding an ATF is that it is scalable to fit the task and often looks different from other ATFs.

Unlike the Canadian Army or Royal Canadian Navy, the RCAF rarely places an entire squadron or unit on high readiness and then deploys them for an extended period of time. Normally, only a portion of each RCAF squadron or unit is placed into high readiness throughout the year and deployed on short-notice in the form of tactical air detachments, both flying and non-flying. When several air detachments are deployed to form an ATF, the RCAF must also provide the ATF’s integral C2 personnel and structure. Providing a high-readiness C2 element to command and control ATFs of various sizes and compositions requires a robust and well-planned RCAF C2 solution—something that is at the heart of the ATF concept.

ATF MALI, 2013

The first operation where the new ATF structure was trialed occurred when CAF supported the Government of France’s Op SERVAL, their military intervention in the West African country of Mali, from 15 January to 31 March 2013. The mandate of ATF Mali was limited to airlift and specifically excluded combat. The airlifts included assets such as personnel, vehicles and resupply equipment such as food, water and medical equipment.



CAF Photo: Sgt Matthew McGregor, Canadian Forces Combat Camera, IS2013-1008-12

French military troops board a Canadian Forces CC177 Globemaster III aircraft at Base aérienne 125 Istres-Le Tubé in Istres.

Canada’s contribution to French operations in Mali consisted of one CC177 Globemaster III heavy-lift transport aircraft and about 40 RCAF personnel, including flight and maintenance crews from 429 Transport Squadron and traffic technicians from 2 Air Movements Squadron, both units of 8 Wing Trenton in southern Ontario.

The CC177 departed Trenton for Europe on 15 January 2013 and conducted the first operational sortie of this deployment on 17 January, transporting a French light armoured vehicle, medical supplies and ammunition from Evreux, France, to Bamako, the capital of Mali. In all, ATF Mali conducted 48 flights and transported approximately 3,561,000 pounds [1,615,240 kilograms] of cargo.

ATF Mali also represents the first time that an RCAF officer performed the role of ATF comd. Major Bill Church of 429 Transport Squadron exercised the expanded roles and responsibilities of the ATF comd, reporting back to the RCAF Joint Force Air Component Commander (JFACC) in Winnipeg.

Op LENTUS 13-1, 2013

Op LENTUS 13-1 was CAF's joint response to a request for assistance by the Province of Alberta to provide support for humanitarian assistance and disaster response operations due to major flooding in southern Alberta. Op LENTUS provided flood mitigation support and prevention to provincial authorities. When tasked to Op LENTUS, personnel, vehicles, equipment, crews and aircraft came under operational command of the Comd, Canadian Joint Operations Command (CJOC) and operational control of the Joint Task Force (West) [JTFW] Comd in Edmonton, Alberta.



CAF Photo: MCpl Patrick Blanchard, Canadian Forces Combat Camera, IS2013-3025-07

Members of Lord Strathcona's Horse (Royal Canadians) help the search and rescue team evacuate people who were stranded in William Watson Lodge in Peter Lougheed Provincial Park during Operation LENTUS in Calgary, Alberta, on June 22, 2013.

RCAF search and rescue CH149 Cormorant helicopters from Comox, British Columbia, and Cold Lake, Alberta, were the first to be called in to assist the Royal Canadian Mounted Police ground evacuation operations, search for missing people and extract home owners and families from their rooftops. At the height of Op LENTUS, approximately 2,300 soldiers, sailors, airmen and airwomen were deployed in Calgary, Canmore, Cochrane, Red Deer, High River, Airdrie and Medicine Hat. The ATF was comprised of approximately 100 personnel, six CH146 Griffon helicopters, two CH149 Cormorant helicopters, one CC130 Hercules airlift aircraft and one CP140 Aurora surveillance aircraft.

One of the first operations to use the draft doctrinal concept, ATF LENTUS utilized the existing Air Component Coordination Element (ACCE) Director as the ATF Comd. This was a choice made by the JFACC to capitalize on the ACCE Director's understanding of the region, advanced situational awareness and trust already developed with the Comd JTFW. By employing the local air-power expert in the region as ATF Comd, the JFACC was able to greatly speed up ATF employment and response time from days to mere hours.

Op IMPACT, 2014–2015

Operation IMPACT is the CAF contribution to the Middle East Stabilization Force—the multinational coalition to halt and degrade the Islamic State of Iraq and Syria (ISIS) in the Republic of Iraq and in Syria.



CAF Photo: Op IMPACT, DND, GD2015-0053-006

Air Weapons Systems technicians use an MJ-1A bomb loader to lift a precision guided munition onto the bomb rack of a CF188 Hornet in preparation for the next mission during Op IMPACT on January 13, 2015, near Camp Patrice Vincent, Kuwait.

Approximately 600 CAF personnel deployed as part of Joint Task Force-Iraq, which included planning and liaison personnel to work with the United States (US) and other coalition partners, aircrew support elements, command and control, logistics and the ATF. Exercising CAF joint C2 doctrine, the deployed ATF comd, subordinate to the joint task force (JTF) comd, is responsible for liaising with the Coalition Air Component Headquarters, while at the same time delivering tactical air effects by flying missions. Within the theatre, a positive relationship evolved between the JTF HQ and ATF HQ in order to ensure the smooth flow of information and sustainment.

Air Task Force-Iraq (ATF-I) is contributing to coalition air operations against ISIS. This mission extension and expansion has allowed the RCAF to strike ISIS targets in both Iraq and Syria. The use of air power has contributed to the destruction of ISIS infrastructure and equipment, denying them the military means to attack Iraqi security forces or coalition assets. At its largest, ATF-I includes six CF188 Hornet fighter aircraft, one CC150T Polaris aerial refueller to support coalition air operations, and two CP140M Aurora surveillance aircraft to contribute to coalition intelligence, surveillance and reconnaissance capabilities.

Originally an airlift mission, ATF-I aircraft conducted 25 CC130 and CC177 flights between 28 August and 26 September 2014, delivering more than 1,600,000 pounds [725,748 kilograms] of military supplies to Iraq. The donations from allied countries included small arms, ammunition and other military equipment. The supplies were delivered in concert with military partners, including the United Kingdom and the US, to security forces working in Baghdad and Erbil.

As of July 2015, ATF-I has flown almost 800 Hornet sorties, more than 200 Polaris sorties (delivering over 12-million pounds [5,443,108 kilograms] of fuel to coalition aircraft) and about 250 Aurora intelligence, surveillance and reconnaissance missions.

Op IMPACT is the first large-scale deployment of an ATF under the new RCAF ATF concept and, as such, is led by an ATF comd at the rank of colonel.

OP REASSURANCE, 2014–2015

CAF has been a major contributor to North Atlantic Treaty Organization (NATO) operations and exercises since its founding 65 years ago and is committed to transatlantic unity, security and stability. In recent years, Canada has been an active participant in NATO-led missions in Afghanistan, the Balkans (Op KOBOLD) and Libya (Op MOBILE).



CAF Photo: Air Task Force - OP REASSURANCE, DND, WG2014-0438-0190

A member of the Canadian ATF describes the characteristics of the CF188 Hornet to Lithuanian, Latvian and Estonian military officers from the General Jonas Zemaitis Military Academy of Lithuania at Šiauliai Air Base, Lithuania, on December 3, 2014, during Op REASSURANCE in support of NATO BAP Block 36.

ATF Romania conducted interoperability training with NATO allies in Cămpia Turzii, Romania, from May to August 2014. Personnel trained with allies in the areas of air defence, air superiority, aerospace testing and evaluation as well as tactical support. The ATF included six CF188 Hornets and about 200 personnel.

NATO Baltic Air Policing mission, Lithuania. The ATF participated in the NATO Baltic Air Policing (BAP) mission from September to December 2014 and was based in Siauliai, Lithuania. ATF Lithuania included approximately 135 personnel, four CF188 Hornets along with an MSE.

The BAP mission was handed over by Portugal and Canada to Italy and Poland respectively. Although Canada formally handed over its BAP mission responsibilities to Poland, the ATF continued to actively support BAP operations until 5 January 2015 to ensure continuity of operations and to support NATO allies and security partners during the transition period.

While participating in the BAP, the ATF worked with NATO allies and responded to any intrusions into Baltic airspace. NATO's Air Policing mission is purely defensive. It is not in response to any specific threat; rather, it is a routine and fundamental component of how NATO provides security to its members.

Op RENAISSANCE 15-1, 2015

As part of a Government of Canada (GC) response, CAF—led by the Department of Foreign Affairs, Trade and Development—provided humanitarian support to Nepal following the devastating earthquakes that hit the country on 25 April 2015 and 12 May 2015. The original magnitude 7.8 earthquake caused significant damage to Nepal's capital, Kathmandu, with aftershocks triggering avalanches in the Himalayan mountains. The earthquake caused significant loss of life, a large number of injuries as well as destruction of property, leaving thousands of people requiring humanitarian support. CAF members began deploying to the region on 26 April 2015, and the mission officially ended on 29 May 2015, with responsibilities for long-term recovery handed over to non-governmental organizations and local authorities.



CAF Photo: Cpl Kevin McMillan, Canadian Forces Combat Camera, IS09-2015-0028-014

Disaster Area Response Team (DART) members offload essential medical equipment and supplies as well as initial elements of DART, including relief supplies as well as medical and Light Urban Search and Rescue personnel from a CC177 Globemaster III at Katmandu Airport in Nepal as part of the Government of Canada's earthquake relief efforts on April 29, 2015.

Initially comprised of two CC177s and their air crews, ATF RENAISSANCE arrived in Kathmandu on 29 and 30 April, carrying over 100 CAF personnel, including members of the Humanitarian Assistance Response Team, engineers, medical personnel, and Light Urban Search and Rescue. Eventually, more CC177 aircraft transported relief supplies, including water, rations and camp equipment (tents and associated items) for victims living outdoors.

Generally speaking, Op RENAISSANCE³ relies on immediate action by the RCAF, as long distances normally need to be covered by responding humanitarian assistance forces. While relatively small in scope, any Op RENAISSANCE requires quick and effective coordination from all players so that the right people with the right equipment get on the right plane ... often planned

with only hours of “notice to move.” Complex operations such as this require a well-developed standing contingency plan (CONPLAN), where all players have worked out their roles well in advance, long before the mission arises. CONPLAN RENAISSANCE is the first to include a fully conceived plan to employ an ATF to support the operation.

ATF—TWO-YEARS-OLD AND WHAT HAVE WE LEARNED?

Generating a scalable and agile force capable of deploying anywhere in the world remains a key goal of the RCAF. The “operational currency” of the RCAF, defined by what it brings to the fight, is the ATF. No matter the size of the ATF or the complexity of the operation it is a part of, a few common observations can be made as to its effectiveness.

Avoiding ad hoc planning and force generation. By offering an alternative to the previously-existing cycle of ad hoc planning for operations and force generation, the ATF has provided an increasingly predictable and manageable way for the Comd 1 Cdn Air Div to present air power and make it ready to deploy. The effect has been felt throughout CAF, as joint commanders and planners now better understand how the RCAF will contribute to an operation, with a living, breathing ATF, not just an airplane and its crew.

Defining deployable RCAF air power. Although it can be defined loosely as “whatever force is needed to get the job done,” the ATF has gone a long way in defining what a deployable RCAF force looks like through its structure, organization and operational language. Most importantly, it focuses the RCAF on a deployable capability which is greater than the sum of its parts. An ATF is no longer a collection of different fleets of aircraft and personnel with specialist skills; rather, it is an organized and cohesive force. No longer do RCAF personnel see themselves as just being part of a Hercules detachment that performed tactical airlift in Africa; they see themselves as part of an ATF that supported an operation—more than just a subtle difference.

The RCAF JFACC and the Combined Aerospace Operations Centre (CAOC). Having several ATFs spread out across Canada and the rest of the world at one time can challenge commanders and their C2 systems. To effectively exercise a span of control over several ATFs simultaneously, it has become necessary for Comd CJOC to place the majority of ATFs under the command of the RCAF JFACC, the chief advisor on air matters. Leveraging the horsepower of the CAOC, the JFACC is best suited to command multiple ATFs and meet the requirements of the operation. The relationship between the JFACC and the Comd CJOC has strengthened considerably since the establishment of the ATF; there exists a more complete understanding of what an ATF can offer and how it can deliver air effects to meet the goals of the Comd CJOC.

Commanding the ATF. Another important result of the establishment of the ATF has been the evolution of the ATF comd, the RCAF officer responsible for making the ATF work. ATF comds have increasingly found themselves having to function at both the operational and tactical level of operations, resulting in a greater need for effective training and preparation before deployment. Developing well-qualified and experienced ATF comds, who are able to work at the operational level, will remain a long-term project for the RCAF that is worthy of continued investment.

In the end, the ATF now represents an RCAF C2 solution that can be flexibly applied to any national or allied/coalition C2 construct. In turn, the ATF comd represents a key component of the ATF, effectively integrating air effects into operations.

CONCLUSION

From its beginnings as an idea that would address lessons learned in past air-power operations about how the RCAF could better prepare for employment, the ATF has had a quick rise to become the accepted way of doing things. In the few short years since its development, the ATF concept has matured rapidly to become the accepted way of organizing forces to react rapidly to the demands of the GC to employ air power in almost every military activity that CAF performs.

While no one will argue about the utility that air power brings to the fight, half the battle will always be training, organizing and leading forces so that they are already prepared to integrate into a joint operation long before the deployment happens. The ATF concept has met with continued success since its inception and will doubtless offer a way forward for some time to come. Happy second birthday, ATF, ... nice work so far! 🎉

Lieutenant-Colonel Pux Barnes is the Air Warfare Education Branch Head at CFAWC in Trenton. He led the team that developed the ATF concept, is the author of the B-GA-401-000/FP-001, *Air Command and Control Doctrine* (to be promulgated) and has written numerous articles and papers on air-power C2 joint operations.

Abbreviations

1 Cdn Air Div	1 Canadian Air Division	DART	Disaster Assistance Response Team
ACCE	air component coordination element	GC	Government of Canada
ATF	air task force	HQ	headquarters
ATF-I	Air Task Force-Iraq	ISIS	Islamic State of Iraq and Syria
BAP	Baltic Air Policing	JFACC	joint force air component commander
C2	command and control	JTF	joint task force
CAF	Canadian Armed Forces	JTFW	Joint Task Force (West)
CAOC	combined air operations centre	MGen	major-general
CFAWC	Canadian Forces Aerospace Warfare Centre	MSE	mission-support element
CJOC	Canadian Joint Operations Command	NATO	North Atlantic Treaty Organization
comd	commander	op	operation
CONPLAN	contingency plan	RCAF	Royal Canadian Air Force
		US	United States

Notes

1. MGen St-Amand, during town hall meeting with members of CFAWC, February 21, 2013.
2. Canadian Forces Air Doctrine Note 14/01, Royal Canadian Air Force Air Task Force Commander Definitions, Roles and Responsibilities, accessed September 29, 2015, <http://www.rcaf-arc.forces.gc.ca/en/cf-aerospace-warfare-centre/doctrine-adn-14-01.page>.
3. Operation RENAISSANCE 15-1 was CAF's contribution to humanitarian relief efforts in Nepal in April-May 2015. Op RENAISSANCE 13-1 was CAF's contribution to humanitarian relief efforts in the Philippines following a typhoon in November 2013. Contingency Plan (CONPLAN) RENAISSANCE is CAF's plan for rapid deployment to the scene of a disaster overseas, as directed by the GC.