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## THE FUTURE OF MULTI-DOMAIN AIR POWER IN CANADA: AN EXPEDITIONARY APPROACH

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# **THE FUTURE OF MULTI-DOMAIN AIR POWER IN CANADA: AN EXPEDITIONARY APPROACH**

*Airpower has become predominant both as a deterrent to war, and-in the eventuality of war-as the devastating force to destroy an enemy's potential and fatally undermine his will to wage war.*

— Gen Omar Bradley, AZ Quotes

## **AIM**

1. The purpose of this paper is to analyse current Royal Canadian Air Force (RCAF) organizational constructs and capabilities to identify efficiencies and ultimately highlight areas to better align with North American aerospace defence and North Atlantic Treaty Organization (NATO) priorities. The rapid evolution of technology, a change in international dynamics and overt prevalence of peer competition has caused a gravitational shift in focus for the allied countries in the western world. In this context, a sound understanding of what will define contested aerospace domains of the future is vital to all force modernisation efforts. While a singular or binary focus on air power may still be relevant to a certain degree, it will be important to identify and implement lessons learned from the RCAF and allied countries alike. From the defence of the Arctic to Multi Domain Operations in a contested environment – Air Forces in North America must adopt a multirole integrated expeditionary mindset to be relevant and effective to respond to the defence challenges of the future. Canada elects to equip an Air Force that is similar in size to an Aviation Combat Element (ACE) of a Marine Air Ground Task Force (MAGTF). In this context, such a model will be discussed in depth and used as a baseline to identify analysis points and ultimately provide three main priorities of focus to inform an agile and flexible force required to meet the demands of the future operating environment.

## **INTRODUCTION**

2. The Royal Canadian Air Force is equipped with talented personnel, the requisite skillsets and ability to design capabilities to effectively reorganize and further contribute to the overarching defence challenges that are envisioned for the next two decades. Amidst the purpose of the paper and such a position, there will be a discussion on Canada's relation to the future of air power in North America through historical anecdotes, comparative analysis to ultimately define what systems and technologies should be at the forefront of the acquisitions process.

3. The management of uncertainty should be a central focus for governments and militaries to further refine design strategies for the next 20 to 30 years. Advanced multirole capabilities employed by forces with an expeditionary mindset must have the ability to fight, manoeuvre and win against peer adversaries that attempt to challenge the will of like-minded countries. Such a mindset should be applied to the aerospace domain

with a focus on integration and interoperability. Therefore, the later part of the discussion will be analysed through the lens of three variables that interact with multiple domains. Specifically; anti-area access denial (A2/AD), the electromagnetic spectrum and an acquisition process informed by integration, interoperability, redundancy and agility. Most importantly, if the variables and analysis points identified are not embedded in the service level decision making processes by allied forces, it will be a significant challenge to effectively outpace our adversaries and dominate the aerospace domain in the long term.

## CONTEXT

4. In an era of budget constraints, aging air platforms and force modernization challenges; militaries will be required to continue to find creative ways to be effective and contribute to the security of North America and world stability. Throughout history, air forces have played a critical role to the emergence and success of great powers. From World War II to Operation Desert Storm, the flexibility, agility and speed that aerospace forces provide to decision makers has evolved over time. Recent conflicts in the Middle East have highlighted the importance of assets in the air domain in order to achieve mission success. Furthermore, a critical planning assumption for a ground force commanders risk calculus has quickly become the viability of persistent intelligence, surveillance and reconnaissance. Recent operational experience highlights the importance of the ability to make decisions from real time updates which rapidly accelerates tempo, mitigates risk to forces and enhances operational effectiveness. Such capabilities that rely predominantly in the aerospace domain are critical to a future air force to further enable flexibility, provide agile support to ground force manoeuvre and ultimately enhance the defence professionals pace of decision making.

5. Fifth generation fighter capabilities combined with complex integrated air defence systems have further challenged assumptions and have in some ways revolutionized asset employment in the aerospace domain. The requirements to achieve air superiority in a multi domain environment now require a joint effort amongst allies and service components alike. The F-35 Joint Strike Fighter, a United States led project and a natural fit for Canada due to proximity and mutual defence interests was once considered. Moreover, the Canadian Armed Forces contribute a significant effort to NATO and defence of North America through North American Aerospace Defence Command (NORAD). These strategic variables alone should be enough for service level decision makers to convince the Canadian political leadership to further reconsider such a capability. The current security environment requires a robust integrated effort by allies and partners to outpace adversarial competition in the aerospace domain in order to mitigate and ultimately deter the escalation of great power conflict.

## DISCUSSION

6. Strategic level defence professionals must have a clear and concise understanding of the electromagnetic spectrum to forecast future requirements. Network centric operations, a concept developed by the United States and effectively employed in 1991 during Operation DESERT STORM leveraged computer networks and information technology to achieve the advantage.<sup>1</sup> In this context, if Moore's law and the availability of advanced technologies are considered, it can be deduced that military capabilities are much more advanced and widely proliferated today. Militaries throughout the world continue to pay close attention to such concepts in order to keep pace and find ways to compete with current and emerging powers. While Canada may not have the population to match the United States Military in size and scope, they remain an effective ally and partner. Historical contributions to mutual security challenges such as the response to attacks on September 11 2001, significant intellectual capital combined with mature technology industry; Canada has the ability and resources to equip a credible aerospace force. In this context, continued focus on an integrated cyber and space capability to further enhance their employment options and enable an effective expeditionary mindset will be important.

7. As military and civilian planners continue to study and further define the problem sets of the future, small and medium size air forces will be required to adapt to an environment characterized by uncertainty and great power competition. What does this mean for a country like Canada that has the benefit of the United States as a neighbouring ally? In order to maximize efficiency both air forces must continue to work on capability integration and interoperability. Canada has the talent and will to effectively structure an air force to meet the demands of the future. Routinely, the greatest hurdles to such achievement are political friction, personnel requirements combined with an over commitment to overseas operations. In western militaries it is common to hear the notion that personnel are its greatest resource.<sup>2</sup> With that in mind, the adoption of a simple talent management strategy that rewards skill and to a certain degree professional military attributes would pay dividends. Such a strategy would aid in retention, boost overall morale and ensure the best of society are present in military service.

8. Canada must continue to emphasize and implement elements of the The Future Air Operating Concept (FAOC).<sup>3</sup> It is relevant and accurately identifies short term

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<sup>1</sup> Clay Wilson, "Network Centric Operations: Background and Oversight Issues for Congress" CRS Report for Congress, (15 March 2007): 29 <https://sgp.fas.org/crs/natsec/RL32411.pdf>

<sup>2</sup> Dr. Richard Goette "Preparing the RCAF for the Future, Defining Potential Niches for Expeditionary Operations" Department of National Defence, (2020): 63 [https://publications.gc.ca/collections/collection\\_2021/mdn-dnd/D2-420-2020-eng.pdf](https://publications.gc.ca/collections/collection_2021/mdn-dnd/D2-420-2020-eng.pdf)

<sup>3</sup> Royal Canadian Air Force Future Concepts Directive Part 2: Future Air Operating Concept, Department of National Defence, (15 August 2016) 9 <http://www.rcaf->

modernization requirements. With that being said, it is difficult to perceive how the RCAF could be proficient in all sub concepts highlighted. While sub concepts such as “Support to Civil Power” and “Continental Air Operating Concept” are important for the Canadian Government, the overarching concept should be consolidated and limited to “Aerospace Defence” and the “Expeditionary Air Operating Concept”.<sup>4</sup> Perhaps a structure similar to a United States Marine Corps (USMC) ACE would be most suitable. As part of the MAGTF, the ACE enables the Ground Combat Element through six functions; assault support, anti-air warfare, offensive air support, electronic warfare, control of aircraft and missiles and aerial reconnaissance.<sup>5</sup> Flexible and agile, the MAGTF organizational construct has a proven track record across the spectrum of conflict. Furthermore, such a mindset is highly conducive to forces that are small in size with multiple components. Furthermore, it would provide the opportunity for the RCAF to consolidate and operate within the realities of their capability, budgetary and personnel limitations.

9. An important process that continues to be a point of friction or even a barrier towards organizational and structural improvement is the defence acquisitions process. Over the last two years, technology has advanced at a pace never seen which caught many organizations to include militaries by surprise. Plagued with stringent and in many ways antiquated bureaucratic processes, large government entities to include parts of the military have been challenged. Such advances have in some ways created instability in large organizations as many have had to evolve and rethink approaches to basic services due to aforementioned technological evolution. Concurrently, governments have had to manage the effects of a worldwide pandemic that has further destabilized and changed the nature of work in itself. How does this relate to the acquisitions process? With importance placed on concepts such as cloud and fusion warfare, the acquisitions and logistics processes play a critical role to ensure systems function and are protected effectively. With a resilient tech enabled acquisitions process, military services will spend less time with mundane analytical tasks and allow the ability to shift personnel to operational roles. Some models that already exist in the ecommerce realm are Amazon and FedEx that can be used as a starting point. Additionally, since there are vulnerabilities to communications technology, information assurance strategies must be a point of focus. Furthermore, while the benefits of technology are critical to the operations of a military, services will be required to design creative contingency plans combined with redundant networks to be successful in a denied environment.

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[arc.forces.gc.ca/assets/AIRFORCE\\_Internet/docs/en/cf-aerospace-warfare-centre/elibrary/future-conceptsdirective-part-2-future-air-operating-concept.pdf](https://arc.forces.gc.ca/assets/AIRFORCE_Internet/docs/en/cf-aerospace-warfare-centre/elibrary/future-conceptsdirective-part-2-future-air-operating-concept.pdf)

<sup>4</sup> Ibid 9.

<sup>5</sup> “Six Functions of Marine Aviation/Aviation Employment Considerations” United States Marine Corps, The Basic School Student Handout, <https://www.trngcmd.marines.mil/Portals/207/Site%20Images/TBS/B2C0333XQ-DM%20-%20B2C0393XQ%20Six%20Funtions%20of%20Marine%20Avations%20and%20Aviation%20Employment%20Considerations.pdf>

10. In a world where weapon systems and military capabilities cross multiple domains and geographical boundaries, a comprehensive approach to air force development will be required. Two cases that in many ways highlight the complex nature of the future battlefield is Operation INHERENT RESOLVE and Operation IMPACT. The environment was multinational, had elements of great power competition, synthesized joint effects and leveraged technology to rapidly accelerate the pace of operations. “Future combat scenarios are likely to resemble the messy, congested airspace that the U.S. Air Force faced in Syria than direct, large-scale combat between the United States and a hostile, nuclear-capable actor like Russia or China”.<sup>6</sup> There is no doubt that conflict will continue to be characterized with advanced technology and will involve multiple state and non-state actors. Additionally, traditional geographic boundaries no longer apply across the spectrum of conflict and therefore mutual defence cooperation agreements, treaties and theatre security engagement arrangements will be important. Lastly, ethical approaches to development in concepts that leverage elements of artificial intelligence will be required in order to keep the human at a minimum on the loop.

11. The discussion up to this point has highlighted some ideas to find efficiencies, leverage technology to be able to contribute to North American defence and the NATO campaigns of the future. Likely the most important conceptually is the fiscal environment that defines a government’s authorities to manage the size and capability of the force. In the end, RCAF challenges are similar to many medium and small air forces throughout the world which encompass; “maintaining an indelible connection between national grand strategy through a comprehensive and articulated military strategy; political imperatives; moral courage; and the veracity of air campaign planning”.<sup>7</sup> With such realities, the cost benefit and viability of an aerospace expeditionary mindset with a few core mission sets that align with elements of the national grand strategy may be the most suitable.

## CONCLUSION

12. Akin to all modern air forces throughout the world, as noted Canada should think of creative ways to force modernize, further integrate the air force with other services/agencies and ultimately reinforce an expeditionary mindset. The realities of adversarial competition and associated levels of uncertainty will remain for the foreseeable future. Therefore, service leaders must critically think through urgent

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<sup>6</sup> "Syria, Airpower, and the Future of Great-Power War." <https://warontherocks.com/2021/08/syriaairpower-and-the-future-of-great-power-war/> (accessed Jan 19, 2022).

<sup>7</sup> Sanu Kainikara, “The Future Relevance of Smaller Air Forces” Royal Australian Air Force Air Power Development Center, working paper (2009): 8. <https://airpower.airforce.gov.au/sites/default/files/2021-03/WP29-The-Future-Relevance-of-Smaller-AirForces.pdf>

procurements and develop investment and divestment strategies that account for rapid technological innovation in a contested multi domain aerospace environment.

13. To conclude, there are evidently many variables to consider to further define the RCAF's role in the context of future airpower. With the advent of hypersonic missiles, cyber and space based capabilities, Canada's role in a joint defence environment will be important to North American security and stability. "The development of air power in its broadest sense, and including the development of all means of combating missiles that travel through the air, whether fired or dropped, is the first essential to our survival in war".<sup>8</sup>

## RECOMMENDATION

14. Priority one – At the institutional level, the defence acquisitions and recruitment processes need reform to meet emerging service requirements to effectively contribute to joint campaigns. Such an acquisitions process must leverage the creative ideas of the private sector and remove antiquated/unnecessary bureaucratic hurdles. Further centralization of control slows down a defence professional decision making process, does not foster creative thinking and ultimately negates significant flexibility. Furthermore, a recruitment strategy that attracts personnel capable to think in multiple domains with competence in technological systems is critical. Specifically, baseline knowledge of computer and networks is rapidly becoming a key to success to any future professional aerospace force. Overall, the human element remains the most important and therefore a selection processes that is sustainable and attracts the necessary skill requirements is a must.<sup>9</sup>

15. Priority two – Canada has the intellectual capital to innovate and ultimately develop command, control and communications (C3) systems and procedures that meet the rigorous demands of the future operating environment. A2/AD problem sets will be a challenge for years to come. Investment in education to enhance what Dr. Goette refers to as intellectual agility will be important.<sup>10</sup> "The key to operating in an A2/AD scenario will be C2 flexibility and empowering subordinates through mission command".<sup>11</sup> Lastly, any systems developed in Canada should be informed by economy of force and have the ability to integrate and operate with assets in the United States.

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<sup>8</sup> Hugh Trenchard, 1<sup>st</sup> Viscount Trenchard, Quote Master <https://www.quotemaster.org/Airpower>

<sup>9</sup> Royal Canadian Air Force Future Concepts Directive Part 2: Future Air Operating Concept, Department of National Defence, (15 August 2016) [http://www.rcaf-arc.forces.gc.ca/assets/AIRFORCE\\_Internet/docs/en/cf-aerospace-warfare-centre/elibrary/future-conceptsdirective-part-2-future-air-operating-concept.pdf](http://www.rcaf-arc.forces.gc.ca/assets/AIRFORCE_Internet/docs/en/cf-aerospace-warfare-centre/elibrary/future-conceptsdirective-part-2-future-air-operating-concept.pdf)

<sup>10</sup> Dr. Richard Goette "Preparing the RCAF for the Future, Defining Potential Niches for Expeditionary Operations" Department of National Defence, (2020): 64 [https://publications.gc.ca/collections/collection\\_2021/mdn-dnd/D2-420-2020-eng.pdf](https://publications.gc.ca/collections/collection_2021/mdn-dnd/D2-420-2020-eng.pdf)<sup>11</sup> Ibid 68.



16. Priority three – It has been acknowledged that Canada lacks sufficient capability and capacity in tactical aviation. As discussed, an immediate investment in a 5<sup>th</sup> generation fighter asset would propel the RCAF's ability to further contribute to the NORAD mission and further strengthen partnerships with Canada's closest ally; the United States.

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