



Deny, Deter, and Defend: How the RCAF Can Modernize Its Operational Approach to Deterrence in a Contemporary NORAD Construct

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Exercise Solo Flight

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DENY, DETER, AND DEFEND: HOW THE RCAF CAN MODERNIZE ITS OPERATIONAL APPROACH TO DETERRENCE IN A CONTEMPORARY NORAD CONSTRUCT

A recurring theme ... is that money spent on deterrence is seldom wasted, especially when considered against the costs incurred when the deterrence fails.

— General (Retired) David Petraeus,

Conflict: The Evolution of Warfare from 1945 to Ukraine

The Royal Canadian Air Force (RCAF) celebrates its 100th anniversary in 2024, a milestone achievement in the defence of Canada, its people, its values, and its sovereignty. Over the course of those 100 years of service, the Government of Canada and the senior leadership of the Canadian Armed Forces have come to view the RCAF as the ‘force of first resort’ to deter threats against Canada in both domestic and expeditionary settings. The reliance on the Air Force as the primary shield for the nation exploits key characteristics and tenets of air and space power: reach, speed, precision, stealth, flexibility, and persistence.¹ Combining these features together allows Canada to apply the RCAF in deterrence and denial roles to ensure the safety and stability of the country and by extension our allies and the global world order.² These roles are therefore executed on behalf of the Government through the active participation in alliances such as the North Atlantic Treat Organization (NATO) and the North American Aerospace Defence Command (NORAD).

As more of our allies adapt their deterrence models to a more denial-based approach, Canada and its Air Force must assess how it sees itself positioned in an evolving global security situation. Deterrence favours the defender, yet it remains costly to achieve and elusive to prove effective until the point where it has failed.³ Facing the challenges of an increasingly obsolescent infrastructure, exigent fiscal constraints compounded by competing capital investments, and a citizenry that places low emphasis on military prowess, the RCAF will be forced to reconcile how it delivers air and space power to the Government and to Canadians to ensure their ongoing security at home. This reconciliation must occur even as NORAD undertakes a period of modernization for continental defence against air breathing and ballistic threats to Canada and the United States. Examining the issue of the RCAF’s approach to defensive air operations through a literature review, a predominantly NORAD and continental defence perspective will be used. This paper will argue that that in order to deter threats to the continent, the RCAF must change its modus operandi within NORAD.

¹ Department of National Defence, B-GA-400-000/FP-001, *Royal Canadian Air Force Doctrine* (Ottawa: DND Canada, 2016), 15-17.

² Department of National Defence, *Strong, Secure, Engaged: Canada’s Defence Policy* (Ottawa: DND Canada, 2017), 14.

³ Michael J. Mazaar, *Understanding Deterrence* (Santa Monica, CA: RAND Corporation, 2018), 7-8.

What is Deterrence?

Strategic deterrence is the belief that the actions under consideration by an aggressor will be met with either swift retribution or strict denial of their freedom of manoeuvre.⁴ In the context of NORAD both aspects of this concept are possible through the combined efforts of the RCAF, the United States Air Force, and the United States Space Force, as they counter threats posed against the North American continent.⁵ Due to their numeric and fiscal superiority over their Canadian counterparts as well as a generally more aggressive stance on defence, the United States can afford both retributive- and denial-based deterrence. This certainly is not the case for most Western nations who, particularly Canada, are actively bolstering their deterrence effects through denial.⁶ This is as much about resource expenditures as it is about return on investment against the fundamental principle that deterrence averts aggression through the belief that a costly reaction will or is highly probable to occur, negating the benefits of conducting said grievous action.

There are two currently defined methods of preventing aggressive behaviour by state and non-state actors: denial- and punitive-based deterrence. The former is meant to create conditions where aggression and unwanted actions are perceived to be unlikely to succeed and thus costly to the perpetrator whereas the latter is retributive and escalatory.⁷ Punishment style deterrence is most recognizable through the concepts of détente and mutually assured destruction that were in effect during the Cold War between the former Soviet Union and NATO.⁸ While it could be argued that the Soviets and Americans succeeded in deterring one another from total global warfare and destruction, it came at an extreme cost that is not tenable for smaller powers. Maintaining a strategic nuclear capability including the development and acquisition of the weapons, their ongoing serviceability requirements, having alert-ready crews to launch and deliver them, as well as keeping the political resolve and rhetoric necessary to stay relevant was and is an expensive endeavour.⁹ For those countries that can afford it, retributive deterrence can be effective as long as the defender possesses the resolve to follow through on promised action despite the risk that it may intensify conflict rather than diminish the threat.¹⁰

Because of the high costs of deterrence by punishment, and the correlated elevated risks of escalation, denial-based approaches are generally more reliable and palatable.¹¹ For small and medium powers, such as Canada, denial strategies are used as

⁴ *Ibid.*, 11.

⁵ Department of National Defence, B-GA-405-000/FP-001, *Canadian Forces Aerospace Shield Doctrine* (Winnipeg: DND Canada, 2012), 26-27.

⁶ Department of National Defence, B-GA-403-000/FP-001, *Canadian Forces Aerospace Shape Doctrine* (Winnipeg: DND Canada, 2014), 22-23.

⁷ Mazaar, *Understanding Deterrence*, 2.

⁸ James Blackwell, "Deterrence at the Operational Level of War," *Strategic Studies Quarterly* 5, no. 2 (Summer 2011): 34.

⁹ David S. McDonough, "Nuclear Superiority Or Mutually Assured Deterrence," *International Journal* 60, no. 3 (September 2005): 812.

¹⁰ Mazaar, *Understanding Deterrence*, 6.

¹¹ Paul Huth and Bruce Russett, "Deterrence Failure and Crisis Escalation," *International Studies Quarterly* 32, no. 1 (March 1988): 42.

they reduce the costs to the defender in terms of treasure, staff, equipment, and the readiness thereof. Deterrence by denial can be accomplished through direct deterrence that is specific to a territory such as the North American continent or extended to defend alliances as in the case of NATO.¹² The persistence of the RCAF in maintaining remote sensors, alert aircraft and crews, and the flexibility in response options to intruders or threats demonstrates its commitment to general deterrence of potential threats against North America.¹³

In the first seven decades of its existence, NORAD has relied on both American and Canadian capabilities to achieve its denial of the continent's airspace and its approaches. Unfortunately these contributions are heavily skewed to the American input due to resources allocated to the RCAF as well as a general public reticence to spend public money on Canadian defence.¹⁴ Despite the mismatched resources, Canada has maintained remote sensing capabilities to warn of impending danger and menacing acts emanating from beyond all three coasts. The sensing systems are obsolete however and are prone to outages and failures, reducing their operational and strategic usefulness.¹⁵ Additionally, the RCAF has and continues to keep aircraft and crews on alert to respond to intelligence cueing to intercept, identify, and prevent incursions to Canadian and North American airspace. The aircraft have evolved from CF101 Voodoos to the CF188 Hornet and eventually the F35 Lightning II, but the effect delivered has remained constant.

As equipment becomes out of date, it must be upgraded and replaced. The concept of "NORAD Next" addresses capability gaps in all domains to ensure that NORAD and the RCAF can continue to meet existing threats and outpace emerging ones.¹⁶ The renewal of the North Warning System, procurement of next generation fighters, acquisition of new long-range strategic air-to-air refuelling aircraft, and digitization of command and control systems are all efforts being made to ensure the enduring safety of the continent.¹⁷ The modernization of NORAD and its public announcements all contribute to domestic and adversarial perceptions that Canada is serious about defence and has the ability to deter unwanted aggression from whoever may consider taking that risk.

Deny Manoeuvrability: See the Threat

To project the plausibility of deterrence, one of the critical aspects that the RCAF will need to retain and improve upon will be that of its detection capability.¹⁸ A hitherto

¹² Mazaar, *Understanding Deterrence*, 3.

¹³ Department of National Defence, *Our North, Strong and Free: A Renewed Vision for Canada's Defence* (Ottawa: DND Canada, 2024), 12.

¹⁴ Kim Richard Nossal, "The Imperatives of Canada's Strategic Geography," in *Canadian Defence Policy in Theory and Practice*, ed. Thomas Juneau, Philippe Lagassé, and Srdjan Vucetic (Cham, Switzerland: Palgrave Macmillan, 2020), 17.

¹⁵ Andrea Charron, and James G. Fergusson, *NORAD: In Perpetuity and Beyond* (Montreal, QC and Kingston, ON: McGill-Queen's University Press, 2022), 176.

¹⁶ North American Aerospace Defense Command, *A Brief History of NORAD* (Colorado Springs, CO: Office of the Command Historian, August, 2020), 11.

¹⁷ Department of National Defence, *Our North, Strong and Free...*, 32.

¹⁸ Andrea Charron, and James G. Fergusson, *NORAD: In Perpetuity...*, 196.

relied upon network of antiquated radars with limited ability to sense objects beyond the line-of-sight, especially across the Arctic Archipelago, will not make Canada a valued defence partner nor a credible deterrent. Of the many contemporary threats faced by Canada and NORAD, many include long-range launch capabilities for weapon systems that are both air breathing and ballistic in nature along with munitions that are super- and hypersonic once fired. To effectively defeat these systems, the RCAF must be able to detect with confidence the weapon's initial engagement before it manifests within the Canadian area of responsibility and interest.¹⁹

Radar and other sensing technology are progressing to the point of being able to see over the horizon, an essential feature for a nation bordered by three oceans. With an ever-increasing detection capability in terms of range, altitude, speed, and bearing it would be irresponsible of the Government and the RCAF to not leverage these advantages. The Canadian Armed Forces should integrate terrestrial and spatial surveillance assets into the RCAF as internal functions without relying on allies and any of the caveats and restrictions that would accompany intelligence sharing.²⁰ In this manner, the RCAF will be able to independently assess dangers to the Canadian homeland and contribute to the broader common operating picture for deterrence and denial operations.²¹ Furthermore, including a sensing function for space-based threats will build upon the existing and evolving radar capability to counter the weaponization of space. To its credit, Canada's latest defence policy, *Our North: Strong, and Free* does commit to future investments in the detection capabilities of Canada and NORAD.²²

While modernizing stationary or orbital sensors is a necessary step, how the RCAF uses the information and augments it is equally important. To maximize the deterrent effect from modernized sensors the staff that comprises the Canadian NORAD Region should be willing to deploy additional tactical assets to the forward edges of the territory.²³ By putting supplementary detection assets at different locations, Canada would be able to augment sensing capabilities with niche or specific sensors to search for and deter aggressive actions across multiple domains. Moreover, with unpredictable forward deployments, the conditions change to favour Canada's deterrent efforts and decrease the odds of success for an adversary.²⁴ Changing how the RCAF uses its sensing technology will contribute to denying adversaries the opportunity manoeuvre against it.

To preserve the integrity of the information gleaned through a modernized detection suite of over the horizon radar, space-based imaging, and airborne reconnaissance platforms the RCAF must protect itself in the cyber domain. Much of the ability to detect rival actions relies on cyber operations and basic procedures will no

¹⁹ *Ibid.*, 265.

²⁰ Andrea Charron, and James Fergusson, "North America's Imperative: Strengthening Deterrence by Denial," *Strategic Studies Quarterly* 15, no. 4 (Winter, 2021): 50.

²¹ Department of National Defence, B-GA-402-000/FP-001, *Canadian Forces Aerospace Sense Doctrine* (Winnipeg: DND Canada, 2012), 7.

²² Department of National Defence, *Our North, Strong and Free...*, Annex C.

²³ Andrea Charron, and James Fergusson, "North America's Imperative...", 53.

²⁴ Department of National Defence, B-GL-300-001/FP-001, *Land Operations* (Kingston, ON: DND Canada, 2008), Chapter 7, Section 9.

longer be sufficient.²⁵ Opponents to Canadian interests have demonstrated the ability to conduct their own cyber operations against foes in support of their operations and Canada will need to do the same to remain relevant and uncompromised.²⁶ If the RCAF and the Canadian NORAD Region wish to preserve their information, they will have to conduct denial operations against threats to disrupt, degrade, or deny freedom of action in the cyber realm when, where, and as appropriate.²⁷ Cyber operations conducted to defend Canadian and NORAD assets “forward”, i.e. outside the territory, carry the potential for strategic deterrence by creating the perception that further operations in other domains by adversaries will not be worth the risk even for motivated aggressors.²⁸

Deter Aggression: Respond to the Threat

If denying an undetected advance into Canadian sovereign airspace fails, possessing a robust response capability is paramount. In this regard, capable interceptors are sensors themselves and must also be operationally and tactically employed to maximize their operational advantages where appropriate.²⁹ Against crewed intruders, detection and interrogation beyond the effective range of the aggressor’s own sensors and weapons systems will give Canada the lead in response. Uncrewed systems such as air- or sea-launched cruise missiles and long-range ballistic missiles also require rapid response to defeat the dangers they pose. Early interception, preferably well outside the air defence identification zone, deters threats and allows fighter engagement if necessary prior to threats populating into imminent perils to Canadians, our critical infrastructure, or core Government functions.

Just as imperative to the interception and prosecution of airborne threats by capable resources are the supporting functions that enable air operations. A swiftly deployable strategic air-to-air refuelling fleet that has the ability to be operationally deployed in numerous locations simultaneously will permit flexible responses in areas that are currently challenging to reach without considerable advance planning. The Government has taken action and is in the process of acquiring the new CC-330 Husky – an Airbus A330 variant – in sufficient numbers though basing locations remains undecided.³⁰ To optimize the new CC-330’s response and support to fighter operations where they will most likely be needed, the RCAF will have to consider non-traditional basing locales such as Cold Lake, Goose Bay, or permanently activating a forward operating location in the North for CC-330 operations. This is unorthodox with conventional RCAF thinking and current Government commitments, yet it would enable

²⁵ Emily O. Goldman and Michael Warner, "The Military Instrument in Cyber Strategy," *SAIS Review of International Affairs* 41, no. 2, (Summer-Fall 2021): 55.

²⁶ Joseph S. Nye, Jr., “Deterrence and Dissuasion in Cyberspace,” *International Security* 41, no. 3 (Winter 2016/17): 49.

²⁷ Mark Montgomery and Erica Borghard, "Cyber Threats and Vulnerabilities to Conventional and Strategic Deterrence," *Joint Force Quarterly* 102 (Third, 2021): 84.

²⁸ Michael P. Fischerkeller and Richard J. Harknett, “Deterrence is Not a Credible Strategy for Cyberspace,” *Orbis* 61, no. 3 (Summer 2017): 387; and Emily O. Goldman and Michael Warner, "The Military Instrument in Cyber Strategy," 56.

²⁹ Department of National Defence, ... *Shape Doctrine*, 19.

³⁰ Department of National Defence, *Our North, Strong and Free...*, 13 and 32.

early, repetitive, and enduring responses to threats and at the same time demonstrate a dedication to defending Canada's Arctic and the air and waterways it encompasses.

Dispersing assets and capabilities is another method of fortifying the RCAF response to threats against the continent.³¹ Whether it is anti-submarine warfare planes that are used to detect sea-launched cruise missile capable submarines or the fighter-interceptors themselves, a balance needs to be struck between concentration of force and effective end results. Canada's current basing strategy of one eastern and one western location for each fleet diminishes the RCAF's ability to answer the call when challenged. Extended transit times due to the sprawling geography of Canada make it untenable to sustain this paradigm. A further benefit is induced force protection of the fleets and their capabilities. By spreading sufficient numbers of aircraft around the country, it avoids catastrophic losses in the event one of their main operating bases is incapacitated.³² Geographic distribution is a force multiplier that ought to be utilized in how the RCAF responds to aggression.

Consideration of mixed-platform responses should be given regardless of sensor upgrades or fleet dispersals. Employing uncrewed aircraft such as drones to conduct long endurance, armed patrols at the extremities of the air defence identification zones would drastically reduce response times while increasing the persistence of surveillance in underserved areas of Canada. Backstopping the drones with crewed aircraft would preserve human autonomy and control while ensuring crews are sufficiently rested to conduct alert operations. Naturally, a modernized command and control construct empowering the operations teams at the operational level is also needed all while upholding the characteristic of centralized control and decentralized execution.³³ Furthermore, provisions to continue enabling the intergovernmental activity supporting aerospace defence between Canada and the United States must be included, particularly if cross-border operations become necessary.³⁴ Combining traditional fleets with uninhabited ones in support of the operational echelon is a novel way of operating for the RCAF, but one that has the potential to deny options and manoeuvre space to any aggressor.

Defend the Continent: Application of RCAF Power

This paper has thus far argued for an idealized situation for the Air Force and the adaptations needed for its deterrence strategy. Reality must be factored for any chance of successful implementation and changes in approach to deterrence. The Government of Canada has not been adequately resourcing the Canadian Forces to maintain, upgrade, replace, or generate new capability in regards to NORAD without significant external pressure from the United States. Even when new fiscal resources or equipment are announced such as in the new 2024 Defence Policy, they are usually projected for

³¹ Department of National Defence, B-GJ-005-314/FP-000, *CFJP 3-13 CF Joint Force Protection Doctrine* (Ottawa: DND Canada, 2006), Chapter 8.

³² *Ibid.*

³³ Andrea Charron, and James G. Fergusson, *NORAD: In Perpetuity...*, 221.

³⁴ Joseph T. Jockel, "Five Lessons from the History of North American Aerospace Defence," *International Journal* 65, no. 4 (Autumn 2010): 1020.

allocation or acquisition in the distant future – often decades away.³⁵ The effect is detrimental to the Air Force’s credibility with our allies and degrades the perception amongst adversaries that Canada is capable of preserving our sovereignty. Aging infrastructure, equipment that is rapidly obsolescing, and a depleting workforce all counter RCAF senior leadership plans to meet and outmanoeuvre the pacing threats.³⁶

While new fighters, maritime patrol aircraft, air-to-air refuelling aircraft, and armed drones are in the procurement phases; the RCAF is forced to continue using fleets that are beyond their end-of-lives. Accepting this reality until the new fleets are delivered and put into operations, the Air Force can still change how it manages and employs its current suite of weapon systems. Building on deterrence theory, aggressors wishing to test Canadian resolve must be confident that there will be a response and that it will be consistent.³⁷ Canada’s denial of adversarial actions in or near our airspace, waterways, and their approaches must be put into motion under two conditions: with credible intelligence and at random. NORAD responses based on accurate intelligence gained from integral capabilities and through sharing by alliance members will continue to be the best method to demonstrate that Canada has the ways and means to deny freedom of action to those who wish to do us harm. Interceptions and diversions away from Canada’s territory deter aggression and therefore defend the continent.

Augmenting deliberate denial responses with arbitrary and unpredictable patrols will further deny options to Canada’s adversaries. Irregular sorties have the added benefit of demonstrating resolve to Canadians and our allies that territorial integrity and the security of the nation remains of utmost importance. Variable air patrols are costly however, and the RCAF and Canadian NORAD Region must remain cognizant of the financial, human resource, and life cycle costs that are imposed. Balancing denial-based deterrence operations and stewardship of the institution’s limited resources will be a challenge yet is not insurmountable. As deterrence’s success is biased towards the defender, implementing surprise will disrupt an antagonist’s decision cycle and reduce their motivation to violate Canadian airspace.³⁸

Finally, deterrence is entirely perception-based and therefore the Air Force must improve its communications to all parties involved. Key stakeholders for public safety and defence reside outside of the RCAF. Classification of information presents the biggest hurdle, however properly vetted data can be made available to other government departments, allies, Canadians writ large, and other Canadian Armed Forces agencies to inform them of the long-term and repetitive nature of the NORAD deterrence roles the RCAF fulfils. Consistent messaging internal to the Armed Forces can generate larger resource shares being allocated so that the Air Force can continue shaping the aerospace environment, typically through an increase in yearly flying rates for the appropriate fleets. Similar strategies outwards to Government and to Canadians will reinforce the true

³⁵ Department of National Defence, *Our North, Strong and Free...*, Annex A.

³⁶ Department of National Defence, *Royal Canadian Air Force Strategy: Agile, Integrated, Inclusive* (Ottawa: DND Canada, February 2023), 8.

³⁷ Nicole J. Jackson, “Deterrence, Resilience and Hybrid Wars: The Case of Canada and NATO,” *Journal of Military & Strategic Studies* 19, no. 4 (2019): 111.

³⁸ James Blackwell, “Deterrence at the Operational Level of War,” 46.

security situation facing the country while tearing down their indifference to defence and reliance on other nation's aide and assistance.³⁹ Focussing communications "up, down, out, and in" will demonstrate the requirement for a lasting deterrent shield to defend Canada and the continent.

Conclusion

As the global world order continues to be challenged, many nations are re-evaluating their concepts of how they deter aggression. Deterrence through denial is the prevalent methodology – it places the consequences back in the adversary's decision and risk acceptance models. Canada and the RCAF are not exceptions and approach deterrence activities in a similar fashion with success. The prospect of infrastructure maturing beyond useful life, fiscal restraints requiring Departmental prioritization by the Minister, and a national populace with a low level of security awareness all conspire against the RCAF's continued execution in deterring harassment and confrontations with adversaries. A new modus operandi is required to defend Canada and North America.

To bolster the Air Force's deterrence capability, it must be able to detect threats. These threats could be air breathing or ballistic in nature and vary in speed from sub- to hypersonic. Early detection in the atmosphere from beyond the horizon or from space increases the probability of successful defeat. Possessing a robust response potential works to deter even motivated aggressors. When challengers to Canadian security know the RCAF is be able to respond quickly, from any point of entry to the country, and with a variety of weapon systems it becomes clear that even low-level aggressions will be met as part of a broad denial strategy. Furthermore, any potential aggressors must possess the belief that they will be unsuccessful. Their belief will come from focussed strategic communications regarding RCAF and NORAD operations deterring access to Canadian air and waterways along with continued successful denial operations.

Denial-based deterrence is based on perceptions and credibility. The RCAF has spent a century building a credible, capable, agile force ready to defend Canada, North America, and the liberal world order. As the international order of law is repeatedly challenged both abroad and on Canada's shores and in its air approaches, the RCAF must change its methodology to ensure a credible deterrence stance is sustained.⁴⁰

³⁹ Kim Richard Nossal, "The Imperatives of Canada's Strategic Geography," 18.

⁴⁰ Andrea Charron, and James Fergusson, "North America's Imperative...", 44.

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