



## TOWARDS A MULTI-DOMAIN CANADIAN SECURITY STRATEGY

Major Jeffrey Tebo

### JCSP 49

#### Exercise Solo Flight

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### PCEMI n° 49

#### Exercice Solo Flight

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CANADIAN FORCES COLLEGE - COLLÈGE DES FORCES CANADIENNES

JCSP 49 - PCEMI n° 49  
2022 - 2023

Exercise Solo Flight – Exercice Solo Flight

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**Major Jeffrey Tebo**

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## **WHO ARE WE AND WHAT ARE WE DOING? A STORY AND A CONCEPT TO PRAGMATICAL MOVE TOWARDS A MULTI-DOMAIN CANADIAN SECURITY STRATEGY**

The soft, morning Quebec snow failed to dampen the electric hum of hundreds of media micro-drones freed from their pre-event electromagnetic barriers. All converged on the biggest story of the 2038 Ottawa-Montreal Olympic games. However, the snow did, perhaps patriotically, conceal those who watch the watchers.

Perched on the snow-covered side of Mount-Tremblant, a career Canadian Sergeant-Major shook his head while smirking half-approval at the busy form of Lieutenant Míngyuè Zhang (張明月). Her breath fogged a screen as she frantically tapped out instructions to the labyrinth of jury-rigged computers, cellphones, and other transmitters she had ad-hoc connected throughout the observation post. The senior soldier contemplated the worn-out tent walls and radio equipment from the 1990s, contrasting against the young officer's displays, flickering with visual representations of the electromagnetic spectrum and emitters on the valley floor, the satellite and fiber traffic status across the official government networks, and all the other, less official traffic emanating from the thousands of unsanctioned signals and devices carrying out their own personal goals in the vicinity of this temporary world stage.

Normally, the senior soldier would, privately, correct Miss Zhang in a time-honored tradition regarding operational security, the use of authorized equipment, orderliness, and the impact on the six junior soldiers who rounded out their eight-person crew. However, now the results outweighed that impulse. He recalled the defining moment that had changed his mind as the stands continued to fill with chanting fans; Canadian, Norwegian, and Chinese flags dominant.

Despite Canada not having access to American networks, Zhang's self-initiated "labyrinth" had detected a malicious transmission to the venue's automated snow grooming machine fleet during initial build up training several weeks prior. Left alone, the machines' autonomous controls would have been at the mercy of anyone able to access the installed backdoor. Zhang, with some help from technical soldiers, had adapted the post's program methods from North American and Asian code sources via GitHub and Gitee, skills unknown to the senior sergeant. Zhang had reveled in the team's prevention of the attack and the approval to keep using her methods. Officials were please, this was a coveted diplomatic win for Canada, they had the matter under control before receiving a warning from allies. Shortly after, an American Colonel had arrived unannounced with a small escort.

He bellowed "Let's go, Canada!" in that eternally optimistic and disarming American manner as they entered but turned all business along alongside his lead teach when they found and inspected Lieutenant Zhang's work. Impressed with the local ingenuity, they poorly masked their underlying sense of disgust at the lack of official capability.

They left the Lieutenant some rarities before departing - hard copy documents, a promise to recommend better armament and a phone to call them if she felt the need arise. The escorting Canadian battery commander had nodded a collegial compliance: positive outreach to America was a top Canadian objective since the advanced fighter program data breach and resultant increased classification of most American systems.

A roar from below brought the Sergeant-Major back to the present as the video feed showed the now familiar biography of the 18-year-old Chinese ski jumper who, despite an amputated arm, had risen to challenge the elite of the sport – becoming an international favorite. The three-way tie between the United States, Germany and China positioned the skier to make history. If the Chinese ski jumper medaled, China would, for the first time in history, win the Winter Olympic Games. The world watched. Thousands in person, millions through the digital eyes on the ground and in the skies.

## INTRODUCTION

"The true defence of Canada is the cultivation of a national spirit and the development of the resources of our vast and fertile territory."

-Sir Wilfrid Laurier, Prime Minister of Canada, 1904 address to the  
Empire Club

History favors nations able to adapt to new circumstances. The Ottoman Empire of the 1400s used gun powder and artillery technology among others to displace the Byzantine Empire, only to, in turn be displaced by European powers the 1500s with similar but improved weapons, further bolstered by communication and transport advances.<sup>1</sup> In a similar vein, China suffered defeats during the last 200 years due to a lack of technological parity with adversaries during the Opium Wars, Sino-Japanese War and the Korea War.<sup>2</sup>

Considering the linkage between strategy, technology and defending the nation, strategist/historian Sir William Freedman underlines important historical trends in *The Future of War: A History*. Real national decision makers must avoid three common fallacies that befall nations: 1- Prediction is often bound up with advocacy, be careful who you listen to; 2- don't assume the recent past can be extrapolated into the future; and 3- do not assume a great transformational discontinuity is about to occur, balance your approach.<sup>3</sup>

Looking to the actual future of warfare, Australian military officer and scholar Mick Ryan's *War Transformed* forthrightly provides a specific outlook of the based

<sup>1</sup> J. Mccarthy, *The Ottoman Turks: An Introductory History to 1923* (Taylor & Francis, 2014), <https://books.google.ca/books?id=aHXJAwAAQBAJ>.

<sup>2</sup> Paul Kennedy, *The Rise and Fall of the Great Powers* (Vintage Books, 1989).

<sup>3</sup> Lawrence Freedman, *The Future of War: A History*, First edition (New York: Public Affairs, 2017).

around 4 disruptors: 1- New-Era Strategic Competition; 2- Demographic Shifts; 3- New And Evolved Technology including Artificial Intelligence, Military Robotics, Quantum Technology, Biotechnology, Energy Weapons, Hypersonic Technology, Space and Additive Manufacturing; and 4- Natural Threat and the Anthropocene (a periods where human activities are such they constitute and distinct geological change to the planet).<sup>4</sup> He then prescribes methods that coalesce around the a mindset: Military and security leaders “must not see themselves [] as an old order defending civilized values against a revolutionary threat [but] as intelligent surf riders spotting the essential currents in a sea which [] if they are skillful enough, they will survive.”<sup>5</sup>

Applied to Canada, these general challenges take on more specific forms, three salient examples include: Changes to climate opening new sea trade routes through the arctic passage, drawing global competition to the relatively undefended, un-policed northern border; Canada’s proximity to the United States in both physical space and as a trusted all pulls us into great power competitions and as an ideal launch point for academic/technical espionage and information campaigns against our neighbor; and finally, our territory contains large reserves of mineral and water wealth. All aspects present the current National Defence departmental plan.<sup>6</sup>

Faced with an exponential increase in security demands emerging from the four introduced disruptors the challenge, and with the common mistakes on hand, how could Canada understand the problem and ensure genuine, relevant national security capabilities are in place?,

Many western militaries have turned to a reframing their concept of the potential warfare environments and how they will act. America has led the charge with a rapid commitment to the concept of multi-domain operations and the resultant multi-domain task force.<sup>7,8</sup> In June 2022 parliament standing committee on National Defence recommend funding and equipping to build Canadian multi-domain capabilities.<sup>9</sup> Reformulated into an explorable form, could a pragmatic security strategy for Canada involve creation of multi-domain task forces in line?

The crowd, and the world, watched vicariously as the Chinese Olympic skier arced through the sky and landed; artificial limb raised in triumph. They stood and clapped as he hugged the Norwegian skier he had trained with since childhood in Øyer

<sup>4</sup> Mick Ryan, *War Transformed: The Future of Twenty-First-Century Great Power Competition and Conflict* (Annapolis, Maryland: Naval Institute Press, 2022).

<sup>5</sup> *Ibid.*, 223.

<sup>6</sup> ‘Department of National Defence and Canadian Armed Forces 2022-23 - Departmental Plan’ (Department of National Defence), accessed 21 October 2022, <https://www.canada.ca/en/department-national-defence/corporate/reports-publications/departmental-plans/departmental-plan-2022-23.html>.

<sup>7</sup> Andrew Feickert, ‘The Army’s Multi-Domain Task Force (MDTF)’ (Congressional Research Service, 16 March 2023), <https://sgp.fas.org/crs/natsec/IF11797.pdf>.

<sup>8</sup> Jose Diaz Leon, ‘UNDERSTANDING MULTI-DOMAIN OPERATIONS IN NATO’, *NATO Joint Warfare Centre, The Three Swords Magazine*, no. 37 (November 2020), [https://www.jwc.nato.int/application/files/1516/3281/0425/issue37\\_21.pdf](https://www.jwc.nato.int/application/files/1516/3281/0425/issue37_21.pdf).

<sup>9</sup> ‘Committee Report No. 1 - NDDN (44-1) - House of Commons of Canada’, accessed 9 May 2023, <https://www.ourcommons.ca/DocumentViewer/en/44-1/NDDN/report-1/page-87>.

and the Fin he had just surpassed. The second roar came as the boards confirmed his silver medal and China's legacy.

He then reached into the bag of his trainer, pulling out a flag. Micro-drones zoomed in for the close-up while the larger systems watched from well overhead as both witnesses and transmitters to the world. And, as he unfurled the flag, a shock struck the crowd.

In place of the 5-star Red Flag, fluttered the white sun on red and blue of the Taiwanese Flag with bold lettering in English and Mandarin: "Flag of the Chinese Republic - "The sky is high and the birds fly freely, the land is vast and the cattle roam." (中華民國國旗, 天高任鸟飞 · 地广任牛行). On the reverse, a heinous satirical comic of the Chinese head of state and pictures of the victims of the Taiwanese Cultural Revolution of 2028.

A warning chime emitted from Lieutenant Míngyuè Zhang's workstation as most systems went to static and the electro-magnetic visualization saturated with immense jamming across many bands – emanating from both space and terrestrial sources. Tapping her keyboard, Zhang commanded: "CONTACT – Sergeant-Major, gun to action - set WEAPONS HOLD. Smyth, get status on EM. I am on nets." All leapt into their action drills as acknowledgements range out, but with the shakes that only come when things are real. One local, jury-rigged sensor suite confirmed most of the micro-drones had been grounded by the jamming. The larger were holding position at higher altitude.

Then disaster. Two medium drones were starting to menacingly descend from their assigned, high orbit. Down towards the venue. Down through the now suppressed barriers, towards thousands of citizens. Down towards a national hero turned activist.

150 kilometers North-West of Ottawa in a small valley, a white knuckled 24-year-old Canadian Armed Forces officer, Lieutenant Míngyuè Zhang, gripped her console and gritted her teeth. Death approached. A childhood ghost made manifest.

**The genuine conceptualization and fielding of a Canadian multi-domain military unit, capable of inter-operability with the United States and United Kingdom, could form a keynote military capability that not only defends the nation, but builds a bridge to key allies and, possibly, a method to move Canadian whole of government towards a national security strategy.**

To that end, this paper presents an small over-view of multi-domain operations as seen throughout the world and suggests who should care about it. The American fielded concept of a multi-domain task force will then introduce both the capability and the national security strategy components that caused the concept to be created. Finally, the suitability for such an element for the Canada Forces will be considered along the lines outlined in the introduction at the national security level. Throughout, the story of

Míngyuè Zhang will play out as useful fiction, to “meld[] narrative and nonfiction,” and “visualiz[e] new technology and trends” relevant to the topic.<sup>10</sup> Annex A contains a continuous copy of the story with notes outlining the non-fiction information driving the narrative.

Writing from an academic institution without classified information, the technical details of in-service equipment and possible future equipment will lack specificity - those who know can fill in the blanks and those who do not can turn to imagination. Finally, the characterization of an adversarial China in the story assumes a terrible, fictional future. Like any rational human-being, the author hopes the people of all nations live in uninteresting times, surrounded by healthy families, and existing in a respectful manner of their own conscience.

Embarked on the Ecuadorian container ship near the mouth of the St-Lawrence seaway, 1st Lieutenant Wang Hong (王红中尉) of the People’s Liberation Army’s Strategic Support Force felt like he was taking the long way to live up to his name. To underline the point, a colleague ribbed him in the slower cadence of Taiwanese Mandarin about his loyalties and to “avoid Code Tempress Zhang”(编码女郎张明). Hong briskly stepped away to avoid the subject and the specter of that name.

Heading for the command center, he listened to Spanish singing from some nearby crew quarters. He wondered if they suspected the Belt and Roads Consolidation Underwater Survey Crew was just a front and among their containers existed two clandestine nuclear small modular reactors, sensors and, most important, a quantum communication system that enabled instantaneous messaging to entangled nodes back in China. His smugness faded as he judged the likelihood that what *he* knew the whole truth. With a nod to the Warring States period, he resigned to "knowing little, thinking much."

Hong snapped back to reality as he slid into his control station marked network warfare senior watch officer, nodding to the supervisor and space warfare watch officer. His two operators provided him the shift report he quizzed them on contingencies – receiving the expected, by the book, responses. They were sharp, but bored. Since the initial mapping of the Olympic games network, they were placed on cyber silence within their geographical region – all work must route through entanglement networks via China. This left simulated practice for the team, and for Hong, a special task from his supervisor.

The Canadian officer Zhang’s unorthodox techniques to detect malicious code routed via in-location Huawei affiliated repeaters embedded in civilian electronics had shattered a key network warfare axis of attack thought open to the Strategic Support Force. While the experts worked on the techniques, Zhang had been selected to shadow her shifts, research her background, and be prepared to counter her from his proximate

<sup>10</sup> August Cole and P.W. Singer, ‘Thinking The Unthinkable With Useful Fiction’, 4 September 2017, 1, [https://www.queensu.ca/psychology/sites/psycwww/files/uploaded\\_files/Graduate/OnlineJournal/Issue\\_2-Singer.pdf](https://www.queensu.ca/psychology/sites/psycwww/files/uploaded_files/Graduate/OnlineJournal/Issue_2-Singer.pdf).

position as part of the overall Chinese network warfare enterprise. His supervisor had offered verbal context upon the assignment: “A great opportunity for Hong the dreamer to place his empathetic tendencies and Taiwanese cultural background in the service of the party!” Opportunities, like loyalty tests, did not come twice in Hong’s organization.

Canada’s good news story media blitz surrounding Zhang made finding her easy. But the shock of seeing the face of a childhood friend from before the Revolution caused him to start as his supervisor observed. A background poster in the photo of Canadian Ambassador, and former Miss Canada, Anastasia Lin saved him. His snide comment recognizing the celebrity PRC opponent masked his truth. The truth that for three years in the mid-2020s, he had attended the Taipei International Book Exhibition and the Yanshui Beehive Rockets Festival as a guest of the Zhang family after the two had become friends at coding club. Her family had fled to Vancouver in 2027 while the Hong family leveraged affiliates to smoothly join the PRC as the revolution swept the country in 2028, placing their son in military preparatory school. How similar and dissimilar they were now.

Jarring, the primary display for the entire command post cracked to life instantaneously ordering their post to battle stations. The words Execute Operation SMILING SEA tensed the room. An unrestricted cyberwarfare engagement. As their displays cracked to life, they oriented to the Olympic Nordic ski site, blanketed in electro-magnet noise from assisting ground and space assets. Simultaneously, automated scripts enacted a software filter, translating all their inputs into Ecuadorian Spanish with digital signatures connecting through Quito, affiliated with the anti-American Union militant arm of that country.

With deniability in place, a script automatically executed and the signals equipment on the ship sent a burning signal through the sky to the high-altitude drones circling over a celebratory scene at the base of the ski jump venue. The signal seized control of two Canadian state media medium drones, both provided at huge discount via a Huawei-Chunghwa telecom subsidiary the year prior. The red bordered text of a lethal action order entered the command prompt: “Primary: Kill target 1. Ballistic impact. Two drones allocated. Expend all drones. Secondary: Maximize Norwegian civilian casualties,” followed by the accompanying cipher authentication. Glowing targets appeared on the display and the network operators prepared commands to execute.

Hong authenticated the cipher and turned to the supervisor. The supervisor, consulting his own ciphered display looked to the watch officer and said, “In the name of Ecuadorian Independence, execute your order,” pushing the button to send the command to Hong’s console. The ciphers were good; Hong executed his drills without thinking, the operators responding to his relay. They chose a stacked attack onto the primary target with an automated reprioritization to the secondary if a data stream from China agreed the primary target had been killed. The second drone would fly an eccentric pattern in trail to defeat long-range direct energy weapons or close in kinetic



systems. Hong nodded instinctually at the excellence of his subordinates' work. Then, suddenly, seconds hung in the air. The drones dove towards their prey.

## WHAT IS MULTI-DOMAIN AND WHO SHOULD CARE?

### Military Security Domains

Militaries that incorporate the new with the old in pragmatic ways often gain extreme advantages over adversaries. While many examples exist,<sup>11</sup> Napoleon's well-known combination of infantry soldiers, mounted cavalry, and artillery so each "commander could fight his command as an integrated combined arms unit"<sup>12</sup> provides a strong historical example. Specifically, the innovation created a huge national security disparity in the early 1800s and its documentation caused it to propagate as the global norm for most nations henceforth. Soon, advanced to naval technology saw coastal bombardment, and amphibious operations create power disparities that led to large increased of empire for those who paired land forces with naval successfully.

To that point, the naval officer and scholar, Mahan, first coined the term "domain" to break down naval features while explaining sea power in his 1890 work *The Influence of Sea Power upon History*.<sup>13</sup> His concept soon expanded and became the dominant sorting method for military forces worldwide, with all major nations of the world currently including land, maritime air and space and, for most, a form of cyber or electromagnetic.

The Government of Canada's current definition of domain is a "sphere of activity, influence or knowledge related to a specific physical or conceptual property"<sup>14</sup> As a point of comparison, the American military defines a domain as "distinct operational environment characterized by a range of factors such as physical and human geography, climate, and infrastructure."<sup>15</sup> In any case, delineation of domains helps guide national security strategy as they describe the environments that warfare will take place and constrain the possible capabilities based on the nature of human endeavor in that domain.

A problem can arise without review, like in the narrative of Lieutenant Zhang, when a nation fails to update its overall conception of domains and their interaction. In Zhang's

<sup>11</sup> Take the Greek city states who, like many ancient civilization found various groupings of chariots, infantry, ships and Graham Wrightson, *Combined Arms Warfare in Ancient Greece: From Homer to Alexander the Great and His Successors*, 1st ed. (Routledge, 2019), <https://doi.org/10.4324/9781351273640>.

<sup>12</sup> Robert M. Epstein, *Napoleon's Last Victory and the Emergence of Modern War*, Modern War Studies (Lawrence, Kan: University Press of Kansas, 1994), 24.

<sup>13</sup> T.A. Mahan, 'The Influence of Sea Power Upon History', 1890, <https://www.gutenberg.org/files/13529/13529-h/13529-h.htm>.

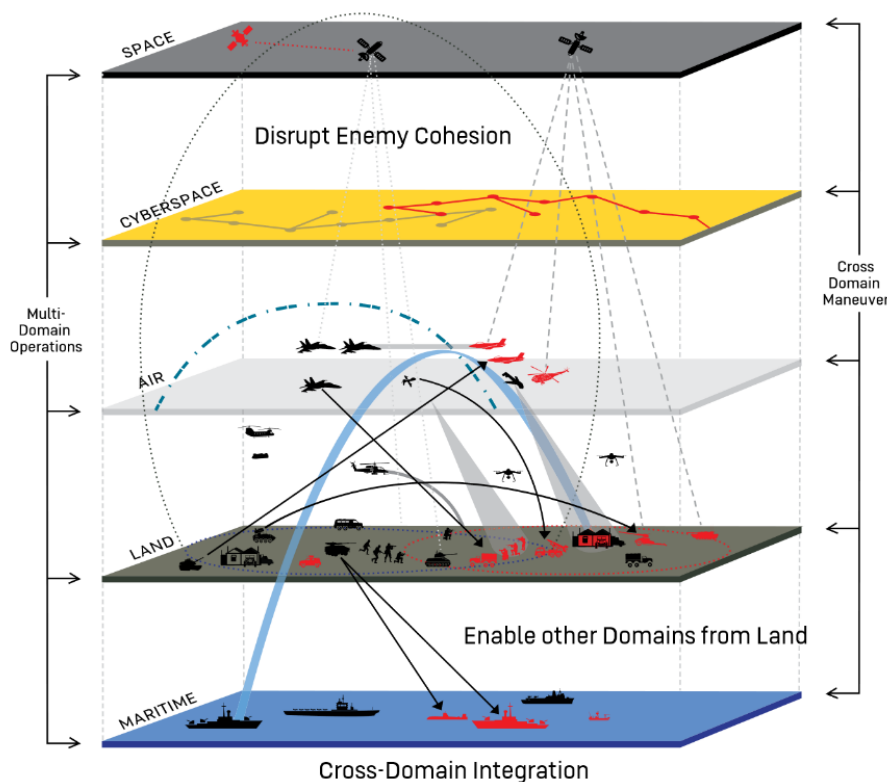
<sup>14</sup> Public Services and Procurement Canada Government of Canada, 'Domain [15 Records] - TERMIUM Plus® — Search - TERMIUM Plus®', 8 October 2009, [https://www.btb.termiumplus.gc.ca/tpv2alpha/alpha-eng.html?lang=eng&i=1&srchtxt=domain&index=alt&codom2nd\\_wet=1#resultrees](https://www.btb.termiumplus.gc.ca/tpv2alpha/alpha-eng.html?lang=eng&i=1&srchtxt=domain&index=alt&codom2nd_wet=1#resultrees).

<sup>15</sup> Joint Publication Joint Chiefs of Staff, 'Joint Operations (JP 3-0)' (CHAIRMAN, JOINT CHIEFS OF STAFF, 22 October 2018).

case, she finds herself based in the land domain struggling to overcome the limited official equipment and doctrine to deal with the 2038 threat environment. Notably the reach of cyber and its combination with civilian or clandestine systems.

### The State of Military Security Domains in 2023

In line with the domains listed above, Figure 1 provides a visualization of the American Multi-domain concept driving the implementation of Multi-Domain Task Forces.



**Figure 1 - Multi-Domain Operations Visualization**

Source: From America's Army: Ready Now, Investing in the Future, 16

Important to interpreting the diagram is the concept of any layer mapping onto other layers depended on geography for maritime, land and air, orbital mechanics for space and distribution of networked devices for cyberspace. Further, black personnel and vehicle representing the friendly force executing actions to defeat adversary forces in red. Multi-domain operations involve elements from different domains while cross-domain maneuver speaks to the movement of elements from one area to another for advantage, such as maritime elements inserting land elements to seize key terrain and, perhaps,

<sup>16</sup> Department of the Army United States, 'America's Army: Ready Now, Investing in the Future', 2020, 6, [https://www.army.mil/e2/downloads/rv7/about/usarmy\\_fy19\\_21\\_accomplishments\\_and\\_investment\\_plan.pdf](https://www.army.mil/e2/downloads/rv7/about/usarmy_fy19_21_accomplishments_and_investment_plan.pdf).

inserting an access point into an enemy installation for exploitation by cyberspace elements.<sup>17</sup> As Table 1 contains multi-domain adjacent terms from several countries.

**Table 1 - Select Multi-Domain Operations Definitions**

US	Multi-domain operations <sup>18</sup>	the combined arms employment of joint and Army capabilities to create and exploit relative advantages that achieve objectives, defeat enemy forces, and consolidate gains on behalf of joint force commanders. Employing Army and joint capabilities makes use of all available combat power from each domain to accomplish missions at least cost.
Canada	Pan-Domain Integration <sup>19</sup>	Mentioned in the departmental plan and likely to be define the draft Pan-Domain Force Employment Concept. Usage aligns to a rough equivalency to multi-domain operations <sup>20</sup> .
NATO	Multi-Domain Operations <sup>21</sup> (draft)	the orchestration of military activities, across all domains and environments, synchronized with non-military activities, to enable the Alliance to deliver converging effects at the speed of relevance”
UK	Multi-Domain Integration <sup>22</sup>	about ensuring all of defence works seamlessly together, and with government partners and our allies, to deliver a desired outcome.
China	All-domain superiority convergence (an interpretation) <sup>23</sup>	converging superiority across different directions of effort different levels of war, different domains, and different spaces according to the needs of war in order to maximize pressure on an opponent or to conduct a strike, and, by maintaining or achieving a superior position, gaining the initiative in war.

Source: Author compiled

<sup>17</sup> Joint Chiefs of Staff, ‘Joint Operations (JP 3-0)’.

<sup>18</sup> Andrew Feickert, ‘Defense Primer: Army Multi-Domain Operations (MDO)’, IF11409 (Congressional Research Service, 21 Nov 22), <https://crsreports.congress.gov/product/pdf/IF/IF11409>.

<sup>19</sup> ‘Department of National Defence and Canadian Armed Forces 2022-23 - Departmental Plan’.

<sup>20</sup> National Defence Canada, ‘Pan-Domain Force Employment Concept Prevailing In A Dangerous World (Draft)’ (Her Majesty the Queen in Right of Canada, as represented by the Minister of National Defence, 2022).

<sup>21</sup> ‘Multi-Domain Operations: Enabling NATO to Out-Pace and Out-Think Its Adversaries :: NATO’s ACT’, accessed 9 May 2023, <https://www.act.nato.int/articles/multi-domain-operations-out-pacing-and-out-thinking-nato-adversaries>.

<sup>22</sup> ‘Multi-Domain Integration’, GOV.UK, 16 February 2023, <https://www.gov.uk/guidance/multi-domain-integration>.

<sup>23</sup> Derek Solen, ‘Chinese Views of All-Domain Operations’, 2020.

The term multi-domain does draw criticism as an attempt to replace functional doctrine to fund futuristic projects that may detract from conventional warfare readiness.<sup>24,25</sup> As a counter, many involved indicate the concept is close enough, and support the rapid acquisition of layered assets a land based cross-domain element is, “right enough”<sup>26,27</sup>

### **Tradecraft Domains**

Consider the domains as they become dissimilar. The increasing variance in tradecraft and culture of the military personnel partaking. Indeed, bringing to mind the Napoleonic scenario, an artillery officer who knows math and rides a horse may seem very removed from a musket carrying infantry soldier for many reasons, but their overall experience has much more in common with each other than a submarine captain.

Like any multi-disciplinary team situations traditionally studied in organization behavior, friction occurs when groups of experts in one field must work with teams with differing cultures and tradecraft.<sup>28,29</sup> Within a national security and warfighting frame, the historical solution has involved similar elements grouping by component with a charismatic, respected, competent leader to bring the teams together such as the Napoleon example above or the cadres of Generals lead by Schwarzkopf who ushered in joint warfare during the asymmetric invasion of Iraq during the First Gulf War.<sup>30</sup>

### **Who Should Care**

These challenges require consideration and as the more disparate the domain, the harder to lead consensus. Paired with the concern of self-advocacy for goals other than national security, the ability to direct national security matters free from politics in a democratic state is a challenge. For Canada’s sake, the elected leaders, appointed senators and high range public servants and their staff must care about setting while of

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<sup>24</sup> A great summary of why Multi-domain is synonymous with Joint Operations across all domains. The prediction is a return to joint and domains. In my view, I would expect multi-domain to re-aggregate and come to mean “an operational unit that conducts cross-domain activities organically.” ‘A Sailor’s Take on Multi-Domain Operations’, War on the Rocks, 21 May 2019, <https://warontherocks.com/2019/05/a-sailors-take-on-multi-domain-operations/>.

<sup>25</sup> A excellent cost estimate of munition and ranges. Mark Gunzinger, ‘Cost-Effective Long-Range Strike’ (Air and Space Forces Magazine, 30 June 2021), <https://www.airandspaceforces.com/article/cost-effective-long-range-strike/>.

<sup>26</sup> ‘Forecasting the Future of Warfare’, 9 April 2018, <https://warontherocks.com/2018/04/forecasting-the-future-of-warfare/>.

<sup>27</sup> ‘People Who Know, Know MDO: Understanding Army Multi-Domain Operations as a Way to Make It Better’, 9 November 2022, <http://www.ansa.org/publications/people-who-know-know-mdo-understanding-army-multi-domain-operations-way-make-it-better>.

<sup>28</sup> Stephen J. Sauer, Matthew Rodgers, and Melissa C. Thomas-Hunt, ‘The Expert Paradox: How Team Members’ Expertise Inhibits Leaders’ Willingness to Integrate That Expertise’, *SSRN Electronic Journal*, 2022, <https://doi.org/10.2139/ssrn.4234416>.

<sup>29</sup> Peter M Senge, *The Fifth Discipline Fieldbook: Strategies and Tools for Building a Learning Organization* (Currency, 1994).

<sup>30</sup> Christopher G Marquis, Denton Dye, and Ross S Kinkead, ‘The Advent of Jointness During the Gulf War’, *Joint Force Quarterly* 85 (2017).

government direction of national security. Given a goal, resources and a strict timeline a team of Canadian with a leader with appropriate authorities could deliver the capability to meet multi-domain challenges.

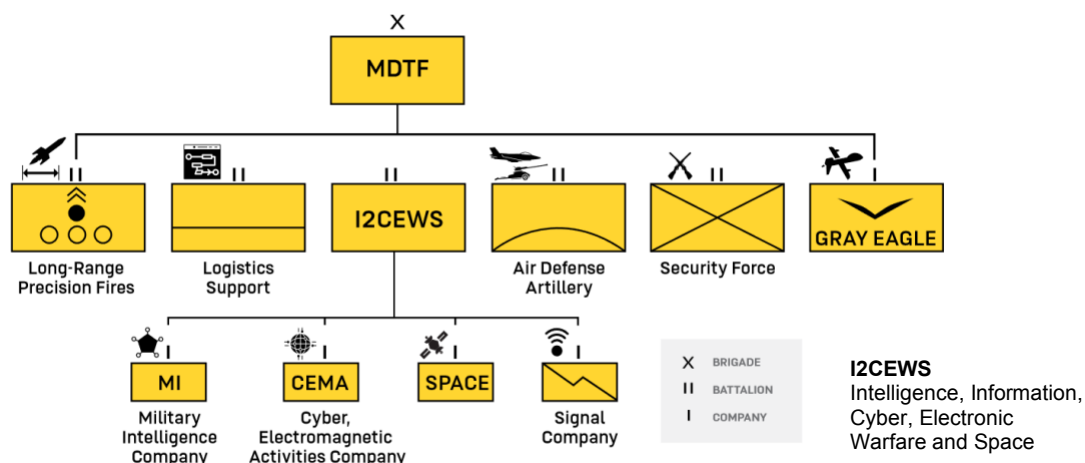
“Sergeant-Major – set WEAPONS FREE in all air defense zones, running radar validator now,” Zhang ordered as she activated a computer line running out to the air defense gun. She whirled to Corporal Smyth. “Cyberwarfare free, shut down anything in the valley communicating with the high-altitude drones.” The dull thud of the close-in weapon system came to life, quickly shredding the first drone as it entered the defense zone above the venue, then the gun fire arced across the sky as the gun attempted to track the cartwheeling second drone. Barely below the gun minimum arc the second drone exploded. Zhang flipped open the provided American phone and dialed. It, unlike any of her issued equipment, started to ring. Down below, realization dawned on the crowd. The majority stampeded for safety. The Chinese Olympian stood firm, flag still held to the air.

From the belly of a container ship, Lieutenant Hong took his feet as the second drone exploded and the space warfare officer questioned how the Canadian gun could track with their radar frequencies jammed. New direction from higher command cut the room off: “Repeat mission. Three drones allocated. An opportunity for redemption.”

Corporal Smyth indicated no signals from the valley except several mini and micro drones that he had grounded using their jury-rigged repeaters, evading the jamming by a modulated waveform using a quantum computing simulator of Zhang’s design to surf the jamming signals. The American appeared on the hand-held: “We see you. We are blocking certain assets to give you some time. But kid, I recommend you get your people out of there. There are.... certain diplomatic rules of engagement that...” He paused to acknowledge someone in his local area, “... good luck and God speed.” The screen went blank. 3 more drones now descended, well-spaced and all with eccentric movement.

## MULTI-DOMAIN TASK FORCE AND A NATIONAL SECURITY STRATEGIES

### The American Concept



**Figure 2 - Multi-domain Task Force Visualization**

Source: From *America's Army: Ready Now, Investing in the Future*, 31

Figure 2 visualizes the structure of the American Multi-domain Task Force generated by the United States Army. The stated purpose of the force is threefold depending on level of hostility: from maintaining contact with adversaries, to provided deterrence or neutralization options to enemy systems that threaten to deny access to critical areas, define technically as anti-access/area denial)<sup>32</sup> and is further explained in the foundation brief to the Joint Chiefs of staff.<sup>33</sup>

In context to Zhang's story this element could dominate a large area with dispersed sensors and systems including long range ground fire missiles, air defense, local drone coverage, a dismounted infantry security force, all connected with a multi-domain headquarters. Of note, lighter vehicle choices such as the wheeled long-range precision fires vehicle speak to air-lift capabilities making it strategically agile to deploy. In the story, the Chinese element on the ship is in the spirit of an Intelligence, Information, Cyber, Electronic Warfare and Space coordination center equipped with organic capabilities and coordinated with all instruments of Chinese national power.

<sup>31</sup> United States, 'America's Army: Ready Now, Investing in the Future', 6.

<sup>32</sup> Feickert, 'The Army's Multi-Domain Task Force (MDTF)'.

<sup>33</sup> Department of the Army United States Headquarters, 'Army Multi-Domain Transformation: Ready to Win in Competition and Conflict', 16 March 2021, <https://api.army.mil/e2/c/downloads/2021/03/23/eeac3d01/20210319-csa-paper-1-signed-print-version.pdf>.

In real life, three task forces exist now with two more expected in the coming years with the US Army chief eager to expand operations into the arctic to address air and sea lanes gaps.<sup>34</sup> As visualized, the unit constitutes of approximately 3000 soldiers.<sup>35</sup>

As the air defence gun expended its last ammunition without effect, Zhang pulled a final idea she and Smyth had simulated in a digital wargame: “Ok Smyth, Swarm Rental. 60% to me, the rest to you.” Seizing control of the small drones on the valley floor, Zhang, with Smyth’s help, placed three small swarms on intercept courses with the descending enemy drones. Tracking algorithms dueled, and the first enemy drone contacted part of Zhang’s swarm, shearing off a wing and falling towards the mountain side.

Elated, Zhang started to shift targets when her skin started to crawl. Just before all systems in their post went dead, she saw the enemy drones evade high, then re-attack, the defending swarms now wayward. Peering out a small window, they heard and felt the crumple of metal impacting the Chinese Olympian, extinguishing his life.

The last remaining drone moved from its trail position, oriented toward the Canadian post, and accelerated. Míngyuè Zhang braced, the spectacle froze for a moment with the debris, lights and heat reminding her of the beehive festivals of her childhood. She recalled that kid Hong and how they had sworn to live meaningful lives as children. She made her peace; she had swung with all her might on the side of freedom. What more could she do?

## **ALLURE, DANGER, AND OPPORTUNITY FOR CANADA**

### **The Allure of Keeping Up with America and NATO**

Military stand-off capability and inter-connectivity of a multi-domain task force is alluring, of the moment a capability that would signal Canadian seriousness about commitments to NORAD<sup>36</sup>, NATO and the Indo-Pacific Strategy.<sup>37</sup> Standing up of two strategically agile Canadian multi-domain task forces equipped with the same equipment as our American allies, but scaled to Canadian budget would provide an answer to any concerns about Canadian follow through. Further, to the plight of the situation, accepting

<sup>34</sup> Jen Judson, ‘US Army Chief Wants Three Multidomain Task Force Units in the Pacific’, Defense News, 15 March 2023, <https://www.defensenews.com/smr/defending-the-pacific/2023/03/15/us-army-chief-wants-three-multidomain-task-force-units-in-the-pacific/>.

<sup>35</sup> ‘Army Seeks Public Feedback on Proposed Stationing of Multi-Domain Task Force’, www.army.mil, accessed 9 May 2023, [https://www.army.mil/article/257742/army\\_seeks\\_public\\_feedback\\_on\\_proposed\\_stationing\\_of\\_multi\\_domain\\_task\\_force](https://www.army.mil/article/257742/army_seeks_public_feedback_on_proposed_stationing_of_multi_domain_task_force).

<sup>36</sup> ‘Department of National Defence and Canadian Armed Forces 2022-23 - Departmental Plan’.

<sup>37</sup> Global Affairs Canada, ‘Canada’s Indo-Pacific Strategy’, GAC, 24 November 2022, <https://www.international.gc.ca/transparency-transparence/indo-pacific-indo-pacifique/index.aspx?lang=eng>.

help from the Americans in this manner, might bolster Canadian sovereignty as the nation gains command of modern stand off weapon and access to information sources across all domains. While security professionals may support such assertions, broader assessment's such as those summarized in *Preparing Canada for a New Generation of Security Challenges* puts multi-domain aspirations into check with the assessment "Despite these promising signals, Canada's national security apparatus remains weak for a country of its size, wealth, and geography."<sup>38</sup>

### **The Danger of Lying to Ourselves**

The bleak picture starts with a "shortfall of 10,000 regular-force members,"<sup>39</sup> an depleted navy and a depleted air force just promised life support of 99 next-generation fighters planned to deliver in 2026. Beyond that, polls show "only 34 percent of Canadian citizens were interested in increasing the defense budget. This was at a time when most Western countries were more aware of the deteriorating defense environment due to the Russian invasion of Ukraine"<sup>40</sup> The article goes on to point out "Canada is unlikely to develop the all-around conventional capabilities to significantly add to NATO" and conclude it might be best for Canada to maintain its stellar special forces component and consider focuses into cyberwarfare and energy security alone. Despite the goal setting and metric tracking in national documents like *Strong, Secure, Engaged*<sup>41</sup> and National Defence Department Plan for FY 2022-23<sup>42</sup> - without a truly federal push and mandate, rapid on-board of programs such as a multi-domain task force seem as unlikely without a radical shift.

### **The Opportunity and Momentum of Doing it Right**

Reservations aside, an American style Multi-domain Task Force could likely be supported as the American production run completes in in the mid-2020s. Given the political will, like the F35 Joint Strike Fighter programme, bold moves are possible

A part of Hong died as the last drone impacted the Canadian position. His ship borne command post mirrored his emotion as all systems moved the silence and the ship changed course.

In the following days Chinese Information Operations branch informed the world. Using a doctored video of the Chinese Olympian now unfurling the 5-Star Red Flag, their outlets detailed how a Taiwanese extremist and Canadian officer, Míngyuè Zhang had orchestrated a terror attack. She had been managed by an American special forces Colonel and manipulated. Thankfully, the Chinese Strategic Support Force had acted quickly, using space-based mining equipment to disrupt the lethal operations

<sup>38</sup> Jack Mageau, 'Preparing Canada For a New Generation of Security Challenges', n.d., 1.

<sup>39</sup> Ibid., 2.

<sup>40</sup> Ibid., 3.

<sup>41</sup> National Defence Canada, 'Strong, Secure, Engaged: Canada's Defence Strategy', 2017, <https://www.canada.ca/content/dam/dnd-mdn/documents/reports/2018/strong-secure-engaged/canada-defence-policy-report.pdf>.

<sup>42</sup> 'Department of National Defence and Canadian Armed Forces 2022-23 - Departmental Plan'.



orchestrated by the revenge seeking Zhang. China pledged to support Canada in its time of need and hold no official grudge. America protested. But, for a large portion of the earth, this was the official narrative. The Canadian broadcast media and government cut losses and called it tragic event with an ongoing investigation.

Hong wrestled with his sense of responsibility. Had he ever, personally, chosen to join the leviathan of the authoritarian uni-party? How could individual freedom result in the excellence and courage of Míngyuè's Zhang and, at the same time, produce a Canadian government unable resist the might of a collectivist autocracy? Did it mean anything to be Taiwanese anymore? Would it mean anything to be Canadian in 100 years?

## CONCLUSIONS

To be included

- Follow the NATO team, inter-operable, avoid a future where we cannot compete against adversaries on our own or as part of a trusted alliance
- Outline the CAF's overall current capabilities by domain using a diagram. Show the scarcity.
- Argue new projects will make things scarcer and, without direction, provide an environment for rivalry within the defense community.
- Opportunity to use such an endeavor as the symbol of Security Strategy delivering results.

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Annex A – To be included