

# Space Security - The Middle Ground: One View from Canada<sup>1</sup>

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## ***Whither deterrence?***

Humanity's utilisation of outer space has reached a critical juncture. No longer do our societies merely explore outer space, they also exploit its full use for a myriad of diplomatic, defence and development purposes. In the remote sensing sector alone, each state makes use of artificial satellites for arms control verification, military intelligence collection on diverse threats, and sustainable development of the nation's natural resources to varying degrees. Likewise, in many fields of our economic endeavours, we have become critically dependent on that usage of outer space. A day without space would be a disaster. The next hundred years without space would be a catastrophe.

The global commons that is outer space today is more and more likely to become an arena for military conflict if we do not take collective action to prevent this. The perils of humankind's first war in space risks losing all that we have gained in the past fifty years in our use of outer space. For example, in 2007, China tested an anti-satellite weapon system based on hit-to-kill technology. The resulting space debris of that single satellite kill increased the population of observable space debris by 15%.<sup>2</sup> It will take hundreds of years or more before much of that debris will return to Earth. In 2008, the United States demonstrated that a modified hit-to-kill ballistic missile defence interceptor can effectively serve as an anti-satellite weapon. France, India, Japan and Russia each have research and development programmes for ballistic missile defence systems based on hit-to-kill technology. So long as nuclear weapon-armed ballistic missiles remain on Earth, ballistic missile defence systems will be sought in order to defend against the use of these horrific weapons. As a consequence, every satellite in low Earth orbit will remain vulnerable to the reach of ballistic missile defence interceptors.

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<sup>1</sup> The views expressed in this paper do not reflect those of the Department of Foreign Affairs and International Trade or the Government of Canada.

<sup>2</sup> Orbital Debris Quarterly News, Volume 11, Issue 2, April 2007, National Aeronautics and Space Administration.

Several nations are also increasingly investing intellectual capital and serious money to simulate how space security can best be achieved. A solution based on military means alone has yet to be found. In fact, regardless of the make-up of the orders of battle modelled in these war games, their outcome has been the same: they have often witnessed the loss of the use of the low Earth orbit for the next thousand years due to the richness of the satellite target-set and the predicted use of hit-to-kill interceptors. Moreover, these simulated space wars were fought and lost within just a few days of the first recognition of hostilities. These simulations have also demonstrated that conflict in outer space could easily escalate into nuclear war among the belligerents, since nuclear weapon states rely on their satellites for strategic stability. Central to the problem of space security is that deterrence, as understood in the context of nuclear weapons, may not work for conventional weapons or within outer space. “Satellites do not have Mothers” is the refrain often heard to express this axiom of space security.

Skirmishes with conventional weapons are often dealt with on Earth by national command authorities within a manageable period of time, but the speed of decision-making required for the active defence of satellites may mean that such protection measures, automated or pre-delegated, could quickly spiral out of control. Guided by military theories developed for conflict on Earth, such as General Douhet’s Command of the Air, space power theorists often advocate for “Go big or Go early” strategies to be adopted by their national command authorities. It is argued that a global power cannot ever permit the loss of its reach, by a regional power attacking the satellites upon which its national power rests. Given the expected location of anti-satellite weapons lying deep within the territory of adversaries, this forward and pre-emptive defence posture could readily deliver attacks on the territorial integrity of countries in possession of such threats to outer space. More frighteningly, the deep-strike forces needed to attack targets on Earth can chase mobile nuclear-armed ballistic missiles as readily as they can attack mobile anti-satellite weapons. Furthermore, pre-positioned weapons in outer space would make reaction times impossibly short for “human-in-the-loop” command and control structures. Outer space and perhaps the surface of the Earth itself could thus be lost quickly or accidentally to space debris and nuclear fallout respectively.

### ***Minimal, Maximal and Median Responses for Space Security***

The dangers elaborated above are recognised to varying degrees by three different camps: the Minimalists; the Maximalists and the Mediators. Each camp espouses a different solution for space security, inversely proportional to its perceived prowess in outer space.

## **The Minimalists**

The Minimalists consider that the current regime for outer space is adequate as it is currently framed. They argue that there is no arms race in outer space, nor is there a need to pursue diplomatic solutions that would limit their freedom of action in outer space and on Earth. They continue to have faith in deterrence - though this hypothesis remains untested in the domain of outer space, being completely alien to existing human experience - and they seek to maintain their options open regarding the future weaponisation of outer space. "The high seas are weaponised and yet they remain free for navigation [by weapons]," these theorists argue.<sup>3</sup> In the view of the minimalists, any new concord for space security should be based on voluntary rules of behaviour and should not constrain either current or future capabilities, including the prospect of space-based ballistic missile defence interceptors. Proposals have been put forward by associates of this camp that set out a list of existing commitments and obligations pertaining to outer space, as opposed to elaborating new rules of behaviour that could serve as indications and warnings of hostile intent, or could serve to build up reassurance through predictable and repeated acts of acceptable behaviour. The Minimalists often prefer the use of means and methods that would produce temporary, localised and reversible effects on satellite signals to defend national security interests, when needed, and they encourage states not to produce long-lived space debris on a voluntary basis. However, they further espouse the view that all military options should nonetheless remain on the table, in the event that diplomats will fail to maintain international peace and security.

## **The Maximalists**

The Maximalists, on the other hand, seek immediate, legally-binding constraints on both capabilities and certain behaviours in outer space. They argue that a new legal regime for outer space is needed, and that it is needed immediately. They also demand that the placement of weapons in outer space and the use of military force on all space objects, including ballistic missiles, should be banned. Proposals have been put forward by this camp that do not prohibit the test or use of weapons on their own satellites, and, would further prevent the application of temporary, localised and reversible effects under conditions for which the UN Charter could be expected to apply. Meanwhile, their research and development of kinetic kill anti-satellite weapons continues apace in order to be able to deal with putative space-based missile defence interceptors and that could turn global powers into regional ones with attacks on the space-based means used to gain battlespace awareness, navigation, and command and control of their military forces on Earth.

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<sup>3</sup> Comparing the sea and the space domains is a false analogy if only because nuclear weapons are prohibited in outer space by the Outer Space Treaty of 1967 but they may sail on or under the high seas on Earth.

## A Mediator's Efforts

A new thrust representing the middle ground has arisen that borrows the best of each of the aforementioned opposing positions. Unlike the concurrent “do too little” or “do too much” alternatives proposed by these camps, respectively, the median way forward foresees an evolutionary adoption, by the international community, of acceptable norms for space security. In this regard, it proposes a layered structure for space security based on: (a) diplomatic assurances - promises not to do certain acts; (b) residual deterrence - the availability of the fallback use of electronic warfare, within the limits of the UN Charter; and, (c) enhanced surveillance - increasing space situational awareness and improving capabilities in monitoring the secure, safe and sustainable use of outer space.

The Canadian position falls squarely into this middle ground. Canada has proposed a clear set of rules, that places equal constraints on all subscribers, and the contraventions of which would be observable by national technical means. Its proposal seeks a ban on the placement of weapons in outer space and the prohibition of the testing and use of weapons on satellites so as to damage or destroy them. It further proposes to prohibit the test or use of satellites, themselves, as weapons. While a definition of a weapon is not needed when the effects of that weapon are also specified within the prohibition, a working definition has also been developed should the need for one arise.<sup>4</sup> The Canadian proposal was first advocated in CD/1865 and in the statement made by Canada's Ambassador to the Conference on Disarmament on 26 March 2009.<sup>5</sup>

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<sup>4</sup> This description drafted in plain language above could also be expressed more precisely as follows:

Each Subscribing State undertakes, in respect of their individual and collective activities in relation to outer space:

- (1) Not to place in orbit around the Earth any weapons or objects carrying weapons, install weapons on the Moon or any other celestial body, or station weapons in outer space in any other manner;
- (2) Not to test or use a weapon on any satellite so as to damage or destroy it and not to test or use a weapon on any other space object so as to produce long-lived space debris;
- (3) Not to test or use a satellite, itself, to gain the effects of a weapon through any direct action;

where,

“weapon” means a device, based on any physical principle, specially-designed or modified for military use, to injure or a kill a person, damage or destroy an object, or render any place unusable;

and,

“test” means to field or flight test in a manner observable by the national or multinational technical means of observation available to a Subscribing State.

<sup>5</sup> Available as of 26 March 2010 at:  
<http://daccess-ddsny.un.org/doc/UNDOC/GEN/G09/615/92/PDF/G0961592.pdf?OpenElement>  
and at: [http://www.reachingcriticalwill.org/political/cd/speeches09/1session/26March\\_Canada-PAROS.pdf](http://www.reachingcriticalwill.org/political/cd/speeches09/1session/26March_Canada-PAROS.pdf)

More recently, Canada has called on states, as a starting point, to pledge to follow these three rules. In a short time, it is hoped that states will adhere to a voluntary code of conduct, built on these rules, which would establish the parameters of an acceptable security regime for outer space.<sup>6</sup> Adherence to such a code, as evidenced through state practice could eventually give rise to a legally-binding obligation, either as established through a negotiating conference, or eventually, through customary international law.

The three rules proposed by Canada present a grand bargain for members of the international community seeking both space and national security. It would effectively prohibit the need for the application of physical force on satellites. If outer space must be contested, pursuant to the UN Charter, then such battles should be waged with electromagnetic interference means and methods that would only produce temporary, localised and reversible effects in space. By following these simple rules during the peace, crisis, war, stabilisation and reconstruction phases of state relations, no space-debris would be created and every state's national security interests would be protected.

This approach recognises that there is no need to damage or destroy a satellite if sufficient reassurance is given that the satellite is not itself a weapon nor that it will be used directly as a weapon. To ensure that such practices are indeed followed by all Subscribing States, enhanced space situation awareness means would be employed to characterise the form and behaviour of all space objects, and consultative mechanisms would be implemented to ascertain compliance in an agreed forum.

The national technical means to verify compliance with these rules will surely evolve, since no military of a global or rising power can currently afford to miss the emergence of a new space-based threat, and no military can expect to prevail in a space war if it cannot quickly discern a space-based weapon from a benign space object. Likewise, enhanced consultative measures will also arise naturally, since it is better to address the potential of new threats with early diplomatic efforts in the quiet of peace, than to face the certainty of real threats later in the din of an immediate crisis.

## ***Conclusion***

A third way is therefore available to the international community to attain space security that bridges the poles of minimalism and maximalism. The middle ground proposal put forward by Canada is likely to fulfil every nation's needs for security arrangements or agreements to be in their national security interest, equitable and verifiable. Moreover, a reliance on temporary, localised and

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<sup>6</sup> See, for example, "Transparency and confidence-building measures in outer space activities," Report of the Secretary-General, Addendum\*\*, UNGA Doc. No. A/64/138/Add.1, 19 September 2009.

reversible electromagnetic interference methods could be exercised legitimately under the self-defence provisions of the UN Charter, and would thus protect all states' national security interests without putting at risk the safe and sustainable use of outer space through the creation of space debris. States can currently make use of outer space only because we have all agreed not to interfere with the signals to and from satellites. A similar understanding is needed to sustain our physical use of outer space for the future.

The failure of repeated simulated military campaigns in outer space based on the application of physical force, advocates for a **conflict-avoidance** strategy based on increased reassurance, residual deterrence and enhanced surveillance of outer space. It has been said that "A day without space would be a military failure."<sup>7</sup> It would, however, pale in comparison to the global failure that would occur if collectively, we do not seize the opportunity for preventative diplomacy that is currently before us. We diplomats owe it to the survival of humanity to ensure that our nation's respective developments can continue to be met through the secure, safe and sustainable use of outer space for peaceful purposes well into the future.

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<sup>7</sup> Col. François Malo, CF, "Schriever V: Lessons Learned - A Canadian Perspective," High Frontier, Air Force Space Command, Vol. 5, No. 4, August 2009, pp. 30-31.