

Available online at www.sciencedirect.com

ScienceDirect

www.compseconline.com/publications/prodclaw.htmComputer Law
&
Security Review

Autonomous weapon systems: Is a space warfare manual required?

Patrick van Esch ^{a,*}, Gavin Northey ^b, Magdalene Striluk ^a,
Helen Wilson ^c

^a Department of Economics and Business, Moravian College, Bethlehem, Pennsylvania, USA

^b Department of Marketing, University of Auckland, Auckland, New Zealand

^c School of Law, Charles Darwin University, Darwin, Northern Territory, Australia

ABSTRACT

Keywords:

Autonomous weapon systems
Space law
Space warfare manual

The legalities for the use of Autonomous Weapon Systems (AWS) in space warfare are examined. Currently, there are manuals for air and missile warfare, naval warfare and cyber warfare, a clear gap in the literature is that there is no manual for space warfare. We find that the current jurisprudence of space is somewhat considered analogous to the high seas and in the absence of a Space Warfare Manual, legal jurisdiction may consider that certain treaties are only in effect when in the territory of that State. In turn, the effectiveness of those treaties may mitigate against any obligations related to the military operations of that same State using AWS in space. Whilst it is yet to be tested in the courts, there are significant gaps identified in *Lex lata* and supporting Declarations, Principles and Treaties in terms of space warfare. Such gaps could act as the foundations for both law reform and the requirement for the creation of a Space Warfare Manual.

© 2017 Patrick van Esch, Gavin Northey, Magdalene Striluk, & Helen Wilson. Published by Elsevier Ltd. All rights reserved.

In the event that a conflict took place in space, the doctrines and procedures of International Humanitarian Law (IHL) and Customary International Law (CIL) would be relevant in principle. However, in such instances, it would be near impossible to avoid harm to neutral States during warfare. Seeing that space resembles that of the high seas (e.g. arising as a component of the international commons), then such a correlation may allow for the application of naval warfare rubrics. Nonetheless, despite the space and high seas similarities, it may be inappropriate and arduous to apply naval warfare rubrics due to the noteworthy variances in conducting hostilities within the two environments.¹ Consideration has been given to

protective symbols on satellites and space vehicles in an attempt to minimise against attack, similar to land warfare and the protection of cultural objects of special importance. Whilst appealing, timeliness would be an issue, as reaching consensus could be difficult due to the need for ratification of a newly created global convention or annexures to existing conventions. Further complexities arise in relation to the issue of space wherever satellites are in orbit as well as individual States who place strategic importance on space.²

Many of the Principles that successfully guide military operations in air, cyber, land and sea may be limited in their applicability to the harsh space environment. Lastly, a

* Corresponding author. Department of Economics and Business, Moravian College, 1200 Main Street, Bethlehem, PA 18018, USA.

E-mail address: vaneschp@moravian.edu (P. van Esch).

<http://dx.doi.org/10.1016/j.clsr.2017.03.004>

0267-3649/© 2017 Patrick van Esch, Gavin Northey, Magdalene Striluk, & Helen Wilson. Published by Elsevier Ltd. All rights reserved.

¹ Crootof, R. (2015). The Killer Robots Are Here: Legal and Policy Implications, *Cardozo Law Review*, 36, 1837–1915.

² Blount, P. J. (2012). Targeting in Outer Space: Legal Aspects of Operational Military Actions in Space, *Harvard Law School National Security Journal*, <http://harvardnsj.org/2012/11/targeting-in-outer-space-legal-aspects-of-operational-military-actions-in-space/>.

Table 1 – Definition of space.

Definition	Source
The dominant view is that space begins at 100 km above the Earth, but some states continue to disclaim the need for the establishment of such a boundary.	Space Security 2010, at 60 (Cesar Jaramillo ed., 2010).
The known and unknown areas of the universe beyond airspace. The boundary between airspace and outer space is not fixed or precise.	Black's Law Dictionary 1212 (9th ed. 2009).
The environment beyond the sensible atmosphere of the Earth.	National Aeronautics and Space Act, 51 U.S.C. § 40302(5) (2010).
The space above the surface of the earth from a height at which it is in practice possible to operate an object in an orbit around the earth.	Space Affairs Act (South Africa, 1993).
Outer space lies beyond the currently undefined upper limit of a state's sovereign airspace. It was declared free for exploration and use by all states and incapable of national appropriation by a 1963 UN General Assembly resolution.	Definition of Space Law, Encyclopaedia Britannica Online: Academic Edition 2011.
In Australia, the Space Activities Act only requires a license for launches of vehicles or payloads that are intended to reach more than 100 km above mean sea level.	Francis Lyall & Paul B. Larsen, <i>Space Law: A Treatise</i> 163 (2009).
Under the functional view, air law should apply to aviation and space law to activities directed towards the use of space. Under such a view, space law would apply to a space launch, which is aborted without reaching orbit, because it is a space activity, and air law would apply to the carriage of a Space Shuttle on the back of a Boeing 747.	Francis Lyall & Paul B. Larsen, <i>Space Law: A Treatise</i> 163 (2009) at 170.
Source: Adapted from Hertzfeld, H. (2012). A Guide to Space Law Terms, Space Policy Institute, p. 82.	

discrepancy still exists as to both the definition and boundaries of space (Table 1). It is deemed that 'space' is the area above the earth's atmosphere between the ranges of 145 to 36,000 km above the surface of the earth, where orbiting Satellites operate whilst travelling at speeds of up to 27,000 km per hour.³

This paper will be structured as follows; first, a background of AWS in terms of jurisprudence and their impact on global communications, second a definition of space warfare and an overview of both *lex lata* and the rules required for a space warfare manual. Lastly, the call for prohibition of AWS in space and if necessary, the requirement for the creation of a Space Warfare Manual.

1. Background

Currently, there is a warfare manual for air and missile warfare (Harvard Guide to Air and Missile Warfare), naval warfare (San Remo Manual) and International Law applicable to cyber warfare (Tallinn Manual), a clear gap in the literature is that there is no manual for space warfare. We provide the proposition for the creation of a Space Warfare Manual and how it could govern in space, the new theatre of war. Currently, there is no Treaty directly dealing with IHL in space. Interestingly, the Outer Space Treaty (signed by 25 and ratified by 103 States),⁴ has the potential to be binding on all States due to codification of established CIL.⁵

However, the area of the law dealing with space appears to be inchoate with the Outer Space Treaty (1967) and the Moon

Treaty (1979), as well as various UN General Assembly declarations that attempt to provide regulations to the administration of laws for State liability and the use for AWS in space.

1.1. Jurisprudence

Jurisprudence and the lawful deployment of AWS in Space may be the setting where AWS could be deployed for use with minimal risk to the military personnel of a State, civilians or civilian objects. The proviso for this being, that the AWS stays within the parameters of space and does not engage in warfare with earth based targets. AWS is defined by NATO Designation (NATO Industrial Advisory Group SG/75) as: "Autonomous self-learning system – Behavior depends on a set of rules that can be modified for continuously improving goal-directed reactions and behaviors within an overarching set of inviolate rules/behaviors".⁶ From a military perspective, there are three levels of autonomy that could be used to classify AWS. First, there are 'human-in-the-loop' systems,⁷ which are human-operated⁸ and have the capacity to be switched over from manual to automatic and vice-versa.⁹ This means the system is human-delegated and operates in automatic mode by default. Second, human-supervised¹⁰ systems operate mostly in autonomous mode and are known as 'human-on-the-loop' systems, where key actions (e.g. a kill order) remain with a human and not the AWS. Third, systems designated 'human-outside-the-loop' allow

⁶ Schmitt, N. M. & Thurnher, S. J. (2013). Out of the Loop: Autonomous Weapon Systems and the Law of Armed Conflict. *Harvard National Security Journal*, 231.

⁷ United States Department of Defence (USDOD) (2011). Unmanned systems integrated roadmap FY2011-2036, viewed July 2015, <<http://info.publicintelligence.net/DoD-UAS-2011-2036.pdf>>.

⁸ European Parliament (EP) (2013). Human rights implications of the usage of drones and unmanned Robots in warfare, Directorate-General for External Policies, European Parliament; viewed July 2015, <<http://www.europarl.europa.eu/committees/en/droi/studiesdownload.html?languageDocument%4EN&file%492953>>.

⁹ Ibid.

¹⁰ USDOD, above, n. 7.

Download English Version:

<https://daneshyari.com/en/article/4957869>

Download Persian Version:

<https://daneshyari.com/article/4957869>

[Daneshyari.com](https://daneshyari.com)