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GA1: Disarmament and Security

Research Report

Topic 1: Monitoring the ongoing development of airborne and unmanned weaponry

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Introduction

The development of airborne and unmanned weaponry can be regarded as a response to the pursuit of a 'Bloodless war[1]'. In modern warfare, technologies such as drones and unmanned aircrafts are intended to minimise deployment of troops, in effect, lessening the risk of human casualties. Airborne and unmanned weaponry also rely on their bolstered precision to minimise troop and civilian casualties, instead opting to directly strike their targets. Techniques such as carpet bombing, have been replaced with precision attacks, in which targets are precisely located.

In theory, these techniques work to minimise the "risk of war"[2], though in practice this does not apply. Since the introduction of technologies such as drones, the agency of non-state actors within the scope of airborne weaponry has increased. While unmanned weaponry can remove people from direct war and potentially minimise civilian casualties this is not always a trend that surfaces. Additionally, the increased capacity of non-state, potentially terrorist actors fortifies the need to aptly monitor the development of this technology.

Definition of Key Terms

Airborne and unmanned weaponry: Refers to weaponised drones without a human pilot onboard, controlled remotely or autonomously. They can carry out missions ranging from target acquisition to ISR (Intelligence, Surveillance, Reconnaissance) assignments[3]. The drones often carry artillery like missiles and bombs or can function as "Kamikaze", where the vehicle becomes the weapon itself.

Uncrewed systems: Colloquially known as drones, unmanned aerial vehicles (UAVs) or unmanned combat aerial vehicles (UCAVs)[4] are aircrafts without a human pilot, controlled autonomously. For the purposes of this report UVAs or drones will be defined within the scope of military or combat use, unless otherwise specified.

[1] "Institute for Regional and International Security (IRIS)," Naval Postgraduate School,
[2] "Institute for Regional," Naval Postgraduate School.
[3] "Unmanned Aerial Vehicles," Oxford Public International Law,
[4] "Armed Uncrewed Systems," UN Office for Disarmament Affairs,

Improvised Explosive Device (IED): In this context we will be considering airborne IEDs. These devices encompass a drone or other unmanned airborne device that transports an explosive for use on enemy targets. These improvised devices are most commonly used by terrorist or non-state actors[5].

Background Information

The contemporary warfare landscape is dominated by Unmanned Combat Aerial Vehicles (UCAVs). This technology can be used to strike targets far beyond the conflict sight, at a conceivably low cost to the operator. The development and use of airborne and unmanned weaponry in armed conflict has become increasingly common, by both state and non-state actors. The use of UCAVs in armed conflict raises concern for the maintenance of international humanitarian law, the protection of civilians and infrastructure, and ultimately global peace and security.

Their origin can be traced to the large-scale reconnaissance missions, popularised during early use in the Vietnam war. Lethal airborne and unmanned weaponry first became widespread in the early 2000s[6]. Conflicts like the 'War on Terror', particularly in relation to American presence in Afghanistan and Iraq, were catalysts for the use of UCAVs seen in modern conflicts today. In that regard, the Russo-Ukrainian war is often called the "War of Drones"[7], due to the scale, significance and integration of drones[8]. The Russo-Ukrainian war provides insight into the presence UCAVs could have on future conflicts.

As highlighted by the United Nations Office for Disarmament Affairs (UNODA), the proliferation of uncrewed systems in armed conflicts which has been used to attack civilian targets, including critical infrastructure, poses a significant threat to peace operations. As noted by the Secretary General Antonio Guterres, the expansion of UCAVs have potential to compromise international security and disarmament efforts. Therefore, action must be taken to

[5] "Institute for Regional and International Security (IRIS)," Naval Postgraduate School,
[6] "History of Drones in Conflict Zones," Geospatial World,
[7] "A Brief History of Drones," Imperial War Museums,
[8] "The Golden Age of Drones: Military UAV Strategic Issues and Tactical Developments," Trends: Research and Advisory,

establish frameworks that monitor and regulate the proliferation and potential expansion of airborne and unmanned weaponry.

In extension, action must also be taken to prevent acquisition of UCAVs by non-state, potentially terrorist actors. With drones and other unmanned, airborne weaponry becoming increasingly cheaper to produce[9] and manufacture independently (outside factories), their technology becomes increasingly available to malicious actors[10].

The rapid proliferation of UCAVs has raised concerns about the technologies' cybersecurity. Modern unmanned aerial combat systems create unique security vulnerabilities. Techniques such as spoofing, jamming and sensor attacks, in addition to malware are primary concerns as UCAVs become more autonomous and complex[11]. To monitor the risk of airborne and unmanned weaponry research emphasises the need for active monitoring and counter efforts[12]. Specifically, battlefield monitoring efforts seen in the Russo-Ukrainian war highlight the performance, vulnerabilities and control limits of advanced uncrewed systems[13].

The United Nations and other international organisations advocate for stricter international oversight and regulation, as well as the establishment of strong legal frameworks. Doing so works to balance the benefits and security risks associated with UCAVs. Ultimately, autonomous weapons development prompts debate surrounding the degree of human control, accountability for lethal actions and the risk of misuse of proliferation; issues this committee will work to address.

[9] "The Golden," Trends: Research and Advisory.
[10] "Institute for Regional and International Security (IRIS)," Naval Postgraduate School,
[11] "The Cybersecurity Risks Threatening Drones: Innovative Solutions in the Digital Age," Pre Prints, [Page 15],
[12] "Ukraine's 'drone war' hastens development of autonomous weapons," Financial Times,
[13] "Ukraine's 'drone," Financial Times.

Major Countries and Organisations Involved

United States of America - As one of the largest manufacturers of combat drones, the United States is at the forefront of modern drone production[14]. In light of developments in the Russo-Ukrainian war, U.S. production has pivoted to a model of mass production, with an aim to produce one million drones annually by 2028[15].

Russia - Russia's relevance to UCAVs and autonomous weapons systems can be examined in relation to the battlefield deployment of the technology in regards to the Russo-Ukrainian war[16]. Additionally, it's active research and experimentation with autonomous functionality[17] establishes it as a significant stakeholder in regards to this issue.

Ukraine - The invasion of Ukraine, by Russia, has accelerated practical use and development of airborne and unmanned weaponry. Notably, due to Russo-Ukrainian war, Ukraine has become one of the largest importers and beneficiaries of drone technology[18].

International Committee for Robot Arms Control (ICRAC) - A non-governmental agency encompassing an international committee of experts in robotics technology, artificial intelligence and aerial arms control. The organisation aims to facilitate discussion and knowledge sharing concerning arms control, in order to reduce the humanitarian threat posed by these systems[19].

Association for Uncrewed Vehicles Systems International (AUVSI) - A U.S. based company specialising in advancing the safe and secure integration of uncrewed systems and robotics across all domains. This is done so through coordinated policy campaigns and engaging industry stakeholders[20].

[14] The Cybersecurity Risks Threatening Drones: Innovative Solutions in the Digital Age," Pre Prints, [Page 23],
[15] "Drone Proliferation Dataset," CNAS
[16] "Great power identity in Russia's position on autonomous weapons systems," Taylor and Frances, [Page 25],
[17]"RUSSIAN PERCEPTIONS OF MILITARY AI, AUTOMATION, AND AUTONOMY," *Foreign Policy Research Institute*, [Page 3],
[18] "Game of drones: the production and use of Ukrainian battlefield unmanned aerial vehicles," OSW
[19] "About ICRAC," ICRAC
[20] "Advocacy Initiatives," AUVS

Relevant UN Resolutions

UN General Assembly Resolution 78/241 - 2023

This resolution is one of the first major acknowledgements by UN member states, of the challenges that are posed by UCAVs[21]. It requests the Secretary General solicit the perspectives of Member States and other relevant stakeholders when addressing issues concerning the security, legality and ethical standards airborne and unmanned weaponry must be held to[22]. The aim of this resolution is to compile a substantive report that will guide future monitoring action. Significantly, the resolution recognises the work promoted by the Convention on Certain Conventional Weapons (CCW), a forum central to addressing the implications of Lethal Autonomous Weapons Systems (LAWS)[23]. In effect, the resolution establishes a structured, inclusive global discussion, central to the establishment frameworks monitoring airborne uncrewed systems[24]. This resolution is therefore essential to shifting the debate about UCAVs away from informal forums to the concentrated, multilateral structure that is the United Nations.

UN General Assembly Resolution 79/62 - 2024

As a follow-up resolution, this document reaffirms the applicability of international, humanitarian and criminal law, as well as the UN charter itself, in regards to autonomous airborne weapons systems[25]. It is therefore reflective of a growing consensus that existing legal frameworks must explicitly evolve to monitor these emerging technologies[26]. The resolution reiterates the need for continued international deliberation. Due to an overwhelming majority of member states voting in favour (166 states)[27] of the resolution, it comes to signify a strengthened political will to confront issues of the autonomy that combative technologies may possess.

[21] "Armed Uncrewed Systems," UN Office for Disarmament Affairs,
[22] Resolution 78/241 "Lethal autonomous weapons systems" adopted by the United Nations General Assembly on 22 December 2023, [Page 4],
[23] Resolution 78/241, [Page 5].
[24] Resolution 78/241, [Page 8].
[25] "79/62. Lethal autonomous weapons systems," United Nations General Assembly, [Page 2],
[26] "Armed Uncrewed Systems," UN Office for Disarmament Affairs,
[27] "Armed Uncrewed," UN Office for Disarmament Affairs.

Previous Attempts to Solve the Issue

The Convention on Certain Conventional Weapons - 2001

The Convention on Certain Conventional Weapons (CCW) monitors the development of airborne and unmanned weaponry by serving as the main UN forum for reviewing emerging weapons technologies and their humanitarian implications[28]. Through the Group of Governmental Experts (GGE) concerned with Lethal Autonomous Weapons Systems (LAWS), the CCW facilitates multilateral discussion and decision making within the scope of this issue[29]. Ultimately, the international humanitarian law instrument is key in attempting the norm-building and transparency when examining the proliferation of UCAVs[30].

Possible Solutions

Strengthening International Legal and Regulatory Frameworks

This endeavour is essential when addressing the proliferation of Armed Uncrewed Systems. This can be most effectively enforced by updating and clarifying existing international humanitarian law, particularly through avenues that include UN involvement[31]. Clearer limits on autonomy and weapon use must also be established, on a global scale. This solution minimises the accessibility of unmanned airborne weaponry to malicious non-state actors. As a potential mitigative approach, this measure will reduce ambiguity around the accountability of state actors and international stakeholders, ensuring emerging technologies remain subject to legal oversight. Therefore, stronger frameworks become poised to promote the responsible development of airborne and unmanned weaponry, while discouraging destabilising arms races.

Enhancing Monitoring and Transparency Globally

Improving international monitoring and transparency mechanisms allows states to bolster their tracking of Armed uncrewed systems, both within their development and deployment. This requires stakeholders to participate in voluntary reporting, information sharing, and

[28] "Armed Uncrewed Systems," UN Office for Disarmament Affairs,

[29] . "Amendment to the Convention on Restrictions on the Use of Certain Conventional Weapons which may be Excessively Injurious," United Nations Office for Disarmament Affairs, [Page 3]

[30] "Amendment to the Convention," [Page 6]

[31] "Armed Uncrewed Systems," UN Office for Disarmament Affairs,

confidence-building measures under UN-led forums such as the CCW. However, there are potential issues associated with the willingness of participants to showcase the full transparency that this measure mandates. Therefore, voluntary information sharing is necessary for Member states to establish their legitimacy as a partner working towards transparent monitoring frameworks. Further, greater transparency reduces mistrust between states, enabling earlier identification of potentially destabilising technologies. As a result, monitoring shifts to being proactive rather than reactive, a fact necessary in a constantly changing field.

Investment Towards Human Control and Standards of Ethical Oversight

Ensuring concrete human control over unmanned weapon systems is a key solution to managing the potential risks they pose. By investing in ethical oversight standards and worker training, the risk of fully autonomous airborne weaponry reduces. By prioritising human decision making, states limit unintended harm caused by automation. This approach combines developments within these technologies with ethical norms and humanitarian principles. Further, it reinforces accountability by keeping humans responsible for the use of force or acts of war, a fact essential in a contemporary wartime landscape.

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