



# LETHAL AUTONOMOUS WEAPON SYSTEMS

A primer for UK policy, March 2021

Over the last decade concerns about the development of lethal autonomous weapons systems or ‘killer robots’ have seized the attention of the international community. Since 2014, this issue has been discussed at the United Nations under the auspices of the Convention on Certain Conventional Weapons (CCW), which aims to ban or restrict the use of inhumane weapons. This briefing introduces some of the key issues involving lethal autonomous weapons systems, including: how these weapons have been defined; concerns regarding their deployment and use; how states, including the UK, are developing technology relating to them; how they are viewed by the public, business, civil society and governments; related arms control and regulatory initiatives.

## WHAT ARE LETHAL AUTONOMOUS WEAPONS SYSTEMS AND WHY DO THEY MATTER?

The extent to which weapons currently exist that can be described as ‘autonomous’ is a subject of some debate. What is clear is that rapid technological developments are enabling militaries to incorporate autonomy into weapons systems.<sup>1</sup> More than 380 partly autonomous weapon systems, many of which involve unmanned drones, have been deployed or are being developed in at least 12 countries, including China, France, Israel, South Korea, Russia, the United Kingdom, and the United States.<sup>2</sup> Existing examples of weapons systems with autonomous elements include: South Korean sentry guns; the UK’s Taranis Stealth Drone; Russia’s Fully Automated Combat Module; MDBA Systems’ Storm Shadow/Scalp EG missile; Israel Aerospace Industries’ loitering munition, ‘Harop’.<sup>3</sup> Recent advances in unmanned aircraft technology and the combination of relevant technologies mean it is likely that the first autonomous weapons will be drone-based systems.<sup>4</sup>

Although there is no agreed international treaty governing such weapons, nor even agreed definitions of terms such as autonomous, it is widely understood that lethal autonomous weapons systems would select (i.e. search for or detect,

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1 Mary Wareham, *Stopping Killer Robots: Country Positions on Banning Fully Autonomous Weapons and Retaining Human Control*, [www.hrw.org](http://www.hrw.org), 10th August 2020

2 Ray Acheson, *A WILPF guide to Killer Robots report*, [www.wilpf.org](http://www.wilpf.org); Peter Burt, *Off the Leash*, [www.dronewars.net](http://www.dronewars.net); Vincent Boulanin and Maaïke Verbruggen, *Mapping the Development of Autonomy in Weapon Systems*, [www.sipri.org](http://www.sipri.org)

3 Ben Donaldson, Fred Carver and Ellen Allde, *Killer robots: who is making the decisions?*, [www.una.org.uk](http://www.una.org.uk)

4 Peter Burt, *Off the Leash*, [www.dronewars.net](http://www.dronewars.net)

identify, track) and engage (i.e. use force against, neutralise, damage or destroy) targets with potentially lethal force, without meaningful human control.<sup>5</sup> Whilst many existing weapons systems have a degree of autonomy or automation, technological advances mean that we are on the brink of a new generation of weapons systems capable of being fully autonomous. Some have argued that lethal autonomous weapons systems will have benefits in warfare for armed forces, including increased speed, precision and efficiency.<sup>6</sup>

However, a number of academics and experts argue that the advent of these weapons entails a revolution in armed conflict which could have devastating ethical, technical and legal consequences.<sup>7</sup> Objections to lethal autonomous weapons systems centre on three arguments: the unpredictable behaviour of technology based on Artificial Intelligence (AI); the inability of AI systems to understand moral dilemmas and contexts; and the potential for these weapons to be used in unintended, unauthorised, harmful and illegal ways.<sup>8</sup> Opponents of lethal autonomous weapons systems therefore argue that their deployment and use would: result in more civilian deaths; not be compliant with international humanitarian law (IHL), or international human rights law (IHRL); make war more likely; encourage an arms race; destabilise international relations; and undermine human dignity.<sup>9</sup>

In response to such concerns, in 2012 the Campaign to Stop Killer Robots was formed by a coalition of NGOs to call on governments to agree a pre-emptive ban on lethal autonomous weapons systems. Subsequently, in July 2018, over 200 technology companies and organisations from more than 36 countries, and 2,600 individuals—including the founders of Google’s Deepmind and Tesla—signed on to a pledge committing them to ‘neither participate in nor support the development, manufacture, trade, or use of lethal autonomous weapons.’<sup>10</sup>

## RECENT INTERNATIONAL DEVELOPMENTS ON LETHAL AUTONOMOUS WEAPONS SYSTEMS

At a meeting of experts convened by the UN in April 2016, 94 countries recommended beginning formal discussions about lethal autonomous weapons systems. The talks considered whether these systems should be restricted under the CCW—a disarmament treaty operating on a consensus basis that has regulated or banned several other types of weapons. In November 2017, 86 countries participated in a meeting of the CCW’s Group of Governmental Experts.<sup>11</sup> Thirty countries now support a prohibition on fully autonomous weapons.<sup>12</sup> The most recent annual meeting of the CCW, scheduled to take place in November 2020, was postponed due to the Covid-19 pandemic.

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5 ICRC, *Autonomous Weapon Systems: Technical, Military, Legal and Humanitarian Aspects*, [www.icrc.org](http://www.icrc.org)  
6 Vincent Boulanin and Maaïke Verbruggen, *Mapping the Development of Autonomy in Weapon Systems*, [www.sipri.org](http://www.sipri.org)  
7 Future of Life Institute, *Lethal Autonomous Weapons*, <https://futureoflife.org>  
8 Nonviolence International Southeast Asia, *Lethal Autonomous Weapons: A Primer for Phillipine Policy*, [www.stopkillerrobots.org](http://www.stopkillerrobots.org)  
9 Ray Acheson, *A WILPF guide to Killer Robots report*, [www.wilpf.org](http://www.wilpf.org)  
10 Future of Life Institute, *Lethal Autonomous Weapons Pledge*, <https://futureoflife.org>  
11 House of Lords, *AI in the UK: ready, willing and able?*, Select Committee on Artificial Intelligence Report of Session 2017–19, <https://old.parliament.uk/business/committees/committees-a-z/lords-select/ai-committee/publications/>  
12 Mary Wareham, *Stopping Killer Robots: Country Positions on Banning Fully Autonomous Weapons and Retaining Human Control*, [www.hrw.org](http://www.hrw.org), 10th August 2020

The 6<sup>th</sup> CCW Review Conference is scheduled for December 2021. The CCW process has helped advance discussion of lethal autonomous weapons systems and enabled states to find common ground on the issue—particularly regarding the need to define what human control over the use of force is required, in order to maintain adherence with legal and ethical requirements. However, a lack of tangible progress towards either a legal framework for appropriate conduct, or a ban, has led civil society advocates to ask whether an alternate venue may be required.<sup>13</sup> In terms of global public opinion, according to a 2020 poll conducted by IPSOS in 28 countries (including the UK) an average of 61% of respondents oppose the use of lethal autonomous weapons systems.<sup>14</sup>

## LETHAL AUTONOMOUS WEAPONS SYSTEMS AND THE UK

The UK Ministry of Defence (MOD) claims that it ‘does not possess fully autonomous weapons and has no intention of developing them.’<sup>15</sup> However, the MOD continues to prioritise and pursue research work in all three of the key disciplines underpinning autonomous technology: artificial intelligence and machine learning; robotics; and sensors. The MOD is also actively undertaking research into technology that supports the development of armed autonomous drones. Although none of the MOD’s current projects are intended to develop a lethal autonomous weapon system, these projects represent developments in technology which could be combined with other systems to form the building blocks of such a weapon system.<sup>16</sup> Furthermore, senior British military figures have recently made statements emphasising the central importance of autonomy and robotics to the future composition of the UK’s armed forces.<sup>17</sup>

In terms of arms control initiatives, the UK has emphasised at the CCW the importance of maintaining human control over the use of weapons systems. However, the UK takes the view that an international legal instrument to ban lethal autonomous weapons is premature and unnecessary and argues that existing CCW mechanisms and IHL provide adequate scrutiny and safeguards.<sup>18</sup> The UK also argues that such a ban would impede ‘technological advancements that can support compliance with IHL’ but has not provided evidence substantiating this claim.<sup>19</sup> In terms of British public opinion, according to a 2020 IPSOS poll, 56% of respondents oppose the use of lethal autonomous weapons systems, whilst 20% supported such use and 24% were not sure.<sup>20</sup>

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56% OF UK RESPONDENTS  
OPPOSE THE USE OF  
LETHAL AUTONOMOUS  
WEAPONS SYSTEMS

13 Neil C. Renic, *Death of efforts to regulate autonomous weapons has been greatly exaggerated*, <https://thebulletin.org>, 18th December 2019

14 IPSOS, *Global Survey Highlights Continued Opposition to Fully Autonomous Weapons*, [www.ipsos.com](http://www.ipsos.com), 2nd February 2021

15 UK Ministry of Defence, *Joint Doctrine Publication 0-30.2: Unmanned Aircraft Systems*, [www.gov.uk](http://www.gov.uk)

16 Peter Burt, *XLUVs, Swarms, and STARTLE: New developments in the UK’s military autonomous systems*, <https://dronewars.net>, 1st May 2020

17 Lucy Fisher, *Soldiers and machines join an army of ‘boots and bots’*, [www.thetimes.co.uk](http://www.thetimes.co.uk), 30th September 2020;

Dan Sabbagh, *Robot soldiers could make up quarter of British army by 2030s*, [www.theguardian.com](http://www.theguardian.com), 8th November 2020

18 Mary Wareham, *Stopping Killer Robots: Country Positions on Banning Fully Autonomous Weapons and Retaining Human Control*, [www.hrw.org](http://www.hrw.org), 10th August 2020; Hayley Evans, *Too Early for a Ban: The U.S. and U.K. Positions on Lethal Autonomous Weapons Systems*, [www.lawfareblog.com](http://www.lawfareblog.com), 13th April 2018

19 UNA-UK, *Ministry of Defence responds to letter on Lethal Autonomous Weapons*, <https://una.org.uk>, 2nd February 2021

20 IPSOS, *Global Survey Highlights Continued Opposition to Fully Autonomous Weapons*, [www.ipsos.com](http://www.ipsos.com), 2nd February 2021

## OUR POSITION ON UK POLICY

Lethal autonomous weapons systems would be both unable to evaluate the proportionality of an attack and distinguish between civilians and combatants during a conflict. In addition, they will function through the use of data, information and algorithms susceptible to error, vulnerable to hacking, and open to potential bias. These weapons are therefore not compatible with either IHL or IHRL. In addition, groups such as the International Committee of the Red Cross have argued that lethal autonomous weapons systems present ‘unique challenges and difficulties in interpreting and applying the relevant IHL rules, which do not find clear answers in existing IHL.’<sup>21</sup>

The prohibition of chemical, biological and blinding laser weapons demonstrates that a ban on lethal autonomous weapons systems would not stifle technological developments for legitimate purposes. Such a ban would also ensure that meaningful human control is retained over all targeting and attack decisions. We therefore support an international treaty being negotiated to regulate a broad scope of sensor-based weapons systems that contains both prohibitions on certain systems, and positive obligations to maintain meaningful human control over the use of the rest, to ensure all concerns are effectively addressed.<sup>22</sup>

It is disappointing that the UK has chosen to repeatedly assert that existing law concerning lethal autonomous weapons systems is wholly sufficient, that no new law is needed, that disagreement in the current debate also shows that no new law is possible, and if it were possible—for example, through a format that did not have the participation of certain militarised states—then it would be unwelcome. We are also concerned at the UK government’s claims that autonomous technology would assist, rather than endanger, the protection of civilians and compliance with the law, and urge it to provide the evidence on which it bases such claims. On a more positive note, the UK has made useful contributions to the debate, particularly on the importance of maintaining human control over weapons systems, which could be built upon in future.<sup>23</sup> We therefore call on the UK to provide leadership by working with other states to strengthen international law, to ensure that the use of force is always under meaningful human control.

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21 Kathleen Lawand, *International Law, Including IHL, on LAWS: Is There a Need for a New Protocol?*, [http://funag.gov.br/biblioteca/download/laws\\_digital.pdf](http://funag.gov.br/biblioteca/download/laws_digital.pdf)

22 Campaign to Stop Killer Robots, *Key Elements of a Treaty on Fully Autonomous Weapons*, [www.stopkillerrobots.org](http://www.stopkillerrobots.org)

23 Richard Moyes, *From “pink eyed terminators” to a clear-eyed policy response?*, [www.article36.org](http://www.article36.org)

Published by the UK branch of the Campaign to Stop Killer Robots, members of the global coalition working to ban fully autonomous weapons: [stopkillerrobots.org](http://stopkillerrobots.org)

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**CAMPAIGN TO STOP  
KILLER ROBOTS UK**