



OFF THE LEASH

The development of autonomous military drones in the UK

Drone Wars UK #OffTheLeash

Executive Summary

Unmanned Aerial Vehicles (UAVs), commonly known as drones, are likely to be the military system which develops into the first truly autonomous weapons systems. Powered by advances in artificial intelligence (AI), machine learning, and computing, we are likely to see the development not only of drones that are able to fly themselves – staying aloft for extended periods – but those which may also be able to select, identify, and destroy targets without human intervention. In many ways, the increasing use of remote controlled, armed drones can be seen as a kind of ‘halfway house’ towards the development of truly autonomous weapon systems. The incremental way in which drone technology is developing, and the ability to ‘bolt on’ new features, means that drones are ideally suited to morph into autonomous weapon systems.

This study looks at current initiatives which are under way in the UK to marry developments in autonomy with military drone technology, examines the risks arising from the weaponisation of such systems, and reviews government policy in this area. Autonomous weapon systems are defined using the definition proposed by International Committee of the Red Cross (ICRC) as: “Any weapon system with autonomy in its critical functions – that is, a weapon system that can select and attack targets without human intervention.”

Two separate uses for AI and autonomous technology are becoming increasingly important in the military world. Firstly, autonomous systems can be used to process and analyse large amounts of raw intelligence information in order to find targets. Secondly, AI can be incorporated into the weapons themselves as well as to execute operational missions.

The extent to which autonomy within a drone raises concerns will depend upon the level of human control over the targeting and launch of weapons and the use of force in general. Although existing armed drones have a degree of autonomy in some of their functions – for instance in relation to flight control – at present human control is maintained over the use of force, and so today’s armed drones do not qualify as fully autonomous weapons. Many question whether systems with the capability to make autonomous targeting decisions would be able to comply with the laws of war.

Our research has found that a number of public organisations, private companies, and government agencies in the UK are involved in undertaking research and development work into autonomous technology, AI and drones. The Ministry of Defence (MoD) sees autonomous technology and data science as “key enablers” for the future, and the Defence Science and Technology Laboratory (DSTL) and its Defence and Security Accelerator programme have extensive research programmes in this field.

The Engineering and Physical Sciences Research Council (EPSEC), too, is a significant funder of research in these areas and a number of universities are working on autonomous technology programmes with military applications, often in collaboration with private sector military contractors.

Investment and innovation in artificial intelligence is being led by the civil sector and not by the world’s militaries. Autonomous technologies, originating in



the civil sector but adapted for military applications, are likely to become key components of the autonomous drones and weapons of the future. Military planners are aware of the civil sector's lead in developing artificial intelligence and autonomous systems and are keen to have a slice of the cake.

Although the military technology research sector is smaller than its civil counterpart and has fewer resources, it is in a position to adapt existing military systems and is adept at anticipating military needs and pursuing military contracts. The Ministry of Defence's favoured contractors for work on drones and autonomous systems appear to be BAE Systems, QinetiQ, and the Thales Group. BAE Systems, for example, has built 'Taranis', an advanced prototype autonomous stealth drone.

Current Ministry of Defence policy states that the UK opposes the development of autonomous weapon systems and has no intention of developing them. However, the Ministry of Defence has been accused of a sleight of hand here by defining autonomous weapons systems differently from other governments and institutions. Although the UK states that it has "no intention" of developing such systems, this does not sit comfortably alongside endorsements for autonomous weapons from senior members of the UK armed forces. The claim that "the UK opposes the development of armed autonomous systems" also appears to be at odds with the evidence. Since 2015, the UK has declined to support moves at the United Nations Convention on Certain Conventional Weapons aimed at banning autonomous weapon systems.

As a nation which considers itself a responsible and leading member of the international community, the United Kingdom has a duty to use its influence and powers to ensure that the weapons of the future are never used outside boundaries set by the laws of humanity and the requirements of the public conscience. Our recommendations are summarised as:

- The UK should support the introduction of a legal instrument to prevent the development, acquisition, deployment, and use of fully autonomous weapons.
- The UK should make an unequivocal statement that it is unacceptable for machines to control, determine, or decide upon the application of force in armed conflict and give a binding political commitment that the UK would never use fully autonomous weapon systems.
- The UK should introduce measures to ensure that human control must be exerted over all attacks in armed conflict.
- The government should realign the UK's definition of autonomous weapons to be the same, or similar, as that used by the rest of the world.
- The government should publish an annual report identifying research it has funded in the area of military autonomous technology and artificial intelligence.
- MPs and Peers should investigate the impact of emerging military technologies, including autonomy and artificial intelligence, and press the government to adopt an ethical framework.
- The government should fund a wide-ranging study into the use of artificial intelligence to support conflict resolution and promote sustainable security.
- The government should initiate a broader public debate on the ethics and future use of artificial intelligence and autonomous technologies, particularly their military applications.