UNIVERSITY OF
BIRMINGHAM

THE SECURITY IMPACT OF DRONES: CHALLENGES AND OPPORTUNITIES FOR THE UK

Birmingham Policy Commission

Executive Summary
October 2014

The Security Impact of Drones

The purpose of this Policy Commission is to explore the issues that confront the UK government in the development, regulation, and use of RPA (Remotely Piloted Aircraft), as well as in reacting to the proliferation of this technology on a global scale. RPA now represent an increasingly important potential for the modern military as well as for civil authorities concerned with safety, security, and policing. The application of RPA technology has great economic value and social benefit in areas such as agricultural and industrial production, environmental monitoring, media, and retail. We must expect RPA to become ubiquitous in the short to medium term in the world's advanced economies, and the United Kingdom will be no exception. Our findings are aimed at helping the UK government have in place the policies to deal with the important social, political, legal, and economic consequences of the widespread arrival of RPA.

Our focus is on the military, intelligence, and policing roles that RPA perform. It is in these areas that government must take the lead and has the greatest interest in determining future developments. Attending to these matters is important for any state, but for the United Kingdom they have particular significance. The UK defence and aerospace industries are on the cutting-edge in the manufacture and design of RPA, though not yet mass producers like the United States. Retaining this technological edge is essential in a growing global market-place for these systems, as well as in supporting UK defence needs. The UK government is, and will continue to be, one of Europe's

principal military powers, retaining an aspiration to play international roles in military operations, crucially alongside key allies. It therefore needs modern, technologically-advanced armed forces. Technological and fiscal challenges necessarily drive the United Kingdom towards RPA partnerships with key allies. The UK's only armed RPA, the Reaper, is purchased from General Atomics in the United States and the Taranis prototype, developed by BAE Systems in conjunction with the Ministry of Defence (MoD), is giving rise to collaboration with France on a possible joint unmanned Future Combat Air System.

We recognise, however, that there are significant obstacles to the use of RPA that must first be overcome. We highlight three.

The first challenge is in gaining wider public understanding and acceptance of the soundness of the ethical and legal frameworks within which the RAF will operate its armed RPA, including new systems as they become available. We reject the argument of those that would single out RPA technology as novel and therefore intrinsically problematic, a position driven by what many perceive as illegal US use of RPA to kill leading figures of al-Qaeda and associated jihadist groups and of the civilian casualties that have resulted. UK policy regulating the use of armed RPA in Afghanistan already meets the highest standards of distinction and proportionality under international humanitarian law, and has played a vital role in force protection. We also reject the

Reaper UAV Takes to the Skies of Southern Afghanistan. Image by POA(Phot) Tam McDonald; © Crown copyright 2010

opposite view of the over-enthusiastic who would seize on the absence of a pilot at risk in the air, and the undoubted precision of the weapons that an RPA can carry, to allow future use of UK RPA for targeted killing of terrorist and insurgent leaders outside the battlefield, along the lines of the current US counter-terrorism strategy. The litmus test for the Commission of the UK's procurement, deployment, and use of armed RPA is compliance with the law. Doing more to explain to the UK public that the use of UK armed RPA, like any other weapon system, is always in compliance with national and international law, and how that compliance is achieved, is critical to winning such acceptance.

A second challenge is to deal with the fears of some that the inevitable development of more advanced RPA will eventually lead to 'killer robots', the fielding of Lethal Autonomous Weapons Systems (LAWS) that make their own targeting and weapon release decisions and thus do away with the need for a pilot on the ground. For a weapon system to be developed and used legally in armed conflict, it has to be acceptable under international humanitarian law. We support work to automate many of the sub-systems, such as navigation, that support the RPA. But we doubt it will ever be possible to programme autonomous air systems to be able to exercise distinction between legitimate

and illegitimate targets. We are not persuaded that it will ever be possible to programme the laws of war into a 'killer robot'. We support the government's decision, as well as that of the US government, not to develop such systems. However, we fear not all actors will be as prudent, and we would like therefore to see the UK government take a leading role in discussions to build an international consensus around a set of norms to regulate, if not ban, LAWS.

A third challenge is around the use of RPA for domestic security. Serious issues of safety and security of airspace and regulation of domestic RPA have to be resolved first. Before police and media surveillance RPA become common in our skies, as we believe they will, the government needs to have consulted the public and established appropriate codes of conduct to safeguard the privacy of the citizen.

With the right policy choices to overcome these challenges, the Commission believes that significant benefits can be reaped – military and civilian – from RPA capabilities. We have, in our Report, ventured a description of a position of which the UK could be proud that could be achievable over the next 20 years. We set that out here since it illustrates how many dimensions the RPA issue has, and the number of different parts of national life that have to be brought together to make policy on the future of RPA in the UK. We suggest that the UK government aims at achieving the following by 2035:

▫ UK RPA use is viewed as an integral, essential, and normal component of UK airpower. This will have been achieved through greater openness about RPA use, and the training, oversight, and legal regulation of those who operate

these systems. Improved openness will have decisively promoted greater public acceptance of the roles these new technologies play and in countering the view that their use is either novel or contentious.

▫ Parliament regards the deployment of UK RPA overseas in the same light as any other type of military equipment. The government accepts the need to keep Parliament informed under existing conventions applying to overseas deployments.

▫ UK Armed Forces will have in their inventory an effective mix of RPA capable of both advanced surveillance and the conduct of direct military operations in a wide range of scenarios which might emerge from the strategic uncertainties of the next 20 years.

▫ That mix will have been created by flexible investment decisions, responding to the appearance of new, powerful and disruptive technologies, and the innovations of potential adversaries. It should include RPA, or what the Royal Navy prefer to call a 'maritime reconnaissance asset', operating off the Queen Elizabeth-class carriers.

▫ The House of Commons Defence Committee will exercise oversight of MoD's RPA policies as for other military systems.

▫ Recognising that the UK military aerospace development and design capability, including stealth, will by 2035 be limited to RPA, there will be collaborative programmes in place with our French, German, and Italian allies. This will not be at the expense of cooperative procurement opportunities with the United States, and operational cooperation and exchange postings with the US Air Force (USAF) will continue.

▫ The UK government will have played a role in clarifying the relative applicability of international human rights law and international humanitarian law in complex conflicts. The UK position on the application of existing international law to the use of armed force will be in line with resulting international opinion.

▫ The UK military will continue to deploy and operate its armed forces at all times strictly within UK law and UK interpretation of international humanitarian law and human rights law. The rules of engagement for each operation or campaign will continue to reflect this. RPA will continue to be operated in accordance with the same legal principles as other combat systems, involving distinction and proportionality.

always be supported by the availability of full-time legal advice to the command chain.

- Drawing on well-publicised national and international research and analysis into the consequences of RPA and other operations, the MoD and Permanent Joint Headquarters Staff (PJHQ) will be trained in evaluating the strategic effects of combat systems, including RPA use, on affected civilian communities and, with the UK civil authorities, any potential for blowback domestically, as well as their operational and tactical effects.

- With the hoped for ending of the post 9/11 US campaign against al-Qaeda and associated groups, the use of armed US RPA by the Central Intelligence Agency (CIA) and USAF for targeted killing outside areas of recognised armed conflict will also end, thus bringing the United States and its North Atlantic Treaty Organisation (NATO) allies into a common position on the lawful use of armed RPA. The UK will have been instrumental in creating this NATO consensus, drawing on the work of the United Nations Special Rapporteurs, and others within the wider community of engagement on this question.

- UK governments will have taken the lead internationally in the use of its RPA capability for military assistance and humanitarian purposes. The UN will be routinely authorising the use of RPA in humanitarian and peacekeeping operations for situational awareness, and the Security Council will be prepared to consider authorising the use of force to protect civilians, subject to contributing nations deciding when it is appropriate to use armed RPA for operations under Chapter VII of the UN Charter.

- It will be accepted internationally that arrangements need to be in place for the effective *post facto* investigation of armed forces missions, including RPA, that result in civilian casualties, except in those rare cases when this is militarily unfeasible. The UK government will have standing arrangements to that effect. Following casualties caused by armed RPA, the outcome of the government's fact-finding investigations should be made public, even if in redacted form, except where operational considerations preclude this.

- Satisfactory compensation arrangements will be available where such casualties are found to be caused by RPA or other UK weaponry. All this will have been effectively communicated to target audiences in order to minimise any alienation of civil populations in theatres of conflict where British forces are operating and especially to reduce the risk of radicalisation where there are concerned ethnic diasporas, or co-religionists in the UK.

- The UK will retain sovereign control over UK RPA and, when operating RPA from another nation, effective safeguards will be in place to ensure UK personnel will continue to apply UK rules of engagement for weapon release for the theatre in question.

- Ethics training as well as legal instruction will be compulsory for those operating and tasking RPA. RPA will be operated by uniformed military personnel only and operational use will

- The UK government will continue to impose strict export controls on the most advanced RPA technologies, but basic RPA technologies will, by 2035, be commonplace around the globe. In the event of the use by terrorist groups of small, commercially available RPA in the UK, the authorities will have successfully reassured the public about the relative significance of this terrorist tactic. They will continue to manage the threat by monitoring RPA related imports and sales in the UK, and by introducing cost-effective defensive measures.

- Agreement will have been reached on safety and security measures to allow the operation of RPA flights in European, including UK, airspace. The commercial use of RPA will have become routine in applications such as agriculture, environmental monitoring, and media broadcasting. UK small and medium enterprises (SMEs) will play a lead role in developing new civil applications.

- UK police services will have ready access to multi-spectral RPA capability for legally-authorised observation and crowd control, organised under national service delivery agreements.

- The use of RPA in the UK by the authorities for directed and area surveillance, including facial recognition software, will be regulated by a Parliamentary approved Code of Conduct under the successor to Regulation of Investigatory Powers (RIPA2000) Part 2, that protects the privacy rights of citizens in accordance with the Human Rights Act. Intelligence data obtained by RPA in the UK will be treated under the same strict data sharing policies in force as for other means of collection. The House of Commons Intelligence and Security Committee will take regular evidence on the application of the Code of Conduct, and on the arrangements for intelligence support for RPA use by the Armed Forces overseas, including the safeguards for exchange of intelligence with allies under ministerially approved guidance to ensure conformity with the UK's interpretation of international law.

- Legislation will regulate the domestic use of the larger RPA by public authorities, the private sector, and by individuals including airworthiness and pilot certification. Regulations by the Civil Aviation Authority (CAA) will continue to control RPA use in restricted airspace.

- There will be well understood and, effectively enforced, restrictions on all private RPA use to protect privacy. A media complaints system under the Royal Charter will adjudicate on *paparazzi* intrusions.

- The technologies relevant to military RPA will have continued to advance including stealth, weight reduction, advanced communications, and the automation of processes such as navigation and manoeuvring. Robotics will have rapidly developed and spread within the civilian economy. With enlightened assistance from government, academia, media, the legal profession, the moral implications of machine autonomy will be clarified and better understood.

- The UK and US governments, as well as other NATO allies and like-minded ethically concerned states, will continue their doctrine of not developing LAWS and insist on having active human control consistent with the requirements of distinction in the use of force under international humanitarian law. This position will have been endorsed at the discussions under the Convention on Certain Conventional Weapons (CCW) in Geneva.
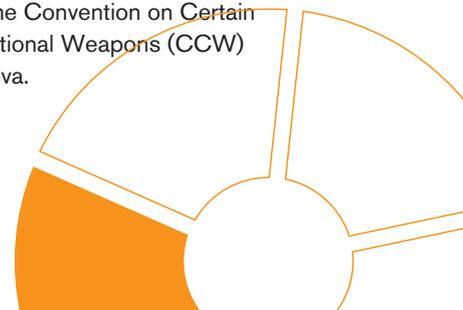
Key Findings and Policy Recommendations

Watchkeeper Remote Piloted Air System. Image by Andrew Linnett; © Crown copyright 2013

Chapter 1: The Strategic Context

- UK RPA operations have been shown to be highly effective in maximising operational intelligence and in contributing to kinetic operations in which the RPA acts as a force multiplier and force protector. That advantage, however, is significantly dependent on the level to which RPA capabilities seamlessly integrate across different services, and with different allies' capabilities.

- Future UK RPA operations, both Intelligence, Surveillance and Reconnaissance (ISR) and armed, based upon a legally sound mandate, can be expected to make a positive contribution to UK national security.

- Beyond their use in counter-terrorism and counterinsurgency operations, RPA also have potential (but as yet untested) roles in humanitarian crises, contributing to emergency relief efforts, ceasefire enforcement, and conflict de-escalation.

- In the context of counterinsurgency and counter-terrorism operations, RPA are likely, along with other military means such as special forces operations, to be the focus of negative local feelings towards UK and coalition forces.

- Careful decisions on the deployment and specific use of RPA need to be made on a case-by-case basis, and at a suitably senior level of command, such that an appropriate level of strategic oversight is achieved.

- We invite the MoD to do more to explain the mix of forces that the UK deploys on missions, and to reassure critics that the RPA component of the force mix will be subject to the same strict rules as other weapon systems, and that potentially negative psychological and propaganda impacts are taken fully into account.

- Supporting RPA needs to be part of the formal national tasking requirement of the UK intelligence community. Planners should not assume that at the start of any military operation, especially those without strategic warning, that the intelligence base will be sufficient to support the full capability of RPA. The early deployment of ISR RPA may be an essential step to rectify this deficiency.

- The threat to deployed UK forces and to UK interests from RPA operated by hostile groups must be expected to increase.

Chapter 2: Futures

- Over the next 20 to 30 years, successive UK governments will need to keep under review both the mix of conventional manned and unmanned systems in the UK inventory, and the type of aircraft systems to which this mix would apply.
- Since RPA will be an increasingly significant component of the operational capabilities of the British Armed Forces, the UK government should take active steps to inform the public of the likely role of RPA in UK military operations and doctrine. Such steps will help build public confidence in the UK government's overall approach to RPA.
- Technological development and procurement needs to ensure the greatest possible interoperability of RPA across the different services, and with allies.

- The UK government should continue to diversify its procurement and development of RPA in order to avoid the associated risks of sole-source acquisitions and the controversy that this has attracted. The UK government should continue to explore partnerships beyond the United States, especially with France, without jeopardizing the UK's unique position in relation to its principal ally.
- Given the scale of possible industrial and employment benefits, the UK government should develop a clearer sense of the capabilities over which it wishes to have sovereign control. The UK government should promote UK expertise in RPA and related technologies, as this will enhance the economic benefits of growth in the sector.
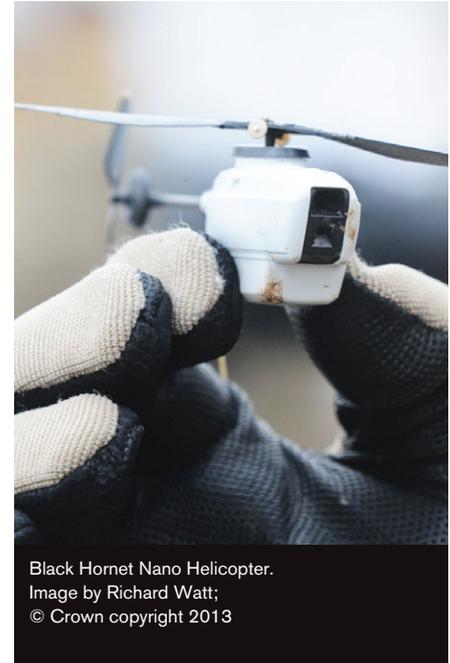
Black Hornet Nano Helicopter.
Image by Richard Watt;
© Crown copyright 2013

Chapter 3: Law

Armed RAF Reaper Aircraft Approaches Kandahar Airfield, Afghanistan. Image by Sgt Corinne Buxton RAF; © Crown copyright 2010

- In situations where UK forces are embedded with US or other forces, the UK government should do more by way of reassurance to explain the safeguards which are in place to ensure that embedded personnel remain compliant with international humanitarian law.
- If allied forces use UK RPA, assurances should be obtained that their use is in accordance with UK legal guidelines.
- Appropriate ministers should make periodic public statements conveying the UK government's judgement as to how the balance between international human rights law and international humanitarian law is developing in this field. Foreign and Commonwealth Office (FCO) and MoD legal advisers should communicate with other lawyers and NGOs as to what these developments imply for the legal restrictions applying to British forces in the various operational theatres in which they might be deployed. At the expert level, MoD and FCO lawyers should ensure opportunities

to provide supporting detail to the legal profession, academia, and Non-Governmental Organisations (NGOs).
- Following casualties caused by armed RPA, the outcome of the government's fact-finding investigations should be made public, except where operational considerations preclude this. In such situations, the government should at a minimum explain its decision.

- The government should confirm that guidance has been issued to staff, and safeguards put in place, to ensure that in sharing intelligence with the US government and military, the UK government does not inadvertently collude in RPA or other counter-terrorist actions contrary to international law.

Chapter 4: Ethics

- There is no convincing general ethical objection to acquiring RPA, whether armed or unarmed, while the ethical acceptability of their use, like that of other weapon systems, is contextually dependent upon meeting the legal principles of distinction and proportionality.
- We do not consider that the threshold for the use of force will be lowered by the availability of RPA to UK Armed Forces, as long as Parliament plays its proper oversight function.
- Compliance with long-term legal standards removes many legitimate ethical concerns about operational employment. Available evidence suggests that the UK complies with its international legal obligations over RPA.
- Those operating UK RPA should be uniformed military personnel who should have the appropriate ethical and technical training, and the requisite educational level and maturity.

39 Squadron Reaper Pilot at Creech Air Force Base. Image by SAC Andrew Morris; © Crown copyright 2009

Chapter 5: Lethal Autonomous Weapons

- Against a high-technology adversary, especially in the air, where speed of response and immunity to detection and jamming matter most, a higher degree of automation in RPA would offer unparalleled capacities for achieving aerial dominance.
- Given the strategic advantages of further automation, UK governments will have to decide how far they wish to invest in this technology, given the likelihood that potential adversaries will do so.
- There remain, however, extraordinarily challenging engineering and programming tasks in order to design autonomous systems able to operate in complex and messy operational environments. Such systems would have to be able to apply the principle of distinction between what is a legitimate military target that can be attacked in accordance with international humanitarian law, and persons who require protection, including civilians, surrendering forces, and prisoners of war.
- We have doubts as to whether LAWS as a successor to RPA could ever be developed for ground operations consistently and effectively to implement the distinction between civilians and combatants, and to exercise the proportionality necessary for compliance with international humanitarian law. We support the UK and US governments' decision not to develop LAWS.
- We encourage the UK government to take a leading role in the CCW discussions in Geneva. The UK's military prowess, diplomatic influence, and extensive experience in arms control means that it is well placed to help secure a new and widely endorsed international normative framework. This would raise the stakes for any government tempted to develop LAWS, which would break existing international humanitarian law.

Part of the Israeli 'Iron Dome' missile defence system.

Chapter 6: Proliferation, Civil Use and Regulation

Commercial delivery drone with the package

- The need to develop new procedures for RPA to operate safely in or near controlled airspace is a matter requiring urgent attention in order to ensure air safety and to assure public confidence.
- Greater efforts need to be made to publicise existing laws on the use of unmanned flying objects (this should include Chinese lanterns, radio-controlled planes, and their modern RPA counterparts).
- Building on the work already done by the CAA and international counterparts, there is a need to establish a robust regulatory framework without overly constraining civilian use.
- As the nature of British air defence changes, the Royal Air Force and the MoD should consider, with civil authorities, the implications of the malign use of RPA technology by state and non-state actors.
- With the changing nature of defence and law enforcement, traditional notions of counter-terrorism and resilience, such as target hardening

and stand-off distances, need to be reconsidered in light of RPA proliferation. These questions deserve serious consideration by those responsible for Britain's resilience strategy, namely the Home Office, Cabinet Office, National Counter Terrorism Security Office, and the Centre for the Protection of National Infrastructure and with those responsible for other counter-terrorism and risk management policies.

- Policy is needed on the rules which should apply for police and security authority use of ISR RPA, for example in routinely monitoring public places for the presence of known criminals or those on counter-terrorist watch lists. A Code of Practice is needed to cover the procedures for authorising surveillance by RPA. The Home Office should accept a policy lead for promoting the efficient use of RPA by the emergency services, for the associated privacy issues and, with the Association of Chief Police Officers (ACPO), engage in public consultation.

- In the wrong hands, RPA could become a dangerous and destabilising delivery system. We doubt how far the proliferation of the various enabling technologies, except perhaps for secure high bandwidth satellite communications, can be controlled.
- We also judge that the UK government is not in a strong position to influence international behaviour over RPA exports, and it has the legitimate concerns of its own aerospace industry to consider. Nevertheless, it would be consistent with general UK policy positions and an ethical concern about international stability and the rule of law, to make every effort to support international efforts to achieve an effective international framework of export control.

Conclusion: Public Diplomacy

General Atomics MQ-9 Reaper about to take off. Image by Sergeant Ross Tilly (RAF); © Crown copyright 2014

- Striking the right tone in public diplomacy over RPA will not be easy. None of the potential problems should be minimised. In our view, a more active and co-ordinated government information policy is essential.
- There is no easy escape from taking the arguments head on, and, in particular, countering assertions in various forms that RPA should be treated in special ways which would make them systematically less available to British forces as operational assets. Nevertheless, the resulting political pressures should be manageable and, providing the UK keeps to its own legal restrictions in operating armed RPA, the global technological momentum of their spread makes it reasonable to expect that controversy will reduce in future years.

List of Commissioners

Chair

Professor Sir David Omand GCB — Visiting Professor, Department of War Studies, King's College, London

Academic Lead

Professor Nicholas J. Wheeler — Professor of International Relations, Director of the Institute for Conflict, Cooperation and Security (ICCS), University of Birmingham

Commissioners

Sir Brian Burridge — Vice President, Strategic Marketing, Finmeccanica UK

Professor David H. Dunn — Professor of International Politics, University of Birmingham

Ms Jennifer Gibson — Staff Attorney, Reprieve

Dr Peter Gray — Senior Research Fellow in Air Power Studies, University of Birmingham

Professor Keith Hayward — Head of Research, Royal Aeronautical Society & Associate Fellow, Royal United Services Institute

Lt. Gen. (Retd.) Sir Paul Newton — Director of Strategy and Security Institute, University of Exeter

Mr Paul Schulte — Senior Visiting Fellow, Centre for Defence Studies, King's College, London & Honorary Professor, Institute for Conflict, Cooperation and Security

Sir David Veness — Honorary Professor of Terrorism Studies, Centre for the Study of Terrorism and Political Violence, University of St Andrews

Professor Mark Webber — Professor of International Politics, University of Birmingham

Ms Elizabeth Wilmshurst — Associate Fellow, International Law, Chatham House

Professor Stefan Wolff — Professor of International Security, University of Birmingham

Institute for Conflict, Cooperation and Security (ICCS)

Ms Catherine Edwards — Institute Manager

Dr Jamie M. Johnson — Research Assistant

Ms Lindsay Murch — Research Assistant

Dr Christopher M. Wyatt — Research Associate