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AGILE WARRIOR QUARTERLY

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ARMY
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PREFACE

Agile Warrior (AW) is the Army's intellectual examination of current and emerging threat and opportunities for land capability. It generates an evidence base to inform the continual transformation of land forces and force structures across all lines of development.

It aims to be both reflective and progressive, challenging current assumptions where necessary. While many of us routinely focus on the near-term future, it is critical that we extend our gaze beyond the short-term horizon to inform our experimentation and modernisation agenda, so that our land forces can continuously adapt to successfully meet future challenges. AW has a horizon of approximately 20 years. As such it is aware of current policy, budget and equipment – however, AW is not constrained by these factors and should encourage conceptual exploration and exploitation of trends and emerging technologies.

The research and experimentation conducted is traditionally published in an annual AW Report. However, publishing articles this way hampers debate and discussion throughout the year and only allows a selection of articles to be published. The intention of the Agile Warrior Quarterly (AWQ) newsletters is just that; by periodically distributing a newsletter to a wide audience debate will be encouraged and facilitated. The digital and unclassified nature of the AWQ supports this objective. You can easily

subscribe to AWQ by sending an email to the address in the contact details.

We would like to invite you to contribute to AWQ and the overall AW programme. You can do so by submitting an article yourself. Submitting articles is open to everybody (British Army, other Services, wider HM Government departments, think tanks, academia, industry, Allies, etcetera) and is greatly appreciated. We intend to develop a digital platform to facilitate comments and discussion in the future.

AWQ will reflect ongoing work within the AW team and themes addressed during the AW events throughout the year. Additionally, AWQ input from the wider community will give you the opportunity to shape future events and further research. An annual AW report which will hold a selection of articles will still be published. With your commitment and contribution this report will remain an influential document for Future Force Development in the United Kingdom and beyond.

Finally, we are confident that the articles in this edition of AWQ will provide food for thought. We hope you enjoy reading it and are looking forward to your contribution to future editions.

CONTENTS



ACKNOWLEDGEMENTS

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Professor Patrick Porter,
from the University of Exeter

Abigail Watson and Emily Knowles,
from the Oxford Research Group
Remote Warfare Programme

Keith Mallon,
from QinetiQ

AGILE WARRIOR KEYNOTE by Professor Patrick Porter (University of Exeter)



We're here to try the impossible, to anticipate the future: future fighting, if not where and when, exactly, then how and why, to understand the pulse of the battlespace decades out. But with what method?

Let's try an image, this one from A.A. Gill. You are in a little boat alone, surrounded by sea. You have no idea how you got here. Then two dots appear on the horizon. They come closer. A voice instructs that you can only stop one. On one boat, there is a man who will give you food, fresh water, some oars and directions to get to land. In the other, there is only a bloke who will tell you how you got here. Which boat do you stop?

Personally I would cheat, and try and stop both, and wreck the exercise.

But I tell that story to caution against an intellectual danger: namely, the rush to solutions, rushing past the prior task of defining problems.

The watchword is "agility" - but recall those agile, operationally excellent forces that still met bitter defeat: the Wehrmacht in World War Two, the US Marine Corps in Vietnam. Agility to what end?

Gatherings like this can fail. They are vulnerable to politics, in a bad way. There is nothing so political as practitioners speculating on future war: scenarios people don't want to imagine because they imply policy failure; capability decisions that threaten factions and their interests; career-minded individuals in the eye of superiors. And above all, sacrifices have been made, and to confront failure is to question the value of those sacrifices.

This isn't easy. It's still there, the distress and the loss of this century's campaigns are still with us, the campaigns of the War on Terror.

So today I'd like to be the bloke who offers only a diagnosis of how you – we – got here.

Wherever we are, it is less than ideal, and we are not ready for it. Multiplying security commitments and problems. Strained resources.

Perverse consequences of well-intended actions. Empowering jihadi militants in campaigns that were supposed to suppress them. Reinforcing bad governance that was supposed to be ended. Wars that were supposed to stabilise regions causing further wars. Counter-proliferation wars that provoke proliferation. And what a week it has been for development, and the deadliness of good intentions, and the menace of the mindset Teju Cole spoke of, “that the world is nothing but a problem to be solved by enthusiasm.”

A UK government trying to improve strategy-making, but still overstretched and confused, still with an incoherent conception of what force is for. All as a feral new order of geopolitical struggle opens up before us.

How did it come to this?

I think we got here not because you lack agility, or because the institutional architecture isn't right. We got here because of bad ideas. Bad ideas about what force is for, and why it is worth investment.

Let's think back to that prehistoric time of just over a decade ago, on the other side of the global financial crisis.

I was lucky to go to work at the British Staff College.

The gravest fears – and the height of intellectual fashion – was worrying about defeating or converting insurgents, out-governing militants on the frontier, rebuilding failed states to cure the diseases that spawned terror, and getting home. “Counter-insurgency”, a counter-insurgency expert instructed me, “is the only game in town.” Military force was the armed guard of development. Britain would go to places to bring order into chaos.

There were crises. But the broader picture was optimistic.

The world economy was booming; the Pax Americana was locked in. Geopolitics was over. Globalisation and the interlocking of economies phased out great power rivalries. If there was a coming superpower, it was the European Union, with all that cash and soft power. We were told to read a blockbuster book prophesying it. I've forgotten the author's name.

China would get rich without developing the ambitions of rising state, and subordinate itself to American primacy.

Russia would have to integrate itself into a state of peaceful interdependence to survive. NATO should expand into Georgia and the Ukraine, for our common security interests, whatever that was. Yet it could safely expand because the major state that might object was so unthreatening that it wouldn't resist.

None of this is mere hindsight. Warnings were made at the time, and breezily shrugged off.

When a colleague wrote an article forecasting Russia's revisionist aggression in Georgia and the Ukraine, it was rejected because of its outmoded RealPolitik.

The state scrapped the Advanced Research and Assessment Group, whose Russia Analysis Section forecast that Russia with its mixture of subversion, force and propaganda would reassert itself in the Ukraine. ARAG had to go, because, in the words of the Commander of Joint Forces Command, "the world had changed at that time" as "the decade of campaigning around Iraq and Afghanistan" cast its shadow. Likewise, diplomatic capability and area expertise was thinned out in a depleted Foreign Office.

Two errors converged. Mirror imaging (the belief that others defined their interests the same way, or could be easily coaxed to) and Presentism, the belief that the future would look like the present.

That was the wager of SDSR 2010. In the wake of a fiscal crisis, the government made credit-worthiness was a strategic priority. Understandably.

But that desire encouraged wishful assumptions, that the world would cooperate. It was a time of complacency. About the possibility of resistance. The possibility of multipolar power struggle. The possibility of major war.

The then Chancellor of the Exchequer dismissed the case for major legacy capabilities. 'We are going to have a bunch of kit that makes us extremely well prepared to fight the Russians on the north German plain. That's not a war we are likely to face.' Not as funny now as it was then.

How could he be so cock-sure? Especially if, as the SDSR repeatedly claimed, the international system is increasingly 'uncertain'? Even if he is right, historically remote contingencies happen. The penalties for presuming against them can be severe. The former Chancellor recently announced he is studying world order under Henry Kissinger. Clearly, the tuition won't be a waste.

Arguments against prioritizing "heavy metal" capabilities, based on assumptions that the future resembled the last five minutes, were widespread. The Institute for Public Policy Research (IPPR) Commission on National Security proposed strengthening capabilities around state building and pandemics at the expense of major war capabilities. Max Hastings, Allen Mallinson, Menzies Campbell, General Richard Dannatt called for the scrapping of carrier programmes and fast jets, the submarine-based nuclear deterrent, as though current campaigns demonstrated the way of the future, and as though victory in minor wars was more vital than deterring potential major ones.

As it turned out, history as a process had not ended. It had just dropped out for a smoke.

Now consider the the multiple warning signs that were already flashing: In March 2009, Russian Foreign Minister Sergei Lavrov warned that NATO enlargement was a source of threat, and that Russia might find gas customers in Asia.

In September 2009, Russia's Zapad Military Exercise rehearsed a clash with NATO around Belarus, spreading and culminating in a first-use nuclear strike on Warsaw.

Russia frequently probed Britain's airspace and offshore waters. The highest number of contacts with Russian submarines since 1987. Russia military doctrine in 2010 designated NATO a source of military danger.

This should not be a mystery. Russia was doing what major powers tend to do, to press their interests. It was determined to dominate its back yard (as we are), to restore some stature (as we would), to oppose threatening expansion into its orbit (as we have).

We can disagree about the wisdom of expansion into the region. We have no right, though, to be shocked at the blowback.

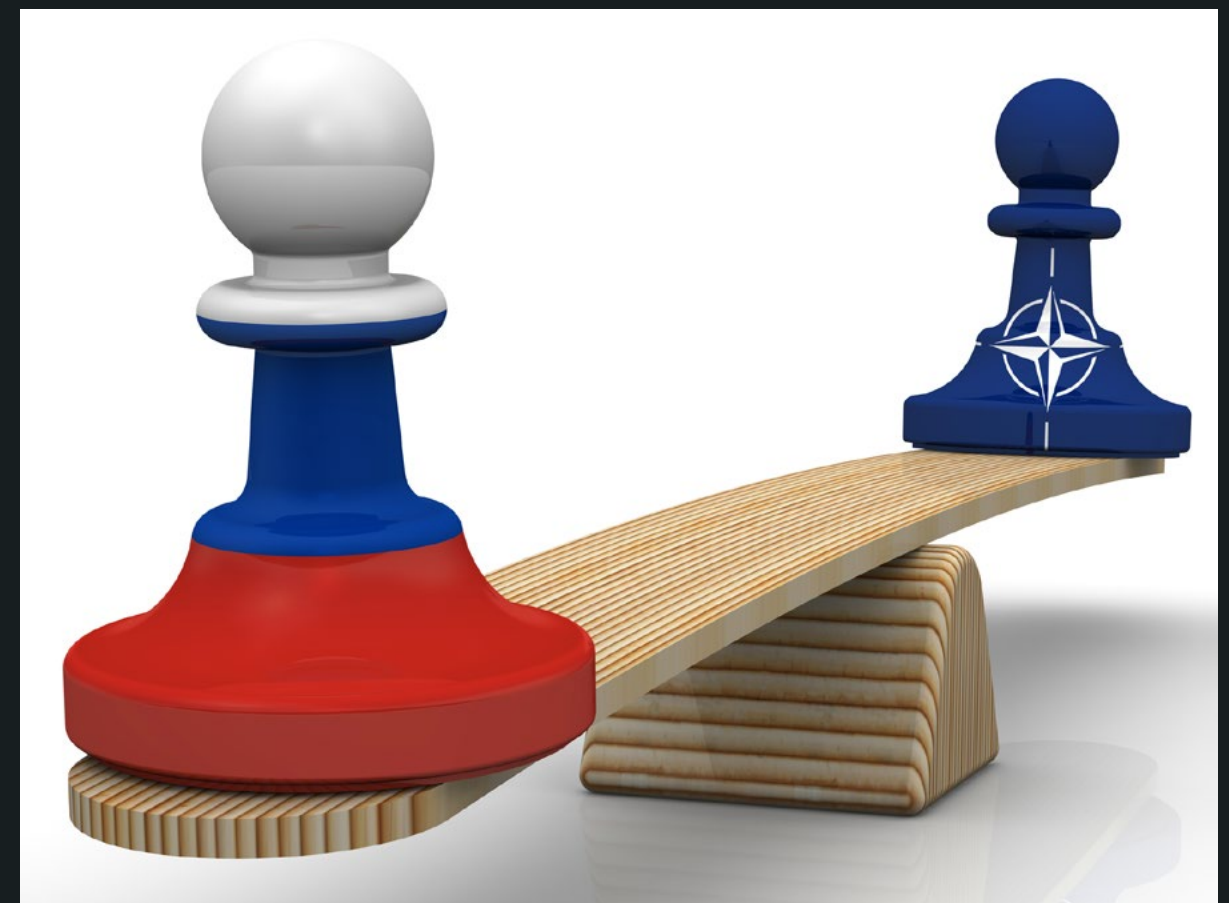
And yet: this development is talked about as though it is a black swan.

SDSR 2010 mentioned Russia twice: once about reducing energy demand, and one about general 'security dialogue.'

We got here through wishful thinking. Because we wanted a commercial, rules-based peace, combating only guerrilla insurgents of the Third World, we fancied other states did too. There was consultation, its true: but before experts even spoke to power, power had decided what it wanted.

Other ideas played their part.

One insidious idea, still haunting debate, is that military force is only valuable, only worth the investment, if it is being continuously, visibly used, and for the remaking of states and societies. The main, proven and most prudent functions of defence – to defend, to deter, to disrupt – faded to the background.



Force instead was judged on its capacity to be a problem-solving instrument, on an expeditionary footing, to fix broken and fragile states, with limited casualty tolerance. As another guru of minor wars, John Nagl insisted, force was now to be optimised for the transformation of whole societies. A vision of war as a decisive solution beckoned. This mindset borrowed from the atypical circumstances of world war two, the desire to end threats decisively, to extirpate ideologies, to spread good governance. It holds defence to an impossible standard. Like saying car insurance is only worthwhile if you regularly crash your car. The wars of the 9/11 era led to further splintering, and more wars.

General David Richards' tryptic for modern British forces - "agile, relevant, useful"- tried to get British forces on the right side of this Whitehall mentality of "usefulness." But by doing so, he reinforced it. My guess is that this also reflected a wider tendency in civil-military relations: to play the game, to say "yes" to missions that were wildly complex, for fear of obsolescence and extinction.

In turn, fatalism set in. The belief arose and spread that we were in these wars, in this way, because we had to be, if not in Iraq, certainly Afghanistan. "We don't get to choose" was the claim.

"Yes we do", replied Gian Gentile, and a range of critics. We do get to choose. It's called strategy. That's the point of being nuclear-armed, offshore, maritime-shielded major powers, secure from snap invasion. Precisely that it affords discretion.

9/11 did not have to lead to a war on terror, or to Baghdad. We did not have to help break a state in North Africa that had disarmed, controlled its borders and was hostile to Islamist insurgents. We do not have to insert our forces into the middle of a multi-sided sprawling set of conflicts in and beyond Syria.



And there was the “something must be done” pathology. Arguments for restraint, for the respectable stance that sometimes “nothing”, or doing minimal harm, is more prudent, were glibly dismissed.

As two observers noted recently, “Nothing is like anything else. You can do nothing well or you can do nothing badly. Some people excel at nothing. Others have more difficulty with it. They grow restless, resent the loss of initiative and control, and, more deeply, they feel that “something” is inherently, even morally, superior to nothing.

The U.S. government national security apparatus, for better or for worse, sucks at nothing. In the policy process, the saying goes, something always beats nothing. As a bureaucratic fact, this is clearly true. But, from a policy perspective, is nothing always the wrong choice?”

Allied to that mentality is “must go-ism”, the instinct that our only true pathway to security is to insist on a regime falling on its sword, and when it doesn’t (they usually like survival), to break and remake the state. The results of this stance have not been uniformly excellent, and often are worse for our security interests than what existed.

And then there is the Anglo-American relationship, and our ambitions and fears for it. Signing up to difficult campaigns, it was argued, was a necessary down payment, or “blood price”, to secure special influence in Washington D.C. I love the republic, and its history and institutions and eccentricities. But policymaking in the U.S. doesn’t work that way. By night, Americans revere the memory of shared sacrifice and purpose, especially the memory of World War Two. By day, its rulers do what they want, do not look to be steered and tutored by older powers, and only have a special relationship with themselves. On the very day Britain deployed 45 Commando into Afghanistan in 2001, the US slapped tariffs on exports from the UK of speciality steel. This does not make them bad. It makes them unexceptional. And as Jacques Chirac’s France demonstrated, remonstrating and resisting can be more effective in the long run.

Final

To finish, with the other boat, with the water and map and advice. You don't have to agree. But you did ask to hear it.

What is coming at us? What agility is needed? What strategy will it/should it serve?

The trouble with the future is that it is unwritten. It hasn't happened yet. Agency matters.

That may sound facile. But it needs saying. Because for too many people, in social science and the military, the future has effectively already happened, we just have to sharpen our predictive tools. For them, it is already an objective, pre-ordained thing lumbering towards us, and so we must anticipate it, and our only choice or agency is whether we are accurate.

But it isn't good enough to specify this or that material environment, the densely populated urban terrain or the hybrid battlespace of information war.

The future is something we partly make. Our strategic choices shape it. Countries like Britain still have discretion. They must take responsibility for it. The battlespaces of the future are not so until we decide to enter and remake them.

In other words, to make that future is at root a political act, and political judgement. About what we are willing to bleed for, and what our power (and military power) is for.

The pathway opening before us is one that deserves rethinking, and hesitation before we march down it.

That is a pathway of more or less continuous war, but called "operations" and dangerously normalised. More or less constant ramping up of NATO's eastern periphery and dangerous security competition with Russia. With forces that have excellent spearheads, but limited depth, sustainability or redundancy to cope when things get intense and protracted. Britain does not have to choose a future of perpetual war, trying to create a "balanced force", being inserted regularly into urban environments.

Some prudent war-avoidance would help, & ranking of geographic areas most important, and a strengthening of Britain's capacity to defend itself & its maritime approaches. Rather than unbounded rhetoric about being "global", something even the US struggles to be.

I'm sort of the reverse of the Whitehall consensus: hawkish about preparing military capabilities, not hawkish about frequently using them.

Agility obviously matters. But it has boundaries, beyond which it is acquired at the expense of precious things.

Not all security missions are equally valuable. This places limits on the value of flexibility.

I don't think it's wisest to be a pentathlete, prizing flexibility above weight of capability, and compromising excellence for the sake of breadth.

The current government's conception of British forces is not clear: the Prime Minister has (I think wisely) disavowed the effort to use military force to remake other countries in our image. But what, then, is Future Force 2025 for?

Certainly in recent time, Britain has allowed its military to elevate counterinsurgency and counter-terrorism-centric force over the past fifteen years, to the detriment of such domains as anti-submarine warfare, air defence, and combined-arms manoeuvre warfare at scale – imbalances that we are now struggling to redress on a tight budget.

A multipolar world of hostile major powers opposed to Britain and our NATO allies, in an environment getting harder to “go to” as an expeditionary force, given the coming of access denial capabilities, will necessitate the heavy, high-end warfighting capabilities necessary to deter conflicts with similarly capable peer-competitor states – and to survive in such conflicts, if deterrence fails. The future of UK security policy is not all about counter-terrorism, weak-state stabilisation, and “asymmetry”.

Indeed, claims that “hybrid operations” in Eastern Europe represent some radical new departure elide (a) just how much heavy capability such operations involve, (b) the centrality of subversion/disinformation to strategy throughout history, and (c) the risk of escalation to conventional/nuclear warfighting that represents “hybrid” warfare's greatest danger.

Strategy is about limitation, about ranking and ordering things we value into a hierarchy, distinguishing the vital from the peripheral. It is about partly shaping the future environment, rather than fatalistically just accepting it.

This is where I break ranks with the Whitehall consensus. Embodied in a recent article by William Hague, who says Brexit Britain must maintain defence spending in order to project power far and wide, and not “retreat.”

I beg to differ.

‘Retreat’ is such a taboo for security traditionalists. As is moments where we choose to “do nothing.” But retreats, restraint and retrenchment from some commitments are an important part of a state's ability to remain solvent.

No-one's suggesting Britain dissolve all commitments. Unlike the consensus, I don't think Britain should try to be a “global” player. Embroilment in the South China Sea is where benign-sounding visions of “global Britain” can lead.

The main strategic problem is not one of budgets themselves, but the size of the policy they must serve, and an imbalance of power and commitments, with ambitions exceeding capability.

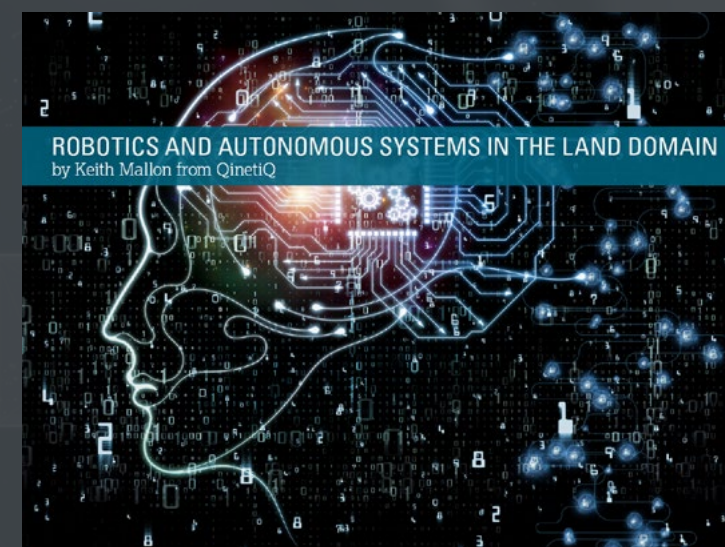
We can choose to be something different: international, not global. Doing minimal harm rather than overconfidently thinking we can bring order into chaos. Or at least, if we insist on doing good, doing it in detail.

Focus efforts, using military force for what it is most suited for, to defend, deter, and disrupt.

And link that with a watchful, accommodating diplomacy, backed up by strength.

I will finish with Winston Churchill, but with a line that has gone under-celebrated:

“Appeasement in itself may be good or bad according to the circumstances. Appeasement from weakness and fear is alike futile and fatal. Appeasement from strength is magnanimous and noble and might be the surest and perhaps the only path to world peace.”



HOW CAN WE WIN? LESSONS LEARNED FROM CONTEMPORARY THEATRES

by Abigail Watson and Emily Knowles
from the Oxford Research Group Remote Warfare Programme

CHALLENGING A FOCUS ON THE MOST DANGEROUS THREAT IN FORCE DESIGN

Conceptual force development faces a bind when it comes to looking out to 2035. Should force design focus on confronting the most dangerous threat on the horizon, or the most likely? Of course, the gold standard would be to design a force that would be adaptable enough to face a range of both likely and dangerous scenarios.

However, this is a daunting task that does not lend itself to the clear predictions of resourcing, training, equipment, and numbers that much force design rests upon. What tends to happen instead is that this desire gets translated into a decision to design narrowly for the most dangerous threat, with the assumption that it will be easier to ‘scale down’ than to ‘step up’.

Recent experience in Iraq and Afghanistan suggests that this assumption is flawed. The skills and approaches needed for population-centric COIN were not easily conjured out of existing British Army training or equipment. Instead, they required a dramatic (and at times, traumatic) rethink at all levels while the UK was in the midst of a fight. Our research on contemporary British military operations – which are taking place on a light footprint and with a heavy emphasis on working by, with, and through local and regional allies – suggests that this type of engagement also requires a skillset that is distinct from – rather than a scaled-back version of – major warfighting operations.

This matters because the prevailing climate of political risk aversion, financial constraints, and enhanced public and parliamentary scrutiny over UK warfighting suggests that this style of operation is likely to dominate British

military engagement in the foreseeable future. Notwithstanding increasing agitation about a rising near-peer or Russian threat to UK security, adversaries continue to have a strong strategic interest in confronting our armed forces off the open battlefield. It does not seem unreasonable to suggest that UK forces may be more likely to find confrontation with Russia in Syria than in the Baltics.

WHY FOCUS ON THE MOST LIKELY COURSE OF ACTION?

A failure of British forces to perform well at their most likely tasks will invariably have knock-on effects. At home, declining confidence in UK defence is unlikely to yield the sorts of resources or permissions that the armed forces need to sustain their operations. Abroad, dents in the UK’s reputation as a reference force for partners and allies could have long-lasting consequences for British influence overseas. On this basis, conceptual force development that fails to optimise for the UK’s most likely course of action may find itself hamstrung before it gets out of the short- to mid-term – even if a most dangerous threat does materialise by 2035.

Therefore, pulling lessons from contemporary campaigns and feeding them into force design, doctrine, concepts, and training is hugely important. This paper is drawn from a larger piece of research on the opportunities and risks of remote warfare for UK defence that will be publicly released in July 2018. It is based on field research undertaken in Kabul, Baghdad, and Basra in 2017, as well as on interviews conducted between 2016-18 with British and international military personnel involved in operations in Somalia.

WHAT IS THE MOST LIKELY COURSE OF ACTION?

The failure of two costly military interventions in Iraq and Afghanistan to establish expected levels of stability has led some commentators to announce the “death of the nation-building project”.¹ Placing comparable numbers of Western boots on the ground, except in the case of a direct threat to state survival, will likely exceed political risk appetites at least for another generation when memories and national budgets may have healed.² This has meant rethinking approaches to military intervention abroad. NATO commitments in places like Afghanistan have been reduced down to 10,000 troops from a height of 100,000 and priorities in many European states have been refocussed on homeland defence – a shift that has been intensified by fears of a resurgent Russia and a string of ISIS-inspired attacks in European cities.

Nevertheless, governments continue to acknowledge that terrorist activity can thrive in the world’s ungoverned or weakly-governed spaces, and that this threatens their security. In order to deny terrorist groups safe havens some unilateral counter-terrorism strikes and raids continue – like the strike against ISIS propagandist and British citizen Reyaad Khan who was killed in Syria in August 2015,³ or the dropping of the Mother of All Bombs (MOAB) on ISIS positions in Afghanistan in April 2017.⁴ The exploitation of Western technological superiority – particularly from the air – has allowed states like the UK to engage in the fight against groups like ISIS without putting large numbers of their own boots on the ground.

This is perhaps the most visible aspect of what we have come to term ‘remote warfare’. However, Western troops are also increasingly working by, with and through local and regional allies in important areas for global security. While local troops are now expected to do the bulk of the frontline fighting against groups like Boko Haram, al Qaeda, ISIS, and al-Shabaab, small teams of Special Forces and military advisers, as well as security assistance and intelligence support are often provided by Western partners.



IS IT WORKING?

By maintaining a light footprint, some of the risks of exposing British troops to another series of gruelling wars appear to have been kept to an acceptable minimum. There have been no high-profile anti-war protests on the streets of London, and – bar the embarrassing defeat in Parliament on the principle of military action against Bashar al-Assad in Syria in 2013 – the UK has been able to lend support to its allies relatively unhindered. The high-profile liberations of Mosul and Raqqa from ISIS control have done much to reassure critics that this model of engagement can work, and that with the right support local fighters can prevail.

However, our interviewees each told variations on the theme of a reality on the ground that doesn't match up to the expectations of policy-makers. In many theatres where the UK is currently engaged, troops that were meant to be training, advising and assisting local forces were not allowed off their bases due to restrictive rules of engagement; political dynamics on the ground were so complex that any exercise set to replicate them would be vetoed for being unrealistic; and the influence that soldiers were instructed to foster appeared elusive in the absence of clear political direction.

Back in London, grumblings about military options being hamstrung by high political risk aversion and limited permissions peppered the many conversations, workshops and interviews that have informed this report. Comments about the decisions being made in Whitehall ranged from descriptions of strategic sleepwalking to a risk-averse process of elimination whereby remote warfare

was all that was left once the list of permissions and restrictions had been run through. The overwhelming diagnosis was one of limited commitment, minimum risk appetite, and a triumph of short-term thinking over long-term strategic thought.

Low risk appetites in Whitehall and Westminster, a challenging financial climate, and the enduring weakness of many Western partners in areas where terrorist groups operate suggests that remote warfare is likely to be called upon again in the future. Indeed, it will perhaps remain the “most likely” form of British military engagement overseas for the foreseeable future. This means that pulling lessons from contemporary campaigns and feeding them into force design, doctrine, concepts, and training is hugely important. This paper is a first attempt to identify some of the factors that have helped or hindered the UK's current remote warfare operations.

WHAT ARE THE LESSONS?

AFGHANISTAN: THE ASPIRATION-CAPABILITY GAP

Following the NATO drawdown in 2014, early dramatic proof of a terrorist resurgence came when a joint U.S.-Afghan special forces operation uncovered the largest al-Qaeda camp ever found in the region in October 2015. The multi-day battle killed more than 160 jihadist fighters in a training camp facility that spanned 30 square miles.⁵ While SIGAR were asked not to release their usual figures on Taliban and ISIS control of Afghan territory in their January 2018 report,⁶ a BBC study during the same month estimated that Taliban fighters are now openly active in 70% of the country.⁷

A sense of fatigue permeated conversations about the state of affairs in post-drawdown Afghanistan. The pressures of delivering on security and breaking what has been called the “stalemate”⁸ (but also the failure)⁹ on the ground are keenly felt. But as one soldier remarked “we face a stalemate today, but we also faced one 5, 8, 10, 15 years ago, we just didn’t know it”.^a There is a general appreciation that the problems in Afghanistan are long-term, with some personnel suggesting that we are likely to see some sort of international Train, Advise, Assist (TAA) mission there forever.^b When one soldier was asked what they thought to having more NATO troops on the ground in Afghanistan, they paused, and then shrugged “I’m not sure that wouldn’t just make us a bigger target.”^c

High risk-aversion has been pushing countries into adopting restrictive Rules of Engagement (RoE) in Afghanistan, with troops being asked to conduct effective training while being essentially constrained to HQ. One interviewee lamented that “This is making relationship-building really hard. We can’t go out and interact like we used to. This is especially hard because people remember when it was different. Staff who have come back now at a higher rank ask us “why aren’t you talking to so and so?,” using their contacts from before. Because we haven’t been able to build those relationships. We can’t get out there.”^d

While acknowledging that ultimately “it is the job of the military to carry out the political mandate”, we were reminded again and again that “ideally any force should have its size based on the conditions on the ground, and the end you are trying to achieve.”^e

In order to really begin to make progress on a peaceful settlement for Afghanistan, interviewees spoke of the need to bring pressure to bear on states like Pakistan, Russia, and the UAE to restrict assistance flowing to the Taliban, to start supporting the delivery of a functioning economy alongside the provision of security, and to build the trust necessary between NATO troops and their Afghan counterparts so that more roles and responsibilities can be handed over.^f None of these problems are easily tackled by remote warfare.

a Interview (22/03/2017)

b Interview (March 2017)

c Interview (01/03/2017)

d Interview (01/03/2017)

e Interview (03/03/2017)

f Interview (01/03/2017)

THE ANTI-ISIS COALITION: THE IMPORTANCE OF THE RIGHT PARTNERS

In January 2014, three years after the withdrawal of international military forces from Iraq, a hitherto little-known group calling itself Islamic State in Iraq and Syria sprang onto the international stage when it seized the Iraqi city of Fallujah, which sits just 43 miles West of Baghdad. A few weeks later, ISIS stormed into the Syrian city of Raqqa and announced it as the group's headquarters. By the end of June 2014, Mosul and Tikrit had also fallen, and ISIS had declared the establishment of a caliphate, naming its leader Abu Bakr al-Baghdadi as Caliph and successor to the Prophet Mohammed.

Following concerted international efforts against ISIS, the territorial gains of the group have been dramatically cut – with the Iraqi government announcing the liberation of Mosul in July 2017,¹⁰ followed shortly by victory in Raqqa in October 2017.¹¹ Many people are now switching their attention to the post-ISIS future of both Iraq and Syria, and all of the associated fears of a weakened but not destroyed ISIS guerrilla force melting back into the Sunni community from which it was originally formed.

However, valuable lessons for future operations need to be drawn from the experience of providing support to a partner force on the ground that is inexperienced in clearing and holding urban terrain from a determined enemy. Iraqi forces had been deeply traumatised by the experiences of 2014, and in many cases were reluctant to advance without heavier levels of international air support than might otherwise have been considered ideal in densely populated urban terrain.

The consequences of this can be seen clearly in western Mosul, the final stronghold of ISIS in the city, where around 15 neighbourhoods have been completely destroyed. These districts previously housed around 230,000 residents, leaving large numbers of internally displaced people (IDPs) who will not be able to return in the short to mid-term.¹² Three-quarters of Mosul's roads, all of its bridges, and most of the electrical network have also been destroyed, and many buildings have been rigged with explosives and booby-traps by retreating ISIS fighters.¹³ UN estimates suggest that 8/10 buildings damaged in Mosul were residential buildings, with 8,475 houses destroyed – more than 5,500 of which in west Mosul's Old City.¹⁴

Current efforts to improve urban warfighting capabilities focus on how to train and equip British troops better for this complex environment. However, it is unclear how helpful this is for preparing British forces to support partner troops. Careful thought about how best to support the next partner operation might yield solutions to an over-reliance on international airstrikes to clear territory.

In addition, legacies of the choices that were made under the banner of countering ISIS are likely to loom large in the region for many years to come. As Robert Malley states in *Foreign Policy*: “[f]or most of the United States’ allies in the Middle East, the war against the Islamic State never was the primary concern... their gaze was fixed on the wars after the war against the Islamic State.”¹⁵ The same is also true of those unfriendly to the interests of the US and its allies – such as Russia and Iran. Thus, as the world looks to a post-ISIS Middle East, the long-term consequences of working with local groups while ignoring the international and local contexts could come back to haunt the UK.

SOMALIA: “TAP ON, TAP OFF”

In Somalia, over twenty years of conflict and a history of fractious relationships between the semi-autonomous federal member states has left the Federal Government in control of less than half of the country. By the end of 2017, around 20% of the country was estimated to be under the control of al-Shabaab.¹⁶ This is the jihadist group responsible for high-profile attacks like the siege of the Westgate shopping mall in neighbouring Kenya in 2013 and a double bombing in Mogadishu at the end of October 2017.¹⁷

Despite concerted international backing since the September 11th attacks in 2001, neither the Somali National Army (SNA) nor the African Union Mission in Somalia (AMISOM) has been able to dislodge terrorist groups with any permanent effect. Worried that al-Qaeda would use Somalia as a safe haven after operations began in Afghanistan, the US sent a small team of Special Operations Forces (USSOF) to the country, liaising with local forces in a similar model to the early days of the Afghan conflict.¹⁸ Over a decade later, operations appear to be stepping up rather than winding down. In 2017, the total count of 34 US drone strikes equalled if not exceeded the cumulative number of attacks over the previous 15 years.¹⁹

At the same time, AMISOM has begun to withdraw its own troops from the country.²⁰ Budget pressures,²¹ including some disquiet over the disproportionate risks borne by regional troops versus their international backers,²² appear to be

taking their toll. The success of light-footprint remote warfare requires strong local buy-in, effective ground forces, and careful international support. Current signs suggest that the anti-al-Shabaab operations have fallen short on each of these key criteria – although we will focus on the last of them here.

British commitment to better outcomes for Somalia has not been consistent over time. Soldiers were worried about the “limited ability to maintain budget and interest over the long-term,”⁹ and the fact that appetites tended to wane “if immediate improvements aren’t seen.”^h One explained that while “everyone wants things to happen quicker than they can do... you have to take very small steps in order to achieve something big and significant.”ⁱ

This is not a problem restricted to remote warfare – changeable political will and the prioritisation of ‘quick wins’ are a recurring theme in many analyses of modern military operations.²³ However, the light-footprint nature of the British presence in Somalia was cited as making the disadvantages particularly acute.

As one interviewee put it, “when you’re there as a team of 15 you don’t have automatic influence... so you need time to build relationships instead. You’re there competing with other internationals for influence.”^j With political will derided as “a yoyo,”^k one soldier called the operation “a waste of time” because “you’re either all in or you’re not in at all.”^l As another put it, it can’t be “tap on, tap off”^m without handing space to groups like al-Shabaab to grow and exploit the chaos.

g Interview (03/02/17)

h Interview (03/02/17)

i Interviews (03/02/17)

j Interviews (03/02/17)

k Interviews (03/02/17)

l Interview (20/10/16)

m Interviews (08/11/17)

CONCLUSIONS

This is not to say that remote warfare shows no promise as a strategic option for the UK. The experiences of the anti-ISIS coalition suggest that a combination of clear political aims and committed local forces, coupled with appropriate support from international actors, can deliver results. However, as the cases of Afghanistan and Somalia remind us, remote warfare really struggles to deliver when expectations move from destroying or degrading a terrorist threat towards setting the conditions for lasting stability.

The answers to these problems are not easy and, most importantly, they are unlikely to be found in the kit and capabilities currently being championed as a way to address the rising threat of Russia. In fact, they are unlikely to be found in any kit and capabilities-heavy approach to force design. While advances in technology, such as AI and more proficient use of cyber, will no doubt play a key role in the future of British warfare; investment in these things is only half of the story.

Working out how to deliver appropriate support to partner forces, and how to work best in broad ad-hoc coalitions of international, regional, and local actors will take an examination of skills and training within the British armed forces. Integrating a proper analysis of the skillsets and specialisms that will be needed within the force should be key to both making sure that the armed forces improve at performing their most likely tasks, and that they are optimised for the widest possible range of future threats. In this way, perhaps an adaptable and agile force will be achieved by 2035.

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ROBOTICS AND AUTONOMOUS SYSTEMS IN THE LAND DOMAIN

by Keith Mallon from QinetiQ

The promise of robotics and autonomous systems (RAS) in the Land domain is well documented. Machine learning technologies continue to rapidly develop with imaginative applications of sophisticated algorithms being unveiled on a weekly basis. New concept systems that offer real operational advantage are moving closer to reality and these may have profound implications for the way in which future operations are conducted. These game-changing benefits have also captured the attention of many nation states that might be characterised as adversaries. So, the pursuit of deployable RAS technologies is becoming less a question of desire and increasingly an issue of necessity. Although the majority of investment in RAS is taking place away from the defence sector, a rapidly growing ecosystem of defence primes and SMEs are either creating their own new technology or partnering with providers from adjacent sectors. Against this backdrop of continuous innovation, it is hard not to be excited about what RAS can bring to Land operations.

It is though necessary to temper this excitement and to focus on some of the challenges and practical problems that the Land community faces in realising these benefits. There is a tendency to view the range of technologies encapsulated in the catch-all term of RAS as a panacea to many of the force development issues that Western militaries must contend with. The history of defence acquisition is littered with bold claims about new transformational technologies. Expectations have been set by both customers and suppliers alike that ultimately prove too grand in scale to feasibly achieve. The pitfalls of such unbridled optimism are readily apparent. For example, stressing requirements,

based upon a flawed understanding of technology maturity lead to spiralling programme costs, drawn out acquisition timelines and an overly complex and fragile solution.

The key to Land leveraging the greatest possible utility from RAS whilst avoiding this burden of expectation (and associated investment) is to set realistic, but nonetheless challenging, near and mid-term goals. A first step though, is to clarify what we mean by “RAS” and to establish what RAS can and can't do.



WHAT DO WE MEAN BY RAS?

RAS can encompass everything from traditional remote control robotic capability, to autonomous robotic platforms. It can also cover the analysis and manipulation of large volumes of data by machine learning techniques or even the predictive reasoning and decision making tasks performed by still-nascent artificial intelligence tools.

One of the inhibitors to informed decision-making about how Land can use RAS is therefore the breadth of what RAS can be taken to mean. Perhaps an easier way to think about RAS is to understand it in terms of its application and what capability it might bring. Although it could be determined to a be crude delineation, the grouping together of Robotics and Platform Autonomy into “Platform Capability” and Machine Learning and Artificial Intelligence into “Decision Support Capability” offers one way to think about RAS. Clearly these groupings miss out on some substantial nuances (e.g. platform autonomy is achieved using machine learning techniques) but it nonetheless allows for some useful simplification of terminology. With Platform Capability we can foresee a range of unmanned ground or air vehicles, with varying degrees of autonomy along with relevant payloads. These can used to achieve effect in the battlespace in a variety of roles – including ISR, EOD, resupply and potentially the application of kinetic effects. With Decision Support Capability we can foresee a range of software based capability packages that assist Commanders and their staff in managing large volumes of data. Obvious areas where this could add benefit include the G2/intelligence role or G5/plans role where a complex mix of partially predictable data points must be fused with multiple known/unknown parameters in order to determine a Course of Action.

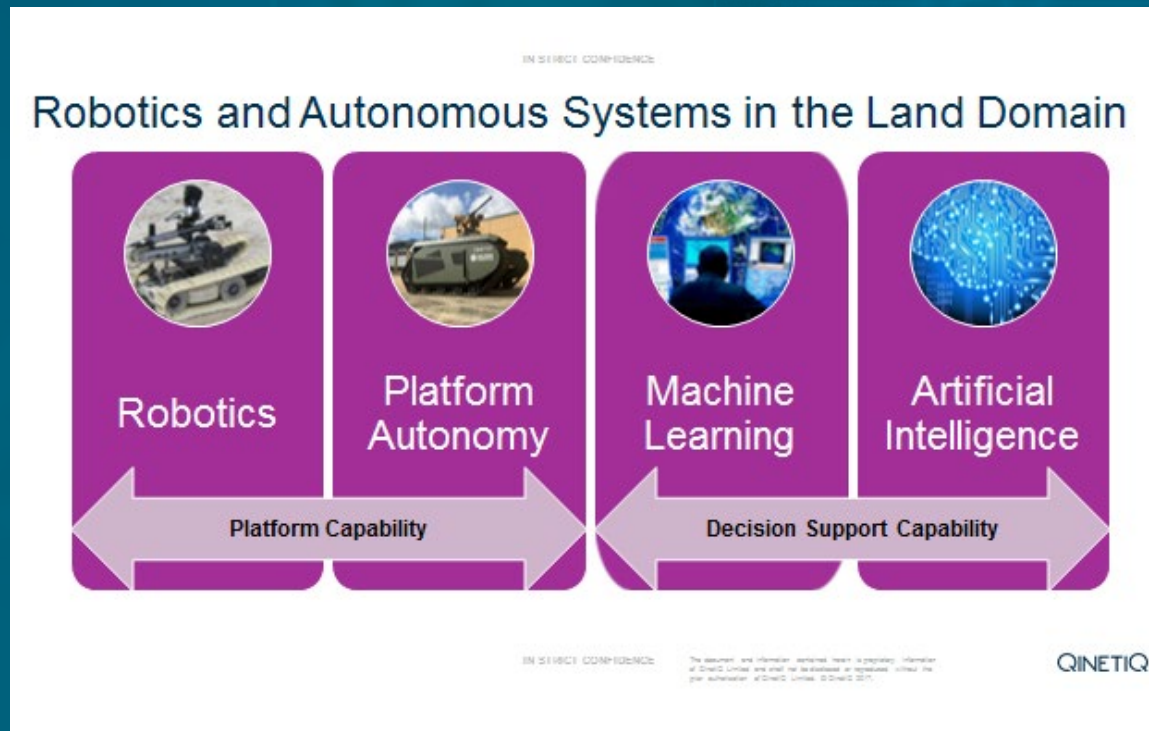


Fig.1: The term “RAS” can cover a disparate range of technologies. This can however be simplified to cover four broad areas of technology that can in turn be applied to approximate areas of capability.

Assuming this Platform Capability and Decision Support Capability delineation, it is worth dwelling briefly on two further points that relate directly to how RAS is viewed in the context of force development.

The first is that Land will require whatever RAS systems it chooses to acquire to operate in environments that are *dynamic, unstructured and uncertain*. This is a fundamental difference to much of the capability that is being developed for adjacent sectors in the civilian market. It is most notable in the area of platform capability where – for example – driverless cars are being developed for rules-based environments. Here there is a variety of predictable cues and infrastructure to help a vehicle find its way. Platform autonomy in the Land domain will be required to operate in far more challenging environments where active sensing modalities are undesirable and the environment the platform has to interact with will be significantly more hostile than travelling along a motorway. For decision support capability, the translation of current civilian technology into something of utility for a military environment is not quite as daunting that faced in the area of platform autonomy. However the assurance of any decision support software – in terms of its data-set, its audit-trail, its communications links and much more – will pose considerable challenges. The point then is that many of the tasks that RAS will be asked to undertake and the environment in which they will be tasked to operate will be more difficult and more demanding than those found in the civilian world. This matters because it means the maturity of RAS in the military space cannot be assumed to be equal to that of the civilian space. There is also an implication here for investment – a topic to which we will return.

The second fundamental point is that individual component RAS technologies will offer a tactical advantage. Taken together, a system of RAS technologies may offer a decisive tactical advantage. What RAS categorically cannot do is offer strategic advantage. Force design can benefit from RAS and we can create a more capable and effective force but it will only ever be a tool of strategy.

The idea that the adoption of RAS technology is a strategy in of itself is not one that is conducive to good system development or design. Nonetheless, the tactical advantages that RAS offers are sufficient to still make for an extremely enticing prospect. Those advantages can be summed up as:

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PRINCIPLES FOR DEVELOPING AND DEPLOYING RAS

With an understanding of what RAS means and what benefits it can and cannot bring, a common set of principles to which both the military customer and the industry supplier can adhere is the next step. These can provide an enduring hand-rail for the development of RAS within Land. Although high level, the following three principles offer a means by which military and industry can go about this task.

- We must strike the right balance between ambition and pragmatism
- Collaboration between customer and supplier is at the heart of all we do
- Experimentation is crucial to understanding both the opportunity and challenge of RAS

Each of these principles will be explored, but it is the first that best dwelled upon in most detail.

BALANCING AMBITION AND PRAGMATISM

At face value, balancing ambition and pragmatism seems a self-evidently sensible thing to do. However, it is perhaps the most fundamental principle to get right if RAS is to be integrated into Land in an efficient and cost-effective manner. The key to understanding how to balance ambition and pragmatism is to have a clear headed view of what the challenges of introducing RAS are and how we must be mindful of their potential impact. The following is by no means an exhaustive list of these challenges, but it does identify some of the near term considerations that could be addressed.

Avoiding the pitfalls of technological determinism

Whilst technology has brought great benefits throughout human history its impact upon our capabilities and skills as a species cannot always be interpreted

as purely positive. Consider the sight of daily commuters on public transport, heads buried in smartphones and electronic devices, actively oblivious to the world around them. Imagine then if that same effect of technology was replicated on the battlefield. Close combat is virtually unique in the industrialised world as it still requires the utilisation of skills that have scarcely changed since our species evolved as hunter-gatherers. Should we create a RAS enabled force that results in combat troops focused solely – heads down – on the operation of their technology, then it seems unlikely that true capability has been achieved. Technology has always influenced –even controlled – how we fight. But it would be a mistake to assume that the ubiquitous adoption of RAS will bring only benefits to how we fight in the future. Good system design, based around the human at the centre of that system is absolutely critical to ensuring RAS creates tactical advantage. This can only be achieved when both customer and supplier are dedicated to working together throughout the capability development cycle.

There is a flipside to this risk of technological determinism – where rather than concern ourselves with the limitations of the technology of the future, we are fixated upon the technology of the past. The 20th century in particular features some stark lessons from militaries that failed to adopt new systems and tactics, preferring instead to focus upon the way things had always been done. There is an inherent danger that capability acquisition will focus only upon “prestige” assets as symbols of traditional military power. The deletion of obsolete systems must absolutely be part of the wider conversation about the development and deployment of RAS. Not only will be this be necessary to create a balanced and coherent force structure, the de-prioritisation of investment in capabilities that are no longer relevant will be required in order to fund the development of RAS. This is a subject that is uncomfortable for many stakeholders and typically comes loaded with emotion – not to mention vested interests. It is nonetheless necessary to identify the real world impacts of continuing to invest in technology that no longer offers a tactical advantage, especially in a world of increasingly finite budgets.

Defence gaining access to the technology and skills to drive innovation in RAS

Settling upon an agreed figure that measures the scale of private sector investment into RAS seems impossible. What is safe to say is that it is a lot – tens of billions annually is an entirely reasonable estimate. Also not disclosed is the scale of defence investment into RAS. But it is equally safe to say that it is a lot less than the adjacent civil sectors. In UK defence, the figure over the last 3 years is probably in the mid tens of millions – less again if you look at what has specifically been developed for the Land domain. As has already been observed, much of the capability developed in the civil sector will not necessarily be suitable for pull-through to defence. Additionally, many of the companies investing in RAS may choose not to sell their products into the defence sector – preferring to avoid the reputational risks that may come with their IP being part of a controversial military conflict. Contrast this with countries such as China where the lines between private sector and state development of RAS are markedly more blurred. It is therefore clear that the military is lagging in developing RAS and will have to compete for access to the technology and skills required to make concept forces a reality. The competition for a limited pool of talent will be particularly fierce. The picture is not uniformly grim. As the wider private sector gains increasing awareness of the most advanced techniques used in the development of RAS, the military will be able to benefit from some pull-through effect. The key to balancing ambition and pragmatism in this sense is to prioritise specific capability gaps or opportunity areas where there is already sufficient technology maturity to leverage existing RAS concepts. An even more selective focus will be required in the technology areas that will be unique to defence. Needless to say, all of this will need to be underpinned by both customer and supplier investment.

Creating new models of acquisition for RAS

Defence has traditionally focused upon the acquisition of assets – the purchase of platforms, weapons, consumables and other physical things. Typically the acquisition process is slow, deliberate and very carefully considered. This is not to say that defence acquisition always gets it right – there are many examples where the military customer might opt to do things differently in retrospect. The UOR years showed us that other acquisition models were possible and that capability could be fielded rapidly. Question marks remain about the longer-term utility of some capability acquired under this methodology. There is scope then for considerable uncertainty within defence as to how new and innovative procurement models might be made to work.

Just as new procurement models may pose risks, so too older, more traditional means of buying capability threaten to deny to the end user the many benefits RAS can bring. Acquiring the component elements of a RAS enabled force for a 30 year life cycle, in the way that tracked IFVs were acquired, would be self defeating. In many instances, the development cycle of new autonomy-enabling software packages is likely to result in generational leaps in capability every 3 years. Perhaps even much less. The idea that robotic platforms should be built around a durability requirement that increases their cost by orders of magnitude is also anachronistic and ill-suited to integrating new technology at pace. RAS capabilities may still be too expensive to ever be considered sacrificial. Yet they may well be classed more like consumables. Designing to a “many and cheap” rather than “exquisite and few” requirement will likely necessitate a change in mind-set within defence acquisition. Fortunately there are options by which the Land community can start to become more comfortable with doing business in new ways.

The need for staged integration of RAS technology

A means by which both customer and supplier can start to explore both the new capabilities offered by RAS and the acquisition models by which to introduce them to service is to pursue an approach of phased integration. Given the scale of research and development required to create a fully RAS-enabled force, it may be tempting for some to believe that we will not introduce RAS technologies for several years yet. However, there are plenty of component elements that are available if not now, then within the next 3 years and they can offer many benefits even in the short to medium term.

There are established precedents to this approach that also illustrate its benefits. Turning again to the example of driverless cars, the phased introduction of the underpinning technology has been occurring for many years. Systems such as autonomous emergency braking, lane keeping assist and blind spot detection are standard in many family cars. They may not be marketed as underpinning technologies for driverless cars, but they are fundamental building blocks in a suite of systems that will ultimately make cars drive autonomously. The benefits of this approach are many. Firstly it allows the everyday user of the technology to become accustomed to it. Secondly it allows the wider public to gain acceptance of this technology in their midst.

Both of these benefits will be relevant to defence – Land in particular. The combat focussed user is naturally wary of the introduction of advanced, but unproven technology. Where the consequences of failing kit are so high, the burden of proof falls heavily upon the provider to show that their system is combat ready. Phased integration of component elements of RAS allows the user to gain confidence in the technology over time. It also allows the supplier to gain understanding of the performance and limitations of the systems they have provided, driving further research and development priorities. Just as importantly, this evidence can also be used to build confidence among the public

in the use of RAS within Land operations. At present, the debate regarding RAS is emotive and often poorly informed. Facile comparisons between limited RAS capabilities where humans always remain in the loop and “Terminators” tend to cloud the debate. Having built up an established record of responsible, safe and legal use of RAS through phased integration, many of the poorly informed arguments against the introduction of this technology can be shown to be unfounded. Similarly, where unforeseen issues do arise, they can be managed in accordance with the bounded scope of their limited integration.

Crucially, given the investment costs required by private enterprise funding research and development, it is necessary illustrate to industry that Land is indeed serious about bringing technology into service. A phased integration approach allows industry to see a way towards return on investment in a nearer timeframe. With unrelenting pressure from shareholders, the brutal reality is that without a visible pathway to this return on investment being apparent to industry, the military will not see the development of capability required to achieve its ambitions for RAS technology.



COLLABORATION AT THE HEART OF ALL WE DO

If through the principle of balancing pragmatism and ambition we can uncover the challenges faced in deploying RAS capabilities for Land, it is through collaboration that we can find a way to mitigate the effects of these challenges. Collaboration can take many different forms. It can be between customer and supplier, it can be between partnerships of suppliers, it can be between suppliers and academic organisations or it can also be between multiple customers, helping to share the costs of development and fielding. The complexity of bringing RAS capabilities into service is sufficiently great that collaboration is not only desirable but utterly necessary. All of the challenges identified previously will benefit from a collaborative approach to solving them. But there are other areas for collaboration where we can not only react to problems, but proactively seek to create opportunities for developing new systems that address real capability shortfalls.

Concept development

The co-creation of new operating concepts where RAS capabilities provide a core level of functionality is one of the most powerful ways by which the phased integration of technology can be achieved. By focusing on a tightly defined operational challenge and associated capability need, military and industry can work together to scope and design systems. The great advantage of a co-creation approach is that it allows for industry to design systems and technology that actually meets the need of the Land customer. This creates a “customer pull” rather than an “industry push” dynamic. A number of themed competitions run by the UK’s Defence and Security Accelerator have followed a model that could be termed as co-creation although it is possible that more close collaborative development could be achieved. Again within the UK, the InnovateUK model of

including customer-backing as a requirement in matched funding competitions – where both government and private industry share the costs of R&D – has proven to be a successful strategy for creating exciting new IP. If the military is to benefit from RAS, this collaborative model of developing new concepts seems to offer real potential in moving from low-TRL proof of concept systems to the deployment of operational kit that can offer tactical advantage.

Education and advocacy

Creating the business case to adopt both the technologies and the new methodologies required to bring them into service will also need to be done collaboratively. This will perhaps prove to be one of the biggest hurdles to clear if RAS is to make a contribution to Land.

The military, like any organisation or community, has its vested interests and pockets of resistance to change. The merits of RAS will not be immediately evident to many and this scepticism will often be a useful check and balance against over-enthusiasm by would-be tech-evangelists. Part of this challenge is in creating an intelligent customer organisation that understands the nature of the technology and also its risks, limitations and dependencies. Creating this intelligent customer organisation will rely heavily upon education – both in the classic sense of training by academic institutions, but also in the sense of industry partners being open about what their products are capable of and how they can be used to achieve effect. This level of openness will be uncomfortable for some, but it will be necessary to convince all stakeholders within the Land community that RAS offers viable new ways of achieving effect that existing systems do not.

Another element to creating a Land wide case for developing and deploying RAS is advocacy. Closely related to education, a collaborative approach to articulating the potential benefits of RAS will be required. This advocacy will need to articulate not just a relentless series of positives, but also an understanding of the changes that RAS will bring, their implications and how Land will need to prepare for the disruptive effect of new systems and how they are employed. Any advocacy effort must also be built upon a foundation of integrity and a clear commitment to not pushing technology upon a customer just for the sake of it. Unless both customer and supplier can show that they are acting from this position of integrity, any advocacy effort is unlikely to succeed.

EXPERIMENTATION DRIVES UNDERSTANDING

As collaboration in concept development, education and advocacy progresses and the case for RAS is built, evidence of the claimed benefits will be necessary. Experimentation is the key to gaining this evidence and will provide an immensely valuable data-set that helps us balance pragmatism and ambition whilst understanding how the Land community can move forward collaboratively.

Synthetic based experimentation

Understanding the implications of incorporating a variety of RAS platforms and decision support capabilities will be complex task. The sheer data generated by swarm of ISR gathering platforms could likely overwhelm a user. The command and control of a network of autonomous devices – understanding where they are located in space and time and the effect they are achieving – could place an unsustainable burden on a commander. Fortunately technology and systems will be designed to alleviate the majority of these concerns, but experimentation will still be required in order to understand how to drive that

design process. Synthetic based simulation will be a powerful tool in generating this understanding. The comparatively low cost of synthetic experimentation and the scalability that is provided the digital replication of physical assets means that force wide effects can be verified, measured and quantified. The flexibility of working within synthetic experimentation environments means that new capabilities can easily be introduced into the scenario allowing for a progressively developing understanding to be created.

Live experimentation

Useful though synthetic experimentation is, there is a tangibility to live experimentation that brings a quality all of its own. Working with capabilities in the physical environment, where people and platforms are subject to the stresses and strains of operating in arduous conditions provides an understanding that synthetic environments cannot replicate. Live experimentation also comes with a significant cost meaning that scope and required outputs of experimentation must be tightly defined in advance. However, the value that can be gained by putting concept systems through their paces in the most realistic environment possible is immense.

The other great benefit of live experimentation is that it provides a valuable set piece interaction for education and advocacy. Being able to feel and see capability in action is the most powerful way to convince the wider community that RAS technology is real and that the benefits it can offer are achievable not just in the future, but in the near-term.

Validation of concepts and influence of requirements

Creating a common awareness and understanding of how Land currently operates in areas where there are capability gaps will allow both the customer and supplier to gain an appreciation of what needs to be improved. From there, new systems can be created to specifically address the short-comings identified. The use of both synthetic and physical experimentation creates an ideal means to provide a baseline level of existing performance data against which the value of any collaboratively designed concept system can be validated. Putting it in the hands of the user is still the ultimate way to comprehend what it is capable of and what it is not. This ongoing cycle of experimentation can then directly influence future concepts of operations and identify the pan-DL0D implications of introducing disruptive capability. In turn, this provides an accelerated capacity to progressively introduce RAS capability on a selective and targeted basis.

Moving towards the future

Whilst the rest of the developed world will unquestionably forge ahead with the integration of RAS into everyday life, it is not pre-ordained that the same will happen within defence and most certainly not within the Land domain. The smartphone device that you most likely have close to hand contains vastly more sophisticated technology than any Land Tactical CIS. The local situational awareness your car is capable of is likely decades ahead of that found in the average military vehicle. Even without this technology, Land forces are still capable of achieving extraordinary things – as witnessed on operations over the last 20 years. But that does not mean that the advantages our technology once enjoyed will endure. Adversaries are pursuing RAS at pace and the future operating environments that Land must contend with will undoubtedly require a technological edge that our in-service equipment is unlikely to provide.



RAS therefore is unquestionably worthy of further exploration and development. By adhering to those principles of balancing ambition and pragmatism, collaborating in all we do and by experimenting to understand, the Land community can look to the future with confidence and optimism.



