

# The future<sup>of</sup> unmanned vehicles

Unmanned vehicles are a relatively young defence discipline, but now they are beginning to hit their stride. QinetiQ CEO **Leo Quinn** and strategic business director **Fiona Lewinton** give Mark Brierley their views on how this rapidly evolving market is shaping up.

The lightweight Zephyr UAV flew for over two weeks in 2010 – an endurance record.



**A**n increasingly frequent sight in theatre, the unmanned vehicle has become an indispensable tool of the modern warfighter. QinetiQ's extensive experience in this discipline has led it to develop a number of sophisticated unmanned vehicle capabilities.

Probably the most widely deployed is the Talon robot, which has been serving on the front line for over a decade. A small tracked robot, it can be used for a number of different missions, but is most widely used in explosive ordnance and IED disposal, with thousands currently at work around the world.

The other is the Zephyr UAV. A lightweight solar-powered demonstrator designed for reconnaissance missions, it flew for over two weeks in 2010, an endurance world record.

Aside from developing these platforms, most of QinetiQ's experience comes from providing

## Fiona Lewinton

Fiona Lewinton is responsible for the development of new cross-cutting capabilities within the technical and information services (TIS) sector in QinetiQ. Her primary focus is on the strategy for UAV and airborne surveillance development.



## Leo Quinn

Leo Quinn was appointed CEO at QinetiQ in 2009. He was formerly group chief executive of De La Rue, where he led the company's transformation into a focused, market-leading security printer, serving governments and central banks.



unmanned vehicle testing, evaluation and consultancy services to the UK Ministry of Defence (MoD) and US Department of Defense.

"About 45% of our total revenue comes from the UK, and about 80% of that comes from the MoD," explains CEO Leo Quinn. "We run and maintain a lot of the MoD's capabilities, such as ranges for the testing of submarines, UAVs or missiles. If the MoD wants to

know if something will work, they will ask us for an answer."

## Growing pains

Despite such expertise, the unmanned market is a relatively young one, and there are still a number of challenges to overcome. "In terms of the market being young, that is definitely true," agrees Fiona Lewinton, strategic business director, technical information services.

“We are looking at a market with a lot of potential and nobody is quite sure how we are going to go from here to the next stage quite yet.”

Arguably the biggest of these challenges is the current financial climate. As governments fight a war of attrition with the economy, defence procurement is under strict control as a means of reducing spending. This in turn hits the defence industry’s ability to fund its R&D programmes.

“Over the past few years, the science and technology budget has gone down,” explains Quinn. “Last year, we lost about 1,000 people because the budget was no longer there to continue to fund their efforts. If you want to take your research to prototype, there’s a cost to it. Then if you want to take that to a commercial product, there’s another, bigger cost to it. You can’t afford that process for all of those [research projects], but you can afford to do it with some of them. So you’ve got to work out which ones you want to invest in.”

This issue is not just confined to research into unmanned vehicles, but applies to the whole industry. In terms of specific challenges facing unmanned systems, one of the most enduring is the issue of separation of airspace; or, more specifically, getting UAVs to the stage where they can safely operate in the same theatre as manned aircraft.

“I don’t see that changing anytime soon” confirms Lewinton. “But if you look forward 20 or 30 years, it will have

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been overcome. There’s an inherent conservatism in that sort of environment, because there has to be; each technology has to be proved safe before you can deploy it.”

QinetiQ tests UAVs at its range in Aberporth, Wales. “We use Aberporth because we can fly over the sea,” says Lewinton. “There’s a lot we can do there to gain confidence in procedures.”

Thanks to this type of testing, UAVs and UGVs have reached a stage where they are now routinely used in theatre,



The Talon small tracked robot is widely used in explosive ordnance and IED disposal.

giving the military extra capabilities in reconnaissance and offensive missions. This gives the warfighter an extra dimension of intel, which needs to be delivered in a timely fashion in order to advance the mission. “The warfighter’s competitive advantage is effective technology,” explains Quinn. Lewinton agrees: “If unmanned technologies don’t change or inform decisions, they haven’t delivered a capability,” she says.

The danger of data deluge is something the industry must work hard to avoid. “Trying to distil useful, timely intelligence involves a great deal of work,” says Lewinton. “To try and get from a huge amount of data to actionable intelligence is an enduring requirement, and a more challenging thing than many people sometimes assume.”

### Endless possibilities

Still, despite these hurdles, the potential of unmanned vehicles goes far beyond the missions they are tasked with today. For example, the extra information they provide can be put to good use elsewhere in the military machine. “If you’re trying to get a remote view on something, there is something to be said for getting a bird’s eye view [using UAVs], and ground vehicles can provide a different view again,” explains Lewinton.

“From this, it’s not hard to knock up a virtual world so you can practise in a synthetic environment before going into the real operation” adds Quinn. Certainly, the ability to train in synthetic environments is something that can save time on the operation, save money when compared with traditional training techniques, and ultimately save lives. This type of simulator training is something QinetiQ is developing as means of making smaller defence budgets go further.

Improving the autonomy of unmanned systems will also make warfighting more cost-effective, thereby freeing up soldiers to perform other tasks. “If you’ve got a UAV taking pictures for quite a long time, do you really need someone with a joystick guiding it along?” says Lewinton. “The whole emphasis is very much on the level of autonomy.”

It’s not just UAVs proper that can benefit from this kind of automation; micro UAVs and UGVs are also ripe for development. “We have done some research on how you would fly micro UAVs as swarms, or flocks, with fewer operators” says Lewinton. “In QinetiQ North America, we were looking at collaboration between aerial and ground unmanned vehicles. Can you manage them as a single entity?”

By automating or at least increasing the level of autonomy of these kinds of operations, soldiers are freed up to do the sorts of tasks that make much better use of human skills. “Somebody is always going to want to look at the pictures, that is something that is very difficult to automate,” says Lewinton. ■