

Seeing **Eye to Eye**

Part 61 pilot and commercial drone operator John Bampfyld fears there's a chasm in the understanding of the rules between traditional pilots and drone operators. He offers some tips for avoiding catastrophe.

All pilots enjoy the view from the cockpit and effortlessly covering distances. And most enjoy the speed, which seems greater when closer to the scenery.

We've all had those flights over mountain ranges – as the destination gets closer, you start the descent, and time it so the last ridge passes close by underneath, with the airfield in the distance on the plain ahead.

You're not worried about an engine failure because the ground's dropping away and it's flat for miles ahead. You get that little thrill of speed as the ridge top whizzes past and you can pride yourself on flying an efficient descent profile. That's being an economical pilot and a cool one, too.

Having done this and a few worse things besides, with experience ranging from hang gliding through to plane ownership, I think the relatively small changes in aviation I've seen over 35 years are about to be eclipsed by a very big change – drones.

I know, I know, you've heard it all before about drones but bear with me. This affects anyone who flies machines in uncontrolled airspace.

I run DroneMate, a company with a Part 102 certificate. Mostly, we do unglamorous surveying work, and while it's 'flying', it's not as Part 61 pilots know it.

The thing goes where you tell it to. When you stop telling it, it hovers. Then it waits until the battery reaches a set percentage and it flies itself back to its take-off spot and lands.

With most survey work, you programme in the survey area on your iPhone®, the software plots a flight grid over the area, you press the green 'start' icon and off the drone goes, coming back when it's done. No manual intervention required, usually.

3D model of cleared forest from 983 UAV images, accurate to a few centimetres in any dimension.

"There may be 1 kg bricks wandering about the sky quite close to the ground. Following a few simple rules will dramatically lower your risk of becoming entangled with them."

As you'd imagine from this, drones appeal to a different audience from pilots – generally people not versed in flying custom and practice.

That makes drones unpredictable to Part 61 pilots and planes unpredictable to drone operators.

A short time ago, we were surveying a steep, tree-covered ridge. Our team of three (operator, assistant, spotter with radio) had filed a NOTAM and were operating slightly below the height of the ridge line and up to 750 ft AGL, with the drone flying a zigzag pattern over the hillside.

Having just completed a survey, and with the drone back on the ground, a Cessna shot over the ridge above us and below where the drone had been five minutes before. It disappeared in a second or two, but it had that 'I'm going fast because I can spot the airfield in the distance and isn't flying fun!' look to it. I know that feeling.

Drones are changing the risk profile of general aviation and both sides need to understand the other's perspectives. Drones are spectacularly useful and are going to be everywhere soon but let's keep it real. All that talk about pizza delivery and Amazon drones may happen, but don't hold your breath.

Let's talk about now.

Drones are transforming surveying. At 600 ft AGL and with a 20MP camera, a decent drone can survey an area of 75 hectares in 20 minutes (one battery). If done well, the survey will become a map accurate to centimetres over heights and distances, with ground resolution below 5 cm. Contours, slope angles, surface areas, volumetric calculations, plant analysis, plant counting, erosion, run off – all from a quick survey.

What would take a surveyor a day or so to do can be done more accurately and more safely in perhaps less than an hour. Surveys are now regularly carried out on farms, roads, rivers, construction sites, quarries, mines, and over towns.

When we say a 'decent' drone, we mean a standard 'out of the box' drone like a DJI Phantom 4. This has a 20MP camera, is the size of a shoebox but less visible in the air than a shoebox, weighs less than 1.5 kg and, at its heart, has a dense, brick sized, 1 kg battery.

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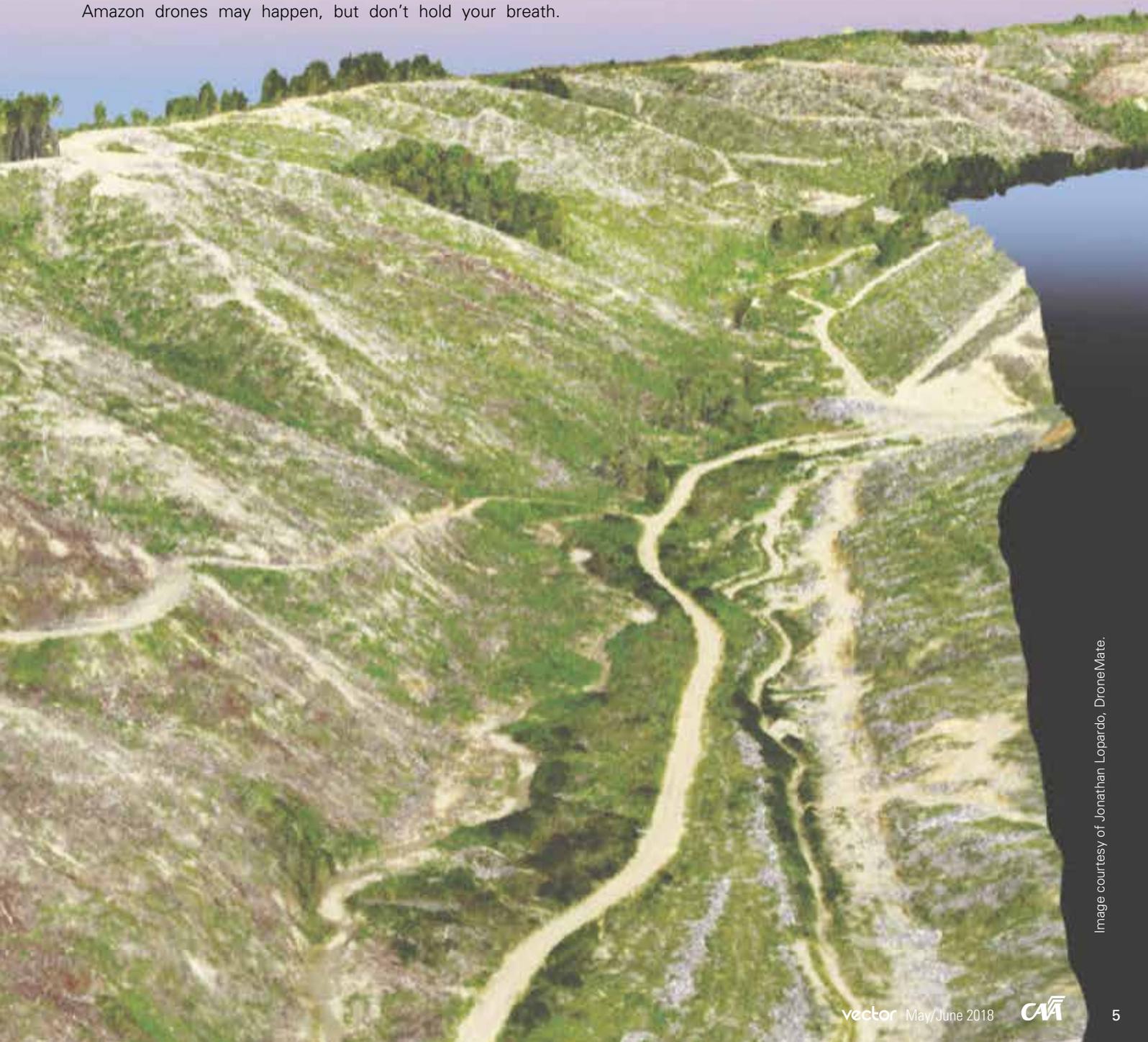


Image courtesy of Jonathan Lopardo, DroneMate.

Hitting it would not be like hitting a seagull, not even slightly. And it can easily – although illegally – be 5 km away from the operator and at 5000 ft.

In the pile of drone regulations, three loom over the rest. Thou shalt not (a) fly beyond line of sight, (b) fly over property where consent has not been granted, and (c) fly above 400 ft AGL.

General aviation is unfamiliar with the idea of (a) or (b). And many of us Part 61s observe the 500 ft AGL rule as a sort of ‘area average’, rather than the actual height above the ridge we’re flying over.

Compare that with a drone operator’s interpretation. Standing at the very top of that same ridge, 120 m (400 ft) above them is their ceiling. And they will go there to get the best pictures.

There is, therefore, very little commonality of understanding between pilots and drone operators of the previously mentioned ‘Big 3’ drone rules. And that’s not even considering the idiots who don’t follow the rules at all.

Returning to our Cessna. Our top gun, ‘Maverick’, perhaps with their mate, ‘Goose’, in their low-flying, tree-skimming C152 appearing from the other side of the ridge won’t give the drone operator or spotters a chance to do much.

The options – assuming there’s time for options – are to (1) hover the drone and hope Maverick will see and avoid, or (2) head for the ground. The far quickest way to do that is an emergency cut-off that stops the motors.

Aside from destroying a drone and anyone standing below, damaged batteries can burn like a blowtorch, igniting whatever’s next to them. Maverick’s beat-up could cause a very big forest burn-up without him or Goose ever knowing.

Don’t rely on the drone spotting you. The drone’s camera has a lowish resolution live feed to the handset display that may be a small mobile phone screen. The camera has a narrow field of view and, if surveying, is pointing downwards anyway.

That Cessna was not our first incident that day. At the start of business, a nice looking Cessna taildragger crossed the valley a few hundred feet above the ridgeline and to one side of us. I guess they just hadn’t seen our NOTAM.

This sort of incident is pretty regular. A couple of months before, we were carrying out a forest survey below 400 ft AGL – and it was therefore not NOTAMed. At the end of its spray run on the neighbouring paddock, a helicopter suddenly shot 100 ft overhead the drone operator.

Now, rule 101.213 requires drone operators to remain clear of all manned aircraft, and they also need to consider whether

agricultural operations are likely in the area. That should be part of their normal safety assessment and risk management.

So ideally, the helicopter operator and us should have been able to discuss that we were both going to be there.

But you don’t know what you don’t know, and it’s a good example of how manned aircraft and drone operators have to keep a constant lookout.

I believe that if the current gulf of understanding remains between GA pilot custom and practice, and drone operators, there will be major incidents.

So here are our top tips for not getting to know a drone too well.

Firstly, a 500 ft AGL lower limit really should mean 500 ft AGL directly below you at every second. If flying over valleys and ridges, make it 500 ft above the ridge tops, not the valleys. That will keep you clear of the vast majority of drones, including those surveying forests.

Secondly, look out for the words “Remotely Piloted...” in NOTAMs and check if the activity is on your route. That will keep you clear of the commercial drones above 500 ft AGL. (Before every Part 102 operation our operators log into the IFIS mobile app and check that our NOTAM is there, under “Warnings”.)

Thirdly, if you see something going on involving diggers, machinery or earthworks, think very seriously about not overflying it below 1000 ft AGL.

Earthworks are a big drone magnet. Did you know a lot of open cut mines in Australia now have a drone in the air most of the time? This trend will only increase. Survey drones generally don’t go much above 800 ft AGL and, even if you missed the NOTAM, do yourself a favour by being high and to one side of the digging.

Drones and light aircraft are going to have to co-exist and the current rules do a decent job of ensuring they shouldn’t meet in the air.

It’s the different cultures, levels of training, and customs of the two groups that lead to ‘soft’ interpretations of the rules that create most of the risk.

One day soon there may be pizzas and other paraphernalia being shipped around the skies and the whole issue of regulation will need a huge rethink.

But take heart. The spectacular rate of drone technological development is more than likely, I believe, to solve the potential airspace issues that will arise.

In the meantime, spare a thought that there may be 1 kg bricks wandering about the sky quite close to the ground. Following a few simple rules will dramatically lower your risk of becoming entangled with them. ■

