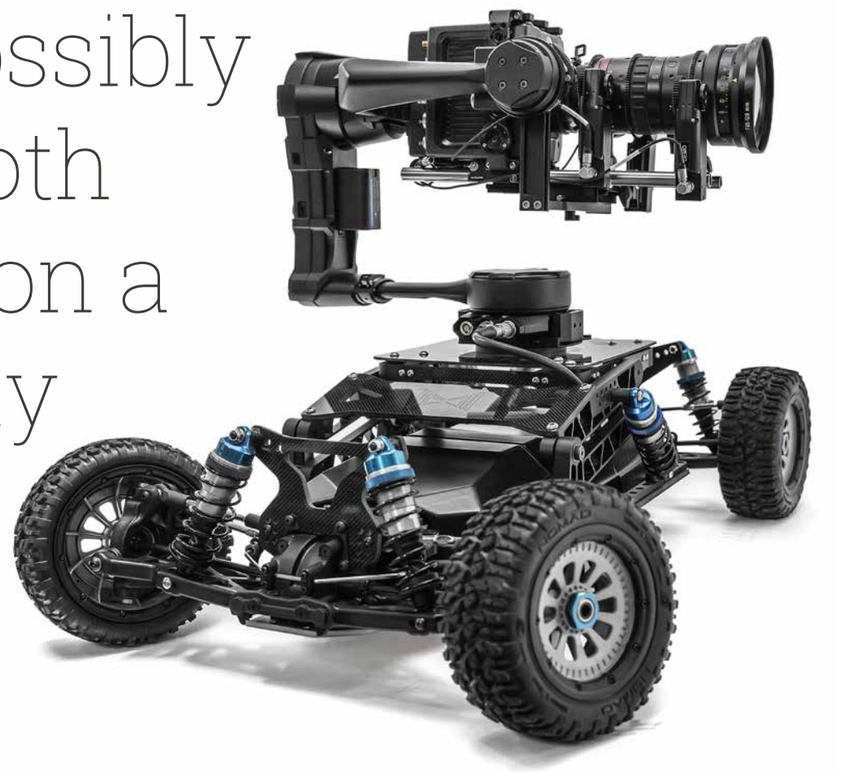
Making impossibly smooth motion a reality



Through their company Motion Impossible, wildlife cameraman **Rob Drewett** and radio control enthusiast and design engineer Andy Nancollis are developing new and innovative ways to move cameras for film, television and virtual reality (VR). The company has already developed the MANTIS, a unique remote stabilised dolly system with no need for tracks, which can work in all sorts of difficult filming situations, in particular for wildlife and VR work. Also recently announced is the AGITO, which allows recordable moves. The arrival of the AGITO was immediately lauded with a Technical Award at this year's Cine Gear. Zerb guest editor Hazel Palmer talked to Rob about the exciting journey of this young company which is making tracks in the camera stabilisation market.

From tree surgeon to wildlife cameraman

Rob Drewett's journey into the world of camera movement innovation began 15 years ago through his passion for wildlife filming and photography, and a desire to work on classic BBC natural history series such as *Blue Planet* and *Planet Earth*.

Rob initially worked as a tree surgeon until, capitalising on his hobbies of travel and scuba-diving, he gradually began to pick up work as an underwater cameraman, as well as making his own documentaries. With no academic qualifications in zoology or biology, but plenty of freelance wildlife filming experience and a great deal of tenacity, Rob managed to secure a BBC NHU bursary, his golden ticket to working on the major David Attenborough shows.

Rob then honed his craft working with the best on an array of BBC wildlife shows, filming capuchin monkeys for *Planet Primate*, tiger sharks and albatrosses for *Life Story,* chipmunks for *Hidden Kingdoms* and locusts for *Planet Earth II.*

The BBC bursary also exposed Rob to the world of camera movement technology and he was soon enthusiastically embracing any work involving stabilisation, gimbals, steadicam, time-slice, and so on. Admitting that he is not someone with the patience to sit in a hide for days, his time was instead spent pushing innovation in camera movement, working out how to set up sliders, ropes and pulleys, to move the camera through a scene, and he notes: "I like it when people go: 'How the hell did you do that?'"

One of his first proper credits was for a sequence showing a rock python giving birth. As this all happens underground, Rob built a set at a snake sanctuary in Uganda and lit it to match the location footage. Using a motorised slider and a miniature camera on an arm, he managed to film the pythons coming down through the middle of a log with the camera right in front of them.

Moving to specialise in stabilisation

When technology progressed still further with motors and stabilisers, Rob was first on the scene. Freefly brought their first MōVI prototypes to the BBC and Rob quickly took to the rig, using it to capture an array of amazing sequences for the series *Wonders of the Monsoon*. Rob explains: "When I was an underwater cameraman I just loved the freedom of being able to move the camera wherever I wanted to – but I ended up having bad ears and couldn't dive any more, so I really wanted to bring that fluid motion to filming on land."

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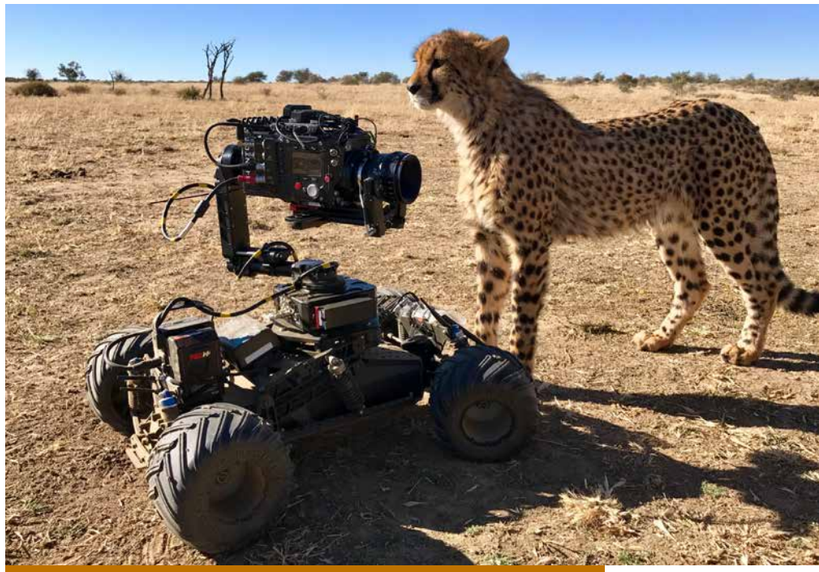
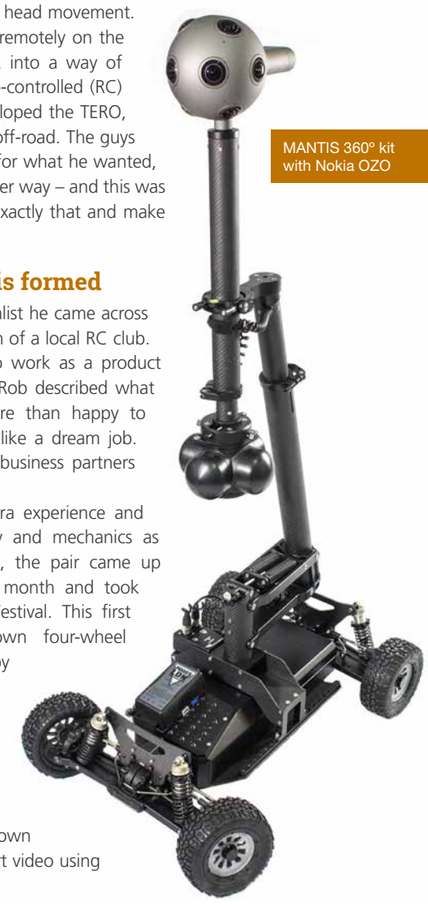
MANTIS filming in the Nambia desert



MANTIS freestlye filming cheetah in Namibia

Having found his specialism of choice, Rob became freelance and set himself up as 'the MōVI man'. He would use it on sliders and zip lines and any way he could to get that stabilised camera head movement. With a view to using MōVI remotely on the ground, Rob began to look into a way of mounting the rig on a radio-controlled (RC) car. Freefly had already developed the TERO, but this couldn't cope with off-road. The guys at Freefly advised Rob that, for what he wanted, he'd have to work out another way – and this was the impetus for him to do exactly that and make his own.

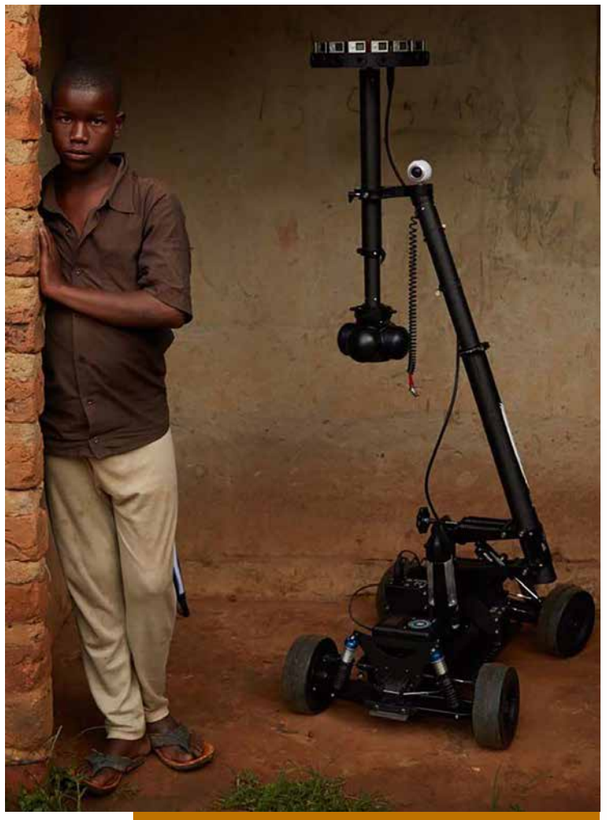


MANTIS 360º kit with Nokia OZO

Motion Impossible is formed

Looking for an RC car specialist he came across Andy Nancollis, the chairman of a local RC club. Andy also just happened to work as a product design engineer and when Rob described what he wanted, Andy was more than happy to join him on what sounded like a dream job. The two of them are now business partners running Motion Impossible.

With Rob's moving camera experience and Andy's grasp of technology and mechanics as well as CAD drawing skills, the pair came up with a prototype within a month and took it to the Wildscreen Film Festival. This first model was a stripped-down four-wheel drive vehicle from the hobby world. They pared this right back to the chassis and transmission, changed all the suspension to make it more stable and better suited to carrying weight, and then rebuilt it with their own parts. They also made a short video using



MANTIS 360º in Uganda with Google Jump

> Everything we're doing right now is about noise reduction because the biggest thing as regards motion sickness with VR is the noise syncing to your eyes. It's crucial to capture the sound you can hear while you're moving through space.

the vehicle to film a peregrine falcon with a lure attached to the camera. People loved the idea and were soon asking to buy it.

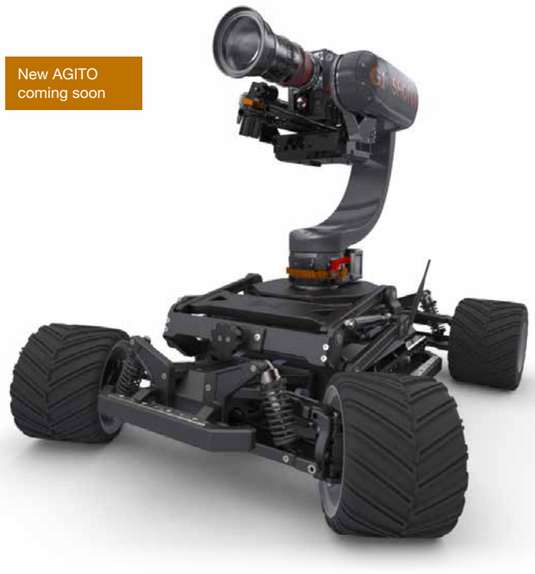
That sent Rob and Andy into working out production and manufacture of their own product from scratch, adapting and adding articulation to get the camera higher off the ground. Later that year, armed with their new MANTIS, they broke into IBC and drove it around the show to get attention. After being kicked out by security they were invited back in because several companies had immediately spotted the potential for filming VR. As such, they became the first ever to move VR cameras, something previously considered impossible due to the motion sickness it could cause. Rob comments: "If you go straight, and very steady, and it's stable, and the sound for your ears is synced to what your eyes are seeing, it doesn't make you feel sick; that's the key." As the fixed position of this early design caused some vibration, Rob and Andy then designed the V-CON, a low-level vertical axis stabiliser, and V-CON XL for high-level stabilisation, both of which fit neatly onto the MANTIS.

It took a long time for people to stop thinking the MANTIS was just an RC car, but Rob recalls: "We never lied – we never said we made it from the ground up, but now we have, so that's pretty nice for us – the latest product is completely ours."

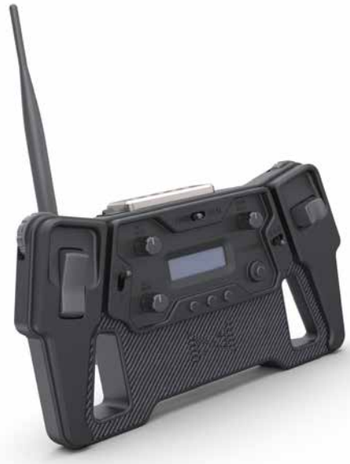
Made in Britain (mostly)

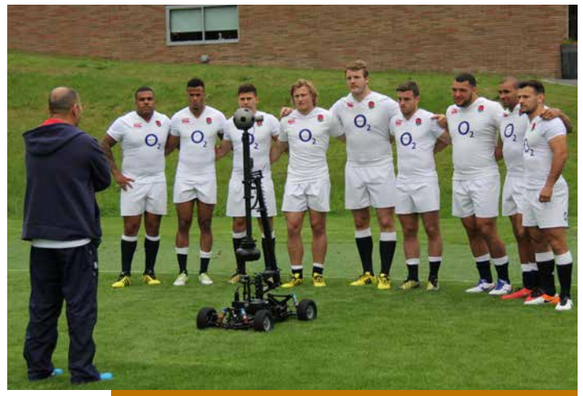
Rob and Andy pay a lot of attention to detail and quality in their production. They use a combination of aluminium and carbon fibre for robustness and weight reduction, and although some of the components come from specialist suppliers around the world, the products are very much British-made, with everything manufactured and distributed from their unit near Bristol.

New AGITO coming soon



New 'MASTER' controller





O2 VR shoot with England rugby team

The vehicles are all four-wheel drive and designed to minimise noise. "It's all about quietness. Some noise is unavoidable, but we're working on this. Everything we're doing right now is about noise reduction because the biggest thing as regards motion sickness with VR is the noise syncing to your eyes. It's crucial to capture the sound you can hear while you're moving through space."

Motion Impossible announced the MANTIS officially at NAB last year and it's been selling really well worldwide, proving to be an essential tool for filming VR and 360 video, not to mention its wildlife applications. What started with just Rob and Andy in a shed now has a team of 15 people with new products coming out and another office in Bristol Robotics Lab where all their R&D is done.

With virtual reality, augmented reality and mixed reality already very much here, and 'volumetric capture' coming to VR in the future, there is strong demand for a remote dolly system that reduces the amount of people, track and everything else around it that make production and post-production so lengthy. Motion Impossible has designed a gyro-stabilised system, which sits below the 360 camera and fits within the footprint of the vehicle (see more detail at www.motion-impossible.com/products).

And, although the MANTIS has already found a niche in the VR market, Rob and Andy have also been keen to develop models suitable for broadcast. The latest, AGITO, is a remote dolly system that can do recordable moves on the ground and has interchangeable wheels for use either on track or off-road with all the stabilisation you need. The AGITO will offer even more options than the MANTIS, including the 'MASTER' controller which adds a more robust radio link with the option to work with licence band and a new and improved user interface.

Multiple applications

There has been interest from the feature film world, with tests for Otto Bathurst's *Robin Hood*. In sport, the NFL has started testing the system and the MANTIS was recently used to film live major-league baseball, scooting onto the pitch in between play to get a different stadium perspective. "We've been getting a lot of good feedback. People want something that's easy to just throw on track or on the ground to do repeatable moves, to move a camera or stabilise without risking people's lives or needing too much time to set up; this is what the new AGITO is all about." And there may be even wider applications in the future too, as Rob suggests: "This is not just a tool for filmmaking. We're basically making a stabilisation system that will enable anything to be attached and moved around, so it could have applications in other industries too."

In the mean time, Rob has recently enjoyed getting back to nature and putting the product to use out in the field, filming cheetahs in Namibia for National Geographic. We look forward to seeing the results.

Fact File

See more about the Motion Impossible range of products: www.motion-impossible.com/products

See more about Rob Drewett's camerawork: www.robthecameraman.co.uk

Check out Motion impossible at IBC Hall 10 Stand C49