As a wildlife documentary cinematographer, DoP, producer and triple GTC Award winner (*Wye: Voices from the Valley*, 2007; *Africa: Congo*, 2014; *The Hunt*, 2016), **Jamie McPherson** specialises in tracking vehicle camerawork, using gimbals mounted on vehicles to create dynamic sequences of animal behaviour with style and movement. This expertise, along with Jamie's innovative approach to problem-solving, enabled the ground-breaking (and almost kit-breaking) coverage of the never before seen night-time activities of two highly documented predators in Kenya's Maasai Mara, for Netflix's breathtaking series *Night on Earth*.

Orchestrated manoeuvres in the dark

When producer Peter Fison phoned me to ask if I wanted to film lions and cheetahs for his *Moonlit Plains* episode of *Night on Earth*, to be honest I wasn't really that interested. Not to say they're not incredible creatures, they are, but I have filmed them a lot – and I mean A LOT – and people always go for the same stories, and often the same individuals too. The clue on this one though was in the 'Moonlit' part of the title. Peter explained the scope of the series to me: how Netflix was backing Plimsoll Productions to try to do something no one had ever done before; that he wanted me to film cheetahs and lions in complete darkness; that it was going to be a huge technical challenge; that it would be dangerous; that we might not all make it back alive… OK, I might have made the last bit up – I was in!

I'd done a fair bit of filming at night in my time, but it had all been static, using either infrared-sensitive cameras and infrared lights, cameras with image intensifiers, or ancient thermal imaging cameras. They were all, in their own way, horrible to use and created images more akin to an etch-a-sketch than anything you'd want to watch on a 4K TV. So, I loved the idea of trying to combine my skills shooting from tracking vehicles with filming at night using the latest tech.

Curiosity of cats' kills

While daylight scenes of these two big cat species hunting are very familiar to all, it was *Night on Earth*'s remit to explore their lesser known nocturnal activities. As lions ambush their prey, exploiting foliage and terrain to conceal their approach in the day, so they favour complete darkness at night to facilitate kills by stealth. This means that the dark phase of the moon is the time to film their hunting.

Cheetahs, on the other hand, are visual predators and use their immense speed to take down their targets, most often doing so during the hottest part of the day. One theory is that, by hunting whilst larger predators such as lions and hyenas are inactive due to the heat, cheetahs are less likely to be chased from and lose their hard-earned kills. The research work of Dr Femke Broekhuis of the Mara Cheetah Project had proved that cheetahs were also active at night. Her GPS collar studies had revealed that they often travel great distances during the full moon, and it was her theory that they would also hunt during this time – which we hoped to help her prove.

Dream team (dress code: flexible)

Peter had been doing his homework on kit and had also put together a crack team: himself (super-talented producer/director and owner of no warm clothing – he ended up wearing dressing gowns from the lodge at night to keep warm); Louis Labrom (Shotover technician, second camera and behind-the-scenes camera operator – Louis is more than qualified to be shooting long lens work himself but, like me, was up for the challenge of working together to do something new); Bazil and Sammy (legendary safari drivers out in Kenya – between them they have more experience of driving for film crews than anyone else on the planet and they can spot an animal from so far away they could

NETFLIX

Out of the shadows: the incredible low light sensitivity of the cameras enabled Jamie to capture stunning images that brought night to life

work for NASA's Deep Space Programme just by looking up; and, it also turns out, they can drive in complete darkness without any accidents… almost!). Oh, and then me: camera monkey, mostly drinking tea and playing what appears to be PlayStation all night in the back of the filming vehicle whilst not wearing any shoes (my mum says this has been a constant battle since childhood that she has clearly lost).

The cat, Shotover, the moon

We decided on a Shotover F1 as our gyrostabilised platform of choice as it's big enough to take the cameras we planned to use and it's rock solid when travelling, even over the roughest terrain. For those who aren't familiar with this system, it's basically a fancy carbon fibre ball gimbal in which you place a camera and lens. It was primarily designed to be mounted on a helicopter but we attached it to a 4x4 and drove it around. The tracking images generated are as stable as if the camera were on rails, even when the ground is rough enough to rattle the teeth out of your head. Using car batteries to power the unit and cameras, we rigged the Shotover to our 4x4 using a Chapman Leonard vertical isolator with a few bits of scaffolding and a liberal application of gaffer tape.

> "During the day, lions are pretty inactive, in fact I'd go as far as to say boring… but at night, they are completely different beasts… the scenes we captured of them hunting wildebeest are some of the most dynamic and exciting scenes I've ever filmed.

Night for day

After the relatively easy decision on how to follow the cats smoothly, the best way to actually *see* them on camera in the pitch black was next on the agenda. It was clear that the two distinct challenges for the *Moonlit Plains* episode (filming cheetahs hunting under the full moon and lions hunting on moonless nights), would each need its own solution. For the cheetahs, we would require a camera that was sensitive enough for the very low levels of light you get reflected off the moon. The Sony a7s II was decided upon, not just because it is capable of delivering great results even at a ridiculous 80,000 ISO but also, by removing its internal IR filter, we were able to gain 1.5 stops of sensitivity. It's one thing having a useable picture at such a high ISO, but what is really impressive is the range and quality of the colour information the camera can gather under those conditions.

Even so, we would still need faster lenses than those used for brighter conditions, so we chose a selection of fast Canon primes and zooms; but this speed came at the cost of focal length, as we were very limited at the telephoto end. I think the longest we could use was a 200mm, the reach of which

The Shotover and Chapman Leonard vertical isolator car rig ready for Jamie to capture another night of big cats hunting

is clearly far short of the go-to wildlife standard Canon 50–1000mm. As a result, we would have to get close and stay close to the cheetahs as they chased down their prey with only a hint of ambient light. Now, I'm not sure if you've heard this, but cheetahs are really quite fast, so this was going to be great fun!

The magic of Merlin

When it came to filming the lions, their method is to exploit complete darkness: no moon at all, pitch black. There is no camera out there that can capture images using only available light during this phase of the moon, so we opted for a thermal imaging camera. Detecting the heat emitted by the animals and the surrounding landscape, the Leonardo SLX Merlin turned out to be an incredible camera. It's HD and, although it can provide a colour image, this doesn't look anywhere near as awesome as its black and white output, so we went with that.

As Netflix is very hot on the tech specs for both acquisition and delivery, series producer Bill Markham and his team at Plimsoll undertook numerous camera tests both before and after the series was commissioned. Thankfully, Netflix was very understanding of the specific demands of this project and gave us special permission to use cameras that are not on the usual approved list.

The focal length range of the SLX's lens is roughly equivalent to 50–800mm, but the lens has no f-stop; being thermal, the camera only reacts to heat. It is truly incredible, capable of detecting the most minute temperature differentials and so sensitive that it can pick out the pupil in a lion's eye. To obtain a dynamic range, you 'expose' a shot against the landscape and it calibrates itself to the characteristics of that image, a bit like using auto iris on a 'normal' camera. Therefore, you want your lineup frame to include within it a range of temperatures because if, say, you fill your frame with just the cool ground, then the animals' body heat will be dramatically higher, resulting in their being 'blown out', just like an overexposed daylight image; likewise, lining up with only an animal in shot

The car-mounted Shotover F1 gimbal allows immersive action footage – on the move, at lion eye level

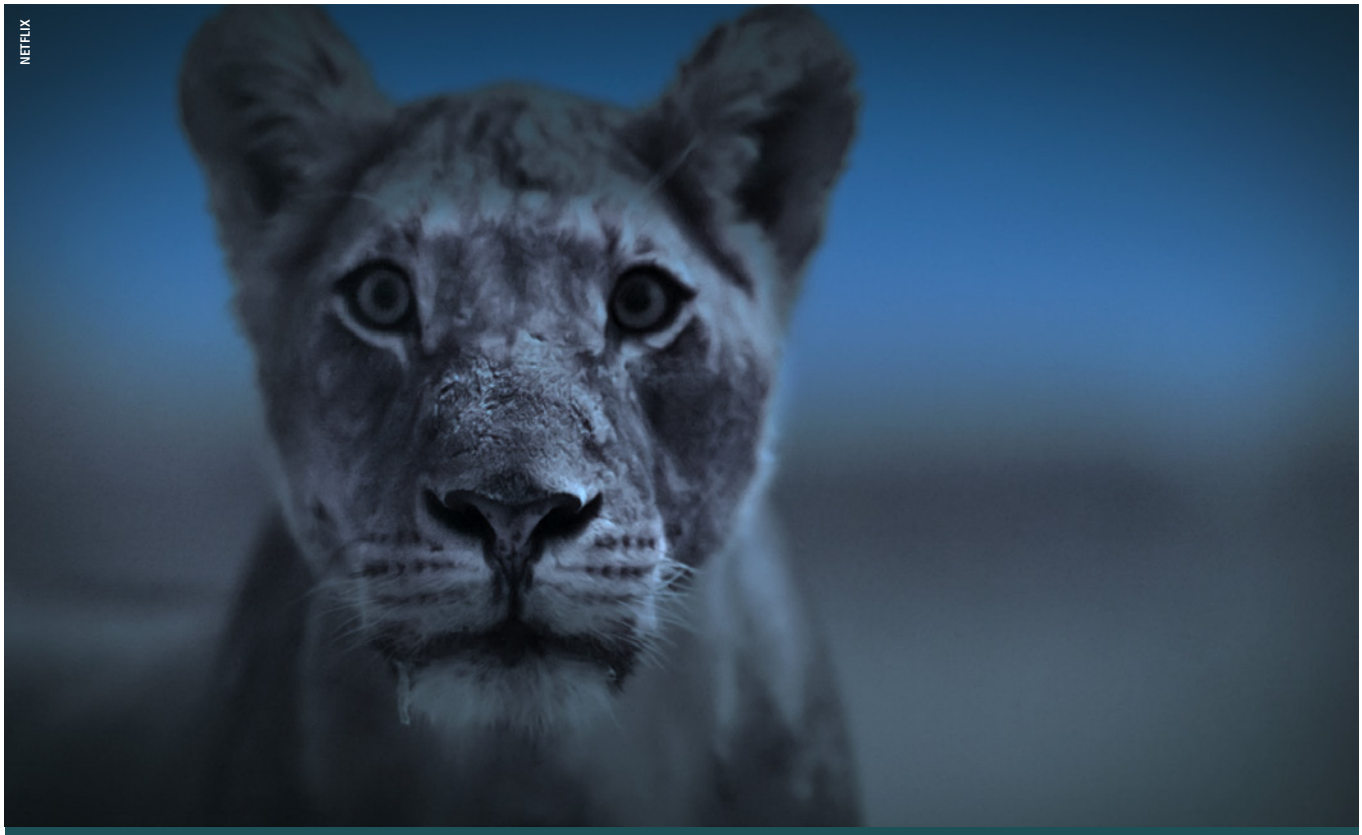
will result in the ground being 'underexposed'. It's a bit of a black art finding just the right frame that will allow calibration of the images with enough temperature latitude, made all the more tricky because we had to be in close and also predict where the lions would be before they got there as it was impossible to see anything with the naked eye.

On top of that, the camera control interface is the touchscreen of a tablet via an app, with which focus, zoom and temperature range (equivalent of the iris) are all adjusted by poking at the screen in the dark. Focusing is a fairly haphazard affair of pressing a vague button on the tablet that makes the focus jump a bit closer or further away, so let's just say that pulling focus on a running lion was incredibly difficult – it was more like using 'The Force', Jedi-like, than actually focusing! This was on top of operating the Shotover with its own controller (which is basically a joystick for pan and tilt) and the focus and iris knobs for the camera… but in this case, I balanced the tablet on the controller and operated the pan and tilt with my right hand and the SLX with my left. Great fun!

Moonshine: cheetahs wax on, lions wane off

We set up camp in the Mara and, over the 6-week shoot, we split our time between filming the cheetahs during the full moon (we had enough light to film 4 nights either side of the full moon) and then, as the moon shrank, we'd move over to the lions for a few weeks before coming back to the cheetahs for

Under the stars: a coalition of male cheetahs roam the Mara plains in search of a moonlit meal



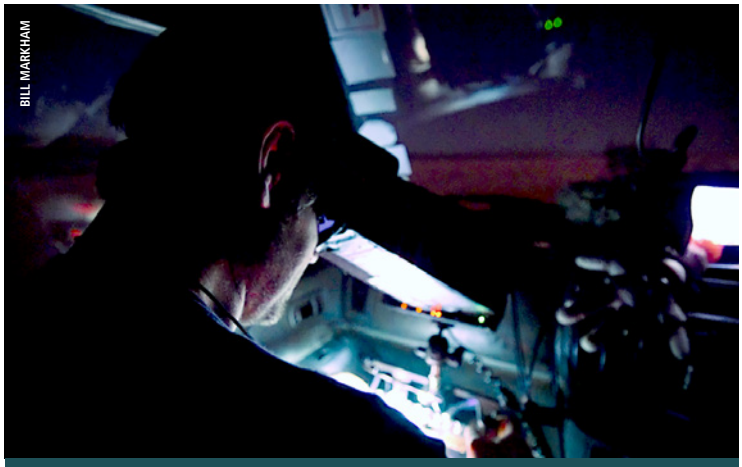
Lion eyes: lions' eyesight is six times better in the dark than that of humans, and about the same as an a7s II, which could capture some stunning shots before the pitch black of moonless nights set in

the following full moon stint, after which we all headed home.

The daily routine involved attempting to get some sleep during the day, often with Louis fixing any issues from the night before and prepping the kit with the correct camera and lens for the next night, and Peter stealing as many dressing gowns as he could find in our accommodation. With a few flasks of tea, the illicit stash of the lodge's luxury robes and two of the best drivers in the world up front, we'd head out early each evening to find the cats, so that we could be ready by the time the sun went down. It was incredible to think of what we were about to witness: cheetahs sprinting at over 60mph with just the light of the moon to guide them and lions running around and jumping on wildebeest in complete darkness. These were going to be very exciting behaviours to try to capture.

The chase is on

For the cheetahs, this was relatively straightforward as we were working under the full moon and so could pretty much make things out with the naked eye.



Playing games on safari: filming in the dark bears little resemblance to regular natural history camerawork

Sammy and Bazil could somehow drive as if it was bright daylight, a combination of incredible knowledge of the area and amazing eyesight… well, apart from one night when we were following a cheetah sprinting flat out across an area of burnt ground, which had no discernible features in the dark, and managed to drive straight into a freshly dug ditch! Luckily, no one was hurt nor any of the kit damaged… amazingly, the Shotover *just* missed the ground due to the angle of the ditch, no tea was spilt and we were all fine. A bit shocked, but all OK – although we did lose the top half of our Deadpool mascot that my son Louie had given us to mount on the bonnet, but Peter managed to get a new one sent out with some kit, so we soon had our mascot back in one piece.

The key to filming cheetah hunts is being in the right place at the right time, and so teamwork was crucial not only in attempting to keep up with them, but also in trying to locate any prey they might bump into before they did, so that we could line them up and film the chase. There was a lot of squinting into the moonlit plains, trying to pick out topi or wildebeest before the cheetahs spotted them. A five-strong coalition of cheetah males hunting at night was an incredible thing to see and film. By collaborating with Femke, we were able to prove her theory correct and to capture, for the first time, behaviour that no one before (apart from her) had even thought happened, and to add to the understanding of one of the most iconic animals in the world was a real achievement.

The lion doesn't sleep tonight

Filming the lions was an even greater challenge as, without the moon, we had to use night-vision goggles to drive and night-vision scopes to spot the lions and their prey. Again, it was an incredible team effort to bring home the amazing images we did. In daylight it's all there in front of us so, if I'm locked on to my monitor and in tight following the action,

the driver or producer can be my eyes on the bigger picture and let me know what else is happening outside of my frame. It's also easier to coordinate where to place the vehicle to try and capture the stalk, run and takedown elements of a lion hunt. But at night, you are all blind, unless looking through a spotting scope (which is like in the daytime looking out of your window through a toilet roll, but with tracing paper over its end) or through night-vision goggles (which is like looking through two toilet rolls filled with green jelly). How Bazil drove in those I still don't know! OK, so the SLX camera allowed me to see in the dark, and Peter and Bazil had monitors so they could see what I was getting, which was great when I had a shot, but being at the 800mm end of the lens and trying to coordinate the image with where we were in space relative to the lions was a real test. It took some getting to grips with the communication but, once we had found our feet, we were able to follow the lions all night and consistently to put ourselves in the right positions.

Seeing is believing

It was an amazing experience to film the cats at night, especially in such a dynamic way; what was truly breathtaking was the ability to extract the extraordinary pursuits of these magnificent animals from the pitch black that surrounded us. During the day, lions are pretty inactive, in fact I'd go as far as to say boring… but at night, they are completely different beasts. They are so active and exciting to watch; they went for everything from giraffes to hippos! And the scenes we captured of them hunting wildebeest are some of the most dynamic and exciting scenes I have ever filmed.

It was an incredibly full-on six weeks and I could not be prouder of the team, working together under often incredibly difficult circumstances, with very little sleep, often no tea and only a dressing gown to keep our boss warm. Awesome fun, and I can't wait for season 2 – I'll just make sure I pack a few extra dressing gowns for Peter to layer up. In fact, I might even treat him to a fancy one – you know, with his name on the back!

Fact File

Over the past 22 years **Jamie McPherson** has worked on many landmark series and films for the BBC, Disneynature and Netflix. His other recent work can be seen in *Our Planet* (Netflix), for which he was nominated for an EMMY and a BAFTA for cinematography. He is currently Series DoP on a new Netflix series which comes out in 2023, so watch this space!

Contact Jamie:
mobile: +44 (0)7939 285442; email: jamiemcpherson@mac.com

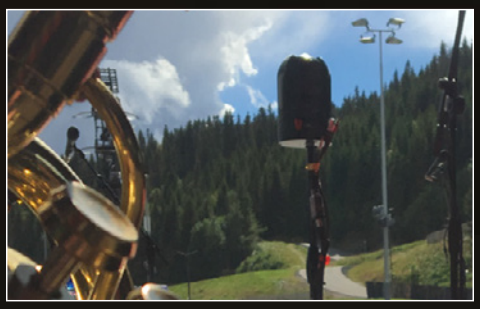
To see more of his work, visit:
website: jamiemcpherson.com; Instagram: @byjamiemcpherson

With thanks to Bill Markham at Plimsoll Productions.

agile
REMOTE CAMERAS

DISCREET REMOTE PTZ CAMERAS
for broadcast, sport, wildlife and live events

Our precision-engineered ARC360 PTZ cameras feature native IP and PoE+ connectivity, 14-bit absolute positioning and genlock option. Whether connecting to an ARC Maxi Controller, media server or RCP, clever IP integration provides confidence when investing in IP architecture.



Contact us for a coffee and demo of our cameras and controllers.

@agileremotecams

Compatible with: BLACKTRAX CyanView disguise MRMC SKAARHOJ

www.agileremotecameras.com