

More attuned to the depths of forests than the world's open spaces, wildlife photographer and author **Nick Garbutt** was frustrated by his inability to take images that he felt captured the rhythms and grandeur of Africa's sweeping plains. Then he explored the capabilities of digital image-stitching technology and has since produced some of his most enchanting work to date. He leads us through his journey of discovery.

TEXT & PHOTOGRAPHS
BY NICK GARBUTT

stitching the Serengeti

My natural habitat is tropical forest, especially rainforest, and I've spent much of my photographic career in its close confines attempting to record its oppressive feel, dark recesses and secretive creatures.

I'm usually less comfortable in open habitats, but over the years I have relished more than a dozen trips to Tanzania and the Serengeti National Park. The wide, open spaces of the plains serve up an instant feeling of freedom and the chance to gaze across great unimpeded vistas. They also intimidate me and I've grown increasingly exasperated by my inability to express this through a lens. And it wasn't simply that I couldn't adequately depict the horizon-to-horizon grandeur; I found it equally difficult to translate the numbers of animals I saw into images that conveyed the concentrations of wildlife moving through a scene. Maybe I simply lacked the imagination or the skills with a 35-mm camera to do justice to what I saw.

One solution would have been to buy a large-format panoramic camera, but such equipment was far too expensive to contemplate seriously. Not any more. Thanks to the digital age, creating large-scale panoramic images is within the scope of anyone with a digital camera – the only 'extra' needed is a relatively inexpensive piece of software.

Stitching images together is not new. The practice has been around since the early days of Photoshop and other image-manipulation packages, but the programs available today are so sophisticated that they automatically solve many of the technical difficulties that beset their predecessors and make the process of creating panoramic images both straightforward and great fun. It's certainly added another terrifically powerful creative dimension to my repertoire. No longer am I intimidated by open spaces, but rather enthused and inspired by their endless possibilities. ▶



The premise is simple

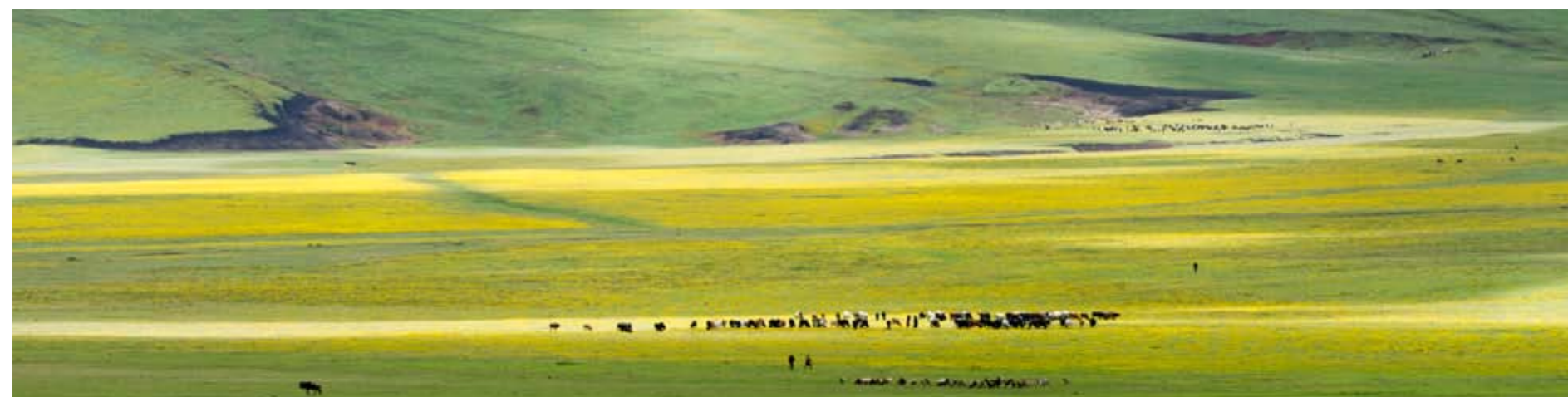
Take two or more images that overlap and combine them into one larger picture. It's intuitively obvious what this achieves – a final image that covers a greater field of view and is more detailed than any single image would otherwise be.

So why not simply use a wide-angle lens? There are a couple of reasons. Firstly, the constraints of the 35-mm format remain and the limits imposed by the field of view of the lens are fixed. And secondly, unless the main subject is very close, there's a tendency when using wide angles for things to appear small and distant in the final image. Cropping this to a panoramic format isn't a satisfactory solution as it reduces the file size and limits the rendering of detail.

Stitching files together makes it possible to combine images taken with a wide-angle lens to create

super-wide-angle images (pictures covering 180 to 360 degrees are feasible), or to combine several telephoto shots or other permutations using focal lengths in between. It is principally the assimilation of images taken with longer telephoto lenses (300–500 mm) that I have found so liberating in the Serengeti. Not only can I home in on subjects that are further away, I can broaden the field of view to include whatever lies on either side.

I'm now able to create images that I feel do justice to the awe-inspiring spectacles that I've witnessed. For example, to create the picture of the storm over the Ngorogoro Crater on the previous spread, a series of sequential images was taken with a wide-angle lens (17–35 mm), orientated vertically. Seven images were then stitched together to create the dramatic, almost 180-degree view. ▶

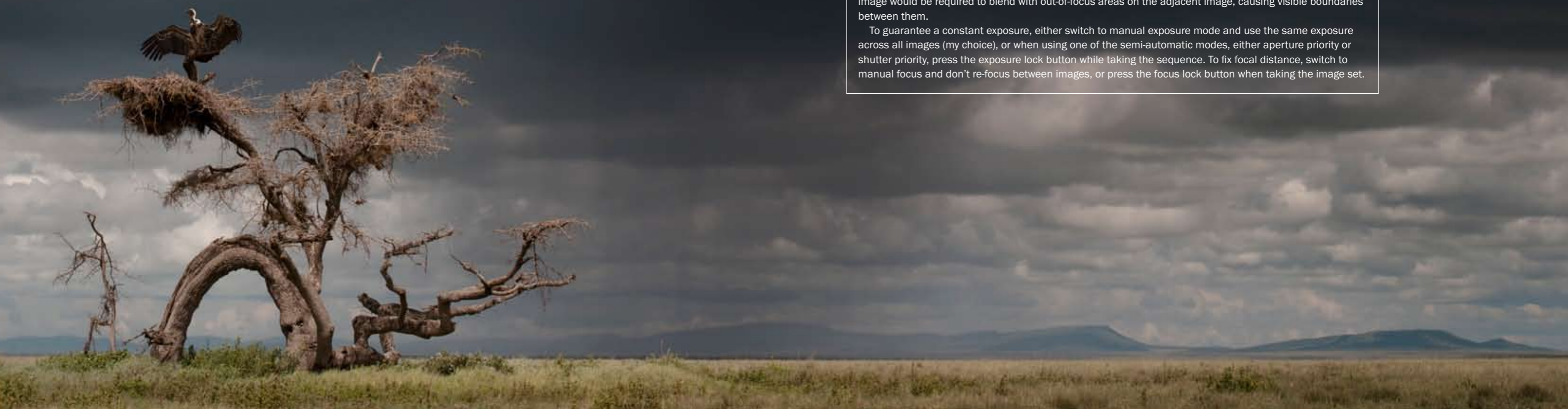


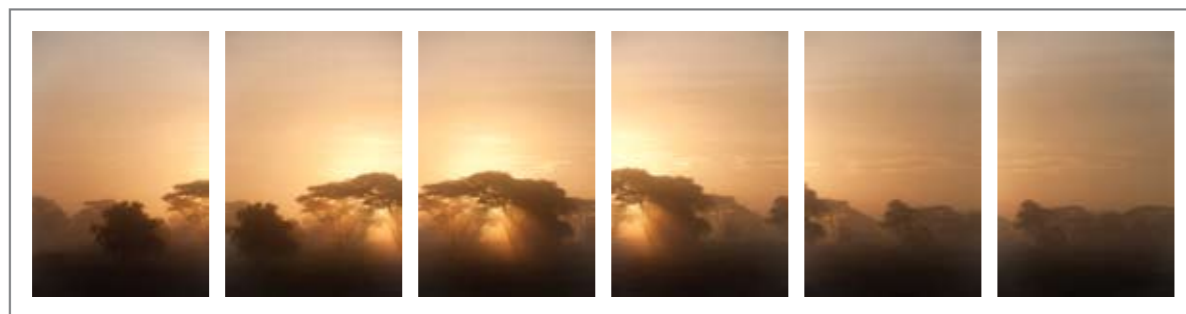
Technical talk

To stitch files successfully, there are some basic rules that need to be borne in mind when taking the constituent images. My first recommendation is to take RAW files (for stitching and all other photography). To make final stitched images look balanced, some processing is vital – using RAW files maintains maximum flexibility and quality.

When taking a stitch sequence, whether two or 102 images, the most important things to remember are that all the images must have the same exposure value (EV), and the focal distance and focal length of the lens (if it's a zoom) must be fixed, as should the white balance. The reasons are straightforward: as you pan across any scene the reflected light levels will change and this will alter the TTL (through the lens) exposure calculations performed by the camera for each image. If the constituent images of a stitch were taken at different EVs, the final panorama would be ruined by a series of bands that betray where one image gives way to its neighbour. Similarly, if the focal distance varies across images, it's likely that in-focus regions on one image would be required to blend with out-of-focus areas on the adjacent image, causing visible boundaries between them.

To guarantee a constant exposure, either switch to manual exposure mode and use the same exposure across all images (my choice), or when using one of the semi-automatic modes, either aperture priority or shutter priority, press the exposure lock button while taking the sequence. To fix focal distance, switch to manual focus and don't re-focus between images, or press the focus lock button when taking the image set.





In the field

The first thing is to identify a scene that's appropriate – scenes with extreme contrast can create major challenges when stitching. The fundamentals can be illustrated with my approach to a relatively simple scene: a misty sunrise near Ndutu in the southern Serengeti.

Locate the central subject or area to use as the benchmark for setting the exposure

value and focus distance for the series. I generally select the most 'contrasty' part of the scene, which in this instance is the area where the light is streaming through the bushes. I composed my initial image and set the exposure in manual mode (in this case, it was around 1 1/3 stops under the TTL reading or -1.3 EV, to prevent the highlights blowing out and to deepen the shadows). I depressed the focus lock button to prevent

the autofocus resetting itself and then recomposed and shot the scene as a sequence of overlapping frames, making sure there was a 25–30 per cent overlap between adjacent images. At sunrise and sunset, it is best to do this as speedily as possible, because light conditions can change rapidly. The scene can be shot from left to right or vice versa, as the software will automatically align the frames in any direction. ►



Back in the office

The remainder of the process switches to the computer. All the stitching software available works according to similar principles. I favour Adobe Lightroom and use this in concert with Photoshop for stitching (and virtually all other processing operations), so the workflow described here reflects this.

In the Lightroom module, I select and optimise the benchmark or 'central' image. This entails performing the basic processing sequence (adjusting exposure, blacks, saturation, etc. as deemed appropriate). At this stage all adjustments should be across the entire image and there should be no local area adjustments. Once the benchmark file has been developed, its processing 'recipe' is applied to all the other images in the stitch sequence, resulting in a batch of identically processed files.

In Lightroom, I then select all the images and follow the menu sequence, Photo>Edit in>Merge to Panorama in Photoshop. One more dialogue box pops up prompting the selection of the images to be



stitched and requesting the type of merge to be performed (Auto, Cylindrical, Spherical, etc.). This relates to image perspective. For the majority of stitch operations Auto is fine, especially when the original images are taken with a telephoto lens. When using wide-angle lenses, perspective can become distorted. Here, the Spherical and Cylindrical options give the best results, but some experimentation may be necessary. Once OK has been clicked, the images open automatically in Photoshop and are merged together to form a seamless panoramic picture.

The final step is to 'flatten' the image, combining all the constituent elements into one file. It may be necessary to use the warp tool to pull and tease some of the extremities of the image back into a roughly rectangular shape (sometimes the stitching process results in perspective distortions that require correcting). The panorama is saved and

automatically re-imports back into Lightroom to reside beside the original images in the catalogue. All that remains is to tweak any specific areas of the image using the tools in Lightroom, such as the ND graduated filter, and finally crop to the preferred panoramic aspect ratio.

There is really no limit to the way this technique can be applied. For example, landscape images are not the only format; vertical panoramas can be equally powerful.

So is this method fail-safe or are there any pitfalls? Unlike older versions, modern stitching software is extremely good at allowing for parallax error, perspective correction and image alignment. There can be few more complex scenes to render than a thronging mass of migrating wildebeest. Can the software cope? Well almost – it got it 99 per cent correct. The panorama shown above is a three-image stitch, again taken near Ndutu. ►

To create the picture above, the software performed the stitch without apparent difficulty. Before flattening the image I meticulously examined the file, expecting to find a number of two-headed or five-legged wildebeest. There was hardly a blemish, except in a couple of blurry areas with wildebeest in dust clouds that hadn't quite melded correctly and so required a little extra work in Photoshop. The same process was followed to produce the seamless image of storks on the next page.





Stitching software

Most camera manufacturers provide basic software with their cameras that includes rudimentary image-stitching capability. However, there are a number of independent options that offer more powerful and versatile alternatives. Try Adobe Lightroom, Photoshop or Bridge, Photoshop www.adobe.com, Kolor Auto Pano Pro www.kolor.com, Pano Weaver7 www.eaypano.com, Panavue www.panavue.com



It is when joining images with areas of soft focus and motion-blur that I've found stitching software to be less efficient. Whenever I've attempted to stitch images of this type, such as the running wildebeest (above), the best results have been achieved when merging them by hand and eye in Photoshop.

If all this is new to you, it perhaps sounds rather complicated and daunting. I assure you it's not. Like so many 'new tricks' that photographers have taken on board since the digital revolution, with a bit of practice it soon becomes second nature. It also highlights one of the major differences between 'old school' film photography and the exciting flexibility of the digital arena. Back

in the days of film, once the shutter button was depressed, the image was largely set in stone. The creative process was complete and the photographer's work effectively done (with the exception of black-and-white work in a darkroom). Today, however, depressing the shutter almost marks the beginning of that process, with all sorts of creative options lying beyond.

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