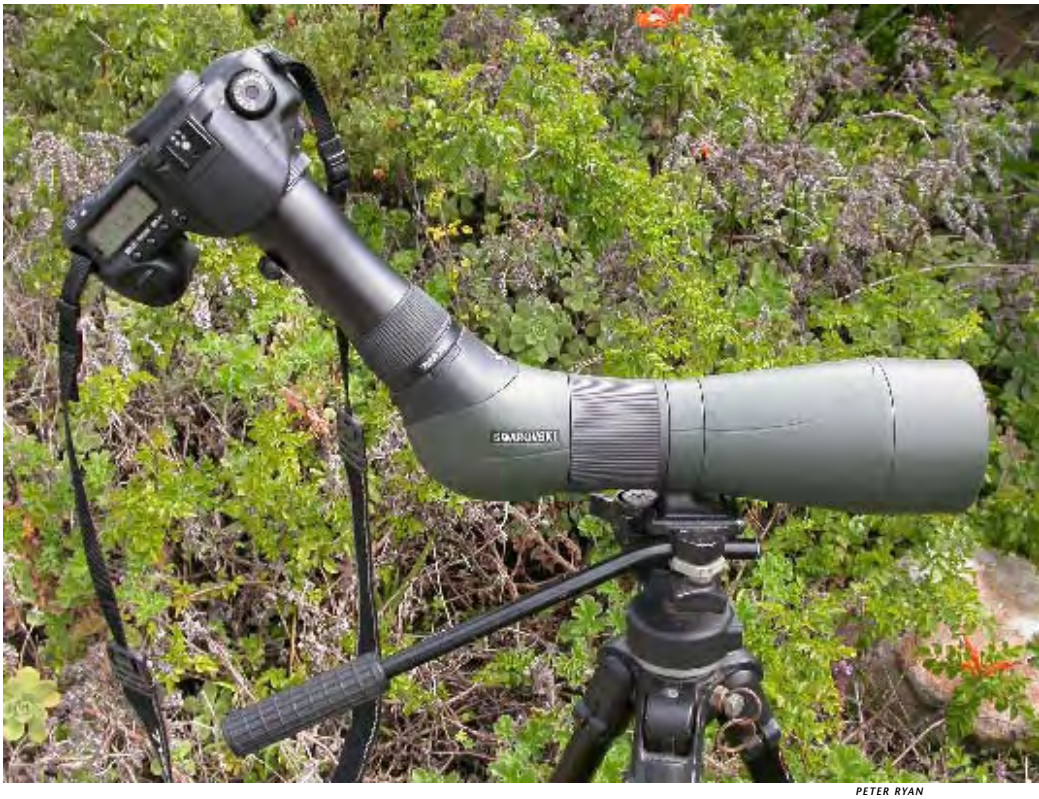
Digiscoping

THE DIGITAL ERA has spawned a plethora of new technologies, revolutionising the way we capture and communicate information. Birding has been affected in many ways, from the way we store data on birds, record and play back their calls, and share our observations with fellow birders around the world. But for many amateur birders, one of the biggest changes has resulted from the replacement of film with digital cameras.

In a series of two articles, **Peter Ryan** discusses the pros and cons of digiscoping and digital SLR cameras.



PETER RYAN

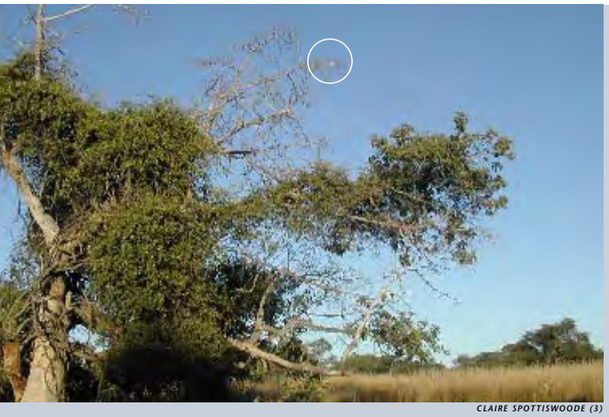
Attaching a digital SLR to a telescope may seem like a perfect solution to many of the problems of digiscoping, because you can see through the viewfinder. However, image quality doesn't compare with that produced by a compact digital camera.

Until recently it was axiomatic that you could be either a birder or a bird photographer. To take good pictures of birds required an arsenal of expensive equipment and endless patience. You would get to know your subjects intimately, but you'd hardly race around seeing large numbers of birds. The advent of digital cameras has changed this dramatically, by allowing even the keenest of twitchers to capture images of the birds they see.

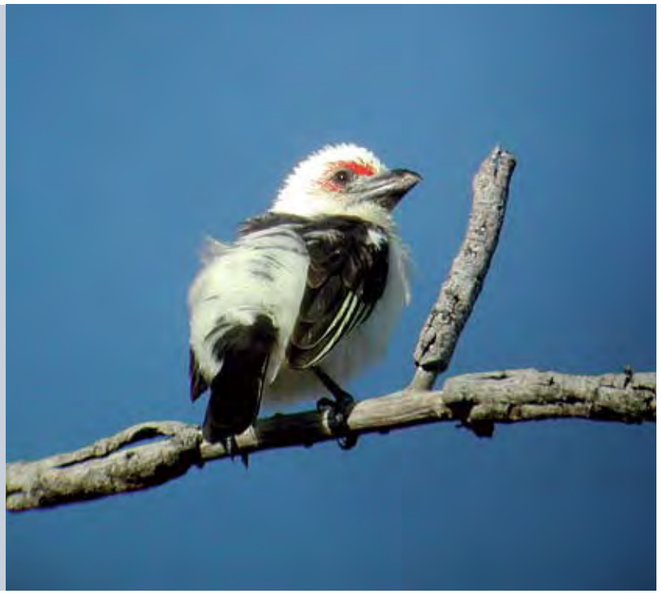
The revolution started with digiscoping. This new approach to bird photography uses compact digital cameras to capture surprisingly good-quality images through traditional birding optics – usually a telescope (often called a spotting 'scope), but you can also take pictures through binoculars. For some time there have been adapters which allow a spotting 'scope to be used as a telephoto lens on a single-lens reflex (SLR) camera body, but the quality of the images isn't competitive because the amount of light coming through a 'scope is not really adequate for film photography. However, compact digital cameras have small sensors which require less light than film does. Digiscoping makes it much easier to take opportunistic images of birds, because you can use the full power of a spotting 'scope, and you don't need to lug around a large amount of dedicated camera equipment.

The photographs in this article should be sufficient to convince you that digiscoping isn't just for record shots. Virtually any compact digital camera can take images through a telescope, but to get good-quality images, you need to make sure you have the right combination of camera and 'scope. Picture quality is only as good as your lens, so you need a good telescope that produces a bright, sharp image with no chromatic aberration. Telescopes with fluorite or high-definition (HD) glass and a large objective lens (at least 80 millimetres) produce the best results for digiscoping.

Vignetting, the darkening of the corners of the image, is a significant problem. You can overcome this by



CLAIRE SPOTTISWOODE (3)



Using a 'scope and the camera's zoom results in impressive magnification, unheard of using even the largest telephoto lenses on an SLR camera. This Chaplin's Barbet (right) is barely visible in the fig tree (above, circled), but produced an image of sufficient quality to grace the cover of a recent book on Zambian birds.

zooming in with the camera, but having a large exit pupil (the diameter of the image that emerges from the eyepiece of the telescope) helps. I strongly suggest using a fixed magnification, wide-angle eyepiece rather than a zoom on the 'scope. And if you must use a zoom lens, you'll get better results at low magnification, because the image is brighter.

Once you have a bird in the field of view, you need to focus the image. First ensure that the 'scope is focused on the subject. Given that you're often doing this using the camera's display, it's not entirely trivial. You may want to use a 2x magnifier to aid focusing. The camera can either be focused automatically or preset. Autofocus works well in open habitats, where there is little risk of focusing on the wrong subject, and can even compensate for the 'scope being slightly out of focus. However, most digiscopers prefer to preset the camera focus, which also reduces the delay between pressing the shutter and actually taking the picture. Some cameras operate best in macro mode, whereas others give the best results when set to infinity. Note that the depth of field is very limited, especially if the bird is fairly close, so it requires some practice to get sharp images.

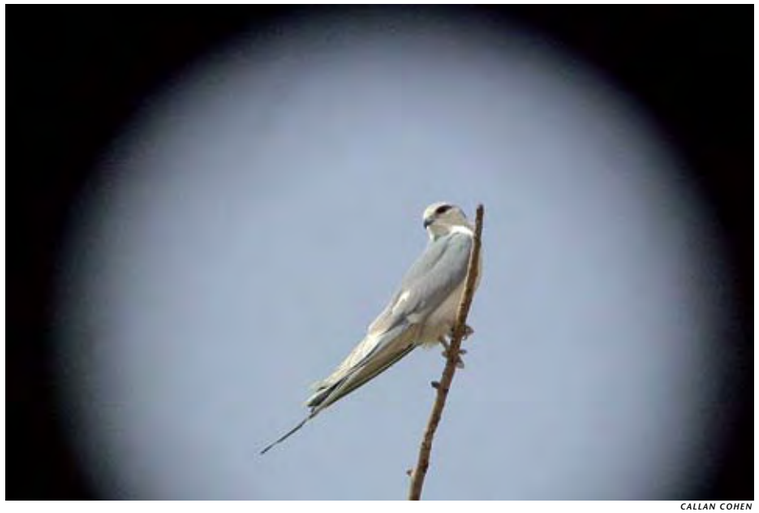
Finally, you have to decide on the best trade-off between shutter speed and sensor ISO (the digital equivalent of filmspeed). Small ISO gives better image quality, but requires more light, thus slowing shutter speeds. Fast shutter speeds are needed to freeze movement and avoid fuzziness resulting from camera shake. Unlike normal photography, with digiscoping aperture size is not too important, because in most instances it is effectively limited by the 'scope's exit pupil. So the best way to control exposure is to set an acceptable ISO (no more than 200), fix the aperture (no more than f5.6) and allow the camera to select the best shutter speed.

digiscoping *checklist*

- ✓ Telescope – ideally high-definition, with at least an 80-mm aperture and a wide-angle eyepiece
- ✓ Compact digital camera with a lens smaller than the 'scope's eyepiece
- ✓ Mounting ring to link camera to 'scope (optional)
- ✓ Shade box around camera's viewing screen (optional)
- ✓ Several memory cards and spare batteries
- ✓ Heavy, sturdy tripod with a solid locking head
- ✓ Computer for viewing and editing images

Discovering the best combination of settings for your camera and telescope is only part of the skills a good digiscoper requires. As you'll soon discover, the biggest problem is aligning the camera with the telescope. If the camera isn't perfectly centred on the field of view, you don't get satisfactory photographs. Several devices have been made to hold the camera in place. The simplest of these is an adapter ring that allows you to screw your camera onto the eyepiece of the 'scope. But this removes the spontaneity of being able to simply grab an image of what you're seeing through the 'scope. By the time you've finished fiddling to get the camera attached, the bird has probably flown. Another solution is to have the camera attached to the scope on a rotating arm that allows it to be swung into place once you have found the bird, but this requires a fairly sophisticated mechanism, custom-designed for the 'scope and camera you are using.

This problem of aligning the camera is exacerbated because the only way you can review what the camera is actually



CALLAN COHEN

Vignetting, the dark ring around this Scissor-tailed Kite, is a common problem when the image produced by your 'scope is too small for the camera. You can overcome it by zooming in and getting a 'scope with a wide field of view and large exit pupil.

Left *The real beauty of digiscoping is the ability to take photos of rare or localised birds in remote areas, such as this Ruspoli's Turaco, confined to a small area in southern Ethiopia.*

seeing is through its display window. The images produced by these small LCD displays are often too dim to see easily in sunlit conditions, especially as you will most likely have the sun behind you, shining onto the camera screen. Serious digiscopers overcome this problem by attaching a shield to the back of the camera to shade the screen. Then there's the problem of camera shake, which increases with the magnification of the image. To get really top-class results, you need to use a solid tripod and a remote shutter release (or use the camera's self-timer delay – if the bird isn't going to fly off!). By this stage, you've moved so far from the initial goal of being able to capture opportunistic images while birding that you may as well go the whole hog and get a digital SLR.

Despite these technical issues, much digiscoping is done by simply holding the camera against the eyepiece of the telescope and taking a series of shots. It's largely hit and miss, but as it costs you nothing, it's worth a try. It is easier if your camera lens is only slightly smaller than the eyepiece of the 'scope, facilitating the correct alignment. If you already have a compact digital camera (or even a camera on your cellphone), try taking images through your 'scope or binoculars – you'll probably be surprised by some of the pictures you can obtain. At the very least it's extremely useful for convincing sceptics about the validity of any rarities you may encounter. And by using your cellphone camera you can really annoy your mates by sending them an image of your latest grip in real time! But note that your camera lens must be smaller than the eyepiece of the 'scope. Many of the more upmarket digital cameras now have quite large lenses, allowing them to have better built-in optical zoom capabilities, but this renders them pretty useless for digiscoping.

The main problem with digiscoping is that it is clumsy, making it difficult to photograph moving birds. Until there's a spotting 'scope with a built-in sensor on which you can record images, it won't compete with traditional telephoto gear. Its main advantage is that you can make use of your existing birding 'scope to capture images of rare or unusual birds without resorting to lugging around a vast amount of dedicated camera equipment. It's great for recording rarities, or for getting record shots on birding trips. You can spend a lot of time and effort capturing striking images of birds, but if that's your primary goal, you should consider an SLR digital camera.

digiscoping *tips*

- Get a **wide-angle eyepiece** for your telescope.
- Ensure that the camera lens is as close to the 'scope eyepiece as possible to ensure **maximum image size** (without scratching your 'scope eyepiece).
- Record images at the camera's **highest resolution** (but storing as a compressed JPEG rather than a raw TIFF file is an acceptable compromise).
- **Take a lot of pictures** of each subject.
- Use **centre-spot focusing** and **exposure metering** (assuming the bird is in the centre of the image).
- Expose for the **highlights** (underexposure can be compensated for digitally).
- Use **aperture priority mode**, usually with the largest possible aperture to maximise shutter speed.
- **Adjust exposures** for backlit birds and white birds, or consider bracketing exposures (if your camera offers this option).
- As in all photography, **light is everything**. The best images come from well-lit subjects that almost fill the frame in the 'scope. Avoid long-distance shots on warm days: heat shimmer is a killer, especially when magnified through a 'scope.
- **Practice** with your equipment so you know how to use it when it matters.
- Use your **birding skills** to get you to the right place at the right time.

digiscoping *websites*

www.digibird.com
www.digiscopingukbirds.homestead.com
www.digiscoped.com