



## Aircraft Photography Part Three

**WELCOME BACK** to this, the third episode in our how-to series on aviation photography. (Episodes 1 and 2 can be downloaded from [www.kiwiflyer.co.nz](http://www.kiwiflyer.co.nz)). I hope you have all been out experimenting with your camera and getting stuck into some photography forums on the internet. In this instalment we will be talking some more about the specialised equipment and lenses you might need for aviation photography, as well as discussing some of the new tools at your disposal since the transition from film to digital.

Also in this issue, I'm thrilled to announce we will be starting a new KiwiFlyer Photo Competition, with some great prizes and lots of time to get your entries in over Summer.

### Advanced Equipment

One common sight at aviation events are photographers walking around with lenses that look more like bazookas than pieces of camera gear. These massive 'Super Telephoto' lenses are usually fixed focal length prime lenses with a very wide aperture, such as a 500mm f4. They are intimidating and, of course, very expensive! Although you will be able to get many great photos using a standard telephoto lens, of say 200 or 300mm, much of the action will be taking place on the other side of the airfield or away from the crowd-line. The extra focal length of a super telephoto lens will allow you to capture these images that you just can't get with a normal telephoto lens. Being prime lenses they usually have exceptional optical quality and very fast auto-focus, but they do have their drawbacks.

The heavy weight and long focal length of these lenses makes them very difficult to use without a tripod or monopod to keep the camera steady. This can restrict your movement and make it difficult to track an aircraft and compose your shot, but there are some good mounts available that allow you some freedom. Bear in



*Super-Telephoto lenses can be intimidating, expensive and heavy, but can capture spectacular images of action happening far away from you.*

### Advanced Equipment and Digital Files Contributed by Chris Gee

mind that at airshows, unless you are in the media gallery, a tripod will possibly trip up others in the crowd, earning you some angry looks. So I would recommend sticking to a monopod, which will still reduce camera shake. Another drawback of using a very long

focal length is the amount of atmospheric distortion that can occur between you and your subject. Heat haze, dust, or humidity can all affect the sharpness of your images. As one 'expensive bazooka' wielding aviation photographer once said to me "I may miss a lot of shots with this lens, but the quality of the ones I do get more than make up for it."

Many manufacturers have released 'Super-Zoom' Lenses, which give you the flexibility of a long variable focal length and therefore the ability to zoom in and out to aid in your composition. At the top of the line are the constant

aperture super-zooms, such as the stunning Nikon 200-400 f4 (about \$10,000!), going through to some much more affordable variable-maximum aperture options, such as the widely-used Sigma 50-500mm F4-6.3 lens, and the Nikon 80-400mm f/4.5-5.6D. The compromise here is a narrower maximum aperture, slower auto-focus and a loss of optical quality.

A super-telephoto lens is far beyond the budgets of most photographers, so many, myself included, prefer to use a normal telephoto or zoom lens, with a 'Tele-Converter' or 'TC' added to achieve the focal length needed. These fit between your lens and your camera body and will increase the focal length by the factor of 1.4x, 1.7x or 2x, depending on the TC, while still retaining the lens' minimum focusing distance. This gain in focal length at a reduced cost and weight does come at a price: adding a TC will

reduce the amount of light entering the camera, and the higher the magnification, the less light. The general rule is that a 1.4x TC will lose you 1 f-stop of light, 1.7x 2 f-stops and a 2x will cost you 3 f-stops. So in order to use a 2x TC, you need to start off with a lens that has a maximum aperture of at least f/2.8, and with a 1.4x TC you need a lens of at least f/4. Once your maximum aperture goes above f/6.3, your auto-focus will have trouble locking on and you'll struggle to get enough light into the camera to get a fast enough shutter speed to avoid camera shake at your increased focal length. (Remember the basic rule is that your shutter speed needs to stay faster than your focal length to avoid camera shake... although rules are made to be broken!)

A tele-converter will also accentuate any aberrations or defects in your lens, so a good trick when using tele-converters is to try not to use them at the maximum aperture that your lens will allow. Instead, stop it down at least one f-stop and image quality will be significantly better. Also, remember that at longer focal lengths you will have less depth of field, so focusing will need to be spot on.

I think the setup I use is a good example of a compromise between cost, weight, flexibility and focal length: I have an excellent 70-200mm f2.8 lens that I can use for all types of photography. By adding a 1.7x converter to this lens I get an equivalent 340mm f4.8 Lens. Since I don't use a full-frame camera I get a further 1.5x from the cropped sensor, which gives me a total of 510mm. Just enough for aviation photography! Of course, as soon as I remove the TC there is a noticeable increase in AF speed, optical quality and the max aperture returns to f2.8. I find I move the TC on and off the lens often depending on the type of aircraft I am photographing and its distance away. With a fixed 500mm lens I would have missed many of my favourite shots, and I certainly can't afford two telephoto lenses!

Many manufacturers are adding the magic of artificial image stabilisation to their lenses. Nikon call this 'VR - Vibration Reduction', Sigma call theirs 'OS - Optical Stabilisation' and Canon call it 'IS - Image stabilisation', though they are essentially all the same thing. Highly sensitive gyros in the lens artificially counter hand-held camera shake by moving elements within the lens to cancel out vibrations. This allows the photographer to employ slower shutter speeds when shooting in low light or at longer focal lengths. Most importantly for aviation photography, it allows you to use a shutter speed that is significantly lower than the focal length of your lens. The new generation of 'VR' allows you to use a shutter speed four stops slower than you would without it. Remember, however, that VR only helps reduce the motion of your camera; it doesn't stop the motion of your subject! So you will still need a fast shutter speed to get clear shots of fast moving aircraft, aerobatics or action. VR is especially useful when making 'panning' shots (more on this in the next issue).

Another piece of equipment you need to have in your bag is an external flash unit, also referred to as a speed-light. Even though most of your images will be taken in daylight, flash can be essential for adding 'fill-flash' to areas in shadow from the sun. The most common use of fill-flash in aviation photography is when taking photos of aircraft interiors and cockpits. A daylight cockpit shot is especially difficult because the scene is naturally high-contrast; the majority of the cockpit will be in shadow, while the sunlight outside the windows or the images on a glass-cockpit computer display is bright. Without fill-flash your photo would consist of over-exposed bright windows and screens, and a dark, under-exposed cockpit interior. The idea is to use your flash to light the shadowed cockpit interior, while allowing your camera to correctly expose for the



*LEFT: Using Fill Flash is essential for cockpit shots. The aim is to expose for the view outside the aircraft while lighting the details inside. A wide angle lens can allow for an expansive view despite the small confines of the cockpit. RIGHT: The affect of atmospheric distortion when photographing distant subjects is apparent in this image of an ME109 crashing on landing at the ILA Airshow in Berlin 2008. The haze from the heat makes the image almost unusable.*



## KiwiFlyer Aviation Photography Competition

**1st Prize \$300**

**2nd Prize \$150**

**3rd Prize \$50**

Prizes will be awarded as Gift Vouchers to be spent at the Tauranga Branch of Down Under Pilot Shop before 31st December 2011.

**Would you like to see your pictures in KiwiFlyer Magazine - and win a prize for them? Then read up on Chris Gee's advice in our photography articles and get snapping over Summer. Good luck !**

### Terms and Conditions of Entry:

Submitted photographs must be the original work of the photographer. Photographs will be judged on composition, technical merit, and how well the image captures the essence of aviation in New Zealand. Photographers warrant that they have secured necessary model releases before submitting portraits. Photographers retain copyright to their images although KiwiFlyer reserves the right to publish and comment on images in KiwiFlyer magazine and online or in other promotional material for KiwiFlyer Magazine. There is a maximum of three entries per person. Persons whose primary income is from photography are not eligible to enter the competition. Images should be in JPG format with file sizes between 1 and 3 megabytes. Email: [editor@kiwiflyer.co.nz](mailto:editor@kiwiflyer.co.nz) or Post to PO Box 72841, Papakura 2244. Posted material will not be returned unless accompanied by a post paid, self addressed envelope. Entrants should provide their name, mailing address and a phone number with their entry. Entries close on 31st March 2011 and the winners will be announced in the April/May issue of KiwiFlyer. The judges' decision will be final and no correspondence will be entered into.

scene outside the windows or canopy. In order to do this you need to have control over your flash exposure.

Adjusting flash exposure shouldn't be confused with adjusting the camera's exposure. Your exposure time is the same for any given lighting situation, set by the amount of light present in the scene. Adding fill-flash should not change your exposure at all—it's just there to fill in the details that would otherwise be in shadow. You can achieve this by setting your flash to 'slow-sync' or switching your camera to manual and getting your exposure correct for the scene outside the windows, and adding the flash in as necessary. While the built-in 'pop-up' flash on the camera may work in some areas, a separate 'off-camera' speed-light will deliver much better results. By holding your flash at arms length and operating it remotely from the camera you can avoid the flatness that makes the use of flash so unpopular. Your remote flash will provide shadows that are at an angle your camera can see, adding depth and detail to the image. Also, since you will most likely be using a wide-angle lens when photographing a cockpit your 'pop-up' flash would probably cast a shadow from your lens across the image.

Another technique to try when using a speed-light is 'bounce flash', where you point your flash at the roof, and bounce the light onto the scene to produce a more even spread of light. Many photographers use diffusers to spread the light out from the flash more evenly. It is important to learn where your flash exposure controls are located so you can turn your flash up or down quickly to get the right balance between the daylight and flashlight.

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**The Digital File**

Let's now set equipment aside, and talk about some of the options the digital revolution has forced upon us. There are far too many different techniques and software available in the post-processing world to cover them all here, but humour me as I skim over the basic terms and tools in your "Digital Dark Room" that you will need to understand as you get the images off your camera and out to their final format.

First, let's talk about one of the greatest advantages of digital over film... the histogram! You'll often see photographers peering intently at the display on the back of their camera after each image. They are most likely not reviewing the image itself, but the



The differences between the White-Balance settings available on your camera are noticeable here. By shooting in RAW, you can apply your treatment afterwards, avoiding your camera misreading the scene and applying the wrong colour-cast, a common problem when using Auto WB mode and shooting in JPEG.

histogram: a graphical representation of the information within each part of the exposure, from black (to the left) through the mid-tones, to white (on the right). Why is this information so important? Well, with a digital image, if you overexpose the highlights of an image, the details in the near-whites will be lost. Even if you reduce the exposure afterwards on your computer the over-exposed whites will simply become flat grey. It can be very difficult when you review your image on your LCD camera screen to see whether this has occurred, or by how much. If you have your camera setup to

display the histogram after each capture, you can see this information instantly. So if your histogram is all the way to the right and off the end of the chart, you'll quickly know that you have overexposed. It's common practice in digital photography to 'expose to the right' (getting as much of your information to the right of the histogram without actually going off the scale). Even though it will leave your image looking too bright, it will not be over-

exposed, and you can reduce the exposure in post-processing to get the image looking natural again. This increases the 'signal-to-noise' ratio of the image, reducing pixilation and allowing recovery of detail that has been lost in shadow.

In order to take advantage of this you must shoot in RAW format though. Most digital cameras will give you the choice of shooting in either RAW or JPEG format. A RAW file is a large uncompressed file, which contains the complete data produced by the camera sensor including all white-balance options and a higher dynamic range. A RAW file must be converted into another format on your computer in order to be viewed, and cannot be directly printed or uploaded to the web. Each manufacturer produces its own RAW format: as an example Nikon use the .NEF file. Specialised software is required to view and edit the image, but this can be incorporated into your editing workflow easily, and comes free with most image manipulation software, such as Photoshop, Aperture, Lightroom, Capture etc. If your camera came with the ability to produce RAW files it probably came with the software for converting the RAW file to a standard format. The RAW format can be edited, copied or moved endlessly with no loss of quality. Most photographers shoot exclusively in RAW to achieve the highest possible image quality and post-processing options.

A JPEG file is much smaller than the RAW file, and is a standard



Most of the editing you will need to do to your photo can be done in the process of converting your RAW image file. Everything from cropping, white balance, colour correction to exposure recovery and image sharpening can be done at this point.

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format that can be read by any computer or printer, and uploaded immediately to the internet. The file is heavily compressed and much of the information in the image is not encoded. Every time the image file is saved, edited, copied or moved, some image quality is lost. Although this loss may be so slight as to be unperceivable at first, it can have a noticeable effect over time. Initially the JPEG image will appear to have more contrast and sharpness than the RAW image, but don't be fooled! A JPEG image only looks good because all the contrast and sharpening is all done for you when the photo is taken, and this limits your options when it comes time to edit the image. The upside of shooting JPEG is that you can fit more images on your memory card (about three times the amount of RAW files), and, since the file is smaller, your frame rate per second will be faster when shooting in continuous shutter release mode. The major drawback is that it will follow the white balance set by your camera, instead of allowing you to alter this in your digital dark room later.

The white balance (WB) is the process of removing unrealistic colorcasts, so that objects that appear to be white in real life are rendered as white in your photo. Many people leave their camera set to 'Auto White Balance' (AWB), which means the camera has to take into account the colour temperature of a light source, which refers to the relative warmth or coolness of the white light. The human eye is very good at judging what should be seen as white under different light sources, but digital cameras often struggle and can create unsightly blue, orange, or even green colorcasts. There are usually options to set a standard WB setting for your camera, such as daylight, cloudy, fluorescent, and tungsten. The problem is that many situations contain a mixture of these light sources, so by shooting in JPEG you restrict yourself the decision your camera has made. Using RAW, you can select 'Pre' WB, and then apply the correct colour temperature settings after the fact.

When I first entered into the realm of digital photography,

I found myself spending way more time editing the images on my computer than I did taking the actual images. At first the whole post-processing concept was quite daunting, but as you get better at taking the images and more confident with your editing workflow, you should find that you spend two minutes at the most per 'keeper' image. Shooting in RAW may appear to complicate matters, but it does, in my opinion, actually simplify it since much of the editing you need to do to your image can be done during the RAW conversion process. This includes cropping, resizing, horizon

straightening, sharpening and Curve/Level control. Also, using automated scripts (called 'actions' in Photoshop), you can save your image in a number of formats simultaneously, such as a full resolution 300dpi image for printing, a medium res 1mb image for emailing and a small watermarked image for posting on the internet. The ins and outs of image editing fall outside the scope of these articles but, as with anything these days, the internet and plenty of nerdy forums are wonderful sources of advice. The trick these days is not so much finding the advice, but deciding which advice to take and which to ignore! A final word of caution: when transferring the images off your memory card, always copy the files onto your computer, back them up, and then erase them from your card. If you simply move them across, you will run the risk of a failure and the loss of images. Learned that one the hard way...

**IN THE PAST** three columns, I have only just scraped the surface of what there is to know about the technical aspects of your photography, but with a basic understanding under your belts we can move ahead onto the really exciting stuff: applying these techniques to real aircraft! In the next episode we will be dealing with shot composition, panning shots, and some airshow photography tactics, applying what we have learnt to some real world examples. Until then, keep that shutter working, and send in some entries for our photo competition!



In this histogram, the dark paint is shown to the left, the medium blue in the middle, and the light clouds to the right. The small area of 'sun-glint' off the fuselage is overexposed, and can be seen to the far right.

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