Model Railroad Photography

A clinic by David Latham

Welcome to my short clinic on model railroad photography. Today I will give a guide to all the beginners in the audience and provide some assistance to those of you who consider yourselves a little above that standard of photographer.

To introduce myself – I am not a professional photographer but I have been interested in this hobby for over 35 years. Over that time I have read books and magazines to further my knowledge and support my experience. I have been interested in model trains for about 20 years and have used my photography experience to document my modelling talent and prototype interests.

Before we start, are there any present who still use film rather than digital? Who would consider themselves beginners, intermediate, advanced photographers? I obviously started in film and moved to digital about 7 years ago. Most of today's clinic is relevant to both – I am presenting ways to capture light. I will however use terms relevant to digital photography because of its popularity. The subsequent modification and printing is an entirely different but engaging subject. All the techniques mentioned also apply to general photography in the field. Hopefully your photographic skills will be enhanced by what you learn today!

Photography Basics

To produce photos, light enters the camera through the lens, is focussed and then recorded on to film or digital sensor. There are many variables, both obvious and not, that come into play and have a profound effect on the ensuing photo.

A photo's exposure is governed basically by three variables – **aperture** (the size of the hole in the lens) and **shutter speed** (the time the hole is left open). Using the analogy of a photo's exposure being a bucket filled with water, do you spend time with a trickle of water or open the tap fully to fill the bucket in the shortest time. Film has been manufactured for many years in different sensitivities (**film speed or ISO setting**) to offer a third option – the size of your bucket – but it is difficult to change film mid-roll. Today the digital photographer can change the sensitivity of the camera's sensor at any time to give a desired shutter speed or aperture. A beginner's camera today can control these variables in a very basic, no frills manner. With focus and exposure achieved automatically, the operator only needs to point and shoot. An experienced photographer with an advanced camera knows how to control that focus and exposure to produce more desirable results.

Equipment

Your photographic equipment will vary depending on your assumed skill level and the depth of your pockets. A few myths to refute firstly – 1. A better, more expensive camera will give you better photos. Not necessarily so as it is your vision and ability to use the camera at hand which will have more bearing on the result. 2. More pixels, higher capacity sensor is better. This will only matter if you intend to print the photos larger than A4 size. It's sort of complicated to explain. 3. We are shooting in 'macro' mode. Macro mode involves extreme close-ups of the subject so that the image on the sensor is the same or bigger than normal size. An example would be a photo of one HO scale wheel or a coupler. 4. The digital zoom will help. When buying a camera (still and video), the optical zoom is the important item. A digital zoom simply magnifies the pixels on screen, the same as zooming in on an image on the computer.

An entry level 'point & shoot' camera is limited in its adjustability and has a smaller (physically) sensor which can not cope well with difficult lighting situations. The next level up, the 'prosumer' camera has more options for adjustments and usually a wider zoom but has the same size sensor. The Digital Single Lens Reflex (DSLR) camera caters for all the adjustments a photographer needs (and many he probably won't care for), the ability to change lenses and has a larger sensor. These days, low-priced DSLRs are probably the best option for a budding photographer, the only downside is the added bulk compared to the 'point & shoot' cameras.

The beginner's path to photography nirvana.

So now we know the basics of photography. How do we put them into practice? I'll now try to follow on a beginner's path to the mysteries of photography's variables. In most of the photos that follow, I've deliberately tried to over-exaggerate the mistakes and short-comings of a point & shoot camera.

The hardest and most personal of the process is the subject matter. If you have built a model railroad or even just a module, then the subject matter is taken care of. The beauty is that the subject is stationary, is available at any time and the lighting and details can be changed any time. If you are a beginner to digital photography, this is a huge bonus. Make as many mistakes as possible and learn from them, electrons come real cheap!

Fig. 1 what you want .....

Where do we start? Firstly what is your primary subject matter? Are you taking photos just to record the development of the layout; are the photos just to record your inventory; are the photos to be a work of art to be displayed at the next NMRA convention? Let's say it's that new steam loco, your pride and joy.

You've seen plenty of photos in magazines, books and on the web of both prototype and model steam locos. It can't be too difficult……

So you go crazy taking photos of your layout using your beginners' camera set at 'Auto' everything. Transfer the photos onto your computer and admire your handiwork. What usually follows is a period of disappointment and frustration. Those magnificent shots of the new steamer in all its glory, pulling its consist through realistic scenery, all seem very ordinary. The loco seems to disappear in its surroundings, the fascia is the only part in focus, the nearest items are over exposed and the background is in shadow and the layout's framework has shown up where you didn't expect it! Remember, the camera is just a tool to capture light entering it; it does not have brain cells to imagine a work of art.

Fig. 2 what you get!

Try getting closer to the action and fill the frame with your subject. Remove the fascia and layout framework from the photo. This exercises another variable – the **zoom lens**. In beginner cameras a common zoom lens would be 3X, meaning the area at its highest effective magnification ('focal length') is three times that of its lowest. Using the lens at its longest focal length means you can get closer to the subject without physically moving. Remember, don't fall for the digital zoom trap. More advanced cameras have up to 15X zooms and removable lenses of any focal length imaginable!

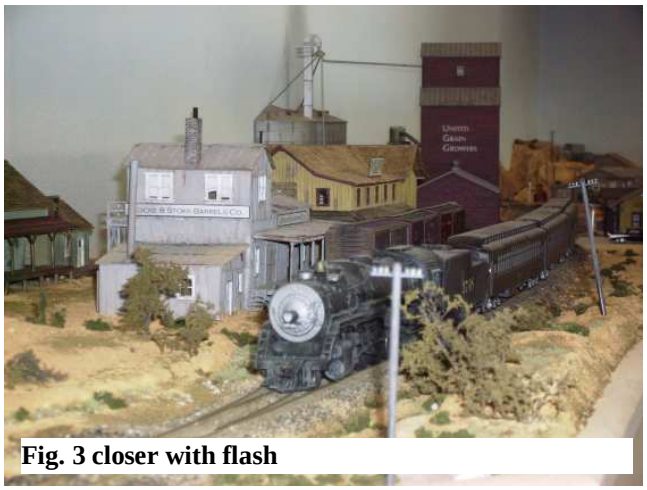

Fig. 3 closer with flash

Fig. 4 digital zoom - bad

You may find that when you zoom in on your loco it goes out of focus! Some lenses lose their ability to focus close at the highest zoom. Having the subject fill the frame is ideal but when it's not possible the photo can be trimmed in the computer or after printing.

First things – disengage the flash. It won't be effective at our focal distance. Now take photos of the loco, filling the frame and in focus. The photos are still blurred but not out of focus. Everything in the photo is 'blurred' not just part of it. The **shutter speed** is too slow and the camera has moved as you pressed the shutter. A common mistake for beginners is to jab the shutter button rather than a slow relaxed 'squeezing' action. Of course there are times that no matter how slowly you squeeze the button, the photo is still blurred. You then need to use a faster shutter speed. You can fool the beginner camera into using a faster shutter speed by changing a few settings. Look for a setting icon of a flower, either on a dial or in a menu, to set the camera to focus closer and maybe increase shutter speed. Then you might find that the zoom won't work! You could also select an icon that looks like a running man. The camera thinks you want to shoot fast action and will automatically shorten the shutter speed. Of course, you can't select the flower and man at the same time. The camera is set up to deliver the fastest possible shutter speed to allow for newcomers' inability to hold a camera still.

Fig. 5 motion blur

Fig. 6 choose your option....

Remember the bucket analogy. To decrease the shutter speed, we need to let more light through the lens, i.e. open the **aperture** (the 'f' stop on advanced equipment, the lower the number the wider the aperture) or increase the 'speed' of the sensor. Of course you could also increase the amount of light on the subject but indoors, lights can get hot and remember you only have two hands and one of those is holding the camera!

Not all cameras allow you to change the sensor sensitivity. It is usually incorporated in the camera's computations to get the best exposure it thinks you want. If it is possible to change it, move the selection to a higher number. This allows you to have a faster shutter and / or a wider aperture. More on this variable later.

You now have the loco in frame, selected the running man and taken more photos. The results are mixed. The main problem is that only the smokebox is in focus, the tender is just an out-of-focus blur. More variables are now coming into play. Like all decisions in life, there are pros and cons to either choice. In our scenario, the faster

shutter is used to stop camera shake and this means a wider aperture. The problem with a wider aperture is the light entering the lens is focused in a narrower band, the 'depth of field'. The smaller the hole, the wider the band of focus but of course, the shutter has to slow to a crawl. On some cameras but probably not your beginner camera, it is possible to view the depth of field prior to releasing the shutter, allowing you to refocus.

Fig. 7 shallow depth of field

You now have the loco in frame but you want the smokebox and tender to both be in focus. You know you need a narrow aperture to increase the depth of field and a fast shutter to reduce blur. You can't have both so you increase the **sensitivity of the sensor** (or change your roll of film!). Fire away! The results, you guessed it – not perfect. This problem is known as 'noise' on the photo and arises from the increased electrical activity in the sensor. A beginner's camera has a smaller sensor than a more advanced camera and this exacerbates the noise problem. Always try and use a low ISO number to prevent this happening.

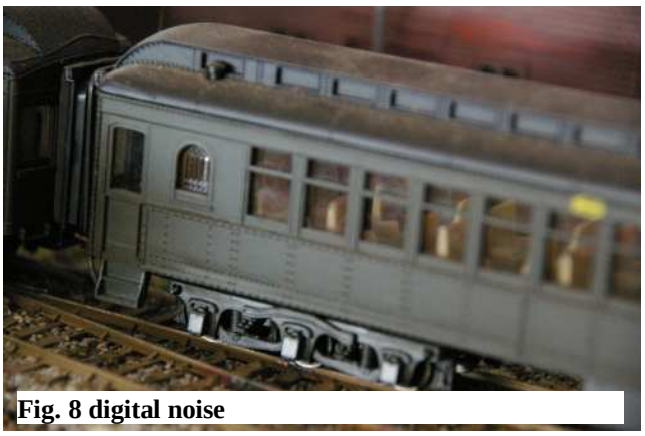

Fig. 8 digital noise

All these variables and still not a good photo. Lucky for you you're using a digital camera. Using film would take weeks and copious notes to get this far! Thinking again, why not **increase the amount of light**, it couldn't be too hard. There is a flash on the camera so why not use it. Unfortunately for us, the flash is factory set up to be used to take photos of people about 2 metres away not at close focus as needed here. If used on our subject loco, the smokebox would be overexposed to a brilliant white and all around would be an indecipherable mess.

How about adding more light bulbs around the loco, say the standard spotlight in the lounge room or that reading light next to the bed. Not a bad idea if the 'other owner' doesn't know or object, but remember that incandescent and halogen bulbs can get hot when left on for long periods. Stationary lights such as these are better than flash because you can concentrate on your subject in the light by which the photo will be taken. Set up a main light, the strongest, up high to simulate sunlight and maybe add dimmer lights further from the loco to fill in dark shadows. Assistants are hard to come by so how are you going to mount the lights?

The loco is in frame, all the lights are hung where you think they should be, the layout room is beginning to look like Sowerby's studio and the assistant's arms are ready to drop off. Quick, check the aperture and shutter speed. The photos are terrible! Everything is yellow colour. Another variable has entered the scene. Incandescent light is in the yellow portion of the light spectrum, halogen a little bluer, fluorescent greener. Our eyes compensate and the brain sees all colours as you think they should be but the camera just records what it is given. Lucky for you this colour problem can be corrected in the computer or the camera's colour perception can be changed, the **'white balance**' but this is not always possible in beginner cameras.

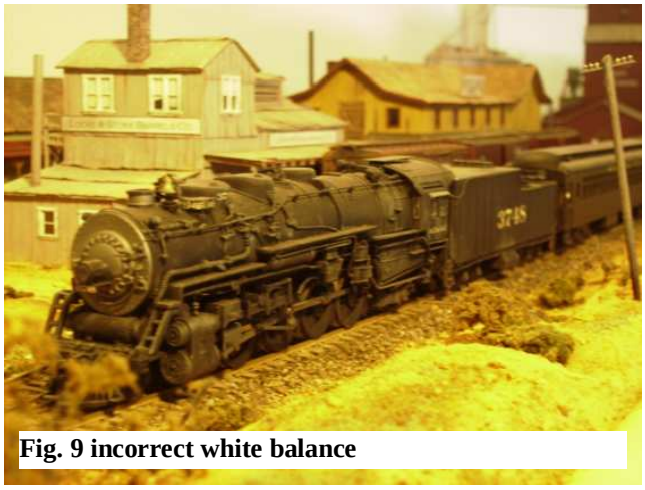

Fig. 9 incorrect white balance

You give up the option of extra lighting but you now know that a small aperture is the most important variable to increase the focal depth of field. This means a slow shutter. To keep the camera stable you need a **tripod** but don't have one on hand so you rack your brain for a substitute. A simple fabric pocket filled with uncooked rice would work here. It keeps the camera supported on all sides and will mould to the shape of its support such as that nice piece of scenery you finished last week. Obviously, a tripod is the best alternative. So you ruin a small section of your landscaping for now and place the camera in the required position and you realise that you now have your hands free. Bingo, a spot light for the sun. Change the colour setting to compensate for the extra light (or set to auto as a standby) and disengage the flash. A remote cable release is needed to release the shutter. Your beginner camera might not have a connection for the cable, so set the shutter to delay release. The purpose of this is that sometimes the action of pressing the button is enough to cause camera shake so let the camera release the shutter for you. The photos will now start to look like they are supposed to. The whole loco is in focus, well lit and appears to be in sunlight.

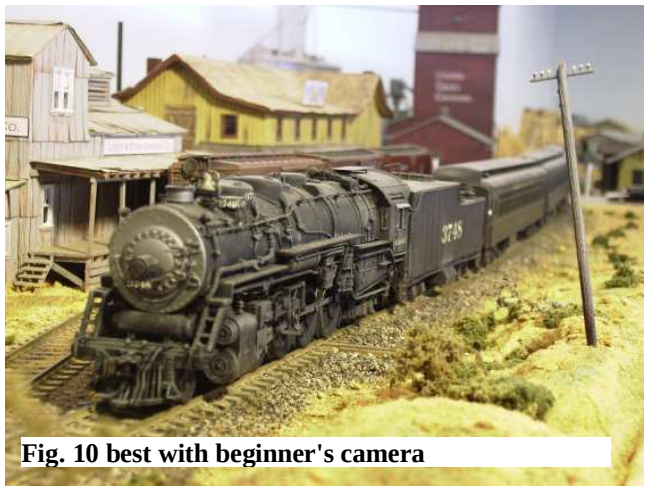

Fig. 10 best with beginner's camera

So, to summarise the last afternoon's frustrations behind the camera. To take acceptable photos of models, you need to alienate the subject to eliminate distractions from structures, scenery, etc. At close focus, it is important to have a greater depth of field so reduce the aperture to the smallest possible and the shutter speed will automatically lengthen. Keep the sensor speed low (to reduce digital 'noise'). Use a

tripod or pillow to support the camera. Additional light can be used to simulate sunlight but check the white balance.

Fig. 11 taken with DSLR 15sec f27

Composition

Once you understand and have "mastered" the basics of photography, you might be inclined to experiment a little. There are no hard and fast rules by which you have to abide. As with most endeavours, the rules are there to be broken.

Let's return to our beginner's journey. He's happy now with his photos but they somehow don't have sparkle nor jump out of the page. The main problem could be the composition of the photos, the way the subject matter and the background relate to each other. The main rule of composition is the 'Rule of Thirds'. The main subject should lie at the intersection of the imaginary lines that divide the frame into thirds. There should not be any conflict of viewing interests – keep it simple with as few distractions as possible. To complicate matters (again), the light / shadow ratio should also be divided by thirds, the horizon should never be across the middle and the viewer's eye could be led towards the subject. Railroad photography does lend itself to the latter because the rails can be used very effectively to lead the eye to the subject (the loco, caboose, structure?). Obviously this rule and its usage are very subjective and open to all sorts of misuse and abuse.

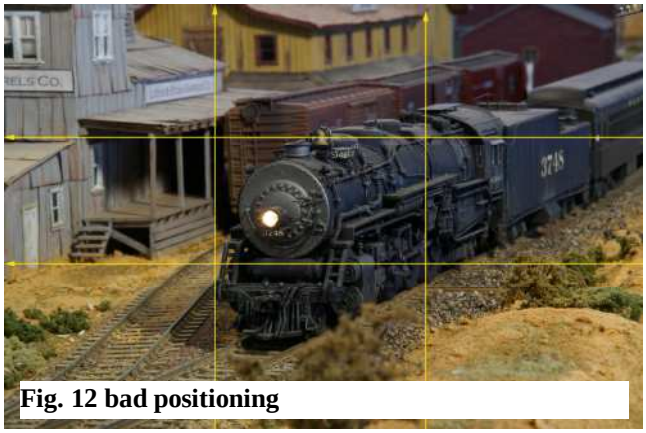
Fig. 12 bad positioning

Fig. 13 f32

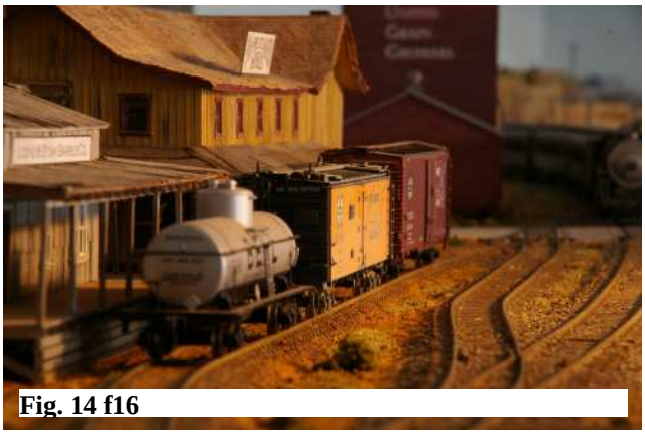

Fig. 14 f16

Fig. 15 f5.6

The photo's depth of field can be used to advantage as well. Close the aperture and the depth of focus increases. If the aperture is opened intentionally, the focus can be applied to only a shallow depth to isolate the subject from its surroundings.

Another means to achieve this is to use a longer focal length on the lens. A wide angle lens magnifies those objects closer to the camera whereas a telephoto lens will foreshorten or flatten the apparent image and also decrease the depth of field. It will also help to remove distractions from the periphery of the image. Obviously, the camera will need to be further from the subject. This is another method by which the eye is led to the subject. In portrait photography the eyes must be in focus. In locomotive photography, the focal point is usually the headlights, i.e. the eyes of the loco. The focal point for rolling stock should be the owner's emblem or reporting marks, for buildings it's the name of the business. When you are photographing the details this rule would then need to be bent.

Fig. 16 focal length 450mm

Fig. 17 focal length 18mm

Advanced Photographic Techniques

We spent the day trying to negate the effects of camera shake by making the shutter work faster and/or using a tripod. If we now slow the shutter, the camera can be panned to keep pace with a moving model either with or without using a tripod. Practice is important to prevent a wavy motion – the panning must be in the same plane as the motion. The model is in focus (relatively) but the background is blurred, giving the impression that the train is racing. Alternatively, the camera is fixed and using the slow shutter speed, the train is moved across the frame, keeping the background in focus and the train is blurred. Both techniques are easy to accomplish with digital cameras because the photographer can experiment with both the shutter speed and loco speed.

Fig. 18 motion sickness? 0.5 sec

In these days of digital photography, people are using the excuse that if the photo is not ideal, it can be fixed in the computer, using one of many photo editing programmes. This is in fact far from the truth, just as it is impossible to make terrific wine by cellaring a chateau cardboard. If you have to rely too heavily on the software, your photography skills must be lacking.

There are many techniques that can be used on the computer to elevate a decent photo to give it the 'wow' factor. Skies and entire backgrounds can be altered and stolen from other photos to make them more dramatic. Motion can be suggested by digital blurring to give similar results to those mentioned above. Smoke and exhaust gases can be simulated. Many photographers have included a scaled photo of themselves in their shots, as engineers, car drivers or in fact any member of the crowd. Colour photos can be converted to black & white or given a sepia tone. To achieve these results, however, it does take quite a lot of time and with a fairly steep learning curve. I am now using Adobe Photoshop Elements Ver 7, having upgraded from version 2 and 5. Granted, there are many talented Photoshop experts out there who appear to be able to manipulate a photo every which way but I don't have the time. I'd rather be working on my layout and taking photos of my achievements.

If you are reading this outline and the photos aren't clear enough, please don't hesitate to email me & I'll send the photos.

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