

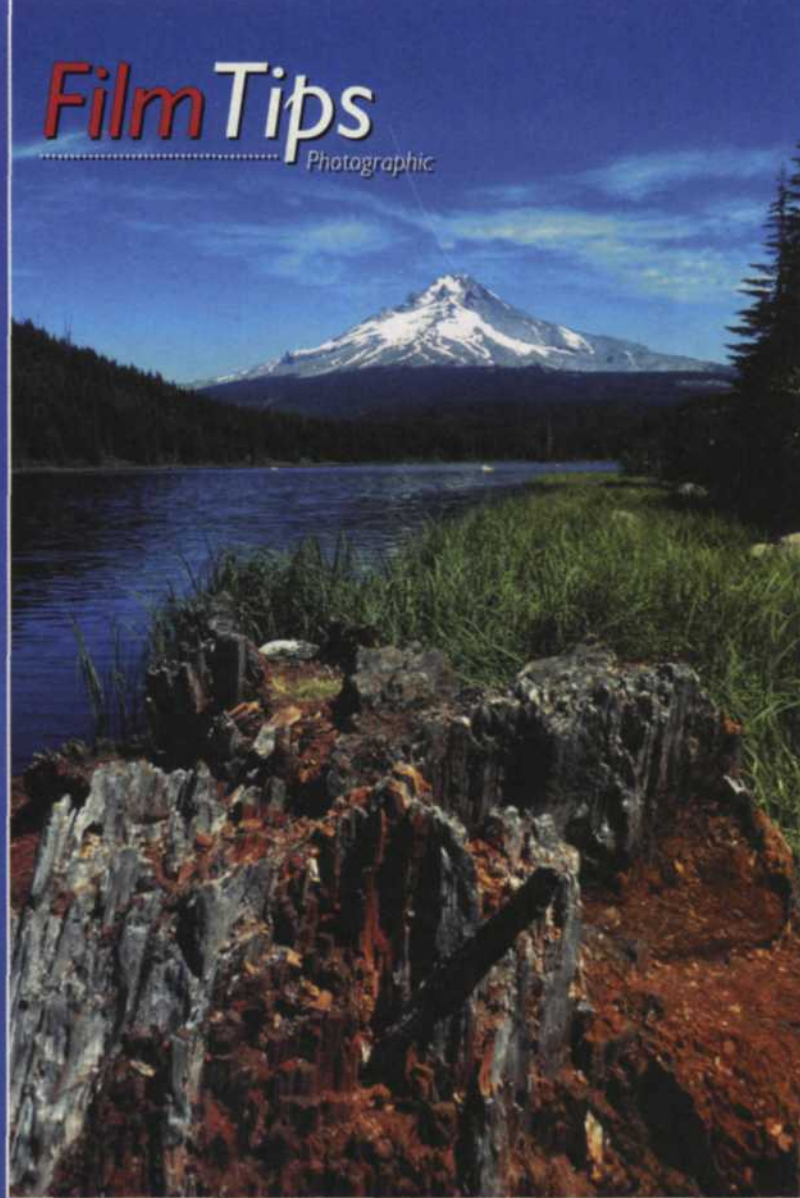
The Sharper Image

Tricks of the trade

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When we went through photo school many years ago, one of the main things the instructors tried to teach us was how to get sharp images. At first we thought this was a no-brainer. After all, who can't learn how focus a camera and lens correctly? As our schooling continued, we found that there are many ways photos lack sharpness, and inaccurate focus is only one reason. In most cases, the solutions for obtaining sharper images are simple; photographers often just forget to put them to use. So, it's off to the land of Sharper Images 101, where we will offer you some simple solutions.

FilmTips
Photographic



Above: To get this scenic shot sharp, we used a monopod, a wide-angle lens at $f/16$ to extend depth of field, and fine-grain film.



Above: Here, a fast shutter speed was used to minimize subject movement.

Tips for Hand-Holding the Camera

Since most picture taking occurs while the camera is hand held, we will discuss its problems first. The most common mistake new photographers make is to press the shutter at the moment they want to take the picture. As they do, they force the camera in a downward motion, and often blur the image. If you gently squeeze the shutter, there will be less camera movement. Sometimes you need to anticipate the action in order to correctly time the shutter squeezing.

Even the act of breathing can affect your camera movement. When your lungs expand against your chest and arms, the movement can blur the image slightly. The best bet is to hold your breath at the time you squeeze off the shutter.

To reduce camera vibration, always look for something to lean against to brace yourself or your camera. It can be a tree, wall, ledge or even a telephone pole. Some photographers carry a small "bean bag" to cradle the camera and lens. Rest your elbows on a railing, countertop or even the back of chair to steady your camera. Sitting down for your picture taking will provide you added stability.

If you are standing and have no support, spread your legs apart slightly like a tripod to give yourself a broader base support for your camera. Bring your elbows and arms

down tight to your side instead of having them up in the air like a bird. Crouching down on one knee and bracing your elbow on your other knee for support also works in a pinch. Each of these actions will bring you a little closer to achieving a sharper image.



Tips for Using a Tripod

Most every picture you take will have improved sharpness if you use a tripod correctly. The problem is that cameras mounted on tripods don't automatically take sharp pictures. If the tripod is small and flimsy, you may be reducing the problem, but it is still there. The sturdier the tripod, the less the vibrations that will occur during exposure. Make sure to extend the tripod legs for added height rather than extending the center column of the tripod.

A cable release will help reduce movement when your camera is on the tripod. You can incur vibrations even when using a cable release with a light tripod. When making exposures from about $\frac{1}{2}$ second to 2 seconds using a cable release, the vibration of the shutter will move the camera for a very short time. If the exposure is less than 2 seconds the camera does not have time to settle down so you will still get a blurry image. Longer exposures give the camera time to settle down, so the camera vibration has little effect on the overall image. You can add a sandbag draped over the camera legs to increase stability, especially when working in windy conditions. If you are very careful, you can lean lightly on the top of the camera when using a lightweight tripod to increase stability.

As a last resort, you can be like those photographers of the 1800s and use a card or large lens cap in front of the lens. There is no tripod movement, since you don't touch the camera during an exposure. Simply place a card in front of the lens, open the shutter, remove the card, time the exposure, replace the card and close the shutter.



Above: A heavy-duty tripod kept low to the ground, and careful focusing help sharpness.

Below and right: Focusing on the main subject at a wide aperture (right) results in a fuzzy background, while focusing on the background yields a soft subject (left). Using a tripod makes it possible to stop the lens down to increase depth of field and get it all in focus (center).



depth-of-field reduction involves your subject area, then you have traded increased shutter speed sharpness for loss of depth-of-field sharpness. The trick is to balance the shutter speed and aperture so you have ample depth of field yet maintain a fast shutter speed.

Going to higher ISO films will increase your shutter speed while keeping the same aperture. If the image you are shooting includes an out-of-focus background, the apparent grain becomes larger. It now becomes debatable as to whether the increase in ISO film speed will offset the sharpness created with increased shutter speed. Again it is a balancing act and it just takes practice. Soon you will know when to increase your ISO film speed, or open up your lens to increase that shutter speed.

Using Higher Shutter Speeds

The shutter speed on a camera serves two functions. Alone it controls the action in a scene and in combination with the aperture, it controls exposure. The faster the shutter speed, the more the action is stopped, and the sharper the image. Shutter speeds can be increased two ways. If you open the aperture control to a larger opening, you let more light through the lens. In order to achieve an accurate exposure, you must increase the shutter speed to compensate. The other way to increase your shutter speed is to use a faster film. Again you must increase your shutter speed to achieve an accurate exposure.

There is a downside to using either of these methods for increasing your shutter speed. With a wider aperture, the depth of field is reduced and the areas in front and behind the subject become less sharp. If this

Fine-Grain Film

When you have mastered minimizing camera movement, you can use a slower film to achieve a finer grain pattern. Most film manufacturers today make some nice fine-grain films that can resolve very fine detail. When you use these films, the apparent sharpness increases. This is especially true with macro nature shots, or any type of image that includes a lot of fine detail.

Often this type of photography will require an electronic flash to add ample light to the scene. Flash has the added advantage of a higher speed, from around $\frac{1}{1000}$ at full power to around $\frac{1}{20,000}$ at low power (or at the minimum distance, in auto mode). This high speed will insure that there is no movement during the exposure by stopping the action, thus creating a much sharper image. This is assuming that you focus the camera on the subject properly.



Above: A feather from our "test bird" (Opie the Macaw) makes a great sharpness-test subject.

Lens Quality

Today the quality of lenses is superior, but even so, some still lose a small degree of sharpness at the edge of the picture when using a wide aperture. It's true that the wider aperture allows higher shutter speeds, but the loss of image quality may offset the gain in sharpness that you achieved using a higher shutter speed. There are some expensive fast lenses that are designed to overcome this problem. If you want the best edge sharpness, you may have to pay a little more for the privilege.

On the flip side of the problem, if you stop a lens all the way down to get maximum depth of field, you may find the overall image sharpness start to decrease. It's true that depth of field will increase, but overall sharpness will decrease due to diffraction. Most lenses are designed to have their sharpest point at about two stops down from wide open. The exceptions are the 50mm and 100mm macro lenses that are designed to be sharpest at about two stops from the smallest aperture.

Telephoto lenses present another problem. A general



Left: Here's a steady way to hand-hold a long lens.

rule of thumb when hand holding a camera and lens is to use shutter speeds at least the reciprocal of the focal length of the lens. For example, a 500mm lens works best at $\frac{1}{500}$ second or faster. This is why telephoto lenses are good candidates for tripods and why you see so many used at sporting events.

Another sharpness problem occurs because of the air space between your lens and your subject. On a cool day there is very little problem, but on hot days the heat rises from the ground and distorts the air space, resulting in softer images.

Lighting

As the lighting ratio increases, so does the apparent image sharpness. The subject is not really any sharper, it just appears to be sharper when the contrast range is increased. You can accomplish this increased contrast range by using studio lights, electronic flash, or selecting the time of day that you photograph your subject in sunlight. The fact that it is only apparent sharpness does not really matter, as long as your photo looks better. A problem occurs if there is too much scene contrast, as it can reduce the amount of shadow detail, so again it is a juggling act.



Left: Macro work magnifies even slight camera or subject movement. Below: Using flash freezes motion and increases depth of field.



Lens Hoods and Filters

When you shoot at an angle to the sun where it strikes the front element of your lens, it will cause lens flare which can reduce the image quality. The use of a lens hood can reduce this problem, but some flare can still occur, lens hood or not. A simple solution is to block the sun by placing your hand in the air between the sun and your lens. It may look a little strange, but it works.

Filters can do some great things for images, but if they are not free of dust and scratches, you may find your image quality is reduced. If you suspect a lens is not as sharp as you hoped, check to make sure that a dirty or sub-par filter is not the problem.

Left: Using a tripod and fine-grain film made this photo as sharp as the needles on its spiny subject.



The Bottom Line on Sharpness

As you can see, getting sharp images isn't as easy as it sounds. Accurate focus is only a small part of the solution. It requires a good working knowledge of photographic basics and plenty of practice. Take a little extra time and effort to use a tripod, or at least brace yourself before squeezing that shutter, and consider the things cited here, and you will find yourself putting fewer images in the round file. ■