An Extension to
The Textbook of Digital Photography

Tripods

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When you take a photo, there is almost always some camera or subject movement that blurs the image. Even under the best of circumstances, this happens ever so slightly and the blur shows in large prints, if not in small ones. To reduce blur caused by camera movement, especially when photographing in dim light, using a long lens, photographing close up, or when planning to make large prints, you have to support the camera so it moves as little as possible. In some cases, a porch railing or tree branch helps. In other cases, you need a tripod or monopod.

There seems to be an endless number of tripods and the familiar aluminum and magnesium tripods are now accompanied by carbon fiber models that are both lighter and more expensive. These tripods are up to 30% lighter than equivalent metal versions yet have the same strength, stability and durability. The tubes are made of long carbon fibers impregnated with epoxy resin under high pressure and temperature. The additional cost of carbon fiber is justifiable if you carry the tripod long distances or photograph in extremely cold temperatures where carbon fiber won’t feel as cold.

Most professionals use tripods from Gitzo or Bogen/Manfrotto but there are other quality manufacturers, most with lower prices. There are hundreds of tripod models and even more accessories so even a fairly large camera store stocks only a limited selection of what’s available. Smaller stores and large chain stores tend to stock only a few inexpensive, and often cheaply made, tripods because that’s what most consumers want. For quality tripods you almost always have to find a large store in a metropolitan area or shop over the Internet at a site such as B & H Photo Video. The dilemma is that to evaluate a tripod you really need to get your hands on it to see how well it works. Buying on-line based solely on a photo and description may not be wise.

When choosing a tripod, there are 3 heights that you should consider; the maximum and minimum working heights, and the collapsed height or carrying length. You’ll find over time that it’s easier to work with a tripod that’s tall enough to position the camera at eye level so you don’t have to bend over.

Tripod legs are tubes with a number of telescopic sections that can be extended or collapsed after unlocking them. The mechanisms used to lock leg sections in place seem endless and ever changing. Bogen/Manfrotto tripods use flip locks and Gitzo uses threaded collars. One small problem with the Gitzo approach is that you have to lock and unlock sections in the right order. You can’t unlock or lock lower sections unless those above them are locked first. With Bogen/Manfrotto locks, you can lock and unlock sections in any order, but the locks can require quite a bit of finger strength to open. On some tripods, the legs can only be set at a limited number or range of angles. On others they can be positioned and locked at almost any angle. This is especially useful when shooting on uneven surfaces as you might be in the woods. Instead of changing leg lengths to level the camera, you can change the angle of one or more legs. Some even have a way to lock the legs in any position.

The number of sections in each leg is another consideration. More sections make a tripod of a given height shorter when collapsed, making it easier to pack or store. However, more sections means more locks to undo and redo when raising or lowering the tripod. Let’s talk a little about extending the
center column and the maximum height does not include extending the
center column because doing so is really for fine tuning because raising it too
high can introduce vibrations. All other things being equal, the only reason to
get a shorter tripod is because it’s lighter and smaller.

Legs usually end in rubber feet, but on some tripods, you can extrude a sharp
spike for outdoor use, or add adapters with spikes, suction cups, or even big
foot adapters for soft ground.

Most tripods have a center column topped by a platform on which you mount
the camera or a tripod head (discussed shortly). Typically you raise or lower
a center column by loosening a lock of some kind and pushing the column
up or down, then relocking it. A few tripods use geared center columns that
you raise or lower with a crank. These add weight, and although popular with
filmmakers, I’m not aware of anyone who uses them in still photography.

The standard tripod has some limitations when trying to photograph wild-
flowers and other subjects close to the ground, or when you want to shoot
from a low perspective. However, solutions have been devised, generally by
repositioning the center column. On some tripods you can remove the center
column and invert it to place the camera closer to the ground. Other center
columns pivot or can be removed and inserted into another hole in the tripod
so they are cantilevered out parallel to the ground, or even pointed down. The
later positions are great when shooting down, as you might be when photo-
graphing wildflowers or using a tabletop setup. A shorter center column also
lets you get the tripod lower to the ground. A longer one will hit the ground
before you can get the camera low enough for some shots.

Tripods come in all sizes. A handy size to have as a second tripod is a tabletop
model. These small tripods fit in a coat pocket and can be set on a railing,
counter, or table to get a shake free shot almost anywhere.

Surveyors often use wooden tripods because of their stability and ability to
dampen vibrations. Many large format photographers prefer them for the
same reason. If nothing else these tripods are heavy. You wouldn’t want to
carry one far from the car. They are made by companies such as Brom, Reis,
and Billingham.
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**MONOPODS**

Carrying a tripod long distances can be a hassle and setting one up can be time consuming. For these reasons the monopod is a popular camera support. Like a walking stick, it has only one leg but that's enough to make a big difference in camera stability. Once the camera is mounted you can compose and shoot almost as fast as you can when just hand holding the camera. In the 19th century a version of the monopod called the chainpod was popular. It’s simply a length of chain attached to the camera’s tripod mount. You stand on the end of the chain that lays on the ground and pull the camera to add tension to the chain that dampens small tremors as you take a photo.

Not only are these light and easy to pack, you can use them where heavy foot traffic prevents you from using a more rigid monopod. (Although it doesn’t seem any are commercially available you can make one by drilling a hole in a 1/4-20 thumb screw, and attaching about 8 feet of light chain.)

With a monopod, you can aim the camera just by moving the camera/monopod unit. However, to switch from horizontal to vertical you need a lens with a collar or a ball head. There are lots of small ball heads to choose from and it helps if you also have a quick release system (discussed shortly) so you can quickly attach and detach the camera.

Closely related to a monopod are the hiking or trekking poles used by hikers for stability and safety, especially on steep slopes or slippery surfaces, while reducing pressure on the knees and other joints. Some of these poles are collapsible and have a tripod screw where you can mount a camera or even a small ball head with a quick release system. These poles have an ergonomic grip for hiking and some have an anti-shock design.

**ACCESSORIES**

When using, carrying, and shipping a tripod, there are some useful accessories to consider.

- Carrying a tripod can be a real pain—literally. After awhile it begins to wear on the shoulder, especially when crossing rough terrain. To make the job easier, you might consider a strap, tripod case, or padded sleeves for the legs. Some camera backpacks also come with straps you can use to tie the camera
Tripods

to the bag. There are also heavy duty bags available if you want to check your tripod on airline flights.

- There are many situations where you’d like the camera to be perfectly level. This is true in landscape, architectural, and panoramic photography. One way to achieve this is to use a spirit level. Some tripods have these built-in but there are separate levels that can be attached to a monopod leg or slipped into a camera's hot shoe.

- Even monopods have accessories including ball heads and supports.

Kaidan’s Bubble Level attaches to a camera’s hot shoe so you can tell when the camera is perfectly level.

Bottlecap tripods for small cameras screw into a camera’s tripod socket so you can screw it onto a bottle.
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TRIPOD HEADS

What we normally think of as a tripod, is actually a combination of parts. You’ve met the first two already—the three legs called the leg set, and a center column that you use to raise or lower the camera. This column ends at a flat platform through which projects a threaded screw you use to mount a camera or tripod head. Tripods and the things you mount on them occasionally have different connectors; a 1/4–20 or 3/8–16 (the fraction is the diameter and the whole number is the number of threads per inch). If the threaded screw or socket is slightly smaller than a normal wooden pencil, it’s 1/4” thread, and if it’s slightly larger, it’s 3/8”. A bushing can be used to reduce a 3/8–16 socket so it accepts a 1/4–20 screw.

It’s time consuming to mount and unmount a camera using the tripods threaded screw. Instead, most photographers use this screw to mount a tripod head. There are two basic kinds of heads—the traditional 3-way pan tilt head and the ball head.

3-WAY PAN/TILT HEADS

The classic tripod head is called a 3-way pan/tilt head. You can rotate (pan) it, tip it forward and back, and tilt it side to side. Movement on each axis is separately controlled so this kind of head is ideal for architecture and other work where the placement of horizontal and vertical elements is critical. To move and lock it in each of these three axis, you use a separate twist handle. These protruding handles cause problems when hiking and packing and take time to set when photographing.

BALL HEADS

Because of the size, weight, and complexity of 3-way heads, many photographers prefer a ball head. Not only are ball heads lighter and smaller, they are faster to use. You can compose an image with one motion and lock the camera with a single control. This makes them ideal for nature photography. It’s also easier to carry and backpack a tripod with a lighter ball head because it doesn’t weigh as much or have the brush-snagging protruding handles that a pan-tilt head has.
One thing is sure, ball heads are things of beauty. Beautifully machined and finished, they have the quality of Swiss clocks. They are also expensive—$250-400 and then you still have to buy quick release plates which aren’t inexpensive. I hesitated for years because of the price, but finally bought three ball heads to compare. I have been converted! It’s hard to go wrong since any ball head is better than a 3-way head for most photography. They are so much faster and easier to use, that they should be considered the head of choice unless you are doing specialty photography such as panoramas or architecture photos where leveling and locking one axis separately from the others is a real advantage. One situation in which ball heads really shine is when paired with a tripod that lets you position the center column at any angle. Here the 3-way head can be not only frustrating to use, but its more limited range of movements prevents some camera angles.

A ball head has a spherical or slightly elliptical ball that moves freely in a housing until you lock it to keep it from moving. Protruding from the top part of the ball is a shaft that holds the quick release clamp or platform. The housing has a slot into which you can drop the shaft when switching the camera to the vertical position.

The Arca Swiss ball head uses a ball that’s slightly elliptical, reducing the need to continually adjust tension to keep the camera in position as you move it off-center. For example, if you’ve adjusted the tension with the camera horizontal, and then point it down, the tension holding it in place automatically increases so the lens doesn’t crash down on the tripod. This prevents the crushed fingers you sometimes get with a 3-way head when one control isn’t locked fully. Other ball heads use a friction adjust knob. Ideally you can adjust tension so you can move the camera to compose images, but when you release it, it won’t move on its own. You can also lock ball heads so they don’t move at all.

Ball heads come in two basic forms—with or without a panning bed and with or without a quick release clamp:

- A panning head allows you to pan the camera in a 360 degree circle as you would for a panorama or when following a moving subject. This panning bed or rotational table, located at the base of the head, is separate from the ball and can even turn when the ball is locked. The one situation where this feature is essential is when you want to make left or right adjustments when the camera is turned in the vertical position using the ball head’s drop notch. Without the panning bed, you have to loosen and rotate the tripod’s center column to perform left-right adjustments. An index scale lets you rotate the camera in degrees. This is especially useful when shooting overlapping images to be stitched together into a panorama.
A quick-release (QR) clamp, often built in, lets you quickly attach and unattach the camera from the head and tripod.

On the side of the housing is a vertical slot, called the drop slot, that lets you rotate the ball so the camera is vertical on the side of the ball head. If you get an L-bracket for the camera, or mount a lens with a lens collar, you don’t need to use this slot. Using it with a heavy lens puts a lot of weight off-center.

When using a pocket camera, monopod, table top tripod, or car window mount, a big expensive ball head may be too much. In these situations there are many small, even miniature ball heads to choose from.

Ball heads are manufactured by a number of companies. You’ll find experienced people testifying to the superiority of each brand and model so it’s more like the endless Mac PC wars.

Other heads

In some circumstances, you may want to look into non-traditional head designs. Some of them are quite unique.

- Bogen makes a grip action ball head that makes it possible to compose the image and lock the ball with one hand. It operates something like a dead-man’s brake on a train. When you release the lever, the ball locks. There is no way that it can get away from you inadvertently.

- Novoflex’s MagicBall ball heads have a fixed ball and a moveable housing, exactly the reverse of traditional ball heads. This design lets you move the camera to a vertical position at any point on the head since there is no need for a vertical drop slot. An accessory 360° rotating panorama base with spirit
QUICK RELEASE SYSTEMS

If you have ever tried to mount your camera directly to a tripod or tripod head using the screw, you know how tiresome it can get after just a few times. To make mounting and unmounting the camera fast and easy, you need a two-part quick release (QR) system—clamps and plates. Some tripod heads have clamps built into the head, and for others you can add one. You then attach plates to your camera and heavier lenses that have lens collars on them. To mount the camera on the tripod you just slip the plate into the clamp and lock it in place. To remove the camera, you just unlock the clamp and pull the camera out. It’s fast and secure.

THE BOGEN/ MANFROTTO SYSTEM

The Bogen/Manfrotto quick release system uses a lever operated clamp on the tripod and hexagonal plates on cameras and lenses. To mount the camera, you press the lever to open a cam-like lock. You then slide the plate into the clamp’s front flanges and press it down in back to push down a pin that closes the cam to lock the plate into position. The system is great with only one drawback. It is a one size fits all solution and some people feel you should be able to use a big plate for a big item and a small plate for a small item. Lots of people use this system and like it. I’ve used it for years. The only thing to be careful of is correctly inserting the plate into the front flanges that hold it in. It is possible to not seat the plate correctly and you risk losing your camera/lens combination. Once locked in, things are very secure.

THE ARCA-SWISS SYSTEM

The Arca-Swiss quick release system uses a tripod channel with “jaws” that can be closed and tightened with the turn of a screw. The channel accepts camera or lens mounted plates that slide into the jaws to be locked in place. No 3-way head that I’m aware of has an integral quick release system. However, most ball heads do, and you can often add one to any head that doesn’t have one built in (although it adds a connection that can rotate on you). The advantage of mounting a separate QR system is that you are not locked in. You can always use another quick release system without changing the ball head.

Head mounted clamps and camera or lens mounted plates are almost always Arca-Swiss compatible. There are some generic plates which work well with point and shoot cameras, but most of those designed for digital SLRs are designed for specific cameras. The reason for this is that no matter how much you tighten a generic QR plate to a camera body, the combined weight of the camera and lens can cause it to rotate, especially when the camera is in a vertical position and the lens is heavy.

Camera specific QR plates have an anti-twist flange that prevents the camera from rotating on the plate. The spacing and length of this flange and mounting screw is unique to each camera. Since these plates are mounted semi-permanently to the bottom of the camera they must be designed so you can change batteries without removing the plate. The result is a profusion of designs, the need for multiple plates for different lenses and cameras, and sky-high prices.

Arca-Swiss style clamps usually have an open channel design. You can slide a plate in either end of the clamp and out the other (bidirectional). On some
clamps, a plate stopper screw, or other stop device keeps the camera or lens plate from sliding through (unidirectional). Some plates also have a safety stop that does the same thing. These unidirectional clamps and plates make the attachment somewhat more certain, but there are benefits to the bidirectional clamps and plates. Not only can you mount the camera from either end, you can also slide a long plate back and forth in the channel to adjust the camera-subject distance in close-up photography. This reduces the need to move the tripod/camera. Some plates have been designed especially long for this very purpose. The ability to slide a long plate back and forth is also beneficial when it’s mounted on a long lens. You can move the camera/lens combo back and forth to position it over the center of gravity. This makes it less prone to tip from a too heavy off-center load.

Most ball heads have a 90 degree drop-slot that you use when positioning the camera in a vertical position. The problem is that this doesn’t keep the weight of the camera centered over the tripod. For this reason an “L” shaped plate has been developed. With one of these mounted on the camera, you actually have two plates—one for horizontal shots and one for verticals. To change orientations, just remove the current plate from the clamp, turn the camera 90 degrees and insert the other plate. Not only does this keep the camera weight centered, it also makes it much easier to switch between landscape and portrait orientations.
OTHER CAMERA SUPPORTS

There are lots of ways to support a camera ranging from trees and porch railing to gimbaled mounts. In this section we look at some of the ones that have found favor, especially with nature photographers.

GIMBALED MOUNTS

A gimbaled head lets you mount a large and heavy camera/lens combination so it’s perfectly balanced on its center of gravity. With the camera suspended in this position, it feels weightless as you quickly elevate or pan the camera to compose an image, or smoothly follow a moving subject such as a bird.

The Wimberly Sidekick slides into your ball head’s clamp to convert it into a gimbaled head. The Sidekick’s elevated tilt mechanism and side mounted quick release allow the lens to rotate around its center of gravity. This provides the same action and ease of use found in the Wimberly Head but is smaller, lighter, and less expensive. Remove the Sidekick and your ball head is ready to use with smaller lenses.

BEANBAGS

If you don’t want the hassle of carrying and setting up a tripod, you can often get away with just a beanbag. When rested on a car hood or window, a fence or railing, a tree branch, or even on the ground, they give shake-free support. There are various models, filled with an odd assortment of things. Kinesis Photo Gear makes a beanbag called the SafariSack™ bean bag and NPC makes Steadybags. Some come filled with plastic beads or even buckwheat hulls. Some are designed to be carried empty and filled with sand, rocks, or water only when needed. This really lightens the load.

WINDOW MOUNTS

If you are enjoy drive-in style photography, you might want to consider a car window mount. Many birders use these because the car acts as a blind and birds approach closer than they will if you stand outside the car where they can see you. Most clamp onto a partly lowered window and support a ball head or quick release system. They are made by Kirk, Bogen, Bushnell, Hakuba, Swift, and others.

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Suction Mounts
If you ever need to mount a camera on a smooth surface, you can do so with a suction mount. I’d be careful when using one in a vertical position. If the sucker ever let go, it might be a long drop to the floor. These are made by Bogen, Matthews, and Cullman. More expensive models use a pump to increase the vacuum so the connection is more secure.

Clamps
If you don’t have a tripod with you, a clamp might be all you need to hold your camera steady. These come in various sizes and shapes and are made by ClamperPod, Bogen, Hi Sierra, and Sunpack.

Focusing Rails
A focusing rail lets you move the camera back and forth in macro photography to make fine adjustments to the camera-subject distance. This is a lot easier and faster than trying to make the adjustments by moving the tripod. Many of these devices are geared so turning a knob makes very small movements for precision focusing. Focusing rails are made by a number of companies including Kirk, Cullman, Bogen, and Really Right Stuff.

Other
There are some camera supports that are so unique they are hard to classify. Here are just some of those that we’ve run across.

• The Cullman Touring Set includes a mini-tripod with a removable ball head, a woodscrew that screws into beams, fence posts, and tree stumps (never into live trees), a clamp for mounting to round, square, or irregularly shaped objects, such as tree limbs or fence posts, a ground spike to push into the ground, and a suction mount for use with any smooth surface such as a car hood or window.

• The Monster pod clings to any surface.

Subject Stabilizers
It doesn’t help to have a rock steady camera when the subject is blowing in the wind. When photographing wildflowers, even a very light breeze will sway flowers at the end of long stalks. You can carry thin stakes and twist ties to secure a plant out of the image area to reduce the movement. The Wimberly Plamp also holds plants steady in the breeze. One end clamps onto the tripod leg and the other to the plant stem.

Tips
When using a tripod, there are a few things you can do to increase sharpness and even safety.

• Tighten all joints and other parts. With everything locked down the tripod will be more rigid with less vibrations. This also prevents the camera from suddenly swinging or a leg collapsing, two unanticipated events that put both you and your equipment at risk.

• Use a selftimer/remote control and mirror lockup on an SLR to eliminate possible sources of vibrations.
• There are some people who believe that having a tripod with too many sections in each leg can make it less rigid and more prone to vibrations because each joint adds some weakness. Some people also believe that raising the center column all of the way causes the same problem. These things may be true when heavy view cameras or extremely long and heavy lenses are used, or when a tripod is cheaply made, but doubtful when mounting a light digital camera on a well made tripod. In normal conditions (not high winds), if the leg and center column locks are tight and the camera is tightly mounted, it’s unlikely there is noticeably more vibration in one situation than the other. Even if the tripod isn’t quite as stable, the fact that more leg sections create a shorter collapsed length may be a more important consideration if you hike or backpack.

• Many center columns are now equipped with a weight hook on which you can hang your camera bag or other weight to give additional stability to the tripod. You can even buy bags designed for this purpose that you fill with rocks or sand on the spot.

The Monsterpod is claimed to stick to any surface for 10 minutes. www.monsterpod.com.