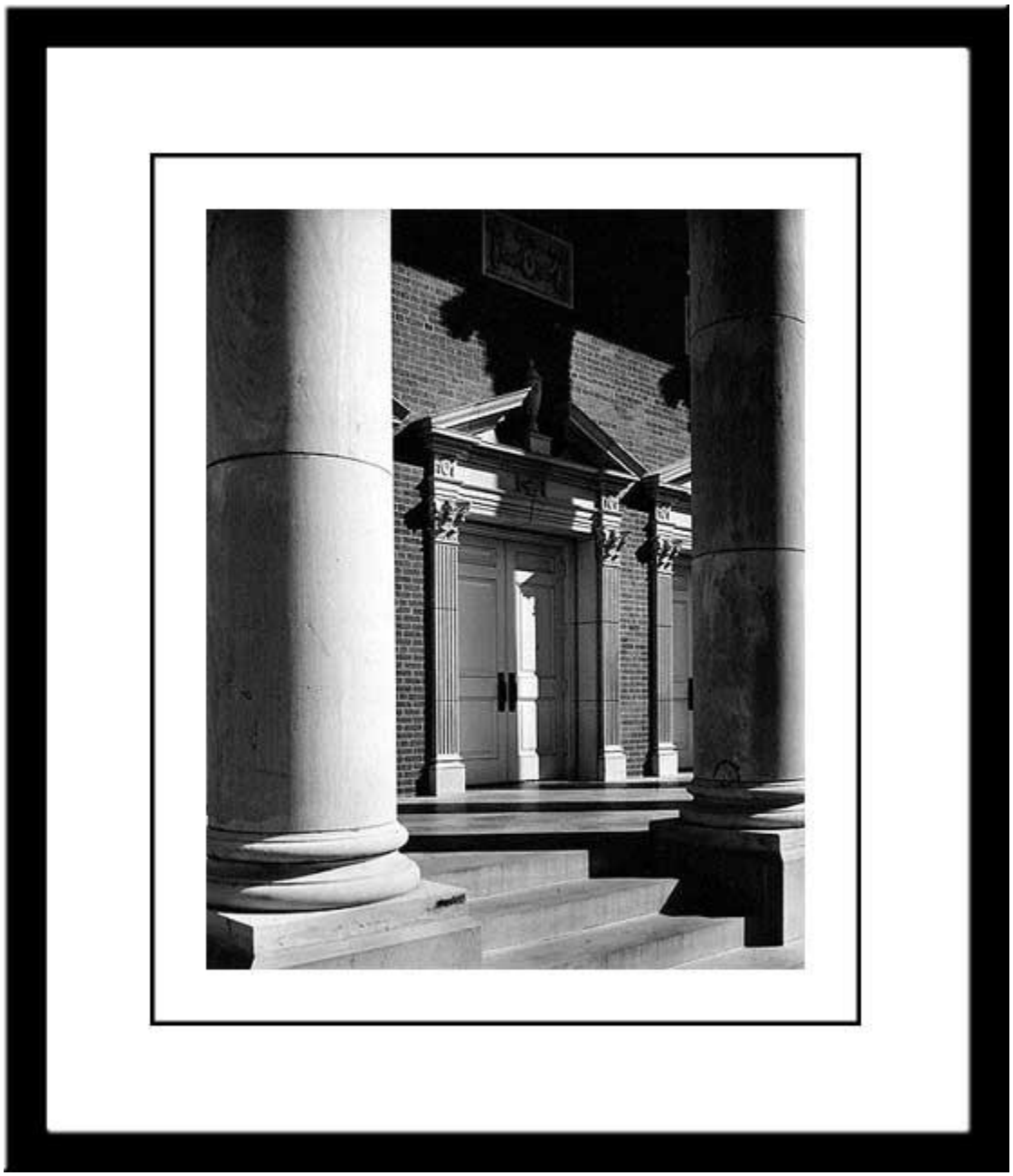
Mastering the View Camera



Jay S. McMullan

Mastering the View Camera

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Mastering the View Camera

Lesson One

Introduction to the View Camera

Mountain Stream – Southern Colorado circa – Jay McMullan

In this book, we shall begin with the very basics of the view camera and move into the more complex things that view cameras are capable of doing. Since this manual is meant to be an accompaniment to JayMc Photographics' workshops, its purpose is not to answer every question about the view camera but rather to give a good overview of the camera and how to use it. Chances are, if you are just moving into the place where you are photographing with a view camera, that you are not new to photography. Very few people in this age begin photographing with such a large, complex camera. You will see that the view camera will do some very intricate things and that it is a very involved camera but on the same hand, it is about as

basic as a camera can be. The view camera is essentially a box with a lens on the front and piece of film in the back. What sets the view camera apart from other cameras though, is that it is capable of perspective control through the movements that are possible with the camera. As we proceed, you will begin to understand what perspective is and how the different camera movements will affect it. Each movement has a specific purpose and application. For many photographers, such as architectural photographers, these controls are absolutely essential. There are 5 movements that can be made with the view camera:

- Focus
- Shift
- Rise and Fall
- Tilt
- Swing

Where some photographers may not think much about focusing their camera because the process seems so simple and straightforward. We will study each movement and its application later. With all of the movements a view camera is capable of making, focus is not always such a simple procedure.

"To obtain sharp images of objects at large distances from the camera, the film must be positioned one focal length away from the image nodal point of the lens. With lenses of conventional design, the image nodal point is normally located between the center and the back surface of the lens. The film will never be moved closer to the lens than this for focusing purposes. As the camera is moved closer to the object being photographed, the distance between the film and the lens must increase to keep the image in sharp focus. The limit of this adjustment is reached with a view camera when the lens and the camera back are at the extreme ends of the camera bed or the bellows is fully extended."[1]

The photographer must make the decision on where to focus each shot. There are times that the photographer will want everything in the photograph to be sharp and there will be times when he wants only parts of the photograph to be sharp.

In the late 19th and early 20th centuries, Pictorialism was a style of photography that

[1] Stroebel, Leslie. ***View Camera Technique***. 1st Edition. Hastings House Publishers, Inc. Library of Congress Catalog Card Number 67-16907. 1967.

was extremely popular. In Pictorialism, the photographer would purposely make his photograph in soft focus. They may also have printed their photographs in more than one color, i.e. blue or sepia toned and added brush strokes. This was an attempt by photographers to add emotion to their photographs.

Portrait photographers normally focus on the plane of the eyes. Many years ago, especially in the mid-20th century, it was very desirable for portrait photographers to focus on their subject's eyes and allow the ears and the rest of the face to fall quickly out of focus.

Because of the very nature of view camera lenses, because they are typically used with very small aperture openings, sometimes it is hard to see, on the ground glass, just how well the camera is focused. Of course, it is always recommended to focus the camera using the widest aperture the lens has available but when using a very small aperture it is a good practice (when not able to determine exact focus) to focus one third to one half of the way into a scene. Depth of field tables can be of use to the photographer too in this case.

Hyper focal Distance is an important concept for any photographer and especially a large format photographer to understand.

"The hyper focal distance is the closest distance at which a lens can be focused while keeping objects at infinity acceptably sharp. When the lens is focused at this distance, all objects at distances from half of the hyper focal distance out to infinity will be acceptably sharp."

"It is important to note that, if you focus at the hyper focal distance, your photo will be sharp from *half* that point out to infinity. So, if your hyper focal distance for a given aperture and focal length is ten feet, everything from five feet all the way until the horizon will appear sharp. Hyper focal distance is only useful when objects that are both *close* and *far away* from your lens need to be sharp. Since you are actually focusing between these objects, neither is perfectly sharp; they are both simply close enough, or as we photographers often say "acceptably sharp". So keep this in mind – when you don't have a nearby object in the scene, you can completely ignore hyper focal distance concerns."[2]

[2] ***Hyper focal Distance Explained.*** (March 5, 2017). Retrieved from https://photographylife.com/hyperfocal-distance-explained/.

Another advantage, in my opinion, of the view camera is that it uses individual sheets of film instead of roll film. Some may find this to be a disadvantage depending upon what kind of photography in which they are involved. Using individual sheets of film allows the photographer the ability to change types of film, such as black and white negative, color negative, color transparency and even different ISO rated film, with each photograph. Depending upon the amount of contrast there is in a scene, the photographer may choose to develop each sheet of film differently. He may "push" or "pull" the film depending upon the amount of contrast or lack thereof in the scene. This is not possible with roll film cameras. By using film adapters, photographers can use roll film with their view camera if they wish. The roll film adapter is put in place on the back of the view camera and can be removed at any time without ruining the film, even in the middle of a roll. Because the roll film adapter uses a smaller format than the view camera normally uses, the photograph taken on it will be cropped. Some photographers are attaching their digital cameras to the back of their view camera now also. The method of doing so may vary but some photographers are using an extension ring mounted to a lensboard which is attached to the back of the view camera. Just like with a roll film back, the image will be cropped to the size of the sensor the digital camera contains.

Most view cameras use 4x5 inch film There are even larger formats including 5x7, 8x10 all the way up to 20x24 inches and larger. The large film format yields very high quality photographs due to the low amount of magnification needed to make a large photograph.

Digital backs are available for view cameras but their prices are out of the range of most photographers. They are typically used in conjunction with a laptop computer when a photograph is made. They are not easy or convenient to use outside of the studio but I have seen some photographers that are doing landscapes with them. Due the cost and the mere fact that most large format camera owners cannot afford a digital back, we will not go into detail about them in this book.

I have always said that with view cameras you "make" photographs, you don't "take" them. Using a view camera takes patience. It takes time to set the camera up, make your perspective movements, focus and then determine the correct exposure for the type of film you are using. When the button is pushed on the shutter release cord, that moment of exposure is almost anticlimactic compared to

everything else the photographer has just done! To many view camera photographers, all of this adds up to the beauty of using the view camera.

Types of View Cameras

There are primarily three types of large format view cameras available and each is suited for a certain type of photography.

The **View Camera** (see Photo 1.1) is generally used in the studio due to the size and weight of the camera. This type of camera requires the use of a tripod or some other form of stabilizing base. It cannot be handheld due to its size and complexity. The view camera tends to have greater movements than the other two types of cameras mentioned here. For this reason, some field photographers (including myself) will put up with the weight and bulkiness and use the View Camera in the field. The standard view camera generally has a rail on which both the front and the rear standards attach. The front and rear standards can be moved along that rail to bring the camera into focus. The rails are usually long and do not make it easy to use in the field. An exception to this is the Toyo VX125. This camera has a very unique collapsing rail that retracts to about six inches in length and expands to around ten inches with optional rail extensions.

Photo 1.1 - View cameras offer perspective control that is not available on many other types of cameras. Studio models such as this camera offer maximum perspective controls without much mobility.

Photo 1.2 – The Field Camera is the choice of many large format landscape photographers. They are made of steel or wood and fold up into a tough, compact box when not being used.

The **Field Camera** (see Figure 1:2), sometimes called a flatbed camera, is usually a folding camera. The camera is folded together into a compact box that is carried to the field and then set on a tripod for use. Some of them have hand straps which allow the photographer to use them without a tripod. This type of camera is usually lighter than the View Camera and is generally preferred in the field by photographers. The field camera doesn't have the degree of movements that the View Camera has but in the field this usually does not cause a problem because there is less of a need for large

camera movements. Field Cameras are built from steel and some of them are built from wood. Some of the wood field cameras are beautiful works of art.

The **Press Camera** was widely used in years gone by. It was the standard for newspaper, sports and wedding photographers until the lighter, more versatile small and medium format cameras became available. The Press Camera could be handheld but was bulky and heavy. Used press cameras are still available at reasonable prices and make excellent field cameras for those starting out in large format photography. They were made in 4x5 and 2 1/4x3 1/4 formats.

Photo 1.3 - The Press Camera was the choice for many years for newspaper, sports and wedding photographers.

Necessary Equipment

Using the view camera requires the use of some accompanying equipment. Below is a list of items that are absolutely required for the photographer in the field.

Sturdy tripod – Because of the weight of the view camera, the tripod that you use for your 35mm or DSLR camera may not be suitable. You will need a sturdy tripod for view camera work, one that will not fall out of alignment from the weight of the camera. For the field photographer who needs the lightest equipment available since he will be packing his camera into places that may not be very accessible, it can be a hard decision on which tripod to use. Wooden tripods tend to be preferred by photographers who use wooden field cameras. Carbon fiber tripods offer weight savings but they come at increased cost over aluminum tripods. The photographer may need to come to a compromise between sturdiness, weight and price when choosing a tripod.

Handheld light meter – In the studio, a simple flash meter will be all that is needed to make photographs with the view camera. Flash meters are typically incidental type meters that are held in the scene when the studio strobes (if that is the type of studio lighting the photographer is using) are fired giving the proper aperture setting for the camera for a fixed shutter speed, typically 1/60th of a second.

The field photographer will need a good handheld meter to take with him into the

field. Many field photographers use a 1 degree spot meter. This reflected light meter allows them to zoom in on different parts of the scene they are photographing to determine the proper exposure for each photograph. Other types of meters are available and effective but they do not give the photographer the flexibility of the spot meter.

Film holders – Film for the view camera must be loaded, in complete darkness, into the film holders. Each film holder holds two sheets of film, one on each side. The film is slid into position in the slide holder and a dark slide covers the film to keep light from exposing the film until the photographer is ready to make his exposure. Film holders are made from aluminum or plastic. It is a good idea, especially for the field photographer, to have several film holders so that he does not have to unload and reload film in the field.

Dark cloth – The dark cloth or focusing cloth is placed around the view camera and covers the rear ground glass of the camera while the photographer is viewing the scene and focusing the camera. This allows the photographer to view the image of the scene being photographed on the ground glass of the camera more clearly by blocking out stray light. If the photographer did not use the dark cloth it would be very difficult to see the image on the ground glass due to the outside light interfering with his vision. The dark cloth is usually a black cloth with Velcro on the sides so it can be fastened around the camera. Some dark cloths are black on the inside and white on the outside so that heat is reflected and field photographer doesn't get too hot while his head is under the cloth while photographing outdoors.

Magnifier – Commonly called a loupe, the magnifier is used to help you focus the view camera. These are critical to assure sharp focus. The photographer must be careful not to use a magnifier with too much magnification. If he does, the grain of the ground glass may be magnified to such an extent to conflict with the magnification of the image. Usually a 4x to 8x loupe is sufficient for viewing. The loupe is placed against the ground glass so the photographer can see when the focus is sharp.

Shutter release cord – The lenses used with view cameras require the use of a shutter release cord. They do not have a shutter button like small and medium format cameras. I have always found that it is a good idea to carry more than one shutter release cord with me. They have a way of getting yanked off the lens and

that destroys the threaded ends on them. Then they will not stay on the lens.

Optional Equipment

Anti-static brush - Lenses seem to collect a lot of dust, especially if you are shooting in the field. Anti-static brushes keep the lens clean and keep your photos sharp. You should also brush off film holders before loading new sheets of film.

Lens cleaning tissue or cloth – Sometimes a brush will not remove everything from the surface of the lens. In this case you need lens cleaning tissues for a soft cloth designed for being used on a lens. Use the tissues and cloth gently to avoid scratching the surface of your lens.

Filters – Filters can greatly enhance a photograph. There are many different types of filters which are available and they will be discussed later. It is good practice to use a UV (ultra-violet) filter over your lens for protection.

Flashlight – When shooting at night, it is very important to have a light to be able to see your equipment. Small flashlights can be carried in a shirt pocket and put out enough light to see what you are doing at night. The flashlight will also help you get through dark trails at night.

Small tape measure – When shooting close-ups with a view camera a simple formula can be used to determine the correct exposure compensation. This will be covered in Lesson 8, "Shooting Close-ups." An exposure compensating tool such as QuickDisc, can be used to quickly and easily determine exposure compensation when shooting close-ups with a view camera. QuickDisc is available for free on the Internet at http://www.salzgeber.at.

Film changing bag or tent – If you are photographing outdoors and you run out of film, you may need to unload film holders and reload more film right there without the aid of a darkroom. During the daytime and many times at night, this is impossible without complete darkness. Standard film changing bags have a compartment for the film holders and the film and then there are two openings for the photographer to place his hands and arms into. These openings are secured around the arms with elastic inside of the sleeves. There are also film changing dome tents. The tents seem to offer more room which can be a huge advantage

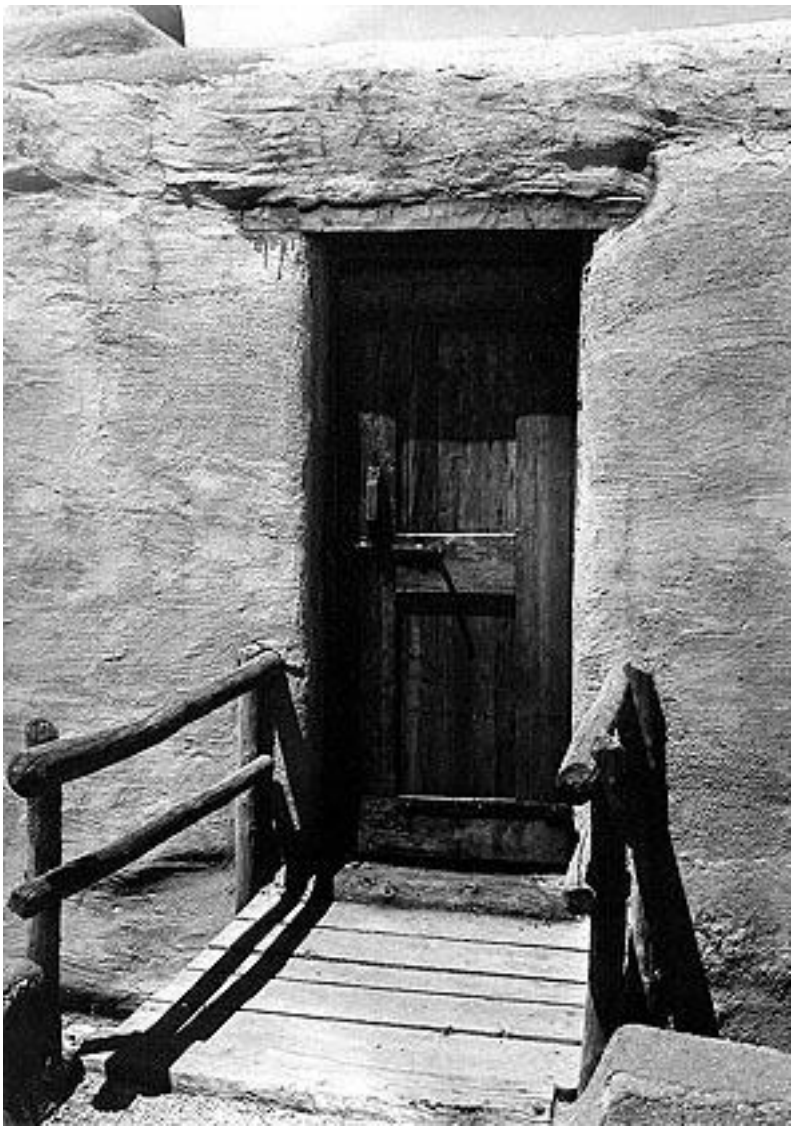
when loading film in the field. Both types of changing bags can be folded up compactly and carried with the photographer to the field. Be sure to carry one or older film boxes in which to store your film if you must change film in the field.

Spirit level – Most view cameras have spirit levels built into the camera. The level is used when setting up the camera to make sure it is level. It is also a good thing to level your tripod before placing the camera on it. If your camera and/or tripod do not have built in spirit levels, small ones can be purchased inexpensively at hardware stores and Harbor Freight.

18% gray card – Some photographers carry an 18% gray card with them into the field. The gray card can be used to easily determine the exposure of a scene. A good field photographer should learn to use the Zone System to understand how to properly expose a scene and how to correctly use the gray card when it is needed.

Lens wraps – These wraps are made of thick, soft material. They are wrapped around your lens, usually while attached to the lens board. Velcro is used to keep the wrap fastened around the lens.

Mastering the View Camera
Lesson Two
Film Choices and Loading Film Holders



Door – Bent's Old Fort National Monument – LaJunta, Colorado circa 1993 – Jay S. McMullan

Surprisingly, in the age of digital imaging, there are still good choices for sheet film. There used to be many more types of film, color and black and white, negative and

transparency but for the professional photographer there are still many good choices in black and white, E6 transparency film and C-41 color negative film. Polaroid made their regular film plus their black and white positive/negative film. Unfortunately, Polaroid no longer makes large format film. Using a sheet of Polaroid film helped the photographer determine his composition and exposure quickly and easily.

Kodak, Fuji and Ilford are still manufacturing sheet film. At the time of this writing, black and white positive/negative film is back in production under the brand of New 55.

Many photographers are developing their negatives and transparencies and then scanning them into high quality digital images in a kind of hybrid analog/digital mix. Much of the processing and manipulation of the final photographic image that used to be done in the darkroom is now done with Photoshop. In fact, now days it is difficult to find a digital color image that is not a "false color" image. I believe Photoshop has been the biggest thing to ever happen to photography. I can remember seeing some amazing things done with Photoshop as far back as the early 90's, before I ever thought I would ever switch to digital imaging. In Lesson 9, "Scanning Negatives and Transparencies," we will talk more about how to get high quality scans of your images.

Ansel Adams developed the Zone System for black and white photography. Using the Zone System, a photographer will "visualize" a scene and then determine the correct exposure when the photograph is taken. Then, in order to expand or contract the amount of contrast in the finished photo, the photographer will manipulate the development time of the negative. All of that combined will eventually turn out in a finished photograph that expresses what the photographer visualizes when he takes the photograph. Let me encourage you to find a copy of "The Negative[3]" by Ansel Adams. It is no longer in print but can be found in libraries and sometimes in used bookstores. Adams wrote the book on how to properly expose black and white film. If you shoot black and white this information is absolutely essential to you unless you want to shoot by trial and error. With the cost of film and chemistry and the time it takes to process your film, it will pay to

[3]Adams, Ansel. ***The Negative***. 10th Edition. Trustees of the Ansel Adams Publishing Rights Trust, 1989

learn the Zone System!

How to Load Sheet Film

Figure 1.1 - Sheet film has identifying notches cut into the sides of the film. Make sure to keep the notches to the bottom right (as you look at the back of the camera). As you grasp the film in total darkness, locate the notches with your finger.

Loading sheet film is completely different than loading roll film. Sheet film holders are required for the film to rest in. Each film holder has two sides and they will hold one sheet of film on each side. There is a "dark slide" on each side of the holder. It covers the film and keeps it from being exposed until the photographer removes it and takes the photograph.

Sheet film has identifying marks on one of the narrower sides. Each type of film has its own unique identifying notches which are marked on the back of the manufacturer's film container. The envelopes and boxes that sheet film comes in will show what each identifying mark looks like on the label. When loading sheet film, turn the film until, using your index finger on your right hand, you feel the notches that are cut into the film. This will be on the bottom, right hand side of the film when the film is in the proper position to be loaded into the film holder. Always clean film holders thoroughly with compressed air and an anti-static brush before loading film. Have the film holder open to the right and slide the film to the left, into the film holder. Replace the dark slide over the film. Each dark slide has a strip toward the side that is black on one side and white on the other side. Some are black on one side and metal colored (silver) on the other. I like to place the dark slide on the film holder when the film has not yet

Photo 2.1 – On the back of film boxes and envelopes is a drawing that shows the identifying notches are cut in the film. You see it just below the numbers "4106" on this box of film. Each type of film has its own specific markings.

been exposed, where the white strip will show. After I expose a sheet of film, when I replace the dark slide, I flip it over to where the black strip shows. That way, I always know which sheet of film has been exposed and which hasn't. If you have never loaded film, take an unexposed sheet of film and practice loading a film holder with the lights on.

I number each film holder starting with number one and I mark each side with an A or a B. I make a note of what kind of film is in each holder if I am using different kinds of film. For instance, I may have color transparency film in some holders and black and white negative film in others. After exposing the film, back in the dark room, I remove the film from the holders in total darkness and keep each type of film separate from the other. If you forget which film is which, you can feel the notches to determine what kind of film it is. If it is still too difficult to tell, take a blank sheet of paper and trace the notch with a pen or pencil on that paper in total darkness. Once the film is put back into a dark spot, turn the light on and compare the traced notch with the identifying mark on the sheet film envelope or box.

Warning!

When handling film it MUST be in total darkness, even black and white film. Unless you are using orthochromatic film, all the black and white and color film you will be using is panchromatic. That means it is sensitive to all the colors in the visible spectrum, including red. Using a red safelight will destroy your film!

Mastering the View Camera
Lesson Three
Setting Up and Making Exposures with the View Camera

Cathedral of the Madeleine – Salt Lake City, Utah circa 2000 – Jay S. McMullan

Setting up the view camera - When you have determined where you want to place your camera, set up your tripod and level it with a spirit level if it is so equipped. View cameras are equipped with a tripod mounting hole. The tripod can be screwed

into the bottom of the view camera or a quick release mount can be used to make the mounting and dismounting much quicker and easier. Using spirit levels on the camera or a hand held spirit level, level the camera and tripod. Unfold the camera and put the lens in place if it is not already. Now you must determine if you want to shoot the scene vertically or horizontally. Composition is as important to a successful photograph as the right exposure. Some cameras have revolving backs. If yours does not, you will need to remove the back, turn it 90 degrees and replace it to change the format. The next step is to place the dark cloth on the camera so you can see the ground glass to focus the image. I use Velcro on my dark cloth to fasten them tightly around the camera. Once the dark cloth is in place you will need to set your lens to the widest aperture (lowest *f* stop number) it has and open the shutter. If you have an older lens that does not have a way to open the shutter, set the lens for a time exposure and open it that way. Look through the ground glass with the dark cloth keeping out all the light possible. It may take a few seconds for your eyes to adjust to the darkness. You will see the image upside down in the in the glass.

Focusing – Begin by moving the front and rear standards close enough together or far enough apart where the camera is close to being focused. Once you have done that, focus with the rear standard on the camera. If you turn the focusing knob all the way and the image is still not focused, you may need to also use the focusing knob on the front standard to bring the image into focus.

Warning!

When using a wide angle lens, the back of the lens, when focused, may be very close to the ground glass. Start by allowing the back of the lens to lightly touch the ground glass by moving the front and rear standards together, then back the lens off with the focusing knobs until the scene comes into focus.

Some telephoto lenses may require the use of a recessed lensboard especially if the bellows on the camera will not extend far enough to focus at infinity. In the mid-20th century, photographers referred to the focal length of their lenses in inches instead of millimeters. A 150mm lens is standard for a 4x5 view camera. In years past it would have been called a 6 inch lens. A 300mm telephoto lens would be a 12 inch lens, a 75mm lens a 3 inch lens. When the view camera is focused at infinity, the distance between the nodal point of the lens and the film plane will be

the same distance as the focal length of the lens you are using.

When the image looks focused, use your focusing loupe to make absolutely sure the image is in focus. Focus on the main subject in the scene. The foreground may very well be out of focus when the main subject is in focus. This is something we will take care of using the perspective controls and the aperture on the camera lens.

Photo 3.1 - The slow shutter speed in this photo can be detected by looking at how the wind was blowing the wind sock/flag on both sides of the entry way.

It may take several times to get the focus absolutely correct.

Exposing the image – At this point in this workbook, I am purposely leaving the step of using perspective control and how to determine exposure of a scene out. How to use perspective controls on the view camera (see Lesson Six “View Camera

Movements") and calculating the exposure will be discussed in much more detail.

Photo 3.2 - The image will appear upside down on the ground glass. Use a loupe to make fine focus adjustments on the camera.

Most people using a view camera will be more inclined to determine the proper exposure by choosing the correct aperture rather than the shutter speed. Years ago, when camera manufacturers began to automate 35mm cameras, some manufacturers like Canon began making shutter speed program mode cameras, like the Canon AE-1 that would also shoot manually. Olympus, on the other hand, with their OM2 allowed the photographer to shoot manually or with aperture preferred program mode. Then the Canon A-1 camera could shoot with a choice of manual, aperture preferred or shutter speed preferred priority. This was groundbreaking technology! In our case, with the view camera, we must make the decision as to which way we want to photograph each scene. The only times I am overly concerned with using the shutter speed as priority is if there is a strong wind and there is something in the scene that will be blurred if I use too slow a shutter speed. In Photo 1.1, you will see the small wind sock was blowing in the wind. Most of the time, I prefer to use a long depth of field and a slow shutter speed. In this case I had to make a decision if I wanted to let the wind sock blur and retain the strong depth of field or if I wanted to sacrifice some of the depth of field to keep the ornament sharp in the photograph. You can see from the blurred wind sock that I chose the depth of field. It was important to me that all the details of the building be very sharp. Depth of field preview can be viewed by stopping down the lens as you look through the ground glass on your camera.

Your shutter release cord should have already been attached before focusing the camera. Make sure there is nothing in the way of the camera lens and that there is no glare from the sun hitting the lens. Some camera manufacturers make lens shades that attach to the front of the camera. Many of the lens shades have a bellows just like the camera. Various kinds of filters can be used with the lens shade too. When everything is ready for the exposure, take your lens off focus mode, carefully slide the film holder in place, making sure it fits snugly so that no light can get into the camera. Cock the shutter, slide the dark slide out of the film holder and click the shutter release button. Replace the dark slide into the film holder and your

exposure is complete.

Photo 3.3 - Photographs showing the amount of bellows extension needed on lenses of different focal lengths. The photo to the left is a 75mm lens. The lens in the middle is a normal 150mm lens. The photo on the right is a 240mm telephoto lens.

Mastering the View Camera

Lesson Four

How the View Camera Works

Christus Consolator by Bertel Thorvaldsen – Temple Square – Salt Lake City, Utah – Jay S. McMullan

View cameras have changed very little in the last century. In fact, if a photographer

from 130 years ago was able to travel to the present time in some sort of time machine, it is my firm belief that he would be able to take up the use of a modern day view camera in no time at all. I do believe that he would be amazed that he did not have to coat glass plates with chemicals and he would be astonished at such modern marvels as our current day light meters and electronic flash units.

There are basically seven essential parts to a view camera:

1. **Front Standard** – Holds the lensboard and the attached lens. Camera focus and other movements can be made with the front standard.
2. **Lensboard** – The lensboard is what the lens attaches to, then it is attached to the front standard by a quick release mechanism allowing the photographer to quickly change lenses. Most lensboards are flat but there are recessed lensboards available for some camera models. Recessed lensboards normally are used for wide angle lenses when, without it, the front and rear standards cannot come close enough to allow the camera to come into focus. A recessed lensboard can also be used with telephoto lens so there is not as much bellows extension. This is a good thing if the bellows won't extend enough to take a telephoto lens.
3. **Bellows** – The bellows is a pleated piece of material that allows the front and rear standards of the camera to move freely in the many movements that the view camera may be required to be positioned in. This includes bellows extension, rise, fall, shift, tilt, etc. Older camera's bellows were made of leather. Newer models of cameras use cloth, vinyl and sometimes a mixture of both. Many times, when a wide angle lens is used on a view camera, the front and rear standards are placed very close to each other. This causes the bellows to bind up when moderate to extreme camera movements must be made. For this reason, many camera manufacturers offer the option of using a bag bellows on their cameras. The bag bellows does not have any pleating like the normal bellows. It is simply a bag that fits in place of the standard bellows and gives the camera much more freedom of movement.
4. **Rear Standard** – Unlike the front standard, the rear standard holds the ground glass and film holder for the camera. The movements on a studio view camera can be made on the rear standard equal to that of the front standard. Sometimes with field cameras and press cameras, the rear standard cannot be moved as freely, or at all, as their front standard. We will discuss how to deal with this problem later.
5. **Ground Glass** – The image captured by the lens on the view camera is

projected onto a piece of ground glass and the image is upside down. This would seem like it would cause a great deal of stress to the photographer but is hardly even noticeable after a while. Some camera manufacturers offer reflex viewing hoods which correct the image, much like looking through a single lens reflex camera. The photographer composes his image and focuses using this piece of ground glass. Some press cameras have rangefinders which allow the photographer to focus without using the ground glass.

Film Holder – In order to be able to shoot multiple exposures in the field, the film is held in light proof holders. There are a variety of manufacturers that make them. The most popular ones are Lisco and Elite. They all share the same common characteristics. The film is slid into position in total darkness and a dark slide is slid into place over the film so that it can be handled with the lights on. I recommend carrying at least ten film holders which will allow the photographer to be able to shoot twenty photographs.

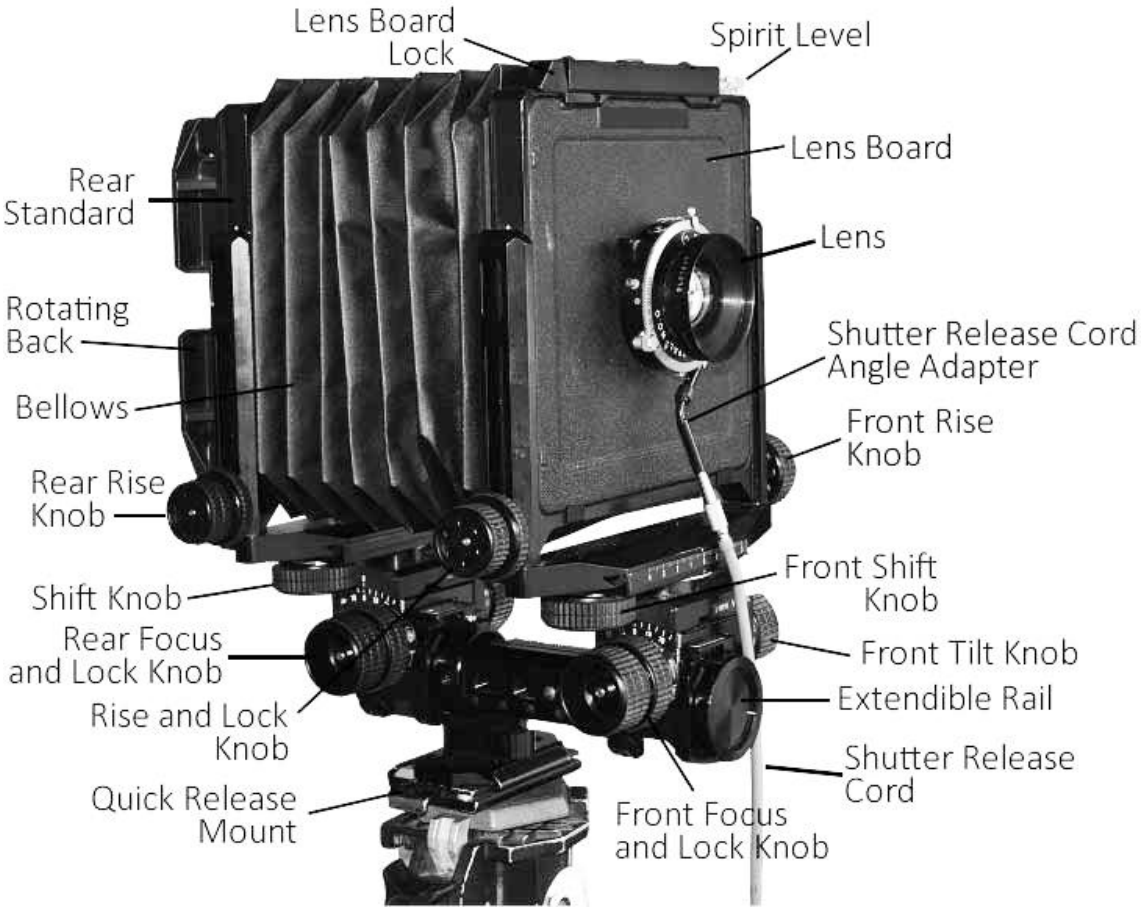


Photo 4.1 – Typical parts of a view camera.

Photo 4.2 – Typical parts and features on the back of a view camera.

Mastering the View Camera

Lesson Five

Photographing What You See

San Francisco de Assisi Mission Church – Ranchos de Taos, New Mexico circa 1992 – Jay S. McMullan. Ansel Adams photographed this church from almost the same angle in 1942. The only difference now is that is electrical power to the church and a gas meter.

The word that most fine art, black and white photographers use is "pre-visualization." Personally, I don't like the word because it conjures up visions of supernatural powers. All that is meant by pre-visualization, is that the photographer takes a look at the scene he is going to photograph and determines what actions he is going to take to make that finished photograph convey what he is seeing and feeling at the time of exposure. Ansel Adams first began to pre-

visualize after a hike up a rock formation in Yosemite National Park called the Diving Board. He made the difficult climb to make a photograph of Half Dome. After making one exposure he realized that it was not going to convey to the viewer what he was seeing and feeling as he looked across the vast expanse toward Half Dome. Adams loaded his last glass plate into his camera and put the Red Wratten filter on the lens to darken the sky and make the enormous granite face stand out from the rest of the scene. For many black and white photographers, Adams changed forever the way film would be exposed, developed and printed.

Learning to pre-visualize a scene is not that difficult if you study the photographic medium. Since many of you taking this workshop are not new to the photographic process we will talk briefly about how exposure meters work. If you have more questions and need further understanding on the subject, please let me know.

To begin the study on pre-visualization, you must first understand that in our medium of photography we must convey an image that is under some sort of light. In our case, we are using the sun as our light source. We know that any type of film has a certain exposure level that must be achieved for it to be properly exposed. To properly expose this film we have several methods we can use. We can simply use trial and error. Many photographers do this by bracketing exposures. This is costly way of making sure you get close to the correct exposure. If you have money to burn, go ahead and make those guesses. It will be sure to make the film manufacturers very happy! Better than trial and error, we can use rules of thumb for our exposures to get us into the ballpark. This too is time consuming and costly due to the many exposures that will result in less than adequate results. What we want is a way to properly expose our film without all the guesswork. The way we do this is by measuring the light that is falling on our subject. Of course this is done with a light meter. There are three types of meters used by photographers. These will be covered in more depth in Lesson 8 “Taking Light Readings and Making an Exposure.”

The light meter does nothing but give the photographer a guide to the exposure of his film. Every kind of film is given an exposure rating that tells the photographer how much light the film needs and how long the film needs to be exposed to the light to properly expose the film. That is why film has an ISO rating. That rating is determined by tests conducted and certified by the International Standards Organization. Before ISO there was ASA, American Standards Association. ISO with

digital cameras refers to the sensitivity of the light sensor. Almost all digital cameras today give the photographer the ability to change the ISO so it is important to understand what ISO is and how and why to change it with digital imaging.

Low ISO film is considered to be “slow” film because it takes longer shutter speeds and/or a wider aperture to properly expose the film. ISO 25 and ISO 50 films are considered to be slow film. ISO 100 film is considered to be normal speed film. Anything higher than ISO 100 is considered to be fast film. As the ISO gets faster, grain size increases. When I first began in photography, ISO 400 color film was out but it was very grainy. Film speed and quality began to get better after that and film with an ISO rating of up to 1200 became available on the market.

Bear in mind that the light meter and ISO ratings are *guides*. If the photographer is serious about his craft, he should run some tests to determine the accuracy of his light meter and the ISO rating of his film. The combination of lens, shutter, light meter and film will all determine the exact speed you need to use when metering a scene. Ansel Adams’ book, ***The Negative,*** goes into great detail on how to run tests, using a densitometer, to ascertain what the actual speed is for each type of film you shoot and how accurate your light meter is. This testing will take all the guess work out of your exposures and your photographs will show a definite improvement.

Mastering the View Camera

Lesson Six

View Camera Movements

Salt Lake City/County Building – Salt Lake City, Utah – Jay S. McMullan

Now we get down into the nitty gritty of what using a view camera is all about. As we talked about in Lesson One, there are basically five movements that the photographer will use with the view camera.

1. Focus
2. Rise and Fall
3. Shift

4. Tilt
5. Swing

Most photographers who use view cameras, when asked what movements the view camera can make, forget to mention focus. There was a time that softly focused landscapes were desired by fine art photographers. This does not sit well with me. The reason I use a view camera is for the larger format and the exceptionally sharp photograph that I will be able to attain. Proper focus is essential to any great photograph. Since we live in a three dimensional world and our camera is recording that world on two dimensional media, we must make some determinations about where we want to focus into the scene. Depth of field settings can control focus to some extent but the photographer does not need to depend on that saving grace if he cannot help it. In portraiture, it is the standard rule that the camera is focused on the plane of the eye, letting the focus on the nose, ears and shoulders, fall to whatever depth of field there may be. Most portrait photographers prefer "fast" lenses which have very wide aperture openings so the eyes of their subject will be in focus but the background of the photo will be out of focus. In landscape photography, focus should be on the main subject of interest. The view camera's movements are utilized to help bring the rest of the scene into focus.

Photo 6.1 - Always start by straightening and leveling your camera. If you get confused while making movements on your camera, return everything to normal and start over.

As we discussed earlier, focus is achieved by using a focusing loupe with between 4x and 8x magnification. The photographer will move the front and rear standards until the image on the ground glass looks close to being in focus. Then the loupe is placed on the ground glass and the front and rear focusing knobs can be used to bring the camera into sharp focus.

Shift is attained by sliding the front or rear standards to the left or right. Shift would be used when the photographer wants to take a photograph looking into a mirror but not see his and the camera's reflection.

Shift is attained by sliding the front or rear standards to the left or right. Shift would be used when the photographer wants to take a photograph looking into a mirror but not see his and the camera's reflection in the finished photograph. Using shift will also move subjects in relation to the film plane. Photo 6.1 shows a Spanish mission near Goliad, Texas. My goal in this photograph, which I achieved, was to place the front door of the mission inside one of the arches. Using a normal camera cannot make this happen. The arch pillars cover the door. By placing the front door to the mission as the main subject, shifting or sliding the front or rear standard will move the arches and put the front door inside the arch. Shift also helps control perspective in horizontally converging lines just as rise and fall do for vertical converging lines.

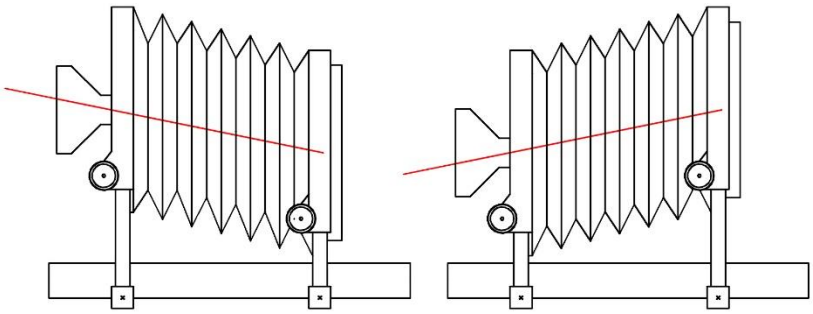


Figure 6.1. Rise and fall on a view camera. This feature will make the camera look up or down while keeping vertical lines vertical.

Rise and Fall

The first view camera movement we will work with is the rise and fall. This will commonly be used in architectural photography to control perspective. To make a photograph of a tall building, we will begin by setting the tripod up straight and level. If your tripod does not have bubble levels, small, inexpensive ones can be purchased. Once the tripod is straightened and leveled, mount the camera on the tripod. Once again, using bubble levels, make sure the camera is straight and level and pointed at the subject of your photograph. The top of the building will most likely but cut off. Raise the front standard, which holds the lensboard, until the top of the building comes into view. You will notice that the sides of the building stay parallel to the sides of the camera. Shooting with a view camera requires patience but you will be rewarded with a great photograph by taking your time to set everything up correctly. I have read stories about Ansel Adams taking hours to get just the shot that he wanted.

Photo 6.2 - Only a view camera can take this photograph. Using the Shift feature allows the camera to "move" the door into the natural frame of the arch.

Things to watch out for - If your lens does not have a large field of coverage, the top of your photograph may be cut off and be vignetted or darkened. In this case, you may have to tilt your camera facing up a small amount until the lens covers the ground glass completely. Of course, this will cause the building to appear to fall away from your view. This can later be corrected in Photoshop.

Photo 6.3 - To shoot down with your camera like you would when photographing Bryce Canyon. Start with both standards raised then lower the front standard. Or you can raise the back standard for the same effect.

To use the fall feature of your view camera, it is just the opposite of rise. Say, for example, you are photographing Bryce Canyon National Park in Utah. To get a photograph of the geological formations in the park, you must photograph looking down into the canyon. Set your camera up straight and level. Start by having the front and rear standards raised, then drop the front standard for the camera to look down. Secondly, you can raise the back of the camera which is, effectively, the same as lowering the front standard. You may need to use the fall feature on your camera if you are on top of a large building photographing another building by looking down.

Shift

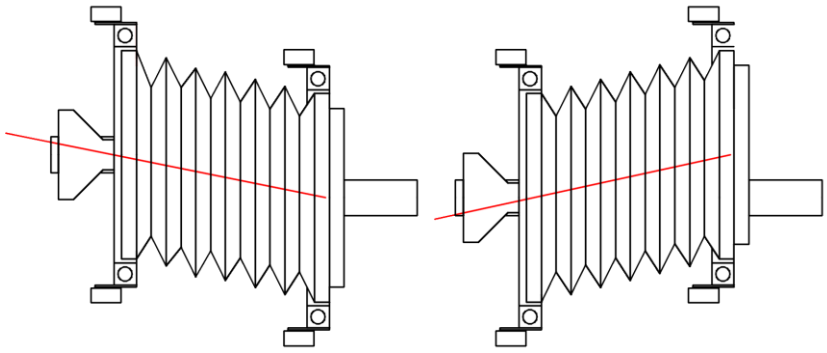


Figure 6.2 - Shift on a camera can be to the left or right. It is the same as rise and fall only at a 90 degree angle, going left or right.

Shift allows the front or the back of the camera to slide to the right or to the left and does the same thing from side to side with the horizontal as rise and fall due to the

vertical. Rise, fall and shift are all parallel movements that move the lens up, down and sideways relative to the center of the camera back. The back of a field camera is a little different. It is fixed and will not shift but the front standard will. The view camera gives the photographer a little more control when using shift but most of the time, the amount of coverage that the lens offers will limit how much the camera can be shifted anyway. Shift works much like rise and fall, control converging lines, except it lets the photographer slide the front or rear of the view camera to the left or right instead of up and down. This is useful for a couple of different things. Have you ever wondered how someone takes a photograph looking into a mirror but the camera is not visible? Most likely, the photographer used the shift feature of the view camera in this instance.

Several years ago I was photographing an old Spanish Mission near Goliad, Texas. The mission is in an "L" shape. Down the side of the mission are arches. The front door is perpendicular to those arches and I wanted to frame the front door within an arch. The problem was, the base of one of the arches blocked the view of the front door. The solution was to set the camera up, pointing toward the front door then sliding (shifting) either the front or the back of the camera moves the arch and the door comes into view. Without a view camera this shot would be impossible! In Photo 6-5, a long shutter speed and a very small aperture controlled the depth of field and kept the pillars and the door in focus. As with any view camera movement, other movements can be combined. In this case, using swing along with the shift feature could help control the depth of field in the scene.

Tilt

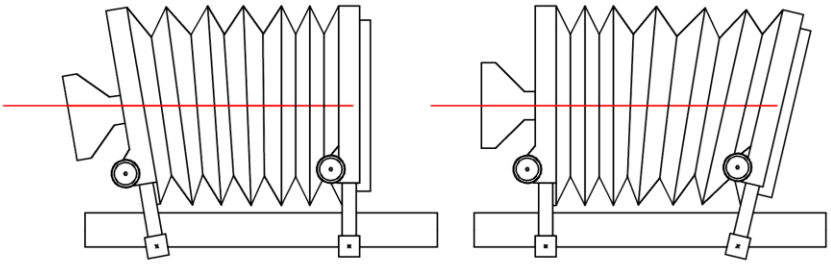


Figure 6.3 - Tilt moves the front or rear standards forward or backward. Moving the front standard forward or the rear standard increases depth of field. Moving them the opposite direction decreases depth of field.

Tilt is the movement of the front or rear standard either down or up. I find that I use tilt more than any other perspective control. To photograph a scene where the photographer wants

something that is nearby in the foreground to be sharp but he also wants the background to be sharp he may not have enough depth of field by the choice of his aperture alone. By tilting the lens down, the foreground will be brought into focus with the background remaining in focus also.

Tilting the back of the camera allows a subject close to the front of the camera to loom into the photograph, or to be exaggerated, and also stay in focus. If you are photographing an item that is, let's say, set on a table and your camera is pointed down at the item at a 45 degree angle, leaving the camera at that angle will cause the item to look as though it is falling away from the camera having converging lines going toward the top of the frame. By tilting the back of the camera to where it is parallel with the item in the photograph, perspective can be controlled. Back when photographic prints were made in the darkroom, this effect could be controlled somewhat in the darkroom by tilting the easel that held the photographic paper. It can now be controlled in Photoshop but the image must be cropped in doing so. I believe it is better to do as much perspective control as you can with the camera and then use Photoshop for whatever else is needed.

If the photographer wants a central part of the photograph to stay in focus but everything else to fall out of focus, he can focus on the main subject then tilt the front standard up. He can get the same result by tilting the back standard up also.

Swing

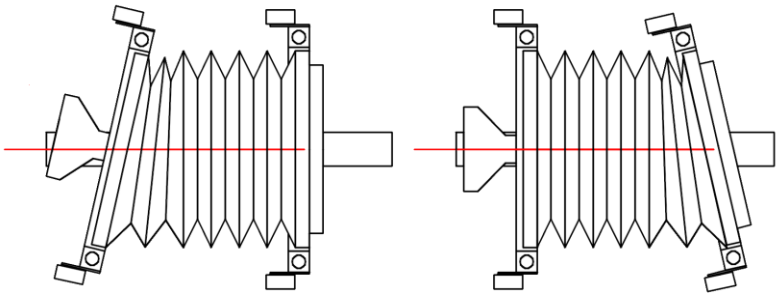


Figure 6.4 - Swing moves the front or rear standards to the left or right. It does the same things that rise and fall do except at a 90 degree angle.

Swing is exactly the same thing as rise and fall except it is done at a 90 degree angle, to the left and right. In Photo 6.5 I wanted to photograph the log in the boulder field. I was using a 75mm wide angle lens and I wanted everything to be sharp,

from the front of the log to the mountain in the background. I began by positioning my camera pointing straight up the boulder field. I focused about mid-scene. The right end of the log was not completely on the ground glass so I shifted the front standard to the right until I had the log where I wanted it on the ground glass.

Photo 6.4 - The back of the camera was tilted back resulting in the ferns in the foreground looming toward the camera while everything stays in focus from front to rear.

To keep the depth of field sharp throughout the photo, I had two choices. I could swing the front lens to the right and bring the front of the log into focus, keeping everything else in focus also or I could swing the back which would not only bring everything into focus, it would also exaggerate the front of the log making it impend into the photograph. You can see that I chose the second option. I swung my back standard to the left bringing the right side of the camera back closer to the log and the left side further away from the log and that brought

Photo 6.5 – In this shot, I placed my camera looking straight up the boulder field and then used shift to bring all of the long onto the ground glass. Then I used swing to increase my depth of field from front to back.

everything into focus. Many times you will find that a combination of camera movements are required to get the photograph you want. If you get confused, set your camera back to normal and start over.

The following information is taken from Toyoview.com.

Getting Started With Image Control and Camera Movements:
Creative Challenges and Simple Solutions

Controlling Perspective and Parallel Lines

Challenge: You want to photograph a building, or a stand of trees, yet keep all lines parallel even though you must angle the camera upwards to encompass the scene.

Solution: Rise. First, align the camera back parallel to the subject. Then, by using the rise movement, the lens' point of view is moved above eye level, thereby keeping vertical lines parallel. Rise, fall and shift are all parallel movements that move the lens up, down and sideways relative to the center of the camera back.

Increased Control of Perspective and Parallel Lines

Challenge: You need more control of perspective than you can achieve with front rise, fall and shift.

Solution: Drop Bed - Front and rear are tilted backward at the same degree and thereby kept parallel, giving the effect of increased Front Fall.

Incline Bed - Front and rear are tilted forward at the same degree and kept parallel, giving the effect of increased Front Rise.

Shift Bed - Front and rear are swung in the same direction to the same degree, giving the same effect as Shift, but with dramatically increased control.

Increasing Depth of Field

Challenge: You see a vast landscape with a field of flowers and distant mountains. You want to have both the flowers near the camera and the distant mountain in focus at the same time. Even if you used the smallest aperture on your lens, you might still need greater depth-of-field.

Solution: Front Tilt. Tilting the lens forward will extend the plane of focus far beyond the effect of using a small lens aperture and allow you to get near and far objects in focus at the same time. Front tilt is usually combined with using a small aperture such as f/16 or f/22. It does not replace using a small aperture, but rather enhances the effect over a greater subject plane.

Challenge: Imagine focusing on a white picket fence, running from near to far, diagonally through your composition. With ordinary cameras you can either focus on the beginning, middle, or end of the fence, use a small aperture, and hope to get most of it in focus.

Solution: Front Swing. With a field camera, you can swing your lens to position it roughly parallel to the fence. This will allow you to get the fence in sharp focus from beginning to end, even with a wide open aperture.

Selective Focus

Challenge: You want to focus on just one leaf or flower and leave everything else in the scene a soft blur. Or, you want to recreate an effect you may have seen in a fashion magazine where only the model's eyes are sharp, and all the clothes are softly blurred.

Solution: Front Tilt-Backward can be used to accomplish these selective focus effects with ease. Front swing can be used for a similar effect with objects to the left or right of your composition center. Swinging in either direction will bring objects in or out of focus.

Correct or Distort the Shape or Size of An Object

Challenge: You want to emphasize a large rock, or other visual element in the foreground of a landscape.

Solution: Rear Tilt. By tilting the back away from the lens, you will notice that the size and shape of objects in the foreground become exaggerated. Similarly,

Rear Swing will pivot the back from side to side, manipulating the shape of objects to the right or left of the composition.

Mastering the View Camera

Lesson Seven

Taking Light Readings and Making the Exposure

Lone Joshua Tree – Somewhere in Arizona. Jay S. McMullan

The art of photography consists of two things, composition and light. Without light there would be no photograph at all and without attractive composition, the photograph would not be aesthetically pleasing. In the modern day of digital imaging almost anyone can take a nice snapshot. Cameras are automatic and do a very good job of averaging the light on a scene and then make a good exposure. The difference between an amateur and a professional photographer though, is knowing how the light on a scene will affect the finished photograph. With a digital camera, you can view your photograph instantly to see what the finished picture looks like. Before the digital age, we had Polaroid which did a fairly good job of capturing light on a sheet of paper. Many large format photographers used Polaroid black and white Type 55 Positive/Negative film to get a quick idea of how his photograph was going to turn out. Polaroid's product was ingenious! It gave the photographer, not only an almost instant print (it took a couple of minutes for the finished photograph to process), it also gave him a very good negative which could be printed from later. The negatives were a little thin but they were of very good

quality. The digital age destroyed Polaroid and they ceased making Type 55 film and all stocks expired in 2010.

A group of individuals called for private funding on the Internet to develop a new positive/negative film. In 2015, they succeeded and came out with New55 film. It is available for 4x5 and 8x10 cameras. Just like the Polaroid Type 55 film, a 545 Polaroid film pack back must be used with the film. New 55 film is expensive ($15 per sheet in 2017) and available in packs of 5. However, a digital back for a 4x5 camera can easily cost upwards of $35,000 U.S. If the large format photographer absolutely must know how a shot will turn out at that instant, the New 55 film is, to me, a better choice than a digital back.

There are three basic types of light meters.

1. Reflected Light Meter
2. Incidental Light Meter
3. Spot Meter

The **Reflected Light Meter** is pointed at the scene and takes an average reading of the light falling on that scene. This is how most photographers will begin to "meter" a scene. In many instances, this will be enough to make a decent photograph. Some photographers will place an 18% gray card into their scene, then move in closely and take a meter reading from that card. The 18% gray card is supposed to be half way between white and black.

Photo 7.1 - The Gossen Luna Pro was the standard reflective light meter for photographers around the world for years.

Ansel Adams developed what he called, "The Zone System." He realized that his photographs of Yosemite were not conveying the majesty of what he saw and experienced. He began to "pre-visualize" the scenes he would photograph and then, through the correct exposure and manipulated development of his film, he was able to make the finished photograph reflect what he saw and felt at the moment of the exposure.

Photo 7.2 - Incidental light meters measure the light falling on a subject instead of light reflected from a subject.

The Zone System is too involved to cover completely in this workbook so we will cover the highlights and how to get a good exposure with any of the three meters listed above.

The **Incidental Light Meter** has a diffuser over the light sensor and is held at the scene, pointed back at the camera. Instead of reading the light that is reflected from the subject, it reads the light that falls on the subject. In portraiture, it is always recommended to take an incidental light meter reading from the shadow side of the face. An old rule of portraiture is to "expose for the shadows and print for the highlights." Flash meters also take incidental light readings in the studio.

The **Spot Meter** is my recommendation for metering a scene, especially if you are using the Zone System. Most spot meters read a 1 degree spot. I have a Zone VI modified Pentax 1 degree spot meter and a Minolta Auto Meter IIIF that has a diffuser for taking incidental light readings has a 10 degree spot meter attachment. It is also a flash meter.

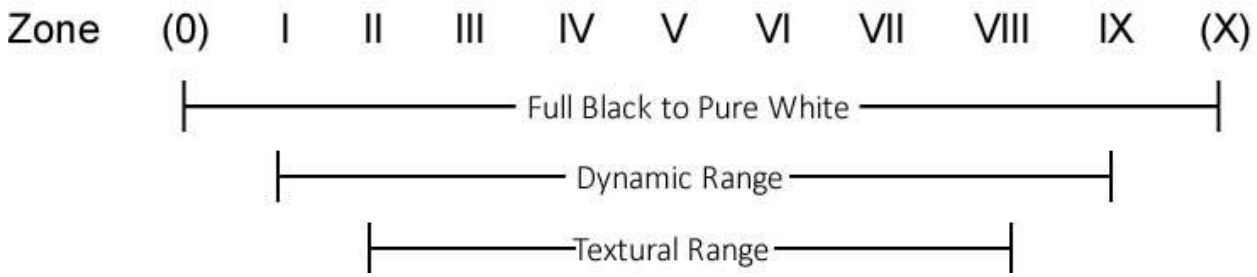
Photo 7.3 - The 1 degree spot meter is ideal for photographers who use the Zone System for exposure.

By using the spot meter, you can meter many different areas in a scene and determine on which "zone" of light that part of the scene will fall. The zones are on a scale which start with Zone 0, which is complete black and it will not render any texture at all on a negative or a print. Pure white is Zone X (Roman numerals are used for the Zone System) and likewise, it will not render any texture in film or on a print. To do the Zone System perfectly, the photographer needs to run exposure tests with his light meter and use a densitometer to determine how accurate his meter is.

"It must be understood that these values are merely points on a continuous scale that range from full black to pure white. Each single value represents a range of grays slightly darker and slightly lighter, and the individual gray values produced in a sequence like this are each the midpoint of their respective zones."

"There are three important scales within the total range of exposures that can be

printed. The full range from black to white is represented by Zones 0 to X. Within this lies the *dynamic range*, representing the first useful values above Zone 0 and below Zone X, or Zones I to IX. The range of zones which convey definite qualities of texture and the recognition of substance is the *textural range*, from Zones II to VIII. Thus:



On this scale I consider the negative density obtained from a Zone I exposure the lowest *useful* density, lower densities can be measured with a densitometer, but have no significance in practical work. Similarly, the densities relating to exposures above Zone IX can be recorded, and in fact, considerable separation may exist *on the negative* for Zones X, XI, XIII and even higher. These extreme high values may require special negative processing and printing procedures to be brought into the scale of the print, with normal handling they will not be represented. The eye seems more responsive to subtle differences in the nearly white values than in the very dark ones. Depending on the film characteristics, however, the separation in values exposed above about Zone IX or X may be lost and processing control may not be effective, if printed lower than pure white, a degraded gray value without texture may result. For the moment we will limit our discussion to the normal dynamic range." From ***The Negative*** by Ansel Adams.

When metering a scene, I previsualize how I think the finished photograph should appear. I begin metering the scene and look for parts of the scene that I believe will fall on Zone V, or right in the middle of the tonal scale. Then I take readings off of other parts of the scene and determine which zone on which they will fall. If the complete scene falls between around Zone III and Zone VIII, I expose for Zone V and then I will develop that negative normally.

If the scene I am photographing is very "contrasty" and has Zone ranges from I to X, I will decrease the development time of the film, sometimes as much as 50%. On

Photo 7.4 – Using a spot meter allows the photographer to take light readings from several different spots to determine the proper exposure for scene. In this photograph two spots fall on Zone V which is where the exposure is made (behind and below the back flywheel and on the side of the building). Any of the readings can be used to determine the exposure settings on your camera when you understand the Zone System.

the other hand, if there is very little difference in contrast in the scene, I will increase the development time of the film.

Ansel Adams referred to manipulation of the development of film by using N-2 to express the maximum amount of under development. N-1 refers to less under development N-2. N refers to normal development. N+1 means over development but not as much over development as N+2.

"The general rule of controlled development is that ***increasing the amount of development increases the contrast of the negative, and reducing development reduces contrast.*** This occurs because all the areas of the negative are not equally affected by a change in development time: the higher negative densities (representing high subject and print values) are affected *more* than the low density areas (around Zone III and lower). Thus the density *difference* between the high and low zones can be increased and decreased by altering the amount of development." From ***The Negative*** by Ansel Adams.

Because of the ability and really, the need to control the amount of development to control the contrast of a scene, it is extremely important to keep records of each exposure made with the view camera. Not only do I like to keep exposure information but I also like to use my GPSr (global position system receiver) so I know exactly where I made the exposure. Many digital cameras have this feature built in or allow an attachment to be mated to the camera so it will record the longitude and latitude in its metadata.

In Photo 7.4, before taking the photograph, I looked at the scene and decided how I wanted the finished photograph to look. Ansel Adams called this "pre-visualization." Using a spot meter, I read the spots that are circled and determined what Zone I wanted each spot to fall on. The exposure was made at 1/60 at *f*:16. Looking at the scale below you can use any of the Zone readings to set your exposure. For example, if you decide you want the back of the engine, directly in front of the back flywheel, to fall on Zone III (where you just begin to see texture in the finished print) you will set your light meter appropriately and determine what your exposure will be at Zone V. Likewise, If I want the snow to be white but still retain texture, I do not want it to go above Zone VIII. You see in the bottom right hand of the photo, the snow falls on Zone VIII. By taking just that one spot meter reading, I can easily determine where Zone V falls and make the correct exposure.

As you start out using the Zone System, I encourage you to read Ansel Adams' book, ***The Negative*** and other books about the Zone System. It will also be useful to carry an 18% gray card and use it to help you determine what Zone V looks like in different scenes. To use the 18% gray card, place it in a shadow and take a direct reading off of it with you spot meter. If you do not have a spot meter, use a reflected light meter by moving in very close to the card to take a light reading.

Filters

Even when I shot film exclusively, I preferred not to use a lot of filters with color film, other than the polarizer. The polarizing filter absorbs ultraviolet rays and transmits plain polarized rays of all visible colors. This filter, when used at ninety degree angles to the sun will darken a blue sky to a vibrant, intense blue without changing the colors in the foreground. The polarizer will also make white clouds really pop out against a dark blue sky. Probably the greatest use of the polarizer is

to cut reflection and glare when photographing through glass or when photographing water. Just remember that when using a polarizing filter you will lose one and two-thirds stops so be sure and make the proper adjustments when you meter your scene. All filters will require some type and amount of exposure compensation except for clear filters such as skylight or UV filters.

When photographing in black and white, filters will be used more often than with color film. Red filters can be used to darken the sky and to cut haze in distant scenes. The red and yellow filters will increase contrast slightly also. Filters can be expensive, especially if you purchase the same kind of filter for each lens you will be using. To save money, in this case, purchase a "step-up" ring for your smaller diameter lenses. For example, the normal lens for your view camera may require a 52mm filter and the lens you have that requires the largest filter may require a 58mm filter. I would recommend you purchase all of your filters in 58mm and purchase a 52mm to 58mm step up ring. "Step-down" rings are also available but I do not recommend them. Using a smaller filter in the place where a larger one should be used could interfere with the light on the edges of your film causing vignetting effect.

I would recommend carrying the following screw-on filters to be carried with your camera at all times.

For shooting color:

- A clear UV filter, on the lens at all times for lens protection. This filter does not usually require exposure compensation. It is much less expensive to replace a damaged filter than it is to replace a lens!
- A polarizing filter.

For black and white film:

- A clear UV filter just as with shooting color.
- A polarizing filter.
- A #8 Yellow filter.
- A #25 Red filter.
- A #58 Green filter.

If you plan on shooting color negative or transparency film with your view camera there are other types of filters you can use. When shooting daylight balanced film under tungsten lighting conditions, use an 80A filter.

Pre-visualization is a great concept in photography and is something that you need to become proficient in. It comes with experience. There are three ways to make the photograph you make represent what you see and feel at the moment you make it.

1. Camera Format
There are certain scenes that, when I see them, I am going to grab my digital camera and snap away. An example of this might be a big bull elk walking across a pasture in the Grand Tetons. But, there are times that nothing will replace pulling out and setting up my view camera such as an old weathered barn with some amazing thunder clouds above it. Using the view camera causes us to slow down and allows our more artful selves to come out, in my opinion. The view camera also makes a difference when using perspective controls such as tilting the back of the camera to exaggerate an image that is close to the camera.

2. Color or Black and White
The decision of whether to use color or black and white will also have an impact on how we perceive a scene. Sometimes color, when photographing an emotional scene will get in the way, almost making the scene look beautiful when maybe it should not feel that way. A friend of mine once told me he had been in the Philippines and he had seen families foraging through garbage dumps for food. He was moved, almost to tears and he shot some color photographs. He said when he got the prints back from the lab, they looked beautiful because of all the colors. He said the photos completely missed what he saw. When I see something with a lot of contrast, not only between the blacks and whites but also in the emotion of a scene, I will most likely choose to shoot in black and white.

3. Use of Filters, Manipulation in Photoshop and Printing Paper Choice. As stated earlier, polarizing filters can darken the sky and make clouds pop out. Thunderstorms look incredible when photographed from a distance with a polarizer. Sometimes the sky can almost turn black when using this filter. The use of a green filter will lighten foliage. A red filter will darken a blue sky and cut haze.

Below are some tables to help you determine when to use filters and which ones to use. These are for black and white film.

Color of Subject	To Lighten, Use	To Darken, Use
Violet	Blue	Red or Orange
Indigo	Blue or Green	Orange or Yellow
Blue	Blue or Green	Red or Orange
Blue – Green	Blue or Green	Red
Green	Green or Yellow – Green	Red or Blue
Yellow	Yellow, Orange or Red	Blue
Orange	Orange or Red	Blue or Green
Red	Deep Red or Red	Blue or Green
Purple	Blue	Green
Magenta	Red	Green

Below is a list of exposure compensations for the recommended filters.

Filter	Exposure Compensation
UV (Skylight filter)	0 Stops
Polarizer	1 2/3rd Stops
#8 Yellow	1/3rd Stop
#25 Red	2 Stops
#58 Green	2 1/3rd Stops

When using a certain filter, if you are not certain how much exposure compensation should be given, take a meter reading of a subject without the filter, then by placing the filter in front of the exposure meter, meter the same subject under the same lighting conditions. Then just simply use the meter reading that is taken through the filter.

The following table is recommended by Kodak for using conversion filters for color films.

Kodak Wratten Gelatin Filter #	Description	Increase in Exposure Stops	For Changing
85B	Amber filter for exposing Type B (tungsten) color materials in daylight	2/3	5500 K to 3200 K

85C	Amber filter sometimes preferred for exposing Type L and tungsten materials in daylight. Also for Type L film with electronic flash. Paler than 85B	1/3	5500 K to 3800 K
80A	Blue filter for exposing daylight balanced color materials in 3200 K tungsten illumination	2	3200 K to 3800 K
80B	Blue filter for exposing daylight balanced color materials in photolamp 3400 K illumination	1 2/3	3400 K to 5500 K
80C	Blue filter for exposing daylight balanced color materials in 3800 K illumination2	1	3800 K to 5500 K

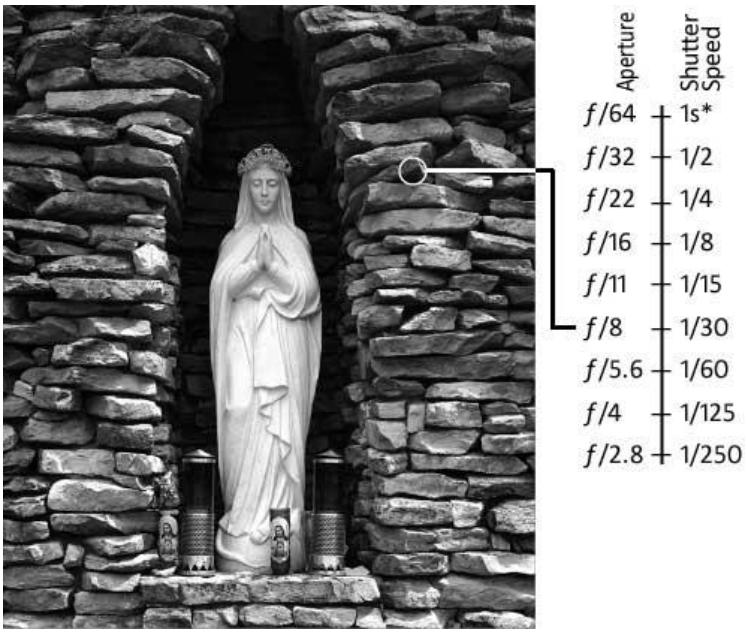


Photo 7.5 – A combination of *f*/stops and shutter speeds may be used with any photograph but the photographer must be aware of the limitation of the film he is using in regard to reciprocity failure.

A very important thing to understand when speaking about exposure is the term, "reciprocity." Under normal circumstances, when a meter reading is taken of a scene, the photographer may choose between several shutter speed/aperture combinations. Let's take the photograph in Photo 7.5 for example and learn about reciprocity. In this photo, an exposure reading was taken from the fray rock inside the circle shown on the print. Using ISO 100 film, an exposure value (EV) of 11 was given. Using this exposure value, all of the listed *f*/stop/shutter speed combinations can be used for satisfactory photographs because of the reciprocity effect until a one second exposure is called for. Extremely slow and extremely fast exposures will result in reciprocity failure. To correct for this failure, exposure compensations must be made and sometimes development changes must be made. With color film, color correcting filters may be called for. Since most view camera lenses' shutter speeds are limited to no more than 1/500th of a second, the

view camera photographer will only be concerned with slower exposures. There are times that slow exposures are desirable even when there is enough available light for a faster shutter speed and adequate depth of field. When photographing a rushing stream of water, the photographer may choose to use a long exposure to give the water a "cotton candy" effect. In bright sunlight, there may be so much available light that neutral density filters must be used to be able to use an *f*/stop/shutter speed combination that will allow a wider aperture and a slower shutter speed. A one second exposure is a slow enough exposure to give the stream of water the effect the photographer is looking for. In some cases though, an increase of 3x compensation will be called for to expose the film properly. Film manufacturers will usually include a reciprocity failure chart with their films. Below is a chart that may be helpful in the event of reciprocity failure.

Black and White Films

Use the exposure and development adjustments in the table below for these black and white films

Kodak Ektapan Film	Kodak Verichrome Pan Film
Kodak Plus-Pan Film	Kodak Tri-X Pan Film
Kodak Plus-X Pan Professional Film	Kodak Tri-X Pan Professional Film

Exposures and Development Adjustments for Most Black and White Films

If Indicated Exposure Time is (Seconds)	Use This Lens-Aperture Adjustment	**or**	**This Adjusted Exposure Time (Seconds)**	**AND Use This Development Adjustment**
1/100,000*†	+ 1 Stop		Change Aperture	+ 20%
1/10,000*†	+ 12 Stop		Change Aperture	+ 15%
1/1,000	None		None	+ 10%‡
1/100	None		None	None
1/10	None		None	None
1	+ 1 Stop		2	- 1%
10	+ 2 Stops		50	-20%
100	+ 3 Stops		1200	-30%

***** Not applicable to Ektapan Film

† Not recommended for Tri-X Pan Professional Film

‡ Ektapan Film does not require an adjusted development time at 1/1,000th second

Exposure and Development Adjustments for Long and Short Exposures: KODAK T-MAX 100, 400 and P3200 Professional Film

If Indicated Exposure Time is (Seconds)	Adjustments for Long and Short Exposures KODAK T-MAX 100 Professional Film		Adjustments for Long and Short Exposures KODAK T-MAX 400 Professional Film		Adjustments for Long and Short Exposures KODAK T-MAX P3200	
	Use this Lens-Aperture Adjustment or	This adjustment Exposure Time (seconds)	Use this Lens-Aperture Adjustment or	This adjustment Exposure Time (seconds)	Use this Lens-Aperture Adjustment or	This adjustment Exposure Time (seconds)
1/10,000	+ 1/3 Stop	Change Aperture	Nome	None	None	None
1/10,000 to 1/10	None	None	None	None	None	None
1	+ 1/3 Stop	Change Aperture	+ 1/3 Stop	Change Aperture	+ 1/3 Stop	Change Aperture
10	+ ½ Stop	15	+ ½ Stop	15	+ 2/3 Stop	15
100	+ 1/3 Stop	200	+ 1 1/2 Stop	200	+ 2 Stops	400

Mastering the View Camera

Lesson Eight

Rules of Composition

A good photograph must contain two aspects, the correct lighting and it should follow good rules of composition. In this lesson, we will cover rules of composition.

Rule of Thirds

Imagine dividing your ground glass into nine equal parts, dividing the horizontal and vertical into three parts each. Many view cameras have these lines etched on their ground glass. I have also known photographers who draw rule of third lines on a piece of Mylar and attach it to the ground glass. My Nikon digital camera has a setting where I am able to set the rule of third lines in the viewfinder.

Keeping your subjects along the lines of the rule of thirds or at the intersections makes the image more pleasing to the eyes.

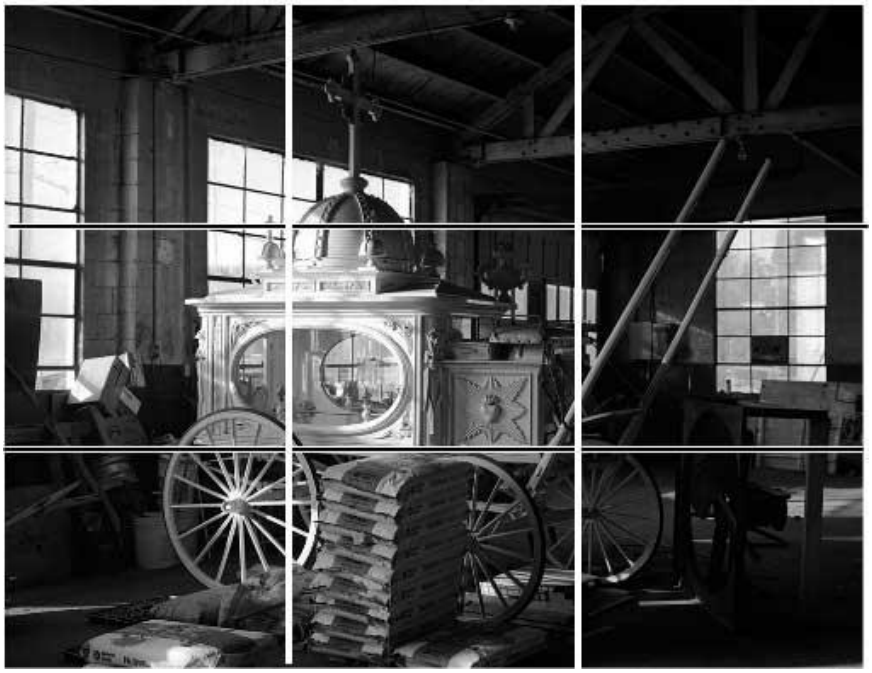


Photo 8.1 – Try to keep your subjects along the rule of third lines or at the intersections to make the photograph more interesting.

Balance the Elements of Your Photograph

Photo 8.2 – In this photo, the setting sun balances out the windmill. Try and keep the elements of your photograph balanced.

Keep more space in front of your subject than behind

Photo 8.3 – It is more natural to the eye to keep more room in front of your subject than behind.

Use leading lines

Photo 8.4 – The eye moves along leading lines. Look for things that move across your ground glass.

When shooting straight into a subject, look for symmetry.

Photo 8.5 – Look for things that are symmetrical when shooting straight into them.

Use depth to draw the eye in.

Photo 8.6 – Look for scenes where the eye is drawn into the photograph.

Look for scenes where the background is not too busy.

Photo 8.7 – Look for simple backgrounds. Busy backgrounds are confusing to the eye.

Look for subjects which are naturally framed.

Photo 8.8 – Look for natural frames, they are all around.

Crop in camera as much as you can.

Photo 8.9 – Crop as much as you can with the camera. Cropping in Photoshop wastes space.

These rules are good to follow in any artistic medium whether it is photography or painting. Once you learn the rules and know them by heart, you can also experiment and break the rules!

Mastering the View Camera

Lesson Nine

Shooting Close-ups

Ansel Adams - Pine Cone and Eucalyptus Leaves, San Francisco, California – 1932

Normally, photography with a view camera is very straight forward. You just set your ISO on your light meter and then determine what shutter speed and aperture combination you desire. But when shooting close-ups, things get a little more complicated. This only applies when the bellows is extended beyond the infinity focus of the lens. When it is focused past the infinity focus length of the lens, you must calculate the bellows extension factor and change the aperture for the shot.

The following information is from http://www.largeformatphotography.info. Several people tackle the bellows extension factor problem in different ways.

Compiled by Q.-Tuan Luong for the Large Format Page

Formulas
Michael Gudzinowicz:

Multiply the marked f-stop by (1 + M), where M is the magnification on the ground glass. Alternatively, mark and measure the position of the lens at infinity focus, and then measure the ground glass to lens distance at close focus. Divide the total extension at close focus by the former number (near infinity, which should be close to the focal length for most LF lenses), and the resultant f-stop factor will be the same (or close enough).

By Richard Koser

When the bellows is extended beyond infinity focus for close-up work, an exposure FACTOR must be determined and applied. Two convenient ways of finding the FACTOR are:

a) When the camera is focused at infinity, note a point on the camera and another on the lens (e.g., diaphragm) such that the distance between them is equal to the focal length (call it F). Then, when the bellows is extended for close-up focus, the extension between those two points will be greater than F (call it E). The exposure factor will be (E/F) squared. For example, extending the bellows to twice-F to focus for an object-to-image ratio of 1:1, the FACTOR will be 4.

b) Measure the object width or height (call it O) and that of its image on the ground-glass (call it o). The exposure factor will be (o/O+1) squared. For example, focusing for an object-to-image ratio of 1:1, the FACTOR will be (1/1 + 1) squared, or 4.

Applying the FACTOR:

If 4 times the exposure is required (per the examples above), open up the lens 2 stops or increase the exposure time 4-fold.

Two complications often arise.

Firstly, it is hard, maybe even impossible, to measure bellows extension when using swings, tilts, rise/fall and combinations thereof; thus the object-to-image measurements are useful (indeed, Calumet offers a handy plastic template, based on that principle, calibrated directly in stops).

Secondly, FACTORs of 2, 4, 8, etc. obviously correspond to 1, 2, 3, etc. stops; what about a FACTOR of 3?? To convert FACTORs to stops, use a scientific calculator; (log FACTOR/log 2) or (ln FACTOR/ln 2) equals stops. For a FACTOR of 3, (log 3/log 2) equals (.48/.3) equals 1.6 stops.

By Roy Harrington

The formula (Extension/Focal Length) **2 is basically correct. The focal length is basically the distance from the center of lens (where the aperture is) to the film plane when the lens is focused at infinity. So a 12inch lens will have 12 inches of bellows when focused at infinity. You move the lens farther away from the film in order to focus on something closer. The new distance of the lens from the film is the "extension" (not the distance to what you're focused on). For instance if you move the lens to 24 inches from the film, objects another 24 inches in front of the lens will be in focus. The image will be the same size as the object i.e. 1:1 magnification and the bellows compensation will be (24/12) **2 = 4 or 2 stops more exposure needed.

Personally, I like to do the calculation directly with the aperture and thereby eliminate the square in the formula. For example the 12 inch lens at 24 inch extension just doubles the effective aperture number so f/16 is really f/32. It's very easy to use the aperture scale on the front of the lens as a visual aid in this calculation. If you had an 8inch lens f/8 just becomes f/N when you have N inches of extension. Many of the lenses have 1/3 stop marks and if you can interpolate between the full stop markings and use inches, mm, cm etc. you can fairly easily figure out what compensation to make without a calculator or any other fancy device.

Some examples if my description is not clear. 1/3 stop values approx.: f/8,9,10 f/11,12.5,14 f/16,18,20 f/22,25,28 f/32,36,40 f/45

```
Lens:        Extension:      Compens:
8in          12.5in           1 1/3 stops  -- f/8 to f/12.5
180mm        220mm            2/3 stops    -- f/18 to f/22
125mm        200mm            1 1/3 stops  -- f/12.5 to f/20
5in          7in              1 stop   (think f/10 to f/14)
```

The nice thing about this is the change can be made right on the lens without even counting the 1/3 stops.

Computing tricks

Using the relationships between f/stops

By Nicholas F. Hanks

We're going to use the relationships between f/stops to determine the additional exposure needed when extending the bellows. First, consider the bellows at infinity as an f/stop type of number. That is, say your 120mm lens is "f/"120, but to bring things down to familiar f/'s, well divide everything by 10, so call it "f/"12. We're now dealing in centimeters, but it doesn't much matter. Let's say you move your bellows out to 160 mm. We'll call that "f/"16. What this says is that we've gone from "f/"12 to "f/"16 which is about one stop. So we've doubled our exposure requirements. Either open up one stop or double your time. Similarly, if we extend to 240mm it becomes "f/"24, which is two stops more exposure or four times the time.

This becomes a little confusing when working with odd numbers. A 90 mm lens extended to 130mm is the difference between f/9 and f/13 which is somewhere between familiar territory. Take a look down at the f/ scale and make an estimate, and it's probably good enough.

It's also hard to know where to measure to. It should be from the iris to film plane, but sometimes the infinity setting doesn't seem to measure what I would expect it to be based on the lens' focal length. It's best just to measure at infinity, then measure at the extension and make the calculation.

While the method seems whimsical, it is based on sound engineering principles. Remember that the f/stop is the ratio of the diameter of the iris divided into the focal length. An f/8 with a 120mm lens would be 15mm in diameter. However, the amount of light is dependent on the area (pi x r^2). The area or a 15mm hole is 175.7 square mm. To double the light you would double the area to 353.4 sq.mm. This gives us a 21.2mm diameter hole which gives an f/ of 120mm/21.2mm which is f/5.6. If you do the calculations for f/4 you'll see that the hole is twice the diameter (8 divided by 4) but four times the light area. Conversely, f/16 is 1/2 the hole diameter but 1/4 the light. Notice that there's a square relationship here.

So what?!!

As it turns, as you move the lens out from the film plane, the amount of area on which light falls also increases in size and thus decreases in density by a square relationship as well. Thus, as you move a 120mm lens to 240mm, although twice the distance, the area on which light projects is 4 times as much (2 squared) resulting in 1/4 the density.

Thus, the f/ scale on the lens with which we are all familiar provides us with a handy

scale showing a square relationship which we can also use as a key for our bellows extension.

A Fast Method to Calculate Bellows Extension Factor

By John A. Cook

There is an old saying that as photographers get older they don't get any better, but they do get faster. During my many years as a studio product photographer, I never had the luxury of spending a lot of time agonizing over technique. There was always a budget and a deadline nipping at my heels.

Of necessity, I learned many shortcuts to get through the mountains of products I was assigned to shoot. This is one of them.

This method for calculating bellows extension is predicated on the relationship between the extension of the bellows (in inches) and common f-stop numbers. It requires no fancy gadgets to purchase nor algebraic formulae to memorize. You don't even need batteries.

Step One:

Make a permanent, durable list of the following F-numbers. (You can also find them on your light meter.) Note that they are shown in 1/3 stops. Those with asterisks indicate "whole" stops:

3.5
4 *
4.5
5
5.6 *
6.3
7.1
8 *
9
10
11 *
13
14
16 *
18
20
22 *
25
28
32 *

Step Two:

Calculate the focal length of your lenses in inches, rather than millimeters, by

dividing by 25.4. Photography is not an exact science - it’s okay to round off these numbers.

90mm = 3.5" 150mm = 6" 210mm = 8.26" 240mm = 9.4" 300mm = 11.8"

Step three:

When you are ready to make the exposure, measure the view camera’s extension from the ground glass to the lensboard in inches. Measure from the center of the lensboard to the center of the ground glass so as to not introduce errors from extreme swings and/or tilts.

Compare this distance to the focal length (or flange distance) of the lens and relate these two numbers to the above list of f-stops. Their difference will indicate the number of stops you must increase the exposure.

For example: a 210mm or 8" lens with 11" of bellows requires a one stop exposure increase (the difference between f8 and f11).

A 240mm or 9.4" lens with 14" of bellows requires a one and one- third stop increase (difference between f9 and f14).

A 90mm or 3.5" lens with 4.5" of bellows requires a two-thirds stop exposure increase. And so on.

This method is not accurate for telephoto lenses, whose optical center is not near the lensboard. To ensure always having a bellows measuring device handy, I sewed a cloth tailor's tape measure to the edge of my focusing cloth.

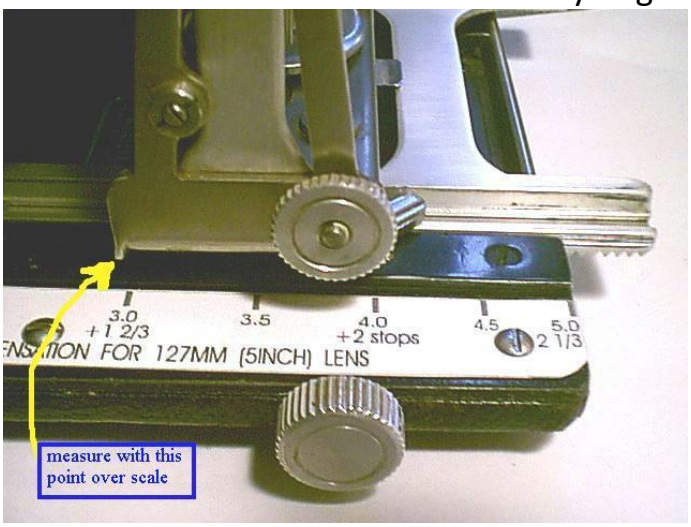
Devices

A Tape

Making a "custom" tape measure means you can leave the calculator at home. Stanley makes a very small (approx. 1.5" x 1.5" x .3") version of their spring-retracting "carpenter's" tape measure. Do the calculations, (once) mark the back of the tape, and you can find exposure comp in a few seconds. It is especially useful for telephoto lens designs that don't conform to the usual exposure comp formulas. I have one marked at 1/3 stop increments using different colored marks for each lens. Works great. Chris Ellinger

A Fixed Scale

Where I only have one lens, a 127mm (5 inch), I figured that a simple scale on the bed next to the focusing rails calibrated in both stops and time increase would do the job. Probably many people have already thought of this where it is so simple but where this is all new to me, ignorance is bliss. I used a paint program on the computer with the measured values printed on heavy card stock which I cut to size. The scale is held in place with the three screws that hold the bed together so there is no modification of the camera and it is simple to change. If I had two lenses a second scale could be put on the other side as well, three lenses and I'm in trouble, but I probably couldn't afford them anyway. I've attached a JPEG picture to show the first revision I made before I noticed where the screws would be so I've moved stuff slightly so the screws don't cover some of the printing on the scale. With modification this could be used on any large format camera.



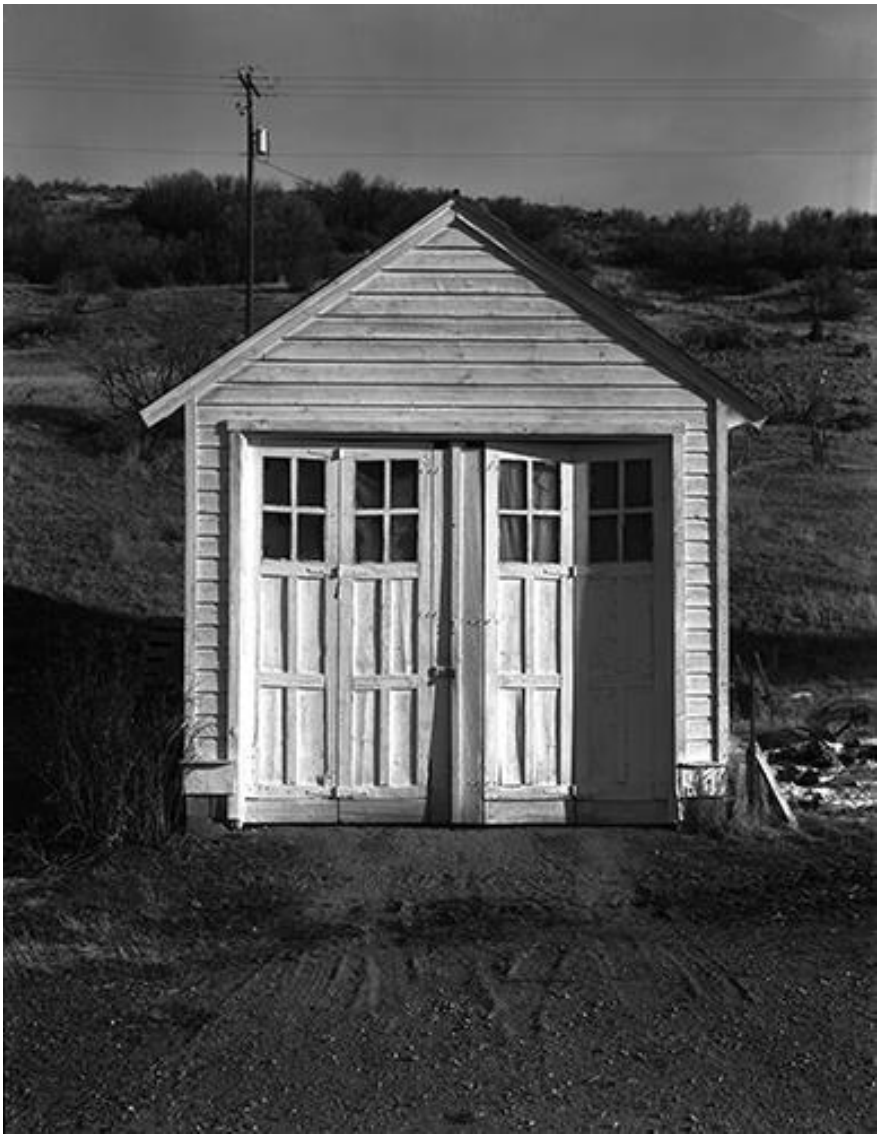
Philipp Salzgeber's QuickDisc

The QuickDisc is a simple and useful tool. The use of the QuickDisc involves no calculation, it is lightweight, easy to replace and free for personal use. It consists of two pieces of cardboard, the disc, and the measuring strip.

Mastering the View Camera

Lesson Ten

Scanning Negatives



Shed – Kamas, Utah circa 2000 – Jay McMullan

I lived in Salt Lake City for 16 years and I had one of the nicest home darkrooms in the country. I could print up to 4x5 inch negatives and transparencies. I used the JOBO system to develop my film and prints. I had hot and cold water plumbed into

the darkroom along with my own custom water temperature controls and a huge sink. There was a time that I loved working in the darkroom. When I was young, I took all of the photos for the Hansford County, Texas Sheriff's Department when someone was killed. I processed and developed everything in house for them. Then, in 1984 I moved to a suburb of Tulsa, Oklahoma to attend seminary. While there I got a job with the Broken Arrow, Oklahoma Police Department as a jailer and I also set up and ran their photo lab. It was there that I got more into color processing and learned how to make a color print really pop!

I moved to Salt Lake City in June 1993. Living in the West was an amazing experience to me and I focused more and more on landscape photography. One of the bedrooms downstairs backed up to the bathroom so I was easily able to plumb in hot and cold water. I bought a 4x5 enlarger and built an incredible darkroom. As I got older though, I didn't enjoy my time as much as I used to in the darkroom and about the same time, digital imaging was starting to really challenge analog photography. I bought a Nikon F5 and probably shot a thousand miles of Ektachrome through it before film started dying out and digital started taking over. At the same time, I used my Toyo VX125 mostly for black and white but did shoot some color with it.

A digital back for my 4x5 is just completely out of my price range and I'm not sure how I would like one in the field anyway. So now, I do a mix of analog and digital with my 4x5. I use my 4x5 view camera with film, then I scan the negatives into digital images.

There are different types of scanners available.

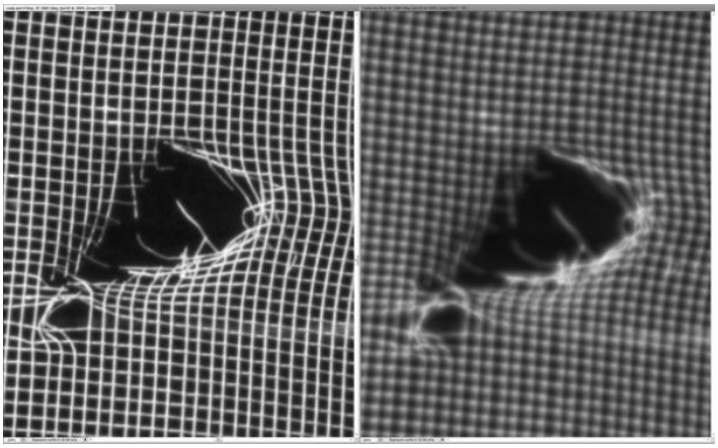
1. Flatbed Scanner
2. Flatbed scanners using wet scans
3. Drum Scanners

Flatbed Scanners are what most people think of when they think of a scanner. A lid is raised, the item to be scanned is placed on a piece of glass, the top lowered and then the scan is made. Flatbed scanners are easy to use but you must be careful to clean the glass on the scanner and whatever you are scanning to help avoid problems with dust. No matter how much you clean the surfaces though, you are still going to have to fix some dust problems once the scan is made. There just isn't

any way around it. I recommend that you use a very good anti-static brush or a Staticmaster brush. Staticmaster brushes use a very small radioactive source which stops dust from clinging to a surface. It has been my experience that they work extremely well. The radioactive sources do have a limited lifespan and can be replaced. They are expensive but well worth it when considering all the time you would otherwise be dust spotting in Photoshop. If you are purchasing a Staticmaster brush or a replacement element, look at the expiration date and get one with the longest useful period before the radioactive element reaches its expiration date. If you are ordering online you will have to take what you get. Other companies that make anti-static brushes are Kinetronics and Fisher Scientific. Some software like Silverlight claim to be able to give dust free scans.

Flatbed scanners are CCD scanners. This means they use a sensor just like your digital camera. Basically, they take a photo of what you are scanning. Many photographers are “wet scanning” their film now. Wet scanning on a flatbed scanner consists of squirting a little bit of a special liquid then placing your sheet film in it. Then more liquid is placed over the top of the sheet of film. Then a special piece of Mylar is placed over that. All of the air bubbles are rubbed or squeegeed out. Then the film is scanned. The special fluid that is used fills in scratches and makes the scan turn out much more clear than it would be without it.

The following information was taken from www.ScanScience.com:

> We recently had an opportunity to scan an ideal image made with a 5 x 7 camera and black and white film, by well Known photographer Craig Alan
> 
> Huber from "In Platino Veritas Images" in Washington State. This image gave us the opportunity to show the differences between fluid scanning and dry scanning which are shown. **ALL THE SCANS ARE RAW SCANS WITHOUT SHARPENING!** At ScanScience we scanned the negative on an Epson V750 using Silverfast 6i at 3600 dpi resolution, on a 16 bit gray scale, using **ScanScience** tools and

Lumina Scanning fluid. The result was an enormous 750 MB plus file, which gave enabled us to crop various sections at high resolution and magnification. This very high resolution scan for such a large negative was chosen as it delivered the best looking image at high magnification. We also tried a scan at 6400 dpi, found no improvements, only bloated files that took longer to scan, so we did not use it.

The optimum focus of V scanners is known to vary so we first determined the optimum elevation for our unit by scanning the new ScanScience target. It turned out to be **2.6 mm**, so all scans including the dry scans were run at 2.6 mm. (The negative was very flat so the un-sharpness of the dry scan was due solely to the inadequacies of dry scanning, which throws away much of the quality.)

We show below two small crops of the image from the center and corner at 200% magnification. Both images are raw, with no manipulations whatsoever by the scanner software or Photoshop.

Image 1, is a small section at center and you can see that hole in the mesh of the source image.

The wet scan at left of Image 1 easily blows away the dry scan on the right by a large factor, helped by the fact that at center the lens is sharper. You would not know the image was that sharp from a dry scan. The detail in the mesh and its contrast are phenomenal in the wet scan.

Drum Scanners

The very best scans available are drum scans. Drum scanners are extremely expensive, require regular maintenance and may take months for the operator to learn all the nuances needed to make excellent scans. When extremely high quality is needed, the drum scan is the way to go. If you need a billboard sized photo this is the only way to go too.

"How a drum scanner differs is that it uses PMT's (Photo Multiplier Tubes). These are basically vacuum tubes (one for each RGB color) that absorb the image pixel by pixel. It's a technology that was derived from nuclear physics.

Why compromise on quality when you can get the best scans that are out there? National Geographic, Vogue, pretty much every big publishing house used to have drum scanners which cost up to $65K or more when new and could scan at up to 11,000 dpi. For these publications, for advertising agencies, for anyone that wanted to have the ultimate quality and/or print big, there was no compromise.

PMT's are ultra-sensitive to light and therefore outperform CCD's in their dynamic range. The stated D-Max on most CCD scanners is highly inflated. Many of the consumer and prosumer manufacturers do this to show that their specs are higher than drum scanners, when in reality those specs are not very accurate.

Wet-mounting

Wet-mounting is the act of sandwiching the film on the drum between a sheet of Mylar and the drum surface. Having the film in this fluid creates an optical effect that increases dynamic range, color vividness, renders fine details more refined, removes much of the defects (scratches and most of the dust) and reduces film grain. You can't emulate, simulate or fake this optical effect in digital post processing – it's pure physics.

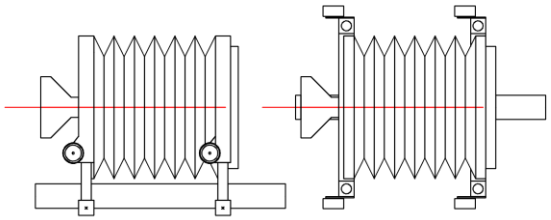
Unlike flatbed or prosumer scanners the scanning surfaces on the drum create almost no side-reflections from neighboring areas. This drum design gives the best possible flatness to the film."

https://phogotraphy.com/2015/09/08/drum-scanning/

Mastering the View Camera

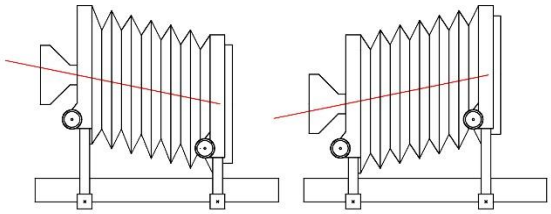
Field Sheet

Camera Setup



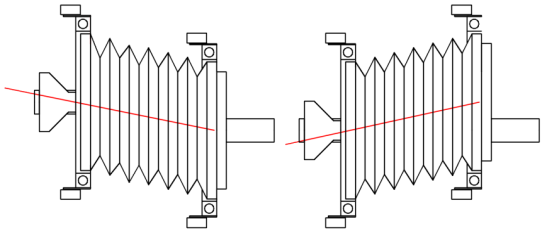
Start by setting tripod level then straighten and level camera.

Rise and Fall



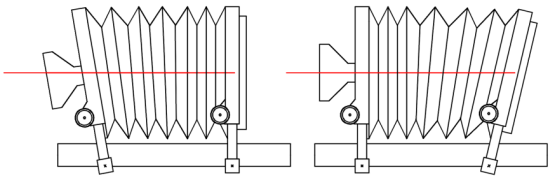
Use to control perspective. Keep front and back of camera parallel. Raise front to look up. Raise back to look down.

Shift



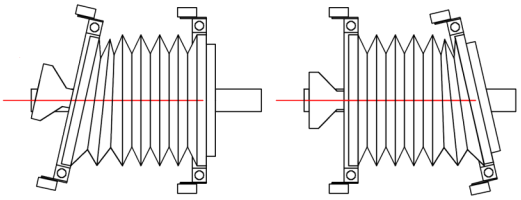
Use to look left or right without changing the position of the camera. Also useful to photograph into a mirror without the camera being seen. Move foreground objects in relation to objects that are further away. Keeps lines moving to the left and right parallel.

Tilt



Use front tilt to increase depth of field. Focus on background then tilt the front to bring the foreground into focus also. Back tilt causes a subject close to the camera to be exaggerated and to loom in the finished photograph. To focus on a small area and then have everything else be out of focus, tilt the front of the camera back or tilt the back forward.

Swing



Works like front and rear tilt. Front tilt will cause a subject running to the side to have a greater depth of field. Swinging the back of the camera will cause a subject to loom into the photograph.

Determining the Best Aperture for Depth of Field

There is a very simple and practical way to find which f-stop you need to use. Make your movements first. Then focus on far, focus on near, read the distance "D" in millimeters between the two positions on your rail, refocus so as to split the distance on the rail, and use the following table that I recommend you carry with you all the time. "F" is given in decimal f-stops, as on a hand-held meter, for example 16.6 is 16 and 0.6 (aka between 1/2 and 1/3) of a f-stop.

D(mm)	F
1	16.6
2	22.6
3	32.2
4	32.6
5	32.9
6	45.2
7	45.4
8	45.6
9	45.8
10	64

Hyper focal Distance Chart for 4x5 Lenses

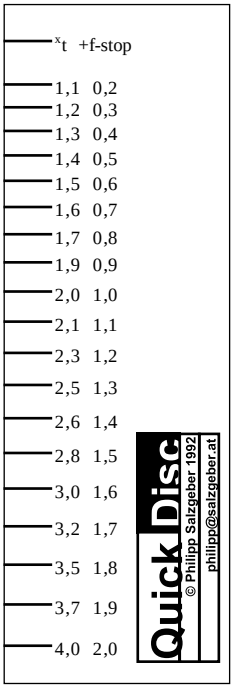
$$\text{Hyperfocal Distance} = \frac{(\textit{focal length})^2}{(f\text{-}\textit{number})(\textit{acceptable circle of confusion})} + (\textit{focal length})$$

Lens Focal Length mm	f Number	Hyper focal Distance										
50	4.5	5556	mm	219	inches	18	feet	Focus from	109	inches or	9	feet to Infinity
	5.6	4464		176		15			88		7	
	8	3125		123		10			62		5	
	11	2273		89		7			45		4	
	16	1563		62		5			31		3	
	32	781		31		3			15		1.3	
	64	391		15		1			8		0.6	
75	4.5	12500	mm	492	inches	41	feet	Focus from	246	inches or	21	feet to Infinity
	5.6	10045		395		33			198		16	
	8	7031		277		23			138		12	
	11	5114		201		17			101		8	
	16	3516		138		12			69		6	
	32	1758		69		6			35		3	
	64	879		35		3			17		1.4	
90	4.5	18000		709		59	feet	Focus from	354	inches or	30	feet to Infinity
	5.6	14464		569		47			285		24	
	8	10125		399		33			199		17	
	11	7364		290		24			145		12	
	16	5063		199		17			100		8	
	32	2531		100		8			50		4	
	64	1266		50		4			25		2.1	
110	4.5	26889		1059		88	feet	Focus from	529	inches or	44	feet to Infinity
	5.6	21607		851		71			425		35	
	8	15125		595		50			298		25	
	11	11000		433		36			217		18	
	16	7563		298		25			149		12	
	32	3781		149		12			74		6	
	64	1891		74		6			37		3.1	
150	4.5	50000		1969		164	feet	Focus from	984	inches or	82	feet to Infinity
	5.6	40179		1582		132			791		66	
	8	28125		1107		92			554		46	
	11	20455		805		67			403		34	
	16	14063		554		46			277		23	
	32	7031		277		23			138		12	
	64	3516		138		12			69		5.8	

210	4.5	98000	3858	322	feet	Focus from	1929	inches or	161	feet to Infinity
	5.6	78750	3100	258			1550		129	
	8	55125	2170	181			1085		90	
	11	40091	1578	132			789		66	
	16	27563	1085	90			543		45	
	32	13781	543	45			271		23	
	64	6891	271	23			136		11.3	
240	4.5	128000	5039	420	feet	Focus from	2520	inches or	210	feet to Infinity
	5.6	102857	4049	337			2025		169	
	8	72000	2835	236			1417		118	
	11	52364	2062	172			1031		86	
	16	36000	1417	118			709		59	
	32	18000	709	59			354		30	
	64	9000	354	30			177		14.8	
300	4.5	200000	7874	656	feet	Focus from	3937	inches or	328	feet to Infinity
	5.6	160714	6327	527			3164		264	
	8	112500	4429	369			2215		185	
	11	81818	3221	268			1611		134	
	16	56250	2215	185			1107		92	
	32	28125	1107	92			554		46	
	64	14063	554	46			277		23.1	

QuickDisc

The QuickDisc is a simple and useful tool for the determination of exposure compensation when photographing small objects with large format cameras. The use of the QuickDisc involves no calculation, it is lightweight, easy to replace and free for personal use. It consists of two pieces of cardboard: the disc, and the measuring strip.



Glue this print-out on a piece of cardboard, and cut out the measuring strip and the QuickDisc along the borders. Now the Quickdisc is ready to use!

How to use the QuickDisc:

1 • Put the circular QuickDisc next to the object you want to photograph. It doesn´t matter if the disc is not perpendicular to the optical axis. Due to the round shape of the QuickDisc, the full diameter is visible in every orientation. (That is what the QuickDisc is all about!)

2 • Measure the largest visible diameter of the image of the QuickDisc with the scale. The measuring scale is tabulated in tenths of an f-stop. The left column, named at gives the correction factor, the exposure time has to be multiplied by this factor to get a correct exposure. The right column gives the correction value in f-stops. Example: When an object is photographed at life size (1:1) the exposure time has to be increased four-fold **OR** the aperture has to be opened by two stops. Be aware, that increasing the exposure time above the limits given by the film manufacturer will result in reciprocity failure and must be compensated according to the technical specifications of the film.

3 • Don´t forget to remove the QuickDisc before taking the picture!

The QuickDisc project is © Philipp Salzgeber (http://www.salzgeber.at/disc/)

Mastering the View Camera

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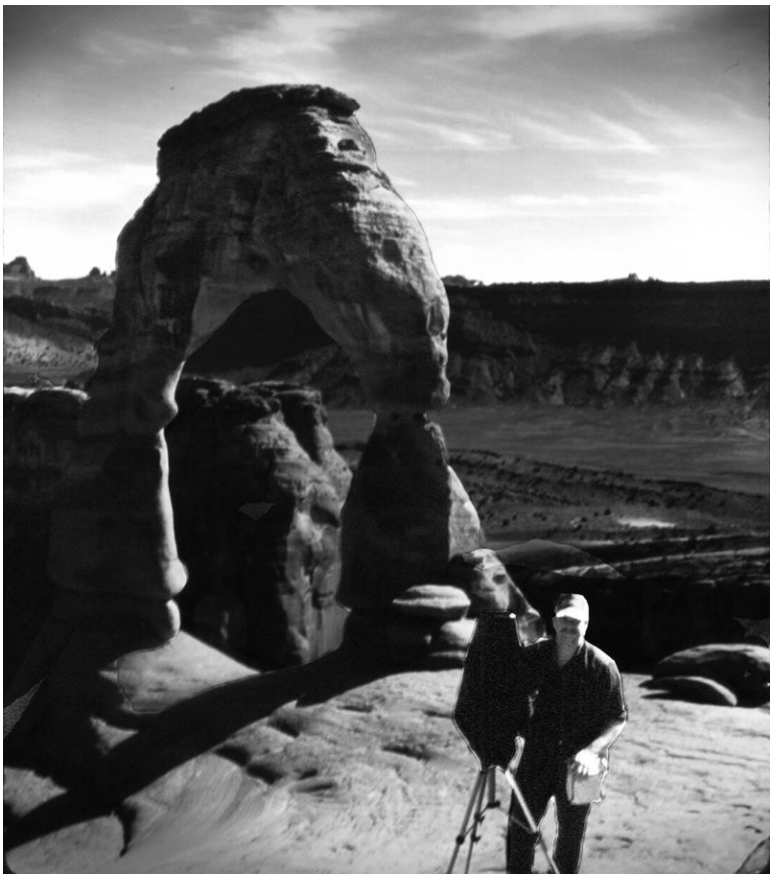
Mastering the View Camera



Designed as a stand-alone book or to accompany JayMc Photographics' "The View Camera Workshop," "Mastering the View Camera" takes the photographer who has never worked with a view camera and quickly teaches them the basic steps to becoming a proficient large format photographer. For those who have experience with large cameras, they are taken to a new level of photographic artistry. This book is a wealth of information that no photographer should be without.

"Mastering the View Camera" teaches photography skills long forgotten due to the influx of automated cameras. With digital photography moving up on the scene so quickly it is a welcome relief to see that this volume will instruct and encourage real photographic artists to learn the whole photographic process in a simple and concise manner, from the moment of loading film into film holders, setting up the view camera to making your first large format photograph.

Filled with dozens of illustrations and photographs, "Mastering the View Camera" and The View Camera Workshop, led by Jay S. McMullan will quickly teach you everything you need to know about the view camera and how to use it.

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