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# **BIG CAMERAS, BIG LENSES, BIG FILM**

by  
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**Y**ou began by experimenting with Black and White photography. You bought a roll of film just to see how it would work. You set up a darkroom. . . processed your first roll of film. . . made some prints and began to fall in love with the whole process. Then you made the move to large format photography. You have probably purchased a 4x5 and have become hooked on just how beautiful prints are from large negatives. You may have tried your hand at some contact printing. . . by far, the easiest printing possible. Maybe you have tried one of the alternative printing methods. . . possibly platinum/palladium. . . and now you realize you need an even larger negative. Of course, you can enlarge your smaller negatives, but this does lead to some degradation in the image quality. You have made the decision, at least at the level of serious consideration, to look into making really large negatives!

So you move up to the ever popular 8x10 view camera. Wow! Now that is an increase in image size. . . but. . . now you're interested in even larger negatives. You are ready to explore what exactly is needed to move up to an even larger class cameras. . . ULF (Ultra Large Format). You will have to make a conscious decision as to exactly how big you really want to go. It is a very wise decision to carefully study exactly what is required to work in the ULF format. It is a major leap. . . and just like jumping out of an airplane, if done with a little preparation, can be a very exhilarating experience!

There are a lot of decisions you have to make. Just what size are you interested in? Should you purchase a vintage used camera (a fixer upper) or something new? How about film, film holders, lenses. . . these are all things that must be thought out before making the leap.

If you have already made the jump from 4x5 to 8x10 you should be aware that doubling the film size does not exactly double the problems. . . nor the cost! They tend to expand exponentially! As the camera gets bigger, the problems rapidly mount. Yet, many are ready, willing and eager to work with the ULF formats. The rewards are really worth the effort, if you are willing to dedicate yourself to the medium. So if you are still interested in ULF, here are a few things to consider.

## **THE FORMATS**

**I**n general, it is safe to say that any film format larger than 8x10 can be considered ULF. There are numerous film sizes larger than 8x10. Some are more common than others. All are certainly large. ULF formats are measured just as 4x5 or 8x10 formats. . . the film measurement. . . height and width. Some sizes can be considered to be standard ratio film sizes. These are the common sizes in the usual ratio of about 1:1.25, like the 4x5 or 8x10 formats. . . and extend into the ULF range with sizes like 11x14, 16x20 and 20x24.

Then there are the wide formats, with ratios as high as 1:2.5. These film sizes maybe better known as the Banquet Format, or Panoramic Format. The banquet formats use film that is usually exposed with the horizon across the longest side. . . though some photographers have used the film for long vertical images.

FILM SIZE	RATIO LxW	NOTES
35mm	1:1.50	Standard 35mm film
2¼x2¼	1:1.00	Medium format
4x5	1:1.25	Standard LF
5x7	1:1.40	Standard LF
4x10	1:2.50	Panoramic LF
8x10	1:1.25	Standard LF
11x14	1:1.27	Standard ULF
16x20	1:1.25	Standard ULF
20x24	1:1.20	Standard ULF
8x20	1:2.50	Banquet ULF
12x20	1:1.67	Banquet ULF
14x17	1:1.21	Standard ULF
18x22	1:1.22	Standard ULF

**Table 1**

The table above lists some of the commonly available film sizes. . . including the ULF format. It also lists the ratio of length to width. Note, there are other sizes, but these are more commonly available.

The Banquet Format came into common use in the early 1900's. It was created mainly for professional portrait photographers who needed to make images of large groups and was also used for sports teams, club gatherings, or large dinner banquets. . . hence the name Banquet Format. In order to satisfy the demands of the customers, it was required that the photographer be capable of capturing large groups. . . sometimes up to 100 people in a single photograph. Each person's face had to be recognizable. Enlargements from small film was not possible at this point in time, so large cameras were designed for making big, elongated, negatives that could be contact printed.

## VINTAGE CAMERAS

**T**he largest camera ever constructed was assembled around 1900 and is considered to be the true mammoth. It was designed by George R. Lawrence and built by camera builder J.A. Anderson.

Lawrence was commissioned by the Chicago & Alton Railway to make the largest photographs ever made of their luxury passenger train the Alton Limited. This camera weighed some 900 pounds and made glass plate negatives that were 8 x 4 ½ feet in size. The camera required a complement of 15 men to operate. Obviously everything about this camera was custom constructed and you will not find anything like this in use today.

There are numerous manufacturers that are long out of business that manufactured LF and ULF cameras in both standard and Banquet Formats. The thing to keep in mind is that these companies are long gone. There is no one left to make repairs and no spare parts. If you buy a vintage camera, be prepared to have any needed repairs done by a custom restoration shop.

## MODERN CAMERAS

**T**here are numerous manufacturers of modern LF and ULF cameras (including Banquet Formats). Just do a search on the Internet and you will find most of them. The sky is the limit, and of course the size of your wallet, as to what formats and features that are available today.

All of the current manufacturers produce a quality product. Each has its own unique design, function and fit. Fit, meaning the particular usefulness the features may have to you personally. The best way to choose, is to try to handle each model in person. This is sometimes difficult, but if you attend a trade show or search out a dealer, you can find some models on display. Another option is to seek out workshops that cater to the ULF user. Again, a search of the Internet can turn up a tremendous amount of information.

Today the largest ULF format in use is 20x24 and B&W film is available in many popular sizes. Refer to the section titled *THE FORMATS*. There are even instant films in 20 inch wide rolls for use in specially designed 20x24 view cameras. There are a hand full of studios around the world that still have the original Polaroid 20x24 cameras available for use.

## FILM

A big consideration when contemplating ULF photography is film. . . maybe, more precisely, the availability of film in the particular size you are considering. Most ULF film is limited to B&W. The major manufacturers of film readily make LF film available in sizes up to, and including 8x10. When you move into the ULF sizes you are faced with limited availability of specific sizes. Yet there are several retailers that cater specifically to the LF and ULF market. Due to the popularity of the LF and ULF formats, numerous specialty companies have come into being and offer film in most every size for the ULF shooter. Again, a quick search on the Internet should turn up quite a few dealers that specialize in ULF film.

Also consider that some Banquet Formats are cut down standard sizes. Hence, you can cut a sheet of 16x20 film into two sheets of 8x20. A sheet of 20x24 can be cut in half to make two sheets of 12x20. Just remember before you try cutting your own film, you will be required to cut the film in total darkness. The sheets will have to be cut square, without damage and without dust contamination.

## FILM HOLDERS

The next ULF challenge is finding useable film holders in the size required to fit the format you have chosen. Every vintage camera manufacturer made film holders for their cameras. The thing to keep in mind is, there are few standards for film holder design once you get into the ULF sizes. There are standard specifications set forth for 4x5, 5x7, 8x10, 11x14 and 14x17 holders by ANSI (American National Standards Institute). . . but many other sizes are dependent upon the camera manufacturer. Some may predate the standard and still require custom design. If you are having new film holders made for a vintage camera, you must specify the make of the camera. You may even have to send the camera film back to the manufacturer to insure proper fit.

Old original film holders can normally be found on the Internet auction sites. A word of caution; old film holders may need to be refurbished. The light traps may need to be replaced. Dark slides can be cracked or broken and need replacing. Old wood sometimes shrinks, splits and warps. Any of these problems can cause improper fit, leading to light leaks, and fogged film. Since there are no standards, a particular holder may not be suitable for another manufacturer's camera. Be very careful here.

Most modern ULF camera manufacturers make new holders to fit their cameras. Some will custom manufacture holders for your vintage camera also. You will need to contact each manufacturer and

explain your exact needs. These people usually run small businesses and do custom work, hand made, one at a time. They are not particularly fast, nor do they usually have a stock of any particular holder on hand. Delivery times can vary from a few weeks to many months.

## LENSES

Since there is so much interest in LF and ULF, and so much confusion as to exactly which lens is appropriate for any particular format, here is a brief overview of what is involved in selecting an appropriate lens. Modern lens manufacturers provide all the information you need when selecting one of their lenses for a particular format. . . but, information on some vintage lenses is often hard to come by. Understanding what is required of a lens and exactly how the lens works with the camera will help in selecting the correct lens for any specific format. Here is a brief explanation of some of the terms you should be familiar with.

### FILM DIAGONAL

Before you can determine if a particular lens will cover your chosen film format, you must know the diagonal measurement of the film. This is relatively painless math and all you will need is a calculator and a few minutes to plug in the appropriate numbers. If you don't want to learn how to use a calculator to do your own calculations, just refer to the table below (Table 2). It contains common film sizes and their diagonal measurement. The measurements are represented in both inches and millimeters. Locate your film size in one of the two columns on the left, then read across to the diagonal dimension.

FILM SIZE inches	FILM SIZE mm	DIAGONAL inches	DIAGONAL mm
4x5	102x127	6.40	163
5x7	127x178	8.60	218
4x10	102x254	10.80	274
8x10	203x254	12.80	325
11x14	279x356	17.80	452
8x20	203x508	21.50	546
16x20	406x508	25.60	650
20x24	508x610	31.20	793

**Table 2**

Film diagonal measurements of commonly available sizes, both measured in inches and millimeters.

If you know the image circle of a particular lens, then you can determine which film sizes will work with the lens. For example, say you are contemplating buying a lens and you know the image circle is 325mm. Looking at the table above you will immediately see that 325mm is the exact diagonal of a sheet of 8x10 film. This lens would probably work. But, you would have absolutely no movement available when using the camera. This lens would adequately cover 4x10 and would have generous coverage for 5x7 and 4x5 formats.

A word of caution; some older lenses are capable of making beautifully sharp images and are highly sought after by serious LF and ULF photographers. Some of these older lenses sell for more than a modern equivalent, especially if they have been fitted into a modern shutter. Realize, that some lens

designs may have a circle of illumination that is somewhat larger than its circle of acceptably sharply formed image. In other words, the lens might project light in a circle that is 300mm, but only produce an acceptably useable image circle of maybe 285mm. Also, depending upon the design, some lenses will produce a larger image circle once stopped down. The lens might have an image circle of 300mm at full aperture, which widens to maybe 325mm once stopped down 3-4 stops. So if you have the specifications for the image circle of a particular lens, be sure you know what aperture is used for the measurement.

## LENS COVERAGE

The covering power of a lens focused at infinity is determined by two parameters. . . the angle of coverage and the focal length. If you know the focal length and angle of coverage, you can calculate the image circle. Just keep in mind that the image circle of the lens in question must be larger than the diagonal of the film. Also remember that the image circle should be somewhat larger than the film format to allow for camera movements.

## LENS EQUIVALENTS

Just about everyone owns or has used 35mm camera equipment. If you have worked with this format you understand the lenses. You know a 20mm lens is a wide angle. . . and a 300mm is a telephoto. But a common question is, how does a particular focal length lens on a view camera compare to 35mm?

In the table below (Table 3) lens focal lengths for various large format sizes are compared to the approximate focal lengths for 35mm film. Look up the lens focal length of interest in the first column. Then read across to the column on the right for the equivalent focal length when used with large format film. This value would be the equivalent for a 35mm camera.

F/L	4X5	5X7	8X10
47mm	15mm	-	-
55mm	17mm	-	-
65mm	20mm	-	-
90mm	30mm	20mm	-
120mm	35mm	24mm	17mm
150mm	46mm	33mm	23mm
200mm	62mm	43mm	30mm
250mm	76mm	54mm	38mm
300mm	90mm	65mm	45mm
350mm	106mm	75mm	52mm
400mm	120mm	86mm	60mm
450mm	134mm	96mm	68mm
500mm	150mm	105mm	75mm
600mm	180mm	128mm	90mm
800mm	240mm	170mm	120mm
1,000mm	360mm	250mm	180mm

**Table 3**

Lens focal lengths compared to 35mm. The numbers above show the approximate relationship between a particular focal length lens when used on different view cameras when compared to the 35mm format.

For example; a 150mm lens on a 4x5 camera would yield the same view as a 46mm lens on a 35mm camera. . . for a 5x7 camera the equivalent 35mm lens would be a 33mm. . . on an 8x10, the equivalent would be 23mm.

## THINGS TO CONSIDER

**K**ee in mind that moving up in film size requires that everything be larger. You know the film, the camera, film holders, and lenses are larger, but don't forget that a move to larger isn't just about the obvious. You may have to invest in a larger tripod in order to support a heavier camera. Also consider how you will transport your larger camera and all the necessary equipment needed to make an exposure. You will need large cases to protect the camera, film holders and lenses. If you travel, will your vehicle be large enough to hold all your equipment, and will it be accessible once on the road?

Also think about the less obvious. . . you will need larger trays, more photographic chemicals and possibly even a larger darkroom. You will need more room to work with larger prints. You may need to consider a larger paper trimmer, larger dry mount press. Also think about how you will store your negatives. You may have to order specially made boxes for odd size film and prints. And don't forget more storage area for your larger storage boxes. These are just a few things to consider. Don't let the idea of going larger scare you away, just be prepared and do a little homework to be sure that LF or ULF is for you.

***AUTHOR'S NOTE:*** *This discussion of LF and ULF equipment is only a beginner's primer. More detailed information can be found in the book "USING THE WOODEN FIELD CAMERA". . . A detailed beginner's guide to getting started using the large format field camera . . . Second Edition by J.B. HARLIN. For more information on LF, ULF, books, and fine art photography, please visit the web site of JB and Susan Harlin;*

**[www.jbhphoto.com](http://www.jbhphoto.com)**

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