



*Fig. 1 Aspen Grove, Manti-La Sal National Forest, Utah, May 2004 Mamiya RB 37mm f4.5 C Fisheye lens on a Toko Nikki II 4X5 camera. Exposure at 1/2 second at f11 on Ilford Delta 100 with a Hoya HMC 25A (red) filter.*

## **Gone Fishin’**

### **Fisheye lenses and large format photography**

Text and Photographs by Joe McGloin

My experience has been that most larger-format photographers, when it comes to

photographic perspective, don’t stray too far from home -- compared to other formats. In



*Fig. 2 Aspen Grove, Manti-La Sal National Forest, Utah, May 2004 A full-frame crop from the circular image in Figure 1. Diagonally, it's still a 180-degree fisheye view from corner to corner.*

the various 35mm and medium format realms, it's common to see super-wide-angle and super-tele-photo lenses. But, for a variety of reasons, these optics are much less likely to make an appearance in a large-format outfit.

Many large-format users, especially hobbyists and field-camera users get by with only three or four lenses, perhaps a wide-angle (90mm to 105mm), a normal (150mm to 210mm), and a telephoto (300mm to 360mm). With all of the other essential gear (and the



*Fig. 3 The Toko 4x5 on the left supports a Mamiya 37mm f4.5 C Fisheye, while the Toko 4x5 on the right has a Spiratone 0.15X fisheye adapter attached to a Fujinon NWS 210mm f5.6 lens. The latter is lightweight, inexpensive and easy to adapt to any 4x5 camera. The former is heavy, hard to find, and expensive -- but the results are superb.*

camera, of course) these lenses can be a big enough burden on the back -- not to mention the old wallet.

Like most large-format users, I started out in 35mm photography, and when I made the move to the larger formats, I wanted to replicate the various perspectives that were familiar to me in 35mm. The longest lenses were a problem because my field cameras just don't have enough bellows draw to accommodate them. In addition, most telephoto lenses are too costly, too big and too heavy for me to carry for any great distance. I get by with a large, heavy, 600mm Fujinon -- which has about the same perspective as a lightweight 200mm lens in the 35mm format. If I need more "reach" than that, I rely on cropping in the darkroom -- which, fortunately, is much easier in the 4x5 format than in 35mm.

In the macro range, there are also fewer options for large-format users relative to 35mm. Here, the size and weight of the available lenses are not the most difficult obstacles -- it's the price. Fortunately, it's fairly easy to attach an enlarging lens to a Copal shutter, and the results are wonderful. I've had great luck using my "35mm" Minolta bellows lenses (12.5mm, 25mm, 50mm, and 100mm), which I have adapted to my large format, Copal #3 shutter.

At the short end of the large format lens perspective, there are many wide-angle lenses, but as the focal length shrinks, the size, weight, and cost head up. It took me some time to afford a Schneider 47mm XL f5.6, but I'm glad I did. I've always liked the perspective from my Voightlander Heliar 12mm f5.6 (which I adapted for use on my 35mm Minolta cameras) and wanted the same effect with my 4x5 cameras. The Schneider 47mm XL f5.6 is up to the task.

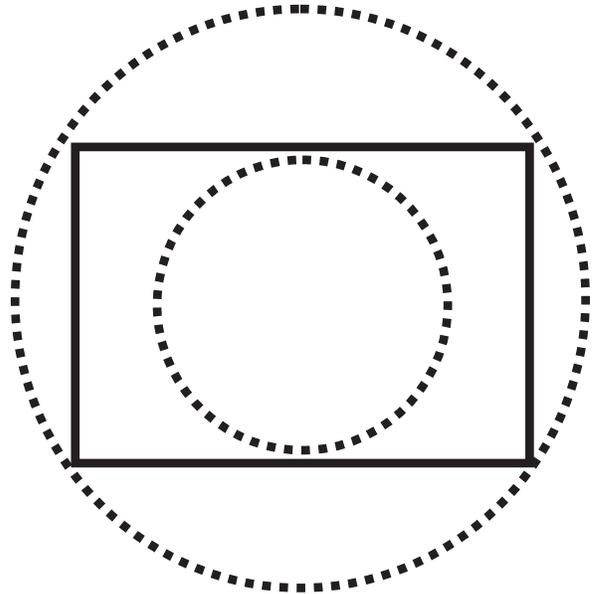
With my 600mm Fujinon telephoto, 47mm Schnieder wide-angle, and Minolta bellows lenses, I felt I had the 4x5 format well covered. Well, almost. There was still a nagging hole in my large-format perspective -- a fisheye! I have never seen a fisheye lens for any of the larger formats, although they are fairly common in the smaller formats -- even medium format. I love the fisheye effect in 35mm and wanted to achieve it in 4x5.

## Choosing a Fisheye Lens

The options for fisheye effects in large format are limited -- some would say nonexistent. There simply aren't any fisheye lenses -- full-frame or circular -- designed for large format cameras.

Over the years, there have been various "fisheye adapters" which attach to the front of a normal lens and provide a fisheye perspective. These adapters have been made in different "strengths", such as 0.25X and 0.15X, and will provide a full-frame to a circular image depending on the adapter and the prime lens that are combined. I started out by exploring the Spiratone 0.25X and 0.15X adapters on my 210mm f4.5 NWS Fujinon, and the results were barely acceptable given severe constraints.

These adapters, when used with my 210mm lens, create a 53mm full-frame fisheye and a 32mm circular fisheye on my 4x5 cameras, respectively, but the quality just isn't up to my standards. At full aperture, only the central part of the image is in focus, and even stopped down all the way, the edges are still fuzzy. And "stopped-down all the way", in this case, means f90 and very long exposures. These adapters are fine for occasional use, but they just don't meet the needs of a serious lover of fisheye views.



*Fig. 4 The solid line represents any film format. The inner circle is from a circular fisheye, while the outer circle is from a full-frame fisheye. A full frame fisheye lens can be used on a larger film format to create a circular fisheye image.*

There are many true fisheye lenses that are potentially good choices for large-format use, but there are several obstacles to their use. But, before we get into that, it's important to consider the nature of a fisheye lens. Take, for example, a 7.5mm fisheye lens in the 35mm format. This would create the inner circle on Figure 4. This is a circular image on the film. But a 16mm fisheye in 35mm -- the outer circle -- provides a full-frame result.

If the same 16mm lens is adapted to a medium format camera, however, it provides a circular image on a medium format camera. For example, I adapted a Minolta 16mm f2.8 MC Rokkor-X full-frame fisheye lens to a Mamiya RB67 6x7 film holder. This created a circular image on the 6x7cm film format. So all I needed was a medium format, full-frame fisheye that I could adapt to being a 4x5 circular fisheye.



*Fig.5 Aspen Grove, Manti-La Sal National Forest, Utah, May 2004. This is an enlargement of a small (17x25mm) chunk of the 4x5" (102x127mm) negative in Figure 1. That's just about half of a 35mm negative! Although it can be hard to find, the Mamiya 37mm is a stellar performer and meets the challenges of the 4X5 format.*

There are many medium-format, full-frame fisheye lenses that can optically meet the needs of the large format user interested in a circular fisheye image. But all

of them will require some modification in order to be used.

Unlike most large-format lenses, most medium format lenses use a shutter inside the camera body -- which is cocked and released through the camera. Because of this, in order to use this type of lens on a large format camera, it must somehow be adapted to a typical large-format camera shutter, such as a Copal #1 or #3.



*Fig.6 Pentax 35mm f4.5 Fish-Eye Takumar. At least three, slightly different versions of this lens were made, but they all would need to be somehow adapted to a typical large format shutter for use.*

It is unlikely that you will find a commercially available adapter(s) of this type, but it's possible to make one or have one made. This might require the removal of the rear mount of the lens.

Another consideration is the short amount of bellows the lens needs. There must be adequate distance between the rear of the lens and film plane to accommodate the shutter and the adapter(s) -- and without causing any physical vignetting of the image.

Another approach -- the one that I have used -- is to find a medium format, full frame, fisheye lens with both the aperture AND the shutter built into the lens. These lenses are, of

course, larger, heavier, and more expensive than lenses without a shutter, but they can save you time and trouble -- if you can find one with a shutter that can be cocked without being on a camera, AND can be fired also without being on a camera.

There is at least one medium-format, full-frame fisheye lens that is up to the challenge. It is the Mamiya-Sekor C 37mm f4.5 180° full-frame fisheye for the RB67 Pro S. Actually there were a few versions of this lens -- the original RB67 37mm was single coated, while the RB67 C 37mm and later versions were multi-coated. They all might work just as well and in the same way as the lens I used here -- the C 37mm.



*Fig.7 Fish-Eye Mamiya-Sekor C f4.5 37mm. Here it is with the built-in metal lens shade that must be carefully cut off for 4x5 use.*

It's designed for the Mamiya RB67 Pro S and has a 96.7mm image circle -- barely covering the 6x7 film format. That may seem odd, but a 96.7mm circular image is a 3.8 inch

diameter circle -- perfect for 4x5 film — if the built-in lens shade is removed. Remember, that the edges of the 4x5 image is “margin” and not used.

As to 4X5 close-ups with a fisheye — it depends on how close you want to get. As the lens is focused away from infinity, the image circle increases in size and it may be too large to fit into your particular camera’s film holders. With my Mido film holders, I get a 1/8” margin — at infinity — so I can focus a little bit closer, but not too much if I want to keep the entire circle on the film. Fortunately, with a 37mm lens (and it’s incredible depth-of-field) you don’t need to add too much extension in order to focus very close.

Of course, you have to figure out how to attach a medium format lens to your 4X5 camera. It all depends on the lens that you choose and the lensboard to which you plan to attach it. In my particular case, I discovered that the rear of the Mamiya-Sekor 37mm fits almost perfectly over the light shield ring on the 4X5 Wista lensboard. I epoxied the rear of the lens to a 77mm filter ring and then epoxied the filter ring to the front of the lensboard. (A possible alternate -- if you happen to have a spare RB67 body mount -- would be to attach that to a lensboard, but modifications would still be needed.) I then covered the seams with black silicone sealant to prevent any light leaks. I, of course, had to first drill out the lensboard to the width of the filter ring. Then I cut off the short, built-in lens shade on the front of the 37mm lens -- some fish-eye lenses have a short lens hood, others do not, but it must be carefully removed. The only “problem” for me is that the fisheye is now centered on the lensboard while all of my other lenses are slightly off-center (as they should be for my particular cameras), about 10mm lower than dead center. That’s not really a problem though because my Toko Nikki II and Toko FL-452 allow for up to a

75mm drop on the front standard. I just drop the front standard 10mm when the fisheye is used to get the image in the center of the film. It’s easy to see on the ground glass. The f4.5 aperture of the Mamiya-Sekor 37mm lens makes the image very bright and clear.

Unlike most (all?) other medium format fisheye lenses that have the shutter in the lens, the Mamiya 37mm fisheye shutter can be manually cocked and released when it is not on the RB camera. There are three pins on the rear of the lens. The two large ones cock the shutter. This is normally done by a levers inside the camera, but the pins can be moved easily with a thumb and index finger.



*Fig.8 Rear plate of the Mamiya Sekor C 37mm f4.5 Fish-Eye. The rear shutter cocking and releasing pins can easily be used when removed from the camera.*

Here is the process in detail:

1. Select your subject.

2. Cock the shutter on the lens by moving the two large pins on the rear of the lens to the red dots. Release them and they should automatically rest on the green dots -- and the shutter should open.

3. Attach the lens to the camera. The aperture stays at f4.5. Focus and compose the image on the ground glass. If you want to check what will be in focus, there are two options with this particular lens. First, it has a depth-of-field scale on the top of the lens, which can help at wide apertures. Plus, there is a Depth-of-Field lever to stop down the lens to visually see what's in focus, if you want. But at f11, everything from infinity to three feet will be in focus!

4. Remove the lens and set it for "mirror up" operation. There is a round dial on the side of the lens with a cable release connection in the middle -- see below. Lift and turn this switch to the "mirror up" setting.

5. Press and hold the third (small) "shutter release" pin on the rear of the lens, and slide the two larger "shutter cocking" pins back to their original positions. The selected f-stop will be set and the shutter will close.



*Fig.9 The "Mirror Up" setting closes the shutter without firing it -- but it stays cocked. You release the shutter with a cable release or turning the dial.*

6. Put the lens back on the camera and load the film into the back.

7. Fire the shutter by turning the "mirror up" dial back to its original position or use a cable release. The cable release approach is better because it will help to minimize vibration, and it is the only way to get long exposures when using the shutter's T setting.

To make additional exposures, just run through these steps again. Sure, it's not as quick and easy as using a typical large format lens and shutter, but with a little practice it almost becomes second nature. Just make sure that when you figure out a way to attach your fisheye lens to a lensboard that you leave enough space to easily access the pin(s) on the rear of the lens.



*Fig.10 The final product on a Tolo Nikki-II 4x5 camera. The results speak for themselves.*

The Mamiya 37mm fisheye lacks the built-in filters of some fisheye lenses. Filters are important to both B&W and color film but cannot be used with many, if not most, fisheye lenses. Fortunately, there is a way around this problem with the Mamiya 37mm fisheye. It happens to have a 40.5mm filter thread on the rear, so ANY filter can be attached -- even polarizers! Since my filter standard is 77mm,

I only needed a couple of step-up rings to get more filter options than any of the smaller-format, “built-in filter” fisheyes.

Two other important considerations are not about the lens, but relate to other gear. First, can your camera be set to allow the front of the lens to extend over the camera base. If you have a fixed rear standard, or for other reasons, this may pose a serious problem. You must consider this before attempting to modify a fish-eye lens for use.

Plus, always remember to position your tripod so that the tripod legs don't appear in the picture. This is not always as easy as you might think. If you look carefully at the opening photograph, you can see the shadow of the camera on the very bottom of the image.

This Mamiya 37mm lens is equivalent to a 7.5 or 8mm fisheye lens with the standard 35mm format -- and it weighs more than a 35mm fisheye lens WITH a 35mm camera!!!

For more information, you can visit:  
<http://www.subclub.org/fujinon/>