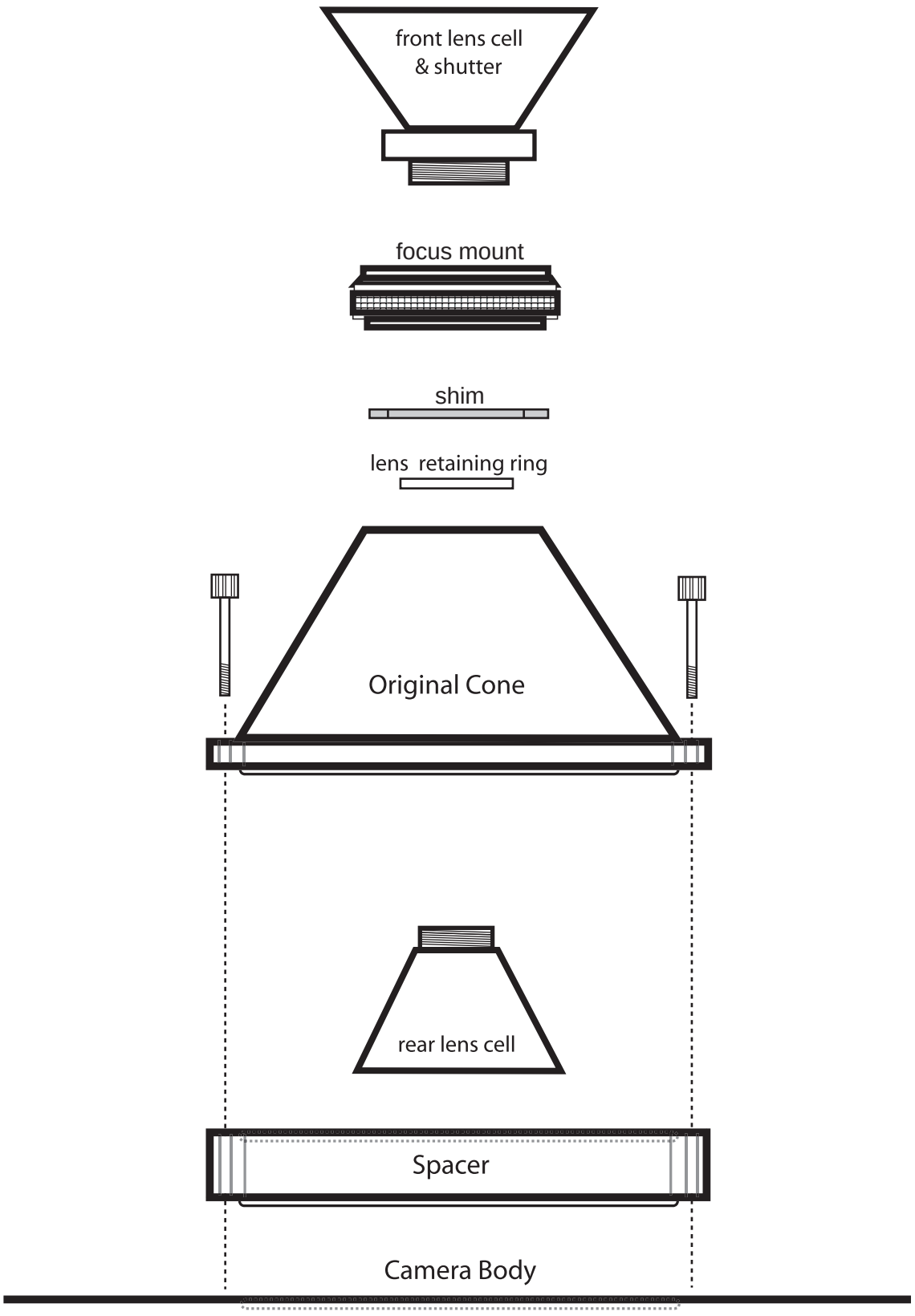
Fotoman Panoramic Cameras


front lens cell
& shutter
focus mount
shim
lens retaining ring
Original Cone
rear lens cell
Spacer
Camera Body

Procedure for Assembly of your Fotoman Camera and Cone Assembly

Please take a moment, and study the assembly diagram shown on the previous page prior to actually assembling your Fotoman camera. If required, a Cone Spacer and any required shim(s) are included with your Fotoman Cone Assembly Kit. The total length of the Cone Assembly has been calculated to match the Flange Focal Distance (FFD) of the lens you have specified. However a final fine calibration will be required to adjust for manufacturing tolerances and the specific FFD of the lens being mounted. (*see Mounting and Calibrating your Fotoman Helical Focus Mount*)

1 - Mount your lens to the Fotoman Helical Focus Mount (HFM) using the supplied retaining ring.
Do not use the retaining ring supplied with your large format lens.
Do not attach the rear element at this time unless it is small enough in diameter to pass through the front openeing of the cone.

2 - Mount the completed Lens-HFM-Cone assembly to the front of the camera body using the four supplied nylon thumb screws. If a cone spacer was included, mount it between the completed Cone/Lens Assembly and the camera body. For ease of shutter cable use it is advised that you orient the lens with the shutter cocking lever pointed towards the bottom of the camera.

4 - Mount the completed camera on a tripod, open the back and place the supplied calibration ground glass in position. Use scotch tape to affix the supplied calibration ground glass (*ground surface towards the lens*) to the center of the film chamber on the film runners.

5 - Aim the camera at a subject which is at infinity, and using a loupe focus until the infinity image is in sharp focus.

You will likely find that at sharp focus, the infinity mark on the focus mount is not aligned to the focus guideline on the HFM.

6 - You are now ready to perform the final infinity calibration of the Fotoman HFM.
Proceed to, and follow the detailed instructions found on page 6...
"Mounting and Calibrating your Fotoman Helical Focus Mount"

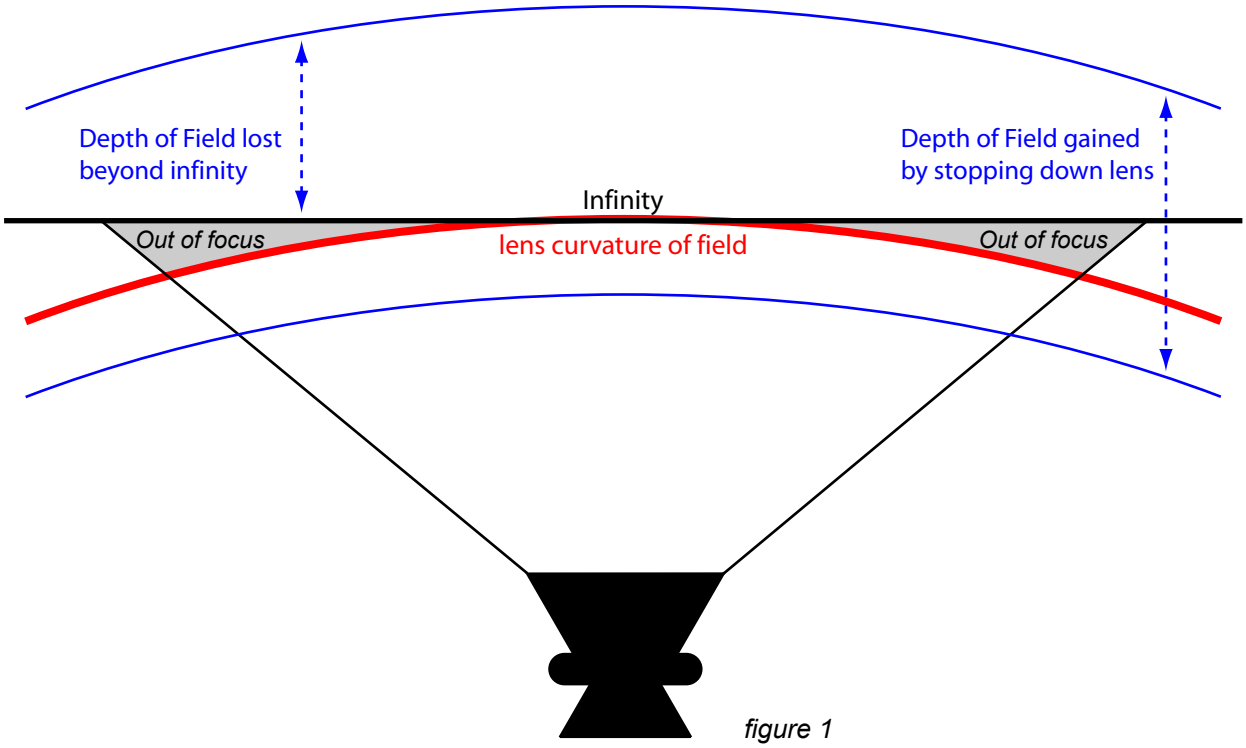


figure 1

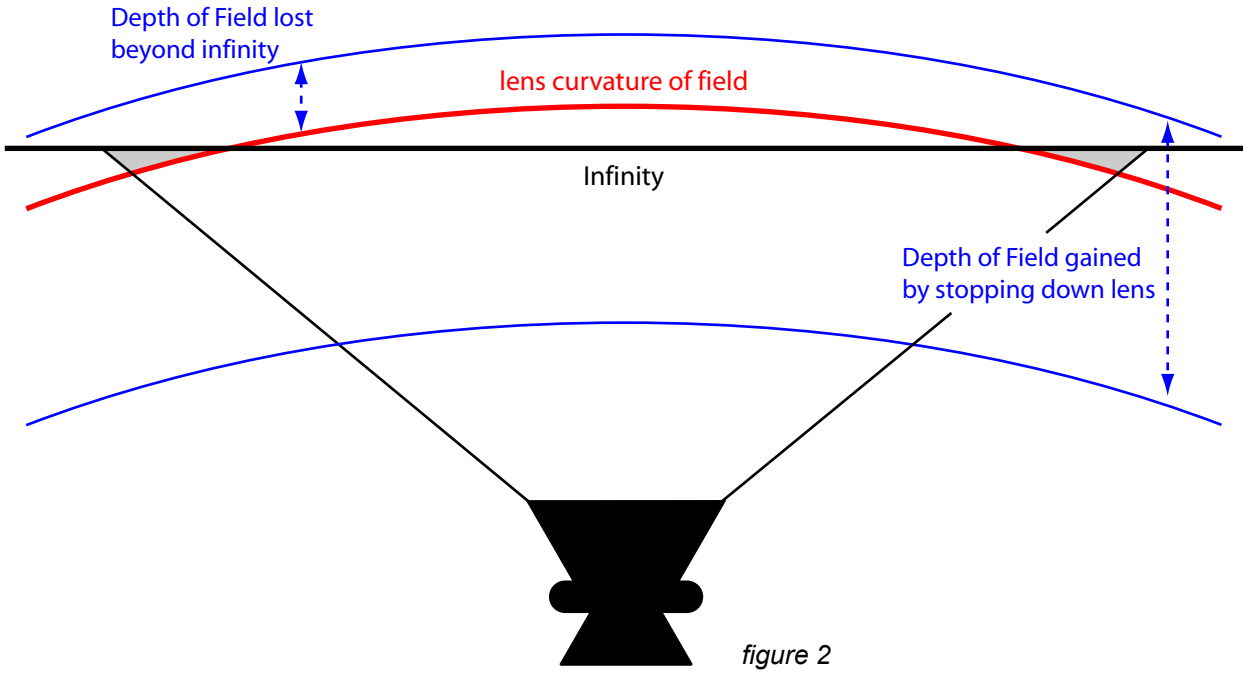


figure 2

When using very-wide and ultra-wide angle lenses it is important to consider the effects of Curvature of Field.

Curvature of field means that the plane of actual focus is curved. Curvature of field effects all lenses, other than specially design "flat field" lenses commonly used for copy and macro photography. The wider the lens, the more curvature of field it usually exhibits. When calibrating your Helical Focus Mount (HFM) for infinity focus you have two choices:

1. Calibrate infinity focus at the ***center*** of the image area.
   This is the easiest method of calibrating the HFM and the preferred method for all lenses *except* the very-wide and ultra-wide angle lenses. Using a loupe and ground glass find sharp infinity focus for an infinity distance target at the *center* of the image area, and follow the instruction for "Calibrating your Helical Focus Mount to Infinity". This will render infinity distant subjects beyond the curvature (*away from the center of the image*) out of focus, even though they are actually at infinity (*see figure 1*). By stopping down the aperture to f-stops normal used in landscape shooting (f16-f32), *thereby increasing depth of field*, you will eventually incorporate the out of focus zone to be in focus once again. Bare in mind however that 2/3 of the depth of field gained by stopping down the aperture will be lost, as it will be gained beyond infinity. This loss in depth of field can be mitigated by focusing to the hyperfocal distance. (see "About Hyperfocal Distance.")

2. Calibrate infinity focus to compensate for lens curvature of field.
   Calibrating the HFM to compensate for the effects of Curvature of Field is the preferred method for very-wide and ultra-wide lenses, or if you will NOT be using the optional Fotoman Ground Glass to confirm focusing for your images. Compensation calibration requires these additional steps;

   a. Initially, find infinity at the center of the image area as detailed in (1) above. Make a note of *or place a mark on* the distance indicated by the distance scale of the HFM. Now perform the same procedure at one of the corners of the image area. This will result in a closer focus distance indicated by the focus distance scale. Make a note of *or place a mark on* the distance indicated on the distance scale of the HFM.

   b. Measure the *linear* distance between the two marked points on the distance scale and divide that number in half. The resulting number is the *linear adjustment factor* to be used to compensate for the effects of field curvature. For example, if the linear distance between the two marks is 10mm, then the linear adjustment factor equals 5mm.

   c. Follow the instructions detailed in "Calibrating your Helical Focus Mount to Infinity", using the point originally found for infinity focus at the center of the image. *Do not tighten the distance ring locking screws at this time, being careful not to disturb the distance ring's placement.*

   d. Rotate the Focus Ring towards a closer distance by the amount calculated for the *linear adjustment factor* in step (b) above. Rotate the Distance Indicator Ring to realign the infinity mark to the red distance indicator line. Now tighten the distance scale locking screws as described in "Calibrating your Helical Focus Mount to Infinity".

   Your HFM is now calibrated to compensate for the effects of Curvature of Field (figure 2), allowing you to take full advantage of the additional depth of field gained by stopping your lens aperture down to normal shooting apertures for landscape photography (f16 - f32). Be aware however that when shooting at shallow apertures (*wide open*) infinity may not be in focus. Also, when viewing the intended image with the optional Fotoman Ground Glass and the lens aperture opened to maximum, the image area in the center of the Ground Glass will not be in focus.

About Hyperfocal Distance

Hyperfocal Distance, Depth of Field and Focus Distance are all inter-related.

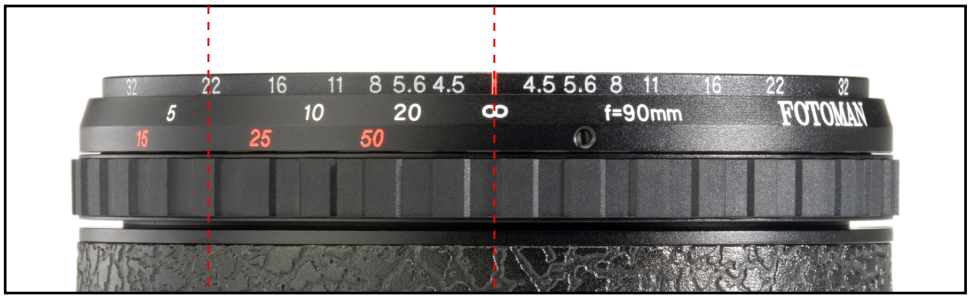
Focus Distance is the distance at which you are actually focused.

Depth of Field is a measurement of the depth of acceptably sharp focus (near to far) at a given aperture setting (f-stop).

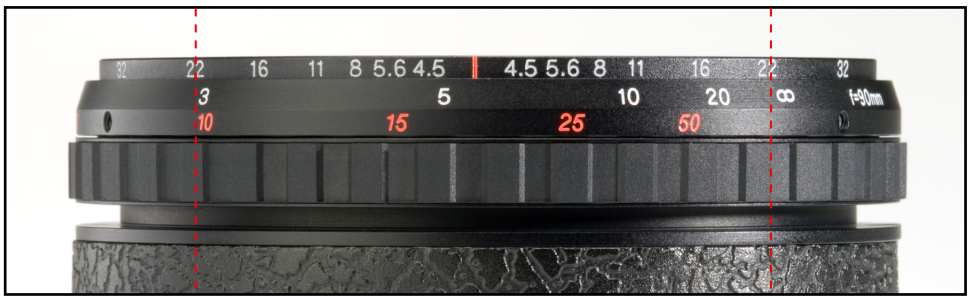
> Large apertures (*smaller f-stop numbers*) exhibit the least Depth of Field, and conversely small apertures (*larger f-stop numbers*) exhibit the most Depth of Field.

The **Hyperfocal Distance** is the actual Focus Distance at which Depth of Field will be maximized for a given aperture (f-stop) setting.

Your Fotoman Helical Focus Mount has an accurately calibrated distance scale located on the Focus ring, and Depth of Field markings for various apertures (*f-stops*) located on the lens mounting plate. By utilizing the Depth of Field markings, one for the near distance and one for the far distance, maximum Depth of Field can be selected at any given aperture (*f-stop*). To know what the Depth of Field is at a given aperture, simply note the near and far distances for the selected aperture (*f-stop*).



In the above photo, the Focus Mount has been focused to infinity. Assuming a lens aperture (*f-stop*) of f22, Depth of Field will be from approximately 6 meters (20 feet) to infinity. The Depth of Field extending beyond infinity has essentially been lost.



In the above photo, the Focus Mount has been focused to approximately 6 meters (20 feet). Assuming a lens aperture (f-stop) of f22, Depth of Field will now be from approximately 3 meters (10 feet) to infinity. The Depth of Field available at f22 has now been used to it's fullest advantage, by focusing to the Hyperfocal Distance of 3 meters (10 feet).

Mounting and Calibrating your *Fotoman* Helical Focus Mount (HFM)

For illustration purposes the HFM is shown without lens.

Figure 4

After finding sharp infinity focus, ***barely loosen*** the (3) Distance Scale Screws, and rotate the Distance Scale Ring to realign the infinity symbol with the red distance Indicator line. Be careful not to disturb the position of the Focus Ring while rotating the Focus Distance Ring.

Most lenses will achieve sharp infinity focus at a distance closer than infinity (see figure 4). However, some lenses may demonstrate sharp infinity focus at a location on the Distance Scale Ring that is beyond the infinity mark.

> ***If the lens you are attempting to calibrate does not acheive sharp infinity focus when the HFM is at it's shortest length, proceed as follows;***

Barely loosen the (3) Distance Scale Screws ***prior*** to finding sharp infinity focus. After finding sharp infinity focus, rotate the Distance Scale Ring to re-align the infinity symbol with the red distance Indicator line. Do not disturb the position of the Focus Ring while rotating the Distance Scale Ring.

Figure 5

Barely tighten the Distance Scale Ring Screws. ***Do Not*** over tighten as the Distance Scale Ring is quite thin, and can be easily damaged by overtigtening the Distance Scale Screws.

Your Fotoman Helical Focus Mount is now fully calibrated for infinity focus as we as for all distances marked on the HFM for use with this specific lens. You may remove the lens for other uses, replacing it on your Fotoman HFM without having to recalibrate.

Film Loading Instructions

Your Fotoman camera is designed to use only size 120 film. Loading and unloading of film is a simple process, but if you have never used 120 roll-film before, you might want to try a few practice runs in advance to going into the field with your camera.

120 roll-fim does not come in a protective canister like 35mm film. As such, 120 roll-film requires a bit more careful handling...

Do not load or unload 120 roll-film in bright light. Even the shade from your body helps reduce the chance of accidentally fogging (exposing) the film.

Keep the roll of film tightly wound as you load it into or unload it from the camera. Once in place in the camera the film springs will maintain the required tension to keep the roll properly wound.

Open the back of the camera, lift up on the right wind knob and place a new roll of film in the right film chamber. Load the film so that the paper backing is facing away from the lens. (i.e. The paper backing is facing towards you as you stand behind the camera.)

Pull out a length of film sufficient to thread into the take-up spool which is located in the left film chamber (take-up chamber). Thread the leader into the spool and turn the take-up winding knob 3-4 turns, verifying the following;

The film is being smoothly advanced as you turn the take-up knob.
The film is centered on the take-up spool.
The film lies smoothly and is centered in the film guide channel.

Continue to turn the take-up knob for about one inch after the "start" line on the film backing paper comes into view.

Close the camera back, and open the film observation window on the back of the camera. Continue to advance the film to the appropriate number for your camera model;

Actual Frame	Fotoman 612	Fotoman 617	Fotoman 624
	(number on film)		
Frame 1	2	3	4
Frame 2	4	6	8
Frame 3	6	9	12
Frame 4	8	12	na
Frame 5	10	na	na
Frame 6	12	na	na

You needn't memorize the above table, as the correct film numbering sequence is clearly labeled on the back of each camera.

IMPORTANT When winding your film to the appropriate film number for each frame, wind the film one or two additional turns, then wind back to the correct number. This process removes any bowing of the film caused during film transport.

ADVISED 120 roll-film can develop a bow if wound to a new frame and too much time passes before making the exposure. It is advised that you develop a habit of always winding to the next frame just prior to exposing the film.

HIGHLY ADVISED To assure the ultimate in film flatness you may counter rotate both the feed and take up knobs to tighten the film just prior to exposure. 120 roll-film is quite strong, and no damage is done to the film by this procedure. The wider the format, the more important performing this process becomes in achieving the ultimate in film flatness and subsequent image sharpness.