

Instruction Manual

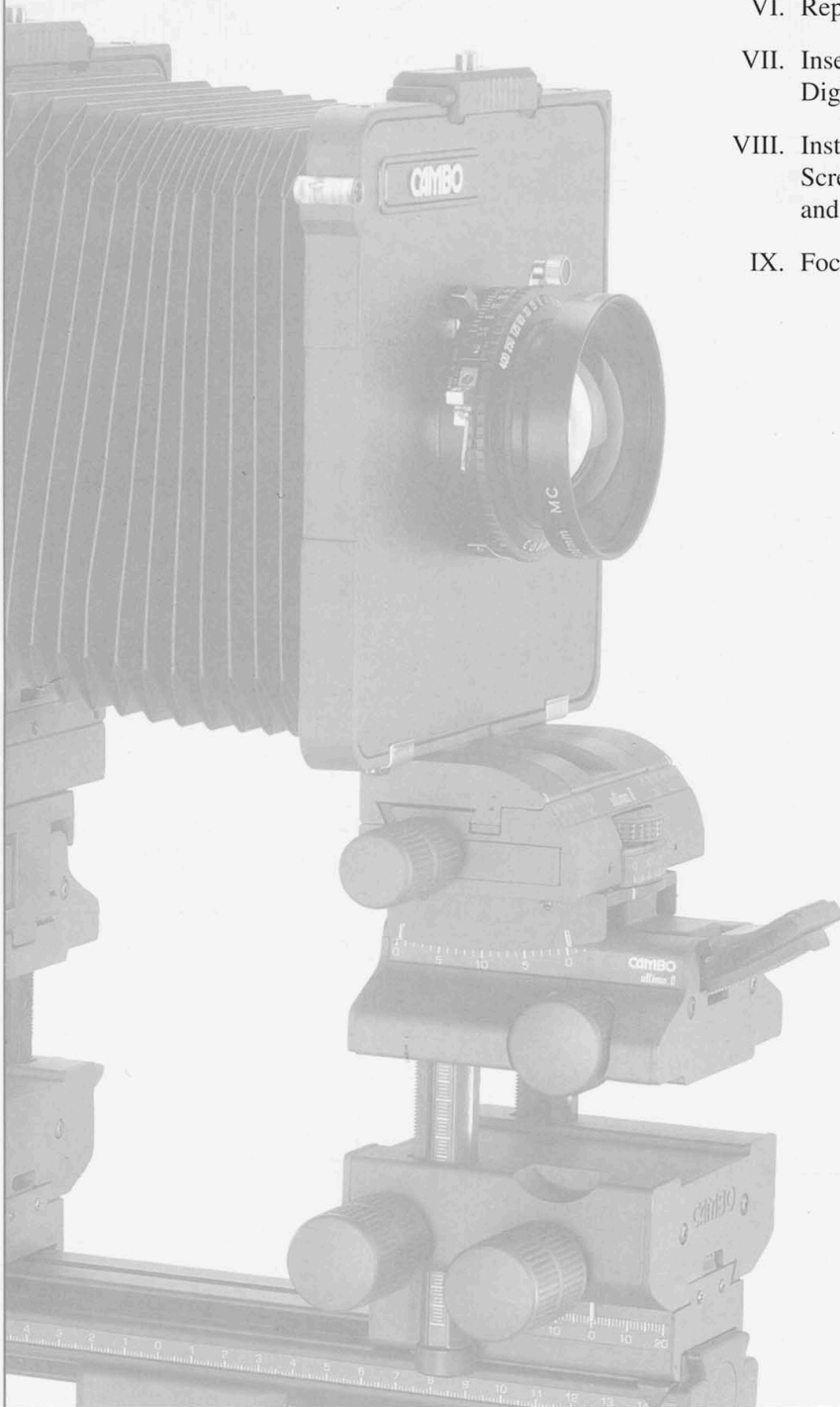
for the

Cambo Ultima Camera



Instruction Manual for the Cambo Ultima Camera

- I. Introduction
- II. List of Functions
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- IV. Using the Depth-of-Field Indicator
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- VIII. Installing Accessories (View Hoods, Focusing Screens, Compendium Hoods, Bag Bellows, and Rail Extensions)
- IX. Focal Plane Depth Adjustment



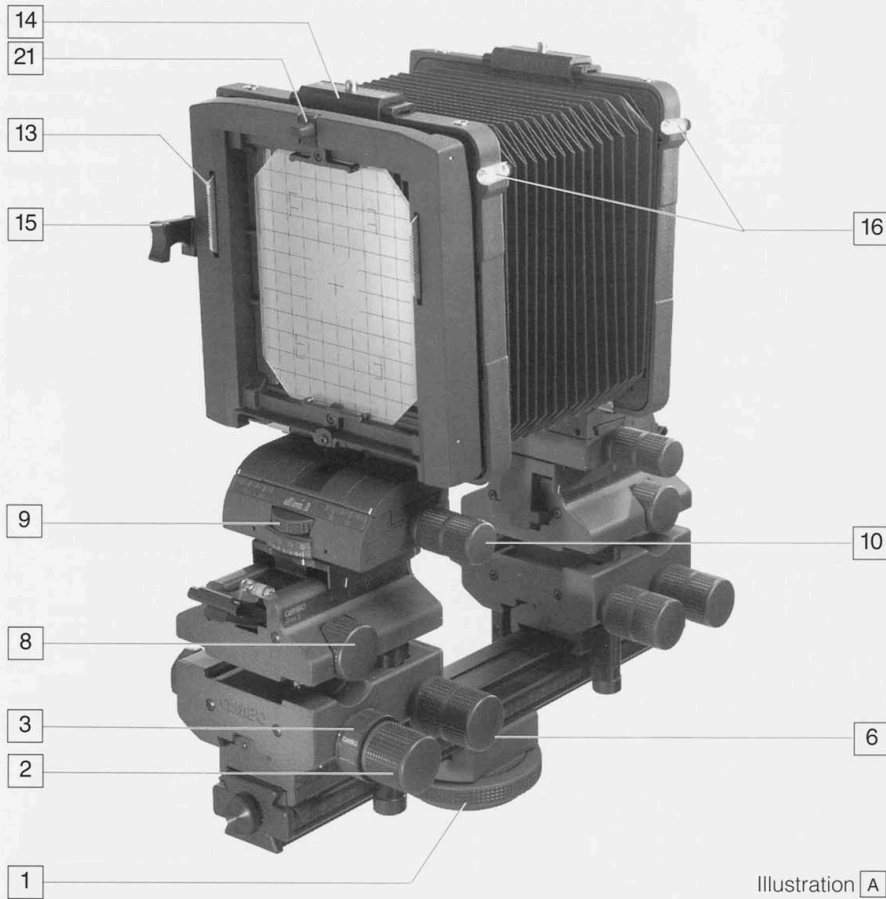


Illustration A

I. Introduction

Welcome to the Cambo family of large format photography! Cambo's newest view camera represents an entirely new and distinctive design created for high performance and maximum flexibility. As its name implies, the Ultima offers the ultimate in precision image control for both digital and traditional large format photography. Both applications for the Ultima are explained in detail in the following pages. To take advantage of your camera's many sophisticated features, study this instruction manual and keep it as a handy reference.

II. List of Functions

Indicated in Illustrations A, B, C and N

1. Rail Clamp Locking Ring
2. Fine Focusing Knob
3. Depth-of-field Indicator
4. Fine Focus Locking Knob
5. Quick Focus Locking Knob
6. Geared Rise/Fall Control Knob
7. Rise/Fall Locking Knob
8. Geared Tilt Control Knob
9. Geared Swing Control Knob
10. Geared Lateral Shift Control Knob
11. Ground Glass Retaining Clips
12. Retaining Clips for Ground Glass Back Assembly (see Illustration C)
13. Ground Glass Frame Removal Bars
14. Slide-lock Bar for Bellows, Ground Glass Back Assembly, and/or Lensboard
15. Bail Release Handle
16. Spirit Levels
17. Depth Adjustment Locking Screws
18. Depth Adjustment Scale (see Illustration C)
19. Depth Adjustment Block (see Illustration C)
20. Monorail End-cap
21. Slide-lock for Viewing Hoods
22. Slide-locks for Graflok Backs (see Illustration N)

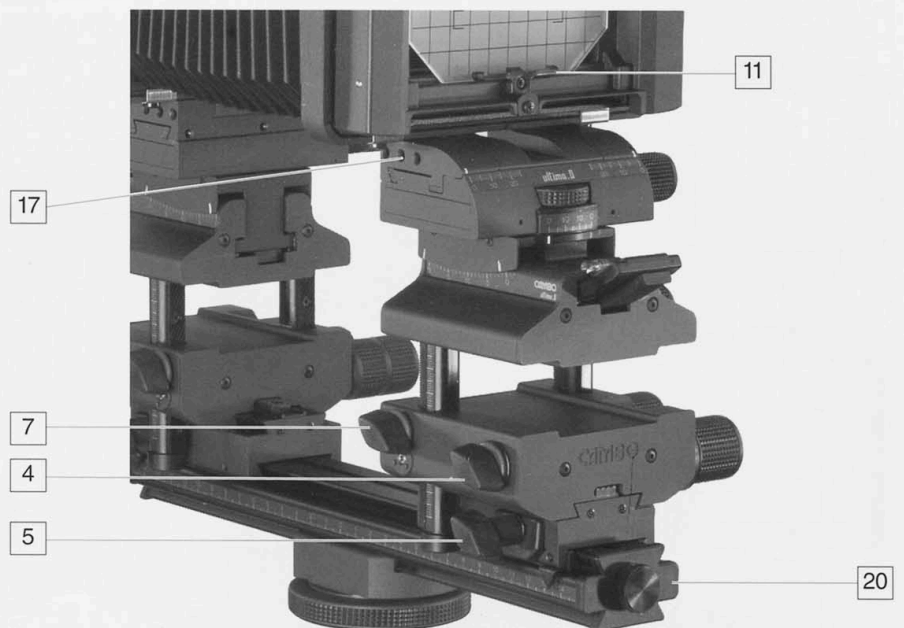


Illustration B



Illustration C

III. Assembling Your Ultima Camera

A. Checking your parts list.

Remove all camera parts from the carton. Make sure that you have one of each of the following:

For the standard Ultima (see Illustration D):

- Front Standard
- Rear Standard
- Monorail with Extension Rail and Rail Clamp
- Lensboard Holder and Ground Glass Back Holder with Allen Wrenches
- Normal Pleated Bellows
- Ground Glass Back Assembly



Illustration D

For the Ultima Digital version: (see Illustration E)

- Front Standard
- Rear Standard
- Monorail with Rail Clamp
- Lensboard Holder and Ground Glass Back Holder with Allen Wrenches
- Bag Bellows



Illustration E

NOTE: All "right" and "left" references in this instruction guide are made from standing behind the camera.

B. Attaching Camera to Tripod or Stand

To mount the camera, begin by attaching the monorail with rail clamp to a tripod or studio stand fitted with a 3/8" mounting thread. (NOTE: Use of a 1/4-20 reducer bushing is not recommended.) Secure tightly. If you want to mount an extension rail, remove the monorail end-cap (#20) at the rear of the camera by turning the knob counter-clockwise (see Illustration F). Adjust the tilt-position of both the front and rear standards to "zero-position" (you will feel the indent) with the geared tilt control knob (#8).

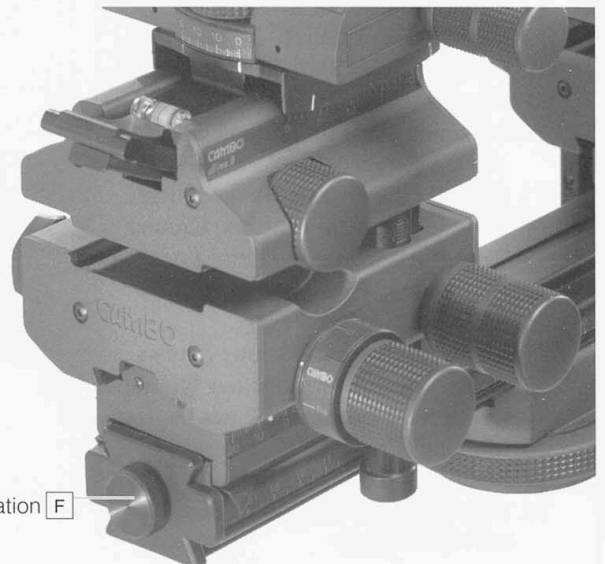


Illustration F

C. Attaching Lensboard Holder

Slide the lensboard holder into the front standard (the one without the depth-of-field Indicator). The spirit level should be located on the right side of the camera. Fasten the lensboard holder with the appropriate Allen wrench by turning the three screws on the left side of the camera (see **Illustration G**), starting with the one indicated with an arrow. Make sure that the lensboard holder is in the "neutral position" (i.e. that the dovetail at the base of the lensboard holder is flush with the standard block. See **Illustration G** below).

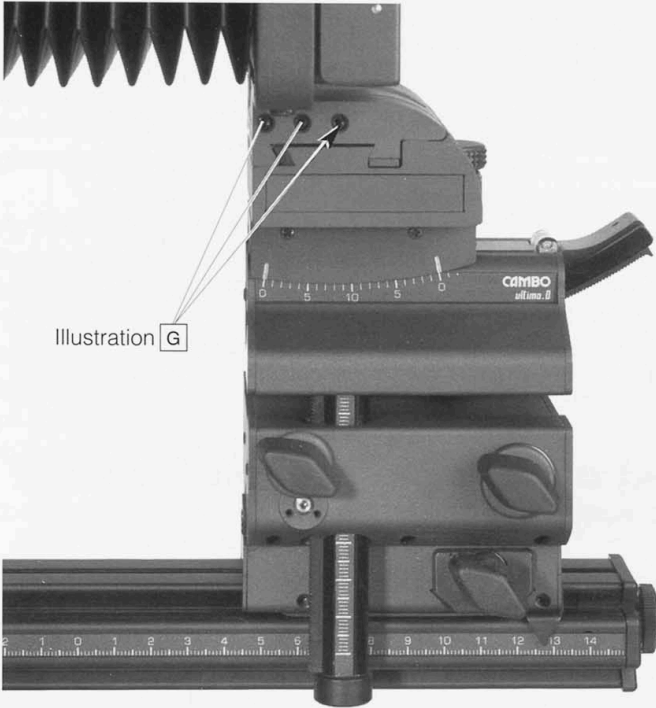


Illustration G

D. Attaching Ground Glass Back Holder

Mount the ground glass back holder to the rear standard (the one with the depth-of-field Indicator) of the camera in the same manner as above.

E. Positioning Front and Rear Standards

Slide both the front and rear standards into position approximately 4" (10cm) from each other by releasing the quick focus locking knob (#5). Lock both standards into this position.

F. Attaching the Bellows

To attach the bellows, position the slide-lock bar on top of the front standard to the "right" and the slide-lock bar on top of the rear standard to the "left." This is done by depressing the button in the middle of the bar and sliding the bar with the arrows in the desired direction.

NOTE: The arrows indicate which side of the standard is unlocked with the slide-lock bar shifted in that direction. When the slide-lock bar is in the "center" position, both sides of the standard are in locked position.

The bellows are reversible, both front-to-rear, and top-to-bottom, but must be attached to the camera with the notches of the mounting plates on the top and the bottom. Insert the bellows mounting plate first into the bottom of the front standard, behind the chrome retainer clips (#12), press the plate flat against the standard and return the slide-lock to the "center," or locked position (see **Illustration H**).

Repeat this procedure on the rear standard.

Illustration H



NOTE: It is not necessary to push the release button when returning to the "center" or locked position. The sliding-lock bar will automatically stop at the locked position.

G. Installing the Ground Glass Back Assembly

To install the ground glass back assembly for standard Ultima, move the rear standard slide-lock bar (#14) to the "right," insert the bottom of the back assembly behind the chrome retainer clips (#12), press it flat against the standard and return the slide-lock bar to the "center" locked position (see **Illustration I**). The ground glass frame can be removed for specific applications such as installing Graflok roll film holders by depressing the two gripped ground glass frame removal bars (#13) and sliding the frame upwards with the frame in the vertical position (see **Illustration J**).

NOTE: All Cambo 4x5 backs have a threaded hole for use with the Prontor Professional Shutter System.

Illustration I



Illustration J



H. Installing the Lensboard

To install the lensboard (not included with the camera), follow the same procedure as installing the ground glass back assembly (see **Illustration K**). Additional lensboards and adapter plates are available from your Cambo distributor.

NOTE: Always refer to the arrows on top of the slide-lock bar which indicates the side of the standard being released. It is always recommended that you hold onto the top of the standard so that your thumb and index finger safely hold the bellows mounting plate and lensboard (or ground glass back assembly/ adapter plate on the rear standard) into position until you are assured that you have released the side that you intended. This is strictly a preventative safeguard. Cambo has an optional Mechanical Safety Catch that can be mounted to the standards to double protect your lensboard and/or back from falling.

Illustration K



IV. Using the Depth-of-field Indicator

The depth-of-field indicator eliminates the need to look through a dark, stopped-down ground-glass to “guess” your field of focus. With this convenient device, your depth-of-field is determined at maximum aperture, without stopping down your lens at all. It’s quick, easy, and (perhaps most important!) accurate.

For determining your maximum shooting aperture, follow these four simple steps:

1. At maximum aperture, focus on the furthest point of a scene you wish to render sharply.
2. Set depth-of-field indicator scale (#3) at zero (“0”).
3. Next, with the lens still at maximum aperture, focus on the nearest point of required focus. The depth-of-field indicator scale will indicate the aperture, or f/stop, needed to encompass the area between the two points. Set your aperture at this f/stop.
4. Rotate the fine focusing knob (#2) backwards, until depth-of-field indicator scale indicates two f/stops less than your shooting aperture.

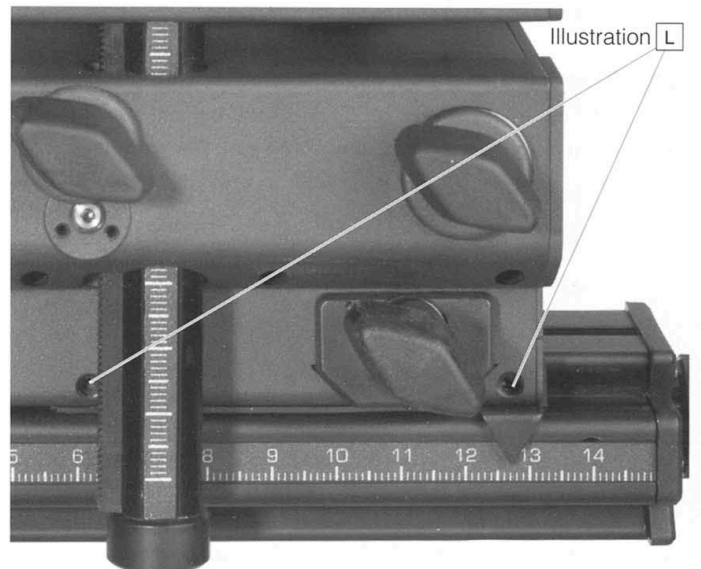
NOTE: This calculator works accurately with any focal length lens and can be used in conjunction with swing and tilt movements.

V. Adjusting the Friction on the Coarse Focusing Movement

The focusing blocks have quick-sliding capabilities for coarse focusing. While using your camera, you may feel the need to adjust the friction on the coarse focusing movement. To increase or decrease the friction of this movement, do the following (see **Illustration L**):

1. Locate the two set-screws on one side of the focusing block.
2. To increase friction, or tighten movement, turn screws clockwise. Use a 2mm Allen wrench. Both screws must be adjusted equal distances for smooth results.
3. To decrease friction, or loosen movement, turn screws counter-clockwise.

Illustration L



VI. Replacing the Ground Glass

If your ground glass breaks, replace the old glass by removing the ground glass retaining clips (#11) with a screwdriver. Install the new glass with the dull side towards the inside of the camera. Replace clips.

VII. Inserting Film Holders, Scanners and Mounting Digital Backs and Installing Accessories

Cambo cameras are designed for your convenience, offering the easiest possible operation and maximum versatility. The following instructions ensure the safest possible film loading, placing scanners and mounting digital backs.

A. Installing Slide-in Holders & Scanners

Inserting Sheet Film, Polaroid and Slide-in Roll Film Holders, and Placing Scanners (see Illustration M)

To load the camera with any “slide-in” film holder or scanner, a convenient bail release handle (#15) is provided to release the tension on the ground glass frame, which reduces the chance of accidental camera movement.

1. Pull out on bail release handle until it locks into open position.
2. Slide loaded film holder between back and frame until it seats against end-stop of back.
3. Close bail release handle until frame rests against film holder.
4. When removing film holder, pull out bail release handle and, when holder is out of the camera, manually return release to closed position.

NOTE: Do not let the ground glass frame “snap” back to closed position. Before inserting or removing scanners from the camera, check to make sure there is enough cable length and/or not too much cable tension.

Illustration M



B. Installing Graflok, or International Roll Film Holders and Scanners (see Illustration N)

1. Remove the ground glass frame by depressing the two gripped ground glass frame removal bars (#13) on either side of the frame and slide up the frame (if it is in vertical position), until it releases (see Illustration J).
2. Place the roll film holder against the frame and lock it into position by pushing the two slide-locks for Graflok backs (#22) down or in to the locked position. Reverse this step to remove roll film holder.
3. After using the roll film holder, re-install ground glass frame by placing it against the back and position the “hooks” of the ground glass frame removal bars into the slots located at the center of, and beneath the slide-locks for Graflok backs (see #22, Illustration N). Depress the ground glass frame removal bars (#13) and slide the ground glass frame down (if it is in the vertical position).

NOTE: Before inserting or removing scanners from the camera, check to make sure there is enough cable length and/or not too much cable tension. Also note that ground glass frames on 5x7 and 8x10 models cannot be removed.

Illustration N



C. Installing Digital Backs

1. To install a digital back mounted on a direct adapter plate (not included with the camera), follow the same procedure as installing the ground glass back assembly (see Section III, Part G, and Illustration I).

NOTE: Always refer to the arrows on top of the slide-lock bar which indicate the side of the standard being released. It is always recommended that you hold onto the top of the standard so that your thumb and index finger safely hold the bellows mounting plate and adapter plate into position until you are assured that you have released the side that you intended. This is strictly a preventative safeguard. Cambo has an optional Mechanical Safety Catch that can be mounted to the standards to double protect your lensboard and/or back from falling.

2. To install a digital back mounted on a Hasselblad Adapter or Mamiya Adapter, first install the optional Cambo Sliding Back or optional Cambo Fixed Adapter containing the right adapting system to the rear standard of the camera. For this purpose, follow the same procedure as installing the ground

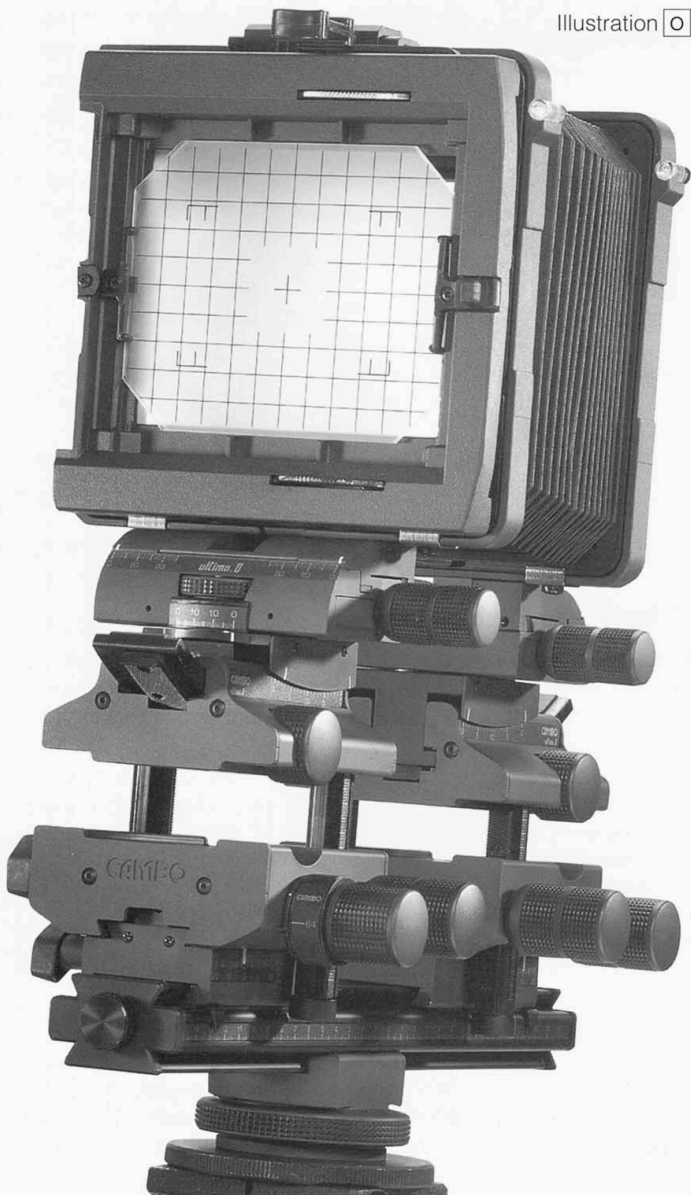
glass back assembly (see Section III, Part G, and Illustration I). Make sure that the adapting system is well fastened and that each of the camera movements is locked whenever possible. Finally, mount the digital back to the camera (without the cables connected if possible) using the appropriate adapting system.

D. Rotating the Ground Glass Back Assembly (see Illustration O)

When changing formats from vertical to horizontal, and vice versa, the ground glass back of the Ultima must be removed and then rotated manually. Hold the back assembly against the rear standard with your thumb and index finger of one hand while you depress the button on the slide-lock bar (#14) and shift the bar to the "right" with your other hand. Remove the back assembly, turn it to the right and place it against the standard. To lock the back assembly into position, shift the slide-lock bar to the "center" locked position.

NOTE: The "left/right" orientation of the rear standard slide-lock bar of the 8x10 model is the reverse of the 4x5 model. Watch the indication arrows!

Illustration O



VIII. Installing Accessories

A. Installing Viewing Hoods (see Illustration P)

To install any viewing hood, pull up the slide-lock for viewing hoods (#21) at the top of the ground glass frame (if it is in the vertical position). Position the viewing hood against the frame, under the small lip at opposite end of the frame from the slide-lock and push the slide-lock down, or in, to secure the hood in place.

NOTE: Viewing hoods are not available for 5x7 and 8x10 models. For these models, we recommend the use of a focusing cloth. Ground glass magnifiers are available from your Cambo distributor as well.

Illustration P



B. Installing Focusing Screens and Fresnel Lens

1. The ruled ground glass on your Cambo camera can be replaced with an unruled ground glass or with a Super Sharp Focusing Screen. To remove the ground glass, unscrew the ground glass retaining clips (#11) and lift out the ground glass. Place the new ground glass or focusing screen with the "frosted side" towards the camera, and replace the ground glass retaining clips.
2. A Fresnel lens, which is smaller than your ground glass, fits over the ground glass. To install the Fresnel lens, hold it with the smooth side facing you and the etched side towards the ground glass. Simply press the Fresnel lens against the ground glass so that the tension of the two ground glass retaining clips (#11) holds the Fresnel lens firmly in place.

NOTE: The Fresnel lens fits between the ground glass retaining clips, not behind them.

C. Installing Bag Bellows, Extension Bellows and Bellows Support

1. To install a bag bellows for wide angle photography, or an extension bellows for close-up work, follow the instructions described in Section III, Part F.
2. For extreme close-ups, or very long extensions, you may need to connect two bellows together with an optional Multi-purpose Standard, which mounts directly to the monorail.
3. An optional Bellows Support is also available, which mounts directly to the monorail.

D. Installing Compendium Lens Hoods

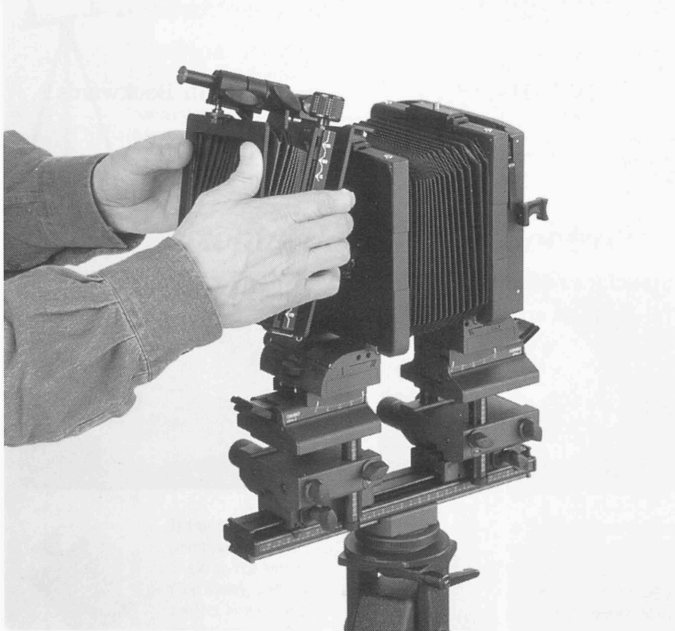
Cambo offers two types of compendium lens hoods for the Ultima: The Deluxe Compendium Lens Hood and the Basic Compendium Lens Hood. Both work effectively with most lenses and shutters. These compendium lens hoods also fit most other Cambo view cameras.

1. To mount either of these compendium lens hoods to your camera, insert the two steel pins at the top of the rear mounting plate of the compendium into the two holes on top of the camera's front standard (see **Illustration Q**), then simply press the bottom of the mounting plate towards the standard.
2. Slide the locking clip, at the bottom of the compendium's rear mounting plate, under the camera's front standard housing until it clicks into place when the compendium is in vertical position.
3. To remove the compendium, press down on the locking clip and pull the compendium mounting plate away from the front standard.

E. Installing Rail Extensions

The standard Ultima monorail is 11½" (30 cm) and the extension rail adds approximately 6" (15cm). Additional monorail extensions are available in 9¾" (25cm), 16½" (42cm) and 25¼" (65cm) lengths.

Illustration **Q**



1. To connect the rail extension to the monorail, remove the monorail end-cap (#20) at the rear of the camera's monorail and screw the threaded bolt of the rail extension into the monorail by turning the knob clockwise.
2. Remove the rail extension by turning the knob counter-clockwise.

NOTE: It is very important that you hold the rail extension parallel to the monorail when placing or removing it, to avoid stripping the bolt's threads. Be sure to replace the monorail end-cap after removing the extension rail.

F. The Cambo Accessory System

For additional information on the complete Cambo system, see our Cambo Accessories literature. You will find a wide variety of items, ranging from sliding adapters to light metering systems and from cable releases to carrying cases. Ask your Cambo distributor for more information.

IX. Focal Plane Depth Adjustment

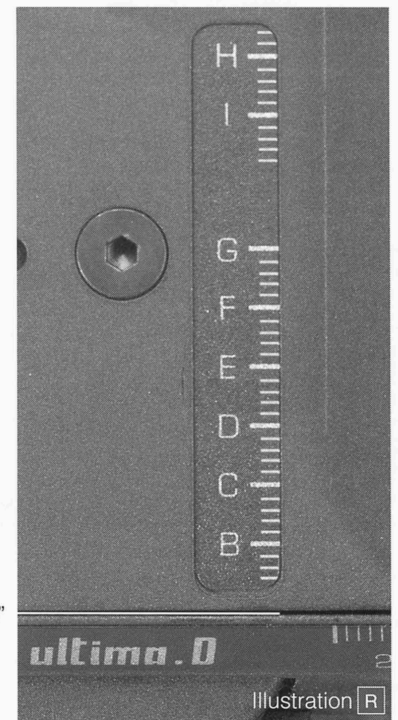
Due to the variety of configurations of the different digital backs and adapters on the market, it is essential that the position of the chip/film plane be adjustable in order to maintain "on-axis" swing and tilt movements of the rear standard. The Ultima's focal plane depth adjustment block (#19, **Illustration C**) allows precise alignment of the chip/film plane, regardless of which digital system you are using, thus preventing the center of the image from moving out of focus when swing or tilt movements are applied. The table below indicates the exact position for the depth adjustment block for most of today's digital systems.

The neutral "A" position of the depth adjustment scale is the correct position for the standard "film" ground glass back on the Ultima. This position is achieved by placing the depth adjustment block in the neutral "A" position, or when the dovetail is fully inserted and flush with the standard block (see **Illustration G**).

Use the table below to find the correct placement of the depth adjustment block (#19) for the digital back and adapter you are using. Make sure that your digital back, or ground glass holder, does not drop when the depth adjustment will be applied.

1. Unfasten the camera's rear standard housing with the appropriate Allen wrench by turning the three screws on the left of the camera (#17, see **illustration B**).
2. The scale underneath the adjustment block is divided into several "lettered" positions, each 5mm apart. The scale (see **Illustration R**) is subdivided into 1mm increments that allow more precise adjustment. Match the appropriate "depth correction" setting given in the table with the scale underneath the camera's adjustment block.
3. Lock the rear standard housing with the Allen wrench, starting with the screw indicated with the arrow (see **Illustration G**).

NOTE: The position on the scale of the rear edge of the adjustment block indicates the depth correction setting (from A to G). The front edge of the block indicates the amount of adjustment on the scale from H back to I. For digital backs or film set-ups that are not displayed in the table below, the adjustment position has to be measured or learned by practice. Please contact your Cambo distributor.



"A" or "neutral position"

Illustration **R**

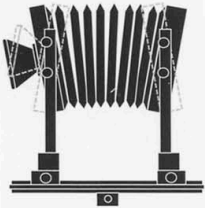
Digital System:	On Adapter/Sliding Back:	Depth Correction:	Remark:
Film Holders 2x3"	Ground Glass Holder Cambo 2x3"	A or "Neutral"	
Scanbacks or 4x5 Film	Ground Glass Holder Cambo 4x5	A or "Neutral"	
Megavision T2	Cambo Adapter	C 3	
Jenoptik Eyelike	Cambo Adapter	B 4	
Digital Backs for Mamiya RZ	Cambo Sliding Adapter 4x5 with Mamiya-RZ Adapter	C 1 (C 3*)	
Digital Backs for Mamiya RZ	Cambo Direct Adapter Plate 4x5 with Mamiya RZ Adapter	A 2 (A 3**)	
Digital Backs for Mamiya 645	Cambo Sliding Adapter with Mamiya-645 Adapter	B 3 (C 0*)	
Digital Backs for Mamiya 645	Cambo Direct Adapter Plate with Mamiya 645 Adapter	H -3 (A**)	Shift Backwards
Digital Backs for Hasselblad	Cambo Sliding Adapter with Hasselblad Adapter	B 1 (B 4*)	
Digital Backs for Hasselblad	Cambo Direct Adapter Plate with Hasselblad Adapter	H -2 (H -3**)	Shift Backwards

* *Digital backs on Sliding Back 2x3.*

** *Digital backs on Direct Adapter Plate 2x3.*

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Basic View Camera Movements

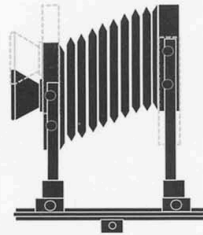


Tilt: Rotating (tilting) the front or back of the camera forward or backward.

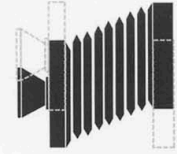


top view

Swing: Rotating (swinging) the front or back of the camera left or right.



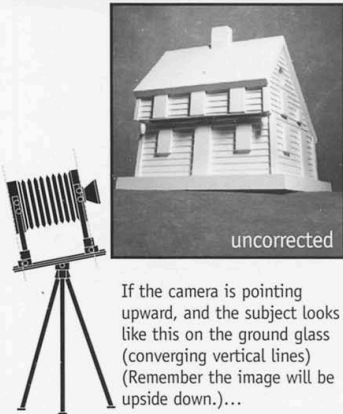
Rise and Fall: Vertically raising or lowering the front or back of camera.



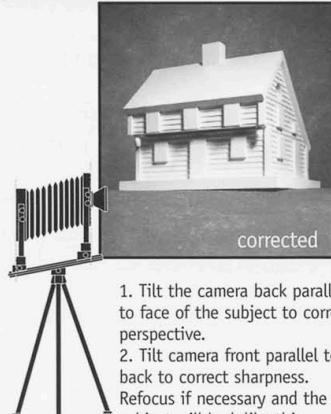
top view

Lateral Shift: Moving the front or back of the camera laterally to the left or right

Vertical Perspective Control (Low Camera Angle)



If the camera is pointing upward, and the subject looks like this on the ground glass (converging vertical lines) (Remember the image will be upside down...)...

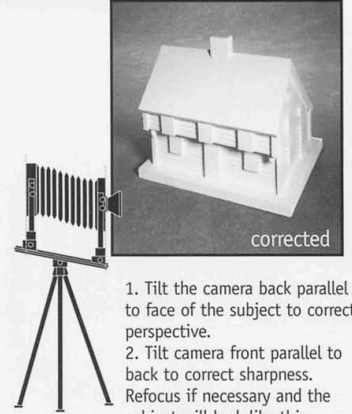


1. Tilt the camera back parallel to face of the subject to correct perspective.
2. Tilt camera front parallel to back to correct sharpness. Refocus if necessary and the subject will look like this.

Vertical Perspective Control (High Camera Angle)



If the camera is pointing downward, and the subject looks like this on the ground glass ...



1. Tilt the camera back parallel to face of the subject to correct perspective.
2. Tilt camera front parallel to back to correct sharpness. Refocus if necessary and the subject will look like this.

Horizontal Perspective Control

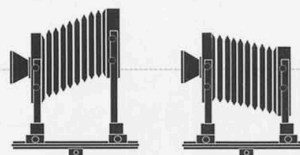


If the camera is pointing at a slight angle to the subject (Top View), and the subject looks like this on the ground glass (converging horizontal lines)...



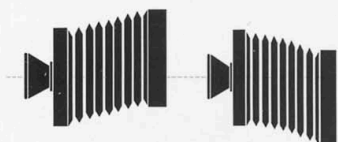
1. Swing camera back parallel to the face of the subject to correct perspective.
2. Swing camera front parallel to back to correct sharpness. Refocus if necessary, and the subject will look like this.

Vertical Image Placement



If the subject looks like **A** on the ground glass, or like **B**, use the front or back rise and fall and the subject will look like **C**, properly composed. Note: Moving the back rise does not change the camera's point of view in relation to the subject. When shooting a tall building, applying a front rise can make it possible to bring the top of the building into view and keep vertical lines parallel.

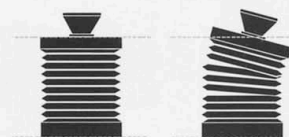
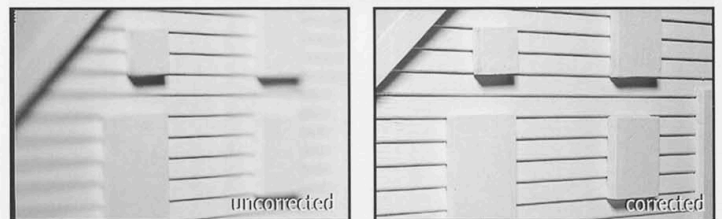
Horizontal Image Placement



top view

If the subject looks like **A** on the ground glass, or like **B**, use the front or back lateral shift, and the subject will look like **C**, properly composed. Note: Moving the back shift does not change the camera's point of view in relation to the subject. Shifting the front, or lens, does alter the camera's viewpoint, affecting the relationship between near and far subjects.

Plane of Focus



top view

A primary benefit of the view camera is its ability to tilt or swing the plane of the lens to match that of the plane of sharp focus within a scene - without changing the shape of the subject. This also allows the photographer to bring a subject into focus without changing the aperture. Above, the subject was brought into full, sharp focus by swinging the lens until the two were parallel.