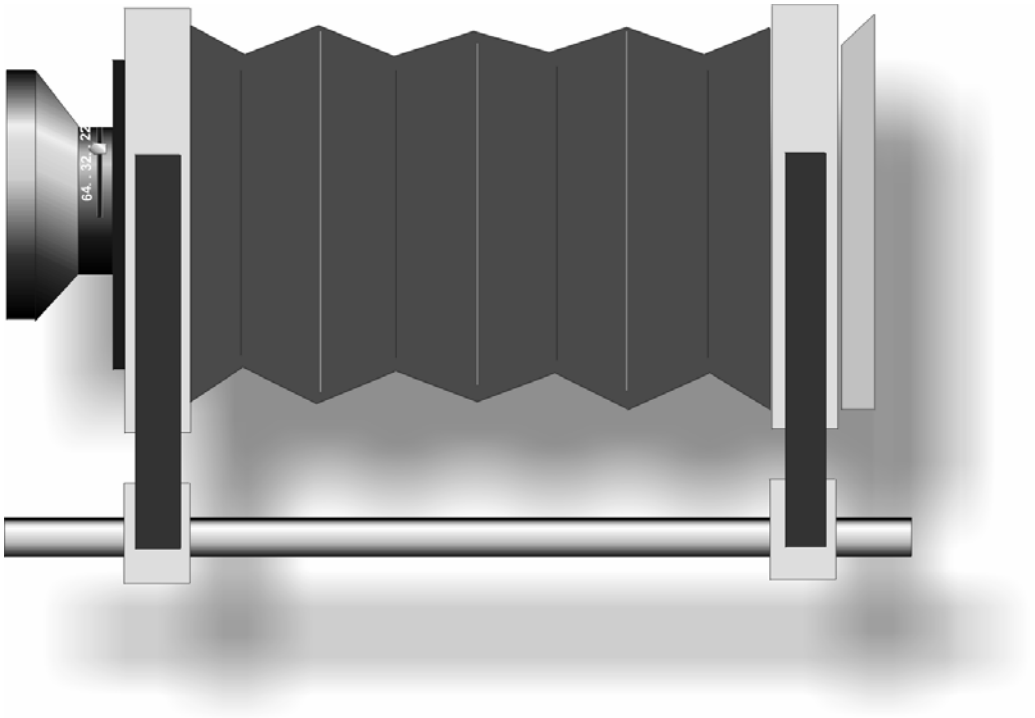
LARGE FORMAT CAMERA



MOVEMENTS AND OPERATION

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COURSE CURRICULA

The Large format camera, in "View" and "Field" versions, are the primary tool for many of the commercial/professional photographic disciplines. Especially for product, advertising, illustration, and high-end fashion and portraiture work, as well as for landscape and nature photography this workhorse camera is the tool selected whenever the ultimate in quality is required.

This course will teach the rudiments of using this tool to control and enhance the image.

Why Large Format

Large format cameras shooting a negative in the 4"x 5" size and larger are cumbersome to carry and slow to set up. So why would a working photographer with deadlines to meet, bother?

The answer is in the resulting image quality and image control. No other photographic tool, including digital post acquisition image manipulation, provides the degree of control and quality available in this format.

Even where the image will be manipulated after acquisition by traditional airbrushing, darkroom techniques, or via digital editing, the old rule of thumb still applies: the better the original image, the better the results will be.

Course Objectives

After successfully completing this course. The student will be able to set up and operate a large format camera and use its optical and film plane movements to control the distortion and depth of field of their photographs.

Course Elements

The complete course will contain:

1. An instructor-led lecture and demonstration,
2. Handouts illustrating the principles,

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	3. A test, and 4. An assignment requiring the student to demonstrate proficiency in the manipulation of the image with the camera movements.
Course Lesson Plan	This Lesson plan contains 1. This introduction to the course section on Large format controls and its objectives 2. A topical outline/synopsis with references 3. A Copy of the class handout 4. A Copy of the examination to measure comprehension 5. A Copy of the assignment sheet to practice the techniques from the class.
Time Requirements	To properly demonstrate the operation and effects of camera movements really requires considerably more time. Were this a real class of 15-20 students, it would take between and hour to an hour and a half of lecture time to demonstrate principles and allow students to observe the effects.
Prerequisites	Large format Camera movements would be part of a mid-level course for serious students intending to go on into commercial or artistic photography. It would assume they have their own large format camera or access to one for class use. Students should already have a very solid grounding in basic photographic topics and Zone System techniques. They should be competent with hand held-meters and have at least seen demonstrations on loading film holders, and how to process and print large format sheet film.
Additional Materials, etc.	Proper demonstration also requires the hands-on use of an actual field or view camera.

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In addition to the classroom portion, the class should then move outside to observe and try to movements and their effects in the campus environment where the correction of such distortion effects as “Keystoning” and depth of field manipulation using the Scheimpflug Effect can be shown more clearly.

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CLASS SYNOPSIS AND OUTLINE

This section contains a topical outline and synopsis of the material to be presented in the Large format Camera Movements and Operations Class. (The topics labeled in **RED** are the sections that will be presented in the mini-lecture for this interview.)

Reasons for Using Large Format Camera

Large format camera movements allow unique control of

- Depth of field
- Distortion

Camera Types

Types of Large format cameras include

- Press
- Field
- View/monorail

Parts of a Large Format Camera

A large format camera consists of the following parts (to be shown, demonstrated, and defined).

- Bed
  - -Case
  - -Tracks
  - -Rails
- Bellows
  - -Types
    - Standard
    - Extended
    - Bag
- Front Standard
  - -Lens Boards
    - Standard
    - Recessed/Wide Angle
- Rear Standards
  - -Ground Glass
  - -Film Backs/Holders (types)
    - Sheet film
    - Roll film
    - Polaroid

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	digital
Moveable Elements	Potential moveable elements available on large format cameras (or any view/field type regardless of format size) include: ✍ Optical Plane movement on the front standard ✍ Film Plane movement on the rear standard
Movement Types	Possible movements of the standards include the following (to be demonstrated): ✍ Raise (vertical movement) ✍ Slide/shift (horizontal movement) ✍ Swing (Vertical axis) ✍ Tilt (horizonal axis) The movements can be combined to place the lens and or the film plane in virtually any XYZ position relative to the image. The extent of these movements is a function of bellows flexibility and the physical/mechanical design and construction of the camera.
Image Elements Effected by Movements	Adjusting these two planes, in coordination, effect the following elements of the image on the negative: ✍ Focus/Focal Distance ✍ Image placement on the film plane ✍ Image distortion at the film plane ✍ Depth of Field
Rules of Thumb	Although somewhat oversimplified, the following rules of thumb provide a starting point for operation of a large format camera:

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- ✍ Front element (optical plane) effects depth of field.
- ✍ Rear element (film plane) effects distortion
- ✍ Both elements effect image placement.
- ✍ Focusing can actually be done by either the front or real standard, but is usually done by the front since it has less effect on the image size after composing the picture. Some field cameras, however, have a fixed front and all focusing must be done by the rear standard.

Depth of Field Control

***Definition**: The area of the image from in front of the point of critical focus (the focal distance) to behind it that will appear as if it were in focus on an 8"x10" print.*

Review concepts, definitions, and principles of Depth of Field.

Review normal elements effecting Depth of Field including:

1. Focal distance
2. Aperture setting
3. Lens focal Length

Relationship of focal length to "Normal" lens definitions to coverage required by increasing negative sizes even though Depth of Field characteristics do not appreciably change for a given focal length regardless of covering power.

Illustrate the Depth of Field "Plane." Note differences with "flat field" lenses.

Illustrate how the Depth of Field plane can be re-aligned by changing the angle of the optical

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plane relative to the subject image plane and film plane (Scheimpflug Effect). The rule is: If the image plane, the film plane, and the optical plane all intersect at a point, then the depth of field plane will be aligned with the image plane.

Show examples. (See Handout illustration)

Distortion Control

Optical Distortion is a term used to cover some very normal optical effects resulting from converting a three dimensional reality into a two dimensional image.

They are generally the results of rendering perspective effects but sometimes, even though the effect is "normal" it create a detrimental result on the image. This is most noticed in two major areas of photography:

- Architectural Photography
- Small Product and Table Top Photography

In all cases, the "distortion" seen on the final image results because the film plane (the rear standard on the camera) is not aligned with the subject/image plane. If the image plane and the film plane are parallel, then there will be no distortion.

(See illustration in Handout.)

Creative Distortion

It is important to note that the same camera movements that can "correct" the effect (meaning to make it look better to the viewer on a two-dimensional print) can also be used, in reverse, to exaggerate the effect for creative purposes.

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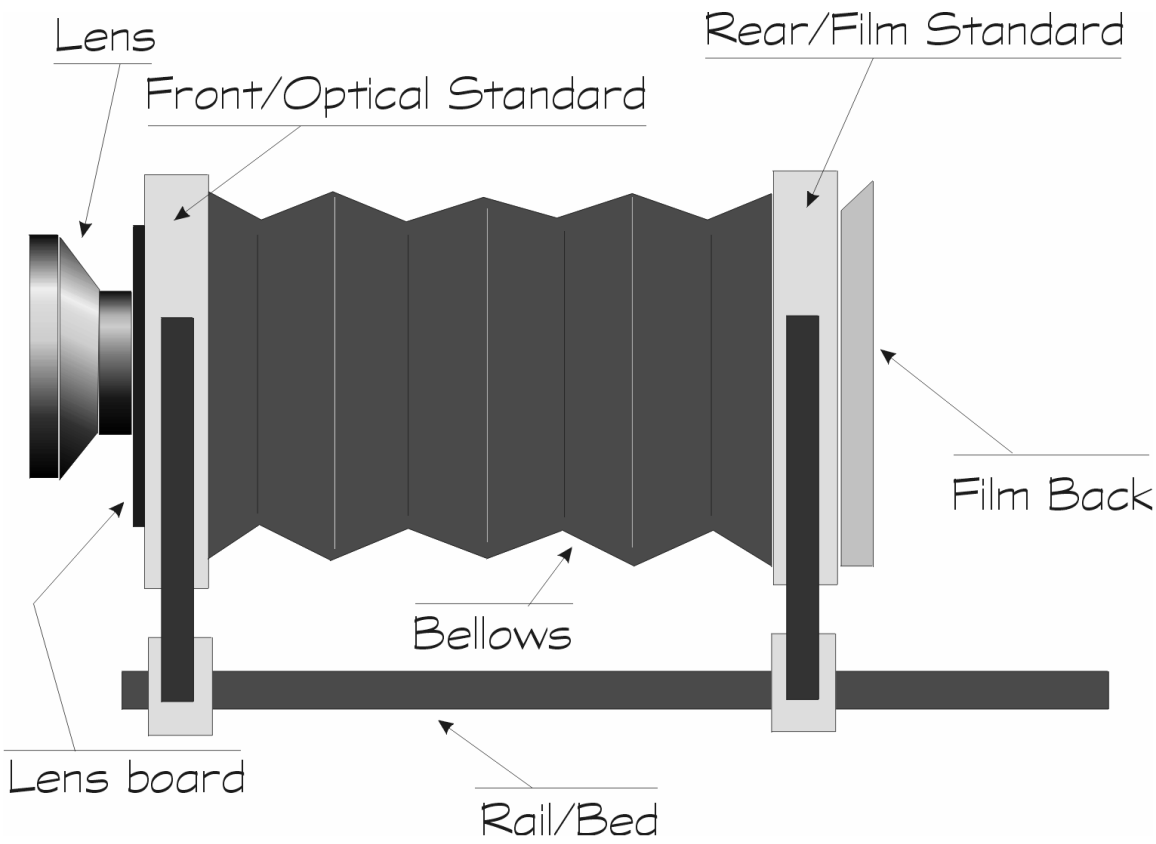
VIEW/FIELD CAMERA MOVEMENTS 7 EFFECTS

In order to help students follow along with the lecture and demonstration as well as to provide a reference guide for their early field work, the following illustrations are provided to show the various movements and their basic results.

Camera Parts

Below is a side view of a typical view camera with the major parts labeled.



Movements

The next illustrations show the basic movements available on the camera.

The illustrations all show the movement on the front standard but are also available on the rear standard of the camera.

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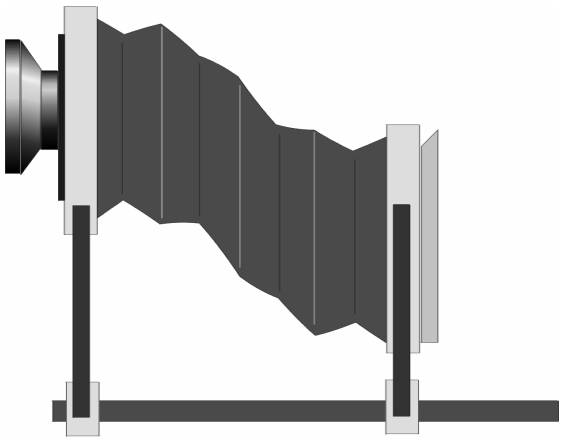
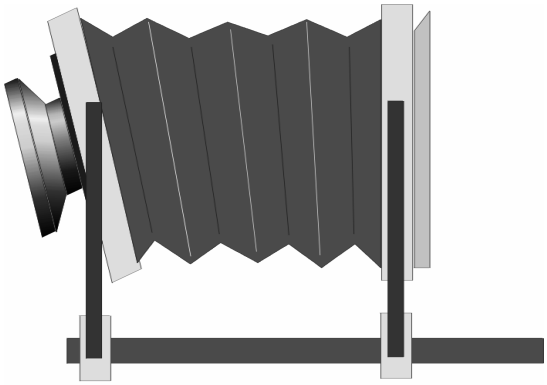
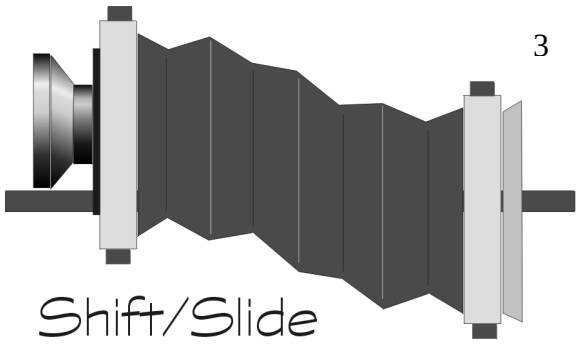


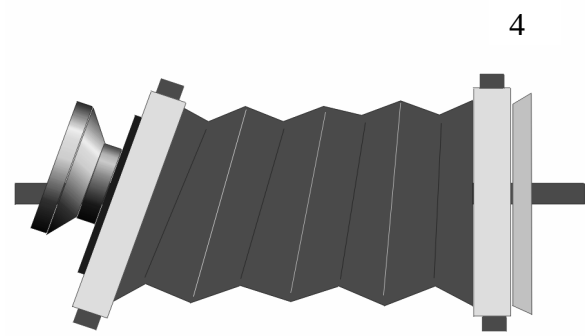
RAISE (Front/Optical Standard) 1



TILT (using Front/Optical Standard) 2



Shift/Slide 3



Swing 4

Figures 1 and 2 show the camera from the side, figures 3 and 4 show it from the top.

Figures 1 and 4 are movements on and around the vertical axis while figures 2 and 3 are on and around the horizontal axis.

These movements can all be used in combination around all axes and using both front and rear movements to align the camera planes an virtually any fashion desired.

The next illustrations will show how to use these core movements to control basic Depth of Field and Image Distortion. Both illustrations are based on controlling the horizontal plane but can as easily be used for the vertical plan or for tilted planes.

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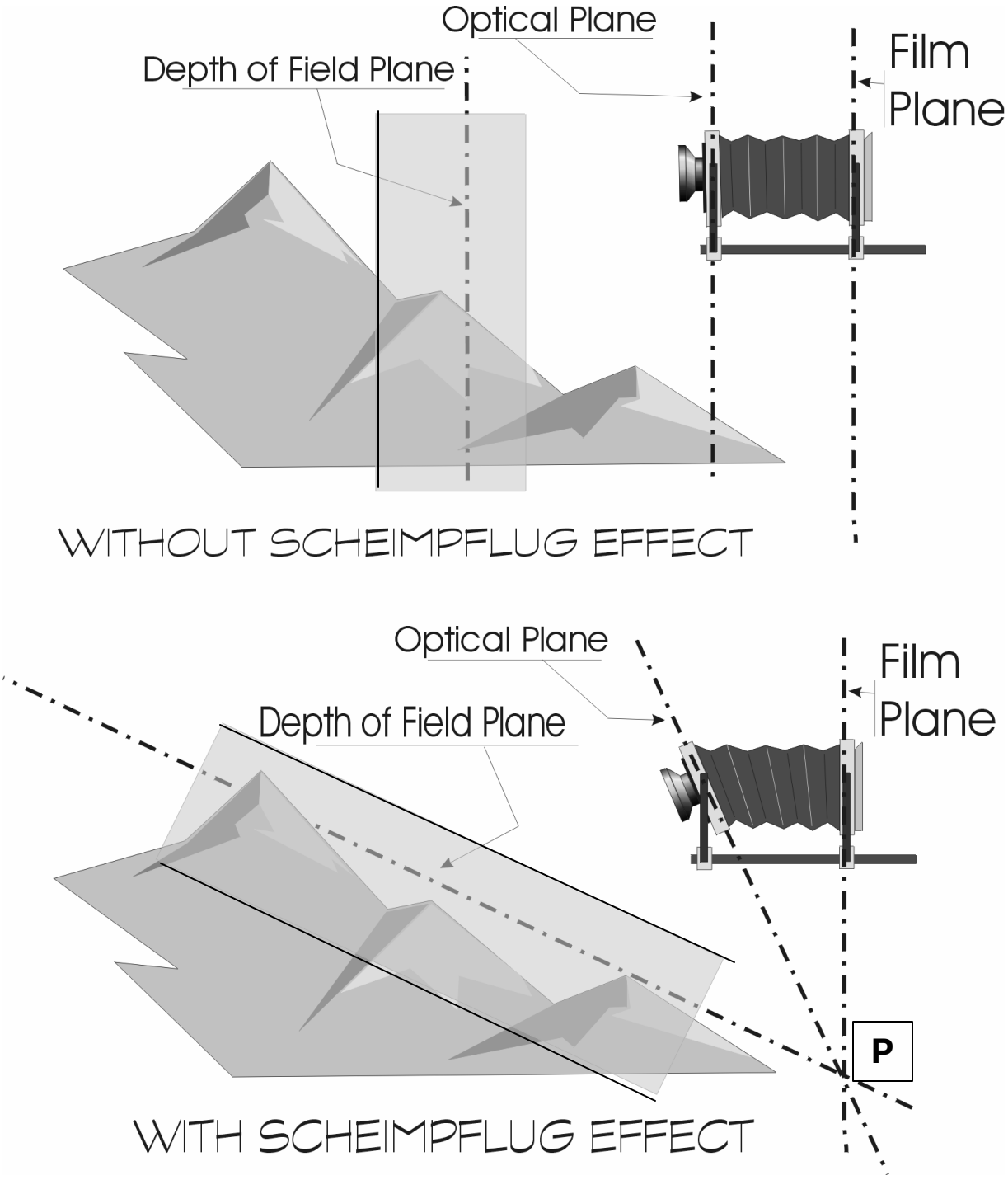
The Illustration on this page shows the effect of using the camera's optical plane movements to gain the illusion of greater depth of field.



Note that all planes intersect at a point (P). In fact, the depth of the plane encompassing the Depth of Field has not been increased at all, it has merely been tilted so that it coincides with the intended subject matter.

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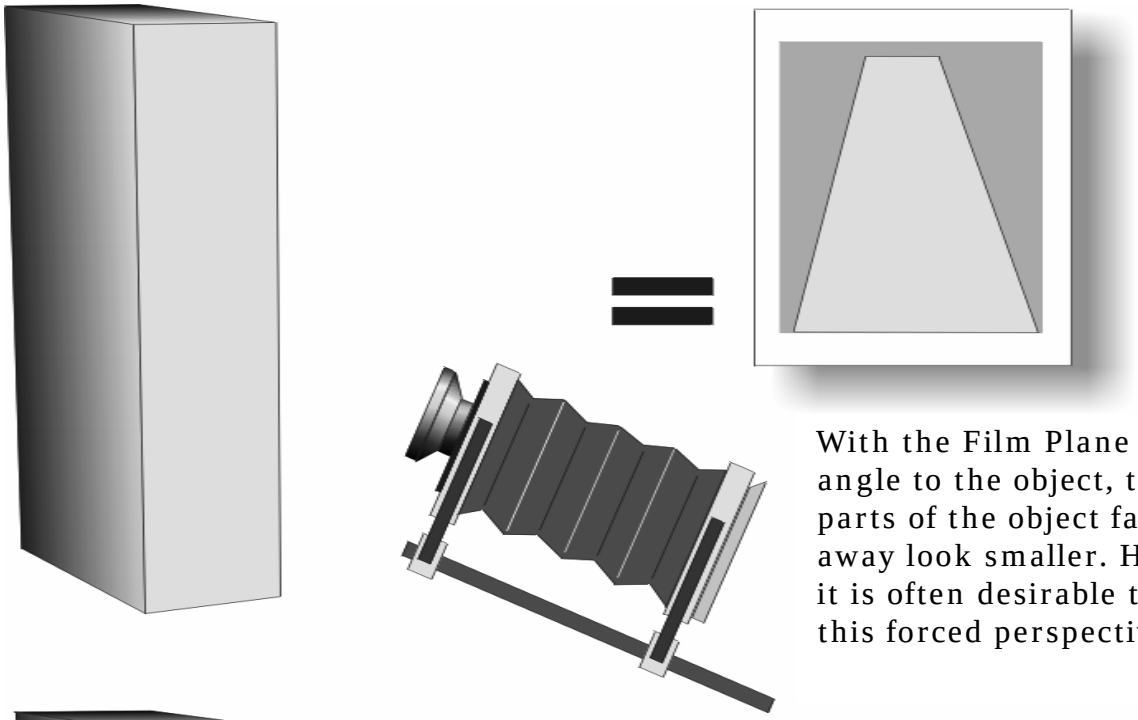
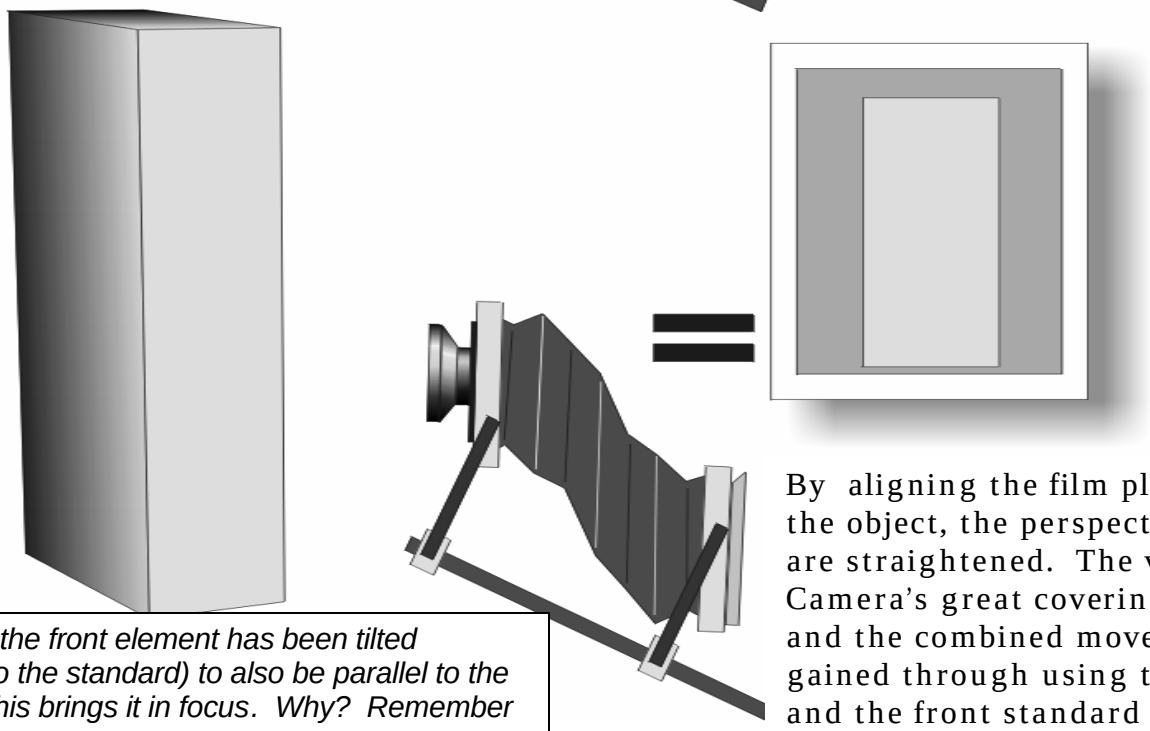
This page's illustrations show how the movements of the rear film plane are used to control image distortion, in this case, the keystoning effect of looking at an object (like a building) that is large enough for perspective to make the part farther away look smaller.



With the Film Plane at an angle to the object, those parts of the object farther away look smaller. However it is often desirable to avoid this forced perspective.



By aligning the film plane with the object, the perspective lines are straightened. The view Camera's great covering power and the combined movements gained through using the rail and the front standard allow a large amount of movement.

Note that the front element has been tilted (relative to the standard) to also be parallel to the object. This brings it in focus. Why? Remember geometry? All parallel lines meet at infinity.

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Class Examination

Examinations are used to determine the student's comprehension of the material. It tells how given students are faring but also can tell whether or not the instructor was able to translate the material properly for a given collection of students and if there are areas that need to be revisited, perhaps from a different point of view. This is a small, targeted quiz designed to let me know how well the student's understood and retained this specific information. The subjects would come from the lecture/demonstration, handouts, and referenced reading.

Exam Questions

1. List the movements that can be made with front and rear standards on a view camera
   _____ _____ _____ _____
2. In general, front/optical plane movements are used to control _____
3. In general rear/film plane movements are used to control _____.
4. The Scheimpflug Effect holds that when the _____ plane, the _____plane and the _____plane all _____, then the Depth of field plane will coincide with the _____ plane.
5. Optical plane movements are generally done with the _____ standard.
6. Large format cameras come in three styles, what are they? 1._____ 2._____ 3._____
7. A "monorail" camera is actually a type of _____ camera.
8. The "Normal" lens on a large format camera has _____ depth of field than the "Normal" lense on a 35mm camera.
9. To avoid distortion of the image, the image plane and the _____ plane should be parallel.
10. The focal length of the "normal" lens for a 2 ¼ camera will be _____ than the normal lens for an 8 x 10 camera.

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Class Assignment

Large Format Cameras such a field and view cameras are not difficult to use but they are often intimidating to the first time users. The quickest way to get over that intimidation is to go out and use them for simple assignment, then start increasing the complexity of the assignment. Below is an example of an early assignment, this one to practice using the camera movements to control Depth of Field.

Introduction

This assignment will begin your familiarity with using large format cameras. It will start by only requiring you to use the front movements to control your depth of field.

Objective

The objective of the assignment is to help you understand the optical and plane geometry aspects of using the Scheimpflug Effect to increase the illusion of greater depth of field. It will also start your practice in setting up and operating a large format camera in the field. And it will limit bracketing forcing you to rely on sound metering techniques.

Turn In

You will turn in the following:

1. Two 8 x 10 prints. The shot demonstrating the use of the camera movements is to be mounted on 11x14 mat board, the other can be unmounted.
2. The negatives and contact sheets for all negatives taken for the assignment. You must shoot at least 8 sheets of film from in no less than three camera positions.
3. This assignment sheet.
4. In an 11x14 manila envelope labeled as per your instruction sheets and course synopsis.

Materials

In addition to your camera, tripod, light meter, and dark cloth, you will need at least 8 sheets of film and 4 film holders.

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Subject	An Architectural Shot. You may choose the location but it must be a large commercial style building, not a house. Assume it is an assignment for the architect who designed the structure for use in his/her portfolio to attract new clients. You are to shoot it at an angle to a long axis so that you must use camera movements to achieve the depth of field you desire. Be prepared to discuss how you set up the camera's movements, and why, in your shot.
Procedure	PLAN YOUR SHOT. I'd suggest scouting the location to find the best time of day, lighting, angle, problems with the environment (traffic, etc.). Many pros will scout with Polaroids? , 35mm slides, or now digital cameras to help plan the shots and work out problems before tackling it with the large camera. Look for unique aspects to the building, things that might be the architect's or builder's "signature" or that make this building really stand out. Think of it as doing a portrait of the building. Once set up, shoot two versions of the final shot. Do one where the camera movements were zeroed (for the unmounted print) and one where you have used the front element to cause the Depth of Field plane to be angled for maximum effect (to be mounted). With eight sheets of film, you can take up to four different views. Take advantage of good lighting, creative filtration, and any Zone System techniques that will help with the image.

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Grading

This is an advanced class, and even though it is a technical assignment you will also be graded on the aesthetic quality of your shot, i.e. how well to you really show off the architectural beauty or uniqueness of the chosen building. This type of shot frequently has very strong lines of composition. Use them to your advantage. Filters play a large part in architectural photography both to deal with the sky but also to bring out architectural elements. Use them to enhance your "story" about this building.

Additionally, you will be graded, as per the specifics in the course synopsis, on the quality of your negative, your printing skills, and the final presentation.

From here on out, you should be thinking of every shot as a potential portfolio shot.

Student's Shot Log (Turn in with Assignment)

Shot	Location	Time	Exposure	Filtration	Develop
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

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