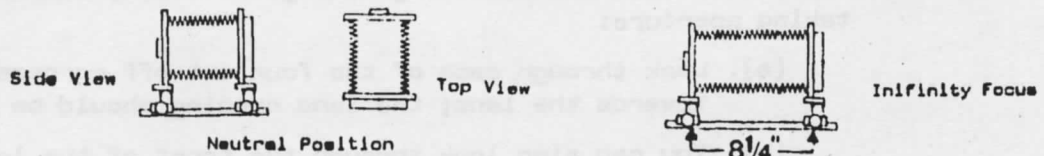


VIEW CAMERA BASICSI. PRIOR TO PHOTOGRAPHING WITH A VIEW CAMERA:

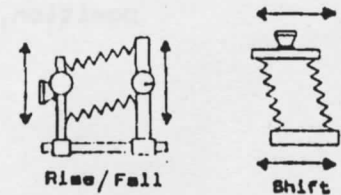
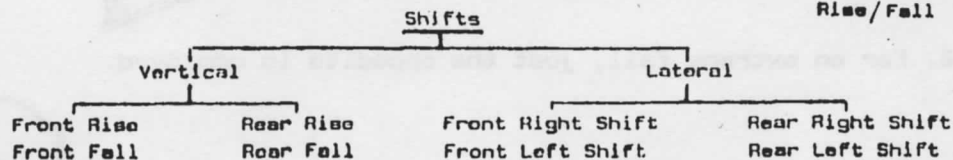
1. Level Camera - Use the bubble levels on the tripod or camera to level fore to aft and port to starboard.
2. Place All Camera Movements In The Neutral or Zero Position -The front (lens) standard and the rear (film) standard should be centered and parallel to one another and both standards should be perpendicular to the monorail or bed.
3. Focus On Infinity -The infinity setting is obtained when the bellows extension (the distance from the film plane to the optical center of the lens) is equal to the focal length of the lens. Example; A 210mm lens would require a 8 1/4 in. bellows extension (1 in. = 25.4mm, therefore  $210/25.4 = 8.25$  inches).

II. VIEW CAMERA MOVEMENTS:

There are two major movements: SHIFTS and PIVOTS

(A). SHIFTS - There are two basic shift movements:

1. Vertical - (Rise and Fall)
2. Lateral - (Right Shift and Left Shift)



Some view cameras, particularly field or flatbed, may have only partial or no shift movements on the rear standard, and limited shifts on the front standard. Swing and tilt movements can be utilized to compensate for these limitations.

Purpose of shifts:

1. To position the subject within the ground-glass borders - Framing the subject.
2. To exaggerate or prevent convergence of parallel lines when photographing tall buildings or long fences. Maintaining the correct subject geometry or shape when doing table-top still lifes. For landscapes, shifts are commonly used to eliminate distracting foregrounds and for placement of the horizon line.

Important Considerations When Using Shifts:

1. Front and rear shifts will not alter the shape or geometry of the image. This is because the subject, lens, and film planes remain parallel; only the relative position of the image on the ground-glass changes.
2. Shifts when used on the front (lens) standard changes the camera's point of view and can alter the spatial relationship between near-far objects within the subject. This effect is minor with distant subjects but becomes

more important and can be useful in close-up photography.



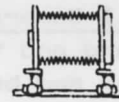
Neutral



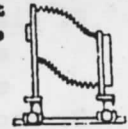
Front Left Shift



Neutral

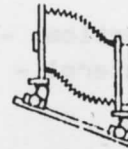


Front Rise



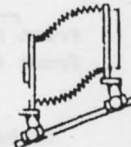
3. Shifts when used on the rear (film) standard do not change the camera's point of view and so space relationships are unchanged.
4. These movements can cause vignetting! To check, stop the lens down to the taking aperture:
  - (a). Look through each of the four cut off corners of the ground-glass towards the lens; the lens opening should be perfectly circular.
  - (b). You can also look through the front of the lens to see if all four corners of the ground-glass are visible.
5. For an extreme rise, the entire camera body is tilted upward on the tripod and the front and rear standards are realigned to a vertical position, this is a forward TILT movement.

Indirect Rise

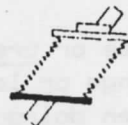


6. For an extreme fall, just the opposite is employed.

Indirect Fall

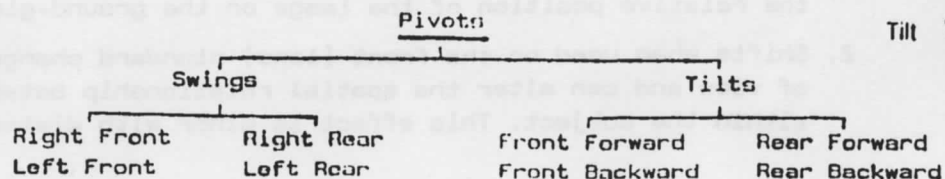
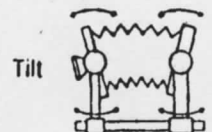
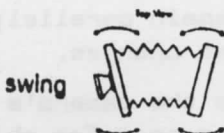


7. Cameras designed without shifting movements can still be shifted to a limited degree. Face the camera in the direction of the desired shift and SWING both standards so they are parallel to the subject and to each other.



- (B). PIVOTS - There are two basic pivot movements:

1. Swings - (Right and Left Swing) - A rotation of the standard on its vertical axis.
2. Tilts - (Forward and Backward Tilt) - A pivoting of the standard on its horizontal axis.



## Purpose of Swings and Tilts:

NOTE: Swing and tilt movements do not produce the same effects for both the front and rear standards.

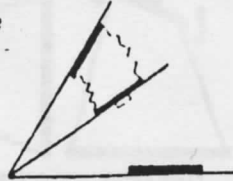
### (a). Front Swings and Tilts;

1. These movements on the front standard are employed to obtain sharp focus when the subject and the film planes are not parallel.

If the lens' focal plane is repositioned to coincide more closely with the subject plane, a greater area of sharpness (depth of field) will result.

For overall sharpness, three planes must be controlled:

- (a). Subject plane
- (b). Lens plane
- (c). Film plane



When these three planes meet at a common point, the image will be sharp from near to far and everything along the subject plane will be in sharp focus.

Review the Scheimpflug effect.

Review the basic controls affecting depth of field - relative aperture, focal length of lens, and subject distance.

## Important Considerations When Using Front Swings and Tilts:

1. Front swings and tilts will not alter the shape or perspective of the image.
2. These movements can be responsible for illumination fall-off and can cause vignetting.
3. There can be a slight displacement of the image when front pivots are used, but a slight shift movement will easily reposition the image.

### (b). Rear Swings and Tilts;

1. These movements on the rear standard are employed to control perspective and to manage image shape.

(a). To prevent the convergence of parallel lines, the back standard must be parallel to the lines. The opposite can be used to exaggerate the convergence effect.

(b). Movement of the back standard elongates the subject shape. Swinging causes horizontal elongation. Tilting causes vertical elongation. The part of the image on the ground-glass moving further from the lens will become larger and the part that moves closer to the lens will become smaller.

2. These movements can also be used to control sharpness.

(a). Back swings can be employed to obtain right to left sharpness and back tilts can be employed to obtain top to bottom sharpness but with a resulting change of the image shape.

## Important Considerations When Using Rear Swings and Tilts:

1. A combination of back movements (swings, tilts, and shifts) may be employed simultaneously to control shape. Keep in mind that when a movement is employed to correct distortion in one plane, a new distortion will be introduced into another plane.

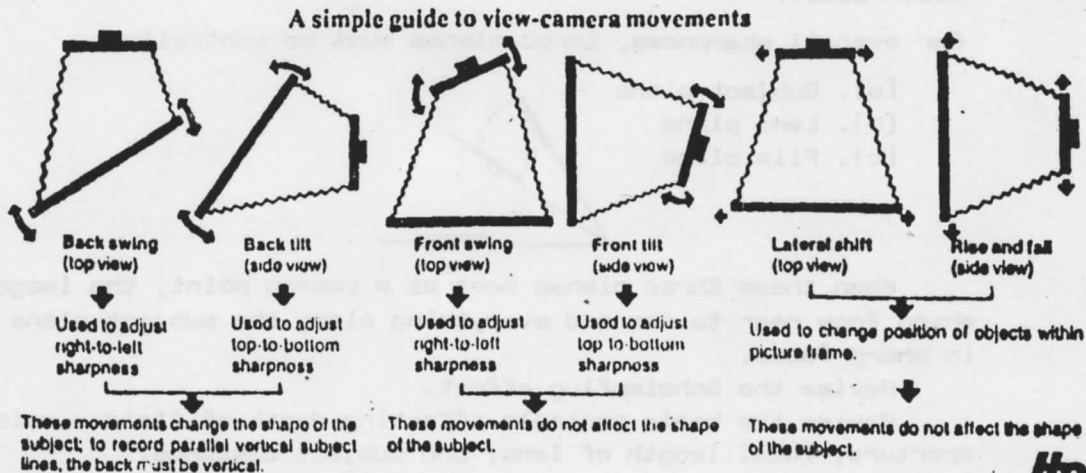
2. Although rear swings and tilts seldom cause vignetting, illumination fall-off can occur.

#### Thumb Rule for View Camera Movements:

Front and rear shifts position the image on film.

Front pivots control sharpness.

Rear pivots control image shape and perspective.

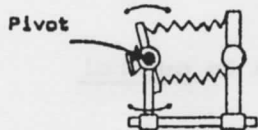


**HP**

### III. FOCUSING THE VIEW CAMERA:

**Axis Tilts or Base Tilts?** There are two types of tilt pivots and each type requires a different focusing procedure.

#### (A). Focusing Using Tilts:



1. **Axis (Center) Tilt** - The lens standard and/or the film standard pivots on an imaginary horizontal line that passes through their centers.

- (a). When using a front or rear axis tilt, the distance between the lens and film remains unchanged. This makes focusing a little easier and quicker because less refocusing is required.
- (b). A disadvantage of axis tilts is that of yaw. Yaw occurs when the camera bed is inclined and a tilt is used simultaneously with a swing. This results in a movement that isn't parallel to the film plane and makes sharp focus impossible. This can be eliminated when the tilt pivot is located beneath the swing pivot; this design is known as yaw-free.

#### Procedure:

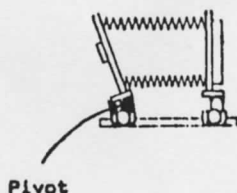
- (1). Position and level the camera in the direction of the subject. Place all camera movements in the neutral position. Open the shutter and diaphragm to the maximum aperture.
- (2). Set bellows at infinity (close-up photography will require a longer bellows extension). Coarse focus by moving the front and/or rear standard along the monorail or camera bed until you have roughly framed your subject and achieved the desired image size (lens to subject distance determines image size). Once the size or magnification of the image is correct, keep the lens to subject distance constant by using the rear standard for any final focusing; this is especially important in close-up photography.



- (3). Fine FOCUS by moving the lens or film standard forward or backward until the NEAR portion of the subject is in sharp focus. This is the subject closest to the camera and is found on the upper portion of the ground-glass, it's the subject foreground. The rest of the subject will be out of focus.
- (4). Next, TILT the lens standard forward until the most distant (FAR) part of the subject is in focus; this is the image found on the bottom portion of the ground-glass. FOCUS ON THE NEAR AND TILT TOWARDS THE FAR.
- (5). If the foreground (near) slips out of focus after tilting, simply refocus on the near and re-tilt the far. These will be very slight adjustments.
- (6). Stop down to the taking aperture and check for vignetting and overall sharpness.

NOTE: The tilting of the rear standard can also be used to obtain sharp focus. It can be used in place of or in conjunction with tilting the lens standard. If used by itself, foreground objects tend to be enlarged.

2. Base (Bottom) Tilts - Base tilts have their point of pivoting located between the bottom of the lens standard and/or film standard and the camera bed.

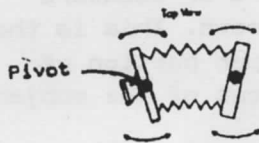


- (a). When using front or rear base tilts, the lens moves away from the film plane or vice versa, causing a change in the lens to film plane distance. This requires considerable refocusing after each base tilt adjustment. This makes focusing a little more difficult than focusing with axis tilts.

Procedure:

- (1). Position and level the camera in the direction of the subject. Place all camera movements in the neutral position. Open the shutter and diaphragm to the maximum aperture.
- (2). Set bellows at infinity (close-up photography will require a longer bellows extension). Coarse focus by moving the front and/or rear standard along the monorail or camera bed until you have roughly framed your subject and achieved the desired image size (lens to subject distance determines image size). Once the size or magnification of the image is correct, keep the lens to subject distance constant by using the rear standard for any final focusing; this is especially important in close-up photography.
- (3). Fine FOCUS by moving the lens or film standard forward or backward until the FAR or most distant part of the subject is in focus; this is the image found on the bottom portion of the ground-glass.
- (4). Next, TILT the lens standard toward the NEAR (foreground) until it's in focus as close as possible; this is the image found on the upper portion of the ground-glass. FOCUS ON THE FAR AND TILT ON THE NEAR.
- (5). Since this entire image is affected by the lens moving away from the film plane, reframe the subject if necessary and repeat steps #3 and #4 at least two more times.
- (6). Stop down to the taking aperture and check for vignetting and overall sharpness.

NOTE: The tilting of the rear standard can also be used to obtain sharp focus but may affect the image shape or perspective.

(B). Focusing Using Swings:

When using swing movements, the center of the lens standard and film standard pivots on their vertical axis. Because of this principle you would follow the same procedure as described under axis tilts for focusing.