W i d e B o y 3

Swing lens panoramic camera

Operating instructions and user guide

A hand crafted camera manufactured at the Horsley Camera Works

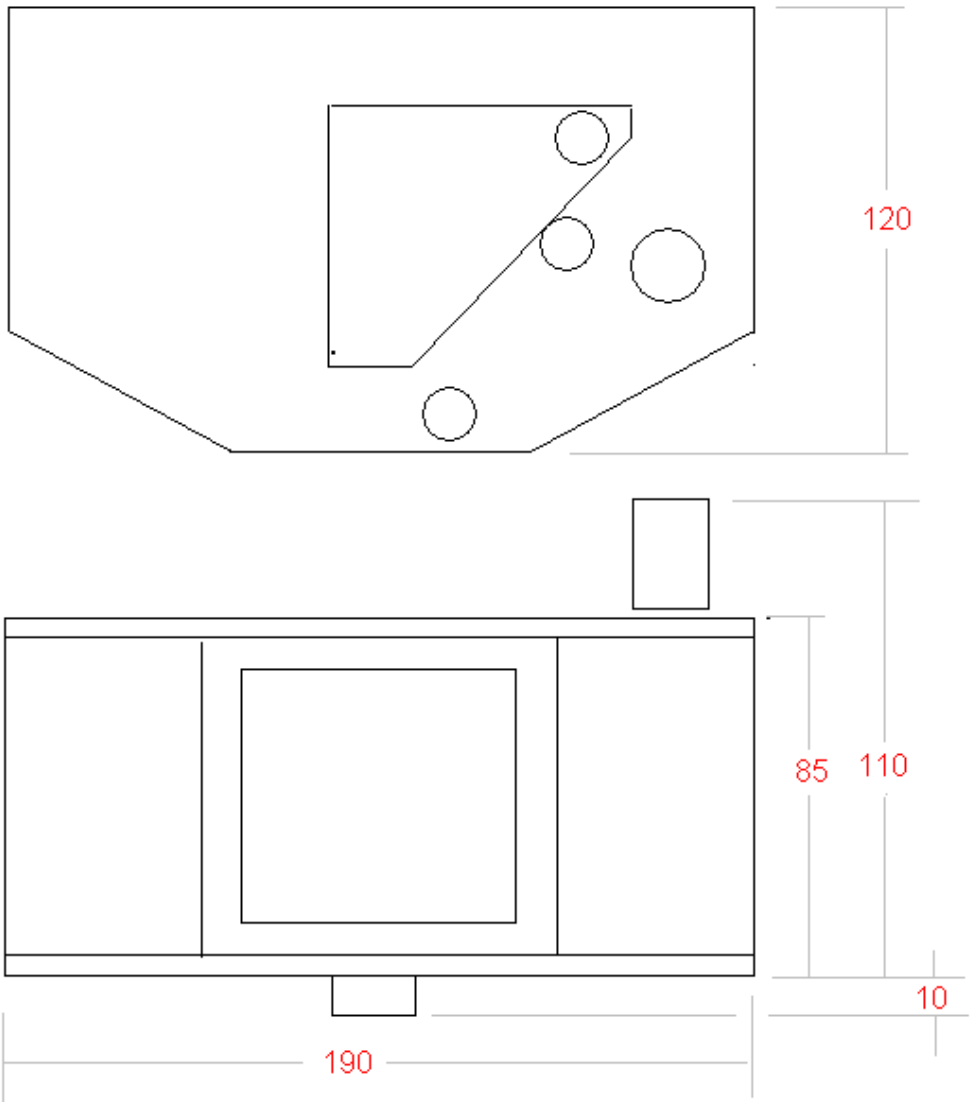
Specification

Horizontal angle of view	120 degrees
Vertical angle of view	46 degrees
Negative size	105 mm x 43 mm

1:1 sample shown below

Film Type	Standard 120 size roll film
Exposures per film	6
Lens	50 mm 4 element
Working aperture	f 16
Shutter speeds	1/100 sec. to 1/10 sec (see text)
Double exposure facility	Yes

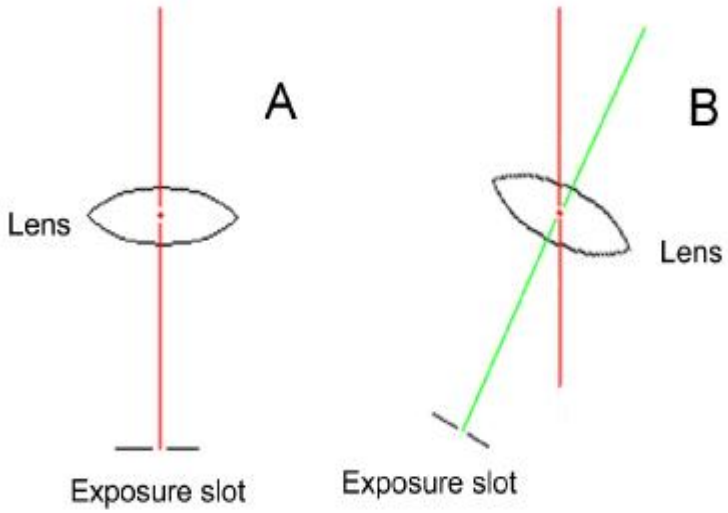
WideBoy3 Dimension and weight



Camera weight 0.8Kg

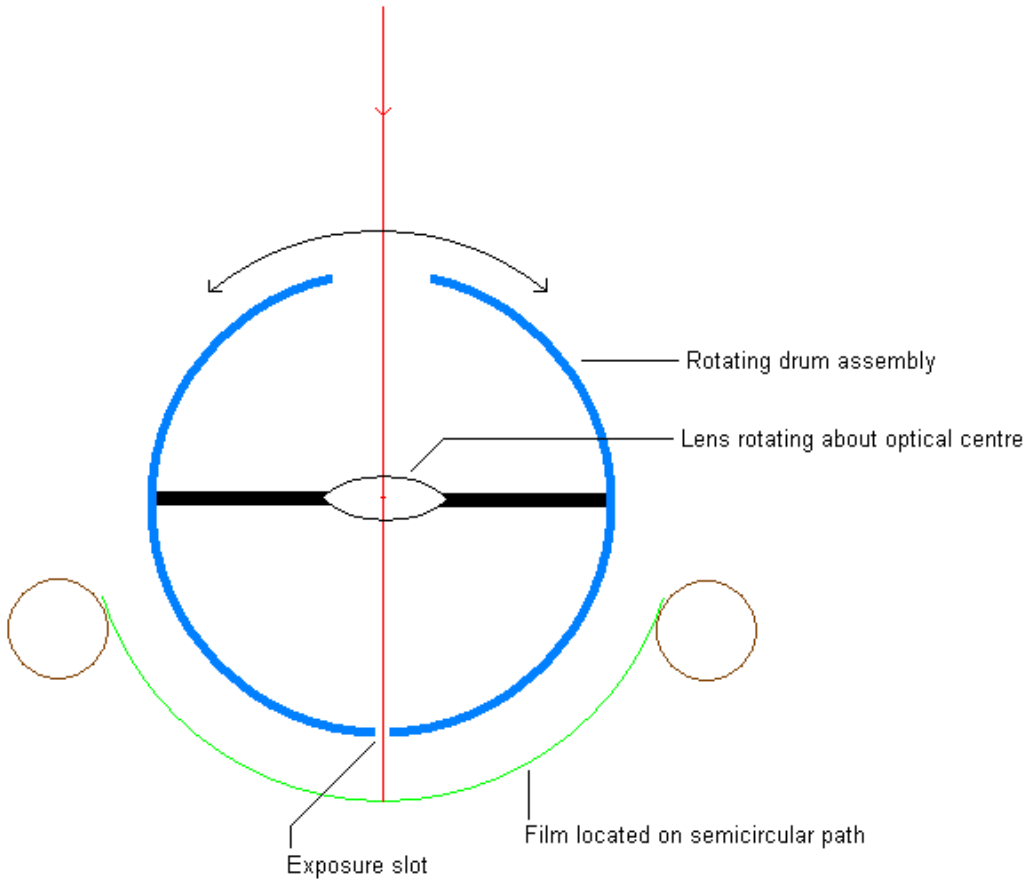
Principle of operation

The swing lens camera differs from a normal wide angle camera by the fact that the lens rotates. In many wide angle designs the problem of coverage is solved by the use of very expensive optics but even in these designs the problem of even light distribution is not always entirely satisfactory. The swing lens solution overcomes this problem by exposing the film through a narrow slot of film sequentially as the lens is rotated to cover the field. This operation relies on the fact that in a lens, all rays can be said to pass through the optical node point, this applying even when the lens is rotated as shown in the diagram below and although the lens rotates, the image remains stationary. In practice the image will soften as the lens is rotated from position A to position B, since in all matters engineering and optical the stationary image effect is a compromise. To overcome the degradation of the image, the design only uses a narrow slot of image and in this condition the image is essentially stationary on the film, this slot rotating with the lens.



The practical camera employing this principle is shown diagrammatically on the following page, in which the disposition of the film which is pulled onto a semicircular guide is shown located at the same axis as the rotating drum containing the lens.

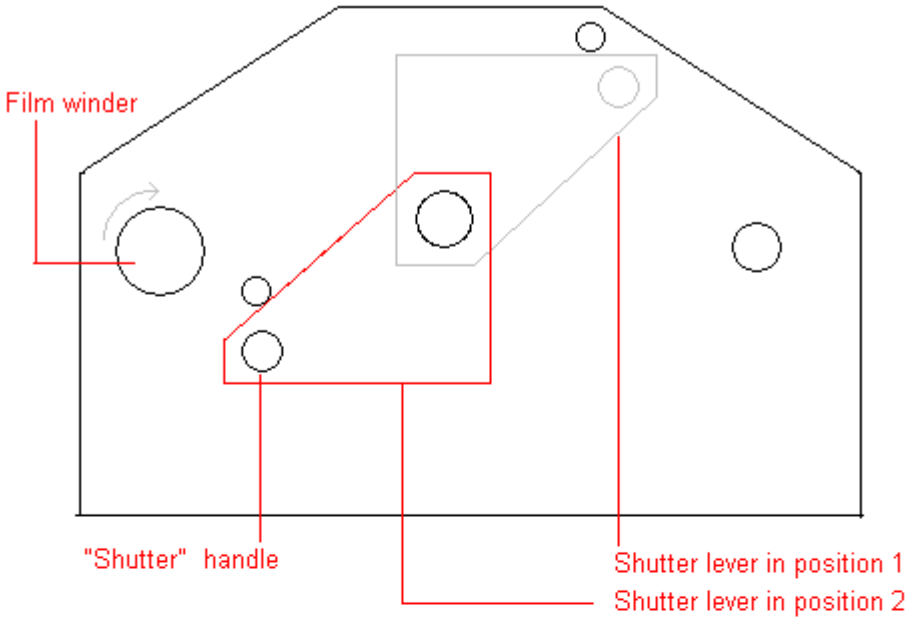
The essential working parts of a swing lens camera can be seen in this diagram.



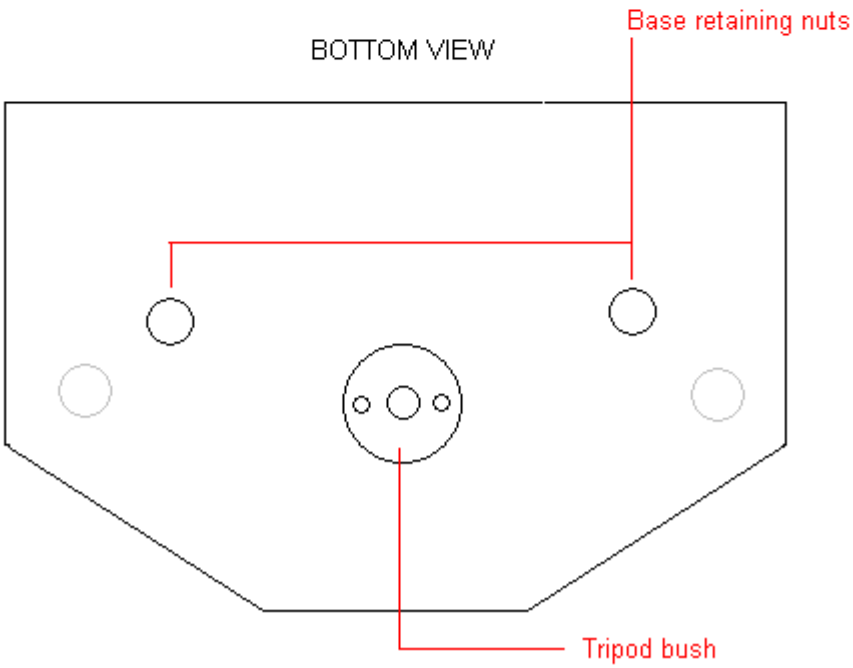
To take a 120 degree panorama it may be seen that the drum and lens assembly must be rotated over the covered angle, the speed at which this operation is performed governs the exposure time and as an example with a 1 mm slot and a negative length of 106 mm (as employed in WideBoy 3), if the 120 degree sweep takes 1 second it can be seen that each strip of film will be exposed for 1/106 sec. If the drum takes 3 seconds to rotate, then the exposure is increased to 3/106 sec or approximately 1/30 sec.

In professional cameras such as the Noblex, this function is motorised, in the WideBoy 3, the operator manually controls the duration of the rotation, hence the shutter speed. The speed of rotation should be kept constant during the operation, or the exposure will vary across the film plane and may result in “banding”. In practice, due to a light frictional load built into the bearing system it is very easy to maintain a constant sweep rate.

Your WideBoy 3



TOP VIEW

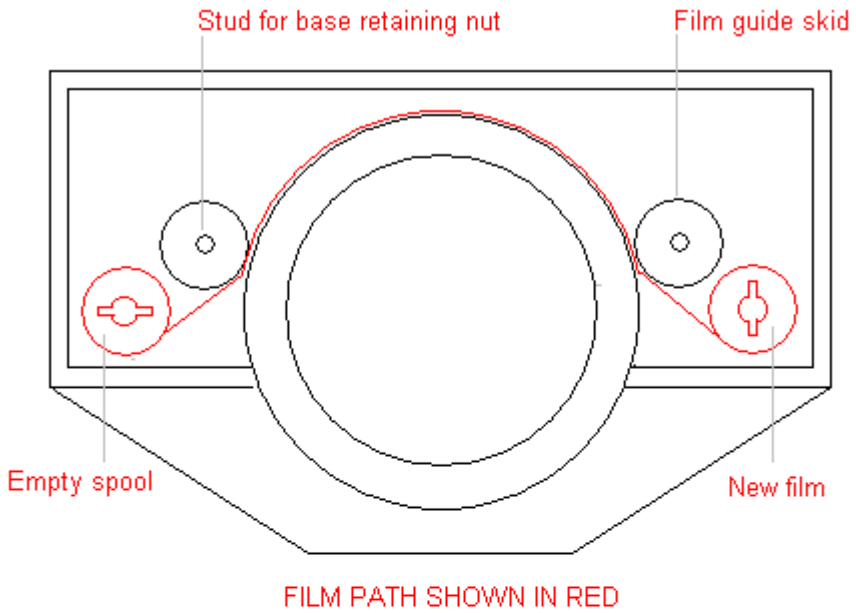


BOTTOM VIEW

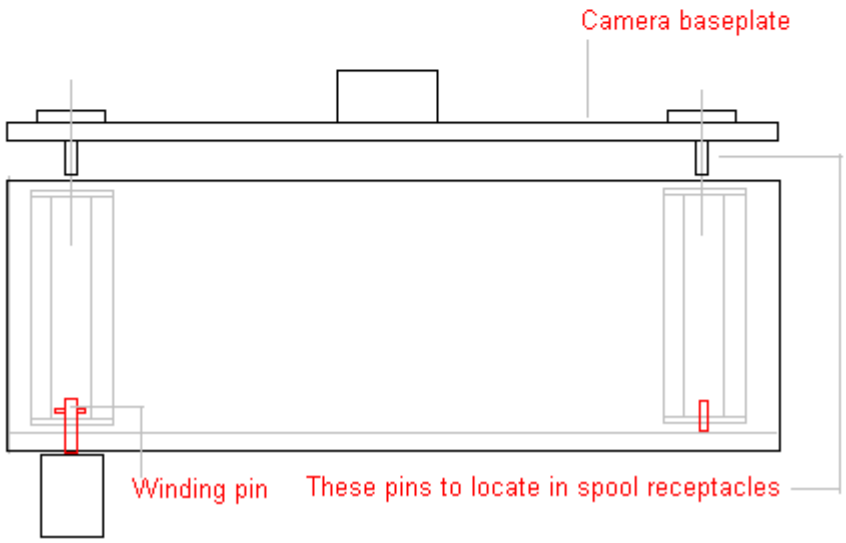
Loading instructions

The leader from the new film should be attached to an empty spool and approximately 8” (200mm) pulled clear from the new film spool. The two spools should the be fed into the body of the camera to take up the position indicated in red taking care to engage both the winding pin for the empty spool and the corresponding pin for the new film.

The base plate must now be offered up to the camera , making certain that the two pins locate in the receptacles in the spools. This operation is best performed with the top of the camera laying horizontally so that the spools may sit vertically in the body.



FILM PATH SHOWN IN RED



Close the back with the two base locking nuts and wind the film to exposure 2 as viewed in the red window located on the back of the camera

Film usage and frame numbers

Each negative is app. 106 mm long, this taking the greater part of two frames of the 12 on series. The film is wound on to exposure number **1** for the first frame , subsequent exposures are made on frames **3 ,5 , 7, 9 and 11**

Remember the sequence:-

1 3 5 7 9 11

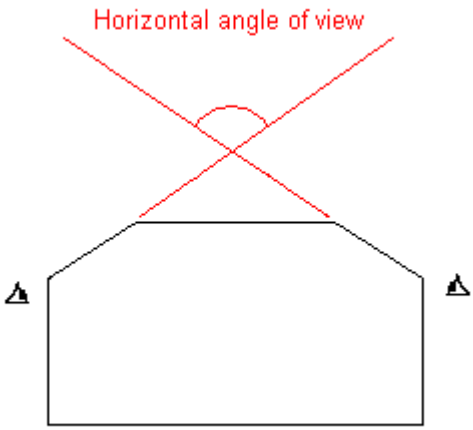
Note When loading the film the shutter operating lever must be in one of the two positions shown on page 5. If it is not set to this condition light mat pass through the two slots in the lens drum and expose the film.

When exposure 10 has been taken the film is wound to the end as in a normal camera and unloaded.

Viewfinder

A plan view of the camera differs from the shape normally encountered.

Placing the eye as shown and looking along the angled front edge defines the horizontal field of view as shown in the diagram below..



Exposure

The lens, located in the rotating drum is set at a working aperture of f 16, this when set at the hyperfocal distance for this aperture gives a sharp field from infinity down to 3 metres.

As explained on page 4, the shutter speed is controlled by the time taken to slew the shutter lever over the field of view. In practice although the negative covers 120 degrees, the shutter lever rotates over an angle of 180 degrees, this is to enable the entrance and exit slots in the drum to be capped off at the end of each shot.

It should be noted that the lever may be left parked in either of the positions shown on page 5.

The slot width is a nominal 1mm in this camera and as previously explained the shutter speed may be defined by the time taken to cover the negative area . The drum has inbuilt friction to enable a steady rate of rotation to be applied and the first and last 30 degrees of travel do not expose the film, this allowing the desired speed to be achieved before the exposure slot reaches the film. A guide the following times for a 180 degree moment of the shutter lever will provide the indicated exposure times.

Time for 180 degree sweep	Effective shutter speed
1 second	1 / 150 sec
3 seconds	1 / 50 sec
6 seconds	1 / 25 sec

Maintenance

In the envelope provided with the camera you will find three components, they are :-

1 A hex key to enable you to perform any maintained necessary. The key will operate on 3 grub screws these being

A The screw that locks the red handle assembly to the drum shaft. To remove the drum if this should become necessary the red handle is removed and the drum may be easily pushed out. Of the bottom of the camera when the base plate has been removed. When reinserting the drum care should be taken not to fold the felt pads into the camera body .

B The base of the rotating drum, onto which is mounted the lens, is fixed in the correct location by a single grub screw. This would need to be removed if the bottom circular plate need to be removed to gain access to the lens.

C The film winder knurled knob is also attached to the winding shaft with a grub screw. If after a long period the knob assembly feels loose then the shaft and knob should be pressed in closer contact to compress the felt washer located under the knob. This should have a little friction to keep the film in tension over the circular film plane.

2 A pair of M5 nuts are provided to hold the bottom plate in place if you should lose the original wing nuts.