

# Calibration Aids for Metron

Revision 3  
EponaTech 2008



The Metron Block is a calibration tool that will ensure that radiographs and photographs of the hoof can be accurately measured using Metron software.

## Positioning the Hoof on the Block

It is important to try to get the horse to stand such that the foot is aligned with the fiducials (grooves) on the top surface of the block. Along the long axis of the block, the hoof should be centered on the grooves, and we suggest that the widest part of the foot be centered on the other set of grooves. The figure below illustrates ideal positioning.



Note that the block is symmetric side-to-side, but not front to back. The front and sides of the block have holes and black screw markers, whereas the back of the block has no holes.

## Positioning the Camera when Photographing

The most common mistake when trying to document the hoof photographically is that the camera is held too high. It is important to hold the camera so the center of the lens is at the same height as the top of the block. The camera should be about 2 or 3 feet away from the block, although the precise distance is not important, as the block can compensate for distance with its built-in scales. The images below are properly taken photographs of a hoof.



Lateral photograph: Note that a “dry erase” pen is used to write the horse’s name and the date of the image on the side of the block. Note that the top surface of the block is seen “edge on” – if you can see the top surface of the block, then you held the camera too high! Also note that you must be aligned with the block such that you can see the black markers at the bottom of the circular holes in the side of the block – this ensures you were lined up approximately perpendicular to the block. Practice taking some images and then compare your results to this image.



Frontal photo: Make sure the block is positioned so there are the holes in the side of the block facing the camera. A “dry erase” pen is used to write the name of the horse, which foot, and the date of the image. Note that you can see the black markers at the bottom of the circular holes if you have positioned the camera properly.

### **Calibration in Metron for Photographs**

Metron will prompt you to pick the four black marker points on the block (two are on the surface of the block and two are in the circular holes) as shown in the image below.



Lateral Photo: Metron prompts you to pick the four black markers on the block. Here, they are highlighted in green after they are picked.

## **Why Four Calibration Points?**

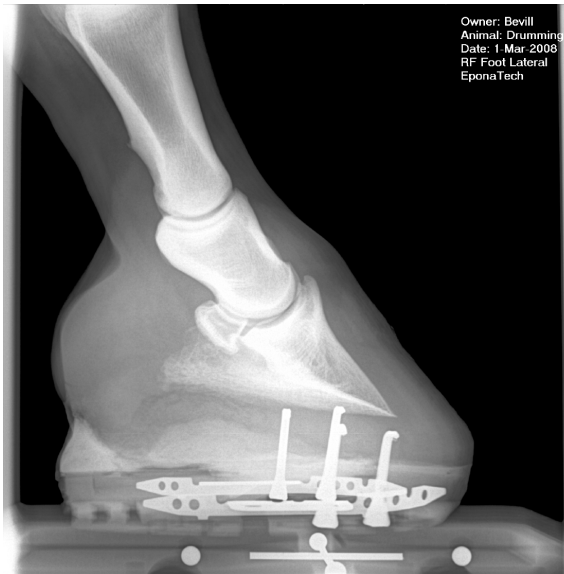
By picking four points, two of which are at a different distance from the camera, Metron can automatically compensate for the focal distance of your camera. No matter how close you were to the block, and no matter how your camera was zoomed, measurements are accurately resolved to the centerline of the block (centerline of the hoof for a lateral radiograph, and at the 'widest part of the foot' for a frontal photograph). It is only important that you hold the camera so that the center of the lens is at the height of the block, and point the camera perpendicular to the long axis of the block. Best is to have the camera about 3 feet away from the block (being too close and using wide-angle zoom can introduce some perspective effects that can reduce accuracy).

## **Positioning the X-Ray Generator for Radiography**

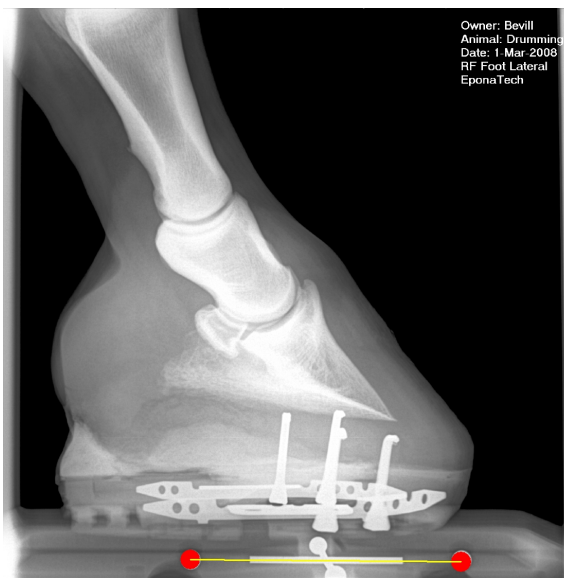
The height of the Metron block is such that it is appropriate for use with a typical x-ray generator such as a MinXray HF80. We position the generator about 30" away from the block, but the distance is not crucial, as the block contains internal metal scaling markers which will provide accurate measurements regardless of the film focal distance used. The film cassette or DR detector plate is placed on the ground just to the side of the block. Note that the positioning of the foot on the block is just as we have shown above for photography – do **NOT** move the foot to the side of the block to get it close to the film or DR detector.

## **Calibration in Metron for Radiographs**

The Metron block contains special metal markers which can be automatically detected by Metron in order to set a scale factor for the image. In this way, measurements made in Metron will be accurate and will not include magnification effects normally present in radiographic measures.

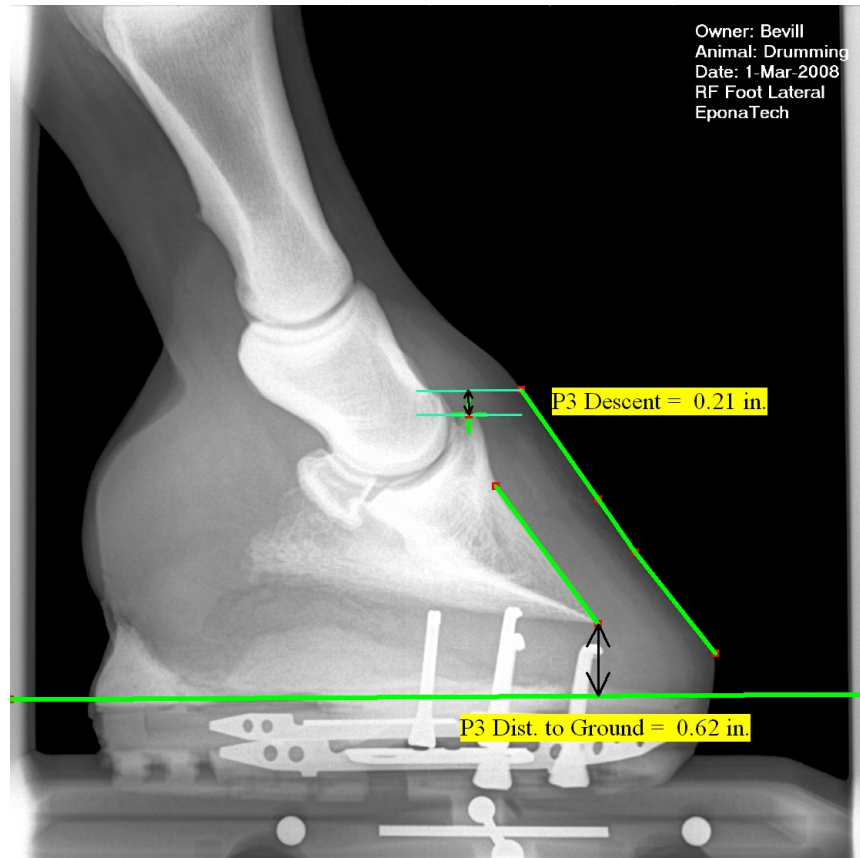


Lateral Radiograph: Note the round metal “balls” which are built into the block and will be used by Metron to calibrate the image.



Lateral Radiograph: As soon as this image is entered in Metron, the software automatically locates the metal balls and the image is auto-calibrated.

If Metron fails to automatically find the metal balls, they can be picked by the user manually. Depending on the exposure and quality of the radiograph, the automatic detection algorithm sometimes does not succeed.



Lateral Radiograph: Example showing just 2 of the 22 numbers that Metron computes for the analysis of the lateral radiograph. These values are accurate because of the automatic scaling performed by the block and the Metron software.

### **The “Auto-Scaler” Tool**

The Auto-Scaler is an alternative to using the Metron Block. The Auto-Scaler can be placed or strapped to locate it as needed. It contains the same metal markers which will appear in the radiograph and which Metron can use to automatically set the scale for the image.

It is important to place the Auto-Scaler on the subject to be radiographed such that the axis of the Auto-Scaler lies in the “plane of interest”. The “plane of interest” is the plane, perpendicular to the central beam of the x-ray generator, in which you wish to make accurate measurements.



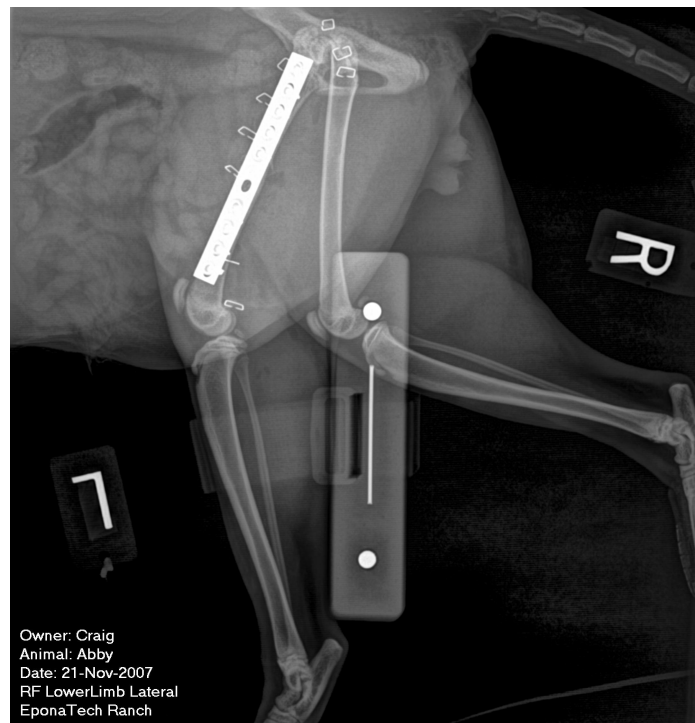
The “Auto-Scaler” with optional Velcro strap.



Auto-Scaler strapped to horse's leg



Image with Auto-Scaler strapped on horse's leg



The Auto-Scaler is particularly useful for Small Animal images



## The “Finger Clips”

Unlike the other two devices already covered, the “Finger Clips” are not used for radiography. They are used for photography of the equine hoof, and specifically for the view of the sole. We always sell these in sets of two.

They contain two fiducial points spaced 2.0” or 5.0 cm apart which the user will later be prompted to pick in the image once it is in Metron. There is also a space where, with a dry-erase pen, some information (which foot, date, etc) can be noted.



**The “Finger Scale” is clipped to a finger and held so that it lies in the “plane of the hoof”. It should be the same distance from the camera as the hoof plane – not closer, not further. The camera should be pointed perpendicular to the plane of the hoof.**