

## A Streamlined guide for radiology technicians to acquire X-ray images with Hexapods

This guide illustrates the general suggested rules to apply when taking the X-ray images with the TL-HEX hexapod system, in order to exploit the full potentiality of TL-HEX software and, in particular, of the x-ray analysis module, HEX-ray.

HEX-ray enables the uploading of the patient's X-rays (AP and Lateral), for different strategies of pre-operative planning and treatment, working directly on images and transferring the calculated parameters in TL-HEX for a more straightforward prescription calculation.

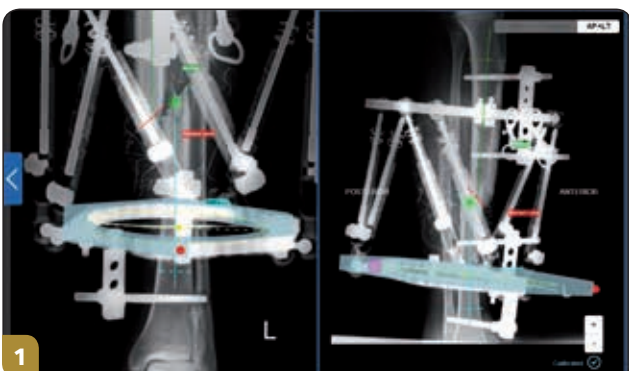
### Acquiring X-ray images: AP and ML

#### AP - Anterior/Posterior acquisition

The preferable position is with the X-ray source under the table and the image intensifier above, this is the desired position for the scatter radiation.

#### ML - Medial/Lateral acquisition

Angulate the C-arm at 90° and turn the C-arm either clockwise or anticlockwise, depending on the side of the bone to be captured. Both, the AP and ML X-rays must be taken at 90° between them, as precisely as possible, in order ensure matching between the images acquired and the HEX-ray's digital template (fig. 1\*).



\* With courtesy of Dr Ferreira

### General methods for taking an X-ray with Hexapods

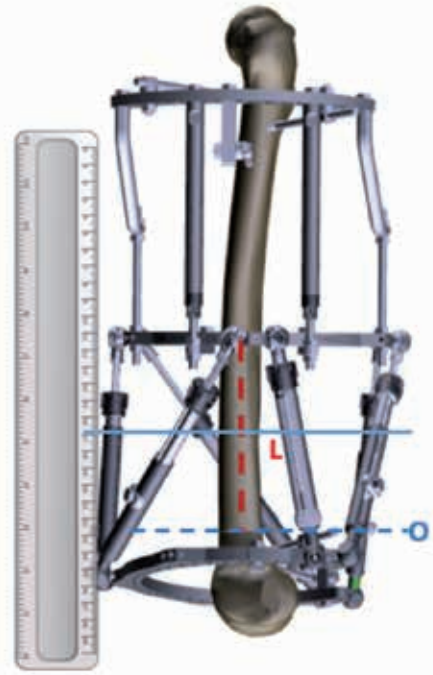
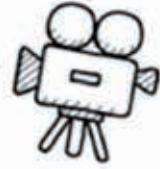
Two X-rays images (AP and ML) must be taken and then used to insert data in the TL-HEX software. The general rule in the orthopaedic world is to take the X-ray as perpendicular as possible to the injured bone, but when working with Hexapods some variations may occur.

Two techniques are possible:

1. *With TL-HEX software v. 1.5 and previous versions as well as TSF* - The C-arm must be aligned with (on the same plane of) the reference ring (fig. 2). This will generate a length (L) that is the distance between the ring and the level of osteotomy. This parameter should be used in the software for the postoperative phase.
2. *With TL-HEX software v. 2.0 and HEX-ray module* - The C-arm must be positioned perpendicular to the longitudinal axis of the bone reference segment (fig. 3). In this case the distance between the reference ring and the level of osteotomy will be L' (the more tilted is the ring, the more different is L' from L). The distance L' is accurate because it is not influenced by the ring angulation. Furthermore, one of the main advantages of the HEX-ray module is that all the parameters are automatically uploaded into the software, thus minimizing the potential users' errors (standard procedure universally adopted by radiologists).

### Uploading X-rays into the HEX-ray module

X-rays can be uploaded HEX-ray module. Accepted formats are .jpeg or .png, up to a maximum size of 2.5MB.

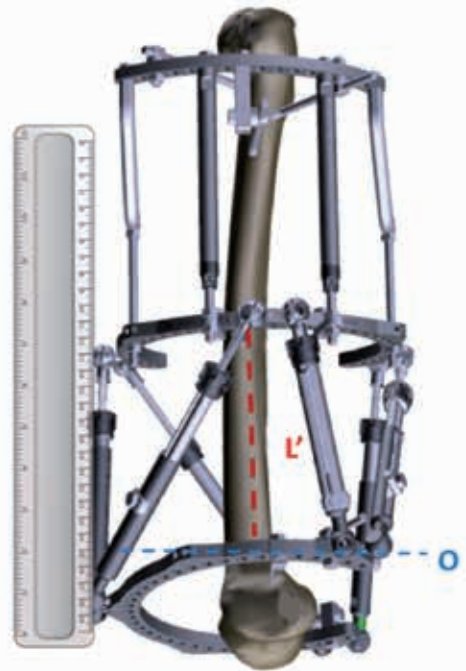


$L = 11\text{cm}$

$O = \text{Level of Osteotomy}$

2

X-ray: perpendicular to the reference ring  
For TL-HEX Software v. 1.5 and previous versions as well as TSF



$L' = 14\text{cm}$

$O = \text{Level of Osteotomy}$

3

X-ray: perpendicular to the reference bone segment  
For TL-HEX Software v. 2.0 and HEX-ray module

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