

UPenn ReActor User's Guide

December 16, 2002

This document is designed to supplement the User's Guide supplied by Ascension Technology and address some commend questions. Please feel free to make additions and correction.

1 Marker Placement

The ReActor system comes with 30 markers. While the configuration of the markers on the motion capture subject is not fixed, there are general guide lines to follow. We will begin by describing the standard marker configuration. The following figures show the standard marker placements

The standard marker set in the FusionCore software sets up rigid bodies between these markers. The rigid bodies help to find the location of markers that are occluded by using the other markers that make up that rigid body. As the term implies, rigid bodies should only be setup between markers whose distances from each other does not change. In Figure 6, the black dots are markers whose positions are known. The gray dot is a markers whose position is unknown. The three markers make up a rigid body as depicted with the red triangle. The rigid body stored the distance between each of the markers. When one of the markers positions is unknown, circles are formulated with centers of the known markers and radius the stored distances to the unknown marker. The position of the unknown marker is then the intersection of the two circles. You will notice, however, that the circles intersect in two locations. As far as we know, the software simply chooses one and therefore could be wrong. To ensure that this does not occur, we can setup rigid bodies between four markers instead of three. This is a little more complex, however, because we must place the markers so that they are planar. In the standard marker set there are three rigid body systems with four markers. When placing the markers on the motion capture subject, make sure that these markers are planar.

Regardless of whether you use the standard marker set or one of your own, the markers should be placed so that they move as little as possible over the body surface. The suit is large, so it may not fit as snugly on the subject as it should. There are velcro strap and various forms of tape¹ to help stablize the markers.

The large suit also means long wires, and the suits' wires can obscure the markers. Therefore, they need to be secured. Where possible, it is best to use the markers

¹DO NOT USE DUCT TAPE ON THE SUIT OR MARKERS. IT WILL LEAVE A RESIDUE.

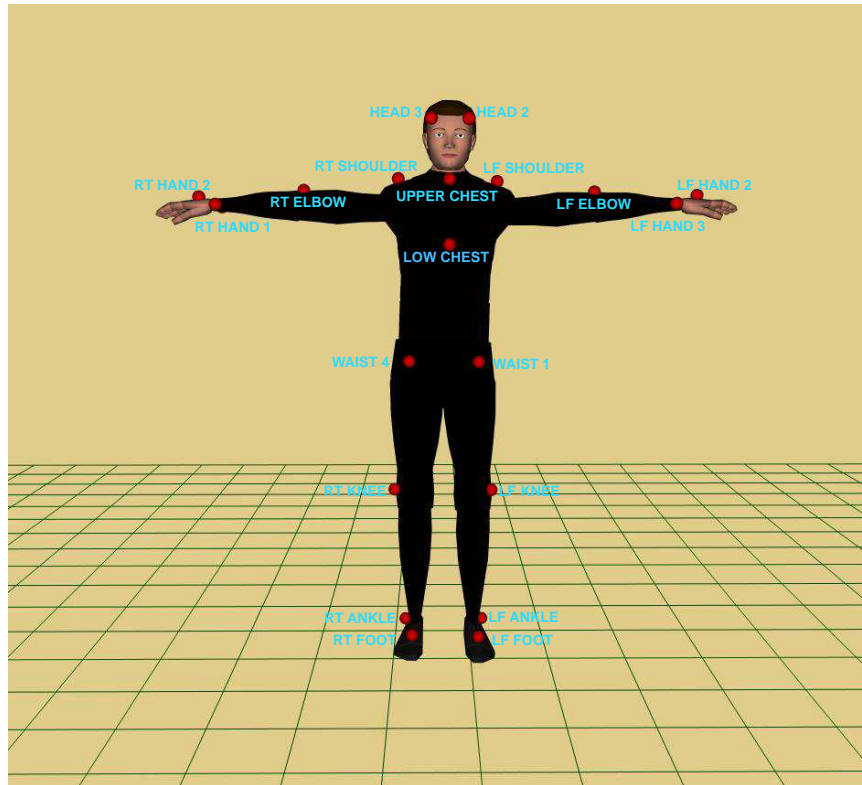


Figure 1: Front View of Marker Placement

themselves to secure the wires. Tuck the wires behind the markers. Where this is not possible use velcro straps or tape.

The waist markers are particularly vulnerable to occlusion by wires. The belt pack and all of the wires of the suit can obscure these markers. Try tucking the wires behind the belt and placing the top part of the sensors on the belt itself.

The best data is received when a marker's signal is received by as many of the sensor bars as possible. When sensors are placed parallel to one of the sensor planes, another sensor plane can not pick up the signal. The top of the feet, the heels, and the shoulders fit this category. If you are having trouble with the data from these markers, trying placing the velcro wedges on the suit and the markers on the wedges, such that they are angled.

2 The Belt Pack

The belt pack is placed around the waist (like a belt) and velcro'd into place. The wires from the markers all have designated locations to be connected with the belt pack. The radio transmitter and batteries are also connected to the belt pack. The batteries

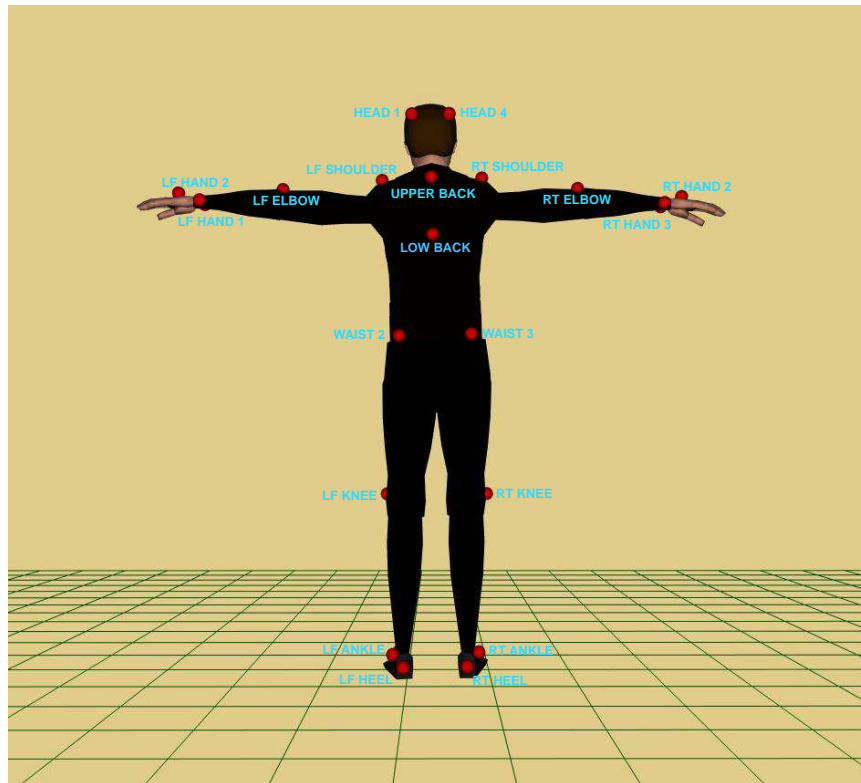


Figure 2: Back View of Marker Placement

connectors are a little difficult to connect, so make sure that they are fully connected. All of the wires are a fragile, so handle them with care.

Once everything has been connected, slide the switch on the belt to the *on* position. The green LED on the belt pack should be lit, the red and green LEDs on the radio pack should be lit, and each marker led should flash.

3 FusionCORE Software

On the ReActor PC, start the FusionCORE software. Go to the *Markers* tab and press *LOAD MARKER SET*. Load the standard marker set. If you are using a set other than the standard set, which assumes the standard placement of the markers, then load or create that set. Go back to the *Capture* tab. Under *Capture Options*, set the *Mode* to *REALTIME*. This is the only mode in which the filter under the *Processing* tab will work. Press the *START CAPTURE* tab and let the subject perform.

It is a good idea to record a few seconds of the subject in the standard T-pose. This will enable you to map the motion to a figure in software like Jack or Filmbox. You can save takes under the *File* menu.



Figure 3: Arm Marker Placement

The data from the ReActor can also be streamed to another application, either in real-time as the capture is occurring, or by loading and playing a previous take. Look at the *Network* tab, and press *OPEN NETWORK*.

4 Troubleshooting

dead batteries? loose connection to batteries to belt pack? real-time capture not on? LEDs lit? correct marker set?

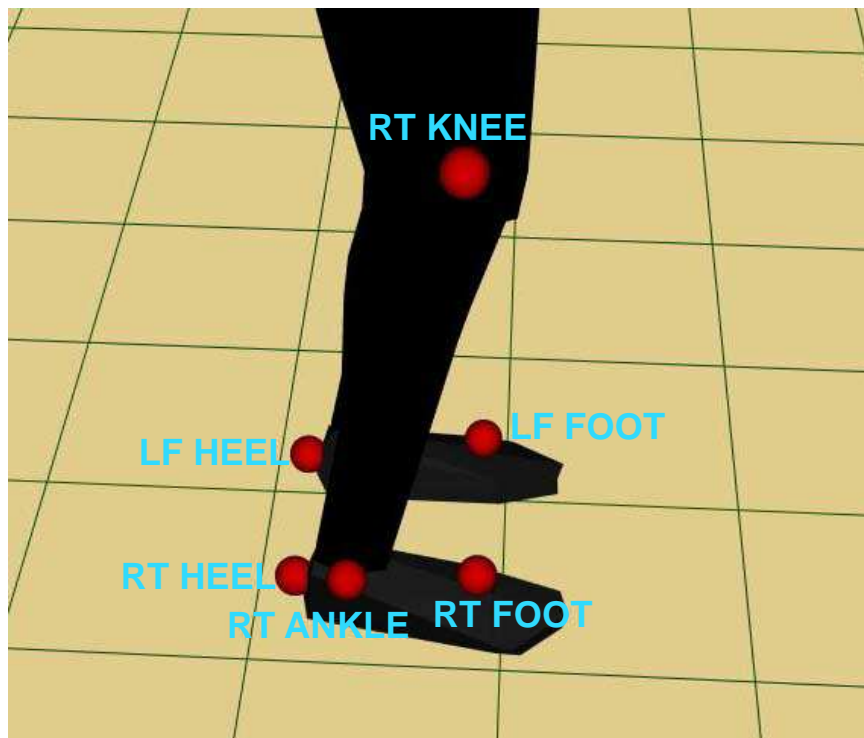


Figure 4: Leg Marker Placement

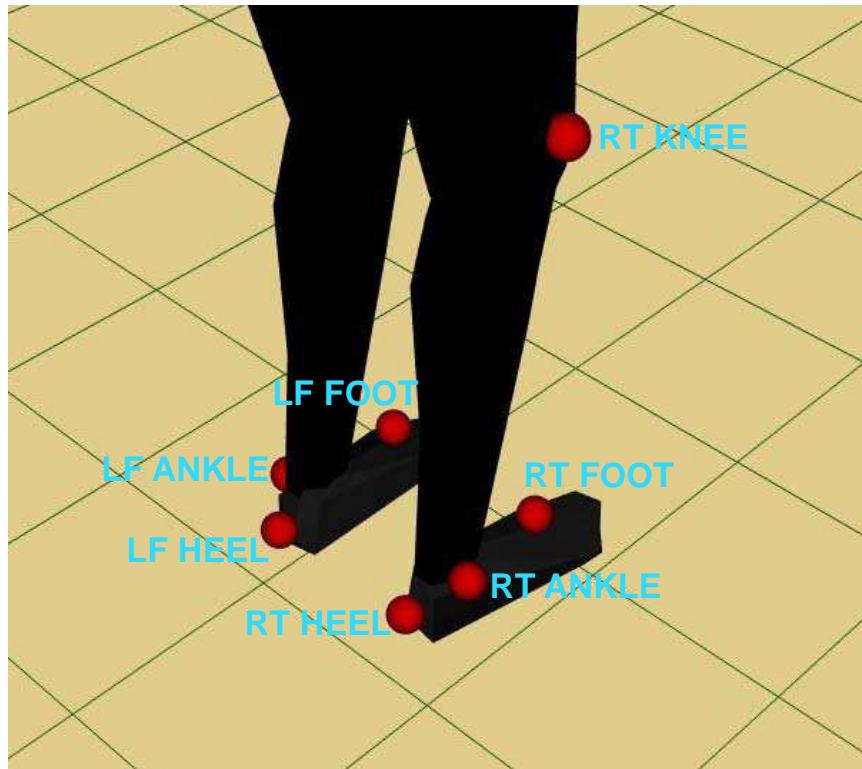


Figure 5: Back View of Leg Marker Placement

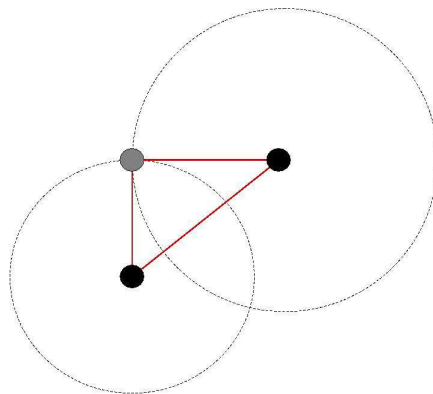


Figure 6: Rigid Bodies

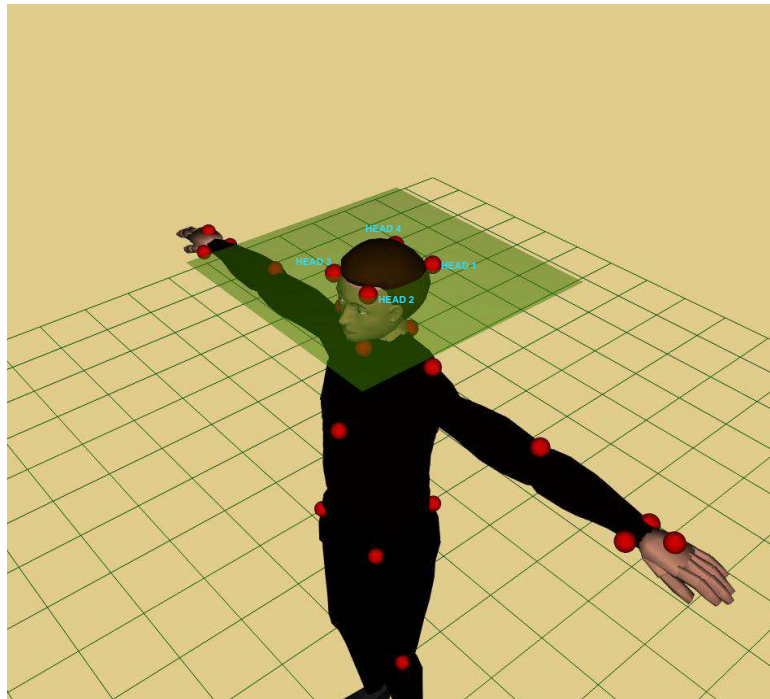


Figure 7: The four head markers should be planar.

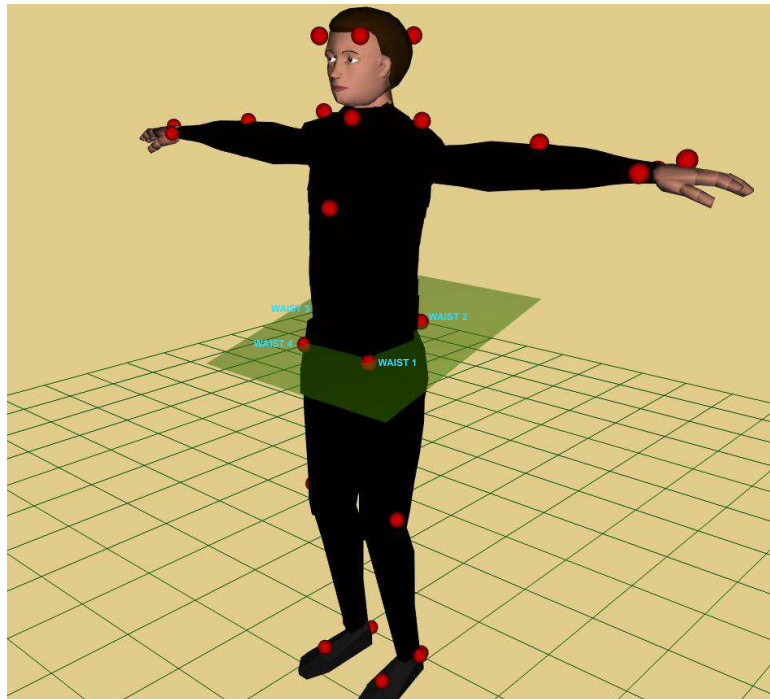


Figure 8: The four waist markers should be planar.

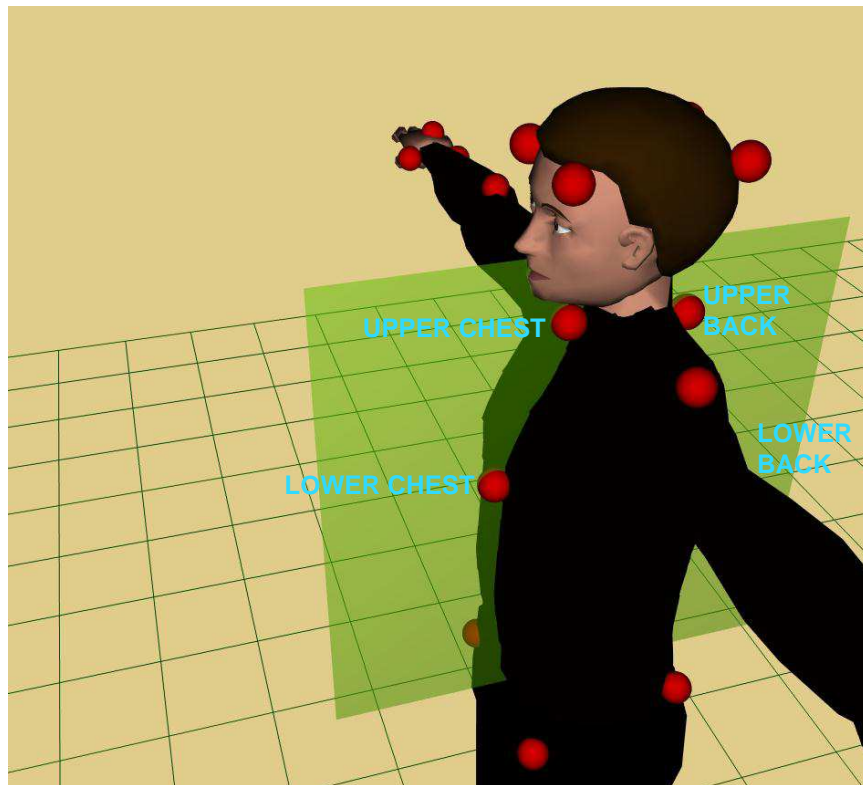


Figure 9: The four torso markers should be planar.