# Eyefollower 2 assembly manual

LC Technologies Inc.

February 28, 2012

## Providing eyegaze with monitor position/orientation data

For accurate eyetracking the Eyegaze system software must know the physical dimensions, position and orientation of the Eyefollower with respect to the eyegaze monitor. The project designer *may* use different monitor sizes and positions for different eyetracking applications, but the monitor parameters must be correctly specified for use by the eyetracking software.

1. To specify the physical dimension fo the monitor width and height, run the EgSettings program, select the Video Hardware tab and set the width and height parameters.

   (If the monitor is a flat panel, the curvature parameters CrvX and CrvY should be set to 0. In the event the monitor has a curved surface such a CRT display, call LC Technologies to determine proper curvature values).

   The monitor offset and rotation parameters are specified in the file

   `C:\Eyegaze\NominalCal.dat`

2. To specify the Eyefollower position with the respect to the monitor, edit the numerical value on the 3 lines labeled **Monitor to Gimbal Offset**. The X,Y,Z offsets are defined as the millimeter distances from center of the monitor's active display are to the *gimbal reference point*. The gimbal reference point is marked by a notchin the gimbal chassis just above the camera window.

   **MonitorToGimbal X offset** (X axis is positive to the user's right). A value of 0.0 implies that the Eyefollower notch is horizontally centered with respect to the center of the monitor's active display. A positive value indicates that the Eyefollower notch is to the user's right of the monitor center. A typical monitor X offset values is 0.0 millimeters.

   **MonitorToGimbal Y offset** (Y axis is positive upward) A value of -150.0 implies that the Eyefollower notch is 150 mm below the vertical center of the monitor display area. The Y offset should be set equal to half the height of the monitor display area, plus the distance from the bottom of the screen display area to the Eyefollower notch.

**MonitorToGimbal Z offset** (Z axis is positive out of the screen toward the user) - The Z offset indicates the longitudinal distance from the screen display surface to the Eyefollower notch. The Z axis is defined to be positive toward the user. Thus, if the Eyefollower notch is in front of the display surface, the Z offset value is positive. A typical value is 13.0 mm.

3. To specify the Eyefollower's mounting orientation with respect to the monitor, edit the numerical values on the 3 lines labeled **Monitor to gimbal rotation**. The monitor-to-gimbal-rotations are defined as the **radian** angles about the X,Y,Z axes from the monitor frame of reference to the gimbal frame of reference. The polarities of all angles are defined with respect to the right hand rule:

   - Eyefollower rotation about X (tilt or pitch) - A value of 0 radians implies that the monitor surface is perpendicular to the top surface of the gimbal box. A negative value means that the monitor plane is tilted backward, away from the user. Typical monitor titl values are between 0.0 and 0.1 radians (0 to 6 degrees)
   - Eyefollower rotation about Y (pan or yaw) - A value of 0 radians implies that the Eyefollower is pointing straight ahead with respect to the monitor. A positive value implies that the Eyefollower is pointing to the user's right of the monitor and a negative value implies that Eyefollower is facing to the user's left of the monitor. The typical monitor pan value (rotation about Y) is 0.0 radians (0.0 degrees).
   - Eyefollower rotation about Z (roll). A value of 0.0 radians implies that the top/bottom lines of the monitor are parallel to the top surface of the gimbal. A positive value indicates that the Eyefollower is rolled to the user's left with respect to the monitor. The typical monitor roll value (rotation about Z) is 0.0 radians.

   Note: There are two sets of rotation and offsets parameters in the NominalCal.dat file, one for the right eye and another for the left. Both sets should have the same values.