

# Rig Setup Procedure

## BackFocus/FrontFocus

## Matching Procedure

### **Requirements:**

- 1) High resolution monitor HD-SDI or DVI (1920x1080) or HD camera view finder with PEAKING control.
- 2) Stereo camera platform (TS2, TS3, etc.) with HD cameras.
- 3) Focus control.
- 4) Zoom control.
- 5) 3D convergence control.
- 6) Stereo Platform Controller (SPC)
- 7) Stereo Image Processor (SIP)
- 8) Zoom or prime lenses.
- 9) Back focus chart (Siemens star or Ptolemy chart) or infinity point in distance with some high contrast detail.

### **General Set Up:**

- 1) Build and cable your 3D camera platform. Be careful to check that all lens motors and drive gears are tightly locked together. To test this, clasp the lens motor body with one hand and the gear in the other. Try to move the gear back and forth on its rotational axis until you feel resistance. Any movement without resistance is play, or gear lash. To avoid adversely affecting the outcome of your LookUp Tables, follow the lens-motor manufacturer instructions to correct any play, and engage the motor to the lens with zero play, but without binding the motor.
- 2) Build a complete system, including your Stereo Image Processor, SPC, and any other engineering. Attach a monitor with a mix output from the SIP.
- 3) Zero all offsets in your SPC (Focus, Zoom, Iris, Vertical and Horizontal correction)
- 4) Select your Rig (from the 3D page of the SPC), set 3D controls to zero and infinity.
- 5) Select your Lens (from the Lens page), and make sure the zoom travel is set to its full travel.
- 6) Check the Rotation on the monitor. If you see a Rotation error, proceed to the Rotation section. If all looks ok, continue to your Back Focus setup.

## **Back Focus Set Up:**

- 1) To view the images one at a time on your monitor, set the SIP to view LEFT eye only or RIGHT eye only. You can also use left eye and right eye output from the cameras.
- 2) Set up a back focus chart of your choice as flat to the photographic plane as possible. It should be set at a very near distance so as to not be too small in the frame on the wide end of the lens but no closer than the minimum focus distance of the lens being back focused.

## **Back Focus Procedure:**

- 1) Set I/A and Convergence to minimum. Place chart parallel with the front of the lens.
- 2) Viewing only one eye/camera on the monitor, frame up the chart in the center of the frame. Lock the camera head.
- 3) Set your IRIS to wide open. Add ND filtration or add shutter if necessary to have a viewable high contrast image.
- 4) Adjust your monitor to a high contrast image by lowering brightness and increasing contrast and peaking if available.
- 5) Zoom in to the maximum focal length of the lens. Adjust your framing if necessary to center your back focus chart. Lock the camera head.
- 6) Focus the lens using the front focus or focus knob while staying zoomed in. Once sharpest focus is achieved, avoid bumping or changing the front focus setting while proceeding on the next steps.
- 7) Zoom out to the widest focal length.
- 8) Loosen the back focus knob or screw at the back of the lens. (Tip: do not loosen the knob too much. Loosen to the point of maintaining drag, or it may slip after you have achieved sharpness and while tightening the knob.)
- 9) While watching your monitor, adjust the back focus ring that you unlocked. Remember you are looking at a very wide view. Only focus on the chart.
- 10) Lock the back focus knob carefully when you are satisfied that you have achieved the sharpest or highest contrast image possible.
- 11) Zoom back in to the tightest image or longest focal length again and re-focus the front focus.
- 12) Zoom back out the widest focal length again and watch to see if focus stays sharp all the way out to the widest focal length. If it is not satisfactory, repeat steps 4 thru 11.
- 13) If you are satisfied move to the other eye/camera.
- 14) Repeat steps 4 thru 11 for the next eye/camera

After back focus procedure is completed, move on the front focus matching procedure.

## **Front Focus Matching Set Up:**

All front focus procedures are done at the long end of the zoom or maximum focal length for critical depth and sharpness.

- 1) Set up focus chart at a close distance. You can use the same chart that was set up for the back focus procedure previously.
- 2) Choose a deep distant high contrast focus target. The further away the better for accuracy.
- 3) Open the SPC to the FOCUS page. Here is where you will set offsets if necessary to match the 2 cameras or eyes.
- 4) Using the SIP VIEW settings choose either left or right or side by side views.

## **Front Focus Matching Procedure:**

- 5) Focus on your deep distant target concentrating on only 1 eye/camera view.
- 6) When you are satisfied that your 1 camera is sharp, check it against the other eye/camera.
- 7) If you notice that the other eye/camera is not sharp, an adjustment will be necessary on the soft eye/camera. Using the SPC FOCUS page, adjust the FAR numbers of the eye/camera that needs correction until a match is achieved. Be aware that backlash may give you a false match. Rack your focus from both sides.
- 8) If focus match is achieved move on to step 8. If not then continue on to next step.
- 9) If a focus match is not possible, then reset the offset numbers back to 0.0
- 10) Front focus the other eye/camera or the soft eye.
- 11) Now going back to the SPC FOCUS page. Adjust the other eye/camera FAR numbers until a focus match is achieved.
- 12) Once a match is achieved on the far target, take the offset number that was generated for the far target and input that number into the CLOSE field of the opposite eye/camera. While it should be a linear offset, sometimes it isn't.
- 13) Focus on the close target. If focus matches on both eyes/cameras then you are done!
- 14) If a focus match adjustment is necessary, the offset number that is already set in the CLOSE field, should be adjusted to achieve a match.
- 15) Close the SPC and return to the home page to save your settings.

## **Correct for Field of View Differences**

- 1) Set your view to full wide and look at the SIP stereo meta-data.
- 2) Adjust your framing to achieve the highest possible SIP confidence
- 3) Turn off the rig.
- 4) Looking at your output in the monitor, judge the mismatch between the images, and physically move the opposite camera's sled (very slightly) to perfectly overlay the views.
- 5) If the mismatch necessitates that you move the left eye sled, double check that you can still converge at maximum without impeding the mirror box.