

# How to Use the Cyberware Laser Scanner

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## ***Part A: Preparation***

1. Switch on the scanner by switching on the three switches: two located at the base and one atop the mirror housing.
2. Seat the subject such that the overhead vertical marker is:
  - a. Slightly above the subject's head
  - b. Centered above the subject when viewed directly in front of the subject
  - c. Aligned with the front of the ears when viewed from the subject's side

Notes:

- Wetting or gelling the subject's hair can improve hair capture.
- Never place objects inside the mirror housing.

## ***Part B: Data Capture***

1. Launch the CyScan application.
2. (Optional) Home the scanner by selecting "Home" under the Scanner menu.
3. Click the Setup button in the bottom left corner of the application window to set the scan settings.
4. Press the Scan button at the bottom of the application window to begin scanning once the subject is properly seated.
5. Review the result of the scan. Use the Ctrl + T hotkey to view the scan with textured surface.
6. Save the scan by selecting "Save" under the File menu. Name the file appropriately. Saving the data in this manner creates two files: an extension-less range data file and a TIF file containing the texture information.

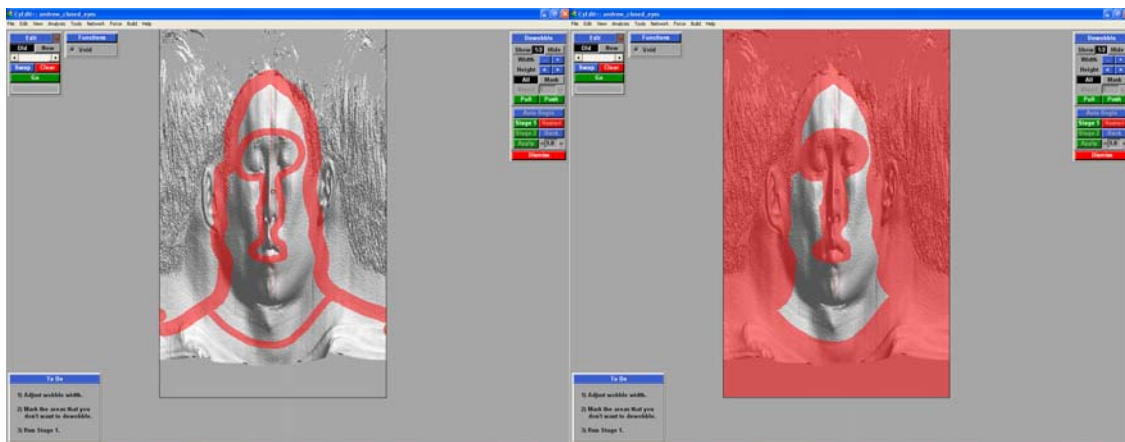
## ***Part C: Data Processing***

1. Load the range data and texture file into the CyEdit+ application using one of the following two methods:
  - a.
    - i. Select both the range data file and its associated texture file in Windows Explorer.
    - ii. Drag and drop both files onto the shortcut icon named "headus 3D tools".

- b.
  - i. Launch the CyEdit+ application.
  - ii. Select “Open Range” under the File menu. The File Range dialog appears.
  - iii. Select the (extension-less) range data file in the file list on the right of the dialog, click the Open button at the bottom at the bottom and then click the Dismiss button to the right of the Open button. The File Range dialog disappears and the File Color dialog appears.
  - iv. Select the (TIF) texture file, click the Open button and then click the Dismiss button. The File Color dialog disappears.

## Dewobble

1. Begin the dewobble procedure by selecting “Dewobble” under the Tools menu.
2. Click the Auto Begin button in the Dewobble toolbar.
3. Adjust the wobble width and height in the Dewobble toolbar if necessary. The default values are typically acceptable.
  - Note: The height is in the z direction.
4. Mark the regions that should not be dewobbled by painting them red with the displayed “paint brush”. Mark the eyes, nose, mouth, ears, hair and shoulder regions.
  - a. Paint by clicking and holding on the left mouse button while moving the mouse.
  - b. Outline a region by beginning and ending a single paint stroke at the same point.
  - c. Fill in an outlined region by double-clicking in the outlined region.
  - d. Undo strokes and fill-ins by using Ctrl + Z.
  - e. Zoom in and out by pressing the z or x keys.

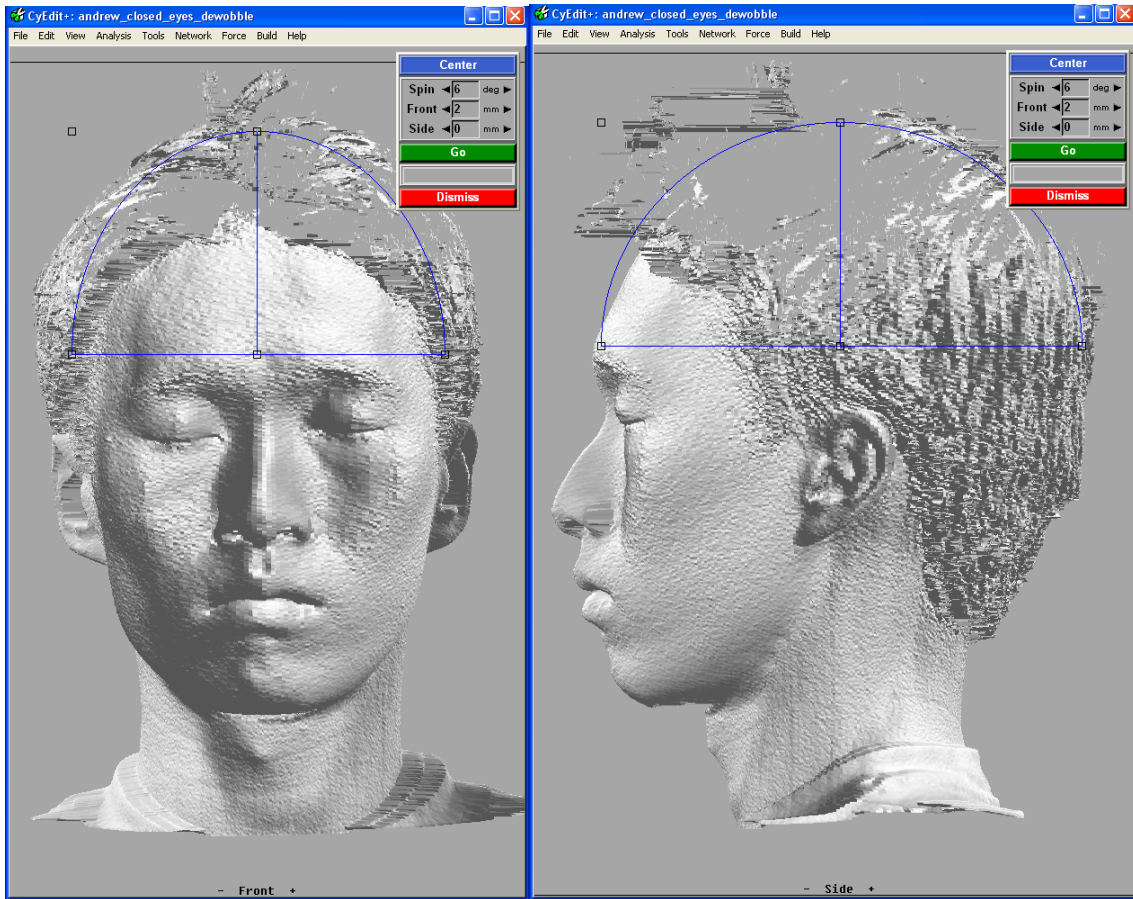


5. Click the Stage 1 button in the Dewobble toolbar to begin the first stage of the procedure.

6. Void the red areas that do not look like wobbles in the screen that follows. This can be done in one of two ways:
  - Click the left mouse button in the Histogram window and use the keyboard arrow keys to remove the painted areas which aren't wobbles.
  - Manually remove the painted areas using the mouse. Ctrl + left mouse button deselects while Ctrl + middle mouse button inverts.
7. Click the Go button in the Edit toolbar.
8. Click the Stage 2 button in the Dewobble toolbar to continue.
9. Click the Apply button in the Dewobble toolbar.
10. Adjust the Apply multiplier (default value is 1.0) to optimize wobble removal. A multiplier value between 1.2 and 1.7 is typically adequate.
11. Save the modified model by selecting "Save Range" under the File menu. The File Range dialog appears.
12. Choose an appropriate location and name for the new range file and then click the Save button. Click the Dismiss button to dismiss the File Range dialog and to bring up the File Color dialog.
13. Choose an appropriate location and name for the new texture file and then click the Save button. Click the Dismiss button to dismiss the File Color dialog and to bring up the View File dialog.
14. Click the Dismiss button to return to the main application window.
15. Click the Dismiss button in the Dewobble toolbar to dismiss all toolbars relevant to the Dewobble procedure.

## **Center**

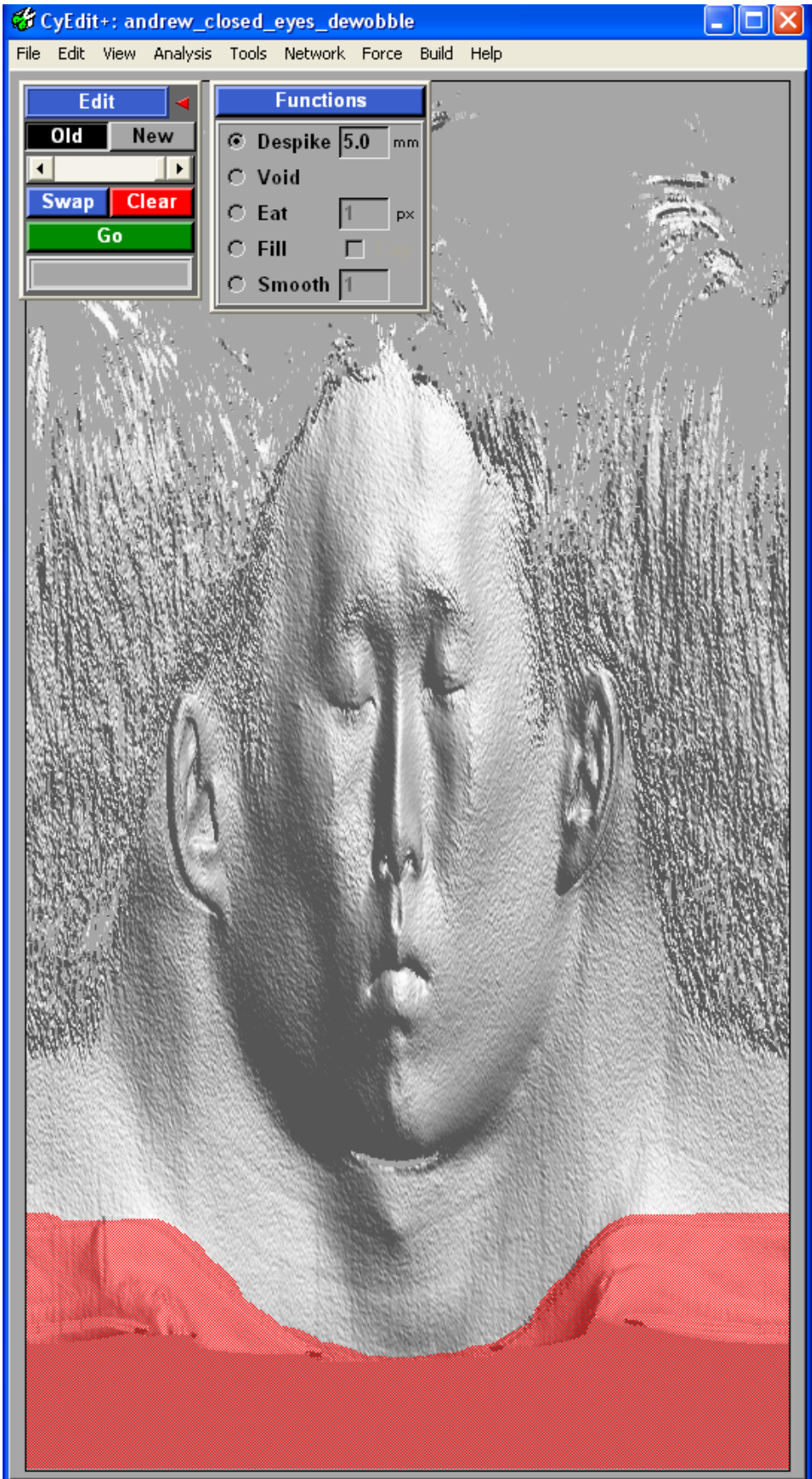
1. Begin the center procedure by selecting "Center" under the Tools menu.
2. Center the front and side vertical lines by adjusting the values in the Center toolbar.
  - Note: For the side visualization, ensure that the center line passes through the ear.
3. Adjust the shape of the blue head contour lines accordingly using Ctrl + middle mouse button to approximate the shape of the subject's head.



4. Click on the Go button in the Center toolbar and then click on the Dismiss button to dismiss the toolbar.

## Range → Void

1. Select “Range” under the Edit menu.
2. Click the Void radio button in the Functions tool bar.
3. Use the paint brush to fill in the area which is to be voided, i.e., removed.
  - Hint: Double-click a region to fully paint it.



4. Click the Go button in the Edit toolbar to void the painted region of the model.
5. Dismiss the Edit and Function toolbars by clicking the red arrow in the top right corner of the Edit toolbar.

## Range → Fill

1. Select “Range” under the Edit menu.
2. Paint the region(s) to be filled.
  - If the Void procedure was performed previously, click the Swap button in the Edit toolbar to swap painted and unpainted regions.
  - Otherwise, paint in the region(s) using manual techniques.



3. Click the Fill radio button in the Functions toolbar and then check the Cap checkbox.
4. Perform the Center procedure (see previous subsection) if not already completed. Make any necessary adjustments to the center lines and shape contour lines.
5. Click the Go button in the Edit toolbar to fill holes in the model using small triangles.
6. Dismiss the Edit and Function toolbars by clicking the red arrow in the top right corner of the Edit toolbar.

## **Range → Smooth**

1. Select “Range” under the Edit menu.
2. Click the Smooth radio button in the Functions toolbar.
3. Use the paint brush to mark the regions that need to be smoothed.
  - Hint: You may use the same region used for the Fill procedure.
4. Adjust the Smooth parameter value in the Functions toolbar if desired.
5. Click the Go button in the Edit toolbar.
6. Dismiss the Edit and Function toolbars by clicking the red arrow in the top right corner of the Edit toolbar.

## **Save Edited Model**

1. Follow steps 11 to 13 (inclusively) in the Dewobble procedure to save the edited range and colour data.
2. Ensure that the .range radio button is selected in the Type dialog.
3. Click the Show button in the View File dialog to view the model in plyview.
  - Hint: Press the s key to apply smooth shading to the model. Press the c key to view the model in colour.
4. Close the plyview window and return to the CyEdit+ application window.
5. Click the Dismiss button in the View File dialog to return to the main application window.
6. Select “Save Ply” under the File menu.
7. Rename the .ply file if necessary and then click the Save button in the File Ply dialog.
8. Click the Dismiss button in the File Ply dialog to return to the main application window.

## ***Part D: Format Conversion (Optional)***

1. Right-click on the .ply file saved at the end of Part C and select “Convert with PlyTool” in the drop-down menu.
2. Click the white arrow beside the Output field to bring up the Mesh Output dialog.

3. Select the radio button of the desired output format.
4. Enter a file name for the output file. It is not necessary to type the file extension.
5. Click the Output button in the Mesh Output dialog.
6. Reduce the Scale parameter value in the PlyTool application window to 0.01.
7. Set the Rotate parameter values to 90, 180 and 0, respectively.
8. Click the Convert button to begin conversion.
9. View the output model in an appropriate viewer to verify its correctness.
10. Adjust parameter values as necessary and reconvert the model if desired