STEREOMICROSCOPE INSPECTION OF POLISHED ALUMINUM COLLECTOR 50684.0. M. C. Rodriguez¹, M. J. Calaway², J. H. Allton³; ¹ Geocontrol Systems- ESCG at NASA/Johnson Space Center, Houston, TX 77058; melissa.rodriguez-1@nasa.gov, ² Jacobs- ESCG at NASA/Johnson Space Center, Houston, TX 77058, ³ NASA/Johnson Space Center, Houston, TX 77058.

Introduction: The Genesis polished aluminum “kidney” collector was damaged during the hard landing of the capsule on September 8, 2004 in the Utah desert. The kidney was introduced into the Genesis (ISO class 4) cleanroom laboratory on November 4, 2004 and stored under nitrogen cover gas. The collector is currently fastened to a highly polished stainless steel plate (Fig.1) for secure handling. Curatorial work at JSC has made successful subdivision and subsequent allocation of samples from the kidney.

Post-flight Characterization of Collector: The pre-flight surface area of the T6061 aluminum alloy collector pre-flight was ~ 245 cm² [1]. In 2004, mosaic imaging was performed on a portion of the polished aluminum slated for early allocation. Subsequently, portions 1, 2, 4, and 5 were removed using a small handsaw (Fig.1). The current effort is to document the remaining surface of the collector. This portion of the collector (50684.0 in Fig. 1) was entirely surveyed for impact craters [2]. No cleaning techniques have been applied to the collector.

Methodology: Challenges in making a mosaic image of the polished aluminum are the great depth of field needed to image a crumpled sheet and the high reflectivity of the substrate. An overview mosaic representation has been constructed using Canvas X with Scientific Imaging software (Fig. 2). Images were acquired using a Leica MZ9.5 stereomicroscope 1.0X lens at 0.63X magnification under oblique lighting.

Future Work: Additional scaled imaging at higher magnification will be done to document individual features.
Fig. 3. Four examples of Utahogenic contamination near collector edges at 0.63X.

Fig. 4. Patterns in extremely fine material coating the polished surface shows evidence of physical movement of fragments during hard landing.

Fig. 5. Examples of microcraters on polished aluminum surface. Image on lower left has not been positively identified.

Fig. 6. Irregularly shaped gouge on aluminum kidney surface.