



SPOTLIGHT ON:
SCAN-BASED
REVERSE ENGINEERING

Intermountain 3D Inc

www.intermountain3d.com

208.391.5570



intermountain3D

SCAN-BASED REVERSE ENGINEERING

- ▶ Scan-based reverse engineering uses a 3D scanner to capture surface data from a physical object and import it into a digital CAD file
- ▶ Surface features and overall object dimensions are highly-accurate. Once complete, reverse engineered scans can be used to augment or alter the original design using CAD software.
- ▶ Generally, reverse engineering is used when no original CAD file exists
- ▶ Scan-based reverse engineering is most effective when the following is true:
 - Part is complex and difficult to physically measure accurately
 - Part design is needed for product development and prototyping purposes
 - Part design is needed for manufacturing processes



REVERSE-ENGINEERING CASE STUDY

- ▶ Stene Aviation offers the most comprehensive line-up of replacement composite fairings for general aviation aircraft
- ▶ Working with AeroLEDs, Stene is introducing wing tips for Cessna aircraft series 150-180 with integrated LED lighting
- ▶ Stene needed to provide AeroLEDs with precise CAD of the end cap so that a custom LED solution could be designed
- ▶ Because of the complex surface curvature of the new wing tips, physically measuring and replicating the shape would have been extremely difficult and likely inaccurate

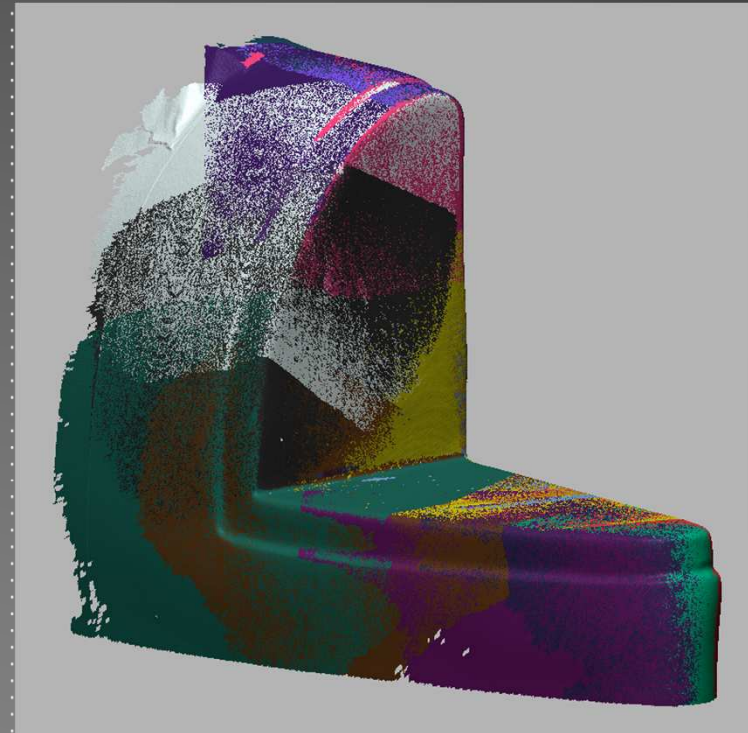


New wing tip design for Cessna 150 thru 210 aircraft



Step 1

- ▶ Scan the end cap of the wing tip using a Geomagic Capture 3D scanner from multiple viewing angles, and then align the point cloud data using Design X software

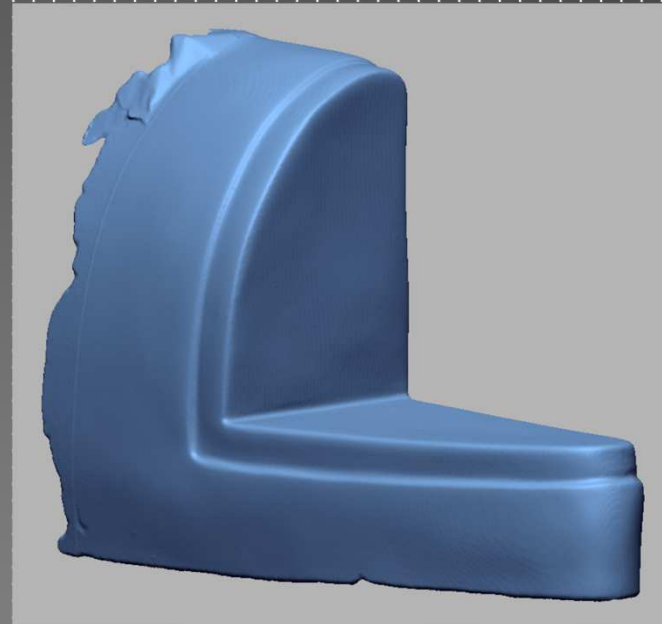


Scan the part with accurate blue light 3D scanner



Step 2

- ▶ Merge the point clouds and build a "best-fit" surface mesh from the all the scan data with Geomagic Design X

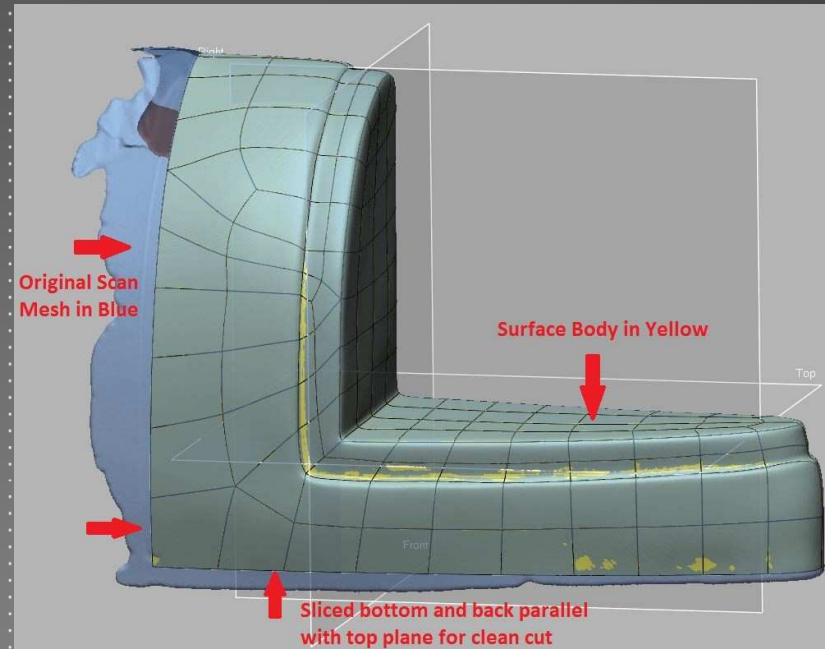


Align and merge data in Design X



Step 3

- ▶ Trim the merged mesh to create clean, square edges and then use Design X "Exact Surfacing" feature to create a highly accurate surface body (a mathematical surface) of the trimmed mesh

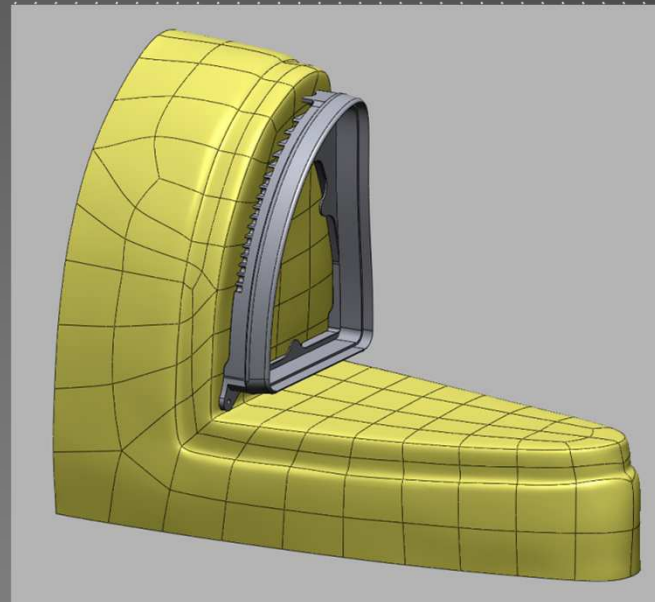


Create surface model in Design X

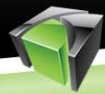


Step 4

- ▶ Export surface body from Design X to CAD software in order to design and integrate the additional features required to complete the LED solution
- ▶ Complete the integration of added features in CAD software, and build parts and assemblies as part of normal CAD design workflow



Convert to 3D CAD and add features



FEATURED COMPANIES

- ▶ Stene Aviation

www.steneaviation.com

470 Regatta Rd # D, Polson, MT 59860

(406) 883-6244

- ▶ AeroLEDs

www.aeroleds.com

8475 W Elisa St, Boise, ID 83709

Phone:(208) 850-3294



ABOUT INTERMOUNTAIN 3D INC

Intermountain 3D was started in 2014 to bring commercial 3D printing and scanning to manufacturers, product designers and entrepreneurs in the pacific northwest.

Engineer to Engineer

When you work with Intermountain 3D, you tap into decades of professional engineering experience, brought to bear on the specific problems and opportunities your project presents. More than just consulting, our engineers work with you to ensure what you envision is actually produced: in CAD drawings, prototypes, production parts, or design-for-manufacturing files.

You know your products; we know 3D design, prototyping and production. Whether you're a one-person shop or 200-people strong, Intermountain 3D is an extension of your team and focused on your success.

Contact us to see how we can help

