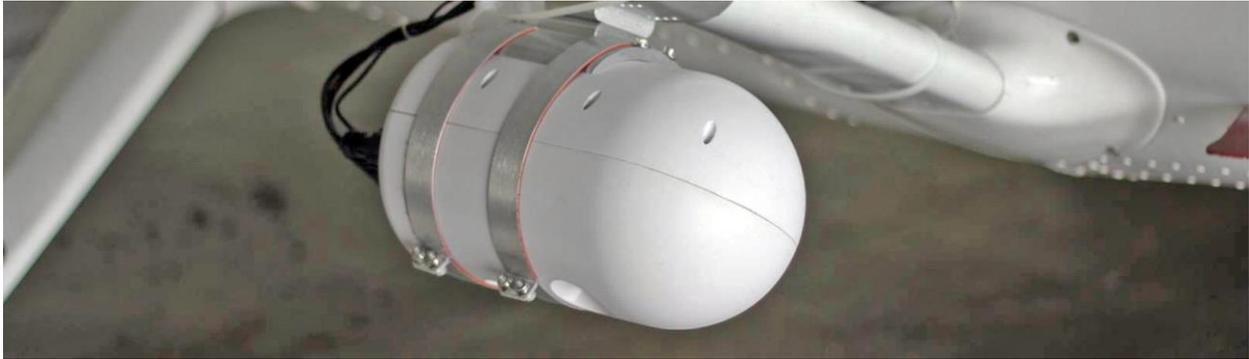


## Non-Metric Aerial Camera Rig - XCAM Pod



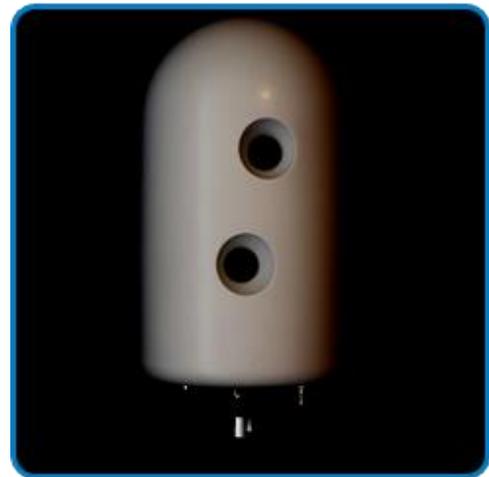
*Mounted XCAM Pod*

CompassData was one of the first U.S. companies to employ a state-of-the-art Aerial Imaging System, the XCAM Pod. It is an accurate, high resolution, and low-cost solution to image acquisition. The intention of the system is to bridge the gap between UAV imagery and aerial large to medium format metric camera systems. The Pod has more range and airspace access than a UAV and less startup costs than a traditional aerial imaging acquisition. It does not require a modified aircraft or dedicated system operator for deployment. This drastically reduces acquisition expenses and promotes mission planning flexibility. Throughout the project lifecycle, the Pod streamlines workflows, enabling a quick turnaround from acquisition to delivery.

CompassData's excitement with the Pod began two years ago at the research and development phase. This provided us with intimate knowledge of the system and its capabilities. We have successfully deployed the system on more than 20 missions in the past year, in environments as varied as dense urban areas to remote mountainous regions. This includes collecting imagery on projects such as airports, transportation networks, oilfields, transmission corridors, surface mines, and golf courses. The Pod has proven to be a reliable and accurate sensor.

The imagery acquired from the Pod produces survey-grade, orthorectified imagery and Digital Elevation Models (DEMs) equal in quality and accuracy to traditional metric camera systems. Ortho imagery and elevation datasets have been used for planimetric extraction, civil engineering, hydrological studies and volumetric calculations. The camera system and software used to process the imagery is cutting edge, while the results and deliverables are industry standard.

The Pod is mounted level to the ground on the wing strut of a Cessna 172 or 182. Within the pod capsule, dual cameras are rigged at opposing angles. In flight this enables the camera system to collect two slightly off nadir images at each trigger position. Images are acquired at 60% forward lap and 70% side lap, during standard grid missions to guarantee adequate overlap for processing. The simplicity of the Flight Control Software (FCS) allows a single pilot to easily navigate a mission by following a heading displayed on a tablet computer mounted in the cockpit. During acquisition, the fully automated hardware and software systems require no manual interaction from the pilot. This removes any distractions typically associated with operating an aerial camera system. The Pod and its FCS are approved by the FAA for commercial-rated pilots.





The Pod can acquire imagery with a Ground Sample Distance (GSD) of 3" (7 cm) to 1' (30 cm), depending on the altitude flown. Most missions are flown at 2,000 to 4,500' above ground level (AGL), producing imagery in the 3-6" GSD range. We have found this to be the best utilization of the camera system's technology yielding high resolution ortho imagery and DEMs. Based on tests of dozens of missions, we have consistently exceeded horizontal/vertical accuracy specifications outlined by ASPRS (2014) Standard Mapping and GIS work requirements. With a comprehensive ground control network and flight plan, all our projects have met or exceeded customer specifications. For example, a 7.24 cm GSD ortho image and DEM of a 3 square mile area resulted in a Root-Mean-Squared Error (RMSE) of 8 cm horizontal and 8.6 cm vertical, measuring 10 independent checkpoints. (Please refer to sample data to review accuracy report)

#### XCAM-B-RGB Specifications

|               |   |
|---------------|---|
| IMAGE SIZE    | 18 MP: 5184 x 3456  |
| FILTER ARRAY  | COLOR (RGB)   |
| LENS          | (2) EF40MM F 2.8 STM  |
| SHUTTER SPEED | FIXED 1/2000, 1/4000  |
| ISO           | 400/800   |
| CALIBRATION   | TERRESTRIAL CALIBRATION WITH FULL REPORT                                      |
| IMU           | YEI TECHNOLOGY 3 IMU  |
| GPS           | NOVATEL OEMSTAR   |
| SOFTWARE      | FLIGHT CONTROL (FCS), MISSION PLANNER, PIX4D PHOTOGRAMMETRIC IMAGE PROCESSING |