



UAV Surveying

CATTERALL & WRIGHT
CONSULTING ENGINEERS



How does it work?

UAV surveying is a digital form of photogrammetry that uses AAT (Automatic Aerial Triangulation) to match individual photos by recognizing common features. Using common photogrammetry practices, the pilot creates a flight plan using ground station software and uploads it to the aircraft while it is still on the ground. The aircraft then receives the flight plan through a Bluetooth connection and travels along its programmed path until it is finished, then the pilot lands the aircraft safely. Quality control is performed in the field using a quick processing option to ensure that all photos are able to be calibrated.

The Infinite Jib Surveyor has an on board GPS, which georeferences the photos to within +/- 1.0m of its correct position. Using a 3 axis gimbal setup, the onboard electronics ensures that photos are always taken parallel to the ground. Then, using RTK GPS, ground control points are measured and matched in the software to obtain a centimeter level accuracy point cloud.

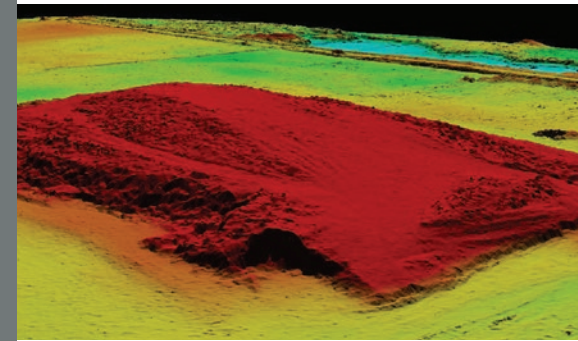
The Infinite Jib comes equipped with a Nikon D5300 24 megapixel camera with several different lens options depending on the size and clarity requirements of the job. A first person view camera is also used to monitor the orientation of the aircraft while in flight and to send live video streams back to the ground station software while performing inspections. The Surveyor 630 can carry a payload of up to 9 lbs, so there are lots of options for cameras and sensors.



Permits & Credentials

Transport Canada has strict regulations and safety requirements that a pilot has to follow when performing a UAV flight. The Infinite Jib Surveyor 630 was deemed a 'safe aircraft' by Transport Canada and has therefore allowed Catterall & Wright to obtain a Standing Special Flight Operations Certificate (SFOC). This allows for most types of flights in the Prairie & Northern Region of Canada (Saskatchewan, Manitoba, Alberta, Yukon, and the Northwest Territories). Our pilots have completed Ground School training and are familiar with Canadian Aviation Regulations (CARS) pertaining to UAV's.

Contact us for more information on whether or not a special permit will be required for your project!



Applications

- Feasibility studies and large scale drainage analysis
- Quantity tracking on complex terrain
- Aerial photography
- Preliminary topographic surveys requiring a high level of detail
- 3D models of buildings and surrounding areas for Architectural planning
- Video/photo inspections of inaccessible areas
- Contour and surface mapping

Outputs

- Aerial and Oblique Photography
- Orthomosaics (think Google Earth) - Georeferenced Aerial Photo
- Coloured Densified Point Clouds
- 3D Mesh and Digital Terrain Models (Bare Earth Model)
- .kml files for Google Earth
- 3D pdf's

Aircraft Specs

- **Flying Height:**
Up to 100 meters above ground level
- **Flying Speed:**
Up to 6 m/s for optimal photo clarity
- **Flight Times:**
25 minutes per flight
- **Payload Capacity:**
4.1 kg (9 lbs)



3D Model Views of a Recreation Facility



Why Use UAV Technology

- **Allows for faster data acquisition**
Can survey a quarter section in 2 hours of flight time.
- **Level of detail is increased greatly**
Buildings are measured with high accuracy, vegetation variations are clearly visible, and measurements are taken every 2 cm's.
- **Accuracy is comparable to GPS**
Accuracy can be as high as +/- 12mm Horizontal, +/- 36mm Vertical
- **Cost effective and non-intrusive**
Downtime during field inspections can be costly. A UAV flight can be performed without disrupting production.
- **Canadian made product**
Turnaround times for maintenance are fast, and technical advice is available in the field.
- **Many different file format possibilities:**

.dxf	.shp	.xml	.las	.kml
.obj	.pdf	.ply	.tiff	.msh



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