

Stewart Surveys

UNMANNED AERIAL VEHICLE (UAV) SURVEYING FOR THE MINING AND RESOURCE INDUSTRIES

Stewart Surveys now has a MAVinci SIRIUS UAV for mapping of large areas producing accurate survey models and high quality photography.



Description

The UAV is a light unmanned aircraft with an on board high resolution camera that can capture overlapping images at about 2cm pixel size and flying at 120 metres or less. The UAV is operated under line of sight by an accredited pilot and CASA approved controller.

The UAV flights are mostly autonomous or automatic while in the air and are continuously monitored by the ground controller who can take manual control and land the plane at any time.

UAVs provide faster data and safer acquisition methods. They produce high resolution aerial photographs and detailed digital elevation models.

Our chief controller holds full CASA accreditation, with a pilot's license, controller's certificate and operation certificate (ARN 816178)

Survey Applications

The system is designed for a wide range of survey modelling and photographic applications for the mining industry including:

- Stockpile Volumes
- Open Cut Pit Surveys including End of Month
- Audit Surveys
- Rehabilitation Modelling & Monitoring
- Environmental Reporting
- Infrastructure Plans
- Accident Site Plans
- Hazardous Site Mapping
- Progress Reporting and Monitoring of Civil Works
- Corridor Surveys of Roads, Pipelines and Power Lines
- Inspections of isolated and dangerous sites

Advantages of using a UAV System

- Site work is carried out faster and more efficiently.
- There is a greatly reduced exposure to risk for surveyors
- Inaccessible and hazardous areas can be surveyed remotely
- Built in fail safe procedures in operation
- Operates in poor weather conditions including cloudy days and winds up to 50kph
- Cost efficient compared to conventional methods.
- Quick turnaround of survey data. Overnight processing.
- No disruption to operations as there is no interaction with vehicles and equipment.
- Battery powered aircraft
- More accurate than conventional piloted aircraft because it flies slower and lower
- UAVs massively reduce the turnaround time and cost of acquiring aerial images and survey data.

UAVs are Safer then Conventional Surveying Methods

- Controlled by a professional UAV operator with built in safety systems



- Surveys conducted remotely
- No need to climb stockpiles
- No need to be near high walls and hazardous areas
- No need for interaction with machinery
- Reduces the risk of incidents

Workflow

- Ground control is set using GPS to place targets with known co-ordinates in selected positions. For sites where flying is going to be an ongoing process this only needs to be done the first time and targets are left on site.
- Flight Planning: A landing and take-off position is selected on site away from mine traffic. The flight planning is carried out using MAVinci Desktop flight planning software. The flight path is uploaded to the SIRIUS UAV.
- Take-off: At the desired take off position the SIRIUS UAV is launched by throwing it into the air by the controller.
- Flight: The SIRIUS UAV will automatically fly the pre defined route by making parallel sweeps taking multiple images with the high resolution on board camera. .
- Landing: When the flight plan is completed the UAV returns to the programmed landing area and the controller lands the plane and downloads the data for processing.
- Postprocessing: Photographs are downloaded and processed through Agisoft software. The software aligns the photographs and reduces the models to produce dtm, point cloud and geo-referenced photo-mosaic.

Outputs & Deliverables

- The Point Cloud is output as an las or txt file format
- A dxf with the tin in Autocad format.
- Geo referenced Ortho-Mosaic photographic (tiff or jpeg)

Calculations

The output data is then ready for upload to CAD, GIS or other software for modelling, mapping and calculations including stockpile and pit volumes, preparation of contour and feature plans..

Services

Stewart Surveys are registered mine surveyors with 25 years experience in the mining industry can provide a comprehensive professional surveying service

