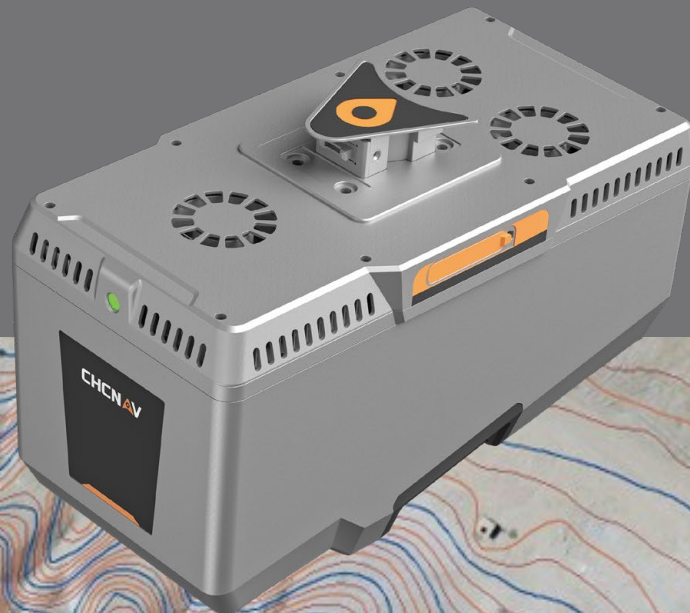


# AlphaAir 15 Pro

Superior Efficiency & Lower Operation  
Cost Aerial Survey Solution

— AA15P on Cessna: 70km Corridor LiDAR Survey in Namibia



## ► Client Introduction

Strydom & Associates Land Surveyors is a professional land surveying company based in Windhoek, Namibia. Established in 1993, the company specializes in cadastral surveying, engineering surveys, topographic mapping, airborne LiDAR, photogrammetry, and large-scale corridor mapping projects.

## ► Pain Points with the Previous Work Model



### Complex Workflow

Low integration results in a cumbersome workflow. This makes the overall workflow more difficult, from mission planning and aircraft setup through to data processing and final deliverables. The team needs to manage different systems, cables, devices, and datasets separately.



### Performance Challenges

In areas of the survey zone with complex terrain, the range limitations of the Lidar prevent the acquisition of complete data or the fulfillment of data requirements in certain areas. Additionally, the camera's pixel resolution and field of view are insufficient to achieve accurate point cloud colourisation, high quality orthophotos, and visually reliable mapping outputs.



### High Cost

The system is quite expensive, with its hardware and software sourced from different manufacturers. Aircraft leasing also incurs significant costs. Multiple bolts, cables, and connections makes on-site work time-consuming, and the numerous potential points of failure can lead to wasted time.

## ► Project Overview

The project involved an aerial LiDAR corridor survey for a proposed pipeline route in the Tumas mining area on the western coast of Namibia. Located south of the existing Bannerman and Langer Heinrich pipelines.

**Length** Approx. 70 km

**Outcome** DEM, Contour (25 cm interval)  
Point clouds

**High point density** Up to 80 pts/m<sup>2</sup>

**Corridor coverage** Approx. 200 m

**Period** 2 days

## ► Overview of Survey Area



# ► CHCNAV Solutions

Item and Advantages	Product and Details
Aircraft platform	Cessna 182
High efficiency at 150 km/h	
LiDAR system	CHCNAV AA15P airborne LiDAR system
Camera / imaging	R10ProS, 100 MP medium format sensor with 50 mm lens
Max range: 3200 m Max PRR: 2400 kHz IMU update rate: 600 Hz Pixels: 100 MP Sensor size: 43.8×32.8 mm Focal length: 50 mm	
Mounting	Wing strut installation using Alpha Mount system
Tool-free quick-release design	
Planning software	BortBiZ-Plan: Flight planning and payload settings
Flight operation software	BortBiZ-NAV: Pilot guidance, LiDAR and camera operation
Meter-level online DEM Estimate survey times Lidar and camera setting and control Pause function to prevent storage unnecessary data Supports changing point frequency during flight Real-time route coverage swaths	
Processing software	CoPre: Pre-processing and quality checks
Further production workflow	CoProcess: Post-processing
CoPre: Coloring Pointclouds, DOM, DSM, 3D model CoProcess: Classification, DEM, Contour, Extraction	

# Workflow with CHCNAV AA15P

## Step1 Flight planning with BortBiZ-Plan



Create the corridor flight lines, set payload parameters, and check how changes in speed, altitude, overlap, pulse rate, reflectance, and point density affect the final mission.

Project details	
Total flight time	02:24 h
Operation time (inc turns)	01:49 min
Number of flightlines	20
Number of Areas	1
Total flightlines length	212 km
Time per turn	02:00 min
On line time	01:11 h
Total turn time	00:30 h
Taxi flight speed	170 km/h
Taxi flight distance	99 km
Taxi flight time	00:35 h
Total images	0

## Step2 Mounting and aircraft setup



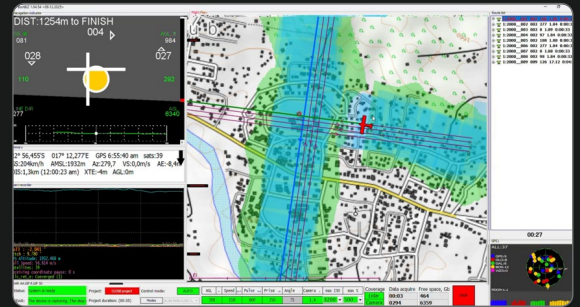
The integrated Alpha Mount system simplified payload installation and reduced setup complexity before flight operations.



## Step3 Flight Operation and Navigation with BortBiZ-NAV



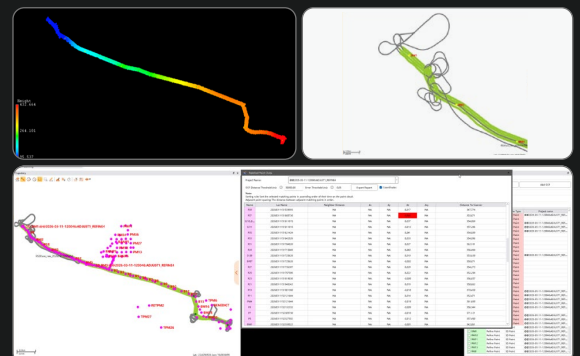
During flight, BortBiZ-NAV provides flight guidance, supports adjusting the Laser pulse repetition rate at any time, enables data acquisition to be paused and resumed, and displays real-time storage levels for LiDAR and camera. This is essential for effective data storage and real-time monitoring of the system's status.



## Step4 Processing with CoPre



CoPre calculates trajectories, creates the point cloud, colours it using the images, writes out the orthophoto, handles strip adjustments, GCP adjustments, and quality checks.

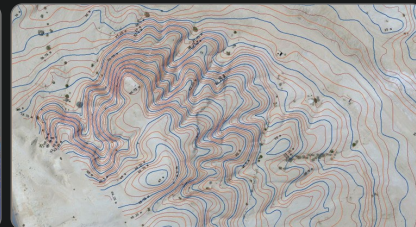
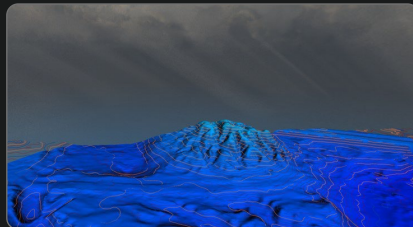
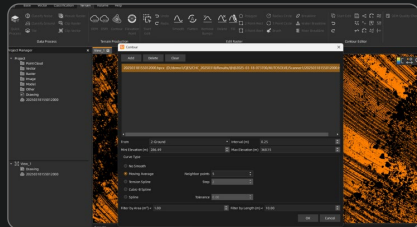


## Step 5

## Final production with CoProcess



Data is exported from CoPre and taken into for classification, DEM generation, and contour production. Final data can be delivered in formats such as LAS, LAZ, and E57.



## Key Achievements and Highlight Data



### High efficiency

70km corridor data was captured, processed, checked, and exported by the end of the following day.



### Faster classification

The clean and dense point cloud allowed classification to be completed in under one day.



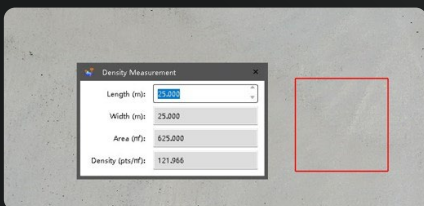
### Clean point cloud

Very little noise and no layer separation was present before applying any noise filters or strip adjustments.



### High density corridor

Approx. 80 pts/m<sup>2</sup> average point density, with high overlap areas close to 150 pts/m<sup>2</sup>



Point density: 121 pts/m<sup>2</sup>



### Accuracy target

We aim for under 5 cm RMSE and was comfortably within this target.

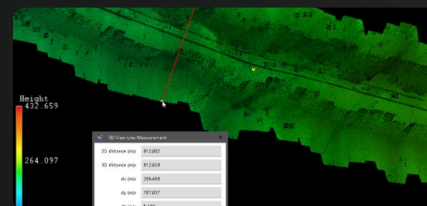
Point Name	Match Name	Horizontal Distance	dX	dY	dZ	RMSE
P10	302601110100893	NA	NA	NA	0.017	NA
P27	302601110100710	NA	NA	NA	0.007	NA
1015_L	302601110101015	NA	NA	NA	0.027	NA
1021	302601110101015	NA	NA	NA	0.012	NA
P15	302601110101214	NA	NA	NA	0.041	NA
P10	302601110104210	NA	NA	NA	0.010	NA
P10	302601110104010	NA	NA	NA	0.027	NA
P10	302601110102610	NA	NA	NA	0.040	NA
1100	302601110102610	NA	NA	NA	0.019	NA
8807	302601110102610	NA	NA	NA	-0.002	NA
8807	302601110102610	NA	NA	NA	0.010	NA
824	302601110102610	NA	NA	NA	0.010	NA

Less than 5 cm accuracy

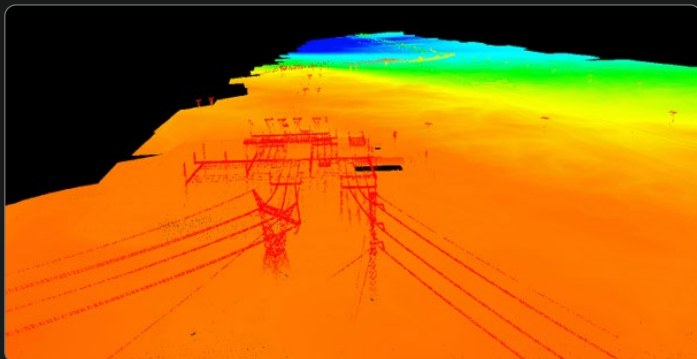


### High coverage

Although the client required a 200 m wide corridor, the final data covered an average corridor width of approximately 800 m



812 meters wide



Power line



Bridge

# ► Previous Workflow vs AA15P Workflow

## Previous workflow



Manual calculations, spreadsheets, and specialist knowledge required.

Speed, altitude, pulse rate, reflectance, and density had to be calculated separately.



Multiple bolts, cables, GNSS antenna, camera hot shoe, and separate power connections.

More manual coordination between pilot and operator.

Data downloaded from three different devices in three different formats.

Once the laser data was processed into LAS, it still required refinement before cleaning and layer separation could be adjusted.

Took long time, on manual classification

## Aspect



Mission Plan and Optimisation



Fieldwork and Flight Operation



Data Processing and Classification

## CHCNAV AA15P workflow



BortBiZ-Plan: Faster planning and easier mission optimisation.

BortBiZ-Plan: shows the effect of changes clearly, allowing the team to tune each mission, easier to visualise, explain, adjust.








Alpha Mount: Simpler mounting process with fewer connection points.

BortBiZ-NAV: Guides pilot and controls LiDAR and camera capture.

CoPre's data copy tool automatically collects LiDAR, trajectory, and camera data, while also providing centimetre accurate photo centre positions.

After the laser data is processed into LAS, very little noise remains and it can already be compared to GCPs.

Automatic, accurate, efficient

Previous workflow	Aspect	CHCNAV AA15P workflow
<ul style="list-style-type: none"> <li>• 1800 m Range</li> <li>• 2000 kHz PRR</li> <li>• 200 Hz IMU update rate</li> <li>• Lack of flexibility</li> </ul>	 <p>Performance</p>	<ul style="list-style-type: none"> <li>• 3200 m Range</li> <li>• 2400 kHz PRR</li> <li>• 600 Hz IMU update rate</li> <li>• Flexibility camera option, multi-platform usage.</li> </ul>
 <p>Limited interactivity. Hardware, software, and accessories, involving multiple third parties</p> <p>Communicating remotely or figuring it out on your own</p>	 <p>Customization, Support and Implementation</p>	 <p>A More Complete Workflow_From hardware to software</p> <p>CHCNAV provides on-site support and training to ensure the final solution fit the company's field</p>
<p>Previous workflow</p> <p>Cost</p> <p>Performance and Benefits</p> <p>Previous workflow has remained high cost</p>	 <p>Cost-effective</p>	<p>Previous workflow</p> <p>CHCNAV AA15P workflow</p> <p>Cost</p> <p>Performance and Benefits</p> <p>AA15P delivered the higher performance and workflow benefits without the excessive cost</p>

## ▶ Customer Feedback



### # Why choose the CHCNAV AA15P solution



The decision to choose the CHCNAV AA15P was based on the complete workflow solution, not only the scanner itself. Strydom & Associates needed an airborne LiDAR system that could improve capture efficiency, simplify field operations, provide high-quality imagery, increase range, reduce processing time, and deliver reliable final outputs. However, CHCNAV has achieved exactly that by offering a simpler, more comprehensive workflow that spans both hardware and software. Furthermore, the AA15P features improved range and acquisition capabilities, with a 3,200-meter range and 2.4 MHz PRR. These enhanced capabilities provide teams with greater flexibility when planning aerial surveys and help mitigate the limitations posed by complex terrain. [lamber\\_yang@chcnav.com](mailto:lamber_yang@chcnav.com)

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