Camera Geometric Verification Certificate

No: DMC III 27550

For

Peregrine Aerial Survey

#201 2555 Townline Road
Abbotsford, British Columbia V2T 6E1

Canada

DMC III 27550 Geometric
Verification

Camera:	DMC III 27550
Manufacturer:	Leica Geosystems Technologies, D-73430 Aalen, Germany
Reference:	PAN
Serial Number:	00126502 (PAN Head)
Date of Calibration:	06 July 2018
Date of Report:	01 June 2022
Number of Pages:	5

This camera system is certified by Leica Geosystems Technologies and is fully functional within its specifications and tolerances.

Date of Calibration: November 2011 Date of Certification: June 2022

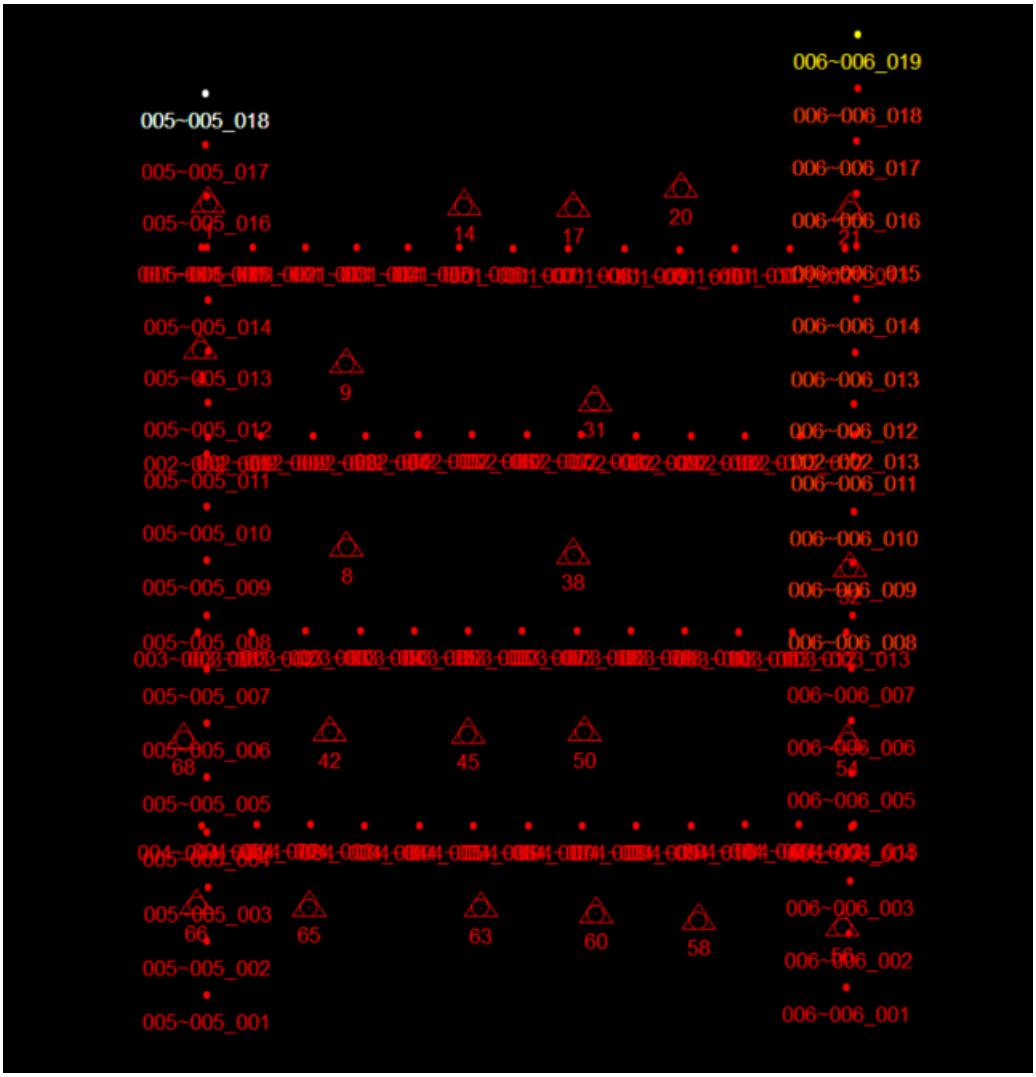
Dipl.Ing. Christian Müller, Product Manager Michael Reading, Customer Support Consultant

Camera Serial Numbers and Burn-In flight

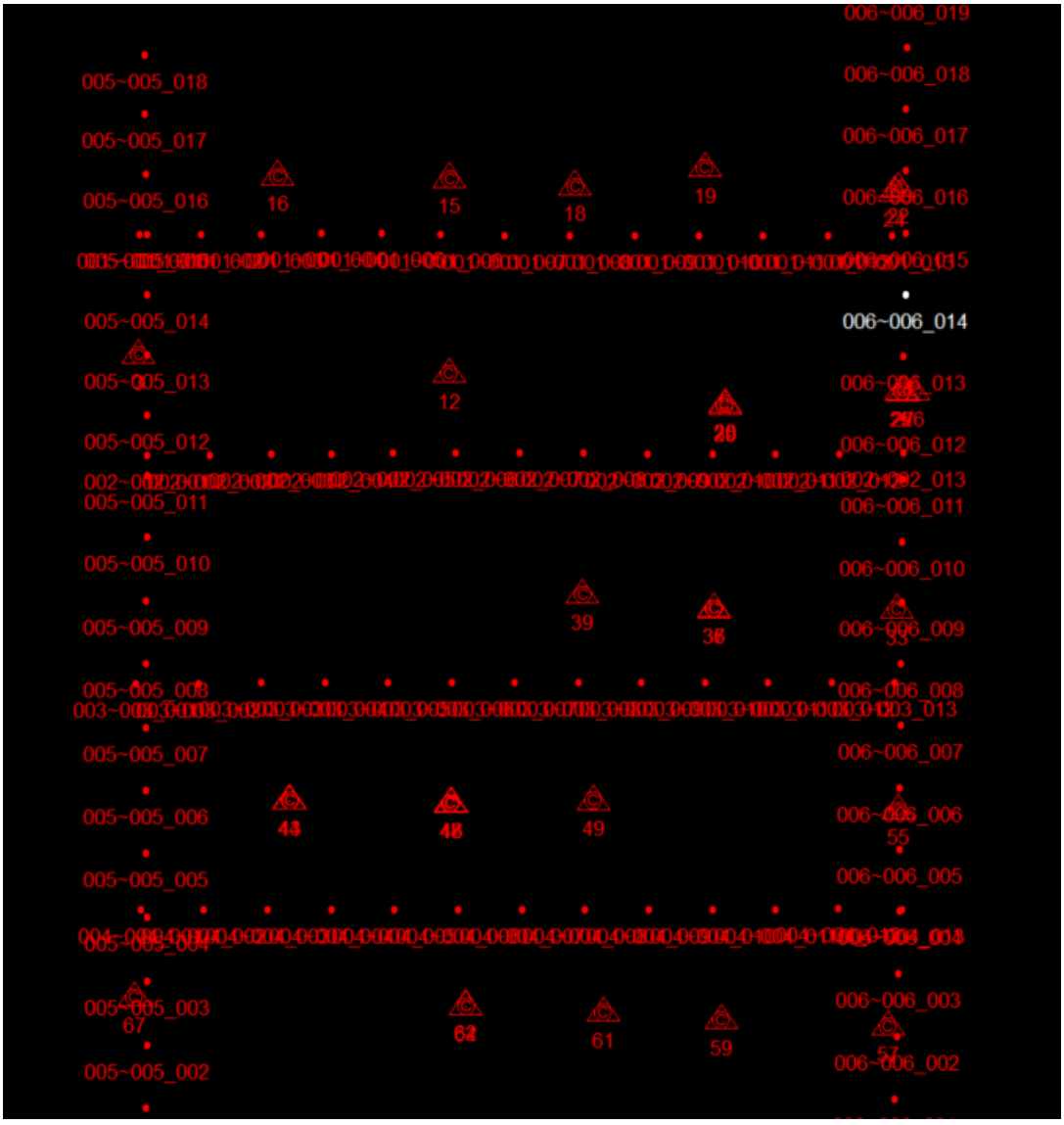
Camera Head	Serial Number	Calib. Date
PAN (reference)	00126502	06.07.2018
MS1 (NIR)	00128786	06.07.2018
MS2 (Blue)	00128804	06.07.2018
MS3 (Red)	00127981	06.07.2018
MS4 (Green)	00128807	06.07.2018

Verification flight performed: 22 May 2022

Flight parameters of 5 cm Verification Flight – Control Points



Flight parameters of 5 cm Verification Flight – Check Points



Parameter	Validation Flight
GSD (cm)	5
End-lap (%)	70
Side-Lap (%)	40
Number of Exposures	89
Number of Flight Lines	4
Number of Cross Flight Lines	2
Number of Control Points	22
Number of Check Points	32
GNSS / INS	Yes

Application

Parameter	Validation Flight
Weighting for manual measured image points (um)	3.0
Weighting for automatic measured image points (um)	3.0
Weighting for Control Points (m)	0.100 / 0.100 / 0.100
Weighting for GPS (m)	0.100 / 0.100 / 0.100
Weighting for INS (deg)	0.010 / 0.010 / 0.020
Modeling of GPS systematic residuals	YES
Bore Sight Alignment (YES/NO)	YES
Camera Self Calibration (YES/NO)	NO

Statistics –Bundle Block Adjustment

Parameter	Validation Flight
Sigma0 [µm]	0.76207
Mean Std Dev Photo Position [m]	0.01866 / 0.01802 / 0.01045
Mean Std Dev Photo Attitude [deg]	0.00076 / 0.00092 / 0.00044
Mean Std Dev Control Points [m]	0.00989 / 0.00974 / 0.02548
Mean Std Dev Check Points [m]	0.03824 / 0.03816 / 0.03892
RMS Photo Position [m]	0.01906 / 0.02755 / 0.01460
RMS Photo Attitude [deg]	0.001906 / 0.00099 / 0.00151

Statistics – Results From Independent Reference Measurements

Parameter	Validation Flight
RMS of Control Points – horizontal [m]	0.03061 / 0.02730
Max Ground Residual of Control Points – horizontal [m]	0.06182 / 0.06661
RMS of Control Points – vertical [m]	0.03317
Max Ground Residual of Control Points – vertical [m]	0.07211
RMS of Check Points – horizontal [m]	0.03765 / 0.03906
Max Ground Residual of Check Points – horizontal [m]	0.08671 / 0.09072
RMS of Check Points – vertical [m]	0.03839
Max Ground Residual of Check Points – vertical [m]	0.15706

The results of the aerial triangulation were generated with ImageStation Automatic Triangulation (ISAT), 2022, Version 16.7.0, Build 573 from Hexagon Geospatial.

Aerial Triangulation performed by _____ 06.01.2022
Michael Reading Date