REGION 11

Cagayan Flood Plain: DREAM LiDAR Data Acquistion

and Processing Report



TRAINING CENTER FOR APPLIED GEODESY AND PHOTOGRAMMETRY

2015





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Abbreviations

ALTM	Airborne Laser Terrain Mapper
DAC	Data Acquisition Component
DEM	Digital Elevation Model
DSM	Digital Surface Model
DTM	Digital Terrain Model
DVC	Data Validation Component
FOV	Field of View
FTP	File Transfer Protocol
GPS	Global Positioning System
GNSS	Global Navigation Satellite System
POS	Position Orientation System
PRF	Pulse Repetition Frequency
NAMRIA	National Mapping and Resource Information Authority







1.1 About the DREAM Program

The UP Training Center for Applied Geodesy and Photogrammetry (UP TCAGP) conducts a research program entitled "Nationwide Disaster Risk and Exposure Assessment for Mitigation (DREAM) Program" funded by the Department of Science and Technology (DOST) Grants-in-Aid Program. The DREAM Program aims to produce detailed, up-to-date, national elevation dataset for 3D flood and hazard mapping to address disaster risk reduction and mitigation in the country.

The DREAM Program consists of four components that operationalize the various stages of implementation. The Data Acquisition Component (DAC) conducts aerial surveys to collect Light Detecting and Ranging (LiDAR) data and aerial images in major river basins and priority areas. The Data Validation Component (DVC) implements ground surveys to validate acquired LiDAR data, along with bathymetric measurements to gather river discharge data. The Data Processing Component (DPC) processes and compiles all data generated by the DAC and DVC. Finally, the Flood Modeling Component (FMC) utilizes compiled data for flood modeling and simulation.

Overall, the target output is a national elevation dataset suitable for 1:5000 scale mapping, with 50 centimeter horizontal and vertical accuracies. These accuracies are achieved through the use of state-of-the-art airborne Light Detection and Ranging (LiDAR) technology and appended with Synthetic-aperture radar (SAR) in some areas. It collects point cloud data at a rate of 100,000 to 500,000 points per second, and is capable of collecting elevation data at a rate of 300 to 400 square kilometers per day, per sensor.

1.2 Objectives and Target Outputs

The program aims to achieve the following objectives:

a) To acquire a national elevation and resource dataset at sufficient resolution to produce information necessary to support the different phases of disaster management;

b) To operationalize the development of flood hazard models that would produce updated and detailed flood hazard maps for the major river systems in the country;

c) To develop the capacity to process, produce and analyze various proven and potential thematic map layers from the 3D data useful for government agencies;

d) To transfer product development technologies to government agencies with geospatial information requirements, and;

e) To generate the following outputs:

- 1) flood hazard map
- 2) digital surface model
- 3) digital terrain model and
- 4) orthophotograph



1.3 General Methodological Framework

The methodology employed to accomplish the project's expected outputs are subdivided into four (4) major components, as shown in Figure 1. Each component is described in detail in the following sections.

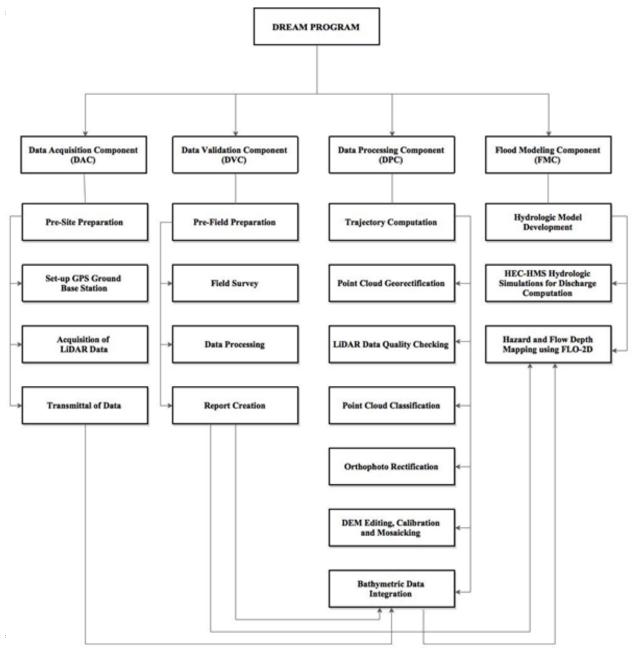


Figure 1. The General Methodological Framework of the Program







Study Area

The Cagayan River Basin is located in the north eastern part of Luzon. The Cagayan River Basin is considered as the largest river catchment in the Philippines with an area of 25,649 square kilometres. The location of Cagayan River Basin is as shown in Figure 2.

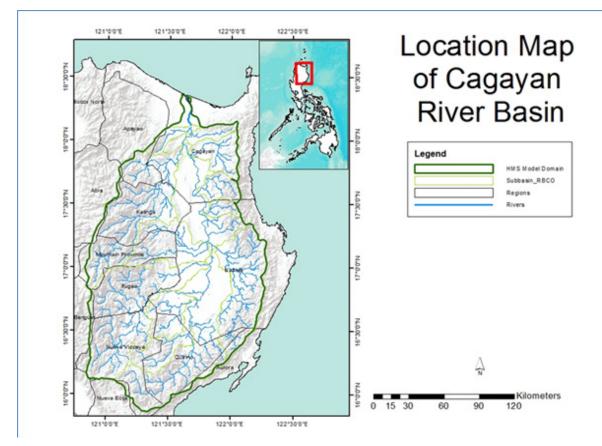


Figure 2. Cagayan River Basin Location Map

It is characterized by a valley oriented north to south. The valley is bounded on the east by the Sierra Madre Mountains, on the west by the Cordillera Mountains, on the south by the Caraballo Mountains, and on the north by the coastline of the Babuyan Channel. The basin covers the provinces Quirino, Nueva Vizcaya, Ifugao, Mountain Province, Kalinga, Apayao, Isabela, and Cagayan.

It drains the northern portion of the island and traverses through Tuguegarao City and Cauayan City and the towns of Natipunan and Maddela in Quirino; San Mateo in Ifugao; San Agustin, Jones, Echague, Angadanan, Naguilian, San Mariano, Gamu, Benito Soliven and Ilagan, Tumauini, Santo, Tomas, Cabagan, Santa Maria and San Pablo in Isabela; and, Enrile, Solana, Iguig, Samulung, Alcala, Santo Niño, Gattaran, Lasam, Lal-lo, Camalaniugan and Aparri in Cagayan.

The average annual rainfall ranges from 1,000 millimeters in the northern part up to 3,000 millimeters in the southern mountains. Floods caused by the Cagayan River flow slowly because of surface retention over the floodplain. Cagayan Valley is relatively flat and basin coverage has a gentle slope. Also, there are retardations of flooding due to several river meanders and gorges.



Study Area

The land and soil characteristics are important parameters used in assigning the roughness coefficient for different areas within the river basin. The roughness coefficient, also called Manning's coefficient, represents the variable flow of water in different land covers (i.e. rougher, restricted flow within vegetated areas, smoother flow within channels and fluvial environments).

The shape files of the soil and land cover were taken from the Bureau of Soils, which is under the Department of Environment and Natural Resources Management, and National Mapping and Resource Information Authority (NAMRIA). The soil and land cover of the Cagayan River Basin are shown in Figure 3 and Figure 4, respectively.

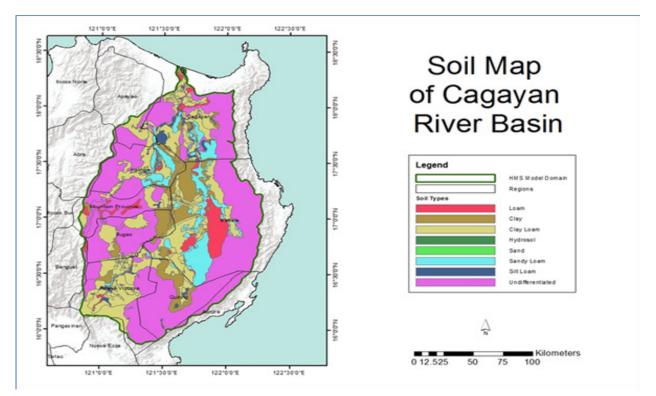


Figure 3. Cagayan River Basin Soil Map



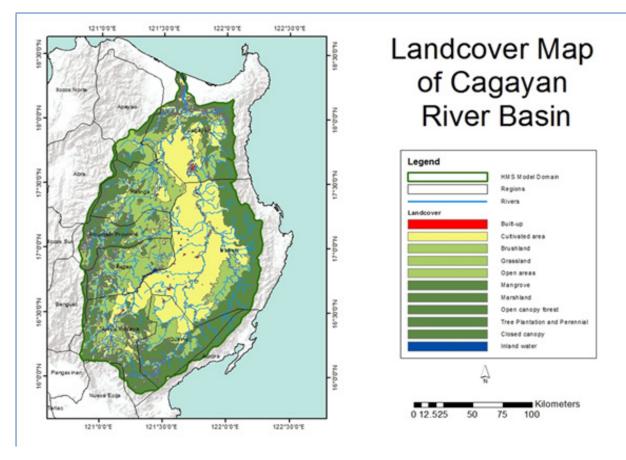


Figure 4. Cagayan River Basin Land Cover Map







3.1 Acquisition Methodology

The methodology employed to accomplish the project's expected outputs are subdivided into four (4) major components, as shown in Figure 5. Each component is described in detail in the following sections.

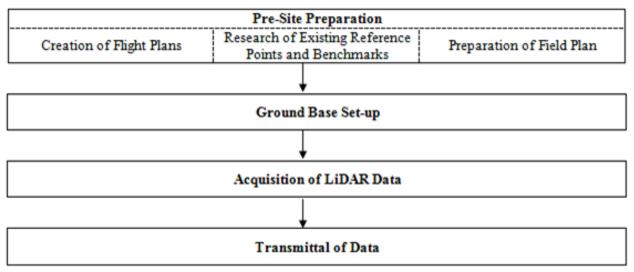


Figure 5. Flowchart of Project Methodology

3.1.1 Pre-site Preparations

3.1.1.1 Creation of Flight Plans

Flight planning is the process of configuring the parameters of the aircraft and LiDAR technology (i.e., altitude, angular field of view (FOV)), speed of the aircraft, scans frequency and pulse repetition frequency) to achieve a target of two points per square meter point density for the floodplain. This ensures that areas of the floodplain that are most susceptible to floods will be covered. LiDAR parameters and their computations are shown in Table 1.

The parameters set in the LiDAR sensor to optimize the area coverage following the objectives of the project and to ensure the aircraft's safe return to the airport (base of operations) are shown in Table 1. Each flight acquisition is designed for four operational hours. The maximum flying hours for Cessna 206H is five hours.



Table 1. Relevant LiDAR parameters

Parameter		Formula	Description	
SW (Swath Width)		SW = 2 * H * tan (θ/2)	Η – altitude Θ – angular FOV	
Pointing	ΔXacross	ΔXacross = (Θ * H) / (Ncos2(Θ/2))	ΔXacross – point spacing across the flight line H – altitude Θ – angular FOV N – number of points in one scanning line	
Space	ΔXalong	ΔXalong = v / fsc	ΔXalong- point spacing along the flight line v – forward speed (m/s) fsc – scanning rate or scan fre- quency	
Point density, dmin		dmin = 1 / (ΔXacross * ΔXalong)	ΔXacross, ΔXalong point spacings	
Flight line separa- tion, e		e = SW * (1 – overlapping fac- tor)	SW – swath width	
# of flight lines, n		n = w / [(1 – overlap) * SW]	w-width of the map that will be produce in meters. The direction of flights will be perpendicular to the width.	

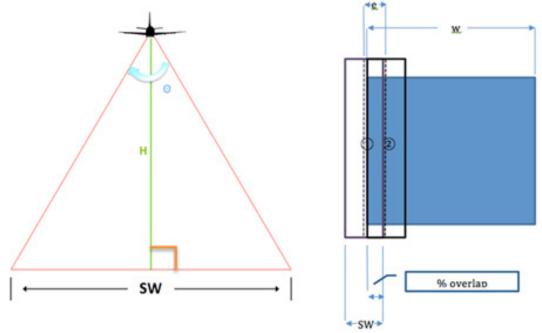


Figure 6. Concept of LiDAR data acquisition parameters



The relationship among altitude, swath, and FOV is show in Figure 6. Given the altitude of the survey (H) and the angular FOV, the survey coverage for each pass (swath) can be calculated by doubling the product of altitude and tangent of half the field of view.

3.1.1.2 Collection of Existing Reference Points and Benchmarks

Collection of pertinent technical data, available information, and coordination with the National Mapping and Resource Information Authority (NAMRIA) is conducted prior to the surveys. Reference data collected includes locations and descriptions of horizontal and vertical control (elevation benchmarks) points within or near the project area. These control points are used as base stations for the aerial survey operations. Base stations are observed simultaneously with the acquisition flights.

3.1.1.3 Preparation of Field Plan

In preparation for the field reconnaissance and actual LiDAR data acquisition, a field plan is prepared by the implementation team. The field plan serves as a guide for the actual fieldwork and included personnel, logistical, financial, and technical details. Three major factors are included in field plan preparation: priority areas for the major river basin system; budget; and accommodation and vehicle rental.

LiDAR data are acquired for the floodplain area of the river system as per order of priority based on history of flooding, loss of lives, and damages of property. The order of priority in which LiDAR data surveys are conducted by the team for the floodplain areas of the 18 major river systems and 3 additional systems is shown in Table 2.



	Target River System	Location	Area of the River Sys- tem (km ²)	Area of the Flood Plain (km ²)	Area of the Watershed (km ²)
1	Cagayan de Oro	Mindanao	1,364	25	1,338.51
1.1	Iponan	Mindanao	438	33	404.65
2	Mandulog	Mindanao	714	7	707.41
2.1	Iligan	Mindanao	153	7	146.38
2.2	Agus	Mindanao	1,918	16	1,901.60
3	Pampanga	Luzon	11,160	4458	6702
4	Agno	Luzon	6,220	1725	4495
5	Bicol	Luzon	3,173	585	2,587.79
6	Panay	Visayas	2,442	619	1823
7	Jalaur	Visayas	2,105	713	1,392
8	Ilog Hilbangan	Visayas	2,146	179	1967
9	Magasawang Tubig	Luzon	1,960	483	1,477.08
10	Agusan	Mindanao	11,814	262	11,551.62
11	Tagoloan	Mindanao	1,753	30	1,722.90
12	Davao	Mindanao	1,609	54	1555
13	Tagum	Mindanao	2,504	595	1,909.23
14	Buayan	Mindanao	1,589	201	1,388.21
15	Mindanao	Mindanao	20,963	405	20,557.53
16	Lucena	Luzon	238	49	189.31
17	Cagayan	Luzon	1,029	90	938.61
18	Boracay	Visayas	43.34	43.34	N/A
19	Cagayan	Luzon	28,221	10386	17,835.14

3.1.2 Ground Base Set-up

A reconnaissance is conducted one day before the actual LiDAR survey for purposes of recovering control point monuments on the ground and site visits of the survey area set in the flight plan for the floodplain. Coordination meetings with the Airport Manager, regional DOST office, local government units and other concerned line government agencies are also held.

Ground base stations are established within 30-kilometer radius of the corresponding survey area in the flight plan. This enables the system to establish its position in three-dimensional (3D) space so that the acquired topographic data will have an accurate 3D position since the survey required simultaneous observation with a base station on the ground using terrestrial Global Navigation Satellite System (GNSS) receivers.

3.1.3 Acquisition of Digital Elevation Data (LiDAR Survey)

Acquisition of LiDAR data is done by following the flight plans. The survey uses a LiDAR instrument mounted on the aircraft with its sensor positioned through a specially modified peep hole on the belly of the aircraft. The pilots are guided by the flight guidance software which uses the data out of the flight planning program with a mini-display at the pilot's cockpit showing the aircraft's real-time position relative to the current survey flight line. The reference points established by NAMRIA are also monitored and used to calibrate the data.

As the system collected LiDAR data, ranges and intensities are recorded on hard drives dedicated to the system while the images are stored on the camera hard drive. Position Orientation System (POS) data is recorded on the POS computer inside the control rack. It can only be accessed and downloaded via file transfer protocol (ftp) to the laptop computer. GPS observations were downloaded each day for efficient data management.

3.1.4 Transmittal of Acquired LiDAR Data

All data surrendered are monitored, inspected and re-checked by securing a data transfer checklist signed by the downloader (Data Acquisition Component) and the receiver (Data Processing Component). The data transfer checklist shall include the following: date of survey, mission name, flight number, disk size of the necessary data (LAS, LOGS, POS, Images, Mission Log File, Range, Digitizer and the Base Station), and the data directory within the server. Figure 7 shows the arrangement of folders inside the data server.



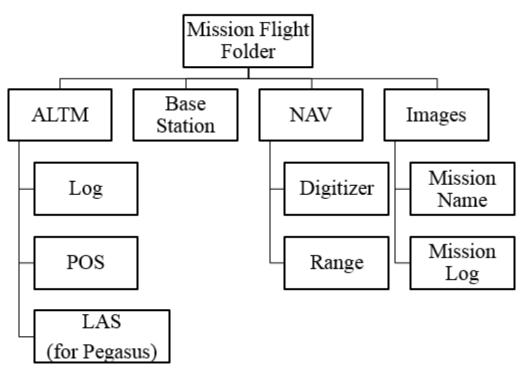


Figure 7. LiDAR Data Management for transmittal

3.1.5 Equipment (ALTM Pegasus and ALTM Gemini)

The ALTM Pegasus (Optech, Inc) is a laser based system suitable for topographic survey (Figure 8). It has a dual output laser system for maximum density capability. The LiDAR system is equipped with an Inertial Measurement Unit (IMU) and GPS for geo-referencing of the acquired data (Annex A contains the technical specification of the system).

The camera of the Pegasus sensor is tightly integrated with the system. It has a footprint of 8,900 pixels across by 6,700 pixels along the flight line (Annex B contains the technical specification of the D-8900 aerial digital camera).





Figure 8. The ALTM Pegasus System: a) parts of the Pegasus system, b) the system as installed in Cessna T206H

The ALTM Gemini is a laser based system suitable for topographic survey especially in high altitude areas with 16 kHz of effective laser rate (Figure 9). It has integrated camera and waveform digitizer (Annex B).

The camera of the Pegasus and Gemini sensor is tightly integrated with the system. It has a footprint of 8,900 pixels across by 6,700 pixels along the flight line (Annex C).



Figure 9. Concept of LiDAR data acquisition parameters



3.2 Processing Methodology

The schematic diagram of the workflow implemented by the Data Processing Component (DPC) is shown in Figure 10. The raw data collected by the Data Acquisition Component (DAC) is transferred to DPC. Pre-processing of this data starts with the computation of trajectory and georectification of point cloud, in which the coordinates of the LiDAR point cloud data are adjusted and checked for gaps and shifts, using POSPac, LMS, LAStools and Quick Terrain (QT) Modeler software.

The unclassified LiDAR data then undergoes point cloud classification, which allows cleaning of noise data that are not necessary for further processing, using TerraScan software. The classified point cloud data in ASCII format is used to generate a data elevation model (DEM), which is edited and calibrated with the use of validation and bathymetric survey data collected from the field by the Data Validation and Bathymetry Component (DVBC). The final DEM is then used by the Flood Modeling Component (FMC) to generate the flood models for different flooding scenarios.

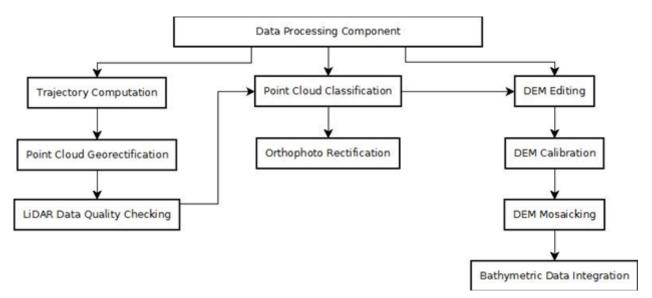


Figure 10. Schematic diagram of the data processing

3.2.1 Data Transfer

The Cagayan mission is named 1CAG171E260A, which was flown with the Airborne LiDAR Terrain Mapper (ALTM[™] Optech Inc.) Pegasus system on September 17, 2013 over Cagayan. The Data Acquisition Component (DAC) transferred 22.3 Gigabytes of range data, 191 Megabytes of POS data, 5.68 Megabytes of GPS base station data to the data server on September 24, 2013. The whole Cagayan dataset was fully transferred on February 18, 2014.

3.2.2 Trajectory Computation

The trajectory of the aircraft is computed using the software POSPac MMS v6.2. It combines the POS data from the integrated GPS/INS system installed on the aircraft, and the Rinex data from the GPS base station located within 25 kilometers of the area. It then computes the Smoothed Best Estimated Trajectory (SBET) file, which contains the best estimated trajectory of the aircraft, and the Smoothed Root Mean Square Estimation error file (SMRMSG), which contains the corresponding standard deviations of the position parameters of the aircraft at every point on the computed trajectory.

The key parameters checked to evaluate the performance of the trajectory are the Solution Status parameters and the Smoothed Performance Metrics parameters. The Solution Status parameters characterize the GPS satellite geometry and baseline length at the time of acquisition, and the processing mode used by POSPac. The acceptable values for each Solution Status parameter are shown in Table 3.

The Smoothed Performance Metrics parameters describe the root mean square error (RMSE) for the north, east and down (vertical) position of the aircraft for each point in the computed trajectory. A RMSE value of less than 4 centimeters for the north and east position is acceptable, while a value of less than 8 centimeters is acceptable for the down position.

Parameter	Optimal Value	
Number of satellites	More than 6 satellites	
Position Dilution of Precision	Less than 3	
Baseline Length	Less than 30 km	
Processing mode	Less than or equal to 1, however short burt- sts of values greater than 1 are acceptable	

 Table 3. Smoothed Solution Status parameters in POSPac MMS v6.2.

3.2.3 LiDAR Point Cloud Rectification

The trajectory file (SBET) and its corresponding accuracy file (SMRMSG) generated in POSPac are merged with the Range file to compute the coordinates of each individual point. The coordinates of points within the overlap region of contiguous strips vary due to small deviations in the trajectory computation for each strip. These strip misalignments are corrected by matching points from overlapping laser strips. This is done by the LiDAR Mapping Suite (LMS) software developed by Optech.

LMS is a LiDAR software package used for automated LiDAR rectification. It has the capability to extract planar features per flight line and to form correspondence among the identical planes available in the overlapping areas (illustrated in Figure 10). In order to produce geometrically correct point cloud, the redundancy in the overlapping areas of flight lines is used to determine the necessary corrections for the observations.



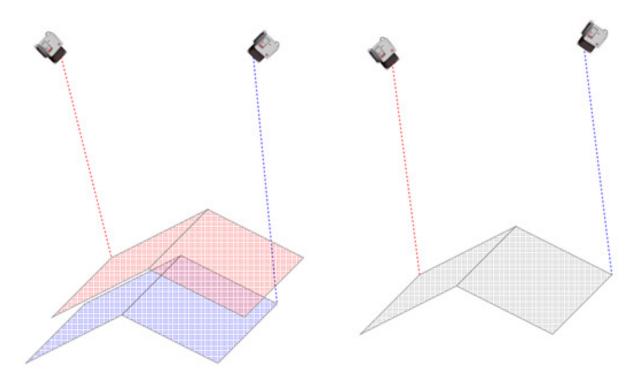


Figure 11. Misalignment of a single roof plane from two adjacent flight lines, before rectification (left). Least squares adjusted roof plane, after rectification (right).

The orientation parameters are corrected in LMS by using least squares adjustment to obtain the best-fit parameters and improve the accuracy of the LiDAR data. The primary indicators of the LiDAR rectification accuracy are the standard deviations of the corrections of the orientation parameters. These values are seen on the Boresight corrections, GPS position corrections, and IMU attitude corrections, all of which are located on the LMS processing summary report. Optimum accuracy is obtained if the Boresight and IMU attitude correction standard deviations are less than 0.001°, and if the GPS position standard deviations are below 0.01 meter.

3.2.4 LiDAR Data Quality Checking

After the orientation parameters are corrected and the point cloud coordinates are computed, the entire point cloud data undergoes quality checking, to see if: (a) there are remaining horizontal and vertical misalignments between contiguous strips, and; (b) to check if the density of the point cloud data reach the target density for the site. The LAStools software is used to compute for the elevation difference in the overlaps between strips and the point cloud density. It is a software package developed by Rapidlasso GmbH for filtering, tiling, classifying, rasterizing, triangulating and quality checking Terabytes of LiDAR data, using robust algorithms, efficient I/O tools and memory management. LAStools can quickly create raster representing the computed quantities, which provide guiding images in determining areas where further quality checks are necessary. The target requirements for floodplain acquisition, computed by LAStools, are shown in Table 4.



Criteria	Requirement
Minimum per cent overlap	25%
Average point cloud density per square meter	2.0
Elevation difference between strips (on flat areas)	0.20 meters

Table 4. Parameters investigated during quality checks.

LAStools can provide guides where elevation differences probably exceed the 20 cm limit. An example of LAStools output raster visualizing points in the flight line overlaps with a vertical difference of +/- 20 cm (displayed as dense red/blue areas) is shown in Figure 12.

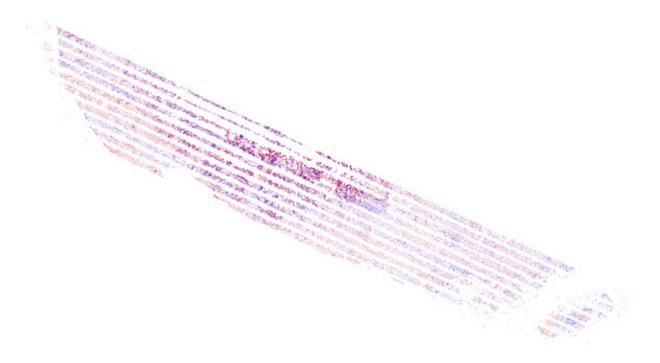


Figure 12. Elevation difference between flight lines generated from LAStools

To investigate the occurrences of elevation differences in finer detail, the profiling tool of Quick Terrain Modeler software is used. Quick Terrain Modeler (QT Modeler) is a 3D point cloud and terrain visualization software package developed by Applied Imagery, Inc. The profiling capability of QT Modeler is illustrated in Figure 13.



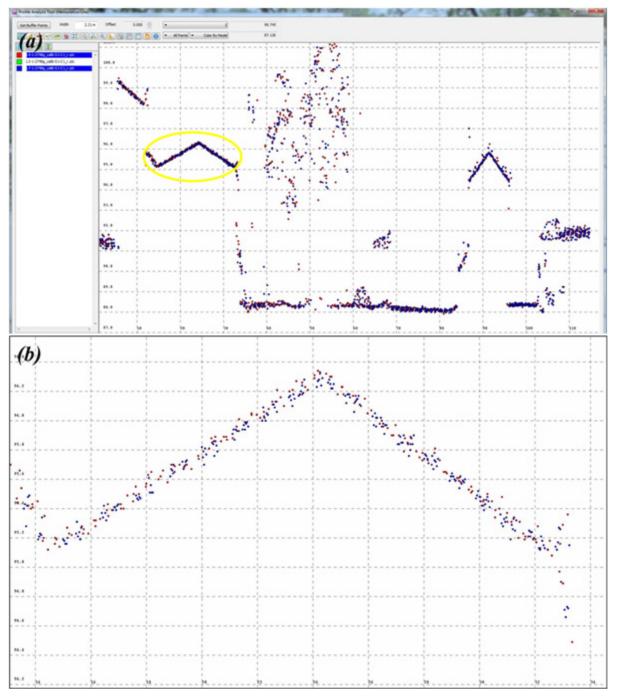


Figure 13. Profile over roof planes (a) and a zoomed-in profile on the area encircled in yellow (b)

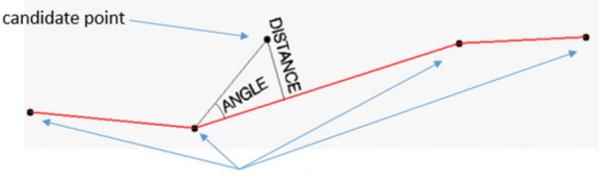
The profile (e.g., over a roof plane) shows the overlapping points from different flight lines which serve as a good indicator that the correction applied by LMS for individual flight lines is good enough to attain the desired horizontal and vertical accuracy requirements. Flight lines that do not pass quality checking are subject for reprocessing in LMS until desired accuracies are obtained.



3.2.5 LiDAR Point Cloud Classification and Rasterization

Point cloud classification commences after the point cloud data has been rectified. TerraScan is a TerraSolid LiDAR software suite used for the classification of point clouds. It can read airborne and vehicle-based laser data in raw laser format, LAS, TerraScan binary or other AS-CII-survey formats. Its classification and filtering routines are optimized by dividing the whole data into smaller geographical datasets called blocks, to automate the workflow and increase efficiency. In this study, the blocks were set to 1 km by 1 km with a 50 m buffer zone to prevent edge effects.

The process includes the classification of all points into Ground, Low Vegetation, Medium Vegetation, High Vegetation and Buildings. The classifier tool in TerraScan first filters air points and low points by finding points that are 5 standard deviations away from the median elevation of a search radius, which is 5 meters by default. It then divides the region into 6 om by 6 om search areas (the maximum area where at least one laser point hits the ground) and assigns the lowest points in these areas as the initial ground points from which a triangulated ground model is derived. The classifier then iterates through all the points and adds the points to the ground model by testing if it is (a) within the maximum iteration angle of 4° by default from a triangle plane, and (b) if it is within the maximum iteration distance (1.2 m by default) from a triangle plane. The ground plane is continuously updated from these iterations. The ground classification technique is illustrated in Figure 14. It is apparent that the smaller the iteration angle, the less eager the classifier is to follow changes in the point cloud (small undulations in terrain or hits on low vegetation). An angle close to 4° is used in flat terrain areas while an angle of 10° is used in mountainous or hilly terrains.



ground model points

Figure 14. Ground classification technique employed in Terrascan

The parameters for ground classification routines used in floodplain and watershed areas are listed in Table 5.



Classification maximums	Floodplain (default)	Watershed (adjusted)
Iteration angle (degrees)	4	8
Iteration distance (meters)	1.20	1.50

Table 5. Ground classification parameters used in Terrascan for floodplain and watershed areas

The comparison between the produced DTM using the default parameters versus the adjusted is shown in Figure 15. The default parameters may fail to capture the sudden change in the terrain, resulting to less points being classified as ground that makes the DTM interpolated (Figure 15a). The adjusted parameters work better in these spatial conditions as shown in Figure 15b. Statistically, the number of ground points and model key points correctly classified can increase by as much as fifty percent (50%) when using the adjusted parameters

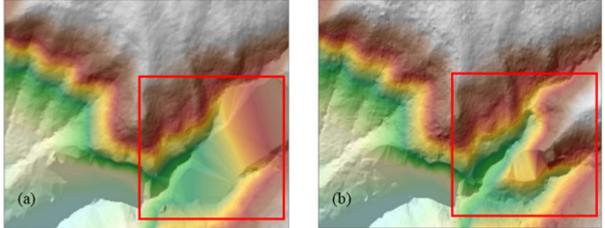


Figure 15. Resulting DTM of ground classification using the default parameters (a) and adjusted parameters (b)

The classification to Low, Medium and High vegetation is a straightforward testing of how high a point is from the ground model. The range of elevation values and its corresponding classification is shown in Table 6.

Table 6. Classification of Vegetation according to the elevation of points

Elevation of points	Classification
(meters)	
0.05 to 0.15	Low Vegetation
0.15 to 2.50	Medium Vegetation
2.50 to 50.0	High Vegetation



The classification to Buildings routine tests points above two meters (2.0 m) if they only have one echo, and if they form a planar surface of at least 40 square meters with points adjacent to them. Minimum size and Z tolerance are the parameters used in the classify buildings routine as shown in Figure 16.

Classify building	s			
Ground class:	2 - Ground 🔹			
From class:	5 - High Vegetation 🔻			
To class:	6 - Building 👻			
Inside fence only				
Accept using:	Normal rules			
Minimum size:	40	m ² building		
Z tolerance:	0.20	m		
Use echo information				
<u>O</u> K		Cancel		



Minimum size is set to the smallest building footprint size of 40 m2 while the Z tolerance of 20cm is the approximate elevation accuracy of the laser points.

The point cloud data are examined for possible occurrences of air points which are to be deleted manually in the TerraScan window. Air points are defined as groups of points which are significantly higher or lower from the ground points. The different examples of air points are shown in Figure 17.

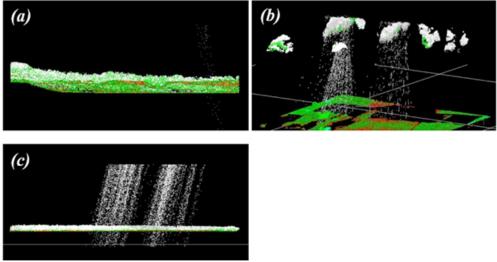


Figure 17. Different examples of air points manually deleted in the TerraScan window



The noise data can be as negligible as shown in Figure 17a or can be as severe as the one shown in Figure 17c. A combination of cloud points and shower of short ranges is displayed in Figure 17b. Shower of short ranges are caused by signal interference from the radio transmission of the tower and the aircraft. During every transmission on a specific frequency (around 120MHz), the signal is getting distorted due to the interference causing showers of short ranges in the output LAS.

Classified LiDAR point clouds that are free of air points, noise and unwanted data are processed in TerraScan to produce Digital Terrain Model (DTM) and the corresponding first and last return Digital Surface Models (DSM). These ground models are produced in the American Standard Code for Information Interchange format (ASCII) format. DTMs are produced by rasterizing all points classified to ground and model key points in a 1 m by 1 m grid. The last return DSMs are produced by rasterizing all last returns from all classifications (Ground, Model Key Points, Low, Medium, High Vegetation, Buildings and Default) in a 1 m by 1 m grid. The first return DSMs on the other hand are produced by rasterizing all first returns from all classifications. Power lines are usually included in this model. All of these ground models are used in the mosaicking, manual editing and hydro correction of the topographic dataset, in preparation for the floodplain hydraulic modelling.

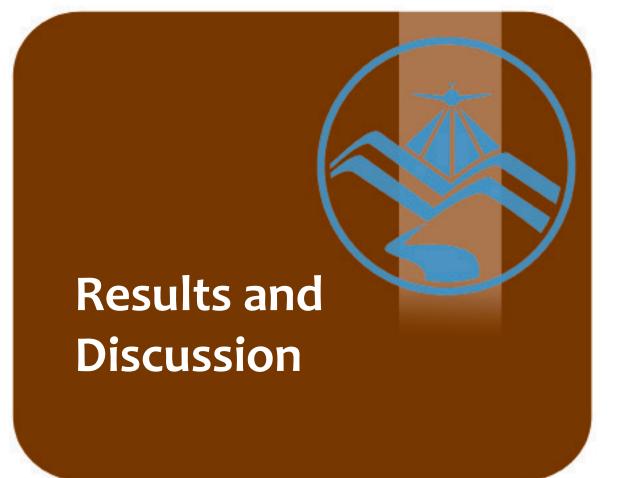
3.2.6 DEM Editing and Hydro-correction

Even though the parameters of the classification routines are optimized, various digital elevation models (DTM, first and last return DSM) that are automatically produced may still display minor errors that still need manual correction to make the DEMs suitable for fine-scale flood modelling. This is true especially for features that are under heavy canopy. Natural embankments on the side of the river might be flattened or misrepresented because no point pierced the canopy on that area. The same difficulty might also occur on smaller streams that are under canopy. The DTM produced might have discontinuities on these channels that might affect the flood modelling negatively. Manual inspection and correction is still a very important part of quality checking the LiDAR DEMs produced.

To correctly portray the dynamics of the flow of water on the floodplain, the river geometry must also be taken into consideration. The LiDAR data must be made consistent to the topographic surveys done for the area, and the bathymetric data must be "burned", or integrated, into the DEM to make the dataset suitable for hydraulic analyses. However, no cross-sectional survey was performed for this area.









4.1 LiDAR Acquisition in Cagayan Floodplain

4.1.1 Flight Plans

Plans were made to acquire LiDAR data within the Cagayan floodplain. Each flight mission had an average of 15 flight lines and ran for at most 4 hours including take-off, landing and turning time. The parameter used in the LiDAR system for acquisition is found in Table 7.

Fixed Variables	Values		
Flying Height (AGL - Above Ground Level) (m)	750m	1000 m	1200 m
Overlap	30 %	30%	30 %
Max. field of View	50	50	50
Speed of Plane (kts)	130	130	130
Turn around minutes	5	5	5
Swath (m)	661.58 m	882 m	1058.53 m

 Table 7. Parameters used in LiDAR System during Flight Acquisition.

The parameters that set in the LiDAR sensor to optimize the area coverage following the objectives of the project and to ensure the aircraft's safe return to the airport (base of operations) are shown in Table 7. Each flight acquisition is designed for four operational hours. The maximum flying hours for Cessna 206H is five hours.



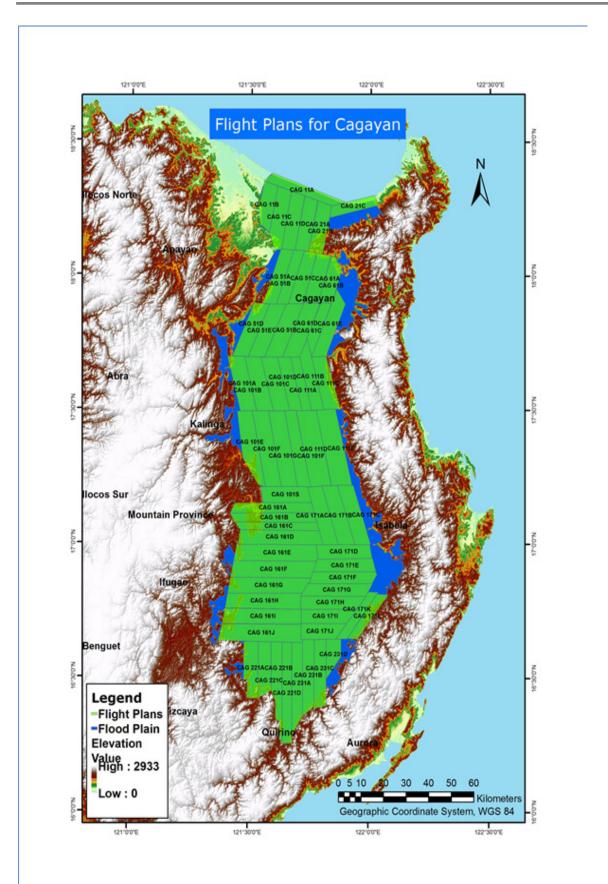


Figure 18. Cagayan Floodplain Flight Plans



4.1.2 Ground Base Station

The project team was able to recover one (1) NAMRIA control station with first (1st) order accuracy, twelve (12) with second (2nd) order accuracy and one (1) with fourth (4th) order accuracy .The certification for the base station is found in Annex F and the Benchmark Ortho values were obtained from the report of the Data Validation Component. The ground control point (GCP) was used as reference point during flight operations using TRIMBLE SPS R8, a dual frequency GPS receiver.

Station Name	CGY-57		
Order of Accuracy	2nd		
Relative Error (horizontal positioning)	1:50000		
	Latitude	17° 33' 33.68091"	
Geographic Coordinates, Philippine Ref- erence of 1992 Datum (PRS 92)	Longitude	121° 41' 10.30057"	
erence or 1992 Datum (PKS 92)	Ellipsoidal Height	21.22300 meters	
Grid Coordinates, Philippine Transverse Mercator Zone 5 (PTM Zone 5 PRS 92)	Easting	572848.612 meters	
	Northing	1942129.42 meters	
	Latitude	17°33 '27.65103" North	
Geographic Coordinates, World Geodet- ic System 1984 Datum (WGS 84)	Longitude	121°41'114.94099''East	
ic System 1984 Datum (WOS 84)	Ellipsoidal Height	57.422 meters	
Grid Coordinates, Universal Transverse	Easting	360563.72 meters	
Mercator Zone 51 North (UTM 51N WGS 1984)	Northing	1941800.44 meters	

Table 8. Details of CGY-57 GCP used as base station for the LiDAR Acquisition





Figure 19. CGY-57 as recovered at the side of a small bridge in Brgy. San. Jose, Enrile, Cagayan Province.



Table 9. Details of the recovered NAMRIA horizontal control point CGY-66 used as base station for the LiDAR Acquisition.

Station Name	CGY-66	
Order of Accuracy	2nd	
Relative Error (horizontal positioning)	1:50000	
	Latitude	17° 42' 56.12254"
Geographic Coordinates, Philippine Ref- erence of 1992 Datum (PRS 92)	Longitude	121° 34' 50.13936"
erence of 1992 Datum (PKS 92)	Ellipsoidal Height	51.902 meters
Grid Coordinates, Philippine Transverse Mercator Zone 5 (PTM Zone 5 PRS 92)	Easting	561584.309 meters
	Northing	1959382.34 meters
	Latitude	17°42 '50.05073" North
Geographic Coordinates, World Geodet- ic System 1984 Datum (WGS 84)	Longitude	121° 34' 54.76735" East
ic system 1984 Datum (wus 84)	Ellipsoidal Height	87.364 meters
Grid Coordinates, Universal Transverse	Easting	349484.16 meters
Mercator Zone 51 North (UTM 51N WGS 1984)	Northing	1959169.01 meters





Figure 20. CGY-66 as recovered near the barangay hall of Brgy. Warat , Piat, Cagayan Province.



Table 10. Details of the recovered NAMRIA horizontal control point CGY-70 used as base station for the LiDAR Acquisition.

Station Name	CGY-70	
Order of Accuracy	2nd	
Relative Error (horizontal positioning)	1:50000	
	Latitude	17° 47' 54.79038"
Geographic Coordinates, Philippine Ref- erence of 1992 Datum (PRS 92)	Longitude	121° 43' 31.26837"
erence of 1992 Datum (PKS 92)	Ellipsoidal Height	26.859 meters
Grid Coordinates, Philippine Transverse Mercator Zone 5 (PTM Zone 5 PRS 92)	Easting	576904.118 meters
	Northing	1968617.425 meters
	Latitude	17° 47'48.71170" North
Geographic Coordinates, World Geodet- ic System 1984 Datum (WGS 84)	Longitude	121° 43' 35.88859" East
ic system 1964 Datum (WOS 64)	Ellipsoidal Height	62.400 meters
Grid Coordinates, Universal Transverse	Easting	364899 meters
Mercator Zone 51 North (UTM 51N WGS 1984)	Northing	1968239.03 meters





Figure 21. CGY-70 as recovered at the back of Estefania Elementary School in Brgy. Estefania, Amulung, Cagayan Province.



Table 11. Details of the recovered NAMRIA horizontal control point CGY-70 used as base station for the LiDAR Acquisition.

Station Name	CGY-87	
Order of Accuracy	2nd	
Relative Error (horizontal positioning)	1:50000	
	Latitude	18° 03' 46.30032"
Geographic Coordinates, Philippine Ref- erence of 1992 Datum (PRS 92)	Longitude	121° 38' 38.76326"
	Ellipsoidal Height	37.212 meters
Grid Coordinates, Philippine Transverse	Easting	568188.029 meters
Mercator Zone 5 (PTM Zone 5 PRS 92)	Northing	1997837.978 meters
Geographic Coordinates, World Geodet-	Latitude	18° 03' 40.15861'' North
ic System 1984 Datum (WGS 84)	Longitude	121° 38' 43.36193'' East
	Ellipsoidal Height	71.696 meters
Grid Coordinates, Universal Transverse	Easting	356498.94 meters
Mercator Zone 51 North (UTM 51N WGS 1984)	Northing	1997546.44 meters



Figure 22. CGY-87 as recovered near the Gattaran municipal hall in Gattaran, Cagayan Province.



Table 12. Details of the recovered NAMRIA horizontal control point CGY-92 used as base station for the LiDAR Acquisition.

Station Name	CGY-92	
Order of Accuracy	2nd	
Relative Error (horizontal positioning)	1:50000	
	Latitude	18° 12' 11.42361''
Geographic Coordinates, Philippine Ref- erence of 1992 Datum (PRS 92)	Longitude	121° 39' 42.14392''
erence of 1992 Datum (PKS 92)	Ellipsoidal Height	14.474 meters
Grid Coordinates, Philippine Transverse Mercator Zone 5 (PTM Zone 5 PRS 92)	Easting	569996.115 meters
	Northing	2013373.807 meters
	Latitude	18° 12' 5.25321" North
Geographic Coordinates, World Geodet- ic System 1984 Datum (WGS 84)	Longitude	121° 39' 46.73084" East
ic system 1984 Datum (wus 84)	Ellipsoidal Height	48.54 meters
Grid Coordinates, Universal Transverse	Easting	358475.41 meters
Mercator Zone 51 North (UTM 51N WGS 1984)	Northing	2013059.26 meters



Figure 23. CGY-92 as recovered in front of the flagpole of Lal-lo National High School in Lal-lo, Cagayan Province.



Table 13. Details of the recovered NAMRIA horizontal control point CGY-93 used as base station for the LiDAR Acquisition.

Station Name	CGY-93	
Order of Accuracy	2nd	
Relative Error (horizontal positioning)	1:50000	
Coordinator Dhillipping Daf	Latitude	18° 11' 3.37014"
Geographic Coordinates, Philippine Ref- erence of 1992 Datum (PRS 92)	Longitude	121° 45' 13.15569"
erence of 1992 Datum (PKS 92)	Ellipsoidal Height	27.380 meters
Grid Coordinates, Philippine Transverse Mercator Zone 5 (PTM Zone 5 PRS 92)	Easting	579731.474 meters
	Northing	2011319.092 meters
Geographic Coordinates, World Geodet- ic System 1984 Datum (WGS 84)	Latitude	18°10 '57.21078'' North
	Longitude	121° 45' 17.74361'' East
	Ellipsoidal Height	61.728 meters
Grid Coordinates, Universal Transverse Mercator Zone 51 North (UTM 51N WGS	Easting	368185.96 meters 2010898.96 meters
1984)	Northing	1968239.03 meters



Figure 24. CGY--93 as recovered near the barangay hall of Brgy. Dagupan, Lal-lo, Cagayan Province.



Table 14. Details of the recovered NAMRIA horizontal control point CGY-3771 used as base station for the LiDAR Acquisition.

Station Name	CGY-3771	
Order of Accuracy	4th	
Relative Error (horizontal positioning)	1 in 10,000	
Coorteenkie Coordinatoo Dhilinging Daf	Latitude	17° 42' 48.97202"
Geographic Coordinates, Philippine Ref- erence of 1992 Datum (PRS 92)	Longitude	121° 34' 46.76260"
erence of 1992 Datum (PKS 92)	Ellipsoidal Height	53.36500 meters
Grid Coordinates, Philippine Transverse Mercator Zone 5 (PTM Zone 5 PRS 92)	Easting	561485.49 meters
	Northing	1959162.214 meters
	Latitude	17° 42' 42.90057" North
Geographic Coordinates, World Geodet- ic System 1984 Datum (WGS 84)	Longitude	121° 34' 51.39076'' East
	Ellipsoidal Height	88.831 meters
Grid Coordinates, Universal Transverse	Easting	N/A
Mercator Zone 51 North (UTM 51N WGS 1984)	Northing	N/A

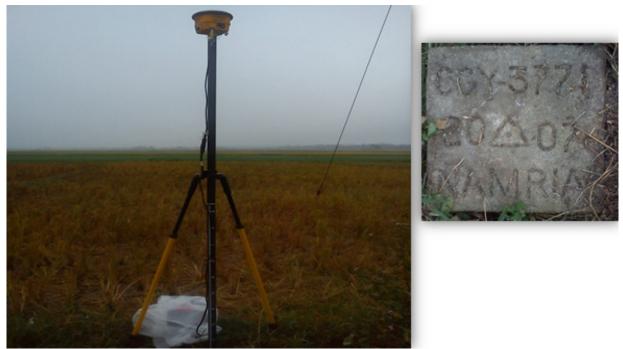


Figure 25. CGY--3771 as recovered near the barangay hall of Brgy. Warat , Piat, Cagayan Province.



Table 15. Details of the recovered NAMRIA horizontal control point ISB-4 used as base station for the LiDAR Acquisition.

Station Name	ISB-4	
Order of Accuracy	1st	
Relative Error (horizontal positioning)	1 in 100,000	
Coorteenkie Coordinatoo Dhilinning Dof	Latitude	16° 30' 18.51803"
Geographic Coordinates, Philippine Ref- erence of 1992 Datum (PRS 92)	Longitude	121° 44' 8.59378"
erence of 1992 Datum (PKS 92)	Ellipsoidal Height	109.764 meters
Grid Coordinates, Philippine Transverse Mercator Zone 5 (PTM Zone 5 PRS 92)	Easting	578545.486 meters
	Northing	1825484.009 meters
	Latitude	16°30 '12.72441'' North
Geographic Coordinates, World Geodet- ic System 1984 Datum (WGS 84)	Longitude	121° 44' 13.32219" East
ic system 1964 Datum (WOS 64)	Ellipsoidal Height	149.42780 meters
Grid Coordinates, Universal Transverse	Easting	365066.7 meters
Mercator Zone 51 North (UTM 51N WGS 1984)	Northing	1825124.83 meters





Figure 26. ISB-4 as recovered in a field in Brgy. Masaya Centro, San Agustin, Isabela.



Table 16. Details of the recovered NAMRIA horizontal control point ISB-90 used as base station for the LiDAR Acquisition.

Station Name	ISB-90	
Order of Accuracy	2nd	
Relative Error (horizontal positioning)	1 in 50,000	
Coographic Coordinator, Dhilipping Def	Latitude	17° 19' 10.25017''
Geographic Coordinates, Philippine Ref- erence of 1992 Datum (PRS 92)	Longitude	121° 46' 09.69589"
erence of 1992 Datum (PKS 92)	Ellipsoidal Height	35.367 meters
Grid Coordinates, Philippine Transverse Mercator Zone 5 (PTM Zone 5 PRS 92)	Easting	581784.952 meters
	Northing	1915619.76 meters
	Latitude	17° 19' 04.27901'' North
Geographic Coordinates, World Geodet- ic System 1984 Datum (WGS 84)	Longitude	121° 46' 14.35585" East
ic system 1964 Datum (WOS 64)	Ellipsoidal Height	72.554 meters
Grid Coordinates, Universal Transverse	Easting	369220.50 meters
Mercator Zone 51 North (UTM 51N WGS 1984)	Northing	1915204.01 meters



Figure 27. ISB-90 as recovered beside the welcome sign of Brgy. Villa Luz, Delfin Albano, Isabela.



Table 17. Details of the recovered NAMRIA horizontal control point ISB-97 used as base station for the LiDAR Acquisition.

Station Name	ISB-97	
Order of Accuracy	2nd	
Relative Error (horizontal positioning)	1 in 50,000	
Coordinates Dillinging Def	Latitude	17° 08' 44.15866''
Geographic Coordinates, Philippine Ref- erence of 1992 Datum (PRS 92)	Longitude	121° 40' 11.01238''
erence of 1992 Datum (PKS 92)	Ellipsoidal Height	62.259 meters
Grid Coordinates, Philippine Transverse Mercator Zone 5 (PTM Zone 5 PRS 92)	Easting	571259.789 meters
	Northing	1896333.662 meters
	Latitude	17° 08' 38.21759'' North
Geographic Coordinates, World Geodet- ic System 1984 Datum (WGS 84)	Longitude	121° 40' 15.68747" East
ic system 1964 Datum (WOS 64)	Ellipsoidal Height	99.759 meters
Grid Coordinates, Universal Transverse	Easting	358498.51 meters
Mercator Zone 51 North (UTM 51N WGS 1984)	Northing	1896031.50 meters



Figure 28. ISB-97 as recovered besides a waiting shed in a vacant lot in Villa Bulusan, Mallig, Isabela



Table 18. Details of the recovered NAMRIA horizontal control point ISB-116 used as base station for the LiDAR Acquisition.

Station Name	ISB-116	
Order of Accuracy	2nd	
Relative Error (horizontal positioning)	1 in 50,000	
	Latitude	16°59'4.21767"
Geographic Coordinates, Philippine Ref- erence of 1992 Datum (PRS 92)	Longitude	122°0'23.58158"
erence of 1992 Datum (PKS 92)	Ellipsoidal Height	97.639 meters
Grid Coordinates, Philippine Transverse Mercator Zone 5 (PTM Zone 5 PRS 92)	Easting	5394202.384 meters
	Northing	1878652.343 meters
Coordinates Would Coordet	Latitude	16° 58'58.33861" North
Geographic Coordinates, World Geodet- ic System 1984 Datum (WGS 84)	Longitude	122° 0' 28.26808'' East
	Ellipsoidal Height	136.459 meters
Grid Coordinates, Universal Transverse	Easting	394202.384 meters
Mercator Zone 51 North (UTM 51N WGS 1984)	Northing	1878652.343 meters



Figure 29. ISB-116 as recovered on the ground near a ridge about 200 meters away from a Military Camp located at Brgy. Poblacion (Zone 1), San Mariano, Isabela.



Table 19. Details of the recovered NAMRIA horizontal control point MC-1 used as base station for the LiDAR Acquisition.

Station Name	MC-1					
Order of Accuracy	2n	d				
Relative Error (horizontal positioning)	1:50000					
	Latitude	N/A				
Geographic Coordinates, Philippine Ref- erence of 1992 Datum (PRS 92)	Longitude	N/A				
erence of 1992 Datum (FRS 92)	Ellipsoidal Height	N/A				
Grid Coordinates, Philippine Transverse	Easting	N/A				
Mercator Zone 5 (PTM Zone 5 PRS 92)	Northing	N/A				
Geographic Coordinates, World Geodet-	Latitude	16° 30' 13.36434" North				
ic System 1984 Datum (WGS 84)	Longitude	121° 44' 13.62483" East				
	Ellipsoidal Height	99.484 meters				
Grid Coordinates, Universal Transverse	Easting	365216.76 meters				
Mercator Zone 51 North (UTM 51N WGS 1984)	Northing	1825076.561 meters				



Figure 30. MC-1 as established near ISB-4 in Brgy. Masaya Centro, San Agustin, Isabela

Table 20. Details of the recovered NAMRIA horizontal control point ISB-2 used as base station for the LiDAR Acquisition.

Station Name	ISE	3-2	
Order of Accuracy	2n	d	
Relative Error (horizontal positioning)	1 in 50	0,000	
Coordinator Dhillipping Daf	Latitude	N/A	
Geographic Coordinates, Philippine Ref- erence of 1992 Datum (PRS 92)	Longitude	N/A	
erence of 1992 Datum (PRS 92)	Ellipsoidal Height	N/A	
Grid Coordinates, Philippine Transverse	Easting	N/A	
Mercator Zone 5 (PTM Zone 5 PRS 92)	Northing	N/A	
	Latitude	16° 51' 06.23292" North	
Geographic Coordinates, World Geodet- ic System 1984 Datum (WGS 84)	Longitude	121° 52' 46.01057" East	
ic system 1964 Datum (WGS 64)	Ellipsoidal Height	130.38 meters	
Grid Coordinates, Universal Transverse	Easting	380624.988 meters	
Mercator Zone 51 North (UTM 51N WGS 1984)	Northing	1863491.374 meters	



Figure 31. ISB-2 as established on the ground about 5 meters east of ISB-118 located at Brgy. Maligaya, Cauayan Isabela.



Table 21. Details of the recovered NAMRIA horizontal control point PISB-1 used as base station for the LiDAR Acquisition.

Station Name	PIS	B-1				
Order of Accuracy	2nd					
Relative Error (horizontal positioning)	1:50	000				
Coographic Coogdinator, Dhilipping Def	Latitude	N/A				
Geographic Coordinates, Philippine Ref- erence of 1992 Datum (PRS 92)	Longitude	N/A				
erence of 1992 Datum (FRS 92)	Ellipsoidal Height	N/A				
Grid Coordinates, Philippine Transverse	Easting	N/A				
Mercator Zone 5 (PTM Zone 5 PRS 92)	Northing	N/A				
	Latitude	16° 58' 56.81323" North				
Geographic Coordinates, World Geodet- ic System 1984 Datum (WGS 84)	Longitude	121° 00' 27.42180" East				
ic system 1904 Datum (WOS 04)	Ellipsoidal Height	140.097 meters				
Grid Coordinates, Universal Transverse	Easting	394353.321 meters				
Mercator Zone 51 North (UTM 51N WGS 1984)	Northing	1877880.608 meters				



Figure 32. PISB-1 as established on the ground at the south west side of a helipad and about 40 meters away south east from ISB-116 located at Brgy. Poblacion (Zone 1), San Mariano Isabela.



Table 22. Details of the recovered NAMRIA horizontal control point CAP-1 used as base station for the LiDAR Acquisition.

Station Name	CA	P-1			
Order of Accuracy	2nd				
Relative Error (horizontal positioning)	1:50	000			
Coographic Coogdinator, Dhilipping Dof	Latitude	N/A			
Geographic Coordinates, Philippine Ref- erence of 1992 Datum (PRS 92)	Longitude	N/A			
erence of 1992 Datum (FRS 92)	Ellipsoidal Height	N/A			
Grid Coordinates, Philippine Transverse	Easting	N/A			
Mercator Zone 5 (PTM Zone 5 PRS 92)	Northing	N/A			
	Latitude	17° 38'29.72001" North			
Geographic Coordinates, World Geodet- ic System 1984 Datum (WGS 84)	Longitude	121° 44'06.91080" East			
ic system 1964 Datum (WGS 64)	Ellipsoidal Height	63.145 meters			
Grid Coordinates, Universal Transverse	Easting	364899.000 meters			
Mercator Zone 51 North (UTM 51N WGS 1984)	Northing	1968239.03 meters			



Figure 33. CAP-1 as established In Tuguegarao Airport.



Table 23. Details of the recovered NAMRIA horizontal control point ISB-3634 used as base station for the LiDAR Acquisition.

Station Name	ISB-3	634			
Order of Accuracy	2nd				
Relative Error (horizontal positioning)	1:50	000			
Coortrankia Coordinator, Dhilinging Daf	Latitude	N/A			
Geographic Coordinates, Philippine Ref- erence of 1992 Datum (PRS 92)	Longitude	N/A			
erence of 1992 Datum (FRS 92)	Ellipsoidal Height	N/A			
Grid Coordinates, Philippine Transverse	Easting	N/A			
Mercator Zone 5 (PTM Zone 5 PRS 92)	Northing	N/A			
	Latitude	17° 09'47.44627" North			
Geographic Coordinates, World Geodet- ic System 1984 Datum (WGS 84)	Longitude	121° 37' 28.89006" East			
ic system 1964 Datum (WGS 64)	Ellipsoidal Height	98.179 meters			
Grid Coordinates, Universal Transverse	Easting	353723.330 meters			
Mercator Zone 51 North (UTM 51N WGS 1984)	Northing	1898125.048 meters			



Figure 34. ISB-3634 as recovered and reestablished as second order control is on the ground near a waiting shade located at Brgy. San Pedro, Roxas Isabela.



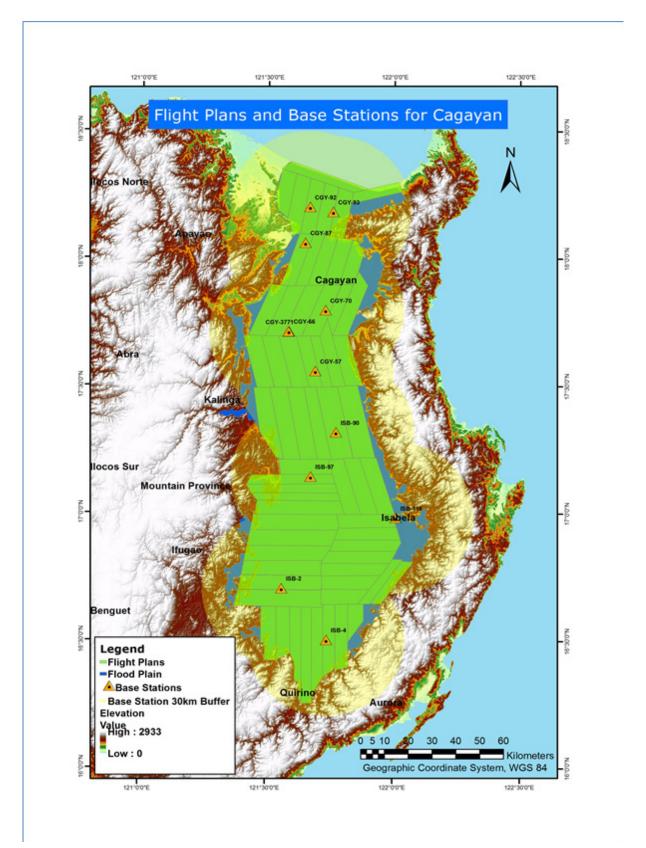


Figure 35. Cagayan Flight Plans and Base Stations.



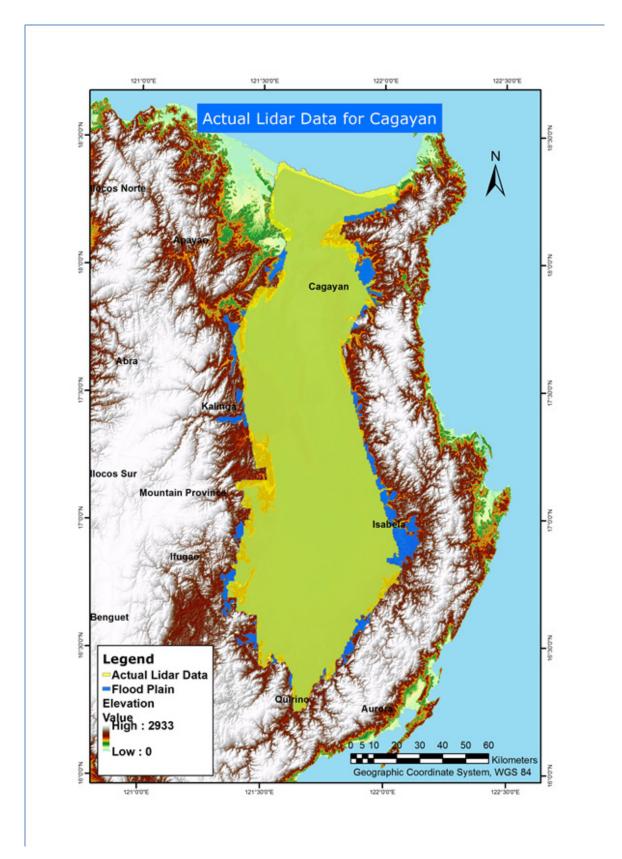


Figure 36. Cagayan Floodplain Data Acquisition LAS Output.



	light Missions			Area Sur-	Area		Flying	Hours
Date Sur- veyed	Name	Flight Plan Area (km²)	Surveyed Area (km²)	d veyed Surveyed within Outside the River the River System Systems (km ²) (km ²)		No. of Images (Frames)	Hours	Min- utes
Sept 4, 2013	161H	130.21	126.83	126.83	0	NA	3	10
Sept 5, 2013	161l	127.73	161.08	161.08	0	NA	3	23
Sept 5, 2013	161P	122.38	93.602	93.602	о	NA	2	29
Sept 6, 2013	161 l	127.73	230.65	230.65	0	NA	3	47
Sept 6, 2013	161F	121.69	169.09	169.09	о	NA	2	23
Sept 7, 2013	161PQ	122.38	114.8	114.8	О	NA	2	43
Sept 10, 2013	161L	115.53	30.476	30.476	0	NA	1	30
Sept 10, 2013	161M	104.67	70.641	70.641	0	NA	1	51
Sept 11, 2013	161LM	220.27	197.78	197.78	0	NA	3	5
Sept 18, 2013	161F	133.92	157.21	157.21	0	NA	3	40
Sept 19, 2013	171G	141.55	160.02	160.02	0	NA	3	22
Sept 22, 2013	171H	148.58	209.81	209.81	0	NA	3	о
Sept 22, 2013	171D, 171FS	240.56	214.52	214.52	О	NA	2	54
Sept 23, 2013	1711	130.9	148.35	148.35	0	NA	3	8
Sept 24, 2013	171J	112.15	122.4	122.4	0	NA	2	50
Sept 25, 2013	171C	171.56	173.2	173.2	0	NA	4	0
Sept 28, 2013	171K	87.869	110.76	110.76	0	NA	2	28
Sept 29, 2013	171L	93.986	101.19	101.19	0	NA	3	5

Table 24. Flight Missions for LiDAR Data Acquisition in Cagayan floodplain.



				Area Sur-	Area		Flying Hours	
Date Sur- veyed	Name	Flight Plan Area (km²)	Surveyed Area (km²)	veyed within the River System (km²)	Surveyed Outside the River Systems (km ²)	No. of Images (Frames)	Hours	Min- utes
Sept 30, 2013	161K	104.74	81.794	81.794	0	NA	2	45
Oct 3, 2013	161G, 171D	133.92	84.058	84.058	ο	191	2	40
Oct 4, 2013	161l, 161H	127.74	132.63	132.63	0	863	4	10
Oct 8, 2013	161NO	221.01	227.31	227.31	0	1264	4	о
Oct 9, 2013	161Q	151.34	149.515	149.515	0	726	3	48
Oct 9, 2013	161E	112.37	89.486	89.486	0	543	2	18
Oct 13, 2013	161CD	126.34	156.82	156.82	0	1395	3	36
Oct 14, 2013	231A	166.85	179.29	179.29	0	1370	4	5
Oct 14, 2013	221D	185.55	136.09	136.09	о	483	2	35
Oct 15, 2013	221C	147.07	149.47	149.47	0	1122	4	5
Oct 15, 2013	221B	127.63	78.268	78.268	0	265	2	29
Oct 16, 2013	231A	166.85	150.958	150.958	0	1113	4	17
Oct 17, 2013	221C	147.07	218.79	218.79	0	981	4	23
Oct 17, 2013	231D	79.303	71.616	71.616	0	278	2	11
Oct 18, 2013	231D	79.303	81.973	81.973	0	265	4	5
Oct 18, 2013	231C	149.45	49.93	49.93	0	1113	2	23
Oct 19, 2013	221D, 231BS	185.55	116.86	116.86	0	901	4	5
Oct 21, 2013	161A	150.11	103.91	103.91	0	621	3	11

				Area Sur-	Area		Flying	Hours
Date Sur- veyed	Name	Flight Plan Area (km²)	Surveyed Area (km²)	veyed within the River System (km²)	Surveyed Outside the River Systems (km ²)	No. of Images (Frames)	Hours	Min- utes
Oct 22, 2013	161AB	132.61	104.01	104.01	0	847	2	47
Oct 23, 2013	111C	293.93	103.84	103.84	0	NA	4	11
Oct 25, 2013	111E	247.4	255.41	255.41	0	1258	4	41
Oct 25, 2013	111D	287.34	149.09	149.09	0	484	2	5
Oct 25, 2013	51E	159.99	134.88	134.88	0	NA	4	17
Oct 25, 2013	51E	159.99	51.556	51.566	0	NA	1	53
Oct 26, 2013	101D	124.35	176.63	176.63	0	NA	3	35
Oct 26, 2013	111D	287.34	118.52	118.52	0	289	1	59
Oct 26, 2013	51F	173.67	110.37	110.37	0	NA	3	53
Oct 26, 2013	51E, 51B	109.56	82.106	82.106	о	NA	2	41
Oct 27, 2013	51G	173.67	151.62	151.62	0	NA	4	11
Oct 27, 2013	61A	135.52	132.62	132.62	0	289	2	35
Oct 27. 2013	111C	293.3	169.35	169.35	0	NA	4	5
Oct 27. 2013	111D	287.34	112.4	112.4	0	NA	3	5
Oct 28, 2013	110A	173.3	102.94	102.94	0	635	3	41
Oct 29, 2013	111B	152.03	149.1	149.1	0	721	4	35
Oct 29, 2013	51B	109.56	88.596	88.596	0	369	2	47
Nov 7, 2013	21A, 51BS	134.06	83.349	83.349	0	NA	3	5

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				Area Sur-	Area		Flying Hours	
Date Sur- veyed	Name	Flight Plan Area (km²)	Surveyed Area (km²)	veyed within the River System (km²)	Surveyed Outside the River Systems (km ²)	No. of Images (Frames)	Hours	Min- utes
Nov 7, 2013	51BS	109.56	64.311	64.311	о	287	2	17
Nov 10, 2013	21A	134.06	120.107	120.107	о	NA	3	11
Nov 11, 2013	11D	144.01	189.46	189.46	о	NA	4	17
Nov 11, 2013	21AS	134.06	87.964	87.964	о	NA	2	35
Nov 12, 2013	51A	135.04	143.137	143.137	0	NA	3	17
Nov 12, 2013	51AS	113.21	40.648	40.648	0	NA	2	5
Nov 13, 2013	51AS	113.21	80.895	80.895	0	NA	2	47
Nov 13, 2013	11AS	130.48	32.694	32.694	0	NA	2	17
Nov 14, 2013	21AS	134.06	147.419	147.419	0	378	4	29
Nov 30, 2013	101D	124.35	75.775	75.775	0	208	2	11
Nov 30, 2013	101D	124.35	95.768	95.768	0	NA	5	3
Dec 2, 2013	171A	162.1	63.253	63.253	0	NA	1	47
Dec 3, 2013	171A	162.1	157.74	157.74	0	NA	4	47
Dec 4, 2013	161AB	132.61	136.78	136.78	0	NA	3	47
Dec 5, 2013	161BCDES	126.34	289.98	289.98	0	NA	4	11
Dec 5, 2013	171B	172.58	55.671	55.671	0	NA	1	59
Dec 7, 2013	171B	172.58	215.3	215.3	0	NA	4	5
Dec 7, 2013	171C	171.56	35.451	35.451	0	NA	1	47
Dec 8, 2013	171C	171.56	206.83	206.83	0	NA	4	11

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				Area Sur-	Area		Flying	Hours
Date Sur- veyed	Name	Flight Plan Area (km²)	Surveyed Area (km²)	veyed within the River System (km²)	Surveyed Outside the River Systems (km ²)	No. of Images (Frames)	Hours	Min- utes
Dec 10, 2013	221B, 221CS	127.63	168.571	168.571	0	1151	3	47
Dec 10, 2013	171D, 171C	140.56	45.716	45.716	0	440	2	11
Dec 11, 2013	101G	227.23	135.67	135.67	о	NA	3	53
Dec 17, 2013	101D	124.35	89.422	89.422	0	364	2	17
Feb 5, 2014	101D	124.35	104.98	104.98	0	NA	2	47
Feb 6, 2014	101A, 111C	173.47	129.008	129.008	0	NA	3	47
Feb 6, 2014	101A	173.47	115.16	115.16	0	NA	2	59
Feb 7, 2014	51D, 101D	156.26	174.812	174.812	0	NA	3	29
Feb 8, 2014	101A, 111C	103.47	99.849	99.849	0	NA	4	22
Feb 9, 2014	101F, 111D	227.23	158.585	158.585	0	NA	2	47
Feb 10, 2014	101E	206.09	89.965	89.965	0	NA	3	5
Feb 11, 2014	101E	206.09	122.84	122.84	0	NA	3	42
Feb 12, 2014	21A, 11A	134.06	123.93	123.93	0	NA	3	53
Feb 13, 2014	61DE	263.79	204.04	204.04	0	NA	3	5
Feb 15, 2014	101A, 111C	173.47	110.653	110.653	0	NA	1	53
Feb 17, 2014	51D	156.26	169.27	169.27	0	NA	3	5
Feb 17, 2014	51A	135.04	148.34	148.34	0	NA	2	59
Feb 18, 2014	101F, 101E	227.28	227.027	227.027	0	NA	4	23



A total of 115 missions were conducted for the LiDAR Data Acquisition in Cagayan floodplain, for a total of 375.16 hours of flying time for RP-C9022, RP-C9122 and RP-C9322. All missions are acquired using the Pegasus, Gemini and Aquarius LiDAR Systems. Table 24 shows the total area to be surveyed according to the flight plan and the total area of actual coverage per survey area.

Cagayan floodplain with a total of 10, 386 square kilometers was surveyed from September 4, 2013 to February 18, 2014 by Marvy Funtilon, Jasmine Alviar, Christopher Joaquin, Mark Gregory Ano, Pauline Joanne Arceo, Pearl Mars, Dan Christoffer Aldovino, Ma. Verlina Tonga, Lovely Acuna, Mary Catherine Baliguas, Renan Punto, Iro Niel Roxas, Lovelyn Asuncion and Faith Joy Sable, as shown in Table 25.

Location	Date Sur- veyed	Operator	Mission Name	Flood- plain Surveyed Area (km²)	Total Flood- plain Area (km²)	Water- shed Surveyed Area (km²)	Total Wa- tershed Area (km²)
	Sept 4, 2013	M. Funtilon	1C161H248A	126.83			
	Sept 5, 2013	J. Alviar	1C161249A	152.882		8.198	
	Sept 5, 2013	M. Funtilon	1C161P249B	93.602		0	
	Sept 6, 2013	M. Funtilon	1C161l250A	221.68		8.97	
	Sept 6, 2013	J. Alviar	1C161F120B	163.5		5.59	
	Sept 7, 2013	M. Funtilon	1C161Q251A	103.79		11.01	
	Sept 10, 2013	M. Funtilon	1C161L254A	30.476		0	
	Sept 10, 2013	M. Funtilon	1C161L254B	70.068		0.573	
	Sept 11, 2013	M. Funtilon	1C161M255A	189.98		7.8	
	Sept 18, 2013	M. Ano	1C171F261A	157.21		0	
Cagayan	Sept 19, 2013	C. Joaquin	1C171G262A	160.02	10, 386	0	
Cagayan	Sept 22, 2013	M. Ano	1C171H265A	209.81	10, 500	0	
	Sept 22, 2013	C. Joaquin	1C171D265B	214.52		0	
	Sept 23, 2013	P. Arceo	1C171l266A	148.35		0	
	Sept 24, 2013	M. Ano	1C171J267A	122.4		0	
	Sept 25, 2013	P. Arceo	1C171C268B	173.2		0	
	Sept 28, 2013	M. Ano	1C171K271A	110.76		0	
	Sept 29, 2013	P. Arceo	1C171L272A	58.93		42.26	

Table 25. Area of Coverage (in sq km) of the LiDAR Data Acquisition in Cagayan floodplain.



Location	Date Sur- veyed	Operator	Mission Name	Flood- plain Surveyed Area (km²)	Total Flood- plain Area (km²)	Water- shed Surveyed Area (km²)	Total Wa- ter-shed Area (km²)
	Sept 30, 2013	C. Joaquin	1C161K- S2271A	81.794		0	
	Oct 3, 2013	M. Ano	2CAG- 161S276A	84.058		0	
	Oct 4, 2013	P. Mars	2CAG 161HS 277	132.63		0	
	Oct 8, 2013	P. Mars	2CAG 161NO 281A	187.05		40.26	
	Oct 9, 2013	D. Aldovi- no	2CAG 161QLS 282A	149.515		0	
	Oct 9, 2013	P. Mars, J. Alviar	2CAG 161E 282B	88.324		1.162	
	Oct 13, 2013	L. Acuna, V. Tonga	2CAG 161CD 286A	151.193		5.627	
	Oct 14, 2013	L. Acuna	2CAG 221A 287A	179.29		0	
	Oct 14, 2013	M. Funtilon	2CAG 221B 287B	136.09		0	
Cagayan	Oct 15, 2013	L. Acuna, M. Baliguas	2CAG 221C 288A	149.47		0	
	Oct 15, 2013	R. Punto	2CAG 221D 288B	69.513		8.755	
	Oct 16, 2013	M. Baligu- as, V. Tonga	2CAG 231A 289A	150.958		0	
	Oct 17, 2013	L. Acuna, V. Tonga	2CAG 221EB- S290A	218.79		0	
	Oct 17, 2013	M. Baliguas	2CAG 231B290B	71.616		0	
	Oct 18, 2013	R. Punto	2CAG 231D291A	81.973		0	
	Oct 18, 2013	M. Baliguas	2CAG 231BS291B	49.93		0	
	Oct 19, 2013	M. Baliguas	2CAG 221DS 292A, 2CAG 231BS 292A	116.86		0	
	Oct 21, 2013	V. Tonga	2CAG161B- C294A	103.91		0	

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Location	Date Sur- veyed	Operator	Mission Name	Flood- plain Surveyed Area (km²)	Total Flood- plain Area (km²)	Water- shed Surveyed Area (km²)	Total Wa- ter-shed Area (km²)
	Oct 22, 2013	V. Tonga, M. Baliguas	2CAG 161AB 295A	104.01		0	
	Oct 22, 2013	P. Arceo	3CAGR 295A	53.135		0]
	Oct 23, 2013	C. Joaquin	3CAG 111C 296A	103.84		о	
	Oct 25, 2013	M. Baliguas	2CAG 111E 298A	255.41		0	
	Oct 25, 2013	I. Roxas	2CAG 111D 298B	149.09		0	
	Oct 25, 2013	P. Arceo	3CAG 51E 298A	134.88		0	
	Oct 25, 2013	C. Joaquin	3CAG 51E 298B	51.556		0	
	Oct 26, 2013	P. Mars	2CAG 101D 299A	176.63		0	
	Oct 26, 2013	I. Roxas	2CAG 111A 299B	118.52		0	
Cagayan	Oct 26, 2013	C. Joaquin	3CAG 512 99A	110.37		0	
	Oct 26, 2013	P. Arceo	3CAG 51F 299B	82.106		0	
	Oct 27, 2013	M. Baliguas	2CAG 51G 300A	151.62		0	
	Oct 27, 2013	I. Roxas	2CAG 61A 300B	132.62		0	
	Oct 27. 2013	P. Arceo	2CAG 111CS 300A	169.35		0	
	Oct 27. 2013	C. Joaquin		112.4			
	Oct 28, 2013	C. Joaquin	3CAG 110A 301A	102.94		0	
	Oct 28, 2013	I.Roxas	2CAG 51A 301A	168.18		15.81	
	Oct 28, 2013	P. Mars	2CAG 61A 301B	130.4		16.16	
	Oct 29, 2013	I.Roxas	2CAG 61B 302A	179.972		26.47	
	Oct 29, 2013	M. Baliguas	2CAG 61D 302B	102.78		2.49	



Location	Date Sur- veyed	Operator	Mission Name	Flood- plain Surveyed Area (km²)	Total Flood- plain Area (km²)	Water- shed Surveyed Area (km²)	Total Wa- ter-shed Area (km²)
	Oct 29, 2013	C. Joaquin	3CAG 111B 302A	149.1		0	
	Oct 29, 2013	P. Arceo	3CAG 51B 302B	88.596		0	
	Nov 5, 2013	V. Tonga	3CAGR 309A	47.248		2.697	
	Nov 7, 2013	D. Aldovi- no	2CAG 21A 311A, 2CAG 51BS 311A	78.132		5.217	
	Nov 7, 2013	V. Tonga	2CAG 51BS 2311B	64.311		0	
	Nov 10, 2013	V. Tonga	2CAG 21A 314B	119.243		0.864	
	Nov 11, 2013	D. Aldovi- no	2CAG 11D 315A	184.35		5.11	
	Nov 11, 2013	V. Tonga	2CAG 21AS 315B	85.207		2.757	
Cagayan	Nov 12, 2013	V. Tonga	2CAG 51A 316A	128.65		14.49	
	Nov 12, 2013	D. Aldovi- no	2CAG 51AS 316B	40.149		0.499	
	Nov 13, 2013	V. Tonga	2CAG 51AS 2317A	80.895		0	
	Nov 13, 2013	D. Aldovi- no	2CAG 11AS 2317B	32.694		0	
	Nov 14, 2013	V. Tonga	2CAG21A- S2318A	118.124		29.29	
	Nov 29, 2013	I. Roxas	2CAG- 101C333A	155.977		0	
	Nov 30, 2013	D. Aldovi- no	2CAG- 101D334A	75.775		0	
	Dec 2, 2013	P. Mars, F. Sable	2CAG 171A 336B	63.253		0	
	Dec 3, 2013	P. Mars	2CAG 171A 337A	157.74		0	
	Dec 4, 2013	P. Mars, F. Sable	2CAG 161AB 338A	132.27		4.51	



Location	Date Sur- veyed	Operator	Mission Name	Flood- plain Surveyed Area (km²)	Total Flood- plain Area (km²)	Water- shed Surveyed Area (km²)	Total Wa- tershed Area (km²)
	Dec 4, 2014	R. Punto	2CAG- 161DES338B	225.34		0	
	Dec 5, 2013	P. Mars, F. Sable	2CAG161BC- DES339A	289.98		0	
	Dec 5, 2013	R. Punto	2CAG 171 339B	55.671		0	
	Dec 7, 2013	P. Mars, F. Sable	2CAG- 171B341A	215.3		0	
	Dec 7, 2013	R. Punto	2CAG- 171C341B	35.451		0	
	Dec 8, 2013	F. Sable	2CAG- 171C342A	206.83		0	
	Dec 10, 2013	P. Mars	2CAG 221CS 231AS 344A	168.571		0	
	Dec 10, 2013	F. Sable	2CAG 171D 344B	45.716		0	
	Dec 11, 2013	F. Sable	2CAG- 101G345A	135.67		0	
Cagayan	Dec 16, 2013	F. Sable	2CAG101FG- S350A	115.58		0	
	Dec 17, 2013	I.Roxas	2CAG- 101D351A	89.422		0	
	Dec 17, 2013	R. Punto	2CAG- 171C341B	35.451		0	
	Feb 5, 2014	V. Tonga	2CAG 101DS 035B	104.98		0	
	Feb 6, 2014	M. Baliguas	2CA- G111037A, 2CAG101AC- S037A	129.008		0	
	Feb 6, 2014	V. Tonga	2CAG 101A 037B	115.16		0	
	Feb 7, 2014	M. Baliguas	2CAG- 51D038A, 2CAG101A- S038A	174.812		0	
	Feb 8, 2014	V. Tonga	2CAG101A- S039A	99.849		0	



Location	Date Sur- veyed	Operator	Mission Name	Flood- plain Surveyed Area (km²)	Total Flood- plain Area (km²)	Water- shed Surveyed Area (km²)	Total Wa- tershed Area (km²)
Cagayan	Feb 9, 2014	M. Baliguas	2CAG 101GS 040A, 2CAG 101H 040A	158.585		0	
	Feb 10, 2014	V. Tonga	2CA- G101EO041A	89.965		0	
	Feb 11, 2014	M. Baliguas	2CAG- 111F042A, 2CAG101E- S042A	122.84		0	
	Feb 12, 2014	V. Tonga	2CAG 11A 043A	123.93		0	
	Feb 13, 2014	M. Baliguas	2CAG- 61D044A, 2CA- G61E044A	204.04		0	
	Feb 13, 2014	V. Tonga	2CAG- 111ESO44B			0	
	Feb 15, 2014	M. Baliguas	2CAG101A- S046A	110.653		0	
	Feb 17, 2014	V. Tonga	2CAG- 51D048A	98.667		70.60	
	Feb 17, 2014	M. Baliguas	2CAG 51A 048B	132.99		15.35	
	Feb 18, 2014	V. Tonga	2CAG 101ES 049A, 2CAG 101FS 049A	227.027		0	



4.2 LiDAR Data Processing

4.2.1 Trajectory Computation

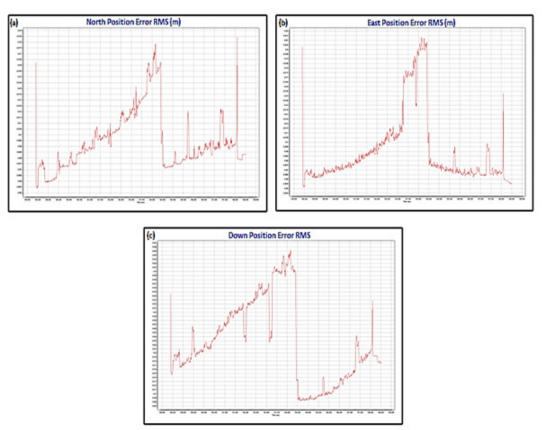


Figure 37. Smoothed Performance Metric Parameters of Cagayan flight

The Smoothed Performance Metric parameters of the Cagayan flight are shown in Figure 37. The x-axis is the time of flight, which is measured by the number of seconds from the midnight of the start of the GPS week. The y-axis is the RMSE value for a particular aircraft position with respect to GPS survey time. The North (Figure 37a) and east (Figure 37b) position RMSE values fall within the prescribed accuracy of 4 centimeters, and all Down (Figure 37c) position RMSE values fall within the prescribed accuracy of 8 centimeters.



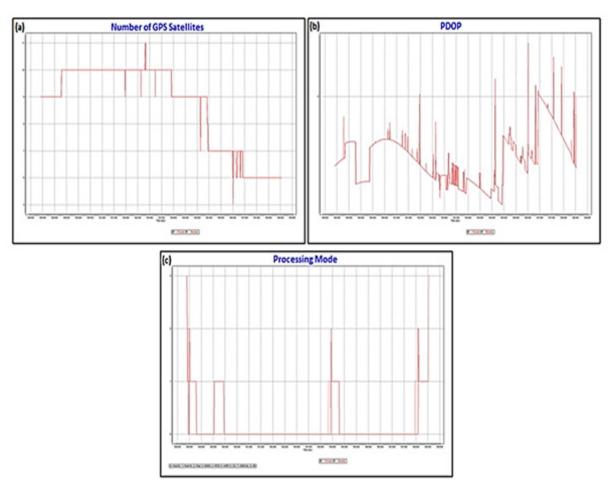


Figure 38. Solution Status Parameters of Cagayan Flight.

The Solution Status parameters of the computed trajectory for Cagayan flight 529P, which are the number of GPS satellites, Positional Dilution of Precision (PDOP), and the GPS processing mode used are shown in Figure 38. The number of GPS satellites (Figure 38a) graph indicates that the number of satellites during the acquisition was between 6 and 10. The PDOP (Figure 38b) value does not exceed the value of 3, indicating optimal GPS geometry. The processing mode (Figure 38c) varies from 0 to 1, the value 0 corresponds to a Fixed, Narrow-Lane mode, which indicates an optimum solution for trajectory computation by POSPac MMS v6.2; the value 1 corresponds a Wide-Lane mode. All of the parameters satisfied the accuracy requirements for optimal trajectory solutions as indicated in the methodology.

4.2.2 LiDAR Point Cloud Computation

The LAS data output contains 12 flight lines, with each flight line containing two channels, a feature of the Pegasus system. The result of the boresight correction standard deviation values for both channel 1 and channel 2 are better than the prescribed 0.001°. The position of the LiDAR system is also accurately computed since all GPS position standard deviations are less than 0.0016 meter. The attitude of the LiDAR system passed accuracy testing since the standard deviation of the corrected roll and pitch values of the IMU attitudes are less than 0.001°.



4.2.3 LiDAR Data Quality Checking

The LAS boundary of the LiDAR data on top of the SRTM elevation data is shown in Figure 39. The map shows gaps in the LiDAR coverage that are attributed to cloud cover present during the survey.

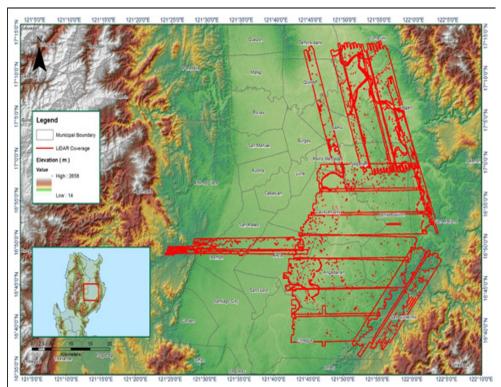


Figure 39. Coverage of LiDAR data for the Cagayan mission

The overlap data for the merged LiDAR data showing the number of channels that pass through a particular location is shown in Figure 40. Since the Pegasus system employs two channels, an average value of 2 (blue) for areas where there are only two overlapping flight lines, and a value of 3 (yellow) or more (red) for areas with three or more overlapping flight lines, are expected. The average data overlap for Cagayan is 42.31%.

The density map for the merged LiDAR data, with the red areas showing the portions of the data that satisfy the 2 points per square meter requirement, is shown in Figure 41. It was determined that 99.63% of the total area satisfied the point density requirement, and the average density for the entire survey area is 3.14 points per square meter.



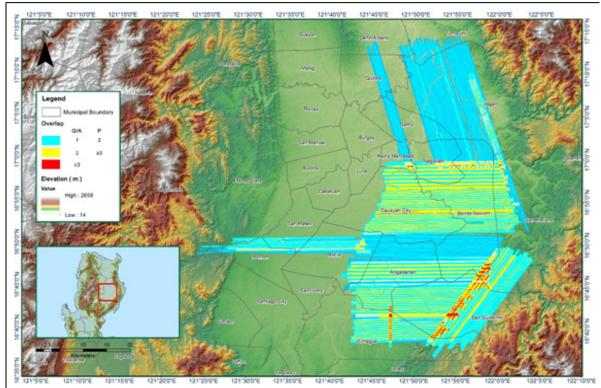


Figure 40. Image of data overlap for the Cagayan mission

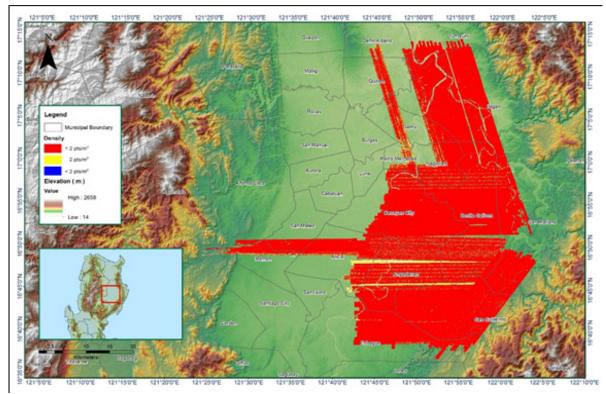


Figure 41. Density map of merged LiDAR data for the Cagayan mission



The elevation difference between overlaps of adjacent flight lines is shown in Figure 42. The default color range is from blue to red, where bright blue areas correspond to a -0.20 m difference, and bright red areas correspond to a +0.20 m difference. Areas with bright red or bright blue need to be investigated further using QT Modeler.

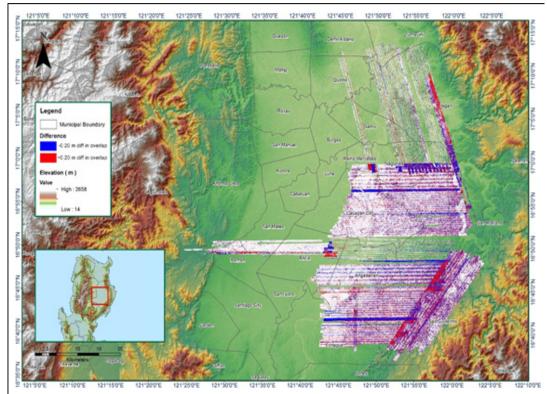


Figure 42. Elevation difference map between flight lines

A screen capture of the LAS data loaded in QT Modeler is shown in Figure 43a. A line graph showing the elevations of the points from all of the flight strips traversed by the profile in red line is shown in Figure 43b. It is evident that there are differences in elevation, but the differences do not exceed the 20-centimeter mark. No reprocessing was necessary for this LiDAR dataset.



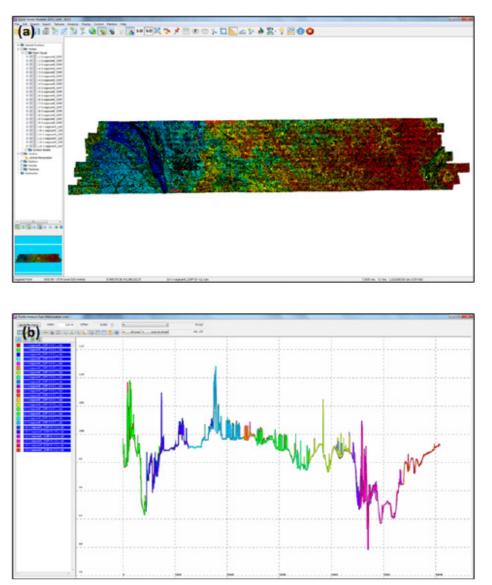


Figure 43. Quality checking with the profile tool of QT Modeler

4.2.4 LiDAR Point Cloud Classification and Rasterization

The block system that TerraScan employed for the LiDAR data is shown in Figure 44a generated a total of 19,119 1 kilometer by 1 kilometer blocks. The final classification of the point cloud for a mission in the Cagayan floodplain is shown in Figure 44b. The number of points classified to the pertinent categories along with other information for the mission is shown in Table 26.



											_																			
							200	199	198	197	196	195	194	193	192	191	190	189	188	187	186	185	184	183	182	181	180	179		
	178	174	173	172	171	170	169	168	167	166	165	164	163	162	161	160	159	158	157	156	155	154	153	152	151	150	149	148		
	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147		
	119	118	117	116	115	114	113	112	111	110	109	108	107	106	105	104	103	102	101	100	099	098	097	090	091	092	093	094	095	
72	073	074	075	076	077	078	079	080	071	081	082	083	084	085	086	087	088	089	057	070	.069	068	067	056	055	054	.053	052	051	17
96	066	065	064	063	062	061	060	059	058	012	014	016	018	019	021	024	026	027	029	031	033	035	038	039	041	043	046	048	049	17
201	002	003	004	005	006	007	008	009	010	011	013	015	017	020	022	023	025	028	030	032	034	036	037	040	042	044	045	047	050	17
							200	199	198	197	196	195	194	193	192	191	190	189	188	187	186	185	184	183	182	181	180	179	1	
			1 1			P 1858	200	199	198	197	196	195	194		192	191		189	188	187	186	185	184	183	182	181	180	179		
										100	100	NG 21		142.2	21.00	100	10.00	100	100		12.2	A 84	66 A	10.18	1000	1000	100	2 W		
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Figure 44. (a) Cagayan floodplain and (b) Cagayan classification results in TerraScan

Pertinent Class	Count
Ground	9,426,294,352
Low Vegetation	12,646,823,530
Medium Vegetation	26,185,909,136
High Vegetation	8,127,853,641
Building	391,440,100
Number of 1km x 1km blocks	19,119
Maximum Height	601.66 m
Minimum Height	21.54 m

Table 26. Cagayan classification results in TerraScan

An isometric view of an area before (a) and after (b) running the classification routines for the mission is shown in Figure 45. The ground points are in brown, the vegetation is in different shades of green, and the buildings are in cyan. It can be seen that residential structures adjacent or even below canopy are classified correctly, due to the density of the LiDAR data.

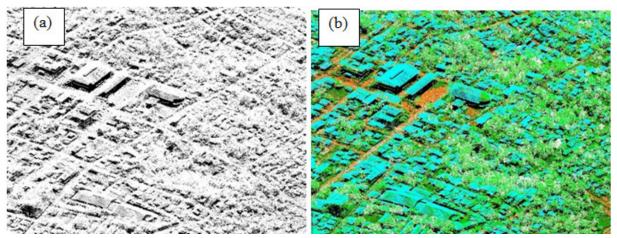


Figure 45. Point cloud (a) before and (b) after classification



4.2.5 DEM Editing and Hydro-correction

Portions of DTMs before and after manual editing are shown in Figure 46. It shows that the embankment might have been drastically cut by the classification routine in Figure 46a and clearly needed to be retrieved to complete the surface as in Figure 46b to allow to hydrologically correct flow of water. A small stream suffers from discontinuity of flow due to an existing bridge in Figure 46c. The bridge is removed also in order to hydrologically correct the flow of water through the river in Figure 46d.

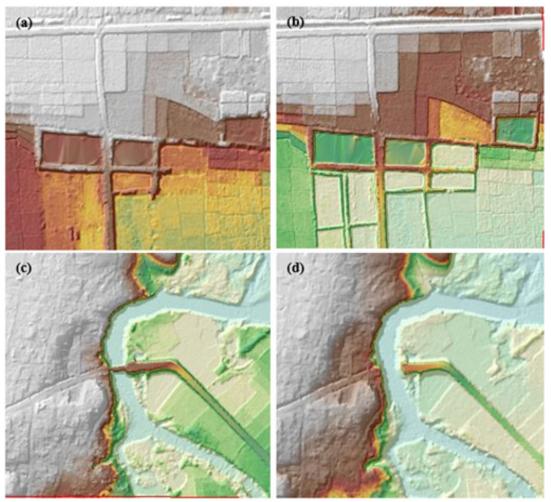


Figure 46. Images of DTMs before and after manual editing



The extent of the validation survey done by the Data Validation Component (DVC) in Cagayan to collect points with which the LiDAR dataset is validated is shown in Figure 47. A total of 5713 control points were collected. The good correlation between the airborne LiDAR elevation values and the ground survey elevation values, which reflects the quality of the LiDAR DTM is shown in Figure 48. The computed RMSE between the LiDAR DTM and the surveyed elevation values is 12.757 centimeters with a standard deviation of 12.756 centimeters. The LE 90 value represents the linear vertical distance that 90% of the sampled DEM points and their respective DVC validation point counterparts should be found from each other. Other statistical information can be found in Table 27. The final DTM and extent of the bathymetric survey done along the river is shown in Figure 49.

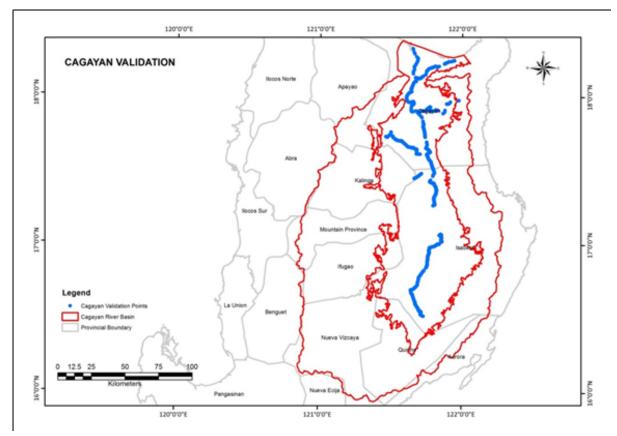


Figure 47. Map of Cagayan River System with validation survey shown in blue



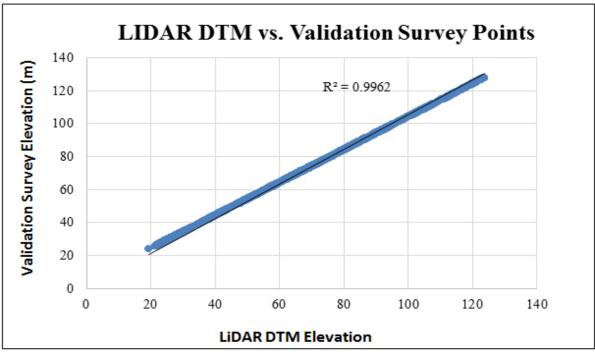


Figure 48. One-one Correlation plot between topographic and LiDAR data

 Table 27. Statistical values for calibration of flights.

Statistical Information	Values (cm)
Min	-29.828
Max	27.385
RMSE	12.757
Stdev	12.756
LE90	16.583



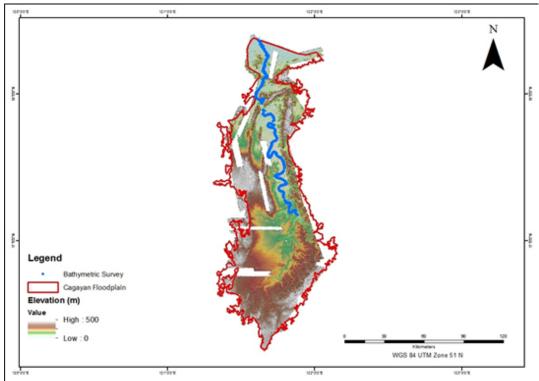


Figure 49. Final DTM of Cagayan with validation survey shown in blue

The floodplain extent for Cagayan is also presented, showing the completeness of the LiDAR dataset and DSM produced, is shown in Figure 50. Samples of 1 kilometer by 1 kilometer of DSM and DTM are shown in Figure 51 and Figure 52, respectively.

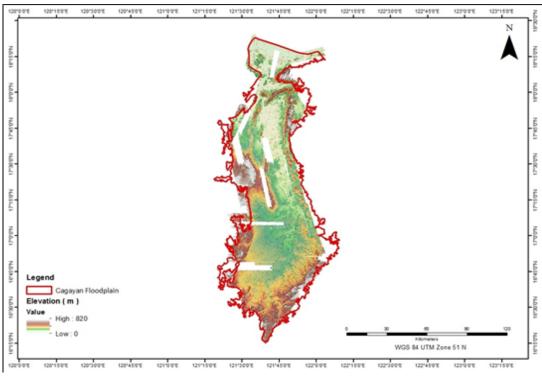


Figure 50. Final DSM in Cagayan



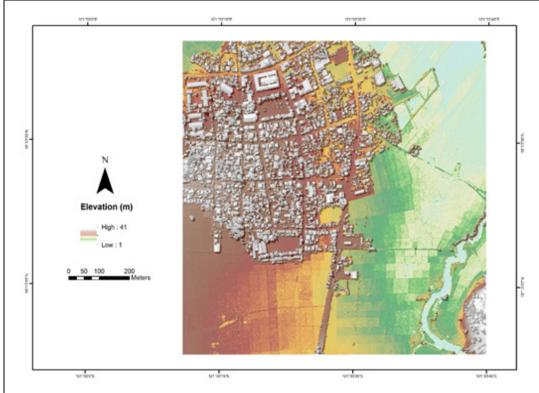


Figure 51. Sample 1x1 square kilometer DSM

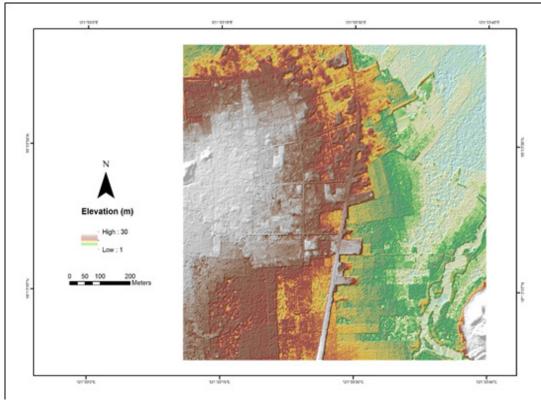


Figure 52. Sample 1x1 square kilometer DTM



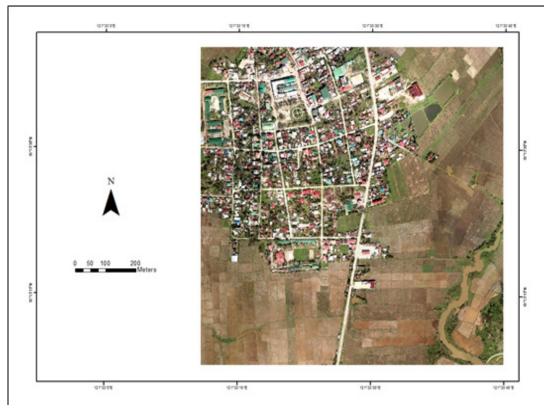


Figure 53. Image of data overlap for the Cagayan mission









OPTECH TECHNICAL SPECIFICATION OF THE PEGASUS SENSOR

Parameter	Specification				
Operational envelope (1,2,3,4)	150-5000 m AGL, nominal				
Laser wavelength	1064 nm				
Horizontal accuracy (2)	1/5,500 x altitude, 1σ				
Elevation accuracy (2)	< 5-20 cm, 1σ				
Effective laser repetition rate	Programmable, 100-500 kHz				
Position and orientation system	POS AV ™AP50 (OEM)				
Scan width (FOV)	Programmable, 0-75 °				
Scan frequency (5)	Programmable, 0-140 Hz (effective)				
Sensor scan product	800 maximum				
Beam divergence	0.25 mrad (1/e)				
Roll compensation	Programmable, ±37° (FOV dependent)				
Vertical target separation distance	<0.7 m				
Range capture	Up to 4 range measurements, including 1st, 2nd, 3rd, and last returns				
Intensity capture	Up to 4 intensity returns for each pulse, includ- ing last (12 bit)				
Image capture	5 MP interline camera (standard); 60 MP full frame (optional)				
Full waveform capture	12-bit Optech IWD-2 Intelligent Waveform Digi- tizer				
Data storage	Removable solid state disk SSD (SATA II)				
Power requirements	28 V, 800 W, 30 A				
Dimensions and weight	Sensor: 630 x 540 x 450 mm; 65 kg;				
Dimensions and weight	Control rack: 650 x 590 x 490 mm; 46 kg				
Operating Temperature	-10°C to +35°C				
Relative humidity	0-95% non-condensing				



OPTECH TECHNICAL SPECIFICATION OF THE D-8900 AERIAL DIGITAL CAMERA

Parameter	Specification				
	Camera Head				
Sensor type	60 Mpix full frame CCD, RGB				
Sensor format (H x V)	8, 984 x 6, 732 pixels				
Pixel size	6μm x 6 μm				
Frame rate	1 frame/2 sec.				
FMC	Electro-mechanical, driven by piezo technology (patented)				
Shutter	Electro-mechanical iris mechanism 1/125 to 1/500++ sec. f-stops: 5.6, 8, 11, 16				
Lenses	50 mm/70 mm/120 mm/210 mm				
Filter	Color and near-infrared removable filters				
Dimensions (H x W x D)	200 x 150 x 120 mm (70 mm lens)				
Weight	~4.5 kg (70 mm lens)				
	Controller Unit				
Computer	Mini-ITX RoHS-compliant small-form-factor embedded computers with AMD TurionTM 64 X2 CPU 4 GB RAM, 4 GB flash disk local storage IEEE 1394 Firewire interface				
Removable storage unit	~500 GB solid state drives, 8,000 images				
Power consumption	~8 A, 168 W				
Dimensions	2U full rack; 88 x 448 x 493 mm				
Weight	~15 kg				
	Image Pre-Processing Software				
Capture One	Radiometric control and format conversion, TIFF or JPEG				
Image output	8,984 x 6,732 pixels 8 or 16 bits per channel (180 MB or 360 MB per image)				



THE SURVEY TEAM

Data Acquisition Component Sub-team	Designation	Name	Agency/Affiliation
Data Acquisition Component Leader	Data Component Project Leader -I	ENGR. CZAR JAKIRI S. SARMIENTO	UP-TCAGP
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Survey Supervisor	Supervising Science Research Specialist	LOVELY ACUNA	UP TCAGP
	Supervising Science Research Specialist	ENGR. LOVELYN ASUNCION	UP TCAGP
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LIDAR Operation	Senior Science Re- search Specialist	JASMINE ALVIAR	UP TCAGP
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	Research Associate	DAN CHRISTOFFER ALDOVINO	UP TCAGP
	Research Associate	MARVY FUNTILON	UP TCAGP
	Research Associate	PAULINE JOANNE ARCEO	UP TCAGP
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	Research Associate	JULIE PEARL MARS	UP TCAGP
	Research Associate	ENGR. IRO NIEL ROXAS	UP TCAGP
	Research Associate	PATRICIA YSABEL ALCANTARA	UP TCAGP
Course 1 Cou	Research Associate	RENAN PUNTO	UP TCAGP
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THE SURVEY TEAM

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LIDAR OPERATION	CO-PILOT	CAPT. MARK TANGONAN	ASIAN AEROSPACE CORPORATION (AAC)



ANNEX D. DATA TRANSFER SHEET FOR CAGAYAN FLOODPLAIN

10					8	Feb 18, 2014	ſ			Ĩ	CHERATO				
	SENCOR	RAI	RAW LAS	Const and	RAW	NORSEW	BANGE	DIGITIZE	BASE STATION (5)	1.1.1	R	2	Fight Plans		SERVERLOCATION
		ACTUAL (MB)	KML (KB)		(inc)	are (xe)			6	GE NFO	S (DPC LOOS) (Bytes)	Actual (KB)	Koni (KB)	CASI (UB)	
	Gemini	NUA	6303	281MB	46.408	30543	23.5	107		12.3	450		12	NIA	WFRENKSamonomer/A
	Gemini	NA	31803	14048	23.708	18848	13.2	NIN		12.3	808		a	NIN	돌용
	Gemini	N/A	104	100	NA	NN	3.64	N.	2.42	-	880	72.8	7.9	30.4	21.23
2CAG10105035A	Gemini	N/A	178	152	NN	NN	10	NIA	9/16	143	305	010	613	47.9	WFBERNAS/geostocage//Ai
2CAG101A037A & 2CAG111C037A	Gemini	N/A	43.3 & 140	210	NN	MN	671	NA	NA 1.15 & 9.50	396	121	433.8140	445 & 333	68.4	
2CAG101A0378	Gemini	N/A	210	285	NIA	NN	15.9	NIN	570408 & 9.50	305	404	100	11,4KB	722	WERTOWS/servicement/http: dome Rev/200505
2C4G51D038A & 2C4G101D5038A	Gemini	H/H	251	176	N.	ź	2.61	1 mg	92758 & BAT22	53	608	265.6 179	217 & 13.4	60.7	W/REDNAS/geosterate2/A/ dome_Bee/205205
2CAG101A5039A & 2CAG11185039A	Gemini	N/N	148	-	NN	NN	100	N. A	809KB & 9.85	20	330	204	ΨZ	+	MPRUNAS anostorade 2.A. doorse Ban/202000
2C4G1016040A & 2C4G101H040A	Gemini	N/N	327	260	NN	12	10. W		NIN 1.12 & 7.39	552	467	453.6.300	605	515	Writth40 accordents/
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					\$	Verified by									
					2 6 3	Name Signature Postion Cate	1	ADA	JANE PALETO	e.					

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SERVER LOCATION Z:\Airborne_ Raw\476G Z:\Airborne_ Raw\480G Z:\Airborne_ Raw\482G OPERATOR COMMENTS FLIGHT (DPC LOGS) PLAN 4.68 KB 843 BYTES 3.94 KB 550 BYTES 3.72 KB 556 BYTES BASE BIGITIZER STATION(S) 3.02 37.2 MB 20.2 MB 29 MB adllago 5.07 GB N/A Name/Signature 8cnjg/min Jula Position <u>5(P.</u> Date 09(1) N/A NA 9.77 GB 16.1 GB MISSION LOG FILE RANGE 383 KB 196 MB 16.1 GB 129 KB 541 KB 163 MB 19.4 GB 187 KB 750 KB 268 MB 16.7 GB 342 KB SEPT9G DATA TRANSFER SHEET Sep 9, 2013 Received by RAW LOGS POS antoria Weth RAW NIA NIA AN MISSION NAME SENSOR 2C161K249B GEMINI 2C1610250B GEMINI 2C161J251B GEMINI Name/Signature Received from Position FLIGHT NO. Sep 6, 2013 480G Sep 5, 2013 476G Sep 7, 2013 484G DATE

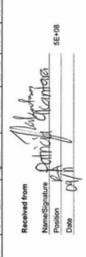


Page 1

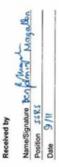


					DATA TRANSFER SHEET Sep 10, 2013	CANSFER Sep 10, 2013	ER SH	EET				1			
DATE	FLIGHT NO.	MISSION	SENSOR	OPERATOR	RAW	LOGS	POS	RAW MAGES	MISSION LOG FILE RANGE	RANGE	DIGITIZER	BASE DIGITIZER STATION(S)	OPERATOR COMMENTS (DPC LOGS)	OPERATOR COMMENTS (DPC LOGS) FLIGHT PLAN LOCATION	SERVER
Sep 4, 2013 479P	479P	1C161H248A	Pegasus	M. Funtion	94.3 MB		1.44 MB 190 MB	NIA	NVA	16.4 GB	NIA	34.8 MB	486 BYTES	613 KB	Z:VAirborne_ Raw\479P
Sep 5, 2013 481P	481P	1C161I249A	Pegasus	J. Alviar	115 MB	1.53 MB	.53 MB 203 MB N/A	N/A	NA	20.3 GB	NIA	37.2 MB	1.02 KB	466 KB	Z:VAirborne_ Raw\481P
Sep 5, 2013 483P	483P	1C161P249B	Pegasus	M. Funtion	64.1 MB BYTES	0 BYTES	143 MB N/A		NIA	11.2 GB	NIA	37.2 MB	471 BYTES	18.9 KB	Z:VAirborne_ Raw/483P
Sep 6, 2013 485P	485P	1C1611250A	Pegasus	M. Funtion	252 MB	1.50 MB	50 MB 232 MB	NA	NIA	24.9 GB	NIA	32.8 MB	481 BYTES	466 KB	Z:VAirborne_ Raw/485P
Sep 6, 2013 487P	487P	1C161F250B	Pegasus	J. Alviar	175 MB	923 KB	138 MB N/A	NIA	NIA	16.8 GB	NIA	32.8 MB	497 BYTES	395 KB	Z:VAirborne_ Raw/487P
Sep 7, 2013 491P	491P	1C1610251A	Pegasus	M. Funtion	128 MB 990 KB 163 MB N/A	990 KB	163 MB		NIA	13.0 GB	NIA	5.03 MB	377 BYTES	20.4 KB	Z:VAirborne_ Raw/491P

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DATE	NO.	NAME	SENSOR	SENSOR RAW LAS LOGS		POS	IMAGES	MAGES LOG FILE RANGE	RANGE	DIGITIZER (S)	(S)	(S) (DPC LOGS) PLAN	PLAN	SERVER
Sep 11, 2013 501	501P	1C161L254A	Pegasus	4A Pegasus 39.0 MB 464 KB 80 MB	464 KB	80 MB	N/A	N/A	4.52 GB N/A		9.06 MB	9.06 MB 370 BYTES 579 KB	579 KB	Z:\Airborne_ Raw\501P
Sep 11, 2013 503	503P	1C161L254B	Pegasus	4B Pegasus 87.5 MB 686 KB	686 KB	111 MB N/A	N/A	N/A	8.73 GB N/A		9.06 MB	9.06 MB 402 BYTES 579 KB	579 KB	Z:\Airborne_ Raw\503P
Sep 12, 2013 507	507P	1C161M255A	Pegasus	5A Pegasus 201 MB 1.15 MB 178 MB N/A	1.15 MB	178 MB		N/A	20.0 GB N/A		6.27 MB	6.27 MB 1000 BYTES 21.8 KB	21.8 KB	Z:\Airborne_ Raw\507P



Received by Name/Signature &c. Amin Magalton Position 52 45



Annex D

		er.	er 1
	SERVER	Z:\Airborne_R aw\545P	Z:\Airborne_R aw\547P
	FLIGHT		24.5 KB
	DIGITIZE STATION (OPERATOR STATION (COMMENTS R S) (DPC LOGS)	235 BYTES	12.5 MB 370 BYTES
	BASE STATION(S)	12.5 MB 235 BYTES	12.5 MB
	DIGITIZE	N/A	N/A
	RANGE	19.7 GB	17.3 GB N/A
_	MISSION LOG FILE RANGE	N/A	N/A
DATA TRANSFER SHEET Sep 24, 2013	RAW IMAGES	N/A	N/A
RANSFER Sep 24, 2013	POS	165 MB	179 MB
ATA TE		1.26 MB	1.05 MB
	NAME SENSOR RAW LAS LOGS	PEGASUS 204 MB 1.26 MB 165 MB N/A	PEGASUS 178 MB 1.05 MB 179 MB N/A
	SENSOR	PEGASUS	PEGASUS
	MISSION NAME	545 1C171H265A	547 1C171D2658
	FLIGHT NO.		
	DATE	22-Sep	22-Sep



Received by

Name/Signature Benjamin Mayeren/f./myll Position 52 KS



	SERVER	LOCATIO	Z:\Airborn e_Raw\54 5P	Z:\Airborn e_Raw\54 7P	Z:\Airborn e_Raw\52 9P	Z:\Airborn e_Raw\53 3P	Z:\Airborn e_Raw\53 7P		
		FLIGHT					30.5 KB		
	OPERATO R COMMENT		235 BYTES 24.2 KB	370 BYTES 24.5 KB	427 BYTES 32.8 KB	438 BYTES 28.7 KB	503 BYTES 30.5 KB		Jel
	BASE	DIGITIZE STATION(S (DPC R S) LOGS)	12.5 MB	12.5 MB			5.15 MB		Name/Signature Ecymen Magaller/fr./mayle Position 52RS Date 9/24
		DIGITIZE R	A/A	N/A			N/A		arun Maya
		RANGE	19.7 GB	17.3 GB			22.4 GB	by	nature Beny- SSR S 9124
L		MISSION LOG FILE RANGE	N/A	N/A	N/A	N/A	N/A	Received by	Name/Signature Position Δsk J Date ¶ zγ
DATA TRANSFER SHEET Sep 24, 2013		RAW IMAGES	N/A	N/A	N/A	N/A	N/A		
RANSFER Sep 24, 2013		POS	165 MB	179 MB	191 MB	222 MB			त्राद
ATA TR		LOGS	1.26 MB	1.05 MB	1.23 MB	1.46 MB	1.68 MB		ha di Cam
Ö		RAW LAS LOGS	204 MB				131 MB	mo	Pature Pathic
		SENSOR	265A PEGASUS 204 MB	PEGASUS	PEGASUS	PEGASUS	PEGASUS	Received from	Name/Signature Rethild of Confined Position CA Date ON 24
		MISSION		547 1C171D265B PEGASUS 178 MB	529 1C171E260A PEGASUS 236 MB	533 1C171F261A PEGASUS 265 MB	537 1C171G262A PEGASUS 131 MB 1.68 MB		
		FLIGHT NO.							
		DATE	22-Sep	22-Sep	17-Sep	18-Sep	19-Sep		

Name Signature trajarin Magating for mage

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Name/Signature Joi DAF F. PRI CTD Position 55R5 Date 01/44

Annex D

	SERVER LOCATIO N	Z:\Airborn e_Raw\59 5G	Z:\Airborn e_Raw\59 7G	Z:\Airborn e_Raw\59 9G	11			
	FLIGHT	3.70 KB	7.52 KB	7.52 KB			11	
	OPERAT OR COMMEN TS (DPC LOGS)	257 BYTE\$3.70 KB	364 BYTE\$7.52 KB	120 BYTE\$7.52 KB	4		378	
	OPERAT OR BASE COMMEN S TATION(TS (DPC S) LOGS)	14.8 MB	10.4 MB	10.4 MB	the offer		P	
	DIGITIZE R	N/A	N/A	N/A	Name/Signature Jolph PRIETD Position 55 K 5 Date 10 0 813		t.	
			35.3 GB		ature Joloja 55 K S 10 0 8 (3		K LELLO X	
SHEET	MISSION	97.1 KB	438 KB	67 KB	Name/Sign Position Date		JOIDA PRIETO A	
DATA TRANSFER SHEET 0ct 7, 2013	RAW	11.5 GB	58.1 GB	8.65 GB		>	28	
TRAI Oct	POS	231 MB	251 MB	87.3 MB	1 Containe	Verified by	Name/Signature Position Date	
DA'	LOGS	415 KB	954 KB	157 KB	icia glo			
	RAW LAS LOGS	N/A	A/N	N/A	Name/Signature Chivid & Position Ki			
	SENSOR	Gamini	Gemini	Gemini	Name/Signature Position		A.	-
ŝ.	MISSION NAME SENSOR	FG5 2CAGS276A	597 2CAGHLIS277A	599 2CAGLMS277B			A started	a a a a
	FLIGHT					Q	tit a	411/210
	DATE	2	4-Oct	4-Oct			(TA)	

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		Z:\Airborne Raw\555P	Z:\Airborne Raw\559P	Z:\Airborne Raw\575P	Z:\Airborne Raw\577P	Z:\Airborne Raw\581P		·				
	BASE STATION (S)	9.62 MB	9.91 MB	5.4 MB	10.2 MB	12.3 GB		* . 0				
	DIGITIZER	N/A	N/A	N/A	N/A	NIA		1996 1996 1997 1997 1997 1997 1997 1997		1		
	RANGE	21.1 GB	16.5 GB	12.2 GB	15.6 GB	17.6 GB	Ā	sture SSE b 4		after a		
	MISSION LOG FILE RANGE	N/A	N/A	N/A	N/A	N/A	Received by	Name/Signature Position Date		Jair P. 1. R. E. W		
	RAW IMAGES	N/A	N/A	N/A	N/A	N/A						
Oct 8, 2013	POS	192 MB	174 MB	138 MB	183 MB	159 MB		9/12	Verified by	Name/Signature Position Date		
ŏ		1.23 MB	1.08 MB	851 KB	0.98 MB	923 KB	AL L	10 alcan	-	240		
	SENSOR RAW LAS LOGS	217 MB	170 MB	121 MB	154 MB		rom	Name/Signature t(h)(d() () () () () () () () () (
	SENSOR					Pegasus	Received from	Name/Sign: Position Date				
	MISSION NAME	ICAG1711266A Pegasus	ICAG171J267A Pegasus	1CAG171K271A Pegasus	1CAG171L272A Pegasus	1CAG161KS273A Pegasus 135 MB						
	FLIGHT NO.											
	DATE	23-Sep 555P	24-Sep 559P	28-Sep 575P	29-Sep 577P	30-Sep 581P						



				DAIA IKANSFEK SHEEI Oct 8, 2013	Oct 8, 2013	3	5		¢		
	FLIGHT	MISSION	RAW			RAW	MISSION		DIGITIZE	BASE SERVEF	SERVER
DATE	NO.	NAME	LAS	LOGS	POS	IMAGES	FILE	RANGE	æ	(S)	NO
Sep 23, 2013 555P	555P	1C171I266A	217 MB	1.23 MB	192 MB	N/A	N/A	21.1 GB	N/A	9.62 MB	Z:\Airborn e_Raw\55 5P
Sep 24, 2013 559P	559P	1C171J267A	170 MB	1.08 MB	174 MB	N/A	A/A	16.5 GB	N/A	9.91 MB	Z:\Airborn e_Raw\55 9P
Sep 28, 2013 575P	575P	1C171K271A	121 MB	851 KB	138 MB	N/A	N/A	12.2 GB	N/A	5.4 MB	Z:VAirborn e_Raw\57 5P
Sep 29, 2013 577P	577P	1C171L272A	154 MB	0.98 MB	183 MB	N/A	N/A	15.6 GB	N/A	10.2 MB	Z:\Airborn e_Raw\57 7P
Sep 30, 2013 581P	581P	1C161KS273A 135 MB		923 KB	159 MB	N/A	N/A	17.6 GB	N/A	12.3 GB	Z:\Airborn e_Raw\58 1P

Received from

Name/Signature C. 640 Min Ser

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Name/Signature JolbA PRIETD N Position SiRS Date Io0813

Annex D

	SERVER	Z:\Airborne_ Raw/613G	Z:\Airbome_ Raw\617G	Z:\Airborne_ Raw/619G			
	FLIGHT	324 KB	349 KB	117 KB	1		
	BASE OPERATOR STATION COMMENTS FLIGH (S) (DPC LOGS) PLAN	635 BYTES	668 BYTES	453 BYTES	for		
	BASE STATION (S)	65.5 MB	12.4 MB	12.4 MB	I KIED		1
	DIGITIZE R	N/A	N/A	92.3 GB	5225 5225		trul
- L	RANGE	32.4 GB	20.1 GB	12.5 GB	by nature		1670 J
R SHEE	MISSION LOG FILE RANGE	280 KB	370 KB	276 KB	Received by Name/Signature Position Date		1161 1161
DATA TRANSFER SHEET Oct 11, 2013	RAW IMAGES	84 GB	49 GB	34.5 GB	5	v	
	POS	237 MB	231 MB	104 MB	Received from Meentank Namersignature Pathyly of all Cantorn Date 10/14/13	Verified by	Name/Signature Position Date
	SOOL	1.34 MB	792 KB	564 KB	ngta d		
	SENSOR RAW LAS LOGS	N/A	N/A	N/A	i from mature Pet 10/11/13		
	SENSOR	GEMINI	GEMINI	GEMINI	Received Name/Sign Position Date		
	MISSION NAME	613 2CAG161N0281/GEMINI	617 2CAG161QLS282GEMINI	619 2CAG161E282B			
	FLIGHT NO.						
	DATE	8-Oct	9-Oct	9-0ct			

HEET	
DATA TRANSFER S	Oct 18, 2013

DATE	FLIGHT NO.	MISSION NAME	SENSOR	RAW LAS LOGS	rogs	POS	RAW	MISSION LOG FILE RANGE	RANGE	DIGITIZE	BASE STATION(S)	OPERATOR LOGS (OPLOG)	FLIGHT PLAN	SERVER
Oct 13, 2013 635G	635G	2CAG161D286A GEMINI	GEMINI	MIN	1.25 MB		87.3GB	706KB	35.1GB	NA	ISB 1224-3.37MB ISB 1228-392KB ISB3634-4.19MB PISB 2A-1.08MB PISB 28-168KB	9068	1.26MB	z'Mirborne_Ra wi635G
Oct 14, 2013 637G	6376	2CAG221A287A	GEMINI	NN	1.27MB	89/266	85.4GB	693KB	39.1GB	VIN	ISB 4- 4,96MB ISB 3634A- 4,36MB ISB3634B- 2,70MB	6418	1.32MB	z'Mirborne_Ra wi637G
Oct 14, 2013 639G	639G	2CAG221B287B GEMINI	GEMINI	NIA	517KB	239MB	31.1GB	244KB	14.8GB	MM	ISB 4-4.96MB ISB 3634A-4.36MB ISB3634B-2.70MB	4438	SOBKB	z,VAirborne_Ra w/639G
Oct 15, 2013 641G	641G	2CAG221C288A	GEMIN	VIN	1.12MB	394MB	69GB	566KB	33.8GB	NA	BMSB 364-806KB ISB 4-4,91MB MC 1A- 1.0MB MC 1B- 245KB PPK- 911KB	8048	942KB	z\Airborne_Ra wi641G
Oct 15, 2013 643G	643G	2CA/5221D2888	GEMIN	NIA	391KB	220MB	18.2GB	1.29KB	10.6GB	NN	BMISB 364-89648 ISB 4-4.91MB MC 1A-1.0MB MC 1B-24540B	3768	18548	z'Mirborne_Ra w/643G



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Name BENJAMIA Magaluan 10121/2015 Possion SCRAM



	SERVER	LOCATION		Z:Withome	Contourne						Z'Mittome	Concorner									Z'Mittome_	Raw651G						Z'Mittome	HURWIDOUG			Z'Wrborne_	1000gmbh
		Kmi		10.2 KB							8.73KB										8.04KB							12.1KB				8.01KB	
	FLIGHT PLAN	Actual Plan K		64.6 KB							197KB										80.09KB							7,05608				5.19MB	
	OPERATOR	(DPC LOGS)		793 BYTES							861 BYTES										405 BYTES							648 BYTES				410 BYTES	
		Base Info	23 BYTES		10 BYTES	55 BYTES		12 BYTES					28 BYTES				55 BYTES		12 BYTES				28 BYTES				10 BYTES		An entreme	10 BY 1ES	10 BYTES		10 BYTES
	BASE STATION(S)	Base	SB-4 - 5.20MB	MC-1-B-4,75MB	MC-1-C-2.11MB backup)	ISB-4 - 5,74MB	MC-1-A-529KB	(backup)	(backup)	- A M00-B21	3.13MB (CONTIGENCY)	ISB-3634 B -	3.97MB (CONTIGENCY)	PISB -2 A - 1.14MB	(CONTIGENCY)	PISB -2B- 112KB (CONTIGENCY)	ISB-4 - 5.74MB	MC-1-A - 52940B	MC-1-B - 89540B	ISB-3634 A -	3.13MB	ISB-3634 B -	(CONTIGENCY)	PISB -2 A - 1.14MB	Back - 20, 11242	(CONTIGENCY)	SB-4 - 5.17MB	MC-1-4-16168	backup)	MC-1 - B- 1.24MB (beckup)	ISB-4 - 5.17 MB	MC-1-A - 151KB	MC-1-B- 1.24MB (beckup)
teer	Contraction of the local division of the loc	UNUI ICEN	_	NN	15.0						NIN						-	1	<u></u>	-910	NIN			M. C	214			157G8				MN	
DATA TRANSFER SHEET Oct 29, 2013		Lower		31,8GB							32.408										10.8GB							21,208				6.6708	
A TRAN	MISSION	LOG FILE		565KB							490KB										142KB							477KB				136KB	
DAT	RAW	IMAGES		67,008							57.1GB										18.3GB							57GB				13.608	
	ave	2		405MB							264MB										121MB							280MB				113MB	
	9001	-		1.08MB							1.27MB										33460							0 BYTES				38.0MB	
	DALL AC			NIA							NIA										NIN							NIN				NIN	
	erver o	OCHOUR		GEMINI							GEMINI										GEMINI							GEMINI				GEMINI	
				2CAG231A289A							2CAG221EBS290A										2CAG23182908							2CAG231D291A				2CAG231BS291B	
	FLIGHT	NO.		645G							6490										661G							663G				665G	
	PATE O			Oct 16, 2013							Oct 17, 2013										Oct 17, 2013							Oct 18, 2013				Oct 18, 2013	



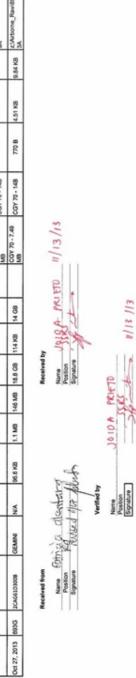
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NameSignature JOIDA PRIETO/AC Verified by

Page 2 of 2

								DATA	DATA TRANSFER SHEET Oct 31, 2013	3 SHEET							
DATE	FLIGHT NO.	MISSION NAME	SENSOR	RAI	RAW LAS	LOG5	POS	RAW	MISSION NO.	RANGE	DIGITIZER	BASE STATION(S)	VTION(S)	OPERATOR LOGS	FLIGHT PLAN	NUN	SERVER
				Output	KML (swath)				_			BASE STATION(S) Base Into (tat)	Base Info (,tut)		Actual	KML	
041 23, 2013 (6650	ensis	3LMS and 3CAG101HS286A	AQUARUS	NN	3CAG111C - 238/08 3LMS296A - 15.7/08	617.4 KB	244 MB	WW	WN	14.8 GB NA		CGY 57 - 4.45 MB ISB 90 - 3.62 MB	30 B	2788	296A - 4.89KB 3LMS - 3.33KB	5.21KB	z:/Airborne_Rawl00 8A
Oct 25, 2013		2CAG1115298A	GEMINI	NIN	894 KB	1.30 MB	290 MB	81.7 GB	652 KB	42 GB	207 GB	ISB 90 - 5.87 MB ISB 90 - 19B	ISB 90 - 19B	503 B	4.21 MB	17168	z:/Aitborne_Rawl68 3A
Oct 25, 2013	685G	2CAG111002988	GEMINI	NIA	256KB	508 KB	118 MB	28.8 GB	246 KB	1608	8.77.6	ISB 90 - 5.87 MB ISB 90 - 19B	ISB 90 - 19B	6178	4.04KB	8.31KB	z;Mittome_Rawl68 SA
Oct 26, 2013	6690	2CAG111C2998	OEMINI	WN	231KB	1.01MB	110MB	17.6 GB	547 KB	11.7 GB N/A		ISB 50 - 6.05MB CGY 70 - 6.41 MB	ISB 90 - 198 CGY 70 - 148	8 697	3.15 KB	7.21 KB	z;Mittome_Rawl68 9A



	DATE	FUGHT	MISSION NAME	SENSOR	8	RAW LAS	LOGS	POS	RAW	MISSION	RANGE	DIGITIZER	BASE STATION(S)	ATION(S)	OPERATOR LOGS (OPLOG)	FLIGHT PLAN	NUN	SERVER
		i			Output	KML (swath)							BASE STATION(S) Base Info (100)	Base Info (.bt)		Actual	KML	
/	Oct 25, 2013	674A	3CA651E298A	AQUARIUS	NIN	NIA	715 KB	205 MB	MA	MIN	20 GB	NW	CGY 70 - 8.2 MB	CGY 70 - 14B	6738	5.05H2B	357708	z'Mittome_Rawl67 4A
1	Oct 25, 2013	676A	30/651£2988	NOUNRIUS	NIA	NIN	242 KB	102 MB	MN	MA	6.75 GB	NIN	CGY 70 - 8.2 MB CGY 70 - 14B	CGY 70 - 14B	NIA	5.05408	116 KB	z'Virborne_Raw/67 6A
1	Oct 26, 2013	678A	3CAG51F299A	AQUARIUS	NIN	NIA	547 KB	228 MB	NIN	NIN	15.3 GB	NIN	CGY 70-6.41 MB CGY 70 - 14B	CGY 70 - 14B	62 B	5, 10 KB	260 KB	z, Mirborne_Raw/67 8A
1	Oct 26, 2013	680.4	3CAG51F2998	AQUARIUS	NN	NIA	422 KB	155 MB	NIN	NIA	11.6 GB	NN	CGY 70-6.41 MB CGY 70 - 14B	CGY 70 - 14B	494.8	5.10 KB	207 KB	z'Mittome_Raw/68 0A
1	Oct 28, 2013	687G	2CAG301H299A	GEMINI	V N	258KB	402KB	212 MB	NIN	2.48 KB	24.208	NN	CAG 70 - 6.05MB CAG 70 - 148 ISB 90 - 5.87 MB ISB 90 - 198	CAG 70 -148 ISB 90 - 198	8909	3,743	6.90KB	z. Mittome_Raw/68 7.A
1	Oct 27, 2013	691G	2CAG515300A	GEMINI	ViN	350H0B	623 KB	261 MB	ViN	1.9608	23.2GB	NA	CGY 70 - 7,49 MB	CGY 70 - 148	NIN	4.61 KB	360KB	z'Aitome_Raw69 1A
2	Oct 27, 2013	682A	3CMG111C5300A	AQUARIUS	NN	NIN	971 KB	241 MB	MIN	MN	19.7 GB	MA	ISB 90 - 5.87 MB	ISB 90 - 41 B	576 B	3.25 KB	364 KB	z'Aitome_Rawl68 2A
2	Oct 27, 2013	6844	3CA6111053008	AQUARIUS	NIN	NN	449 KB	176 MB	NIN	MM	13.9 GB	MIN	ISB 90 - 5.87 MB	ISB \$0 - 41 B	1248	2.33 KB	248 KB	z;Mittome_Raw/66 4A

DATA TRANSFER SHEET Nov 5, 2013

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RIETO 1513 Name Jorga Position Verified by Name JAIDA PRIETA Peakon Sprace

Annex D

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TAT		FLIGHT	WISSION NAME	SENSOR	RAN	RAW LAS	roas	POS	RAW	MISSION RANGE	RANGE	DIGITIZER	BASE STATION(S)		OPERATOR LOGS (OPLOG)	FLIGHT PLAN	ILAN	SERVER
	_	Ň.			Output	KML (swath)							BASE STATION(S) Base Info (.bd)			Actual	KML	
Oct 22,	Oct 22, 2013 664A		SCAGR295A	AQUARIUS	MIN	NN	321 KB 159 MB N/A	180 MB	NN	NIN	7.71 GB N/A		CGY 57-5.81 MB ISB 3634-4.84 MB	32.8	502 B	9.87 MB	126 KB	z'Nitome_Rawl66
Oct 22, 2013	2013 67	6730 20	2CAG361AB295A	OEMNI	WN	VIN	450 KB	167 MB 57 GB		80 KB	13.5 GB NIA		CGY 57-5.81 MB ISB 3634-4.64 33 B MB	33.8	529 8	4.07 KB	230KB	90KB 2. Mittome_Rawl67



Received by Name JoIDA PATETO Posion 15 A3

UTAIRY PRIETU Vertified by Name Position Signature

									A								
DATE	FUGHT	MISSION NAME	SENSOR	5	RAW LAS	rogs	504	RAW	MISSION	RANGE	DIGITZER	BASE STATION(S)	(Tiow(S)	OPERATOR LOGS	FLIGHT PLAN	PLAN	SURVER
				Output	KML (swath)							BASE STATION(S)	Base Info (tot)	lannah	Actual	K	LOCATION
Oct 22, 2013	664A	SCAGR295A	NUMBUS	MM	NN	321 KB	169 MB	NIN	NIN	7.71 GB	NIN	CGY 57-5.81 MB ISB 3634-4.84 MB	32.0	502 B	9.67 KB	126 KB	z: Mittome_Rawl66
Oct 22, 2013	673G	2CA0161A8295A	GEMINI	NIN	WN	460 KB	167 MB	57 GB	189 KB	13.5 GB	NIN	CGY 57-5.81 MB ISB 3634-4.84 MB	33 B	8 605	4.07 KB	29048	z'Mittome_Rawl67 3A
Oct 25, 2013	674A	3CAG61CF98A	AQUARUS	NN	NIA	715 KB	265 MB	NIN	NIA	20 GB	NN	CGY 70 - 8.2 MB	CGY 70 - 148	6738	5.06KB	36748	z'Mitome_Rawl67
Oct 25, 2013	676A	BCAG53CD52988	NOUNRUCS	NN	NA	242 KB	102 MB	NN	NN	6.75 GB	N/N	CGY 70 - 8.2 MB	CGY 70 - 14B	NIA	5.05KB	116 KB	z'Mittome_Rawl67 6A
Oct 26, 2013	678A	3CAG51F299A	AQUARIUS	NN	NA	547 KB	228 MB	NN	NN	15.3 GB	MIN	CGY 70- 6.41 MB CGY 70 - 148	CGY 70 - 148	52.0	5,10 KB	269 KB	z'Mittome_Rawl67 8A
Oct 26, 2013	660A	3CAG51152998	AQUARIUS	NN	NN	422 KB	155 MB	NN	NN	11.6 GB	WA	CGY 70-6.41 MB CGY 70 - 14B	CGY 70 - 14B	494.8	5.10 KB	207 KB	z, Mittome_Rawl68 0A
Oct 26, 2013	6670	2CAG103H299A	GEMINI	WN	ZSEKB	89268	212 MB	NIN	2.46 KB	24.208	VIN	CAG 70 - 6.09MB CAG 70 -148 ISB 90 - 5.87 MB ISB 90 - 198	CAG 70 -148 ISB 90 - 198	4068	3,768	6.9348	z.Wittorre_Rawl08 7A
Oct 27, 2913	691G	2CA651E300A	GEMINI	NIN	360KB	623 KB	261 MB	NIN	1.9KB	23.208	NN	CGY 70 - 7.49 MB	CGY 70 - 14B	NIN	4.81 KB	350408	z, Mittome_Rawl69
Oct 27, 2013	662A	\$CAG111D300A	ADUARIUS	NIN	NN	971 KB	241 MB	NIA	NIN	19.7 GB	NN	ISB 90 - 5.87 MB	ISB 90 - 41 B	576.0	3.25 KB	354 KB	z'Mittome_Rawld8 2A
Oct 27, 2013	684A	SCAG111D53008	NOUNTING	NN	NN	449 KB	176 MB	NN	NIN	13.9 GB	NIN	ISB 90 - 5.87 MB	ISB 90 - 41 B	124.8	2.33 KB	245 KB	z'Airtome_Rawl68 4A
		Received from						Received by	,								





51/4/10

Annex D

	SERVER	LOCATION	Z:'Airborne_ Raw/695G	Z:'Airborne_	Z:Vairborne_ Raw/715A							
	FLIGHT PLAN	KML	BKB	OKB								
		Actual	SKB	SKR	5 KB							
	OPERATOR	(00100)	2KB	1KB			<1/8/11					
	(5	(tot)	1KB	0/1+			11					
	BASE STATION(S)	BASE STATION(S)	CGY 70 - 7592KB	DV001 01 VOO			JOLDA F. PRIETO					
		DIGITIZER	NIA		GB		HOIDP SS		5) (8/1			
		RANGE	20.9GB		7,55GB	Received by	Name Postion Signature		2 5			
Nov 8, 2013	and i more sur	FILE	317KB		NIA				SSES THETO			
2		RAW IMAGES	40.2GB		N/A				AdioL			
		POS	228MB		152MB		8 81					
		LOGS	756KB	100	345KB		Pears May 11/8/13	Verified by	Name Position Signature			
	RAW LAS	Output LAS KML (swath)	505 KB	-	385 KB 131 KB			-				
	RAV	Output LAS	NIA		NIA	Received	Name Position Signature					
		SENSOR	GEMINI		GEMINI							
		MISSION NAME	695 2CAG51C301A GEMINI		697 2CAG61A301B GEMINI NA 715 3CAGR309A AQUARUUNA							
		FLIGHT NO.										
	ſ	DATE	28-Oct		5-Nov							

Airborne Rawl68 SERVER Mirtome Raw Withome Raw 005 KB Ň FUGHT PLAN 5 5 Actual V8 KB 100 100 88 OPERATOR LOGS (OPLOG) 458.8 58 116 Base Info (.tot) BASE STATION(S) 188 2 5 BASE STATION(S) E1/11/12 11.4 MB 13.6 MB 13.6 MB **DIGITUZER** 2.39 GB 10.9 GB 28.6 GB RANGE 12.2 08 DATA TRANSFER SHEET Nov 11, 2013 22.08 MISSION 1 2211 108 146 KB ş RAW Received by 95.1 MB 3.26 KB 1.22 MB 203 MB 18.6 GB Name Position Signature NN. 171 MB 502 LOGS 126 KB 869 KB KML (swath) RAW LAS 217 KB 44 KB 40 KB C. Johnen Output Ň ş 1 SENSOR GEMINI **CMIN** GEMINI 2CAG51B52311B MISSION NAME LMS CALIBRATION 3CA021A+265311 Received from < Positi Signet NON 66203 0940 6000 Nov 6, 2013 Nov 7, 2013 Nov 7, 2013 DATE File 7146 7166

		NEW			RAV	RAW LAS			Num	WIRKION	-		BASE STATION(S)	(TON(S)	OPERATOR LOGS	FLIGHT PLAN	NUN	SERVER
	1	NO.	MISSION NAME	SENSOR			LOGS	SO4	MAGES	LOO FLE	Turner.	Contractor of			(DOLIOO)			LOCATION
	ź				Output	KML (swath)							BASE STATION(S)	Base Info (.tet)		Actual	KML	
Nov 5, 2013	7150	TOBA	3CAGR309A	AQUARIUS	_	131 KB	34548	154MB	NA	WW	7,55GB	62.660	CGY 92-2445KB 1KB	1KB	268	SKB	8KB	Z Withome_RawU 06A
	6620	7120_L	204614633108	CEMIN	2	4443	12648	95.1MB	3.2040	2/2/1 KB	2.3908 10.908	10.968	CGY 70-5724KB, RDM 1-5960KB	1KB	1KB	6KB	2108	Z Wittome_RawV 120_LMS
Nov 7, 2013	Dives	714G	2046214+5185311A	GEMINI	¥	40KB	659KB	171MB	¥N.	ž	12.208	28.6	CAP 1 110713- 555688*** CGY 70 - 7842KB* CGY 93- 4491KB**	1KB	243	6.6KGB	torska	Z.Verborne_Raw/7 14G
Nov 7, 2013	0980	716G	2CA6518523110	OEMINI	NA	217KB	1.22MB	290MB	18.608	146948	12.208	NA	CAP 1 110713- 55968"*, CGY 70 - 784248*	148	148	BKB	848	Z.Withome_Raw0 16G
													"Iransit base. "main base					



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Annex D

	TION		Rawl	Plank?	Rawl7	Pawa
	SERVER		Z Wettome_Raw/7 505	Z Wittome_Raw7 530	Z'Mirtoorne_Rawl7 60G	Z Withome_RawU 620
	PLAN	KML	1298	1248	BHS	Bres
	FLIGHT PLAN	Actual	849	849	8HB	8045
	OPERATOR LOGS (OPLOG)		148	848	1KB	1KB
	(should)	Base Info (.txt)	140	1KB	1kB	1KB
	BASE STATION(S)	BASE STATION(S) Base Info (141)	CGY 70 - 10030KB, CGY 92 - 8154KB, CGY 93 - 8171KB	CGY 70 - 10330KB, CGY 92 - 8154KB, CGY 93 - 8171KB	CGY 66 - 4333KB, CGY 70 -8072KB, CGY 50 - 7366KB	CGY 70 - \$951KB, CGY 92 6191KB, CGY 93- 6106KB
	DIGITIZER		89,1GB	35 908	51.708	97.508
ĺ	RANGE		24.1GB	4508	12.508	13.3GBV 6.20GB
	MISSION MISSION		BWB	13kB/78K B	264KB	22KB/241 13.3Gb/ KB/20KB 5.20GB
	RAW		48GB	14508/1, 15%8/76K 5 4508/8 52 8 08	29.508	29.708/2
	POS		229MB	116MB	8W921	BN222
	LOGS		800KB	0W0P1	6994/B	974KB
	RAW LAS	KML (swath)	604KB	856929	3169(B	1548
	RA	Output	N.	NA	NA	W
	SENSOR		GEMINI	GEMINI	GEMINI	OEMINI
	MISSION NAME		2CAG11B320A	2CAG11853208	2CAG218122A	2C46218323A
	FUGHT					
	DATE		Nev 16, 2013 750G	Nov 16, 2013 752G	Nov 18, 2013 7603	New 19, 2013 762G

DATA TRANSFER SHEET



98 | 🍝

	SERVER LOCATION		NUM NUMERICANS/ Records and Numerican Numerican Street Str	NUM TOPPECHASterostocrate/DA	30.4 WERTINAS/servicense/104 docre_Rew/104/055	47.9 (VERENAS)aeconomical IA/ foome_Raw/205.000	Severation Stand Street Stands Street	72.2 (VERCENAS) deconstrate (VA) (berre: Rew/205505	60.7 WERTPANDaerontenaer/MA	41 WRITINAS/aecotocrae/3/41 thome_Raw/202905	31.3 WFREENAS/genotomate/0/4	1					
	CASHIDAN		12	6	7.9	8.13	446.8.333	11.4KB	217 8 13.4	MA	550						
	Flight Plans	CB) Kont (KB)			72.8	310		1000		204	330						
		5) Actual (p0b)	450	530	999	366	721 43.3 & 140	404	903 265 & 179	330	467 453 & 330						
		E NETO LOGIS) TES) (Bytes)	12.3	12.3	117	143	365	SINC	528	282	82	2			e		
	BASE STATION (S)	BASE (MD) BASE MFO BASE (MD) (BYTES)			2.42	91.96	NIA 1.15 & 9.56	5709/B-8	937KB &	80900 8 9.85	1.12 & 7.39	JOIDA F. PRIETO	1		JACO F PRIETO		
	DIGITUDE	R (GB)	157	NIN	NIN	NN		NIN	NN V	ž	ž	SARS.	Ł		Phile P		
*	RANGE	(98)	3 23.5	13.2	3.64	65	17.9	15.9		Sector N	1.0	ha h	n				
Feb 18, 201	MOISSIM	FILE (908	8 36543	B 16643	A NIA	A NA	A NA	A NA	A NA	NIA NIA	NUM NUM	Received by Name/Signature Position		Verified by	Name/Signature Position Date		
Feb 18, 2014	RAW RAW		281148 46.408	145MB 23.70B	VIN OCS	152 NIA	210 N/A	162 NIA	176 NIA	105 N	260 N						
	S one run	KML (KB)		31803 14	104	178	43.3 & 140	210	251	148	327	41					
	RAW LAS	ACTUAL (MB) KM	-	NIN	N/A	N/A	N/A 43.	N/A	HIA	N/A	N/A	-papers					
	crucue		Gemini N	Gemini	Gemini N	Gemini	Gemini	Gemini	Gemini	Gemini	Gemini	Acura Strang	histor				
	ANALY MANUT		2CAG618302A	2CAG61E302B	ZMtAS033A	2CAG101D5035A	2CAG101A037A & 2CAG111C037A	2C4610140378	2CAG51D038A & 2CAG101D5038A	2CAG101A5039A & 2CAG111B5039A		Record tran Homes parter Lovely Acused Hagd and Press	120				
	CHOILT WO		9669	7016	70476C	70516C	70546C	7055GC	70576C	70696C	70616C						
	DAVE of Personsion	UNIE OF OPERATION	10/29/2013	10/29/2013	2/2/2014	2/4/2014	2/6/2014	2/6/2014	2/7/2014	2/8/2014	2/9/2014						



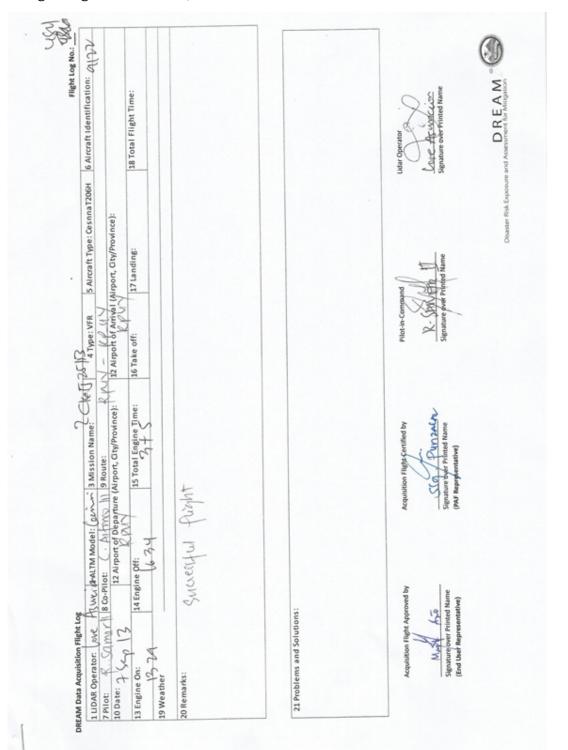
	SERVER		Z'Mittome_Rawl7 49G	Arborne_Raw/7	X:Mittome_Raw/7 66 G	X:Mittome_Rawl7 68 G	Arbome_Raw/7 G	X!Mittome_Rawl7 72.G	Mittome_Raw/7	Mittome_Raw/7
		KML	NN AN			9 KB 60	940B 70			11 KB 86
	FUGHT PLAN	Actual							10.9 KB 2	10.9 KB
	OPERATOR LOGS	lana	8 NIA		8 KB	9 KB	5 KB	6 KB	10.4	10.6
	COPER		1.23 KB	1 10	2 KB	1 KB	1 KB	2 KB	1 10	1 KB
	ATRON(5)	Base Info (.txf)	359 B	1 KB	1 KB	1 KB	1 108	1 108	1 108	1 108
	BASE STATION(S)	BASE STATION(S)	25.9 GB	21.1 MB	23.8 MB	23.8 MB	29.2 MB	29.2 MB	54.4 MB	20.9 MB
	DIGITIZER	1.0								
	RANGE	-	24.7 GB 188 GB	10.9 GB 89.0 GB	26.3 GB 185 GB	9.05 GB N/A	14.2 GB N/A	11.6 GB 80.0 GB	7.63 GB 22.3 GB	34.8 GB 124 GB
et av la nan	MISSION		417 103			156 KB	257 KB		107 KB 7	
	RAW		53.8 GB 4		48.5 GB 4	17.6 GB 1	28.7 GB 2	21.7 GB 1		60.5 GB 450 KB
	504		232 MB 53		205 MB 48	128 MB 17			93.1 MB 15.1 GB	274 MB 60
	1008		1.10 MB 22		932 KB 28	2.07 MB 12	847 KB 11		269 KB 90	1.64 MB 27
		KML (swath)	SS8 KB 1.		1.00 MB 90	317 KGB 21	445 KB 84		148 108 26	
	RAW LAS	Output NM		502	1,0	317	448	202	148	662 KB
	SOR	0-	Z			NN	NN I			NN I
	E SENSOR		GEMINI	GEMINI	GEMINI	GEMINI	GENINI	OEMIN	OEMINI	A GEMINI
	MISSION NAME		2CAG11CS33198	2CAG2183238	2CAG21C and 2188324A	2CAG21D3248	2CAG2105325A	2CA061F3268	2CAG1018328A	2CAG1018S329A
	PLIGHT NO.		748G	2640	766G	7680	7700			
	DATE		Nov 15, 2013		Nov 20, 2013	Nov 20, 2013	Nov 21, 2013	4pv 21, 2013 7720	Nov 24, 2013 7820	Nov 25, 2013 7860

	SERVER	X'Mittome_ Rawl816G	X'Mithome_ Raw/818G	X:Withome_ Raw/822G				X'Mittome_ Raw836G	X'Mittome_ Raw638G	X'Mirborne_ Raw/846G	X:Mirborne_ Raw/848G		X:Wirbome_ Raw/862G	
	FLIGHT PLAN	NIA	19.9 KB	10.1 KB	9.58 KB	8.39 KB	4.63 KB	10.2 KB	10.2 KB	9.27 KB	10.5 KB	10.2 KB	10.1 KB	
	Actual	4.03 KB	8.45 KB	69.5 KB	5.06 KB	66.3 KB	4.62 KB	5.25 KB	316 KB	239 KB	96.1 KB	406 KB	400 KB	
	OPERATOR LOGS (OPLOG)	346.8	504 B	612 B	489 B	363.8	505.8	257.8	564 B	697 B	448 B	250.8	1 KB	
	Base Info		317.8	315.8	200 B	289 B	219.8	219.0	219.8	314 B	314 B	306.8	306 B	M
	BASE STATION(S) BASE Base I Antronect		16.3 MB	19.3 MB	50.9 MB	10.9 MB	11.3 MB	11.3 MB	11.3 MB	15.7 MB	15.7 MB	15.9 MB	15.7 MB	11/20/13
	DIGITIZER	NIA	156 GB	122 GB	170 GB	NUA	121 GB	NIN	NIA	NIN	NIN	38.1 GB	NIM	
	RANGE	8.63 GB	53.3 GB	37.9.08	28.6 GB	9.82 GB	40.2 GB	9.14 GB		35.4 GB	13.6 GB	27.2 GB	50.9 GB	F. PR
	FILE MISSION LOG	NIA	NUA		NIA	NUA	NIA	NIN	88		222 KB	314 KB	NUA	JOIDAF. PRIETU
	RAW IMAGES	NIN	NNA N		NN		Nav	NIN	80			40.6 GB		for a
	POS	80.8 MB	200 MB				239 MB	65.6 MB				178 MB		
ſ	roos	179 KB	856 KU				669 KB							
	LAS KML (swath)	_	432 KB				430 KB							
	RAW LAS	NUA	N/N				NIA							4 DJ4 N 50 CIAT
ľ	SENSOR	GEMINI	GEMINI						Γ	Γ				e said
	WVN NOISSIM	2CAG171A3368			1 4	SCACUTIBOOD			L	15		1	1	6 th to
	FUGHT NO.	816G	ALMO.										862G	
	DATE	Dec 2, 2013								Dec 1, 2013	-			

Г		(June	1 June	Trivel	1/mill	4	-	Come:		Name						
	SERVER	X'Antome Raw6	690 X Wittome Raw1	XVAintome_R	011P X Mithome Rawl	dE10	CS2G	X.Wittome_	Canol Canol	X.Vurtome_Faw/						
	N	KML	M			N	12	NA	-	NA						
	FUGHT PLAN	Actual	9	42947	8	NA	\$	8		4						
	OPERATOR LOGS				1KB	1KB	1908	140	-	140						
		Base Info (,txt)		8	tixB	1KB	txB	5KB		1KB	hi a					
	BASE STATION(5)	BASE STATION(S) B	1HD	1KB					10100		6/17/2014					
()ake	autrosis	-	3 7,35	0 5.57	4 8.24	63.8 8.24	Γ			A 2.42	Received by ReleTD Name JOID AS RELETD					
J, CAG, M	-		79.3	31.2 140	18.5 93.4	11.3 53			100	3.64 Nuk	S.C.					
(Missing Flights - NEJ, CA		LOGFILE	66/139 20					Τ			Idiol					
ert7/2014 (Missing Flights - NEJ, CAG, Arayel)		INVOER N		0 361	3 NA			1	8	30.4(cast) NA	Received by Name Position Signature	11				
6177201	-	804	101MB 38.9	41.0	5 15.3				100	136	g Z.6.0					
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	F	(unality)	N						8							
	RAW LAS	Output ku	_						250	No.	Ţ	Π				
		SENSOR	ť						N N	* 1	eaved from C. J. C. A. J.	П				
		_	- Venue	_	Т		PEGASUS		A GEMIN	MUNICIPAL STATE	Unit					
		MISSION NAME		2040363636404	INLIADION	LNE118021A	1NU180218	2NE/JC026A	2NE15CS02BA		Received from Name Position Signature					
		PLOAFT NO.				9110	10139	7002G	7036G	Denot	-					
		DATE				Jan 21, 2014	Jan 21, 2014	Jan 26, 2014	Jan 28, 2014	AND 2014						

ANNEX E. FLIGHT LOGS FOR CAGAYAN FLOODPLAIN

1. Flight Log for 2CAG161J251B Mission





Model: Kurant Type: Cosmon 2006.2004 A Type:	893	-	T	T	ŕ	1]			1	
4 Type: VFR 5 Alrcraft Type: Cesnna T206H Alrport of Arrival (Alrport, Gty/Province): Take off: 1.7 Landing: Placin-command Placin-command Placin-command Signabure oray frinted Name	Flight Log No.: 46%	6 Aircraft Identification: RP9/D;	~		18 Total Fiight Time:						ar Operator	
[2 Alithund Shinsion Name: 300c strong and a Type: VFR 101: F. Dr Connero 1101: F. Dr Connero 12 Alitport of Departure (Aliport, Gry/Province): 12 Alitport of Departure (Aliport, Gry/Province): 12 Alitport of Antival (Alitport, Gry/Province): 12 Alitport of Antival (Alitport, Gry/Province): 13 Total Engine Time: 14 Alitport of Autemotic 14 Alitport of Departure (Alitport, Gry/Province): 15 Total Engine Time: 16 Take off: 17 Alitport of Departure (Alitport, Gry/Province): 15 Total Engine Time: 16 Take off: 17 Alitport of Departure (Alitport, Gry/Province): 16 Alite Off: 16 Alite Off: 17 Alitport of Autemotic 17 Alitport of Autemotic 18 Alitport of Autemotic 19 Alitport of Autemotic 19 Alitport of Autemotic 10 Alite Off: 10 Alite 10 Aliter 11 Aliter <td></td> <td>5 Aircraft Type: Cesnna T206H</td> <td></td> <td>Alrport, City/Province):</td> <td>17 Landing:</td> <td></td> <td></td> <td></td> <td></td> <td>V</td> <td></td> <td></td>		5 Aircraft Type: Cesnna T206H		Alrport, City/Province):	17 Landing:					V		
12 ALTM Model: Gounday 3 Mission Name: Screent (101: F. DY COMPTON 9 Route: 2.12 Airport of Departure (Airport, City/Province): 12 Airport of Departure (Airport, City/Province): 15 Total Engine Time: 14 e.3 14 e.1 15 for Off: 15 Total Engine Time: 16 e.1 17 april 1 17 habdyoo 1/2 april 1 11 must fur condition. 17 habdyoo 1/2 april 1 11 must fur condition. 18 for Off: 15 for the condition. 18 for Off: 16 for the condition. 18 for Representative) 16 for the condition.				12 Airport of Arrival (16 Take off:				•		Plot-in-comman	
12 AITM Mode :: Kountures 100: F. Dr Ocenero 22 Airport of Departure (J 100: F. Dr Oceano ammunero 101: Model 102: Modell 102: Modell 10	21 M/C 4	3 Mission Name: 3044 mg	9 Route:	Urport, City/Province):	15 Total Engine Time: 4+11		CALIE NA				n Flight Certified by	
		J 2 ALTM Model: KOUMMUS	Plot: F. DV OCMMPO	12 Airport of Departure (A			community unit				Acquisition	

2. Flight Log for 3LMS296A & 3CAG111C296A Mission



3. Flight Log for 3CAG51E298A Mission

e 3	12 Airport of Departure (Airport, Gty/Province): 12 Airport of Arrival (Airport, Gty/Province):	14 Engline Off: 15 Total Engline Time: 16 Take off: 17 Landing: 18 Total Flight Time: 13.33 4 + 17 16 Take off: 17 Landing: 18 Total Flight Time:	- Cleared	Finalish 20/84 UNET. Million NOT amplicted Dute 70 Medic of Full Continuition.		Acquisition Fight Continued by Acquisition Fight Continued by Acquisition Fight Continued by Plot in Confinand Action Confina
1 UDAR Operator: PAN AACOFO 7 Pilot: R. CANNAN II 8 Co	10 Date: OCTOPAR 2C, 10 IS	13 Engine On: 914	19 Weather	20 Remarks:	21 Problems and Solutions:	Acquisition Fight, Appopued b Har March CALAR Parties Signature over Printed Name (End User Representative)



4. Flight Log for 3CAG51E298B Mission

DREAM Data Acquisition Filght Log					Flight Log No.: /
rator: CHARG JONGUIN	2 ALTM Model: Abuse Juc	1 UDAR Operator: CHRK JONGUN 2 ALTM Model: Abuervic 3 Mission Name: 30% 578 2694 4 Type: VFR	ed 4 Type: VFR	5 Alrcraft Type: Cesnna T206H	6 direraft Identification: ee dan
7 Pllot: R. SMMML B CO-Pl	8 Co-Pilot: F. De Ocempo	9 Route:		and a second of the second of the	
0	12 Airport of Departure (Airport, City/Province):		12 Airport of Arrival	12 Airport of Arrival (Airport, Gty/Province):	
	14 Engine Off: IbiC	15 Total Engine Time: 1 1+£3	16 Take off:	17 Landing:	18 Total Flight Time:
	Completes the	NOTION CONTINUESING ALL ANALAGINOD			
	burue	burshe the print plant.			
21 Problems and Solutions:					
Acquisition Flight Apagoned by Magazine Carl Post To Signature over Printed Name (End User Representative)	Acquisit	Accutation Flight Coupled by	Pilocin-command		Udar Operator Signahud over Printed Name

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5. Flight Log for 3CAG51F299A Mission

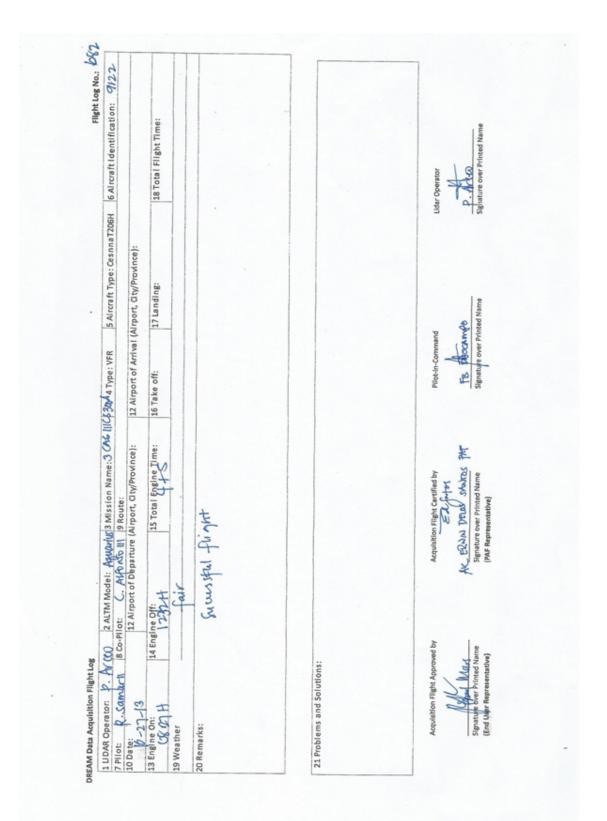
	Signature offer Printed Name
R Altim Model: Acumental 3 Mission Name: 2000 Field B Co-Pilot: C - ALTON Model: Acumental 3 Mission Name: 2000 Field 22 B Co-Pilot: C - ALTONOS H 3 Mission Name: 2000 Field 12 Airport of Departure (Airport, Gty/Province): 12 12 Airport of Departure (Airport, Gty/Province): 13 12 Airport of Departure (Airport, Gty/Province): 13 12 Airport of Departure (Airport, Gty/Province): 13 12 Airport of Departure (Airport, Gty/Province): 14 12 Airport of Departure (Airport, Gty/Province): 15 14 Auguston Right, Contrained by Acquisition Right, Contrained by 14 Departure over Physical Name 15 Sgrature over Physical Name 10 Paresensative)	Signature over smeao name (PAS Representative)



Flight Log for 3CAG51F299B Mission 6.



7. Flight Log for 3CAG111CS300A Mission



8. Flight Log for 3CAG111DS300B Mission

DREAM Data Acquisition Filght Log		the second			. Flight Log No.: DPY
1 UDAR Operator: CARIS JOAQUIN 7 Pilot: K. CANVAR, II 8 Co-PI	MQUIVI 2 ALTM Model: August 3 Mission Name: 8 Co-Pilot: C- Autorico IV 9 Route:	3 Mission Name: 9 Route:	4 Type: VFR	5 Aircraft Type: CesnnaT206H	6 Aircraft Identification: RP9/22
10 Date: ccr08472 27, 2475	12 Airport of Departure (Airport, City/Province):	Airport, City/Province):	12 Airport of Arrival	12 Airport of Arrival (Airport, Gty/Province):	
13 Engine On: 3/9	(4 Engine Off: [§ 23	15 Total Engine Time:	16 Take off:	17 Landing:	18 Total Flight Time:
19 Weather		2109			
21 Problems and Solutions:					
Acquisition Filight Approved by Prince And Approved by Signature beer Princed Name (End User Representative)		Acquisition Flight Cartilled by Course of the Arthon Arthon Synature over Printed Name (PAF Representative)	Plan-In-company		Lidar Ogwator Control Signature over Prinaed Name

9. Flight Log for 3CAG110A301A Mission

DIREVEN DATA ACQUISITION FIGHT LOG				Flight Log No.: 6 89
1 UDAR Operator: Criticut UDARUN 2 ALTM Model: Abundud 3 Mission Name: 2016 IDA XIA	3 Mission Name: 206/10/h 2014	4 Type: VFR	5 Aircraft Type: Cesnna T206H	S Aircraft Type: Cesnna T206H 6 Aircraft Identification: RP9 222-
- 8 Co-Pliot: F. Agro-20 1]	9 Route:			
CODPerk 28, 2015 12 Airport of Departure (Airport, City/Province):		12 Airport of Arrival (12 Airport of Arrival (Airport, Gty/Province):	
ngine Off: Juli	15 Total Engine Time: 1 3 + 13	16 Take off:	17. Landing:	18 Total Filght Time:
21 Problems and Solutions:				
Acquisition Flight Approved by Acquisition Flight Approved by Acquisition Englishment of the Acquisition Signature of the Printed Name (and User Rapresentative) (PAF Representative)	Acquisition Flath Cereting by Conference of Merit Ard y	Pilot-In-Command		Lider Operator



Flight Log for 3CAG111BS302A Mission 10.

All Data Acarditation Flight Leg All Data Acarditation Flight Leg 2000 Operation: Circles views_1/2 2004 2010: C Sperior, T. Bardiner, S. Minori of Departure (Miport, OryPhroninee); 21 2010: C Sperior, 2-9, 3-9, 3-9, 3-9, 3-9, 3-5, 7 20 Nation (Miport, OryPhroninee); 21 21 21 28 24 27 29 24 26 20 24 25 20 24 25 20 25 27 20 24 26 20 24 26 20 24 26 20 24 26 20 24 26 20 24 26 20 24 26 20 24 26 20 24 26 20 24 26 20 24 26 20 26 26 20 26 26 20 26 26 20 26 26 20 26 26 20 26 26 20 26 26 20 26 26 20	S Aircraft Type: CesnnaT206H 6 Aircraft Identification: R.P. 9/22	Province):	: 18 Total Flight Time:			Lidar Operator C. J. P. H. A. Signature over Printed Name	
		rival (Airport, Gty/	17 Landing			computed Name	
	4 Type: VI	12 Airport of Ai	16 Take off:				
M Model: Ac. wights	3 Mission Name:	Virport, City/Province):	15 Total Engine Time: 3 + 59	an completed		Alle .	
Acquisition Flight Log Derator: Crr/LK, vones.IA, 2411 C. Spit/Mr. 11 8 Co-Fliot: C. C. CRPAY, 24, 30, 12 Mi e On: 9 co 14 Engine Of Her Acquisition Flight Approved by Acquisition Flight Approved by Signature over Princed Name (End Uver Representative)	ALTM Model: AQUINTUL	Alrport of Departure (A		UDILLA			



11. Flight Log for 3CAG51B302B Mission

1 UDAR Operator: Pho Ait Cero	ARCED	2 ALTM Model: An er lix	2 ALTM Model: An arrive 3 Mission Name Warns in h	d Tuna VED	C Alcourfe Towns, Case and Torius	Hight Log Not A
7 Pilot: A. CAAAAA #	8 Co.	8 Co. Plint: A Second	Q Doutes		Donal Billican table to an include	CUP NICIAIL IDENTIFICATION: N. 4/17
10 Date: Arren 20 50	1 .	e		2 Airport of Arrival (12 Airport of Arrival (Airport, Gty/Province):	
13 Engine On: /3//0	14 En	14 Engine Off: 16 21	15 Total Engine Time: 11	16 Take off:	17 Landing:	18 Total Flight Time:
19 Weather						
20 Remarks:		FINNERED 14/23 LINET. MISTON NAT COMPLETED DUE	Lings.	-Median,		
21 Problems and Solutions:	tions:					
Acquisition Flight Approved by APT M. Sub. And And Signature over Princed Name (End User Representative)	pht Approved by		Acquisition Flight Centified by	Pllot-in-Commercial		Lider Operator

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12. Flight Log for 2CAG21A311A AND 2CAG51BS311A Mission

e: VFR S Aircraft Type: Ces nna1206H 6 Aircraft Identific of Arrival (Airport, City/Province): 18 Total Flight Tim 19 Total Flight Tim 10 Arrival Arrival Arrest Contract Contract Contract 10 Arrival Arrival Arrest Contract C	Name: X76516314 4 Type: VFR 5 Alrcraft Type: Cesnna T206H 6 Alrcraft Identific (Province): 12 Airport of Arrival (Alrport, Chy/Province): 13 I and ing: 18 Total Flight Tim gine Time: 16 Take off: 17 Landing: 18 Total Flight Tim d Some Ursu Orecars 18 Total Flight Tim d Some Ursu Orecars 19 Landing: 18 Total Flight Tim d Some Ursu Orecars 17 Landing: 18 Total Flight Tim d Some Ursu Orecars 10 Orecars 10 Orecars died by Pilot in Command Udda. Operation Udda. Operation Outline Signature from Allene Signature over Printed Name	ation:			
of Arrival (A	10 2 AITM Model: Earie 3 Mission Name: 2065/5344 4 Type: VFR 8 Co-Ploi: AL Eargoocan 9 Route: 12 Airport of Départure (Airport, Gry/Province): 12 Airport of Arrival (A 12 Airport of Départure (Airport, Gry/Province): 12 Airport of Arrival (A 12 Airport of Arrival (A 14 Engine Off: 15 Total Engine Time: 16 Take off: 16 12 Airport of Départure (Airport, Gry/Province): 12 Airport of Arrival (A 12 Airport of Arrival (A 14 Engine Off: 15 Total Engine Time: 16 Take off: 16 12 Airport of Départure (Airport, Gry/Province): 12 Airport of Arrival (A 10 12 Airport of Départure (Airport, Gry/Province): 15 Take off: 16 12 Airport of Départure (Airport, Gry/Province): 15 Take off: 16 12 Airport off: 37 05 05 17 12 Augustion Flight Certified by Arrivel Arrive A 50 me 06 10 10 7 07 06 11 10 10 10 10 12 10 10 10 10 13 10 10 10 10 14 10 10 10 10	6 Aircraft Identific	18 Total Flight Time:		Lidar Operation
C of A of A	10 2 AITM Model: Earie 3 Mission Name: 206515349 4 Type: V 8 Co-Ploi: AL Earie 9 Route: 12 Airport of A 12 Airport of Départure (Airport, Gity/Province): 12 Airport of A 14 Engine Off: 15 Total Engine Time: 16 Take off: 15 Gainy at vome ports of auruy or s. 16 Take off: 15 Total Engine Time: 16 Take off: 16 Take off: 15 Total Engine Time: 16 Take off: 16 Take off: 15 Total Engine Time: 16 Take off: 16 Take off: 15 Total Engine Time: 16 Take off: 16 Take off: 15 Total Engine Time: 16 Take off: 17 Aurus of the aurus of a struct of the aurus of a struct 18 Take off: 15 Total Engine Time: 16 Take off: 18 Take off: 15 Total Engine Time: 16 Take off: 18 Take off: 15 Total Engine Time: 16 Take off: 18 Take off: 15 Total Engine Time: 16 Take off: 18 Take off: 15 Total Engine Time: 16 Take off: 17 Take off: 17 Take off: 18 Take off:	5 Aircraft Type: CesnnaT206H Uraort. Cltv/Province):	17 Landing:		nd An Linger
4. 3 Mission Name: 201651 9 Route: 15 Total Engine Time: 3 + 05 9 Curl Woyed Some 9 Curl Woyed Some 9 Curl Woyed Some	A Eng 8 Co-P	S3# 4 Type: VFR 12 Airport of Arrival (A	16 Take off:		Pillorin Con FB DU Signature
	A English A English	4 3 Mission Name: 2005	15 Total Engine Time: 3 + 05 orth of articuty of	suvery some	uisition Flight Certified by Early DEZers UPANPLS PAP sature-oder Printed Name

13. Flight Log for 2CAG51BS2311B Mission

$\begin{array}{ c c c c c c c c c c c c c c c c c c c$		6 Aircraft Identification: 9(2)		18 Total Flight Time:		Lidar Operator Par Par Suptaure bore Printed Name
NITM Model: Carrier 3 Mission Name: 20065152848 4 Type: VFR Filot: ML Tongencen 9 Route: 12 Airport of Arrival Iz Airport of Départure (Airport, Gty/Province): 12 Airport of Arrival ngine Off: 15 Total Engine Time: 16 Take off: Sulc LCSS Aul 3 7 / 7 16 Take off: Air CCSS Aul 3 7 / 7 16 Take off: Air CCSS Aul Arrival 10 Arrival Sulc LCSS Aul 15 Total Engine Time: 16 Take off: Air CCSS Aul 3 7 / 7 16 Take off: Air CCSS Aul 15 Total Engine Time: 16 Take off: Autoria 3 7 / 7 16 Take off:			(Airport, City/Province):			R
Number 2. ALTM Model: Centriny 3 Mission Name: 2006015 -Pilot: ML Eorgenen 9 Route: 9 Route: 12 Airport of Départure (Airport, Gry/Province): 12 Airport of Départure (Airport, Gry/Province): ngine Off: 15 Total Engine Time: 2.4 / 7 3.7 / 7 Sulc CCSS ful 15 Total Engine Time: Aire Cruss ful 3.7 / 7 Sulc CCSS ful 15 Total Engine Time: Sulc CCSS ful 3.7 / 7 Sulc CCSS ful 3.7 / 7 Succession flight Certified by Aire Enclips Aire of Phases SAL Pas Aire Aire Enclips of Phases SAL Pas Aire Aire Enclips Aire	and a budo	2 AVIS 4 Type: VFR	12 Airport of Arrival (16 Take off:		Y 15
NICL CSS ful Convintion of Départure (12 Airport of Départure (ngine Off: 24 CLCSS ful by Acquist	and the other states and states	3 Mission Name: 2096515	Airport, City/Province):	15 Total Engine Time:		on Flight Certified by Englace for 12 Annas SAU Das AHF
		2 ALTM Model: (central	12 Airport of Départure (/	ngine Off: // 02	success ful	

14. Flight Log for 2CAG21A314B Mission

c streets Trees Corner The Alcords I don't free tions	> Aurclant Type: Ceshna Looon > Aurclant toemunication:	12 Airport of Arrival (Airport, Gty/Prowince):	17 Landing: 18 Total Flight Time:				mand Udar Operator M. C. S. S. To Suppluse on Printed Name Suppluse on Printed Name
1111	2 ALIM Model: 他有所小/ 3 Mission Name: 2006-41791909 4 19Pe: VFK ilot: ML Tanashan 9 Route:	ty/Province):	15 Total Engine Time: 16 Take off: $3 \neq //$		successful - surveyed 10 Circs.		Acquisition Flight Carilled by Pilot-in Commund Filot in Commund AIC ERUIN DELOS SANTAL PAF M. C. M. C. Suprature on Philosophia Suprature one Printed Name (PAF Suprature on Philosophia)
040		12 Airport of Departure (Airport, City/Province):	14 Engine Off: 14 Engine Off: 1			500 C	
	7 Pilot: T. De Mener 8 Co-P		13 Engine On: , , , 5	19 Weather 606 of	20 Remarks: p1/55/01	21 Problems and Solutions:	Acquisition Flight Approved by Acquisition Flight Approved by Auther Approved Physics Signature oder Printed Name (End User Representative)

Flight Log for 2CAG11D315A Mission 15.

1 UDAR Operator: DC Aldona	Orino	Z ALTM Model: 6cm-v 3 Mission Name: 2ch6f D315 4 Type: VFR	CA 4 Type: VFR	5 Aircraft Type: Cesnna 7206H	Flight Log No.: 7.30 5 Alreraft Type: CesnnaT206H 6 Alreraft Identification: 4/2 c
7 Pilot: 7 . De Ocenpo	8 Co-Pilot: ML Tanganan	9 Route:			
10 Date: - - 0	12 Airport of Departure (Airport, City/Province):	(Airport, City/Province):	12 Airport of Arrival	12 Airport of Arrival (Airport, City/Province):	
	14 Engine Off: 12 5 g	15 Total Engine Time: 44 17	16 Take off:	17 Landing:	18 Total Flight Time:
po					
20 Remarks: Mission	on Completed				
	-				
21 Problems and Solutions:					
Acquisition Flight Approved by Conserved out- AutoRector and Anti- Signature over Printed Name (End User Representative)	E 1 de	Acquisition Flight Certified by App Correct Der Jo- Banature over Printed Name (PAF Representative)	Pilot-in-Copmany	2 Apple And	Lider Operation



16. Flight Log for 2CAG21AS315B Mission

A	DREAM Data Acquisition Filght Log					Flight Log No.:
7 Pilot: CD-CD-CD-CD-CD-CD-CD-CD-CD-CD-CD-CD-CD-C	Tory 2 ALTM	Model: Gemini	3 Mission Name: 2096 246	43/24 Type: VFR	S Aircraft Type: CesnnaT206H 6 Aircraft Identification: 9/2 2	6 Aircraft Identification:
10 Date: 11-11- 13	12 Airpo	ort of Departure (A	12 Alrport of Departure (Airport, Gty/Province): 12 Airport of Arrive	12 Airport of Arrival	12 Airport of Arrival (Airport, City/Province):	
13 Engine On: 1341	14 Engine Off:		15 Total Engine Time:	16 Take off:	17 Landing:	18 Total Flight Time:
19 Weather 60000						
20 Remarks:						
Mission		Conpleted.				
21 Broklams and Coluitan						
Acquisition Flight Approved by Converting Acquisition Flight Approved by Acquisition Flight Approved by End User Representative)	val barro	Acquisition Acquisition A IC ERUN Signature (PAT Repres	Acquisition Flight Gertified by Earlin Datus SANgus PAP Signature over Printed Name (PAF Representative)	Pilotin Contrand	Alt	Udar Operator

17. Flight Log for 2CAG51A316A Mission

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Airport, City/Province): 12 Airport of Arrival (Airport, City/Province): 15 Total Engling Time: 16 Take off: 17 Landing: 16 Take off: 16 Take off: 17 Landing: 17 Octal Engling 16 Take off: 17 Landing: 18 Take off: 16 Take off: 17 Landing: 19 Landing: 16 Take off: 17 Landing: 19 Landing: 16 Take off: 17 Landing: 10 Landing: 16 Landing: 10 Landing: 10 Landing: 10 Landing: 10 Landing: 1	. 6	2 ALTM Model: Geminy 3	3 Mission Name: 24465/ 9 Route:	90% 4-4 Type: VFR	5 Aircraft Type: Cesnna T206H	6 Aircraft Identification: 9/27
ne off: 13 13 34 grant Filme: 15 Take off: 17 Landing: Caseful - Surveyul 14 Univ reactured and 14 Univ Manufation Film Equation of the Place off: 17 Landing: Manufation Film Equation of the Surveyor Physical Command Manufation Film Equation of the Place of the Surveyor Physical Office of Name Superior over Printed Name (Manufation Film Equation over Printed Name		12 Airport of Departure (Ai	Virport, City/Province):	12 Airport of Arrival	(Airport, City/Province):	
restrict . Surveyor 14 ins. Restrictions report of instruction and the command Mathield in the contrast of the contrast Separate one Printed Name Separate one Printed Name Separate one Printed Name	1000	(3 /3	15 Total Engine Time:	16 Take off:	17 Landing:	18 Total Flight Time:
safel - Garragh W. Cins Realistion slight garilled by Madinica Right garilled by Magazine one Printed Name Signature one Printed Name (M. E. M. Connand M. C. M. C. M. Connand M. C. M. C. M. Connand M. M. Representation M. Representation	1 1					
Acquisition Flight Gentiled by Recutilition Flight Gentiled by NIC ERCIVILY Tarks Off-pro-MF Bignature over Printed Name (M. E. H. E. H. E. M. Command Bignature over Printed Name (M. E. M. E. M. Command Bignature over Printed Name (M. E. M. Command Bignature over Printed Name	*	cester . Same	14	_		
Acquisition Flight Corrited by Acquisition Flight Corrited by Pilot-in-Command M. E. The Command M. E. The Command M. E. The Command Signature over Printed Name (M. Representative) (M. Representative)						
Acquisition Flight Specified by Placin-Command Luder Operator End Au N.C. ERC.Jul Dicaus ONH-pro PAT H. L. The Equipment of End Name Signature over Printed Name (PMF Representative)						
	Acquisition Flight Approved by Advantation Approved by AutoMCM Michael Signature over Primad Name (End Uver Representation)		n Filen Sertified by En Sertified by Decaus Other por PAT performed Name secretive)	Pilotin-Commung		Y WILL

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18. Flight Log for 2CAG51AS316B Mission

Active 2 ALTM Model: Conv. 3 Mission Name: 2062/11 8 Co-Filot: ML Fonce of 9 Route: 12 Almoot of Departure (Almoot, Gty/Province): 14 Engine Off: Acol 15 Table 5 Act 9 aps A 2CML 21 45 316 5 Act 9 aps : : : : : : : : : : : : :	Well A Type: VFR 5 Aircraft Type: CesnnaT206H 6 Aircraft Identification: 12 Airport of Arrival (Airport, Gty/Province): 16 Take off: 17 Landing: 18 Total Filght Time:	6 Aircraft Identification: 9/72
Le Barder M. Fangeren 9 Route: 12 Airport of Ofeparture (Airport, Gry/Province): 14 Engine Ott: Acol 15 Total Engine Time: Ard 2012 1 45 3/65 dat gags ons: ons: Acoutation flight Certified by	1 (Airport, Giy/Province): 17 Landing:	
12 Airport of Departure (Airport, Gry Province): 14 Engine Off: Kol 15 Total Engine Time: A.A. 2CAL 21 45 316 8 dot gaps ons: ons: Acquisition Flight Certified by	1 (Airport, City/Province): 17 Landing:	18 Total Filght Time:
Lie Engine Off: Kol Is Total Engine Time: Is Take the A 2CAL 21 45 3165 date gags ons: Approved by Acquisition Flight Certified by	17 Landing:	18 Total Flight Time:
the 2CAL 21 45 316 5 date gaps ons: Approved by Acquisition Flight Certified by		
Completed 201421 45 316 8 date gags and solutions: 		
wed by Acquisition Flight Centified by		
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Name PAT Sa	YOUNO TEO Name	Udar Operator

19. Flight Log for 2CAG51AS2317A Mission

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Flight Log No.: 746	ino:						
£	6 Aircraft Identification:		18 Total Flight Time:				Udar Operation
	5 Aircraft Type: Cesnna T206H	12 Airport of Arrival (Airport, Gty/Province):	17 Landing:				ded Name
	4 Type: VFR	12 Airport of Arrival	16 Take off:		aps.		
	3 Mission Name:	9 Route: Airport, City/Province):	15 Total Engine Time:		lives and Fill the gaps.		Acquisition Flight Sentilied by AIC_ERUIN_ERAU
	WW	ture (14 Engine Off:		4 lives and		Acquisit A/C_ <u>ERU</u> Signatur
DREAM Data Acquisition Flight Log	1 LIDAR Operator: DC Adowno	27		19 Weather 600 d	20 Remarks: Fouryed 9	21 Problems and Solutions:	Acquisition Flight Approved by Control Acadimo Acquisition Flight Approved by Signature Over Printed Name (End User Representative)

20. Flight Log for 2CAG11AS2317B Mission



Flight Log for 2CAG21AS2318A Mission 21.

Flight Log No.: 742	11h]
Flight 6. Al receift I denoi (flowellow)	A MINISTERIA CONTRACTOR AND A		18 Total Flight Time:				Udar Oganation At Arry MIE Frick A Sughture over Printed Name
S Alrcraft Twon: Cesnna T206H 6 Alreadt Identification		12 Airport of Arrival (Airport, City/Province):	17 Landing:				
Chaled 4 Type: VFR		12 Airport of Arrival (16 Take off:				Pilot-In-Command FB Orthongo Signature oper Printed Name
3 Mission Name: 0 /4/01	& do-Pilot: C. Javiny 9 Route:	Airport, City/Province):	15 Total Engine Time:	1	Mission completed		Acquisition Fight Certified by Zerfahrer Alle 4-Ribuins (1905 Jannas Signature over Printed Name (PMF Representative)
2 ALTM Model: Cemini	lot: C. Javier	12 Airport of Departure (Airport, City/Province):	3 H	USUN	Mizzim		Acquisition AIC Signature (PAF Repri
Acquisition Flight Lo	(z	c102-11	13 Engine On: 14 Engi	her	20 Remarks:		Acquisition Flight Approved by A signature Signature over Printed Name (End User Representative)



22. Flight Log for 2CAG11C318B Mission

3 Mission Name: 34% SI/C 2/98 A Type: VR 5 Aircraft Type: Cesnna T206H 6 Aircraft Identification: 7/12 9 Route: Upport, City/Province): 12 Airport of Arrival (Airport, City/Province): 12 Airport 12 Airport 15 Total Engine Time: 12 Airport of Arrival (Airport, City/Province): 12 Airport 12 Airport 5 Total Engine Time: 15 Take off: 17 Landing: 18 Total Flight Time: 16 Aircraft Lensing 16 Take off: 17 Landing: 18 Total Flight Time: 17 Airport 10 Aircraft Aircraft Aircraft Lensing 10 Aircraft Aircraft Aircraft Aircraft Aircraft Aircraft	Is Aircraft Type: Cesnna T206H Aircraft Identification: 12 Airport of Arrival (Airport, City/Province): 12 Airport of Airbort, City/Province): 16 Take off: 17 Landing: 16 Take off: 17 Landing: 18 Total Flight Time: Airbort of Airbort, City/Province):	Ì					. [
15 Take off: 15 Take off: 16 Take off: Plot-in-Comman Plot-in-Comman	3 Mission Name: 24%s/I/C 3/9/8 4 Type: VFR 9 Route: 15 Total Engine Time: 15 Total Engine Time: 15 Total Engine Time: 16 Take off: 2 4/1/ 16 Take off: 17 Airport of Arrival (Airport of				18 Total Flight Time:			tar Operator Zan Ali John Danie paature over Printed Hame
110	3 Mission Name: Jans IIC. 9 Route: (Airport, Gty/Province): 15 Total Engine Time: 3 4/1/ Creation Star 34/1/ Creation Printed by 2 Over Printed Name	5 Aircraft Type: Cesnna T206H		Airport, Gty/Province):	17 Landing:			
3 Mission Name: 24/6/1 9 Route: 15 Total Engine Time: 15 Total Engine Time: 2 + 11 2 Total Star 24 + 11 2 + 111 2 + 11 2 + 111 2 + 111 2 + 111 2 + 111 2 + 111 2 +		C 3/98 4 Type: VFR			16 Take off:			Pilot in Comma FB 90068
		3 Mission Name: Jans I	9 Route:		15 Total Engine Time:			in Fight Certified by



23. Flight Log for 2CAG11CS2319B Mission

Flight Log No.: 748	3/22						
Flight Lo	6 Aircraft Identification: 9/ 2 2		18 Total Flight Time:				Idar Operation Data Hibberland
	5 Aircraft Type: Cesnna T206H	12 Airport of Arrival (Airport, City/Province):	17 Landing:				Pilot in Command FB 0 Performant Separatureforer Printed Name
	C\$3754 Type: VFR	12 Airport of Arrival	16 Take off:				
	3 Mission Name: 2046 // C 39754 Type: VFR	9 Koute: Airport, City/Province):	15 Total Engine Time: 또구 03		6 lines.		Acquisition Flega, Certified by ALC ERJUJ DEJOU SHUPS Sepature over Printed Name (PM Representative)
	Genial	8 Co-Pilot: 4. VANC 9 Route: 12 Airport of Departure (Airport, City/Province):	1612		inverged 14/16 cines. Mission success ful		Alc Enviro
sition Flight Log	Aldown	8 (0-	1109 14 Engine Off:	Good	Surveyed Mission	21 Problems and Solutions:	Acquisition Flight Approved by Arguistion Flight Approved by Autoropy Antoning Signature over Printed Name (End Uber Representative)
DREAM Data Acquisition Flight Log	1 UDAR Opera	1 Pilot: 1 . 120/12-13 10 Date: 11 - 15 - 13	13 Engine On: //09	19 Weather	20 Remarks:	21 Problems	Acque Signa

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24. Flight Log for 2CAG11B320A Mission

DREAM Data Acquisition Flight Log					- ····································	
1 UDAR Operator: MVE Toryo	2 ALTM Model:	3 Mission Name: JCA & I/ B 30A 4 Type: VFR	S 200 4 Type: VFR	5 Aircraft Type: Cesnna T206H	6 Aircraft Identification: 9/22	N
F. Delconnac	8 Co-Pilot: J. Jawr	9 Route:				
-	12 Airport of Departure (Airport, Gity/Province):	(Airport, Gity/Province):	12 Airport of Arrival	12 Airport of Arrival (Airport, City/Province):		
13 Engine On: 084/ 14 En	14 Engine Off:	15 Total Engine Time:	16 Take off:	17 Landing:	18 Total Flight Time:	
19 Weather Cloudy of	was parts of the are.	yes care.				
20 Remarks:						
Conversed	19 Gres.					
Mission	Successful					
21 Problems and Solutions:						
Acquisition Flight Approved by	,	Acquisition Flight Certified by The ERUIN DELAS SAMP	Pilot-in-Command F& Deco Armone Signature ofer Printed Name	ted Name	Udar Operator An you on the Tungo Manature over Printed Name	
(End User Representative)	(PAF Re	(PAF Representative)	1			

25. Flight Log for 2CAG11CS2320B Mission

IN N	ð				
1 UDAR Operator: JC H/d	1 UDAR Operator: OC Fildovino 2 ALTM Model: Carin ¹ 3 Mission Name: 2006 11 CF 2004 Type: VFR	3 Mission Name: 2046 /	C 1264 Type: VFR	5 Aircraft Type: Cesnna T206H	6 Aircraft Identification: 9/ 32
		2 monte.		1	
10 Date: 11-16-13	12 Airport of Departure (Airport, City/Province):	Airport, Gty/Province):	12 Airport of Arrival	12 Airport of Arrival (Airport, City/Province):	
13 Engine On: 14 10	14 Engine Off:	15 Total Engine Time:	16 Take off:	17 Landing:	18 Total Flight Time:
19 Weather 60 od	-				
20 Remarks:					
Surveard	Y				
MI SSION	Internont Holsin				
21 Problems and Solutions:					
Acquisition Flight Approved by Acquisition Flight Approved by AMM INC MOUNT Amount Annual Signature over Printed Name Irend Ince Beneroscitisch	. (<u>s</u>	Acquisition Flight Consilled by The FRUIN (Security Strups PAF Signature over Interd Name (DAE Reconcentation)	Plotin Command AF <u>3E</u> Ductor Vinto	d Name	Udar Operator



26. Flight Log for 2CAG51D322B Mission

15 74): 12 Airport of Arrival (Airport, City/Prownce): e: 16 Take off: 17 Landing: 18 Total Flight Time: 5			Pilot in Command T.E. Differ more Signature over Printed Name Signature over Printed Name
inite	It Aurport of Departure (Aurport, City/Prownce): ine Off: $2 \circ 9$ IS Total Engine Time: $3 \neq 6 \lesssim$	Infest		Acquisition Flight Certified by Zer for the PIC EFLID DEFLOS SAM PAS Signature over Printed Name (PAF Representative)
DREAM Data Acquisition Flight Log 1 LiDAR Operator: Z.N. KOX45 2 ALTM Model: Comini 7 Pilot: F. Operango 8 Co-Pilot: J. Unice	10 Date: $ l-lg-ls $ 12 Auport of De 13 Engine On: $ \beta \circ \beta $ 14 Engine Off: $ L \circ 9 $ 10 Weather	Mission successful	21 Problems and Solutions:	Acquisition Flight Approved by

27. Flight Log for 2CAG21B323A M

2 ALTM Model: Econiai 3 Mission Name: 20459143289 4 Tone: VFR 5 Aircraft Tone: Cesnna T2064 6 Aircraft Identification: 9/20		12 Airport of	15 Total Engine Time: 16 Take off: $\frac{3}{3}$ 17 Landing: 18 Total Flight Time: $3\neq q\gamma$		mission successful	100 To degoal I restarted surved times, been functioned	Acquisition flight Certified by Pilot-in-Command Udar Operator The FRAM DE240 SAV PU Pilot in Command Udar Operator AIC EFRAM DE240 SAV PU Pilot in Command Semantured Name Semantured Name Semantured Name
ALTM Model: Ganiai 3	: Judavier 9	arture	1304	cloudy	8 lince.	7 restanted	Acquisition Flight C
1 UDAR Operator: IN Coxes 2 A	1		13 Engine On: 09 2 I 14 Engine Off:	hart	20 Remarks: Fur Verye d	21 Problems and Solutions: 180 To dragout - 181 Jun Hur	Acquisition Flight Approved by

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28. Flight Log for 2CAG21BS323B Mission

No.: 76	9122							
Flight Log No.: 764	6 Aircraft Identification: 9			18 Total Flight Time:			1	lidar Operator Marten Marten Signature over Mined Name
	5 Aircraft Type: Cesnna T206H		12 Airport of Arrival (Airport, Gty/Province):	17 Landing:				r m Pe
	ST 3238 4 Type: VFR		12 Airport of Arrival	16 Take off:		7 lines.		Pilot-in-Command TB DECOM-IN-
	2 ALTM Model: Comini 3 Mission Name: 209071 28 338 4 Type: VFR	9 Route:	Airport, City/Province):	15 Total Engine Time:		successful. Surveyed 7 lines.		Acquisition Flight Certified by 2010 2010 Derois Jake par Signature over Printed Name (PAF Representative)
		6	12 Airport of Departure (Airport, Gty/Province):	14 Engine Off: 16/3				
DREAM Data Acquisition Flight Log	1 LIDAR Operator: MLE Tongs	7 Pilot: P. Decempo 8 Co-Pilot: Jubyer	10 Date: //- /9 - /3		19 Weather Goudy	20 Remarks: Miggion	21 Problems and Solutions:	Acquisition Flight Approved by



29. Flight Log for 2CAG21C324A Mission

DREAM Data Acquisition Flight Log	30	2CT64	acrealcood A and		Flight Log No.: 766
IDAR Operator: MVE	1 UDAR Operator: M VE Tong. 2 ALTM Model: Geniai 3 Mission Name: 2004 1882 3394 Type: VFR	3 Mission Name: 2000	1052 Saled Type: VFR	5 Aircraft Type: Cesnna T206H	6 Aircraft Identification: 972
7 Pilot: F. OLD COMPO	8 Co-Pilot: J Javer	9 Route:			
10 Date: 11- 20 - 43	12 Airport of Departure (Airport, Gty/Province):	(Airport, Gity/Province):	12 Airport of Arrival (Airpor	12 Airport of Arrival (Airport, Gty/Province):	
13 Engine On: 09 Jo	14 Engine Off: /2 33	15 Total Engine Time: 47 2 3	16 Take off:	17 Landing:	18 Total Flight Time:
19 Weather Cloudy -					-
20 Remarks: Miらららか	sion completed				
21 Problems and Solutions:					
Acquisition Flight Approved by		Acquisition Flight Certified by ZALAND SCALL DEPUS JANTAS PAP Signature over Printed Name	Pilot in Command TB D PENDA IN an		Udar Operator Artan Septemy over Printed Name

30. Flight Log for 2CAG21D324B Mission

Flight Log No.: / ation: 972.2	1						
6 Aircraft Identific			18 Total Flight Time:				Lidar Operator Signatury over Printed Name
S Aircraft Type: Cesnna T206H		12 Airport of Arrival (Airport, City/Province):	17 Landing:				And Name
OSOV8 4 Type: VFR		12 Airport of Arrival	16 Take off: 0		6 Ches.		Pilotin-Command 78 Defter In-Do
3 Mission Name: 306.2	9 Route:	Arport, Gty/Province):	15 Total Engine Time:	-	Surveyed		Acquisition Flight Certified by
2 ALTM Model: 6ceriai 3 Mission Name: 306 210 008 4 Type: VFR	8 Co-Pilot: U.J. wier	12 Airport of Departure (Airport, Gty/Province):	14 Engine Off: 75		success ful. Surveyed Elines.		
1 LUDAR Operator: /N KeX45	1	0.00-11	16 81	er	Nissian	21 Problems and Solutions:	Acquisition Flight Approved by
LIDAR O	Pilot:	10 Date:	13 Engine On:	19 Weather	20 Remarks:	21 Probl	

31. Flight Log for 2CAG21D325A Mission

9/22						Q
6 Aircraft Identification: 4			18 Total Flight Time:			Eldar Operator Signaturyover Printed Name
5 Aircraft Type: Cesnna T206H		12 Airport of Arrival (Airport, City/Province):	17 Landing:			Printed Name S
D32Ga 4 Type: VFR		12 Airport of Arrival	16 Take off:			Pilot-in-Command #8 Defects mare Signature over Printed Name
2 ALTM Model: Genini 3 Mission Name: 2CM 3103500 4 Type: VFR	9 Route:	Airport, Gty/Province):	15 Total Engine Time:			Acquisition Flight Certified by The Carlier And And And Signature over Printed Name (PAF Representative)
2 ALTM Model: Ganini	8 Co-Pilot: Un Janie	12 Airport of Departure (14 Engine Off: 1211 15 Total Engine Time:			
Operator: L. Lox	P. Decempo	10 Date: //- J/ - 13	13 Engine On: 9 / 8 14 Er	19 Weather	20 Remarks: 21 Problems and Solutions:	Acquisition Flight Approved by



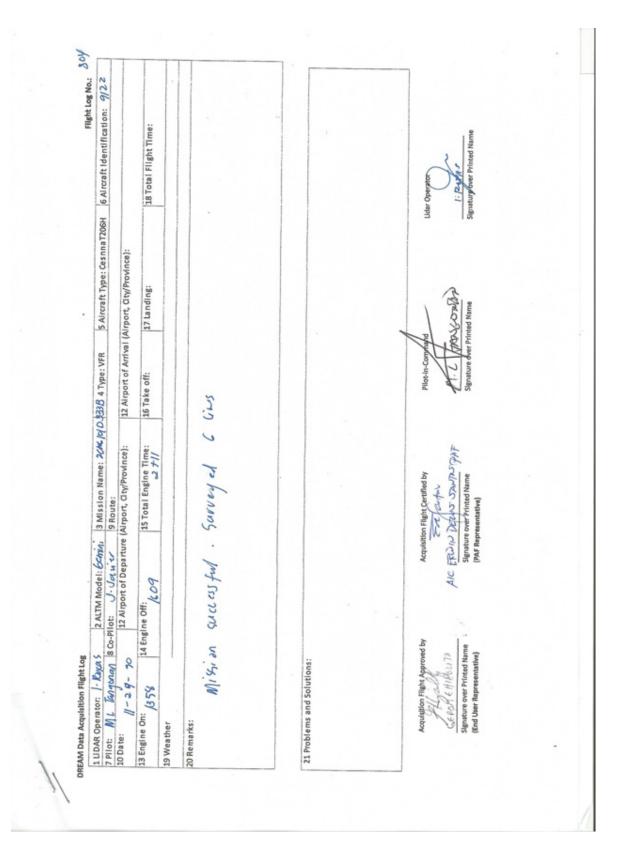
32. Flight Log for 2CAG61F325B Mission

33. Flight Log for 2CAG101BS329A Mission

Flight Log No.: 802	22/6 :uo						
	6 Aircraft Identificat		18 Total Flight Time:				Udar Operator Parton
	5 Aircraft Type: Cesnna T206H 6 Aircraft Identification: 9/22	12 Airport of Arrival (Airport, City/Province):	17 Landing:	-			12
	33 A 4 Type: VFR	12 Airport of Arrival	16 Take off:		f lines		₹ ' 3
	3 Mission Name: 2000 Mg	9 Route: Airport, City/Province):	15 Total Engine Time:		surveyed 19		Acquisition Flight Certified by The Acquisition Flight Certified by AIC ERCILD Distroct JALIAN PAT Signature Over Printed Name (PAF Representative)
	ivi	ture (14 Engine Off: 13 5 %		successful surveyed 14 lines		
DREAM Data Acquisition Flight Log	1 UDAR Operator: A. I E Tons	10 Date: 1-29-13 12 Altport of Depart		19 Weather Ubudy	20 Remarks: Miggion	21 Problems and Solutions:	Acquisition Flight Approved by



34. Flight Log for 2CAG101D222B Mission



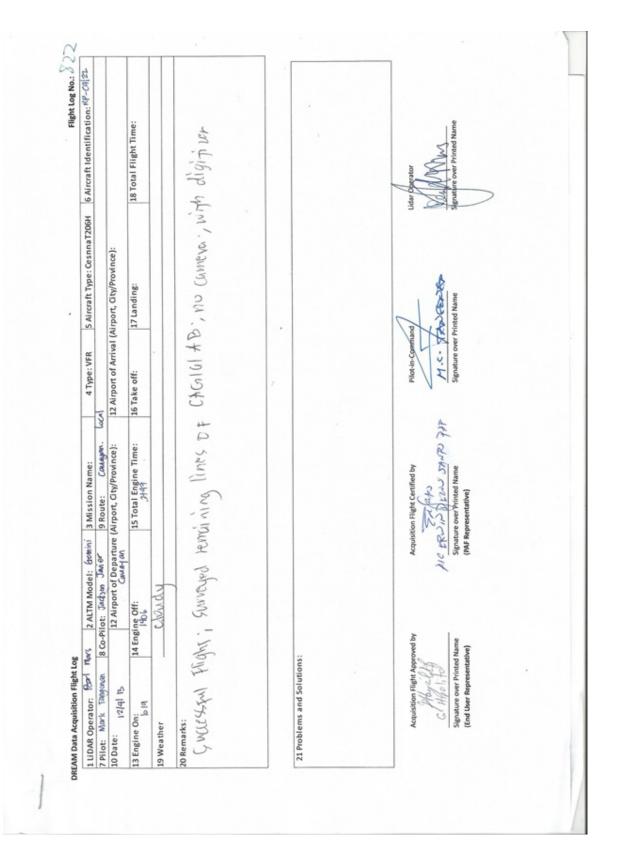
35. Flight Log for 2CAG171A336B Mission

2	tel: Gemini	3 Mission Name:	4 Type: VFR	5 Aircraft Type: CesnnaT206H	6 Aircraft Identification: AP -C4/22
DirgonOn 8 Co-PI	Janer	9 Route: Guinner Loca			
	of Departure	12 Airport of Departure (Airport, City/Province):	12 Airport of Arrival	12 Airport of Arrival (Airport, City/Province):	
14 Engine Off		15 Total Engine Time:	16 Take off:	17 Landing:	18 Total Flight Time:
19 Weather (DUDU)					
Surveyed C/15 lings, / lin	e with	, I line with 100% dwp augs; no compa	, nu cume	à	
			,		
21 Problems and Solutions:					
Acquisition Flight Approved by Conferent Hand	Acquisition Flight Acquisition Flight AIC LFC 0.1.7 Signature over PM (PAF Representati	Acquisition Flight Certified by Acquisition Flight Certified by E. E.F. J. J. D. L. J. J. J. J. J. J. S. Signature over Printed Name (PAF Representative)	Pilot-in-Compand	Decite) Inted Name	Lidar Operator Signature over Printed Name

36. Flight Log for 2CAG171A337A Mission

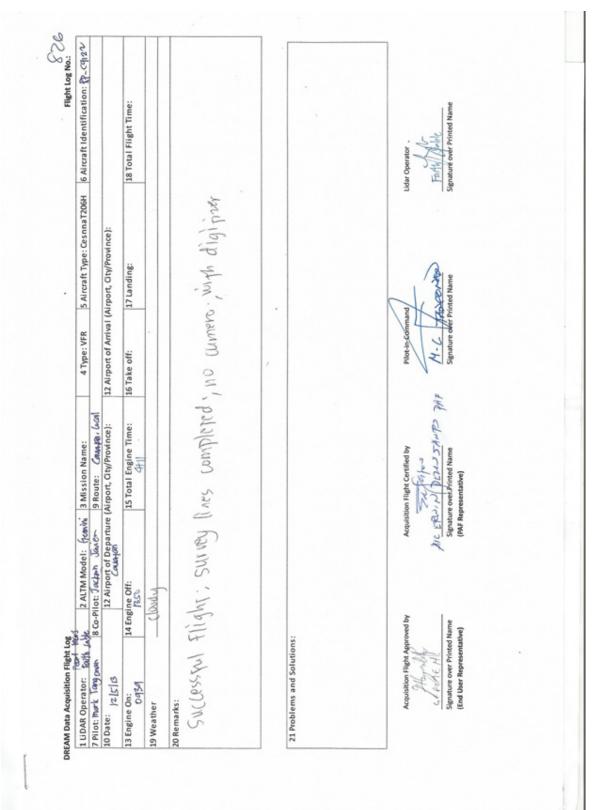
alarias gas sugar	5 Aircraft Type: CesnnaT206H 6 Aircraft Identification: 102-09/02			18 Total Flight Time:		of GG NULIAB;			Lidar Operation
	5 Aircraft Type: Cesnna T206H		12 Airport of Arrival (Airport, Gtty/Province):	17 Landing:		ullesspul flight; surveyed remlaining liner of CACIFIA and Flize lines of GG NeLAB;			Pilot-in-Commands M. (Aladicana Signature over Printed Name
	4 Type: VFR		12 Airport of Arriva	16 Take off:		CACIFIA		,	
	3 Mission Name:	9 Route: CAMPM TAGE	(Airport, Gty/Province):	15 Total Engine Time:		ining liner of	digi prov		Acquisition Flight Certified by The constraints of the signature over Printed Name (PAF Representative)
	2 ALTM Model: Scolor 3 Mission Name:	7 Pilot: Mark Thurshan 8 Co-Pilot: Jackson Jauer	12 Airport of Departure (Airport, Gty/Province):	14 Engine Off:	Doudy	it ; surreyed remu	no connevari ni ph digitizer		
DREAM Data Acquisition Flight Log	1 LIDAR Operator: Port Nac	7 Pilot: Mari Jangnan	10 Date: (2 05 13	13 Engine On: AIG	19 Weather	20 Remarks: GULUESSFUL FILGIN	No CI		Acquisition Flight Appoved by Acquisition Flight Appoved by Control Manuel Signature over Printed Name (End User Representative)

37. Flight Log for 2CAG161AB338A Mission



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38. Flight Log for 2CAG161BCDES339A Mission



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39. Flight Log for 2CAG171339B Mission

ſ					Flight Log No.:
1 LIDAR Operator: Kown Futh 2 ALTM Model: Scenini 7 research and 1 Autor		3 Mission Name:	4 Type: VFR	5 Aircraft Type: Cesnna T206H	6 Aircraft Identification: KP-C4124
13	ort of Departure (12 Airport of Departure (Airport, Gty/Province):		12 Airport of Arrival (Airport, City/Province):	
13 Engine On: 14 Engine Off: 14 Engine Off: 1425		15 Total Engine Time:	16 Take off:	17 Landing:	18 Total Flight Time:
successful filight , S	pahan M.	r surveyed lelle lines; no compra; no digipizer	e Cumpra,	no digipzer	
			*		-
21 Problems and Solutions:					
Acquisition Flight Agproved by Physical Approved by Connect Apple 1, A Signature over Printed Name (End User Rapresentative)	Acquist	Acquisition Flight Certified by Acquisition Flight Certified by ALC EF J IN DELI J JA app MF Signature over Printed Name (PAF Representative)	Pilot-in-Co		Lidar Operator



40. Flight Log for 2CAG171B341A Mission

6 Aircraft Identification: Rf - C9/20			18 Total Flight Time:		digipizer		•	Idar Operator Signature over Printed Name
5 Aircraft Type: Cesnna T206H		12 Airport of Arrival (Airport, City/Province):	17 Landing:		Remarks: Lucessful Flight; Surveyed remaining lines of CAGIFIE; no amore; with digipizer			ACC NAC
4 Type: VFR	cal	12 Airport of Arrival	16 Take off:	-	CAG171 \$,		Pllot-in-Command M.C. MA Signature over Prin
3 Mission Name:	9 Route: Carland . Le	12 Airport of Departure (Airport, City/Province): 12 Cáuaijan	15 Total Engine Time: 4+05		to saril for in			Acquisition Flight Certified by Acquisition Flight Certified by Alo ERDIN DEPLAN SAWED GAP Signature over Phyliced Name (PAF Representative)
2 ALTM Model: Gemini	8 Co-Pilot: Jackym Clarker	12 Airport of Departure (14 Engine Off:	hpm	Surveyed remain			Acquisi Signatu (PAF Re
1 UDAR Operator: Toth She	Manla			87	sspul Plight ;		21 Problems and Solutions:	Acquisition Flight Approved by <u>Control of Mane</u> Signature over Printed Name (End User Representative)
1 UIDAR Op	7 Pilot: N	10 Date: 7 p	13 Engine On:	19 Weather	20 Remarks: AULOS		21 Proble	K 195

l



7 Pilot: flart languran 8 Co-Pilot: Jaulyan Jan &- 10 Date:	AN P.	A North Contraction of the second sec			
		9 KOUJE: CAMANAN ' V COI			
	Departure (/	12 Airport of Departure (Airport, City/Province):	12 Airport of Arrival	12 Airport of Arrival (Airport, City/Province):	
14 Engine Of		15 Total Engine Time:	16 Take off:	17 Landing:	18 Total Flight Time:
19 Weather (Dividue)			-		
soremarks: Gullesspirit Flight ; Surveyed 5/20 litres, no aumera, with diginater	pahan	6/10 lines., no	CUMARS ,	with digipatr	
			,		
21 Problems and Solutions:					
Acquisition Flight Approved by Acquisition Flight Approved by Signature over Printed Name (End User Representative)	Acquisit Acquisit Signatur (PAF Re)	Acquisition Flight Certified by Acquisition Flight Certified by MC CFCJ 1, JLPAN SAPP3 777 Signature over Printed Name (PMF Representative)	Pilot-in-Compand	Pilot-in-Compand M.C. Marken Ka	Udar Operator

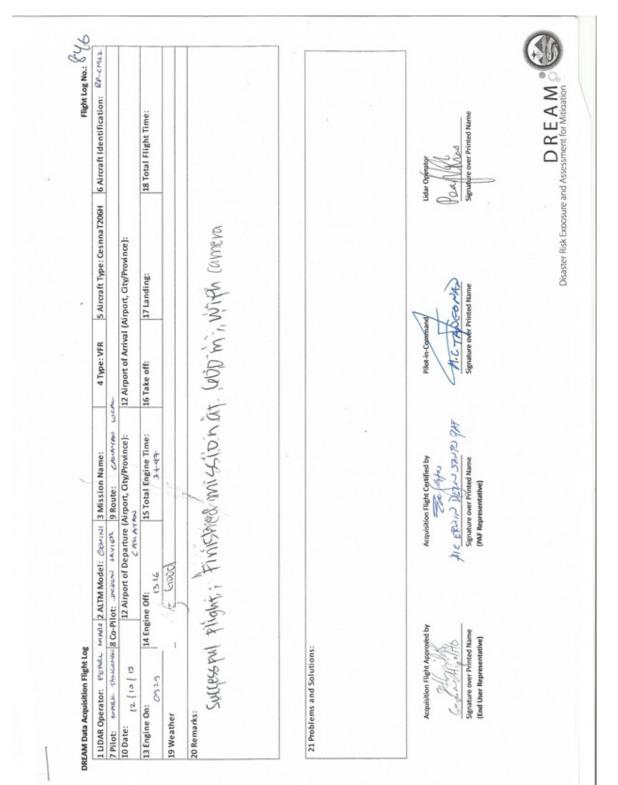
41. Flight Log for 2CAG171C341B Mission



42. Flight Log for 2CAG171C342A Mission

1 เปอส Operator: ก็ก่ำ (มัน 2 AITM Model: 3cm 7 Pillot: ที่เห/เ 10 Date: 12 Airport of Depart (ปร/13) 12 Airport of Depart (ปร/13) 12 Airport of Depart (ปร/13) 13 Engine On: 14 Engine Off: 14 Airport of Depart (ปร/13)					100 CO. 100
14 Eng	-	3 Mission Name:	4 Type: VFR	5 Aircraft Type: CesnnaT206H	6 Aircraft Identification: KP-C9134
	Virport of Departure	12 Airport of Departure (Airport, Gty/Province):	12 Airport of Arrival	12 Airport of Arrival (Airport, City/Province):	
	De Off:	15 Total Engine Time:	16 Take off:	17 Landing:	18 Total Flight Time:
Run					
20 Remarks: Sullection Hight; Surveyed reprinting lines of CAG171C; with cumera; ho digipte	Surveyed re	mining lines of	CAGIFIC	; with cumpra; he	مر بارابه ر
			1		
14 Proprems and Sourcens 12					•
				4	
Acquisition Flight Approved by Control Providence Signature over Printed Name (End User Representative)	Acquisi Al C <u>EFC</u> Signatu (PAF Re	Acquisition Flight Corrited by The FTWIN DEAL SAMPL AMP Signature over Printed Name (PAR Representative)	Pilot-in-Command M-1	Control Name	Udar Operator Ten Hy Sable Signature over Printed Name

Flight Log for 2CAG221CS231AS344A Mission 43.



44. Flight Log for 2CAG171D344B Mission

Genuint 3 Mission Name: 4 Type: VR S Alrcraft Type: Cestma T200H 6 Alrcraft Identificuration January S Route: January S Route: January S Alrcraft Type: Cestma T200H 6 Alrcraft Identificuration Upside: January S Route: January S Alrcraft Type: Cestma T200H 6 Alrcraft Identificuration Upside: January S Route: January S Alrcraft Alroy C Gty/Province): January S Alroy S	Marken Carrier S Aircraft Type: Cesnna T206H	Flight Log No.: 848	- C9RL						(
General 3 Mission Name: 4 Type: VFR S Aircrai Graves 9 Route: Carvaras Locat Graves 9 Route: Carvaras Locat Graves 9 Route: Carvaras Locat Parture (Airport, Gity/Province): 12 Airport of Arrival (Airport, Gity/Province): 12 Jand Parture (Airport, Gity/Province): 12 Jand 12 Jand Parture (Airport, Gity/Province): 12 Jand 11 Jand Rest 15 Total Engine Time: 16 Take off: 17 Jand Rest 15 Total Engine Time: 16 Take off: 17 Jand Rest 6 J 2 J Hine S Mi M. Chine M. 17 Jand Rest 6 J 2 J Hine S Mi M. Chine M. 17 Jand Rest 6 J 2 J Hine S Mi M. Chine M. 17 Jand Rest 6 J 2 J Hine S Mi M. Chine M. 17 Jand Rest 6 J 2 J Hine S Mi M. Chine M. 17 Jand	Mould Jarling 3 Mission Name: 4 Type: VFR 5 Aircai 8 Co-Pilor: Jardine 3 Mission Name: 4 Type: VFR 5 Aircai 8 Co-Pilor: Jardine 12 Airport of Arrival (Airport, City/Province): 12 Airport of Airport, City/Province): 12 Airport of Airport 12 Airport of Airport, City/Province): 12 Airport of Airport 12 Airport of Airport 12 Airport of Airport 12		6 Aircraft Identification: RP			18 Total Flight Time:		Lidar Operator	
Acquisition Flight Cartified by Acquisition Flight Cartified by Acquisition Flight Cartified by Acquisition Flight Cartified by Signature over Printed Name (pM Representative)	MOLE ZAITM MODEL: GENTRI 3 MISSION Name: 8.Co-Pillo: JACKEND JANEND JR. 2000 Name: 12. Aliport of Departure (Aliport, Gty/Province): 12. Aliport of Departure (Aliport, Gty/Province): 13. Aliport of Departure (Aliport, Gty/Province): CD D D D D D D D D D D D D D D D D D D		5 Aircraft Type: Cesnna T206H		(Airport, City/Province):	17 Landing:		a Central Name	
2 ALTM Model: Gennaria 3 Mission Name: 10: JACKEND GARAN 9 ROUTE: CANANAS 12 Airport of Departure (Airport, Gity/Province): ne Off: Lui 15 Total Engine Time: 2 4 11 Mie St. Mie S	ADUC 2 A A ADUC 2 A A A A A A A A A A A A A A A A A A		4 Type: VFR	LOCAL	12 Airport of Arrival	16 Take off:		VI HU CLAMPERS	
A consisting the contract of t	ADUC 2 A A ADUC 2 A A A A A A A A A A A A A A A A A A		3 Mission Name:	CANANAS	irport, Gity/Province):	15 Total Engine Time: 2-4-11		6 / 22 Mr B S Mr S V	
	In 112 Agrowed by the fight Ag		2 ALTM Model: General		12 Airport of Departure (A	1171	10		

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45. Flight Log for 2CAG101G345A Mission



46. Flight Log for 2CAG101G347A Mission

1: Re-Colar								W
6 Aircraft Identification			18 Total Flight Time:				Udar Operator	DREAM
5 Aircraft Type: CesnnaT206H 6 Aircraft Identification: V2P - C912L		12 Airport of Arrival (Airport, City/Province):	17 Landing:				first Jean A	
4 Type: VFR	LOCAL	12 Airport of Arrival	16 Take off:					
3 Mission Name:	9 Route: CAMANAN	Airport, City/Province):	15 Total Engine Time: 3 + (?+		12/21 lines		Acquisition Flight Certified by MC Brown Stand Converts Pro- Signature over Printed Name (PAF Representative)	
Net 2 ALTM Model: CENNON 3 Mission Name:	Co-Pilot: dacies the invite	12 Airport of Departure (Airport, City/Province):	14 Engine Off: الإطراح	Cloudy	Sullessful Flight, finished 12/21 lines			
1 LiDAR Operator: PENCL MARI	7 Pilot: puerte Trademon 8 Co-Pilot: dacies Javien	10 Date: 12- (15)13	13 Engine On: 14	19 Weather	20 Remarks: SULLESSFUL FA	21 Problems and Solutions:	Acquisition Fight Approved by Let and Apple Apple Apple Apple Apple Apple Apple Apple (End User Representative)	

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47. Flight Log for 2CAG101F347B Mis

ation: \$20-C6122-							
6 Aircraft Identification: 12P - C6122-			18 Total Flight Time:		o alrport time		Udar Operator
5 Aircraft Type: Cesnna T206H		12 Airport of Arrival (Airport, City/Province):	17 Landing:		Substan Problem; I fire fine and I fine; In 165100 abouted due to airport time testination		d Table Concession rinted Name
4 Type: VFR	moun 1	12 Airport of Arrival (16 Take off:		ne ; mission		Plocin-command Signature over Printed Name
3 Mission Name:	9 Route: CAUNTAN LOCAL	(Airport, City/Province):	15 Total Engine Time:		fire and I fi		Acquisition Flight Certified by Acquisition Flight Certified by ALL ALL (ALL (A) JED (S) Ser of S Ver F Signature over Planted Name (PMF Representative)
1 LIDAR Operator: PANHA CNOW 2 ALTM Model: GRAWN 3 Mission Name:	7 Pilot: MARIK The bruch 8 Co-Pilot: JACKS AN WAR 9 Route:	12 Airport of Departure (Airport, City/Province):	14 Engine Off: Icolo		Problem; 1 file		
1 LIDAR Operator: PANTHE CASH	MARTIC TRUETAND 8 CO	0/0/21 :	1424			21 Problems and Solutions:	Acquisition Flight Approved by Monthly Mich Signature over Printed Name (End User Representative)
1 LIDAR	7 Pilot:	10 Date:	13 Engine On:	19 Weather	20 Remarks:	21 Prol	



48. Flight Log for 2CAG101F348A Mission

Data Model: Contraction Amost Appendent 10: Control Approxime: Amount GryProvince): 12: Altoron of Data Miles Consumment 12: Altoron of Annual (Milport, GryProvince): Information: 12: Altoron of Data Miles Lot Lot 13: Strate off: 12: 14: Information: 15: 16: Strate off: 12: 17: 17: 17: 16: Strate off: 12: 17: 17: 17: 16: 10: 17: 17: 10: 17: 16: 10: 17: 17: 10: 17: 17: 10: 17: 17: 10: 17: 17: 10: 17: 17: 10: 10: 17: 10: 10: 17: 10: 10: 17: 10: 10: 17: 10: 10: 17: 10: 10: 17: 10: 10: 17: 10: 10: 17: 10: 10: 17: 10: 18:							
U 22 International International Arrival Airport, C Regine Time: 16 Take off: 17 land 5 + 17 12 Inte 5 20 22 Inte 5 20 22 Inte 5 20 22 Inte 6 21 International Arrival Airport, C 21 International Arrival Airport, C 21 International Arrival	1 LIDAR Operator: HANTH SHOUL 2	2 ALTM Model: General	3 Mission Name:	4 Type: VFR	5 Aircraft Type: Cesnna T206H	6 Aircraft Identification:	
12. Live 113 12. Airport of Arrival (Airport, CityProvince): 12. Airport of Arrival (Airport, CityProvince): 10.3.3 14. Engine Off: 15. Total Engine Time: 16. Take off: 10.3.3 14. Engine Off: 15. Total Engine Time: 16. Take off: 10.3.3 14. Engine Off: 17. Jand Subscription: 15. Total Engine Time: 16. Take off: 11. Jand 17. Jand Subscription: 16. Take off: 17. Jand Subscription: 16. Take off: 17. Jand Subscription: 16. Take off: 17. Jand Subscription: 10. Lot 2.0 Lot 10. K Subscription: 10. Lot 2.0 Lot 10. K Subscription: Subscriptin: Subscription: Subscription: Subsc	ilot: MARA TANGANAN & CO-PILO	of: dreiged druck		Locar			
1033 14 Engine Off: 15 Total Engine Time: 16 Take off: 17 Land GULLEISFM Hight 1 Hildhid 20 / 22 Hing's Sand Solutions: and Solutions: sand Solutions: Reaching the Carlied by Reaching the Carlied by Muse Representation Acquisition Flight Carlied by Acquisition Flight Carlied by Reaching the Carlied by Muse Representation Acquisition Flight Carlied by Muse Representation	12/114/13	2 Airport of Departure ((Airport, City/Province):	12 Airport of Arrival	(Airport, City/Province):		
GULESS Field Hight , Hindhid 20/22 lines and solutions: and solutions: Acquisition Flight Approved by Acquisition Flight Certified by Acquisition Flight Approved by Acquisition Flight Certified by Acquisition Flight Approved by Acquisiti	(033	e Off: (4762)	15 Total Engine Time:	16 Take off:	17 Landing:	18 Total Flight Time:	
SULPSSFUL FIGHT , FINISHIG 20/22 LINKS s and Solutions: s and Solutions:	Weather				_		
Hight J. Mulshin 2012 112 1103 wed by Acquisition Flight Certified by Plot-in-Compadi Plot-in-Compadi Acquisition Flight Certified by		1	and color her				
eed by Acquisition Flight Centified by Pilot-in-Commanda Acquisition Flight Centified by Pilot-in-Commanda Aric Econ. 25 Avr. 24 Pr. Proc. France Ann Signature over Printed Name Signature over Printed Name (PAE Representative)	ind indestations	ght i philo	1. 20 22 12 Mill	~			
eed by Acquisition Flight Centified by Pilor-in-Commanda Arc ERUIJ TANK THE Pilor-in-Commanda Arc ERUIJ TANK THE Pilorent Name Signature over Printed Name (PAE Representative)							
Acquisition Flight Certified by AIC ERVIS STAPS AR Plac-in-Command AIC ERVIS STAPS AR PLACE	Problems and Solutions:						
Acquisition Flight Certified by Pilot-in-Command AIC ERVID THAT ARE ARE ALL FRANCES Signature over Printed Name (PAF Representative)							
DREAM	Acquisition Flight Approved by Den Approved by Suggiture over Printed Name (End User Representative)	Acquisit Arc ERU Signatur	tion Flight Castified by The Andrew 21,2 Dates Shurps 747 re over Printed Name presentative)	Pilot-in-Com	Act Sett	udar Operator	
					Constant of the second s	DREAM	



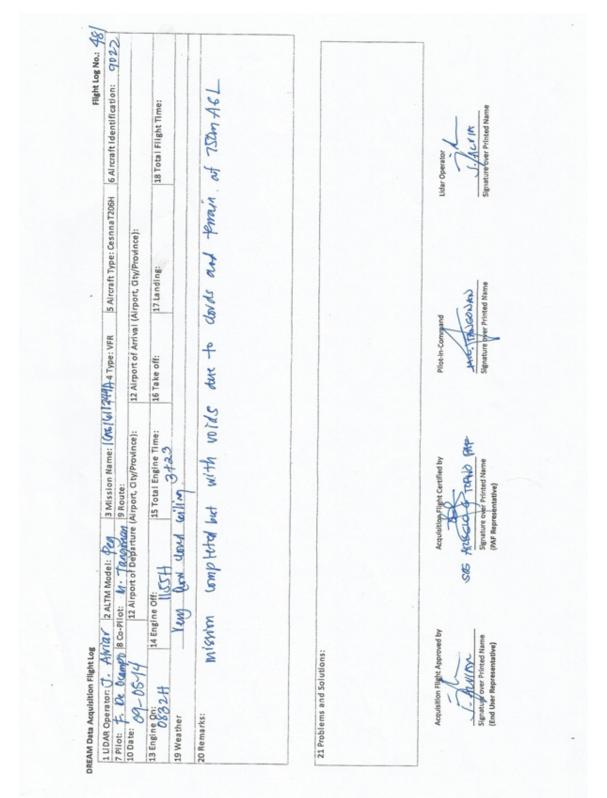
49. Flight Log for 2CAG101D351A Mission

UNEARNI Data Acquisition Fight Log						
SYXO	2 ALTM Model: GEM	3 Mission Name:	4 Type: VFR	5 Aircraft Type: Cesnna T206H	6 Aircraft Identification: c4/22	
7 Pilot: R . SAMAR I 8 Co-Pi	8 Co-Pilot: J. ALAJAK	9 Route:				
2	12 Airport of Departure (Airport, City/Province):	(Airport, City/Province):	12 Airport of Arrival	12 Airport of Arrival (Airport, City/Province):		_
	14 Engine Off: I 4 oq	15 Total Engine Time:	16 Take off:	17 Landing:	18 Total Flight Time:	
Finitud	d Blins at 190m	[a0m				
21 Problems and Solutions:						
Acquisition Flight Approved by Burnel And Anglian Signature over Printed Name (End User Representative)	I ts	Acquisition Flight Certified by	Pilot-In-Comprand	APUE Anne Anne	Lidar Operation Signature over Printed Name	_

50. Flight Log for 1CAG161H248A Mission

GU22				
Flight Log No.: 6 Aircraft Identification: 900		ht Time:	at 750 + 107 min lover to driport and no imager	A M
6 Aircraft Ide		18 Total Flight Time:	and w	And Udar Operator M. A. M.
snnaT206H	e):		Fordup	
5 Aircraft Type: Cesnna T206H	t, City/Provinc	17 Landing:	loser b	tame
	12 Airport of Arrival (Airport, Gity/Province):	171	(ung)	Pilotin-Compand
HAA Type: V	2 Airport of A	16 Take off:	192	Pilotin Signat
3 Mission Name: CAG 6 HDHSA4 Type: VFR				HA .
lission Name	ort, Gty/Prov	15 Total Engine Time:	Cree	Acquisition Flight Certified by Artics Cold Porty to Signature over Printed Name (PMF Representative)
100 3 N	parture (Airp	Ubredy	Sevin	Acquisition Fight Cert
IN 2 ALTM Model: Per	Airport of De	LU DIH partug	surrayer 4/8 lings of chellett	ġ
LOE Inhilthn 2 A	1 PHOE:	14 Engine		ph Approved by MAHC Printed Name resentative)
DREAM Data Acquisition Flight Log	har hundre	HUR	0 Remarks: 21 Problems and Solutions:	Acquisition Flight Approved by Acquisition Flight Approved by Acquisition Flight Approved by Sights over Printed Name (End User Representative)
AM Data Acqu	10 Date:	13 Engine On:	20 Remarks: 21 Problems	Acc S(g) (En

51. Flight Log for 1CAG161l249A Mission



52. Flight Log for 1CAG161P249B Mission

RP-CAO22							
6 Aircraft Identification: 75 P - 640 2 2			18 Total Flight Time:		10		Udar Operator Martin Suprator
5 Aircraft Type: Cesnna T206H		12 Airport of Arrival (Airport, City/Province):	17 Landing:		liquet .		
4 Type: VFR	- Caunyan	12 Airport of Arrival (Conservent of	16 Take off:		d durius filigert.		Pilot-In-Commund
Name: Ic/ul P3	1		igine Time: 2+24	Antion .	only worthwestern area; precipitation occured		Acquisition Fliggat Certified by Signature over Printed Name (PAF Representative)
2 ALTM Model: Provins	8 CO-PILOT: M. Tangewan	12 Airport of Departure (Airport, City/Province): Caveyaw	14 Engine Off: 1 414 H	Cloudy w/ graipitation	coorthwestern area;	ł	
5				19 Weather	20.Remarks: Surveyed auly	21 Problems and Solutions: Lason B dropound	Acquisition Right Approved by

53. Flight Log for 1CAG161l250A Mission

1 LIDAR Operator: M. Funhlen	Fundalen	2 ALTM Model: Persent	3 Mission Name: Idd the way	4 Type: VFR	5 Aircraft Tune: Cesnna T306H	6 Aircraft Idantification: Porcourt
7 Pilot: F. De Ocamera	8 Co-	Hot: M. Taucawan	9 Route: Cause an -	- Co	Look and the country of	o wich air i den unite non: +1-C 40
10 Date: 5013		12 Airport of Departure (Airport, City/Province):	(Airport, City/Province): Common	12 Airport of Arrival (Air	12 Airport of Arrival (Airport, City/Province):	
13 Engine On: 0408/H		14 Engine Off: / cs-s-H	15 Total Engine Time: 8 +47	16 Take off:	17 Landing:	18 Total Flight Time:
19 Weather		Cloudy				-
20 Remarks: Mičsiom		completed at 1000m Adl	ton that			
21 Problems and Solutions: Justewsity too low	tons: the li		at opt sim ; restarted thes	Say		
Acquisition Flight Approved by	Approved by		Acquisition Flight Certified by	Pilotin Confirmed	8	Udar Operator Mithold Puritikan
Signature over Printed Name (End User Representative)	entative)	Signatur (PAF Rej	Signature over Pflinted Name (PAF Representative)	Signature over	Signature over Printed Name	Signature over Printed Name



54. Flight Log for 1CAG161F250B Mission

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a B Co Pillet: M. Thangeuter B Control Obparture (Marcula Galance) 2.4 (Marcul	1 LIDAR Operator: J. Awa			4 Type: VFR	5 Aircraft Type: CesnnaT206H	6 Aircraft Identification: Rp- c+02
14 Engine Off. 15 Table off. 16	2	3		Com ou on		
Partly claudy i trady completed at tream A&L olutions:	13 Engine On: /354/	14 Engine Off: /42a/F		16 Take off:		18 Total Flight Time:
istim completed at traven A.6.L. indications: import indications: in	19 Weather	clouety ;				
the d at troom 14.61. weldy Acquisition stilling carited by A	20 Remarks:					
vedby Acquisitions flight Certified by Acquisitions flight Certified by Pilotin Comparing Terter Comparing T	prission any	ß				
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Acquisition flugh Certified by Pilot-in-Company Pilot-in-Company Table Caperator Signature over Printed Name (PAF Representative) Signature over Printed Name Signature over Printed Name	sasani ost					
	Acquisition Flight App Separature over Printed (End User Representa		Ition Flight Certified by	Pilotin-Compd	,	idar Opprator Jastoni v. e. Aluzian ignature over Printed Name

55. Flight Log for 1CAG161Q251A Mission

A lai	200	1 11-1		· · · · · · · · · · · · · · · · · · ·	
Flight Log No.: مَرْمَر يَكْ	6 Aircraft Identification: /2/>- C 40 2	18 Total Flight Time:			Udar Operator Andrew Frankan Signature over Printed Name
	-State 1 Type: VFR 5 Aircraft Type: Cesnna T206H - Courany out 12 Airport of Arrival (Airport, Gty/Province): Caucany out	17 Landing:			<u>A</u>
	- Couray our Couray our 12 Alrport of Arrival (Air	I6 Take off:	peo imasts		Plact-in-Commany Fox and RECOV Signature over Phintel Name
	3 Mission Name: 10/010 3 9 Route: Courayon- diport, City/Province):	15 Total Engine Time: でナダふ	m . m post		Acquisition Algar Certified by Signature over-thinted Itane (PM Representative)
	2 ALTM Model: Pgraws 3 Mission Name: ICI6 Not: M. Tangonam 9 Route: Cane ay 12 Airport of Departure (Airport, ChyProvince): Caurayown		Mission completed at 1		Acquisition
M Deta Acquisition Flight Log	01: 14. Function 26 Ocampo 8 CO-P	¹³ Engine Off: 1326 H 14 Engine Off: 14 Engine Off: 10 off: 14 Engine Of	Polission com	i froblems and Solutions: the imstas	Acquidition Light Approved by Autor Signature over Printed Name (End User Representative)
ř.					



56. Flight Log for 1CAG161L254A Mission

Hight Log No., 5D /	S Aircraft Type: Cesnna T206H 6 Aircraft Identification: kf-q022	18 Total Flight Time:				dar Operator MARAF Symmon gusture over Printed Hanse	
	e: Cesnna T206H 6 A					2 18	
	FR S Aircraft Typ	12 Airport of Arrival (Airport, Gity/Province): CAUDANN 16 Take off: 16 Take off:				Plot in Crystalad FDR Capt Guile and	
	LJSAA 4 Type: VFR	12 Airport of Arriv CAUDANAN 16 Take off:				Pilot in Corp	
	3 Mission Name: ICIU 9 Route: CAUAYAN	Airport, City/Province): 15 Total Engine Time:	1730	Manna arono		Acquisiting Flight Certified by Signature of Printed Rame (PAF Representative)	
	UDAR Operator: M. FUNTLON 2 ALTM Model: PEGASUS 3 Mission Name: ICULDSRA 4 TY PILOE: M.TANGONAN 8 Co-Pilot: C. ALPONSO 9 Route: CAUAYAM- CAUAYAM	14 Engine Off:	Adho17	ED DUE TO HEAVY CLOUP BUILDUP		tby e	
VM Data Acquisition Filght Log	Pilot: M.TANGONAN 84	SEPT 8, 200	'3 Weather	"Remarks: FLIGHT ABORTED	31 Problems and Solutions:	Acquisition Flight Approved by Signature over Printed Name (End User Representative)	



Flight Log 573	1011: PP-C402-1		
	6 Aircraft Identificati 18 Total Flight Time:		Lidar Operator Manuel Countruel
	As A Type: VFR 5 Aircraft Type: Cesnna1206H 6 Aircraft Identification: PP-cess Countrie Countrie 12 Airport of Airival (Airport, City/Province): 12 Airport of Airival (Airport, City/Province): 18 Total Flight Time: 16 Take off: 17 Landing:	due to precipitation / source wiport	Carlor Carlo
	12 Arport of Arrival (Altr 12 Arport of Arrival (Altr 15 Take off:	e to preci	Pilot in Sommand
	2 ALTM Model Programs 3 Mission Name: (cl (L 254) llot: C + Alfanso 9 Route: Courtyon 12 12 Alrport of Departure (Alrport, Clty/Province): 12 12 Alrport of Departure (Alrport, CltyProvince): 12 ine Off: 15 Total Engine Time: 16 (453) Clouredy	mission of the c	Acquisition Flight Cartified by Acquisition Flight Cartified by Signature of the Printed Name (PMR Representative)
	Artion 2 ALTM Model Process 8 Co-Pilot: C · Althuso 12 Airport of Departure 14 Engine Off: 14 Secondor 14 Convolo	red but aborted	
DREAM Data Acquisition Flight Log	1 LIDAR Operator: M. Fundriffon 2 ALTM Model Programs 3 Mission Name: local Clarker 4 Type: VFR 7 Pilor: M. Tong an an 8 Co.Pilor: C. Affanos 9 Route: Commy an Commy an 10 Date: 12 Aliport of Departure (Aliport, ClyProvince): 12 Aliport of Aniva 10 Eate: 5 soft zor 12 Aliport of Departure (Aliport, ClyProvince): 12 Aliport of Aniva 13 Engine On: 14 Engine Off: 15 Total Engine Time: 15 Take off: 19 Weather - V zug. cloured 15 Total Engine Time: 16 Take off:	20 Remarks: Pata acquired weather ay 21 Problems and Solutions:	Acquisition Flight Approved by

57. Flight Log for 1CAG161L254B Mission

Hunton 307P	benedo.			
Flight	6 Aircraft Identification. 18 Total Flight Time:			Lidar Operator Anthory ChurDhand Signature over Printed Name
	1 LiDAR Operator: M. Furtilon 2 ALTM Model: Research 3 Mission Name: [Culmarsta 4 Type: VFR 5 Aircraft Type: Cesnna 7206H 6 Aircraft Identification: Program 7 Pilot: H. Tangon and 8 Co-Pilot: C. Alfanse 9 Route: Causery and Causery	me volde on Freigthation		Pliot in Computing
	2 ALTM Model: Provide 3 Mission Name: [C/6/1972743 4 Type: VFR 5 Aircraft Type: Cesnn Not: C. Alfanse 9 Route: Courted and Courted Alfance, Gty/Province): 12 Alrport of Departure (Airport, Gty/Province): 12 Alrport of Alfance, Gty/Province): 12 Alrport of Courted and Name (City/Province): 12 Alrport of Courted and Name (City/Province): 12 Alrport of Courted and Name (City/Province): 13 Alrport of Courted and Name (City/Province): 15 Total Engine Time: 16 Take off: 17 Landing:	Mission completed at 1000 m with come voids		Acquisition Hight Certified by Signature over Printed Name (PAF Representative)
DREAM Data Acquisition Flight Log	1 LiDAR Operator: M. Funklon, 2 ALTM Model: Person 7 Pilot: H. Tanson an 8 Co-Pilot: C. Alfonese 10 Date: Stort 2013 13 Engine On: 13 Engine Off: 13 Under Off: 13 Under 12 Off: 13 Under 12 Consequences	19 Weather Council 20 Remarks: 1911 55100 Corry A	21 Problems and Solutions: New investor	Acquisition Flight Approved by Signifuce over Printed Name (End User Representative)

Flight Log for 1CAG161M255A Mission 58.



59. Flight Log for 1CAG171E260A Mission

Flight Log No. 520			
FH ₄ 6 Aircraft Identificatio	18 Total Flight Time:		Udar Operator
5 Alrcraft Type: CesnnaT206H 6 Alrcraft Identification: 100 9002	12 Airport of Arrival (Airport, Gty/Province): 16 Take off:		
# 26dA 4 Type: VFR	12 Airport of Arrival 16 Take off:		Plot in Com
3 Mission Name: IC(7)	9 Route: Airport, City/Province): 15 Total Engine Time: 3インの	. Cananamoo	Acquisition Flight Certified by
ALTM Model: Productos	ture (/	Proissivu	Acquisition Fig Stanture over Signature over (PM Represent
M Data Acquisition Flight Log 11DAR Operator: C. JOGQUIJ, 2 ALTM Model: Procectors 11Oct: No. The Control & C. Prilor: C. A. Prilor N. A. The Control & C. Prilor: V.F.	. 17, 2015 1 50 1 50	0 Remarks: 21 Problems and Solutions:	Acquisition Flight Approved by Acquisition function Signatule of ver Printed Name (EndUser Representative)
AM Data Acquisition FI UDAR Operator: C.	1 Date: ser. 17. ser. 17. 13 Engine On: 11 So	0 Remarks: 21 Problems and Sole	Acquisition Fig. Signary & prort

60. Flight Log for 1CAG171F261A Mission

Hight to. G3					
Flight 6 Aircraft Identification		18 Total Flight Time:			Lidar Operator M. M. M. M. S. S. Bratupe over Printed Name
Hight to _o کا rcraft Type: Cesnna T206H 6 Aircraft Identification: ۸۹	12 Airport of Arrival (Airport, Gity/Province):	17 Landing:			ted Name
A 4 Type: VFR	12 Airport of Arrival (J	16 Take off:			Pilot-in-Continhand ML. T. Mar Signature prover Prin
2 ALTM Model: PECASCK 3 Mission Name: 1c19/H26/A	Airport, City/Province):	15 Total Engine Time: 3+40	2	MISSING COM PLETRO.	Acquisition Flight Certified by
2 ALTM Model: PECMOR Co-Pilot: C. PMPM (0 1)	12 Airport of Departure (Airport, Gty/Province):	14 Engine Off: 13 co	havoro	MI sti	e e
1 LIDAR Operator: C. AHO 2 ALTM Model: PEONS 7 Pilot: m. Thurbound 8 Co-Pilot: C. ANTM Co 11	10 Date: 12, 2015	13 Engine On: 14	19 Weather	20 Remarks: 21 Problems and Solutions:	Acquisition Flight Approved by

61. Flight Log for 1CAG171G262A Mission

Hight Los. (537	ttob 12				
Flight	6 Aircraft Identifica		18 Total Flight Time:		Lidar Operator
	5 Aircraft Type: Cesnna T206H	12 Airport of Arrival (Airport, Gty/Province):	17 Landing:		
	A 4 Type: VFR	12 Airport of Arrival (A	16 Take off:		Pilot in Confinaded
	2 ALTM Model: PEAKOS 3 Mission Name: IC191C264A 4 Type: VFR lot: C. ALTO-Da (1) 9 Route:	Airport, Gty/Province):	15 Total Engine Time: 3 4 2-2-	Cranuma complexition	Acquisition Flight Certified by <u>All second</u> <u>All and the pay-</u> Signature over Printed Name (PAF Representative)
	id.	12 Airport of Departure (Airport, City/Province):	14 Engine Off: 1322		lby e
DREAM Data Acquisition Flight Log	M. Thulon AN			20 Remarks: 21 Problems and Solutions:	Acquisition Flight Approved by

Flight Log for 1CAG171H265A Mission 62.

Hight in 549	Secop an					•		
Fitaba L	6 Aircraft Identification: RP 9032		18 Total Flight Time:					Lidar Operator Many Hand
	5 Aircraft Type: Cesnna T206H	irport, Gty/Province):	17 Landing:					
	4 Type: VFR	12 Airport of Arrival (Airport, Gity/Province):	16 Take off:					Ploty of Comm
	3 Mission Name: ICIT [H2	irport, Gity/Province):	15 Total Engine Time: 3+roo		MASSAND MS MA			Acquisition Flight Certified by
	0 [2 ALTM Model: PGACOS 3 Mission Name: IC1*11,265A 18 Co-Pilot: C- ALENXO III 9 Route:	nre (M1551 001			Acquisition High Cer Sec. Myseuce Signature over Plinte (PAF Representative)
Log	Co-P		14 Engine Off: 12 2.5				:50	Flight Approved by Mental Name Geresentative)
DREAM Data Acquisition Flight Log	1 LIDAR Operator: C. ANO 7 Pilot: M. The Control 8	10 Date: Sept. 22, 70B	13 Engine On:	19 Weather	20 Remarks:		21 Problems and Solutions:	Acquisition Flight Approved by Signatury over Printed Name (End Uder Representative)



5 Aircraft Type: Cesnna T206H 6 Aircraft Identification: 82 9023 Flight Lou 55 18 Total Flight Time: Lidar Operator signature ov 2 12 Airport of Arrival (Airport, Gty/Province): 17 Landing: And all er Printed M 1 LIDAR Operator: C. Jonoviv 2 ALTM Model: Pacados 3 Mission Name: ICT7(D245 B 4 Type: VFR 7 Pilot: M. Tavsouwa 8 Co-Pilot: C. ALTBuso 11 9 Route: Su arts the. 16 Take off: MA 1551W the onlot 3 15 Total Engine Time: 2 + 57 12 Airport of Departure (Airport, Gty/Province): Signature over Printed Name (PAF Representative) dissility 20 Acquisition 14 Engine Off: 1612 Acquisition Flight Approved by Printed Name dep6 . 22 , 2013 (End User Representative) DREAM Data Acquisition Flight Log 21 Problems and Solutions: 1319 13 Engine On: 20 Remarks: 19 Weather 10 Date:

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64. Flight Log for 1CAG171l266A Mission

B. Sol	RP 9023			4 d 		
Flight	6 Aircraft Identification:		18 Total Flight Time:			PNN HE Proto
	5 Aircraft Type: Cesnna T206H	(Airport, City/Province):	17 Landing:			
	266 A Type: VFR	12 Airport of Arrival (16 Take off:			Play of Command
	3 Mission Name: Icit(J) 9 Route:	Virport, City/Province):	15 Total Engine Time: 3 + 04			Acquisition Fight Certified by Misc. C. C. Totalo Phy- Signature over Printed Name (PAF Representative)
	ALTM Model: PEGAGUS	2 Airport of Departure (ur fuckt		Acquisition Fill
	ă,		1252		Yoblems and Solutions:	Acquisition Flight Approved by Signature over Frinted Name (End Usyf Representative)
		3 2 ALTM Model: Pacadox 3 Mission Name: IcuFLT266A 4 Type: VFR 5 Aircraft Type: Cesnna 7206H 6 Aircraft Identifica 1 Co-Pilot: C- ALTM Model: Pacadox 1 9 Route:	20 2 ALTM Model: PECACLS 3 Mission Name: Icr4(124c/h 4 Type: VFR 5 Aircraft Type: Cesnna T206H 6 Aircraft Identification 10 Co-Pilot: C- Aurovio nj 9 Route: 12 Airport of Departure (Airport, Gty/Province): 12 Airport of Aurival (Airport, Gty/Province): 12 Airport of Aurival (Airport, Gty/Province):	2 2 AlTM Model: Pecacos 3 Mission Name: Icr4(J2ccA 4 Type: VFR 5 Aircraft Type: Cesnna 7206H 6 Aircraft Identificant Identificant Identificant Identificant Identificant I 2 Aircraft I 2 Aircraft Identificant I 2 Aircraft I	D 2 AITM Model: Pecacus 3 Mission Name: CuritIzed 4 Type: VFR 5 Aircraft Type: CesnnaT206H 6 Aircraft Identification 10.0-Pllot: C. Aurovio nj 9 Route: 12 Airport of Arrival (Airport, Gty/Province): 12 Airport of Arrival (Airport, Gty/Province): 12 Airport of Arrival (Airport, Gty/Province): 13 Airport of Arrival (Airport, Gty/Province): 13 Airport of Arrival (Airport, Gty/Province): 18 Total Fight Time: 4 Engine Off: 15 Total Engine Time: 15 Total Engine Time: <t< td=""><td>D Jarrin Model: Pacpace Mission Name: fortication 10-10: C. Autowiko N 9 Route: 11-10: C. Autowiko N 9 Route: 12-11: 12-11: Airport, Gty/Province): 12-11: 12-11: 15-11: 12-11: 12-11: 12-11: 15-11: 12-11: 12-11: 12-11: 15-11: 12-11: 12-11: 13-11: 15-11: 15-11: 12-11: 14-11: 15-11: 15-11: 12-11: 15-11: 15-11: 15-12: 12-11: 16-0 3-4:05 15-12: 15-14:</td></t<>	D Jarrin Model: Pacpace Mission Name: fortication 10-10: C. Autowiko N 9 Route: 11-10: C. Autowiko N 9 Route: 12-11: 12-11: Airport, Gty/Province): 12-11: 12-11: 15-11: 12-11: 12-11: 12-11: 15-11: 12-11: 12-11: 12-11: 15-11: 12-11: 12-11: 13-11: 15-11: 15-11: 12-11: 14-11: 15-11: 15-11: 12-11: 15-11: 15-11: 15-12: 12-11: 16-0 3-4:05 15-12: 15-14:



65. Flight Log for 1CAG171J267A Mission

2 ALTM Model: Renss 3 Mission Name: ICIP122;1A 4 Type: VFR 5 Alrcart Type: Cosma T206H 6 Alrcart i identific 3 Route: 12 Aliport. GityProvince): 12 Aliport. GityProvince): 12 Aliport. GityProvince): 13 Total Flight Tim 3 Route: 12 Aliport. GityProvince): 15 Alica flight 12 Aliport. GityProvince): 13 Total Flight Tim 4 Engline Off: 15 Total Engline Time: 16 Take off: 12 Landing: 18 Total Flight Tim 2 45D 2 45D 10 Alica flight 10 Alica flight 10 Alica flight	DREAM Data Acquisition Flight Log					and the start of t
cept. 24, wi3 12 Airport of Departure (Airport, Gty/Province): 12 Airport of Airval (Airport, Gty/Province): iList 14 Regine Off: 15 Total Engine Time: 16 Take off: 12 Landing: List 14 Regine Off: 12 Total Engine Time: 16 Take off: 12 Landing: Successful Fleqs 12 Airport of ChryProvince): 10 Airbort, Gty/Province): Successful Fleqs 15 Total Engine Time: 16 Take off: 12 Landing: Successful Fleqs 12 Airbort, Gty/Province): 10 Airbort, Gty/Province): Successful Fleqs 12 Airbort, Gty/Province): 10 Airbort, Gty/Province):	1 UDAR Operator: C. ANO 7 Pilot: In. Thusonand 8 Co-	2 ALTM Model: REMARK	3 Mission Name: ICI31261 9 Route:	A 4 Type: VFR	5 Aircraft Type: Cesnna T206H	6 Aircraft Identific
14 Engline Off: 13 Total Engline Time: 16 Take off: 12 Tanding: 2.450 2.450 10 Tanding: 12 Tanding: Successful FLMT 10 Tanding: 10 Tanding:		12 Airport of Departure (12 Airport of Arrival	(Airport, City/Province):	
Successful Flash and Solutions: and Solution	. 1.			16 Take off:	17 Landing:	18 Total Flight Time:
Successful Flant and Solutions: and Solutions: and Solutions: And Approved by Apple Representation (90.1 Representation (90.1 Representation (90.1 Representation (90.1 Representation (90.1 Representation) (90.1 Represen						
Getsful Flick Math Math	20 Remarks:					
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Iby Acquisition Flight Certified by Plot-in-Command Udar Operator	21 Problems and Solutions:					
Iby Acquisition Flight Certified by Plockin-Command Udar Operator e Appletect Total of the second seco						
	Acquisition Flight Approved by Signatury of Printed Name (End Uyer Representative)	8		Pilot in Column		

Flight Log for 1CAG171C268B Mission 66.

Hight In. 563	ttob dar			• 2 •	
Fla	6 Aircraft Identifi	18 Total Flight Time:			lidar Operator Phylics Priceo Signature over Printed Name
	B 4 Type: VFR 5 Aircraft Type: Cesnna T206H 12 Airport of Arrival (Airport, Cht/Province):	17 Landing:			
	4 Type: VFR	16 Take off:			Plice in compand
	110.209	15 Total Engine Time: 11	MISSION CONFLETED.		Acquisition filtph Certified by Anuscing and the Pro- Signature over Printed Name (PAP Representative)
	ED 2 ALTM Model: RE(nsus 3 Mission Name: ICI: 8 Co-Pllot: C. MURPHILD II 9 Route: 12 Airport of Departure (Alrport, ChyProvince): 12 Airport of Departure (Alrport, ChyProvince):	ine Off: 15 76 CLOUD-1			Acquisition F
DREAM Data Acquisition Flight Log	68.060 8 Co-P	2pt - 23, 2013 34 14 14 14 Eng		21 Problems and Solutions:	Acquisition Right Approved by Accession of the contract of the contract of the Printed Name (End Uder Representative)
DREAM Data Acq	1 LIDAR Operator: P. 7 Pilot: M. Thusoupl 10 Date:	13 Engine On: 11 19 Weather	20 Remarks:	21 Problem	Acq. Sign



67. Flight Log for 1CAG171K270A Mission

24/	22000						
Hight Lo. 57	6 Aircraft Identification: R		18 Total Flight Time:			Lidar Operator	
	5 Aircraft Type: CesnnaT206H 6 Aircraft Identification: AP 90.22	12 Airport of Arrival (Airport, City/Province):	17 Landing:	di ana an		. 4	
	4 Type: VFR	12 Airport of Arrival	16 Take off:	ed out to themary cland Build UP		Plot in Command	
	3 Mission Name: 9 Route:	Airport, City/Province):	15 Total Engine Time: 1 + 25	FUGHT ABORTED ONE 2 WN ONE		Acquisition Fligh Certified by APP Vest A Control Pars Signature over Printed Name (PAF Representative)	
	2 ALTM Model: Persou 3 Mission Name: Pilot: C. ALPENKO VI 9 Route:	12 Airport of Departure (Airport, City/Province):	14 Engine Off: 바 다	%n#		್ಯಾಂ	
DREAM Data Acquisition Flight Log	1 LIDAR Operator CJOMSON	A		20 Remarks :	21 Problems and Solutions:	Acquisition Flight Approved by Signature of Arthreet Name (End Usef Representative)	



68. Flight Log for 1CAG171K271A Mission

De Pilot: C. Anallos II 9 Route: 12 Airport of Arrival (Airport, City/Province): 12 Airport of Departure (Airport, City/Province): 12 Airport of Airport, City/Province): 12 Inding: 14 C3 2 + 23 15 Take off: 17 Landing: A. FULAT Lood 17 Airport of Airport, City/Province): 12 Airport of Airport, City/Province): A. FULAT Lood 12 Airport of Airport, City/Province): 12 Airport of Airport, City/Province): A. FULAT Is fake off: 12 Landing: 12 Landing: A. FULAT Article Airport, City/Province): 12 Airport, City/Province): A. FULAT Article Airport, City/Province): 12 Landing: A. FULAT Article Airport, City/Province): 12 Landing: A. FULAT Article Airport, City/Province): 12 Airport, City/Province): A. FULAT Article Airport, City/Province): 12 Landing: A. FULAT Article Airport, City/Province): 12 Landing: A. FULAT Article Airport, City/Province): 13 Landing: A. FULAT Article Article 10 Airport, City/Province): B. Article Article Article 10 Airport, City/Province):	DREAM Data Acquisition Flight Log		2 ALTM Model: Particus	I 3 Mission Name: 101116	2% A Type: VFR	S Aircraft Tune: Casona 1206H	Flight Log STA
14 Engline Cif: 15 Total Engine Time: 16 Take off: 17 Landing: Cond-I Cond-I 17 Tanding: 17 Landing: Cond-I Cond-I Internet control off: 17 Landing: Cond-I Cond-I Cond-I Internet control off: 10 Landing: Cond-I Spature control for thine Spature control for the control fo	7 Pilot: M. Thylough	0-P	ot: C. Aumuo II	9 Route: [Airport. City/Province]:	12 Airport of Arrival (Aimort Chu/Province)	
1453 2+28 Condol Condol Condol Condol Condol Fundation Condol Fundation Condol Page and the fundation Condol Angenetic Bay Place Place Condol Place Condol Place Condol Place Condol Place Signature over Printed Name Signature over Printed Name	5201. ×, 2013 13 Engine On:	14 Engin	te Off:	15 Total Engine Time:	16 Take off:	17 Landing:	18 Total Flight Time:
And EGEN EVENT I and Solutions: and Solutions: Signature cont Printed Name Signature cont Printed Name	1225		1453	2+28			
And Estructure to the provided of the provided	19 Weather		Crowo-1				
Acquisition Flight Cettiled by Pilotin Quantum de Lidue Operate M.C. M.M. U.M.M. D.M.M. Standard Lidue Operate Signature over Printed Name Signature over Printed Name Survature on Printed Name Sur	21 Problems and Solution	3					
(PAF Representative)	Acquisition Flight App Signaturoover Presenta (End User Representa	roved by I Name tive)		ion Fight Certified by	Pilot in Chuman	2	lidar Operator

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Flicht (6 Aircraft Identific		18 Total Flight Time:						Idar Operator
	5 Aircraft Type: Cesnna T206H	12 Airport of Arrival (Airport, Gty/Province):	17 Landing:		NAT HIP				The Contract and the Contract
	2 A 4 Type: VFR	12 Airport of Arrival	16 Take off:		REAMS OSCIMINING EL SMO	dsyst him			Pilot in Compand
	2 ALTM Model: PEAKAS 3 MIssion Name: ICITI272A ot: C. ALTMSO II 9Route:	Airport, City/Province):	15 Total Engine Time: \$+ of			~			Acquisition Flight Certified by
	Co-Pil	12 Airport of Departure (Airport, City/Province):	14 Engine Off: 13 46	Kanan	MISSION COMPLETED WY VOIDS	the trac brankth			4
DREAM Data Acquisition Flight Log	perator: P. MAO		13 Engine On: 14	19 Weather	20 Remarks :		21 Problems and Solutions:	-	Acquisition Flight Approved by Signature off printed Name (End User Representative)

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Flight Log for 1CAG171L272A Mission 69.



70. Flight Log for 1CAG161KS273AMission

Altratity 4 Type: VFR 5 Altratit Type: Cesnna 7206H an - Counsy can 12 Altiport of Arrival (Altiport, City/Province): 16 Take off: 17 Landing: 16 Take off: 17 Landing: 16 Take off: 17 Landing: 16 Take off: 17 Landing: 17 Counsy can curved hurs Pilor:in-Command Arrited Name Signature off Printed Name	EM Data Aquisition Flight Log <u>1 UDAR Operator: C. Jaanuma</u> <u>2 AitTM Model: Frances 3 Mission Name: (Civikgraph, 4 Type: VFR 7 Pilot: M. Tangenean <u>Counserant</u> <u>Counserant</u></u>
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71. Flight Log for 1CAG161FGS273B Mission

983 P				1
Flight Log No.: 583 P	6 Aircraft Identification: RP- C90 24			Lidar Operator J. Alvar Signature over Printed Name
	Aircraft Type: Cesnna T206H port, City/Province): 7 Landing:			EON-PTI
	2228 4 Type: VFR 5 22.00,00,00 8 12 Airport of Anival (Air 12 Airport of Anival (Air 16 Take off:			Pilot-in-Commind A.C. TATAN Signature over Prin
	2 ALTM Model: Reports 3 Mission Name: LLLIP65253B 4 Type: VFR 101: C.: Alfonco 9 Route: Courty and	due to system problems	could not fire laser	Acquisition Elight Certified by Crist Oral Manks a Signature over Prinked Name (MS Representative)
Poe	8 Co-P	Mission aborted duce t	lad Solutions: lacer operation tecues -	pproved by ted Name ntative)
DREAM Data Acquisition Flight Log	1 UDAR Operator: J . Alviour 7 Pilot: M. Tomgelman 8 Co. 10 Date: J sept 2013 13 Engine On: 14 En 14 En 19 Weather	20 Remarks: Mrssion	21 Problems and Solutions:	Acquisition Flight Approved by



72. Flight Log for 2LMSTAR275A

and the second	2				
Hight Log No. 50	o vircant (dentification: 10.6.2	18 Total Filght Time:			Anone Printed Mallie
A Mirror Constraints	100718	17 Landing:			Underford
	9			save star Si	Pilot in Command
will Mission Name? CM	100 M. (Western & Co-Pilot: C. A. Corres 9 noute: Collect 10 Date: 20 B 20 B 12 Airport Of Departure (Airport, City/Province): 12 Airport of Arrival	Is Total Engine Time:	14-100 % love drop nA wiss on aborted due to love pollom disjoin error occurale trus viesnes douted	To started caves to check time missing laster in air real sunary date	hequisition flight Certified by Lose Debued Marine Signature over Printed Thime (DM Representative)
Mess)2 ALTIM Model (CON	8 Co-Pilot: C. IT Farso	e En: 1525A 14 Engine Off. 2400 1525A 14 Engine Off. her. Outy/Swiny	lever drop ut aborted due anor occurat	retested cavor to cherr	P
M Data Acquisition Bight Log UDAR Operator:	") Date: N. (USon 8	3 Engine on: 1525 19 19 9 Weather	14-(00 % love drop wiss on aborted distriction error occur	1 Problems and Solutions:	Acquisition Flight Approved by Aurican Signature over Printed Name (End User Representative)

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9-191	24032			
Fight for No. 470-65	6 Aircraft Identification: 27-C9032	18 Total Flight Time:		Udar Operator And And Signature over Printed Name
).	27644 Type: VFR S Aircraft Type: Cesnna T206H	off: 17 Landing:		School
/	2744 Type: VFR	16 Take off:		Pilot-in-Command AACHAAN COMMAN Signature over Printed Name
	3 Mission Name: 204 161 22244 Type: VFR 9 Route: Counsyer Counse	Course for the Time: 15 Total Engine Time: 2 +40		Acquisition Flight Certified by Boye Manuel Certified by Sepasitive olegitighted Name (pMR Representative)
	2 ALTM Model: Grewind 3 Mission Name: 2.046 8 Co-Pilot: C. Alence 9 Route: Courses 12 Airport of Departure (Airport, GTV/Province):	14 Engine Oft: 1538/4 Fordes clouder	omphotod at loop un.	
And And And And And And	1 IDAR Operator: M. Auo Pilot: M. Temson 8 Co. 10 Date: A. Temson 8 Co.		20 Remarks: Micston completion 21 Problems and Solutions: Commeran 25 Cr	Acquisition Flight Approved by

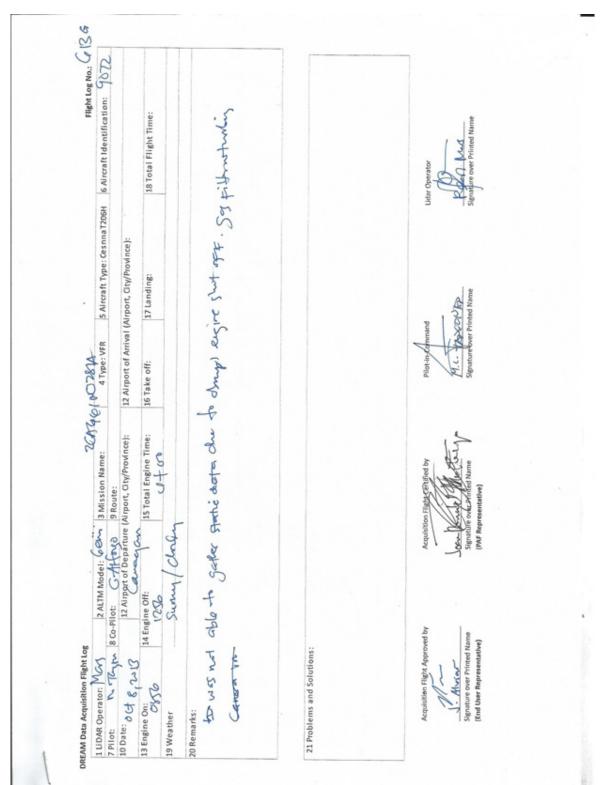
Flight Log for 2CAG161S276A Mission 73.



Flight Log No.:5976 ana T2064 6 Aircraft Identification: 7022	18 Total Flight Time:		Udar Operange
5.2.77 A 4.Type: VFR 5.Alrcraft Type: Cesnna T206H c.C.C.U. 12.Alrport of Arrival (Alrport, Gty/Province):	17 Landing: 250 pr		Pilot-in-Compand
2GACH (1527) A me: 4 Type: VFR Casuardor Octu	(0 16Take off:		
2 ALTIM Model: (2011, 17) 3 MISSION Name: 4179 1010: C. M. Truy J. 18 MISSION Name: 4170 12 Airport of Departure (Altronit, GryProvince): 12 Airport	Aught Conducted Completed 0 700 m		Acquicition Flight Certified by Les Verter (UMBENT-Luy) Signature over Printed Name (PAF Representative)
20 Date: 18 device 18 device 2 ALTM Model: (2011) 19 Mission Name: 2 Diot: No. 7 201 No. 2 2 ALTM Model: (2011) 19 Mission Name: 2 Pilot: No. 7 201 8 20 Pilot: C. Althorado 9 19 Route: Ca 2 Diot: 18 4 2	9		Acquis Separate (PAF R
ight Log AT Mærg DZGM 8 Co-1	13 Engine On: 19 Weather Date of 14 Engine Off: 19 Weather Date of the off: 20 Remarks: Lare De Lover De Lo	21 Problems and Solutions:	Acquisition Fight Approved by

74. Flight Log for 2CAG161HS277A Mission





Flight Log for 2CAG161NO281A Mission 75.



76. Flight Log for 2CAG161QLS282A Mission

Martin PATTALAND		2046/6/QUC282A		()
I WAY UPERATOR A CUMIND 2 ALIM MODEL: UPMINI 3 MISSION NAME: 7 PILOT: N. Tavarovan 8 CO-PILOT: C. Altanco 9 Route:	nivia 3 Mission Name: 9 Route:	4 Type: VFR	5 Aircraft Type: Cesnna T206H	6 Aircraft Identification: 9022
10 Date: Oct 9, 2013 12 Alrport of Departure (Alrooth col):	Arthorit, City/Province):	12 Airport of Arrival	12 Airport of Arrival (Airport, City/Province):	
13 Engine On: 14 Engine Off: 1 33 AM 14 Engine Off: 1	15 Total Engine Time:	16 Take off:	17 Landing:	18 Total Flight Time:
churb				
ALC = 750 M				
8	to tenani custaning			
21 Problems and Solutions:				
¢ 2				
Acquisition Flight Approved by	Acquisition Flight Certified by	Pilosin, Command		Lidar Operator
J. Menson Signature over Printed Name (End User Representative)	Carl Machael Mile (1242) V Separate over Philed Name (PAF Representative)	M.L. Signature		Dar Addring Separations over Printed Name

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77. Flight Log for 2CAG161E282B Mission

:: VFR S Aircraft Type: Ces ma T206H 6 Aircraft Identific if Arrival (Airport, Gty/Province): if Arrival (Airport, Gty/Province): 17 Landing: 18 Total Flight Tin 18 Total Flight Tin 10 Command Arrive ature over Printed Name Signature over Printed Name	DREAM Data Acquisition Flight Log	2006 6	2000 60 EDO2 8		Flight Log No.: OC
12 Airport of Arrival (Airport, Gty/Province): 16 Take off: 17 Landing: 16 Take off: 17 Landing: 17 Landing: 18 Total Flight Time 18 Total Flight Time 18 Total Flight Time 18 Total Flight Time 18 Total Flight Time 19 Signature off: 17 Landing: 10 Signature ofer Printed Name Signature over Printed Name	1 LIDAR Operator: Aviar / Nug 2 ALTM Mc	del: (cover 3 Mission Name:	4 Type: VFR	5 Aircraft Type: CesnnaT206H	6 Aircraft Identification: 9 20
16 Take off: 17 Landing: 18 Total Flight Time Plotin-Command Plotin-Command Signature ofer Printed Name Signature over Printed Name	10 Date: Oct 9, rs 12 li2 Airport	of Departure (Airport, Gty/Province):	12 Airport of Arrival (Alrport, City/Province):	
The mark due to during the transformed to the toperate the toperate the toperate top	13 Engine On: 467 624	15 Total Engine Time:	16 Take off:	17 Landing:	18 Total Flight Time:
15 sing part dir fright fright dir fright di	5	-			
wed by Acquisition flight Cardination med by Acquisition flight Cardination Manual Plot in Comband Signature over mentad Name Signature over Printed Name Manual Signature over Printed Name	20 Remarks: missirs range prompt mission donge due t	the state	-		/
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Acquisition Fight Cartified by Pilot-in Comband Lider Operator Lex. De March March Comband Signature over Printed Name (PM Representative) Signature over Printed Name Signature over Signature over Signatu					
	Acquisition Flight Approved by Signature over Printed Name (End User Representative)	Acquisition Fight Cartificially Lex. Der John Mitycher Signature contrartice Name (PMF Representative)	Pilot-in-Compar		idar Operator Abriau / PCAA Mars ignature over Printed Name



DREAM Data Acquisition Flight Log		2 edetu 12 edetu	4		Flight Log No.: CSTG
1 LIDAR Operator: L. Aturia, 'J. 100'2 ALTM Model: Confine	LTM Model: Canin	N N	4 Type: VFR	S Aircraft Type: CesnnaT206H	6 Aircraft Identifica
10 Date: M. Teng onen 8 Co-Pilot:	C-S- Attenso 11	9 Route:			
ol3	Carleyan	LA AIRPORT OF DEPARTURE (AIRPORT, CITY/PROVINCE):	12 Airport of Arrival	12 Airport of Arrival (Airport, City/Province):	
13 Engine On: 14 Engine Off:	Off: 5 147814	15 Total Engine Time:	16 Take off:	17 Landing:	18 Total Flight Time:
20 Remarks: Setter 1 Acred	1 Provide				
Darka acquired but lines	but lines 1-2	s were well Amiliard	shed		
					1
21 Problems and Solutions:					
Acquisition Flight Approved by Lever Academic Signature over Printeed Name (End User Representative)	Acquisi	Acquisition Flight Certified by	Pilotin-Compand		Udar Operator 3-g-d
					-

78. Flight Log for 2CAG161CD286A Mission



79. Flight Log for 2CAG221A287A Mission

Flight Log for 2CAG221B287B Mission 80.

Flight Log No.: 639 6	1: C7022						
Fligh	6 Aircraft Identification		18 Total Flight Time:				Lidar Operator MARXY FEINILLON Signature for Printed Name
	5 Aircraft Type: Cesnna T206H 6 Aircraft Identification: C7622	urport, City/Province]:	17 Landing:				0
5	4 Type: VFR	12 Airport of Arrival (Airport, City/Province):	16 Take off:				Pilot-in-Compand M. C. T. T. C. Day Signature order Printed Name
0 68 C 81 2007	3 Mission Name:	9 Route: Airport, City/Province):	15 Total Engine Time:	8			Acquisition Fight Cartified by Local And Manager
	2 ALTM Model: 6cmin	8 Co-Pilot: CS. Alfenso 9 Route: 12 Airport of Departure (Airport, Gty/Province):	14 Engine Off: 6:15	Scatured charded	8/m lines		
DREAM Data Acquisition Flight Log	1	ela.			20 Remarks: Finisherd 8/14	21 Problems and Solutions:	Acquisition Flight Approved by 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4



81. Flight Log for 2CAG221C288A Mission

EM Data Acquisition Flight Log 2.2.4.6.23.1.C. 2.8% A 1 (Does view) 4 Type: VFR 5 Aircs 1 LIDAR Operator: L. Acuaria, etc. M ¹ /2 Airly Model: 6 (ani i) 3 Mission hame: 4 Type: VFR 5 Aircs 10 Date: K. A. 2013 8.0.7 Pilot: L. Tangaran 8.0.7 Pilot: C.4. Airca (Airport, City/Prov/nee)): 12 Airport, City/Prov/nee)): 12 A
DREAM Data Acquisition Flight Log 1 LIDAR Operator: L. Acuna, K. 7 Pilot: M. Tangewan 88 10 Date: K. ed. 2013 13 Engine On: K. ed. 2013 14 19 Weather 20 Remarks: 7 Furble & S.S. Acquisition Flight Approved Acquisition Flight Approved Signature over Printed Name Signature over Printed Name 20 Nover Printed Name 21 Problems and Solutions: 22 Problems and Solutions: 23 Problems and Solutions: 24 Approved Acquisition Flight Approved Acquisition Flight Approved 23 Problems and Solutions: 24 Approved 25 Problems and Solutions: 25 Problems and Solutions: 26 Approved 27 Problems and Solutions: 27 Problems and Solutions: 28 Approved 29 Approved 20 Approved 20 Approved 20 Approved 20 Approved 20 Approved 20 Approved 20 Approved 20 Approved 21 Problems and Solutions: 22 Approved 23 Approved 24 Approved 24 Approved 25 Approved 26 Approved 27 Approved 28 Approved 29 Approved 20 Approved 21 Approved 22 Approved 23 Approved 24 Approved 24 Approved 25 Approved 26 Approved 26 Approved 27 Approved 27 Approved 28 Approved 29 Approved 20 App



82. Flight Log for 2CAG221D288B Mission

2				
S Aircraft Type: CesnnaT206H 6 Aircraft Identification: R-C902-2	18 Total Flight Time:		Lidar Operator	Signature over Printed Name
S Aircraft Type: CesnnaT206H	12 Alrport of Arrival (Alrport, City/Province): 16 Take off: 17 Landing:	traved		
		trictions, show	Plict-in-Conjuriand	Signature offer Printed Name
2 ALTM Model: Gennini 3 Mission Name: 101: C. Alfanar (9 Route: Consurgan - Local	(Airport, Gty/Province): 15 Total Engine Time: コナンろ	liurs, airport operations restrictions, shortened to trigh terrain	Acquisition Flight Certified by	seguate over Prilgad-fame (PAF Representative)
2 ALTM Model: Gennin 8 Co-Filot: C - Alfonan C	14 Engine Off: 14 Engine Off: 16 2	7/15 livrs, airpart a		
DREAM Data Acquisition Flight Log 111DAR Operator: E. Pundro 7 Pilot: N. Tanyenan 8 CC		20 Remarks: Finished 7/15 lines due	21 Problems and Solutions: Acquisition Flight Approved by	agradue over Finger ome

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Flight Log No.: 석도 섬				Storm
6 Aircraft Identific	18 Total Flight Time:			Lidar Operator
S Aircraft Type: Cesnna T206H irport, Gty/Province):	17 Landing:	M		
4 Type: VFR dirport of Arrival (A	16 Take off: 17	rest of CAG 221		Pilot-in-command MARP/TZNKE DNATN Signaturg over Printed Name
2 ALTM Model: 6 _{Chenci} 3 Mission Name liot: C. Alfussan 9 Route: حصرمو حد 12 Alrport of Departure (Alrport, City/Province): 12 A	15 Total Engine Time:	line of CKS 2218 and the rest of CKS 2218		Acquisition Flight Certified by
2 ALTM Model: Grauni Pllot: C. Alfersa II 12 Alroot of Departure Couguan	on p			
Bet Bet		Fruished cylon	21 Problems and Solutions:	Acquisition Flight Approved by <u>Hand</u> <u>Lavel T. C. K. A. J. A.</u> Signature over Printed Name (End User Representative)

83. Flight Log for 2CAG231A289A Mission



84. Flight Log for 2CAG221EBS290A Mission

ition: (9022							<u>~</u>
6 Aircraft Identification: (9022		18 Total Flight Time:					Uder Operator M. No. J. J. C. Tor. Signalare over Printed Name
5 Aircraft Type: CesnnaT206H	12 Airport of Arrival (Airport, City/Province):	17 Landing:		4			
CapA 4 Type: VFR	12 Airport of Arrival	16 Take off:		and the rest at			Pllot-in-Command
3 Mission Name:えいら2条を55pp人 4 Type: VFR 9 Route:	Airport, City/Province):	15 Total Engine Time: イキュア		CAG 22/E			Acquisition Flight Certified by A Meridial of Marthur Apo Signature over Intited Name (PAF Representative)
TM Model: 6cm NJ	12 Al rport of Departure (Ai rport, City/Province):	14 Engine Off: 323	clordy with preipidation	12/15 line of		•	~
7 Pilot: 8 Co-Pilot: 2 AL	10 Date: 04. 17, 2013	13 Engine On: 14 0900	19 Weather	20 Remarks: Fiwished 12, CAG 221 B	21 Problems and Solutions:		Acquisition Flight Approved by 4pJ - 1 Lovert A CMAA Signature over Printed Name (End User Representative)

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85. Flight Log for 2CAG231B290B Mission

Flight Log No.: 6576 6 Aircraft Identification: 12,P-C-902	18 Total Flight Time:		Lidar Operator Mary Carefund Davibution Signature over Printed Name
	18 To		lidar Operator
5 Aircraft Type: Cesnna T206H	12 Airport of Arrival (Airport, City/Province): 12 Airport of Arrival (Airport, City/Province): 16 Take off:		Action Action
4 Type: VFR	t of Arrival (Pilot-in-Command M. L. Hassen
	12 Airport of 16 Take off:		a. 191
ZCAC23(3290A	101: C. Alfra, 10 T. 9 Route: Constynn - lora, 12 Nirport of Departure (Airport, CT4/Province): 1 ine Off: 15 Total Engine Time: 1 buschert, Unrohy		Acquisition Flight Certified by Concert Control Control of the Con- Signature order Printed Name (PAF Representative)
		incs	Acquisition
2 ALTM Mode	8 CO-PILOL: C. Alfonso II 12 Airport of Departure 14 Engine Off: 14 IV 16 AF 14 IV 16 AF	c/12 lives	
sht Log Catherine Bailiguau	2w 8 Co-	5	light Approved b d Currist
DREAM Data Acquisition Flight Log 1 LIDAR Operator: New Californ 2 2 ALTM Model: Gammi	7 Pilot: M・7 2000 200 10 Date: [a/19 (プッ)ラ 13 Englor On: (4 からり H・ 19 Weather	20 Remarks: Hunshue	Acquisition Flight Approved by 4 2 2 4 2 4 2 4 2 4 2 4 2 4 2 4 2 4 2 4



86. Flight Log for 2CAG231D291A Mission

Runto	8 Co-Pi 14 Engi	Mission Name: Mission Name: Route: Coveryon - book port, City/Province): 5 Total Engine Time: 41 tr	4 Type: VFR 12 Airport of Arrival (v 16 Take off:	4 Type: VFR 5 Alrcraft Type: Cesnna T206H 6 Alrcraft Identification: LF-C5a22. 12 Alrport of Arrival (Airport, City/Province):	Flight Log No.: GE2 C	
	8 Co-Pi 14 Engi		2 Airport of Arrival (, 6 Take off:	Airport, City/Province):	6 Aircraft Identification: 11-Control	
	14 Engine Off: 306 H Scalend chud	15 Total Engine Time: 1 러 번	6 Take off:			
	T			17 Landing:	18 Total Flight Time:	
19 Weather						
Acquisition Flight Appro-		on Flight Cestified by	Pilot-in-Comman	5	dar Operator	
Acquisition Filight Approved by Used		Acquisition Flight Centifield W Def Character Menuly Signature over Printed Name (PAF Representative)	Pilotin-Command M. f Thoreever Signature over Printed Name	2	Lider Operator	

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87. Flight Log for 2CAG231BS291B Mission

Jag M.C. Deal	1 110A0 Constant of a to	2cAc23(85271B	1		Flight Log No.: 655 5
	7 Pilot: M. Tananam R. C. Ballayas Z ALIM Model: Srmin	3 Mission Name:	4 Type: VFR	5 Aircraft Type: CesnnaT206H	5 Aircraft Type: CesnnaT206H 6 Aircraft Identification: 29-CqU2-2
10 Date: 15 2013	12 Airport of Departure (12 Alroot of Departure (Airport, Gty/Province): 12 [Calvagen	12 Airport of Arrival	12 Airport of Arrival (Airport, City/Province):	
	14 Engine Off: ILog H	15 Total Engine Time:	16 Take off:	17 Landing:	18 Total Flight Time:
	scational claudo				
Fruished	Fruished 5/8 lince				
21 Problems and Solutions:					
Acquisition Flight Approved by Ugod		Acquisition Flight Certified by	Pilotin-Copfin	2	Lidar Operator Mark Martin A



Flight Los No. 200	4 Type: VFR S Alrcraft Type: CesnnaT206H 6 Alrcraft Identific	head	ce): IX AUTOON OF ARTIVAL (AUTOON, UTY/PTOWINCE):	ne: 16 Take off: 17 Landing: 18 Total Flight Time:		hur to hravy cloud
		8 CO-PILOT: C.S. Alburn II. 9 Route: Counsen	Canada an	14 Engine Off: 15 Total Engine Time: Basth	and clouds	truisurd 20162318; schontaned lines due to hrang cloud build up and high terrain
DREAM Data Acquisition Flight Log	1 UDAR Operator: Mc. Be	7 Pilot: N. Targenan	Eloz /w/ol .aug	13 Engine On: Dayo H	19 Weather	20 Remarks: Finisturd build

88. Flight Log for 2CAG221DS292A & 2CAG231BS292A Mission



89. Flight Log for 2CAG161BC294A Mission

Flight Log for 2CAG161AB295A Mission 90.

14 Engine off: 15.00 claudy SUCCERSPUL FUGHT	15 Total Engine Time: 고 부식기	16 Take off:	17 Landing:	18 Total Flight Time:
successful fullett				
21 Problems and Solutions: Acquisition Flight Approved by Acquisition	Acquisition Flight Certified by	Pilot-In-Commany		udar Operator
Brature over Printed Name Signature over Printed Name (End User Representative)	Contract Menter of Separatives	W.T. THAS WAS	2	We. Varligh / T. C. Mung.

Y



6.83 Flight Log No.: 6886 5 Aircraft Type: CesnnaT206H 6 Aircraft Identification: 9223 AMET CAMBURE EULARTH BAULANS Signature Contraction Baul 18 Total Flight Time: Lidar Operator 12 Airport of Arrival (Airport, Gty/Province): 17 Landing: 1. SHANGONA 4 Type: VFR 16 Take off: Pilot-Ir 1 UDAR Operator: MCB Baligans 2 ALTM Model: Genini 3 Mission Name: 2040III: 1944 7 Filot: M. Targaran 8 Co-Filot: F. De Quantage Route: 20 Date: In a series 12 Altront of Departure (Airport, Chy/Prownee): 12 15 Total Engine Time: 4+41 Acquisition Flight Centified by Signature over Printed Name Ś (PAF Representative) 850 44 patty donaly 14 Engine Off: 1313 H comptated at Acquisition Flight Approved by Signature over Printed Name (End User Representative) 22 **DREAM Data Acquisition Flight Log** 21 Problems and Solutions: Alen 10 Date: 10 - 25-13 10 145MM 0832H 13 Engine On: 20 Remarks: 19 Weather

Flight Log for 2CAG111E298A Mission 91.



92. Flight Log for 2CAG111D298B Mission

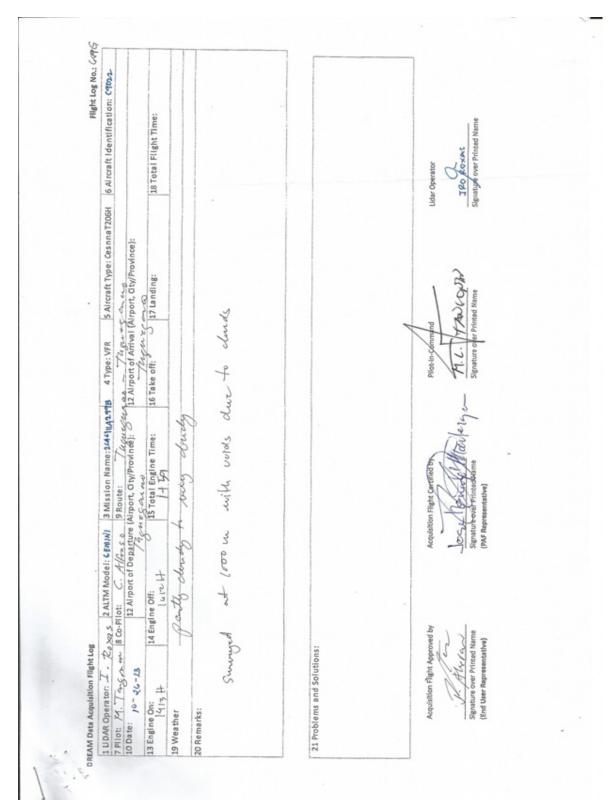
2 ALTIM Model: Levin 3 MISSION Name: 2144 410 748 8 Co-Pliot: 3 MISSION Name: 2144 410 748 12 Altiport of Departure (Aliport, Gly/Province): 12 Altiport of Cly/Province): 12 Altiport of Cly/Province): 13 Altiport of Cly/Province): 14 Altiport		nnaT206H 6 Alrcraft Identification: 09822. :):	18 Total Flight Time:			Lidar Operator
2 AITM Model: (resh; 3M 2 AITM Model: (resh; 3M 4 Engline Offic: 12 Aitport of Departure (Aitp 22 Aitport of Departure (Aitp 12 Aitport of Departure (Aitp 13 Tour ; 13 Tour ; 25 Tour ; 14 Engline Acquisition Fil		4 Type: VFR Airport of Arrival (A		other Aulted		Pilovin, schminhind M. CT TANCE
de by		10.79£	15 Total Engine Time: 2+05			
2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	DREAM Data Acquisition Flight Log	THUM OPERATOR: 2. RANNS 2 ALIM MODEL (4 7 FILDT: (1. 1 anga toon 8 Co-FILDT: 10 Date: 10 - 25 - 13	14 Engine Off: 14 Urls H		21 Problems and Solutions:	Acquisition Flight Approved by

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Parts dured art sorow and 3135 art sorow and grant and	3435	
at sook at	chundy	
Acquisition Flight Certified by Pllot in Command Each Control Certified by August and A	200	
	Acquisition Flight Certifields Martin Certifields Martine Control Martine Signature over Printed Marine IPAF Representative)	

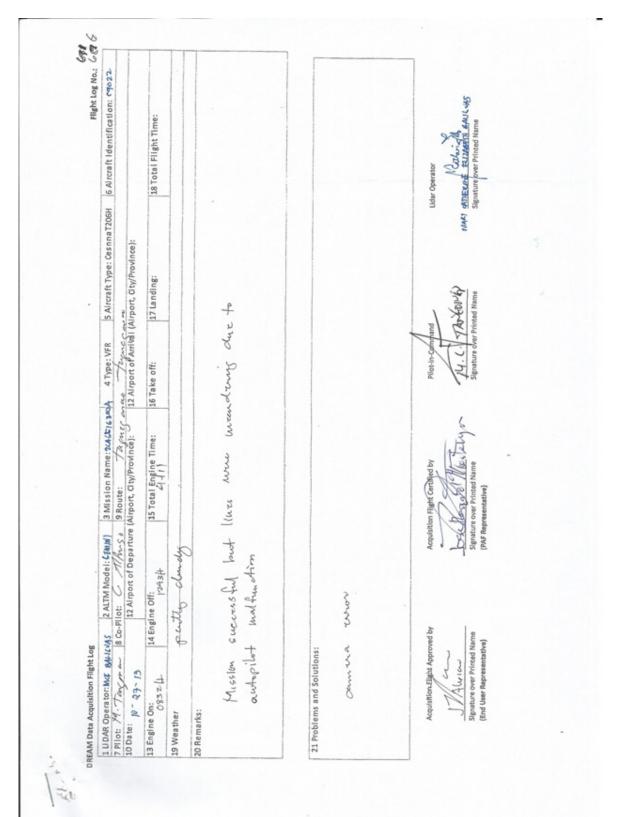
93. Flight Log for 2CAG101D299A Mission





94. Flight Log for 2CAG111A299B Mission





95. Flight Log for 2CAG51G300A Mission

Flight Log for 2CAG61A300B Mission 96.

Flight Log No.: 6926	22			T						
Flight Log N	6 Al rcraft Identification: CPd 22.			18 Total Flight Time:						Ider Operator
	5 Aircraft Type: CesnnaT206H		12 Airport of Arrival (Airport, City/Province):	17 Landing:	duing lines				4	
	opg 4 Type: VFR		12 Airport of Arrival (16 Take off:	www.mean					Pliotin-Constant
	3 Mission Name: 2044 514 3008 4 Type: VFR	9 Route:	Al rport, Ci ty/Province):	15 Total Engine Time: 2435	Successful liddon zurrug but uf cour ever; meandairy ling	mait which on		this data		Acquisition Elight Certified by Erre Derect (of Marit 1 + + +) = Signature over Mented Name (PAF Representative)
	2 ALTM Model: Laway	lot:	12 Airport of Departure (Airport, City/Province):	14 Engine Off:	anna survey			Cam even: intesting this data		Acquists
ſ	Operator: I- KOX45	8 Co-PI	10 Date: 10-27-13		20 Remarks: Successful	at mond	21 Problems and Solutions:	cam error		Acquisition Filiph Approved by Art VI over Signature over Printed Name (End User Representative)



97. Flight Log for 2CAG61D301A Mission

1 UDAR Operator: 2: KOMS2 ALTM Model: CANNY3 Mission Name:4 Type: VFR5 Aircaft Type: Cesnn7 Pilot:8 CO-Pilot:9 Route:9 Route:12 Airport of Arrival (Airport, Gty/Province):12 Airport of Arrival (Airport, Gty/Province):13 Engine On:14 Engine Off:12 Airport of Departure (Airport, Gty/Province):15 Take off:17 Landing:13 Engine On:14 Engine Off:15 Total Engine Time:15 Take off:17 Landing:13 Engine On:14 Engine Off:15 Total Engine Time:15 Take off:17 Landing:13 Engine On:14 Engine Off:15 Total Engine Time:15 Take off:17 Landing:13 Engine On:14 Engine Off:15 Total Engine Time:15 Take off:17 Landing:13 Engine On:14 Engine Off:15 Total Engine Time:15 Take off:17 Landing:13 Engine On:14 Engine Off:15 Total Engine Time:15 Take off:17 Landing:13 Weather7 Autug3 Part3 Fart15 Take off:17 Landing:20 Remarks:20 Remarks:20 Remarks:20 Landing:20 Landing:20 Landing:	pe: CesnnaT206H Yovince):	6 Aircraft identification: <2023. 18 Total Filght Time:
12 Aliport of Departure (Aliport, alty/Province): 14 Engine Off: 11 4114 downedy 17 withy downedy 17 withy downedy 19 withy downedy 10 with 10 with	Yovince):	fotal Filght Time:
14 Engline Off: 15 Total Engline Time: 16 Take off: 11 4114 dowedy : 3 +41 Putty dowedy : antopi lot walf		fotal Filght Time:
Surveyed at	4 jan	
Surveyed at	A in	
21 Problems and Solutions:		
Acquisition Flight Approved by Acquisition Flight Certified by Pilos-in-Command		Lider Operator



98. Flight Log for 2CAG51A301B Mission

10.: 695ts	22								
Flight Log No.: C. 975	6 Aircraft Identification: Cqp12	18 Total Flight Time:			1			Lidar Operator P. M. M. Signatule Systeme	
	IS 4 Type: VFR S Aircraft Type: CesnnaT206H	1 ucury meno 12 Airport of Arrival (Airport, Gty/Province): 16 Take off: 17 landing:					V	Pilocy/Confirmed Ud	
· · ·	2 ALTM Model: GT MINI 3 Mission Name: 2 246 614-34 IS 4 Type: VFR	DE JONIO PROUTE: Turgue and the Departure (Alrport, City/Province): Turgues and the filme: 07 341	2	lded				Acquisition Alger Castilled by Learner Court Printed Name (PAF Representative)	
-	ARS	/ PUDE IN-L- 戸村 65044/) 8 C0-PIOE F.5. 10 Date: 10 - 会会 - 1.5 12 Alrpo 13 Engine On: 13 Engine Off: 13 Engine Off:	19 Weather Poddy	20 Remarks: Missim comp 1d		21 Problems and Solutions:		Signature over Printed Name (End User Representative)	

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Flight Log No.: 6 9765 $\frac{10 \text{D}\text{R} \text{ Operator: } P. \text{MA} \text{S}}{7 \text{ HOR OPERATOR: } 2 \text{ ALTM Model: } \text{CarNINJ} 3 \text{ Mission Name: } \text{Correct VFR} 5 \text{ Alrcraft Type: CesnnaT206H} 6 \text{ Alrcraft Identification: } \text{CPD22} \\ \frac{7 \text{ Flot: M.L. } \text{M}(\text{could})}{8 \text{ Co-Plot: F-a}, \text{ B} \text{ composition} 9 \text{ Route: } \text{Thoregoever } - \text{Thoregoever} - \text{Thoregoever} - \text{Thoregoever} \\ \frac{10 \text{ Date: } 1 \text{ b} - 28 \text{ correct}}{12 \text{ Alrport of Departure (Alrport, Gty/Prowince): } 2 \text{ Alrcraft Type: CesnnaT206H} 6 \text{ Alrcraft Identification: } \text{CPD22} \\ \frac{10 \text{ Date: } 1 \text{ b} - 28 \text{ correct}}{12 \text{ Alrport of Departure (Alrport, Gty/Prowince): } 2 \text{ Alrcraft Type: CesnnaT206H} 6 \text{ Alrcraft Identification: } \text{CPD22} \\ \frac{12 \text{ Alrport of Departure (Alrport, Gty/Prowince): } 12 \text{ Alrport of Arrival (Alrport, Gty/Prowince): } 12 \text{ Alronomed: } 13 \text{ Correct} \\ \frac{12 \text{ Engline OH: } 10 \text{ correct} \text{ correct} \\ \frac{12 \text{ Correct} 10 \text{ correct} \text{ correct} \\ \frac{12 \text{ correct} 10 \text{ correct} \text{ correct} \\ \frac{12 \text{ correct} 10 \text{ correct} \text{ correct} \\ \frac{12 \text{ correct} 10 \text{ correct} \text{ correct} \\ \frac{12 \text{ correct} 10 \text{ correct} \text{ correct} \\ \frac{12 \text{ correct} 10 \text{ correct} \text{ correct} \\ \frac{12 \text{ correct} 10 \text{ correct} \text{ correct} \\ \frac{12 \text{ correct} 10 \text{ correct} \text{ correct} \\ \frac{12 \text{ correct} 10 \text{ correct} \text{ correct} \\ \frac{12 \text{ correct} 10 \text{ correct} \text{ correct} \\ \frac{12 \text{ correct} 10 \text{ correct} \text{ correct} \\ \frac{12 \text{ correct} 10 \text{ correct} \text{ correct} \text{ correct} \\ \frac{12 \text{ correct} 10 \text{ correct} \text{ correct} \text{ correct} \\ \frac{12 \text{ correct} 10 \text{ correct} 10 \text{ correct} \text{ correct} \text{ correct} \\ \frac{12 \text{ correct} 10 \text{ correct} 10 \text{ correct} \text{ correct} 10 \text{ correct} \\ \frac{12 \text{ correct} 10 \text{ correct} 10 \text{ correct} \text{ correct} 10 \text{ correct} \\ \frac{12 \text{ correct} 10 \text$ Lidar Ope (HUCHA) A over Printed Name M.C Signature over Printed Na (PAF Representative) Acquisition Flight 64 - mang patty dondy Mission completed Acquisition Flight Approved by Signature over Printed Name (End User Representative) DREAM Data Acquisition Flight Log 21 Problems and Solutions: 3 . Myrian 20 Remarks: 19 Weather

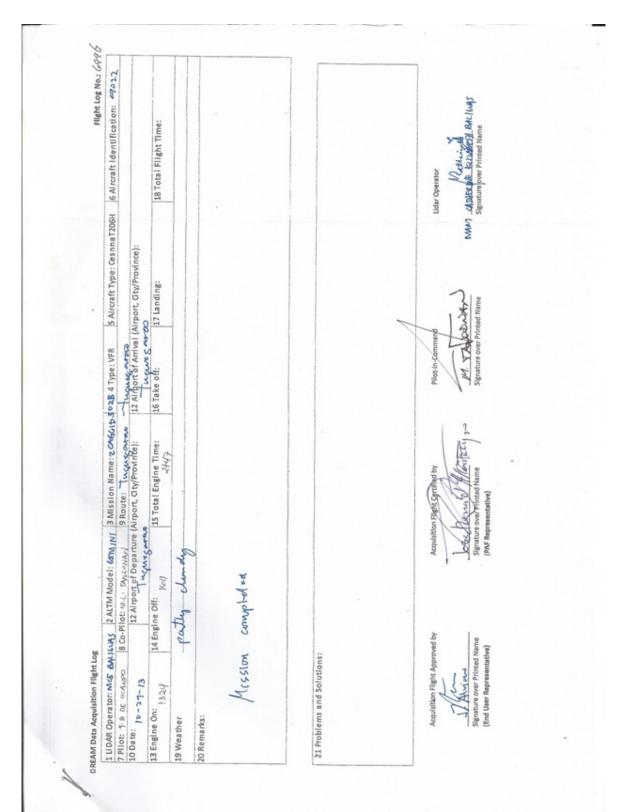
99. Flight Log for 2CAG61A302A Mission



100. Flight Log for 2CAG61B302B Mission

Oddel: Statical: Display True Statical: Stati	Flight Log No.: 6976	24023				
Oddel: Carnul 3 Mission Name: 2 CACABES Social 4 Type: UFR 5 Alrcraft Type: Cesnna T206 to Departure (Wiport, City/Province): 12 Airport of Arrival (Airport, City/Province): 12 Janding: v/o 15 Total Engine Time: 16 Take off: 12 Landing: v/o 15 Total Engine Time: 16 Take off: 12 Landing:	Flight Lo	6 Al rcraft Identification: 1		18 Total Flight Time:		ar Operator
Odel: CTNJIA) 3 Mission Name: 2 CASAGOS JOJA 4 Type: VFR 9 Route: 9 Route: 15 Total Engine Time: 12 Airport of Arrival (A 15 Total Engine Time: 15 Take off: 16 Take off: 16 Take off:		craft Type: CesnnaT206H	t, City/Province):	nding:		
Odel: CTNJNJ 3 Mission Name: 2 CAGARS 9 Route: 9 Route: 40 15 Total Engine Time: 40 15 Total Engine Time: 40 15 Total Engine Time:			2 Airport of Arrival (Airport			Pilobin-Carlinand M. Harkerta
Vo Acquisito		Route:				Med by Name
	2 Al TM Model - Person	8 Co-Pilot: 9	12 Airport of Departure (Ai		Arseion completed	Acquiation F Acquiation F Signature ow

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101. Flight Log for 1CAG61AS356A Mission



150L				-				
Flight Log No .: - 70 5	6 Aircraft Identification: 9322			18 Total Flight Time: 24.301				Udar Operator Mart Prof. Manue ofer Printed Name
	5 Aircraft Type: Cesnna T206H		(Airport, City/Province):	17 Landing:				Pilot in Command I R. S. Artific I Signature over Printed Name
	4 Type: VFR	ID TP - RAUT	2 Airport of Arrival RPMT	16 Take off:				Pilot in Comma
	2 ALTM Model: GEWFLAS1 3 Mission Name: 2060006868	9 Route: RPUT - Tugwegoroo TP - RANT	(Airport, City/Province): 1.	15 Total Engine Time: 16		10 lines (without Chrol)		Acquisition Flight Certified by Zerforth ALC (FL), DELL'S SANPS PAF Signature over Printed Name (PAF Representative)
	2 ALTM MODEL: GENERAL	8 Co-Pilot: Auron40 4	12 Airport of Departure (Airport, City/Province): RPUT	14 Engine Off: 1423	strong winds	mission successful; Europed 10 lines (without Chro17		A1 9
	L'TONGA		4. 2244	1) Engine On: 1336	19 Weather	20 Remarks:	21 Problems and Solutions:	Arquivition 1 fight Approved b Handler Signature over Printed Name (End User Representative)

102. Flight Log for 2CAG101DS035B Mission



Flight Log No.: 7054	322					Strate
Flight L	6 Aircraft Identification: 93		18 Total Flight Time:	9404		Lidar Operator Madery Gritte and Europhith Barlivids Signature free Printed Name
	5 Aircraft Type: Cesnna T2064 6 Aircraft Identification: 9322	(Airport, Gty/Province):	17 Landing:	k (Asi)		Printed Name
a part	ad 4 Type: VFR	P - ROW 12 Airport of Arrival	16 Take off:	es of 1014. (m		Pulot-In-Comm R. CANA Signature Over
2 CALING OF A BUNG	2 ALTM Model: CEMICAS 3 Mission Name: JongrolAs 0384	Route: RPMI - Congular	15 Total Engine Time: 3447	the ret of CARIIC and sourced for face of 101 A. (with CASI)		Acquisition Fight Certified by ALC ERUIN THE AND Signature over Printed Name (PAF Representative)
	2 ALTM Model: 48M4445	8 Co-PilotAuronise Int. 9 Route: RANG - Canada TO - KPWT 12 Airport of Departure (Airport, City/Province): 12 Airport of Airival (Airport, City/Province): DOUT	14 Lngine Off: 12.2.1			
ght Log	SPUSINAS	1		fair	: 540	If Agroved
DREAM Data Acquisition Flight Log	I UDAR Operator: MCE @AH6UAS	10 Date: Fab. 4, 2014	13 Engine On: 0854	19 Weather 20 Remarks: 6	21 Problems and Solutions:	Acquiring and Funds Agencies by C 11 pol

103. Flight Log for 2CAG111C037A & 2CAG101A037A Mission



Flight Log for 2CAG101A037B Mission 104.

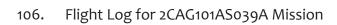
-	-	1	-	11			 	
6 Aircraft Identification: 9322			18 Total Flight Time:	[.1] M				Lider Operator And Tark Signature over Printed Name
5 Aircraft Type: Cesnna T206H		(Airport, Gty/Province):	17 Landing:					Pilot in Command R. S. S. M. M. M. Signature oxys Printed Name
3 B. 4 Type: VFR	10 40 - 20MT	12 Airport of Arrival	16 Take off:					Pilot-in-Command R. SAM
ALTM Model: Com + chail 3 Mission Name: 24461014053 B. 4 Type: VFR	Boute: DOUT - Poson	12 Airport of Departure (Airport, City/Prownce): 2011 Airport of Airbort, City/Prownce): 2017 RPUG	15 Total Engine Time: 2454		01			Acquisition Flight Certified by The ERD IN The day Separative Over Printed Name (PAF Representative)
2 ALTM Model: Gpu + chs1	8 Co-Pilot: ALFONSO AL	12 Airport of Departure (A	14 Engine Off: [413	party worky	(Isto yitm) soul relat hours			
1 UDAR Operator: V. TONGA		2014		19 Weather 00	20 Remarks: Sv	21 Problems and Solutions:		Acquireling Flight Approved b



Flight Log No.: 70 5	5 Aircraft Type: Cesnna T206H 6 Aircraft Identification: 9342		17 Landing: 18 Total Flight Time: Oft-2D				Lidae Operator Mode Parigoure Antipoure Signature Over Frinted Name		
Vates (post	4 Type: VFR	12 Airport of Departure (Airport, City/Province): 12 Airport of Airwal (Airport, City/Province):	15 Total Engine Time: 16 Take off: 17 La		12/13 lifes at chesto and control vids of chelol A		Kalled by Pitot in Command I		
	1.2	12 Airport of Departure (Airport, City)	14 Lngine Off: Iui식 15 Total Eng	pair			oved by Acquisition Fight Certified by Acquisition Fight Certified by ALC ERCIN Declar Stanter PAF Name United Name (MR Representative)		
DREAM Data Acquisition Flight Log	1 UDAR Operator: NO: Polignac 7 Pilot: Course of B Co-F	plaz		19 Weather 49	20 Remarks: Servey w	21 Problems and Solutions:	Acquivition Flagh Androved b Phylor Action of the Action	×	

105. Flight Log for 2CAG51D038A AND 2CAG101AS038A Mission





(Ity/Province): 1.24/Inport of Arrival (Auror, City/Province): 1. Expire: 1.24/Inport of Arrival (Auror, City/Province): 3.1-1 1.21 Landine: 3.1-1 3.1-1 3.1-1 1.21 Landine: 1.1 1.1< Landine: 1.1 1.1< Landine: 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1	Gity/Province): If Antron of Anival Jarpon, Gity/Province): I Engine Time: I. Tanding: Attract I. Tanding: Attract I. Tanding: Attract I. Tanding: Attract Internation Attract Internation	ViProvince: If Ariport of Arrival (Arroot, City/Province): altain If Reput of Arrival (Arroot, City/Province): altain If a se off: 12 Landing: 1 Reput in Command From Market by Pilot in Command From Market by Signature fore Printed Name and Name	[2 ALTM Model:Uswit ofg] 3 Mission Name: 2cdi-jol/solyld Hot: Argonics 10
I Engine Time: 16 Take off: 17 Landing: 3729 10 Centified by Pilot-in-Command Pi	I Engine Time: 16 Take off: 17 Landing: 3729 Mi Certified by Mi Certified by Pilot-in-Command Command Pilot-in-Com	I fingine Time: Is Take off: I? Landing: It and the second	rport, City/Pro
In Certified by In Certified by Pilot-in-Command Pilot-in-Comma	in Centilied by Phot-in-Command Phot-in-Command Phot-in-Command Phot-in-Command Phot-in-Command Phot-in-Command Signature forer Printed Name Istrine)	M Certified by M Certified by Plot-in-Command M M M M M M M M M M M M M M M M M M M	fotal Engine
In Centified by Phot-in-Command Phot-i	in Centified by Pilot-in-Command Pilot-in-Comm	Pilot in Command Pilot in Command Signature over Printed Name	
Pilot-in-Command Pilot-in-Command Signature Over Printed Name	Pilot-in-Command Pilot-in-Command Reprint Command Signature Cover Printed Name	Pilot-in-Command Pilot-in-Command Signature Over Printed Name	8
Pilot-in-Command R. Grand II Signature over Printed Name	Pilot-in-Command R. S. Miller Signature Over Printed Name	Pilot-in-Command F. Grand Mane Signature over Printed Name	
			Ilight Certific

Flight tog No.: 7061	9812		
116	6 Aircraft Identification: 18 Total Flight Time: 4412		Udar Operator McC Bay K vis Signalure over Printed Name
	S Aircraft Type: Cesnna 72064 6 Aircraft identification: 9322. Misort, City/Province): 17 Landing: 18 Total Filght Time: 17 Landing:		Palor in Command H
fon Q	2 ملت السوطان (1993) ما 19 المان الم مان المان مان المان مان المان الم مان المان المان ممان المان المال مان المان ال	(witcuit carse)	
2 CALLOI 6 5 04 04 2	13 Mission Name: 2440 9 Route: RP VT - Airport, City/Province): 15 Total Engine Time: 44 22	15 lines; doubly in the evitery area (without case)	Acquisition Fight Certified by
	Luny ZAITM Model: 68111 GIS 8 Co-Pilot: Auronso H 12 Airport of Departure (14 Lingine Oll: الاجه دواع، ماح		
	1 11DAR Operator: いとち らんしじ いん 2 7 Pilot: Skvvd.e. 11 8 Co-Pilo 10 Date: F-Jb- 9, 2-44 1 13 Engine On: 102.8 14 Engin 19 Weather	Surveyed 21 Problems and Solutions:	Acquired town Hughel Augeogreed by C A VA A A A A A A A A A A A A A A A A A

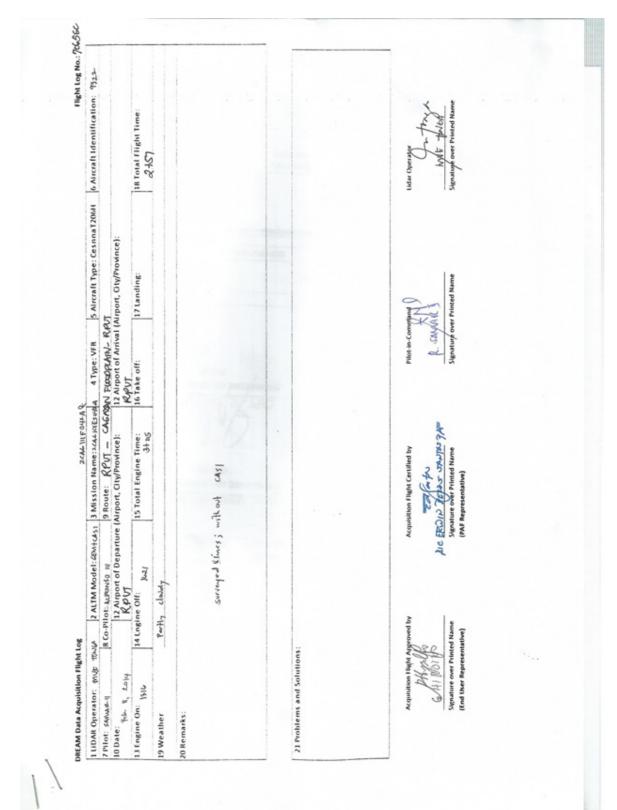
107. Flight Log for 2CAG101GS040A & 2CAG101H040A Mission





10n: 9322							ame
6 Aircraft Identification: 9322			18 Total Flight Time: ダイス の				Udar Operator
5 Aircraft Type: Cesnna 7206H		Airport, Gty/Province):	17 Landing:				Flict in Command Suprature over Printed Name
A 4 Type: VFR	an TPO - RMG	12 Airport of Arrival (RPUT	16 Take off:				Filor in Command
MENDING: amen unissim E	9 Route: RPUT - Conjun	Virport, City/Province):	15 Total Engine Time: 244구				Acquisition Fight Certified by The FROID DELAS Sharps PAF Signature over Manael Name (PAF Representative)
2 AI TAA Mordial' (muk ca ci	D-Pilot: ALEGNSO VIL	12 Airport of Departure (Airport, City/Province): 2 Airport of Arrival (Logine Off: Iuja	Partly cloudy	surreyed & Enes with CASI		A1 1
1110AB Onession V. Touch		Hee		19 Weather	20 Remarks: Sur	21 Problems and Solutions:	Arquintury Flight Approved b Arthogo Ling Substance over Printed Name (End User Representative)

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109. Flight Log for 2CAG111F042A & 2CAG101ES042A Mission



1 LIDAR Operator: V- TowkA	DREAM Data Acquisition Flight Log					
	2 ALTM Model: 6	abut case 3	2 ALTM Model: 66wi cast 3 Mission Name: 2046 Maoult	4 Type: VFR	5 Aircraft Type: CesnnaT206H 6 Aircraft Identification: 9512	6 Aircraft Identification: 9313
	8 CO-PILOT: ALFONSO II	6	9 Route:		a second of a state of the second of the second s	
2014	12 Airport of Del	parture (Ai	12 Airport of Departure (Airport, City/Province): 12	2 Airport of Arrival (12 Airport of Arrival (Airport, City/Province):	
	14 Lngine Off: 1426		15 Total Engine Time: 16 3442	16 Take off:	17 Landing:	18 Total Flight Time:
19 Weather	forthy cloudy					
20 Remarks:	surveyed & lines who ches	lines	when Casel			
21 Problems and Solutions:						
Acquisition Fliggi Approved by PAL Act Approved by CAL ACT A Substatute over Printed Name (End User Representative)		Acquis Arc EROIN Signati	Acquisition Flight Certified by The from the for Signature over Printed Name (PAF Representation)	Pilot-in-Commage P. Stilly	Pilot-in-Command D. SqLop M. J. Signature over Printed Name	Lister Operator
·**.*						

110. Flight Log for 2CAG11A043A Mission

2.NTM Model: Genu 4m JMISSION Name : 246_610 or 10 for UR 5 Ancalt Type: UR 5 Ancalt Type: Cerma 12001 6 Ancalt Identification 00: 12 Airport of Annual (Airport, City/Province): 12 Airport of Annual (Airport, City/Province): 12 Airport of Annual (Airport, City/Province): 13 Airport of Annual (Airport, City/Province): 13 Airport of Annual (Airport, City/Province): 14 Airport	4A 4 Type: VFR 12 Airport of Arrival (A 16 Take off: Pitorin-Comm Pitorin-Comm	Dog and too and the								
2.A.T.M. Model: Gent 4s:1 3.Mission Name: 2c.cc.ci0 explored 4. Type: VFR 01: 1.5. Total Engine Time: 1.2. Airport of Arrival (F 12: 1.5. Total Engine Time: 1.2. Airport of Arrival (F ne Off: 1.5. Total Engine Time: 1.6. Take off: ne Off: 1.5. Total Engine Time: 1.6. Take off: ne Off: 1.5. Total Engine Time: 1.6. Take off: ne Off: 1.5. Total Engine Time: 1.6. Take off: ne Off: 1.5. Total Engine Time: 1.6. Take off: ne Off: 1.5. Total Engine Time: 1.6. Take off: ne Off: 1.5. Total Engine Time: 1.6. Take off: ne Off: 1.5. Total Engine Time: 1.6. Take off: ne Off: 1.6. Engine 1.7. Engine ne Accumution fight Certified by 1.6. Take off: 1.6. Stanture off: Afree Engine 1.6. Engine 1.6. Engine 1.6. Engine Stanture over Printed hame Stanture over Printed hame Stanture over Printed hame	Rec. Building 2 Al TM Model: Gener as is 3 Mission Name: 24,640 orling 4 Type: VR "and R Control 12 Aliport of Departure (Aliport, City/Province): 12 Aliport of Arrival (I "and 12 Aliport of Departure (Aliport, City/Province): 12 Aliport of Arrival (I "and 13 Aliport of Control 13 Aliport of Arrival (I "and 14 Ingline OII: 13 Aliport of Arrival (I "and 14 Ingline OII: 14 Ingline OII: "and 15 Total Engine Time: 16 Take of (I:	6 Aircraft Identificatio			18 Total Flight Time:					Udur Operator Nuclearly Mage BALICE VAS Sighature over Printed Nam
2.A.I.I.M. Model: Grant 4451 3 Mission Name: 2.C.G.G.10 049 001: Argrosso III 9 Route: 12 Argrosso III 9 Route: 3453 ne OII: nay 15 Total Engine Time: 3453 Serveyed Farland 12 Fines without 451 Serveyed Farland 12 Fines without 451 Arguitation Flight Certified by Arguitation Flight Certified by Mie EPDID Theoremative)	Reference 2 ALTM Model: Erent Ass 3 Mission Name: Eccle cloud Report of Departure 8 Route: Report of Departure (Alrport, City/Province): Representation Representation Representation Representation	5 Aircraft Type: Cesnna T206H		(Airport, Gty/Province):	17 Landing:					wer Printed Name
2.A.I.I.M. Model: Gravi 4451 [3] Mission Name: 2.C.G.G.10 over 12 Airport of Departure (Airport, City/Province): ne OIt: 12 Airport of Departure (Airport, City/Province): a of 453 [12] Is Total Engine Time: 3463 [12] [12] [16:0: without (As] [13] [14] [15] [15:0: without (As] [15] [15] [15] [15] [15] [15] [15] [15	Reference 2 ALTM Model: Erent Ass 3 Mission Name: Eccle cloud Report of Departure 8 Route: Report of Departure (Alrport, City/Province): Report Representation Representation Representation Representation		i.	2 Airport of Arrival	6 Take off:					Pilot-in-Cor <u>7. SA</u> Signature o
2 ALTM Model: Chut 4sti lot: Algowso III 12 Algort of Departure (A ne Off: ray Model: Tay Alle Res	Toly 8 Co-P	3 Mission Name:2040 610 0444	9 Route:		13	12 lines without chal	•		-	ation flight Certified by The for the former of the forme
	Toly 8 Co-P Toly 14 Ling Toly Approved on Flight Approved	2 ALTM Model: Grut deci	llot: AuFowso II	12 Airport of Departure (A	12-1	serveyed the times				

111. Flight Log for 2CAG61D044A & 2CAG61E044A Mission

112. Flight Log for 2CAG111ES044B Mission

Flight Log No.: 706 960	6 Aircraft Identification: 9322		18 Total Flight Time:				Udar Operator	
	6 Aircraft		18 Total				Udar Operator	
	5 Aircraft Type: Cesnna T206H	12 Airport of Arrival (Airport, City/Prownce):	17 Landing:				Pilot-in-Command A. CAMUNA Synature over Printed Name	
	4 Type: VFR	port of Arrival	16 Take off:				Pilot-in-Command	
		12 Air	16 Tal				k	
	3 Mission Name: 20641	9 Route: Vrport, City/Province):	15 Total Engine Time: 3+o5		દ અહેત વ્યક્તિ		 Acquisition Flight Certified by Telf the	
	2 ALTM Model: CEW+ 4/51 3 Mission Name: 20641E-50448	8 Co-frilot: 4,478-0450 III 9 Route: 12 Airport of Departure (Airport, City/Province):	ne Off: 14.05	Party cloudy	contered 9 lines with ansy		Acquir AIC ERDIA	
tlog		8 Co-Pi	14 Lngine Off: 14 05	Part			Apgroved by	
DREAM Data Acquisition Flight Log	1 UDAR Operator: V-ToN44	7 Pilot: SAMAG. A 10 Date: Fub 13, 2-314	13 Engine On: 13 620	19 Weather	20 Remarks:	21 Problems and Solutions:	Activity (1904) Approved by ALT PALLY Signature over Printed Name (End User Representative)	*

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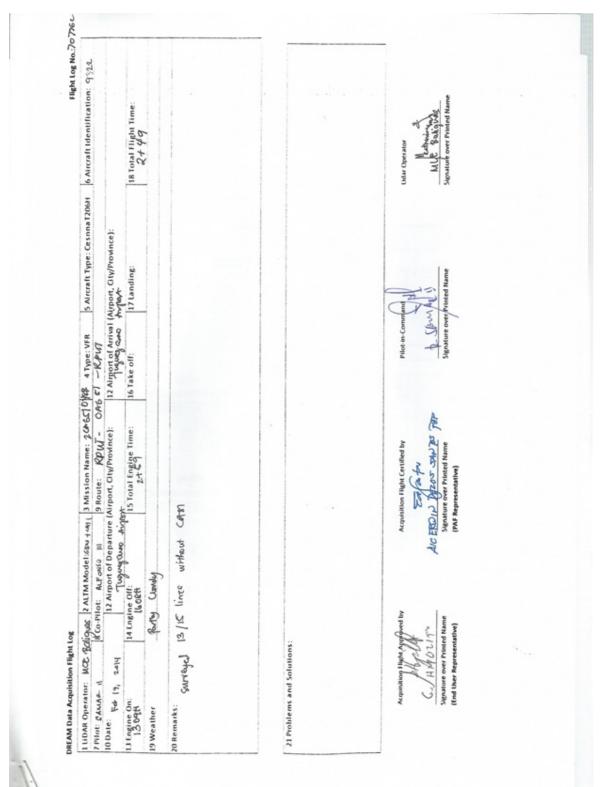
Flight Log No.: 2072 GC	illication: 9322		Time:				nted Name
	6 Aircraft Ident		18 Total Flight Time:				Udar Operator Marie Tork MGE BALLEUS Sepature over Printed Name
	5 Aircraft Type: Cesnna T206H 6 Aircraft Identification: 9322	1 A - RAVT 12 Airport of Arrival (Airport, City/Province):	17 Landing:		closed Lift-up		Pilot-in-Command P. Churuh H
	4 4 Type: VFR	1A - RAJT 12 Airport of Arrival	16 Take off:		hoory of sof		Pilot-In-Company
	2 ALTM Model: GEM! disj 3 Mission Name: 2046 Joid 5064 4 Type: VFR	8 Co-Pilot: Auronio II 9 Route: APUNT - Carlol A - RAVT 12 Airport of Departure (Airport, City/Province):	15 Total Engine Time:		cotered viside of the CACIOIA; mission aborted dres to knowy about baild-up		Acquisition Flight Certified by The End of Start Starting AIC Signature over Printed Name (PAR Representative)
	c 2 ALTM Model: GEM + CAS	0-Pilot: Automo ni 12 Airport of Departure (Lugine Off: [['4kH	low clauds	catered vivids of how		2
DREAM Data Acquisition Flight Log	1 UDAR Operator: NG\$ BAUKVAS	7 Pilot: 5 Anader V 8 Co 10 Date: Ech. 10 2010	F		20 Remarks:	21 Problems and Solutions:	Arquivition Flight Argopored b Gebra (A.) (M.) 70 Signature over Printed Name (End User Representative)

113. Flight Log for 2CAG101AS046A Mission



- Flight Log No.: 70766C High Log 8 Co-Hiot: Arensos of 9 Route: RPUT - CASTORIA 4 Type: VFR 5 Aircraft Type: Cesnna T206H 6 Aircraft Identification: 7322 12 Airport of Departure (Airport, City/Province): 12 Airport of Aircraft Airport, City/Province): 14 Castor Aut 18 Total Flight Time: Uidar Operato 12 Airport of Arrival (Airport, City/Province): 16 Take off: 12 Landine: nature over Printed Name R-SWMMM Pilot-in-Cor ILIDAR Operator: MVE TENJA 2 ALTM Model: 4844 045/ 3 MISSION Name: 2 CA6CONA ALC FROID DEFOS JANTOS PAF Signature over Printed Name (PAF Representative) Total Engine Time: Acquisition Flight Certified by refer 3400 completed Without CARI 14 Lugine Off: USWH you dy signature over Printed Name End User Representative) **DREAM Data Acquisition Flight Log** 21 Problems and Solutions: Mission 10 Date: Feb. 13, 2014 Mar 6 7 Pilot: SANAR A 13 fingine On: 20 Remarks: 19 Weather
- 114. Flight Log for 2CAG51D048A Mission





115. Flight Log for 2CAG51A048B Mission



116. Flight Log for 2CAG101ES049A & 2CAG101FS049A Mission



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