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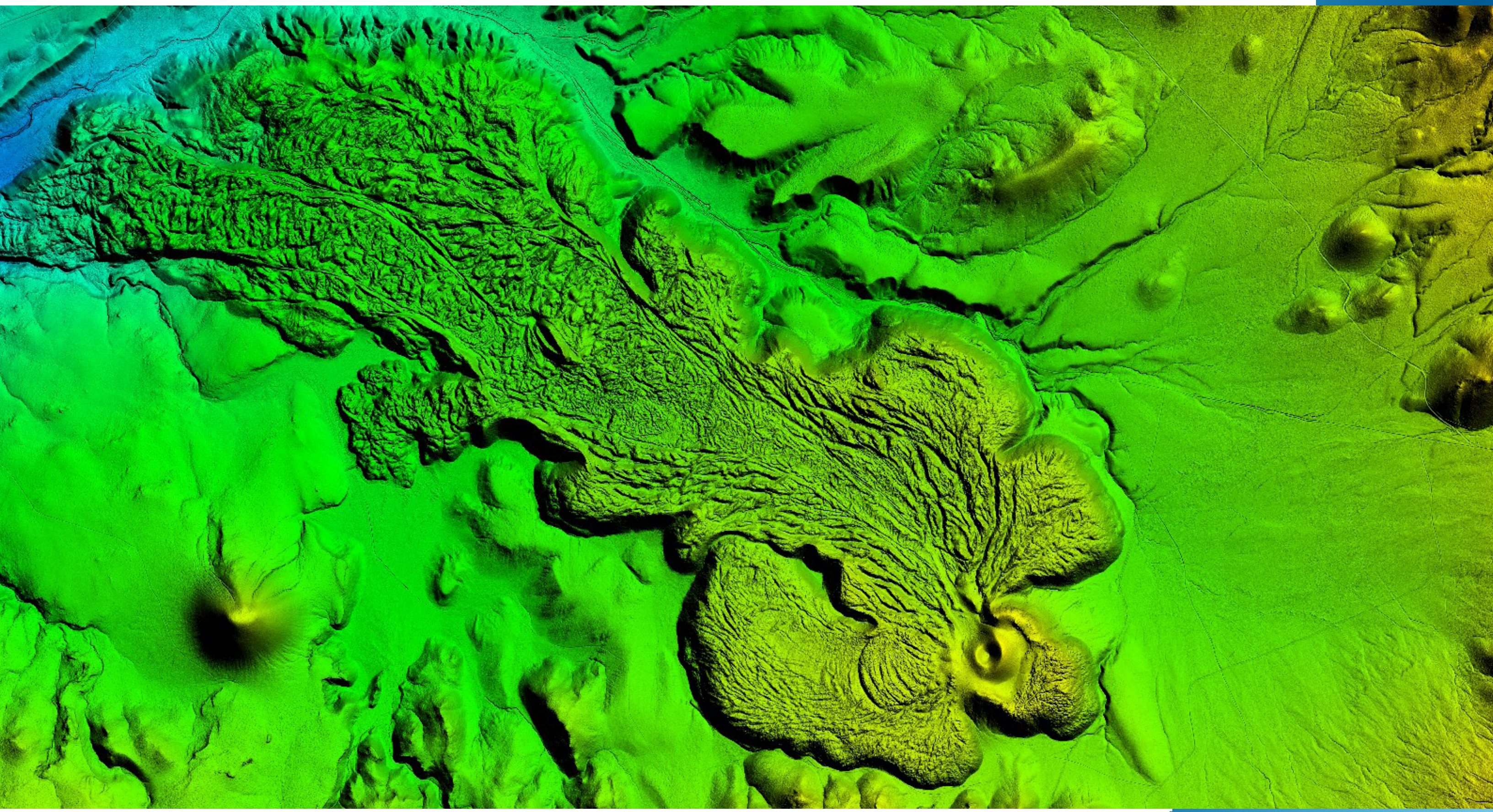

# NV_WestCentral_ EarthMRI_2020_D20 LIDAR PROCESSING REPORT

# 2022

Submitted:September9,2022

Project ID: 198162

Work Unit: 198159

Prepared for:

USGS

science for a changing world

Prepared by:

NV5 GEOSPATIAL

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# 1. Summary / Scope

## 1.1. Summary

This report contains a summary of the NV_WestCentral_EarthMRI_2020_D20, Work Unit 198159 lidar acquisition task order, issued by USGS under their Contract G16PC00016 on 09/15/2020. The task order yielded a project area covering approximately 5,455 square miles over Nevada. The intent of this document is only to provide specific validation information for the data acquisition/collection, processing, and production of deliverables completed as specified in the task order.

## 1.2. Scope

Aerial topographic lidar was acquired using state of the art technology along with the necessary surveyed ground control points (GCPs) and airborne GPS and inertial navigation systems. The aerial data collection was designed with the following specifications listed in Table 1 below.

**Table 1. Originally Planned Lidar Specifications**

| Average Point Density | Flight Altitude (AGL) | Field of View | Minimum Side Overlap | RMSEz |
|---|---|---|---|---|
| 2 pts / m2 | 2305 m | 58.5° | 30% | ≤ 10 cm |

## 1.3. Coverage

The project boundary covers approximately 5,455 square miles over Nevada. Project extents are shown in Figure 1.

## 1.4. Duration

Lidar data was acquired from October 15th, 2020 to November 4th, 2020 in 27 total lifts. See "Section: 2.4. Time Period" for more details.

## 1.5. Issues

There were no issues to report.

| NV_WestCentral_EarthMRI_2020_D20 Work Unit 198159<br>Projected Coordinate System: UTM Zone 11N<br>Horizontal Datum: NAD83(2011)<br>Vertical Datum: NAVD88 (GEOID 18)<br>Units: Meters | |
|---|---|
| Lidar Point Cloud | Classified Point Cloud in .LAS 1.4 format |
| Rasters | • 1-meter Hydro-flattened Bare Earth Digital Elevation Model (DEM) in GeoTIFF format<br>• 1-meter Intensity images in GeoTIFF format |
| Vectors | Shapefiles (*.shp)<br>• Project Boundary<br>• Lidar Tile Index<br>• Calibration and QC Checkpoints (NVA/VVA)<br>• Building Footprint Polygons<br>Geodatabase (*.gdb)<br>• Continuous Hydro-flattened Breaklines |
| Reports | Reports in PDF format<br>• Focus on Delivery<br>• Focus on Accuracy<br>• Processing Report |
| Metadata | XML Files (*.xml)<br>• Breaklines<br>• Classified Point Cloud<br>• DEM<br>• Intensity Imagery |

# NV_WestCentral_EarthMRI_2020_D20
# Work Unit 198159 Boundary

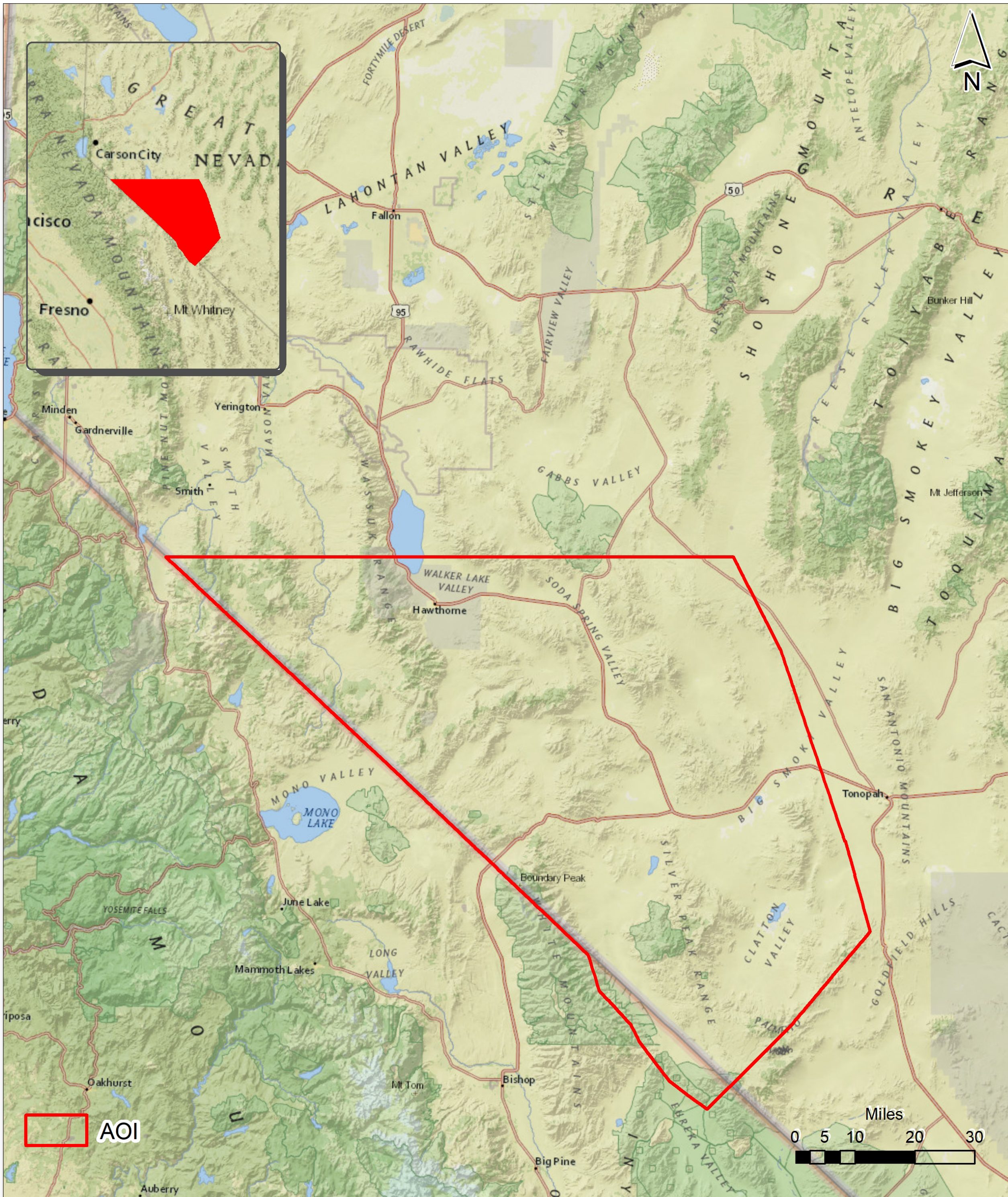



**Figure 1. Work Unit Boundary**

# 2. Planning / Equipment

## 2.1. Flight Planning

Flight planning was based on the unique project requirements and characteristics of the project site. The basis of planning included: required accuracies, type of development, amount / type of vegetation within project area, required data posting, and potential altitude restrictions for flights in project vicinity.

Detailed project flight planning calculations were performed for the project using Leica Terrain Mapper planning software.

## 2.2. Lidar Sensor

NV5 Geospatial utilized a Leica Terra Mapper lidar sensor (Figure 2) for data acquisition.

Aerial LiDAR data was collected utilizing a Lecia Terrain Mapper. The Terrain Mapper is a discrete return topographic LiDAR mapping system manufactured by Leica Geosystems.

A brief summary of the aerial acquisition parameters for the project are shown in the lidar System Specifications in Table 2.

**Table 2. Lidar System Specifications**

| | | Terra Mapper (TM_9054) |
|---|---|---|
| Terrain and Aircraft Scanner | Flying Height | 2,800 m |
| | Recommended Ground Speed | 165 kts |
| Scanner | Field of View | 40° |
| | Scan Rate Setting Used | 92.3 Hz |
| Laser | Laser Pulse Rate Used | 650 kHz |
| | Multi Pulse in Air Mode | yes |
| Coverage | Full Swath Width | 2,016 m |
| | Line Spacing | 1,411 m |
| Point Spacing and Density | Average Point Spacing | 0.65 m |
| | Average Point Density | 2 pts / $m^2$ |

**Figure 2. Terra Mapper Lidar Sensor**

## 2.3. Aircraft

All flights for the project were accomplished through the use of customized planes. Plane type and tail numbers are listed below.

Lidar Collection Planes

- Cessna Conquest 2 (twin-turboprop), Tail Number(s): N207SS

These aircraft provided an ideal, stable aerial base for lidar acquisition. These aerial platforms have relatively fast cruise speeds, which are beneficial for project mobilization / demobilization while maintaining relatively slow stall speeds, proving ideal for collection of high-density, consistent data posting using a TM_9054 lidar system. Some of NV5 Geospatial's operating aircraft can be seen in Figure 3 below.

**Figure 3. Some of NV5 Geospatial's Planes**

## 2.4. Time Period

Project specific flights were conducted between October 15th, 2020 and November 4th, 2020. Twenty-Seven aircraft lifts were completed. Accomplished lifts are listed below.

- 20201015154055
- 20201015214029
- 20201016160448
- 20201016212443
- 20201017153134
- 20201017233020
- 20201018153433
- 20201019153450
- 20201019220635
- 20201020153032
- 20201020215328
- 20201021153349
- 20201022190618
- 20201023011115
- 20201023045845
- 20201023161702
- 20201023221044
- 20201024164840
- 20201026163842
- 20201027154831
- 20201027220902
- 20201028152217
- 20201028212920
- 20201029151957
- 20201029212657
- 20201030153459
- 20201030173615
- 20201031155542
- 20201031201122
- 20201104171729

# 3. Processing Summary

## 3.1. Flight Logs

Flight logs were completed by Lidar sensor technicians for each mission during acquisition. These logs depict a variety of information, including:

- Job / Project #
- Flight Date / Lift Number
- FOV (Field of View)
- Scan Rate (HZ)
- Pulse Rate Frequency (Hz)
- Ground Speed
- Altitude
- Base Station
- PDOP avoidance times
- Flight Line #
- Flight Line Start and Stop Times
- Flight Line Altitude (AMSL)
- Heading
- Speed
- Returns
- Crab

Notes: (Visibility, winds, ride, weather, temperature, dew point, pressure, etc). Project specific flight logs for each sortie are available in Appendix A.

## 3.2. Lidar Processing

Inertial Explorer software was used for post-processing of airborne GPS and inertial data (IMU), which is critical to the positioning and orientation of the lidar sensor during all flights. Applanix POSPac combines aircraft raw trajectory data with stationary GPS base station data yielding a “Smoothed Best Estimate Trajectory” (SBET) necessary for additional post processing software to develop the resulting geo-referenced point cloud from the lidar missions.

During the sensor trajectory processing (combining GPS & IMU datasets) certain statistical graphs and tables are generated within the Inertial Explorer processing environment which are commonly used as indicators of processing stability and accuracy. This data for analysis include: max horizontal / vertical GPS variance, separation plot, altitude plot, PDOP plot, base station baseline length, processing mode, number of satellite vehicles, and mission trajectory.

Point clouds were created using the Leica HxMap software. The generated point cloud is the mathematical three dimensional composite of all returns from all laser pulses as determined from the aerial mission. The point cloud is imported into GeoCue distributive processing software. Imported data is tiled and then calibrated using TerraMatch and proprietary software. Using TerraScan, the vertical accuracy of the surveyed ground control is tested and any bias is removed from the data. TerraScan and TerraModeler software packages are then used for automated data classification and manual cleanup. The data are manually reviewed and any remaining artifacts removed using functionality provided by TerraScan and TerraModeler.

DEMs and Intensity Images are then generated using proprietary software. In the bare earth surface model, above-ground features are excluded from the data set. Global Mapper is used as a final check of the bare earth dataset.

Finally, proprietary software is used to perform statistical analysis of the LAS files.

| Software | Version |
|---|---|
| Leica HxMap | 2.6.0 |
| Inertial Explorer | 8.90 |
| GeoCue | 2020.1.22.1 |
| Global Mapper | 19.1;20.1 |
| TerraModeler | 21.008 |
| TerraScan | 21.016 |
| TerraMatch | 21.007 |

## 3.3. LAS Classification Scheme

The classification classes are determined by Lidar Base Specifications 2.1 and are an industry standard for the classification of lidar point clouds. All data starts the process as Class 1 (Unclassified), and then through automated classification routines, the classifications are determined using TerraScan macro processing.

The classes used in the dataset are as follows and have the following descriptions:

**Table 3. LAS Classifications**

| | Classification Name | Description |
|---|---|---|
| 1 | Processed, but Unclassified | Laser returns that are not included in the ground class, or any other project classification |
| 2 | Bare earth | Laser returns that are determined to be ground using automated and manual cleaning algorithms |
| 7 | Low Noise | Laser returns that are often associated with scattering from reflective surfaces, or artificial points below the ground surface |
| 9 | Water | Laser returns that are found inside of hydro features |
| 17 | Bridge Deck | Laser returns falling on bridge decks |
| 18 | High Noise | Laser returns that are often associated with birds or artificial points above the ground surface |
| 20 | Ignored Ground | Ground points that fall within the given threshold of a collected hydro feature. |

## 3.4. Classified LAS Processing

The bare earth surface is then manually reviewed to ensure correct classification on the Class 2 (Ground) points. After the bare- earth surface is finalized; it is then used to generate all hydro-breaklines through heads-up digitization.

All ground (ASPRS Class 2) lidar data inside of the Lake Pond and Double Line Drain hydro flattening breaklines were then classified to water (ASPRS Class 9) using proprietary tools. A buffer of 3 feet/1 meter was also used around each hydro flattened feature to classify these ground (ASPRS Class 2) points to Ignored ground (ASPRS Class 20). All Lake Pond Island and Double Line Drain Island features were checked to ensure that the ground (ASPRS Class 2) points were reclassified to the correct classification after the automated classification was completed.

Any noise that was identified either through manual review or automated routines was classified to the appropriate class (ASPRS Class 7 and/or ASPRS Class 18) followed by flagging with the withheld bit.

All data was manually reviewed and any remaining artifacts removed using functionality provided by TerraScan and TerraModeler. Global Mapper is used as a final check of the bare earth dataset. GeoCue was then used to create the deliverable industry-standard LAS files for all point cloud data. NV5 Geospatial's proprietary software was used to perform final statistical analysis of the classes in the LAS files, on a per tile level to verify final classification metrics and full LAS header information.

## 3.5. Hydro-Flattened Breakline Processing

Class 2 lidar was used to create a bare earth surface model. The surface model was then used to heads-up digitize 2D breaklines of Inland Streams and Rivers with a 100 foot nominal width and Inland Ponds and Lakes of 2 acres or greater surface area.

Elevation values were assigned to all Inland streams and rivers using NV5 Geospatial's proprietary software.

All ground (ASPRS Class 2) lidar data inside of the collected inland breaklines were then classified to water (ASPRS Class 9) using TerraScan macro functionality. A buffer of 3 feet was also used around each hydro-flattened feature. These points were moved from ground (ASPRS Class 2) to Ignored Ground (ASPRS Class 20).

The breakline files were then translated to Esri file geodatabase format using Esri conversion tools.

Breaklines are reviewed against lidar intensity imagery to verify completeness of capture. All breaklines are then compared to TINs (triangular irregular networks) created from ground only points prior to water classification. The horizontal placement of breaklines is compared to terrain features and the breakline elevations are compared to lidar elevations to ensure all breaklines match the lidar within acceptable tolerances. Some deviation is expected between breakline and lidar elevations due to monotonicity, connectivity, and flattening rules that are enforced on the breaklines. Once completeness, horizontal placement, and vertical variance is reviewed, all breaklines are reviewed for topological consistency and data integrity using a combination of Esri Data Reviewer tools and proprietary tools.

## 3.6. Hydro-Flattened Raster DEM Processing

Hydro-Flattened DEMs (topographic) represent a lidar-derived product illustrating the grounded terrain and associated breaklines (as described above) in raster form. NV5 Geospatial's proprietary software was used to take all input sources (bare earth lidar points, bridge and hydro breaklines, etc.) and create a Triangulated Irregular Network (TIN) on a tile-by-tile basis. Data extending past the tile edge is incorporated in this process so that proper triangulation can occur. From the TIN, linear interpolation is used to calculate the cell values for the raster product. The raster product is then clipped back to the tile edge so that no overlapping cells remain across the project area. A 32-bit floating point GeoTIFF DEM was generated for each tile with a pixel size of value-units. Appropriate horizontal and vertical projection information as well as applicable header values are written into the file during product generation. Each DEM is reviewed in Global Mapper to check for any surface anomalies and to ensure a seamless dataset. NV5 Geospatial ensures there are no void or no-data values (-999999) in each derived DEM. This is achieved by using propriety software checking all cell values that fall within the project boundary. NV5 Geospatial uses a proprietary tool called FOCUS on Delivery to check all formatting requirements of the DEMs against what is required before final delivery.

## 3.7. Intensity Image Processing

GeoCue software was used to create the deliverable intensity images. All withheld points were ignored during this process. This helps to ensure a more aesthetically pleasing image. The GeoCue software was then used to verify full project coverage as well. GeoTIFF files with a cell size of 1-meter were then provided as the deliverable for this dataset requirement.

## 3.8. Height Separation Raster Processing

Swath Separation Images are rasters that represent the interswath alignment between flight lines and provide a qualitative evaluation of the positional quality of the point cloud. NV5 Geospatial proprietary software generated 1-meter raster images in GeoTIFF format using last returns, excluding points flagged with the withheld bit, and using a point-in-cell algorithm. Images are generated with a 75% intensity opacity and (4) absolute 8-cm intervals, see below for interval coloring. Intensity images are linearly scaled to a value range specific to the project area to standardize the images and reduce differences between individual tiles. Appropriate horizontal projection information as well as applicable header values are written to the file during product generation. NV5 Geospatial uses a proprietary tool called FOCUS on Delivery to check all formatting requirements of the images against what is required before final delivery.

| | |
|---|---|
| (green) | 0-8cm |
| (yellow) | 8-16cm |
| (orange) | 16-24cm |
| (red) | >24cm |

# NV_WestCentral_EarthMRI_2020_D20
# Work Unit 198159 Tile Layout

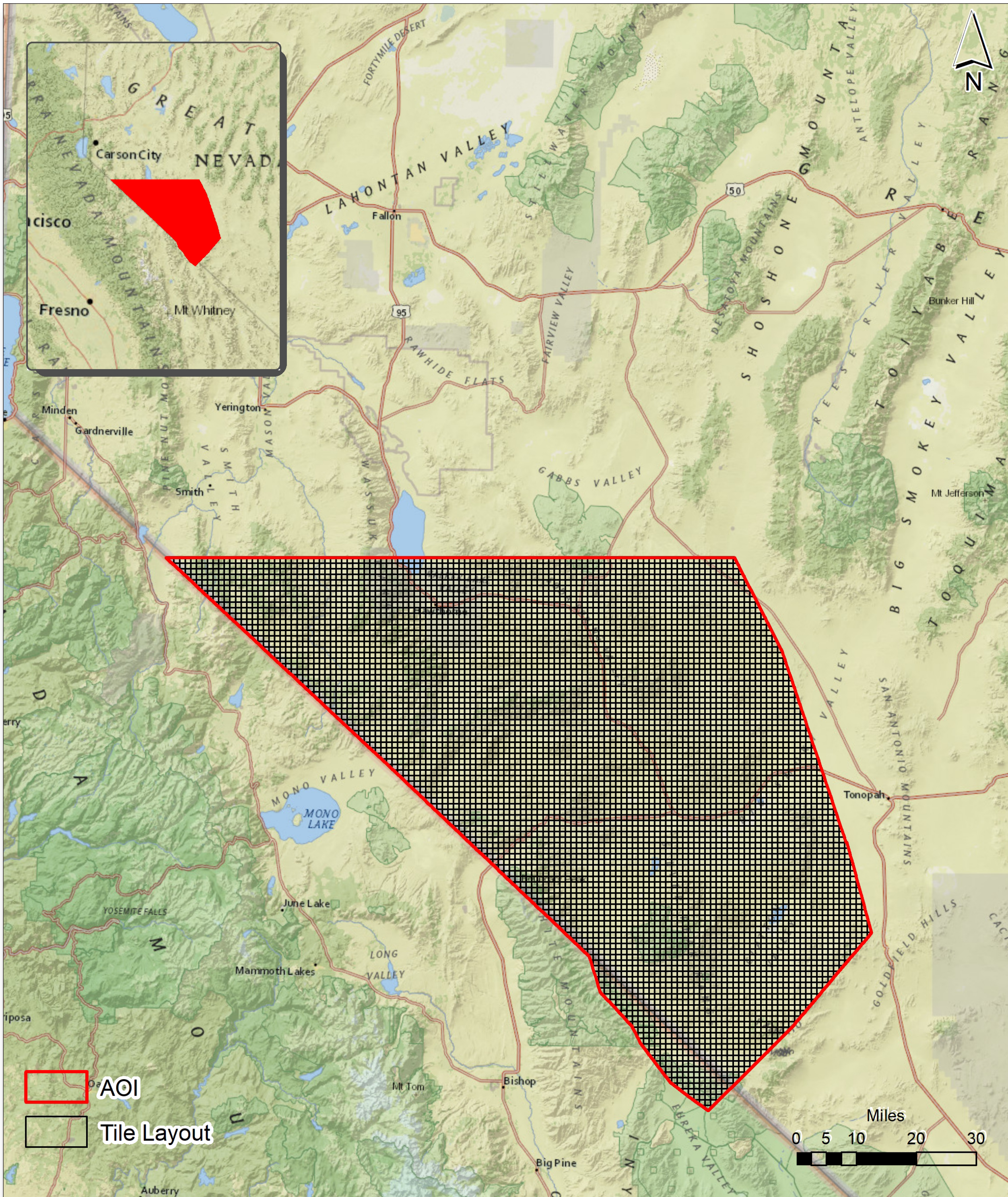



Figure 4. Lidar Tile Layout

# 4. Project Coverage Verification

Coverage verification was performed by comparing coverage of processed .LAS files captured during project collection to generate project shape files depicting boundaries of specified project areas. Please refer to Figure 5.

# NV_WestCentral_EarthMRI_2020_D20
# Work Unit 198159 Lidar Coverage

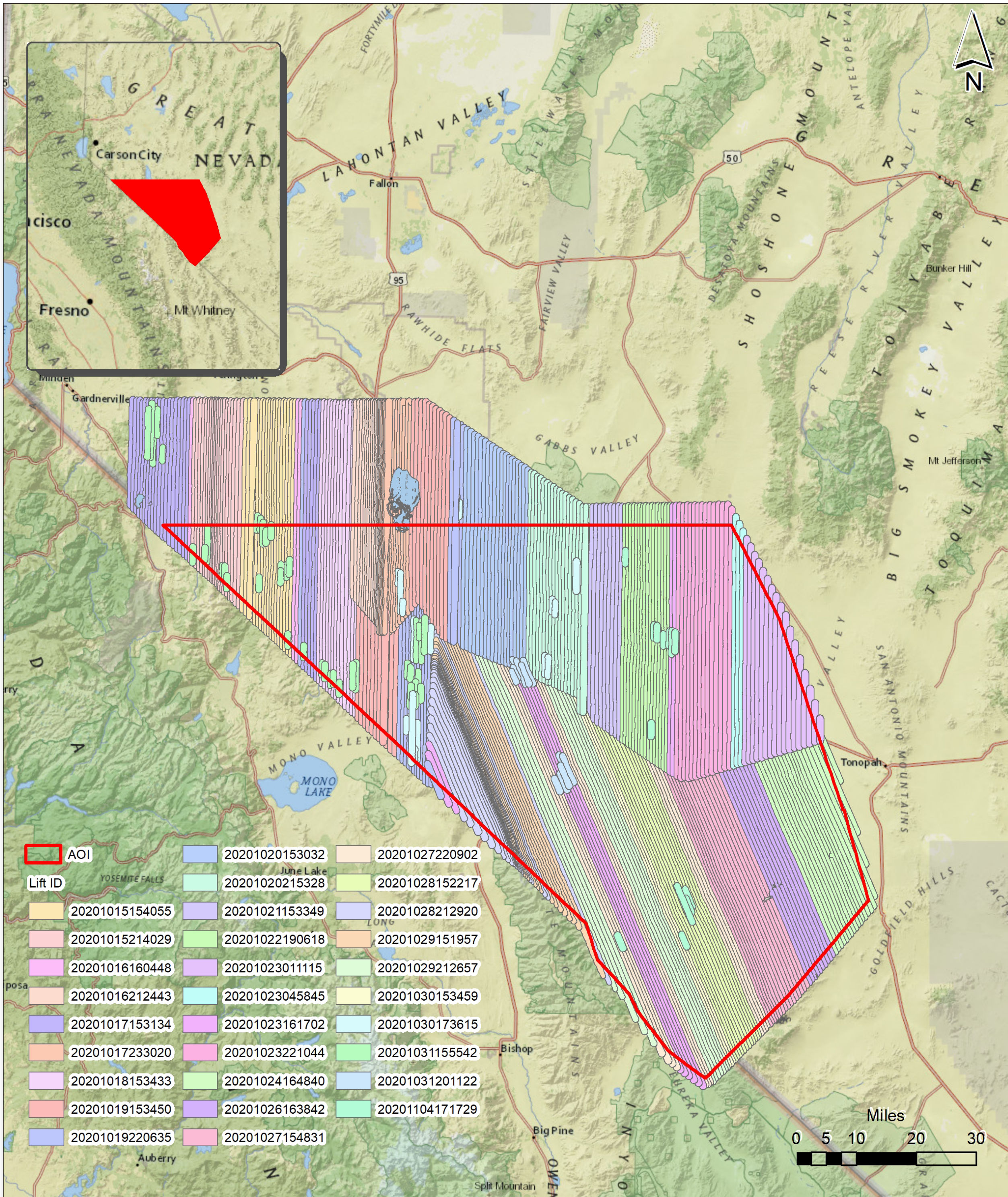



**Figure 5. Lidar Coverage**

# 6. Geometric Accuracy

## 6.1. Horizontal Accuracy

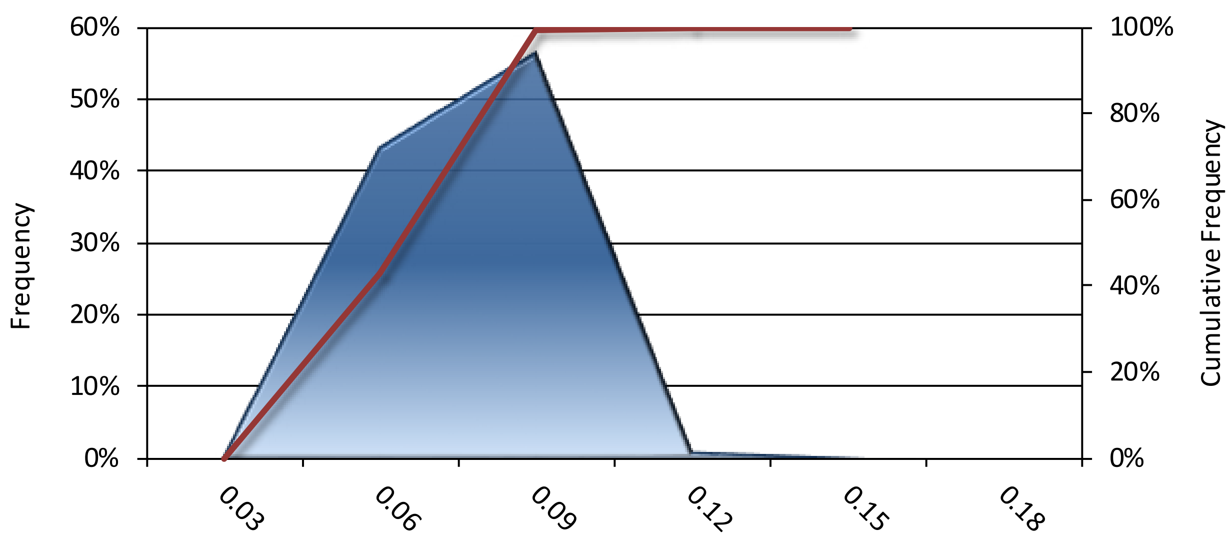
Lidar horizontal accuracy is a function of Global Navigation Satellite System (GNSS) derived positional error, flying altitude, and INS derived attitude error. The obtained $RMSE_r$ value is multiplied by a conversion factor of 1.7308 to yield the horizontal component of the National Standards for Spatial Data Accuracy (NSSDA) reporting standard where a theoretical point will fall within the obtained radius 95% of the time. Based on a flying altitude of 2800 meters, an IMU error of 0.002 decimal degrees, and a GNSS positional error of 0.015 meters, this project was compiled to meet 0.12 meter horizontal accuracy at the 95% confidence level. A summary is shown below.

| Horizontal Accuracy | |
|---|---|
| $RMSE_r$ | 0.58 ft |
| | 0.17 m |
| $ACC_r$ | 1 ft |
| | 0.30 m |

## 6.2. Relative Vertical Accuracy

Relative vertical accuracy refers to the internal consistency of the data set as a whole: the ability to place an object in the same location given multiple flight lines, GPS conditions, and aircraft attitudes. When the lidar system is well calibrated, the swath-to-swath vertical divergence is low (<0.10 meters). The relative vertical accuracy was computed by comparing the ground surface model of each individual flight line with its neighbors in overlapping regions. The average (mean) line to line relative vertical accuracy for the NV_WestCentral_EarthMRI_2020_D20 project was 0.06 feet (0.018 meters). A summary is shown below.

| Relative Vertical Accuracy | |
|---|---|
| Sample | 444 flight line surfaces |
| Average | .06 ft |
| | .018 m |
| Median | .061 ft |
| | .019 m |
| RMSE | .062 ft |
| | .019 ft |
| Standard Deviation (1σ) | .007 ft |
| | .002 m |
| 1.96σ | .014 ft |
| | .004 m |




Nevada QL1 D1, Nevada Relative Vertical Accuracy (ft)
Total Compared Points (n = 99,627,686,574)

# Project Report Appendices

**The following section contains the appendices as listed in the NV_WestCentral_EarthMRI_2020_D20 Lidar Project Report.**

# Appendix A

## Flight Logs

# Digital Aerial Solutions Flight Log

| | | | | | | |
|---|---|---|---|---|---|---|
| **Project/Flight Plan:** | **Nevada Earth** | **Lift** | **Temp °C Before** | **Temp °C After** | **Pressure (kPa)** | **Sensor Operator** |
| | | **1** | **8** | **10** | 103.05 | Chuck Harris |

| | | | | |
|---|---|---|---|---|
| **Date/Julian:** | **10/15/2020** | **Disk Drive** | **Sensor** | **Pilot** |
| **Hobbs End** | **7191.9** | TM MM30 (103, 104) | TM_90524 | Anthony Kosinski |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Hobbs ST** | **7186.6** | **TARGET MSL** | **Target AIRSPD** | **Base Name** | **PID** | **Base Name** | **PID** | **Base Height** | **Aircraft** | **Airport Identifcation:** |
| **Flight Time** | **5.3** | 13,500 | 165 | KMEV01 | | KMEV02 | | 1.500 | C441-N207SS | Minden (KMEV) |

| ∠ | Flight Line | Mission Line | UTC time: Begin: | UTC time: End: | Direction | GPS Altitude | Speed | Available MM Space | S/Vs | Position Acc. AVG PDOP | Position Acc. AVG HDOP | Comments and Conditions: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **58** | 58 S | 16:06 | 16:20 | 167° | 13593 | 160 | 7045 | 23 | 1.1 | 0.6 | |
| | **57** | 57 N | 16:23 | 16:37 | 347° | 13616 | 157 | 7034 | 21 | 1.2 | 0.7 | |
| | **56** | 56 S | 16:41 | 16:54 | 167° | 13591 | 160 | 7024 | 19 | 1.4 | 0.8 | |
| | **55** | 55 N | 16:58 | 17:12 | 348° | 13598 | 155 | 7013 | 19 | 1.3 | 0.8 | |
| | **54** | 54 S | 17:15 | 17:28 | 167° | 13547 | 159 | 7003 | 21 | 1.1 | 0.7 | |
| | **53** | 53 N | 17:33 | 17:46 | 347° | 13521 | 155 | 6993 | 21 | 1.1 | 0.7 | |
| | **52** | 52 S | 17:50 | 18:03 | 167° | 13512 | 160 | 6984 | 18 | 1.1 | 0.7 | |
| | **51** | 51 N | 18:07 | 18:20 | 248° | 13528 | 157 | 6974 | 18 | 1.2 | 0.7 | |
| | **50** | 50 S | 18:24 | 18:36 | 167° | 13501 | 155 | 6962 | 17 | 1.4 | 0.8 | |
| | **49** | 49 N | 18:40 | 18:53 | 347° | 13500 | 163 | 6953 | 18 | 1.3 | 0.8 | |
| | **48** | 48 S | 18:56 | 19:09 | 167° | 13495 | 158 | 6944 | 17 | 1.4 | 0.8 | |
| | **47** | 47 N | 19:13 | 19:26 | 347° | 13430 | 157 | 6933 | 18 | 1.3 | 0.7 | |
| | **46** | 46 S | 19:29 | 19:41 | 167° | 13458 | 160 | 6922 | 19 | 1.3 | 0.7 | |
| | **45** | 45 N | 19:45 | 19:57 | 347° | 13468 | 163 | 6913 | 22 | 1.1 | 0.6 | |
| | **44** | 44 S | 20:02 | 20:12 | 167° | 13450 | 162 | 6903 | 21 | 1.0 | 0.6 | |
| | **43** | 43 N | 20:16 | 20:28 | 347° | 13461 | 163 | 6893 | 22 | 1.0 | 0.5 | |
| | **42** | 42 S | 20:32 | 20:43 | 167° | 13457 | 165 | 9883 | 21 | 1.2 | 0.6 | |
| | **41** | 41 N | 20:47 | 20:59 | 347° | 13512 | 160 | 6874 | 22 | 1.2 | 0.6 | |
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# Digital Aerial Solutions Flight Log

| Project/Flight Plan: | Nevada Earth | Lift | Temp °C Before | Temp °C After | Pressure (kPa) | Sensor Operator | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2 | 20 | 13 | 102.91 | Geoffrey McCall | | | | |
| Date/Julian: | 10/15/2020 | Disk Drive | | Sensor | | | | | Pilot | |
| Hobbs End | 7197.2 | TM MM30 (101, 102) | | TM_90524 | | | | | Mike Wasielewski | |
| Hobbs ST | 7191.9 | TARGET MSL | Target AIRSPD | Base Name | PID | Base Name | PID | Base Height | Aircraft | Airport Identifcation: |
| Flight Time | 5.3 | 13,500 | 165 | KMEV01 | | KMEV02 | | 1.500 | C441-N207SS | Minden (KMEV) |

| ∠ | Flight Line | Mission Line | UTC time: | | Direction | GPS Altitude | Speed | Available | S/Vs | Position Acc. | | Comments and Conditions: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Begin: | End: | | | | MM Space | | AVG PDOP | AVG HDOP | |
| | 40 | 40s | 22:06 | 22:17 | 167° | 13655 | 156 | 6766 | 24 | 1.2 | 0.6 | |
| | 39 | 39n | 22:23 | 22:34 | 347° | 13695 | 159 | 6767 | 22 | 1.1 | 0.6 | |
| | 38 | 38s | 22:39 | 22:50 | 165° | 13691 | 154 | 6758 | 23 | 1.2 | 0.6 | |
| | 37 | 37n | 22:54 | 23:05 | 346° | 13595 | 156 | 6749 | 22 | 1.2 | 0.7 | |
| | 36 | 36s | 23:10 | 23:21 | 167° | 13700 | 155 | 6740 | 23 | 1.1 | 0.6 | |
| | 35 | 35n | 23:25 | 23:36 | 348° | 13733 | 158 | 6733 | 24 | 1.1 | 0.7 | |
| | 34 | 34s | 23:40 | 23:51 | 167° | 13749 | 155 | 6726 | 20 | 1.2 | 0.8 | |
| | 33 | 33n | 23:55 | :6 | 346° | 13739 | 157 | 6717 | 19 | 1.3 | 0.8 | |
| | 32 | 32s | :10 | :20 | 165° | 13747 | 158 | 6710 | 21 | 1.1 | 0.7 | |
| | 31 | 31n | :25 | :35 | 349° | 13732 | 156 | 6703 | 21 | 1.2 | 0.7 | |
| | 30 | 30s | :39 | :49 | 169° | 13747 | 156 | 6697 | 20 | 1.2 | 0.7 | |
| | 29 | 29n | :54 | 1:04 | 347° | 13744 | 161 | 6690 | 16 | 1.4 | 0.7 | |
| | 28 | 28s | 1:09 | 1:18 | 170° | 13751 | 154 | 6685 | 15 | 1.8 | 0.8 | |
| | 27 | 27n | 1:23 | 1:33 | 345° | 13748 | 159 | 6677 | 15 | 1.6 | 0.8 | |
| | 26 | 26s | 1:37 | 1:47 | 168° | 13747 | 155 | 6670 | 18 | 1.3 | 0.7 | |
| | 25 | 25n | 1:51 | 2:01 | 347° | 13637 | 150 | 6663 | 19 | 1.1 | 0.7 | |
| | 24 | 24s | 2:05 | 2:15 | 166° | 13633 | 155 | 6658 | 20 | 1.2 | 0.8 | |
| | 23 | 23n | 2:19 | 2:29 | 346° | 13625 | 162 | 6651 | 20 | 1.1 | 0.7 | |
| | 22 | 22s | 2:33 | 2:43 | 168° | 13626 | 165 | 6644 | 18 | 1.2 | 0.7 | |
| | 21 | 21n | 2:47 | 2:57 | 346° | 13644 | 156 | 6637 | 16 | 1.4 | 0.8 | |
| | | | | | | | | | | | | |
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# Digital Aerial Solutions Flight Log

| Project/Flight Plan: | Nevada Earth | Lift | Temp °C Before | Temp °C After | Pressure (kPa) | Sensor Operator |
|---|---|---|---|---|---|---|
| | | 3 | 7 | 13 | 103.15 | Chuck Harris |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Date/Julian: | 10/16/2020 | Disk Drive | | Sensor | | | | | Pilot | |
| Hobbs End | 7198.7 | TM MM30 (103, 104) | | TM_90524 | | | | | Wes Ashmore | |
| Hobbs ST | 7197.2 | TARGET MSL | Target AIRSPD | Base Name | PID | Base Name | PID | Base Height | Aircraft | Airport Identifcation: |
| Flight Time | 1.5 | 13,500 | 165 | KMEV01 | | KMEV02 | | 1.500 | C441-N207SS | Minden (KMEV) |

| ∠ | Flight Line | Mission Line | UTC time: Begin: | UTC time: End: | Direction | GPS Altitude | Speed | Available MM Space | S/Vs | Position Acc. AVG PDOP | Position Acc. AVG HDOP | Comments and Conditions: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 20 | 20 S | 16:31 | | 167° | 13524 | 160 | 6865 | 20 | 1.5 | 0.9 | smoke - line aborted |
| | 59 | 59 S | 16:44 | 16:58 | 167° | 13633 | 157 | 6861 | 19 | 1.4 | 0.8 | haze last 10 mi |
| | 60 | 60 N | 17:01 | 17:15 | 346° | 13672 | 157 | 6851 | 20 | 1.2 | 0.7 | haze first 10 mi |
| | 20 | 20 S | 17:23 | 17:31 | 167° | 13590 | 157 | 6839 | 21 | 1.0 | 0.6 | haze last 8 mi |
| | | | | | | | | | | | | |
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# Digital Aerial Solutions Flight Log

| Project/Flight Plan: | Nevada Earth | | | | Lift | Temp °C Before | Temp °C After | Pressure (kPa) | Sensor Operator |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 4 | 21 | 15 | 102.61 | Geoffrey McCall |
| Date/Julian: | 10/16/2020 | Disk Drive | | Sensor | | | | | Pilot |
| Hobbs End | 7203 | TM MM30 (101, 102) | | TM_90524 | | | | | Anthony Kosinski |
| Hobbs ST | 7198.7 | TARGET MSL | Target AIRSPD | Base Name | PID | Base Name | PID | Base Height | Aircraft | Airport Identifcation: |
| Flight Time | 4.3 | 13,500 | 165 | KMEV01 | | KMEV02 | | 1.500 | C441-N207SS | Minden (KMEV) |

| ∠ | Flight Line | Mission Line | UTC time: | | Direction | GPS Altitude | Speed | Available | S/Vs | Position Acc. | | Comments and Conditions: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Begin: | End: | | | | MM Space | | AVG PDOP | AVG HDOP | |
| | 61 | 61s | 21:56 | x | 168° | 13646 | 159 | 6630 | 22 | 1.2 | 0.7 | Stop with 17 NM to end...Smoke |
| | 233 | 233n | 22:15 | 22:26 | 347° | 13879 | 159 | 6624 | 24 | 1.1 | 0.6 | |
| | 234 | 234s | 22:30 | 22:41 | 167° | 13675 | 162 | 6616 | 23 | 1.2 | 0.6 | |
| | 235 | 235n | 22:45 | 22:56 | 348° | 13470 | 157 | 6607 | 22 | 1.3 | 0.6 | |
| | 236 | 236s | 23:00 | 23:11 | 167° | 13326 | 155 | 6598 | 23 | 1.2 | 0.6 | |
| | 237 | 237n | 23:15 | 23:26 | 346° | 13300 | 159 | 6590 | 22 | 1.2 | 0.6 | |
| | 238 | 238s | 23:30 | 23:42 | 166° | 13316 | 159 | 6581 | 21 | 1.1 | 0.6 | |
| | 239 | 239n | 23:46 | 23:58 | 347° | 13185 | 158 | 6572 | 21 | 1.1 | 0.6 | |
| | 240 | 240s | :1 | :13 | 169° | 13189 | 161 | 6563 | 21 | 1.1 | 0.6 | |
| | 241 | 241n | :17 | :29 | 346° | 13193 | 145 | 6550 | 22 | 1.1 | 0.7 | |
| | 242 | 242s | :33 | :45 | 167° | 13150 | 151 | 6538 | 21 | 1.0 | 0.7 | Smoke? 16 NM from end |
| | 243 | 243n | :49 | 1:01 | 349° | 13081 | 154 | 6527 | 18 | 1.4 | 0.8 | |
| | 244 | 244s | 1:05 | 1:17 | 169° | 13083 | 155 | 6516 | 17 | 1.7 | 0.9 | |
| | 245 | 245n | 1:22 | 1:34 | 344° | 13067 | 152 | 6503 | 16 | 1.7 | 0.8 | |

# Digital Aerial Solutions Flight Log

| Project/Flight Plan: | Nevada Earth | | Lift | Temp °C Before | | Temp °C After | | Pressure (kPa) | | Sensor Operator | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 5 | 4 | | 24 | | 102.51 | | Chuck Harris | |
| Date/Julian: | 10/17/2020 | Disk Drive | | | Sensor | | | | | Pilot | |
| Hobbs End | 7208.6 | TM MM30 (103, 104) | | | TM_90524 | | | | | Anthony Kosinski | |
| Hobbs ST | 7203 | TARGET MSL | | Target AIRSPD | Base Name | PID | Base Name | PID | Base Height | Aircraft | Airport Identifcation: |
| Flight Time | 5.6 | 13,500 | | 165 | KMEV01 | | KMEV02 | | 1.500 | C441-N207SS | Minden (KMEV) |

| ∠ | Flight Line | Mission Line | UTC time: Begin: | End: | Direction | GPS Altitude | Speed | Available MM Space | S/Vs | Position Acc. AVG PDOP | AVG HDOP | Comments and Conditions: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **19** | 19 S | 15:53 | 16:01 | 167° | 13532 | 160 | 6831 | 18 | 1.1 | 0.7 | Gimbal data from PAV missing |
| | **18** | 18 N | 16:06 | 16:14 | 347° | 13512 | 155 | 6826 | 18 | 1.3 | 0.7 | |
| | **17** | 17 S | 16:19 | 16:27 | 167° | 13610 | 161 | 6819 | 18 | 1.3 | 0.7 | " " |
| | **16** | 16 N | 16:32 | 16:40 | 347° | 13608 | 158 | 6813 | 18 | 1.3 | 0.7 | |
| | **15** | 15 S | 16:44 | 16:52 | 167° | 13767 | 159 | 6807 | 17 | 1.3 | 0.7 | |
| | **14** | 14 N | 16:57 | 17:05 | 347° | 13914 | 161 | 6802 | 18 | 1.2 | 0.7 | |
| | **13** | 13 S | 17:08 | 17:16 | 167° | 14014 | 158 | 6797 | 20 | 1.1 | 0.6 | |
| | **12** | 12 N | 17:20 | 17:28 | 347° | 14007 | 156 | 6792 | 21 | 1.0 | 0.6 | |
| | **11** | 11 S | 17:32 | 17:39 | 167° | 14000 | 158 | 6786 | 21 | 1.0 | 0.6 | " " |
| | **10** | 10 N | 17:44 | 17:51 | 347° | 14017 | 158 | 6779 | 19 | 1.0 | 0.6 | |
| | **9** | 9 S | 17:55 | 18:02 | 167° | 14003 | 156 | 6774 | 18 | 1.1 | 0.7 | |
| | **8** | 8 N | 18:06 | 18:13 | 347° | 14005 | 154 | 6769 | 17 | 1.3 | 0.8 | |
| | **7** | 7 S | 18:17 | 18:24 | 167° | 14006 | 164 | 6763 | 16 | 1.4 | 0.8 | " " |
| | **6** | 6 N | 18:29 | 18:35 | 347° | 13990 | 158 | 6757 | 19 | 1.2 | 0.8 | |
| | **5** | 5 S | 18:39 | 18:45 | 167° | 13996 | 164 | 6752 | 19 | 1.4 | 0.8 | |
| | **4** | 4 N | 18:51 | 18:56 | 347° | 14015 | 155 | 6745 | 19 | 1.4 | 0.8 | |
| | **3** | 3 S | 19:00 | 19:06 | 166° | 14028 | 160 | 6741 | 20 | 1.3 | 0.7 | |
| | **2** | 2 N | 19:11 | 19:17 | 346° | 14032 | 158 | 6736 | 20 | 1.3 | 0.7 | |
| | **1** | 1 S | 19:21 | 19:27 | 166° | 14250 | 162 | 6733 | 22 | 1.2 | 0.7 | |
| | **62** | 62 N | 19:39 | 19:53 | 347° | 13648 | 164 | 6727 | 24 | 1.0 | 0.6 | |
| | **63** | 63 S | 19:57 | 20:12 | 166° | 13671 | 162 | 6716 | 23 | 1.1 | 0.6 | |
| | **64** | 64 N | 20:16 | 20:31 | 346° | 13673 | 158 | 6704 | 23 | 1.2 | 0.6 | |
| | **65** | 65 S | 20:35 | 20:49 | 167° | 13718 | 165 | 6694 | 24 | 1.2 | 0.6 | |
| | **66** | 66 N | 20:54 | 21:09 | 347° | 13742 | 154 | 6682 | 23 | 1.2 | 0.6 | |
| | | | | | | | | | | | | |
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# Digital Aerial Solutions Flight Log

| Project/Flight Plan: | Nevada Earth | Lift | Temp °C Before | Temp °C After | Pressure (kPa) | Sensor Operator |
|---|---|---|---|---|---|---|
| | | 6 | 28 | 10 | 102.23 | Geoffrey McCall |

| Date/Julian: | 10/17/2020 | Disk Drive | | Sensor | | | | | Pilot | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hobbs End | 7214.2 | TM MM30 (101, 102) | | TM_90524 | | | | | Mike Wasielewski | |
| Hobbs ST | 7208.6 | TARGET MSL | Target AIRSPD | Base Name | PID | Base Name | PID | Base Height | Aircraft | Airport Identifcation: |
| Flight Time | 5.6 | 13,500 | 165 | KMEV01 | | KMEV02 | | 1.500 | C441-N207SS | Minden (KMEV) |

| ∠ | Flight Line | Mission Line | UTC time: Begin: | UTC time: End: | Direction | GPS Altitude | Speed | Available MM Space | S/Vs | Position Acc. AVG PDOP | Position Acc. AVG HDOP | Comments and Conditions: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 246 | 246s | :3 | :16 | 166° | 13050 | 158 | 6489 | 20 | 1.2 | 0.7 | Gimbal |
| | 247 | 247n | :21 | :34 | 346° | 13053 | 155 | 6479 | 20 | 1.1 | 0.7 | |
| | 248 | 248s | :38 | :51 | 166° | 13055 | 155 | 6471 | 19 | 1.2 | 0.7 | Gimbal |
| | 249 | 249n | :55 | 1:08 | 348° | 13070 | 155 | 6462 | 17 | 1.4 | 0.8 | |
| | 250 | 250s | 1:16 | 1:28 | 167° | 13076 | 158 | 6453 | 15 | 1.5 | 0.8 | |
| | 251` | 251n | 1:33 | 1:46 | 346° | 13061 | 158 | 6444 | 18 | 1.2 | 0.7 | |
| | 252 | 252s | 1:50 | 2:03 | 166° | 13050 | 156 | 6435 | 18 | 1.0 | 0.6 | |
| | 253 | 253n | 2:07 | 3:30 | 348° | 13053 | 157 | 6426 | 19 | 1.1 | 0.7 | |
| | 254 | 254s | 2:25 | 2:37 | 169° | 13049 | 148 | 6417 | 19 | 1.2 | 0.7 | |
| | 255 | 255n | 2:42 | 2:55 | 346° | 13040 | 158 | 6408 | 17 | 1.4 | 0.8 | |
| | 256 | 256s | 2:59 | 3:12 | 171° | 130-36 | 158 | 6401 | 18 | 1.4 | 0.8 | |
| | 257 | 257n | 3:16 | x | 347° | 13046 | 152 | 6392 | 19 | 1.2 | 0.7 | Refly Fuel Imbalance |
| | 257 | 257s | 3:35 | x | 169° | 13144 | 158 | 6384 | 20 | 1.2 | 0.6 | Refly Auto Pilot |
| | 257 | 257s | 3:45 | 3:57 | 170° | 13018 | 155 | 6384 | 24 | 1.0 | 0.6 | |
| | 258 | 258n | 4:08 | 4:20 | 347° | 13063 | 156 | 6374 | 22 | 1.1 | 0.6 | |
| | 259 | 259s | 4:25 | 4:36 | 167° | 13032 | 159 | 6365 | 23 | 1.1 | 0.6 | |
| | 260 | 260n | 4:42 | 4:53 | 347° | 13052 | 152 | 6358 | 22 | 1.2 | 0.6 | |
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# Digital Aerial Solutions Flight Log

| Project/Flight Plan: | Nevada Earth | Lift | Temp °C Before | Temp °C After | Pressure (kPa) | Sensor Operator |
|---|---|---|---|---|---|---|
| | | 7 | 6 | 27 | 102.37 | Chuck Harris |

| Date/Julian: | 10/18/2020 | Disk Drive | Sensor | Pilot |
|---|---|---|---|---|
| Hobbs End | 7219.2 | TM MM30 (103, 104) | TM_90524 | Wes Ashmore |

| Hobbs ST | 7214.2 | TARGET MSL | Target AIRSPD | Base Name | PID | Base Name | PID | Base Height | Aircraft | Airport Identifcation: |
|---|---|---|---|---|---|---|---|---|---|---|
| Flight Time | 5 | 13,500 | 165 | KMEV01 | | KMEV02 | | 1.500 | C441-N207SS | Minden (KMEV) |

| ∠ | Flight Line | Mission Line | UTC time: Begin: | UTC time: End: | Direction | GPS Altitude | Speed | Available MM Space | S/Vs | Position Acc. AVG PDOP | Position Acc. AVG HDOP | Comments and Conditions: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 67 | 67 S | 16:01 | 16:16 | 167° | 13772 | 157 | 6669 | 21 | 1.1 | 0.7 | Gimbal PAV warning |
| | 68 | 68 N | 16:20 | 16:36 | 347° | 13796 | 158 | 6658 | 19 | 1.3 | 0.8 | |
| | 69 | 69 S | 16:39 | 16:55 | 167° | 13799 | 148 | 6644 | 19 | 1.3 | 0.8 | |
| | 70 | 70 N | 16:59 | 17:15 | 347° | 13956 | 157 | 6635 | 21 | 1.0 | 0.6 | |
| | 71 | 71 S | 17:19 | 17:35 | 167° | 14042 | 156 | 6623 | 24 | 1.8 | 0.6 | |
| | 72 | 72 N | 17:39 | 17:55 | 347° | 14140 | 157 | 6614 | 19 | 1.1 | 0.7 | |
| | 73 | 73 S | 17:59 | 18:15 | 168° | 14236 | 156 | 6602 | 19 | 1.0 | 0.6 | |
| | 74 | 74 N | 18:19 | 18:36 | 346° | 14422 | 156 | 6590 | 17 | 1.4 | 0.8 | |
| | 75 | 75 S | 18:40 | 18:56 | 168° | 14523 | 164 | 6577 | 17 | 1.5 | 0.7 | |
| | 76 | 76 N | 19:00 | 19:18 | 347° | 14482 | 157 | 6563 | 19 | 1.4 | 0.7 | |
| | 77 | 77 S | 19:21 | 19:38 | 167° | 14147 | 158 | 6550 | 22 | 1.2 | 0.7 | |
| | 78 | 78 N | 19:43 | 20:00 | 347° | 13861 | 162 | 6536 | 25 | 0.9 | 0.5 | |
| | 79 | 79 S | 20:04 | 20:21 | 167° | 13521 | 160 | 6522 | 24 | 1.0 | 0.6 | |

# Digital Aerial Solutions Flight Log

| Project/Flight Plan: | Nevada Earth | | Lift | Temp °C Before | Temp °C After | Pressure (kPa) | Sensor Operator |
|---|---|---|---|---|---|---|---|
| | | | 8 | 6 | 26 | 102.40 | Chuck Harris |
| Date/Julian: | 10/18/2020 | Disk Drive | | Sensor | | | Pilot |
| Hobbs End | 7224.8 | TM MM30 (103, 104) | | TM_90524 | | | Anthony Kosinski |

| Hobbs ST | 7219.2 | TARGET MSL | Target AIRSPD | Base Name | PID | Base Name | PID | Base Height | Aircraft | Airport Identifcation: |
|---|---|---|---|---|---|---|---|---|---|---|
| Flight Time | 5.6 | 13,500 | 165 | KMEV01 | | KMEV02 | | 1.500 | C441-N207SS | Minden (KMEV) |

| ∠ | Flight Line | Mission Line | UTC time: Begin: | UTC time: End: | Direction | GPS Altitude | Speed | Available MM Space | S/Vs | Position Acc. AVG PDOP | Position Acc. AVG HDOP | Comments and Conditions: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **80** | 80 S | 16:01 | 16:09 | 168° | 15351 | 154 | 6506 | 22 | 1.1 | 0.7 | Gimbal PAV warning |
| | **81** | 81 N | 16:13 | 16:21 | 347° | 15407 | 154 | 6499 | 21 | 1.1 | 0.7 | |
| | **82** | 82 S | 16:24 | 16:32 | 167° | 15500 | 157 | 9494 | 19 | 1.4 | 0.7 | |
| | **83** | 83 N | 16:35 | 16:43 | 348° | 15588 | 158 | 6489 | 19 | 1.3 | 0.7 | |
| | **84** | 84 S | 16:47 | 16:54 | 167° | 15719 | 156 | 6484 | 19 | 1.3 | 0.7 | |
| | **85** | 85 N | 16:58 | 17:05 | 348° | 15751 | 165 | 6477 | 21 | 1.1 | 0.6 | |
| | **86** | 86 S | 17:09 | 17:17 | 167° | 15802 | 156 | 6472 | 22 | 1.0 | 0.6 | |
| | **87** | 87 N | 17:20 | 17:28 | 346° | 15820 | 162 | 6467 | 20 | 1.0 | 0.6 | |
| | **88** | 88 S | 17:32 | 17:39 | 167° | 15800 | 166 | 6462 | 22 | 1.0 | 0.6 | |
| | **89** | 89 N | 17:43 | 17:51 | 347° | 16075 | 166 | 6456 | 21 | 1.0 | 0.6 | |
| | **90** | 90 S | 17:54 | 18:03 | 167° | 16139 | 154 | 6449 | 21 | 1.0 | 0.6 | |
| | **261** | 261 N | 18:17 | 18:28 | 347° | 13003 | 160 | 6443 | 19 | 1.3 | 0.8 | |
| | **262** | 262 S | 18:32 | 18:43 | 166° | 12980 | 163 | 6435 | 24 | 1.4 | 0.8 | |
| | **263** | 263 N | 18:47 | 18:58 | 348° | 13008 | 148 | 6427 | 21 | 1.5 | 0.7 | |
| | **264** | 264 S | 19:02 | 19:14 | 167° | 12986 | 161 | 6420 | 20 | 1.5 | 0.7 | |
| | **265** | 265 N | 19:17 | 19:29 | 346° | 13030 | 155 | 6412 | 22 | 1.2 | 0.6 | |
| | **266** | 266 S | 19:32 | 19:44 | 167° | 13074 | 157 | 6403 | 25 | 1.0 | 0.5 | |
| | **267** | 267 N | 19:47 | 20:00 | 347° | 13040 | 161 | 6394 | 24 | 1.0 | 0.6 | |
| | **268** | 268 S | 20:03 | 20:14 | 167° | 13073 | 160 | 6383 | 25 | 1.1 | 0.6 | |
| | **269** | 269 N | 20:18 | 20:30 | 347° | 13100 | 162 | 6376 | 22 | 1.2 | 0.6 | |
| | **270** | 270 S | 20:34 | 20:46 | 167° | 13171 | 157 | 6368 | 22 | 1.2 | 0.6 | |
| | **271** | 271 N | 20:51 | 21:03 | 347° | 13191 | 161 | 6359 | 21 | 1.2 | 0.6 | |
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# Digital Aerial Solutions Flight Log

| Project/Flight Plan: | Nevada Earth | | Lift | Temp °C Before | Temp °C After | Pressure (kPa) | Sensor Operator |
|---|---|---|---|---|---|---|---|
| | | | 9 | 26 | 8 | 102.03 | Geoffrey McCall |

| Date/Julian: | 10/19/2020 | Disk Drive | | Sensor | | | | Pilot | |
|---|---|---|---|---|---|---|---|---|---|
| Hobbs End | 7230.8 | TM MM30 (101, 102) | | TM_90524 | | | | Mike Wasielewski | |
| Hobbs ST | 7224.8 | TARGET MSL | Target AIRSPD | Base Name | PID | Base Name | PID | Base Height | Aircraft | Airport Identifcation: |
| Flight Time | 6 | 13,500 | 165 | KMEV01 | | KMEV02 | | 1.500 | C441-N207SS | Minden (KMEV) |

| ∠ | Flight Line | Mission Line | UTC time: | | Direction | GPS Altitude | Speed | Available | S/Vs | Position Acc. | | Comments and Conditions: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Begin: | End: | | | | MM Space | | AVG PDOP | AVG HDOP | |
| | 272 | 272s | 22:37 | 22:49 | 167° | 13255 | 159 | 6350 | 20 | 1.2 | 0.6 | |
| | 105 | 105s | 22:58 | 23:04 | 166° | 14186 | 160 | 6341 | 21 | 1.1 | 0.6 | |
| | 104 | 104n | 23:11 | 23:21 | 348° | 14087 | 160 | 6336 | 20 | 1.2 | 0.7 | |
| | 103 | 103s | 23:26 | 23:36 | 169° | 13935 | 162 | 6327 | 20 | 1.0 | 0.6 | |
| | 102 | 102n | 23:40 | 23:51 | 347° | 13927 | 165 | 6320 | 18 | 1.1 | 0.7 | |
| | 101 | 101s | 23:55 | :5 | 166° | 13736 | 160 | 6311 | 19 | 1.1 | 0.6 | |
| | 100 | 100n | :10 | :21 | 341° | 13725 | 156 | 6302 | 20 | 1.0 | 0.6 | |
| | 99 | 99s | :24 | :35 | 169° | 13569 | 160 | 6293 | 18 | 1.2 | 0.7 | |
| | 98 | 98n | :39 | :50 | 346° | 13574 | 162 | 6284 | 16 | 1.3 | 0.7 | |
| | 97 | 97s | :54 | 1:04 | 169° | 13550 | 157 | 6275 | 15 | 1.6 | 0.8 | |
| | 96 | 96n | 1:08 | 1:19 | 346° | 13555 | 158 | 6268 | 15 | 1.5 | 0.8 | |
| | 95 | 95s | 1:23 | 1:34 | 168° | 13544 | 156 | 6259 | 17 | 1.2 | 0.7 | |
| | 94 | 94n | 1:39 | 1:48 | 347° | 14000 | 155 | 6252 | 20 | 1.0 | 0.6 | |
| | 93 | 93s | 1:53 | 2:03 | 166° | 14520 | 151 | 6245 | 21 | 1.2 | 0.7 | |
| | 92 | 92n | 2:09 | 2:18 | 346° | 14702 | 157 | 6236 | 21 | 1.2 | 0.7 | |
| | 91 | 91s | 2:23 | 2:32 | 167° | 15110 | 154 | 6229 | 18 | 1.6 | 0.9 | |
| | 232 | 232n | 2:40 | 2:42 | 325° | 15542 | 156 | 6224 | 18 | 1.5 | 0.8 | |
| | 273 | 273n | 2:49 | 3:01 | 348° | 13300 | 160 | 6222 | 21 | 1.1 | 0.7 | |
| | 274 | 274s | 3:05 | 3:17 | 167° | 13295 | 160 | 6213 | 22 | 1.1 | 0.7 | |
| | 275 | 275n | 3:21 | 3:33 | 345° | 13292 | 160 | 6206 | 22 | 1.2 | 0.7 | |
| | 61 | 61s | 3:44 | 3:58 | 167° | 13701 | 160 | 6197 | 23 | 1.1 | 0.6 | |
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# Digital Aerial Solutions Flight Log

| Project/Flight Plan: | Nevada Earth | | Lift | Temp °C Before | Temp °C After | Pressure (kPa) | Sensor Operator |
|---|---|---|---|---|---|---|---|
| | | | 10 | 5 | 24 | 102.30 | Chuck Harris |

| Date/Julian: | 10/20/2020 | Disk Drive | | Sensor | | | | | Pilot | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hobbs End | 7236.3 | TM MM30 (103, 104) | | TM_90524 | | | | | Wes Ashmore | |
| Hobbs ST | 7230.8 | TARGET MSL | Target AIRSPD | Base Name | PID | Base Name | PID | Base Height | Aircraft | Airport Identifcation: |
| Flight Time | 5.5 | 13,500 | 165 | KMEV01 | | KMEV02 | | 1.500 | C441-N207SS | Minden (KMEV) |

| ∠ | Flight Line | Mission Line | UTC time: | | Direction | GPS Altitude | Speed | Available | S/Vs | Position Acc. | | Comments and Conditions: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Begin: | End: | | | | MM Space | | AVG PDOP | AVG HDOP | |
| | **276** | 276 N | 16:09 | 16:21 | 347° | 13334 | 155 | 6347 | 17 | 1.2 | 0.7 | |
| | **277** | 277 S | 16:24 | 16:36 | 167° | 13375 | 153 | 6338 | 16 | 1.3 | 0.7 | |
| | **278** | 278 N | 16:40 | 16:51 | 347° | 13404 | 162 | 6330 | 16 | 1.3 | 0.7 | |
| | **279** | 279 S | 16:55 | 17:07 | 167° | 13383 | 159 | 6320 | 18 | 1.1 | 0.6 | |
| | **280** | 280 N | 17:10 | 17:22 | 348° | 13458 | 156 | 6311 | 19 | 1.0 | 0.6 | |
| | **281** | 281 S | 17:26 | 17:38 | 167° | 13489 | 166 | 6302 | 18 | 1.0 | 0.6 | |
| | **282** | 282 N | 17:41 | 17:53 | 347° | 13500 | 154 | 6293 | 17 | 1.2 | 0.7 | |
| | **283** | 283 S | 17:56 | 18:08 | 167° | 13505 | 150 | 6284 | 18 | 1.1 | 0.7 | |
| | **284** | 284 N | 18:11 | 18:23 | 347° | 13517 | 158 | 6276 | 17 | 1.2 | 0.7 | |
| | **285** | 285 S | 18:27 | 18:39 | 167° | 13550 | 154 | 6267 | 19 | 1.2 | 0.7 | |
| | **286** | 286 N | 18:42 | 18:54 | 348° | 13500 | 156 | 6258 | 19 | 1.3 | 0.7 | |
| | **287** | 287 S | 18:58 | 19:09 | 167° | 13475 | 161 | 6250 | 19 | 1.3 | 0.7 | |
| | **288** | 288 N | 19:13 | 19:24 | 347° | 13464 | 158 | 6242 | 21 | 1.2 | 0.6 | |
| | **289** | 289 S | 19:27 | 19:39 | 167° | 13451 | 157 | 6232 | 23 | 1.0 | 0.6 | |
| | **290** | 290 S | 19:42 | 19:54 | 347° | 13450 | 155 | 6225 | 22 | 1.1 | 0.6 | |
| | **291** | 291 N | 19:58 | 20:09 | 167° | 13447 | 157 | 6215 | 24 | 1.1 | 0.6 | |
| | **292** | 292 S | 20:12 | 20:24 | 347° | 13445 | 158 | 6207 | 23 | 1.1 | 0.6 | |
| | **293** | 293 N | 20:27 | 20:39 | 167° | 13435 | 157 | 6200 | 23 | 1.1 | 0.6 | |
| | **294** | 294 S | 20:42 | 20:53 | 347° | 13433 | 157 | 6192 | 23 | 1.2 | 0.6 | |
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# Digital Aerial Solutions Flight Log

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|---|---|---|---|---|---|---|
| **Project/Flight Plan:** | **Nevada Earth** | **Lift** | **Temp °C Before** | **Temp °C After** | **Pressure (kPa)** | **Sensor Operator** |
| | | **11** | **25** | **8** | 101.76 | Geoffrey McCall |

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|---|---|---|---|---|
| **Date/Julian:** | **10/20/2020** | **Disk Drive** | **Sensor** | **Pilot** |
| **Hobbs End** | **7241.9** | TM MM30 (101, 102) | TM_90524 | Anthony Kosinski |

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|---|---|---|---|---|---|---|---|---|---|---|
| **Hobbs ST** | **7236.3** | **TARGET MSL** | **Target AIRSPD** | **Base Name** | **PID** | **Base Name** | **PID** | **Base Height** | **Aircraft** | **Airport Identifcation:** |
| **Flight Time** | **5.6** | 13,500 | 165 | KMEV01 | | KMEV02 | | 1.500 | C441-N207SS | Minden (KMEV) |

| ∠ | Flight Line | Mission Line | UTC time: Begin: | UTC time: End: | Direction | GPS Altitude | Speed | Available MM Space | S/Vs | Position Acc. AVG PDOP | Position Acc. AVG HDOP | Comments and Conditions: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **195** | 195s | 22:23 | x | 143° | 13989 | 161 | 6187 | 23 | 1.2 | 0.6 | Stopped. Refly. Smoke |
| | **295** | 295n | 22:34 | 22:45 | 344° | 13471 | 152 | 6182 | 23 | 1.2 | 0.6 | |
| | **296** | 296s | 22:49 | 23:00 | 167° | 13452 | 151 | 6173 | 23 | 1.1 | 0.6 | |
| | **297** | 297n | 23:04 | 23:15 | 348° | 13470 | 158 | 6164 | 20 | 1.1 | 0.6 | |
| | **298** | 298s | 23:19 | 23:30 | 166° | 13440 | 165 | 6156 | 19 | 1.0 | 0.6 | |
| | **299** | 299n | 23:34 | 23:45 | 346° | 13477 | 135 | 6149 | 17 | 1.2 | 0.7 | |
| | **300** | 300s | 23:49 | : | 169° | 13485 | 158 | 6140 | 17 | 1.2 | 0.7 | |
| | **301** | 301n | :4 | :15 | 347° | 13480 | 163 | 6132 | 18 | 1.1 | 0.7 | |
| | **302** | 302s | :19 | :30 | 167° | 13535 | 161 | 6125 | 18 | 1.2 | 0.7 | Gimbal warning. |
| | **303** | 303n | :34 | :45 | 343° | 13528 | 156 | 6116 | 16 | 1.4 | 0.8 | |
| | **304** | 304s | :48 | :59 | 166° | 13567 | 161 | 6109 | 16 | 1.3 | 0.89 | |
| | **305** | 305n | 1:03 | 1:14 | 348° | 13600 | 160 | 6100 | 15 | 1.5 | 0.8 | |
| | **306** | 306s | 1:18 | 1:28 | 167° | 13613 | 159 | 6093 | 16 | 1.2 | 0.7 | |
| | **307** | 307n | 1:32 | 1:43 | 347° | 13600 | 164 | 6084 | 19 | 1.1 | 0.7 | |
| | **308** | 308s | 1:47 | 1:57 | 168° | 13617 | 163 | 6077 | 22 | 1.2 | 0.7 | |
| | **309** | 309n | 2:01 | 2:12 | 346° | 13553 | 160 | 6068 | 22 | 1.1 | 0.6 | |
| | **310** | 310s | 2:16 | 2:26 | 166° | 13530 | 163 | 6061 | 20 | 1.2 | 0.7 | |
| | **311** | 311n | 2:31 | 2:42 | 350° | 13475 | 159 | 6056 | 19 | 1.4 | 0.7 | |
| | **312** | 312s | 2:46 | 2:57 | 166° | 13480 | 157 | 6049 | 20 | 1.3 | 0.7 | |
| | **313** | 313n | 3:02 | 3:13 | 348° | 13480 | 160 | 6040 | 19 | 1.2 | 0.7 | |
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# Digital Aerial Solutions Flight Log

| Project/Flight Plan: | Nevada Earth | | | Lift | Temp °C Before | Temp °C After | Pressure (kPa) | Sensor Operator |
|---|---|---|---|---|---|---|---|---|
| | | | | 12 | 6 | 19 | 101.83 | Chuck Harris |
| Date/Julian: | 10/21/2020 | Disk Drive | | Sensor | | | | Pilot |
| Hobbs End | 7245.3 | TM MM30 (103, 104) | | TM_90524 | | | | Anthony Kosinski |
| Hobbs ST | 7241.9 | TARGET MSL | Target AIRSPD | Base Name | PID | Base Name | PID | Base Height | Aircraft | Airport Identifcation: |
| Flight Time | 3.4 | 13,500 | 165 | KMEV01 | | KMEV02 | | 1.500 | C441-N207SS | Minden (KMEV) |

| ∠ | Flight Line | Mission Line | UTC time: | | Direction | GPS Altitude | Speed | Available | S/Vs | Position Acc. | | Comments and Conditions: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Begin: | End: | | | | MM Space | | AVG PDOP | AVG HDOP | |
| | 314 | 314 N | 16:12 | 16:24 | 347° | 13458 | 157 | 6180 | 18 | 1.2 | 0.7 | |
| | 315 | 315 S | 16:28 | 16:40 | 167° | 13456 | 148 | 6171 | 18 | 1.1 | 0.7 | |
| | 316 | 316 N | 16:43 | 16:55 | 347° | 13466 | 158 | 6161 | 20 | 1.0 | 0.6 | |
| | 317 | 317 S | 16:59 | 17:11 | 167° | 13446 | 158 | 6154 | 20 | 1.0 | 0.6 | |
| | 318 | 318 N | 17:15 | 17:27 | 347° | 13431 | 159 | 6144 | 17 | 1.0 | 0.7 | |
| | 319 | 319 S | 17:31 | 17:43 | 167° | 13416 | 157 | 6135 | 17 | 1.1 | 0.7 | |
| | 320 | 320 N | 17:47 | 17:59 | 347° | 13427 | 150 | 6125 | 17 | 1.1 | 0.7 | |
| | 321 | 321 S | 18:03 | 18:17 | 167° | 13411 | 165 | 6116 | 15 | 1.4 | 0.8 | Possible smoke last 10 mi |
| | 322 | 322 N | 18:20 | 18:33 | 348° | 13421 | 150 | 6108 | 17 | 1.4 | 0.8 | Possible smoke first 10 mi |

# Digital Aerial Solutions Flight Log

| Project/Flight Plan: | Nevada Earth | Lift | Temp °C Before | Temp °C After | Pressure (kPa) | Sensor Operator |
|---|---|---|---|---|---|---|
| | | 13 | 18 | 17 | 101.69 | Geoffrey McCall |

| Date/Julian: | 10/22/2020 | Disk Drive | | Sensor | | | | | Pilot | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hobbs End | 7251.1 | TM MM30 (101, 102) | | TM_90524 | | | | | Wes Ashmore | |
| Hobbs ST | 7246 | TARGET MSL | Target AIRSPD | Base Name | PID | Base Name | PID | Base Height | Aircraft | Airport Identifcation: |
| Flight Time | 5.1 | 13,500 | 165 | KTPH01 | | KTPH02 | | 1.500 | C441-N207SS | Tonopah (KTPH) |

| ∠ | Flight Line | Mission Line | UTC time: | | Direction | GPS Altitude | Speed | Available | S/Vs | Position Acc. | | Comments and Conditions: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Begin: | End: | | | | MM Space | | AVG PDOP | AVG HDOP | |
| | **323** | 323n | 19:34 | 19:47 | 347° | 13416° | 160 | 6032 | 21 | 1.1 | 0.6 | |
| | **324** | 324s | 19:51 | 20:04 | 167° | 13492° | 155 | 6022 | 23 | 1.1 | 0.6 | |
| | **325** | 325n | 20:08 | 20:21 | 348° | 13590° | 150 | 6011 | 22 | 1.1 | 0.6 | |
| | **326** | 326s | 20:25 | 20:38 | 168° | 13575° | 155 | 6002 | 20 | 1.3 | 0.7 | Gimbal warning |
| | **327** | 327n | 20:42 | 20:55 | 346° | 13587° | 153 | 5992 | 20 | 1.2 | 0.6 | |
| | **327** | 328s | 20:59 | 21:13 | 168° | 13575° | 152 | 5982 | 20 | 1.2 | 0.6 | |
| | **329** | 329n | 21:17 | 21:30 | 347° | 13581° | 157 | 5971 | 20 | 1.2 | 0.6 | |
| | **330** | 330s | 21:34 | 21:48 | 165° | 13565° | 155 | 5962 | 23 | 1.1 | 0.6 | Gimbal warning |
| | **331** | 331n | 21:52 | 22:05 | 348° | 13580° | 161 | 5952 | 23 | 1.1 | 0.6 | |
| | **332** | 330s | 22:09 | 22:23 | 166° | 13568° | 157 | 5942 | 22 | 1.2 | 0.6 | PAV stabilization low performance |
| | **333** | 333n | 22:27 | 22:41 | 347° | 13581° | 162 | 5931 | 22 | 1.2 | 0.6 | |
| | **334** | 334s | 22:44 | 22:58 | 169° | 13564° | 162 | 5922 | 22 | 1.3 | 0.7 | |
| | **335** | 335n | 23:02 | 23:17 | 347° | 13562° | 165 | 5912 | 21 | 1.1 | 0.6 | |
| | **336** | 336s | 23:20 | 23:34 | 168° | 13579° | 154 | 5903 | 18 | 1.2 | 0.7 | |
| | **337** | 337n | 23:38 | 23:53 | 345° | 13590° | 158 | 5891 | 19 | 1.1 | 0.7 | |
| | **338** | 338s | 23:56 | :11 | 166° | 13571° | 152 | 5882 | 20 | 1.1 | 0.7 | hazy at very end of line |
| | | | | | | | | | | | | |
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# Digital Aerial Solutions Flight Log

| Project/Flight Plan: | Nevada Earth | | | Lift | Temp °C Before | | Temp °C After | | Pressure (kPa) | | Sensor Operator | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 14 | 15 | | 8 | | 101.62 | | Chuck Harris | |
| Date/Julian: | 10/22/2020 | Disk Drive | | | Sensor | | | | | | Pilot | |
| Hobbs End | 7256 | TM MM30 (103, 104) | | | TM_90524 | | | | | | Anthony Kosinski | |
| Hobbs ST | 7251.1 | TARGET MSL | | Target AIRSPD | Base Name | PID | Base Name | PID | Base Height | | Aircraft | Airport Identifcation: |
| Flight Time | 4.9 | 13,500 | | 165 | KTPH01 | | KTPH02 | | 1.500 | | C441-N207SS | Tonopah (KTPH) |

| ∠ | Flight Line | Mission Line | UTC time: Begin: | UTC time: End: | Direction | GPS Altitude | Speed | Available MM Space | S/Vs | Position Acc. AVG PDOP | Position Acc. AVG HDOP | Comments and Conditions: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **374** | 374 N | 1:35 | 1:36 | 348° | 13892 | 150 | 6096 | 23 | 1.0 | 0.6 | |
| | **373** | 373 S | 1:40 | 1:43 | 167° | 13894 | 155 | 6095 | 21 | 1.2 | 0.7 | Gimbal warning |
| | **372** | 372 N | 1:47 | 1:50 | 348° | 13865 | 157 | 6095 | 21 | 1.2 | 0.7 | |
| | **371** | 371 S | 1:54 | 1:59 | 167° | 13841 | 157 | 6094 | 21 | 1.2 | 0.7 | Gimbal warning |
| | **370** | 370 N | 2:02 | 2:07 | 347° | 13816 | 155 | 6090 | 20 | 1.3 | 0.7 | |
| | **369** | 369 S | 2:12 | 2:18 | 167° | 13857 | 155 | 6086 | 17 | 1.5 | 0.8 | Gimbal warning |
| | **368** | 368 N | 2:22 | 2:28 | 347° | 13850 | 153 | 6083 | 17 | 1.5 | 0.8 | |
| | **367** | 367 S | 2:33 | 2:40 | 167° | 13839 | 157 | 6078 | 18 | 1.3 | 0.7 | |
| | **366** | 366 N | 2:44 | 2:52 | 347° | 13846 | 152 | 6072 | 18 | 1.3 | 0.7 | |
| | **365** | 365 S | 2:56 | 3:05 | 168° | 13827 | 155 | 6066 | 17 | 1.3 | 0.7 | |
| | **364** | 364 N | 3:08 | 3:18 | 347° | 13827 | 155 | 6062 | 19 | 1.3 | 0.7 | |
| | **363** | 363 S | 3:22 | 3:31 | 167° | 13841 | 163 | 6055 | 21 | 1.1 | 0.6 | |
| | **362** | 362 N | 3:35 | 3:46 | 348° | 13831 | 150 | 6048 | 20 | 1.1 | 0.6 | |
| | **361** | 361 S | 3:49 | 4:00 | 166° | 13819 | 155 | 6042 | 20 | 1.2 | 0.6 | |
| | **360** | 360 N | 4:04 | 4:15 | 348° | 13808 | 157 | 6034 | 22 | 1.2 | 0.6 | |
| | **359** | 359 S | 4:19 | 4:31 | 167° | 13802 | 153 | 6027 | 22 | 1.2 | 0.6 | |
| | **358** | 358 N | 4:35 | 4:47 | 348° | 13871 | 161 | 6018 | 23 | 1.1 | 0.6 | |
| | **357** | 357 S | 4:51 | | 167° | 13961 | 159 | 6009 | 23 | 1.2 | 0.6 | FlightPro Froze (04:53) - Airstart |
| | **357** | 357 N | 5:14 | 5:27 | 347° | 13932 | 155 | 6007 | 28 | 1.0 | 0.5 | |
| | **356** | 356 S | 5:31 | 5:44 | 167° | 14051 | 153 | 5998 | 27 | 1.0 | 0.5 | |
| | **355** | 355 N | 5:48 | 6:02 | 348° | 14065 | 158 | 5989 | 23 | 1.1 | 0.6 | |
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# Digital Aerial Solutions Flight Log

| Project/Flight Plan: | Nevada Earth | Lift | Temp °C Before | Temp °C After | Pressure (kPa) | Sensor Operator |
|---|---|---|---|---|---|---|
| | | 15 | 8 | 17 | 102.10 | Chuck Harris |

| Date/Julian: | 10/23/2020 | Disk Drive | Sensor | Pilot |
|---|---|---|---|---|
| Hobbs End | 7261.2 | TM MM30 (103, 104) | TM_90524 | Anthony Kosinski |

| Hobbs ST | 7256 | TARGET MSL | Target AIRSPD | Base Name | PID | Base Name | PID | Base Height | Aircraft | Airport Identifcation: |
|---|---|---|---|---|---|---|---|---|---|---|
| Flight Time | 5.2 | 13,500 | 165 | KTPH01 | | KTPH02 | | 1.500 | C441-N207SS | Tonopah (KTPH) |

| ∠ | Flight Line | Mission Line | UTC time: | | Direction | GPS Altitude | Speed | Available | S/Vs | Position Acc. | | Comments and Conditions: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Begin: | End: | | | | MM Space | | AVG PDOP | AVG HDOP | |
| | **231** | 231 N | 16:54 | 16:57 | 324° | 15406 | 159 | 5977 | 20 | 1.1 | 0.6 | |
| | **230** | 230 S | 17:01 | 17:05 | 143° | 15265 | 160 | 5975 | 19 | 1.0 | 0.6 | |
| | **181** | 181 N | 17:29 | 17:56 | 324° | 12815 | 153 | 5970 | 18 | 1.2 | 0.7 | |
| | **182** | 182 S | 17:59 | 18:26 | 145° | 13010 | 155 | 5950 | 17 | 1.4 | 0.8 | |
| | **183** | 183 N | 18:30 | 18:56 | 323° | 12891 | 160 | 5929 | 17 | 1.3 | 0.7 | |
| | **184** | 184 S | 18:59 | 19:25 | 144° | 12875 | 162 | 5909 | 19 | 1.2 | 0.6 | |
| | **185** | 185 N | 19:29 | 19:56 | 325° | 12776 | 159 | 5889 | 21 | 1.1 | 0.6 | |
| | **186** | 186 S | 19:59 | 20:24 | 144° | 12674 | 163 | 5869 | 21 | 1.2 | 0.6 | |
| | **187** | 187 N | 20:28 | | 324° | 12688 | 159 | 5849 | 22 | 1.1 | 0.6 | Line Aborted - Thick Smoke |
| | **339** | 339 N | 20:53 | 21:07 | 348° | 13605 | 158 | 5833 | 22 | 1.2 | 0.6 | |
| | **340** | 340 S | 21:12 | 21:26 | 167° | 13680 | 156 | 5822 | 20 | 1.3 | 0.7 | Possible Smoke 10 mi in |
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# Digital Aerial Solutions Flight Log

| Project/Flight Plan: | Nevada Earth | Lift | Temp °C Before | Temp °C After | Pressure (kPa) | Sensor Operator |
|---|---|---|---|---|---|---|
| | | 16 | 18 | 10 | 101.79 | Geoffrey McCall |

| Date/Julian: | 10/23/2020 | Disk Drive | Sensor | Pilot |
|---|---|---|---|---|
| Hobbs End | 7266.1 | TM MM30 (101, 102) | TM_90524 | Mike Wasielewski |

| Hobbs ST | 7261.2 | TARGET MSL | Target AIRSPD | Base Name | PID | Base Name | PID | Base Height | Aircraft | Airport Identifcation: |
|---|---|---|---|---|---|---|---|---|---|---|
| Flight Time | 4.9 | 13,500 | 165 | KTPH01 | | KTPH02 | | 1.500 | C441-N207SS | Tonopah (KTPH) |

| ∠ | Flight Line | Mission Line | UTC time: | | Direction | GPS Altitude | Speed | Available | S/Vs | Position Acc. | | Comments and Conditions: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Begin: | End: | | | | MM Space | | AVG PDOP | AVG HDOP | |
| | 354 | 354n | 22:38 | 22:53 | 347° | 14133 | 158 | 5872 | 23 | 1.1 | 0.6 | Gimbal |
| | 353 | 353s | 22:57 | 23:12 | 167° | 14170 | 160 | 5862 | 21 | 1.2 | 0.7 | Gimbal |
| | 352 | 352n | 23:15 | 23:30 | 347° | 14195 | 160 | 5851 | 21 | 1.2 | 0.7 | |
| | 351 | 351s | 23:52 | 23:49 | 167° | 14174 | 157 | 5841 | 21 | 1.3 | 0.8 | |
| | 350 | 350n | :12 | :8 | 349° | 14200 | 158 | 5832 | 22 | 1.3 | 0.7 | |
| | 349 | 349s | :30 | :25 | 168° | 14175 | 158 | 5821 | 21 | 1.3 | 0.7 | |
| | 348 | 348n | :39 | :45 | 347° | 14195 | 158 | 5811 | 19 | 1.4 | 0.7 | |
| | 347 | 347s | :49 | 1:04 | 167° | 14128 | 159 | 5801 | 18 | 1.6 | 0.8 | |
| | 346 | 346n | 1:08 | 1:22 | 344° | 14140 | 163 | 5792 | 18 | 1.3 | 0.7 | |
| | 345 | 345s | 1:26 | 1:42 | 168° | 14042 | 158 | 5781 | 25 | 1.1 | 0.7 | |
| | 344 | 344n | 1:46 | 2:01 | 344° | 14067 | 159 | 5771 | 24 | 1.1 | 0.7 | |
| | 343 | 343s | 2:05 | 2:20 | 171° | 13983 | 160 | 5760 | 22 | 1.2 | 0.7 | PAV Stabilization |
| | 342 | 342n | 2:25 | 2:40 | 348° | 13880 | 155 | 5751 | 19 | 1.4 | 0.8 | |
| | 341 | 341s | 2:44 | 2:59 | 169° | 13785 | 161 | 5738 | 20 | 1.3 | 0.7 | |
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# Digital Aerial Solutions Flight Log

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|---|---|---|---|---|---|---|---|---|---|---|
| **Project/Flight Plan:** | Nevada Earth | | Lift | Temp °C Before | | Temp °C After | | Pressure (kPa) | Sensor Operator | |
| | | | 16 | 18 | | 10 | | 101.79 | Geoffrey McCall | |
| **Date/Julian:** | **10/23/2020** | Disk Drive | | | Sensor | | | | Pilot | |
| **Hobbs End** | **7266.1** | TM MM30 (101, 102) | | | TM_90524 | | | | Mike Wasielewski | |
| **Hobbs ST** | **7261.2** | TARGET MSL | Target AIRSPD | Base Name | PID | Base Name | PID | Base Height | Aircraft | Airport Identifcation: |
| **Flight Time** | **4.9** | 13,500 | 165 | KTPH01 | | KTPH02 | | 1.500 | C441-N207SS | Tonopah (KTPH) |

| ∠ | Flight Line | Mission Line | UTC time: | | Direction | GPS Altitude | Speed | Available | S/Vs | Position Acc. | | Comments and Conditions: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Begin: | End: | | | | MM Space | | AVG PDOP | AVG HDOP | |
| | **354** | 354n | 22:38 | 22:53 | 347° | 14133 | 158 | 5872 | 23 | 1.1 | 0.6 | Gimbal |
| | **353** | 353s | 22:57 | 23:12 | 167° | 14170 | 160 | 5862 | 21 | 1.2 | 0.7 | Gimbal |
| | **352** | 352n | 23:15 | 23:30 | 347° | 14195 | 160 | 5851 | 21 | 1.2 | 0.7 | |
| | **351** | 351s | 23:52 | 23:49 | 167° | 14174 | 157 | 5841 | 21 | 1.3 | 0.8 | |
| | **350** | 350n | :12 | :8 | 349° | 14200 | 158 | 5832 | 22 | 1.3 | 0.7 | |
| | **349** | 349s | :30 | :25 | 168° | 14175 | 158 | 5821 | 21 | 1.3 | 0.7 | |
| | **348** | 348n | :39 | :45 | 347° | 14195 | 158 | 5811 | 19 | 1.4 | 0.7 | |
| | **347** | 347s | :49 | 1:04 | 167° | 14128 | 159 | 5801 | 18 | 1.6 | 0.8 | |
| | **346** | 346n | 1:08 | 1:22 | 344° | 14140 | 163 | 5792 | 18 | 1.3 | 0.7 | |
| | **345** | 345s | 1:26 | 1:42 | 168° | 14042 | 158 | 5781 | 25 | 1.1 | 0.7 | |
| | **344** | 344n | 1:46 | 2:01 | 344° | 14067 | 159 | 5771 | 24 | 1.1 | 0.7 | |
| | **343** | 343s | 2:05 | 2:20 | 171° | 13983 | 160 | 5760 | 22 | 1.2 | 0.7 | PAV Stabilization |
| | **342** | 342n | 2:25 | 2:40 | 348° | 13880 | 155 | 5751 | 19 | 1.4 | 0.8 | |
| | **341** | 341s | 2:44 | 2:59 | 169° | 13785 | 161 | 5738 | 20 | 1.3 | 0.7 | |
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# Digital Aerial Solutions Flight Log

| Project/Flight Plan: | Nevada Earth | Lift | Temp °C Before | Temp °C After | Pressure (kPa) | Sensor Operator |
|---|---|---|---|---|---|---|
| | | 18 | -1 | 6 | 102.64 | Chuck Harris |

| Date/Julian: | 10/26/2020 | Disk Drive | | Sensor | | | | | Pilot | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hobbs End | 7274.5 | TM MM30 (103, 104) | | TM_90524 | | | | | Anthony Kosinski | |
| Hobbs ST | 7271.2 | TARGET MSL | Target AIRSPD | Base Name | PID | Base Name | PID | Base Height | Aircraft | Airport Identifcation: |
| Flight Time | 3.3 | 13,500 | 165 | KTPH01 | | KTPH02 | | 1.500 | C441-N207SS | Tonopah (KTPH) |

| ∠ | Flight Line | Mission Line | UTC time: | | Direction | GPS Altitude | Speed | Available | S/Vs | Position Acc. | | Comments and Conditions: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Begin: | End: | | | | MM Space | | AVG PDOP | AVG HDOP | |
| | 126 | 126 S | 17:06 | 17:18 | 144° | 13352 | 163 | 5629 | 21 | 1.1 | 0.7 | |
| | 127 | 127 N | 17:23 | 17:36 | 324° | 13295 | 161 | 5620 | 21 | 1.1 | 0.7 | |
| | 128 | 128 S | 17:40 | 17:52 | 143° | 13355 | 165 | 5610 | 20 | 1.1 | 0.7 | Gimbal PAV warning |
| | 129 | 129 S | 17:57 | 18:10 | 324° | 13303 | 161 | 5599 | 22 | 1.4 | 0.8 | |
| | 130 | 130 N | 18:14 | 18:27 | 144° | 13356 | 160 | 5590 | 21 | 1.3 | 0.7 | |
| | 131 | 131 S | 18:32 | 18:45 | 324° | 13312 | 153 | 5579 | 20 | 1.4 | 0.7 | |
| | 132 | 132 N | 18:49 | 19:02 | 144° | 13333 | 162 | 5569 | 22 | 1.2 | 0.7 | |
| | 133 | 133 S | 19:07 | 19:20 | 325° | 13350 | 162 | 5560 | 24 | 1.1 | 0.6 | |
| | 134 | 134 N | 19:25 | 19:38 | 144° | 13301 | 160 | 5549 | 23 | 1.1 | 0.6 | Gimbal PAV warning |
| | 135 | 135 S | 19:43 | 19:57 | 324° | 13333 | 155 | 5540 | 22 | 1.1 | 0.6 | |

DAS Digital Aerial Solutions

# Digital Aerial Solutions Flight Log

| Project/Flight Plan: | Nevada Earth | Lift | Temp °C Before | Temp °C After | Pressure (kPa) | Sensor Operator |
|---|---|---|---|---|---|---|
| | | 19 | 4 | 14 | 102.57 | Chuck Harris |

| Date/Julian: | 10/26/2020 | Disk Drive | Sensor | Pilot |
|---|---|---|---|---|
| Hobbs End | 7280.1 | TM MM30 (103, 104) | TM_90524 | Anthony Kosinski |

| Hobbs ST | 7274.5 | TARGET MSL | Target AIRSPD | Base Name | PID | Base Name | PID | Base Height | Aircraft | Airport Identifcation: |
|---|---|---|---|---|---|---|---|---|---|---|
| Flight Time | 5.6 | 13,500 | 165 | KTPH01 | | KTPH02 | | 1.500 | C441-N207SS | Tonopah (KTPH) |

| ∠ | Flight Line | Mission Line | UTC time: | | Direction | GPS Altitude | Speed | Available | S/Vs | Position Acc. | | Comments and Conditions: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Begin: | End: | | | | MM Space | | AVG PDOP | AVG HDOP | |
| | 136 | 136 S | 16:16 | 16:32 | 144° | 13267 | 162 | 5527 | 18 | 1.1 | 0.7 | Gimbal PAV warning |
| | 137 | 137 N | 16:35 | 16:48 | 324° | 13294 | 158 | 5514 | 17 | 1.1 | 0.7 | Gimbal PAV warning |
| | 138 | 138 S | 16:53 | 17:06 | 143° | 13321 | 161 | 5506 | 17 | 1.1 | 0.7 | |
| | 139 | 139 N | 17:11 | 17:25 | 324° | 13264 | 155 | 5495 | 17 | 1.1 | 0.7 | "  " |
| | 140 | 140 S | 17:29 | 17:43 | 144° | 13284 | 160 | 5485 | 17 | 1.1 | 0.7 | |
| | 141 | 141 N | 17:48 | 18:02 | 324° | 13296 | 154 | 5476 | 15 | 1.4 | 0.8 | "  " |
| | 142 | 142 S | 18:06 | 18:21 | 144° | 13372 | 155 | 5466 | 18 | 1.6 | 0.8 | "  " |
| | 143 | 143 N | 18:26 | 18:40 | 324° | 13284 | 160 | 5457 | 18 | 1.6 | 0.7 | |
| | 144 | 144 S | 18:45 | 18:59 | 144° | 13399 | 155 | 5445 | 20 | 1.3 | 0.7 | |
| | 145 | 145 N | 19:04 | 19:19 | 325° | 13397 | 158 | 5432 | 24 | 1.0 | 0.5 | |
| | 146 | 146 S | 19:23 | 19:39 | 144° | 13400 | 160 | 5420 | 24 | 1.1 | 0.6 | "  " |
| | 147 | 147 N | 19:44 | 20:00 | 324° | 13378 | 164 | 5409 | 25 | 1.2 | 0.6 | |
| | 148 | 148 S | 20:05 | 20:21 | 143° | 13389 | 162 | 5397 | 24 | 1.2 | 0.6 | |
| | 149 | 149 N | 20:26 | 20:42 | 324° | 13438 | 158 | 5384 | 22 | 1.2 | 0.6 | |
| | 150 | 150 S | 20:47 | 21:04 | 144° | 13455 | 161 | 5373 | 24 | 1.2 | 0.6 | |
| | 151 | 151 N | 21:08 | 21:25 | 324° | 13433 | 159 | 5358 | 25 | 1.2 | 0.6 | |
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# Digital Aerial Solutions Flight Log

| Project/Flight Plan: | Nevada Earth | Lift | Temp °C Before | Temp °C After | Pressure (kPa) | Sensor Operator |
|---|---|---|---|---|---|---|
| | | 20 | 14 | 8 | 102.27 | Geoffrey McCall |

| Date/Julian: | 10/27/2020 | Disk Drive | | Sensor | | | | | Pilot | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hobbs End | 7285.9 | TM MM30 (101, 102) | | TM_90524 | | | | | Mike Wasielewski | |
| Hobbs ST | 7280.1 | TARGET MSL | Target AIRSPD | Base Name | PID | Base Name | PID | Base Height | Aircraft | Airport Identifcation: |
| Flight Time | 5.8 | 13,500 | 165 | KTPH01 | | KTPH02 | | 1.500 | C441-N207SS | Tonopah (KTPH) |

| ∠ | Flight Line | Mission Line | UTC time: | | Direction | GPS Altitude | Speed | Available | S/Vs | Position Acc. | | Comments and Conditions: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Begin: | End: | | | | MM Space | | AVG PDOP | AVG HDOP | |
| | **152** | 152s | 22:39 | 22:56 | 147° | 13571 | 154 | 5726 | 20 | 1.1 | 0.6 | |
| | **153** | 153n | 23:02 | 23:20 | 325° | 13480 | 160 | 5714 | 21 | 1.1 | 0.6 | |
| | **154** | 154s | 23:31 | 23:49 | 144° | 13598 | 160 | 5703 | 19 | 1.1 | 0.7 | |
| | **155** | 155n | 23:53 | :12 | 324° | 13540 | 152 | 5689 | 20 | 1.2 | 0.7 | |
| | **190** | 190s | :24 | :47 | 143° | 13197 | 155 | 5675 | 16 | 1.6 | 0.8 | Autopilot turned off. PAV limit warning. |
| | **189** | 189n | :53 | 1:17 | 325° | 12930 | 153 | 5661 | 18 | 1.1 | 0.7 | |
| | **188** | 188s | 1:22 | 1:47 | 145° | 12785 | 160 | 5645 | 20 | 1.2 | 0.7 | |
| | **187** | 187n | 1:52 | 2:17 | 326° | 12735 | 158 | 5630 | 17 | 1.6 | 0.9 | |
| | **180** | 180s | 2:21 | 2:46 | 142° | 12885 | 153 | 5614 | 20 | 1.3 | 0.8 | |
| | **179** | 179n | 2:51 | 3:17 | 321° | 13160 | 152 | 5597 | 23 | 1.2 | 0.7 | |
| | **178** | 178s | 3:21 | 3:46 | 140° | 13282 | 158 | 5581 | 25 | 1.2 | 0.6 | |
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# Digital Aerial Solutions Flight Log

| Project/Flight Plan: | Nevada Earth | | | Lift | Temp °C Before | Temp °C After | Pressure (kPa) | Sensor Operator |
|---|---|---|---|---|---|---|---|---|
| | | | | 21 | 7 | 19 | 102.61 | Chuck Harris |

| Date/Julian: | 10/28/2020 | Disk Drive | | Sensor | | | | | Pilot | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hobbs End | 7291.4 | TM MM30 (103, 104) | | TM_90524 | | | | | Wes Ashmore | |
| Hobbs ST | 7285.9 | TARGET MSL | Target AIRSPD | Base Name | PID | Base Name | PID | Base Height | Aircraft | Airport Identifcation: |
| Flight Time | 5.5 | 13,500 | 165 | KTPH01 | | KTPH02 | | 1.500 | C441-N207SS | Tonopah, NV (KTPH) |

| ∠ | Flight Line | Mission Line | UTC time: | | Direction | GPS Altitude | Speed | Available | S/Vs | Position Acc. | | Comments and Conditions: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Begin: | End: | | | | MM Space | | AVG PDOP | AVG HDOP | |
| | 156 | 156 N | 15:50 | 16:08 | 144° | 13572 | 157 | 5344 | 17 | 1.3 | 0.8 | |
| | 157 | 157 S | 16:12 | 16:31 | 324° | 13557 | 156 | 5328 | 19 | 1.1 | 0.7 | |
| | 158 | 158 N | 16:35 | 16:55 | 144° | 13577 | 161 | 5315 | 21 | 1.0 | 0.6 | |
| | 159 | 159 S | 16:58 | 17:17 | 324° | 13547 | 152 | 5301 | 17 | 1.0 | 0.6 | |
| | 160 | 160 N | 17:21 | 17:41 | 144° | 13572 | 161 | 5286 | 17 | 1.1 | 0.6 | |
| | 161 | 161 S | 17:46 | 18:06 | 324° | 13554 | 155 | 5271 | 17 | 1.2 | 0.7 | |
| | 162 | 162 N | 18:10 | 18:30 | 144° | 13571 | 151 | 5257 | 18 | 1.3 | 0.7 | |
| | 163 | 163 S | 18:35 | 18:56 | 324° | 13537 | 158 | 5240 | 20 | 1.2 | 0.6 | |
| | 164 | 164 N | 19:01 | 19:23 | 144° | 13573 | 155 | 5226 | 22 | 1.0 | 0.5 | |
| | 165 | 165 S | 19:27 | 19:50 | 324° | 13560 | 153 | 5210 | 21 | 1.1 | 0.6 | |
| | 166 | 166 N | 19:54 | 20:16 | 144° | 13572 | 156 | 5194 | 23 | 1.1 | 0.6 | |
| | 167 | 167 S | 20:20 | 20:43 | 324° | 13620 | 154 | 5178 | 21 | 1.2 | 0.6 | |

# Digital Aerial Solutions Flight Log

| Project/Flight Plan: | Nv_Earth | Lift | Temp °C Before | Temp °C After | Pressure (kPa) | Sensor Operator |
|---|---|---|---|---|---|---|
| | | 22 | 19 | 10 | 102.30 | Geoffrey McCall |

| Date/Julian: | 10/28/2020 | Disk Drive | Sensor | Pilot |
|---|---|---|---|---|
| Hobbs End | 7297.4 | TM MM30 (101, 102) | TM_90524 | Anthony Kosinski |

| Hobbs ST | 7291.4 | TARGET MSL | Target AIRSPD | Base Name | PID | Base Name | PID | Base Height | Aircraft | Airport Identifcation: |
|---|---|---|---|---|---|---|---|---|---|---|
| Flight Time | 6 | 14,692 | 165 | KTPH01 | | KTPH02 | | 1.500 | C441-N207SS | KTPH |

| ∠ | Flight Line | Mission Line | UTC time: | | Direction | GPS Altitude | Speed | Available | S/Vs | Position Acc. | | Comments and Conditions: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Begin: | End: | | | | MM Space | | AVG PDOP | AVG HDOP | |
| | 196 | 196s | 22:03 | 22:24 | 143° | 13977 | 162 | 5562 | 23 | 1.2 | 0.6 | |
| | 206 | 206n | 22:32 | 22:48 | 323° | 14606 | 159 | 5546 | 23 | 1.2 | 0.6 | |
| | 216 | 216s | 22:51 | 23:03 | 144° | 14690 | 157 | 5534 | 25 | 1.0 | 0.6 | |
| | 217 | 217n | 23:08 | 23:20 | 323° | 14699 | 160 | 5527 | 21 | 1.2 | 0.7 | |
| | 218 | 218s | 23:24 | 23:36 | 144° | 14719 | 163 | 5517 | 22 | 1.1 | 0.7 | |
| | 219 | 219n | 23:40 | 23:52 | 323° | 14707 | 158 | 5508 | 22 | 1.1 | 0.6 | |
| | 220 | 220s | 23:56 | :8 | 144° | 14703 | 163 | 5499 | 19 | 1.4 | 0.8 | |
| | 221 | 221n | :12 | :23 | 324° | 14728 | 159 | 5490 | 19 | 1.4 | 0.8 | PAV stabilization low |
| | 222 | 222s | :27 | :38 | 144° | 14719 | 158 | 5482 | 17 | 1.5 | 0.8 | |
| | 223 | 223n | :42 | :53 | 322° | 14718 | 162 | 5475 | 18 | 1.3 | 0.7 | |
| | 224 | 224s | :57 | 1:06 | 1142° | 14715 | 160 | 5470 | 19 | 1.1 | 0.7 | |
| | 225 | 225n | 1:11 | 1:19 | 323° | 14727 | 161 | 5463 | 19 | 1.3 | 0.7 | |
| | 226 | 226s | 1:24 | 1:32 | 143° | 14739 | 162 | 5456 | 19 | 1.3 | 0.8 | |
| | 227 | 227n | 1:36 | 1:43 | 324° | 14731 | 162 | 5451 | 18 | 1.2 | 0.7 | |
| | 228 | 228s | 1:48 | 1:54 | 143° | 14665 | 158 | 5447 | 17 | 1.4 | 0.7 | |
| | 229 | 229n | 1:58 | 2:03 | 321° | 15024 | 164 | 5444 | 17 | 1.4 | 0.7 | |
| | 215 | 215s | 2:09 | 2:21 | 144° | 14688 | 161 | 5439 | 19 | 1.3 | 0.7 | |
| | 211 | 211n | 2:26 | 2:40 | 323° | 14752 | 160 | 5430 | 19 | 1.2 | 0.7 | |
| | 210 | 210s | 2:44 | 2:57 | 149° | 14766 | 156 | 5419 | 20 | 1.2 | 0.7 | |
| | 205 | 205n | 3:03 | 3:19 | 323° | 14605 | 160 | 5410 | 23 | 1.2 | 0.7 | |
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# Digital Aerial Solutions Flight Log

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project/Flight Plan:** | Nevada Earth | | | **Lift** | **Temp °C Before** | | **Temp °C After** | | **Pressure (kPa)** | | **Sensor Operator** | |
| | | | | **23** | **4** | | **18** | | 102.68 | | Chuck Harris | |
| **Date/Julian:** | **10/28/2020** | **Disk Drive** | | | | **Sensor** | | | | | **Pilot** | |
| **Hobbs End** | **7302.7** | TM MM30 (103, 104) | | | | TM_90524 | | | | | Anthony Kosinski | |
| **Hobbs ST** | **7297.4** | **TARGET MSL** | | **Target AIRSPD** | **Base Name** | **PID** | **Base Name** | **PID** | **Base Height** | | **Aircraft** | **Airport Identifcation:** |
| **Flight Time** | **5.3** | 14,500 | | 165 | KTPH01 | | KTPH02 | | 1.500 | | C441-N207SS | Tonopah, NV (KTPH) |

| ∠ | Flight Line | Mission Line | UTC time: Begin: | UTC time: End: | Direction | GPS Altitude | Speed | Available MM Space | S/Vs | Position Acc. AVG PDOP | Position Acc. AVG HDOP | Comments and Conditions: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **214** | 214 N | 15:54 | 16:06 | 324° | 14672 | 160 | 5159 | 21 | 1.1 | 0.7 | Snow on peaks 1st mile |
| | **213** | 213 S | 16:10 | 16:24 | 144° | 14677 | 157 | 5149 | 22 | 1.1 | 0.7 | Snow on peaks last mile |
| | **212** | 212 N | 16:27 | 16:41 | 324° | 14673 | 157 | 5140 | 21 | 1.0 | 0.6 | |
| | **209** | 209 S | 16:44 | 16:59 | 144° | 14733 | 160 | 5131 | 19 | 1.2 | 0.7 | |
| | **208** | 208 N | 17:02 | 17:17 | 324° | 14726 | 159 | 5120 | 18 | 1.2 | 0.7 | |
| | **207** | 207 S | 17:21 | 17:36 | 143° | 14642 | 157 | 5109 | 19 | 1.1 | 0.7 | |
| | **204** | 204 N | 17:40 | 17:56 | 324° | 14488 | 156 | 5097 | 17 | 1.4 | 0.8 | |
| | **203** | 203 S | 18:00 | 18:17 | 144° | 14494 | 160 | 5085 | 17 | 1.4 | 0.7 | |
| | **202** | 202 N | 18:21 | 18:38 | 323° | 14389 | 165 | 5072 | 18 | 1.3 | 0.7 | |
| | **201** | 201 S | 18:42 | 18:59 | 143° | 14385 | 160 | 5058 | 21 | 1.0 | 0.6 | |
| | **200** | 200 N | 19:03 | 19:21 | 324° | 14280 | 164 | 5044 | 23 | 1.0 | 0.6 | |
| | **199** | 199 S | 19:25 | 19:43 | 144° | 14195 | 158 | 5031 | 22 | 1.1 | 0.6 | |
| | **198** | 198 N | 19:47 | 20:05 | 324° | 14188 | 160 | 5016 | 22 | 1.1 | 0.6 | |
| | **197** | 197 S | 20:09 | 20:29 | 144° | 14114 | 165 | 5002 | 21 | 1.2 | 0.6 | |
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# Digital Aerial Solutions Flight Log

| Project/Flight Plan: | Nv_Earth | Lift | Temp °C Before | Temp °C After | Pressure (kPa) | Sensor Operator |
|---|---|---|---|---|---|---|
| | | 24 | 20 | 11 | 102.40 | Geoffrey McCall |

| Date/Julian: | 10/28/2020 | Disk Drive | | Sensor | | | | | Pilot | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hobbs End | 7309 | TM MM30 (101, 102) | | TM_90524 | | | | | Mike Wasielewski | |
| Hobbs ST | 7302.7 | TARGET MSL | Target AIRSPD | Base Name | PID | Base Name | PID | Base Height | Aircraft | Airport Identifcation: |
| Flight Time | 6.3 | 14,692 | 165 | KTPH01 | | KTPH02 | | 1.500 | C441-N207SS | KTPH |

| ∠ | Flight Line | Mission Line | UTC time: | | Direction | GPS Altitude | Speed | Available | S/Vs | Position Acc. | | Comments and Conditions: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Begin: | End: | | | | MM Space | | AVG PDOP | AVG HDOP | |
| | 195 | 195s | 22:00 | 22:22 | 143° | 13999 | 151 | 5398 | 21 | 1.2 | 0.6 | |
| | 194 | 194n | 22:26 | 22:47 | 323° | 13995 | 155 | 5381 | 22 | 1.1 | 0.6 | |
| | 193 | 193s | 22:52 | 23:14 | 144° | 14009 | 151 | 5365 | 18 | 1.2 | 0.6 | |
| | 192 | 192n | 23:18 | 23:42 | 325° | 13982 | 155 | 5349 | 19 | 1.1 | 0.7 | |
| | 191 | 191s | 23:46 | :10 | 144° | 13904 | 164 | 5335 | 19 | 1.2 | 0.7 | |
| | 177 | 177n | :17 | :42 | 322° | 13509 | 159 | 5318 | 16 | 1.6 | 0.8 | |
| | 176 | 176s | :47 | 1:11 | 143° | 13619 | 154 | 5301 | 21 | 1.2 | 0.7 | |
| | 175 | 175n | 1:16 | 1:40 | 323° | 13810 | 157 | 5287 | 21 | 1.5 | 0.8 | |
| | 174 | 174s | 1:44 | 2:08 | 142° | 13817 | 154 | 5269 | 18 | 1.5 | 0.9 | |
| | 173 | 173n | 2:13 | 2:37 | 325° | 13805 | 156 | 5253 | 19 | 1.2 | 0.8 | |
| | 172 | 172s | 2:41 | 3:04 | 144° | 13720 | 159 | 5237 | 17 | 1.6 | 0.8 | |
| | 171 | 171n | 3:08 | 3:32 | 323° | 13708 | 156 | 5223 | 20 | 1.1 | 0.7 | |

# Digital Aerial Solutions Flight Log

| Project/Flight Plan: | Nv_Earth | | | Lift | Temp °C Before | | Temp °C After | | Pressure (kPa) | | Sensor Operator | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 24 | 3 | | 18 | | 102.51 | | Chuck Harris | |
| Date/Julian: | 10/30/2020 | Disk Drive | | | Sensor | | | | | | Pilot | |
| Hobbs End | 7313.6 | TM MM30 (103, 104) | | | TM_90524 | | | | | | Wes Ashmore | |
| Hobbs ST | 7309 | TARGET MSL | | Target AIRSPD | Base Name | PID | Base Name | PID | Base Height | | Aircraft | Airport Identifcation: |
| Flight Time | 4.6 | 13,500 | | 165 | KTPH01 | | KTPH02 | | 1.500 | | C441-N207SS | Tonopah, NV (KTPH) |

| ∠ | Flight Line | Mission Line | UTC time: | | Direction | GPS Altitude | Speed | Available | S/Vs | Position Acc. | | Comments and Conditions: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Begin: | End: | | | | MM Space | | AVG PDOP | AVG HDOP | |
| | 168 | 168 S | 16:08 | 16:31 | 144° | 13624 | 158 | 4984 | 20 | 1.1 | 0.6 | |
| | 169 | 169 N | 16:35 | 16:58 | 324° | 13691 | 156 | 4966 | 19 | 1.0 | 0.6 | |
| | 170 | 170 S | 17:02 | 17:26 | 144° | 13745 | 160 | 4949 | 17 | 1.2 | 0.7 | |
| | | | | | | | | | | | | |
| | 455 | 455 N | 17:52 | 17:53 | 347° | 14952 | 161 | 4931 | 16 | 1.4 | 0.8 | |
| | 454 | 454 S | 17:56 | 17:57 | 166° | 14928 | 162 | 4929 | 17 | 1.4 | 0.7 | |
| | 456 | 456 N | 18:03 | 18:04 | 346° | 14532 | 155 | 4929 | 18 | 1.3 | 0.7 | |
| | 457 | 457 S | 18:07 | 18:08 | 167° | 14650 | 161 | 4928 | 18 | 1.3 | 0.7 | |
| | 458 | 458 N | 18:12 | 18:13 | 347° | 13525 | 161 | 4926 | 18 | 1.3 | 0.7 | |
| | 452 | 452 N | 18:22 | 18:22 | 347° | 14740 | 160 | 4924 | 18 | 1.3 | 0.7 | |
| | 453 | 453 S | 18:26 | 18:27 | 167° | 14519 | 163 | 4924 | 19 | 1.3 | 0.7 | |
| | 450 | 450 S | 18:33 | 18:34 | 167° | 14458 | 163 | 4924 | 20 | 1.2 | 0.6 | |
| | 437 | 437 N | 18:39 | 18:41 | 347° | 15239 | 158 | 4923 | 21 | 1.1 | 0.6 | |
| | 431 | 431 S | 18:45 | 18:48 | 167° | 15211 | 159 | 4921 | 21 | 1.1 | 0.6 | |
| | 430 | 430 N | 18:50 | 18:52 | 347° | 14360 | 157 | 4921 | 22 | 1.0 | 0.5 | |
| | 429 | 429 S | 18:56 | 18:57 | 167° | 14307 | 161 | 4919 | 22 | 1.0 | 0.6 | |
| | 461 | 461 N | 19:01 | 19:02 | 347° | 15610 | 165 | 4918 | 20 | 1.1 | 0.6 | |
| | 463 | 463 N | 19:03 | 19:05 | 347° | 15235 | 145 | 4916 | 21 | 1.1 | 0.6 | |
| | 462 | 462 N | 19:10 | 19:11 | 347° | 14200 | 159 | 4914 | 21 | 1.1 | 0.6 | |
| | 433 | 433 S | 19:26 | 19:27 | 167° | 16498 | 164 | 4913 | 21 | 1.1 | 0.6 | |
| | 432 | 432 N | 19:31 | 19:32 | 347° | 16430 | 159 | 4912 | 21 | 1.2 | 0.6 | |
| | 446 | 446 S | 19:36 | 19:40 | 167° | 16275 | 159 | 4911 | 21 | 1.2 | 0.6 | |
| | 448 | 448 N | 19:43 | 19:44 | 347° | 16152 | 163 | 4907 | 21 | 1.1 | 0.6 | |
| | 447 | 447 S | 19:49 | 19:51 | 167° | 16095 | 160 | 4907 | 20 | 1.3 | 0.6 | |
| | 459 | 459 N | 19:56 | 19:57 | 347° | 16080 | 158 | 4905 | 22 | 1.1 | 0.6 | |
| | | | | | | | | | | | | |

# Digital Aerial Solutions Flight Log

| Project/Flight Plan: | Nv_Earth | Lift | Temp °C Before | Temp °C After | Pressure (kPa) | Sensor Operator |
|---|---|---|---|---|---|---|
| | | 26 | 2 | 23 | 102.71 | Geoffrey McCall |

| Date/Julian: | 10/31/2020 | Disk Drive | Sensor | Pilot |
|---|---|---|---|---|
| Hobbs End | 7319.9 | TM MM30 (101, 102) | TM_90524 | Wes Ashmore |

| Hobbs ST | 7314.3 | TARGET MSL | Target AIRSPD | Base Name | PID | Base Name | PID | Base Height | Aircraft | Airport Identifcation: |
|---|---|---|---|---|---|---|---|---|---|---|
| Flight Time | 5.6 | 14,692 | 165 | KMEV01 | | KMEV02 | | 1.500 | C441-N207SS | KMEV |

| ∠ | Flight Line | Mission Line | UTC time: Begin: | UTC time: End: | Direction | GPS Altitude | Speed | Available MM Space | S/Vs | Position Acc. AVG PDOP | Position Acc. AVG HDOP | Comments and Conditions: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 65 | 465s | 16:20 | 16:22 | 170° | 15733 | 155 | 5205 | 20 | 1.1 | 0.7 | |
| | 64 | 464n | 16:26 | 16:29 | 346° | 15717 | 162 | 5203 | 22 | 1.0 | 0.6 | |
| | 1 | 401s | 16:33 | 16:36 | 167° | 15400 | 153 | 5200 | 20 | 1.1 | 0.6 | |
| | 2 | 402n | 16:40 | 16:41 | 345° | 15408 | 152 | 5200 | 18 | 1.1 | 0.7 | |
| | 3 | 403s | 16:46 | 16:47 | 167° | 15033 | 161 | 5200 | 16 | 1.2 | 0.7 | |
| | 23 | 423s | 16:52 | 16:53 | 167° | 16169 | 155 | 5198 | 18 | 1.2 | 0.7 | |
| | 25 | 425n | 16:56 | 16:57 | 346° | 15611 | 165 | 5197 | 18 | 1.1 | 0.7 | |
| | 24 | 424s | 17:01 | 17:03 | 168° | 15162 | 163 | 5197 | 18 | 1.1 | 0.7 | |
| | 26 | 426n | 17:08 | 17:09 | 347° | 15919 | 158 | 5195 | 18 | 1.1 | 0.7 | |
| | 27 | 427s | 17:13 | 17:14 | 166° | 15883 | 158 | 5193 | 18 | 1.1 | 0.7 | |
| | 28 | 428n | 17:18 | 17:19 | 347° | 16073 | 158 | 5193 | 18 | 1.2 | 0.7 | |
| | 12 | 412n | 17:22 | 17:23 | 345° | 15855 | 154 | 5193 | 17 | 1.4 | 0.8 | |
| | 13 | 413s | 17:27 | 17:27 | 167° | 15958 | 155 | 5190 | 17 | 1.4 | 0.8 | |
| | 16 | 416s | 17:30 | 17:31 | 167° | 15331 | 160 | 5190 | 17 | 1.4 | 0.8 | |
| | 14 | 414n | 17:35 | 17:36 | 347° | 15940 | 166 | 5190 | 19 | 1.4 | 0.8 | |
| | 15 | 415s | 17:41 | 17:41 | 166° | 16019 | 158 | 5190 | 19 | 1.4 | 0.8 | |
| | 17 | 417n | 17:46 | 17:47 | 347° | 16277 | 157 | 5190 | 19 | 1.4 | 0.8 | |
| | 20 | 420s | 17:52 | 17:53 | 167° | 15956 | 161 | 5190 | 19 | 1.4 | 0.8 | |
| | 18 | 418n | 17:56 | 17:57 | 345° | 15817 | 154 | 5189 | 19 | 1.4 | 0.8 | |
| | 21 | 421s | 18:01 | 18:02 | 167° | 15547 | 156 | 5189 | 20 | 1.3 | 0.7 | |
| | 19 | 419n | 18:05 | 18:06 | 346° | 15544 | 163 | 5189 | 20 | 1.3 | 0.7 | |
| | 22 | 422s | 18:13 | 18:13 | 166° | 15545 | 160 | 5189 | 20- | 1.3 | 0.7 | |
| | 60 | 460n | 18:17 | 18:18 | 348° | 15590 | 162 | 5187 | 20 | 1.3 | 0.7 | |
| | 4 | 404s | 18:21 | 18:22 | 167° | 15591 | 161 | 5187 | 20 | 1.3 | 0.7 | |
| | 5 | 405n | 18:26 | 18:26 | 347° | 15879 | 156 | 5186 | 21 | 1.3 | 0.8 | |
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# Digital Aerial Solutions Flight Log

| Project/Flight Plan: | Nv_Earth | | Lift | Temp °C Before | Temp °C After | Pressure (kPa) | Sensor Operator |
|---|---|---|---|---|---|---|---|
| | | | 26 | 2 | 23 | 102.71 | Geoffrey McCall |

| Date/Julian: | 10/31/2020 | Disk Drive | | Sensor | | | | | Pilot | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hobbs End | 7319.9 | TM MM30 (101, 102) | | TM_90524 | | | | | Wes Ashmore | |
| Hobbs ST | 7314.3 | TARGET MSL | Target AIRSPD | Base Name | PID | Base Name | PID | Base Height | Aircraft | Airport Identifcation: |
| Flight Time | 5.6 | 14,692 | 165 | KMEV01 | | KMEV02 | | 1.500 | C441-N207SS | KMEV |

| ∠ | Flight Line | Mission Line | UTC time: Begin: | End: | Direction | GPS Altitude | Speed | Available MM Space | S/Vs | Position Acc. AVG PDOP | AVG HDOP | Comments and Conditions: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 6 | 406s | 18:30 | 18:31 | 167° | 16181 | 158 | 5186 | 21 | 1.2 | 0.6 | |
| | 7 | 407n | 18:35 | 18:35 | 349° | 15933 | 161 | 5186 | 21 | 1.2 | 0.7 | |
| | 8 | 408s | 18:40 | 18:40 | 168° | 15911 | 154 | 5184 | 22 | 1.1 | 0.6 | |
| | 9 | 409n | 18:44 | 18:45 | 347° | 16545 | 161 | 5184 | 22 | 1.1 | 0.6 | |
| | 11 | 411s | 18:49 | 18:50 | 168° | 16125 | 151 | 5182 | 21 | 1.1 | 0.6 | |
| | 10 | 410n | 18:55 | 18:56 | 348° | 15948 | 161 | 5180 | 23 | 1.0 | 0.6 | |
| | 35 | 435s | 19:01 | 19:02 | 167° | 16660 | 155 | 5180 | 22 | 1.1 | 0.6 | |
| | 34 | 434n | 19:07 | 19:08 | 348° | 16428 | 265 | 5180 | 22 | 1.1 | 0.6 | |
| | 36 | 436n | 19:08 | 19:09 | 348° | 16714 | 165 | 5178 | 23 | 1.1 | 0.6 | |
| | 38 | 438s | 19:14 | 19:17 | 164° | 15333 | 157 | 5178 | 23 | 1.1` | 0.5 | |
| | 39 | 439n | 19:20 | 19:22 | 347° | 15357 | 163 | 5175 | 23 | 1.2 | 0.6 | |
| | 51 | 451s | 19:26 | 19:28 | 166° | 15273 | 153 | 5173 | 24 | 1.2 | 0.6 | |
| | 49 | 449n | 19:33 | 19:33 | 348° | 15265 | 159 | 5170 | 24 | 1.2 | 0.6 | |
| | 40 | 440s | 19:36 | 19:37 | 167° | 15290 | 153 | 5170 | 24 | 1.2 | 0.6 | |
| | 44 | 444s | 19:40 | 19:41 | 168° | 15815 | 159 | 5170 | 24 | 1.2 | 0.6 | |
| | 41 | 441n | 19:44 | 19:46 | 347° | 15965 | 155 | 5168 | 24 | 1.2 | 0.6 | |
| | 42 | 442s | 19:50 | 19:51 | 167° | 16232 | 156 | 5167 | 24 | 1.3 | 0.6 | |
| | 43 | 443n | 19:55 | 19:55 | 348° | 16490 | 154 | 5167 | 25 | 1.1 | 0.6 | |
| | 44 | 445s | 20:00 | 20:00 | 166° | 16166 | 164 | 5167 | 24 | 1.2 | 0.6 | |
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# Digital Aerial Solutions Flight Log

| Project/Flight Plan: | Nv_Earth | Lift | Temp °C Before | Temp °C After | Pressure (kPa) | Sensor Operator |
|---|---|---|---|---|---|---|
| | | 26 | 2 | 23 | 102.71 | Geoffrey McCall |

| Date/Julian: | 10/31/2020 | Disk Drive | Sensor | Pilot |
|---|---|---|---|---|
| Hobbs End | 7319.9 | TM MM30 (101, 102) | TM_90524 | Wes Ashmore |

| Hobbs ST | 7314.3 | TARGET MSL | Target AIRSPD | Base Name | PID | Base Name | PID | Base Height | Aircraft | Airport Identifcation: |
|---|---|---|---|---|---|---|---|---|---|---|
| Flight Time | 5.6 | 14,692 | 165 | KMEV01 | | KMEV02 | | 1.500 | C441-N207SS | KMEV |

| ∠ | Flight Line | Mission Line | UTC time: Begin: | UTC time: End: | Direction | GPS Altitude | Speed | Available MM Space | S/Vs | Position Acc. AVG PDOP | Position Acc. AVG HDOP | Comments and Conditions: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 8 | 477s | 20:25 | 20:26 | 143° | 14220 | 160 | 5165 | 21 | 1.3 | 0.7 | |
| | 10 | 479n | 20:30 | 20:31 | 325° | 14098 | 159 | 5164 | 21 | 1.3 | 0.6 | |
| | 9 | 478s | 20:35 | 20:36 | 144° | 14045 | 147 | 5162 | 22 | 1.3 | 0.7 | |
| | 7 | 476n | 20:41 | 20:42 | 325° | 14445 | 163 | 5162 | 20 | 1.6 | 0.7 | |
| | 15 | 484s | 20:46 | 20:47 | 143° | 14641 | 157 | 5161 | 22 | 1.3 | 0.7 | |
| | 16 | 485n | 20:50 | 20:51 | 325° | 14172 | 159 | 5161 | 22 | 1.3 | 0.7 | |
| | 17 | 486s | 20:59 | 21:00 | 144° | 14900 | 159 | 5160 | 24 | 1.1 | 0.6 | |
| | 12 | 481n | 21:03 | 21:04 | 324° | 14804 | 167 | 5160 | 24 | 1.1 | 0.6 | |
| | 14 | 483s | 21:08 | 21:09 | 138° | 14783 | 166 | 5158 | 25 | 1.1 | 0.6 | |
| | 11 | 480n | 21:13 | 21:14 | 324° | 14878 | 162 | 5158 | 25 | 1.1 | 0.6 | |
| | 13 | 482s | 21:18 | 21:20 | 143° | 14878 | 155 | 5156 | 24 | 1.1 | 0.6 | |
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# Digital Aerial Solutions Flight Log

| Project/Flight Plan: | Nv_Earth | Lift | Temp °C Before | Temp °C After | Pressure (kPa) | Sensor Operator |
|---|---|---|---|---|---|---|
| | | 27 | 10 | 21 | 102.91 | Geoffrey McCall |

| Date/Julian: | 11/4/2020 | Disk Drive | | Sensor | | | | | Pilot | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hobbs End | 7323.3 | TM MM30 (101, 102) | | TM_90524 | | | | | Anthony Kosinski | |
| Hobbs ST | 7319.9 | TARGET MSL | Target AIRSPD | Base Name | PID | Base Name | PID | Base Height | Aircraft | Airport Identifcation: |
| Flight Time | 3.4 | 14,692 | 165 | KMEV01 | | KMEV02 | | 1.500 | C441-N207SS | KMEV |

| ∠ | Flight Line | Mission Line | UTC time: Begin: | UTC time: End: | Direction | GPS Altitude | Speed | Available MM Space | S/Vs | Position Acc. AVG PDOP | Position Acc. AVG HDOP | Comments and Conditions: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 17 | 517s | 17:47 | 18:00 | 165° | 13495 | 158 | 5153 | 17 | 1.6 | 0.8 | |
| | 18 | 518n | 18:03 | 18:16 | 348° | 13532 | 155 | 5143 | 18 | 1.6 | 0.7 | |
| | 19 | 519s | 18:19 | 18:31 | 166° | 13535 | 158 | 5134 | 21 | 1.3 | 0.7 | |
| | 20 | 520n | 18:35 | 18:47 | 347° | 13543 | 154 | 5127 | 24 | 1.0 | 0.5 | |
| | 8 | 508s | 18:56 | 18:57 | 167° | 15395 | 161 | 5118 | 22 | 1.1 | 0.6 | |
| | 9 | 509n | 19:04 | 19:04 | 346° | 16032 | 158 | 5116 | 21 | 1.2 | 0.6 | |
| | 10 | 510s | 19:08 | 19:09 | 167° | 16167 | 157 | 5115 | 20 | 1.2 | 0.6 | |
| | 11 | 511n | 19:13 | 19:13 | 349° | 15955 | 164 | 5115 | 20 | 1.3 | 0.6 | |
| | 12 | 512s | 19:17 | 19:18 | 167° | 15733 | 165 | 5113 | 20 | 1.3 | 0.7 | |
| | 15 | 515n | 19:22 | 19:23 | 351° | 15309 | 146 | 5113 | 21 | 1.3 | 0.7 | |
| | 16 | 516s | 19:27 | 19:28 | 168° | 15175 | 156 | 5113 | 20 | 1.3 | 0.7 | |
| | 13 | 513s | 19:32 | 19:32 | 167° | 13555 | 166 | 5110 | 20 | 1.3 | 0.7 | |
| | 1 | 501s | 19:40 | 19:41 | 144° | 15910 | 160 | 5110 | 21 | 1.2 | 0.6 | |
| | 2 | 502n | 19:45 | 19:45 | 322° | 16406 | 157 | 5110 | 18 | 1.3 | 0.7 | |
| | 3 | 503s | 19:50 | 19:52 | 144° | 15524 | 161 | 5108 | 18 | 1.3 | 0.7 | |
| | 4 | 504n | 19:56 | 19:56 | 324° | 15703 | 153 | 5107 | 18 | 1.2 | 0.7 | |
| | 14 | 514s | 20:02 | 20:02 | 143° | 13929 | 156 | 5105 | 18 | 1.2 | 0.7 | |
| | 7 | 507n | 20:11 | 20:12 | 348° | 18095 | 154 | 5105 | 18 | 1.3 | 0.7 | |
| | 6 | 506s | 20:16 | 20:17 | 167° | 17763 | 164 | 5105 | 20 | 1.2 | 0.6 | |
| | 5 | 505n | 20:21 | 20:22 | 346° | 17760 | 157 | 5102 | 19 | 1.3 | 0.7 | |
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