DSS™ 439

Specifications

1. Camera

Image Size:	39 MP: 5412 x 7216
Pixel Size:	0.0068 mm
Filter Array:	Color (VIS) or ColorIR (CIR)
Applanix AeroLens™ by Carl Zeiss:	Standard: 60 mm, F/3.5, FOV(deg): crosstrack 44, alongtrack 34, diagonal 54 (CIR and VIS) Optional: 40 mm, F/4, FOV(deg): crosstrack 62, alongtrack 49, diagonal 74 (CIR and VIS)
Exposure Control:	Aperture priority (calibrated) Manual or Shutter priority
Light Metering:	Center weighted average
Shutter:	Electronically controlled focal plane
Shutter Speed:	125 - 4000 (slower speeds not recommended)
ISO:	Up to 800
Exposure Compensation:	+- 2 EV in 1/3 EV steps
Max Exposure Rate:	2.8 seconds ± 0.03 sec 1 sigma
Sensor Head:	Proprietary CCD mount, ruggedized exoskeleton, Designed to hold geometric accuracy over RTCA/DO-160D shock/vibe spec to within 1 pixel*
Calibration:	Terrestrial and Airborne calibration with full report

*When mounted on supplied shock isolators

2. Computer System

Data Logger

- Embedded OS
- Removable pressurized and temperature controlled ruggedized disk drive, 7000 image capacity per drive (2 supplied, 500 GByte each)

Navigation, Direct Georeferencing and Flight Management

- Embedded Applanix POSTrack, Integrated GPS/Inertial Direct Georeferencing and Flight Management System
- XTRACK Mission Planning software
- Remote Pilot display with touch screen
- Operator or pilot only operation mode
- Panasonic Toughbook for optional operator interface (operator client can be run on any Windows computer)
- Real-time image, camera, and POS status display

Tested and meets RTCA/DO-106D specs for shock and vibe

3. Performance

Direct Georeferencing, RMS

	C/A GPS	DGPS*	Post-Processed
Position (m)	4.0-6.0	0.3-2	0.05-0.3
Velocity (m/s)	0.1	0.05	0.005
Roll & Pitch (deg)	0.015	0.010	0.008
True Heading (deg)	0.08-0.016	0.050	0.015

*When using optional Satellite Based Augmentation Service (SBAS)

TruSpectrum™ Radiometry

Bands	1 (Red/NIR)*	2 (Green/Red)*	3 (Blue/Green)*
Color Mode, nm	600-700	500-600	400-500
60mm CIR, nm	800-960	600-720	500-600
40mm CIR, nm	850-1100	600-720	500-600

*VIS/CIR Modes

Minimum Ground Sample Distance (GSD), Portrait Mode*

Effective *(Developed Images)* 0.033 m *(1.3 X Theoretical GSD)*

*60 mm lens, Speed < 60 kts, Height < 220 m AGL, 30% endlap, 1/f > 2000

*40 mm lens: Speed < 60 kts, Height < 150 m AGL, 30% endlap, 1/f > 2000

Product Accuracy, RMS, High Precision Post-processing*

Orthophoto: max of 1.2 X GSD** (max) or POS AV position accuracy

Stereo: H: max of 1.2 X GSD**(max) or POS AV position accuracy

V: max of 3 X GSD**(max) or POS AV position accuracy

*Post-processed POS AV, QA/QC procedure followed, self-extracted or high-accuracy DEM (LIDAR), datum errors removed.

**Effective GSD = (1.2 - 1.3) X Theoretical GSD

4. Physical

Size:	Camera sensor head	180 x 180 x 360 mm
	Camera mount tray	250 x 310 x 36 mm
	Computer system	340 x 370 x 340 mm
Weight:	Camera w/o Az Mount	~ 7 kg (60 mm lens)
	Camera mount tray	~ 2 kg
	Computer system	24 kg
Power:	Computer system	28 VDC 280 W (max) (includes camera, Az Mount)
Temp. Range:	Camera	0 deg C to +40 deg C
	Computer System	-20 deg C to +55 deg C
Humidity:	5 to 90% RH non-condensing	
Altitude:	Up to 10,000 ft, with supplied operator laptop (higher altitude option available)	
	Up to 20,000 ft, without supplied laptop	

5. Processing Software

Produces plotter ready images and Exterior Orientation data

DSS Tools

- MissionView: Data management software, downloads images from removable drives
- ImageView: Image development software, lens fall-off correction < 3%, image sharpening tools, formats conversion: TIFF, JPEG, IMG, quantization conversion: 8 bit or12 bit, color balance via calibration inputs

POSPAC Air

- GNSS Aided INS Processing Tools: Differential GNSS processing, Inertial/GNSS post-processing
- Photogrammetry Tools: Direct Georeferencing software; productes exterior orientation for each photo, IMU/camera boresight calibration, camera calibration, Quality Control

DTMBox and OrthoBox (Optional)

- Softcopy Software by InPHO; automatic DTM extraction and OrthoMosaic generation

6. User Supplied Equipment

PC for Post-processing

- PC with Windows OS
- Minimum of 300 GB disk space (512 MB of RAM)
- Tower rack with external SATA or USB port

Softcopy OrthoPhoto Software

- Compatible with BAE Socet Set, Z/I ImageStation, Leica LPS, and others

Applanix Corporation
85 Leek Crescent, Richmond Hill, Ontario
CANADA L4B 3B3
905.709.4600 905.709.6027 fax

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DSS™ Azimuth Mount Specifications

1. Description

The DSS Azimuth Mount is a small, ruggedized, single axis mount, designed to automatically remove the effects of aircraft crab or yaw drift. This ensures that all images taken with the DSS are parallel to each other, which is essential for high performance stereo applications.

The mount is controlled automatically by the POS AV embedded in the DSS and can be commanded to follow the mean track angle (velocity vector along the ground) or a desired heading. The mount correction angle is encoded and fed back to the POS AV for dynamic lever arm translation.

2. Specifications

Size:	432 mm x 355 mm x 58 mm
Weight:	15 kg without camera head 22 kg with camera head
Power:	28 Watts Max, 28 VDC (supplied with the DSS)
Altitude:	0 to 20,000 ft
Temperature:	0 deg C to + 55 deg C operational
Drift Correction Range:	+/- 40 deg
Drift Correction Accuracy:	< 0.5 deg RMS, absolute
Encoder Rate:	5 Hz
Encoder Resolution:	0.01 deg
Interfaces:	RS232 to POS AV COM1 and COM3
Shock/Vibration Isolation:	Built-in isolators
Motor Reliability:	100,000 hours MTBF as per MIL SPEC 17 methods

3. Typical Results

Figure 1 shows a plot of the crab angle (heading of the aircraft minus the track angle over ground) that was experienced during a flight test of the mount. In this case, the crab easily exceeded +-/- 20 deg.

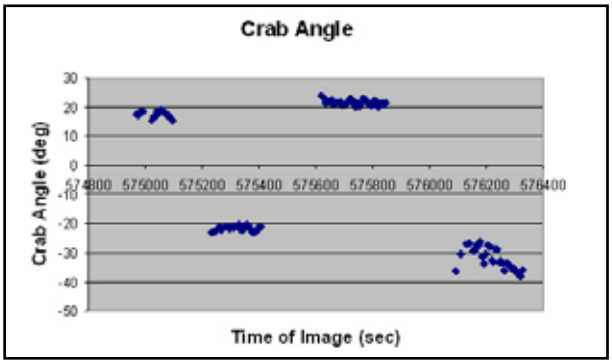

Figure 1

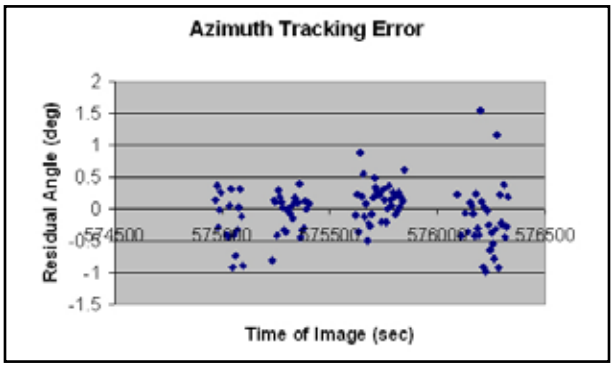

Figure 2

Figure 2 shows the residual tracking error of the mount for the same flight, which is the heading of the camera minus the track angle over the ground. The mount removes the crab angle so that that the images are taken parallel to each other to less than 0.5 deg RMS. This is also illustrated in Figure 3 which shows the footprints of the images projected onto the ground.

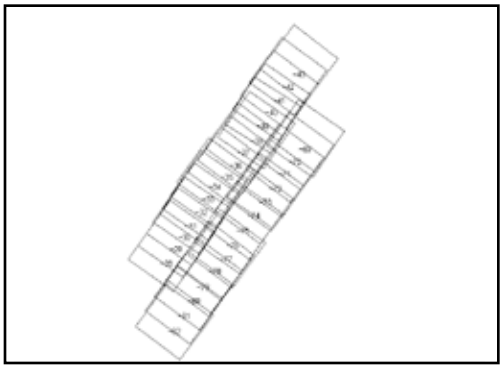

Figure 3

Applanix Corporation
85 Leek Crescent, Richmond Hill, Ontario
CANADA L4B 3B3
905.709.4600 905.709.6027 fax

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