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Terrestrial Calibration # 1 of DSS 439 SN1007 60mm CIR lens

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Special Notes

1. Terrestrial Calibration Data was collected on 27 June 2012
2. IMU Boresight Initial Calibration has not been computed

Table 1: Serial Numbers of the DSS Components

Component	SN
CCS	3996
IMU	N/A
Digital Back	30R0854281
Lens (60mm)	8913779
AE Prism Finder	N/A
CIR Filter	71886-2
VIS Filter	N/A
Camera Body	1017

Table 2: Camera Calibrated Parameters of DSS 439 SN1007 - 60mm lens - CIR

Parameter	Value	Accuracy
f (mm)	60.193	0.009 mm
x^P_{PPAC} (pixels) +	3646.52	0.4 pixels
y^P_{PPAC} (pixels) +	2721.53	0.4 pixels
x^i_{PPAC} (mm) ++	0.276	0.0036 mm
y^i_{PPAC} (mm) ++	-0.119	0.0036 mm

☐ + x^P_{PPAC} and y^P_{PPAC} are the offsets of the principal point of Autocollimation measured from image upper left corner, (image size 7212 pixels x 5408 lines) see Figure 1

☐ ++ x^i_{PPAC} and y^i_{PPAC} are measured from image centre (pixel size = 6.8 microns) see Figure 1
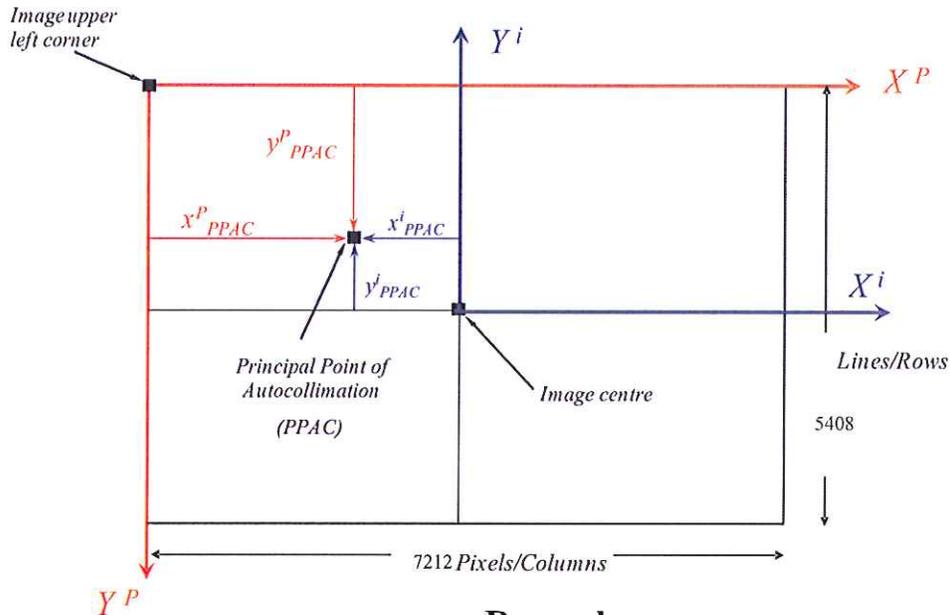
Remarks

1. X^i and Y^i: Image Coordinate Frame - Right Handed System
2. X^P and Y^P: Pixel/Monitor Coordinate Frame - Left Handed System

Figure 1: An Example of The Principal Point Offsets in a generic DSS Digital Image

Table 3: Radial Lens Distortion Table of DSS 439 SN1007 - 60mm lens - CIR

Radial Distance (mm)	Radial Distortion (Pixel)	Radial Distortion (microns)
1.00	-0.00	-0.020
2.00	-0.02	-0.160
3.00	-0.08	-0.539
4.00	-0.19	-1.276
5.00	-0.37	-2.487
6.00	-0.63	-4.286
7.00	-1.00	-6.784
8.00	-1.48	-10.089
9.00	-2.10	-14.304
10.00	-2.87	-19.528
11.00	-3.80	-25.854
12.00	-4.91	-33.370
13.00	-6.20	-42.156
14.00	-7.69	-52.286
15.00	-9.39	-63.825
16.00	-11.30	-76.832
17.00	-13.43	-91.353
18.00	-15.80	-107.428
19.00	-18.39	-125.084
20.00	-21.23	-144.337
21.00	-24.29	-165.193
22.00	-27.59	-187.645
23.00	-31.13	-211.670
24.00	-34.89	-237.235
25.00	-38.87	-264.289
26.00	-43.05	-292.769
27.00	-47.44	-322.592
28.00	-52.01	-353.661
29.00	-56.74	-385.860
30.00	-61.63	-419.055
31.00	-66.63	-453.091

Table 4: Calibrated USGS Lens Distortion Coefficients - SN1007

Coefficient	Value
K1	-2.0018290e-005
K2	+4.8946001e-009
K3	+1.1433473e-013

Table 5: Camera Calibrated Gain Value and Default Settings for DSS 439 SN1007 - 60mm lens

Filter Type	Calibrated Parameter	Calibrated Value
VIS	k (Gain value)	N/A
	ISO (Default)	200
	Exposure Compensation	0
CIR	k (Gain value)	N/A
	ISO (Default)	200
	Exposure Compensation	0

Table 6: Terrestrial Initial Boresight Calibration Results - SN 1007 - 60mm lens - CIR

Parameter	Value(arcmin)	Accuracy(arcmin)
Tx	N/A	N/A
Ty	N/A	N/A
Tz	N/A	N/A