8.2 Laser Altimeter

Apollo 17
pan camera
Calibration
2/28/73

APOLLO 17

LASER ALTIMETER CALIBRATION DATA

DATA SHEET NO. 7 Revision B P/N 1231AA1

MAPPER CAMERA NO. 71-004 LENS NO. 203

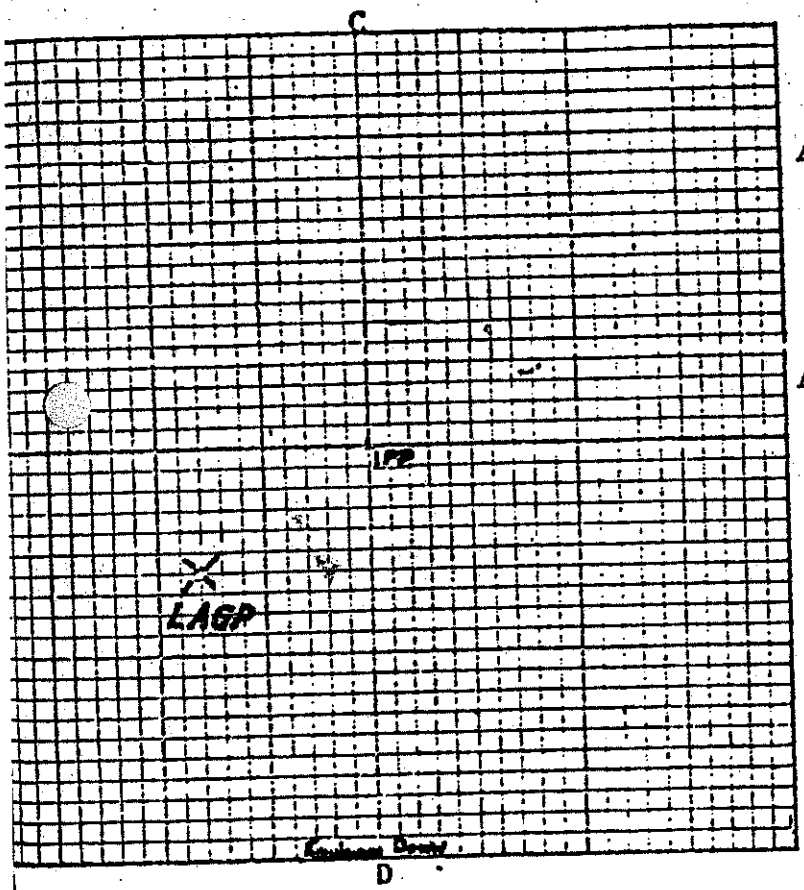
ALTIMETER NO. 0006

LASER ALTIMETER GROUND MEASUREMENT POINT

The positions of all points are referenced to the Indicated Principal
(IPP) as origin with the straight line drawn between the A and B
ials being coincident with the X- axis. The CD line goes through the
n but is not generally coincident with the Y- axis.

e 1 Box = 0.001 MM

: Emulsion Down



⊕ X_{LAGP} = −0.008 mm

⊖ X_{LAGP} = −0.008 mm

AVG X_{LAGP} = −0.008 mm

⊕ Y_{LAGP} = −0.006 mm

⊖ Y_{LAGP} = −0.006 mm

AVG Y_{LAGP} = −0.006 mm

A

NOTE: SIGNS ARE CORRECT FOR EMULSION DOWN MEASUREMENT.

11-4-72

X_{LAGP} - Location on X - coordinate of Laser Altimeter Ground Measurement Point

Y_{LAGP} - Location on Y - coordinate of Laser Altimeter Ground Measurement Point

⊕ - "+g" mode

⊖ - "-g" mode

8.3 Optical Bar Panoramic Camera

APOLLO 17

PANORAMIC CAMERA CALIBRATION DATA

Test Procedure No. TP121

No. of Pages 8

APOLLO 17

TEST PROCEDURE

FOR

PROJECT 9446
VEILING GLARE MEASUREMENTS
PANORAMIC CAMERA
FOR SCIENTIFIC INSTRUMENT
MODULE

EXPERIMENT S-163

Itek

ITEK CORPORATION

Lexington 73, Massachusetts

Date 9-15-70

	PREPARED	PROJECT APPROVAL	QUALITY ASSURANCE APPROVAL
By	R. SHERLOCK	C. BACKE	R. WESPISER
Signed	R. Sherlock	C. Backe	R. Wespiser
Date	9/17/70	9/21/70	9/18/70

CUST./GOV'T. REP. _____ Date _____
Reviewed

Q199-1 1/65

6.3.1.3 Itek Test Data Sheet

VEILING GLARE MEASUREMENT

Panoramic Camera Lens, P/N 105150, Serial No. N-53

	Step Wedge							Black Dot	% Veiling Glare
Step No.	1	2	3	4	5	6	7	X	
	* Calibrated Value								
	1.22	1.07	.92	.78	.65	.50	.36	X	
Field Position	*Measured Test Values								
-6°	.18	.26	.38	.58	.79	1.14	1.58	.46	13.8
-4°	.20	.28	.42	.66	.92	1.24	1.58	.51	13.8
-2°	.20	.27	.42	.66	.92	1.24	1.58	.50	13.3
0°	.20	.26	.37	.58	.82	1.10	1.45	.46	14.1
+2°	.20	.25	.36	.57	.86	1.08	1.49	.64	17.8
+4°	.20	.28	.44	.71	.88	1.36	1.57	.70	16.2
+6°	.22	.30	.46	.70	.99	1.27	1.58	.78	17.9

Legend: * Density values are logarithmic as read on the Macbeth Densitometer.

% Veiling Glare is computed from the black spot density plot (attached) for each field position.

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Project Approval: [signature] 9-25-70

Test Procedure No. TP121

Test Procedure No. TP123 No. of Pages 9

TEST PROCEDURE

FOR

PROJECT 9446
SPECTRAL TRANSMITTANCE
MEASUREMENTS
PANORAMIC CAMERA
FOR SCIENTIFIC INSTRUMENT
MODULE

EXPERIMENT S-163

Itek

ITEK CORPORATION

Lexington 73, Massachusetts

Date 9-15-70

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Signed	R. Sherlock	C. Backe	R. J. Wespiser
Date	9/17/70	9/21/70	9/17/70

CUST./GOV'T. REP. _____ Date _____
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Q199-1 11/65

6.3.1.3 Itek Test Data Sheet

SPECTRAL TRANSMITTANCE MEASUREMENT

Panoramic Camera Lens, P/N 105150, Serial No. N-53

Wavelength nm	Radiometer Readings A	A_1	B	B_1	% Transmittance
400	5.7	2.0	1.2	.2	47.5
420	18.3	6.7	3.4	.6	48.2
440	35.5	13.5	6.3	1.3	54.3
480	83.0	33.0	15.0	3.9	65.4
520	128.0	52.0	23.3	6.8	71.8
560	143.0	58.0	26.0	7.6	72.1
601	133.0	53.0	23.7	6.5	68.8
640	118.0	43.0	20.7	4.8	63.6
680	97.5	34.5	17.3	3.4	55.5
720	51.5	23.5	12.7	2.1	36.2

Legend:

A = Brightness of the calibrated standars Lambertian source using the radiometer telescope.

A_1 = Brightness of the collimator target as seen from the lens test position using the radiometer telescope.

B = Brightness of the calibrated standard Lambertian source using the radiometer microscope.

B_1 = Brightness of the collimator target aerial image at the image plane (lens in place) using the radiometer microscope.

% Transmittance = $\left[(B_1/B) \div (A_1/A)\right]$ X 100.

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Project Approval: [signature] 9/25/70

Test Procedure No. TP123

2

6.3.1.3 Itek Test Data Sheet

T STOP CALCULATION

Panoramic Camera Lens, P/N 105150, Serial No. N-53

Wavelength nm	% Transmittance	T STOP
400	47.5	5.08
420	48.2	5.04
440	54.3	4.81
480	65.4	4.33
520	71.8	4.14
560	72.1	4.12
601	68.8	4.22
640	63.6	4.39
680	55.5	4.69
720	36.2	5.83

Legend:

$$T\ STOP = \frac{f/number}{\sqrt{t}}$$ where f/number is 3.5 and t is transmittance.

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QA Monitor: [signature] 9-25-70

Project Approval: [signature] 9/25/70

Test Procedure No. TP123 Page 9

Test Procedure No. TP127

No. of Pages 5

TEST PROCEDURE

FOR

PROJECT 9446

C.F.L./MEASUREMENTS
PANORAMIC CAMERA

FOR SCIENTIFIC INSTRUMENT
MODULE

EXPERIMENT S-163

Itek

ITEK CORPORATION

Lexington 73, Massachusetts

Date 9-15-70

	PREPARED	PROJECT APPROVAL	QUALITY ASSURANCE APPROVAL
By	R. SHERLOCK	C. BACKE	R. WESPISER
Signed		C. Backe	R. Wespiser
Date	9/17/70	9/21/70	9/21/70

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Q199-1 11/65

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Lens N- 53

C.F.L. Calibration Summary

Filter	Field Position (degrees)	Mean C.F. L. (inches)	STD Deviation of mean CFL (inches)
23A	+6	23.9991	0.0002
	+4	24.0002	0.0007
	+2	24.0026	0.0009
	0 *	24.0008	0.0005
	-2	24.0008	0.0010
	-4	24.0018	0.0003
	-6	24.0003	0.0003
12	+6	24.0030	0.0012
	+4	24.0053	0.0010
	+2	24.0045	0.0019
	0 *	24.0029	0.0007
	-2	24.0009	0.0014
	-4	24.0028	0.0009
	-6	24.0009	0.0006
8	+6	24.0040	0.0002
	+4	24.0070	0.0008
	+2	24.0069	0.0003
	0 *	24.0052	0.0006
	-2	24.0048	0.0016
	-4	24.0045	0.0004
	-6	24.0041	0.0012
2A	+6	24.0033	0.0003
	+4	24.0059	0.0004
	+2	24.0056	0.0008
	0 *	24.0040	0.0006
	-2	24.0030	0.0007
	-4	24.0036	0.0002
	-6	24.0023	0.0008
no filter	+6	24.0036	0.0004
	+4	24.0052	0.0008
	+2	24.0067	0.0015
	0 *	24.0031	0.0010
	-2	23.9998	0.0010
	-4	24.0023	0.0007
	-6	24.0011	< 0.0001

* Average of all field positions

Quality Assurance Review W. R. Fitz Bricke

5.3.1.3 Itek Test Data Sheet

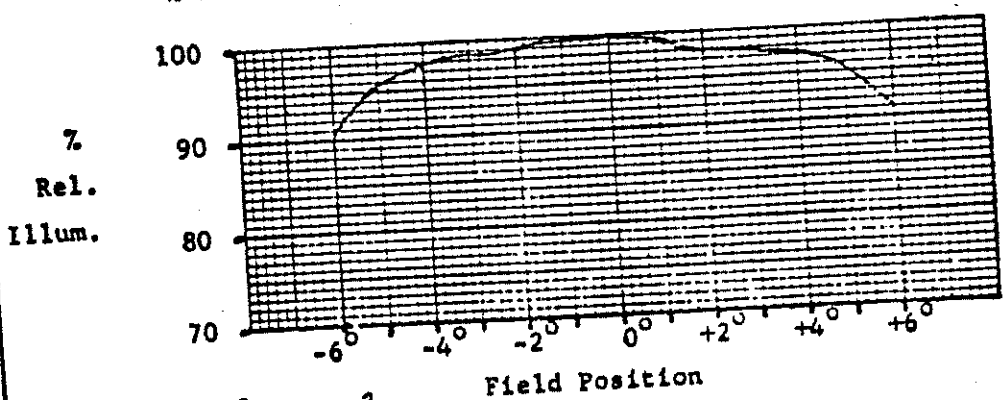
RELATIVE ILLUMINATION MEASUREMENT

Panoramic Camera Lens, P/N 105150, Serial No. N-53

	Field Position	Radiometer Readings vdc	Relative Illumination %
B	-6°	66	90.4
	-5°	70	95.9
	-4°	71	97.3
	-3°	72	98.6
	-2°	72	98.6
	-1°	72.5	99.3
A	0°	73	100.0
B	+1°	72.5	99.3
	+2°	71.5	97.9
	+3°	71.5	97.9
	+4°	71	97.3
	+5°	69.5	95.2
	+6°	66.5	91.1

Meter Scale for Radiometer Readings: 1K

% Relative Illumination = $\frac{B}{A}$ X 100



Data Recorded By: [signature] Date: 9/23/70

QA Monitor: [signature] 9-25-70

Project Approval: [signature] 9-25-70

Page 8

Test Procedure No. TP125

Test Procedure No. TP127

No. of Pages 5

TEST PROCEDURE

FOR

PROJECT 9446

C.F.L./MEASUREMENTS
PANORAMIC CAMERA

FOR SCIENTIFIC INSTRUMENT
MODULE

EXPERIMENT S-163

Itek

ITEK CORPORATION

Lexington 73, Massachusetts

Date 9-15-70

	PREPARED	PROJECT APPROVAL	QUALITY ASSURANCE APPROVAL
By	R. SHERLOCK	C. BACKE	R. WESPISER
Signed	R. Sherlock	C. Backe	R. Wespiser
Date	9/17/70	9/21/70	9/21/70

CUST./GOV'T. REP. _____ Date _____
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Q199-1 11/65

Lens N- 53

C.F.L. Calibration Summary

Filter	Field Position (degrees)	Mean C.F. L. (inches)	STD Deviation of mean CFL (inches)
23A	+6	23.9991	0.0002
	+4	24.0002	0.0007
	+2	24.0026	0.0009
	0 *	24.0008	0.0005
	-2	24.0008	0.0010
	-4	24.0018	0.0003
	-6	24.0003	0.0003
12	+6	24.0030	0.0012
	+4	24.0053	0.0010
	+2	24.0045	0.0019
	0 *	24.0029	0.0007
	-2	24.0009	0.0014
	-4	24.0028	0.0009
	-6	24.0009	0.0006
8	+6	24.0040	0.0002
	+4	24.0070	0.0008
	+2	24.0069	0.0003
	0 *	24.0052	0.0006
	-2	24.0048	0.0016
	-4	24.0045	0.0004
	-6	24.0041	0.0012
2A	+6	24.0033	0.0003
	+4	24.0059	0.0004
	+2	24.0056	0.0008
	0 *	24.0040	0.0006
	-2	24.0030	0.0007
	-4	24.0036	0.0002
	-6	24.0023	0.0008
no filter	+6	24.0036	0.0004
	+4	24.0052	0.0008
	+2	24.0067	0.0015
	0 *	24.0031	0.0010
	-2	23.9998	0.0010
	-4	24.0023	0.0007
	-6	24.0011	< 0.0001

* Average of all field positions

Quality Assurance Review H. R. Fitz Bucalo

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