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24 Pages
(Including Cover Sheet)

CORONA "J" FLIGHT DATA BOOK

SYSTEM NO. J2

VEHICLE NO. 1163

MISSION NO. 1002

CAMERA NOS. 116 & 117

Prepared by: [redacted]

Checked by: [redacted]

Approved by: [redacted]

Approved by: [redacted]

Approved by: [redacted] Manager
S. E.

[redacted]

[redacted]

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SYSTEM NO. 12
VEHICLE NO. 1163
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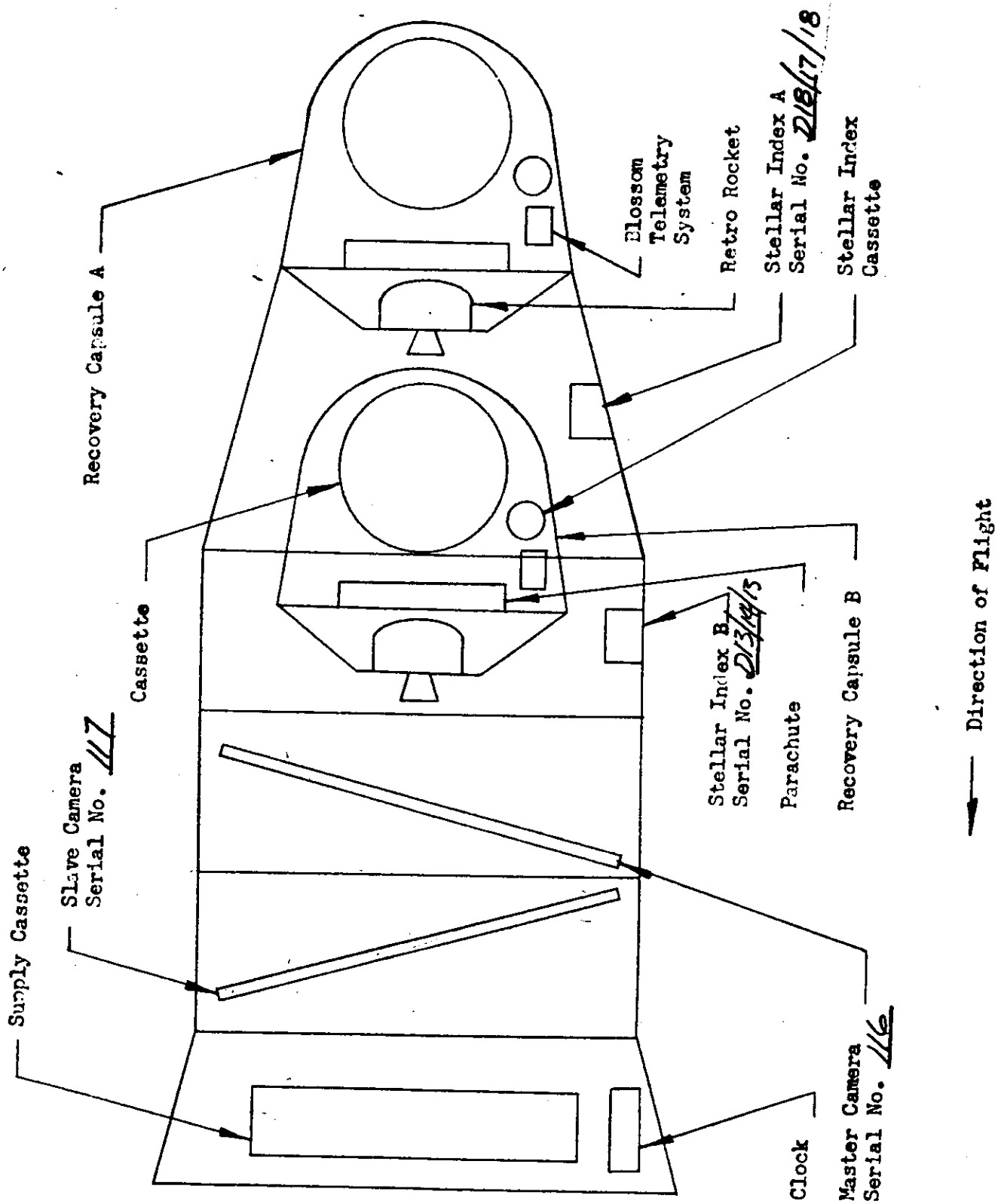
CAMERA NOS. 1164/117

VEHICLE LAYOUT:



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SYSTEM NO. 12
MISSION NO. 1163
VEHICLE NO. 1002
CAMERA NOS. 116 & 117

GENERAL FLIGHT DATA:

Master Camera Serial No. 116

Slave Camera Serial No. 117

Stellar Index "A" Serial No. D18/17/18

Stellar Index "B" Serial No. D13/14/13

Launch Date 9/23/63

Orbital Parameters: (Rev. 28)

Period 90.59 Min.

Perigee 99.8 NM

Apogee 235.5 NM

Eccentricity 0.0188

Perigee Latitude 35.86 Deg. N

Inclination Angle 74.96 Deg. N

Recovery Orbit No. 49

Recovery Date 9/26/63

REMARKS:

[redacted]

[redacted]

[redacted]

SYSTEM NO. J2
VEHICLE NO. 1163
MISSION NO. 1002
CAMERA NOS. 116 & 117

LENS SETTINGS AND FILM TYPES:

Panoramic Camera Settings:

	Camera No. 116	Camera No. 117
Panoramic Optics Slit Width	0.250 in.	0.250 in.
Panoramic Optics Filter Type	WRATTEN 21	WRATTEN 21
Horizon Optics Exp. Time	1/100 sec.	1/100 sec.
Horizon Optics Aperture	F 6.8	F 6.8
Horizon Optics Filter Type	WRATTEN 25	WRATTEN 25

Stellar Index Camera Settings:

	Stellar Index A		Stellar Index B	
	Stellar	Index	Stellar	Index
Exposure Time	2 TO 5 Sec	1/500 Sec	2 TO 5 Sec	1/500 Sec
Aperture Setting	F1.9	F4.5	F1.9	F4.5
Filter Type	NONE	WRATTEN 21	NONE	WRATTEN 21

Ratio: One Stellar Index Frame Per 7 Master Camera Frames.

Film:

Panoramic Cameras:

	Camera No. 116	Camera No. 117
Type	1J40 (S0132)	1J40 (S0132)
Length	16,000 ft.	16,000 ft.
Splices	4	4
Emul. Data	3-1-7-5-3	3-1-7-5-3

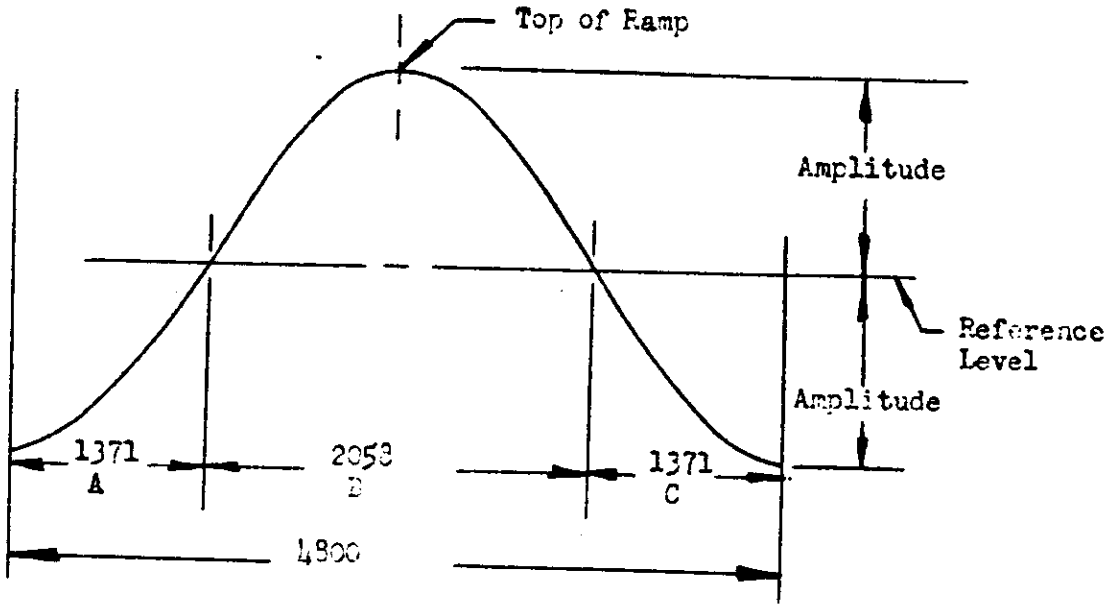
Stellar Index Cameras:

	Stellar Index A		Stellar Index B	
	Stellar	Index	Stellar	Index
Type	3J34(S0102)	1J33(S0130)	3J34(S0102)	1J33(S0130)
Emul. Data	5-6-1-8-3	9-3-63	5-6-1-8-3	9-3-63

[redacted]

VEHICLE NO. 1163
MISSION NO. 1002
CAMERA NOS. 116 & 117

V/H RAMP CONFIGURATION AND CONSTANTS:



Cycle Rate Computation:

A. C to 1371 Sec Up Ramp: CPS=R+A Sin (1.5 X -1.5707963)

B. 1372 to 3429 Sec Up Ramp: CPS=R+A Sin (2 X -2.0943951)

C. 3430 to 4800 Sec Up Ramp: CPS=R+A Sin (1.5 X - 0.7853982)

FMC Rate Computation:

$$\text{FMC Rate (In/Sec)} = 2\pi \left(\frac{0.3203}{CP}\right) = 2.02307 \times CPS$$

$$\text{FMC Rate (Radians/Sec)} = 2\pi \left(\frac{0.3203}{24\ CP}\right) = 0.84378 \times CPS$$

Scan Velocity Computation:

$$\text{Scan Velocity (In/Sec)} = \frac{48\pi}{CP} = 150.796 \times CPS$$

$$\text{Scan Velocity (Radians/Sec)} = \frac{48\pi}{24\ CP} = 6.28319 \times CPS$$

$$\text{Exposure Time (Milliseconds)} = 1000 \left(\frac{CP \times SLIT}{48\pi}\right) = 6.63146 \left(\frac{SLIT}{CPS}\right)$$

WHERE: $X = \frac{\text{Time Up Ramp (Seconds)}}{1309.4179}$ $R = \frac{1}{2}$ (CPS (top) + CPS (bottom))

$A = \frac{1}{2}$ (CPS top - CPS bottom) CP = Camera Cycle Period in Sec/Cycle

CPC = Camera Cycle Rate in Cycles/Sec

SLIT = Slit Width in Inches

[redacted]

MISSION NO. J6
VEHICLE NO. 1163
MISSION ID. 1002
CAMERA NOS. 116 & 117

CYCLE PERIOD DATA:

PRE-FLIGHT CYCLE PERIODS:

V/H Ramp Level	V/H Ramp Amplitude	Cycle Period Seconds		Time Up Ramp Sec
		Master	Slave	
3	4	4.98	4.86	0
3	4	2.17	2.16	2400
4	4	5.23	5.16	0
4	4	2.22	2.21	2400

IN-FLIGHT CYCLE PERIODS

V/H Ramp Level	V/H Ramp Amplitude	Cycle Period Seconds		Orbit No.	Time Up Ramp Sec
		Master	Slave		
3	4	4.32	4.35	9	525
4	4	4.36	4.43	25	625
4	4	4.25	4.28	41	685
4	4	2.23	2.28	47	2125

[redacted]

MISSION NO. 1002

0.2 V/H RAMP DATA.

V/H RAMP LEVEL 3, AMPLITUDE 4.

TIME	CYC/SEC	SEC/CYC	V/H RATIO	NO OF CYC
0	.2014	4.969	.0182	27
200	.2039	4.902	.0184	46
400	.2091	4.803	.0188	67
600	.2140	4.672	.0193	82
800	.2213	4.518	.0200	104
1000	.2300	4.345	.0208	126
1200	.2401	4.163	.0217	150
1400	.2514	3.977	.0227	174
1600	.2637	3.791	.0238	200
1800	.2769	3.611	.0250	224
2000	.2907	3.438	.0263	256
2200	.3051	3.276	.0276	285
2400	.3199	3.125	.0289	317
2600	.3352	2.974	.0304	349
2800	.3509	2.809	.0321	384
3000	.3749	2.666	.0339	421
3200	.3930	2.544	.0355	459
3400	.4096	2.441	.0370	499
3600	.4244	2.356	.0383	541
3800	.4369	2.288	.0395	584
4000	.4470	2.236	.0404	628
4200	.4544	2.200	.0411	673
4400	.4589	2.178	.0415	719
4600	.4605	2.171	.0416	765
4800	.4589	2.178	.0415	811
5000	.4544	2.200	.0411	857
5200	.4470	2.236	.0404	902
5400	.4369	2.288	.0395	946
5600	.4244	2.356	.0383	989
5800	.4096	2.441	.0370	1031
6000	.3930	2.544	.0355	1071
6200	.3749	2.666	.0339	1109
6400	.3559	2.809	.0321	1145
6600	.3362	2.974	.0304	1181
6800	.3199	3.125	.0289	1213
7000	.3051	3.276	.0276	1245
7200	.2907	3.438	.0263	1274
7400	.2769	3.611	.0250	1303
7600	.2637	3.791	.0238	1330
7800	.2514	3.977	.0227	1355
8000	.2401	4.163	.0217	1380
8200	.2300	4.345	.0208	1404
8400	.2213	4.518	.0200	1426
8600	.2140	4.672	.0193	1448
8800	.2081	4.803	.0188	1469
9000	.2039	4.902	.0184	1489
9200	.2014	4.969	.0182	1510
9400	.2006	4.985	.0181	1530

MISSION NO. 1002

J-2 V/H RAMP DATA.

V/H RAMP LEVEL 4, AMPLITUDE 4.

TUR	CYC/SEC	SEC/CYC	V/H RATIO	NO OF CYC
0	.1914	5.232	.0172	0
100	.1910	5.209	.0173	19
200	.1914	5.224	.0175	38
300	.1986	5.033	.0179	58
400	.2044	4.891	.0184	78
500	.2117	4.722	.0191	99
600	.2204	4.536	.0199	121
700	.2304	4.338	.0208	143
800	.2417	4.136	.0218	166
900	.2537	3.937	.0229	192
1000	.2670	3.744	.0241	218
1100	.2808	3.560	.0254	247
1200	.2952	3.387	.0267	274
1300	.3098	3.227	.0280	304
1400	.3260	3.066	.0294	336
1500	.3436	2.992	.0312	369
1600	.3646	2.742	.0329	405
1700	.3826	2.613	.0346	442
1800	.3994	2.505	.0361	481
1900	.4138	2.416	.0374	522
2000	.4264	2.345	.0383	564
2100	.4364	2.291	.0394	607
2200	.4438	2.253	.0401	651
2300	.4482	2.230	.0405	696
2400	.4498	2.223	.0406	741
2500	.4482	2.230	.0405	786
2600	.4438	2.253	.0401	830
2700	.4364	2.291	.0394	874
2800	.4264	2.345	.0385	918
2900	.4138	2.416	.0374	960
3000	.3991	2.505	.0361	1000
3100	.3826	2.613	.034	1039
3200	.3646	2.74	.032	1077
3300	.3456	2.892	.031	1112
3400	.3260	3.066	.0294	1146
3500	.3098	3.227	.0280	1178
3600	.2952	3.387	.0267	1208
3700	.2808	3.560	.0254	1237
3800	.2670	3.744	.0241	1264
3900	.2538	3.937	.0229	1290
4000	.2417	4.137	.0218	1315
4100	.2304	4.338	.0208	1339
4200	.2204	4.536	.0199	1361
4300	.2117	4.722	.0191	1383
4400	.2044	4.891	.0184	1403
4500	.1986	5.033	.0179	1424
4600	.1944	5.141	.0176	1443
4700	.1910	5.209	.0173	1463
4800	.1911	5.232	.0172	1482

[redacted]

SYSTEM NO. J2
VEHICLE NO. 1163
MISSION NO. 1002
CAMERA NOS. 116 & 113

LENS DATA SUMMARY: Panoramic Camera No. 116

Lens Serial No. 0592435

Slit Width 0.250 Inch

Filter Type WRATTEN 21

Equivalent Operational Focal Length 609.627 MM

Resolution:

Static:

	Lines/MM	Film Type	Target Contrast
Bench Test			
Other			

Dynamic:

Itek ~~Pre~~ Post-Vibration	183	50132	High
Itek Post Vibration	145	50132	Low
AP	168	50132	High
AP	90	50132	Low
Other			

Note: ~~Itek~~ AP Post Vibration Resolution of 168 lines/MM Reported In Message No. _____ dated _____

Distortion - Positive (Pincushion)

Angle Off Axis Deg.	0	1	2	3					
Distortion Millimeters	.000	.000	.001	.0025					

SYSTEM NO. V2
VEHICLE NO. 1163
MISSION NO. 1002
CAMERA NOS. 116 & 117

LENS DATA SUMMARY: (Horizon Cameras for Panoramic Camera No. 116)

	Take-Up	Supply
Lens Serial No.	810098	807536
Exposure Time	1/100 Sec.	1/100 Sec.
Filter Type	WRATTEN 25	WRATTEN 25
Aperture	F6.8	F6.8
Operational Focal Length	89.75 MM	89.1 MM
Radial Distortion:		
10° off Axis	.007 MM	.005 MM
20° off Axis	.041 MM	.046 MM
Tangential Distortion (Maximum Vector)	.004 MM	.002 MM

Resolution:

Angle off Axis Deg.	0	5	10	15	20	25	27.5	0	5	10	15	20	25	27.5
Radial Resolution	56	44	44	32	36	29	22	51	46	42	31	30	28	30
Tangential Resolution	56	37	36	32	28	25	19	51	44	39	34	32	27	19

35.4 Lines/MM Avg. 36 Lines/MM Avg.

Note:

1. Distortion and resolution are read at equivalent operational focal length.
2. Resolution in lines per mm on SuperXX film and 8/16A contrast target.

[redacted]

[redacted]

SYSTEM NO. J2
VEHICLE NO. 1165
MISSION NO. 1007
CAMERA NOS. 116 & 117

LENS DATA SUMMARY: Panoramic Camera No. 117

Lens Serial No. 0612435

Slit Width 0.250 Inch

Filter Type (WRATTEN) 21

Equivalent Operational Focal Length 609.577 MM

Resolution:

Static:

	Lines/MM	Film Type	Target Contrast
Bench Test			
Other			

Dynamic:

Itek ~~Pre~~ Post-Vibration	161	50132	HIGH
Itek Post Vibration	133	50132	LOW
AP	156	50132	HIGH
AP	97	50132	LOW
Other			

Note: ~~Itek~~ AP Post Vibration Resolution of 156 lines/MM Reported In Message No. _____ dated _____

Distortion - Positive (Pincushion)

Angle Off Axis Deg.	0	1	2	3					
Distortion Millimeters	.000	.0015	.0025	.006					

[redacted]

SYSTEM NO. J2
VEHICLE NO. 1163
MISSION NO. 1002
CAMERA NOS. 116 & 117

LENS DATA SUMMARY: (Horizon Cameras for Panoramic Camera No. 117)

	Take-Up	Supply
Lens Serial No.	810096	810097
Exposure Time	1/100 Sec.	1/100 Sec.
Filter Type	WRATTEN 25	WRATTEN 25
Aperture	F6.8	F6.8
Operational Focal Length	89.8 MM	89.7 MM
Radial Distortion:		
10° off Axis	.011 MM	.009 MM
20° off Axis	.046 MM	.040 MM
Tangential Distortion (Maximum Vector)	.010 MM	.007 MM

Resolution:

Angle off Axis Deg.	0	5	10	15	20	25	27.5	0	5	10	15	20	25	27.5
Radial Resolution	56	49	45	30	27	25	22	56	49	40	32	30	31	29
Tangential Resolution	56	49	42	32	29	24	18	56	49	40	29	32	25	20

36 Lines/MM Avg. 37 Lines/MM Avg.

Note:

1. Distortion and resolution are read at equivalent operational focal length.
2. Resolution in lines per mm on SuperXX film and 1/16X contrast target.

[illegible]. J2
[illegible]. 1163
[illegible]. 1002
[illegible]. 116&117

[illegible] DEFINITIONS:

1.0 Measurements are made with respect to collimator targets fixed with respect to the mechanical interface between the total payload assembly and the orbital vehicle.

2.0 Two sets of three targets each, are aligned to be coplanar within ±5" of arc so positioned to form an angle of -15.00° ±5" to the mechanical interface for master camera calibrations and an angle of +15.00°±5" to the mechanical interface for slave camera calibrations.

2.1 One target, Target 1 of each set is imaged on the Terrain format.

2.2 The second and third targets of each set are at angles of 75.00° ±5" from target one and are imaged on the horizon formats.

3.0 The indicated center of format for the panoramic cameras is given by the intersection of a line through the center of mass of the central shrinkage marker drawn normal to the edge of format containing the shrinkage marker and a line parallel to the same edge located at a position half-way between the format edges.

4.0 The indicated principal points of the horizon cameras are the points of intersection of lines joining opposite fiducials.

5.0 Xvo and Yvo are the offsets of Target 1 from the indicated center of format of the panoramic cameras as defined in Paragraph 3.

6.0 Xs, Ys and Xt, Yt are the offsets of Targets 2 and 3 from the indicated principal points of the supply and take-up horizon cameras respectively.

7.0 The indicated flight direction is the direction of vehicle travel during orbit. The forward edge of format is the edge opposite the shrinkage markers for the master camera and is the edge containing the shrinkage markers for the slave camera.

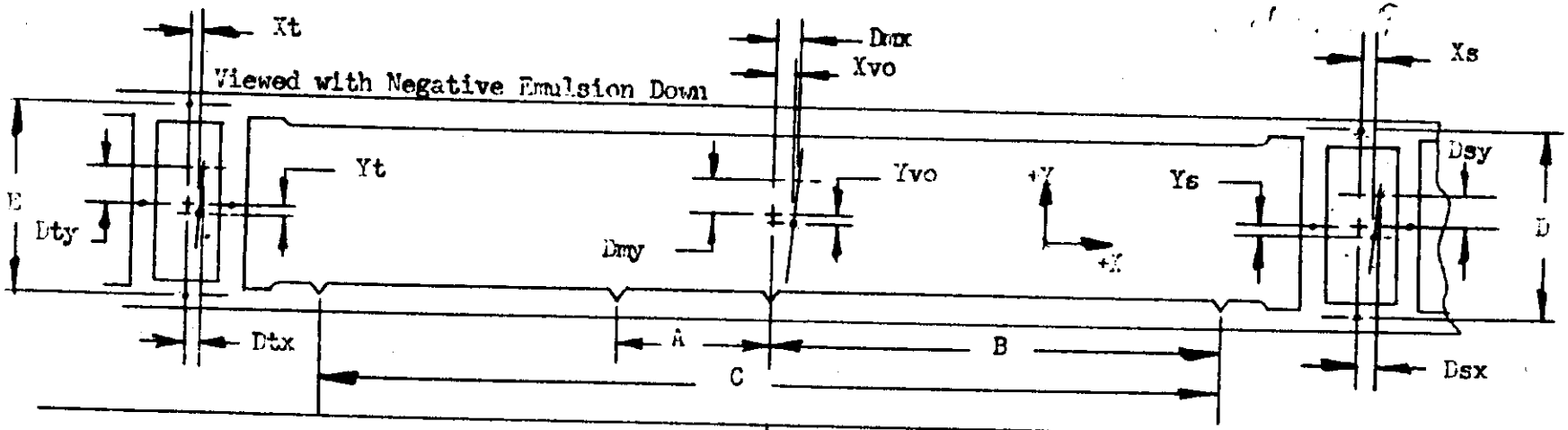
8.0 Dimensions A, B and C are the spacings of the shrinkage markers and dimensions D and E are the spacings of the Y Axis fiducials. Techniques for exact measurement of these dimensions have not been developed. The figures quoted are measurements made on hand processed film without control of shrinkage.

9.0 The format dimensions are measured to the best estimate of format edge.

10.0 Measurement of the angle between the indicated axis of the panoramic cameras and the line of intersection of the plane defined in Paragraph 2 on the format is obtained from the offset dimensions Dmx and Dmy of Target 1 for each camera.

11.0 Measurement of the angle between the indicated axis of the horizon cameras and the line of intersection of the plane defined in Paragraph 2 on the format is made by measuring the scan direction offset of the targets defined in Paragraph 2.2 at a fixed distance from the target center in the Y direction. Dimensions Dtx, Dty, Dsx and Dsy are the offsets of these measurements.

[redacted]



Camera No. 116	Vehicle Motion	Scan Direction
76.1	Xt +.654	Dtx +.693
355.16	Yt −.224	Dty −10.224
710.53	Xs −.690	Dsx −.636
56.332	Ys −.087	Dsy −10.087
56.404	Xvo +.407	Dmx +.380
	Yvo +.803	Dmy +10.803

Format Dimensions:

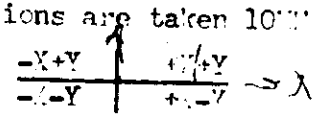
	Panoramic	Take-Up	Supply
Height			
Width			

Camera No. 117	Vehicle Motion	Scan Direction
A 76.0	Xt +1.333	Dtx +1.297
B 355.53	Yt +.161	Dty +10.161
C 710.73	Xs −.786	Dsx −.826
D 56.546	Ys +.166	Dsy +10.163
E 56.458	Xvo +.015	Dmx −.004
	Yvo +.079	Dmy +10.079

Format Dimensions:

	Panoramic	Take-Up	Supply
Height			
Width			

Note: 1. All dimensions are in millimeters and are average dimensions of three formats.
2. Height of main format is taken at center of format.
3. Dt, Dm, Ds, X and Y dimensions are taken 10" above point defining target center.
4. Format Sign Convention



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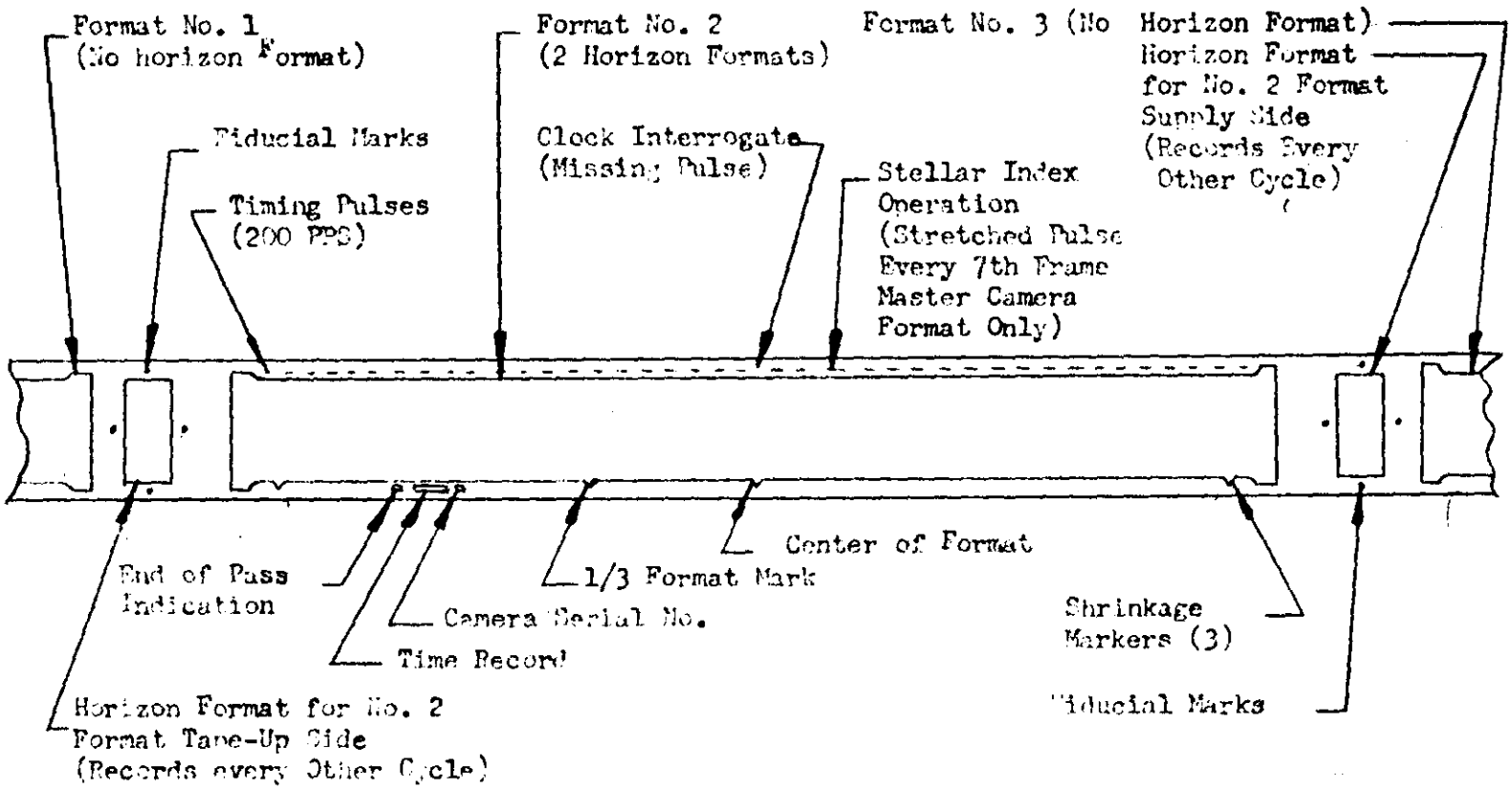
FOCAL LENGTHS: (PANORAMIC CAMERAS)

[redacted]



Panoramic Camera No. 116

Viewed With Negative Emulsion Down

Direction of Film Transport ←

Direction of Scan →

Direction of Vehicle Motion ↓

Panoramic Camera No. 117

Viewed With Negative Emulsion Down

Direction of Film Transport ←

Direction of Scan →

Direction of Vehicle Motion ↓

SYSTEM NO. 12
VEHICLE NO. 1163
MISSION NO. 1002
CAMERA NOS. 116 & 117

[redacted]

LENS DATA SUMMARY STELLAR INDEX D18/17/18:

	Stellar	Index
Lens Serial No.	10459	811713
Reseau Serial No.	18	17
Filter Type	NONE	KRATEN 21
Aperture	F1.9	F4.5
Exposure Time	2 TO 5 Sec.	1/500 Sec.
Operational Focal Length	84.00 MM	38.53 MM
Equivalent Focal Length	84.10 MM	38.39 MM

Resolution:

Angle off axis	0	10	20	30	35
Resolution L/MM High Contrast	68 / 76	86 / 84	117 / 94	109 / 65	84 / 34
Resolution L/MM Low Contrast	56 / 61	65 / 64	76 / 72	68 / 50	63 / 32

Note: Index Resolution of 82.175 Lines/MM AWAR
Read From _____ Film.

Distortion: NOT REPORTED

Angle off Axis Deg.										
Distortion Millimeters										

	Stellar	Index
Perpendicularity of Reseau to Optical Axis	000	000
Location of Principal Point:	X -.057 MM	X -.014 MM
	Y +.088 MM	Y +.025 MM

[redacted]

LENS DATA SUMMARY STELLAR INDEX 013/14/13:

	Stellar	Index
Lens Serial No.	———	———
Reseau Serial No.	13	14
Filter Type	NONE	WRATTEN 21
Aperture	F1.9	F4.5
Exposure Time	2 TO 5 Sec.	1/500 Sec.
Operational Focal Length	——— MM	——— MM
Equivalent Focal Length	——— MM	——— MM

Resolution:

Angle off axis										
Resolution L/MM High Contrast										
Resolution L/MM Low Contrast										

Note: Index Resolution of _____ Lines/MM AWAR
Read From _____ Film.

Distortion:

Angle off Axis Deg.										
Distortion Millimeters										

Perpendicularity of Reseau to Optical Axis ——— ———

Location of Principal Point: X_____MM X_____MM

Y_____MM Y_____MM

[redacted]

[illegible]: J2
VEHICLE NO.: 1163.
[illegible]: 1002
[illegible]: 1164117

[redacted]

PRELIMINARY CLOCK CORRELATION:

ORBIT	S[illegible] TIME	[illegible]	DIFFERENCE
9	43946.553	55342.018	—
25	44539.152	142334.590	
41	45105.221	229300.699	

[redacted]

[redacted]

SYSTEM NUMBER [illegible]02

VEHICLE NUMBER 1163

MISSION NUMBER 1002

PANORAMIC CAMERA NUMBERS 116 AND 117

STELLAR/INDEX CAMERA NUMBER D18/17/18

PERFORMANCE ESTIMATE

ORB PAN ST LAT TIME ON TUR DUR SOLAR EXPOS.

SUB PROG NO FR CR ON OFF ZD ST NO SEC SEC ON OFF ON OFF

LAUNCH 116 122 17

LAUNCH 117 126

0	8	0	116	[illegible]	01	221	219	2383345	3	4	0	44	37	37	6.1	6.0
0	8	0	117	49		223	220	2383345	3	4	0	44	37	37	6.1	6.0
2	6	1	116	49	07	274	268	24 6777	3	4	1195	154	14	20	4.4	4.1
2	8	1	117	49		274	269	24 6777	3	4	1196	154	13	20	4.4	4.1
4	6	1	116	65	10	254	245	2418060	3	4	[illegible]	154	29	32	3.2	3.1
4	6	1	117	65		255	246	2415060	3	4	1808	154	28	32	3.2	3.1
5	6	1	116	48	06	272	266	2423162	3	4	1474	132	17	22	3.8	3.5
5	6	1	117	48		272	267	2423162	3	4	1474	132	17	21	3.8	3.5
5	6	2	116	45	07	254	248	2423502	3	4	1813	106	29	31	3.2	3.1
5	6	2	117	45		254	249	2423502	3	4	1813	106	28	31	3.2	3.1
6	A	[illegible]	116	[illegible]	08	258	250	2428876	3	4	1749	140	27	31	3.3	3.1
6	6	1	117	[illegible]		259	250	2428876	3	4	1749	140	26	30	3.3	3.1
6	6	2	116	53	08	246	236	2429103	3	4	1976	119	33	35	3.1	3.0
6	6	2	117	[illegible]		246	237	2429103	3	4	1975	119	32	35	3.0	3.0
7	6	1	116	51	07	259	252	2434298	3	4	1682	124	26	30	3.3	3.1
7	6	1	[illegible]	51		260	252	2434298	3	4	1682	124	26	29	3.3	3.1
7	6	2	116	30	11	249	237	2434463	3	4	1648	181	31	34	3.1	2.9

7	6	2	117	80		250	239	2434463	3	4	1848	181	31	34	3.1	2.9
8	10	1	116	154	22	265	237	2439628	3	4	1579	374	23	33	3.5	3.0
8	10	1	117	153		266	240	2439628	3	4	1579	374	22	33	3.5	3.0
9	3	0	116	19	03	135	139	2443951	3	4	473	64	-18	-16	6.1	5.9
9	3	0	117	15		133	137	2443951	3	4	473	64	-19	-17	6.1	5.9
9	3	1	116	133	19	261	242	2445136	3	4	1658	317	25	33	3.3	3.0
9	3	1	117	132		262	243	2445136	3	4	1658	317	25	33	3.4	3.0
11	3	0	116	7	01	123	125	2454633	3	4	0	-32	-24	-23	6.9	6.9
11	3	0	117	7		121	123	2454633	3	4	0	-32	-25	-24	6.9	6.9
17	4	1	116	144	05	270	264	[illegible]	4	4	1511	121	19	24	3.8	3.6
17	4	1	117	143		271	265	[illegible]	4	4	1511	121	18	23	3.9	3.7
18	6	1	116	53	07	274	268	[illegible]	4	4	1400	153	14	20	4.0	3.7
18	6	1	117	53		274	269	[illegible]	4	4	1400	153	13	20	4.0	3.7
20	6	1	116	207	30	273	242	2518286	4	4	1442	537	16	34	3.9	3.1
20	6	1	117	206		273	244	2518286	4	4	1442	537	15	34	3.9	3.1
21	6	1	116	34	05	275	273	2523625	4	4	1348	102	11	16	4.1	3.9
21	6	1	117	34		275	273	2523625	4	4	1348	102	11	15	4.1	3.9
21	6	2	116	39	05	271	266	2523766	4	4	1499	106	18	22	3.8	3.6
21	6	2	117	39		271	267	2523766	4	4	1499	106	17	22	3.8	3.6
21	6	3	116	51	08	255	247	2524074	4	4	1797	121	29	33	3.3	3.1
21	6	3	117	50		256	248	2524074	4	4	1797	121	29	32	3.3	3.2
21	6	4	116	45	06	242	235	2524281	4	4	2005	100	35	37	3.0	3.0
21	6	4	117	44		242	236	2524281	4	4	2005	100	35	37	3.1	3.0
22	10	1	116	47	07	258	252	2529460	4	4	1752	116	27	31	3.4	3.2
22	10	1	117	47		259	252	2529460	4	4	1752	116	26	30	3.4	3.3
22	10	2	116	54	08	240	241	2529616	4	4	1907	127	32	35	3.2	3.1
22	10	2	117	53		230	242	2529616	4	4	1907	127	31	35	3.2	3.1
23	6	1	116	165	23	260	236	2534870	4	4	1721	393	25	37	3.4	3.0
23	6	1	117	162		261	236	2534870	4	4	1721	393	26	37	3.4	3.0

23	6	2	116	64	09	302	312	2535826	4	4	2679	145	36	33	3.0	3.1			
23	6	2	117	63		301	311	2535826	4	4	2679	146	37	34	3.0	3.1			
24	6	1	116	180	26	263	237	2540253	4	4	1671	431	24	37	3.4	3.1			
24	6	1	117	178		264	237	2540253	4	4	1671	431	24	36	3.5	3.0			
25	6	0	116	11	02	139	142	2544608	4	4	592	49	-18	-16	6.5	6.3			
25	6	0	117	11		137	140	2544608	4	4	592	49	-19	-17	6.4	6.3			
25	7	1	116	77	11	251	240	2545891	4	4	1876	181	31	36	3.2	3.0			
25	7	1	117	76		252	241	2545891	4	4	1876	181	30	35	3.2	3.1			
27	7	0	116	6	00	101	103	2554869	4	4	0	31	-36	-35	7.9	7.9			
27	7	0	117	6		100	102	2554869	4	4	0	31	-36	-36	7.9	7.9			
31	6	1	116	36	06	158	161	2577454	4	4	850	138	-9	-3	5.4	5.0			
31	6	1	117	36		158	160	2577454	4	4	850	138	-10	-4	5.4	5.1			
31	6	2	116	36	05	170	174	2577755	4	4	1151	119	8	8	4.6	4.4			
31	6	2	117	35		169	173	2577755	4	4	1151	119	2	7	4.7	4.4			
32	5	1	116	39	05	253	248	2619243	4	4	1879	89	30	33	3.2	3.1			
32	5	1	117	38		254	249	2619243	4	4	1879	89	30	33	3.2	3.1			
32	5	2	116	38	06	245	240	2619371	4	4	2006	87	35	37	3.1	3.0			
32	5	2	117	38		246	241	2619371	4	4	2006	87	34	37	3.1	3.0			
37	5	1	116	57	09	258	250	2624595	4	4	1799	139	27	32	3.3	3.2			
37	5	1	117	57		259	251	2624595	4	4	1799	139	27	32	3.3	3.2			
37	5	2	116	146	21	242	221	2624853	4	4	2057	331	36	42	3.1	2.9			
37	5	2	117	145		243	222	2624853	4	4	2057	331	36	42	3.1	3.0			
38	2	1	116	37	05	274	271	2629696	4	4	1469	103	13	18	3.9	3.7			
38	2	1	117	37		274	271	2629696	4	4	1469	103	12	17	3.9	3.7			
38	2	2	116	57	08	258	250	2630032	4	4	1805	137	27	32	3.3	3.2			
38	2	2	117	56		259	251	2630032	4	4	1805	137	27	32	3.3	3.2			
38	2	3	116	113	10	242	226	2630289	4	4	2062	255	36	41	3.1	2.9			
38	2	3	117	112		243	227	2630289	4	4	2062	255	36	41	3.1	3.0			
39	5	1	116	40	06	270	265	2535244	4	4	1583	104	18	23	3.6	3.4			

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 39  5 1 117  40    271 266 2635244  4 4 1503 104 18 22 3.6 3.4
 39  5 2 116 159 43 260 237 2635435  4 4 1773 373 26 38 3.3 3.0
 39  5 2 117 159    261 238 2635435  4 4 1773 378 26 38 3.3 3.0
 40  4 1 116  66 23 241 237 2640852  4 4 1760 393 26 38 3.3 3.0
 40  4 1 117 165    262 238 2640852  4 4 1760 393 25 36 3.4 3.0
 41  4 0 116  12 02 139 142 2645172  4 4  649  49-21-19 5.8 5.7
 41  4 0 117  12    137 140 2645172  4 4  649  49-22-20 5.8 5.7
 42  5 1 116  44 06 254 248 2646404  4 4 1881 105 30 33 3.3 3.1
 41  5 1 117  48    255 249 2646404  4 4 1881 105 29 33 3.3 3.2
 42  3 1 116  37 06 233 228 2652167  4 4 2213  86 39 41 3.1 3.1
 42  3 1 117  37    234 228 2652167  4 4 2213  86 39 41 3.1 3.1
 43  3 0 116   7 01 101 103 2655431  4 4    0  31-39-38 7.3 7.3
 43  3 0 117   7    100 102 2655431  4 4    0  31-39-39 7.2 7.2
 47 10 1 116  36 05 153 161 2678004  4 4  905 138-11 -5 5.4 5.0
 47 10 1 117  37    152 160 2678004  4 4  905 138-12 -6 5.2 4.9
 47 10 3 116  32 04 238 234 2679257  4 4 2158  76 38 39 3.2 3.2
 47 10 3 117  32    239 234 2679257  4 4 2158  76 37 39 3.2 3.2
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AAA BB C DDD EEE FF GHH GII JKKKKK L M NNNN OOO PP QQ RRR SSS

A ORBITAL TIME/CYCLE NUMBER

B PROGRAM NUMBER

C OPERATION NUMBER

D PAN. CAMERA SERIAL NUMBER (MASTER IS EVEN, SLAVE IS ODD)

E EST. NO OF PAN FRAMES, BASED ON COUNTER READINGS INFLITE

F EST. NUMBER OF STELLAR/INDEX FRAMES

G QUADRANT (QUAD 1 IS NORTHBOUND FROM ASCENDING NODE)

H EST. LATITUDE OF FIRST FORMAT CENTER IN PASS

I EST. LATITUDE OF LAST FORMAT CENTER IN PASS

J = ZULU DATE

K SYSTEM TIME IN SECONDS (GMT)

L FMC PROGRAMMER REFERENCE LEVEL

M FMC PROGRAMMER AMPLITUDE LEVEL

N EST. TIME UP RAMP IN SECONDS TO OPERATE COMMAND

O EST. SECONDS DURATION OF OPERATION, BETWEEN ON AND OFF

P SOLAR ELEVATION AT ITEM J

Q SOLAR ELEVATION AT ITEM I

R EST. MILLISECONDS EXPOSURE TIME AT ITEM H

S EST. MILLISECONDS EXPOSURE TIME AT ITEM I

FRAMES TO FEET, PAN X 2.562, STELLAR X 0.099, INDEX X 0.198

PRELIMINARY CLOCK CORRELATION

ORBIT	SYSTEM TIME	CLOCK TIME
9	43946.553	55342.018
25	44530.152	142334.590

[redacted]

SYSTEM NUMBER J-02

VEHICLE NUMBER 1163

MISSION NUMBER 1002

PANORAMIC CAMERA NUMBERS 116 AND 117

STELLAR/INDEX CAMERA NUMBER D18/17/18

PERFORMANCE ESTIMATE

SUB	PROG		CAM NO.	PAN FR.	SI FR	LAT. ON	LAT. OFF	TIME ON ZD ST	NO		TUR SEC.	DUR SEC	SOLAR ON	SOLAR OFF	EXPOS. ON	EXPOS. OFF
LAUNCH			116	122	17											
LAUNCH			117	126												
0	8	0	116	9	01	221	219	2383345	3	4	0	44	37	37	6.1	6.0
0	8	0	117	9		223	220	2383345	3	4	0	44	37	37	6.1	6.0
2	8	1	116	49	07	274	268	24 6777	3	4	1196	154	14	20	4.4	4.1
2	8	1	117	49		274	269	24 6777	3	4	1196	154	13	20	4.4	4.1
4	6	1	116	65	10	254	245	2418060	3	4	1808	154	29	32	3.2	3.1
4	6	1	117	65		255	246	2418060	3	4	1808	154	28	32	3.2	3.1
5	6	1	116	48	06	272	266	2423162	3	4	1474	132	17	22	3.8	3.5
5	6	1	117	48		273	267	2423162	3	4	1474	132	17	21	3.8	3.5
5	6	2	116	45	07	254	248	2423502	3	4	1813	106	29	31	3.2	3.1
5	6	2	117	45		255	249	2423502	3	4	1813	106	28	31	3.2	3.1
6	6	1	116	58	08	258	250	2428876	3	4	1749	140	27	31	3.3	3.1
6	6	1	117	58		259	250	2428876	3	4	1749	140	26	30	3.3	3.1
6	6	2	116	53	08	244	236	2429103	3	4	1976	119	33	35	3.1	3.0
6	6	2	117	53		245	237	2429103	3	4	1976	119	32	35	3.0	3.0
7	6	1	116	51	07	259	252	2434298	3	4	1682	124	26	30	3.3	3.1
7	6	1	117	51		260	252	2434298	3	4	1682	124	26	29	3.3	3.1
7	6	2	116	80	11	249	237	2434463	3	4	1848	181	31	34	3.1	2.9
7	6	2	117	80		250	238	2434463	3	4	1848	181	31	34	3.1	2.9
8	10	1	116	154	22	265	243	2439628	3	4	1579	374	23	33	3.5	3.0
8	10	1	117	153		266	243	2439628	3	4	1579	374	22	33	3.5	3.0
9	3	0	116	15	03	135	139	2443951	3	4	473	64-18-16			6.1	5.9
9	3	0	117	15		133	137	2443951	3	4	473	64-19-17			6.1	5.9
9	3	1	116	133	19	261	242	2445136	3	4	1658	317	25	33	3.3	3.0
9	3	1	117	132	9	262	243	2445136	3	4	1658	317	25	33	3.4	3.0
11	3	0	116	7	01	123	125	2454633	3	4	0	32-24-23			6.9	6.9
11	3	0	117	7		121	123	2454633	3	4	0	32-25-24			6.9	6.9
17	4	1	116	44	06	270	264	25 2055	4	4	1511	121	19	24	3.8	3.6
17	4	1	117	43		271	265	25 2055	4	4	1511	121	18	23	3.9	3.7
18	6	1	116	53	07	274	268	25 7375	4	4	1400	153	14	20	4.0	3.7
18	6	1	117	53		274	269	25 7375	4	4	1400	153	13	20	4.0	3.7
20	6	1	116	207	30	273	243	2518286	4	4	1442	537	16	34	3.9	3.1
20	6	1	117	206		273	244	2518286	4	4	1442	537	15	34	3.9	3.1
21	6	1	116	34	05	275	273	2523625	4	4	1348	102	11	16	4.1	3.9
21	6	1	117	34		275	273	2523625	4	4	1348	102	11	15	4.1	3.9
21	6	2	116	39	05	271	266	2523776	4	4	1499	106	18	22	3.8	3.6
21	6	2	117	39		271	267	2523776	4	4	1499	106	17	22	3.8	3.6
21	6	3	116	51	08	255	247	2524074	4	4	1797	121	29	33	3.3	3.1
21	6	3	117	50		256	248	2524074	4	4	1797	121	29	32	3.3	3.2
21	6	4	116	45	06	242	235	2524281	4	4	2005	100	35	37	3.0	3.0

[redacted]

[redacted]

[redacted]

21	6	4	117	44	178	242	236	2524281	4	4	2005	100	35	37	3.1	3.0
22	10	1	116	47	07	258	252	2529460	4	4	1752	116	27	31	3.4	3.2
22	10	1	117	47	182	259	252	2529460	4	4	1752	116	26	30	3.4	3.3
22	10	2	116	54	08	249	241	2529616	4	4	1907	127	32	35	3.2	3.1
22	10	2	117	53	180	250	242	2529616	4	4	1907	127	31	35	3.2	3.1
23	6	1	116	165	23	260	236	2534870	4	4	1721	393	26	37	3.4	3.0
23	6	1	117	162	213	261	236	2534870	4	4	1721	393	26	37	3.4	3.0
23	6	2	116	64	09	302	312	2535828	4	4	2679	145	36	33	3.0	3.1
23	6	2	117	63	221	301	311	2535828	4	4	2679	145	37	34	3.0	3.1
24	6	1	116	180	26	263	237	2540253	4	4	1671	431	24	37	3.4	3.0
24	6	1	117	178	28	264	237	2540253	4	4	1671	431	24	36	3.5	3.0
25	6	0	116	11	02	139	142	2544608	4	4	592	49-18-16			6.5	6.3
25	6	0	117	11	[illegible]	137	140	2544608	4	4	592	49-19-17			6.4	6.3
25	7	1	116	77	11	251	240	2545891	4	4	1876	181	31	36	3.2	3.0
25	7	1	117	76	[illegible]	252	241	2545891	4	4	1876	181	30	35	3.2	3.1
27	7	0	116	6	00	101	103	2554869	4	4	0	31-36-35			7.9	7.9
27	7	0	117	6		100	102	2554869	4	4	0	31-36-36			7.9	7.9
31	6	1	116	36	06	153	161	2577454	4	4	850	138	-9	-3	5.4	5.0
31	6	1	117	36		152	160	2577454	4	4	850	138-10		-4	5.4	5.1
31	6	2	116	36	05	170	174	2577755	4	4	1151	119	3	8	4.6	4.4
31	6	2	117	35		169	173	2577755	4	4	1151	119	2	7	4.7	4.4
36	5	1	116	38	05	253	248	2619243	4	4	1879	89	30	33	3.2	3.1
36	5	1	117	38		254	249	2619243	4	4	1879	89	30	33	3.2	3.1
36	5	2	116	38	06	245	240	2619371	4	4	2006	87	35	37	3.1	3.0
36	5	2	117	38		246	241	2619371	4	4	2006	87	34	37	3.1	3.0
37	5	1	116	57	08	258	250	2624595	4	4	1799	139	27	32	3.3	3.2
37	5	1	117	57		259	251	2624595	4	4	1799	139	27	32	3.3	3.2
37	5	2	116	146	21	242	221	2624853	4	4	2057	331	36	42	3.1	2.9
37	5	2	117	145		243	222	2624853	4	4	2057	331	36	42	3.1	3.0
38	2	1	116	37	05	274	271	2629696	4	4	1469	103	13	18	3.9	3.7
38	2	1	117	37		274	271	2629696	4	4	1469	103	12	17	3.9	3.7
38	2	2	116	57	08	258	250	2630032	4	4	1805	137	27	32	3.3	3.2
38	2	2	117	56		259	251	2630032	4	4	1805	137	27	32	3.3	3.2
38	2	3	116	113	16	242	226	2630289	4	4	2062	255	36	41	3.1	2.9
38	2	3	117	112		243	227	2630289	4	4	2062	255	36	41	3.1	3.0
39	5	1	116	40	06	270	265	2635244	4	4	1583	104	18	23	3.6	3.4
39	5	1	117	40		271	266	2635244	4	4	1583	104	18	22	3.6	3.4
39	5	2	116	159	23	260	237	2635435	4	4	1773	378	26	38	3.3	3.0
39	5	2	117	159		261	238	2635435	4	4	1773	378	26	38	3.3	3.0
40	4	1	116	166	23	261	237	2640852	4	4	1760	393	26	38	3.3	3.0
40	4	1	117	165		262	238	2640852	4	4	1760	393	25	38	3.4	3.0
41	4	0	116	12	02	139	142	2645172	4	4	649	49-21-19			5.8	5.7
41	4	0	117	12		137	140	2645172	4	4	649	49-22-20			5.8	5.7
41	5	1	116	44	06	254	248	2646404	4	4	1881	105	30	33	3.3	3.1
41	5	1	117	43		255	249	2646404	4	4	1881	105	29	33	3.3	3.2
42	3	1	116	37	06	233	228	2652167	4	4	2213	86	39	41	3.1	3.1
42	3	1	117	37		234	228	2652167	4	4	2213	86	39	41	3.1	3.1
43	3	0	116	7	01	101	103	2655431	4	4	0	31-39-38			7.3	7.3
43	3	0	117	7		100	102	2655431	4	4	0	31-39-39			7.2	7.2
47	10	1	116	36	05	153	161	2678004	4	4	905	138-11		-5	5.4	5.0
47	10	1	117	37		152	160	2678004	4	4	905	138-12		-6	5.2	4.9
47	10	3	116	32	04	238	234	2679257	4	4	2158	76	38	39	3.2	3.2
47	10	3	117	32		239	234	2679257	4	4	2158	76	37	39	3.2	3.2

AAA BB C DDD EEE FF GHH GII JJKKKKK L M NNNN OOO PP QQ RRR SSS

[redacted]

[redacted]

A ORBITAL TIMER SUBCYCLE NUMBER
B PROGRAM NUMBER
C OPERATION NUMBER
D PAN. CAMERA SERIAL NUMBER (MASTER IS EVEN, SLAVE IS ODD)
E EST. NO OF PAN FRAMES, BASED ON COUNTER READINGS INFLITE
F EST. NUMBER OF STELLAR/INDEX FRAMES
G QUADRANT (QUAD 1 IS NORTHBOUND FROM ASCENDING NODE)
H EST. LATITUDE OF FIRST FORMAT CENTER IN PASS
I EST. LATITUDE OF LAST FORMAT CENTER IN PASS
J ZULU DATE
K SYSTEM TIME IN SECONDS (GMT)
L FMC PROGRAMMER REFERENCE LEVEL
M FMC PROGRAMMER AMPLITUDE LEVEL
N EST. TIME UP RAMP IN SECONDS TO OPERATE COMMAND
O EST. SECONDS DURATION OF OPERATION, BETWEEN ON AND OFF
P SOLAR ELEVATION AT ITEM H
Q SOLAR ELEVATION AT ITEM I
R EST. MILLISECONDS EXPOSURE TIME AT ITEM H
S EST. MILLISECONDS EXPOSURE TIME AT ITEM I

FRAMES TO FEET, PAN X 2.662, STELLAR X 0.099, INDEX X 0.198

PRELIMINARY CLOCK CORRELATION

ORBIT	SYSTEM TIME	CLOCK TIME
9	43946.553	55342.018
25	44539.152	142334.590

[redacted]