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(Including Cover Sheet)

CORONA "J" FLIGHT DATA BOOK

SYSTEM NO. J-22

VEHICLE NO. 1617

MISSION NO. 1022

CAMERA NOS. 168 & 169

Prepared by: [REDACTED]

Checked by: [REDACTED]

Approved by: [REDACTED]

Approved by: [REDACTED]

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In Accordance with E. O. 12958

on NOV 26 1997

27 JUL 1965

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SYSTEM NO. NG 1-22
VEHICLE NO. 1617
MISSION NO. 1022
CAMERA NOS. 168/169

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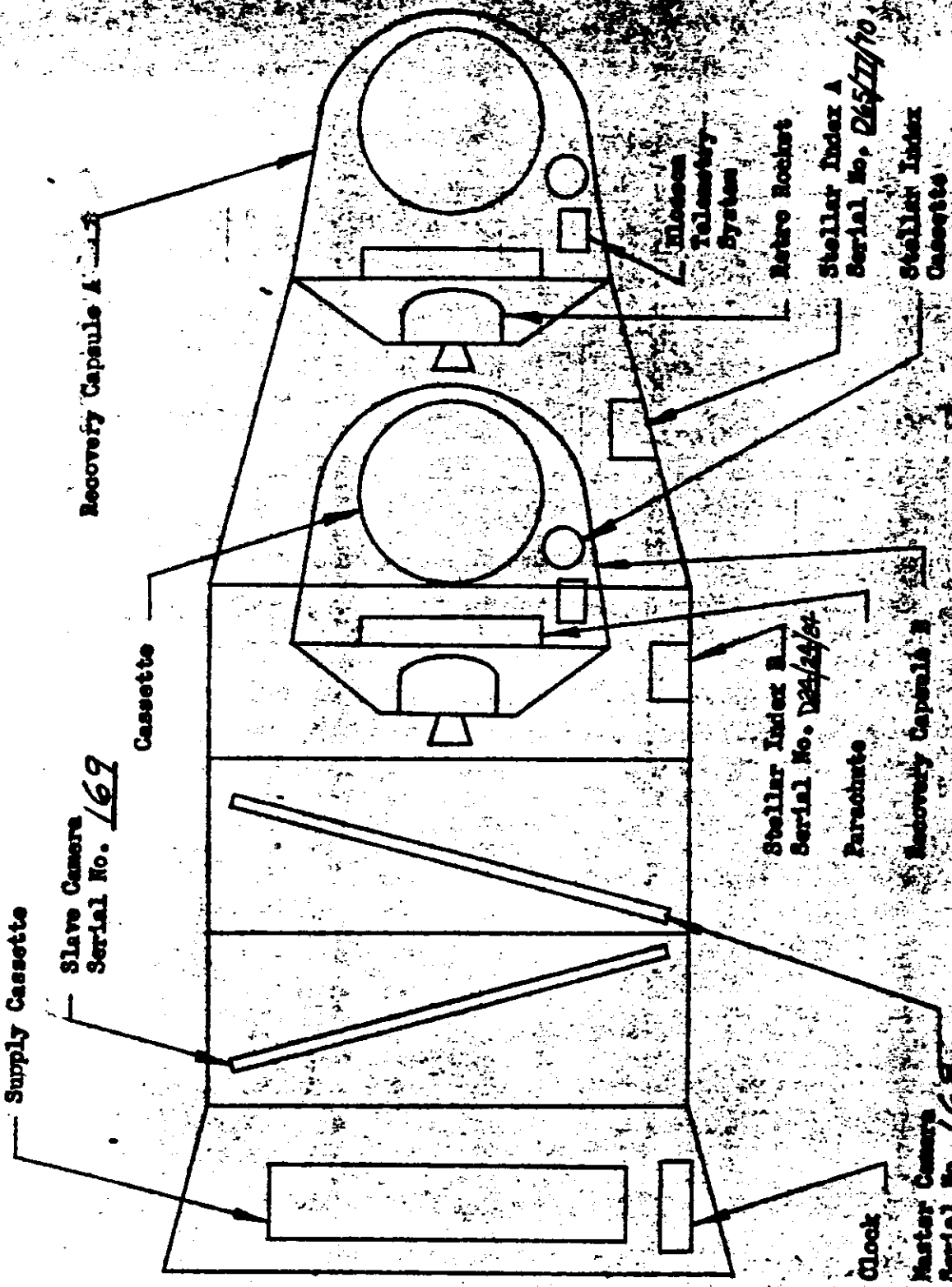
SYSTEM NO. J-22
VEHICLE NO. 1617
MISSION NO. 1022
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VEHICLE LAYOUT:

NO. [REDACTED]



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CAMERA NOS. 168 & 169

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GENERAL FLIGHT DATA:

Master Camera Serial No. 168

Slave Camera Serial No. 169

Stellar Index "A" Serial No. D65/77/70

Stellar Index "B" Serial No. D24/24/24

Launch Date 7/19/65

Reactivation Date NA

Reactivation Orbit No. NA

Orbital Parameters: (Rev. 32)

Period 91.009 Min.

Eccentricity 0.02136

Perigee 99.672 NM

Perigee Latitude 230.26 Deg.

Apogee 254.20 NM

Inclination Angle 85.052 Deg.

Recovery Orbit No. 65

Recovery Date 7/23/65

REMARKS:

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VEHICLE NO. 1617
MISSION NO. 1023
CAMERA NOS. 168 & 169

LENS DATA SUMMARY: Maxitraz Camera No. 168

Lens Serial No. 1532435

Slit Width .250 Inch

Filter Type WRITTEN 25

Equivalent Operational Focal Length 609.625 MM

Resolution:

Static:

	Lines/MM	Film Type	Target Contrast
Focus Test	<u>238</u>	<u>53402</u>	<u>HIGH</u>
Other	<u>142</u>	<u>53402</u>	<u>LOW</u>

Dynamic:

	Lines/MM	Film Type	Target Contrast
Itak ^{Post} Vibration	<u>184</u>	<u>3404</u>	<u>HIGH</u>
Itak Post Vibration	<u>131</u>	<u>3404</u>	<u>LOW</u>
AP	<u>171</u>	<u>3404</u>	<u>HIGH</u>
AP	<u>117</u>	<u>3404</u>	<u>LOW</u>
Other	<u> </u>	<u> </u>	<u> </u>

Note: Itak Post Vibration Resolution of 184 lines/MM Reported In

Message No. dated

Distortion - Positive (Pincushion)

Angle Off Axis Deg.	<u>3</u>	<u>2</u>	<u>1</u>	<u>0</u>	<u>359</u>	<u>358</u>	<u>357</u>		
Distortion Millimeters	<u>.004</u>	<u>.002</u>	<u>.000</u>	<u>.000</u>	<u>.000</u>	<u>.002</u>	<u>.005</u>		

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CAMERA NOS. 168, 169

LENS DATA SUMMARY: (Horizon Cameras for Panoramic Camera No. 168)

	Take-Up	Supply
Lens Serial No.	<u>813513</u>	<u>812308</u>
Exposure Time	<u>1/100</u> Sec.	<u>1/100</u> Sec.
Filter Type	<u>WRATTEN 25</u>	<u>WRATTEN 25</u>
Aperture	<u>F8.0</u>	<u>F6.8</u>
Operational Focal Length	<u>54.59</u> MM	<u>55.07</u> MM
Radial Distortion:		
10° off Axis	<u>.001</u> MM	<u>.000</u> MM
20° off Axis	<u>.001</u> MM	<u>.007</u> MM
Tangential Distortion (Maximum Vector)	<u>.006</u> MM	<u>.005</u> MM

Resolution:

Angle off Axis Deg.	0	5°	10	15	20	25	27.5	0	5	10	15	20	25	27.5
Radial Resolution	116	116	108	99	73	63	49	130	123	96	71	62	83	65
Tangential Resolution	116	109	100	86	72	43	36	116	109	95	66	48	53	44

RESOLUTION ON-AXIS 116 Lines/MM Avg. 123 Lines/MM Avg.

Notes:

1. Distortion and resolution are read at equivalent operational focal length.
2. Resolution in lines per mm on 3404 film and HIGH contrast target.

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VEHICLE NO. 1617

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CAMERA NOS. 168 & 169

LENS DATA SUMMARY: Slave Camera No. 169

Lens Serial No. 1582435

Slit Width .175 Inch

Filter Type WRITTEN 21

Equivalent Operational Focal Length 609.60 MM

Resolution:

Static:

	<u>Lines/MM</u>	<u>Film Type</u>	<u>Target Contrast</u>
Bench Test	<u>265</u>	<u>3404Z</u>	<u>HIGH</u>
Other	<u>139</u>	<u>3404</u>	<u>LOW</u>

Dynamic:

^{Post} Itek Pre -Vibration	<u>193</u>	<u>3404</u>	<u>HIGH</u>
Itek Post Vibration	<u>128</u>	<u>3404</u>	<u>LOW</u>
AP	<u>196</u>	<u>3404</u>	<u>HIGH</u>
AP	<u>109</u>	<u>3404</u>	<u>LOW</u>
Other			

NOTE: Itek Post Vibration Resolution of 193 lines/MM Reported In

Message No. _____ dated _____

Distortion - Positive (Pincushion)

Angle Off Axis Deg.	<u>3</u>	<u>2</u>	<u>1</u>	<u>0</u>	<u>359</u>	<u>358</u>	<u>357</u>		
Distortion Millimeters	<u>.002</u>	<u>.002</u>	<u>.000</u>	<u>.000</u>	<u>.002</u>	<u>.003</u>	<u>.004</u>		

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VEHICLE NO. 16M

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MISSION NO. 1022

CAMERA NOS. 168E169

LENS DATA SUMMARY: (Horizon Camera for SLAVE Camera No. 169)

	<u>Take-Up</u>	<u>Supply</u>
Lens Serial No.	<u>812297</u>	<u>812311</u>
Exposure Time	<u>1/100</u> Sec.	<u>1/100</u> Sec.
Filter Type	<u>WRITTEN 25</u>	<u>WRITTEN 25</u>
Aperture	<u>F6.3</u>	<u>F8.0</u>
Operational Focal Length	<u>55.159</u> MM	<u>55.187</u> MM
Radial Distortion:		
10° off Axis	<u>.009</u> MM	<u>.026</u> MM
20° off Axis	<u>.013</u> MM	<u>.045</u> MM
Tangential Distortion (Maximum Vector)	<u>.007</u> MM	<u>.003</u> MM

Resolution:

Angle off Axis Deg.	0°	5°	10°	15°	20°	25°	30°
Radial Resolution	164	145	144	119	110	99	65
Tangential Resolution	164	145	126	102	91	60	44

Angle off Axis Deg.	0°	5°	10°	15°	20°	25°	30°
Radial Resolution	164	173	162	141	137	132	41
Tangential Resolution	164	172	127	108	91	60	46

RESOLUTION ON AXIS 164 Lines/MM Avg. 164 Lines/MM Avg.

NOTE:

- Distortion and resolution are read at equivalent operational focal length.
- Resolution in lines per MM on 3404 film and HIGH contrast target.

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 MISSION NO. 1022 NO. [REDACTED]
 CAMERA NOS. 168 & 169

LENS DATA SUMMARY STELLAR INDEX D65/77/70: "A" MISSION

	<u>Stellar</u>	<u>Index</u>
Lens Serial No.	<u>11972</u>	<u>B17461</u>
Reseau Serial No.	<u>70</u>	<u>77</u>
Filter Type	<u>NONE</u>	<u>WRITTEN 21</u>
Aperture	<u>F/1.8</u>	<u>F/4.5</u>
Exposure Time	<u>2.0</u> Sec.	<u>1/500</u> Sec.
Equivalent Focal Length	<u>84.00</u> MM	<u>38.35</u> MM

Resolution:

Angle Off Axis	0°	10°	20°	30°	35°
Resolution L/MM	74	81	101	98	93
High Contrast	74	81	86	39	25

NOTE: Index Resolution of 72.5 Lines/MM AWAR
 Read From 3400 Film.

Distortion:

All distortions less than maximum allowable. Full Data to be reported as part of Photogrameter Data Reduction.

Alignment:

.0003 "/.937 Inches .0004 "/2.25 Inches

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 MISSION NO. 1022
 CAMERA NOS. 168 & 169

LENS DATA SUMMARY STELLAR INDEX D24/24/24: "B" MISSION

	<u>Stellar</u>		<u>Index</u>	
Lens Serial No.	<u>10079</u>		<u>811900</u>	
Reseau Serial No.	<u>24</u>		<u>24</u>	
Filter Type	<u>NONE</u>		<u>WRATTEN 21</u>	
Aperture	<u>F/1.8</u>		<u>F/4.5</u>	
Exposure Time	<u>2.0</u>	Sec.	<u>1/500</u>	Sec.
Equivalent Focal Length	<u>83.76</u>	MM	<u>38.37</u>	MM

Resolution:

Angle Off Axis	0°	10°	20°	30°	35°
Resolution L/MM High Contrast	96 90	100 104	112 100	81 45	67 35

NOTE: Index Resolution of 72.2 Lines/MM AWAR
 Read From 3400 Film.

Distortion:

All distortions less than maximum allowable. Full Data to be reported as part of Photogrammetric Data Reduction.

Alignment:

.000 "/.937 Inches .022 MM "/2.25 Inches

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DEFINITION OF PANORAMIC CAMERA FORMAT CALIBRATIONS:

- 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 $\pm 5^\circ$ of arc so positioned to form an angle of $\pm 15.00^\circ \pm 5^\circ$ to the mechanical interface for master camera calibrations and an angle of $\pm 15.00^\circ \pm 5^\circ$ 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 $75.00^\circ \pm 5^\circ$ 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 Dsx and Dsy 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.

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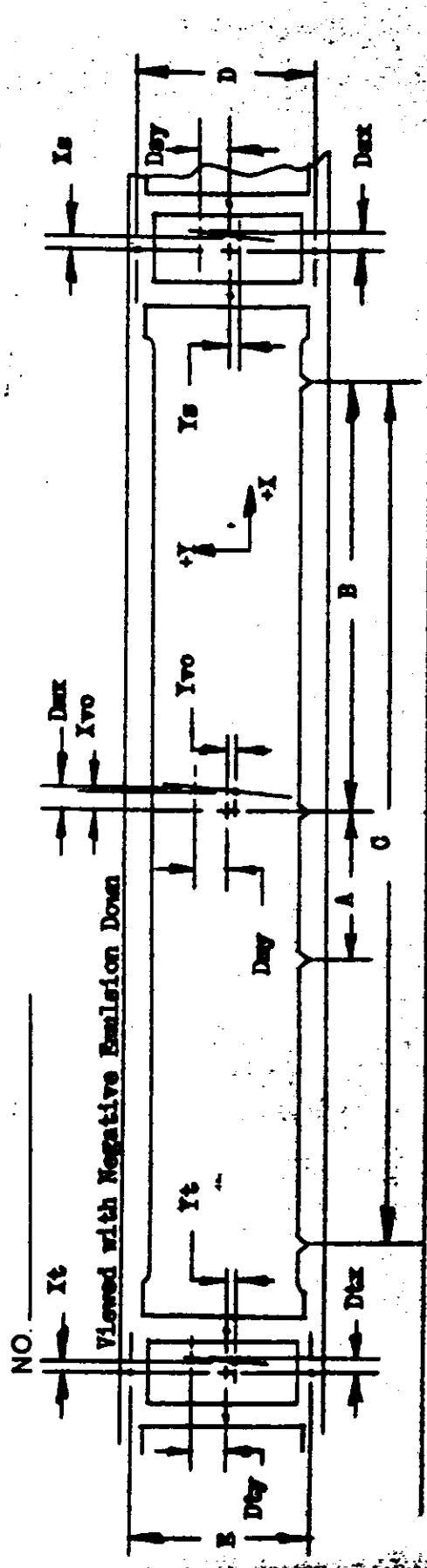
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SYSTEM NO. 1617
VEHICLE NO. 1022
MISSION NO. 168-E-169
CAMERA NOS. 168-E-169

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FORMAT DIMENSIONS: (PANORAMIC FORMATS)



Camera No.	Vehicle Motion	Scan Direction
A 76.022	Xt + 0.012	Dtx + 0.011
B 355.017	Yt - 0.018	Dvy + 2.982
C 709.856	Xs - 0.344	Dsx - 0.339
D 56.510	Ys - 0.031	Dsy - 2.031
E 56.535	Xvo - 0.004	Dvx - 0.005
	Yvo + 1.768	Dvy + 21.768

Format Dimensions:

Height	Panoramic	Take-Up	Supply
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

- Notes:
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, Dv, Ds, X and Y dimensions are taken 10MM above point defining target center.
 4. Format Sign Convention

$$\begin{matrix} -X+Y & +X+Y \\ -X-Y & +X-Y \end{matrix}$$

Format Dimensions:

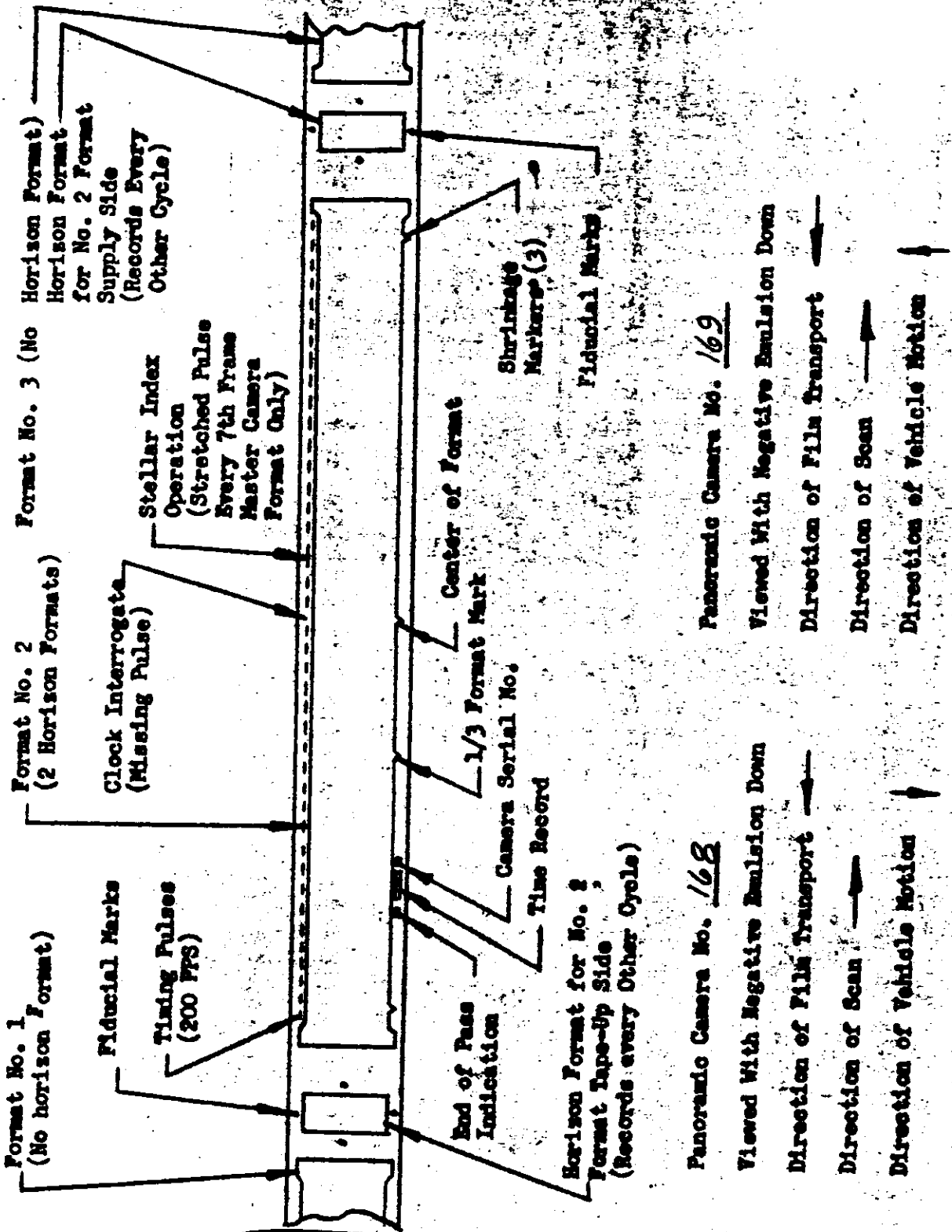
Height	Panoramic	Take-Up	Supply
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

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FORMAT LAYOUT: (PANORAMIC CAMERAS)



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MISSION NO. 1022
CAMERA NOS. 168 & 169

LENS SETTINGS AND FILM TYPES:

Panoramic Camera Settings:	Camera No. <u>168</u>	Camera No. <u>169</u>
Panoramic Optics Slit Width	<u>.250</u> in.	<u>.175</u> in.
Panoramic Optics Filter Type	<u>WRITTEN 25</u>	<u>WRITTEN 21</u>
Horizon Optics Exp. Time	<u>1/100</u> sec.	<u>1/100</u> sec.
Horizon Optics Aperture	<u>SUPPLY F6.8</u> <u>TAKE-UP F8.0</u>	<u>SUPPLY F8.0</u> <u>TAKE-UP F6.8</u>
Horizon Optics Filter Type	<u>WRITTEN 25</u>	<u>WRITTEN 25</u>

Stellar Index Camera Settings:

	Stellar Index A		Stellar Index B	
	Stellar	Index	Stellar	Index
Exposure Time	<u>2.0 Sec.</u>	<u>1/500</u>	<u>2.0 Sec.</u>	<u>1/500</u>
Aperture Setting	<u>F/1.8</u>	<u>F/4.5</u>	<u>F/1.8</u>	<u>F/4.5</u>
Filter Type	<u>NONE</u>	<u>WRITTEN 21</u>	<u>NONE</u>	<u>WRITTEN 21</u>
Ratio: One Stellar Index Frame Per	<u>7</u>		Master Camera Frames.	

Film:

Panoramic Cameras:	Camera No. <u>168</u>	Camera No. <u>169</u>
Type	<u>3404</u>	<u>3404</u>
Length	<u>16000</u> ft.	<u>16000</u> ft.
Splices	<u>3</u>	<u>2</u>
Emul. Data	<u>20B-1-5-5</u>	<u>20B-1-5-5</u>

Stellar Index Cameras:

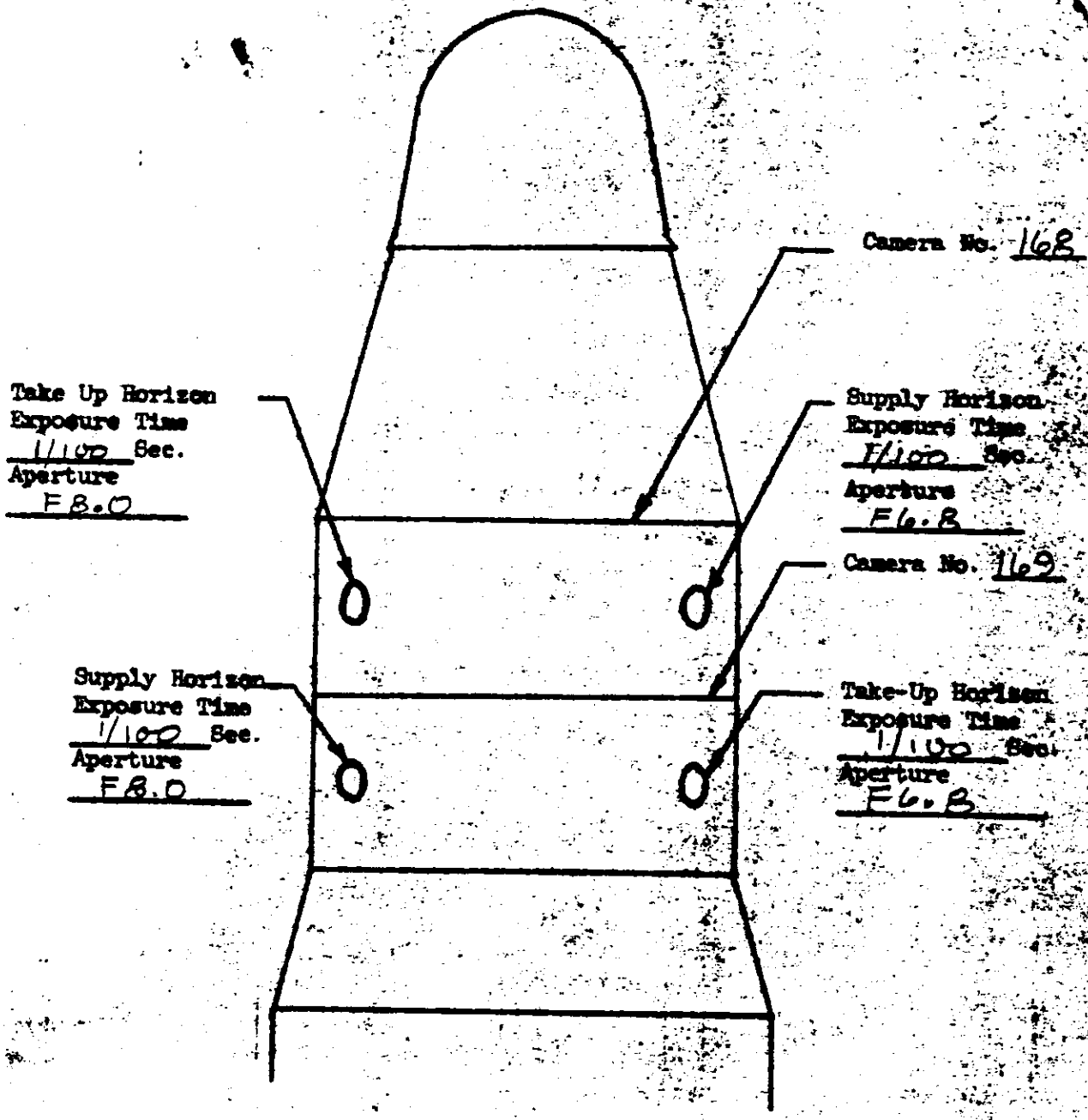
	Stellar Index A		Stellar Index B	
	Stellar	Index	Stellar	Index
Type	<u>3401</u>	<u>3400</u>	<u>3401</u>	<u>3400</u>
Emul. Data	<u>124-35-6-5</u>	<u>37-1-2-5</u>	<u>124-35-6-5</u>	<u>37-1-2-5</u>

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HORIZON LINE SETTINGS (Viewed from top of vehicle in flight)



Flight Direction



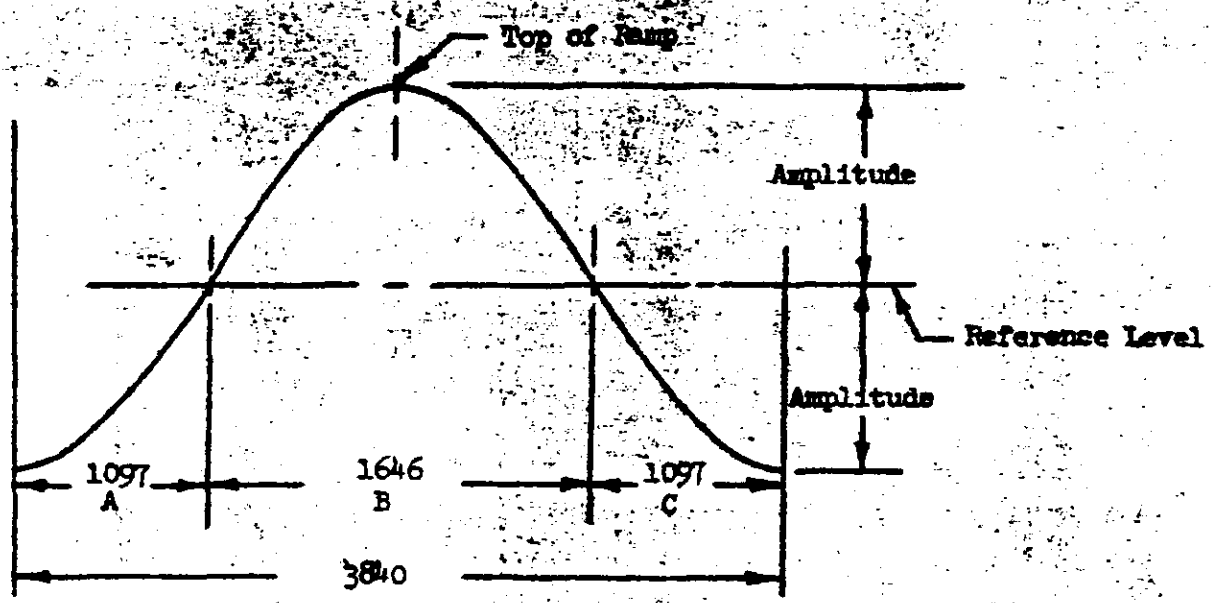
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V/H RAMP CONFIGURATION AND CONSTANTS:



Cycle Rate Computation:

- A. 0 to 1097 Sec Up Ramp: $CPS = R+A \sin (1.5 X - 1.5707963)$
- B. 1097 to 2743 Sec Up Ramp: $CPS = R+A \sin (2 X - 2.0943951) \leq .4625$
- C. 2743 to 3840 Sec Up Ramp: $CPS = R+A \sin (1.5 X - 0.7853982)$

FMC Rate Computation:

$$FMC \text{ Rate (In/Sec)} = 2 \pi \left(\frac{0.3223}{CP} \right) = 2.02507 \times CPS$$

$$FMC \text{ Rate (Radians/Sec)} = 2 \pi \left(\frac{0.3224}{24 CP} \right) = 0.84378 \times CPS$$

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: $X = \frac{\text{Time Up Ramp (Seconds)}}{1047.6942}$ $R = \frac{1}{2} (CPS_{top} + CPS_{bottom})$
 $A = \frac{1}{2} (CPS_{top} - CPS_{bottom})$ $CP = \text{Camera Cycle Period in Sec/Cycle}$
 CPS = Camera Cycle Rate in Cycles/Sec
 SLIT = Slit Width in Inches

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CYCLE PERIOD DATA:

PRE-FLIGHT CYCLE PERIODS:

V/H Ramp Level	V/H Ramp Amplitude	Cycle Period Seconds		Time Up Ramp Sec
		Master	Slave	
8	3	5.091	5.094	150
8	3	2.254	2.266	1705
7	3	2.200	2.200	1845
7	3	2.201	2.201	1815
7	3	2.200	2.200	1866

IN-FLIGHT CYCLE PERIODS

V/H Ramp Level	V/H Ramp Amplitude	Cycle Period Seconds		Orbit No.	Time Up Ramp Sec
		Master	Slave		
8	3	5.08	5.12	9	150
8	3	2.310	2.321	16	1705
7	3	2.233	2.254	31	1845
7	3	2.250	2.265	47	1815
7	3	2.236	2.236	63	1866

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A. 1022-1, LAUNCH 2201Z, 7/19/65
B. DRY
C. FINAL PERFORMANCE ESTIMATE, PART 1

NO. [REDACTED]

OPERATIONS SUMMARY

FWD PAN. CAMERA NUMBER 168		Q		LAT		LONG		HEIGHT	RANGE	DA	H	M	S	LTIM	S-TIM		
OPN	NO	FRA															
PRE-FLT 128																	
1	4	0	20	ON	2	66	13	149	24W	779236	807809	19	23	27	58	1330	84478
				OFF	2	62	14	147	47W	753972	781584	19	23	28	58	1337	84538
2	4	1	16	ON	2	71	59	176	01W	816778	846782	20	00	57	32	1313	03452
				OFF	2	68	47	173	40W	794684	823845	20	00	58	21	1323	03501
5	5	1	73	ON	2	81	32	095	52E	884865	917479	20	05	28	03	1151	19683
				OFF	2	67	06	118	41E	778741	807295	20	05	31	54	1326	19914
5	5	2	22	ON	2	41	51	124	29E	648492	672118	20	05	38	10	1356	20290
				OFF	2	38	08	124	49E	635989	659145	20	05	39	05	1358	20345
6	5	1	47	ON	2	66	44	096	00E	774808	803213	20	07	03	02	1327	25382
				OFF	2	58	04	099	05E	722774	749204	20	07	05	12	1341	25512
6	5	2	21	ON	2	54	14	099	56E	702199	727850	20	07	06	09	1345	25569
				OFF	2	50	34	100	34E	684083	709050	20	07	07	04	1349	25624
6	5	3	23	ON	2	42	21	101	35E	649589	673257	20	07	09	05	1355	25745
				OFF	2	38	38	101	54E	636961	660153	20	07	10	00	1357	25800
7	9	1	15	ON	2	56	12	076	40E	711180	737170	20	08	36	42	1343	31002
				OFF	2	53	37	077	11E	697771	723254	20	08	37	20	1346	31040
7	9	2	15	ON	2	51	14	077	36E	686072	711114	20	08	37	56	1348	31076
				OFF	2	48	37	077	59E	674047	698635	20	08	38	35	1350	31115
7	9	3	69	ON	2	46	14	078	17E	663772	687974	20	08	39	10	1352	31150
				OFF	2	35	06	079	18E	626136	648922	20	08	41	54	1359	31314
8	9	1	21	ON	2	59	45	052	55E	729441	756123	20	10	06	51	1338	36411
				OFF	2	56	00	053	50E	708872	734775	20	10	07	47	1343	36467
8	9	2	78	ON	2	49	45	054	57E	678068	702808	20	10	09	20	1349	36560
				OFF	2	37	05	056	18E	630880	653844	20	10	12	27	1357	36747
9	9	0	9	ON	1	39	09	132	16W	1296730	1345478	20	11	17	33	0228	40653
				OFF	1	42	07	132	00W	1277092	1325057	20	11	18	20	0230	40700
9	9	1	109	ON	2	61	45	029	26E	739528	766592	20	11	37	23	1335	41843
				OFF	2	43	04	032	55E	649565	673232	20	11	42	00	1353	42120
10	5	1	37	ON	2	25	53	011	13E	607919	630022	20	13	17	14	1402	47834
				OFF	2	20	07	011	28E	604578	626557	20	13	18	38	1404	47918
11	6	1	19	ON	2	28	50	011	46W	611314	633545	20	14	47	33	1400	53253
				OFF	2	25	46	011	37W	607504	629591	20	14	48	18	1401	53298
11	6	2	19	ON	2	23	19	011	30W	605552	627567	20	14	48	53	1402	53333
				OFF	2	20	13	011	23W	604492	626467	20	14	49	38	1404	53378
16	6	0	10	ON	2	37	01	126	36W	626284	649076	20	22	20	40	1354	80440
				OFF	2	35	18	126	28W	622101	644736	20	22	21	05	1355	80465
18	1	1	33	ON	2	68	31	179	20W	767941	796085	21	01	14	54	1317	04494
				OFF	2	62	21	176	32W	731106	757851	21	01	16	27	1330	04587
18	1	2	19	ON	2	17	50	171	21W	606152	628189	21	01	27	23	1401	05243
				OFF	2	14	45	171	15W	608632	630762	21	01	28	08	1403	05288
19	1	1	23	ON	2	71	29	155	42E	785492	814303	21	02	45	10	1307	09910
				OFF	2	66	58	158	39E	756914	784638	21	02	46	19	1320	09979
19	1	2	54	ON	2	62	32	160	32E	730882	757619	21	02	47	26	1329	10046
				OFF	2	52	54	162	57E	681408	706274	21	02	49	50	1341	10190
20	1	1	31	ON	2	74	02	130	22E	800930	830330	21	04	15	32	1257	15332
				OFF	2	67	58	135	14E	761647	789551	21	04	17	05	1318	15425
20	1	2	22	ON	2	50	39	140	27E	670569	695026	21	04	21	24	1343	15684

NO

		OFF	2	46	58	140	58E	655673	679570	21	04	22	18	1346	15738		
20	1	3	42	ON	3	14	08	143	48E	709693	735625	21	04	37	12	1412	16632
		OFF	3	21	48	144	04E	757243	784977	21	04	39	05	1415	16745		
22	1	1	19	ON	2	82	30	061	39E	861869	893601	21	07	15	12	1121	26112
		OFF	2	79	15	075	27E	835024	865727	21	07	16	11	1217	26171		
22	1	2	81	ON	2	75	38	082	36E	808728	838426	21	07	17	09	1247	26229
		OFF	2	61	03	092	26E	718983	745268	21	07	20	52	1330	26452		
22	1	3	28	ON	2	57	41	093	21E	701385	727005	21	07	21	42	1335	26502
		OFF	2	53	00	094	20E	679040	703817	21	07	22	52	1340	26572		
22	1	4	36	ON	2	05	52	097	32E	627085	649906	21	07	34	22	1404	27262
		OFF	2	00	11	097	41E	644852	668341	21	07	35	45	1406	27345		
23	5	1	18	ON	2	81	32	044	18E	851488	882821	21	08	46	31	1143	31591
		OFF	2	78	11	055	12E	825334	855666	21	08	47	29	1228	31649		
23	5	2	99	ON	2	50	45	071	51E	668296	692668	21	08	54	26	1341	32066
		OFF	2	35	09	073	29E	619198	641724	21	08	58	15	1352	32295		
23	5	3	63	ON	2	32	44	073	38E	614690	637047	21	08	58	50	1353	32330
		OFF	2	23	08	074	07E	605813	627838	21	09	01	10	1357	32470		
24	3	1	24	ON	2	26	23	051	07E	607141	629215	21	10	31	24	1355	37884
		OFF	2	22	40	051	17E	605848	627874	21	10	32	18	1357	37938		
25	3	1	66	ON	2	57	47	024	45E	698584	724098	21	11	54	43	1333	42883
		OFF	2	47	05	026	39E	652336	676107	21	11	57	21	1343	43041		
25	3	2	60	ON	2	00	00	029	07E	647959	671564	21	12	08	49	1405	43729
		OFF	3	09	45	029	22E	691463	716707	21	12	11	12	1408	43872		
26	4	1	43	ON	2	24	55	005	28E	606291	628334	21	13	33	47	1355	48827
		OFF	2	18	09	005	44E	607687	629782	21	13	35	26	1358	48926		
27	1	1	24	ON	2	82	30	052	36W	852715	884095	21	14	50	16	1119	53416
		OFF	2	78	12	036	15W	818604	848679	21	14	51	32	1226	53492		
28	7	1	32	ON	2	65	41	046	28W	736904	763869	21	16	25	46	1319	59146
		OFF	2	60	08	044	26W	706779	732604	21	16	27	09	1329	59229		
29	5	1	62	ON	3	20	04	061	44W	757574	785321	21	18	17	46	1410	65866
		OFF	3	31	48	061	12W	843705	874737	21	18	20	39	1415	66039		
30	2	1	36	ON	2	74	40	098	59W	789072	818020	21	19	25	30	1249	69930
		OFF	2	68	04	093	24W	747847	775227	21	19	27	12	1313	70032		
31	2	1	44	ON	2	70	00	117	29W	757929	785692	21	20	57	42	1307	75462
		OFF	2	62	32	113	47W	715514	741669	21	20	59	35	1324	75575		
31	2	2	24	ON	2	32	54	109	14W	612377	634648	21	21	06	52	1349	76012
		OFF	2	29	07	109	01W	608083	630193	21	21	07	47	1351	76067		
35	4	1	54	ON	2	58	56	155	52E	692519	717804	22	03	04	29	1327	11069
		OFF	2	50	11	157	38E	655159	679036	22	03	06	39	1337	11199		
36	4	1	62	ON	2	50	55	134	39E	657060	681009	22	04	37	28	1336	16648
		OFF	2	41	16	135	50E	626613	649417	22	04	39	50	1343	16790		
37	4	1	71	ON	2	76	53	097	44E	792387	821461	22	06	01	56	1232	21716
		OFF	2	64	20	108	22E	717274	743496	22	06	05	09	1318	21909		
37	4	2	23	ON	2	53	01	111	27E	664369	688593	22	06	07	57	1333	22077
		OFF	2	49	19	112	02E	650313	674008	22	06	08	52	1337	22132		
37	4	3	24	ON	2	41	37	112	56E	626928	649744	22	06	10	45	1342	22245
		OFF	2	37	50	113	16E	618484	640984	22	06	11	40	1344	22300		
38	7	1	86	ON	2	74	15	078	38E	773599	801957	22	07	33	37	1248	27217
		OFF	2	59	17	087	12E	690722	715940	22	07	37	24	1326	27444		
38	7	2	22	ON	2	56	50	087	49E	679465	704258	22	07	38	01	1329	27481
		OFF	2	53	11	088	34E	664051	688263	22	07	38	55	1333	27535		
38	7	3	65	ON	2	48	48	089	15E	647720	671318	22	07	39	59	1337	27599
		OFF	2	38	41	090	20E	619735	642282	22	07	42	28	1343	27748		
39	9	1	79	ON	2	47	20	066	36E	642037	665421	22	09	11	21	1337	33081
		OFF	2	35	08	067	45E	613024	635319	22	09	14	20	1345	33260		

TOP SECRET

NO

NO. [REDACTED]

40	4	1	27	ON	2	70	48	036	12E	749335	776772	22	10	36	30	1301	38190
				OFF	2	66	07	039	01E	722908	749343	22	10	37	41	1313	38261
40	4	2	82	ON	2	59	53	041	19E	691265	716504	22	10	39	15	1324	38355
				OFF	2	46	39	043	49E	639128	662402	22	10	42	31	1337	38551
42	3	1	43	ON	2	24	59	000	15W	605971	628001	22	13	49	46	1348	49786
				OFF	2	18	12	000	00E	610981	633199	22	13	51	25	1351	49885
47	7	1	20	ON	2	37	59	115	18W	615022	637391	22	21	21	33	1340	76893
				OFF	2	34	47	115	04W	610526	632728	22	21	22	20	1342	76940
53	7	1	23	ON	2	53	58	105	35E	654151	677990	23	06	23	33	1325	23013
				OFF	2	50	15	106	13E	641598	664966	23	06	24	28	1329	23068
53	7	2	161	ON	2	42	00	107	13E	620229	642795	23	06	26	29	1335	23189
				OFF	2	17	20	108	38E	616444	638866	23	06	32	29	1347	23549
54	7	1	35	ON	2	56	55	082	07E	664409	688635	23	07	53	48	1322	28428
				OFF	2	51	13	083	13E	643966	667423	23	07	55	12	1328	28512
54	7	2	90	ON	2	41	56	084	22E	619728	642274	23	07	57	28	1334	28648
				OFF	2	28	20	085	19E	606529	628580	23	08	00	47	1342	28847
55	8	1	153	ON	2	59	55	058	30E	675765	700419	23	09	24	02	1318	33842
				OFF	2	36	13	062	00E	610606	632811	23	09	29	51	1337	34191
56	9	1	21	ON	2	70	48	030	31E	727420	754026	23	10	52	17	1254	39137
				OFF	2	67	13	032	48E	708633	734527	23	10	53	11	1304	39191
56	9	2	119	ON	2	61	55	035	01E	683490	708435	23	10	54	31	1314	39271
				OFF	2	43	14	038	32E	621545	644160	23	10	59	07	1333	39547
56	9	3	38	ON	2	32	58	039	21E	607737	629834	23	11	01	37	1339	39697
				OFF	2	27	13	039	40E	606947	629014	23	11	03	01	1341	39781
58	3	1	37	ON	2	28	00	006	03W	606981	629049	23	14	04	46	1340	50686
				OFF	2	22	11	005	48W	611136	633360	23	14	06	11	1342	50771
62	5	1	21	ON	2	26	54	097	24W	608423	630545	23	20	08	56	1339	72536
				OFF	2	23	39	097	15W	611093	633315	23	20	09	43	1340	72583
63	5	1	17	ON	2	37	39	120	55W	611163	633388	23	21	37	17	1333	77837
				OFF	2	34	04	120	39W	608384	630505	23	21	38	09	1335	77889

OPERATIONS SUMMARY

AFT	PAN	CAMERA	NUMBER			169			HEIGHT	RANGE	DA	H	M	S	LTIM	S-TIM	
OPN	NO	FRA	Q	LAT	LONG												
PRE-FLT	129																
1	4	0	10	ON	2	66	22	149	32W	772924	801257	19	23	28	13	1330	84493
				OFF	2	64	20	148	38W	760111	787957	19	23	28	44	1334	84524
2	4	1	15	ON	2	73	09	177	10W	816778	846782	20	00	57	32	1308	03452
				OFF	2	69	55	174	29W	794684	823845	20	00	58	21	1320	03501
5	5	1	73	ON	2	82	33	089	57E	884865	917479	20	05	28	03	1127	19683
				OFF	2	68	13	117	59E	778741	807295	20	05	31	54	1323	19914
5	5	2	22	ON	2	42	48	124	20E	648492	672118	20	05	38	10	1355	20290
				OFF	2	39	03	124	41E	635989	659145	20	05	39	05	1357	20345
6	5	1	46	ON	2	67	50	095	20E	774808	803213	20	07	03	02	1324	25382
				OFF	2	59	07	098	45E	722774	749204	20	07	05	12	1340	25512
6	5	2	21	ON	2	55	16	099	40E	702199	727850	20	07	06	09	1344	25569
				OFF	2	51	34	100	21E	684083	709050	20	07	07	04	1348	25624
6	5	3	22	ON	2	43	18	101	25E	649589	673257	20	07	09	05	1354	25745
				OFF	2	39	34	101	46E	636961	660153	20	07	10	00	1357	25800
7	9	1	14	ON	2	57	14	076	22E	711180	737170	20	08	36	42	1342	31002
				OFF	2	54	38	076	56E	697771	723254	20	08	37	20	1345	31040
7	9	2	15	ON	2	52	14	077	22E	686072	711114	20	08	37	56	1347	31076
				OFF	2	49	36	077	47E	674047	698635	20	08	38	35	1349	31115
7	9	3	68	ON	2	47	12	078	07E	663772	687974	20	08	39	10	1351	31150
				OFF	2	36	01	079	11E	626136	648922	20	08	41	54	1358	31314

~~TOP SECRET~~ [REDACTED]

NO. [REDACTED]

NO

8 9 1	21 ON	2 60 49 052 32E	729441	798123	20 10 06 51	1337 36411
	OFF	2 57 02 053 33E	708872	734775	20 10 07 47	1342 36467
8 9 2	77 UN	2 50 45 054 45E	678068	702808	20 10 09 20	1348 36560
	OFF	2 38 01 056 10E	630880	653844	20 10 12 27	1357 36747
9 9 0	9 UN	1 37 15 132 32W	1296730	1345478	20 11 17 33	0227 40653
	OFF	1 40 15 132 18W	1277092	1325057	20 11 18 20	0229 40700
9 9 1	108 ON	2 62 49 029 00E	739528	766592	20 11 37 23	1333 41843
	OFF	2 44 01 032 45E	649565	673232	20 11 42 00	1353 42120
10 5 1	37 ON	2 26 46 011 08E	607919	630022	20 13 17 14	1401 47834
	OFF	2 21 00 011 22E	604578	626557	20 13 18 38	1404 47918
11 6 1	19 ON	2 29 44 011 52W	611314	633545	20 14 47 33	1400 53253
	OFF	2 26 39 011 43W	607504	629591	20 14 48 18	1401 53298
11 6 2	19 ON	2 24 12 011 36W	605552	627567	20 14 48 53	1402 53333
	OFF	2 21 06 011 28W	604492	626467	20 14 49 38	1403 53378
16 6 0	10 ON	2 37 56 126 43W	626284	649076	20 22 20 40	1353 80440
	OFF	2 36 12 126 36W	622101	644736	20 22 21 05	1354 80465
18 1 1	33 ON	2 69 37 180 06W	767941	796085	21 01 14 54	1314 04494
	OFF	2 63 25 176 59W	731106	757851	21 01 16 27	1328 04587
18 1 2	19 ON	2 18 43 171 26W	606152	628189	21 01 27 23	1401 05243
	OFF	2 15 38 171 20W	608632	630762	21 01 28 08	1402 05288
19 1 1	23 ON	2 72 36 154 39E	785492	814303	21 02 45 10	1303 09910
	OFF	2 68 03 157 59E	756914	784638	21 02 46 19	1318 09979
19 1 2	54 ON	2 63 36 160 04E	730882	757619	21 02 47 26	1327 10046
	OFF	2 53 53 162 42E	681408	706274	21 02 49 50	1340 10190
20 1 1	31 ON	2 75 09 128 55E	800930	830330	21 04 15 32	1251 15332
	OFF	2 69 04 134 31E	761647	789551	21 04 17 05	1315 15425
20 1 2	22 ON	2 51 38 140 14E	670569	695026	21 04 21 24	1342 15684
	OFF	2 47 56 140 47E	655673	679570	21 04 22 18	1345 15738
20 1 3	42 ON	3 13 06 143 42E	709693	735625	21 04 37 12	1412 16632
	OFF	3 20 42 143 57E	757243	784977	21 04 39 05	1414 16745
22 1 1	19 ON	2 83 24 054 17E	861869	893601	21 07 15 12	1052 26112
	OFF	2 80 20 072 03E	835024	865727	21 07 16 11	1204 26171
22 1 2	81 ON	2 76 45 080 48E	808728	838426	21 07 17 09	1240 26229
	OFF	2 62 06 092 01E	718983	745268	21 07 20 52	1329 26452
22 1 3	28 ON	2 58 42 093 02E	701385	727005	21 07 21 42	1333 26502
	OFF	2 54 00 094 06E	679040	703817	21 07 22 52	1339 26572
22 1 4	36 ON	2 06 47 097 27E	627085	649906	21 07 34 22	1404 27262
	OFF	2 01 07 097 36E	644852	668341	21 07 35 45	1406 27345
23 5 1	18 ON	2 82 31 038 38E	851488	882821	21 08 46 31	1121 31591
	OFF	2 79 17 052 26E	825334	855666	21 08 47 29	1217 31649
23 5 2	99 ON	2 51 43 071 38E	668296	692668	21 08 54 26	1341 32066
	OFF	2 36 04 073 22E	619198	641724	21 08 58 15	1351 32295
23 5 3	63 ON	2 33 38 073 32E	614690	637047	21 08 58 50	1352 32330
	OFF	2 24 01 074 02E	605813	627838	21 09 01 10	1357 32470
24 3 1	24 ON	2 27 16 051 01E	607141	629215	21 10 31 24	1355 37884
	OFF	2 23 33 051 11E	605848	627874	21 10 32 18	1357 37938
25 3 1	66 ON	2 58 48 024 26E	698584	724098	21 11 54 43	1332 42883
	OFF	2 48 02 026 28E	652336	676107	21 11 57 21	1343 43041
25 3 2	60 ON	2 00 57 029 02E	647959	671564	21 12 08 49	1404 43729
	OFF	3 08 44 029 17E	691463	716707	21 12 11 12	1408 43872
26 4 1	43 ON	2 25 48 005 22E	606291	628334	21 13 33 47	1355 48827
	OFF	2 19 03 005 39E	607687	629782	21 13 35 26	1358 48926
27 1 1	24 ON	2 83 23 059 52W	852715	884095	21 14 50 16	1050 53416
	OFF	2 79 17 039 00W	818604	848679	21 14 51 32	1215 53492
28 7 1	32 ON	2 66 45 047 03W	736904	763869	21 16 25 46	1317 59146

TOP SECRET

NO

NO. [REDACTED]

		OFF	2	61	09	044	49W	706779	732604	21	16	27	09	1327	59229		
29	5	1	61	ON	3	18	57	061	50W	757574	785321	21	18	17	46	1410	65866
		OFF	3	30	34	061	20W	843705	874737	21	18	20	39	1415	66039		
30	2	1	36	ON	2	75	46	100	31W	789072	818020	21	19	25	30	1243	69930
		OFF	2	69	08	094	07W	747847	775227	21	19	27	12	1310	70032		
31	2	1	43	ON	2	71	05	118	21W	757929	785692	21	20	57	42	1304	75462
		OFF	2	63	34	114	14W	715514	741669	21	20	59	35	1322	75575		
31	2	2	24	ON	2	33	48	109	21W	612377	634648	21	21	06	52	1349	76012
		OFF	2	30	01	109	07W	608083	630193	21	21	07	47	1351	76067		
35	4	1	54	ON	2	59	57	155	32E	692519	717804	22	03	04	29	1326	11069
		OFF	2	51	08	157	25E	655159	679036	22	03	06	39	1336	11199		
36	4	1	62	ON	2	51	52	134	26E	657060	681009	22	04	37	28	1335	16648
		OFF	2	42	11	135	41E	626613	649417	22	04	39	50	1342	16790		
37	4	1	71	ON	2	77	57	095	36E	792387	821461	22	06	01	56	1224	21716
		OFF	2	65	22	107	52E	717274	743496	22	06	05	09	1316	21909		
37	4	2	23	ON	2	53	59	111	12E	664369	688593	22	06	07	57	1332	22077
		OFF	2	50	16	111	50E	650313	674008	22	06	08	52	1336	22132		
37	4	3	24	ON	2	42	32	112	47E	626928	649744	22	06	10	45	1341	22245
		OFF	2	38	45	113	08E	618484	640984	22	06	11	40	1344	22300		
38	7	1	86	ON	2	75	20	077	12E	773599	801957	22	07	33	37	1242	27217
		OFF	2	60	17	086	51E	690722	715940	22	07	37	24	1324	27444		
38	7	2	22	ON	2	57	49	087	31E	679465	704258	22	07	38	01	1328	27481
		OFF	2	54	09	088	19E	664051	688263	22	07	38	55	1332	27535		
38	7	3	65	ON	2	49	45	089	04E	647720	671318	22	07	39	59	1336	27599
		OFF	2	39	36	090	12E	619735	642282	22	07	42	28	1343	27748		
39	9	1	79	ON	2	48	16	066	25E	642037	665421	22	09	11	21	1337	33081
		OFF	2	36	01	067	37E	613024	635319	22	09	14	20	1344	33260		
40	4	1	27	ON	2	71	51	035	16E	749335	776772	22	10	36	30	1257	38190
		OFF	2	67	10	038	26E	722908	749343	22	10	37	41	1311	38261		
40	4	2	82	ON	2	60	53	040	57E	691265	716504	22	10	39	15	1323	38355
		OFF	2	47	35	043	39E	639128	662402	22	10	42	31	1337	38551		
42	3	1	44	ON	2	25	52	000	21W	605971	628001	22	13	49	46	1348	49786
		OFF	2	19	06	000	04W	610981	633199	22	13	51	25	1351	49885		
47	7	1	8	ON	2	37	54	115	21W	613477	635789	22	21	21	48	1340	76908
		OFF	2	36	35	115	15W	611645	633888	22	21	22	07	1341	76927		
53	7	1	23	ON	2	54	55	105	21E	654151	677990	23	06	23	33	1324	23013
		OFF	2	51	11	106	01E	641598	664966	23	06	24	28	1328	23068		
53	7	2	160	ON	2	42	54	107	04E	620229	642795	23	06	26	29	1334	23189
		OFF	2	18	15	108	33E	616444	638866	23	06	32	29	1346	23549		
54	7	1	35	ON	2	57	53	081	50E	664409	688635	23	07	53	48	1321	28428
		OFF	2	52	09	083	00E	643966	667423	23	07	55	12	1327	28512		
54	7	2	90	ON	2	42	51	084	14E	619728	642274	23	07	57	28	1334	28648
		OFF	2	29	13	085	13E	606529	628580	23	08	00	47	1341	28847		
55	8	1	152	ON	2	60	53	058	08E	675765	700419	23	09	24	02	1316	33842
		OFF	2	37	07	061	52E	610606	632811	23	09	29	51	1337	34191		
56	9	1	21	ON	2	71	50	029	37E	727420	754026	23	10	52	17	1250	39137
		OFF	2	68	14	032	10E	708633	734527	23	10	53	11	1301	39191		
56	9	2	118	ON	2	62	54	034	37E	683490	708435	23	10	54	31	1313	39271
		OFF	2	44	08	038	23E	621545	644160	23	10	59	07	1332	39547		
56	9	3	38	ON	2	33	52	039	15E	607737	629834	23	11	01	37	1338	39697
		OFF	2	28	06	039	34E	606947	629014	23	11	03	01	1341	39781		
58	3	1	37	ON	2	28	53	006	09W	606981	629049	23	14	04	46	1340	50686
		OFF	2	23	05	005	53W	611136	633360	23	14	06	11	1342	50771		
62	5	1	21	ON	2	27	47	097	30W	608423	630545	23	20	08	56	1338	72536
		OFF	2	24	33	097	21W	611093	633315	23	20	09	43	1340	72583		

TOP SECRET [REDACTED]

NO. [REDACTED]

NOTES

- 1) TM DATA INDICATE NORMAL SYSTEM PERFORMANCE.
- 2) THE S/I HAD EXHAUSTED FILM SUPPLY BY REV 63 OPERATION.
- 3) THE LAST FEW FRAMES OF OPN 63-5-1 ARE CONTAINED IN THE SECOND MISSION CAPSULE. THESE ARE NOT INCLUDED IN THE ABOVE LISTED NUMBER OF FRAMES OR FEET. ACTUALLY, 21 FRAMES WERE TAKEN BY EACH CAMERA DURING THE OPERATION.
- 4) A COMMAND ANOMALY WAS EXPERIENCED DURING THE PERIOD FROM REV 30 [REDACTED] FADE TO REV 31 [REDACTED] RISE, THE EFFECT OF WHICH WAS TO OFFSET THE ORBIT TIMER BY 18 SEC ON REV 31. WHILE INVESTIGATION IS CONTINUING, THE MORE PROBABLE CAUSES ARE THOUGHT TO BE RFI FROM AN EXTERNAL SOURCE (BOTH S BAND AND VHF) OR AN INTERNAL PROBLEM IN THE S BAND BEACON.
- 5) STEREO SUPPRESS WAS UTILIZED FOR OPERATIONS ON REVS 1 AND 47 TO PROVIDE A TEST OF VEHICLE STABILITY DURING NONSIMULTANEOUS CAMERA STARTUP AND SHUTDOWN.

PHOTOGRAPHIC SUMMARY

OPN NO	FRA	FEET	ET	S-EL	S-DIR	FILTER EV	3404 FILM FULL	INT	PRI
PRE-FLT	128	338.6							
1 4 0	20	52.9	ON 207	42.5	39.8	11.54	12.08	11.48	10.88
			OFF 215	45.6	42.3	11.60	12.09	11.49	10.89
2 4 1	16	42.3	ON 193	37.8	36.9	11.45	12.05	11.45	10.85
			OFF 200	40.5	38.3	11.50	12.07	11.47	10.87
5 5 1	73	193.1	ON 177	29.2	34.8	11.32	11.96	11.36	10.76
			OFF 206	41.9	38.8	11.54	12.08	11.48	10.88
5 5 2	22	58.2	ON 252	58.6	62.9	11.83	12.10	11.50	10.90
			OFF 256	60.2	68.6	11.85	12.10	11.50	10.90
6 5 1	47	124.3	ON 207	42.2	38.9	11.55	12.08	11.48	10.88
			OFF 225	48.8	44.7	11.67	12.10	11.50	10.90
6 5 2	21	55.5	ON 233	51.5	48.0	11.71	12.10	11.50	10.90
			OFF 239	53.9	51.6	11.75	12.10	11.50	10.90
6 5 3	23	60.8	ON 251	58.4	62.0	11.83	12.10	11.50	10.90
			OFF 256	60.0	67.6	11.85	12.10	11.50	10.90
7 9 1	15	39.7	ON 229	50.1	46.1	11.69	12.10	11.50	10.90
			OFF 234	51.9	48.4	11.72	12.10	11.50	10.90
7 9 2	15	39.7	ON 238	53.5	50.8	11.75	12.10	11.50	10.90
			OFF 242	55.1	53.7	11.77	12.10	11.50	10.90
7 9 3	69	182.5	ON 246	56.5	56.6	11.80	12.10	11.50	10.90
			OFF 260	61.3	73.5	11.87	12.10	11.50	10.90
8 9 1	21	55.5	ON 223	47.6	43.1	11.65	12.10	11.50	10.90
			OFF 230	50.3	46.1	11.70	12.10	11.50	10.90
8 9 2	78	206.3	ON 241	54.4	52.2	11.77	12.10	11.50	10.90
			OFF 258	60.7	69.9	11.86	12.10	11.50	10.90
9 9 0	9	23.8	ON 115	-21.5	29.6	10.70	0.	0.	0.
			OFF 116	-18.9	29.1	10.71	0.	0.	0.
9 9 1	109	288.3	ON 217	46.1	41.5	11.62	12.10	11.50	10.90
			OFF 249	58.3	60.4	11.81	12.10	11.50	10.90
10 5 1	37	97.9	ON 264	62.9	90.5	11.90	12.10	11.50	10.90
			OFF 265	62.3	101.6	11.90	12.10	11.50	10.90
11 6 1	19	50.3	ON 263	62.8	84.6	11.89	12.10	11.50	10.90