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November 1963

TECHNICAL PUBLICATION

PHOTOGRAPHIC EVALUATION REPORT
MISSION 9056
27-30 JUNE 1963

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NATIONAL PHOTOGRAPHIC INTERPRETATION CENTER

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PART I. MASTER PANORAMIC CAMERA

Mission No: 9056
Camera No: 110
Slit Width: 0.200"
Film Type: 7J23-7800 (4404)

Filter, Panoramic: Wratten 21
Aperture, Panoramic: f/3.5
Filters, Horizon: Wratten 25
Evaluated By: [redacted]

1. Shutter Operation (Horizon Cameras): The port horizon camera shutter failed to open throughout the mission. The starboard horizon camera shutter operated satisfactorily.

2. Horizon Camera Exposure:
   a. Supply (Port): No imagery due to shutter malfunction (f/6.8, 1/100 second).
   b. Take-Up (Starboard): The exposure is adequate on all descending passes. Very little horizon imagery is present on ascending passes because of sun angle (f/6.8, 1/100 second).

3. Camera Number: The camera number malfunctioned (was not recorded) after pass A02.

4. Data Block: The data block record operated erratically throughout the mission and the lamps are noticeably bloomed. The index lamps of the data block malfunctioned (were not recorded) after pass A02. All data block lamps recorded simultaneously on approximately 65 frames.

5. Film Metering: The film metering is normal.

6. Film Tracking: The film tracking is normal.

7. Frequency Markers: The marks are adequately exposed and are recorded outside the format with a reflected image extending into the format of the panoramic frames. The clock interrogate mark and the framing camera mark operated properly throughout the mission.

8. Fiducials:
   a. Panoramic Camera: The fiducials are well defined.
   b. Horizon Cameras: The fiducials for both horizon cameras operated satisfactorily but are slightly flared.

9. Light Leaks: Eighty percent of the master panoramic photography is degraded by light leaks. The first five and the last three frames of each pass contain heavily fogged areas and shadowgraphs (minus density areas) of the system's equipment. A triangular plus density area appears at the supply end of each frame. This area measures 2.2" along the titled edge and tapers to 0.9" at the untitled edge of the film. Fog extends 0.1" in from the titled edge throughout the mission. At times it has the appearance of scalloping but is usually parallel to the edge.

10. Static Electricity: Dendritic edge static is present intermittently throughout the film. Examples: pass D25, frames 140-152; pass A50, frames 14-31; pass D55, frames 52-71.

11. Pinholes: Present intermittently throughout the film. Examples: passes A01, D04, D05, D14, D19, D41, D56.

12. Abrasions and Scratches: Rail scratches on both the titled and untitled side of the film are present throughout. Most passes contain numerous possibly camera-induced emulsion scratches and/or abrasions. Pass A02, frame 30, contains a heavy diagonal scratch. Random scratches or abrasions, ranging from minor to severe, are present throughout the mission. Emulsion digs occur on most passes. Examples: pass A02, frames 02-05, 15, 16, 21, 22, 29-31, 36, 38, 40, 54, 68, 71, 78; pass D02, head to tail; pass

[redacted]

[redacted]

D25, frames 53, 108, 119, 122, 128, 157, 158, 186; pass A34, head to tail.

13. Tearing: None noted. A manufacturing splice is present on pass A34, frame 13. A transparent splice is present on pass A44 between frames 11 and 12.

14. Water Marks: None observed.

15. Pressure Streaks: None observed.

16. Processing Streaks: None observed.

17. Blistering and Crimping: Blisters are present on pass A01, frame 26; pass A02, frame 05; pass D23, frame 09; pass D24, frame 75; pass D52, frame 11. Crimps, occurring after processing, are few and intermittent.

18. Contrast: 74% low (partially due to light leaks), 26% medium, and 0% high.

19. Apparent Resolution: Fair; comparable to Mission 9054.

20. Apparent Graininess: Fine.

21. Photo Quality:
a. Panoramic Camera: The quality ranges from fair to good. Fogging due to camera system light leaks, a plus density streak (also possibly due to light leaks in the system) and numerous possibly camera-induced scratches are the major degrading factors. A distortion of imagery of undetermined origin, parallel to the line of flight, is present on numerous frames.
b. Horizon Cameras: The port camera failed to operate throughout the mission. The quality of the starboard horizon is good.

22. Camera Operation:
a. Panoramic Camera: Good. The emulsion and base scratches may have been camera induced.
b. Horizon Cameras: The port camera shutter failed to operate throughout the mission. The starboard horizon camera operated properly, with good results.

23. Suitability for PI: Good, where not degraded by fogging.

Remarks

1. The photography produced by the master panoramic camera is inferior to that produced by the slave. This degradation is attributed to the light leaks in the camera system, distortion of imagery parallel to the line of flight, and a loss of acuteness.

2. A plus density streak approximately 1.0" from and nearly parallel to the untitled edge is present on most passes. This streak is most noticeable in the film metering area and least noticeable on ascending passes. The streak is not sharp or well defined and is possibly caused by the light leaks mentioned in paragraph 9.

3. Minus density streaks which appear to follow the IMC trace are present intermittently on passes D40, A49, and D52.

4. Film transport is present at all camera off/on positions.

5. The following descriptions of overlap from camera No 110 were determined from the fifth and last frame of each pass where possible. Cloud cover, low sun angle, or lack of imagery may have precluded these determinations. When such is the case, the omission is denoted by "NM" for "Not Measurable."

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Overlap
(Percent)

Pass	Beginning	End	Pass	Beginning	End
A01	12	14	A34	10	12
A02	10	15	D34	10	0
D02	11	NM	D35	10	12
D04	NM	0	D37	06	06
D05	NM	09	D38	11	04
D07	10	12	D39	10	NM
A09	02	09	A40	10	10
D09	NM	12	D40	09	12
A14	NM	12	D41	10	12
D14	12	12	A44	12	14
D19	NM	20	A47	12	14
D23	11	10	A49	18	14
D24	10	10	A50	06	04
A25	08	10	D52	06	NM
D25	10	15	D54	17	15
A31	09	14	D55	NM	12
A33	09	14	D56	10	07

6. Density readings were taken on each pass, using a MacBeth Quantalog Densitometer, Model EP 1,000, with an ET 20 attachment and an 0.5 mm aperture. The values are correlated below.

Reading	Pass	Frame	Terrain		Limiting		Gross Fog		
			D-Min	D-Max	D-Min	D-Max	Leading	Center	Trailing
1	A01	16	1.09	1.32	1.09	2.03	0.40	0.53	0.69
2	A02	7	0.69	1.31	0.69	2.09	0.32	0.44	0.54
3		54	1.42	1.99	0.69	1.99	0.39	0.54	0.69
4	D02	13	WX	WX	1.99	2.14	0.77	1.04	1.11
5	D04	16	1.80	2.04	1.80	2.05	0.79	1.09	1.24
6	D05	22	1.71	2.07	1.71	2.12	0.59	0.65	0.95
7		78	1.00	0.57	1.00	2.14	0.36	0.54	0.56
8		107	0.64	0.71	0.55	1.94	0.27	0.30	0.39
9		145	WX	WX	0.50	1.66	0.22	0.23	0.27
10	D07	34	1.13	1.73	1.13	1.65	0.41	0.60	0.76
11		79	0.65	1.48	0.65	2.07	0.29	0.48	0.56
12		92	0.95	1.36	0.95	2.08	0.31	0.47	0.59
13	A09	7	WX	WX	0.30	1.47	0.11	0.11	0.11
14	D09	94	0.68	1.87	0.64	1.87	0.37	0.51	0.65
15	A14	6	1.50	1.62	1.50	2.06	0.59	0.73	0.64
16	D14	43	0.60	1.24	0.70	2.10	0.29	0.37	0.45
17	D19	4	WX	WX	1.82	2.00	0.37	0.45	0.52
18	D23	67	0.90	1.45	0.90	1.85	0.35	0.48	0.68
19		135	0.76	1.69	0.76	2.08	0.27	0.29	0.43
20		160	0.68	1.61	0.66	2.01	0.26	0.26	0.37
21	D24	47	0.95	1.65	0.95	2.14	0.34	0.44	0.59
22		77	0.94	1.64	0.94	2.09	0.32	0.40	0.56
23		154	0.67	1.38	0.67	2.04	0.35	0.39	0.54
24	A25	5	WX	WX	0.25	1.52	0.19	0.17	0.19
25	D25	12	1.04	1.31	0.99	2.06	0.59	0.68	0.91
26		61	0.47	1.05	0.47	1.64	0.19	0.26	0.44
27		163	0.99	1.66	0.99	1.66	0.19	0.31	0.46
28	A31	24	WX	WX	0.75	2.02	1.07	0.22	0.34
29	A33	18	0.82	1.42	0.82	1.79	0.31	0.37	0.59
30	A34	61	0.68	1.72	0.57	1.88	0.21	0.29	0.57
31		77	WX	WX	0.57	1.84	0.26	0.36	0.67
32	D34	8	0.90	1.75	0.85	1.99	0.40	0.64	1.00

[redacted]

[redacted]

Reading	Pass	Frame	Terrain		Limiting		Gross Fog		
			D-Min	D-Max	D-Min	D-Max	Leading	Center	Trailing
33	D35	18	1.05	1.45	1.05	1.99	0.57	0.87	1.00
34		83	0.70	1.90	0.70	1.98	0.32	0.36	0.59
35	D37	30	0.79	1.27	0.79	2.03	0.29	0.42	0.69
36		100	0.05	1.33	0.65	1.95	0.22	0.34	0.54
37		126	0.50	1.22	0.45	2.02	0.20	0.34	0.53
38	D38	39	0.85	1.34	0.85	1.99	0.42	0.69	1.01
39		69	0.94	1.62	0.94	1.97	0.24	0.44	0.64
40	D39	11	0.52	1.17	0.52	1.17	0.15	0.24	0.40
41		62	0.94	1.65	0.94	2.03	0.20	0.35	0.50
42	A40	8	0.29	0.61	0.29	1.19	0.20	0.19	0.20
43	D40	84	0.86	1.49	0.86	1.93	0.20	0.30	0.50
44		161	0.82	1.21	0.82	2.02	0.23	0.37	0.58
45	D41	58	0.67	1.62	0.67	1.97	0.21	0.37	0.46
46	A44	15	0.42	1.87	0.69	1.88	0.16	0.22	0.32
47	A47	21	WX	WX	0.49	1.97	0.15	0.20	0.30
48	A49	16	0.41	0.77	0.41	1.61	0.15	0.19	0.32
49		55	1.60	1.97	1.60	2.01	0.44	0.70	0.85
50	A50	15	0.43	0.97	0.43	1.96	0.20	0.39	0.57
51	D52	32	0.66	1.25	0.66	1.95	0.24	0.38	0.57
52	D54	67	0.69	1.75	0.69	1.99	0.22	0.32	0.50
53		87	1.12	1.66	1.12	1.87	0.32	0.43	0.57
54	D55	30	0.51	1.25	0.51	2.08	0.17	0.26	0.44
55		57	1.11	1.57	1.11	2.00	0.33	0.42	0.59
56	A56	4	0.11	0.57	0.11	0.57	0.10	0.10	0.10
57	D56	30	0.99	1.45	0.99	2.04	0.42	0.58	0.85
58		133	0.86	1.59	0.86	2.04	0.21	0.32	0.56

NOTE: WX indicates complete cloud cover.

Terrain

D-Max Range 0.57-2.07
D-Min Range 0.29-1.71
Average D-Max 1.46
Average D-Min 0.86

Limiting

D-Max Range 0.57-2.14
D-Min Range 0.11-1.99
Average D-Max 1.91
Average D-Min 0.85

Gross Fog Range 0.10-1.24
Average Gross Fog 0.44

PART II. SLAVE PANORAMIC CAMERA

Mission No: 9056
Camera No: 111
Slit Width: 0.200"
Film Type: 7J23-7800 (4404)

Filter, Panoramic: Wratten 21
Aperture, Panoramic: f/3.5
Filters, Horizon: Wratten 25
Evaluated By: [redacted]

1. Shutter Operation (Horizon Cameras): Both shutters operated erratically throughout the mission (See Item No 5 under Remarks).

2. Horizon Camera Exposure:

a. Take-Up (Port): Imagery appears adequately exposed on all passes (f/6.8, 1/100 second).

b. Supply (Starboard): Imagery is slightly overexposed on all passes (f/6.8, 1/100 second).

[redacted]

[redacted]

3. Camera Number: The camera number is flared but readable through pass D05. It is not recorded on pass D07 and subsequent passes.

4. Data Block: The data block record operated throughout the mission but the individual lamps are bloomed. Double data blocks are recorded at the camera off/on positions but in some instances are displaced to the first frame of the next camera on. Example: pass D25. The data block for frame 127 (camera off) is displaced to frame 128 (camera on). Index lamps of the data block malfunctioned on pass D07 and were not recorded on subsequent passes.

5. Film Metering: The film metering is normal.

6. Film Tracking: The film tracking is normal.

7. Frequency Markers: The frequency marks are recorded inside the format or very close to the edge of the format on all passes. The marks degrade the photography where terrain densities are less than the density of the marks and are not readable where the terrain densities are greater than the density of the marks. Marks are not recorded on most frames of camera off positions. Examples: pass D53, frame 63; pass D54, frame 50; pass D55, frame 99.

8. Fiducials:

a. Panoramic Camera: The fiducials are well defined.

b. Horizon Cameras: The fiducial of the starboard horizon camera adjacent to the parent panoramic frame functioned only on pass A02. The other fiducials functioned throughout; however, they were slightly flared. All other fiducials recorded satisfactorily.

9. Light Leaks: On the third frame of each pass, and after a camera off/on, there is a fogged area approximately 1.2" wide, transverse to the film, followed on the next frame by a similar shadowgraph (minus density). Also associated with these plus and minus density areas are patches of diagonal plus density streaks. All of these phenomena are attributed to the light leaks that degraded the majority of the photography from the master camera.

10. Static Electricity: Dendritic static emanating from the edges of the film is present intermittently throughout the mission. Examples: pass D35, frames 10, 36, 40, 49, 84, 86; pass D02, frames 3, 6, 32-34; pass D37, frames 12, 27, 28, 46, 71, 84, 121, 144, 154; pass D23, frames 19, 26, 64, 174.

11. Pinholes: Pinholes are present intermittently throughout the mission. Examples: passes A01, D02, D04, D05, D09, A14, D14, D19, D23, A31, A33, A34, D37, A40, D41, A44.

12. Abrasions and Scratches: The photography is characterized by numerous minor emulsion digs and scratches. Pass D04 contains a severe scratch 1.9" from the titled edge throughout the pass. Pass D05 contains a severe gouge in frame 31. Pass D14 contains a continuous base scratch from frame 39 through frame 48. Pass D41 contains numerous abrasions and scratches.

13. Tearing: None. Transparent splices are present between the following frames on the passes indicated: pass D07, frames 84, 85; pass D24, frames 154, 155; pass D41, frames 55, 56. A manufacturing splice is present on pass A31, frame 25.

14. Water Marks: None observed.

15. Pressure Streaks: None observed.

16. Processing Streaks: None observed.

17. Blistering and Crimping: Blistering is present on pass D05, frame 62. Crimps occurring after processing are few and intermittent.

18. Contrast: 50% low, 50% medium, 0% high.

19. Apparent Resolution: Good, comparable to Mission 9050.

[redacted]

[redacted]

20. Apparent Graininess: Fine.

21. Photo Quality:
a. Panoramic Camera: Good where not degraded by light leaks.
b. Horizon Cameras: Fair to good where exposure was adequate.

22. Camera Operation:
a. Panoramic Camera: Good. The emulsion and base scratches may have been camera induced.
b. Horizon Cameras: Poor, due to frequent shutter malfunctions.

23. Suitability for PI: Good, despite presence of fogged areas due to light leaks and minor scratches and abrasions.

Remarks

1. The photography produced by the slave camera is superior to that produced by the master camera. The light leaks that degraded the master camera photography depreciated to a lesser degree that of the slave camera.

2. Titling transfer and smear are present on numerous passes. Examples: passes D05, A09, A14, D19, D23, D24, A25, D34, D44.

3. Titled frame 170 of pass D24 is actually the first exposure of pass D25.

4. Foreign matter which appears to be pieces of white threadlike substance were found on pass D25. Pass D41, frame 44, contains fingerprints.

5. In 7 passes both horizon cameras and the horizon fiducial lamps failed to operate in the last frame of a camera on or at the end of a pass. Examples: passes D24, D25, D37, D39, D40, D44, D54. In 9 passes the port shutter failed to operate but the fiducial lamps did operate (Examples: pass D07, frame 81; pass D24, frames 103, 121, 137, 147, 151, 165; pass D25, frames 31, 63, 97, 109, 110, 151, 155, 157, 161, 163; pass D34, frame 30; pass D35, frames 78, 79; pass D38, frames 94, 100, 101; pass D40, frames 138, 167; pass D54, frame 94. On passes A40 and A56 the port shutter failed to operate but the fiducial lamps did operate.

6. The following descriptions of overlap from camera No 111 were determined from the fifth and last frame of each pass, where possible. Cloud cover, low sun angle, or lack of imagery may have precluded these determinations. When

Overlap (Percent)

Pass	Beginning	End	Pass	Beginning	End
A01	0	0	D34	NM	10
A02	NM	0	D35	10	15
D02	NM	NM	D37	12	20
D04	NM	NM	D38	NM	NM
D05	NM	NM	D39	10	10
D07	NM	10	A40	NM	NM
A09	NM	NM	D40	NM	10
D09	13	19	D41	10	10
A14	NM	NM	A44	NM	NM
D14	NM	7	A47	10	10
D19	NM	NM	A49	14	NM
D23	NM	10	A50	10	NM
D24	30	18	D52	NM	NM
A25	NM	NM	D54	10	10
D25	20	NM	D55	NM	NM
A31	NM	NM	A56	0	0
A33	10	10	D56	NM	0
A34	0	NM			

[redacted]

such is the case the omission is denoted by "NM" for "Not Measurable."

7. Density readings were taken on each pass, using a MacBeth Quantalog Densitometer, Model EP 1000, with an ET 20 attachment and an 0.5 mm aperture. The values are correlated below:

Reading	Pass	Frame	Terrain		Limiting		Gross Fog		
			D-Min	D-Max	D-Min	D-Max	Leading	Center	Trailing
1	A01	22	0.62	1.14	0.62	2.01	0.22	0.22	0.22
2	A02	62	0.99	1.94	0.59	2.08	0.22	0.22	0.22
3	D02	9	WX	WX	1.99	2.15	0.22	0.22	0.22
4	D04	13	WX	WX	1.75	2.15	0.23	0.23	0.23
5	D05	23	WX	WX	1.97	2.12	0.11	0.11	0.12
6		85	0.65	1.49	0.65	2.15	0.22	0.21	0.21
7		121	0.55	1.15	0.46	1.85	0.22	0.21	0.22
8	D07	25	0.55	1.19	0.55	1.93	0.22	0.21	0.22
9		85	0.92	1.68	0.52	2.10	0.23	0.21	0.22
10	A09	2	WX	WX	0.64	2.04	0.22	0.22	0.22
11	D09	107	0.92	1.77	0.92	1.77	0.22	0.21	0.22
12	A14	11	1.47	1.94	1.47	2.04	0.22	0.21	0.22
13	D14	26	0.49	1.18	0.49	1.98	0.22	0.21	0.22
14	D19	30	0.83	1.87	0.83	1.87	0.12	0.12	0.12
15	D23	57	1.00	1.59	1.00	1.72	0.22	0.22	0.23
16		94	0.75	0.84	0.75	0.84	0.22	0.22	0.23
17		143	0.87	1.18	0.87	1.97	0.12	0.12	0.12
18	D24	34	0.85	1.18	0.62	1.76	0.22	0.22	0.22
19		91	0.71	1.17	0.69	2.03	0.18	0.17	0.17
20		145	0.77	1.03	0.77	1.85	0.11	0.11	0.11
21	A25	9	WX	WX	0.33	1.82	0.22	0.22	0.22
22	D25	18	0.62	1.26	0.49	2.06	0.22	0.22	0.22
23		167	0.72	1.72	0.72	1.72	0.17	0.16	0.17
24	A31	7	WX	WX	0.79	1.90	0.19	0.14	0.14
25	A33	23	0.59	1.17	0.59	1.86	0.25	0.22	0.22
26	A34	53	WX	WX	0.54	1.98	0.22	0.22	0.23
27	D34	9	0.58	1.67	0.58	2.01	0.14	0.13	0.14
28	D35	22	0.45	1.04	0.45	1.99	0.11	0.11	0.11
29		81	0.91	2.05	0.75	2.05	0.22	0.22	0.22
30	D37	37	0.41	1.18	0.41	1.98	0.11	0.11	0.12
31		100	0.47	1.52	0.47	1.90	0.22	0.22	0.22
32	D38	47	0.65	1.48	0.65	2.10	0.22	0.22	0.22
33		77	0.94	1.66	0.94	2.04	0.22	0.22	0.22
34	D39	13	0.49	1.31	0.49	1.31	0.22	0.22	0.22
35		45	0.92	1.57	0.92	2.11	0.22	0.22	0.22
36	A40	10	0.32	1.21	0.32	1.21	0.22	0.22	0.22
37	D40	93	0.84	1.57	0.84	2.07	0.22	0.21	0.22
38		177	0.77	1.78	0.77	2.06	0.22	0.21	0.22
39	D41	64	0.64	1.80	0.64	2.09	0.22	0.22	0.22
40	A44	19	0.57	2.12	0.56	2.12	0.22	0.22	0.22
41	A47	28	WX	WX	0.88	2.03	0.23	0.22	0.23
42		43	1.10	1.98	1.10	2.05	0.22	0.22	0.22
43	A49	17	0.58	1.00	0.58	2.01	0.22	0.22	0.23
44		60	1.85	2.09	1.85	2.09	0.22	0.22	0.23
45	A50	18	0.57	1.28	0.47	1.96	0.22	0.22	0.22
46		35	WX	WX	0.82	2.00	0.22	0.22	0.23
47	D52	42	0.44	1.43	0.44	1.87	0.23	0.22	0.23
48	D54	44	0.47	1.37	0.47	2.05	0.22	0.22	0.23
49		74	0.70	1.82	0.70	2.10	0.22	0.22	0.23
50	D55	44	0.54	1.07	0.54	2.07	0.22	0.22	0.23
51		68	1.07	1.75	1.07	2.07	0.22	0.22	0.23

[redacted]

Reading	Pass	Frame	Terrain		Limiting		Gross Fog		
			D-Min	D-Max	D-Min	D-Max	Leading	Center	Trailing
52	A56	5	0.27	1.49	0.27	1.49	0.22	0.22	0.23
53	D56	41	0.63	1.28	0.79	2.13	0.22	0.22	0.23
54		139	0.87	1.65	0.87	2.12	0.22	0.22	0.23
55		152	0.86	1.45	0.86	2.04	0.22	0.22	0.22

NOTE: WX indicates complete cloud cover.

Terrain		Limiting	
D-Max Range	0.84-2.12	D-Max Range	1.21-2.15
D-Min Range	0.27-1.65	D-Min Range	0.32-1.99
Average D-Max	1.48	Average D-Max	1.95
Average D-Min	0.73	Average D-Min	0.77

Gross Fog Range 0.11-0.23
Average Gross Fog 0.20

PART III. STELLAR CAMERA

Mission No: 9056
Camera No: D11
Exposure Setting: f/1.9, 2 seconds
Filter: None.
Film Type: 4400/4401
Evaluated By: [redacted]

1. Shutter Operation: The shutter failed to open and there were no fiducials recorded on frames 398-400, 405.

2. Exposure: Under exposed. There are very faint possible stellar images recorded on the 4401 film (frames 38, 39, 59, 60). There are no stellar images recorded on the 4400 film.

3. Frame Correlation Fiducial Mark: Operational, but overexposed and flared throughout.

4. Camera Number: Although the camera number is well defined on the pre-flight film (4401), the frame correlation fiducial mark on the 4401 film that has exposures is flared to such an extent that the camera number is not discernible. On the 4400 film having exposures, the camera number is well defined.

5. Reseau Calibration Points: Operational, but overexposed and flared throughout on both 4400 and 4401.

6. Reseau: The grid is visible only in the flared area where it is well defined.

7. Film Metering: Normal throughout.

8. Film Tracking: Normal.

9. Light Leaks: There is a reflection of the reseau plate on frames 156, 157, 161, 162, 213, 214, 241, 242.

10. Static Electricity: Dendritic edge static is present adjacent to the following frames: 385, 386, 390, 391, 401-409. Additional edge static, associated with a splice, is noted on frames 243-245, 252-254. There are small spot discharges randomly spaced throughout.

[redacted]

[redacted]

11. Abrasions and Scratches: Scratches, probably camera induced, are present on frames 114, 138, 166, 168, 170, 175, 177, 178, 181, 182, 205, 228, 230, 231, 235, 243, 253, 298.

12. Pinholes: None.

13. Water Marks: None.

14. Processing Streaks: None.

15. Pressure Streaks: None.

16. Tearing: None.

17. Blistering and Crimping: None.

18. Foreign Matter: None.

19. Contrast: Sufficient to determine very faint stellar images on the 4401 film when flare is present.

20. Apparent Graininess: Medium.

21. Photo Quality: Poor. Very little stellar imagery is recorded.

22. Camera Operation: Fair, due to shutter malfunctions and probably camera-induced scratches.

Remarks

1. Two types of film were used in the stellar camera, 4400 and 4401.

2. Stellar images appear only on frames having flare.

3. Film type 4401 has a high gross fog level throughout, appearing as though it were hypersensitized.

4. Film type 4400 appears not to have been exposed, although flared areas do appear on some of the frames.

5. A minus density streak with a wavering pattern is present on frames 50, 51, 60-246. The streak appears to be associated with the fiducials and is present only on 4401 film.

6. Density readings were taken on each pass and the values are correlated below:

Reading	Pass	Frame	Beginning		End		Gross Fog
			D-Min	D-Max	D-Min	D-Max	Center
1	A01	1	0.34	0.40			0.30
2		4			0.38	0.44	0.38
3	A02	5	0.38	0.50			0.36
4		15			0.50	0.78	0.48
5	D02	16	0.52	0.66			0.49
6		20			0.40	0.78	0.34
7	D04	21	0.38	0.78			0.34
8		25			0.34	0.82	0.32
9	D05	26	0.34	0.83			0.32
10		46			0.34	0.38	0.32
11		47			0.34	0.34	Blank frame 0.34
12	D07	48	0.36	0.44			0.34
13		60			0.40	0.92	0.38
14	A09	61	0.34	0.40			0.34
15	D09	62	0.34	0.48			One frame 0.34
16		77			0.42	0.50	0.40
17	A14	78	0.46	0.78			0.42
18		81			0.54	0.90	0.50
19	D14	82	0.52	0.60			0.50
20		88			0.46	0.78	0.40
21	D19	89	0.42	0.62			0.40
22		94			0.34	0.51	0.32
23	D22	95	0.34	0.62			0.32
24		118			0.34	0.50	0.34
25	D24	119	0.32	0.48			0.32

[redacted]

[redacted]

Reading	Pass	Frame	Beginning		End		Gross Fog
			D-Min	D-Max	D-Min	D-Max	Center
26		142			0.32	0.48	0.32
27	A25	143	0.32	0.32			0.30
28		144			0.34	0.38	0.32
29	D25	145	0.38	0.48			0.38
30		170			0.32	0.42	0.32
31	A31	171	0.36	0.52			0.35
32		174			0.33	0.5[illegible]	0.33[illegible]
33	A33	175	0.34	0.47			0.34
34		179			0.32	0.42	0.32
35	A34	180	0.37	0.56			0.36
36		192			0.48	0.92	0.47
37	D34	193	0.47	0.74			0.46
38		196			0.50	0.85	0.50
39	D35	197	0.54	0.94			0.52
40		209			0.36	0.66	0.35
41	D37	210	0.38	0.76			0.38
42		233			0.37	0.51	0.37
43	D38	234	0.40	0.74			0.38
44	Partial frame	246			0.40	0.57	0.40
45		247	Missing frame		Missing frame		247-250 Missing
46	D39	248	Missing frame		Missing frame		
47		251	0.18	0.23			0.18
48		257			0.17	0.19	0.17
49	A40	258	0.16	0.17			0.16
50		259			0.16	0.17	0.16
51	D40	260	0.16	0.24			0.16
52		288			0.13	0.15	0.13
53	D41	289	0.13	0.15			0.13
54		296			0.13	0.15	0.13
55	A42E	299	0.13	0.14			0.13
56	A44	300	0.13	0.15			0.13
57		306			0.13	0.17	0.13
58	A47	307	0.13	0.16			0.13
59		314			0.13	0.20	0.13
60	A49	315	0.13	0.15			0.13
61		323			0.15	0.30	0.14
62	A50	324	0.14	0.15			0.14
63		329			0.14	0.15	0.14
64	D52	330	0.14	0.17			0.14
65		338			0.13	0.16	0.13
66	D54	339	0.13	0.16			0.13
67		352			0.13	0.18	0.13
68	D55	353	0.13	0.15			0.13
69		365			0.13	0.14	0.13
70	A56	366	0.13	0.17			0.13
71	D56	367	0.13	0.21			0.13
72		396			0.14	0.15	0.14
73	D57	397	0.14	0.16			0.14
74		410			0.14	0.17	0.14
75	A64	411	0.14	0.16			0.13
76		416			0.13	0.16	0.13
77	A65	471	0.13	0.14			0.13
78		428			0.14	0.21	0.14

Average beginning D-Min - 0.26 Average ending D-Min - 0.29
Average beginning D-Max - 0.42 Average ending D-Max - 0.44
Average Gross Fog - 0.27

[redacted]
Control System Only

[redacted]

PART IV. INDEX CAMERA

Mission No: 9056
Camera No: D11
Exposure Setting: f/4.5, 1/500 second

Filter: Wratten 21
Film Type: 7J33 (4400)
Evaluated By: [redacted]

1. Shutter Operation: The shutter failed to operate on frames 39, 398-400, 405. Possible double exposures occur on frames 248 and 410.

2. Exposure: Adequate except for frames 258, 259, 366 which are underexposed.

3. Camera Number: Well defined.

4. Film Metering: Normal.

5. Film Tracking: Normal.

6. Reseau: Well defined on all frames.

7. Light Leaks: No fogging attributed to light leaks; however, edge fogging along both edges is present throughout.

8. Static Electricity: None noted except on frame 398 where a possible static discharge appears on the take-up edge of the film.

9. Pinholes: Few.

10. Abrasions and Scratches: None.

11. Tearing: None.

12. Water Marks: None.

13. Pressure Streaks: None.

14. Processing Streaks: None.

15. Blistering and Crimping: None.

16. Contrast: 60% low, 40% medium, 0% high.

17. Apparent Resolution: Good. Close to optimum system capability.

18. Apparent Graininess: Medium.

19. Photo Quality: Good.

20. Camera Operation: Good except as noted above.

21. PI Suitability: Good for scale achieved.

Remarks

1. Commencing with frame 18 and continuing to the end of the mission, an egg-shaped or oblate spheroid mark is present in the same location on every frame. This mark is 0.6" from the titled edge and 0.6" from the supply edge and has an associated flare around the perimeter.

2. A streak approximately 0.12" long, with an associated hair-like pattern, is present on each frame 0.03" below the titled edge and commencing 0.12" from the take-up edge.

3. The titling is smeared throughout the mission.

4. The correlation lamps operated satisfactorily.

5. Density readings were taken on each pass and the values are correlated below:

[redacted]

[redacted]

Reading	Pass	Frame	Terrain		Limiting		Gross Fog		
			D-Min	D-Max	D-Min	D-Max	Title Edge	Center	Untitled Edge
1	A01	1	0.25	0.40	0.13	0.91	0.06	0.05	0.06
2		4	0.12	0.23	0.13	0.79	0.06	0.05	0.05
3	A02	5	0.25	0.40	0.16	1.31	0.07	0.07	0.07
4		11	0.13	0.89	0.12	1.07	0.07	0.07	0.07
5		12	0.31	1.05	0.14	1.22	0.06	0.07	0.06
6		15	0.32	1.24	0.32	1.24	0.09	0.08	0.09
7	D02	16	0.91	1.62	0.91	1.62	0.09	0.08	0.08
8		20	NR	NR	0.78	1.61	0.11	0.11	0.10
9	D04	21	0.69	1.46	0.69	1.46	0.09	0.08	0.08
10		25	0.13	0.31	0.13	1.19	0.07	0.06	0.09
11	D05	26	0.49	1.47	0.49	1.47	0.07	0.07	0.08
12		29	0.60	1.55	0.60	1.55	0.07	0.07	0.07
13		30	0.31	0.51	0.29	1.55	0.07	0.07	0.07
14		39	NR	NR	0.29	1.41	0.07	0.07	0.07
15		40	0.31	0.31	0.27	1.22	0.10	0.09	0.09
16		46	NR	NR	0.12	0.96	0.09	0.08	0.08
17		47	Blank frame		Blank frame			Blank frame	
18	D07	48	0.17	0.26	0.17	1.16	0.09	0.08	0.08
19		60	0.32	1.24	0.23	1.69	0.08	0.07	0.07
20	A09	61	0.10	0.45	0.10	0.49	0.07	0.07	0.07
21	D09	62	0.24	0.72	0.24	1.94	0.07	0.07	0.07
22		71	0.18	0.57	0.13	0.57	0.06	0.06	0.06
23		72	0.10	0.79	0.10	0.79	0.06	0.05	0.05
24		77	0.19	0.99	0.10	0.99	0.05	0.05	0.05
25	A14	78	0.49	1.10	0.31	1.42	0.06	0.06	0.06
26		81	0.33	1.42	0.33	1.42	0.06	0.05	0.06
27	D14	82	0.34	0.55	0.09	1.58	0.06	0.06	0.06
28		88	0.21	0.32	0.12	1.49	0.06	0.06	0.06
29	D19	89	0.29	0.96	0.29	1.52	0.10	0.09	0.09
30		94	0.27	1.26	0.18	1.38	0.06	0.06	0.07
31	D23	95	0.29	1.24	0.12	1.36	0.06	0.06	0.07
32		102	0.20	1.31	0.20	1.49	0.07	0.07	0.07
33		103	0.14	0.49	0.14	1.38	0.07	0.07	0.07
34		108	0.13	1.23	0.13	1.23	0.07	0.07	0.07
35		109	0.31	0.46	0.31	1.61	0.06	0.07	0.07
36		118	0.24	1.13	0.18	1.55	0.07	0.07	0.07
37	D24	119	NR	NR	0.17	1.28	0.07	0.07	0.07
38		142	0.27	0.97	0.19	1.61	0.07	0.07	0.07
39	A25	143	0.09	0.38	0.09	0.50	0.07	0.07	0.07
40		144	0.09	0.83	0.09	0.83	0.06	0.07	0.07
41	D25	145	0.18	0.43	0.12	1.46	0.06	0.06	0.06
42		162	0.22	1.00	0.17	1.00	0.06	0.06	0.06
43		162	NR	NR	0.10	0.58	0.07	0.07	0.07
44		170	0.58	1.25	0.32	1.48	0.06	0.07	0.08
45	A31	171	0.10	0.21	0.10	1.00	0.07	0.06	0.07
46		174	0.26	1.43	0.19	1.48	0.07	0.07	0.07
47	A33	175	0.21	0.51	0.19	1.23	0.06	0.06	0.06
48		179	0.14	0.26	0.13	0.78	0.07	0.07	0.07
49	A34	180	0.13	0.22	0.13	0.96	0.07	0.07	0.07
50		192	NR	NR	0.11	1.21	0.06	0.06	0.06
51	D34	193	0.21	1.21	0.17	1.42	0.06	0.05	0.05
52		196	0.22	1.38	0.09	1.42	0.06	0.05	0.05
53	D35	197	NR	NR	0.61	1.51	0.06	0.07	0.06
54		201	0.25	0.41	0.19	1.51	0.06	0.06	0.07
55		202	0.22	1.37	0.22	1.50	0.07	0.07	0.08
56		209	0.26	1.37	0.18	1.52	0.07	0.07	0.07
57	D37	210	0.38	1.10	0.38	1.86	0.07	0.07	0.07
58		216	0.26	0.91	0.26	1.51	0.07	0.07	0.07
59		217	0.22	0.41	0.22	1.49	0.07	0.07	0.07

[redacted]

[redacted]

Reading	Pass	Frame	Terrain		Limiting		Gross Fog		
			D-Min	D-Max	D-Min	D-Max	Title Edge	Center	Untitled Edge
60		233	0.35	0.82	0.21	1.64	0.07	0.07	0.07
61	D38	234	0.27	0.47	0.27	1.69	0.07	0.07	0.08
62		240	0.13	0.74	0.13	1.38	0.07	0.07	0.08
63		241	0.36	1.00	0.36	1.51	0.07	0.07	0.08
64		247	0.49	1.03	0.40	1.62	0.07	0.07	0.08
65	D39	248	0.27	0.79	0.27	1.72	0.08	0.08	0.09
66		252	0.18	1.02	0.18	1.02	0.07	0.07	0.08
67		253	0.21	0.59	0.17	1.65	0.07	0.07	0.07
68		257	0.26	1.37	0.26	1.46	0.07	0.07	0.08
69	A40	258	0.08	0.14	0.08	0.14	0.08	0.08	0.08
70		259	0.09	0.36	0.09	0.36	0.08	0.07	0.08
71	D40	260	0.20	0.98	0.20	1.54	0.07	0.08	0.08
72		268	0.16	1.18	0.10	1.23	0.08	0.08	0.08
73	D41	289	0.21	0.52	0.14	1.21	0.07	0.08	0.08
74		298	0.18	0.80	0.18	1.52	0.09	0.09	0.09
75	A42E	299	Blank frame		Blank frame		0.09	0.08	0.09
76	A44	300	0.17	0.70	0.10	0.70	0.09	0.09	0.09
77		306	0.23	0.96	0.16	1.08	0.07	0.07	0.08
78	A47	307	0.15	1.21	0.15	1.21	0.09	0.08	0.08
79		309	0.14	1.38	0.14	1.38	0.10	0.08	0.09
80		310	0.22	0.85	0.22	1.12	0.08	0.07	0.08
81		314	0.41	1.49	0.41	1.55	0.09	0.07	0.09
82	A49	315	0.12	0.47	0.12	0.93	0.06	0.06	0.09
83		318	0.15	0.41	0.15	1.43	0.06	0.07	0.06
84		319	0.39	1.22	0.39	1.58	0.06	0.06	0.06
85		323	0.69	1.33	0.69	1.70	0.09	0.09	0.09
86	A50	324	0.13	0.37	0.12	1.20	0.09	0.09	0.09
87		329	0.20	1.04	0.19	1.50	0.08	0.08	0.09
88	D52	330	0.19	0.59	0.19	1.69	0.09	0.09	0.09
89		338	NR	NR	0.17	1.57	0.07	0.07	0.07
90	D54	339	0.12	0.28	0.12	1.12	0.06	0.07	0.07
91		345	0.22	0.59	0.20	1.45	0.06	0.07	0.07
92		346	0.17	1.12	0.17	1.33	0.07	0.07	0.07
93		352	0.38	1.04	0.38	1.65	0.07	0.07	0.07
94	D55	353	0.11	0.75	0.11	1.41	0.07	0.07	0.07
95		359	0.17	0.95	0.17	1.25	0.07	0.07	0.07
96		360	0.40	0.87	0.40	1.53	0.06	0.06	0.06
97		365	NR	NR	0.28	1.53	0.06	0.06	0.07
98	A56	366	0.07	0.22	0.07	0.22	0.07	0.07	0.07
99	D56	367	NR	NR	0.37	1.64	0.07	0.06	0.07
100		396	0.23	1.37	0.23	1.59	0.07	0.07	0.07
101	D57	397	0.26	0.52	0.26	1.26	0.07	0.07	0.07
102		410	0.31	0.72	0.22	1.62	0.07	0.07	0.07
103	A64	411	0.17	0.38	0.15	1.13	0.07	0.07	0.07
104		416	0.21	0.72	0.14	1.68	0.07	0.07	0.07
105	A65	417	0.18	0.33	0.17	1.06	0.07	0.07	0.07
106		428	0.52	1.38	0.29	1.52	0.07	0.07	0.07

NOTE: NR denotes no reading made.

Terrain		Limiting	
D-Max Range	0.[redacted]1.62	D-Max Range	0.14-1.72
D-Min Range	0.06-0.91	D-Min Range	0.06-0.91
Average D-Max	0.84	Average D-Max	1.30
Average D-Min	0.25	Average D-Min	0.23

Gross Fog Range 0.06-0.11
Average Gross Fog 0.07

[redacted]

[redacted]

PART V. EXPERIMENTAL "P" CAMERA

Mission No: 9056
Camera No: P-2
Slit Width: 0.080"
Film Type: SP 507-500 (4400-1-3-4-3)
Filter: Wratten 12
Aperture: f/18.0
Evaluated By: [redacted]

A camera system evaluation of this camera is not possible because of an apparent malfunction of the camera door (failed to open) resulting in total lack of imagery. The film take is clear with the exception of random static discharges and four fogged areas 8' to 9' long corresponding to the amount of film between the camera and take-up spool, indicating the cause to be light leaks affecting the film as it remained at rest between passes. The timing track operated satisfactorily and is well defined throughout. Little or no physical damage of the material is present.

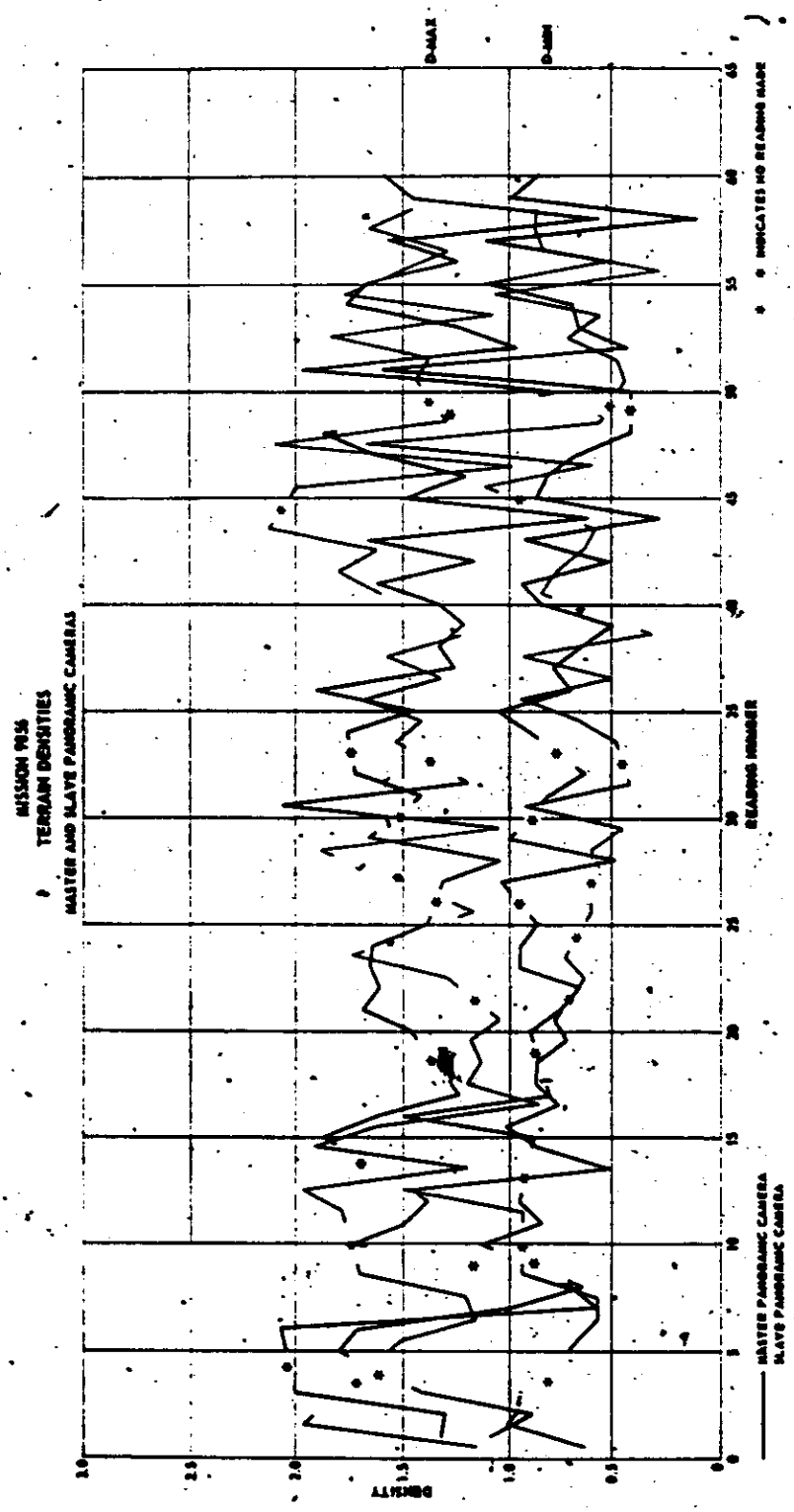
PART VI. VEHICLE ATTITUDE

Pass	Pitch Variation (All Minus Readings)	Pitch Range	Roll Variation	Roll Range	No of Frames
A01	15°05' 14°55'	0°10'	-0°53' -0°27'	0°26'	28
A02	15 22 14 46	0°36	-0 41 -0 15	0 26	50
	15 04 14 56	0 08	-0 14 -0 05	0 09	30
D02	14 47 14 43	0 04	-0 21 -0 10	0 11	25
D04	14 43 14 31	0 12	-0 27 -0 08	0 19	23
D05	14 39 13 50	0 49	-0 08 -0 04	0 04	31
	15 51 14 04	1 47	-0 16 -0 01	0 15	70
	16 02 14 56	1 06	-0 23 -0 25	0 08	52
D07	15 42 13 59	1 43	1 01 -0 22	1°23	96
A08	No information available				10
D08	15 15 14 12	1 03	-0 39 -0 02	0 37	67
	14 20 13 56	0 24	0 23 -0 03	0 26	47
A14	14 53 14 08	0 45	0 09 -0 20	0 29	96
D16	15 36 14 17	1 19	0 19 -0 09	0 28	46
D19	19 45 19 29	0 16	0 02 -0 16	-0 18	42
D23	19 59 19 17	0 42	0 09 -0 11	0 20	63
	19 20 18 59	0 21	0 26 -0 22	0 48	28
	21 46 19 57	1 49	0 35 0 14	0°21	73
D24	21 19 19 16	2 03	0 19 -0 11	0 30	170
A25	No information available				10
D25	20 32 19 41	0 51	0 12 -0 18	0 30	12[illegible]
	21 15 21 03	0 12	0 26 0 10	0 26	[illegible]
A31	15 58 15 07	0 51	0 11 -0 06	0 20	[illegible]
A32	18 0[illegible] 16 4[illegible]	1 18	0 [illegible] 0 0[illegible]	0 21	[illegible]
A34	17 1[illegible] 16 0[illegible]	1 [illegible]	0 [illegible] 0 [illegible]	0°1[illegible]	[illegible]
D34	20 [illegible] 20 1[illegible]	0 16	0 0[illegible] 0 1[illegible]	0 24	[illegible]
D36	1[illegible] [illegible] 1[illegible] [illegible]	1 11	0 [illegible] 0 [illegible]	0 1[illegible]	[illegible]
[illegible]	20 [illegible] 1[illegible] [illegible]	[illegible]	[illegible]	0 [illegible]	[illegible]

Pass	Pitch Variation (All Minus Readings)	Pitch Range	Roll Variation	Roll Range	No of Frames
D37	20 13 19 55	0 19	0 24 -0 09	0 33	44
	21 52 20 43	1 09	0 47 0 18	0 29	123
D38	20 14 19 44	0 30	0 03 -0 14	0 17	55
	21 29 20 48	0 41	0 17 0 08	0 09	45
D39	19 49 19 31	0 11	0 07 -0 17	0 24	43
	20 35 19 27	1 08	0 07 -0 17	0 24	89
A40	No information available				11
D40	21 28 19 28	2 00	0 33 -0 03	0 36	205
D41	20 42 20 17	0 25	0 04 -0 11	0 15	75
A42	No information available				6
A44	16 23 15 39	0 44	0 18 -0 10	0 28	45
A47	14 50 14 32	0 18	-0 13 0 00	0 13	25
	18 07 18 01	0 06	0 22 0 13	0 09	32
A49	16 36 16 23	0 13	0 34 0 01	0 33	32
	19 49 19 19	0 30	0 34 0 19	0-15	33
A50	17 54 17 04	0 50	0 33 0 10	0 23	44
D52	20 54 20 43	0 11	-0 06 0 00	0 06	63
D54	21 04 20 58	0 06	0 20 -0 13	0 33	50
	20 59 20 40	0 19	0 10 0 06	0 04	45
D55	20 54 20 24	0 30	0 37 0 00	0 37	46
	20 36 20 19	0 17	0 12 0 07	0 05	45
A56	No information available				11
D56	21 08 20 27	0 26	0 27 0 02	0 25	150

[redacted]

PART VII. DENSITY CHARTS



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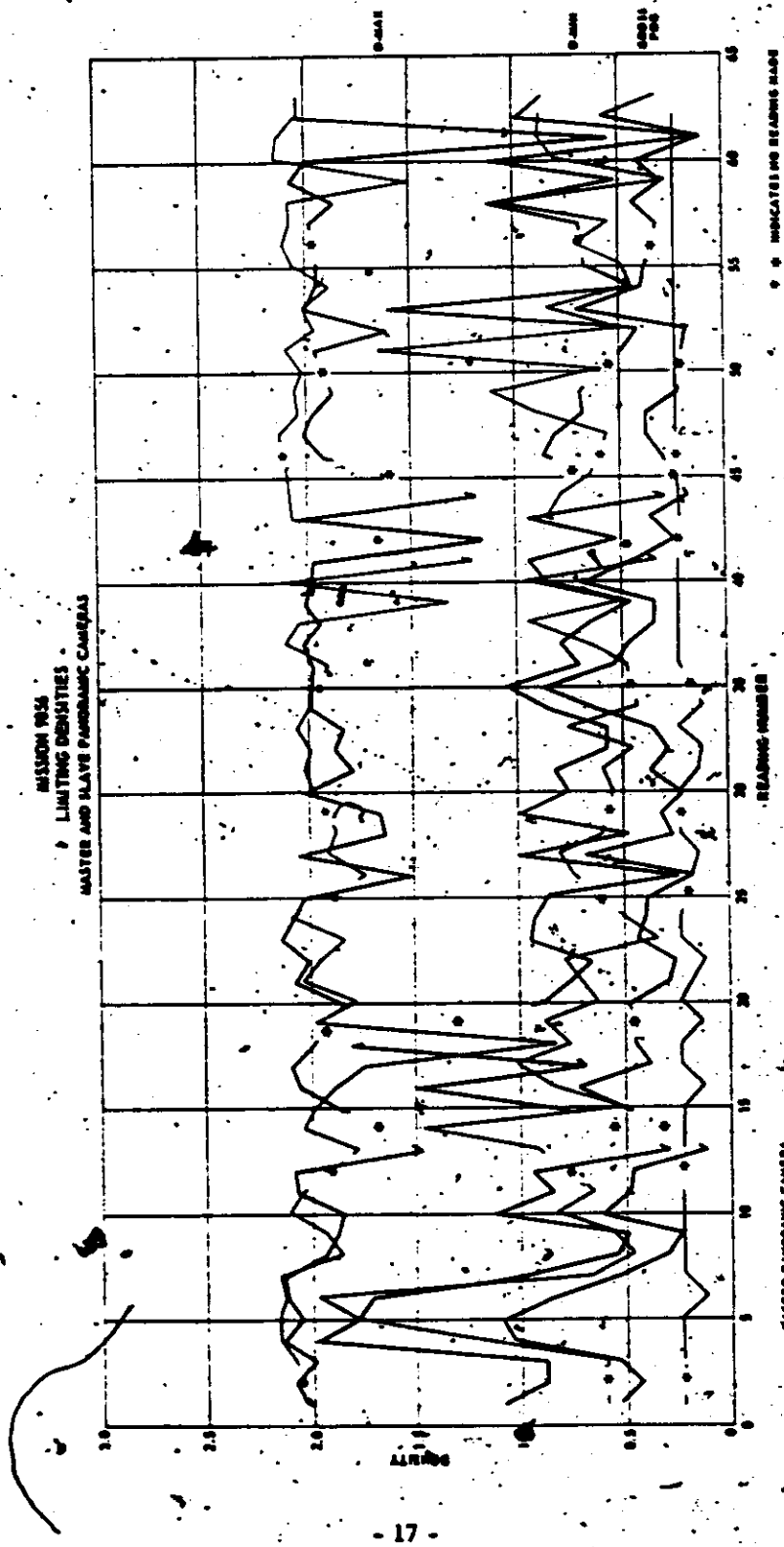
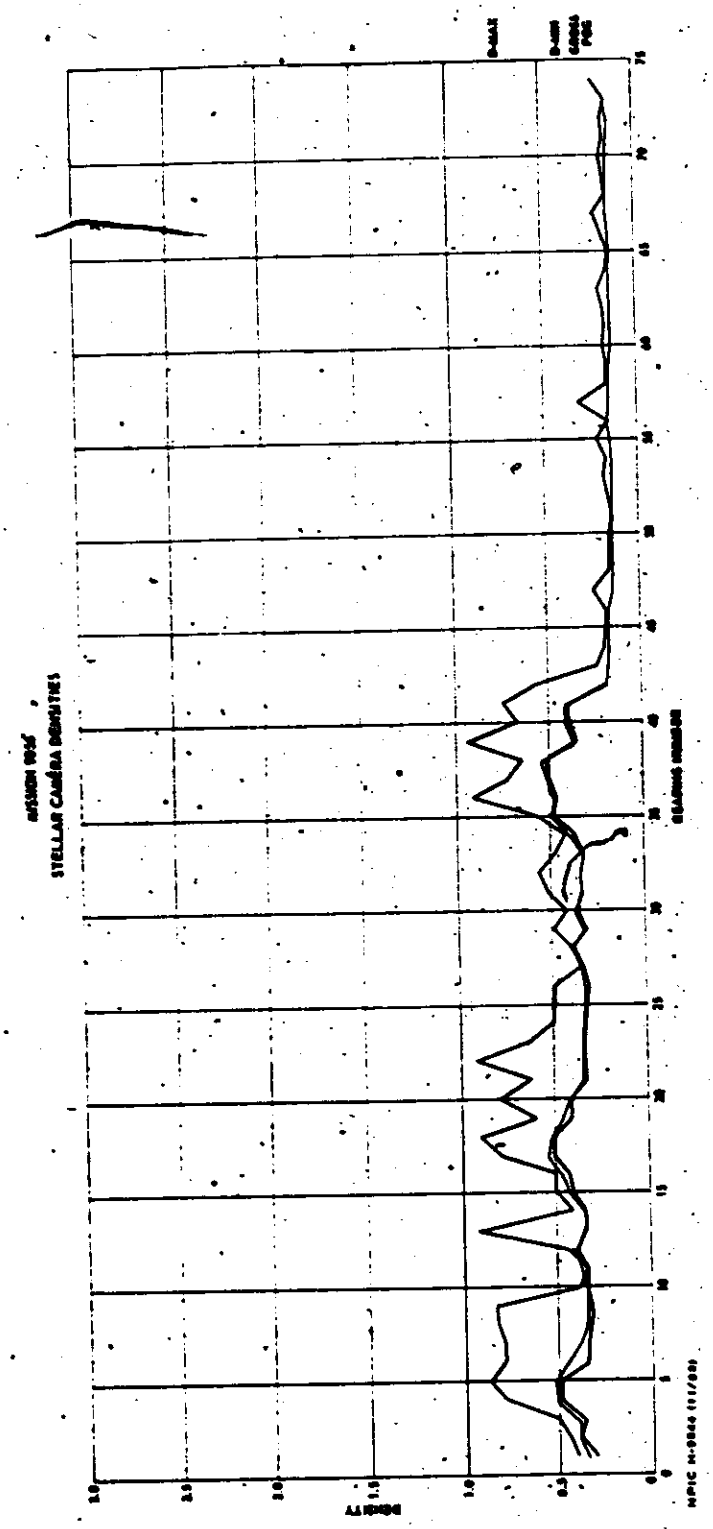
Control System Only


MISSION 9036
LIMITING DENSITIES
MASTER AND SLAVE PANORAMIC CAMERAS
READING NUMBER
DENSITY
MASTER PANORAMIC CAMERA
SLAVE PANORAMIC CAMERA

[redacted]



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~~Control System Only~~