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October 1963

TECHNICAL PUBLICATION

PHOTOGRAPHIC EVALUATION REPORT

MISSION 9054

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TECHNICAL PUBLICATION

PHOTOGRAPHIC EVALUATION REPORT

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13 - 16 JUNE 1963

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NATIONAL PHOTOGRAPHIC INTERPRETATION CENTER

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PART I. MASTER PANORAMIC CAMERA

Mission No: 9054 (M-21)
Camera No: 112
Slit Width: 0.800"
Film Type: 7J23-7800 (SO 132)

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

1. Shutter Operation (Horizon Cameras): The port and starboard horizon cameras malfunctioned (failed to open) in pass D06, frame 141; pass D08, frame 5; pass D09, frames 5, 7, 47, 49; pass A30, frame 6; pass D55, frame 33.

2. Horizon Camera Exposure:
   a. Supply (Port): The exposure is adequate for the majority of descending passes but is insufficient to compensate for prevailing low sun angle in 50% of the ascending passes (f/6.8, 1/100 second).
   b. Take-Up (Starboard): The exposure is adequate for the majority of all passes (f/6.8, 1/100 second).

3. Camera Number: The number is flared but readable. No camera number appears on pass D55, frame 33.

4. Data Block: The data block functions throughout the mission but the lamp images are "bloomed." All of the lamps are imaged simultaneously in pass D09, frame 35; pass D36, frame 46; pass A47, frame 67; pass D52, frames 91, 93. Two data blocks are recorded at the termination of most passes, one with the camera number and the other with the end-of-pass marker. In such instances the data blocks are separated by a distance approximately equal to film transport. One of the two data blocks recorded at the end of pass D55 is displaced into the horizon camera format. In pass A02 the end-of-pass marker is superimposed over the data block record.

5. Film Metering:
   a. The average metering between the supply (port) horizon camera and the following panoramic frame is 0.13" and ranges from 0.12" to 0.18".
   b. The average metering between the take-up (starboard) horizon camera and the preceding panoramic frame is 0.13" and ranges from 0.12" to 0.16".

6. Film Tracking: The panoramic frames are slightly skewed from normal. When viewed with the film oriented to the direction of flight, the take-up end of the format is pitched approximately 0.10" forward (higher) in relation to the supply end.

7. Frequency Markers: The marks are flared with reflected images, and they do not terminate at pass ends. The marks occasionally track into the skewed panoramic formats. Example: pass D06, frames 121 to end-of-pass.

8. Fiducials:
   a. Panoramic Camera: The fiducials are well defined throughout the film.
   b. Horizon Cameras: The fiducials are well defined with little or no flare present.

9. Light Leaks: A diagonal light leak enters the format across the trailing (titled) edge of the third-from-last panoramic frame at most, pass ends and camera-off positions. Examples: pass A01, frame 45; pass D04, frames 29, 75; pass D07, frame 149; pass D36, frame 158; pass A47, frame 76. A fogged area appears intermittently in the take-up ends of frames containing the diagonal light leaks. Examples: pass D09, frame 127; pass D18, frame 37; pass D36, frame 158. Equipment images are present

intermittently, usually appearing in the third frame of a pass and/or the next-to-last frame. Examples: pass D23, frame 3; pass A30, frame 3; pass D36, frames 3, 159. Edge fog is present on the trailing (titled) edge of pass D23, frames 1-31.

10. Static Electricity: A corona discharge degrades the take-up end of pass A40, frame 4.

11. Pinholes: Present intermittently throughout the film. Examples: pass A02, frames 1, 34, 38; pass D34, frames 1, 2, 4, 21; pass D50, frames 7, 30.

12. Abrasions and Scratches: Present intermittently throughout the film. The majority are minor and randomly located. Examples: pass M04, frame 14; pass D06, frames 61, 73; pass D25, frame 77; pass D36, frames 1, 34, 71. Pass A01 contains small scratches and abrasions in excessive number on frames 1-47. Severe scratches, apparently processing-induced, are present in pass A02, frame 3. Multiple fine base scratches appear intermittently. Example: pass D07, frames 137-139.

13. Tearing: None noted. A heat splice appears on pass A02, frame 3, and a manufacturers splice is present on pass D25, frame 69.

14. Water Marks: None noted.

15. Pressure Streaks: Small base rubs are present intermittently throughout the film.

16. Processing Streaks: None noted.

17. Blistering and Crimping: Blisters are noted in pass D02, frame 19; pass D06, frame 112; pass D50, frame 13. Crimps are minor and few in number.

18. Contrast: 45% low, 50% medium, 5% high.

19. Apparent Resolution: Good, comparable to Mission 9047.

20. Apparent Graininess: Fine.

21. Photo Quality:

a. Panoramic Camera: The photographic quality ranges from fair to good.

b. Horizon Cameras: Photographic quality of the port and starboard images is poor. Both cameras are out of focus. The starboard images contain little or no terrestrial detail, while approximately half of the port images are severely degraded by low sun angle, particularly in the ascending passes.

22. Camera Operation:

a. Panoramic Camera: Good. No malfunctions or faults noted other than the light leaks described in Item 9 (Light Leaks).

b. Horizon Cameras: Fair. The out-of-focus condition of the photography precludes assignment of a more favorable rating.

23. Suitability for PI: Good.

Remarks

1. Plus-density bands perpendicular to film travel appear in areas of water photography. Examples: pass D04, frames 49-63; pass D09, frames 50-60.

2. Minus-density streaks occur intermittently throughout the film. Examples: pass A02, frame 4; pass A18, frames 23, 28, 102; pass A31, frames 13, 16; pass A32, frames 3, 5, 9, 24, 25; pass A34, frames 6, 7. Severe minus-density streaks are noted on pass D36, frames 149, 154, 155.

3. On pass D56, frames 29, 30, 63 contain edge-to-edge plus- and minus-density diagonal patterns resembling film crease images. These patterns are most intense in frame 29, one located 3.5" from the supply edge of the format and another 6.0" inboard of supply. A 0.50" shift in the direction of supply is noted in frame 30. A single pattern is present 6.0" from the take-up edge of the format in frame 63.

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4. Foreign matter, usually consisting of opaque material transfers, is present on pass A01, frame 47; pass D08, frames 33, 36, 45-47, 54; pass A16, frame 3; pass A34, frame 65; pass D36, frame 39. Smeared titles appear intermittently but the titling is legible throughout the film. Examples: pass D04, frame 47; pass A47, frame 78.

5. A small emulsion defect occurs on pass D34, frame 48.

6. A total of 13 parts were spooled tails out.

7. Image acuity appears superior to that obtained from the slave panoramic camera.

8. Erratic film metering due to film exhaustion occurs on the last few frames of pass A59.

9. The following descriptions of overlap from Camera Number 112 were determined from the fifth and last frames of each pass, where possible. Film transport was determined from the first and last frames of each pass. Cloud cover, low sun angle, or lack of imagery may have precluded determination of these values in some passes. When such is the case, the omissions are denoted by "NM" for "Not Measurable."

10. Density readings were taken on each pass, using the MacBeth Quantalog Densitometer, Model EP 1000, with an ET 20 attachment and an 0.5 mm aperture. Terrain and limiting density readings for D-Max, D-Min, and Gross Fog are correlated on the following pages.

Pass	Overlap (Percent)		Film Transport (From Take-Up Side in Inches)	
	Beginning	End	First Frame	Last Frame
A01	0	NM	NONE	16.5
A02	NM	NM	NONE	NONE
D02	NM	NM	NONE	NONE
M04	NM	NM	NONE	NONE
D04	NM	NM	NONE	11.0
D06	10	10	19.25	NONE
D07	6	9	NONE	NONE
D08	8	10	20.0	NONE
D09	6	10	NONE	NONE
A15	0	NM	18.25	12.5
A16	5	NM	10.75	12.5
A17	0	0	10.4	16.5
A18	6	NM	10.5	NONE
D18	NM	6	12.75	NONE
D23	8	9	16.0	NONE
D25	10	NM	8.0	8.0
A30	7	NM	20.0	16.0
A31	8	8	13.5	13.75
A32	NM	9	10.75	13.25
A33	0	NM	10.5	17.5
A34	6	NM	14.0	15.0
D34	NM	NM	12.7	NONE
D36	NM	6	17.5	16.0
D39	9	NM	19.75	18.0
A40	NM	NM	19.5	11.0
A44	0	0	NONE	15.0
A46	NM	NM	12.25	13.0
A47	5	NM	10.5	15.5
A48M	7	9	13.5	13.5
A50	6	8	11.75	15.0
D50	0	NM	NONE	19.5
D52	6	NM	17.5	NONE
D56	10	15	19.5	NONE
D56	10	10	9.25	NONE
A59	4	NM	19.6	NONE

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Reading	Pass	Frame	Terrain		Limiting		Group Fog		
			D-Min	D-Max	D-Min	D-Max	Leading	Center	Trailing
1	A01	10	0.37	0.82	0.37	1.88	0.17	0.17	0.17
2		37	1.65	1.94	1.65	2.06	0.17	0.17	0.17
3	A02	8	0.59	1.31	0.59	1.96	0.17	0.17	0.17
4	D02	40	1.13	1.84	1.13	2.04	0.09	0.09	0.09
5	D04	4	1.08	1.88	1.06	2.02	0.09	0.09	0.09
6		15	1.01	1.89	1.01	1.89	0.07	0.07	0.07
7	D06	14	0.47	1.06	0.47	1.96	0.09	0.09	0.09
8		99	0.36	1.13	0.36	2.00	0.09	0.09	0.09
9		143	0.91	1.21	0.91	1.99	0.09	0.09	0.09
10	M04	9	1.22	1.94	0.57	1.96	0.06	0.06	0.06
11	D07	59	0.46	1.06	0.46	1.96	0.07	0.06	0.07
12		84	0.62	1.64	0.58	1.98	0.17	0.17	0.17
13	D08	70	0.79	1.57	0.78	1.65	0.15	0.15	0.15
14		79	0.82	1.58	0.69	1.99	0.15	0.15	0.15
15	D09	15	0.37	1.06	0.37	1.98	0.09	0.09	0.09
16		115	0.41	1.64	0.30	1.64	0.09	0.09	0.09
17	A15	6	0.20	1.30	0.20	1.63	0.09	0.09	0.09
18	A16	10	0.45	1.00	0.45	1.78	0.17	0.17	0.17
19	A17	28	0.42	1.52	0.42	1.82	0.17	0.17	0.17
20	A18	50	0.32	0.69	0.29	1.63	0.17	0.17	0.17
21		76	0.62	0.98	0.41	1.82	0.15	0.15	0.15
22	D18	23	1.05	1.27	1.05	1.94	0.10	0.10	0.10
23	D23	22	0.39	0.72	0.29	1.93	0.09	0.09	0.09
24		42	0.34	1.15	0.30	1.92	0.09	0.09	0.09
25		108	0.57	1.57	0.57	1.94	0.15	0.15	0.15
26		156	0.53	1.62	0.53	1.82	0.15	0.15	0.15
27	D25	9	0.55	1.34	0.51	1.68	0.15	0.15	0.15
28		97	0.70	1.54	0.70	2.02	0.19	0.19	0.19
29		151	1.05	1.74	0.37	1.74	0.11	0.11	0.11
30	A30	10	0.36	0.62	0.29	1.50	0.18	0.18	0.18
31		45	0.65	0.84	0.65	1.89	0.07	0.07	0.07
32	A31	17	0.44	0.88	0.44	1.65	0.18	0.18	0.18
33	A32	20	0.38	0.65	0.38	1.53	0.18	0.18	0.18
34	A33	20	0.35	0.67	0.35	1.92	0.19	0.19	0.19
35		56	1.49	1.87	0.69	1.97	0.11	0.11	0.11
36	A34	20	0.34	0.90	0.34	1.71	0.19	0.19	0.19
37		70	0.75	1.30	0.50	1.91	0.17	0.17	0.17
38		23	0.40	0.70	0.40	2.07	0.19	0.20	0.22
39	D34	14	0.37	1.93	0.29	1.93	0.07	0.07	0.07
40	D36	31	1.56	1.96	1.56	1.99	0.11	0.11	0.11
41		58	0.31	0.78	0.31	1.96	0.06	0.06	0.06
42		133	0.55	1.26	0.49	2.02	0.19	0.19	0.19
43	D39	70	0.30	1.24	0.30	2.00	0.09	0.09	0.09
44		80	0.51	1.31	0.51	1.96	0.15	0.15	0.15
45	A40	9	NR	NR	0.19	0.66	0.19	0.20	0.19
46	A44	41	0.40	1.84	0.40	1.90	0.09	0.09	0.09
47		51	1.11	1.84	1.01	1.84	0.09	0.09	0.09
48	A46	9	NR	NR	0.19	1.63	0.09	0.09	0.09
49	A47	49	0.54	1.94	0.42	1.94	0.17	0.17	0.17
50		80	0.69	1.75	0.69	1.84	0.17	0.17	0.17
51	A48M	36	0.38	0.51	0.38	1.85	0.94	0.94	0.94
52	A50	15	0.41	0.82	0.41	1.45	0.90	0.90	0.90
53	D50	13	0.45	1.80	0.45	1.84	0.11	0.11	0.11
54		23	0.29	1.88	0.29	1.88	0.11	0.11	0.11
55	D52	37	0.96	1.96	0.96	1.99	0.09	0.09	0.09
56		107	0.51	1.44	0.51	1.50	0.19	0.19	0.19
57	D55	15	1.05	1.52	1.05	2.09	0.19	0.19	0.19
58		46	0.37	1.32	0.37	1.88	0.19	0.19	0.19
59		82	0.73	1.25	0.73	1.94	0.19	0.19	0.19
60		177	0.37	1.92	0.35	1.92	0.09	0.09	0.09

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Reading	Pass	Frame	Terrain		Limiting		Gross Fog		
			D-Min	D-Max	D-Min	D-Max	Leading	Center	Trailing
61	D56	12	0.75	1.69	0.78	2.06	0.17	0.17	0.17
62		65	0.45	2.02	0.45	2.02	0.19	0.19	0.19
63	A59	5	0.64	1.59	0.64	1.84	0.19	0.19	0.19

NOTE: NR denotes no reading made.

Terrain		Limiting	
D-Max Range	0.20-1.65	D-Max Range	0.19-1.56
D-Min Range	0.51-2.02	D-Min Range	0.66-2.09
Average D-Max	1.39	Average D-Max	1.86
Average D-Min	0.63	Average D-Min	0.56

Gross Fog Range 0.07-0.22
Average Gross Fog 0.14

PART II. SLAVE PANORAMIC CAMERA

Mission No: 9054 (M-21)
Camera No: 113
Slit Width: 0.200"
Film Type: 7J23-7800 (SO 132)
Filter, Panoramic: Wratten 21
Aperture, Panoramic: f/[redacted]
Filters, Horizon: Wratten 25
Evaluated By: [redacted]

1. Shutter Operation (Horizon Cameras): The port and starboard horizon camera shutters functioned throughout the mission.

2. Horizon Camera Exposure:

a. Take-Up (Port): The exposure [illegible] to be excessive in the majority of descending passes and insufficient for the ascending passes (f/6.8, 1/100 second).

b. Supply (Starboard): The exposure is excessive in the majority of descending and ascending passes (f/6.8, 1/100 second).

3. Camera Number: The number is flared but readable.

4. Data Block: The data block functions throughout the mission but the lamp images are "bloomed." Two data blocks are recorded at the termination of all passes, one with the camera number and the other with the end-of-pass marker. In such instances the data blocks are separated by a distance approximately equal to film transport. Single data blocks are recorded at the majority of camera-off positions within the passes, and the end-of-pass markers are present and displaced from the data block records by a distance approximately equal to film transport.

5. Film Metering:

a. The average metering between the take-up (port) horizon camera and the preceding panoramic frame is 0.18" and ranges from 0.18" to 0.19".

b. The average metering between the supply (starboard) horizon camera and the following panoramic frame is 0.13" and ranges from 0.12" to 0.14".

6. Film Tracking: The panoramic frames are slightly skewed from normal. When viewed with the film oriented to the direction of flight, the supply end of the format is pitched approximately 0.10" forward (higher) in relation to the take-up end.

7. Frequency Markers: The marks are flared with reflected images, and terminate 3.0" from supply in the last frame of each pass and at the

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camera-off positions within the passes. The marks occasionally track into the skewed formats. Example: pass D06, frames 119 to end-of-pass.

8. Fiducials:
   a. Panoramic Camera: The fiducials are well defined throughout the film.
   b. Horizon Cameras: The fiducials are well defined with little or no flare present.

9. Light Leaks: Diagonal light leaks similar to those noted in the master panoramic cameras are present in the second or third panoramic frames of most passes. Examples: pass D06, frame 3; pass A17, frame 2; pass A18, frame 2; pass A30, frame 3; pass D36, frame 3. Equipment images appear in most passes and are usually present in the first, second, or third and the last or next-to-last panoramic frames, including those immediately preceding the camera-off positions within the passes. Examples: pass M04, frame 29; pass D06, frames 3, 151; pass A15, frames 1, 3, 35; pass A16, frame 22; pass D25, frames 181, 182; pass A30, frames 1, 3, 68. Edge fog is present on the leading (titled) edges of the first few frames of some passes and fogged areas appear intermittently at pass beginnings or ends and at the camera-off/camera-on positions within the passes. Examples: pass D09, frames 124-126; pass A15, frame 2; pass A47, frame 6; pass A50, frames 1, 2; pass D50, frame 31.

10. Static Electricity: Corona static discharges are first observed in pass A18 and are present throughout the remainder of the mission, increasing in intensity as the mission progresses. Degradation is most severe in the first few frames of the passes affected (usually frames 3-5) and the initial discharges are followed by heavy fog which degrades much of the subsequent photography. Corona discharges also occur at camera-on positions within the passes. Approximately 45 frames of the mission are so severely degraded as to completely negate their use for PI purposes. Many more, although less seriously degraded, are of dubious value for PI readout. Examples: pass A18, frames 3-9 (corona discharge and associated fog); pass D23, frames 4, 5; pass D25, frames 3-5; pass A30, frames 3-5, 33-35; pass A33, frames 3-5; pass D36, frames 3-5, 42, 43, 75; pass A46, all frames affected, particularly frames 3, 4, and the last few frames at end-of-pass; pass A47, frames 1-5; pass D50, frames 1-15 (corona discharge and associated fog). In the majority of the preceding examples, frame 4 appears to be the most severely affected individual frame.

11. Pinholes: Present intermittently throughout the film. Examples: pass D06, frames 137, 139; pass D08, frames 1, 2, 6, 39; pass D36, frames 4, 6, 11, 32, 41, 105.

12. Abrasions and Scratches: They are present intermittently throughout the film. The majority are minor and of random distribution. Examples: pass D09, frames 22, 28, 77, 102; pass A15, frames 25, 36; pass A18, frames 94-96; pass D23, frames 7, 12. Severe scratches are present on pass D18, frames 1, 29. Multiple, fine base scratches are noted on pass D07, frame 57. An emulsion dig is present on pass D06, frame 116.

13. Tearing: None noted. A manufacturers splice is present on pass D25, frame 71.

14. Water Marks: None noted.

15. Pressure Streaks: None noted except for small, intermittent base rubs.

16. Processing Streaks: None noted.

17. Blistering and Crimping: Minor and few. Examples: pass D06, frame 85; pass D08, frame 5.

18. Contrast: 45% low, 50% medium, 5% high.

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19. Apparent Resolution: Good. It is comparable to Mission 9047 where not degraded by corona static discharges or fog.

20. Apparent Graininess: Fine.

21. Photo Quality:
a. Panoramic Camera: The photographic quality ranges from poor to good, depending upon the degree of degradation by corona static. Where no degradation occurs the quality is only slightly inferior to that obtained from the master panoramic camera.
b. Horizon Cameras: The photographic quality of the port and starboard horizon images is poor. Both images are out of focus.

22. Camera Operation:
a. Panoramic Camera: Fair. The recurrent corona static precludes assignment of a more favorable rating.
b. Horizon Cameras: Fair, due to the out-of-focus condition of the photography.

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

Remarks

1. Twin, parallel minus-density streaks located 0.25" and 0.50" inboard of the trailing (untitled) edge of the panoramic formats are continuous throughout the film.

2. An edge-to-edge minus-density band, 0.05" wide, is located 9.0" from supply in pass A47, frame 46. A similar minus-density band is located 7.0" from supply in pass A50, frame 3. A plus-density area, 3.5" wide, is present in pass D08, frame 80.

3. Foreign matter, usually consisting of opaque material transfers, is found intermittently throughout the film. Examples: pass D06, frame 66; pass D07, frames 34, 62; pass D09, frame 77.

4. Smeared titles appear intermittently but the titling is readable throughout the film. Examples: D06, intermittent throughout; pass D18, frame 31.

5. A total of 9 parts were spooled tails out.

6. Image acuity appears slightly inferior to that obtained from the master panoramic camera.

7. Erratic film metering occurs on the last few frames of pass A59, due to film exhaustion. Some film damage also occurs on these frames.

8. The following descriptions of overlap from Camera Number 113 were determined from the fifth and last frames of each pass, where possible. Film transport was determined from the first and last frames of each pass. Cloud cover, low sun angle, or lack of imagery may have precluded determination of these values in some passes. When such is the case, the omissions are denoted by "NM" for "Not Measurable."

Pass	Overlap - (Percent)		Film Transport (From Take-Up Side in Inches)	
	Beginning	End	First Frame	Last Frame
A01	0	NM	NONE	11.7
A02	9	9	9.7	10.6
D02	NM	NM	NONE	16.6
M04	NM	NM	14.75	15.0
D04	NM	NM	NONE	19.5
D06	10	10	17.6	6.0
D07	8	NM	8.75	10.5
D08	6	6	16.2	20.8
D09	5	6	NONE	10.5
A15	1	NM	16.25	11.5
A16	10	NM	NONE	10.2
A17	0	1	NONE	11.0

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Pass	Overlap (Percent)		Film Transport (From Take-Up Side in Inches)	
	Beginning	End	First Frame	Last Frame
A18	NM	1	NONE	18.0
D18	NM	NM	11.0	18.5
D23	5	9	16.25	11.0
D25	NM	NM	NONE	10.3
A30	0	NM	17.0	14.0
A31	0	1	NONE	11.5
A32	NM	NM	NONE	11.0
A33	NM	1	NONE	15.0
A34	NM	NM	13.0	NONE
D34	NM	NM	11.0	18.5
D36	NM	5	16.5	18.4
D39	6	8	18.5	20.5
A40	NM	NM	NONE	9.5
A44	0	0	7.4	13.0
A46	0	NM	10.75	10.75
A47	0	NM	NONE	14.0
A50	0	NM	12.0	14.0
D50	NM	1	11.5	18.75
D52	7	9	16.0	20.5
D55	0	9	18.2	20.5
D58	7	NM	NONE	20.5
A59	4	4.5	18.2	NONE

9. Density readings were taken on each pass, using the MacBeth Quantalog Densitometer, Model EP 1000, with an ET 20 attachment and an 0.5 mm aperture. Terrain and limiting density readings for D-Max, D-Min, and Gross Fog are correlated below.

Reading	Pass	Frame	Terrain		Limiting		Gross Fog		
			D-Min	D-Max	D-Min	D-Max	Leading	Center	Trailing
1	A01	16	0.54	0.92	0.54	2.16	0.21	0.20	0.21
2		41	1.94	2.12	1.94	2.36	0.21	0.21	0.21
3	A02	13	0.70	1.32	0.70	2.32	0.19	0.20	0.20
4	D02	45	1.64	2.24	1.65	2.34	0.20	0.20	0.20
5	M04	14	2.12	2.25	0.85	2.30	0.15	0.16	0.15
6	D04	9	0.90	2.11	0.90	2.25	0.10	0.10	0.10
7		58	0.45	1.11	0.45	2.11	0.21	0.21	0.21
8	D06	52	1.04	1.84	1.04	2.34	0.20	0.21	0.20
9		103	0.90	1.87	0.90	2.33	0.21	0.21	0.21
10	D07	57	0.55	0.97	0.55	2.16	0.10	0.10	0.10
11		87	0.51	1.79	0.51	2.16	0.15	0.15	0.15
12		145	1.41	2.27	1.41	2.31	0.20	0.21	0.20
13	D08	75	1.93	1.42	0.69	1.99	0.19	0.19	0.20
14		76	0.78	1.86	0.78	2.09	0.20	0.20	0.20
15	D09	17	0.79	1.38	0.79	2.23	0.19	0.19	0.19
16		118	0.47	1.73	0.47	1.91	0.12	0.12	0.12
17	A15	10	0.39	2.00	0.39	2.02	0.21	0.21	0.21
18	A16	14	0.44	0.91	0.44	2.02	0.21	0.21	0.21
19	A17	31	0.44	2.02	0.44	2.02	0.21	0.21	0.21
20	A18	23	0.41	0.84	0.41	1.79	0.19	0.19	0.19
21		76	0.40	0.89	0.35	2.05	0.19	0.19	0.19
22		100	1.74	2.04	1.04	2.10	0.19	0.19	0.19
23	D18	28	NR	NR	1.51	2.27	0.19	0.19	0.19
24	D23	30	0.67	1.11	0.67	2.21	0.11	0.11	0.11
25		47	0.70	1.78	0.66	2.20	0.21	0.21	0.21
26		160	0.56	1.86	0.55	2.18	0.19	0.19	0.19
27	D25	14	0.69	1.58	0.53	1.98	0.19	0.19	0.19
28		102	0.80	1.76	0.80	2.14	0.20	0.20	0.21
29		154	1.17	2.08	0.62	2.08	0.20	0.20	0.21

[redacted]
Control System Only

[redacted]

Reading	Pass	Frame	Terrain		Limiting		Gross Fog		
			D-Min	D-Max	D-Min	D-Max	Leading	Center	Trailing
30	A30	17	0.31	0.62	0.31	1.44	0.18	0.18	0.18
31	A30	50	1.25	1.64	1.25	2.10	0.19	0.19	0.19
32	A31	20	0.39	0.74	0.39	1.69	0.19	0.19	0.19
33	A32	20	0.44	0.72	0.44	1.85	0.19	0.19	0.19
34	A33	23	0.42	0.70	0.42	1.99	0.19	0.19	0.19
35		60	1.55	2.14	1.02	2.14	0.07	0.07	0.07
36	A34	23	0.40	0.70	0.40	2.07	0.19	0.20	0.22
37		73	0.65	1.44	0.42	1.95	0.19	0.19	0.19
38	D34	18	0.37	2.00	0.37	2.02	0.11	0.11	0.11
39		37	0.74	1.94	0.70	2.12	0.09	0.09	0.09
40	D36	59	0.85	1.80	0.85	2.17	0.17	0.17	0.17
41		83	0.93	1.84	0.93	2.16	0.17	0.17	0.17
42		136	0.50	1.45	0.48	2.10	0.17	0.17	0.17
43	D39	75	0.60	1.48	0.60	2.11	0.17	0.17	0.17
44		84	0.72	1.43	0.66	2.12	0.19	0.19	0.19
45	A40	5	NR	NR	NR	NR	0.11	0.11	0.11
46	A44	44	0.65	2.01	0.65	2.07	0.19	0.21	0.32
47	A46	6	0.34	0.70	0.34	1.76	0.24	0.34	0.25
48	A47	25	0.44	0.86	0.44	1.98	0.23	0.45	0.34
49		63	1.01	1.97	1.01	1.97	0.14	0.26	0.22
50	A50	17	0.47	0.98	0.47	1.76	0.35	0.46	0.39
51		34	0.86	1.10	0.84	1.91	0.31	0.66	0.45
52	D50	17	0.76	1.67	0.69	2.04	0.21	0.24	0.26
53		28	0.29	2.13	0.29	2.13	0.14	0.16	0.22
54	D52	40	1.30	2.01	1.18	2.14	0.17	0.29	0.29
55		63	0.55	1.56	0.51	2.11	0.19	0.32	0.29
56		131	0.46	1.63	0.46	2.10	0.22	0.22	0.20
57	D55	18	0.82	1.62	0.62	2.14	0.19	0.32	0.29
58		50	0.46	1.74	0.46	2.06	0.19	0.19	0.24
59		86	0.74	1.42	0.74	2.14	0.19	0.19	0.22
60		180	0.35	1.75	0.35	1.75	0.09	0.09	0.09
61	D56	17	0.67	1.74	0.67	2.14	0.19	0.19	0.22
62	A59	11	0.97	1.74	0.62	1.90	0.19	0.19	0.19

NOTE: NR denotes no reading made.

Terrain		Limiting	
D-Max Range	0.62-2.27	D-Max Range	1.44-2.36
D-Min Range	0.29-2.12	D-Min Range	0.29-1.94
Average D-Max	1.56	Average D-Max	2.07
Average D-Min	0.78	Average D-Min	0.69

Gross Fog Range	0.07-0.66
Average Gross Fog	0.24

[redacted]

[redacted]

PART III. STELLAR CAMERA

Mission No: 9054 (M-21)
Camera No: 9
Camera Setting: f/1.9, 2 seconds

Filter: None
Film Types: SO 102, SO 130
Evaluated By: [redacted]

1. Shutter Operation: The shutter failed to open 40 times. No definable sequence or pattern of failure is evident. Examples: frames 32, 39, 40, 64, 120, 135, 184, 235, 281, 307.

2. Exposure: The exposure is adequate to produce stellar imagery.

3. Frame Correlation Fiducial Mark: The mark is operational throughout the mission although slightly flared as a result of overexposure.

4. Camera Number: The number is well defined and properly registered within the frame correlation fiducial mark.

5. Reseau Calibration Points: The lamps are operational throughout the mission but slightly flared by overexposure.

6. Reseau: The grid is visible in areas of sufficient density to support detectable imagery. Outlines of the grid perimeter are imaged 33 times. Examples: frames 8, 24, 59, 161, 249, 265, 334, 342.

7. Film Metering: Normal throughout the film, (see item 6 in Remarks).

8. Film Tracking: Normal throughout the film.

9. Light Leaks: Numerous throughout the film. Crescent-shaped, edge-to-edge light leaks are evident in frames coincident with camera-off/camera-on positions in the panoramic photography. Light leak examples (all types) follow: frames 3, 10, 56, 82, 108, 137, 163, 220, 281, 301.

10. Static Electricity: Intermittent. Static discharges are few and randomly located.

11. Abrasions and Scratches: Intermittent and few except for a continuous scratch, similar to a rail scratch in appearance and location, present throughout the last half of the stellar film on the titled edge.

12. Pinholes: Few.

13. Water Marks: None noted.

14. Processing Streaks: None noted.

15. Pressure Streaks: None noted.

16. Tearing: None.

17. Blistering and Crimping: None noted.

18. Foreign Matter: None noted.

19. Contrast: The contrast is adequate to establish the presence of stellar images.

20. Apparent Graininess: Medium.

21. Photo Quality: Fair only. The quality is degraded by the abundance of light leaks and consistent flare within the formats.

22. Camera Operation: Fair. The shutter malfunctions and excessive light leaks previously mentioned preclude assignment of a higher rating.

Remarks

1. Stellar images, to stars of the sixth magnitude, are recorded. The images recorded on SO 130 film are fewer and less definitive than those recorded on SO 102.

2. Approximately 40% of each frame is degraded by flare within the format.

[redacted]

[redacted]

3. A minus-density streak of irregular configuration is present throughout the stellar film, located near the titled edge.

4. Frames 1-6, 9-11, 29, 35-37 contain sharply delineated plus-density streaks of undetermined origin. Although located within the image formats, they do not appear to be associated with stellar imagery.

5. Image motion is detectable in the stellar images but not to a significant degree.

6. Double exposures and possible multiple exposures are suspected but difficult to confirm in the stellar formats. Examples: frames 26, 28, 96, 101, 139, 174, 186, 218, 293, 316.

7. The ratio of stellar to panoramic exposures varies from 1:7 (normal) to a high of 1:21. Examples: frames 56, 57 (corresponding to panoramic frames 139, 148 in pass D06) represent an exposure ratio of 1:9; frames 96, 97 (corresponding to panoramic frames 40, 51 in pass D09) represent an exposure ratio of 1:11; frames 108, 109 (corresponding to panoramic frames 6, 27 in pass A17) represent an exposure ratio of 1:21; and frames 114, 115 (corresponding to panoramic frames 57, 71 in pass A18) represent an exposure ratio of 1:14. A tabulation of these discrepancies is attached to the Index Camera evaluation.

8. Density readings were taken using the MacBeth Quantalog Densitometer, Model EP 1000, with an ET 20 attachment and an 0.5 mm aperture. Image area, flared area, and gross fog density values are correlated below.

Reading	Pass	Frame	Terrain		Limiting		Gross Fog	
			D-Min	D-Max	D-Min	D-Max	Film Type	Center
1	A01	1			0.28	3.68	SO 102	0.22
2	A02	11			0.38	3.74	SO 102	0.27
3	D02	20			0.65	3.64	SO 102	0.30
4	D04	25			0.91	3.86	SO 102	0.50
5	D06	41			0.66	3.82	SO 102	0.34
6		51			0.56	3.61	SO 102	0.24
7	D07	63			0.65	3.78	SO 102	0.22
8		71			0.76	3.78	SO 102	0.27
9	D08	80			0.68	3.77	SO 102	0.22
10	D09	85			0.69	3.81	SO 102	0.26
11		101			1.58	3.92	SO 102	0.29
12	A18	111			0.76	3.80	SO 102	0.44
13	D18	122			0.78	3.80	SO 102	0.25
14	D23	131			0.62	3.78	SO 102	0.26
15	D25	140			0.55	3.74	SO 102	0.24
16		150			0.57	3.74	SO 102	0.28
17	A30	164			0.42	3.71	SO 102	0.30
18	A33	171			0.57	3.77	SO 102	0.27
19	A34	180			0.46	3.76	SO 102	0.32
20	D34	192			0.80	3.85	SO 102	0.28
21	D36	205			1.12	3.86	SO 102	0.38
22		212			0.62	3.78	SO 102	0.33
23	D39	222			0.61	3.88	SO 102	0.31
24		230			0.61	3.71	SO 102	0.28
25	A44	241			0.43	3.81	SO 102	0.27
26	A46	250			0.32	3.70	SO 102	0.26
27	A48M	261			0.40	3.71	SO 102	0.32
28	A50	272			0.68	3.85	SO 102	0.29
29	D52	282			0.97	3.82	SO 102	0.27
30		291			0.58	3.68	SO 102	0.30
31	D55	300			0.77	3.82	SO 102	0.26
32		310			0.58	3.74	SO 102	0.26

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Control System Only

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Reading	Pass	Frame	Terrain		Limiting		Gross Fog	
			D-Min	D-Max	D-Min	D-Max	Film Type	Center
33		331			0.61	3.71	SO 102	0.37
34	D56	331			0.68	3.76	SO 102	0.36
35	A59	340			0.21	3.09	SO 130	0.18
36		341			0.90	3.06	SO 130	0.18
37		345			0.18	3.11	SO 130	0.17
38		346			0.90	3.11	SO 130	0.17
39		348			0.27	3.20	SO 130	0.17
40		350			0.23	3.21	SO 130	0.18
41		351			0.23	3.19	SO 130	0.18

SO 102

D-Max Range	3.68-3.92
D-Min Range	0.28-1.58
Average D-Max	3.78
Average D-Min	0.64

SO 130

D-Max Range	3.08-3.30
D-Min Range	0.18-0.27
Average D-Max	3.14
Average D-Min	0.22

Gross Fog Range	SO 102: 0.22-0.50
	SO 130: 0.17-0.18
Average Gross Fog	SO 102: 0.39
	SO 130: 0.17

PART IV. INDEX CAMERA

Mission No: 9054 (M-21)
Camera No: D9
Camera Setting: f/4.5, 1/500 second
Filter: Wratten 21
Film Type: SO [redacted]
Evaluated By: [redacted]

1. Shutter Operation: The shutter failed to open 40 times. No sequence or pattern of failure is definable. Examples: frames 32, 39, 64, 129, 236, 329, 334 (the first and last frame numbers given are the first and last malfunctions, respectively).

2. Exposure: The exposure is adequate.

3. Camera Number: The number is well defined and properly registered in the number chamber.

4. Film Metering: Normal throughout the film (see Item 1, in Remarks). Average metering is 0.15".

5. Film Tracking: Normal.

6. Reseau: Well defined in most frames. The outline of the grid plate perimeter is imaged 33 times. Examples: frames 8, 54, 107, 279, 229, 342. Small bits of lint or scivings adhered to the grid plate and caused small defraction rings to appear on every frame.

7. Light Leaks: None noted.

8. Static Electricity: Spot discharges and dendritic static traces are present intermittently throughout the film, although not seriously degrading to the imagery. Static discharges are most evident in the blank frames resulting from

[redacted]

[redacted]

the shutter malfunctions previously noted in Item 1.

9. Pinholes: Few.

10. Abrasions and Scratches: Few.

11. Tearing: None. Creases occur on frames 290-295.

12. Water Marks: None noted.

13. Pressure Streaks: Cinch marks are present intermittently and are most readily observed in the blank frames. These are camera-induced and are derived from the camera's film transport system.

14. Processing Streaks: None noted.

15. Blistering and Crimping: None noted.

16. Contrast: 15% low, 80% medium, 5% high.

17. Apparent Resolution: Good.

18. Apparent Graininess: Medium.

19. Photo Quality: Good except where double and/or multiple exposures occur. Refer to Item 1, Remarks, for details.

20. Camera Operation: Poor. A more favorable rating is precluded by the erratic shutter operation previously noted in Item 1, and the multiple exposures discussed in Remarks. The erratic shutter operation may have been due to faulty command pulses.

21. PI Suitability: Good for the scale achieved except where usefulness of the photography is reduced by multiple exposures.

Remarks

1. A double exposure is noted in frame 26, the first of approximately 25 double and/or multiple exposures. Additional examples: frames 96, 101, 117, 128, 139, 174, 293, 327. Particular note is made of frame 107 on which at least 9 exposures may be detected. No appreciable film advance is observed in this case.

2. The ratio of index to panoramic exposures varies from 1:7 (normal) to a high of 1:21. Examples: frames 56, 57 (corresponding to panoramic frames 139, 148 in pass D06) represent an exposure ratio of 1:9; frames 96, 97 (corresponding to panoramic frames 40, 51 in pass D09) represent an exposure ratio of 1:11; frames 108, 109 (corresponding to panoramic frames 6, 27 in pass A17) represent an exposure ratio to 1:21; frames 114, 115 (corresponding to panoramic frames 57, 71 in pass A18) representing an exposure ratio of 1:14.

3. The total number of exposed frames is 351.

4. A stellar/index - panoramic camera correlation with pertinent remarks on probable malfunctions appears below.

S/I Frame	Pass	Pan Frame	Remarks	S/I Frame	Pass	Pan Frame	Remarks
1	A01	3		14		47	
2		10		15		54	
3		17		16	D02	5	
4		24		17		12	
5		31		18		19	
6		38		19		26	
7		45		20		33	
8	A02	5		21		40	
9		12		22		47	
10		19		23		54	
11		26		24	M4	3	
12		33		25		10	
13		40		26		17&24	Double exposure

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S/I Frame	Pass	Pan Frame	Remarks	S/I Frame	Pass	Pan Frame	Remarks
27		31		83		31	
28	D04	6&13	Double exposure	84		38	
29		20		85		45	
30	D04	27		86		52	
31		34		87		59	
32			Shutter failure	88	D08	66	
33		48		89		73	
34		55		90		80	
35		62		91	A09E	5	
36		69		92	D09	2	10 frames between
37		76		93		12	exposures
38	D06	6		94		19	
39			Shutter failed	95		26	
40			Shutter failed	96		33&40	Double exposed
41		34		97		51	11 frames from 40-51
42			Shutter failed	98			Blank frame
43		48		99		65	
44		55		100		72	
45			Shutter failed	101		79&86	Double exposed
46		69		102		93	
47		76		103		100	
48		83		104		107	
49		90		105		114	
50		97		106		121&128	Double exposed
51		104		107	A15		9 frames exposed
52		111			A16		thrcout 2 passes
53		118		108	A17	6	21 frame jump
54		125		109		27	between exposures
55		132		110	A18	1&8	Blank frame
56		139	9 frames between	111		15&22	Double exposed
57		148	exposures 139&148			29&36	
58		155		112		43	
59	D07	5		113		50	
60		12		114		57	14 frame jump
61		19		115		71	between exposures
62		26		116		78	
63		33		117	A18	92-99	Double exposed
64			Blank frame	118	D18	3-10	Double exposed
65		47		119		17	
66		54		120			Blank frame
67		61					
68		68		121		31	
69		75		122		38	
70		82		123	D22	6	Blank frame
71		89		124		13	
72		96		125			Blank frame
73		103		126		34	
74		110		127			Blank frame
75		117		128		55&62	Double exposed
76		124		129			Blank frame
77		131		130		97&118	Double exposed
78		138		131		125&132	Double exposed
				132		139	
79		145					
80	D08	1	9 frames from	133		146	
81		10	exposures 1-10	134		153	
82		17	14 frames from	135			
			17-31	136	A24E	2&9?	Blank frame

[redacted]

S/I Frame	Pass	Pan Frame	Remarks
137	D25		Blank frame
138		12	
139		19&26	Double exposed
140		33	
141		40	
142		47	
143		54	
144			Blank frame
145		68	
146	D25	75	
147		82&89	Double exposed
148		96	
149		103-110	Double image- 3 frames
		117	
150		124	
151		131&138	Double exposure
152			Blank frame
153		152-159	Double exposure
154		166	
155		173-180	Double exposure
156	A30	1	9 frame jump
157		10	Double exposure
158		24, 31, 38,45,52	Triple images & grids
159			Blank frame
160		67	
161	A31	3	Out of focus - no double imagery
162		17	
163		24	
164	A32	6	
165		13	
166		20	
167	A33	2	
168		9	
169		16	
170		23	
171		30	
172		37	
173		44	
174		51-58	Double exposure
175	A33	65	
176	A34		Blank frame
177		10	
178		17	
179		24	
180		31	
181		38	
182		45	
183		52	
184			Blank frame
185		66	
186		73-80	Double exposure
			One out-of-focus
187		87	
188	D34	2	
189		9	
190		16	
191		23	
192		30	
193		37	
194		44	
195		51	
196	D36	7	
197		14	
198		21	
199		28	
200		85	
201		42	
202		49	
203		56	
204	D36	63	
205		70	
206		77	
207		84	
208		91	
209		98	
210			Blank frame
211		112	
212		119	
213		126	
214		133	
215		140	
216		147	
217		154	
218	D39	1-8-15	2 images double exposed
219		22	
220		29	
221		36	
222		43	
223		50	
224		57	
225		64	
226			Blank frame
227			Blank frame
228		85	
229		92	
230		99	
231		106	
232		113	
233	D39	120	
234		127	
235			Blank frame
236			Blank frame
237	A40	5	
238	A44	1	
239		8	
240		15	
241		22	
242		29	
243		36	
244		43	

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S/I Frame	Pass	Pan Frame	Remarks
245		50	
246	A46	1	
247		8	
248			Blank frame
249		22	
250	A47	6	
251		13	
252		20	
253		27	
254		34	
255		41	
256		48	
257			Blank frame
258		62	
259		69	
260			Blank frame
261	A48M	5	
262	A48M	12	
263		19	
264		26	
265	A50	2	
266		9	
267		16	
268		23	
269		30	
270		37	
271		44	
272		51	
273		58	
274	D50	2	
275		9	
276		16	
277		23	
278			Blank frame
279	D52	4	
280		11	
281			Blank frame
282		25	
283		32	
284		39	
285		46	
286		53	
287		60	
288		67	
289		74	
290		81	
291	D52	88	
292		95	
293		102-109	Double exposure
294		116	
295		123	
296		130	
297		137-144	Double exposure
298		151	
299	D55	156-5	Double exposure

S/I Frame	Pass	Pan Frame	Remarks
300		19	
301		19	
302			Blank frame
303		33	
304		40	14 frame jump
305		54	between exposures
306		61	
307			Blank frame
308		76	8 frame jump
309		83	
310		97	14 frame jump
311		104	
312		111	
313		118	
314		125	
315			Blank frame
316		139-146	Double exposure
317			Blank frame
318			Blank frame
319		167	
320	D55		Blank frame
321		181	
322		188	
323		195	
324	A56E	4	
325		11	
326	D56	7	
327		14&21	Double exposure
328		28	
329		35	
330		42	
331		49	
332		56	
333		63	
334	A59		Blank frame
335		12	
			End of imagery

[redacted]

5. Density readings were taken on each pass, using the MacBeth Quantalog Densitometer, Model EP 1000 with an ET 20 attachment and an 0.5 mm aperture. Terrain and limiting density readings for D-Max, D-Min, and Gross Fog values are correlated below.

Reading	Pass	Frame	Terrain		Limiting		Gross Fog		
			D-Min	D-Max	D-Min	D-Max	Titled Edge	Center	Camera No. Edge
1		1	0.17	0.42	0.15	1.22	0.09	0.08	0.08
2		11	NR	NR	0.19	1.24	0.08	0.08	0.08
3		20	0.54	1.42	0.54	1.40	0.09	0.09	0.08
4		28	0.94	1.48	0.70	1.80	0.09	0.09	0.08
5		41	NR	NR	0.52	1.85	0.08	0.08	0.08
6		51	0.55	0.82	0.35	1.59	0.07	0.08	0.07
7		63	0.32	0.68	0.25	1.52	0.06	0.06	0.07
8		71	0.44	0.80	0.28	1.35	0.07	0.07	0.08
9		80	0.36	0.82	0.26	1.38	0.08	0.10	0.09
10		95	0.34	0.47	0.26	1.75	0.09	0.08	0.08
11		101	0.45	1.10	0.32	1.10	0.09	0.09	0.09
12		111	0.22	0.42	0.15	0.96	0.10	0.10	0.10
13		122	NR	NR	0.48	1.40	0.09	0.09	0.10
14		131	0.75	1.18	0.54	1.50	0.10	0.10	0.10
15		140	0.32	0.76	0.21	1.58	0.08	0.08	0.09
16		150	0.36	1.01	0.25	1.80	0.09	0.09	0.10
17		164	NR	NR	0.11	1.03	0.07	0.08	0.06
18		171	NR	NR	0.16	0.92	0.06	0.07	0.06
19		180	NR	NR	0.12	1.06	0.08	0.09	0.06
20		192	0.25	0.85	0.25	1.36	0.10	0.09	0.09
21		205	NR	NR	0.29	1.51	0.08	0.09	0.08
22		212	0.37	0.59	0.27	1.59	0.10	0.09	0.10
23		222	0.21	0.67	0.21	1.50	0.09	0.12	0.11
24		230	0.36	0.61	0.30	1.30	0.09	0.09	0.09
25		241	0.16	0.72	0.14	0.94	0.10	0.09	0.10
26		250	NR	NR	0.14	1.00	0.10	0.09	0.10
27		261	NR	NR	0.11	0.68	0.09	0.09	0.09
28		272	NR	NR	0.22	1.20	0.10	0.10	0.11
29		282	0.60	1.35	0.60	1.48	0.10	0.10	0.11
30		291	0.29	0.91	0.23	1.23	0.11	0.10	0.12
31		300	0.37	0.65	0.37	1.44	0.10	0.11	0.12
32		310	0.32	0.87	0.32	1.72	0.10	0.10	0.10
33		321	0.34	0.95	0.34	0.95	0.10	0.12	0.12
34		331	0.23	0.71	0.21	1.75	0.11	0.12	0.11
35		340	NR	NR	0.17	1.13	0.10	0.09	0.09
36		341	NR	NR	0.13	1.00	0.12	0.10	0.10
37		345	0.16	0.79	0.12	1.12	0.11	0.12	0.10
38		346	NR	NR	0.11	1.05	0.10	0.10	0.10
39		348	NR	NR	0.19	1.46	0.09	0.09	0.10
40		350	0.30	0.72	0.30	1.14	0.10	0.10	0.11
41		351	0.21	0.65	0.20	1.08	0.10	0.10	0.12

NOTE: NR denotes no reading made.

Terrain		Limiting	
D-Max Range	0.42-1.55	D-Max Range	0.68-1.85
D-Min Range	0.17-0.94	D-Min Range	0.11-0.60
Average D-Max	0.84	Average D-Max	1.35
Average D-Min	0.37	Average D-Min	0.27

Gross Fog Range 0.06-0.12
Average Gross Fog 0.09

[redacted]

PART V. VEHICLE ATTITUDE DATA

Pass	Pitch Variation		Pitch Range	Roll Variation		Roll Range	No of Frames	Remarks
A01	16°58'	16°33'	0°25'	00°36'	00°01'	0°25'	47	
A02	14 57	14 54	0 03	-01 52	-01 46	0 06	55	Estimated values 1-32
D02	16 54	16 35	0 19				57	
M04	16 55	16 53	0 02	00 31	00 26	0 05	31	
D04	16 53	16 47	0 06	-00 24	-00 17	0 07	31	
	16 58	16 37	0 19	01 09	00 49	0 20	45	
D06	16 46	16 35	0 11	00 06	00 03	0 03	54	
	17 10	16 22	0 48	00 38	-00 12	0 50	84	
	17 01	16 56	0 05	-00 27	-00 04	0 23	36	Estimated values 15-36
D07	16 56	16 38	0 18	00 29	00 08	0 21	41	
	17 11	16 45	0 26	00 33	-00 43	1 16	107	
D08	14 20	14 01	0 19	00 15	00 00	0 15	80	
D09	14 56	13 46	1 10	00 12	-00 27	0 39	76	
	13 55	13 17	0 38	01 05	00 55	0 10	51	
A15	14 56	14 54	0 02	01 50	01 12	0 38	37	All values are estimated
A16	14 54	14 45	0 09	01 37	00 47	0 50	24	All values are estimated
A17	15 07	14 50	0 17	01 41	01 01	0 40	32	All values are estimated
A18	16 30	15 26	1 04	00 40	-00 02	0 42	101	Estimated values 1-75
D18	16 01	15 31	0 30	00 14	-00 02	0 16	38	
D23	14 11	13 54	0 17	00 22	00 00	0 22	42	
	14 05	13 45	0 20	00 07	-00 38	0 45	121	
D25	14 31	13 44	0 47	01 54	00 00	1 21	141	
	14 20	14 06	0 14	00 40	00 20	0 20	42	
A30	14 24	14 22	0 02	00 47	00 24	0 23	29	All values are estimated
	13 59	13 38	0 21	00 44	00 25	0 19	41	
A31	14 51	14 43	0 08	01 18	01 09	0 09	25	All values are estimated
A32	14 42	14 35	0 07	00 36	00 15	0 21	25	All values are estimated
A33							34	No values
	14 05	13 59	0 06	00 57	-00 06	1 03	34	
A34	15 33	15 17	0 16	01 31	-00 02	1 33	62	All values are estimated
	14 23	14 08	0 15	-00 56	-00 02	0 54	28	
D34	14 01	13 36	0 25	01 31	00 31	1 00	50	
D36	14 08	13 55	0 11	00 04	-00 15	0 19	38	
	14 13	13 55	0 18	00 08	-00 47	0 50	33	
	14 22	13 58	0 24	-00 05	-01 08	1 08	85	
D39	14 15	13 58	0 17	01 18	01 04	0 14	48	
	14 04	13 58	0 06	00 37	00 33	0 04	57	
	14 18	14 05	0 06	00 35	00 26	0 09	46	
A44	15 33	15 12	0 21	00 34	00 18	0 16	31	All values are estimated
	14 38	13 55	0 43	01 25	00 02	1 23	25	
A46	13 54	13 41	0 13	-00 28	-00 23	0 15	22	All values are estimated
A47	14 21	14 07	0 14	01 32	01 19	0 13	43	All values are estimated
	14 10	13 40	0 30	00 02	-00 32	0 34	33	
A50	14 37	14 40	0 17	01 29	00 55	0 34	27	All values are estimated
	14 10	13 50	0 20	00 26	00 15	0 11	36	
D50	13 58	13 50	0 08	00 02	-00 01	0 03	32	
D52	13 59	13 54	0 05	00 14	00 10	0 04	28	
	14 13	13 46	0 27	01 32	00 45	0 47	31	
	14 59	13 54	1 05	01 28	00 27	1 01	104	
D55	14 29	13 45	0 44	00 36	-00 01	0 37	149	
	14 38	13 35	0 37	01 21	00 40	0 40	47	
D56	14 24	14 09	0 15	00 46	00 28	0 18	94	
A59	16 20	15 11	1 09	01 18	00 23	0 55	29	

[redacted]

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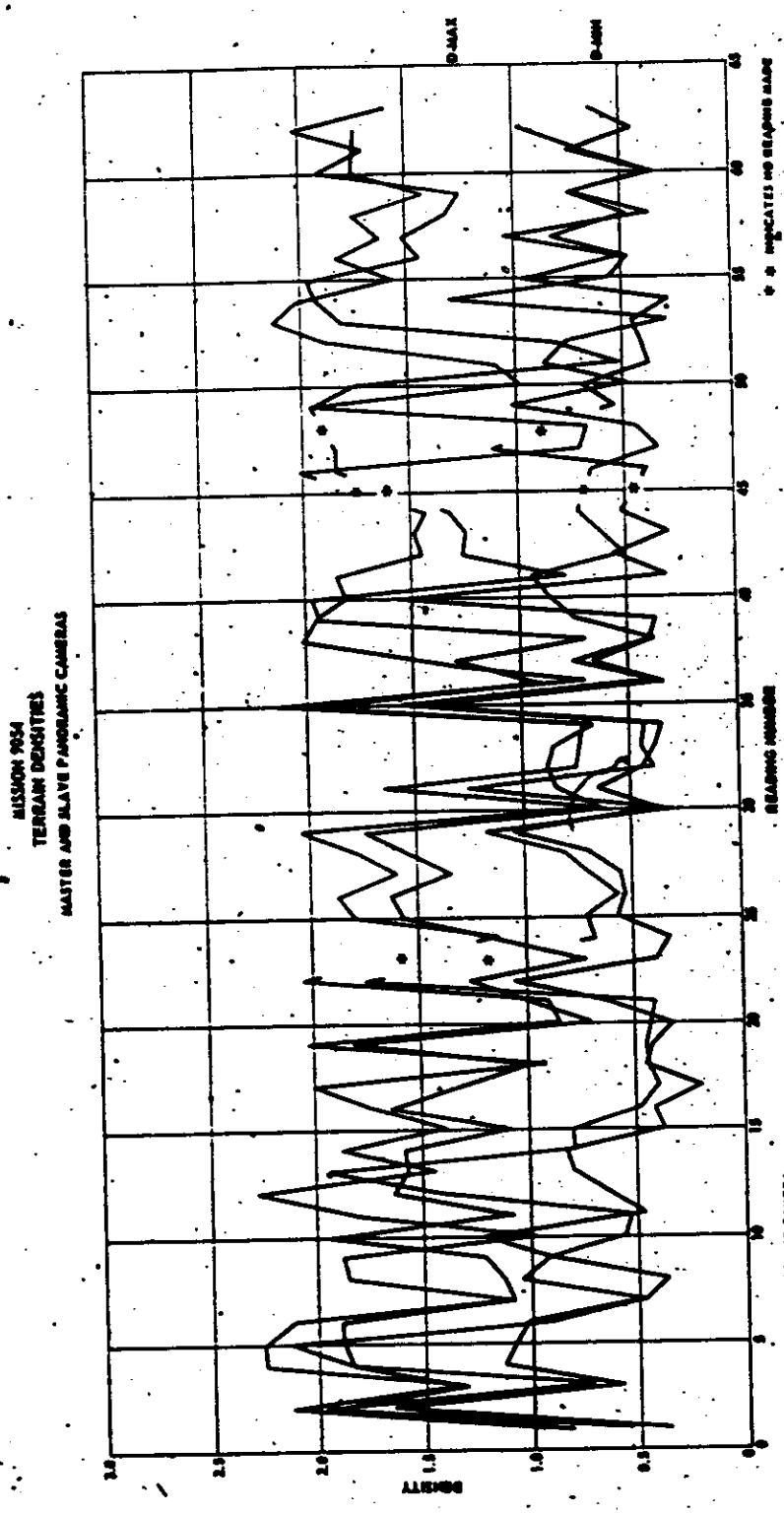
PART VI. DENSITY CHARTS



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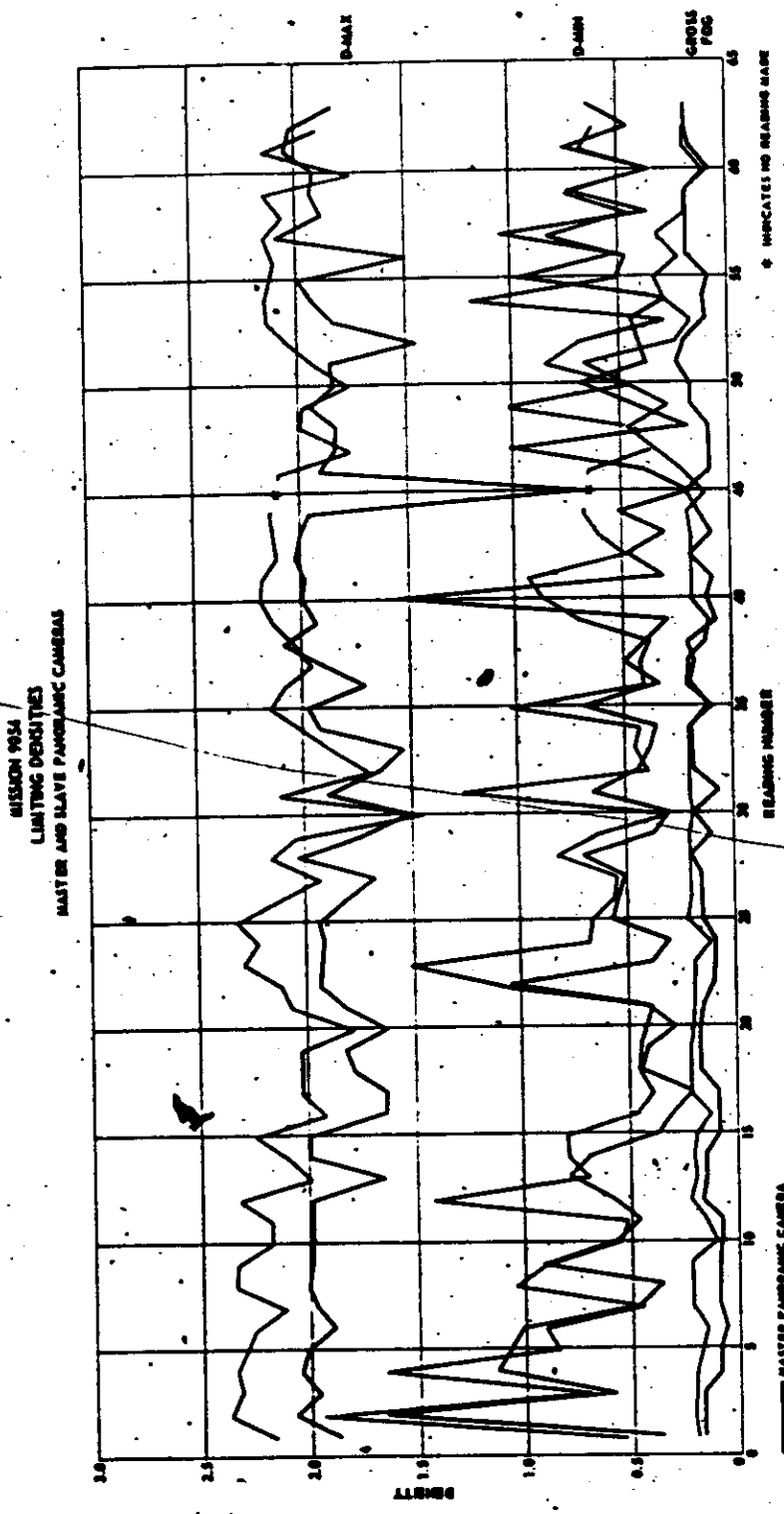
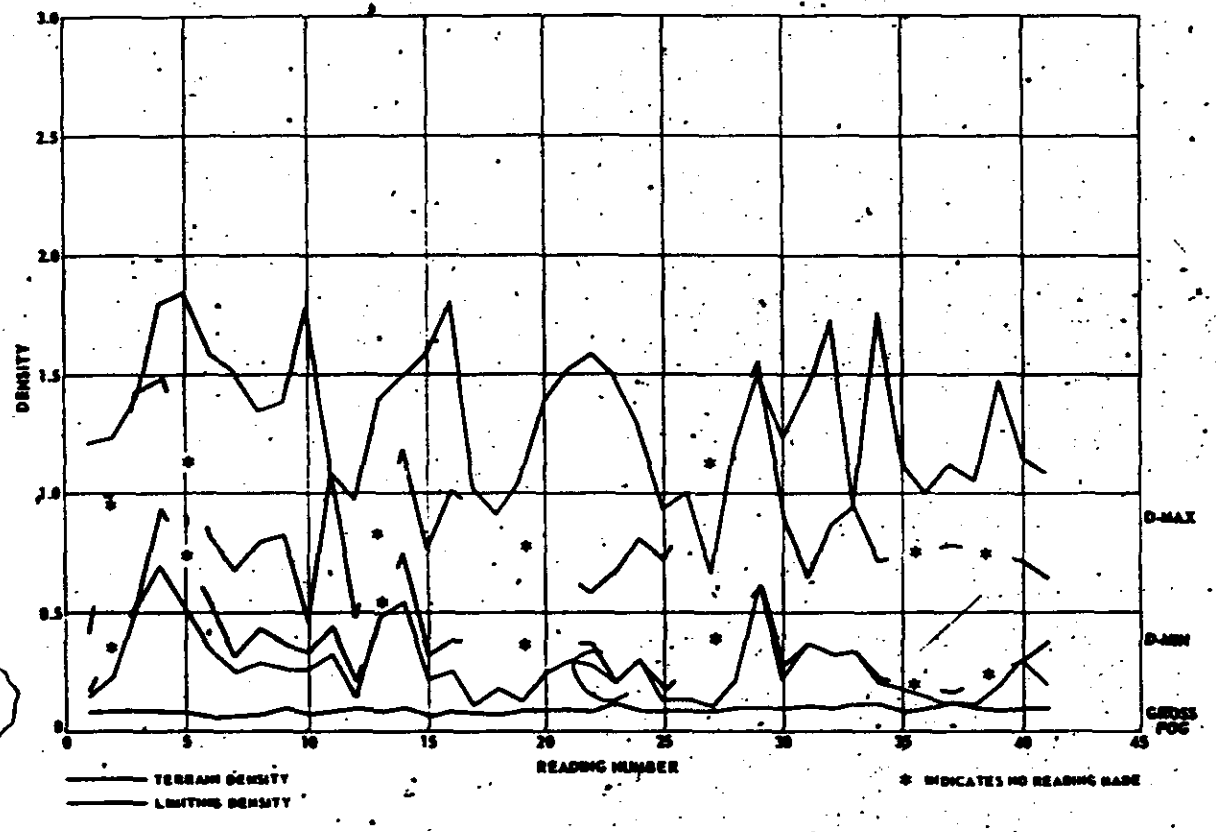
Control System Only


MISSION 9034
LIMITING DENSITIES
MASTER AND SLAVE PANORAMIC CAMERAS
D-MAX
D-MIN
GROSS FOG
* INDICATES NO READING MADE
READING NUMBER
DENSITY
MASTER PANORAMIC CAMERA
SLAVE PANORAMIC CAMERA

[redacted]

MISSION 9054
INDEX CAMERA DENSITIES



NPIC H-6712 (8/68)

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MISSION 9054
STELLAR CAMERA DENSITIES