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B/C 1400008869

[redacted]
28 November 1962

PHOTOGRAPHIC EVALUATION REPORT

Mission 9045
30 September 1962
1, 2 October 1962 Z

FE No. 38-62

HANDLE VIA [redacted]
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[redacted]

PART I - FORWARD CAMERA

Mission No: 9045
Camera No: 96
Slit Width: 0.200"
Film Type: 7J-23-7800 (SO 132)

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

1. Shutter Operation (Horizon Cameras): Starboard horizon camera shutter malfunction is indicated by loss of imagery within the horizon camera format. Malfunctions occur on the following passes: M01, D07, D08, D09, A14, D14, D18, D20, A21, D21, D22, D23, A31, D32. They also possibly occur on passes D02, A30, D30, D34, D35, D36, A36, M37, D38, D39, D40, D45, A46, A47, D49, D41 but due to excessive port roll the malfunction is not discernible. The malfunction is some instances has a pattern of every fourth frame as in pass M01, frames 2, 6, 10, 14, 18, 22, 26, 30. A port horizon camera malfunction occurs on pass D22, frame 71 (no image is present within the horizon camera format).

2. Horizon Camera Exposure:
   a. Supply (Port): Underexposed on all passes, when the vehicle attitude is normal, at f/6.8 with a 1/200 second shutter speed. On passes having excessive port roll, exposure varies from slightly underexposed to slightly overexposed.
   b. Take-Up (Starboard): Overexposed on all passes, when the vehicle attitude is normal, at f/6.8 with a 1/200 second shutter speed. Exposure on passes having excessive port roll is not assessable.

3. Camera Number: Operational through pass D32, frame 12, thereafter a malfunction occurs and no camera number appears. When the camera number is operational it is overexposed with a slight "blossoming" into the format area.

4. Binary Operation: The binary functions throughout most of the mission, however a malfunction occurs on pass D32, frame 12, thereafter no index lamps appear. Lamps 16-29 "blossom" into the format intermittently throughout the photography. Double binaries and single end-of-pass markers are present on 30 frames, all occurring on the last frame of the pass. Single binaries are associated with the end-of-pass marker on the last frame of three passes and on all split passes at the camera-off position.

5. Film Metering:
   a. The average metering between the supply (port) horizon camera and the following terrain frame is 0.17".
   b. The average metering between the take-up (starboard) horizon camera and the previous terrain format is 0.21".

6. Film Tracking: Normal throughout the film.

7. Timing Pulses: These are readable and appear outside the format area. They do not terminate on the last frame of a pass as in previous missions. Double and sometimes multiple reflected images are recorded on all frames. An interruption in the timing pips of as much as 4.0" occurs on all frames containing the streaked pulse, signifying an exposure of the framing camera for every seventh frame of the panoramic camera.

8. Fiducials:
   a. Main Camera: Well defined.
   b. Horizon Cameras: Well defined with little or no flare.

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9. Light Leaks: Light leaks consisting of equipment images and diagonal patterns occur on 20 frames of the film. In pass D49, which is the last pass of the mission, fogging is present in frames 25-33. This fogging progresses in intensity from frame 25, which shows a light uniform fog, to frames 32 and 33 where there is a total fogging, resulting in the loss of all imagery. This condition is possibly due to exposure of film after the recoverable package separated from the main vehicle.

10. Static Electricity: Small fan-shaped static was recorded on 20 frames.

11. Pinholes: Pinholes are few in number and scattered intermittently throughout the film.

12. Abrasions and Scratches: Minor scratches and abrasions are present on approximately 50 frames of the film, possibly occurring after processing.

13. Tearing: A manufacturing splice is present on pass D35, frame 25. Transparent splices appear on pass D08, between frames 48 and 49; pass D21, between frames 21 and 22; pass D33, between frames 13 and 14; pass D37, between frames 151, 152 and 154, 155; pass D41, between frames 11 and 12.

14. Water Marks: Very few. An example is present in pass D34, frame 42.

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

16. Processing Streaks: None evident on film.

17. Blistering and Crimping: Blistering occurs on 15 frames of the film. Crimps, possibly occurring after processing, are present on 20 frames.

18. Contrast: Low 55%, medium 45%, high 0%.

19. Apparent Resolution: Image quality is fair to good, comparable to mission 9037 as determined from those areas not degraded by vehicle attitude and sun angle.

20. Apparent Granularity: Fine.

21. Photo Quality:
    a. Main Camera: Quality ranges from fair to good, due to degradation by vehicle attitude, sun angle, scratches and lifted emulsion.
    b. Horizon Cameras: The port horizon camera produced a poor image due to underexposure and a condition resembling an out-of-focus image. The starboard horizon camera is rated poor due to consistent overexposure, when present, and a condition resembling an out-of-focus image.

22. Camera Operation:
    a. Main Camera: Good throughout the mission.
    b. Horizon Cameras: Starboard horizon malfunctioned intermittently throughout the mission. Both port and starboard cameras appear to be out-of-focus.

23. Suitability for PI: A rating of "fair" is assigned, due to degradation by vehicle attitude, sun angle and cloud cover.

Remarks:

1. Handling marks are found intermittently throughout the film possibly due to film handling after processing. Foreign matter consisting of bits of wax, opaquing and small bits of lifted emulsion appear on approximately 25 frames of the film. Example: pass D23, frames 99, 138, 146.

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2. Lifted emulsion occurs intermittently throughout the film. Examples are pass D09, frames 8, 18, 40, 41; pass D23, frames 2, 76, 126, 159.

3. A gross fog, slightly above normal density, is present on all of the film. This fogging is possibly attributable to the level at which the original negative film was processed.

4. Lacquer extends 0.1" inside format on the titled edge on pass D07, frame 82; pass D49, frames 1-33.

5. A band of very fine, continuous plus-and minus-density streaks, extending 0.5" inside format on trailing edge, occurs on pass D30, frames 1-18; pass D32, frames 38 and 39; pass D40, frames 8-15. Other minor minus-density spots and streaks and plus-density streaks occur on approximately 50 frames of the film.

6. The following descriptions of overlap and film transport for camera number 96 were determined from the fifth and last frames of each pass, wherever possible. Cloud cover, or lack of imagery may have precluded determination of these values in some passes.

	Overlap (Percent)		Film Transport (From Take-Up Side in Inches)	
Pass	Beginning Percent	End Percent	First Frame	Last Frame
M01	NM	NM	None	14"
D02	NM	NM	11.8"	15.4"
D07	NM	6%	12.5"	None
D08	4%	5%	None	None
D09	4%	7%	None	15"
A14	3%	NM	12.9	None
D14	6%	11%	None	10.7"
D18	4%	7%	16.8"	13.8"
D20	2%	7%	11.7"	16"
A21	NM	0%	14"	None
D21	NM	NM	None	16.5"
D22	NM	6%	NM	15"
D23	0%	NM	NM	14"
A30	9%	11%	NM	NM
D30	6%	NM	9"	17.7"
A31	NM	NM	NM	11.1"
D32	NM	7%	8.8"	12.4"
D33	NM	NM	10.5"	13.4"
D34	NM	11%	11.5"	15"
D35	NM	10%	12"	14.7"
A36	0%	NM	12.5"	None
D36	NM	10%	None	16.1"
M37	NM	NM	NM	11"
D37	NM	12%	NM	16.9"
D38	12%	9%	NM	19"
D39	5%	8%	NM	17.2"
D40	7%	10%	NM	17"
D41	4%	4%	NM	15"

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Pass	Overlap (Percent) Beginning Percent	Overlap (Percent) End Percent	Film Transport (From Take-Up Side in Inches) First Frame	Film Transport (From Take-Up Side in Inches) Last Frame
D45	7%	16%	12.5"	20"
A46	8%	13%	NM	11.2"
D46	6%	11%	NM	19.2"
A47	NM	NM	NM	11.5"
D49	NM	NM	9.5"	NM

Note: NM denotes "Not Measurable".

7. Density Readings were taken on every pass using the MacBeth Quantalog Densitometer, Model EP 1000, with an EP 20 attachment and a 0.5 mm aperture. Terrain and Limiting density value readings for D Max and D Min as well as Gross Fog are correlated below.

			Terrain		Limiting			Gross Fog	
Reading	Pass	Frame	D Min	D Max	D Min	D Max	Leading	Center	Trailing
1	M01	17	Clouds	Clouds	Clouds	2.12	0.31	0.29	0.30
2	D02	36	Clouds	Clouds	0.94	2.09	0.29	0.28	0.29
3	D07	60	0.49	1.44	0.49	1.87	0.20	0.18	0.19
4		122	0.94	1.85	0.94	2.17	0.33	0.32	0.34
5		161	0.87	2.20	0.87	2.25	0.30	0.30	0.31
6	D08	10	Clouds	Clouds	1.22	2.16	0.32	0.31	0.32
7		103	1.28	1.78	1.23	2.21	0.35	0.32	0.34
8	D09	25	0.89	1.54	0.89	2.19	0.34	0.32	0.34
9	A14	2	0.67	2.12	0.67	2.20	0.35	0.34	0.36
10.	D14	4	0.63	1.81	0.63	2.27	0.35	0.33	0.36
11	D18	20	1.10	2.15	1.10	2.18	0.35	0.32	0.34
12	D20	58	0.66	1.40	0.66	1.97	0.37	0.34	0.35
13	A21	2	Clouds	Clouds	1.58	2.08	0.41	0.39	0.41
14	D21	60	1.22	2.12	1.22	2.20	0.37	0.34	0.37
15		83	1.18	1.84	1.18	2.13	0.37	0.35	0.37
16	D22	59	0.88	2.06	0.81	2.06	0.35	0.31	0.34
17		87	0.88	2.15	0.88	2.21	0.34	0.31	0.33
18	D23	67	1.16	1.88	1.08	2.17	0.35	0.31	0.33
19		122	1.10	2.07	1.10	2.07	0.34	0.32	0.34
20		153	1.10	1.76	1.10	1.76	0.34	0.32	0.34
21	A30	16	0.71	2.12	0.71	2.12	0.33	0.31	0.32
22	D30	15	0.89	1.76	0.86	2.19	0.34	0.31	0.33
23	A31	33	Clouds	Clouds	1.65	2.09	0.34	0.30	0.32
24	D32	39	Clouds	Clouds	1.32	2.14	0.34	0.31	0.32
25	D33	22	1.54	2.14	1.54	2.14	0.32	0.28	0.30
26	D34	37	0.74	1.93	0.71	2.03	0.31	0.29	0.31
27	D35	12	1.07	1.76	1.07	2.17	0.32	0.29	0.31
28	A36	33	Clouds	Clouds	0.76	2.11	0.36	0.31	0.32
29	D36	50	0.92	1.73	0.77	2.10	0.37	0.33	0.41
30	M37	12	0.84	1.38	0.78	2.08	0.35	0.31	0.34
31	D37	57	1.44	2.10	1.10	2.18	0.36	0.32	0.33
32		97	1.03	1.78	0.98	2.14	0.35	0.33	0.34
33		175	0.58	1.66	0.58	2.05	0.37	0.32	0.34
34	D38	61	1.32	1.96	1.26	2.04	0.35	0.31	0.33
35		109	0.78	2.12	0.78	2.16	0.35	0.31	0.34
36	D39	68	0.88	1.76	0.88	2.16	0.34	0.30	0.33
37		137	0.75	2.08	0.75	2.10	0.34	0.30	0.33
38		173	1.10	1.98	1.10	1.98	0.33	0.29	0.31
39	D40	21	0.89	1.67	0.81	2.00	0.33	0.30	0.33
40		109	0.72	1.51	0.60	2.12	0.34	0.28	0.32
41	D41	25	0.65	1.68	0.65	2.10	0.35	0.30	0.33
42	D45	52	0.64	1.73	0.57	2.18	0.33	0.28	0.31
43	A46	33	0.74	1.89	0.66	1.94	0.36	0.30	0.32
44	D46	22	0.86	1.56	0.61	2.06	0.35	0.29	0.33
45	A47	37	Clouds	Clouds	1.19	2.18	0.36	0.29	0.32
46	D49	25	1.40	1.96	1.30	2.13	0.60	0.95	0.78

Terrain		Limiting	
Average D Max	1.85	Average D Max	2.11
Average D Min	0.94	Average D Min	0.95
Range D Max	2.20-1.38	Range D Max	2.27-1.76
Range D Min	1.54-0.49	Range D Min	1.65-0.49
Overall Range	2.20-0.49	Overall Range	2.27-0.49

Average Gross Fog	0.32
Range Gross Fog	0.95-0.18

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PART II - AFT CAMERA

Mission No: 9045
Camera No: 97
Slit Width: 0.200"
Film Type: 7J-23-7800 (SO 132)

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

1. Shutter Operation (Horizon Cameras): Operational.

2. Horizon Camera Exposure:
   a. Take-Up (Port): The imagery appears slightly out-of-focus throughout the film. Exposure is f/6.8 at 1/200-second.
   b. Supply (Starboard): The imagery appears slightly out-of-focus throughout the film. Exposure is f/6.8 at 1/200-second. Complete evaluation is precluded by total loss of imagery in passes D 30, D33, D34, D35, D36, M37, D37, D38, D39, D40, D41, D45, D46, A47 and D49. In addition, severe sun-flare is present in passes A30, A31, A36 and A46. The above conditions are due to vehicle attitude.

3. Camera Number: The camera number is slightly overexposed and "blossoming" is present in the center background but this does not appreciably affect readability of the numerals.

4. Binary Operation: The binary is operational throughout the mission. The index lamps and lamp numbers 16 to 29 "blossom" into the format area. Multiple binary images (from two to four) are recorded in the last frames of 95% of the passes. Where triple and quadruple binaries occur, one binary is in its normal location and contains the camera number, while the additional binaries are superimposed upon each other. Single end-of-pass markers are present in all cases. Malfunctions are found throughout the later passes of the mission. For specific details refer to message number 0102, originated by this office.

5. Film Metering:
   a. Take-Up (Port): Averages 0.22" with a range of 0.20" to 0.24".
   b. Supply (Starboard): Averages 0.22" with a range of 0.21" to 0.25".

6. Film Tracking: Normal.

7. Timing Pulses: The timing pulses are operational throughout the mission but are flared, with reflected images. Pulses terminate from 1.5" to 4.5" of the supply ends in the camera-off frames.

8. Fiducials:
   a. Main Camera: Well defined.
   b. Horizon Cameras: Well defined.

9. Light Leaks: Intermittent, throughout. Examples: pass M01, frames 27 (equipment image) and 28; pass D02, frames 45, 46, 47 (equipment image) and 48; pass D07, frames 169 and 170; pass D08, frame 110 (equipment image); pass D09, frames 38, 39, 40 (equipment image); pass A14, frame 2; pass D14, frame 48; pass D18, frame 1; pass D20, frames 69-71; pass A21, frame 1; pass D21, frames 108, 109; pass D22, frames 98, 99 (equipment image); pass D23, equipment images in frames 1, 158 and 159 and a light leak in frame 160; pass A30, frames 1-3 and 41; pass D30, frames 1, 2; pass A31, frames 1-3 with an equipment image in frame 2; pass D32, frames 1, 40, 41; pass D33, frames 1, 3, 4; pass D34, frames 1, 51 (equipment images) and light leaks in frames 49-53; pass D35, frames 2, 27 (equipment images); pass A36, equipment images in frames 1, 2; pass D36, frame 78 (equipment image); pass M37, equipment images in frames 1, 2; pass D37, frame 188 (equipment image); pass D38, frames 1, 2, 134 (equipment image) pass D39, frames 1-3; pass D40, frames 1, 2; pass D41, frames 28 and equipment images in frames 30, 31; pass D45, frames 1, 2, 3; pass A46, frames 1, 3; pass D46, frames 50, 51; pass A47, frames 1, 41; pass D49, frames 1, 3, frames 23-32 are

heavly fogged (last frames of the mission).

10. Static Electricity: Static discharges are present in pass D07, frame 74; pass D08, frame 110; pass D09, frames 31, 40 (outside format in leading edge); pass D36, frame 50 and outside the format of frame 58; pass D37, frames 84, 156, 184; pass D39, frames 12, 140; pass D49, frame 12.

11. Pinholes: Few scattered throughout the film.

12. Abrasions and Scratches: Intermittent throughout. Examples: pass M01, frame 22; pass D08, frames 53, 62, 97, 102; pass D09, frame 7; pass A21, frames 3, 7, 15; pass D21, frame 89; pass D22, frames 40, 41, 84; pass A31, frame 41; pass A36, frames 7, 8; pass D38, frames 76-88 (severe scratches); pass D40, frames 32-34; pass D45, frames 27, 47; pass A46, frame 33; pass A47, frames 8-10; pass D49, frames 26, 45.

13. Tearing: None, but clear splices are present in pass D08, between frames 36 and 37; pass D21, frames 93 and 94; pass D32, frames 29 and 30; pass D34, center of frame 33; pass D37, frames 143 and 144; pass D40, frames 96 and 97. A manufacturing splice is located off-center in frame 33 of pass D34.

14. Water Marks: Few. Examples: pass D37, frames 101, 102, 173; pass D38, frames 1, 2 (extensive water staining); pass D38, frames 85-87; pass D40, frames 124-147.

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

16. Processing Streaks: None are present.

17. Blistering and Crimping: Blisters are few throughout the film. Crimps (apparently due to handling after processing) are present intermittently. Examples: pass M01, frame 29; pass D02, frames 7, 49; pass D07, frames 112 and 172; pass D08, frames 35, 53, 59; pass D22, frame 73; pass A30, frames 2, 5; pass D39, frames 128, 137, 140, 142; pass D40, frames 33, 34; pass A47, frames 14, 22, 26. A crease is present in pass D45, frame 59.

18. Contrast: 55% low, 45% medium, 0% high.

19. Apparent Resolution: Fair to Good, compares favorably with that obtained in mission 9037. Acuity and resolution of the aft camera photography is slightly better than that of the forward camera.

20. Apparent Granularity: Fine.

21. Photo Quality:
    a. Main Camera: Fair to good. A higher rating is precluded by the presence of intermittent abrasions and scratches and degradation of imagery by miscellaneous light leaks.
    b. Horizon Cameras: Poor to fair. Although exposure appears to be correct, a condition resembling an out-of-focus image is apparent in both horizon cameras. In addition, there is a total loss of starboard horizon imagery in 15 passes and the imagery in four other passes is severely sun-flared, due to vehicle attitude.

22. Camera Operation:
    a. Main Camera: Fair. Although no mechanical malfunctions are detected, the light leaks (including a number of equipment image shadows) and camera-induced static traces and scratches indicate less than optimal camera performance.
    b. Horizon Cameras: Fair only, due to a condition resembling an out-of-focus image, present in both horizon cameras.

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23. Suitability for PI: Good, any degradation is due to light leaks and cloud cover.

Remarks:

1. Handling marks are noted in 18 frames.

2. Foreign matter is present in 35 frames throughout the film. Transfer of opaque material occurs in 71 frames. Emulsion skiving is noted in pass D39, frame 76, and examples of lifted emulsion are present in 79 frames.

3. Chemical staining, characterized by a light blue cast, is visible in several passes: This is presumed caused by wax remover residue and does not appreciably degrade the imagery. Examples: pass D39, all frames; pass D45, intermittent throughout; pass A46, all frames; pass D46, intermittent throughout. An example of an unusually heavy deposit is noted in frame 3 of pass A46. This stain is ring-shaped and affects a two-inch area of the format end.

4. A continuous lacquer strip is present inside the format and adjacent to the leading edge. Width of this strip is 0.10" and it is found in the latter passes of the mission. Examples: pass A46, all frames; pass A47, all frames.

5. Excessive port roll is evident in passes D30 to D49 and is responsible for the loss of starboard horizon imagery previously noted.

6. The following descriptions of overlap and film transport for Camera Number 97 were determined from the fifth and last frames of each pass, wherever possible. Cloud cover or lack of imagery may have precluded determination of these values in some passes.

	Overlap (Percent)		Film Transport (From Take-Up Side in Inches)	
Pass	Beginning Percent	End Percent	First Frame	Last Frame
M01	NM	NM	0"	17.5"
D02	NM	NM	15.3"	19.2"
D07	NM	6%	NM	20.0"
D08	3%	7%	17.5"	18.1"
D09	2%	7%	0%	17.2"
A14	3%	NM	15.1"	11.6"
D14	5%	9%	9.5"	22.0"
D18	9%	1%	19.5"	14.0"
D20	1%	10%	21.5"	11.8"
A21	0%	4%	16.0"	NM
D21	6%	NM	0"	0"
D22	NM	9%	17.1"	17.8"
D23	9%	9%	16.0"	20.0"
A30	9%	11%	19.0"	13.0"
D30	4%	NM	10.5"	22.8"
A31	NM	NM	NM	13.5"
D32	NM	9%	11.0"	13.9"
D33	NM	10%	11.7"	15.4"
D34	NM	11%	13.5"	17.0"
D35	NM	NM	15.0"	16.6"
A36	0%	NM	14.5"	0"
D36	NM	10%	0"	24.9"

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Pass	Overlap (Percent) Beginning Percent	Overlap (Percent) End Percent	Film Transport (From Take-Up Side in Inches) First Frame	Film Transport (From Take-Up Side in Inches) Last Frame
M37	NM	NM	17.0"	0"
D37	NM	14%	0"	20.7"
D38	9%	12%	20.8"	19.6"
D39	2%	12%	17.8"	21.7"
D40	4%	12%	18.4"	19.8"
D41	5%	9%	0"	12.0"
D45	5%	15%	15.5"	23.0"
A46	1%	13%	0"	0"
D46	5%	9%	0"	22.4"
A47	NM	NM	NM	13.4"
D49	NM	NM	11.5"	NM

Note: NM denotes "Not Measurable."

7. Density readings were taken on each pass, using the MacBeth Quantalog Densitometer, Model EP 1000, with an EP 20 attachment and a 0.5 mm aperture. Terrain and Limiting density value readings for D Max and D Min, as well as Gross Fog, are correlated below.

Reading	Pass	Frame	Terrain D Min	Terrain D Max	Limiting D Min	Limiting D Max	Gross Fog Leading	Gross Fog Center	Gross Fog Trailing
1	M01	21	Clouds	Clouds	Clouds	2.09	0.19	0.20	0.19
2	D02	43	Clouds	Clouds	0.89	1.92	0.19	0.20	0.19
3	D07	65	0.46	1.38	0.46	1.88	0.15	0.15	0.15
4		128	0.77	1.78	0.77	2.12	0.20	0.20	0.20
5		167	0.51	1.98	0.51	2.12	0,19	0.19	0.19
6	D08	15	Clouds	Clouds	0.81	2.17	0.21	0.21	0.21
7		109	1.16	1.74	1.11	2.17	0.22	0.21	0.21
8	D09	30	0.54	1.23	0.54	2.14	0.21	0.21	0.21
9	A14	7	0.46	2.08	0.38	2.18	0.23	0.22	0.22
10	D14	9	0.34	1.72	0.34	2.16	0.23	0.22	0.22
11	D18	26	0.82	2.07	0.82	2.12	0.20	0.21	0.22
12	D20	64	0.62	1.48	0.46	1.87	0.24	0.23	0.22
13	A21	8	Clouds	Clouds	1.11	2.07	0.23	0.21	0.22
14	D21	65	1.18	2.14	0.96	2.14	0.22	0.23	0.24
15		88	1.21	1.78	0.87	2.12	0.24	0.22	0.23
16	D22	64	0.64	2.00	0.64	2.00	0.23	0.21	0.21
17		92	0.80	2.06	0.80	2.14	0.21	0.20	0.20
18	D23	73	0.81	1.76	0.81	2.18	0.21	0.20	0.19
19		128	0.91	2.00	0.91	2.00	0.20	0.18	0.19
20		158	1.01	1.81	1.01	1.81	0.21	0.20	0.19
21	A30	22	0.41	2.04	0.41	2.04	0.20	0.19	0.18
22	D30	22	0.59	1.63	0.54	2.08	0.21	0.21	0.20
23	A31	40	Clouds	Clouds	1.22	2.02	0.22	0.21	0.20
24	D32	39	Clouds	Clouds	1.04	2.04	0.21	0.22	0.21
25	D33	27	1.34	2.16	1.34	2.16	0.19	0.17	0.18
26	D34	42	0.74	2.03	0.54	2.05	0.24	0.21	0.23
27	D35	17	0.91	1.68	0.91	2.15	0.24	0.22	0.23
28	A36	38	Clouds	Clouds	0.55	2.01	0.23	0.21	0.21
29	D36	57	0.85	1.65	0.76	2.15	0.25	0.22	0.23
30	M37	16	0.74	1.24	0.74	2.00	0.23	0.22	0.22

HANDLE VIA [redacted]
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Reading	Pass	Frame	Terrain D Min	Terrain D Max	Limiting D Min	Limiting D Max	Gross Fog Leading	Gross Fog Center	Gross Fog Trailing
31	D37	64	1.23	2.13	0.93	2.15	0.25	0.23	0.23
32		103	1.03	1.72	0.81	2.10	0.25	0.23	0.22
33		181	0.45	1.58	0.45	2.05	0.25	0.23	0.22
34	D38	68	0.82	1.61	0.82	2.06	0.22	0.21	0.22
35		115	0.67	2.09	0.67	2.14	0.22	0.20	0.20
36	D39	74	0.78	1.68	0.78	2.00	0.21	0.19	0.20
37		143	0.52	2.01	0.52	2.08	0.21	0.19	0.20
38		179	1.02	1.93	1.02	1.93	0.20	0.19	0.21
39	D40	26	0.69	1.51	0.69	2.02	0.21	0.18	0.20
40		115	0.54	1.48	0.50	2.00	0.21	0.19	0.22
41	D41	32	0.69	1.53	0.56	2.08	0.24	0.21	0.26
42	D45	59	0.51	1.65	0.33	2.12	0.23	0.20	0.23
43	A46	37	0.51	1.93	0.51	1.93	0.24	0.21	0.24
44	D46	28	0.81	1.51	0.45	2.00	0.24	0.22	0.24
45	A47	42	Clouds	Clouds	1.06	2.09	0.25	0.21	0.24

Terrain

Average D Max	1.77
Average D Min	0.76
Range D Max	2.16-1.23
Range D Min	1.34-0.41
Overall Range	2.16-1.23

Limiting

Average D Max	2.06
Average D Min	0.74
Range D Max	2.18-1.81
Range D Min	1.34-0.33
Overall Range	2.18-0.33

Average Gross Fog 0.21
Range Gross Fog 0.25-0.15

PART III- FRAMING CAMERA

Mission No: 9045
Camera No: D3
Camera Setting: f/4.5, 1/125 second
Filter: Wratten 21
Film Type: SO 206
Evaluated By: [redacted]

1. Shutter Operation: Functional until film supply was exhausted.

2. Exposure: Good over terrain.

3. Camera Number: Clearly registered except in dense terrain or clouds.

4. Film Metering: Metering averages 0.1" from frames 1-62, becoming erratic thereafter, intermittently metering out excessive film. An electronic malfunction is probable, as 2.4", 4.8" and 7.3" units of film are metered out in excess of what is needed, suggesting that double, triple and quadruple plusing was activating the metering device. Excessive film measuring 2.4" was metered out intermittently for a total of 83 times. Excessive film measuring 4.8" was metered out intermittently for a total of 27 times, and that measuring 7.3" was metered out once. A total of 28 feet of film was lost due to this malfunction, resulting in film exhaustion from pass D46, to the end of the mission.

5. Film Tracking: Normal.

6. Reseau Grid: The camera body and magazine were not properly aligned, resulting in a slightly skewed format in respect to the film edges. No imagery was lost however.
   The edges of the reseau grid plate reflected light causing a thin circular light leak 3.6" in diameter to occur with varying densities throughout the film. Scratches in the opaque portions of the grid appear as small black streaks every 2.5" along the camera number edge, outside the format area. Grid lines are sharp and clean, however, a small opaque spot occurs near the second line down from the titled edge, obscuring a small portion of one grid square.

7. Light Leaks: A heavy circular fog patch occurs every 7.2" on the preflight material and into the operational portion of the mission, to frame 5. Miscellaneous light leaks are present on frames 325-329 (end of film).

8. Static Electricity: Dendritic static associated with two thin black lines 1/10" apart, 1.5" in from the camera number edge of the film occurs intermittently throughout the film in the interframe area and only when the film was not metering properly. An example may be seen between frames 81 and 82.

9. Pinholes: Few

10. Abrasions and Scratches: A few small abrasions and scratches are present intermittently throughout the film.

11. Tearing: None.

12. Water Marks: Water stains occur only on frames 327, 328 and 329.

13. Pressure Streaks: Two parallel dark lines with associated static occur spasmodically in metered areas of abnormal length. These lines appear to become desensitized at times.

14. Processing Streaks: None are present.

HANDLE VIA [redacted]
CONTROL SYSTEM ONLY

15. Blistering and Crimping: Crimping is present every 0.7" outside the format edge on frames 1-120, 144-149, 288-311, and inside the format on frames 286-288.

16. Contrast: Low to medium

17. Apparent Resolution: Resolution is good for the system employed.

18. Apparent Granularity: Slightly grainy.

19. Photo Quality: Fair.

20. Camera Operation: Fair. Degradation is due to problems brought about by the reseau grid, and metering.

Remarks:

1. No uniform radiation fogging is present on this mission.

2. Overlap is normal, 55 to 60% for all frames.

3. Transfer of opaquing material used in titling appears on most frames.

4. Vignetting causes a serious drop in contrast and density in the corners of the format.

5. A processing stain occurs on frames 144-149 and appears intermittently throughout the film.

6. Small bits of emulsion are displaced on frames 165, 275, 277, 289, and 317.

7. The correlation marker to indicate firing of the stellar camera did not function.

8. Density readings were taken from selected frames using the MacBeth Quantalog Densitometer Model EP 1000, with an EP 20 attachment and a 0.5 mm aperture. Terrain and Limiting density readings for D Max, D Min and Gross Fog are given below.

			Terrain		Limiting		Gross Fog
Reading	Pass	Frame	D Min	D Max	D Min	D Max	Center
1	M01	2	NR	NR	2.00	2.58	0.18
2	D02	10	NR	NR	0.62	2.52	0.23
3	D07	20	0.57	1.02	0.57	1.52	0.23
4	D08	38	0.44	0.70	0.44	2.46	0.24
5	D09	54	0.68	0.90	0.60	2.20	0.18
6	A14	61	0.63	1.04	0.40	2.10	0.18
7	D14	68	0.68	0.87	0.38	2.34	0.20
8	D18	75	0.83	1.26	0.44	2.44	0.24
9	A20	88	0.50	0.75	0.40	1.93	0.20
10	A21	94	0.52	0.68	0.52	2.29	0.22
11	D21	106	0.73	1.05	0.73	2.45	0.22
12	D22	119	0.55	1.38	0.55	2.07	0.21
13	D23	144	0.60	2.00	0.54	2.06	0.20
14	A30	152	0.56	0.69	0.32	1.88	0.19

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Reading	Pass	Frame	Terrain D Min	Terrain D Max	Limiting D Min	Limiting D Max	Gross Fog Center
15	D30	158	0.84	1.49	0.30	2.49	0.19
16	A31	166	NR	NR	0.42	2.59	0.20
17	D32	173	0.72	2.00	0.42	2.52	0.20
18	D33	180	0.63	1.68	0.38	2.34	0.19
19	D34	186	0.96	1.01	0.30	2.25	0.20
20	D35	192	0.88	1.93	0.35	2.53	0.20
21	A36	196	0.59	1.38	0.44	2.04	0.22
22	D36	207	0.60	1.40	0.60	2.42	0.28
23	A37	213	0.45	1.04	0.35	1.88	0.23
24	D37	237	0.86	1.20	0.33	1.98	0.20
25	D38	257	1.11	1.78	0.36	2.50	0.20
26	D39	282	1.48	2.18	0.41	2.18	0.18
27	D40	291	0.54	1.98	0.32	2.11	0.20
28	D45	319	1.00	1.88	0.32	2.68	0.20
29	A46	324	NR	NR	0.22	1.32	0.20
30	D46	328	NR	NR	0.40	2.34	0.25

Note: NR denotes "Not Readable."

Terrain	
Average D Max	1.33
Average D Min	0.72
Range D Max	2.18-0.70
Range D Min	1.48-0.44
Overall Range	2.18-0.44

Limiting	
Average D Max	2.23
Average D Min	0.58
Range D Max	2.68-1.32
Range D Min	2.00-0.30
Overall Range	2.68-0.30

Average Gross Fog 0.21
Range Gross Fog 0.25-0.18

PART IV - STELLAR CAMERA

Mission No: 9045
Camera No: 3
Camera Setting: f/1.9 @ ½-second

Filter: None
Film Type: 7J-3-135 (SO 130)
Evaluated By: [redacted]

1. Shutter Operation: Possible intermittent shutter malfunction is indicated by lack of imagery in a total of 12 frames throughout the mission. These frames are: 163, 176, 177, 179, 206, 231, 233, 293, 332, 334, 319, and 346.

2. Exposure: Considered adequate, where stellar imagery is present. Overexposure was due to earth flare and sun flare which is apparent when vehicle attitude became erratic.

3. Frame Correlation Fiducial Mark: Operational.

4. Camera Number: The number is present and clearly registered on all frames where the frame correlation fiducial mark functions.

5. Reseau Calibration Points: Operational throughout the photography but the"-A" point is overexposed and "bloomed."

6. Reseau Grid: The grid is visible except where the format density precludes its detection.

7. Film Metering: Erratic, the measured distance between format centers ranges from normal (1.18") to 6.0". Approximately 25% of the film contains evidence of deviations from the norm, with the longer metered space occurring in the latter portion of the mission. The 6.0" metering space is present near the film tail (frames 343-344) and is preceded intermittently by metering spaces that measure as much as 4.0". (It is noted that occurrences of metering eccentricities are proportional and correspond to those of the framing camera.)

8. Film Tracking: Normal.

9. Light Leaks: A bar-shaped light leak extends across the non-titled edge from frames 1 to 4,inclusive. Maximum width is about 0.25", gradually dissipating to "knife-edge" fogging, from frames 5 to 18, inclusive. A light leak resembling a right triangle is present in 28 frames. Of the 28 frames affected, the light leak degrades the image format in 60% of the cases and is present in the erratic metering spaces of the remaining 40%. Examples: frames 11, 38, 54, 56, 62, 66, 73, 80, 91, 97, 149, 168, 182, 193, 263, 308, 309, 324, 329 and 336. (A possible correlation exists between these light leaks and camera-off).

10. Static Electricity: Minor static traces are intermittent and few. Possible examples of corona static are present in frames 1, 113, 332, and 343.

11. Scratches and Abrasions: Minor and few.

12. Pinholes: Few.

13. Water Marks: None.

14. Processing Streaks: None.

15. Pressure Streaks: None.

16. Tearing: None.

HANDLE VIA [redacted]
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17. Blistering and Crimping: None.

18. Foreign Matter: Little detected.

19. Contrast: Low to medium, where not obscured by heavy density within the image format or degraded by flare.

20. Apparent Resolution: Good.

21. Apparent Granularity: Medium.

22. Photo Quality: Fair, where not degraded by fogging and/or earth flare.

23. Camera Operation: A rating of no more than "fair" is assigned. In addition to the possible shutter malfunction and light leaks previously noted, high-density format areas (4.0-plus) accompanied by images of the perimeter of the Reseau Grid and clamps occur in 178 frames. This condition is caused by excessive light entering through the lens. Examples: frames 137-147, 154-161, 166-192, 197-322, 328-335 and 338-345. Partial reflected images of the format areas are present in 22 frames. These frames are: 6, 9, 11, 18, 42, 58, 60, 63, 68, 75, 81, 94, 99, 113, 127, 150, 153, 164, 170, 175, 184 and 214. In most of these cases a portion of the reflected image may be found within the stellar format.

Remarks:

1. Overall fogging is present intermittently throughout the film and affects from as few as one or two frames at a time to as many as twenty. The first five frames are heavily fogged. It is felt that this latter fogging probably is due to light leakage rather than exposure of the film to radiation.

2. Duplicate impressions of the frame numbers are pressure-imprinted along the non-titled edge throughout frames 1 to 22.

3. The lower portion of the frame numbers are slightly smeared but the numerals are not appreciably degraded. Transfer of opaque titling material occurs frequently throughout the photography but is confined to the titled edge.

4. Density readings were taken as indicated below, using the MacBeth Quantalog Densitometer, Model EP 1000, with an EP 20 attachment and a 0.5 mm aperture. D-Max and D-Min readings were taken wherever a gradation of densities existed within the formats. Readings of 4.0-plus indicate densities of such extent that the densitometer indicator deflected off-scale and precise values were unobtainable. In addition, minimum values of such high density areas were not always obtainable, and these omissions are indicated by "NR", for "Not Readable."

Note: The first 35 readings are consecutive. Thereafter, only one frame per pass was evaluated.

Reading	Pass	Frame	D-Max	D-Min	Gross Fog
1	M01	1	2.61	1.34	1.32
2	M01	2	2.75	1.76	1.74
3	M01	3	2.64	1.32	1.32
4	M01	4	2.56	1.00	0.99
5	D02	5	2.72	0.92	0.65
6	D02	6	2.50	0.73	0.52
7	D02	7	2.50	0.86	0.47

HANDLE VIA [redacted]
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Reading	Pass	Frame	D-Max	D-Min	Gross Fog
8	D02	8	2.57	0.97	0.47
9	D02	9	2.55	0.96	0.40
10	D02	10	2.48	0.85	0.31
11	D02	11	2.42	0.86	0.23
12	D07	12	2.31	0.34	0.24
13	D07	13	2.25	0.29	0.23
14	D07	14	2.38	0.62	0.44
15	D07	15	2.36	0.38	0.29
16	D07	16	2.32	0.44	0.31
17	D07	17	2.30	0.60	0.52
18	D07	18	2.16	0.53	0.38
19	D07	19	1.96	0.37	0.26
20	D07	20	1.88	0.31	0.26
21	D07	21	1.88	0.36	0.31
22	D07	22	1.86	0.51	0.43
23	D07	23	1.75	0.33	0.24
24	D07	24	1.70	0.30	0.26
25	D07	25	1.77	0.33	0.24
26	D07	26	1.81	0.45	0.32
27	D07	27	1.90	0.52	0.40
28	D07	28	1.90	0.32	0.22
29	D07	29	1.91	0.34	0.25
30	D07	30	1.84	0.33	0.24
31	D07	31	1.94	0.55	0.38
32	D07	32	1.94	0.48	0.35
33	D07	33	1.88	0.32	0.23
34	D07	34	1.88	0.34	0.26
35	D07	35	1.92	0.35	0.28
36	D07	36	2.06	0.56	0.48
37	D08	44	2.05	0.38	0.26
38	D09	55	2.10	0.56	0.45
39	A14	61	1.38	0.29	0.25
40	D14	70	2.00	0.69	0.62
41	D18	74	2.32	0.76	0.61
42	D20	82	2.32	1.68	1.06
43	A21	93	2.14	0.52	0.45
44	D21	100	2.48	0.78	0.46
45	D22	120	2.72	2.22	0.37
46	D23	130	2.69	2.48	0.27
47	A30	150	1.28	0.54	0.48
48	D30	160	4.00+	NR	0.24
49	A31	165	4.00+	3.28	0.24
50	D32	168	4.00+	3.78	0.22
51	D33	180	4.00+	NR	0.42
52	D34	185	4.00+	NR	0.98
53	D35	190	4.00+	3.89	0.43
54	A36	195	3.86	2.02	0.46
55	D36	205	4.00+	3.92	0.37
56	A37	212	4.00+	3.53	0.38
57	D37	236	4.00+	3.75	0.24
58	D38	250	4.00+	3.84	0.22
59	D39	280	4.00+	3.63	0.22
60	D40	300	4.00+	3.73	0.34
61	D41	310	4.00+	3.79	0.26
62	D45	320	4.00+	3.76	0.23
63	A46	323	0.74	0.39	0.32
64	D46	330	4.00+	3.88	0.32
65	A47	340	4.00+	3.08	0.24

[redacted]

Reading	Pass	Frame	D-Max	D-Min	D-Base
66	D49	345	3.20	3.08	0.25

Average D Max	2.20
Average D Min	0.76
Range, D Max	4.00^{+} - 0.74
Range, D Min	3.92 - 0.29
Overall Range	4.00^{+} - 0.29
Average D Base	0.50
Range, D Base	1.74 - 0.22

Note: In computing the above, all 4.00^{+} D Max readings and their associated D Min values were not included in determination of density averages.

HANDLE VIA [redacted]
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PART V - VEHICLE ATTITUDE DATA

Pass	Pitch Variation		Pitch Range	Roll Variation		Roll Range	No. of Frames	Remarks
M01	-16° 46'	-16° 31'	0° 15'	-0° 54'	-0° 23'	0° 31'	29	
D02	-17 01	-16 12	0 49	-6 22	-5 24	0 58	49	
D07	-16 41	-16 15	0 26	1 18	-0 04	1 22	173	
D08	-16 38	-16 14	0 24	1 06	0 20	0 46	112	
A09	-15 30	-15 03	0 27	-0 55	-0 27	0 28	8	
D09	-16 39	-16 25	0 14	1 20	0 40	0 40	42	
A14	-16 09	-15 30	0 39	-2 14	0 24	2 38	33	
D14	-16 31	-15 52	0 39	1 07	0 25	0 42	51	
D18	-16 34	-16 16	0 18	1 25	0 54	0 31	48	
D20	-16 11	-15 34	0 37	-6 40	-5 15	1 25	73	
A21	-17 04	-13 44	3 20	-2 54	-0 31	2 23	38	
D21	-16 48	-16 29	0 19	-5 44	-5 02	0 42	73	split pass
	-16 59	-16 27	0 32	-6 59	-6 23	0 36	39	
D22	-16 41	-15 58	0 43	-8 19	-6 29	1 50	100	
D23	-16 48	-12 55	3 53	-10 44	-6 32	4 12	160	
A30	-18 02	-16 35	1 27	11 18	7 28	3 58	41	approx. values
A31	-16 23	-15 14	1 09	-12 05	-8 55	3 10	42	approx. values
D38	-17 59	-01 00	16 59	No Info		No Info	75	approx. values first 75 frames

Note:

Vehicle attitude on the last 18 passes deviated abnormally from expected nominal values, resulting in total loss of horizon images. Pitch and roll variations for these passes cannot be accurately computed.

HANDLE VIA [redacted]
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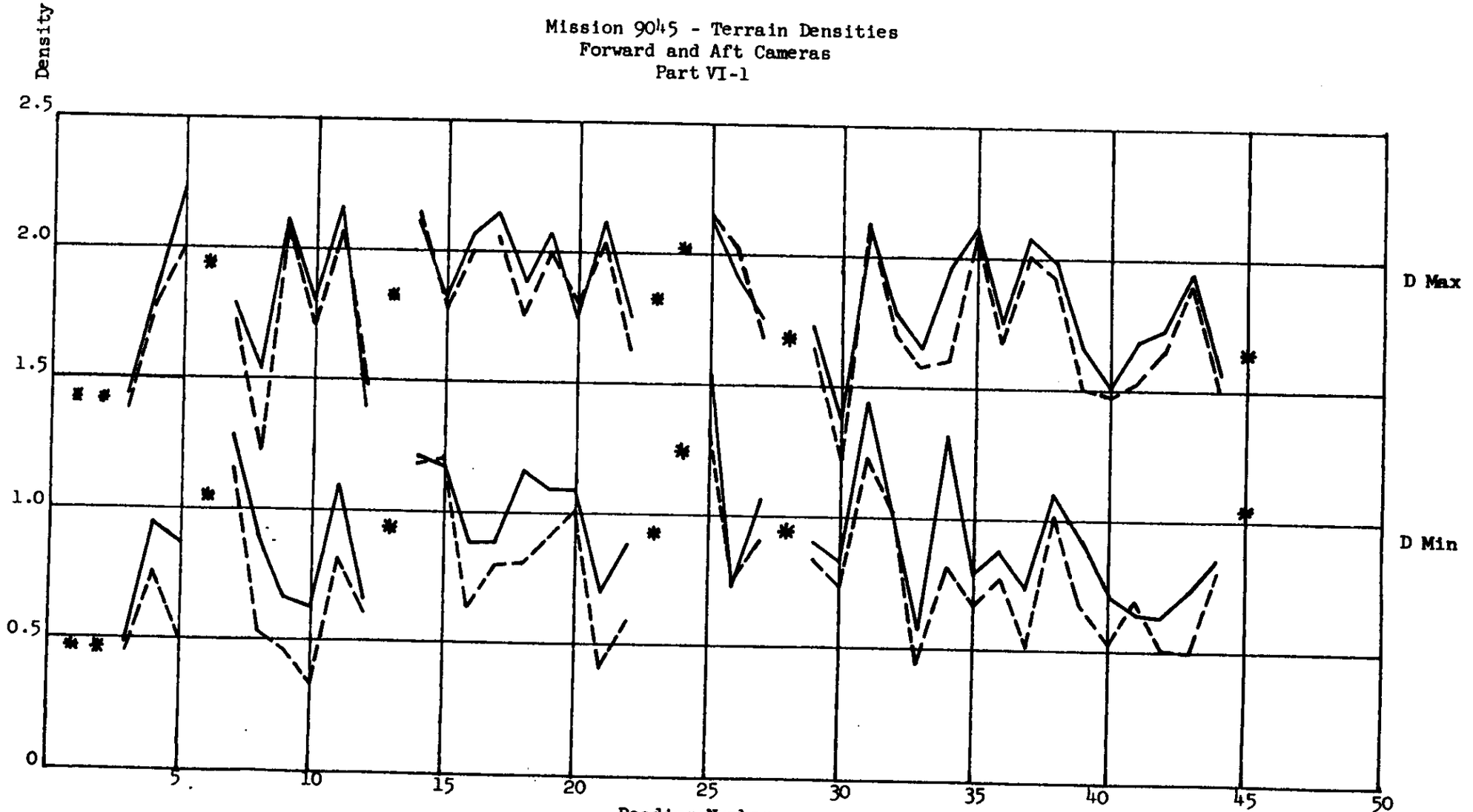
Mission 9045 - Terrain Densities
Forward and Aft Cameras
Part VI-1



NPIC H-0813 (12/62)

HANDLE VIA [redacted]
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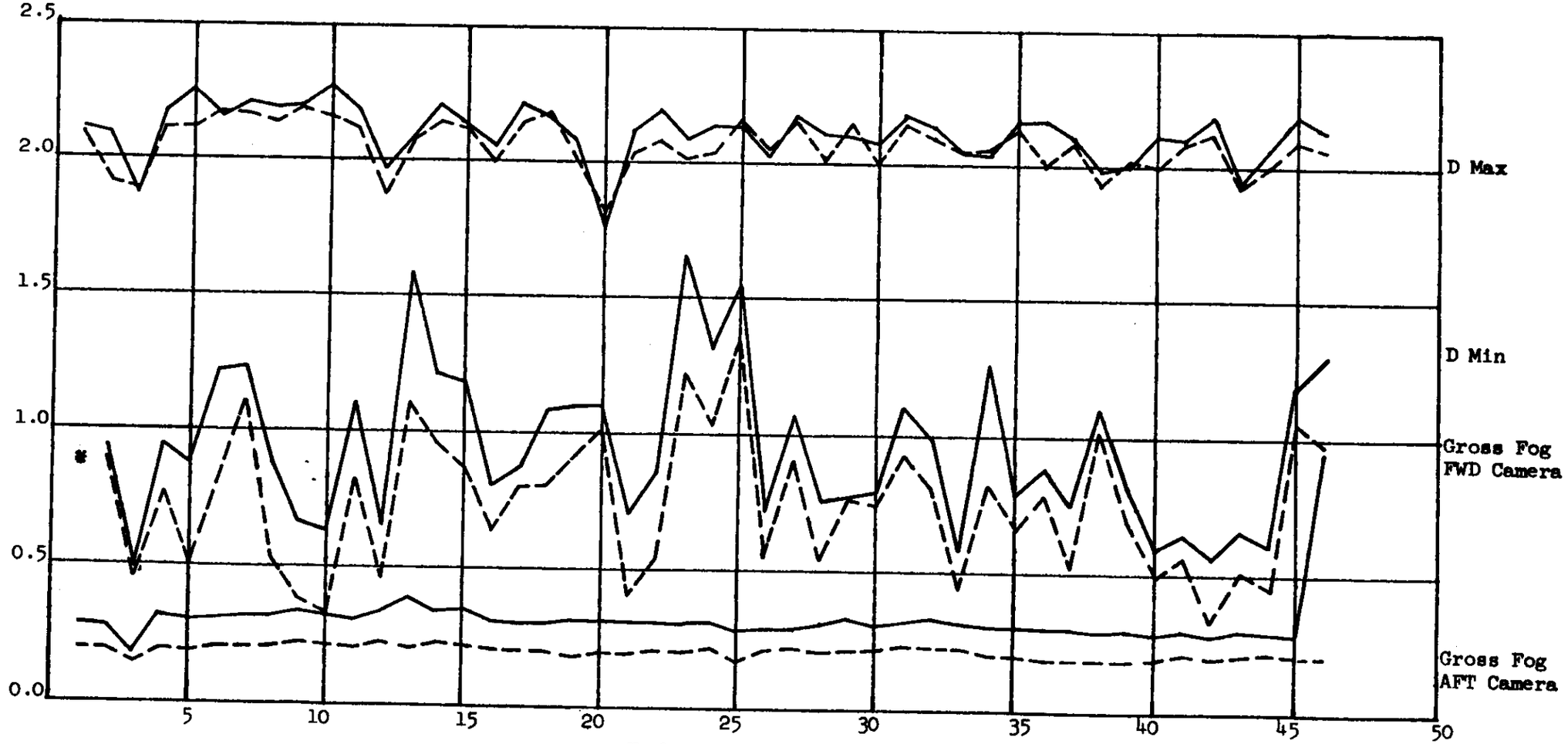
Mission 9045 - Limiting Densities
Part VI-2



NPIC H-0814 (12/62)

HANDLE VIA [redacted]
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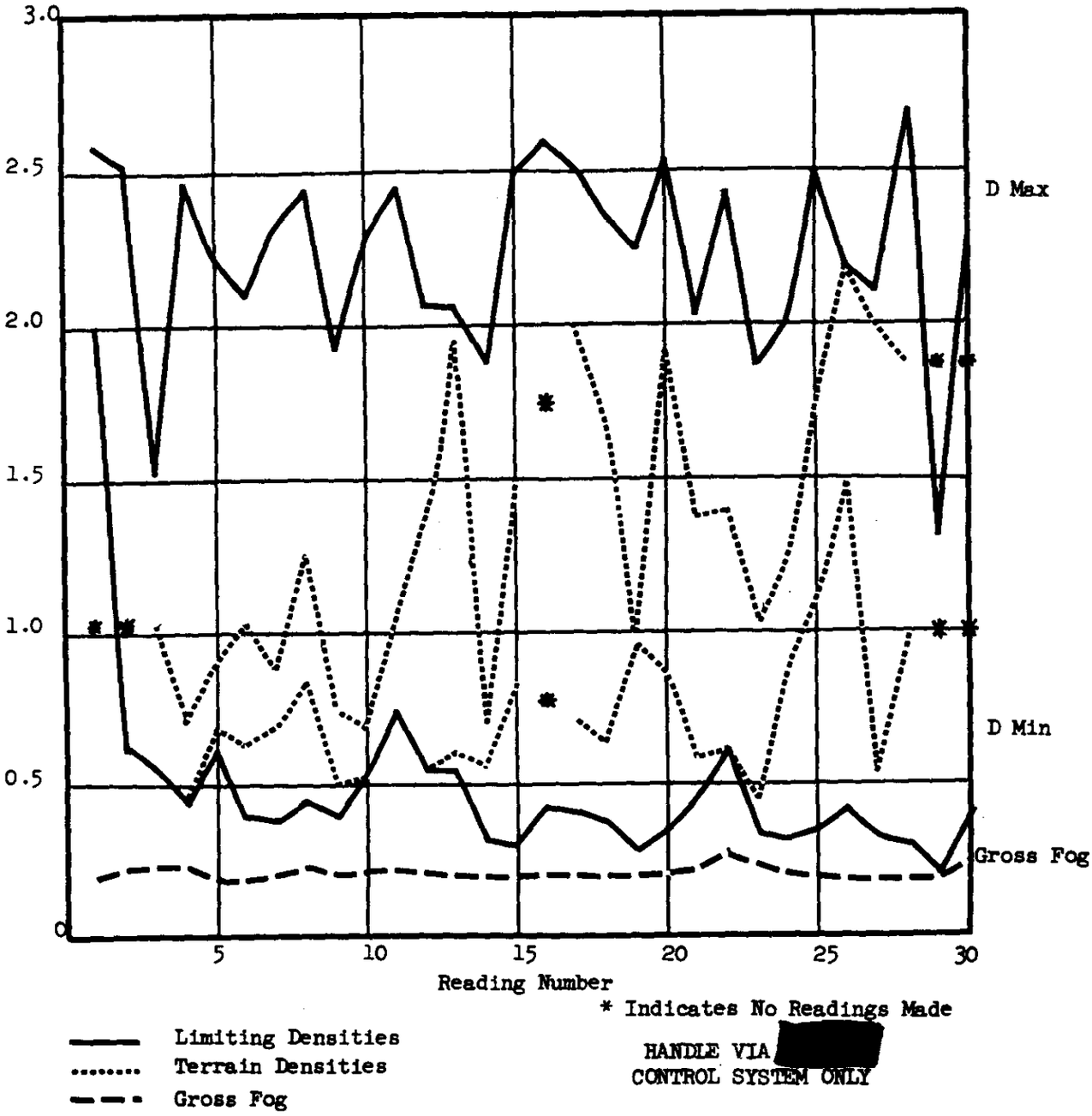
[redacted]

Mission 9045
Framing Camera Densities
Part VI-3



HANDLE VIA [redacted]
CONTROL SYSTEM ONLY

NPIC H-0818 (12/62)