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5 November 1962

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PHOTOGRAPHIC EVALUATION REPORT

Mission 9039
21 July 1962 Z

FE NO. 37-62

HANDLE VIA [redacted]
CONTROL SYSTEM ONLY

[redacted]
5 November 1962

PART I - FORWARD CAMERA

Mission No: 9039
Camera No: 90
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): Probable port horizon camera shutter malfunction is indicated by abrupt loss of imagery within the port horizon format areas. Examples: pass A01, frames 44, 48; pass A02, all frames; pass D07, all frames; pass D09, all frames.

2. Horizon Camera Exposure:
   a. Supply (Port): Overexposed (f/8, with a 1/50-second average speed) and out-of-focus.
   b. Take-Up (Starboard): Overexposed (f/8, with a 1/50-second average speed) and out-of-focus.

3. Camera Number: Operational, except where a second or third binary is exposed at the camera-off position. The number is "bloomed" but legible.

4. Binary Operation: The binary functions throughout the mission but during pass A01 light numbers 12, 15, 22, 25 are faintly evident throughout, although they should not have been illuminated at this time. Double binaries appear intermittently throughout pass D07 and triple binaries occur in the last frame of passes A02, D07, D08.

5. Film Metering:
   a. Supply (Port) Horizon Camera: Metering averages 0.20", with a range of 0.16" - 0.24".
   b. Take-Up (Starboard) Horizon Camera: Metering averages 0.20", with a range of 0.16" - 0.26".

6. Film Tracking: Normal.

7. Timing Pulses: The timing pulses are imaged outside the format but are flared throughout the film and fail to terminate in the last frame of passes A01, A02, D08. On the last frame of the remaining passes, the timing pulses terminate as much as 0.60" to 2.75" from the supply side. In passes D08 and A09 the timing pulses end 0.75" from supply throughout the pass.

8. Fiducials:
   a. Main Camera: The fiducials are well defined in most passes and usable throughout the photography.
   b. Horizon Cameras: The fiducials are well defined, with no flare present.

9. Light Leaks: Twin parallel light leaks appear in the trailing edge of pass D07, frame 5. They are parallel to the format edge and pass through the camera number and a portion of the binary. Their lengths are 2.0" and 2.5", respectively. Light leaks are also noted in pass D07, frame 173 and in the metering space between frames 13-14 of pass A09. A possible equipment image shadow appears in pass A02, frame 64.

10. Static Electricity: A static trace is present in the metering space between frames 25-26 of pass A02. The presence of possible corona static is indicated by striations and fog patches noted in previous missions as being associated with corona static discharges. Examples: pass D07, striations in the port horizon camera formats and metering spaces throughout the pass, and small fog patches spaced about 6.0" apart in the leading edge (observed only in the last one-third of the pass); pass D07, fog patches in the metering spaces throughout

the pass; pass D08, frame 4 to end-of-pass (striations in the metering spaces and fog patches in the leading edge); pass A09, frames 4-15 (striations and fog patches in the metering spaces); pass D09, frames 3 to end-of-pass (striations and fog patches in the metering spaces).

11. Pinholes: Few and intermittent.

12. Abrasions and Scratches: Few and intermittent but lifted emulsion is present in pass A01, frames 43, 46, 50-55; pass A02, frame 41; pass D09, frames 118, 119. In pass A09, frames 4-14, abraded emulsion is present consistently under the "A" in the pass number "A09."

13. Tearing: None. A clear splice is present in the take-up end of frame 34 in pass A02.

14. Water Marks: None noted but a possible chemical stain is present in pass A02, frame 25.

15. Pressure Streaks: Base rubs are present in pass D07, frames 97, 109, 112, 147, and are found infrequently throughout the remaining passes.

16. Processing Streaks: None positively defined.

17. Blistering and Crimping: Blisters are few and intermittent. Examples: pass A02, frames 17, 25, 26; pass D07, frame 92 (small, circular crimps); pass D09, frame 119 (contains crimps, apparently incurred before processing).

18. Contrast: Low 70%, medium 30%, high 0%.

19. Apparent Resolution: Image quality is fair where not degraded by uniform fogging and/or low sun angle.

20. Apparent Granularity: Fine.

21. Photo Quality:
    a. Main Camera: Quality ranges from poor to fair, due to degradation by uniform fogging and low sun angle.
    b. Horizon Cameras: The imagery from both cameras is poor. Overexposure results in images of such density that detail is not discernible in most cases. An out-of-focus condition in both cameras is also present.

22. Camera Operation:
    a. Main Camera: No malfunctions are noted but a rating of no more than "fair" is assigned, due to the presence of uniform fogging and static effects. Approximately 50% of the photography is thereby degraded.
    b. Horizon Cameras: Possible shutter malfunction of the port horizon camera is noted (refer to comments in 1. Shutter Operation) and both port and starboard cameras are noticeably out-of-focus.

23. Suitability for PI: A rating of not more than "fair" is assigned, due to degradation of the imagery by uniform fogging, static effects, cloud cover, and low sun angle.

Remarks:

1. Handling marks are found intermittently throughout the film. There is a cinch mark in pass A01, frame 52. Foreign matter (mostly lacquer) is present in pass A02, frames 3, 64; pass D07, frames 80, 130; pass A09, frame 15; pass D09, frames 30, 93 (opaquing) and frames 1, 7, 119 (other foreign matter).

2. Uniform fogging, possibly derived from exposure of the film to radiation, is present intermittently. Examples: pass A02, frames 63-65; pass D07, frames 1-3, intermittent thereafter to end-of-pass.

3. No desensitized streaks or spots are noted.

4. Negative density streaks appear in pass A01, frames 47, 50, 51; pass D07, in the metering space between frames 22-23 and frames 9-10; pass D08, frames 70, 75. Negative density streaks are also present throughout all of Part Two of pass D08.

5. The following descriptions of overlap and film transport for Camera Number 90 were determined from the fifth and last frames of each pass, wherever possible. Cloud cover, low sun angle with resultant loss of imagery, and excessive fogging may have precluded determination of these values in some passes.

	Overlap (Percent)		Film Transport (From Take-Up Side in Inches)	
Pass	Beginning	End	First Frame	Last Frame
A01	7	11	0.0	0.0
A02	NM	NM	NM	12.0
D07	NM	NM	NM	16.0
D08	9	0	13.5	0.0
A09	0	0	0.0	0.0
D09	0	7	5.7	NM

Note: NM denotes "Not Measurable."

6. 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	A01	58	0.92	1.58	0.98	2.08	0.24	0.24	0.24
2	A02	34	0.90	1.62	0.82	2.18	0.24	0.24	0.24
3	D07	75	NR	NR	1.24	2.12	0.34	0.34	0.38
4		125	0.92	2.00	0.90	2.12	0.28	0.29	0.30
5		155	NR	NR	NR	2.10	0.29	0.30	0.32
6	D08	75	0.59	1.86	NR	NR	0.23	0.24	0.23
7		117	0.55	1.78	0.50	2.01	0.22	0.22	0.22
8	A09	5	0.82	1.56	0.82	2.14	0.21	0.28	0.25
9	D09	29	0.98	1.70	0.98	2.11	0.29	0.27	0.28
10		98	0.48	1.70	0.48	2.04	0.31	0.26	0.30

NR denotes "Not Readable."

	Terrain	Limiting
Average D Max	1.72	2.10
Average D Min	0.77	0.79
Range D Max	2.00 - 1.56	2.18 - 2.01
Range D Min	0.98 - 0.48	1.24 - 0.82
Overall Range	2.00 - 0.48	2.18 - 0.82

Average Gross Fog 0.26
Range Gross Fog 0.34 - 0.21

PART II - AFT CAMERA

Mission No: 9039
Camera No: 91
Slit Width: 0.200"
Film Type: 7J-23-7800 (SO 132)

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

1. Shutter Operation (Horizon Cameras): Probable starboard horizon camera shutter malfunction is indicated by abrupt loss of imagery within the starboard horizon format areas in pass D07, frames 1-75, 151-174; pass A09, all frames; pass D08, all frames.

2. Horizon Camera Exposure:
   a. Supply (Starboard): Overexposed (f/6.8 with a 1/10-second average speed) and out-of-focus.
   b. Take-Up (Port): Overexposed (f/8, with a 1/100-second average speed) and out-of-focus.

3. Camera Number: Operational, except where a second or third binary is exposed at the camera-off position. The number is "bloomed" but legible.

4. Binary Operation: The binary functions throughout the mission although the index light does not always appear at end-of-pass. Double binaries are present intermittently throughout pass D07 and a triple binary occurs at end-of-pass in pass A01.

5. Film Metering:
   a. Supply (Starboard) Horizon Camera: Metering averages 0.20" with a range of 0.16" - 0.26".
   b. Take-Up (Port) Horizon Camera: Metering averages 0.22" with a range of 0.20" - 0.24".

6. Film Tracking: Normal.

7. Timing Pulses: The timing pulses are imaged outside the format edge but reflected images are present throughout the film. In pass D08 the timing pulses are imaged on a bias and images are present within the format area of frames 76-127. The timing pulses fail to terminate in the last frame of passes D07, D08, and A09. In the remaining passes, the timing pulses terminate as much as 1.0" to 1.5" from the supply side in the end-of-pass frames. In pass D07 the timing pulses terminate 0.60" from supply throughout frames 76-150.

8. Fiducials:
   a. Main Camera: The fiducials are well defined in most passes and are usable throughout the photography.
   b. Horizon Cameras: The fiducials are well defined, with no flare present.

9. Light Leaks: In pass A01, frame 50, a vertical band is present across the format located 0.60" from the take-up end. A possible equipment image appears in pass D07, frame 1. Three parallel streaks intrude on the binary and camera number of frame 129 in pass D07. Small fog patches appear intermittently in the metering spaces of most passes, located near the leading or trailing edges and sometimes present in both simultaneously.

10. Static Electricity: The possible presence of corona static is indicated by striations and fog patches in the metering spaces of pass D07, frames 1-75;

* Starboard only; no filter, Port.

pass D08, all frames; pass A09, frames 4 to end-of-pass, pass D09, frames 2 to end-of-pass. These striations and related fog patches resemble the patterns noted in previous missions as being corona-associated.

11. Pinholes: Few and intermittent.

12. Abrasions and Scratches: Intermittent and minor. Examples: pass A02, frames 2, 63; pass D07, frames 1, 2, 27, 51, 60, 137, 138, 154, 156; pass D08, frame 8. Lifted emulsion is present in pass A01, frames 1, 2; pass D07, frames 1, 7, 10, 34, 63, 64, 65; pass D08, frames 1, 13, 33, 34, 44, 46, 50, 54, 61, 88, 89, 97; pass D09, frame 15.

13. Tearing: None. A clear splice is present in pass D07, between frames 88 and 89.

14. Water Marks: None noted.

15. Pressure Streaks: Base rubs are present in pass A02 intermittently throughout; pass D07, frames 45, 46, 69, 127, 143, 149, 154. Pass D07, frame 177 contains vertical pressure bands.

16. Processing Streaks: Pass D07, frames 56, 78.

17. Blistering and Crimping: Blisters are intermittent and few. Pass D07 contains crimps in the metering space between frames 30 and 31, and crimps within the format area, pass D09, frame 116 contains crimps.

18. Contrast: Low 70%, medium 30%, high 0%.

19. Apparent Resolution: Image quality is fair where not degraded by uniform fogging and/or low sun angle.

20. Apparent Granularity: Fine.

21. Photo Quality:
    a. Main Camera: Quality ranges from poor to fair, due to degradations by uniform fogging and low sun angle.
    b. Horizon Cameras: The imagery from both cameras is poor. Overexposure resulted in images of such density that detail is not discernible in most cases. An out-of-focus condition in both cameras is also present.

22. Camera Operation:
    a. Main Camera: A possible capping shutter malfunction is noted intermittently throughout pass D07, frames 1-75. In addition, approximately 50% of the photography is degraded by uniform fogging and static effects. Hence, a rating of no more than "fair" is assigned.
    b. Horizon Cameras: Possible shutter malfunction of the starboard horizon camera is indicated (refer to comments noted in 1. Shutter Operation) and both port and starboard cameras are noticeably out-of-focus.

23. Suitability for PI: Fair only, due to degradation of the imagery by uniform fogging, cloud cover, and low sun angle.

Remarks:

1. Handling marks are found intermittently throughout the film. Cinch marks are found in pass A01, frames 59, 60. There are spots of opaque matter in pass A01, frames 4-20, 22-60; pass A02, frames 55, 58; pass D07, intermittent throughout. Other foreign matter is present in pass D08, in the metering space between frames 64-65 and in frames 1, 26, 31, 48; pass A09, frames 7, 10, 11.

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2. Uniform fogging, possibly derived from exposure of the film to radiation, is present intermittently. Examples: pass A02, frames 60 to end-of-pass; pass D07, frames 1-3, and intermittent thereafter.

3. Negative density streaks appear in pass A02, parallel to trailing edge throughout; pass D07, frames 6, 77; pass D09, throughout. A negative density spot is present in pass A02, in the starboard horizon camera format. Negative density smears occur in the metering spaces in pass D07 between frames 11-12, 22-23, 46-47.

4. No desensitized streaks or spots are noted.

5. The following descriptions of overlap and film transport for Camera Number 91 were determined from the fifth and last frames of each pass wherever possible. Cloud cover, low sun angle with resultant loss of imagery, and excessive fogging may have precluded determination of these values in some passes.

	Overlap (Percent)		Film Transport (From Take-Up Side in Inches)	
Pass	Beginning	End	First Frame	Last Frame
A01	8	12	0.0	9.9
A02	1	NM	0.0	10.0
D07	6	8	NM	0.0
D08	0	1	15.0	0.0
A09	0	NM	NM	NM
D09	1	5	4.5	NM

NM denotes "Not Measurable."

6. 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	A01	52	0.92	1.52	0.68	2.18	0.25	0.25	0.24
2	A02	36	0.74	1.80	0.74	2.00	0.23	0.23	0.23
3	D07	74	1.00	1.51	0.91	1.89	0.40	0.40	0.34
4		118	0.80	1.70	0.80	2.10	0.37	0.31	0.31
5		177	0.67	1.96	0.67	2.06	0.25	0.25	0.25
6	D08	73	0.68	1.78	NR	NR	0.26	0.27	0.28
7		122	0.88	1.70	0.74	2.00	0.34	0.28	0.29
8	A09	8	1.12	1.42	0.92	2.12	0.28	0.36	0.30
9	D09	38	1.00	1.88	0.74	2.03	0.25	0.25	0.25
10		104	0.53	1.58	0.53	2.00	0.21	0.22	0.23

NR denotes "Not readable."

	Terrain	Limiting
Average D Max	1.68	2.04
Average D Min	0.83	0.80
Range D Max	1.96 - 1.51	2.18 - 1.89
Range D Min	1.12 - 0.53	1.02 - 0.68
Overall Range	1.96 - 0.53	2.18 - 0.68

Average Gross Fog	0.27
Range Gross Fog	0.40 - 0.21

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PART III - FRAMING CAMERA

Mission No: 9039
Camera No: 86
Camera Setting: f/6.3, 1/250 second

Filter: Wratten 21
Film Type: 7J-3-135 (SO 130)
Evaluated By: [redacted]

1. Shutter Operation: The shutter functioned for 22 frames, then remained closed for approximately 16 frames before opening for a final exposure. Thereafter, the shutter was closed for the remainder of the mission.

2. Exposure: Good, when not degraded by uniform fogging.

3. Camera Number: Clearly registered on all frames.

4. Film Metering: Slightly erratic, averaging 0.15".

5. Film Tracking: Normal.

6. Reseau Grid: Opaque material, parallel to the film transport, and between the grid lines, obscures portions of all imaged frames. Grid lines are sharp and well defined.

7. Light Leaks: Thin bar-shaped light leaks perpendicular to film transport occur on frames 8, 13, 23.

8. Static Electricity: Dendritic static occurs on the film between frames 22 and 23, and on that portion of the film lacking imagery subsequent to frame 23.

9. Pinholes: Few.

10. Abrasions and Scratches: Very few.

11. Tearing: None.

12. Water Marks: None.

13. Pressure Streaks: None.

14. Processing Streaks: None.

15. Blistering and Crimping: A small blister is present on the film between frames 22 and 23.

16. Contrast: Low to medium, where not affected by fog.

17. Apparent Resolution: Good for the system employed.

18. Apparent Granularity: Slightly grainy.

19. Photo Quality: Good where not affected by fog.

20. PI Suitability: Poor. Degradation is due to fogging, shutter malfunction and light leaks.

21. Camera Operation: Poor. The shutter malfunction caused loss of imagery for the majority of the mission.

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Remarks:

1. Uniform fog is present on frames 10 through 18, with a fog pattern occurring every 4.5" throughout the film. The fogging gradually diminishes in density toward the end of the photography (Pass D07), with the exception of the film edges.

2. Mottling occurs along the titled edge of the film.

3. Overlap is normal, ranging between 55 and 65 percent.

4. A small circular white spot, near the camera number edge, occurs every 6.8" in the fogged area between frames 22 and 23, and for the remainder of the film. Indications suggest that this may be a portion of film that was protected from radiation by a specific camera part.

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

		Terrain		Limiting			Gross Fog	
Pass	Frame	D Max	D Min	D Max	D Min	Titled Edge	Center	Outboard Edge
A01	1	1.78	0.73	2.87	0.73	0.38	0.40	0.28
	2	1.58	0.84	2.62	0.58	0.18	0.13	0.12
	3	1.78	1.16	3.01	0.67	0.38	0.40	0.29
	4	1.48	0.84	3.01	0.82	0.16	0.16	0.13
	5	1.49	1.09	3.01	1.09	0.37	0.40	0.30
	6	1.22	0.98	3.01	0.98	0.18	0.18	0.17
	7	1.27	0.83	2.82	0.83	0.37	0.37	0.29
	8	1.10	0.68	2.55	0.68	0.22	0.22	0.18
	9	1.20	0.78	2.74	0.78	0.35	0.32	0.29
D01E	10	Clouds	Clouds	2.96	1.68	0.84	0.74	0.80
	11	Clouds	Clouds	3.04	Clouds	1.09	1.01	1.16
A02	12	2.64	1.70	2.64	1.70	1.49	1.51	1.53
	13	2.48	1.78	2.48	1.78	1.72	1.78	1.79
	14	2.51	2.16	2.51	2.16	2.22	2.24	2.24
	15	Clouds	Clouds	2.60	2.46	2.49	2.44	2.43
	16	Clouds	Clouds	3.00	2.69	2.58	2.56	2.44
	17	Clouds	Clouds	3.06	2.49	2.22	2.14	2.17
	18	Clouds	Clouds	2.96	2.09	1.71	1.66	1.71
	19	Clouds	Clouds	2.96	1.78	0.72	0.62	0.62
	20	Clouds	Clouds	2.96	1.61	0.42	0.36	0.36
D07	21	1.70	1.16	3.04	1.16	0.39	0.34	0.37
	22	1.92	0.84	2.92	0.84	0.89	0.66	0.67
	23	2.52	1.86	2.52	1.86	2.28	2.52	2.25

Note: Excessive fog is due to exposure to radiation

	Terrain	Limiting
Average D Max	1.78	2.84
Average D Min	1.16	1.39
Range D Max	2.64 - 1.10	3.06 - 2.48
Range D Min	2.16 - 0.68	2.69 - 0.58
Overall Range	2.64 - 0.68	3.06 - 0.58

Average Gross Fog (Center Reading) 1.05
Range Gross Fog (Center Reading) 2.56 - 0.13

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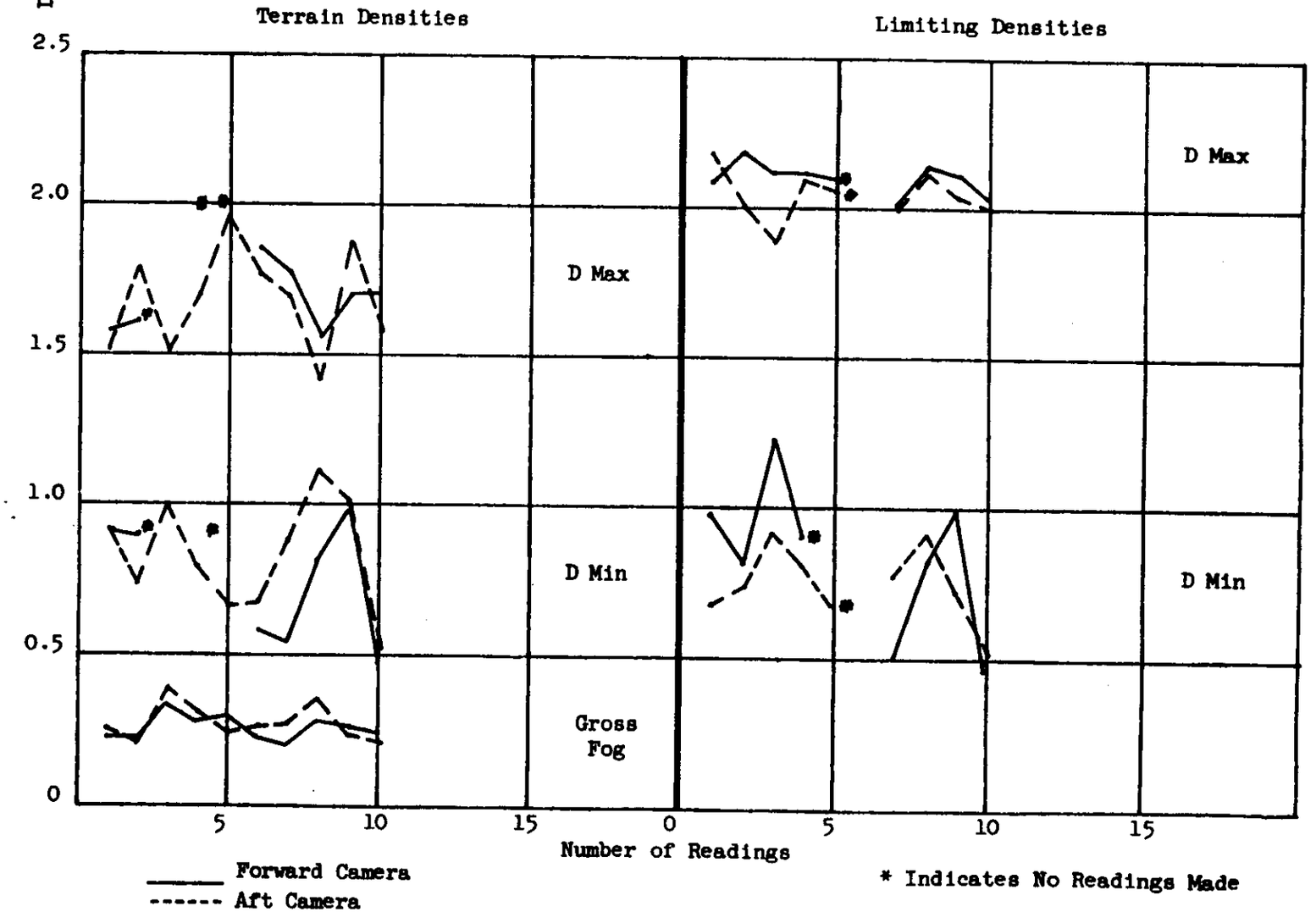
PART IV - VEHICLE ATTITUDE DATA

Pass	Pitch Variation		Pitch Range	Roll Variation		Roll Range	No. of Frames	Remarks
A01	-16° 43'	-16° 31'	0° 12'	-0° 31'	0° 05'	0° 36'	60	
D01	-16 33	-16 15	0 18	-0 22	0 35	0 57	15	
A02	-16 42	-16 12	0 30	-0 24	0 24	0 48	64	
D07	-16 45	-15 54	0 51	-0 03	1 00	1 03	126	
	-16 23	-15 52	0 31	-0 24	1 40	2 04	48	
D08	-16 41	-15 56	0 45	-0 49	0 42	1 31	126	
A09	-16 38	-16 26	0 12	0 09	1 01	0 52	15	
D09	-16 37	-16 05	0 32	-1 03	0 36	1 39	116	

Mission 9039
Terrain and Limiting Densities
Forward and Aft Cameras



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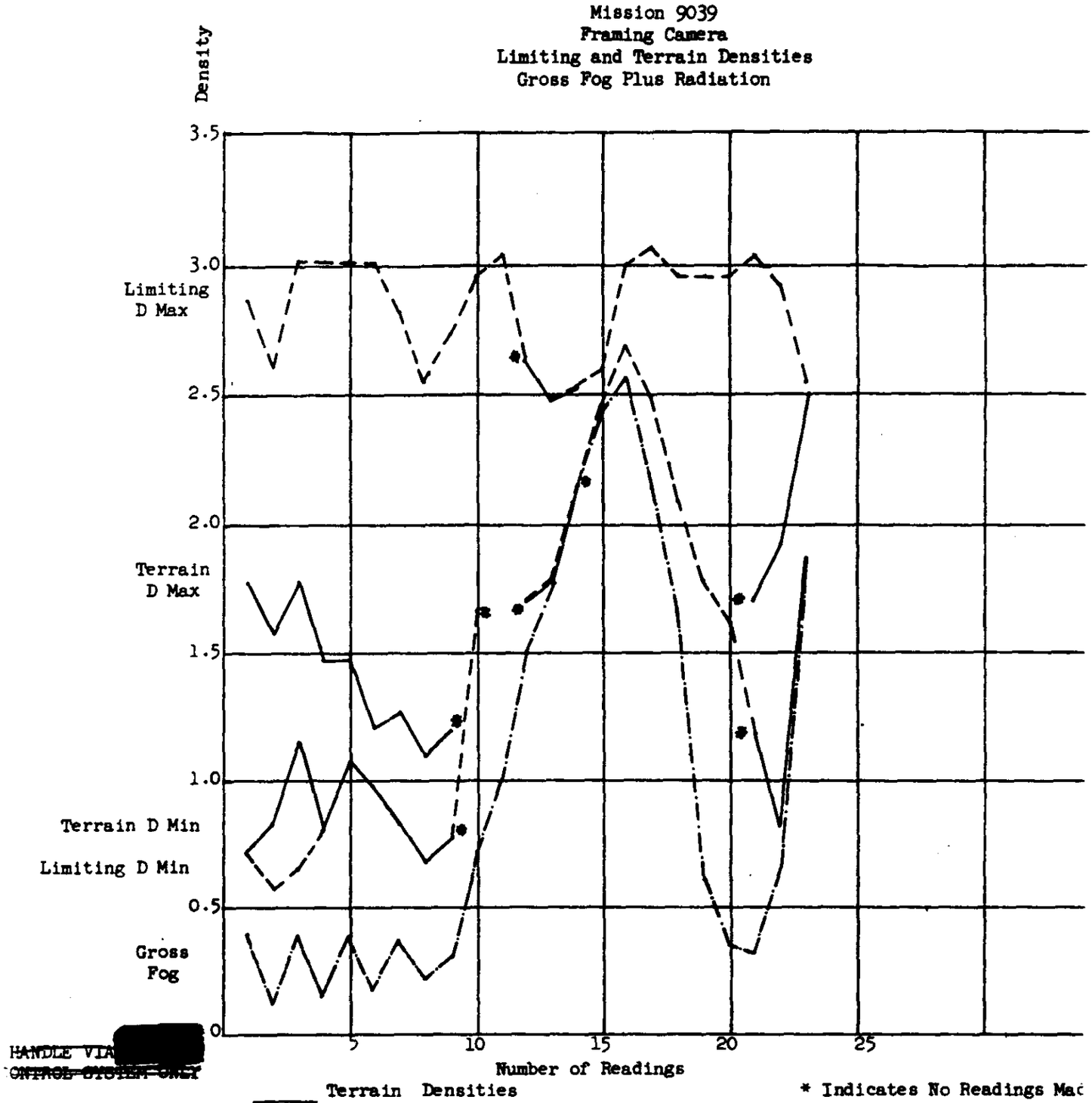
Mission 9039
Framing Camera
Limiting and Terrain Densities
Gross Fog Plus Radiation



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