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17 September 1962

PHOTOGRAPHIC EVALUATION REPORT

Mission 9037
23, 24, 25 and 26 June 1962 Z

FE No. 32-62

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HANDLE VIA [redacted]
CONTROL SYSTEM ONLY

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17 September 1962

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PART I - FORWARD CAMERA

Mission No: 9037
Camera No: 80
Slit Width: 0.200"
Film Type: J-23-7600 (SO 132)

Filter, Main: W 21
Filters, Horizon: Wratten 25
Evaluated By: [redacted]

1. Shutter Operation (Horizon Cameras): Operational.

2. Horizon Camera Exposure:
   a. Port Horizon Camera - F 8.0, 1/50 second. Imagery is overexposed.
   b. Starboard Horizon Camera - F 8.0, 1/50 second. Imagery is fuzzy and overexposed.

3. Camera Number: The camera number and binary index lamp fails to function after pass D05, frame 112.

4. Binary Operation: Functional. Binary pip numbers 7 and 11 remain faintly lighted in some instances when they should not record, causing misreadings by automatic readout devices. Double and triple binary recordings occur on the last frame before camera shut-off. For further information on binary problems, reference should be made to a report on binary clock malfunctions that will soon be released by NPIC/TID/TAB.

5. Film Metering:
   a. Metering on the supply side (port horizon camera) averages 0.23", except on the last frame of the mission, where it measures 2.3".
   b. Metering on the take-up side (starboard horizon camera) averages 0.15", except on the last frame of the mission, where it measures 3.5".

6. Film Tracking: Normal.

7. Timing Pulses: Functional and readable; however, the stretch pulse signifying the firing of the framing camera is erratic, functioning correctly approximately 70% of the time. The gap in the timing pulses, employed in determining an exact time reference, is always present.

8. Fiducials:
   a. Main Camera - Slightly ragged but functional.
   b. Horizon Cameras - Well defined, with little or no flare.

9. Light Leaks: Miscellaneous light leaks, usually occurring on the last few frames of every pass, fogs portions of approximately 85 frames. Small bar-shaped light leaks occur intermittently on the first and last frames of some passes.

10. Static Electricity: Environmental tests performed by the camera manufacturers indicate that fog patterns, usually attributed to possible light leaks occurring on frame 3 of most passes in previous missions, may be caused by a corona type static discharge within the camera. A fog patch of this type occurs on frame 3 of every pass after D08 in this mission. Edge static is present on the leading edge of pass D08, frame 66; pass A31, frames 6, 7, 18, 19, 21, 22, 26, 48, 49; pass A32, frames 6, 10, 20. Edge static occurs on the trailing edge of pass D06, frames 31-60; pass A49, frame 49; pass D49, frame 54. Small possible static marks are present intermittently between the starboard horizon camera format and the main format.

11. Pinholes: Few. 32 frames throughout the mission have a few scattered pinholes.

12. Abrasions and Scratches: Small scratches occur on 29 frames scattered throughout the mission. Examples: pass A03, frames 69, 76; pass D09, frames 1, 19, 81; pass D49, frames 1, 22, 24, 45. Heavy rail scratches are present on both leading and trailing edges of the film.

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13. Tearing: No tearing is present, however a manufacturing splice occurs on pass A04, frame 53. Transparent splices occur on pass D05, between frames 78 and 79; pass D08, between frames 51 and 52; pass D47, between frames 16 and 17.

14. Water Marks: Very few. Pass A15, frame 9 in an example of the type of water spots present.

15. Pressure Streaks: Small shiny emulsion rubs occur intermittently throughout the film.

16. Processing Streaks: Plus and minus density streaks, possibly occurring during processing, are present on approximately 50 frames. Examples: pass D07, frames 149, 150; pass D37, frames 131-139, 146-149, 162-178.

17. Blistering and Crimping: 27 small blisters are scattered throughout the film. Crimping occurs on approximately twenty scattered frames.

18. Contrast: Medium 80%, low 20%.

19. Apparent Resolution: Good. Acuity appears better than that of mission 9035 but does not achieve the quality observed in mission 9032. Very little difference can be seen between the forward and aft cameras of this mission.

20. Apparent Granularity: Fine.

21. Photo Quality:
    a. Main Camera - Good. Degradation is due to light leaks, possible static problems, scratches and miscellaneous minor streaks and spots.
    b. Horizon Cameras - Fair. Both horizon camera images are overexposed with the starboard horizon image noticeably fuzzy.

22. Camera Operation:
    a. Main Camera - Good. The only apparent degradations are due to a possible corona static effect noticeable on the third frame of passes after D08, and the loss of the camera number and binary index after pass D05, frame 112.
    b. Horizon Cameras - Fair. Both horizon cameras are overexposed and the starboard imagery is fuzzy.

23. Suitability for PI: Good. The only major degrading factor is atmospheric conditions.

Remarks:

1. Plus density streaking is evident on several passes emanating from dense imagery, such as clouds, with streaking in the direction of film supply.

2. The end-of-pass marker was double exposed on the majority of passes, usually associated with a double exposure of the binary readout.

3. Small bits of emulsion have been pulled or lifted from approximately 75 frames scattered through the film.

4. Foreign matter, usually consisting of small bits of wax, lacquer, opaquing material from the titling and embedded dirt, occurs on approximately 125 frames scattered through the film.

5. Skiving and skiving marks are intermittent and of minor consequence.

6. Handling marks, fingerprints and cinch marks occur on 20 frames scattered through the film, usually on the first and last frames of passes.

7. Titling is smeared on pass A13, frame 39.

8. Enumerated below is the amount of overlap (in percent); the amount of film transport (in inches); and the linear distance not occupied by timing pips on the last frame of all passes (measured in inches from the supply end of the main format):

	Overlap				Film Transport		Pip Termination Supply Side
Pass	Beginning Frame	Percent	End Frame	Percent	First Frame	Last Frame	
D01	8	1	Clouds		None	19.0"	7.5"
A03	20	1	102	5	16.8"	15.0"	12.5"
D03	4	2	54	9	13.0"	18.8"	12.2"
A04	Clouds		53	7	NM	16.4"	12.4"
D04	6	6	37	9	NM	20.3"	12.0"
D05	7	4	Clouds		18.2"	22.5"	12.0"
D06	Clouds		156	11	NM	22.0"	12.0"
D07	7	3	175	10	20.5"	22.0"	12.0"
D08	4	2	110	9	NM	20.5"	12.0"
D09	4	3	Water		NM	22.3"	7.4"
A13	Clouds		55	4	20.3"	13.8"	12.6"
A14	5	0	60	1	11.9"	13.5"	12.7"
A15	5	0	40	2	11.5"	NM	12.6"
D15	3	4	17	9	6.3"	21.0"	12.0"
A16	5	0	52	5	NM	15.8"	12.6"
A17	15	2	97	3	5.0"	13.2"	12.5"
A18	8	1	135	8	NM	16.0"	12.4"
D23	5	5	98	11	14.1"	20.5"	10.0"
D24	8	3	108	10	NM	21.0"	12.0"
D25	4	2	68	9	NM	20.4"	12.0"
A29	7	3	Clouds		18.4"	13.5"	13.5"
A30	10	1	85	7	6.0"	14.2"	12.5"
A31	5	0	73	3	12.1"	16.3"	12.6"
D31	5	3	17	9	NM	21.3"	11.7"
A32	6	2	48	9	NM	14.4"	12.6"
A35	7	2	101	7	17.5"	15.5"	12.2"
D36	4	1	84	10	NM	21.7"	12.0"
D37	5	3	178	12	19.7"	22.0"	11.8"
D38	Clouds		171	7	20.2"	21.5"	12.0"
D41	8	5	59	9	NM	20.7"	12.0"
A47	12	1	58	4	19.0"	14.6"	12.6"
D47	16	7	21	7	NM	21.7"	11.7"
A48	9	1	63	2	19.6"	14.8"	12.3"
A49	8	1	72	5	12.9"	14.9"	12.4"
D49	5	4	55	11	NM	20.0"	12.0"
A50	1	0	3	0	18.1"	NM	Continuous

Note: NM denotes "Not Measurable"

9. Density readings were made on every pass using the MacBeth Quantalog Densitometer Model EP 1000 with an EP 20 attachment. Absolute values read for D Max and D Min as well as Gross Fog are correlated below.

Pass	Part	Frame	D Max	D Min	Gross Fog	Sun Angle*
D01	1	10	1.50	0.22	0.08	
A03	1	15	1.89	0.37	0.11	
	2	85	1.25	0.23	0.11	
D03	1	9	1.90	0.19	0.08	
A04	1	15	2.08	0.38	0.10	
D04	1	33	1.82	0.23	0.08	
D05	1	9	1.90	0.38	0.08	
	2	134	1.78	0.30	0.10	
D06	1	16	1.88	0.45	0.08	
	2	49	2.10	0.27	0.10	
	3	146	1.84	0.27	0.09	

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Pass	Part	Frame	D Max	D Min	Gross Fog	Sun Angle*
D07	1	13	1.96	0.33	0.10	
	2	109	1.88	0.32	0.09	
	3	166	1.95	0.28	0.10	
D08	1	7	2.10	0.20	0.10	
	2	92	1.95	0.31	0.11	
D09	1	7	1.92	0.19	0.10	
	2	76	1.88	0.22	0.10	
A13	1	50	1.83	0.50	0.09	
A14	1	48	1.63	0.27	0.11	
A15	1	13	1.97	0.25	0.10	
D15	1	5	1.11	0.30	0.10	
A16	1	34	1.70	0.22	0.11	
A17	1	2	1.55	0.36	0.11	
	2	89	1.92	0.30	0.09	
A18	1	58	1.90	0.32	0.12	
	2	108	1.83	0.38	0.09	
D23	1	6	1.84	0.39	0.10	
	2	82	1.70	0.38	0.10	
D24	1	3	1.93	0.23	0.11	
	2	93	1.62	0.37	0.11	
D25	1	56	1.88	0.30	0.10	
A29	1	21	1.84	0.38	0.11	
A30	1	20	1.66	0.16	0.10	
	2	82	1.70	0.34	0.10	
A31	1	29	1.56	0.19	0.10	
D31	1	9	1.91	0.37	0.09	
A32	1	43	1.78	0.32	0.18	
A35	1	53	2.05	0.38	0.22	
	2	93	1.45	0.30	0.18	
D36	1	12	1.99	0.60	0.18	
	2	88	1.96	0.37	0.21	
D37	1	2	1.94	0.68	0.18	
	2	37	2.00	0.48	0.21	
	3	164	1.89	0.53	0.19	
D38	1	66	1.94	0.60	0.26	
	2	113	1.92	0.48	0.20	
	3	152	1.69	0.58	0.20	
D41	1	26	1.96	0.63	0.21	
A47	1	36	1.75	0.42	0.20	
D47	1	7	1.86	0.70	0.20	
A48	1	8	1.94	0.38	0.22	
A49	1	41	1.84	0.34	0.19	
D49	1	9	1.92	0.44	0.22	
A50	1	2	1.33	0.46	0.20	

* Sun angle data not published at this date. This information will be sent out in addendum to the Film Evaluation Report for Mission 9037.

Average D Max	1.82
Average D Min	0.36
Average Gross Fog	0.13
Range D Max	1.11 - 2.10
Range D Min	0.16 - 0.70
Overall Range	0.16 - 2.10
Range Gross Fog	0.08 - 0.26

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PART II - AFT CAMERA

Mission No: 9037
Camera No: 81
Slit Width: 0.200"
Film Type: J-23-7600 (SO 132)

Filter, Main: Wratten 21
Filters, Horizon: None
Evaluated By: [redacted]

1. Shutter Operation (Horizon Cameras): Operational.

2. Exposure:
   a. Port Horizon Camera - F 6.8, 1/25 second. Imagery is heavily overexposed.
   b. Starboard Horizon Camera - F 6.8, 1/25 second. Imagery is heavily over-exposed.

3. Camera Number: The camera number and binary readouts are legible and functional.

4. Binary Operation: Functional. Double and triple binary recordings occur on the last frame before camera shut-off.

5. Film Metering:
   a. Metering on the supply side (port horizon camera) averages 0.24".
   b. Metering on the take-up side (starboard horizon camera) averages 0.2".

6. Film Tracking: Normal.

7. Timing Pulses: Functional and readable.

8. Fiducials:
   a. Main Cameras - Slightly ragged but functional.
   b. Horizon Cameras - The starboard horizon camera fiducial nearest the main camera format "blossomed" throughout the film. All other fiducials were well defined with little or no flare.

9. Light Leaks: Miscellaneous light leaks, usually occurring on the last few frames of every pass, degrades portions of approximately 75 frames. Small bar-shaped light leaks occur on one of the last three frames of every pass. Thin diagonal light streaks appear on pass D01, frames 2, 20; pass A03, frame 2; pass D03, frame 2; pass A13, frame 3; pass A15, frame 39; pass D24, frame 2; pass A29, frame 3; pass A32, frame 47; pass A35, frame 2; pass D41, frame 158.

10. Static Electricity: A possible corona type static discharge fogs portions of the third frame of most passes after D08. Small fog patches with striations recur every 6.3" from pass D08 to pass D30 (with the exception of the first few frames of every pass) and intermittently thereafter, to the end of the mission. Edge static occurs intermittently on passes D24, A30, A35, D36, D41. Small possible static marks are present intermittently between the port and starboard horizon camera formats and the main format.

11. Pinholes: Few. 18 frames show scattered pinholes.

12. Abrasions and Scratches: Heavy rail scratches are present on both leading and trailing edges of the film. A camera induced scratch 1/8" in from the leading edge of the film readout pips, and approximately 5" from the supply edge of the main format recurs on every frame throughout the film. Small scratches occur on 20 scattered frames throughout. Numerous abrasions are found on pass D38, frames 1-75; pass D49, frames 25-36.

13. Tearing: No tearing is present, however a manufacturing splice occurs on pass D36, frame 97 and transparent splices occur on passes D05, D08, D36, A47.

14. Water Marks: Very few.

15. Pressure Streaks: Small shiny emulsion rubs having no specific pattern occur intermittently throughout the film.

16. Processing Streaks: Plus and minus density streaks, possibly associated with processing, occur intermittently throughout the film. Thin minus density streaks are associated with areas of thin density. Minus density spots, some comet-shaped, occur on 18 scattered frames.

17. Blistering and Crimping: 36 small blisters occur throughout the film. Small crimps appear on approximately 27 scattered frames. Edge rippling occurs on pass D06, frame 107; pass D49, frames 25-36.

18. Contrast: Medium 80%, low 20%.

19. Apparent Resolution: Good. Acuity appears better than that of mission 9035, but does not achieve the quality observed on mission 9032. Very little difference can be seen between the forward and aft cameras of this mission.

20. Apparent Granularity: Fine.

21. Photo Quality:
    a. Main Camera - Good. Degradation is due to light leaks, possible static conditions, scratches and miscellaneous minor streaks and spots.
    b. Horizon Cameras: Fair. Both horizon cameras are heavily overexposed and there is "blooming" present in one of the starboard camera fiducials.

22. Camera Operation:
    a. Main Camera - Good. The only apparent degradation would be due to the possible corona static effect that fogs portions of numerous frames.
    b. Horizon Cameras - Fair. Both horizon cameras are heavily overexposed.

23. Suitability for PI: Good. Atmospheric conditions and fogging possibly caused by corona static are the only degrading factors.

Remarks:

1. Plus density streaking is evident on several passes, emanating from dense imagery such as clouds, with streaking in the direction of film supply.

2. The end-of-pass marker was double exposed on many passes, usually associated with a double exposure of the binary readout.

3. Small bits of emulsion have been pulled or lifted from approximately 51 frames scattered throughout the film.

4. Foreign matter, usually consisting of small bits of wax, lacquer, opaquing material from titling, and embedded dirt, occurs on approximately 75 frames.

5. Skiving and skiving marks are intermittent and of minor consequence.

6. Handling marks, fingerprints and cinch marks occur on 17 frames scattered through the film, usually on the first and last frames of passes.

7. Vertical banding is present throughout pass D09.

8. Enumerated below is the amount of overlap (in percent); the amount of film transport (in inches); and the linear distance not occupied by timing pips on the last frame of all passes (measured in inches from the supply end of the main format).

Pass	Overlap Beginning Frame	Overlap Beginning Percent	Overlap End Frame	Overlap End Percent	Film Transport First Frame	Film Transport Last Frame	Pip Termination Supply Side
D01	5	NM	21	5	NM	15.25"	8.25"
A03	20	0	22	1	NM	11.75"	8.80"
D03	3	2	55	8	NM	16.50"	8.25"
A04	5	NM	53	7	NM	NM	8.50"
D04	3	5	43	9	NM	17.20"	7.80"
D05	4	1	142	16	NM	18.50"	8.00"
D06	4	4	155	13	NM	18.75"	8.00"
D07	7	1	184	16	16.20"	18.50"	8.00"
D08	4	2	112	NM	NM	17.10"	8.40"
D09	4	1	90	10	NM	17.50"	8.00"
A13	6	1	55	NM	15.50"	11.20"	8.50"
A14	5	0	60	2	9.30"	10.90"	8.60"
A15	6	1	36	3	NM	10.90"	8.50"
D15	3	1	10	NM	NM	17.80"	7.80"
A16	7	1	50	5	NM	11.50"	8.50"
A17	5	1	96	5	8.70"	12.20"	8.50"
A18	6	1	120	7	NM	13.00"	8.30"
D23	5	5	99	10	11.20"	17.40"	8.00"
D24	6	1	106	10	NM	15.20"	8.20"
D25	5	NM	68	9	NM	17.00"	7.00"
A29	5	1	35	NM	11.20"	14.80"	8.50"
A30	11	1	85	5	NM	11.50"	8.50"
A31	5	0	72	5	10.10"	11.20"	8.50"
D31	4	4	17	9	NM	18.00"	8.20"
A32	6	1	97	5	NM	11.70"	8.50"
A35	5	1	102	6	12.00"	13.30"	8.20"
D36	3	3	91	13	6.70"	18.30"	7.70"
D37	5	5	179	10	NM	18.90"	7.70"
D38	5	0	169	11	NM	18.20"	7.80"
D41	4	2	59	8	NM	17.30"	8.00"
A47	13	1	58	5	15.30"	12.10"	8.40"
D47	1	7	17	NM	NM	18.50"	7.70"
A48	8	2	63	4	NM	12.40"	8.20"
A49	9	1	72	4	10.20"	NM	8.40
D49	4	4	36	12	10.10	NM	NM

Note: NM denotes "not measurable"

9. Density readings were made on every pass using the MacBeth Quantalog Densitometer Model EP 1000 with an EP 20 attachment. Absolute values read for D Max and D Min as well as Gross Fog are correlated below.

Pass	Part	Frame	D Max	D Min	Gross Fog	Sun Angle*
D01	1	14	1.84	0.26	0.09	
A03	1	21	1.90	0.41	0.11	
	2	91	1.06	0.25	0.11	
D03	1	15	1.98	0.29	0.08	
A04	1	20	2.08	0.43	0.09	
D04	1	41	1.91	0.22	0.11	
D05	1	15	1.93	0.26	0.09	
	2	81	1.97	0.25	0.09	
	3	141	1.76	0.18	0.09	
D06	1	22	1.96	0.52	0.10	
	2	60	2.05	0.24	0.10	
	3	151	1.96	0.19	0.10	
D07	1	20	1.96	0.27	0.09	
	2	118	1.90	0.27	0.09	
	3	173	1.91	0.20	0.09	

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Pass	Part	Frame	D Max	D Min	Gross Fog	Sun Angle*
D08	1	10	2.04	0.23	0.09	
	2	98	1.93	0.22	0.09	
D09	1	12	1.90	0.18	0.09	
	2	80	1.97	0.30	0.10	
A13	1	55	1.91	0.51	0.09	
A14	1	53	1.75	0.28	0.10	
A15	1	7	1.81	0.24	0.10	
	2	32	1.73	0.21	0.09	
D15	1	11	1.04	0.27	0.09	
A16	1	40	1.83	0.21	0.10	
A17	1	7	1.41	0.23	0.10	
	2	80	1.83	0.86	0.08	
A18	1	15	1.99	0.40	0.14	
	2	88	1.74	0.16	0.09	
	3	114	1.83	0.41	0.09	
D23	1	12	1.87	0.33	0.09	
	2	78	1.80	0.50	0.10	
D24	1	2	2.00	0.48	0.11	
	2	99	1.75	0.36	0.09	
D25	1	16	1.94	0.39	0.11	
A29	1	27	1.87	0.44	0.08	
A30	1	28	1.56	0.18	0.11	
	2	79	1.86	0.55	0.08	
A31	1	33	1.72	0.16	0.10	
D31	1	16	1.92	0.24	0.11	
A32	1	44	1.92	0.30	0.12	
A35	1	48	1.84	0.23	0.10	
	2	97	1.74	0.44	0.18	
D36	1	16	1.93	0.63	0.15	
	2	95	1.89	0.31	0.19	
D37	1	7	1.96	0.75	0.21	
	2	92	1.96	0.52	0.26	
	3	168	1.84	0.38	0.23	
D38	1	71	2.08	0.64	0.28	
	2	120	1.95	0.53	0.23	
	3	159	1.65	0.61	0.21	
D41	1	32	2.02	0.68	0.22	
A47	1	41	1.66	0.48	0.20	
D47	1	12	1.92	0.56	0.21	
A48	1	14	2.04	0.38	0.23	
A49	1	47	1.89	0.41	0.19	
D49	1	15	1.90	0.50	0.21	
A50			No Take			

* Sun angle data not published at this date. This information will be sent out in addendum to the Film Evaluation Report for Mission 9037.

Average D Max	1.85
Average D Min	0.37
Average Gross Fog	0.13
Range D Max	1.04 - 2.08
Range D Min	0.16 - 0.75
Overall Range	0.16 - 2.08
Range Gross Fog	0.08 - 0.28

HANDLE VIA [redacted]
CONTROL SYSTEM ONLY

PART III - FRAMING CAMERA

Mission No: 9037
Camera No: 88
Camera Setting: F/6.3, 1/250 Second (Average)

Filter: Wratten 21
Film Type: J-22
Evaluated By: [redacted]

1. Shutter Operation: Shutter functions properly to pass D07, frame 13. A possible total shutter malfunction then occurs, and no imagery can be discerned for the rest of the mission.

2. Exposure: All frames indicate good exposure.

3. Camera Number: Good.

4. Film Metering: Slightly erratic metering occurs, varying from 0.16 to 0.30 inches.

5. Film Tracking: Good.

6. Grid: Grid lines are sharp and distinct. Foreign material adhering to the grid obscures a small portion of imagery between grid lines 8, 9 from the camera number edge, and lines 7-11 from the take-up side of the format, continuously throughout the film.

7. Flare: A "hot spot" exists near the center of frames 1, 18, 40 and 83. These frames correspond to the first or last frame of some passes.

8. Light Leaks: A thin curved double-line light leak emanating from the edge of the film occurs on frames 10, 18, 26, 32, 52, 57, 66 and 75. No apparent pattern is discernible. Edge fog is present intermittently along the edge opposite the camera number.

9. Static Electricity: Two parallel lines of static electricity 0.4" apart, the first being 0.8" from the titled edge, run continuously from preflight to the end of the mission. Intermittent static occurs randomly throughout the film.

10. Pinholes: Very few.

11. Abrasions and Scratches: Numerous base abrasions and scratches occur in a continuous fashion throughout the film, due mainly to film handling after the material left the processing site.

12. Tearing: None present.

13. Pressure Streaks: Small shiny base rubs are present scattered randomly throughout the film.

14. Contrast: Image contrast is low, absolute contrast varies from medium to high.

15. Apparent Resolution: Good.

16. Apparent Granularity: Slightly grainy.

17. Photo Quality: Fair until shutter malfunction. Degradation is due to foreign material on the grid plate, and static electricity.

18. Camera Operation: Poor. Degradation is due to shutter malfunction, static electricity and foreign matter on grid plate.

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19. Suitability for PI: Fair until shutter malfunction. Degradation is due mainly to atmospheric conditions.

20. Fingerprints, as a result of film handling after material left processing site, occurs intermittently.

21. Opaquing on the frame number 67 did not adhere properly, rendering the number difficult to read.

22. Density readings made on selected frames using the MacBeth Quantalog Densitometer Model EP 1000 with an EP 20 attachment and a 0.5 mm aperture, are recorded below.

Frame	D Max (Terrain)	D Min (Terrain)	D Max (Absolute)	D Min (Absolute)	Fog and/or Degradation
1	0.72	0.48	2.97	0.23	None
5	0.88	0.30	No Clouds		None
10	Heavy Clouds		2.50	0.49	None
15	0.70	0.25	2.75	0.22	None
20	0.90	0.53	2.96	0.35	None
25	Heavy Clouds		2.76	0.90	None
30	Heavy Clouds		2.70	0.45	None
35	Heavy Clouds		2.82	0.80	None
40	0.90	0.32	2.62	0.20	None
45	1.10	0.30	2.86	0.18	None
50	1.22	0.54	2.94	0.22	None
55	1.18	0.48	3.00	0.16	None
60	0.98	0.44	2.62	0.40	None
65	0.90	0.68	2.82	0.18	None
70	0.80	0.36	3.04	0.28	None
75	1.72	0.63	Light Clouds		None
80	0.97	0.47	2.84	0.28	None
85	0.88	0.56	2.42	0.22	None
90	Heavy Clouds		2.68	0.54	None
95	1.06	0.64	2.28	NM	None

Note: NM denotes "not measurable"

[redacted]

PART IV - VEHICLE ATTITUDE DATA

Pass	Pitch Variation		Pitch Range	Roll Variation		Roll Range	No. of Frames
	° '	° '	° '	° '	° '	° '	
D01	13 47	13 35	0 12	-0 09	-0 44	0 35	20
A03	14 06	13 23	0 43	+0 29	-0 31	1 00	102
D03	13 50	13 37	0 13	+0 21	-0 45	1 06	54
A04	13 46	13 31	0 15	-0 19	-0 48	0 29	53
D04	14 08	13 32	0 36	+0 15	-0 26	0 41	42
D05	14 17	13 10	1 07	+0 50	-0 40	1 30	145
D06	13 41	13 30	0 11	+0 25	-0 56	1 21	30
	14 03	13 03	1 00	+0 39	-0 04	0 43	67
	14 34	13 37	0 57	+0 45	-0 29	1 14	59
D07	14 09	13 43	0 26	+0 31	-0 27	0 58	184
D08	14 18	13 18	1 00	+0 25	-0 50	1 15	111
D09	14 35	13 18	1 17	+0 08	-0 59	1 07	92
A13	14 09	13 10	0 59	+0 23	-0 34	0 57	55
A14	13 49	13 12	0 37	+0 04	-0 43	0 47	61
A15	14 02	13 04	0 58	+0 47	-0 29	1 16	40
D15	14 17	13 46	0 31	-0 04	-0 09	0 05	17
A16	14 06	12 59	1 07	+0 32	-0 19	0 51	52
A17	13 53	13 13	0 40	-0 16	-1 14	0 58	28
	14 11	13 34	0 37	+1 12	-1 50	3 02	39
	14 04	13 38	0 26	+0 34	-0 38	1 12	31
A18	14 20	13 06	1 14	+0 29	-0 54	1 23	135
D23	14 18	14 04	0 14	+0 12	-0 32	0 44	55
	14 02	13 33	0 29	+1 10	-1 47	2 57	44
D24	13 45	12 46	1 59	+0 18	-0 34	0 52	109
D25	14 06	13 08	0 58	+0 05	-0 27	0 32	68
A29	13 51	13 16	0 35	+0 21	-0 17	0 38	34
A30	14 27	13 25	1 02	+0 09	-0 24	0 33	85
A31	14 33	14 09	0 24	+0 28	-0 37	1 05	41
	13 35	13 26	0 09	+0 18	-1 58	2 16	32
D31	13 48	13 22	0 26	-0 25	-0 40	0 15	17
A32	14 10	13 15	0 55	+0 38	-0 39	1 17	48
A35	14 00	13 04	0 56	+0 15	-1 07	1 22	58
	14 16	13 48	0 28	+0 24	-0 56	1 26	43
D36	14 19	13 14	1 05	+0 48	-1 01	1 49	98
D37	14 33	13 31	1 02	+0 03	-0 57	1 00	29
	14 21	13 02	1 19	+0 16	-0 17	0 33	69
	14 22	13 25	0 57	+0 30	-1 29	1 59	80
D38	14 00	13 21	0 39	+0 17	-0 31	0 48	52
	14 18	13 17	1 01	+0 27	-1 19	1 46	119
D41	13 59	12 58	1 01	+0 13	-0 12	0 25	59
A47	14 04	13 13	0 49	-0 00	-0 52	0 52	58
D47	14 02	13 44	0 18	+0 40	+0 31	0 09	17
A48	14 18	13 09	1 09	-0 10	-0 57	0 47	63
A49	14 38	13 07	1 31	-0 02	-0 45	0 43	72
D49	13 54	13 17	0 37	+0 36	-0 37	1 13	57
A50	14 10	13 35	0 25	-0 43	-0 45	0 02	03

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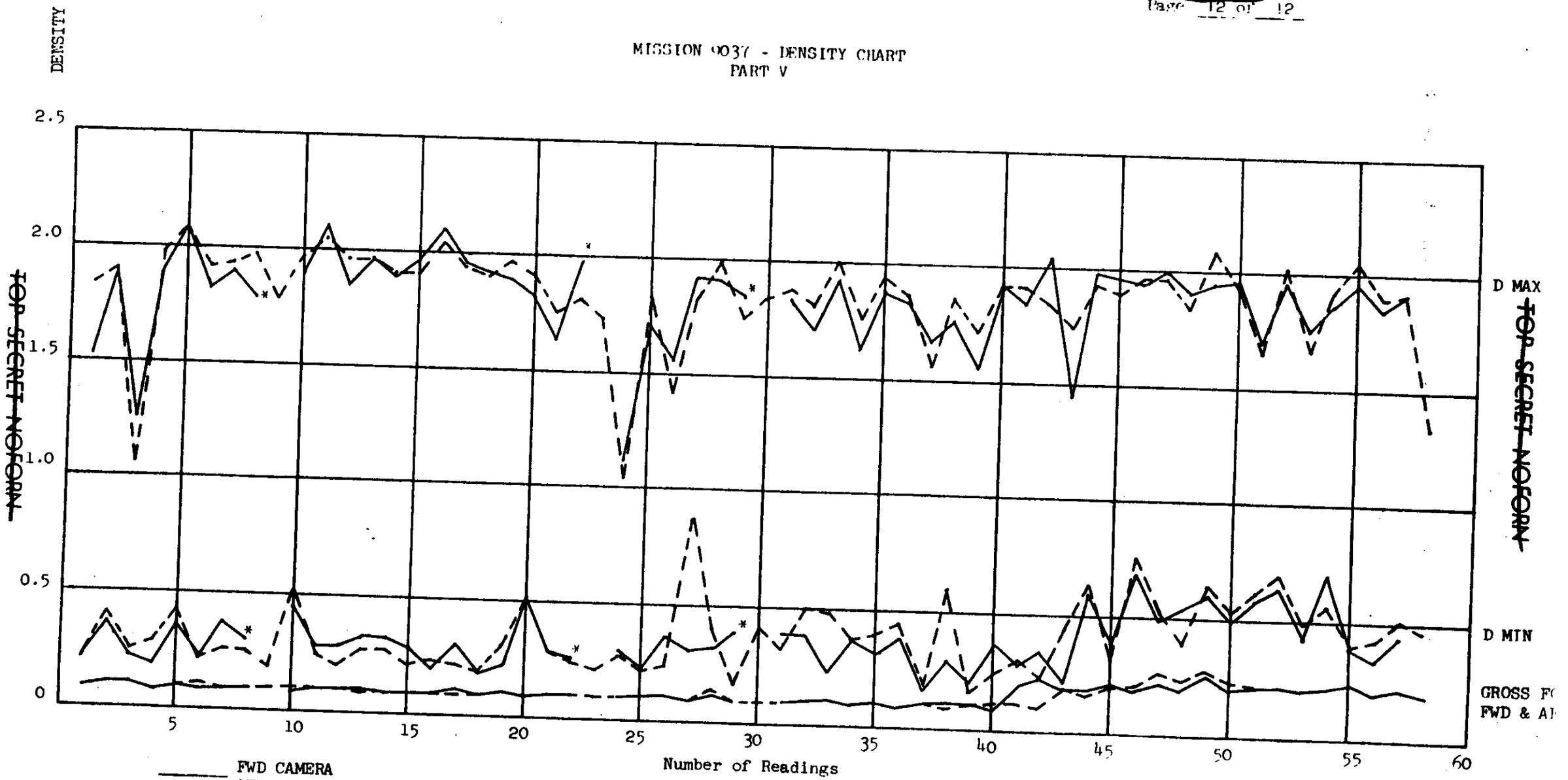
MISSION 9037 - DENSITY CHART
PART V



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