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17 Pages

March 1964

TECHNICAL PUBLICATION

PHOTOGRAPHIC EVALUATION REPORT

MISSION 8003

31 JULY - 1 AUGUST 1963

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This document contains information referring to

Project Corona/Lanyard

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NATIONAL PHOTOGRAPHIC INTERPRETATION CENTER

TECHNICAL PUBLICATION

PHOTOGRAPHIC EVALUATION REPORT
MISSION 8003
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[redacted]

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TABLE OF CONTENTS

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PART I. PANORAMIC CAMERA

Mission No: 6003
System No: L3
Camera No: 01
Vehicle No: 1167
Lens Aperture: f/5.0

Slit Width: 0.307"
Exposure: 1/200 Second
Film Type: 4404 (SO 132)
Filter: Wratten 12
Calibrated Focal Length: 66.036"
Evaluated By: [redacted]

1. Data Block: The data block record operated satisfactorily throughout the mission. A portion of the record is imaged inside the panoramic format in pass D14, frames 27, 33, 34, 36-39, 43-47; pass D15, frames 18, 26, 27, 36, 45, 46, 56-63, 66, 67, 76. The density of the record is adequate but in a few isolated instances the lamps are slightly bloomed.

2. Film Metering: Film metering is normal except on passes D14 and D15 where some of the data block binary lamps recorded inside the panoramic format.

3. Film Tracking: Film tracking is normal.

4. Fiducials: The fiducials are well defined.

5. End-of-Pass Marker: The marker operated on all passes except pass D19. The location of the mark is consistent and the density is good.

6. Light Leaks: The only degradations by light leaks are small fogged areas along the titled edge approximately 4.0" from the take-up end of the format in the second to last frame of each 16 frame burst. A reflection from the guide rail causes a plus-density area approximately 0.2" wide in the format along the untitled edge of every frame.

7. Static Electricity: Fog, possibly caused by a corona-type static, is present along the titled edge 6.5" from the take-up end of the format, in the first frame of each 16 frame burst. Additional corona-type static is noted in pass D20, frames 23-27; and pass D22, frames 56-60.

8. Pinholes: There are numerous pinholes throughout all passes. Examples: passes D01, D09, D14, D22.

9. Abrasions and Scratches: Abrasions and scratches are present in most passes. Examples: pass D01, frames 1, 2, 6, 15, 35, 37, 45; pass D06, frames 1, 14, 19; pass D07, frame 31; pass D09, frame 8; pass D14, frames 50, 88; pass D15, frames 16, 24, 32, 80; pass D18, frame 5; pass A19, frame 33; pass D21, frame 31; pass D20, frame 7. In addition, minor abrasions are consistently present throughout the film on the base and emulsion sides.

10. Tearing: No tears are present in the film.

11. Watermarks: None observed.

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12. Pressure Marks: Continuous, multiple streaks of near-abrasive degree are present on the base throughout the film.

13. Processing Streaks: Processing streaks occur in passes D00, D02, D09.

14. Blistering and Crimping: A few small blisters are present in pass D01, frames 14, 16, 19, 22; pass D06, frame 10; pass D14, frames 62, 71-73; pass D20, frame 4.

15. Contrast: 63% low, 37% medium, 0% high.

16. Apparent Resolution: Good, though not optimum, through pass D09. The resolution falls off noticeably in all subsequent passes.

17. Apparent Graininess: Fine.

18. Photo Quality: The photo quality is seriously degraded after pass D09. All imagery is slightly out of focus.

19. Camera Operation: Good.

20. System Operation: Good, with the possible exception of excessive temperature ranges. A roll capability was adequately demonstrated.

21. PI Suitability: Good through pass D09, poor thereafter.

Remarks

1. Transverse banding is noted in the following passes: D00, D03, A19.

2. The titling is smeared in pass D08, frames 61 and 78, and pass D15, frame 9.

3. Pass D03 contains a continuous plus-density streak approximately 0.2" wide.

4. Gross Fog readings indicate that the film received full processing. All density readings fall along the straight line portion of the processing curve for emulsion 4404 in the developer used.

5. The following descriptions of overlap were determined from the second and third and the last two frames of each pass.

Pass	Overlap (percent)	
	Beginning	End
D00	NM	NM
D01	NM	NM
D02	11.0	12.0
D03	5.8	5.8
D06	6.0	6.0
D07	12.0	8.0
D08	7.1	6.0
A09	13.0	10.0
D09	8.0	8.0
A11	11.0	7.0
D14	NM	8.2
D15	8.7	6.7
D16	6.0	20.0
A18	6.0	12.0
D18	10.0	7.5
A19	7.3	NM
D19	11.0	8.3
D20	NM	NM
D21	8.3	8.0
D22	NM	9.2

NOTE: NM denotes not measurable.

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

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Panoramic Camera

Reading	Pass	Frame	Terrain		Limiting		Gross Fog		
			D-Min	D-Max	D-Min	D-Max	Titled	Center	Untitled
1	D00	4	NM	NM	0.42	1.68	0.14	0.15	0.14
2	D00	12	NM	NM	0.46	2.08	0.14	0.15	0.15
3	D01	4	NM	NM	1.35	1.82	0.15	0.15	0.15
4	D01	12	0.78	1.92	0.78	1.92	0.15	0.15	0.15
5	D01	20	NM	NM	1.90	2.00	0.17	0.16	0.15
6	D01	28	NM	NM	1.60	2.05	0.17	0.18	0.15
7	D01	36	NM	NM	1.70	1.90	0.15	0.15	0.15
8	D01	44	NM	NM	1.62	1.92	0.16	0.17	0.15
9	D01	52	NM	NM	0.35	1.97	0.15	0.15	0.15
10	D01	60	NM	NM	0.50	1.70	0.15	0.15	0.15
11	D02	4	1.27	1.65	0.43	1.68	0.16	0.16	0.16
12	D02	12	0.33	1.30	0.33	1.85	0.17	0.17	0.17
13	D12	20	0.32	0.57	0.26	1.58	0.14	0.14	0.14
14	D02	28	0.27	0.58	0.27	1.50	0.14	0.14	0.14
15	D02	36	NM	NM	0.26	2.08	0.16	0.16	0.16
16	D02	44	NM	NM	0.22	1.98	0.16	0.16	0.16
17	D03	4	0.50	0.60	0.41	1.50	0.16	0.16	0.16
18	D03	12	NM	NM	0.40	1.28	0.17	0.17	0.17
19	D06	4	NM	NM	1.04	2.00	0.22	0.22	0.23
20	D06	12	NM	NM	1.55	1.91	0.17	0.17	0.17
21	D06	20	0.38	0.60	0.28	2.06	0.16	0.17	0.16
22	D06	28	0.34	0.62	0.32	2.10	0.14	0.14	0.14
23	D06	36	0.24	1.28	0.24	0.75	0.14	0.14	0.14
24	D06	44	0.25	1.16	0.25	1.65	0.16	0.16	0.17
25	D07	4	NM	NM	0.54	1.90	0.16	0.17	0.16
26	D07	12	NM	NM	0.66	1.95	0.16	0.16	0.16
27	D07	20	0.40	1.30	0.40	2.03	0.19	0.18	0.18
28	D07	28	0.63	1.33	0.50	2.12	0.20	0.18	0.18
29	D08	4	0.48	0.77	0.37	1.72	0.18	0.18	0.18
30	D08	12	0.42	0.95	0.33	1.68	0.17	0.18	0.16
31	D08	20	0.33	1.42	0.25	1.97	0.16	0.17	0.17
32	D08	28	0.32	0.65	0.30	1.97	0.16	0.17	0.16
33	D08	36	0.26	1.64	0.22	1.64	0.17	0.18	0.18
34	D08	44	0.25	1.62	0.22	1.82	0.16	0.18	0.16
35	A09	4	0.22	0.45	0.20	0.45	0.18	0.18	0.16
36	A09	12	0.21	0.45	0.20	0.45	0.19	0.18	0.18
37	D09	4	0.46	0.64	0.22	2.00	0.15	0.15	0.15
38	D09	12	0.52	0.85	0.22	2.04	0.15	0.16	0.15
39	D09	20	0.62	0.97	0.40	2.07	0.15	0.16	0.16
40	D09	28	0.58	1.06	0.35	2.04	0.15	0.16	0.15
41	D09	36	0.45	0.92	0.40	1.80	0.14	0.15	0.14
42	D09	44	0.52	0.80	0.48	1.82	0.15	0.15	0.15
43	D09	52	0.43	0.68	0.36	1.98	0.16	0.16	0.16
44	D09	60	0.40	1.14	0.32	2.02	0.16	0.16	0.16
45	A13	4	NM	NM	1.45	1.96	0.18	0.18	0.18
46	A13	12	NM	NM	1.16	1.82	0.17	0.17	0.16
47	D14	4	NM	NM	0.80	1.96	0.18	0.18	0.18
48	D14	12	NM	NM	0.60	1.96	0.18	0.17	0.18
49	D14	20	0.48	0.68	0.40	1.96	0.18	0.18	0.17
50	D14	28	0.40	0.98	0.40	2.00	0.18	0.18	0.18
51	D14	36	0.50	0.92	0.38	1.65	0.17	0.17	0.16
52	D14	44	0.50	0.59	0.46	1.68	0.17	0.17	0.17
53	D14	52	NM	NM	0.43	1.95	0.18	0.18	0.17
54	D14	60	NM	NM	0.42	2.02	0.20	0.20	0.19
55	D14	68	0.43	0.74	0.32	1.93	0.17	0.17	0.17
56	D14	76	0.38	0.75	0.32	1.64	0.19	0.18	0.18
57	D14	84	0.30	1.02	0.25	2.00	0.17	0.16	0.16
58	D14	92	0.30	0.78	0.27	1.72	0.17	0.17	0.18
59	D14	100	NM	NM	0.27	1.73	0.18	0.18	0.18
60	D14	108	0.40	1.09	0.22	1.66	0.15	0.15	0.15

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Panoramic Camera (Continued)

Reading	Pass	Frame	Terrain		Limiting		Gross Fog		
			D-Min	D-Max	D-Min	D-Max	Tilted	Center	Untilted
61	D13	116	0.28	1.50	0.28	1.92	0.16	0.16	0.16
62	D14	124	0.37	0.75	0.24	1.98	0.16	0.15	0.15
63	D14	132	0.28	0.22	0.28	0.22	0.17	0.16	0.16
64	D14	140	NM	NM	0.25	1.92	0.17	0.18	0.17
65	D15	4	0.30	1.19	0.28	1.19	0.17	0.17	0.17
66	D15	12	0.32	1.29	0.32	1.82	0.17	0.17	0.17
67	D15	20	0.60	0.98	0.52	2.06	0.17	0.17	0.17
68	D15	28	0.30	1.19	0.30	2.00	0.17	0.17	0.17
69	D15	36	NM	NM	0.70	2.06	0.18	0.18	0.18
70	D15	44	0.67	1.32	0.25	2.05	0.17	0.17	0.17
71	D15	52	0.28	1.42	0.27	1.88	0.17	0.17	0.17
72	D15	60	0.35	1.26	0.27	2.02	0.17	0.17	0.16
73	D15	68	0.28	1.18	0.27	1.85	0.17	0.17	0.17
74	D15	76	0.32	1.28	0.30	2.05	0.17	0.17	0.17
75	D16	4	NM	NM	0.24	1.51	0.17	0.17	0.17
76	D16	12	NM	NM	0.22	1.65	0.17	0.17	0.17
77	D16	20	NM	NM	0.45	1.90	0.16	0.16	0.17
78	D16	28	NM	NM	0.48	1.78	0.19	0.18	0.19
79	A18	4	0.23	0.55	0.22	1.28	0.13	0.14	0.14
80	A18	12	0.28	0.53	0.22	1.92	0.15	0.15	0.15
81	A18	20	NM	NM	0.35	1.67	0.16	0.16	0.16
82	A18	28	NM	NM	0.33	1.74	0.16	0.16	0.17
83	D18	4	NM	NM	0.71	1.84	0.17	0.17	0.16
84	D18	12	0.61	1.55	0.45	1.71	0.16	0.17	0.17
85	A19	4	0.42	0.60	0.42	0.90	0.15	0.16	0.15
86	A19	12	0.38	0.54	0.38	0.54	0.15	0.15	0.15
87	A19	20	0.30	0.62	0.30	0.62	0.14	0.14	0.14
88	A19	28	0.28	0.56	0.28	0.56	0.14	0.15	0.15
89	A19	36	NM	NM	0.68	1.98	0.16	0.16	0.17
90	A19	44	NM	NM	0.78	1.70	0.17	0.16	0.16
91	D19	4	0.60	1.35	0.51	1.88	0.17	0.17	0.17
92	D19	12	0.74	1.30	0.58	1.30	0.17	0.17	0.17
93	D20	4	NM	NM	1.40	1.88	0.20	0.20	0.21
94	D20	12	NM	NM	0.65	1.85	0.17	0.17	0.17
95	D20	20	0.30	0.50	0.26	1.65	0.17	0.17	0.17
96	D20	28	0.30	0.43	0.24	1.74	0.15	0.16	0.15
97	D21	4	0.93	1.48	0.51	1.92	0.24	0.22	0.22
98	D21	12	1.32	1.60	1.08	1.96	0.16	0.16	0.16
99	D21	20	NM	NM	0.64	0.92	0.17	0.17	0.17
100	D21	28	NM	NM	0.60	1.75	0.17	0.17	0.17
101	D21	36	0.40	1.04	0.30	1.94	0.14	0.14	0.15
102	D21	44	0.42	0.97	0.30	2.04	0.17	0.18	0.17
103	D22	4	NM	NM	0.52	1.56	0.17	0.17	0.17
104	D22	12	0.82	1.71	0.40	1.85	0.17	0.17	0.16
105	D22	20	NM	NM	1.15	1.92	0.18	0.18	0.17
106	D22	28	NM	NM	1.10	1.92	0.17	0.17	0.17
107	D22	36	0.50	1.20	0.28	1.92	0.17	0.17	0.17
108	D22	44	0.42	1.42	0.30	1.86	0.17	0.17	0.17
109	D22	52	0.30	1.20	0.22	2.02	0.17	0.17	0.17
110	D22	60	0.62	1.20	0.62	1.20	0.17	0.17	0.17

Note: NM denotes not measurable.

Terrain

D-Max Range 0.92-1.92
D-Min Range 0.21-1.32
Average D-Max 1.08
Average D-Min 0.44
Limiting Mean D-Min 0.30
Limiting Mean D-Max 1.95

Gross Fog Range 0.13-0.24
Average Gross Fog 0.17

Limiting

D-Max Range 0.92-2.13
D-Min Range 0.50-1.90
Average D-Max 1.75
Average D-Min 0.50*

*Higher than Terrain D-Min due to influence of 41 more readings which ranged between 0.50 and [redacted].

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PART II. STELLAR CAMERA

Mission No: 8003
Camera No: 4
Exposure Setting: f/1.9, 2 seconds

Filter: None
Film Type: 4400 (SO 130)
Evaluated By: [redacted]

1. Shutter Operation: The shutter was operational throughout the mission.

2. Exposure: Adequate to record stellar imagery through the seventh magnitude in the majority of exposures. Frames 1-26 are underexposed and frames 27-30, 1084-1089, 1276-1298, 1310-1323 are overexposed and accompanied by edge reflections of the reseau plate. Overexposure was caused by earth flare due to programmed vehicle roll.

3. Frame Correlation Fiducial Mark: The mark is operational but not usable for panstellar correlation as the stellar unit is used independently of the panoramic instrument.

4. Camera Number: The number is definable in frames 1-25 only. Following that, the frame correlation fiducial mark is consistently overexposed and the number is not discernible.

5. Reseau Calibration Points: The points are operational throughout the mission but are overexposed and considerably bloomed.

6. Reseau: The grid is visible in the flared areas only, where the density is sufficient to support the grid image.

7. Film Metering: The metering appears erratic following frame 345. The exposure sequences contain from one to fifteen consecutive exposures, interrupted by one, two, or three blank spaces. This is coincident with the same sequence in the index unit and may be attributed to a shutter rewind mechanism malfunction.

8. Film Tracking: The tracking is normal throughout the mission.

9. Light Leaks: Frames 1360, 1368, 1369, 1374-1377 are fogged.

10. Static Electricity: No static discharges are noted.

11. Abrasions and Scratches: Multiple, continuous scratches are present on the base and emulsion sides of the film throughout the entire take.

12. Pinholes: Pinholes are intermittent and few.

13. Water Marks: None present.

14. Processing Streaks: None present.

15. Pressure Streaks: None present.

16. Tearing: No tears occur. Transparent splices are located between frames 388/389, 459/460, 919/920, 1205/1206, 1252/1253, and 1276/1277.

17. Blistering and Crimping: None present.

18. Foreign Matter: None present.

19. Contrast: The contrast is sufficient to determine the presence of stellar images in the majority of exposures.

20. Apparent Graininess: Medium.

21. Photo Quality: The quality is rated fair only, due to the presence of flared areas within the formats.

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22. Camera Operation: Fair. The possible shutter rewind malfunction precludes assignment of a more favorable rating.

Remarks

1. Approximately 35 percent of each frame is degraded by flare.

2. Fine, linear plus-density images appear at random in a number of frames. These are tentatively identified as crystallized particles of discharged gas. Examples are found in frames 47-62, 421-429, 624-626.

3. Density readings were taken at intervals throughout the material using a Macbeth Quanta-Log Densitometer, Model EP 1000, with an ET 20 attachment and an 0.5 mm aperture. Limiting density readings for D-Max, D-Min, and Gross Fog values are correlated below.

Stellar Camera

Reading	Frame	Limiting		Gross Fog Center	Reading	Frame	Limiting		Gross Fog Center
		D-Min	D-Max				D-Min	D-Max	
1	26	0.09	NM	0.09	26	210	0.14	2.06	0.10
2	27	NM	3.58	0.09	27	223	0.15	2.18	0.11
3	31	0.10	0.38	0.09	28	300	0.16	1.88	0.13
4	35	0.11	0.74	0.10	29	400	0.14	1.96	0.10
5	40	0.11	1.19	0.10	30	500	0.14	2.04	0.09
6	45	0.12	1.54	0.10	31	527	0.10	0.42	0.10
7	50	0.12	1.78	0.10	32	600	0.14	1.84	0.09
8	55	0.12	1.33	0.10	33	625	0.09	0.26	0.09
9	60	0.14	2.01	0.10	34	675	0.20	2.30	0.09
10	65	0.14	2.03	0.10	35	700	0.11	0.65	0.09
11	70	0.14	2.08	0.10	36	800	0.14	2.04	0.09
12	75	0.14	1.98	0.10	37	825	0.09	0.74	0.09
13	80	0.14	1.91	0.10	38	900	0.13	1.84	0.09
14	85	0.14	2.04	0.10	39	949	0.09	0.34	0.09
15	89	0.14	1.96	0.10	40	975	0.14	2.12	0.09
16	90	0.10	0.48	0.10	41	1050	0.09	0.84	0.09
17	100	0.11	1.20	0.09	42	1084	NM	3.57	0.10
18	110	0.14	1.79	0.09	43	1100	0.11	1.64	0.09
19	120	0.14	2.02	0.10	44	1175	0.20	2.10	0.10
20	130	0.14	2.03	0.09	45	1225	0.28	2.60	0.12
21	140	0.14	1.92	0.09	46	1276	0.34	3.18	0.10
22	151	0.12	1.69	0.10	47	1277	NM	3.54	0.10
23	152	0.10	0.49	0.10	48	1298	NM	3.62	0.11
24	170	0.13	1.83	0.10	49	1310	NM	3.64	0.11
25	190	0.14	2.10	0.11	50	1373	0.18	2.10	0.11

Note: NM denotes not measurable.

Gross Fog Range 0.09-0.13
Average Gross Fog 0.10

Limiting

D-Max Range 0.26-3.64
D-Min Range 0.09-0.34
Average D-Max 1.84
Average D-Min 0.14

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PART III. INDEX CAMERA

Mission No: 8003
Camera No: S-3
Exposure Setting: f/45, 1/500 second

Filter: Wratten 21
Film Type: 4400 (SO 130)
Evaluated By: [redacted]

The index camera shutter malfunctioned (failed to open) throughout 99 percent of the mission. Consequently, Part III is presented in narrative form rather than in the customary itemized sequence.

The shutter performed properly in frames 27-29 only. Exposure and resolution appear adequate in those frames. Frames 674, 691, 907, 943, 949, 1009, 1070, 1142, 1232, 1299, and 1377 (last frame) received sufficient exposure to achieve full format but contain no visible terrestrial imagery. The reseau is detectable in those frames where the density is sufficient to support the grid image. A plus-density area is present in the supply corner on the binary edge. These exposed frames also contain a possible corona-type static discharge near the frame centers, and abrasions parallel to the titled edge. The remaining frames are blank except for intermittent, faint, plus-density traces in the supply corners on the binary edge.

The metering appears erratic after frame 345 possibly due to a shutter rewind malfunction. Corona discharges are present throughout frames 1150-1177. The binary lamps are present throughout but grossly overexposed and bloomed. "Ghost" images of the lamps appear in all frames. The index take was titled consecutively from 1 to 1377, regardless of the prevailing lack of imagery. No density readings were taken as only three frames had terrestrial imagery.

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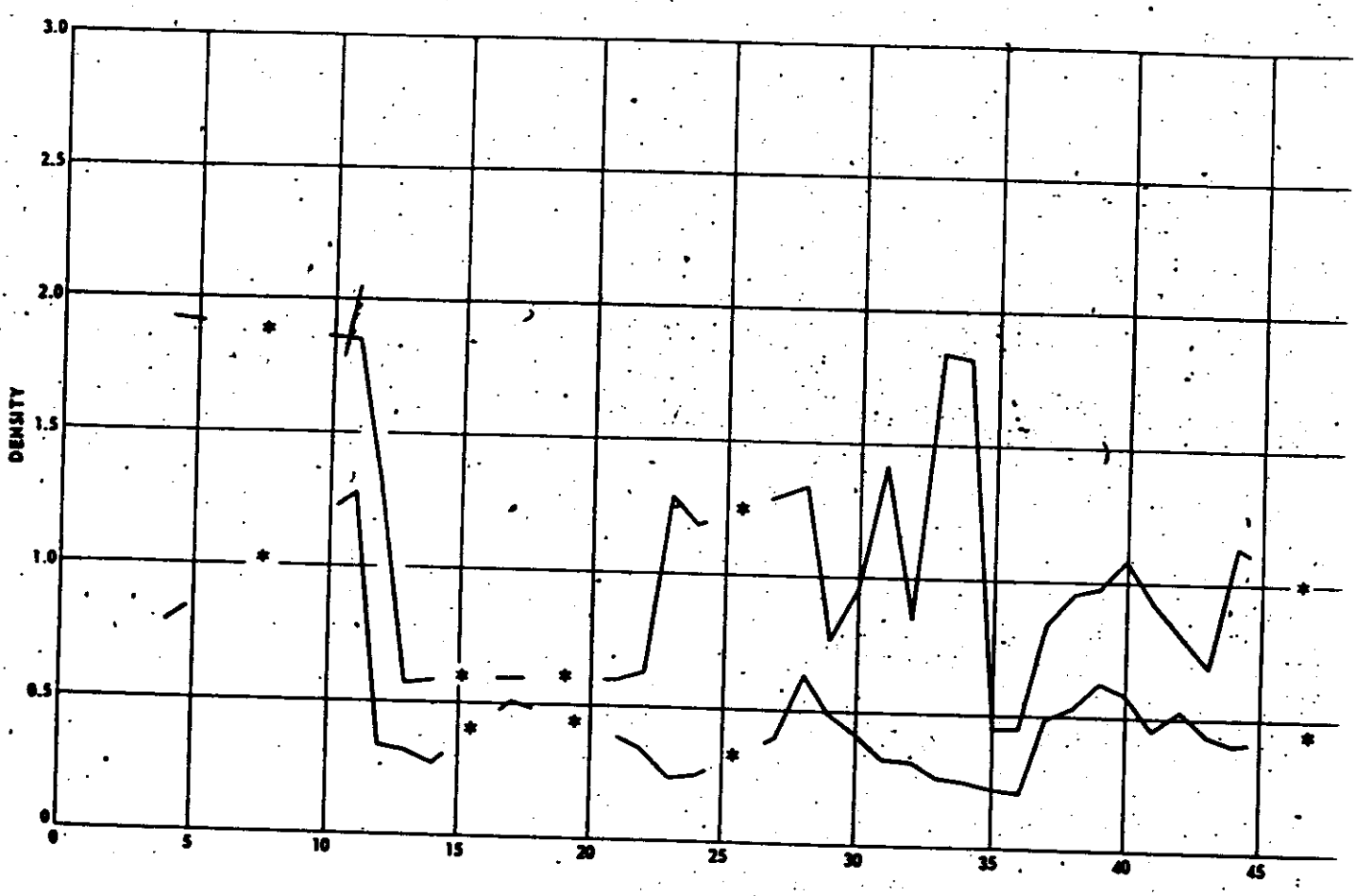
DENSITY
3.0
2.5
2.0
1.5
1.0
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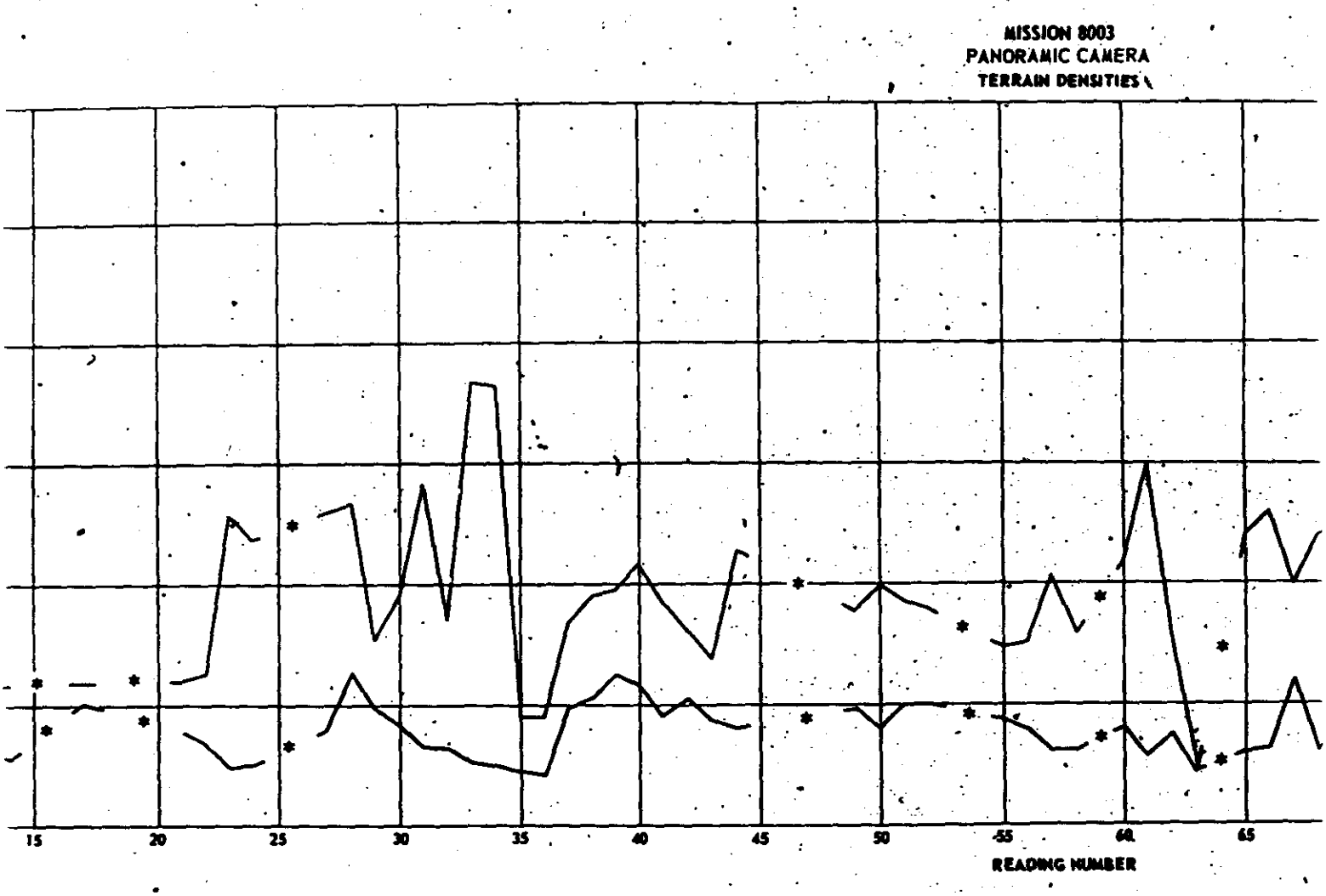
MISSION 8003
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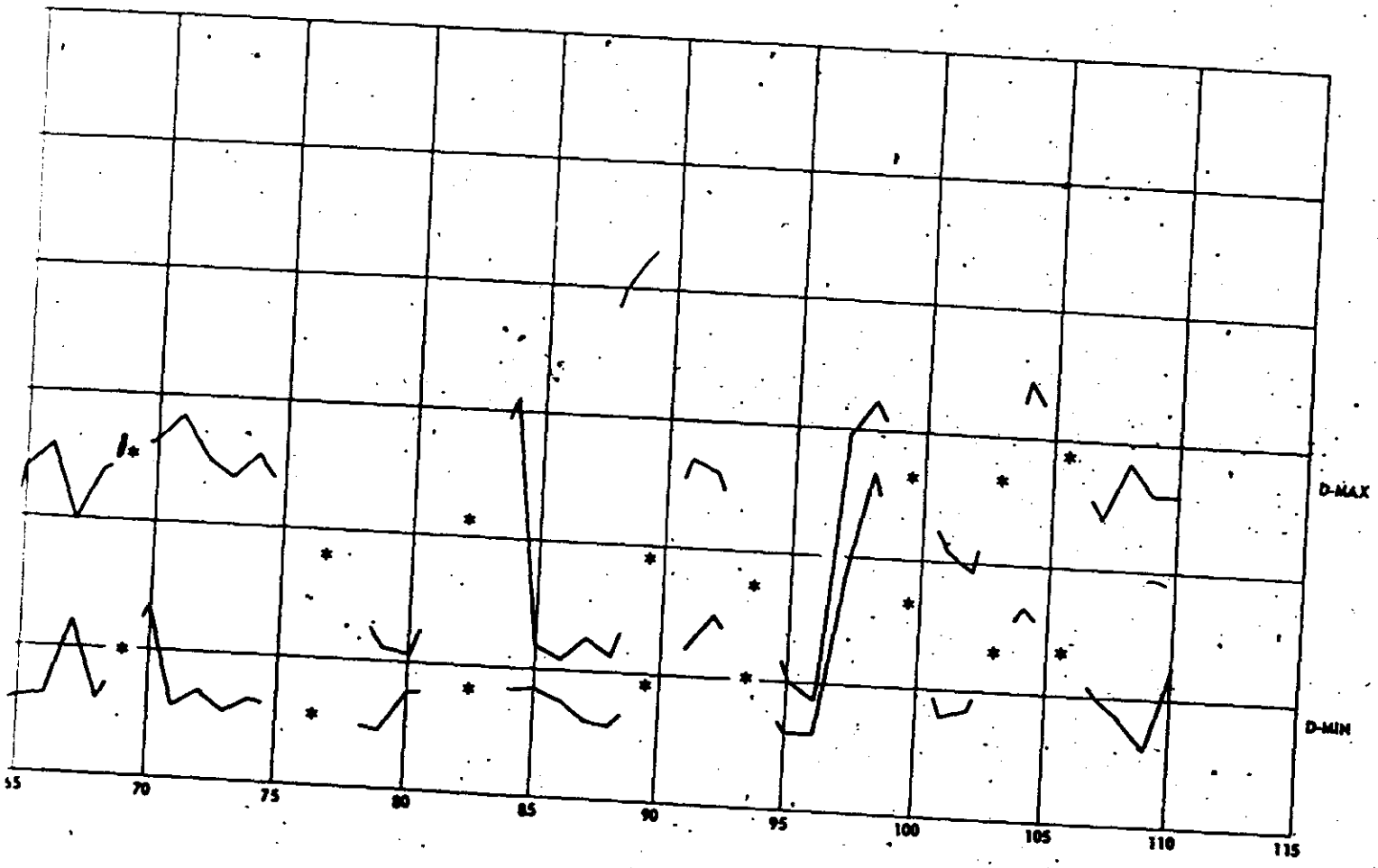

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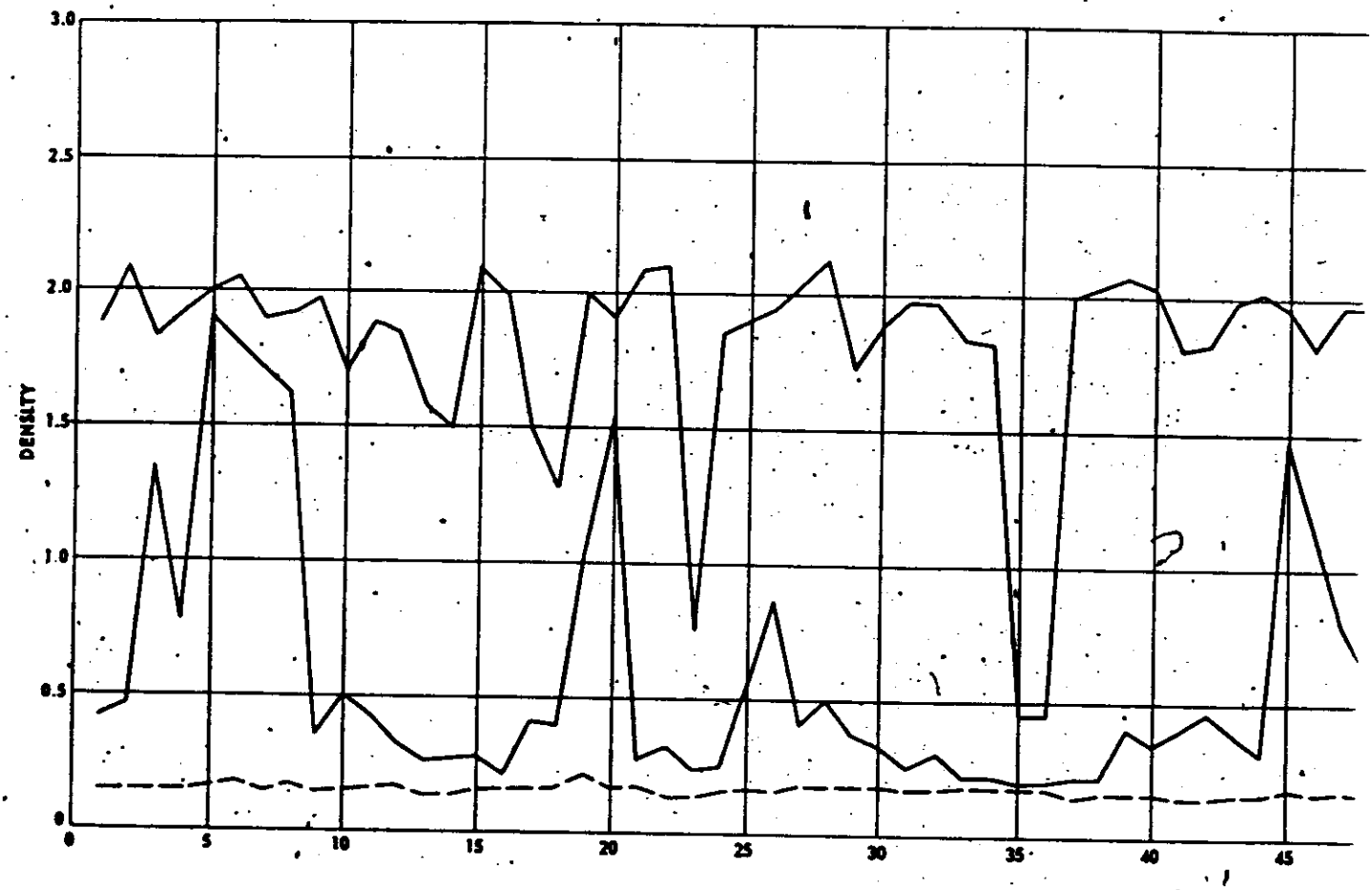

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Control System Only

MISSION 8003
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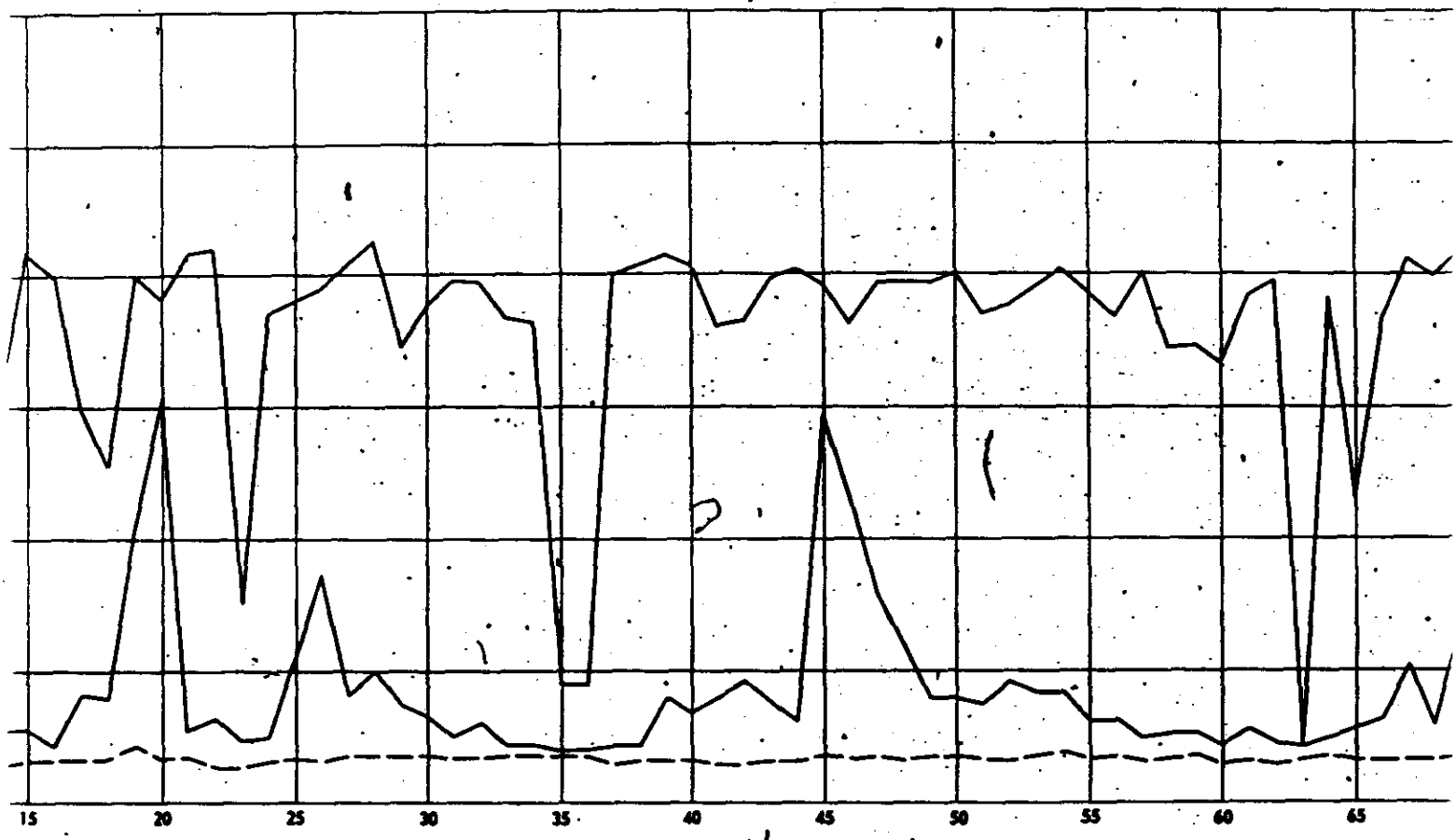

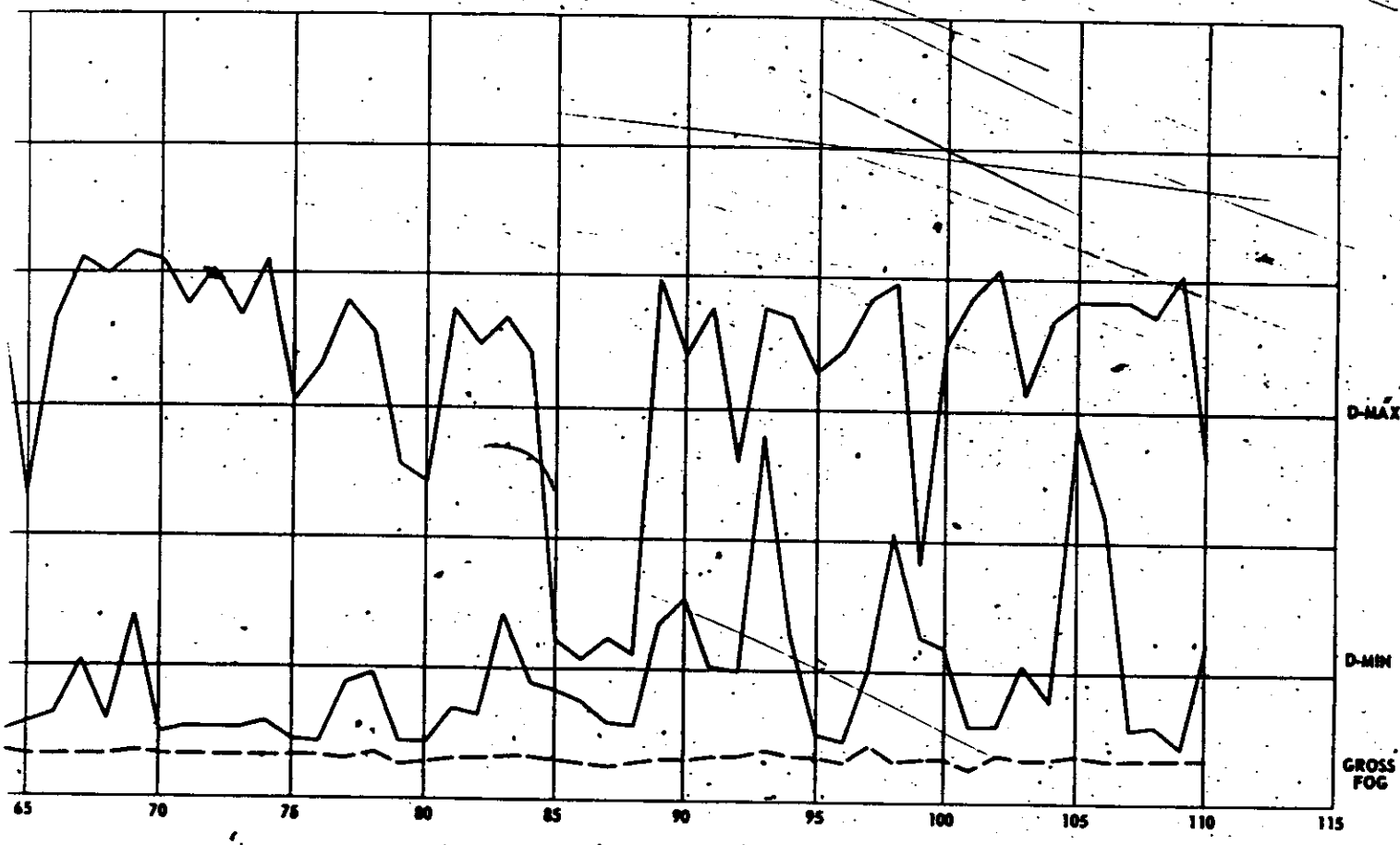

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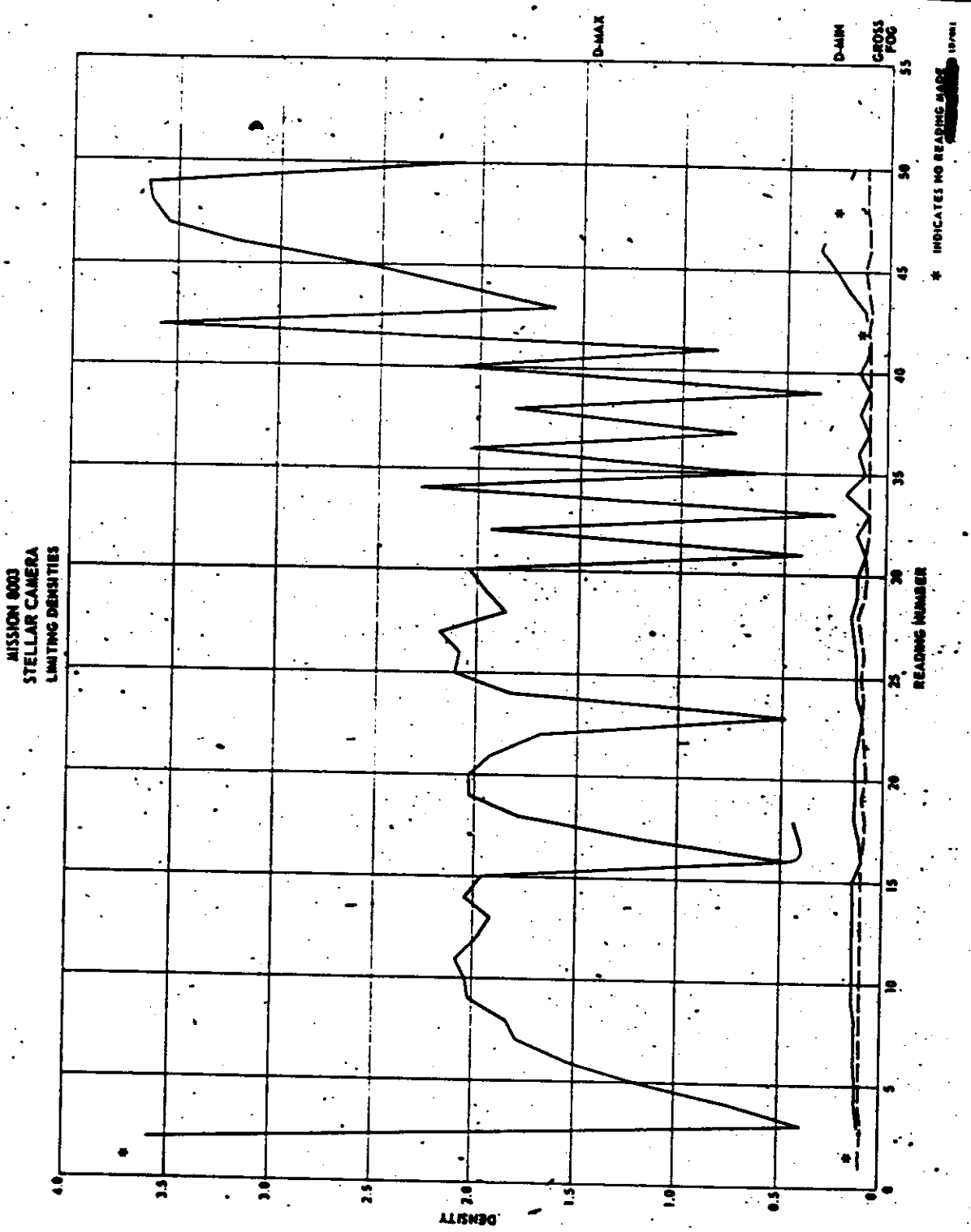

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