CORONA J

PERFORMANCE EVALUATION REPORT

MISSION 1019-1 AND 1019-2

FTV 1614; J-04

September 19, 1966

APPROVED: [redacted]
Manager
Advanced Projects

APPROVED: [redacted]
Manager
Program [redacted]

FOREWORD

This report details the performance of the payload system during the operational phase of the Program [redacted] Flight Test Vehicle 1614.

Lockheed Missiles and Space Company has the responsibility for evaluating payload performance under the Level-of-Effort and "J" System Contracts.

This document is the final paylead test and performance evaluation report for Missions 1019-1 and 1019-2 which was launched on 23 April 1965.

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INTRODUCTION

This report presents the final performance evaluation of Missions 1019-1 and 1019-2 of the Corona Program. The purpose of this report is to define the performance characteristics of the J-04 payload system and identify the source of in-flight anomalies.

The performance evaluation was jointly conducted by representatives of Lockheed Missiles and Space Company (LMSC) and ITEK at the facilities of NPIC and AFSPPF. The off-line evaluation using Corona engineering photography acquired over the United States was performed at the individual contractors plants.

The quantitative data used for this report is obtained from government organizations. The diffuse density data and MTF/AIM resolution are produced by AFSPPF. The vehicle attitude error values, frame correlation times are made at NPIC who also supply the Processing Summary and MTF/AIM resolution reports published by [redacted]

Computer programs developed by A/P are utilized to calculate and plot the frequency distribution of the various contributors to image smear to permit analysis and correlation of the conditions of photography to the information content and quality of the acquired pictures. Computer analysis of the exposure, processing and illumination data provides the necessary data to analyze the exposure criteria selected for the mission.

[redacted]

SECTION 1

SYSTEM PERFORMANCE

A. MISSION OBJECTIVES

The payload section of Mission 1019, placed into orbit by Flight Test Vehicle #1614 and SLV-2A booster #437, consisted of two panoramic cameras, two Stellar-Index cameras, two Mark 5A recovery capsules and a space structure to enclose the cameras and provide mounting surfaces for all equipments. Figure 1-1 presents an inboard profile on the J-04 payload system. This Corona "J" system is designed to acquire search and reconnaissance photography of selected areas of the earth from orbital altitudes. The mission consisted of a 5 day and a 4 day photographic operation with no deactivate/reactivate.

B. MISSION DESCRIPTION

The payload was launched from Vandenberg Air Force Base (VAFB) at 2144:57 Z (1444:57 PDT) on 29 April 1965. Ascent and injection were normal and the achieved orbit within nominal tolerances. Tracking and command support was effected by the Air Force Satellite Control Facility consisting of tracking and command stations at [redacted] under central control of the Satellite Test Center at Sunnyvale, California. Mission 1019-1 consisted of five days operation and was completed by air recovery on 4 May 1965. Mission 1019-2 followed immediately, with no deactivate, and consisted of four days operation terminating with an unsuccessful recovery attempt on 8 May 1965.

The comparison of the planned and actual orbit parameters is tabulated as follows:

ORBITAL PARAMETERS

Parameter	Predicted	Orbit 1 Actuals
Period (Min.)	91.06	91.12
Perigee (N.M.)	99.98	99.08
Apogee (N.M.)	255.05	259.73
Inclination (Deg.)	85.00	85.03
Perigee Latitude (Deg. N.)	21.72	27.14
Eccentricity	0.02145	0.02219

[redacted]

SCHEMATIC INBOARD PROFILE - CORONA J SYSTEM

MISSION 1019

Master Camera No: 118

Slave Camera No: 119

Supply Cassette No: SC 6

Clock No: 512

Yaw Programmer No: N/A

"A" Recovery Subsystem No: 626

"A" Stellar-Index Camera No: 39/39/35

"B" Recovery Subsystem No: 627

"B" Stellar-Index Camera No: 19/18/19

Pressure Make-up Unit No: 1008

[redacted]

C. PANORAMIC CAMERAS

The Master and Slave panoramic cameras operated throughout both missions with no significant problems and Mission 1019-1 produced good photographic coverage. The cloud cover and atmospheric haze observed in the photography was nominal.

D. STELLAR-INDEX CAMERAS

The Mission 1019 Stellar-Index cameras operated properly throughout both missions.

E. OTHER SUB-SYSTEMS

The telemetry and command system performance was satisfactory throughout the flight with the following exceptions:

1. The film footage pot on the slave instrument take-up cassette became erratic on orbit 110 during -2 mission.
2. Three programmed stereo operations consisting of 131 cycles were missed on orbit 53 descending.
3. The instruments operated for 11 cycles when inadvertently turned on during orbit 76, [redacted] acquisition.

The clock performance was satisfactory throughout the flight. The pressure makeup system functioned properly during both missions. Gas consumption was normal.

The thermal environment for both instruments was within tolerance for the entire flight.

The -1 SRV unit was air recovered successfully. The impact point was within tolerance.

The -2 SRV unit was not recovered. Restarting of the recovery timer caused the retro events to occur with the capsule in the wrong attitude. The retro rocket imposed a velocity component on the capsule in the direction of flight causing it to continue in a changed orbit.

F. CONCLUSIONS

Mission 1019-1 achieved the objective of acquiring high quality search and reconnaissance photography from orbital altitudes.

[redacted]

SECTION 2

PRE-FLIGHT SYSTEMS TEST

A. ENVIRONMENTAL TESTING

1. Test Objective

As a standard procedure, the J payload systems are subject to thermal/altitude environmental testing which simulates orbital environment. One of the purposes of this test is to demonstrate the system susceptability to Corona discharge. Such discharge fogs the film thus degrading the operational photography.

2. Test Summary

The environmental test for the J-04 payload system was conducted in the TASC chamber at Sunnyvale from 15 December to 20 December 1964. The test consisted of three days of operation in the "A" mode, a one day soak period and two days of operation in the "B" mode.

The panoramic camera operation was satisfactory throughout the test. Both instruments ran to 2.5% fast in the "A" mission and to 2.0% slow in the "B" mission. The "A" stellar index operated properly throughout the "A" mission. The "B" stellar index failed to meter from orbit 8 to the end of the test.

Both the "A" and "B" recovery sequences operated properly with the exception of tape recorder channel #1. This channel read out-of-band high during the cut and wrap sequence. Both instruments stowed properly and transfer to the "B" mode was normal.

This payload system does not have the provisions for deactivation. The instruments were operated for 30 seconds at the bottom of Ramp 8, Amplitude 2 and the stow position was attained.

The clock performance was satisfactory.

3. Panoramic Camera Performance

The panoramic instrument S/N 118 (Master) performance was satisfactory throughout the environmental test. The cycle rate predictability errors varied from 2.5% fast to 1.5% slow. The instrument cycle rates were an average of 1.5% fast throughout the "A" mission where the simulated "β" angle was 53°. In the "B" mission the instrument cycle rates were an average of 1% slow where the simulated "β" angle was 0°.

The panoramic instrument S/N 119 (Slave) performance was satisfactory through orbit 15 of the "B" mission. Fail-safe occurred just prior to the end of a stereo instrument operation. Inspection revealed that the instrument had depleted the payload supply. Cycle rates for the slave panoramic instrument varied from 1% fast to 0.7% slow for the "A" mission and 0.5% fast to 2.0% slow in the "B" mission. The average deviation was 0.7% fast in the "A" mission and 1.4% slow in the "B" mission.

Tables 2-1, 2-2, 2-3, and 2-4 are a tabulation of cycle rate comparison made during the entire environmental test.

Evaluation of the test film showed that both cameras produced minor start-up Corona marking which was well within the acceptance criteria. The J-04 system was recommended for flight.

4. Stellar-Index Camera Performance

The "A" stellar index S/N D/39 operation was acceptable throughout the environmental test.

The "B" stellar index S/N D/19 failed to meter once in orbit 7 and failed completely in orbit 8. The failure was caused by a faulty take-up clutch. This take-up unit was replaced with a flight certified unit and faulty unit was returned to ITEK for repair.

5. Instrument Performance

The instrumentation system performed satisfactory throughout the test.

6. Temperature Environment

Two temperature sensor self heating calibrations were conducted. One in the "A" mode and one in the "B" mode. Results of the "A" mode calibration is included as Table 2-5. The "B" mode test was invalidated because the start of the test was improperly recorded.

The simulated temperature conditions were for a "S" angle of 53° during the "A" mission and a "S" angle of 0° for the "B" mission.

The following is a tabulation of the average instrument temperatures recorded at various times during the test.

AVERAGE INSTRUMENT-TEMPERATURES

A Mode	Orbit 1	Orbit 13
Master Instrument	65	73
Slave Instrument	69	81

B Mode	Orbit 5	Orbit 15
Master Instrument	67	58
Slave Instrument	70	61

7. Pressure Make-up System Performance

The pressure make-up system produced an internal pressure that varied from 15 microns to 45 microns. The internal pressure was stable once a pressure level was reached. The alphatron pressure gauge wiring in the TASC chamber was found to be defective. The pressure make-up system supply pressure depletion rate was 9.8 PSIA per minute of instrument operation. This rate is slightly higher than normal. The pressure regulator was found to have a high flow rate and was changed. The pressure depletion is graphically illustrated in Figure 2-1.

B. RESOLUTION TEST

The dynamic resolution test of the J-04 payload system was performed at the A/P facility on 8 January 1965. Each panoramic camera photographed high and low contrast resolution targets. The resulting through focus resolution data is shown in Figure 2-2 for the Master camera and in Figure 2-3 for the Slave camera.

C. LIGHT LEAK TEST

The examination of the film threaded in the J-04 system during the light leak test determined only minor fogging was present. The light leak integrity of the system was considered acceptable for flight.

D. FLIGHT LOADING CERTIFICATION

The J-04 flight readiness test was completed on 23 April 1965. Processed film exhibits from instrument 118 contained no anomolies. All data recording was present and acceptable. No density banding was evidenced. Processed film exhibits from instrument 119 contained multiple scratches and in some areas the emulsion coating was torn away from the Estar support. The multiple scratches on the emulsion side of the film proved to be from the take-up cassette retrieval operation. The torn emulsion coating defect was attributed to VAFB processing. The emulsion scratches and the torn emulsion effect present in the film exhibit from instrument 119 are attributed

to improper film handling and are considered not to represent J-04 system performance. All instrument 119 data recording was acceptable with no density banding evidenced in the test film exhibit. Processed readiness test film exhibits indicate that J-04 system is acceptable for flight.

The J-04 supply cassette was loaded with flight film on 23 April 1965. Supply cassette loading was completed without incident in 42 minutes. Cassette mate and final system operations were completed in 8 hours on 24 April 1965. J-04 system was certified for flight.

[redacted]

J-04 118/119 ENVIRONMENTAL TEST CYCLE RATES 12-15-64

REV/MODE		RAMP		T.U.R.	INST 118 ACT.	INST 118 NOM.	INST 118 DEV.	INST 119 ACT.	INST 119 NUM.	INST 119 DEV.	118/119 DIFF.
1	A	7	7	375	3.510	3.504	-0.17	3.530	3.505	-0.71	0.57
2	A	4	1	1428	2.173	2.184	0.52				
2	A	4	1	1593				2.173	2.166	-0.33	
2	A	4	1	2128	2.140	2.158	0.85	2.160	2.160	0.02	0.93
3	A	5	8	703	2.873	2.898	0.88	2.886	2.896	0.33	0.45
3	A	5	8	1548	2.430	2.442	0.51	2.440	2.437	-0.14	0.41
4	A	7	7	2275	2.546	2.570	0.92	2.550	2.565	0.57	0.16
5	A	8	2	325	5.080	5.123	0.83	5.130	5.131	0.02	0.98
5	A	8	2	0	5.410	5.523	2.04	5.470	5.533	1.13	1.11
6	A	11	1	1450	2.626	2.685	2.21	2.653	2.681	1.05	[redacted]
6	A	11	1	1980	2.270	2.300	1.31	2.285	2.293	0.33	0.66
7	A	5	8	1075	2.660	2.702	1.54	2.683	2.698	0.54	0.86
7	A	5	8	1425	2.465	2.496	1.23	2.480	2.490	0.40	0.61
8	A	7	7	1175	2.846	2.874	0.96	2.870	2.871	0.03	0.84
8	A	7	7	1600	2.533	2.563	1.16	2.550	2.558	0.30	0.67
8	A	7	7	2525	2.703	2.731	1.03	2.720	2.727	0.27	0.63
9	A	4	1	1000	2.713	2.751	1.37	2.723	2.747	0.81	0.37
9	A	4	1	1745	2.138	2.158	0.92				
9	A	4	1	2600				2.320	2.295	-1.10	
9	A	4	1	3205	3.370	3.432	1.80	3.410	3.432	0.65	1.19
10	A	11	1	875	4.420	4.483	1.40	4.475	4.489	0.31	1.24
10	A	11	1	1885	2.265	2.299	1.49	2.275	2.292	0.76	0.44

Table 2-1

[redacted]

REV/MODE		RAMP		T.U.R.	INST 118 ACT.	INST 118 NOM.	INST 118 DEV.	INST 119 ACT.	INST 119 NOM.	INST 119 DEV.	118/119 DIFF.
10	A	11	1	2975	4.330	4.440	2.47	4.380	4.446	1.48	1.15
11	A	7	7	275	3.515	3.553	1.06	3.540	3.554	0.40	0.71
11	A	7	7	2055	2.455	2.497	1.70	2.475	2.492	0.67	0.81
11	A	7	7	2370	2.566	2.622	1.36	2.600	2.617	0.64	0.54
12	A	8	2	1150	2.940	2.985	1.51	2.970	2.983	0.43	1.02
12	A	8	2	1751				2.180	2.192	0.56	
13	A	8	2	840	3.605	3.702	2.63	3.640	3.705	1.74	0.97
13	A	4	1	2625	2.345	2.342	-0.13	2.330	2.335	0.22	-0.64
14	A	11	1	1975	2.270	2.299	1.28	2.280	2.292	0.54	0.44
14	A	11	1	3075	4.840	4.896	1.14	4.890	4.904	0.28	1.03
15	A	5	8	1931	2.350	2.369	0.81	2.355	2.363	0.33	[illegible]
15	A	5	8	3095	2.840	2.867	0.93	2.853	2.864	0.37	0.46
CW	A	8	2	0	5.650	5.523	-2.30	5.710	5.533	-3.20	1.06
1	B	7	7	385	3.465	3.498	0.96	3.480	3.499	0.56	0.43
2	B	4	1	1430	2.150	2.184	1.55				
2	B	4	1	1610				2.140	2.165	1.15	
2	B	4	1	2130	2.125	2.158	1.54	2.135	2.160	1.18	0.47
3	B	5	8	730	2.860	2.885	0.85	2.870	2.882	0.41	0.35
3	B	5	8	1545	2.440	2.444	0.15	2.430	2.438	0.31	-0.41
4	B	7	7	2580	2.770	2.777	0.26	2.780	2.774	-0.23	0.36
5	B	8	2	336	5.080	5.097	0.33	5.100	5.105	0.10	0.39
5	B	8	2	1730	2.188	2.201	0.61				

Table 2-2

[redacted]

REV/MODE		RAMP		T.U.R.	INST 118 ACT.	NUM.	DEV.	INST 119 ACT.	NUM.	DEV.	118/119 DIFF.
5	B	8	2	2250				2.255	2.261	0.27	
6	B	11	1	1450	2.680	2.685	0.20	2.673	2.681	0.30	-0.26
6	B	11	1	2035	2.310	2.313	0.15	2.310	2.306	-0.15	-0.
7	B	5	8	1090	2.710	2.694	-0.82	2.726	2.690	-1.35	0.37
7	B	5	8	1450	2.512	2.484	-1.14	2.512	2.478	-1.37	-0.
8	B	7	7	1180	2.887	2.869	-0.63	2.893	2.866	-0.95	0.21
8	B	7	7	1595	2.583	2.565	-0.70	2.593	2.560	-1.29	0.39
8	B	7	7	2530	2.763	2.735	-1.02	2.766	2.731	-1.27	0.11
9	B	4	1	1015	2.733	2.725	-0.30	2.733	2.721	-0.44	-0.
9	B	4	1	1745	2.148	2.158	0.46				
9	B	4	1	2605				2.353	2.303	-2.1	[redacted]
9	B	4	1	3200	3.445	3.421	-0.70	3.465	3.422	-1.27	[redacted]
10	B	11	1	880	4.480	4.461	-0.42	4.495	4.467	-0.62	0.33
10	B	11	1	1865	2.295	2.303	0.34	2.300	2.296	-0.18	0.22
10	B	11	1	2960	4.420	4.377	-0.99	4.440	4.382	-1.32	0.45
11	B	7	7	0	3.640	3.610	-0.83	3.650	3.612	-1.06	0.27
11	B	7	7	140	3.615	3.596	-0.53	3.645	3.598	-1.32	0.83
11	B	7	7	1910	2.500	2.487	-0.54	2.505	2.481	-0.97	0.20
11	B	7	7	2280	2.596	2.572	-0.93	2.593	2.567	-1.01	-0.12
12	B	8		1850				2.183	2.189	0.25	
13	B	8	2	845	3.745	3.689	-1.51	3.755	3.692	-1.72	0.27
13	B	8	2	2740	2.350	3.060	23.20	2.375	3.058	22.33	1.06

Table 2-3

[redacted]

REV/MODE	RAMP	T.U.K.	INST 118 ACT.	INST 118 NOM.	INST 118 DEV.	INST 119 ACT.	INST 119 NOM.	INST 119 DEV.	118/119 DIFF.
14 B	11 1	1975	2.310	2.299	-0.46	2.330	2.292	-1.64	0.87
14 B	11 1	3065	4.920	4.848	-1.49	4.930	4.855	-1.54	0.20
15 B	5 8	1935	2.400	2.369	-1.30	2.413	2.363	-2.13	0.54
15 B	5 8	3115	2.913	2.877	-1.25	2.930	2.874	-1.95	0.58
16 B	8 2	1735	2.213	2.201	-0.55	2.188	2.193	0.24	-1.13

DEV. AND DIFF. ARE IN PERCENT
THE (-) SIGN INDICATES THAT THE INST IS SLOWER THAN PREDICTED OR THAT INST 1 IS SLOWER THAN INST 2

Table 2-4

[redacted]

VEHICLE 1613 PAYLOAD J-04 SELF HEATING TEST

SUMMARY OF SELF HEATING CORRECTION CURVES

39 TC2	37 TC1	31 203	33 204	36 205	28 113	50 211	
53 BAT	21 SS1	20 110	41 207	44 CA1	55 213	23 111	
	40 SS2	08 105					
	10 106	18 109					
		03 103					
		13 107					
		38 206					
		48 210					
		15 108					
		25 112					
		43 208					
		52 212					
		05 104					
		46 209					

TIME	NO. 1	NO. 2	NO. 3	NO. 4	NO. 5	NO. 6	NO. 7
0.10	-0.1	0.8	1.0	2.4	2.3	2.4	4.5
0.13	0.0	1.0	1.2	2.5	2.5	2.6	5.2
0.16	0.1	1.1	1.4	2.7	2.8	2.9	6.2
0.20	0.2	1.3	1.6	2.9	3.0	3.2	7.3
0.25	0.3	1.5	1.9	3.2	3.3	3.6	8.7
0.32	0.5	1.9	2.2	3.5	3.7	4.2	10.5
0.40	0.6	2.2	2.7	4.0	4.2	4.8	12.8
0.50	0.9	2.7	3.3	4.5	4.8	5.7	15.7
0.63	1.0	2.8	3.5	4.8	5.1	6.1	16.6
0.79	1.1	3.0	3.8	5.1	5.5	6.7	17.8
1.00	1.2	3.2	4.2	5.5	5.9	7.4	19.3
1.26	1.3	3.4	4.4	5.7	6.2	7.8	20.1
1.58	1.4	3.5	4.7	6.1	6.6	8.4	21.1
2.00	1.6	3.7	5.1	6.5	7.2	9.1	22.3
2.51	1.6	3.8	5.3	6.7	7.5	9.4	22.8
3.16	1.7	3.9	5.5	6.9	7.9	9.8	23.5
3.98	1.8	4.1	5.8	7.3	8.3	10.4	24.3
5.01	2.0	4.2	6.1	7.7	9.0	11.0	25.3
6.31	2.0	4.4	6.3	7.9	9.3	11.3	25.7
7.94	2.1	4.5	6.5	8.1	9.8	11.7	26.1
10.00	2.2	4.7	6.8	8.4	10.4	12.1	26.7
12.59	2.3	4.8	7.0	8.6	10.9	12.4	27.0
15.85	2.3	5.0	7.2	8.8	11.4	12.6	27.3
19.95	2.4	5.2	7.5	9.1	12.1	12.8	27.6
25.12	2.5	5.4	7.6	9.2	12.5	12.8	27.7
31.62	2.5	5.6	7.7	9.3	13.0	12.8	27.7
39.81	2.6	5.8	7.9	9.5	13.7	12.8	27.8
50.12	2.6	6.1	8.1	9.7	14.5	12.8	27.8
63.10	2.7	6.4	8.2	9.8	15.1	12.6	27.7
79.43	2.7	6.7	8.3	9.8	15.8	12.3	27.5
100.00	2.8	7.1	8.5	9.9	16.7	11.9	27.3

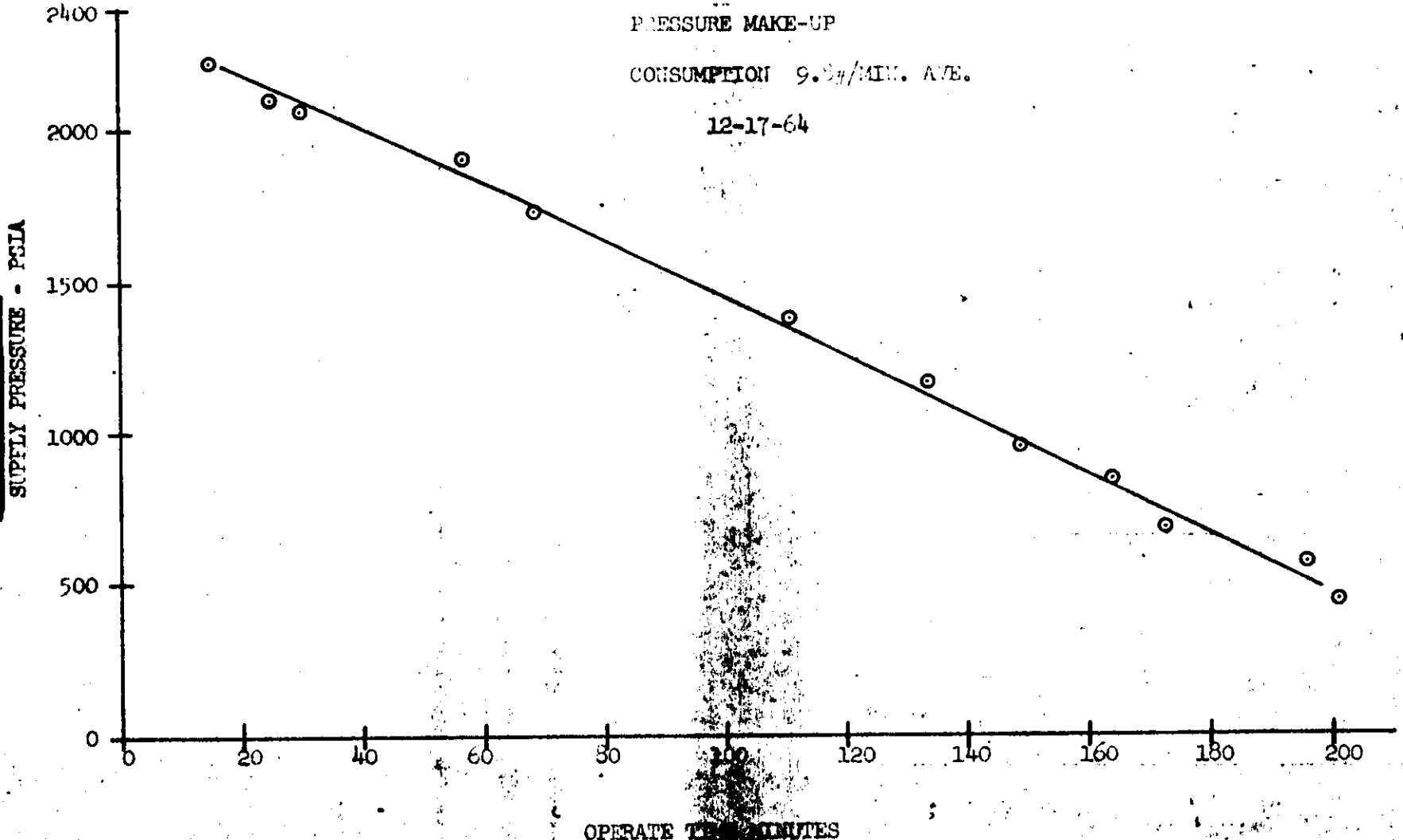
Table 2-5

J-04 TASC

PRESSURE MAKE-UP

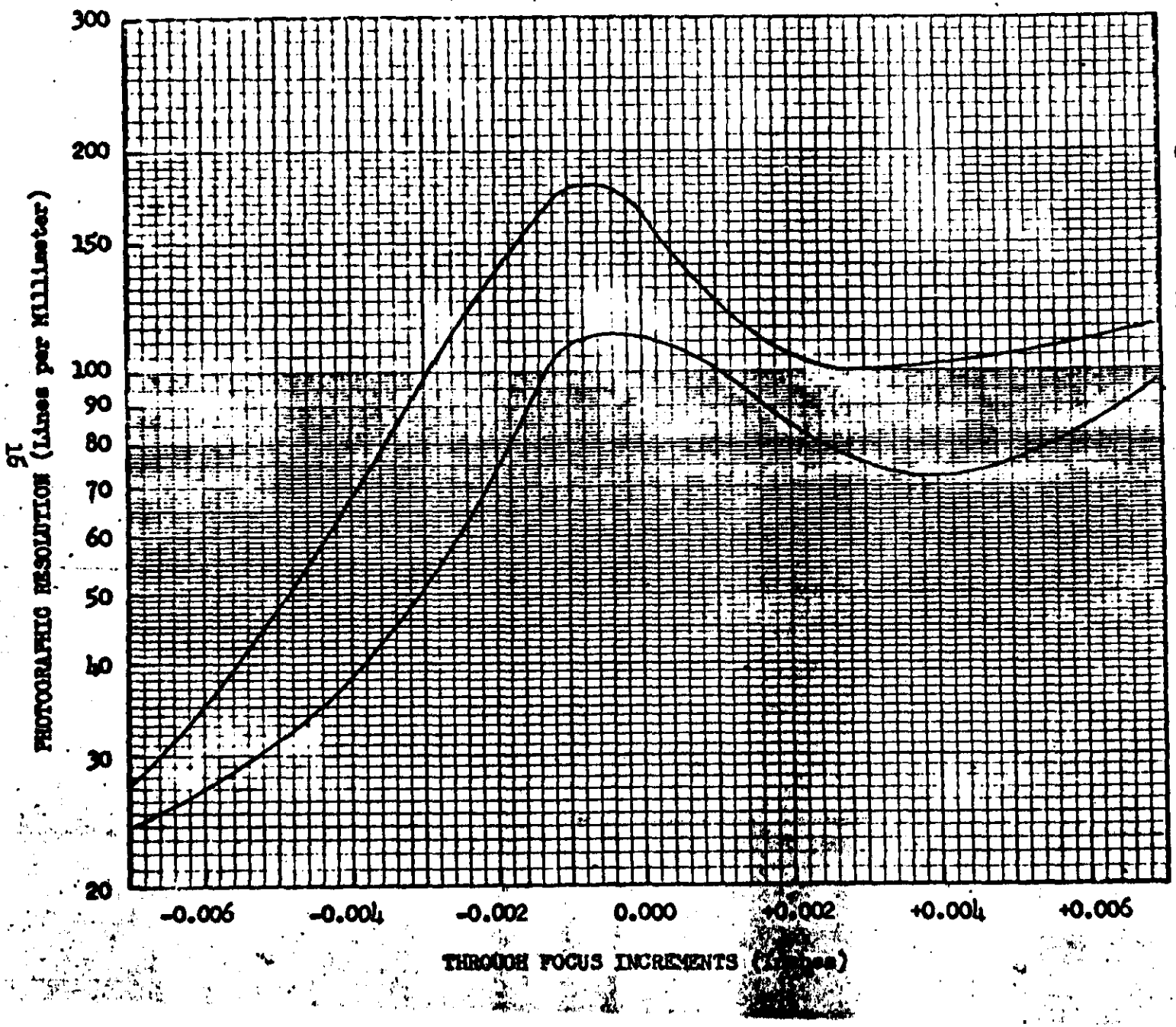
CONSUMPTION 9.[illegible]#/MIN. AVE.

12-17-64



[redacted]

PRE-FLIGHT DYNAMIC RESOLUTION



Camera No: 118

Payload No: J-04

Resolution (1/mm)

High Contrast: 179

Low Contrast: 112

Film Type: 3404

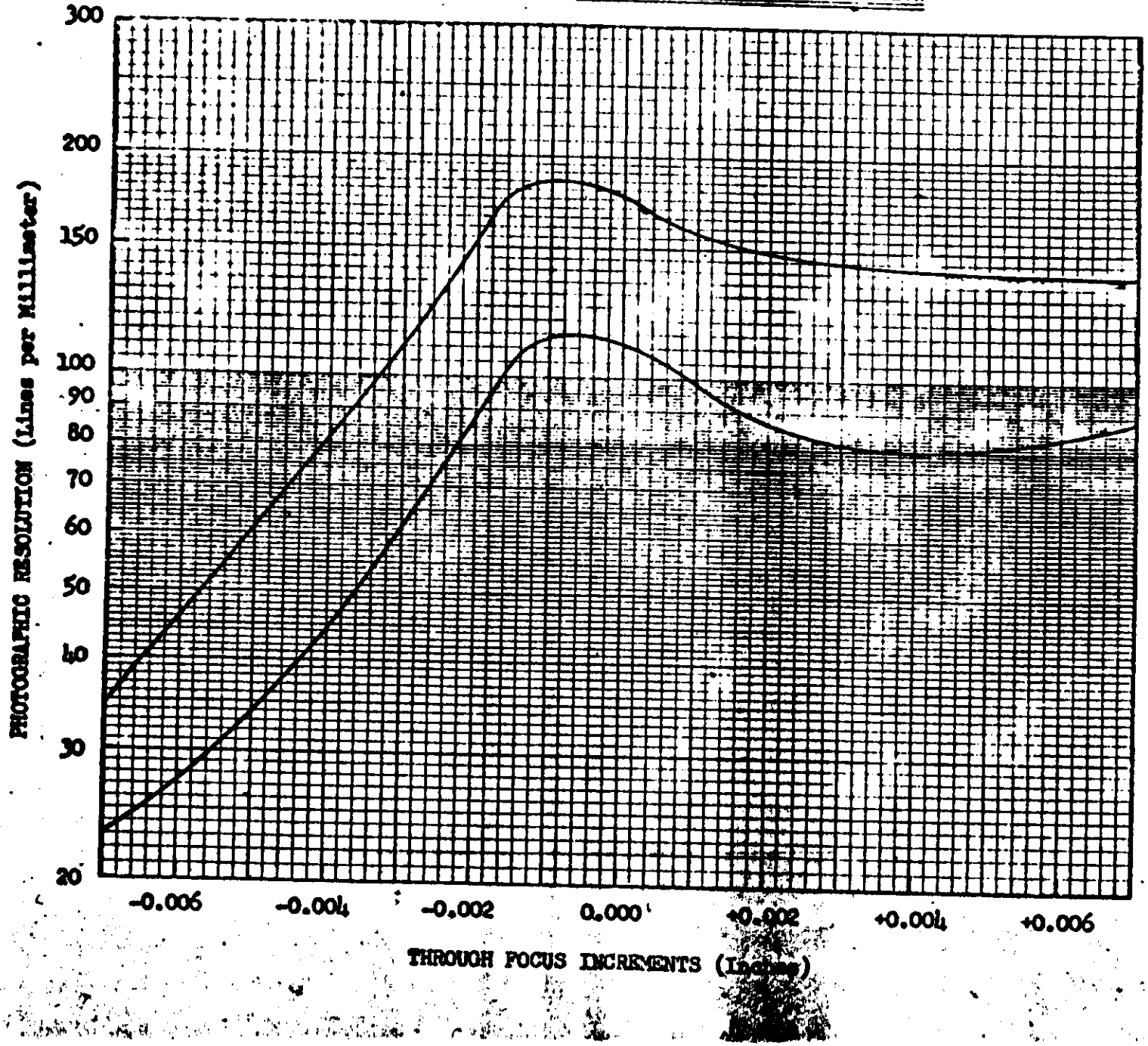
Test Date: 1/8/65

Figure 2-2

[redacted]

TOP SECRET [redacted]

PRE-FLIGHT DYNAMIC RESOLUTION



Camera No: 119

Payload No: J-04

Resolution (1/mm)

High Contrast: 186

Low Contrast: 114

Film Type: 3404

Test Date: 1/8/65

Figure 2-3

TOP SECRET [redacted]

SECTION 3

FLIGHT OPERATIONS

A. INSTRUMENTATION AND COMMAND PERFORMANCE

The telemetry instrumentation was satisfactory throughout the flight. The only exception was the film footage pot for the slave instrument payload on the -2 SRV take-up cassette unit. Erratic TLM voltage levels were observed on both Auggie and [redacted] microwave data from orbit 110 throughout the remainder of the flight, or to orbit 142. The pot voltage monitor (13-1-31) read 2.7 volts which was the proper level corresponding to the cycle counter data. At instrument "on" command for the orbit 110, [redacted] Engineering Operation, the pot voltage level stepped down to 1.5 volts. After 45 seconds the level changed to 2.1v and remainded at this level for 8 seconds. The level changed to 1.5v for another 28 seconds and then back to 2.1v until fade. During subsequent acquisitions stable voltage levels from 2.0 to 3.45 volts were indicated. After orbit 133 the level remained at approximately 3.0 volts.

The command system performance was satisfactory throughout the flight except for the loss of three stereo operations (131 cycles) programmed on orbit 53 and an inadvertent instrument turn-on during orbit 76 over the [redacted] The three programmed stereo operations consisting of 23, 76, and 32 cycles were missed on orbit 53 descending. The RTC settings were:

RTC	6	8	9	10	11	12	15
POS.	8	3	6	4	7	8	1

With the real time command switches in the above position, the instrument should have turned on with a brush 40 command. Analysis disclosed the following:

1. The RTC command settings were verified by Auggie data on orbits 53 and 54 and the tracking data from orbit 53 [redacted] acquisition. All RTC settings were in the proper position.
2. The H-timer brush 40 which turns the instruments "on" when RTC-9 is in program 6 functioned properly for operations during orbits 3, 4, 56, 71, 80 through 85, 103, 128 and 132.

3. The H-timer tape verification list verified that the brush 40 punches were on the tape.
4. A 400 cycle power failure would have caused a 1 cycle instrument operation when power resumed. This did not occur.
5. A ± 28v regulated power failure would have caused a clock time discontinuity. The clock time was continuous throughout the entire flight.
6. A 24v unregulated power failure cannot be determined.
7. The possibility of a stepper switch failure for either RTC 9, 11, 12 or 15 is discounted because identical settings were used on orbit 71 Engineering Operation and the instruments responded properly.
8. This malfunction was not repeated for any other programmed operation during the remainder of the flight.

During orbit 76, [redacted] acquisition, the instruments were inadvertently commanded "on". An error made in converting latitude to system time resulted in an RTC-12 being sent which put the system into an "on" mode during a stored program. (Program 1). RTC-9 was commanded to program 3 prior to the brush 31 which was the stored command to turn the instrument off. The "redundant off" brush 28 command was then required for instrument off. The instruments operated for 11 cycles before shut-down.

B. PANORAMIC CAMERA PERFORMANCE

Engineering operations were observed on TLM for several orbits acquired by the [redacted] Tracking Station. Table 3-1 presents the cycle rate data for these instrument operations.

Instrument dynamics were good for each of the operations observed as indicated by the center-of-format, lens rotation, film supply, and film take-up monitors. Payload transport was smooth. Instrument start-up and shut-down was normal for each operation observed.

The master instrument operated approximately 1.5% faster then the slave throughout both missions. Cycle rates obtained for the Engineering Operations indicated that the instruments were operating within ± 3% of the nominal cycle rate data. Average 99/101 clutch ratios were 7/6 and 6/6 for master and slave, respectively.

Film consumption for the flight was as follows:

Mission 1019-1

	Master	Slave
Cycles	2955	2953
Feet	7816	7811

Mission 1019-2*

Cycles	3085	3094
Feet	8160	8184

*The values given for the 1019-2 mission represent the amount of payload in the capsule at the time that recovery was attempted.

All of the payload was used up during the flight. Payload depletion for the slave instrument was observed by TLM during the Engineering Operation on orbit 142. The master instrument ran out of payload during orbit 143. The above consumption value for the master instrument during -2 mission was estimated since the payload was already depleted when the instrument operation was observed on TLM during orbit 142.

The V/H ramp setting of Ramp 8, Amplitude 3 provided a satisfactory FMC match for the entire flight. The V/H ramp start delay selector, RTC-10 was changed from position 6 to position 4 at orbit 5 to adjust the V/H ramp start time to compensate for the difference in predicted and actual perigee latitude (See Orbital Parameters, Section 1).

Payload consumption was up to 3.75% slower than nominal for the master instrument during the -1 mission and .2% slower during the -2 mission. The slave instrument consumption was 5.5% and 1.5% slower for the -1 and -2 missions, respectively.

C. STELLAR-INDEX PERFORMANCE

Both -1 and -2 stellar-index units operated normally during the flight. All of the S/I programmer commands occurred in their proper sequence. S/I metering was observed on TLM for all of the Engineering Operations acquired at [redacted] Shutter pulses were observed during orbits 16, 31, 47, 63, 79, 94, 110, 126, and 142 which were daytime passes over [redacted] Metering ratios were 7/3 and 8/3 for both units. The index payload was out prior to Rev 142 which was the last time the S/I was observed on TLM prior to -2 recovery attempt.

D. CLOCK PERFORMANCE

Satisfactory clock correlation was obtained for both missions. Clock/System time correlation data is contained in Table 3-2. The system time is fitted to a best fit curve of clock versus system times which is represented by a second order equation in this case. The table includes the amounts that the recorded values of system time deviate from the corrected values.

The corrected system time values are computed from the equation - $y = a_2x^2 + a_1x + a_0$, where y = corrected system time and x = clock time.

E. PRESSURE MAKE-UP SYSTEM PERFORMANCE

The PMU system operated satisfactorily throughout both missions of the flight.

The supply pressure decay history is shown on Figure 3-1 where the supply bottle pressure is plotted as a function of total instrument operate time. The pressure values plotted were obtained from [redacted] TIM acquisitions. The average gas consumption rate for the flight was 6.9 psi/min.

F. TEMPERATURE ENVIRONMENT

The temperature data obtained on [redacted] TLM acquisitions are summarized on Table 3-3. Predicted and actual flight temperatures are compared in Figures 3-2 to 3-4.

The average instrument temperatures were within tolerance, $70 \pm 10^{\circ}F$, for the entire flight.

J-04/1614 MISSION 1019-CYCLE RATE SUMMARY-ENGR. OPERATIONS

REV/MODE	RAMP	T.U.R.	INST 118 ACT.	INST 118 NOM.	INST 118 DEV.	INST 119 ACT.	INST 119 NOM.	INST 119 DEV.	118/119 DIFF.
8 A	8 3	259	4.750	4.866	2.38	4.830	4.874	0.89	1.68
16 A	8 3	1821	2.224	2.236	0.52	2.272	2.228	-1.97	2.16
24 A	8 3	316	4.710	4.774	1.34	4.760	4.781	0.45	1.06
31 A	8 3	1963	2.215	2.223	0.37	2.251	2.216	-1.60	1.63
47 A	8 3	1936	2.237	2.222	-0.67	2.278	2.214	-2.87	1.83
56 A	8 3	432	4.495	4.549	1.19	4.573	4.556	-0.38	1.74
63 A	8 3	2012	2.230	2.230	-0.01	2.260	2.222	-1.70	1.35
71 A	8 3	485	4.397	4.434	0.84	4.453	4.440	-0.29	1.27
79 A	8 3	2085	2.254	2.250	-0.19	2.288	2.242	-2.05	[redacted]
87 B	8 3	541	4.248	4.308	1.38	4.316	4.313	-0.07	[redacted]
94 B	8 3	2142	2.275	2.274	-0.05	2.306	2.267	-1.73	1.36
110 B	8 3	2124	2.289	2.265	-1.04	2.298	2.258	-1.76	0.39
126 B	8 3	2159	2.317	2.283	-1.50	2.330	2.276	-2.39	0.56
142 B	8 3	2223	2.327	2.322	-0.21	2.360	2.315	-1.94	1.42

DEV. AND DIFF. ARE IN PERCENT
THE (-) SIGN INDICATES THAT THE INST IS SLOWER THAN PREDICTED OR THAT INST 1 IS SLOWER THAN INST 2

Table 3-1

[redacted]

1019 CLOCK CORRELATION

ORDER FIT 1

SYS TIME I/P	CL TIME I/P	COMP SYS TM	DELTA ST	REV	STA
78731.5859	27453.4939	78731.5973	-0.011373	0	1
34318.2709	69440.1899	34318.2800	-0.009026	8	1
79578.5859	114760.5139	79578.5896	-0.003639	16	1
35372.6629	156894.6029	35372.6652	-0.002226	24	1
75241.9979	196763.9399	75241.9895	0.008448	31	1
36408.9899	244330.9499	36408.9844	0.005568	40	1
76179.4699	284101.4439	76179.4657	0.004211	47	1
37425.3289	331747.3209	37425.3276	0.001356	56	1
77270.8509	371542.8479	77270.8419	0.009022	63	1
32959.9229	413681.9399	32959.9205	0.002402	71	1
78225.5179	458947.5429	78225.5092	0.008791	79	1
33944.1059	501066.1519	33944.1048	0.001180	87	1
73771.6809	4022.8269	73771.6791	0.001840	94	1
34907.0829	51558.2429	34907.0800	0.002951	103	1
74720.4859	91371.6639	74720.4883	-0.002393	110	1
30386.8779	133438.0639	30386.8750	0.002979	118	1
75558.8179	178610.0289	75558.8256	-0.007662	126	1
36762.0259	226213.2519	36762.0335	-0.007530	135	1
76497.3229	265948.5589	76497.3278	-0.004898	142	1

A0= 0.51278112100 05 A1= 0.9999996821180 00

SIGMA=0.00584 NU. POINTS= 19

RATIO OF CLOCK TIME TO SYS TIME= 0.1000000317880 01

[redacted]

Table 3-2

[redacted]

[redacted]

1019 CLOCK CORRELATION

ORDER FIT 2

SYS TIME I/P	CL TIME I/P	COMP SYS TM	DELTA ST	REV	STA
78731.5859	27453.4939	78731.5878	-0.001896	0	1
34318.2709	69440.1899	34318.2736	-0.002633	8	1
79578.5859	114700.5139	79578.5861	-0.000174	16	1
35372.6629	156894.6029	35372.6641	-0.001121	24	1
75241.9979	196763.9399	75241.9903	0.007650	31	1
36408.9899	244330.9499	36408.9870	0.002917	40	1
76179.4699	284101.4439	76179.4696	0.000358	47	1
37425.3289	331747.3209	37425.3325	-0.003519	56	1
77270.8509	371592.8479	77270.8473	0.003641	63	1
32959.9229	413681.9399	32959.9261	-0.003169	71	1
78225.5179	458947.5429	78225.5145	0.003413	79	1
33944.1059	501066.1519	33944.1096	-0.003651	87	1
73771.6809	4022.8269	73771.6831	-0.002145	94	1
34907.0829	51558.2429	34907.0826	0.000389	103	1
74720.4859	91371.6639	74720.4894	-0.003414	110	1
30386.8779	133438.0639	30386.8740	0.003932	118	1
75558.8179	178610.0289	75558.8221	-0.004195	126	1
36762.0259	226213.2519	36762.0269	-0.000972	13[redacted]	1
76497.3229	265948.9589	76497.3184	0.004587	14[redacted]	[redacted]

A0= 0.51278100420 05 A1= 0.9999997652550 00
A2=-0.10014459003910-12

SIGMA=0.00325 NO. POINTS= 19

[redacted]

Table 3-2

[redacted]

TABLE 3-3

J-04 TEMPERATURE SUMMARY

SENSOR	ORBITS ACQUIRED																		
Master Camera	0	8	16	24	31	40	47	56	63	71	79	87	94	103	110	118	126	135	142
3	68	72	63	69	63	65	63	67	63	68	61	66	57	61	56	59	57	60	55
4	68	75	67	73	64	71	65	72	66	70	64	70	60	66	59	63	60	63	58
5	70	81	74	79	73	74	71	76	71	76	70	75	66	70	64	67	63	68	63
6	66	84	77	82	77	80	76	78	76	78	75	76	70	70	68	71	65	70	66
7	66	80	74	77	74	73	73	75	74	75	71	73	67	73	66	68	67	67	64
8	74	83	75	80	75	79	74	79	71	76	71	76	68	73	67	70	68	70	65
9	68	85	76	80	75	79	74	79	73	77	73	75	68	72	67	70	67	69	64
10	66	84	71	72	70	69	70	69	70	70	69	67	64	63	63	62	64	61	62
11	95	79	68	74	73	77	70	68	72	73	69	64	64	61	60	64	59	65	58
12	74	76	67	73	67	72	67	72	67	73	66	69	61	67	61	67	62	66	60
13	71	82	72	78	73	77	72	73	72	76	71	71	66	66	64	65	63	65	63
AVG		80	73	76	71	75	70	74	72	74	71	72	65	67	64	66	64	66	62
Slave Camera																			
3	66	80	73	77	73	74	72	76	72	75	70	71	64	66	63	65	59	64	59
4	66	75	66	73	66	71	65	71	65	70	64	67	58	63	57	62	56	61	55
5	67	76	69	74	69	69	68	68	68	68	68	64	62	61	61	64	60	62	60
6	65	77	69	75	70	71	69	72	70	72	69	69	63	65	63	65	64	64	61
7	66	78	73	76	73	74	72	74	72	71	72	70	66	67	66	68	65	64	64
8	65	73	65	71	66	70	65	71	65	70	64	66	59	64	58	63	58	62	57
9	65	71	65	70	65	69	65	69	65	70	64	65	59	63	58	63	58	62	58
10	66	73	71	72	71	69	70	70	71	70	69	66	64	62	63	63	63	59	63
11	97	69	66	69	63	67	63	69	64	66	63	63	57	60	57	60	57	58	55
12	72	72	72	70	71	77	70	78	71	76	69	72	64	70	63	67	61	66	60
13	71	75	71	74	68	72	68	72	68	72	67	67	61	64	61	62	60	61	60
AVG		75	69	74	69	71	68	72	69	71	67	68	62	64	61	64	60	62	60
Supply Spool																			
1	63	55	54	55	55	55	55	55	55	55	54	52	49	49	47	49	48	48	46
2	61	59	55	58	55	58	55	58	56	58	54	52	49	50	47	51	47	48	46

NOTE: All data corrected for self-heating, except injection.

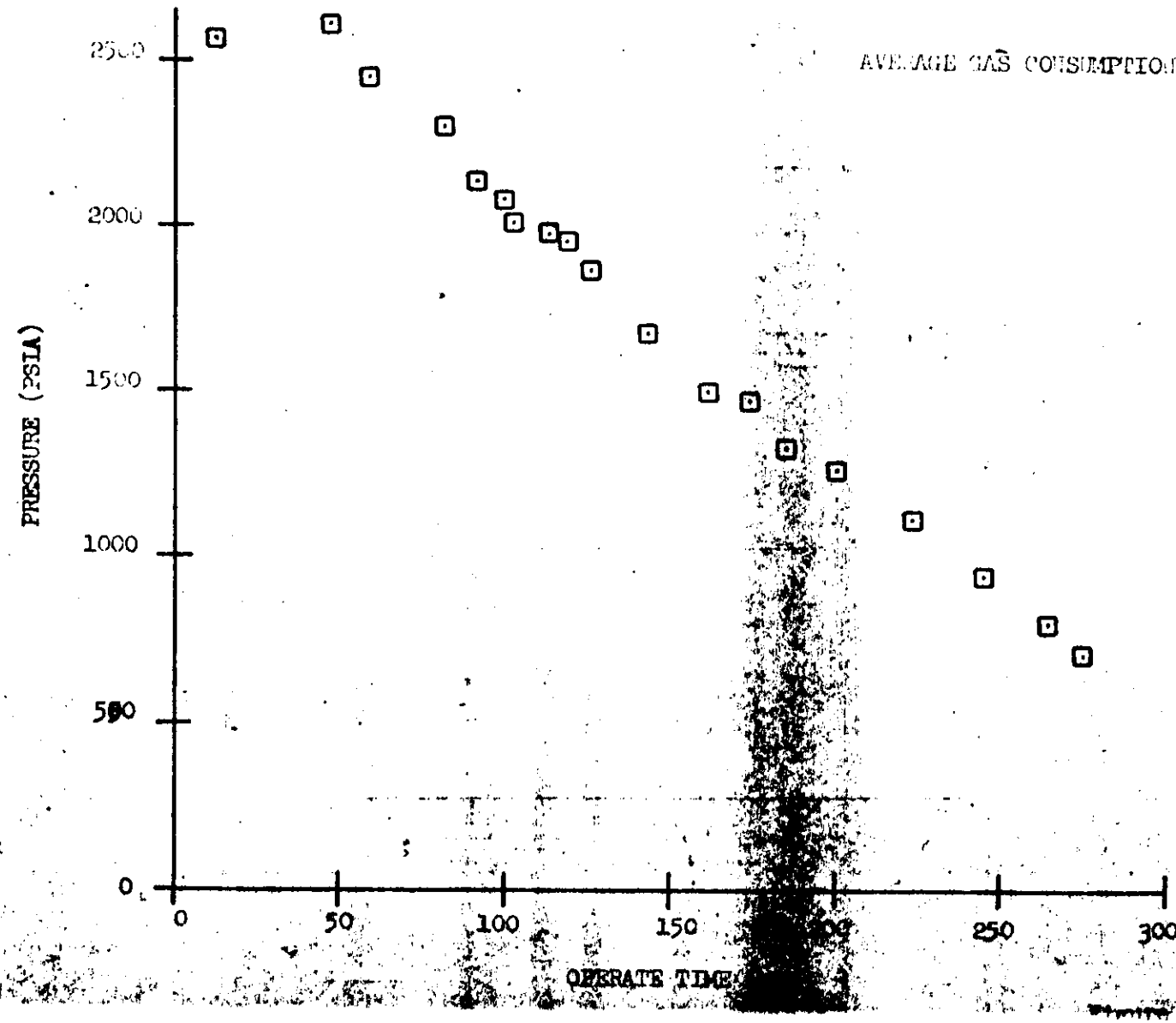
Table 3-3

J-04 TEMPERATURE SUMMARY

SENSOR	ORBITS ACQUIRED																		
Fair ("A") Barrel #1 ("B")	0	8	16	24	31	40	47	56	63	71	79	87	94	103	110	118	126	135	142
1	OBH	27	65	45	74	92	65	27	74	30	71	29	55	23	52	23	49	23	45
2	OBH	3	3	2	6	3	3	-1	6	3	6	57	64	51	70	51	64	54	67
3	227	3	19	6	22	3	19	0	19	3	19	61	147	55	152	55	136	55	136
4	231	48	57	48	61	45	57	45	61	48	57	39	92	33	89	30	77	30	71
5	OBH	60	67	64	67	57	64	54	67	54	57	37	62	31	56	31	50	31	47
6	OBH	48	93	48	99	48	88	44	91	48	82	--	--	--	--	--	--	--	--
Barrel #2																			
1	160	53	75	53	75	50	75	50	72	50	65	40	62	33	56	30	50	30	46
2	153	56	112	56	115	46	106	43	109	46	101	40	98	36	98	33	84	33	81
3	239	54	137	61	148	61	139	61	150	61	145	61	148	57	150	57	134	54	139
4	220	50	50	50	60	50	56	50	60	53	63	50	63	47	66	50	63	47	63
5	195	50	66	50	72	50	69	46	69	50	66	40	62	36	59	36	56	36	56
Comic Adapter																			
1	169	49	62	46	62	46	59	43	59	46	52	30	39	30	36	26	33	23	30
Clock																			
1	93	71	64	71	66	69	66	66	66	69	66	58	56	56	54	56	54	52	54
2	97	71	66	73	69	71	68	69	69	71	69	58	56	56	56	56	54	54	54
Thrust Cone "A" to "B" SRV																			
1	110	41	35	37	35	35	34	35	35	36	40	59	57	57	56	58	59	56	56
2	80	63	53	57	53	54	51	53	50	53	50	68	66	66	65	65	61	63	61
Stellar/Index "A" to "B"																			
1	87	65	59	59	59	59	59	56	59	59	59	67	64	61	61	61	61	58	58
2	82	67	61	64	61	64	60	64	61	64	61	72	65	68	65	68	65	65	62
Recovery Battery "B" SRV																			
1	71	66	67	66	67	66	66	66	67	65	67	77	82	79	78	80	79	84	83
Master Cassette "A" SRV																			
2	99	54	50	45	48	41	45	41	46	41	48	0	--	--	0	0	0	0	0

NOTE: Only Thrust Cone Data corrected for Self-Heating

AVERAGE GAS CONSUMPTION 6.9#/MIN.



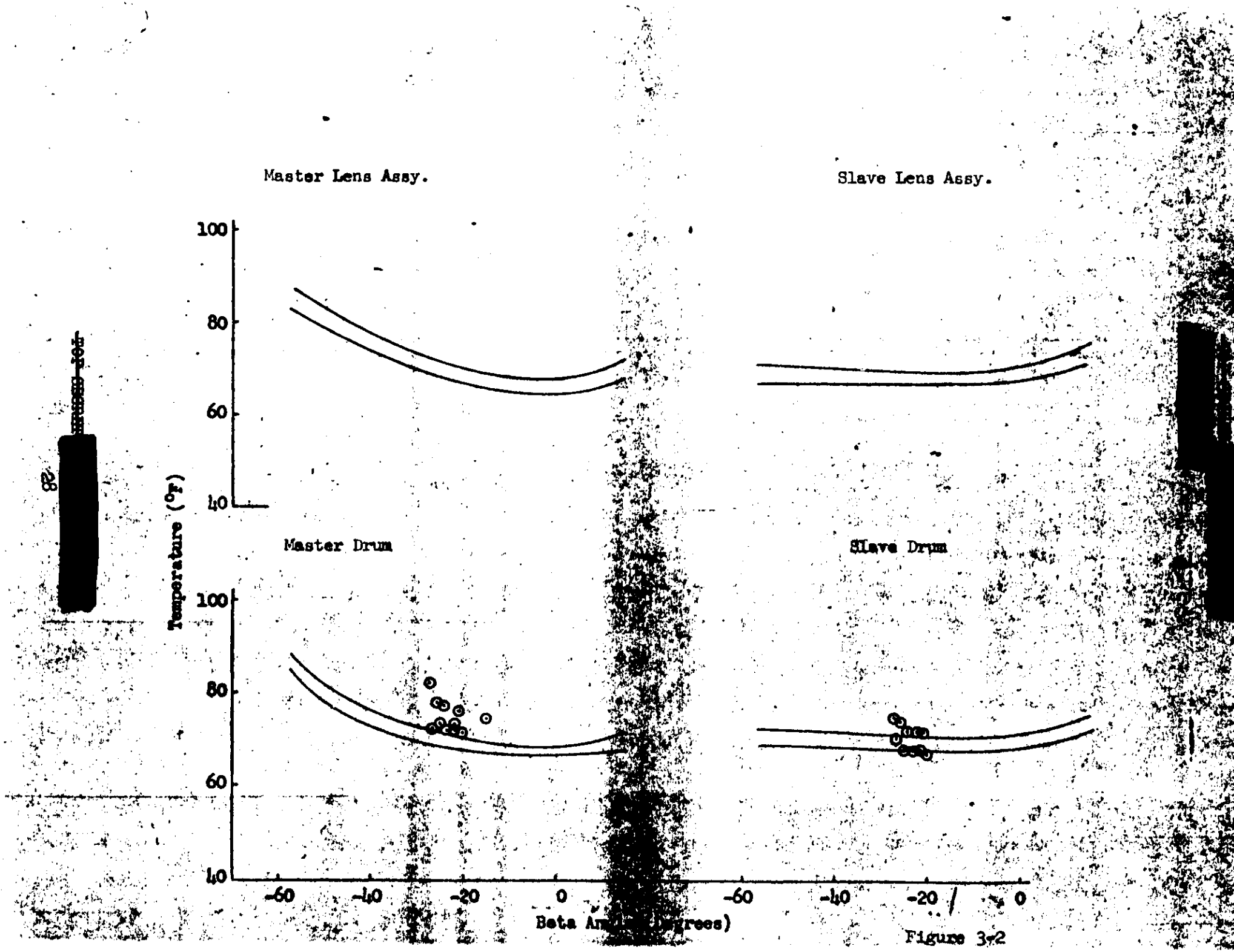
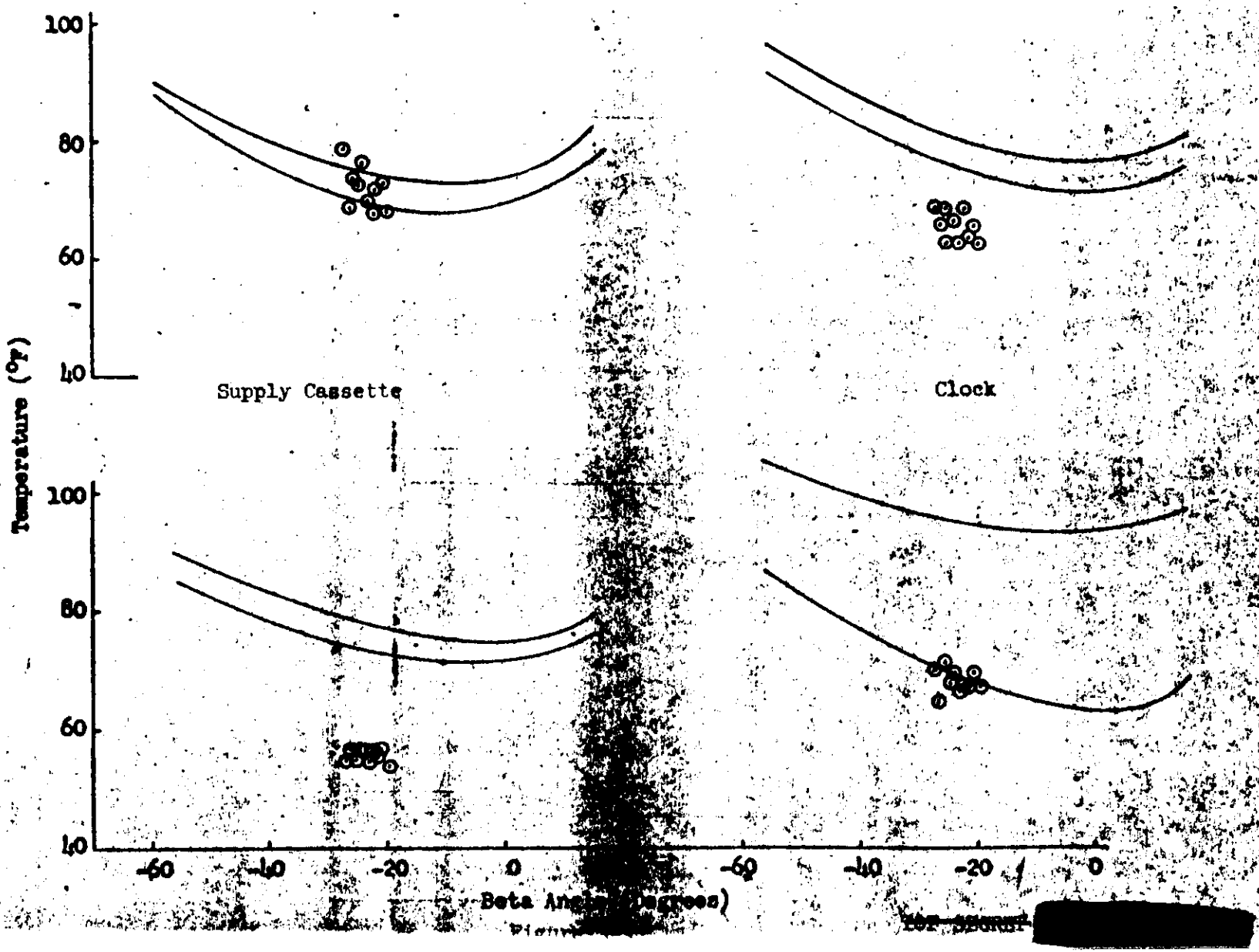
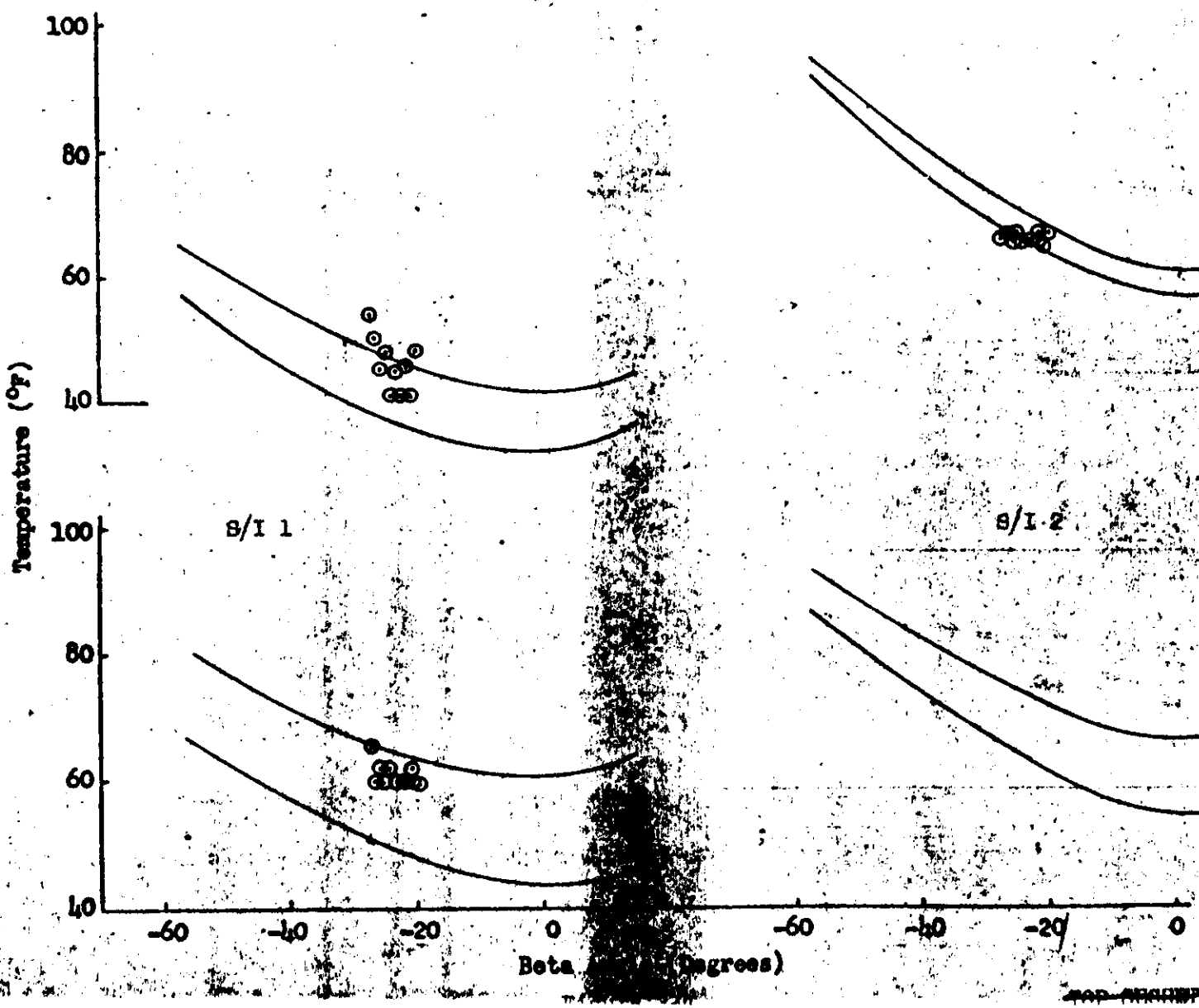

Master Lens Assy.
Slave Lens Assy.
100
80
60
40
Temperature (°F)
Master Drum
Slave Drum
100
80
60
40
-60
-40
-20
0
-60
-40
-20
0
Beta Ar
egrees)

Figure 3-2




SRV 1
SRV 2
S/I 1
S/I 2
100
80
60
40
Temperature (°F)
-60
-40
-20
0
Beta (Degrees)

SECTION 4

MISSION 1019-1 RECOVERY SYSTEM

SRV #626 was received at A/P on 9 May 1963. The receiving weight was 152 pounds. After modifications and incorporation of outstanding E.O.'s the SRV was delivered to systems test for incorporation into the J-04 system.

The capsule was shipped to VAFB on 28 January 1965.

The -1 SRV system was successfully recovered on orbit 80, 5/4/65. The re-entry sequence of events are listed in Table 4-1. Only the retro events are available. The impact point was within tolerance. Channel 9 of capsule telemetry did not change level to 2 volts at Thrust Cone separation. Level remained at 0 volts for rest of retro events. The [redacted] Tracking Station capsule telemetry acquisition indicated the same 0 volt level. Chute events were not seen on telemetry.

The condition of the recovered capsule was satisfactory with no damage other than normal paint blistering due to the re-entry environment.

MISSION 1019-1

RECOVERY SEQUENCE OF EVENTS

EVENT	DELTA TIME	
	ACTUAL	NOMINAL
ARM	--	--
TRANSFER	76.95	75.0 ± 1.25
ELECT. DISC.	1.01	.900 + .43 - .40
*SEPARATION	2.00	2.0 ± .25
**SPIN	3.47	3.4 ± .30
RETRO	7.54	7.55 ± .45
DESPIN	10.65	10.75 ± .54
T/C SEPARATION	1.46	1.5 ± .15
V/M CLOSE	180.	180 + 44

*FROM TRANSFER

**FROM ELECT. DISC.

BLOSSOM TELEMETRY SERIAL NO. 138

TABLE 4-1

SECTION 5

MISSION 1019-2 RECOVERY SYSTEM

SRV #627 was received at A/P on 31 May 1963. The receiving weight was 152 pounds. After modifications and incorporation of outstanding E.O.'s the SRV was delivered to systems test for incorporation into the J-04 system.

The capsule was shipped to VAFB on 28 January 1965.

The -2 SRV system was not recovered. Recovery was attempted on orbit 143, 5/8/65. Retro events occurred in the proper sequence but due to a restart of the Dian Timer, the vehicle was in an improper attitude at capsule separation. The re-entry events are listed in Table 5-1. The separation event occurred approximately 175 seconds later than nominal. Vehicle pitching continued past the normal attitude for separation so that the capsule was given a velocity component in the direction of flight [redacted] retro event occurred. Tracking of the capsule on subsequent orbits showed it to be still in orbit although the orbit was changed. The parameters for the new orbit are as follows:

Period, Min.	96.48
Perigee Height, N.M.	84
Apogee Height, N.M.	680
Eccentricity, N.M.	0.0674
Inclination, Deg.	84.85

MISSION 1019-2

RECOVERY SEQUENCE OF EVENTS

EVENT	DELTA TIME	
	ACTUAL	NOMINAL
ARM	--	--
TRANSFER	***155.5	75.0 ± 1.25
ELECT. DISC.	0.97	0.90 + .43 - .40
*SEPARATION	2.0	2.0 ± .25
**SPIN	3.43	3.4 ± .30
RETRO	7.59	7.55 ± .45
DESPIN	10.69	10.75 ± .54
T/C SEPARATION	1.50	1.5 ± .15

*FROM TRANSFER

**FROM ELECT. DISC.

***OUT OF TOLERANCE DUE TO RECOVERY TIMER RESTART.

BLOSSOM TELEMETRY SERIAL NO. 139

TABLE 5-1

SECTION 6

MASTER (FWD) PANORAMIC CAMERA

A. COMPONENT ASSIGNMENT

Component	Serial Number
Main Camera	118
Main Camera Lens	0602435
Supply Horizon Camera	144B
Supply Horizon Camera Lens	812278
Take-up Horizon Camera	144A
Take-up Horizon Camera Lens	812304
Supply Cassette	SC-6

B. CAMERA DATA AND FLIGHT SETTINGS

Main Camera:

Lens	24" f/3.5
Slit Width	0.250"
Filter Type	Wratten 25
Film Type	Eastman Type 3404

Supply (Port) Horizon Camera:

Lens	55mm f/6.8
Aperture Setting	f/6.8
Exposure Time	1/100 second
Filter Type	Wratten 25

Take-up (Starboard) Horizon Camera:

Lens	55mm f/6.8
Aperture Setting	f/8.0
Exposure Time	1/100 second
Filter Type	Wratten 25

C. POST FLIGHT PERFORMANCE EVALUATION

This camera produced 2029 frames (7254 feet, including pre-flight test footage) of photography during Mission 1019-1. A total of 2019 frames had been predicted from telemetry data. The overall photographic quality was judged to be about equal to the best of the recent Corona missions or, in other words, equal to Mission 1015. Cloud coverage was estimated to be 45%.

Image contrast obtained from the master camera was greater than that obtained from the slave camera. In general, it also appeared that the information content obtained from the master camera was greater. The MIP frame for the mission was given a rating of 85 and was produced by the master camera.

The master panoramic camera and its auxiliary equipment operated in generally satisfactory manner throughout the mission. Lights for the time word, serial number, and index marks functioned normally throughout. The end of pass mark showed excessive density and bloomed throughout the mission. The 200 cps timing marks were of acceptable density and location with respect to the format. The horizon cameras functioned normally and provided imagery of good quality. Both sets of horizon image fiducial marks were usable throughout but showed some blooming and softness.

Longitudinal emulsion scratches occurred near each edge of the format of most frames. These scratches extend approximately from the take-up end of the format to the region under the serial number. Similar scratches have been observed on past missions but generally they have not been as prominent. There were also two regions of many very small longitudinal scratches in transverse bands one or two inches wide across the format near the take-up end and under the serial number. These latter scratches cause relatively minor damage to the imagery. Both types of scratches described here are believed to be caused during film transport by the scan head rollers as the scan arm is returning to the start of scan position. Thus the scratches are actually made just after the film at the point of the scratches, has entered the platen. The film metering continues and the scratched areas stop near the take-up end of the format. The scratches appear on most formats except the first of a pass. This is attributed to the slow movement of the system at startup causing less pressure between the film and scan head rollers.

A minus density streak occurs intermittently during passes DO-1 and DO-3. The streaks are near the middle of the film and are approximately parallel to the major axis. In some cases the path appears possibly related to the movement of the field flattenor, but in other cases, it is clearly not so related. The cause of these streaks is not known and is the subject of further investigation.

It has been observed for some time that there is a highly repetitive pattern of light leak fogging in pan camera material that is associated with shut-down periods. An intensive examination was made of the light leaks in Mission 1018. Subsequently revised light leak tests and other studies were conducted at A/P. As a result, the sources of regularly appearing light leaks have been identified.

Light leaks appearing on the fifth frame before end of pass on the master, and sixth frame on the slave, result from light passing through the ablative plastic forebody on the first, or "A" mission. This fogging does not appear on the second, or "B" mission because the fairing provides sufficient shielding to reduce the light leak below a detectable level. An effort was made to remedy this problem for this mission by applying additional black paint to the inside of the forebody. The result was not successful because several areas were not accessible to a brush. Improved paint application apparently has eliminated this problem on Mission 1021.

All of the rest of the regular light leak fogging results from leaks at the drums of the cameras, along the felt seals or at the end of them. Only the seal at the take-up side is important because the scan arm deflects light leaks at the supply side from regions where the film passes. On the slave camera, this light leak causes fogging only on film actually in the platen area. However, this leak on the master causes much more fogging. Not only is film in the platen fogged, but also both master and slave films in the vicinity. Slave camera film is typically fogged at the point where it emerges through a hole in the master camera mainplate. Then both films are fogged in an area between the No. 1 barrel/IR barrel interface and the IR roller assembly. This results from light passing upward from the drum leak and striking a large polished thermal surface in the IR barrel. The light is thus reflected on to the films.

This fog appears in the second frame from end of pass on the master and third frame from end of pass on the slave. It does not appear possible to eliminate the drum leaks without redesign of the hardware. However, with care in adjusting the felt seals, it may be possible to reduce the fogging to more acceptable levels.

SECTION 7

SLAVE (AFT) PANORAMIC CAMERA

A. COMPONENT ASSIGNMENT

Component	Serial Number
Main Camera	119
Main Camera Lens	0572435
Supply Horizon Camera	142B
Supply Horizon Camera Lens	812313
Take-up Horizon Camera	142A
Take-up Horizon Camera Lens	812303
Supply Cassette	

B. CAMERA DATA AND FLIGHT SETTINGS

Main Camera:	
Lens	24" f/3.5
Slit Width	0.175"
Filter Type	Wratten 21
Film Type	Eastman Type 3404
Supply (Starboard) Horizon Camera:	
Lens	55mm f/6.8
Aperture Setting	f/8.0
Exposure Time	1/100 second
Filter Type	Wratten 25
Take-up (Port) Horizon Camera:	
Lens	55mm f/6.8
Aperture Setting	f/6.8
Exposure Time	1/100 second
Filter Type	Wratten 25

C. POST FLIGHT PERFORMANCE EVALUATION

This camera produced 2779 frames (7842 feet, including pre-flight test footage) of photography during Mission 1019-1. A total of 2816 frames had been predicted from telemetry data. The overall photographic quality was judged to be comparable to that of the master camera. As previously noted, the image contrast and information content of the slave instrument appeared to be slightly less than that of the master instrument.

The slave panoramic camera and its auxiliary equipment operated in a generally satisfactory manner throughout the mission. Except as noted below, lights for the serial number, index marks, timeword end of pass, and fiducials operated normally. The 200 cps timing marks were of acceptable density and location with respect to the format. The fiducial light nearest the format on the supply horizon camera and the index light adjacent to serial number both caused excessive density and blooming.

Both types of scratches that occurred in the master camera also appeared in the slave. These include the large scratches along the edge of the format and the many small scratches over the image area near the take-up end. The cause of these scratches is described in the section on the master panoramic camera.

Light leak fogging is observed during instrument shut-down periods. The location of these light leaks is the same as those observed from slave instruments on past missions.

Transverse banding occurs near the take-up (start of scan) end of frames in pass D-24, and becomes greater in subsequent passes to the end of the mission. This banding is due to non-linear movement of the scan head with respect to the film. In the preliminary examination of such areas, no evidence of loss of image quality was observed. No attempt was made to gather quantitative data since the original negative material was not available and the processing conditions of the positive cannot be adequately evaluated.

SECTION 8

PANORAMIC CAMERA EXPOSURE

The exposure parameters of both the panoramic cameras were the normal combinations of a 0.175 inch wide slit with a Wratten 21 filter, and a 0.250 inch wide slit with a Wratten 25 filter. These conditions place the nominal exposure between the intermediate and full level processing curves, as published by [redacted] for their 3404 emulsion.

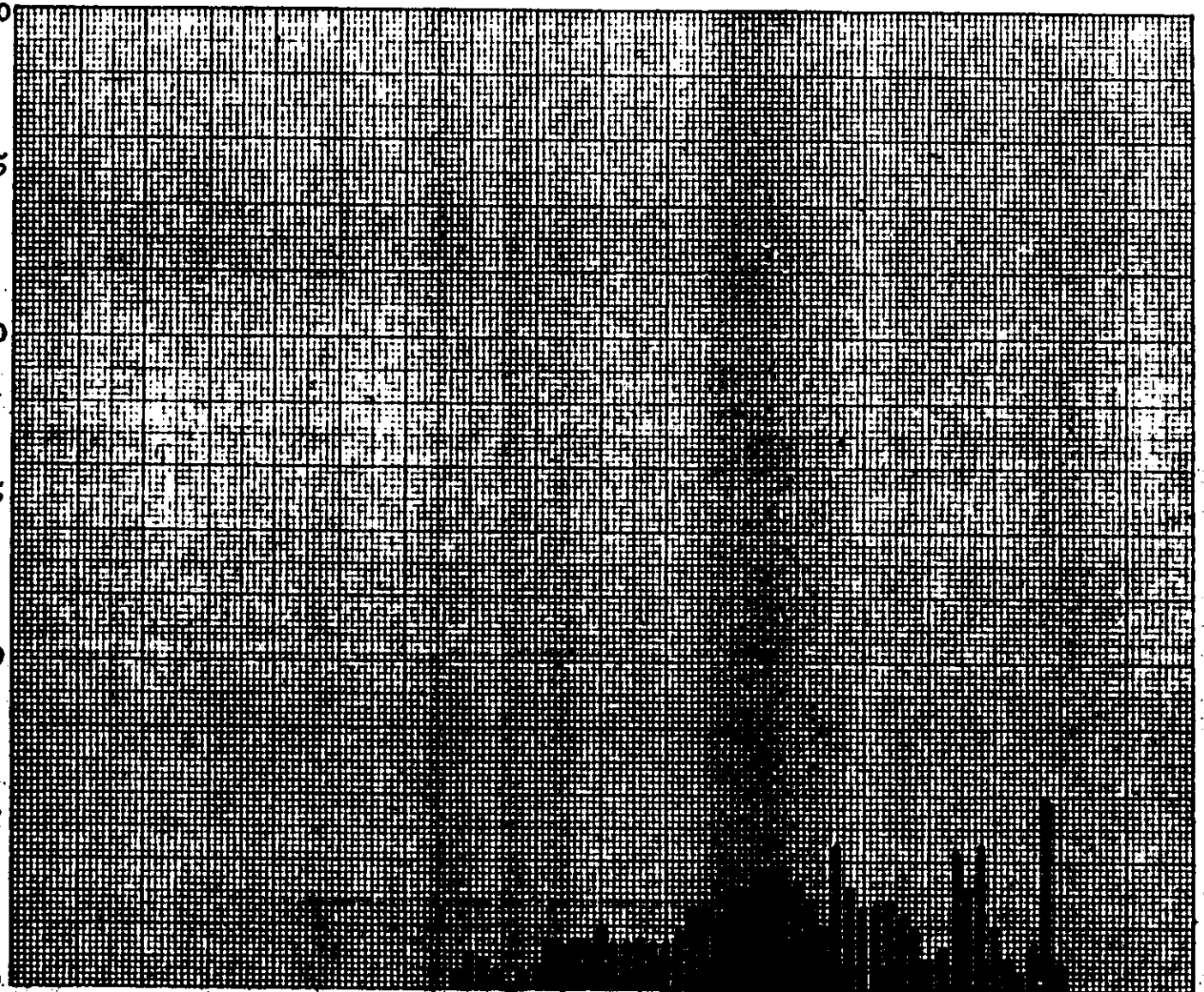
The frequency distributions of the solar elevations and solar azimuths encountered during the photographic operations are shown in Figures 8-1 and 8-2.

The nominal exposure times are shown as a function of latitude for passes D-08, D-40 and D-72 in Figures 8-3 through 5 for the Master camera and Figures 8-6 through 8-8 for the Slave. The predicted level of processing for the original negative is based on the in-flight performance estimate and is tabulated below with the processing levels reported by [redacted]

Mission	Camera		Primary	Intermediate	Full
1019-1	FWD	Predicted	0	21	79
		Reported	22	32	46
1019-1	AFT	Predicted	0	92	8
		Reported	26	55	19

TOP SECRET [redacted]

SOLAR ELEVATION FREQUENCY DISTRIBUTION



Mission No: 1019-1

Payload No: [redacted]

Camera No: 118

Launch Date: 4/29/65

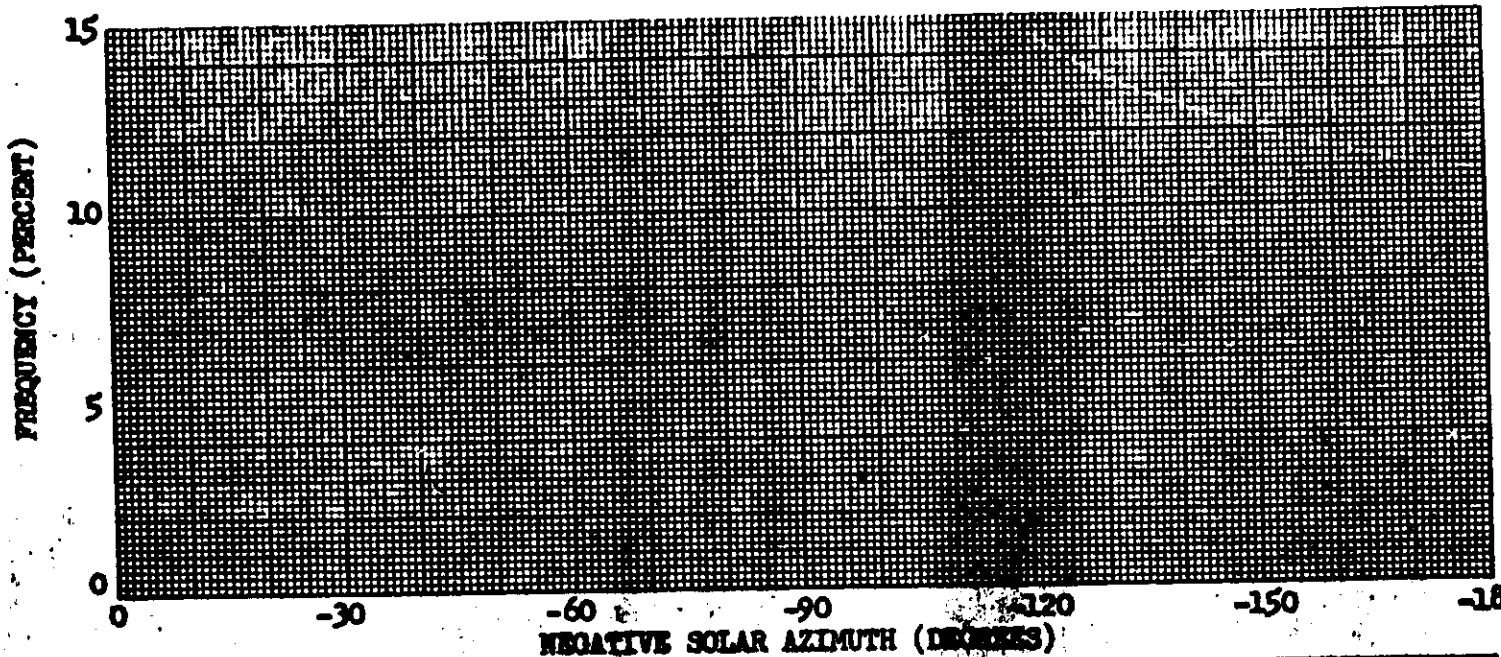
Launch Time: 2144 Z

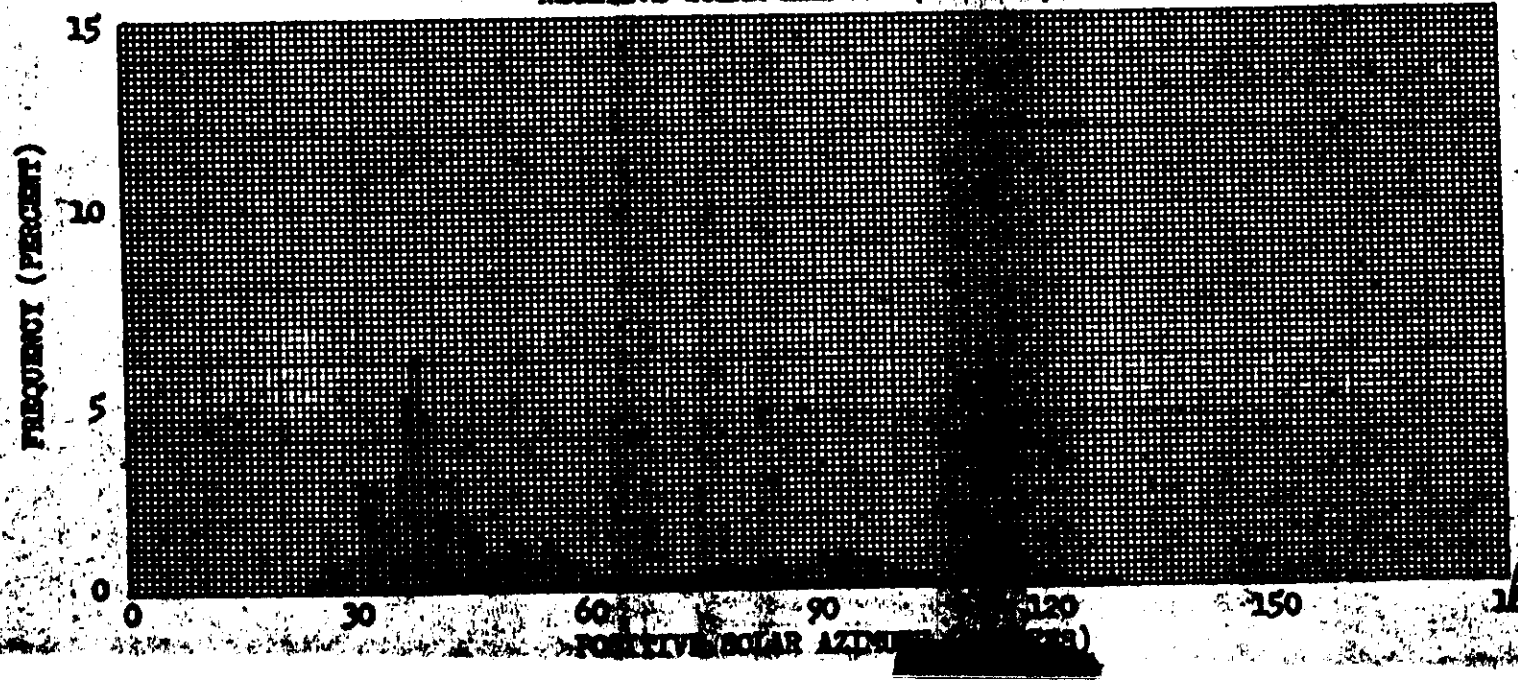
Inclination: 85°

Figure 8-1

[redacted]

SOLAR AZIMUTH FREQUENCY DISTRIBUTION





Mission No: 1082nd

Payload No: J-04

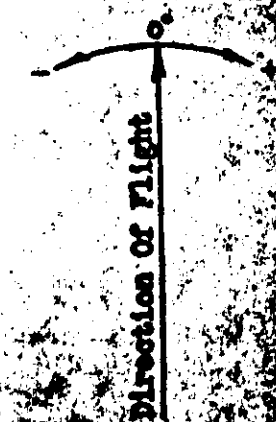
Camera No: 118

Launch Date: 4/29/65

Launch Time: 2144 Z

Inclination: 85°

SIGN NOTATION

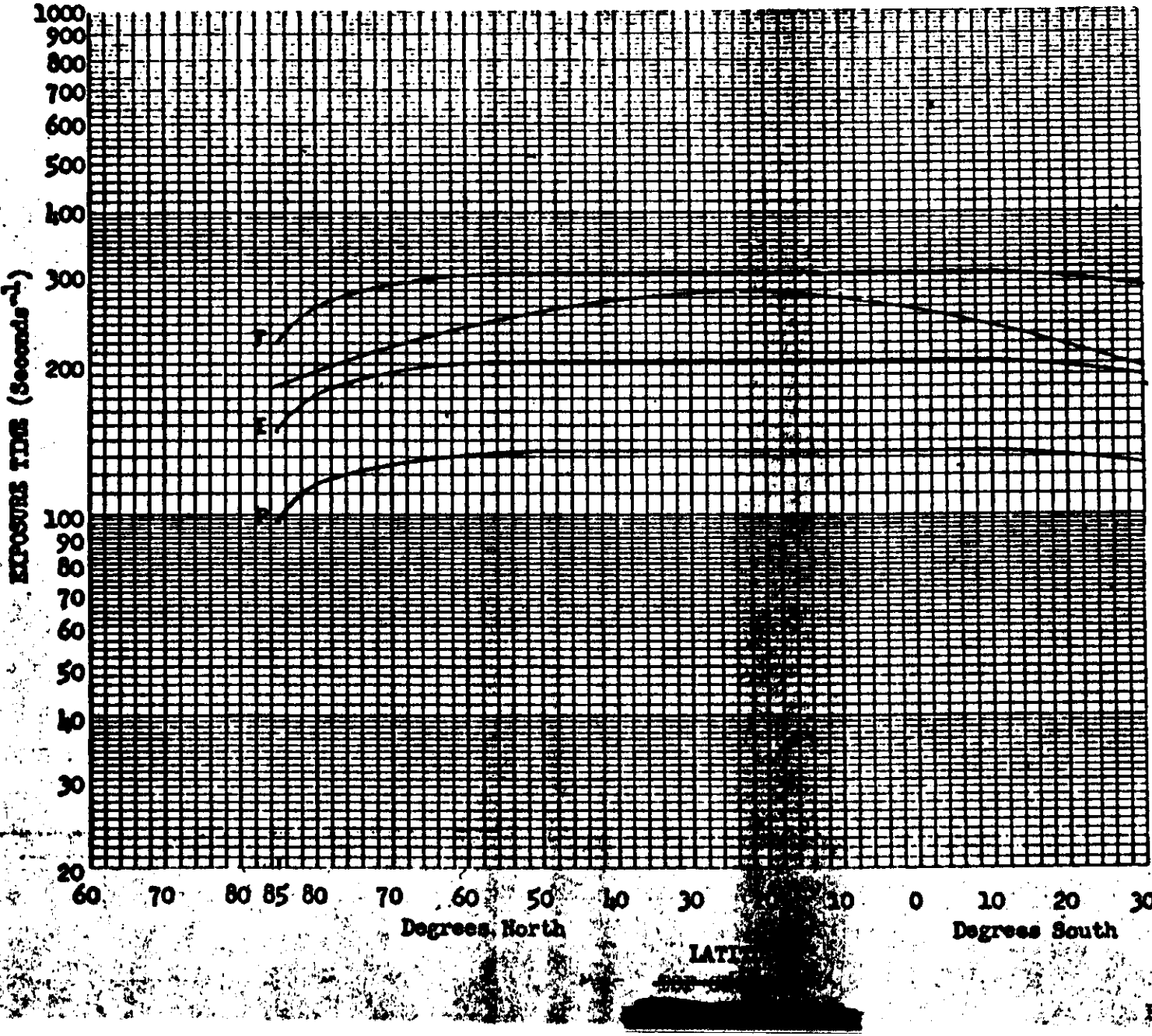


43

Figure B-2

[redacted]

EXPOSURE POINTS



[redacted]

Mission No: 1019-1

Payload No: J-04

Camera No: FWD

Pass No: 8

Launch Date: 4/29/65

Launch Time: 2114 Z

Slit Width: .250

Filter Type: Wratten 25

Film Type: 4404

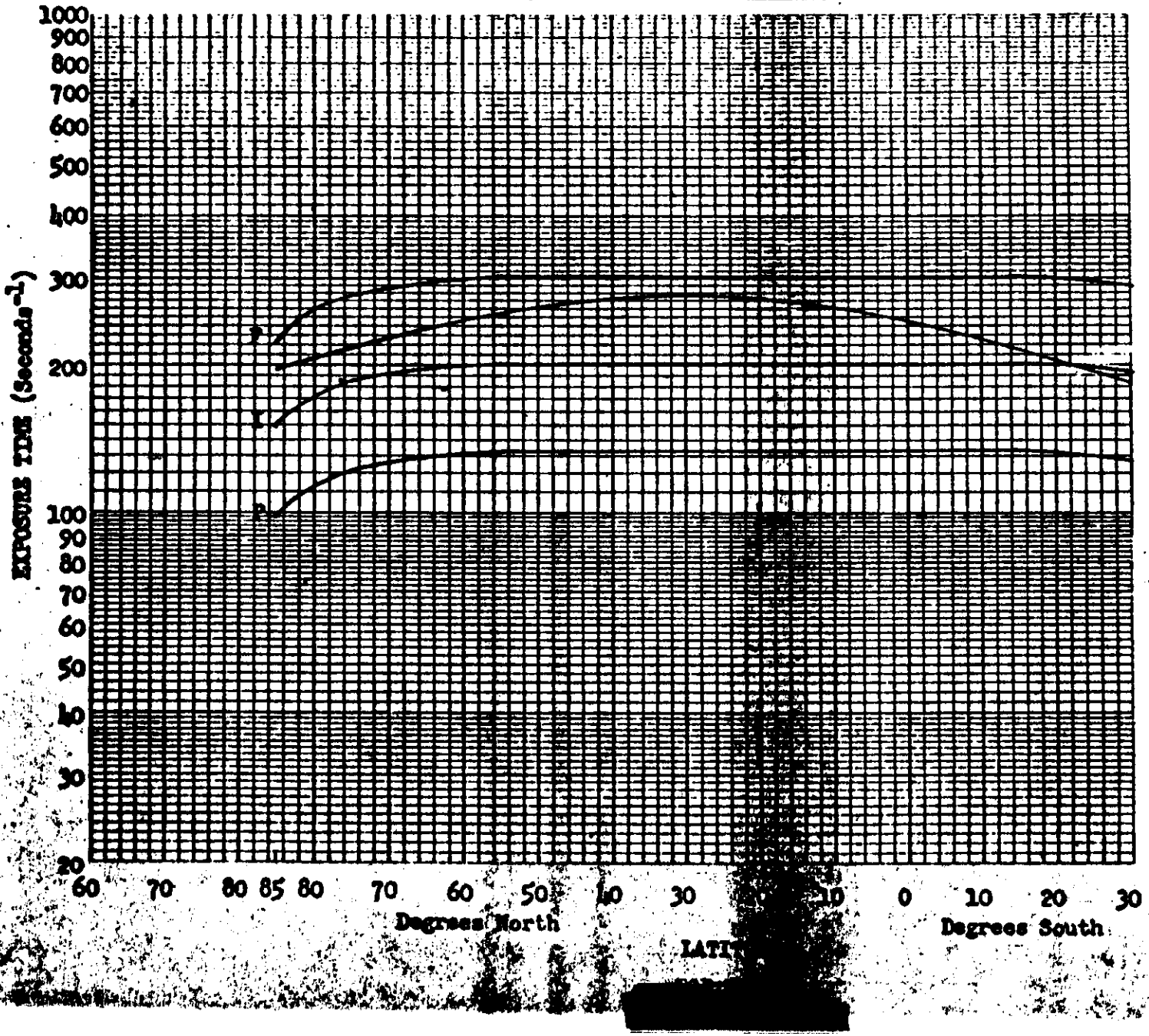
Figure A-3

~~TOP SECRET~~

[redacted]

[redacted]

EXPOSURE POINTS



Mission No: 1019-1

Payload No: J-04

Camera No: FWD

Pass No: 40

Launch Date: 4/29/65

Launch Time: 2114 Z

Slit Width: .250

Filter Type: Wratten 25

Film Type: 4404

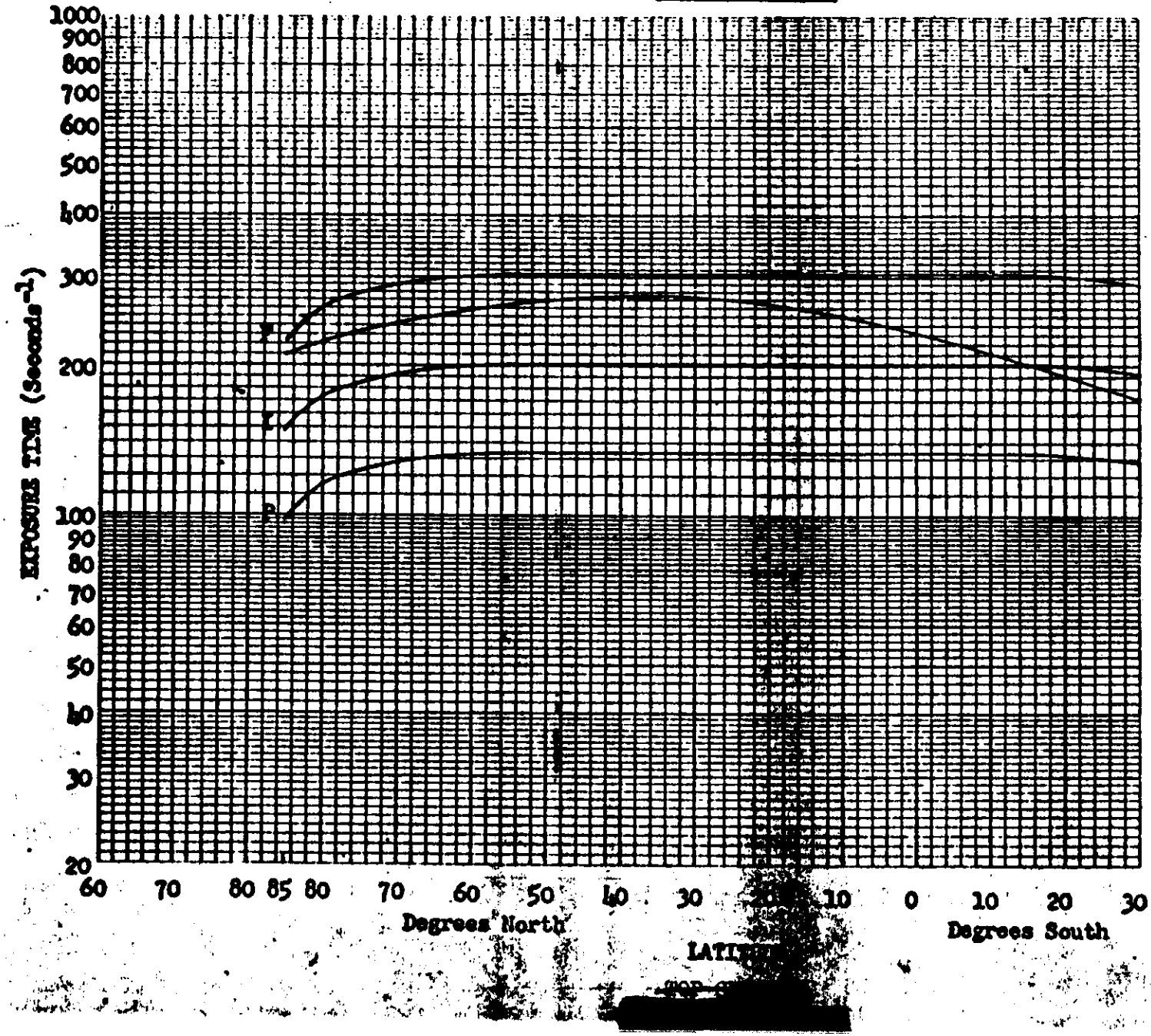
[redacted]

Figure 9.4

[redacted]

[redacted]

EXPOSURE POINTS



Mission No: 1019-1

Payload No: J-04

Camera No: FWD

Pass No: 72

Launch Date: 4/29/65

Launch Time: 2114 Z

Slit Width: .250

Filter Type: Wratten 25

Film Type: 4404

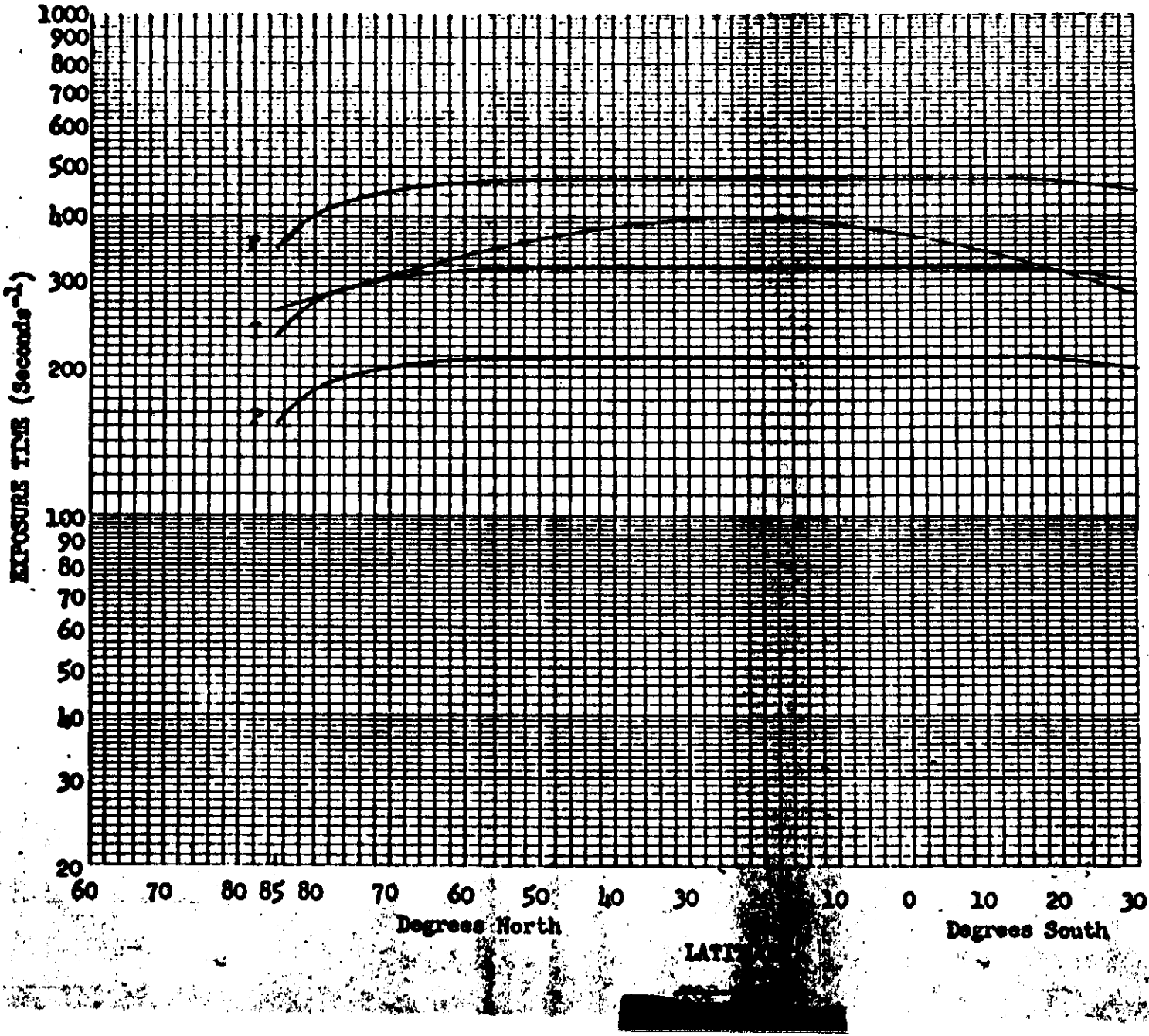
Figure 8-5

[redacted]

~~TOP SECRET~~

[redacted]

EXPOSURE POINTS



[redacted]

Mission No: 1019-1

Payload No: J-04

Camera No: AFT

Pass No: 8

Launch Date: 4/29/65

Launch Time: 2114 Z

Slit Width: .175

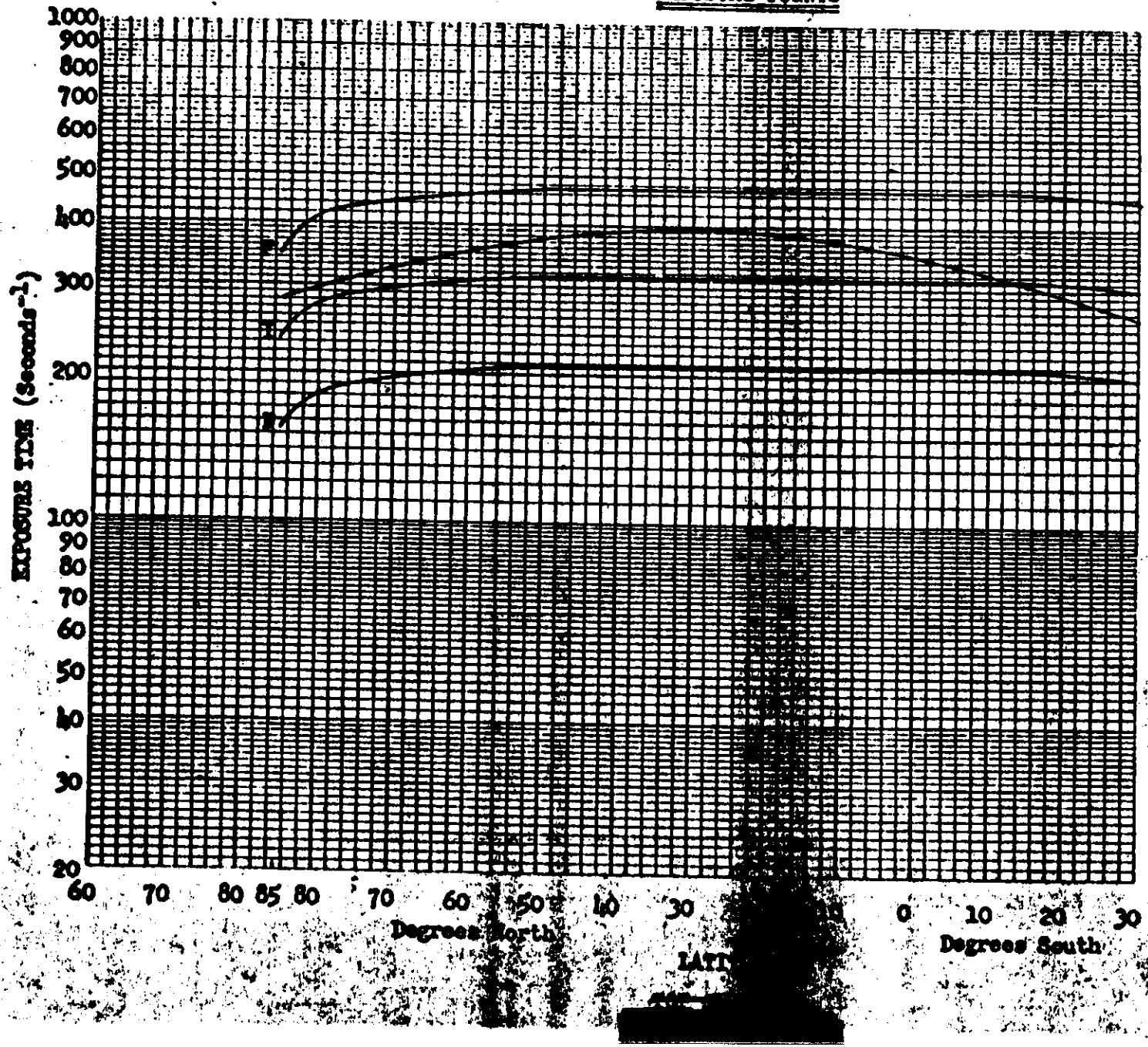
Filter Type: Wratten 21

Film Type: 4404

Figure 8-6

[redacted]

EXPOSURE POINTS



[redacted]

Mission No: 1019-1

Payload No: J-04

Camera No: AFT

Pass No: 40

Launch Date: 4/29/65

Launch Time: 2144 Z

Slit Width: .175

Filter Type: Wratten 21

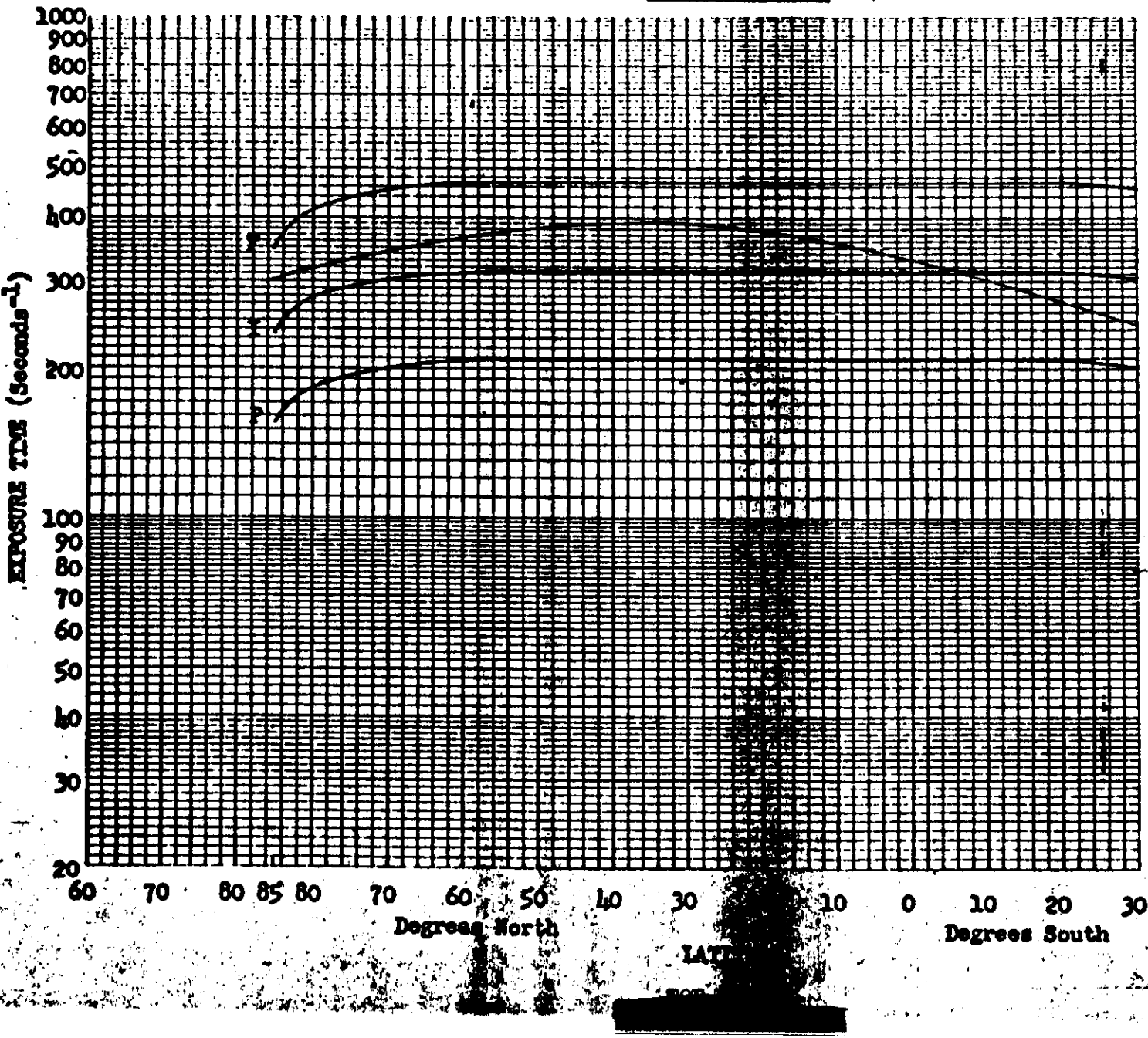
Film Type: 4404

Figure 8-7

[redacted]

[redacted]

EXPOSURE POINTS



Mission No: 1019-1

Payload No: J-04

Camera No: AFT

Pass No: 72

Launch Date: 4/29/65

Launch Time: 2144 Z

Slit Width: .175

Filter Type: Wratten 21

Film Type: 4404

Figure 8-8

[redacted]

SECTION 9

DIFFUSE DENSITY MEASUREMENTS

The diffuse density measurements made by AFSPPF were computer sorted at A/P to permit analysis of the density ranges encountered at the three processing levels. A study of sorting techniques showed that no absolute method was available to separate the density values as the accuracy of the Processing History published by [redacted] appears rather low and processing transition phases are not accounted for. The sorting technique selected uses the base plug fog density values where measurements up to 0.09 density are considered as having received Primary processing, 0.10 to 0.17 as Intermediate and above 0.17 density as Full. The percentage of original negative that was processed at each level, based on the computer sort, is tabulated below with the predicted and reported processing percentages.

Mission	Camera		Primary	Intermediate	Full
1019-1	FWD	Predicted	0	21	79
		Reported	22	32	46
		Computed	4	56	40
1019-1	AFT	Predicted	0	92	8
		Reported	26	55	19
		Computed	3	87	10

The tabulations of density frequency distributions for Mission 1019-1 are included in Appendix A, Table A-1 and A-2. The graphical presentation of the density distribution are computer plotted in Appendix A, Figures A-1 through A-36.

A summary of the processing and exposure analysis is shown in Table 9-1. The terrain D_{Min} criteria (range) for proper exposure and processing is 0.40 to 0.90 density units.

~~TOP SECRET~~ [redacted]

MISSION 1019-1 INSTR - FWC 06-11-65 PROCESSING AND EXPOSURE ANALYSIS

PROCESS LEVEL	SAMPLE SIZE	UNDER EXPOSED	UNDER PROCESSED	CORRECT EXP+PROC	OVER PROCESSED	OVER EXPOSED
PRIMARY	9	0 PC	11 PC	44 PC	0 PC	44 PC
INTERMEDIATE	134	0 PC	12 PC	51 PC	26 PC	10 PC
FULL	97	10 PC	0 PC	84 PC	6 PC	0 PC
ALL LEVELS	240	4 PC	7 PC	64 PC	17 PC	7 PC

MISSION 1019-1 INSTR - AFT 06-11-65 PROCESSING AND EXPOSURE ANALYSIS

PROCESS LEVEL	SAMPLE SIZE	UNDER EXPOSED	UNDER PROCESSED	CORRECT EXP+PROC	OVER PROCESSED	OVER EXPOSED
PRIMARY	6	0 PC	33 PC	17 PC	0 PC	50 PC
INTERMEDIATE	208	0 PC	13 PC	69 PC	15 PC	2 PC
FULL	24	4 PC	0 PC	88 PC	8 PC	0 PC
ALL LEVELS	238	1 PC	13 PC	70 PC	14 PC	3 PC

PROCESS LEVEL	BASE + FOG	UNDER EXPOSED	UNDER PROCESSED	CORRECT EXP+PROC	OVER PROCESSED	OVER EXPOSED
PRIMARY	0.01-0.09	0.01-0.13	0.14-0.39	0.40-0.90	---------	0.91 AND UP
INTERMED	0.10-0.17	0.01-0.20	0.21-0.39	0.40-0.90	0.91-1.34	1.35 AND UP
FULL	0.18 AND UP	0.01-0.35	---------	0.40-0.90	0.91-1.69	1.70 AND UP

~~TOP SECRET~~ [redacted]

Table 9

SECTION 10

PERFORMANCE MEASUREMENTS

The photography acquired by both panoramic cameras during Mission 1019-1 received an MIP rating of 85. A summary is tabulated below of the average visual RES values and MTF/AIM resolution values measured by AFSPPF and the MTF/AIM resolution values made by [redacted] The microdensimeter slit used by AFSPPF and [redacted] was 1 x 80 microns.

Mission	Camera	Visual RES	AFSPPF	[redacted]
1019-1	FWD	81	76	88
1019-1	AFT	99	83	87

The details of the measurement and computing techniques, targets measured and target locations are fully reported in the evaluation report [redacted] published by AFSPPF and are not normally included in this report.

SECTION 11

OBSERVED DATA

The fixed displays of ground test targets at Indian Springs and Pahrump, Nevada, were covered on pass D-47. The target bars were oriented about 20 degrees from the principal vehicle axes and thus are fair measures of along-track and cross-track performance. The following ground resolutions were indicated:

Target	Camera	Direction	Ground Resolution
Indian Springs	Forward	Along	Not resolved
		Cross	Not resolved
	Aft	Along	10 ft., 10 in.
		Cross	Not resolved
Pahrump	Forward	Along	9 ft., 8 in.
		Cross	9 ft., 8 in.
	Aft	Along	10 ft., 10 in.
		Cross	9 ft., 8 in.

The largest target at Indian Springs is the 10 foot, 10 inch size. While not resolved in three cases, it was nearly resolved. Thus, it appears reasonable to describe the average ground resolution achieved as about 10 feet. The general categories of objects that could be detected and recognized throughout the mission were comparable with those on the best of the recent J-system missions.

SECTION 12

MISSION 1019-1 STELLAR-INDEX CAMERA

A. COMPONENT ASSIGNMENT

Component	Serial Number
Camera	D 39
Index Reseau	39
Stellar Reseau	35

B. CAMERA DATA AND FLIGHT SETTINGS

Stellar Camera:

Lens	85mm f/1.8
Exposure Time	2 seconds
Filter Type	None
Film Type	Eastman Type 3401

Index Camera: [redacted]

Lens	[redacted]
Exposure Time	1/500 second
Filter Type	Wratten 21
Film Type	Eastman Type 3400

C. POST FLIGHT EVALUATION

The camera produced 401 frames of stellar and index photography. The index imagery is considered the best obtained to date. The stellar formats contained thirty or more star images and the quality is considered generally good. Approximately twenty-four of the stellar images showed evidence of some movement during the two second exposure. The dumbell-shaped image occurred most frequently (eight frames). Other disturbed images showed tails and elongated streaks ranging to an extreme case with a length to width ratio of nine. The dominant motion was most frequently associated with roll movement. It was noted that the streaked images occurred most frequently when a main camera was turned off.

SECTION 13

MISSION 1019-2 STELLAR-INDEX CAMERA

A. COMPONENT ASSIGNMENT

Component	Serial Number
Camera	D 19
Index Reseau	18
Stellar Reseau	19

B. CAMERA DATA AND FLIGHT SETTINGS

Stellar Camera:

Lens	85mm f/1.8
Exposure Time	2 seconds
Filter Type	None
Film Type	Eastman Type 3401

Index Camera:

Lens	[redacted]
Exposure Time	1/500 second
Filter Type	Wratten 21
Film Type	Eastman Type 3400

C. POST FLIGHT EVALUATION

No recovery.

[redacted]

SECTION 14

VEHICLE ATTITUDE

The vehicle attitude errors for Mission 1019-1 were derived from the reduction of the Stellar camera photography. This attitude data is supplied to A/P by NPIC.

The attitude errors for each frame and the attitude control rates are calculated at the A/P computer facility. The computer also plots the frequency distribution of the rates and errors. Figures 14-1 through 14-6 show these distributions for Mission 1019-1.

The summary table below lists the maximum attitude errors and rates that were experienced during 90% of the FWD photographic operations, excluding the first six frames of each operation, and the total range of the errors and rates.

	Mission 1019-1	
Values	90%	Range
Pitch Error (°)	0.43	-0.65 to +0.80
Roll Error (°)	0.36	-0.50 to +0.70
Yaw Error (°)	0.97	-1.5 to +0.65
Pitch Rate (°/Hr)	31.56	-80 to +50
Roll Rate (°/Hr)	34.73	-90 to +100
Yaw Rate (°/Hr)	33.01	-85 to +90

The performance of the attitude control system is comparable to the control systems used on recent missions. The panoramic photography was not degraded by the attitude control system.

Figure 14-7 shows roll data from pass D-05. It should be noted that alignment bias has not been removed, so that only relative magnitudes are significant. The effect of uncompensated moments in the pan instruments is clearly evident. It is the same uncompensated movements that cause the stellar image disturbances described earlier in this report.

J-04 A BUCKET - FWD INSTR - FRAMES 1-6 OF EACH OP OMITTED - 90 PERCENT - 0[illegible]

Y - PITCH ANGLE ERROR - DEGREES (X) VERSUS FREQUENCY - PERCENT (Y)

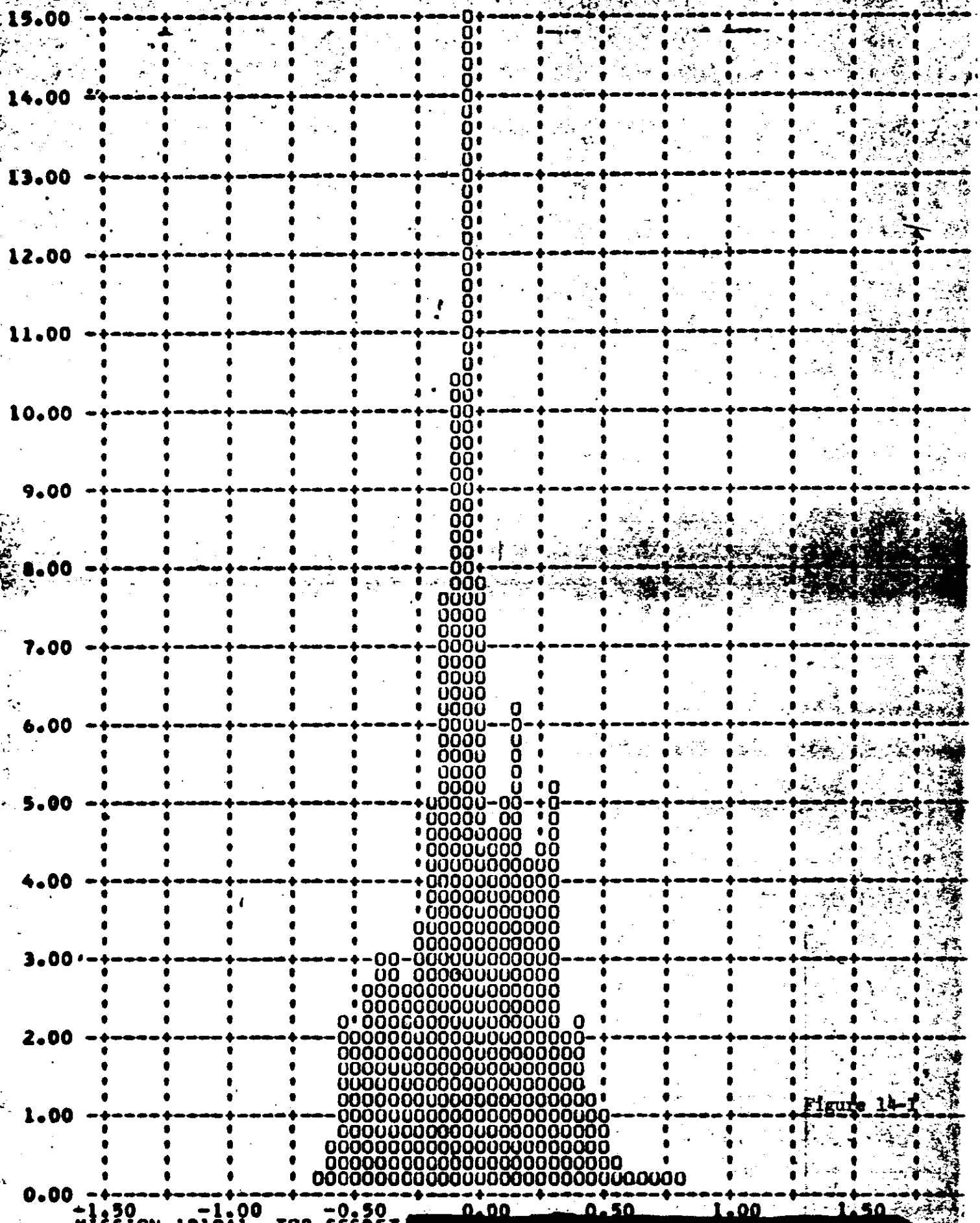


Figure 14-1

J-04 A BUCKET - FWD INSTR - FRAMES 1-6 OF EACH OP OMITTED 90 PERCENT = 0.

Y ROLL ANGLE ERROR - DEGREES (X) VERSUS FREQUENCY - PERCENT (Y)

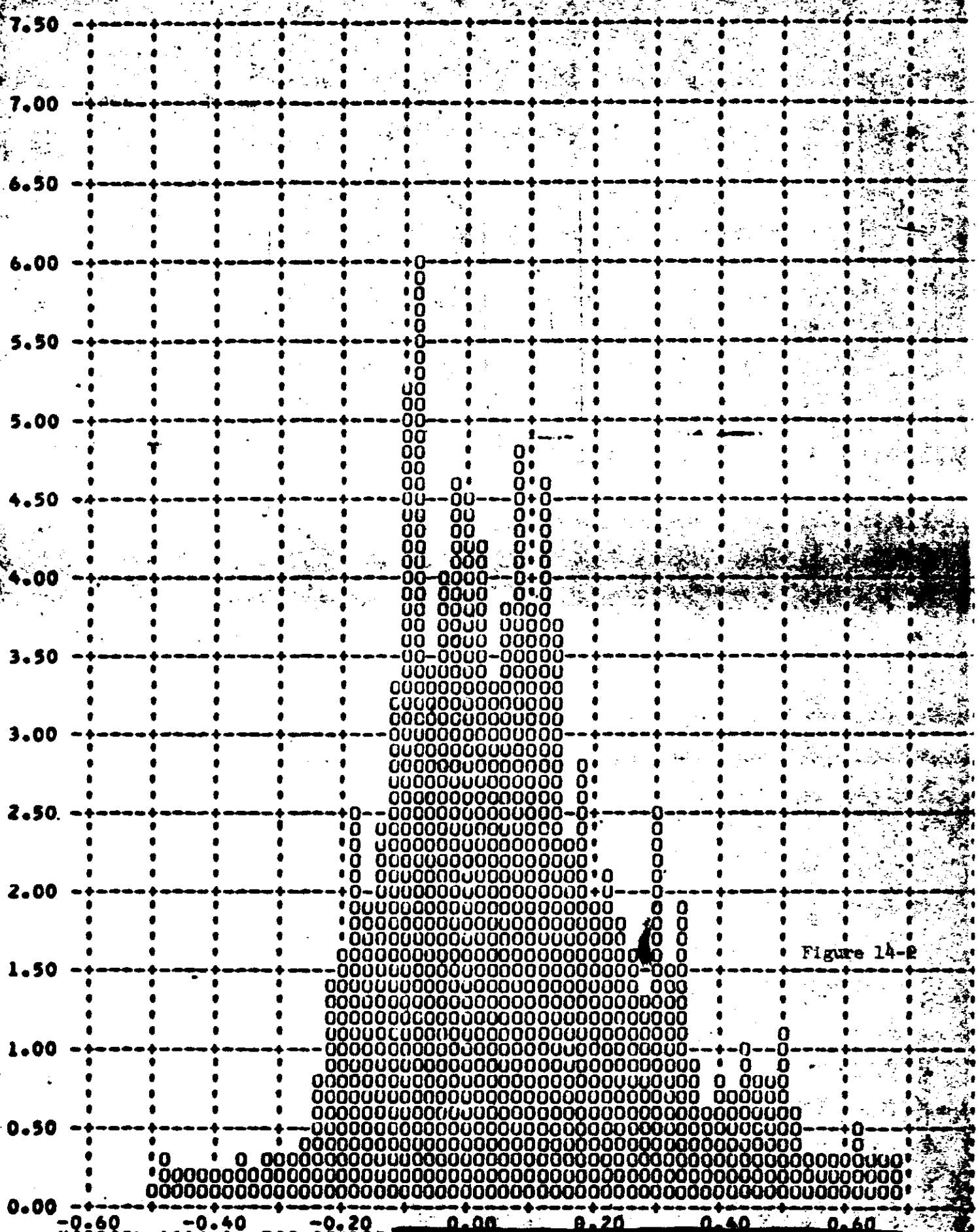


Figure 14-2

J-04 A BUCKET - FWD INSTR - FRAMES 1-6 OF EACH OP OMITTED - 90 PERCENT = 0.5

Y YAW ANGLE ERROR - DEGREES (X) VERSUS FREQUENCY - PERCENT (Y)

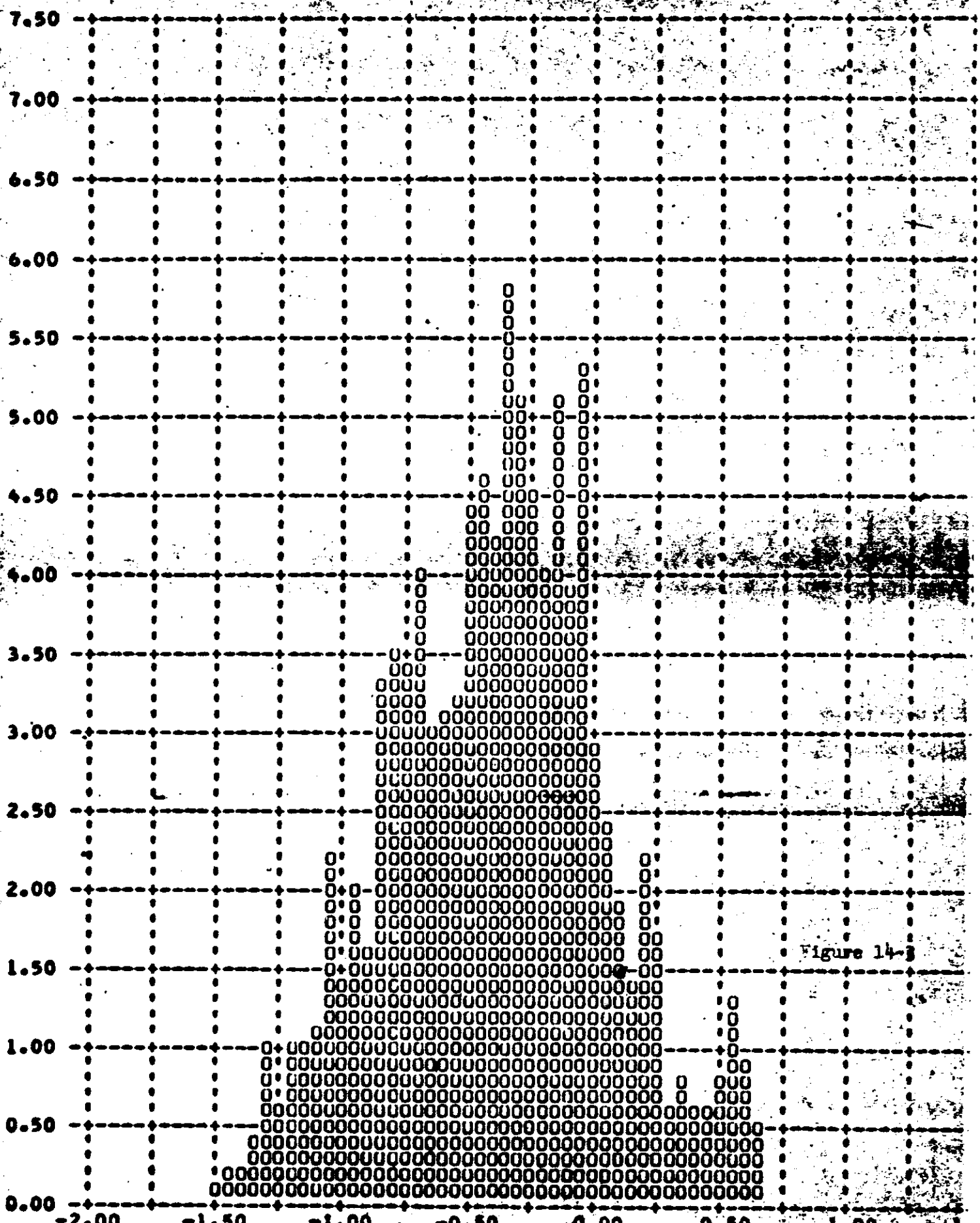


Figure 14-3

J-04 A BUCKET - FWD INSTR FRAMES 1-6 OF EACH OP OMITTED 90 PERCENT = 31

Y PITCH RATE ERROR - DEG/HOUR (X) VERSUS FREQUENCY - PERCENT (Y)

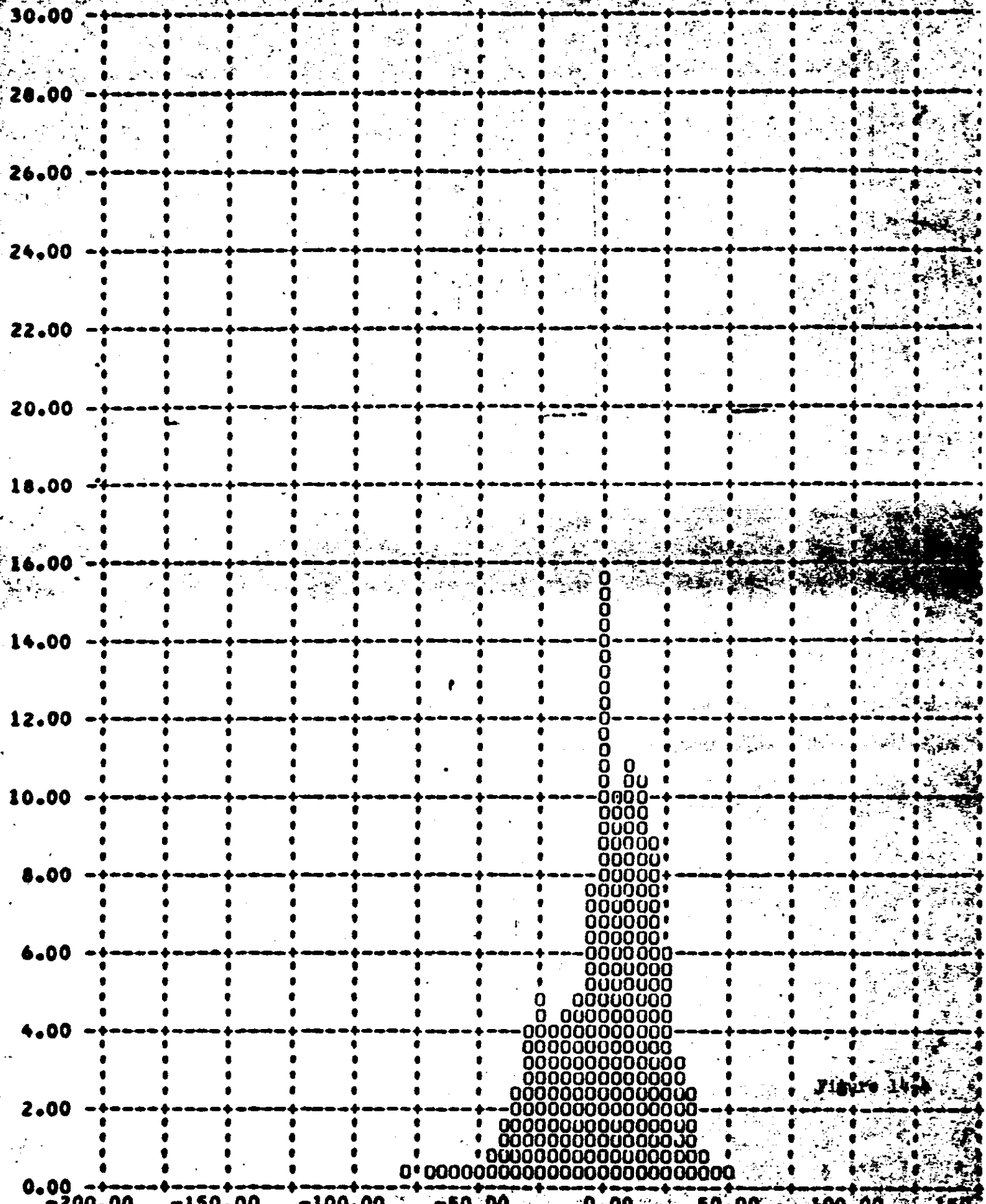


Figure 14-4

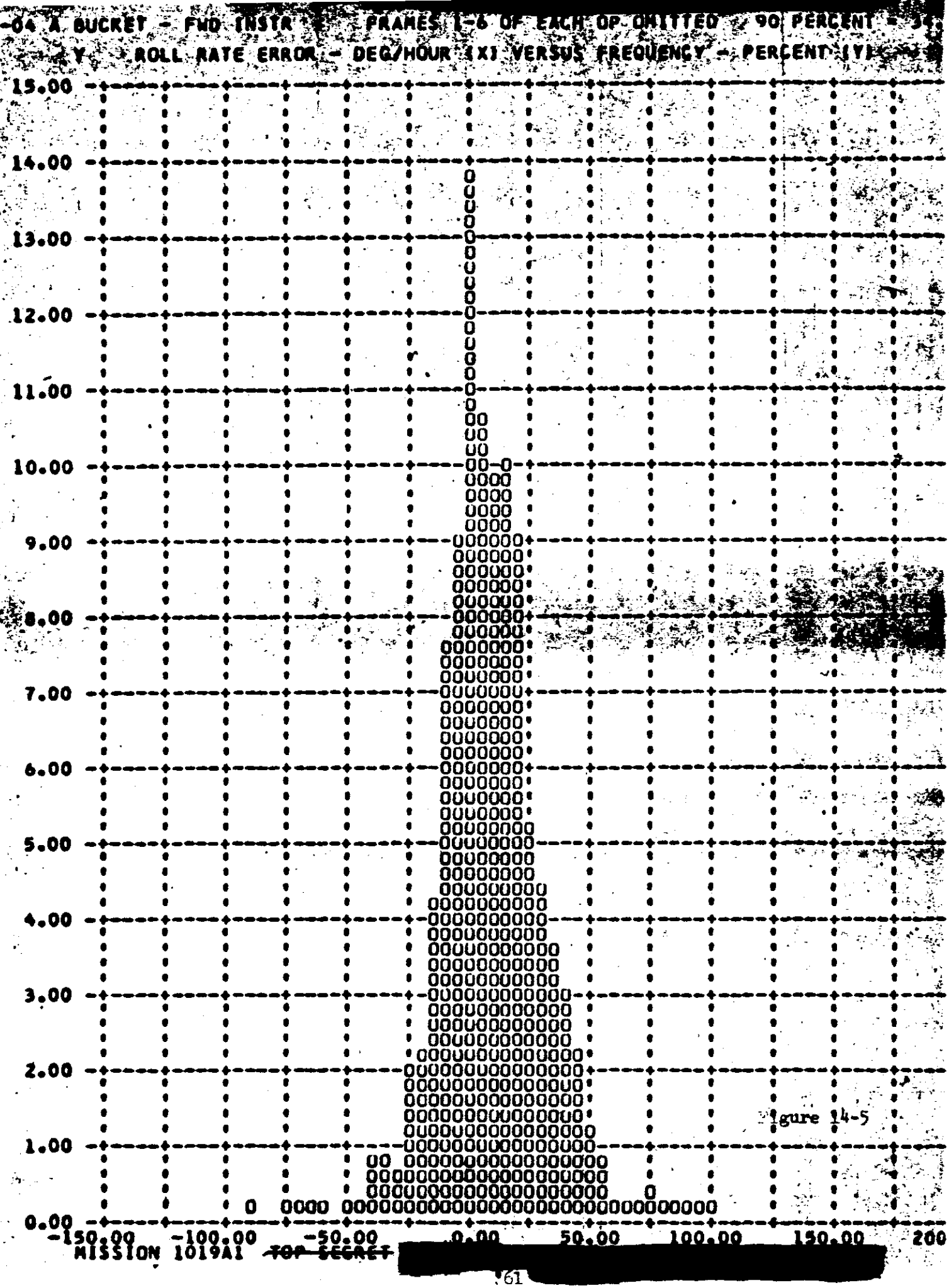

J-04 A BUCKET - FWD INSTR - FRAMES 1-6 OF EACH OP OMITTED - 90 PERCENT = 34.
Y - ROLL RATE ERROR - DEG/HOUR (X) VERSUS FREQUENCY - PERCENT (Y)
15.00
14.00
13.00
12.00
11.00
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
-150.00
-100.00
-50.00
0.00
50.00
100.00
150.00
200

Figure 14-5

J-04 A BUCKET - FWD INSTR FRAMES 1-6 OF EACH OP OMITTED 90 PERCENT = 33.(

Y YAW RATE ERROR - DEG/HOUR (X) VERSUS FREQUENCY - PERCENT (Y)

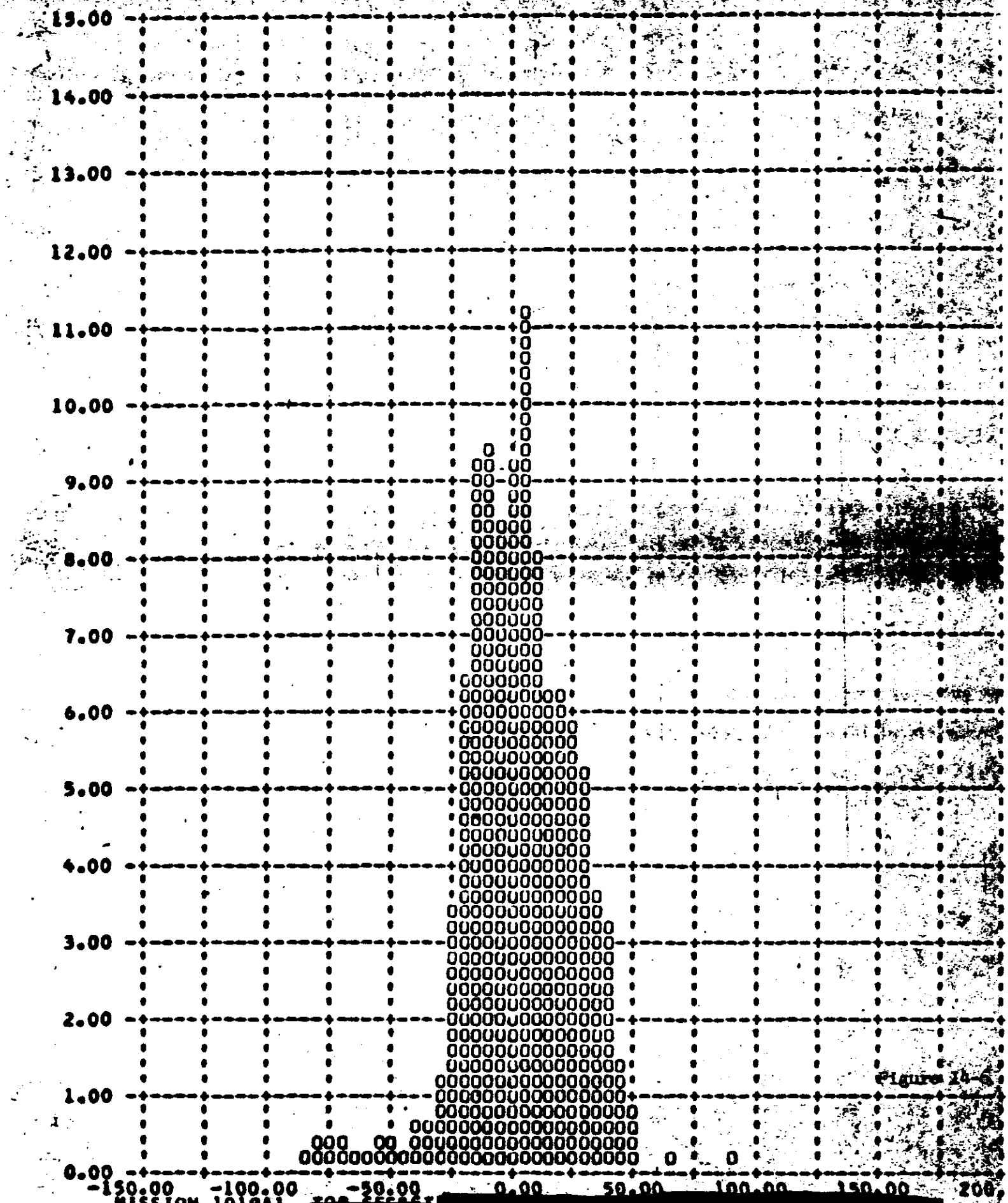
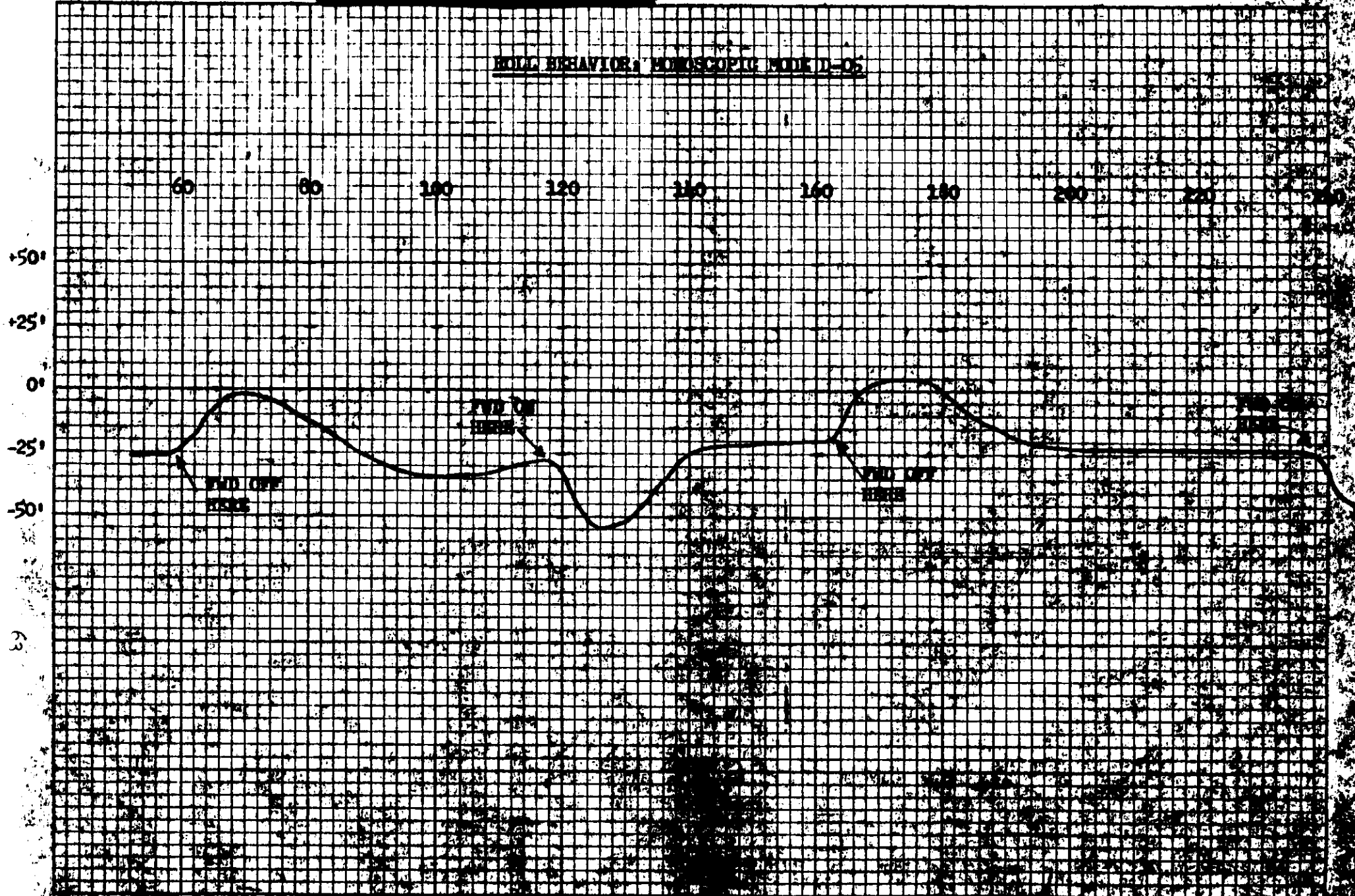


Figure 14-6

ROLL BEHAVIOR, MONOSCOPIC MODE D-05



SECTION 15

IMAGE SMEAR ANALYSIS

The frame correlation tape supplied to A/P by NPIC contains the binary time word of each frame of photography. A computer program has been assembled at A/P which calculates the exposure time of each frame and compares the camera cycle rate with the ephemeris to calculate the V/h mismatch. This data is combined with the vehicle attitude error and rate values of each frame and the crab error caused by earth rotation at the latitude of each frame. The program outputs the total along track and cross track IMC error and the limit of ground resolution that can be acquired by a camera regardless of focal length and system capabilities.

The computer rejects the first six frames of all operations as the large V/h error induced by camera start-up is not representative of the overall system operations. The frequency distribution of the V/h errors and resolution limits are computer plotted and are shown in Figures 15-1 through 15-6.

The summary table, 15-1, below presents the maximum V/h ratio errors and resolution limits that existed during 90% of the photographic operations and the total range of values during all operations that were computed.

			Mission 1019-1	
Value	Units	Camera	90%	Range
V/h Ratio Error	%	FWD	3.33	-5.0 to +4.6
		AFT	3.40	-9.4 to +2.6
Along Track Resolution Limit	Feet	FWD	9.32	0.2 to 12.6
		AFT	4.76	0.2 to 6.8
Cross Track Resolution Limit	Feet	FWD	9.13	0.8 to 11.4
		AFT	6.51	0.6 to 8.0

TABLE 15-1

J-04 A BUCKET - FWD INSTR ' FRAMES 1-6 OF EACH OP OMITTED 90 PERCENT = 3.

Y V/H RATIO ERROR - PERCENT (X) VERSUS FREQUENCY - PERCENT (Y)

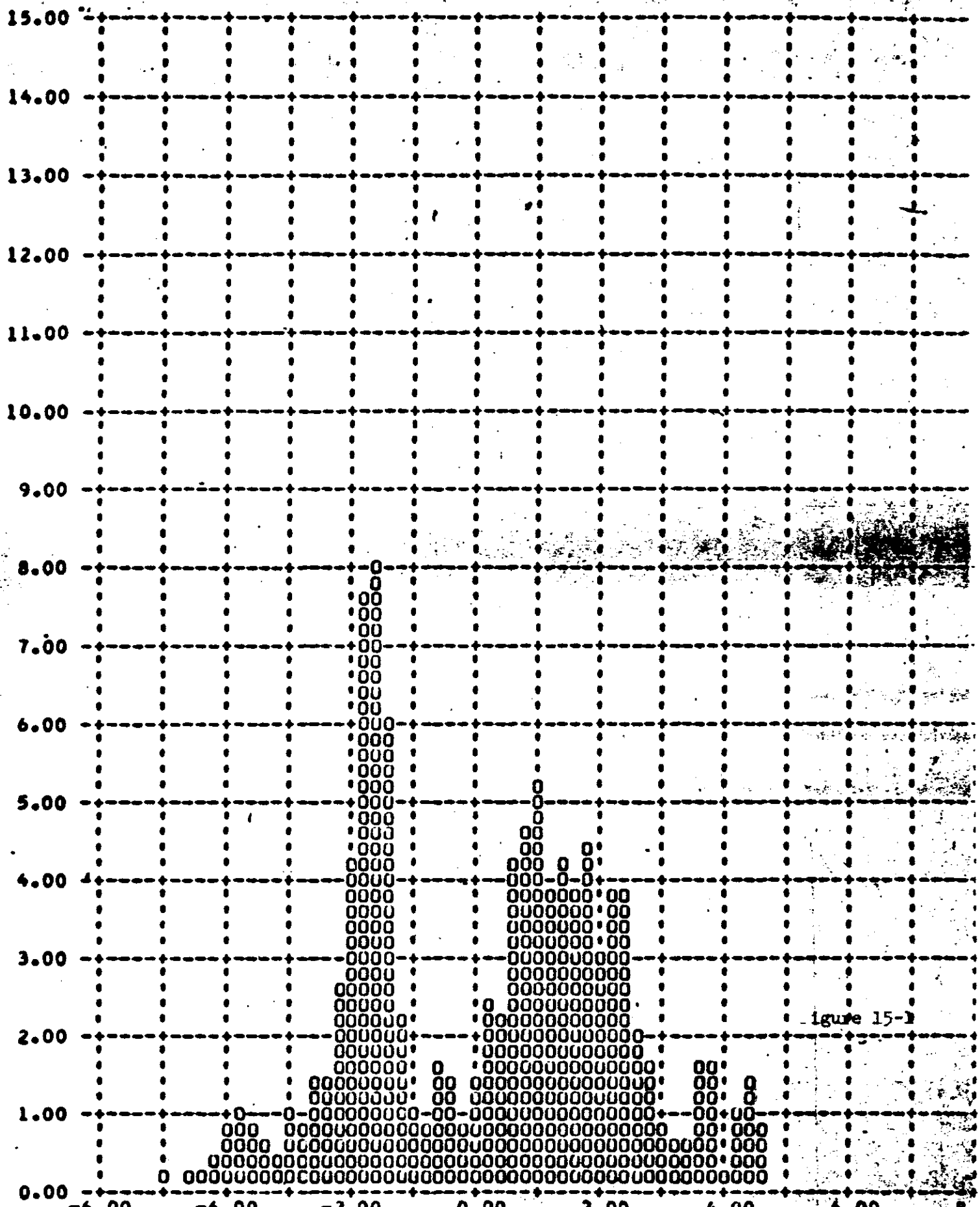


Figure 15-1

J-04 A BUCKET - FWD INSTR FRAMES 1-6 OF EACH OP OMITTED 90 PERCENT = 9.

Y ALONG TRACK RESOLUTION LIMIT - FEET (X) VERSUS FREQUENCY - PERCENT (Y

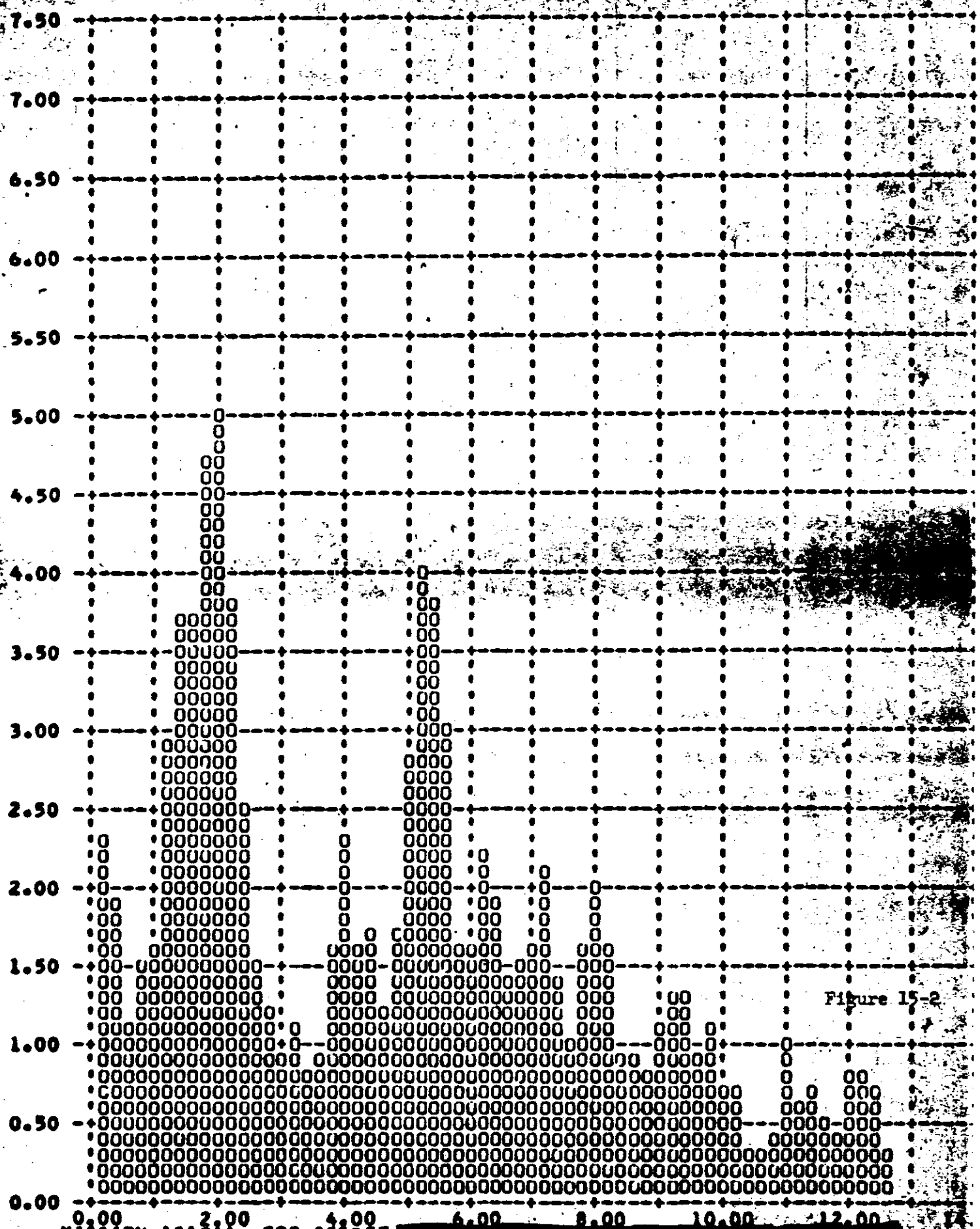


Figure 15-2

J-04 A BUCKET - PRO INSTR - FRAMES 1-8 OF EACH OF UNITED - 90 PERCENT = 9.1

Y - CROSS TRACK RESOLUTION LIMIT - FEET (X) VERSUS FREQUENCY - PERCENT (Y

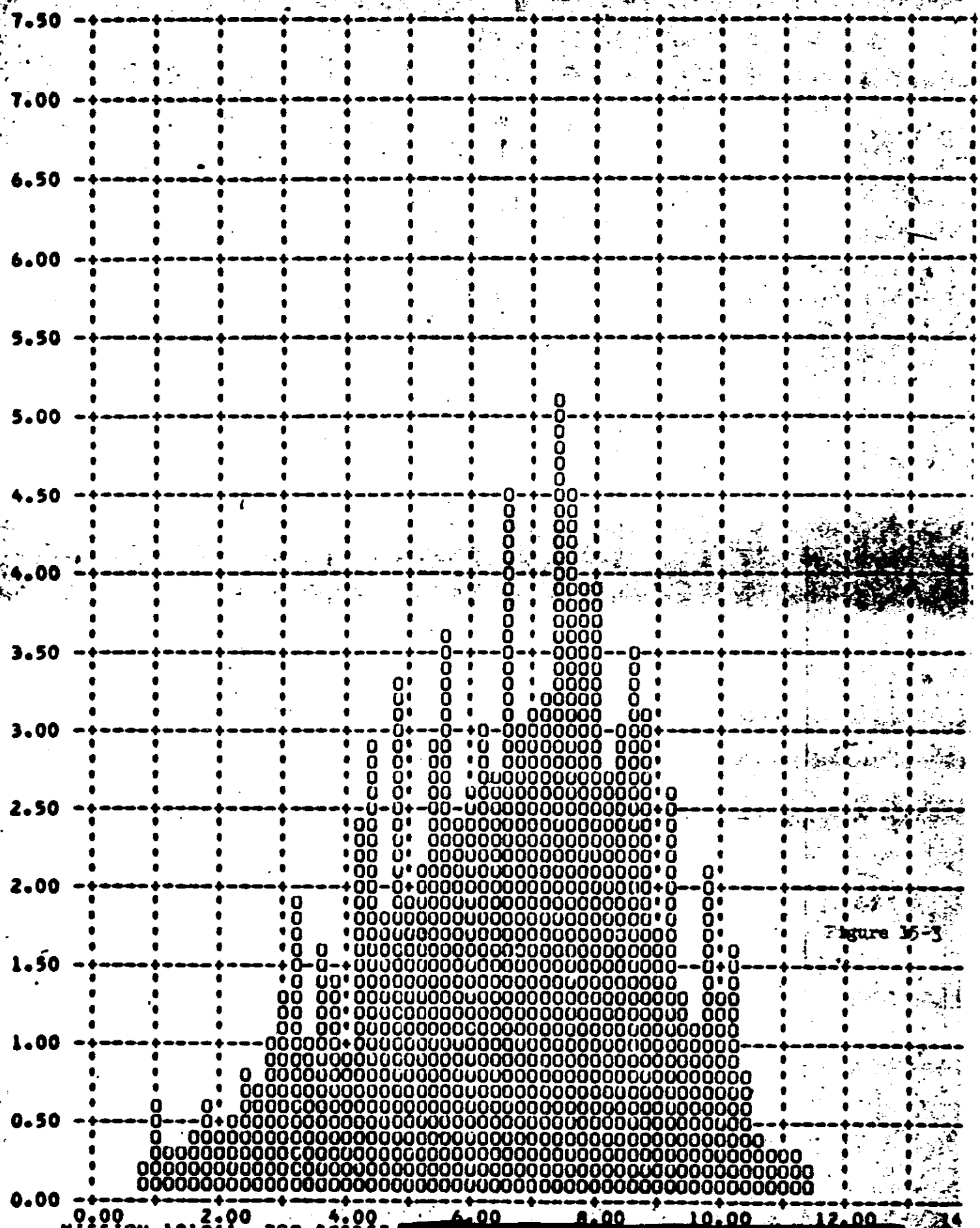


Figure 15-3

J-04

FRAMES 1-6 OF EACH OP OMITTED 90 PERCENT = 3.4(

Y V/H RATIO ERROR - PERCENT (X) VERSUS FREQUENCY - PERCENT (Y)

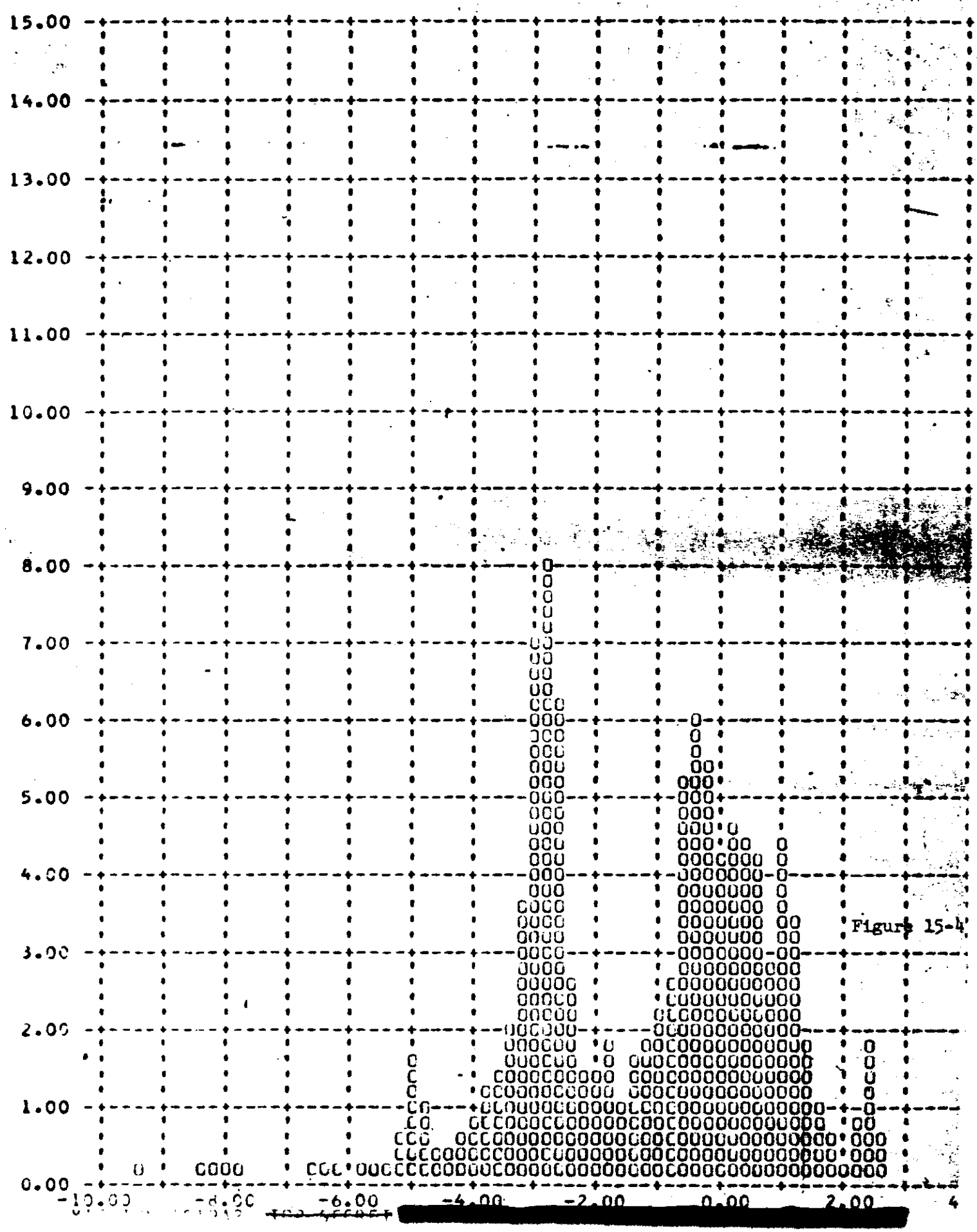


Figure 15-4

[redacted]

FRAMES 1-6 OF EACH OP OMITTED 90 PERCENT = 4.76

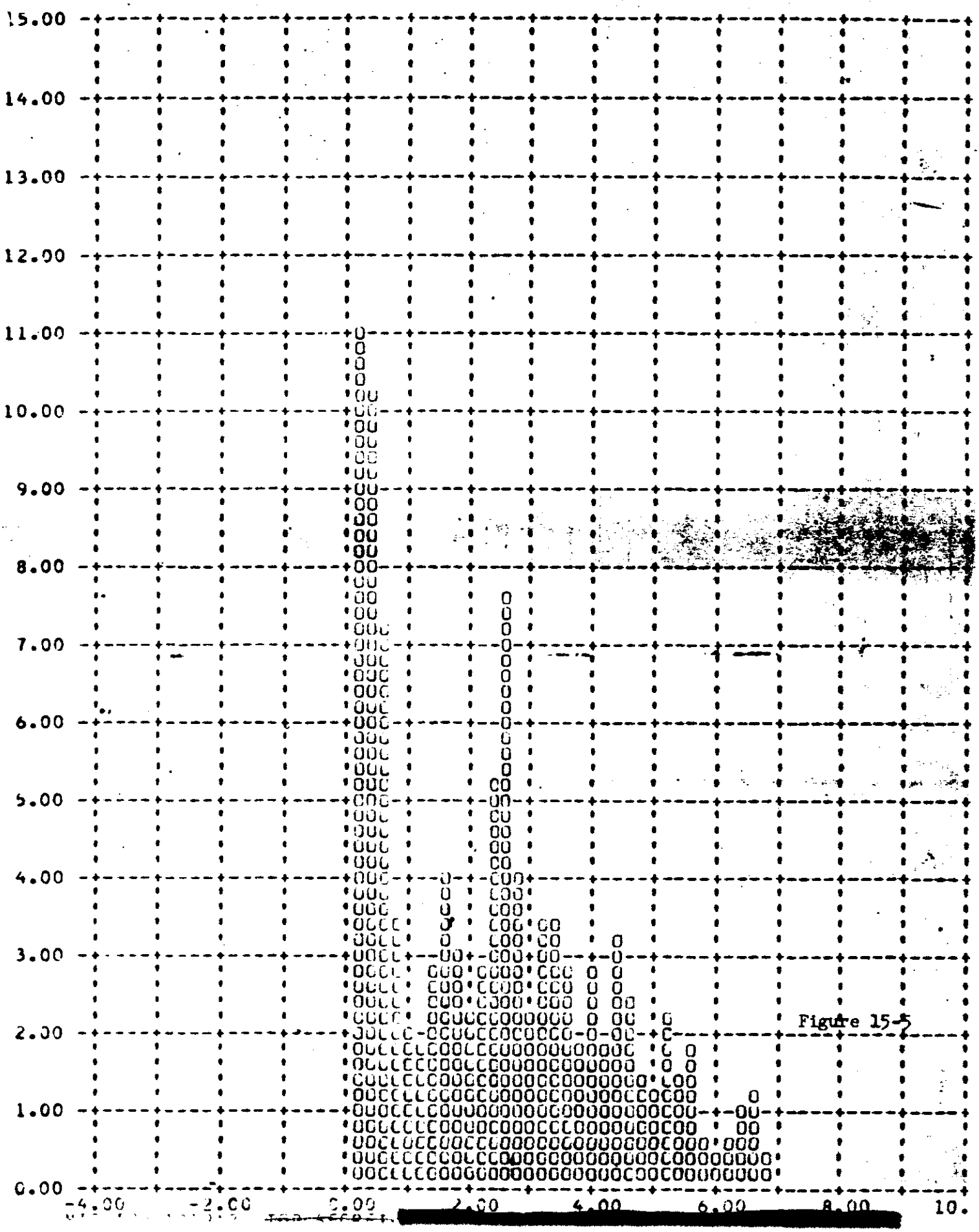


Figure 15-5

FRAMES 1-6 OF EACH OP OMITTED 90 PERCENT = 6.

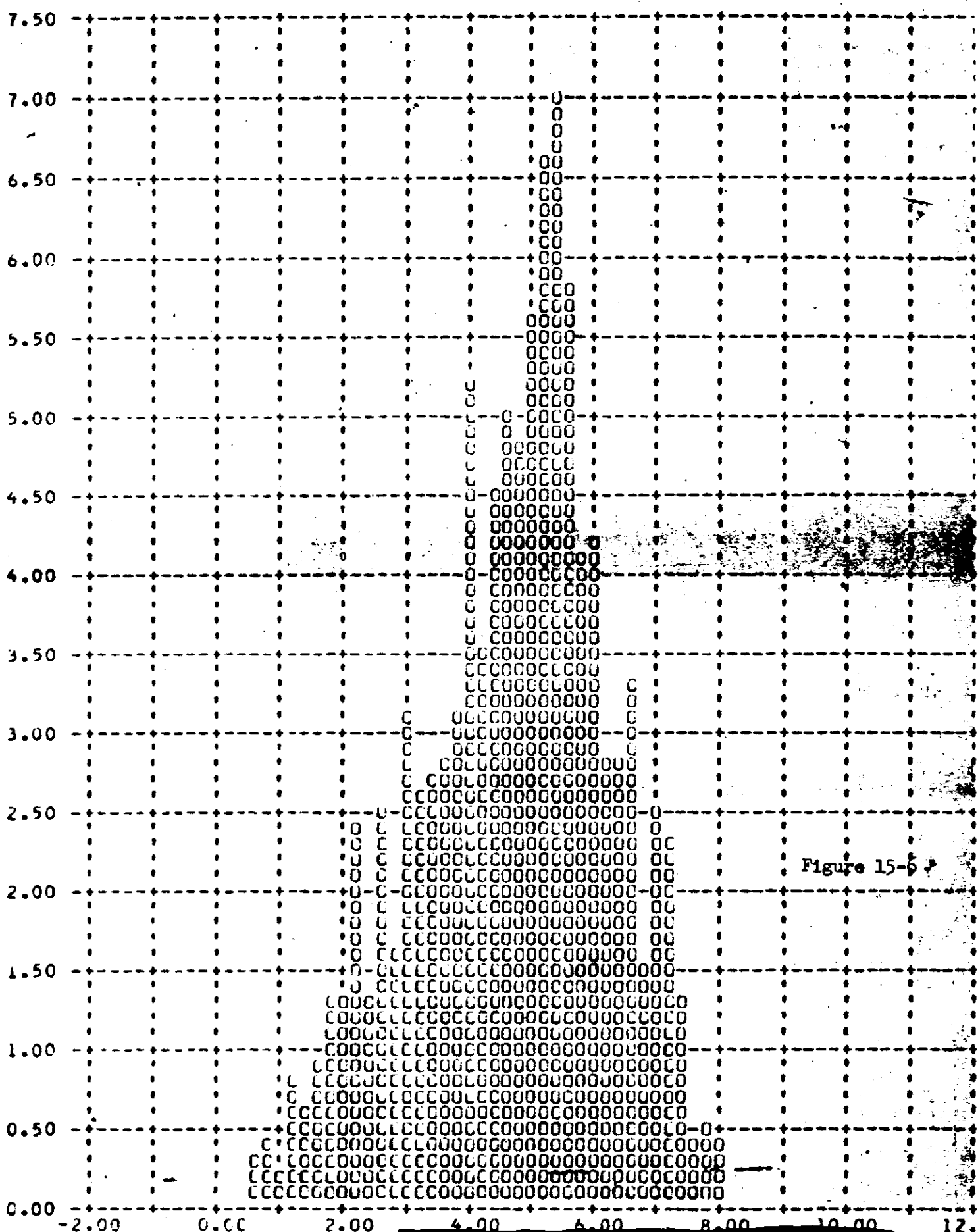


Figure 15-6

[redacted]

SECTION 16

RADIATION DOSAGE

Each recovery system flown on a Corona mission contains a sealed packet of Eastman Type 3401 and Royal X Pan emuslions to determine the total radiation received at the take-up cassette. Both film types have been irradiated by LMSC at various levels and the base plus fog densities recorded after controlled processing.

Following recovery the film dosimeter packets are removed at A/P and processed with a pre-flight sample of the same film type and sensitometric control film. The resulting base plus fog density measurement of the dosimeter strips is used to ascertain the total radiation level. The table below presents the base plug fog readings for the dosimeter strips and the radiation level equivalents.

Mission 1019-1

Emulsion	B + F Density	Radiation
Type 3401	.18	0.6R
Royal X Pan	.24	0.4R

This mean total radiation seen by the take-up cassettes during both missions was approximately 0.5 roentgens. This level is essentially the same as received during recent missions and is below the level that will degrade the panoramic photography.

[redacted]

SECTION 17

SYSTEM RELIABILITY

Reliability calculations for the payload are based on a sample beginning with M-7. Hence both the major part of the Mural Program and the "J" Program are covered in the calculation. For certain auxiliaries, i.e., the stellar-index camera and the horizon cameras, the sample size is changed to recognize incorporation of modified equipment or new designs where reliability was one of the principal reasons for the modification. However, for primary mission function, the sample size is consistent with reliability reporting for the vehicle.

The realiability estimates of this section deal exclusively with the payload. Failures to achieve orbit or vehicle induced failures are thereby excluded. Recoveries before a complete mission has been completed are considered as full missions providing that early termination was caused by reasons not connected with payload operation. Film quality is not considered in the reliability estimate calculation. Hence, only electrical and mechanical functioning are considered.

The reliability estimate is also divided into primary and secondary functions. The primary functions are operation of the panoramic cameras, main camera door operation, operation of the payload clock, and recovery operations. The secondary mission functions are horizon camera operation excluding catastrophic open shutter failure mode, auxiliary data recording, and stellar-index camera operation. A summary of estimated reliability is shown in Table 17-1.

Panoramic Camera Reliability

Sample Size - 102 opportunities to operate.
One failure - S/I programming on System J-19
Assume - 3000 cycles per camera per mission.
Estimated reliability = 98.4% at 50% confidence level

Main Camera Door Reliability

Sample Size - 37 vehicles x 2 doors = 74 opportunities to operate

Estimated reliability = 99.1% at 50% confidence level

Payload Command and Control Reliability

Sample Size - 5136 hours operation

One failure

Estimated reliability = 96.9% at 50% confidence level

Payload Clock Reliability

Sample Size - 5136 hours operation

No Failures

Estimated Reliability = 98.7% at 50% confidence level

Estimated Reliability of Payload Functioning on orbit = 96.8% at 50% confidence level

Recovery System Reliability

39 opportunities to recover

1 Failure - improper separation due to water seal - cutter failure

Estimated reliability = 95.8% at 50% confidence level

Stellar-Index Camera Reliability

Sample begins with J-5

Sample size = 8075 cycles

Number of failures = 1

Estimated reliability = 91.5% at 50% confidence level

Horizon Camera Reliability

Sample includes J5A, and up

Sample Size = 43,500 cycles

Estimated reliability of single camera = 97.6% at 50% confidence level

Estimated reliability of four horizon cameras at a Parallel redundant system = 99.9% at 50% confidence level.

[redacted]

ESTIMATED RELIABILITY SUMMARY

(AT 50% CONFIDENCE LEVEL)

MISSION NUMBER	PRIMARY FUNCTIONS						SECONDARY FUNCTIONS	
	PANORAMIC CAMERA	PANORAMIC CAMERA BOOST	COMMAND & CONTROL SYSTEM	PAYLOAD SYSTEM	ON-ORBIT FUNCTIONS	RECOVERY SYSTEM	STELLAR-INDEX CAMERAS	MISSION RECORDER
	SAMPLE FAILURES RELIABILITY	SAMPLE FAILURES RELIABILITY	SAMPLE FAILURES RELIABILITY	SAMPLE FAILURES RELIABILITY	RELIABILITY	SAMPLE FAILURES RELIABILITY	SAMPLE FAILURES RELIABILITY	SAMPLE FAILURES RELIABILITY
1009 TO 1059	60 1 98.3	52 0 98.8	3104 0 99.0	3104 0 99.0	96.1	58 1 98.7	2400 0 99.4	12,000 0 99.97
1060	60 1 97.4	54 0 98.7	2816 0 99.0	2816 0 99.0	96.2	60 1 91.8	4800 0 99.8	24,000 0 99.99
1010	62 1 97.8	56 0 98.8	3432 0 99.1	3432 0 99.1	96.4	62 1 98.8	5200 0 99.8	26,000 0 99.99
1011	72 1 97.7	66 0 98.9	3960 0 99.1	3960 0 99.1	96.5	68 1 98.9	5800 0 99.8	29,000 0 99.99
1012	76 1 97.8	68 0 98.9	4256 0 99.2	4256 0 99.2	96.6	70 1 98.9	6600 0 99.8	34,000 0 99.99
1013	78 1 97.9	72 0 98.9	4940 1 99.0	4940 1 99.3	96.8	76 1 98.9	7200 0 99.8	36,000 0 99.99
1014	82 1 98.0	74 0 98.9	5256 1 99.1	5256 1 99.3	96.9	78 1 98.9	7800 0 99.8	39,000 0 99.99
1015	86 1 98.0	80 0 98.9	5720 1 99.2	5720 1 99.3	96.1	84 1 98.9	8400 0 99.8	42,000 0 99.99
1016	88 1 98.1	82 0 98.9	6072 1 99.2	6072 1 99.3	96.4	86 1 98.9	9000 0 99.8	45,000 0 99.99
1017	92 1 98.2	86 0 98.9	6424 1 99.2	6424 1 99.3	96.5	92 1 98.9	9600 0 99.8	48,000 0 99.99
1018	96 1 98.2	90 0 98.9	6776 1 99.2	6776 1 99.3	96.6	96 1 98.9	10,200 0 99.8	51,000 0 99.99
1019	98 1 98.3	92 0 98.9	7128 1 99.2	7128 1 99.3	96.7	98 1 98.9	10,800 0 99.8	54,000 0 99.99
1020	102 1 98.3	96 0 98.9	7480 1 99.2	7480 1 99.3	96.8	102 1 98.9	11,400 0 99.8	57,000 0 99.99
1021	106 1 98.4	100 0 98.9	7832 1 99.2	7832 1 99.3	96.9	106 1 98.9	12,000 0 99.8	60,000 0 99.99
1022	110 1 98.4	104 0 98.9	8184 1 99.2	8184 1 99.3	96.1	110 1 98.9	12,600 0 99.8	63,000 0 99.99
1023	114 1 98.4	108 0 98.9	8536 1 99.2	8536 1 99.3	96.2	114 1 98.9	13,200 0 99.8	66,000 0 99.99
1024	118 1 98.4	112 0 98.9	8888 1 99.2	8888 1 99.3	96.3	118 1 98.9	13,800 0 99.8	69,000 0 99.99
1025	122 1 98.4	116 0 98.9	9240 1 99.2	9240 1 99.3	96.4	122 1 98.9	14,400 0 99.8	72,000 0 99.99

SECTION 18

SUMMARY DATA

The comparison of the operating parameters and the performance achieved by previous missions has been difficult due to the large volume of data that results from each mission. Some of the pertinent characteristics from prior missions have been summarized in Tables 18-1 through 18-3.

The summary data was started with Mission 1004 as the J-05 camera system was the first to incorporate the major modifications of the titanium drum and scan arm, four roller scan head and Corona J capabilities. Only those missions that culminated in the recovery of some photography have been listed, therefore, Missions 1003 and 1005 are deleted.

[redacted]

MISSION SUMMARY

MISSION NUMBER	PAYLOAD NUMBER	VEHICLE NUMBER	LAUNCH DATE	LAUNCH TIME	ORBIT INCLINATION (°)	PERIGEE ALTITUDE (NM)	PERIGEE LOCATION (°N)	RECOVERY PASS	MASTER CAMERA CAMERA NUMBER	MASTER CAMERA SLIT (")	MASTER CAMERA FILTER TYPE	SLAVE CAMERA CAMERA NUMBER	SLAVE CAMERA SLIT (")	SLAVE CAMERA FILTER TYPE	STELLAR-INDEX CAMERA NUMBER
1004	J-08	1174	2/15/64	2138 Z	74.9	99.9	29.0	49 / 112	124	0.250	W-21	125	0.250	W-21	029/29/29 / 042/42/37
1006	J-09	1176	6/4/64	2259 Z	79.9	84.0	65.2	65 / 128	148	0.200	W-21	149	0.200	W-21	045/47/45 / 049/53/42
1007	J-07	1609	6/19/64	2318 Z	85.0	99.2	41.5	65 / 128	144	0.250	W-25	145	0.200	W-21	043/43/43 / 064/56/51
1008	J-10	1177	7/10/64	2314 Z	85.0	99.4	40.8	49 / 112	150	0.200	W-21	151	0.200	W-21	048/45/48 / 033/26/23
1009	J-12	1605	8/8/64	2316 Z	80.1	99.6	39.5	49 / 128	154	0.200	W-21	155	0.200	W-21	036/34/36 / 038/38/34
1010	J-11	1178	9/14/64	2254 Z	84.9	97.4	42.6	65 / 144	152	0.175	W-21	153	0.175	W-21	041/41/41 / 044/46/44
1011	J-3X	1170	10/8/64	2150 Z	79.9	99.3	20.9	65 / —	160	0.175	W-21	161	0.175	W-21	030/30/30 / 057/57/52
1012	J-13	1179	10/17/64	2202 Z	75.0	98.2	32.4	49 / 81	156	0.200	W-21	157	0.200	W-21	031/31/47 / 048/52/55
1013	J-15	1175	11/2/64	2130 Z	80.0	100.0	25.0	65 / 81	158	0.225	W-21	159	0.225	W-21	056/49/58 / 042/48/54
1014	J-16	1180	11/18/64	2036 Z	70.0	103.2	69.6	81 / 145	162	0.250	W-25	139	0.175	W-21	053/59/49 / 050/44/46
1015	J-17	1607	12/19/64	2110 Z	74.9	96.7	21.5	81 / 175	138	0.250	W-25	141	0.175	W-21	061/61/61 / 058/58/58
1016	J-18	1608	1/15/65	2101 Z	74.9	99.4	30.2	81 / 159	132	0.250	W-25	133	0.175	W-21	056/55/50 / 059/60/59
1017	J-14	1611	2/25/65	2144 Z	75.0	97.2	28.9	81 / 145	140	0.250	W-25	168	0.175	W-21	021/21/21 / 060/62/71
1018	J-19	1612	3/25/65	2111 Z	98.0	100.2	40.3	65 / 99	122	0.250	W-25	123	0.175	W-21	020/20/20 / 022/22/22
1019	J-04	1614	4/23/65	2144 Z	85.0	99.1	27.1	80 / —	118	0.250	W-25	119	0.175	W-21	038/38/38 / 018/18/19

[redacted]

Table 18-1

[redacted]

PERFORMANCE SUMMARY

MISSION NUMBER	CAMERA	SERIAL NUMBER	M T F VALUE	VISUAL RES	AFSPPL MTF/AIM SLIT (μ)	AFSPPL MTF/AIM AVERAGE	[redacted] SLIT (μ)	[redacted] AVERAGE	SLIT (μ)	AVERAGE ALL	AVERAGE HIGH	90% ATTITUDE ERROR (°) PITCH	90% ATTITUDE ERROR (°) ROLL	90% ATTITUDE ERROR (°) YAW	90% ATTITUDE RATES (7HR) PITCH	90% ATTITUDE RATES (7HR) ROLL	90% ATTITUDE RATES (7HR) YAW	90% V/H ERROR (%)	90% RESOLUTION LIMIT (FEET) ALONG TRACK	90% RESOLUTION LIMIT (FEET) CROSS TRACK
1004-1	FWD	124	85	78	350	97	43	109	320	115	127	0.45	0.42	1.08	30.0	25.0	21.0	5.1	7.7	6.[illegible]
	AFT			86		80		96		117	124									
1004-2	FWD	125	85	78		88		113		82	90	0.74	0.50	0.91	44.0	30.0	29.0	4.9	6.8	6.5
	AFT			73		83		106		89	95									
1006-1	FWD	148	90	78	350	65	43	88	320	84	97	0.41	0.42	1.14	26.8	28.5	27.8	15.4	13.8	6.[illegible]
	AFT			74		71		90		87	92									
1006-2	FWD	149	90	86		64		81		84	90	0.49	0.40	1.08	31.1	27.9	30.0	11.6	10.1	7.0
	AFT			83		72		90		87	94									
1007-1	FWD	144	85	80	350	60	43	87	320	92	91	0.58	0.48	1.43	37.6	28.9	29.9	3.6	3.1	2.4
	AFT			86		63		83		97	110							4.8	2.1	1.8
1007-2	FWD	145	85	79		72		81		68	74	0.64	0.47	—	43.0	26.9	—	3.2	2.4	—
	AFT			81		77		92		74	81							4.2	1.8	—
1008-1	FWD	150	85	80	350	80	43	95	320	81	89	0.58	0.39	0.94	43.8	23.9	29.6	2.9	4.8	3.[illegible]
	AFT			78		73		89		86	95									
1008-2	FWD	151	85	82		84		96		83	92	0.63	0.36	0.71	42.9	24.0	32.5	2.8	4.8	3.[illegible]
	AFT			79		91		83		85	91									
1009-1	FWD	154	85	92	350	80	—	—	80	75	88	0.66	0.65	0.71	28.2	22.7	27.6	3.3	8.8	5.[illegible]
	AFT			89		85				75	83									
1009-2	FWD	155	85	94		85				76	84	0.48	0.65	0.59	33.6	23.9	27.2	2.6	4.9	3.[illegible]
	AFT			87		87				72	79									
1010-1	FWD	162	85	90	350	90	80	88	80	87	98	0.53	0.30	0.87	39.1	23.6	30.8	4.5	2.3	1.[illegible]
	AFT			88		86		80		92	103									
1010-2	FWD	155	85	92		81		82		82	93	0.86	0.70	1.21	45.4	23.6	30.7	4.6	7.5	3.[illegible]
	AFT			90		82		85		87	98									
1011-1	FWD	160	90	84	350	78	80	96	80	78	87	0.77	0.39	0.97	43.1	28.9	31.1	2.8	5.3	4.[illegible]
	AFT	161		84		77		86		83	93									
1012-1	FWD	156	85	92	—	—	80	91	80	84	98	0.66	0.51	—	47.1	33.2	—	3.8	4.[illegible]	[illegible]
	AFT			91				87		89	100									
1012-2	FWD	157	85	91				89		84	91	0.86	0.77	0.81	45.2	30.7	30.4	4.8	5.5	[illegible]
	AFT			89				96		85	98									
1013-1	FWD	158	85	89	—	—	80	94	80	85	99	0.48	0.32	1.34	36.9	29.0	32.5	3.7	7.8	[illegible]
	AFT	159		77				97		81	103	0.84	0.32	1.84	36.9	29.0	32.5	3.7	5.8	[illegible]
1014-1	FWD	162	80	87	—	—	80	78	80	74	86	0.62	0.41	1.46	35.0	38.1	38.5	2.2	8.2	6.[illegible]
	AFT			83				80		95	107	0.82	0.41	1.44	34.8	36.0	38.2	3.3	2.8	[illegible]
1014-2	FWD	139	80	83				75		70	77	1.08	0.55	—	38.4	36.4	—	1.4	6.4	—
	AFT			86				84		80	88	1.06	0.59	—	38.1	36.0	—	3.2	2.2	—
1015-1	FWD	138	85	87	—	—	80	76	80	90		0.48	0.38	0.83	47.0	28.4	38.2	8.0	3.8	7.8
	AFT			87				73		97	—	0.80	0.39	0.83	46.9	29.2	38.2	6.3	3.4	5.5
1015-2	FWD	141	85	83				72		89										
	AFT			82				72		90										
1016-1	FWD	132	85	85	—	—	80	86	80	81		0.72	0.83	2.01	48.9	30.2	40.4	2.0	8.5	10.8
	AFT			83				61		94	—	0.82	0.83	2.01	48.4	30.1	40.4	3.8	3.4	7.4
1016-2	FWD	133	85	80				86		92		0.88	0.93	2.19	42.2	27.2	39.9	1.5	4.9	5.0
	AFT			81				64		91		0.86	0.93	2.19	42.2	27.3	39.9	2.5	2.9	3.9
1017-1	FWD	140	85	72	—	—	80	87	80	78	88	0.52	0.76	2.60	35.5	32.2	38.4	3.3	3.6	11.8
	AFT			75				70		94	107	0.52	0.26	2.49	35.3	32.0	38.8	4.3	2.9	8.1
1017-2	FWD	165	85	85				66		80	94	0.52	0.45	—	36.8	34.0	—	1.8	6.2	—
	AFT			85				69		96	101	0.52	0.45	—	36.3	33.9	—	2.3	3.8	—
1018-1	FWD	122	85	79	—	—	80	70	80	82	92	0.48	0.48	—	47.6	36.7	—	3.4	8.9	—
	AFT			77				74		98	109	0.47	0.47	—	46.2	36.2	—	3.2	3.7	—
1018-2	FWD	123	85	84				75		77	89	0.63	0.63	—	34.7	30.7	—	2.1	8.6	—
	AFT			86				71		91	103	0.63	0.63	—	34.8	30.7	—	2.8	4.1	—

DATA NOT PRESENTLY AVAILABLE

[redacted]

TOP SECRET [redacted]

PERFORMANCE SUMMARY

MISSION NUMBER	CAMERA	SERIAL NUMBER	M I P VALUE	VISUAL RES.	AFSPPL MTF/AIM SLIT (μ)	AFSPPL MTF/AIM AVERAGE	[redacted] SLIT (μ)	[redacted] AVERAGE	SLIT (μ)	AVERAGE ALL	AVERAGE HIGH	90% ATTITUDE ERROR (°) PITCH	90% ATTITUDE ERROR (°) ROLL	90% ATTITUDE ERROR (°) YAW	90% ATTITUDE RATES (°/HR) PITCH	90% ATTITUDE RATES (°/HR) ROLL	90% ATTITUDE RATES (°/HR) YAW	90% V/H ERROR (%)	90% RESOLUTION LIMIT (FEET) ALONG TRACK	90% RESOLUTION LIMIT (FEET) CROSS TRACK
1019-1	FWD	118	88	81	—	—	80	76	80	88	104	0.43	0.34	0.87	31.8	34.7	33.0	3.3	9.3	9.1
	AFT	119		99				63		87	101	0.44	0.37	0.96	31.6	34.9	33.1	3.8	8.0	8.9

Figure 18-2

[redacted]

[redacted]

EXPOSURE - PROCESSING SUMMARY

MISSION NUMBER	CAMERA	SOLAR ELEVATION RANGE (°) LOW	SOLAR ELEVATION RANGE (°) HIGH	SOLAR AZIMUTH RANGE (°) LOW	SOLAR AZIMUTH RANGE (°) HIGH	PREDICTED PROCESSING (%) P	PREDICTED PROCESSING (%) T	PREDICTED PROCESSING (%) F	REPORTED PROCESSING (%) P	REPORTED PROCESSING (%) T	REPORTED PROCESSING (%) F	COMPUTED PROCESSING (%) P	COMPUTED PROCESSING (%) T	COMPUTED PROCESSING (%) F	TERRAIN D-MIN RANGE LOW	TERRAIN D-MIN RANGE HIGH	TERRAIN D-MIN MEAN	TERRAIN D-MIN MEDIAN	TERRAIN D-MAX RANGE LOW	TERRAIN D-MAX RANGE HIGH	TERRAIN D-MAX MEAN	TERRAIN D-MAX MEDIAN	CLOUD D-MAX RANGE LOW	CLOUD D-MAX RANGE HIGH	CLOUD D-MAX MEAN	CLOUD D-MAX MEDIAN	UNDER EXPOSED (%)	UNDER PROCESSED (%)	NOMINAL EXP & PROC (%)	OVER PROCESSED (%)	OVER EXPOSED (%)	CLOUD COVER (%)
1004-1	FWD	-3	81	25	124	5	76	19	4	79	17	0	79	21	0 26	1 89	0 83	0 78	0 49	2 45	1 97	2 02	1 00	2 43	2 04	2 08	0	4	60	31	5	35
	AFT	-3	81	25	124	5	74	21	4	79	17	0	80	20	0 22	1 86	0 76	0 70	0 43	2 45	1 92	1 94	1 08	2 43	1 98	2 03	1	4	67	26	3	30
1004-2	FWD	-4	68	10	131	7	76	17	37	50	13	4	83	13	0 29	1 80	0 83	0 78	0 36	2 30	1 84	1 90	0 41	2 37	1 87	1 93	0	4	59	27	9	36
	AFT	-4	68	10	131	7	76	17	37	50	13	4	77	19	0 29	1 91	0 81	0 73	0 36	2 39	1 89	1 99	0 43	2 46	1 89	1 98	0	4	67	20	9	29
1006-1	FWD	38	86	52	140	1	99	0	1	51	48	0	51	49	0 23	1 81	0 71	0 68	0 60	2 31	1 58	1 52	1 31	2 40	2 20	2 24	0	5	72	21	1	60
	AFT	38	86	52	140	1	99	0	0	23	77	0	24	76	0 35	1 66	0 87	0 84	0 96	2 35	1 72	1 72	1 14	2 40	2 24	2 28	0	1	58	40	1	60
1006-2	FWD	32	64	36	147	2	98	0	30	41	29	11	59	30	0 21	1 14	0 53	0 50	0 56	2 28	1 49	1 50	1 30	2 33	2 11	2 16	2	21	72	4	0	40
	AFT	32	64	36	147	2	98	0	35	40	25	21	54	25	0 26	1 34	0 62	0 58	0 68	2 19	1 48	1 47	1 56	2 50	2 12	2 16	0	11	77	9	3	40
1007-1	FWD	12	49	80	103	0	5	95	1	20	79	0	25	75	0 26	1 22	0 52	0 47	0 62	2 23	1 44	1 40	1 22	1 36	2 17	2 21	20	8	67	5	0	40
	AFT	11	49	48	102	0	100	0	10	42	48	6	77	17	0 26	1 76	0 58	0 55	0 78	2 31	1 82	1 52	1 54	2 39	2 20	2 24	1	13	80	5	1	60
1007-2	FWD	32	87	43	112	0	25	75	3	28	69	0	26	74	0 26	1 23	0 81	0 48	0 70	2 32	1 44	1 40	0 90	2 37	2 15	2 20	18	9	71	2	0	60
	AFT	31	87	38	111	0	100	0	19	41	40	3	88	9	0 24	1 66	0 60	0 56	0 44	2 27	1 90	1 52	0 84	2 41	2 17	2 25	1	16	74	9	1	60
1008-1	FWD	30	81	50	102	0	100	0	4	32	64	1	35	64	0 32	1 48	0 68	0 62	0 78	2 24	1 55	1 54	1 46	2 35	2 21	2 24	2	2	86	8	1	40
	AFT	30	81	50	102	0	100	0	4	27	69	0	34	66	0 32	1 57	0 71	0 69	0 61	2 21	1 57	1 58	1 08	2 37	2 21	2 24	1	1	84	15	0	40
1008-2	FWD	29	56	42	105	0	100	0	3	31	66	0	27	73	0 14	1 81	0 76	0 72	0 97	2 10	1 84	1 55	1 09	2 40	2 20	2 25	2	1	73	23	1	60
	AFT	29	56	42	105	0	100	0	3	30	67	0	29	71	0 32	1 64	0 77	0 76	0 73	2 10	1 55	1 55	1 10	2 35	2 18	2 22	1	3	69	27	0	60
1009-1	FWD	12	49	42	132	0	100	0	1	26	73	0	34	66	0 32	1 40	0 65	0 62	0 85	2 41	1 53	1 52	0 83	2 51	2 30	2 36	5	4	77	14	0	60
	AFT	12	49	42	132	0	100	0	0	40	60	0	45	55	0 28	1 42	0 70	0 64	0 92	2 28	1 58	1 55	0 63	2 51	2 32	2 36	1	8	73	20	0	60
1009-2	FWD	23	56	35	138	2	98	0	3	21	76	0	40	60	0 29	1 55	0 69	0 64	0 73	2 37	1 53	1 53	1 06	2 45	2 26	2 30	4	4	74	17	0	60
	AFT	23	56	35	138	2	98	0	4	47	49	0	56	44	0 26	1 47	0 69	0 64	0 64	2 42	1 61	1 60	1 61	2 50	2 31	2 34	1	4	77	18	0	60
1010-1	FWD	18	47	45	83	0	21	79	0	13	87	0	9	91	0 26	1 14	0 52	0 47	0 45	2 38	1 38	1 32	1 11	2 42	2 16	2 20	18	3	75	4	0	40
	AFT	18	47	45	83	0	21	79	0	19	81	0	16	84	0 27	1 25	0 57	0 52	0 78	2 42	1 45	1 41	0 96	2 46	2 20	2 26	9	4	81	6	0	40
1010-2	FWD	18	52	38	76	0	50	50	0	16	84	0	13	87	0 26	1 51	0 55	0 50	0 52	2 36	1 41	1 38	1 00	2 44	2 14	2 20	22	4	67	6	0	40
	AFT	18	52	38	76	0	50	50	0	23	77	0	25	75	0 20	1 48	0 59	0 56	0 30	2 40	1 47	1 45	1 29	2 48	2 18	2 22	13	3	76	8	0	40
1011-1	FWD	2	55	33	66	0	64	36	2	23	75	2	23	75	0 18	0 99	0 50	0 46	0 96	2 36	1 48	1 43	0 78	2 40	2 07	2 16	17	11	70	2	0	40
	AFT	2	55	33	66	0	67	33	3	47	50	0	37	63	0 24	1 48	0 60	0 56	0 90	2 38	1 87	1 55	0 74	2 37	2 11	2 18	3	7	81	8	0	40
1012-1	FWD	0	45	38	71	0	64	36	7	56	37	0	65	35	0 25	1 30	0 59	0 53	0 84	2 39	1 40	1 42	0 90	2 39	1 93	2 00	6	17	68	10	0	40
	AFT	0	45	38	71	0	64	36	0	33	67	0	49	51	0 26	1 40	0 61	0 58	0 47	2 27	1 44	1 40	0 72	2 32	1 89	1 96	5	10	74	11	0	40
1012-2	FWD	0	57	34	106	0	77	23	6	44	50	0	49	51	0 30	1 20	0 58	0 55	0 73	2 32	1 49	1 42	0 67	2 34	1 91	2 00	4	9	80	7	0	40
	AFT	0	57	34	106	0	77	23	3	15	82	0	10	90	0 30	1 27	0 68	0 62	0 48	2 33	1 85	1 58	0 70	2 38	1 96	2 02	4	0	72	23	0	40
1013-1	FWD	0	56	28	83	0	64	36	0	42	58	0	55	45	0 20	1 66	0 56	0 36	0 92	2 29	1 66	1 59	1 21	2 41	2 03	2 10	7	13	78	4	0	40
	AFT	0	56	28	83	0	64	36	2	7	91	0	33	67	0 28	1 56	0 66	0 48	0 84	2 29	1 59	1 53	1 10	2 36	1 97	2 05	5	5	74	16	0	40
1014-1	FWD	0	59	15	71	0	21	79	1	38	61	0	63	37	0 17	0 99	0 40	0 36	0 89	2 36	1 40	1 42	1 01	2 38	1 94	2 08	27	33	39	1	0	40
	AFT	0	59	14	69	0	31	69	0	13	87	36	36	64	0 18	1 26	0 51	0 48	0 88	2 38	1 42	1 49	0 42	2 43	1 91	2 00	19	12	64	5	0	40
1014-2	FWD	0	77	0	36	0	21	79	0	26	74	0	61	39	0 17	1 06	0 36	0 31	0 29	2 32	1 30	1 36	0 42	2 36	1 72	1 80	31	40	27	2	0	40
	AFT	0	76	0	34	0	29	71	0	5	95	0	68	32	0 18	1 49	0 44	0 40	0 27	2 28	1 34	1 45	0 26	2 44	1 71	1 84	19	29	50	2	0	40
1015-1	FWD	5	68	19	68	0	8	92	2	2	96	0	2	98	0 25	1 70	0 54	0 47	0 94	2 28	1 44	1 46	0 46	2 41	1 86	1 90	28	0	69	7	0	40
	AFT	4	68	16	67	0	30	70	0	5	95	0	4	96	0 29	1 20	0 60	0 56	0 46	2 28	1 49	1 50	0 80	2 36	1 86	1 95	14	0	77	8	0	40
1015-2	FWD	0	80	-2	71	0	10	90	0	10	90	0	11	89	0 22	1 10	0 50	0 46	0 84	2 07	1 29	1 30	0 28	2 34	1 69	1 78	28	4	65	3	0	40
	AFT	0	79	-2	71	0	21	79	0	9	91	0	9	91	0 28	1 21	0 59	0 52	0 98	2 22	1 37	1 38	0 38	2 40	1 74	1 80	17	1	70	12	0	40
1016-1	FWD	5	69	13	76	0	7	93	1	41	58	0	59	41	0 13	1 55	0 51	0 45	0 70	2 48	1 67	1 68	0 85	2 44	1 91	1 90	19	17	56	8	1	40
	AFT	4	69	12	76	0	27	73	0	26	74	0	42	58	0 22	1 65	0 64	0 58	0 85	2 34	1 69	1 72	0 98	2 46	1 90	1 98	11	9	62	17	1	40
1016-2	FWD	1	84	-4	76	0	8	92	0	31	69	0	48	52	0 18	1 86	0 48	0 44	0 78	2 38	1 45	1 44	0 34	2 50	1 76	1 82	22	18	56	3	0	40
	AFT	0	84	-4	76	0	19	81	1	27	72	0	40	60	0 20	1 88	0 85	0 49	0 86	2 42	1 62	1 60	0 30	2 49	1 75	1 82	23	5	65	6	1	40
1017-1	FWD	-11	50	21	89	0	0	100	13	63	24	0	82	18	0 20	1 66	0 66	0 61	0 60	2 32	1 74	1 78	0 60	2 32	1 93	2 00	1	8	77	13	1	40
	AFT	-1	57	19	88	0	17	83	24	58	18	9	90	6	0 20	1 62	0 64	0 60	0 86	2 32	1 75	1 75	1 18	2 36	1 89	1 90	1	13	74	11	2	40
1017-2	FWD	1	78	9	139	0	0	100	5	62	33	7	77	16	0 22	1 22	0 66	0 55	0 78	2 37	1 78	1 80	0 66	2 37	1 85	1 94	3	14	74	9	0	40
	AFT	1	79	7	135	0	7	93	18	62	20	0	89	11	0 20	1 54	0 64	0 62	0 [illegible]	[illegible]	[illegible]	[illegible]	0 36	2 34	1 85	1 [illegible]	2	13	74	10	1	40
1018-1	FWD	5	77	13	134	0	0	100	9	63	28	11	83	16	0 19	1 46	0 56	0 52	[illegible]	[illegible]	[illegible]	1 73	1 00	2 32	1 96	1 [illegible]	2	19	71	7	0	40
	AFT	5	78	10	129	0	22	78	8	53	39	5	72	23	0 18	1 36	0 62	0 58	[illegible]	[illegible]	[illegible]	1 80	1 03	2 28	1 [illegible]	2 [illegible]	1	12	72	9	2	40
1018-2	FWD	-8	77	14	134	0	0	100	18	74	8	17	79	4	0 18	1 78	0 67	0 49	[illegible]	[illegible]	[illegible]	1 54	0 90	2 26	1 [illegible]	1 [illegible]	2	[illegible]	[illegible]	8	[illegible]	[illegible]
	AFT	6	77	10	138	0	15	85	1	50	49	0	74	26	0 22	1 60	0 71	0 79	[illegible]	[illegible]	[illegible]	1 74	1 09	2 36	1 [illegible]	2 04	0	[illegible]	[illegible]	[illegible]	2	[illegible]

[redacted]

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EXPOSURE - PROCESSING SUMMARY

MISSION NUMBER	CAMERA	SOLAR ELEVATION RANGE (°)		SOLAR AZIMUTH RANGE (°)		PREDICTED PROCESSING (%)			REPORTED PROCESSING (%)			COMPUTED PROCESSING (%)			TERRAIN D-MIN				TERRAIN D-MAX				CLOUD D-MAX				UNDER EXPOSED (%)	UNDER PROCESSED (%)	NOMINAL EXP. & PRO. (%)	OVER PROCESSED (%)	OVER EXPOSED (%)	CLOUD COVER (%)
		LOW	HIGH	LOW	HIGH	P	I	F	P	I	F	P	I	F	RANGE LOW	RANGE HIGH	MEAN	MEDIAN	RANGE LOW	RANGE HIGH	MEAN	MEDIAN	RANGE LOW	RANGE HIGH	MEAN	MEDIAN						
1019-4	FWD	24	70	24	192	0	21	79	22	32	46	4	56	40	0.26	1.92	0.71	0.61	0.80	2.15	1.45	1.50	0.84	2.26	1.94	2.00	4	7	64	17	7	48
	AFT	23	70	21	192	0	92	8	26	58	19	3	87	10	0.13	1.70	0.66	0.60	0.39	2.26	1.46	1.45	0.80	2.30	1.96	2.02	1	13	70	14	3	45

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SECTION A

APPENDIX

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MISSION • 1019-1 • INSTRUMENT • FWD 06-11-65 DENSITY FREQ DISTR

DENSITY VALUE	PRIMARY MIN	PRIMARY MAX	PRIMARY LIM	INTERMEDIATE MIN	INTERMEDIATE MAX	INTERMEDIATE LIM	FULL MIN	FULL MAX	FULL LIM	ALL LEVELS MIN	ALL LEVELS MAX	ALL LEVELS LIM
0.01	0	0	0	0	0	0	0	0	0	0	0	0
0.02	0	0	0	0	0	0	0	0	0	0	0	0
0.03	0	0	0	0	0	0	0	0	0	0	0	0
0.04	0	0	0	0	0	0	0	0	0	0	0	0
0.05	0	0	0	0	0	0	0	0	0	0	0	0
0.06	0	0	0	0	0	0	0	0	0	0	0	0
0.07	0	0	0	0	0	0	0	0	0	0	0	0
0.08	0	0	0	0	0	0	0	0	0	0	0	0
0.09	0	0	0	0	0	0	0	0	0	0	0	0
0.10	0	0	0	0	0	0	0	0	0	0	0	0
0.11	0	0	0	0	0	0	0	0	0	0	0	0
0.12	0	0	0	0	0	0	0	0	0	0	0	0
0.13	0	0	0	0	0	0	0	0	0	0	0	0
0.14	0	0	0	0	0	0	0	0	0	0	0	0
0.15	0	0	0	0	0	0	0	0	0	0	0	0
0.16	0	0	0	0	0	0	0	0	0	0	0	0
0.17	0	0	0	0	0	0	0	0	0	0	0	0
0.18	0	0	0	0	0	0	0	0	0	0	0	0
0.19	0	0	0	0	0	0	0	0	0	0	0	0
0.20	0	0	0	0	0	0	0	0	0	0	0	0
0.21	0	0	0	0	0	0	0	0	0	0	0	0
0.22	0	0	0	0	0	0	0	0	0	0	0	0
0.23	0	0	0	0	0	0	0	0	0	0	0	0
0.24	0	0	0	0	0	0	0	0	0	0	0	0
0.25	0	0	0	0	0	0	0	0	0	0	0	0
0.26	0	0	0	1	0	0	0	0	0	1	0	0
0.27	0	0	0	0	0	0	0	0	0	0	0	0
0.28	0	0	0	2	0	0	0	0	0	2	0	0
0.29	0	0	0	0	0	0	0	0	0	0	0	0
0.30	0	0	0	3	0	0	0	0	0	3	0	0
0.31	0	0	0	1	0	0	0	0	0	1	0	0
0.32	0	0	0	1	0	0	0	0	0	2	0	0
0.33	0	0	0	1	0	0	1	0	0	2	0	0
0.34	0	0	0	0	0	0	1	0	0	1	0	0
0.35	0	0	0	2	0	0	1	0	0	4	0	0
0.36	0	0	0	1	0	0	1	0	0	2	0	0
0.37	0	0	0	1	0	0	1	0	0	2	0	0
0.38	0	0	0	0	0	0	0	0	0	0	0	0
0.39	0	0	0	2	0	0	4	0	0	5	0	0
0.40	0	0	0	1	0	0	1	0	0	3	0	0
0.41	0	0	0	1	0	0	1	0	0	3	0	0
0.42	0	0	0	0	0	0	0	0	0	0	0	0
0.43	0	0	0	2	0	0	4	0	0	5	0	0
0.44	0	0	0	1	0	0	3	0	0	5	0	0
0.45	0	0	0	1	0	0	2	0	0	5	0	0
0.46	0	0	0	0	0	0	1	0	0	2	0	0
0.47	0	0	0	1	0	0	0	0	0	1	0	0
0.48	0	0	0	1	0	0	2	0	0	3	0	0
0.49	0	0	0	1	0	0	6	0	0	3	0	0
0.50	0	0	0	3	0	0	1	0	0	1	0	0
SUBTOTAL	2	0	0	35	0	0	32	0	0	69	0	0

~~TOP SECRET~~ [redacted]

Table A-1

~~TOP SECRET~~ [redacted]

MISSION • 1019-1 • INSTRUMENT • FWD 06-11-65 DENSITY FREQ DISTR

DENSITY VALUE	PRIMARY MIN	PRIMARY MAX	PRIMARY LIM	INTERMEDIATE MIN	INTERMEDIATE MAX	INTERMEDIATE LIM	FULL MIN	FULL MAX	FULL LIM	ALL LEVELS MIN	ALL LEVELS MAX	ALL LEVELS LIM
0.51	1	0	0	4	0	0	2	0	0	7	0	0
0.52	0	0	0	4	0	0	5	0	0	9	0	0
0.53	0	0	0	0	0	0	3	0	0	3	0	0
0.54	0	0	0	2	0	0	2	0	0	4	0	0
0.55	0	0	0	1	0	0	0	0	0	1	0	0
0.56	0	0	0	1	0	0	2	0	0	3	0	0
0.57	0	0	0	1	0	0	2	0	0	3	0	0
0.58	0	0	0	0	0	0	1	0	0	1	0	0
0.59	0	0	0	3	0	0	5	0	0	8	0	0
0.60	0	0	0	2	2	0	6	0	0	8	2	0
0.61	1	0	0	4	1	0	2	0	0	7	1	0
0.62	0	0	0	1	0	0	1	0	0	2	0	0
0.63	0	0	0	0	0	0	3	0	0	3	0	0
0.64	0	0	0	1	0	0	2	0	0	3	0	0
0.65	0	0	0	1	1	0	2	0	0	3	1	0
0.66	0	0	0	1	0	0	0	0	0	1	0	0
0.67	0	0	0	2	1	0	0	0	0	2	1	0
0.68	0	0	0	0	0	0	0	0	0	0	0	0
0.69	0	0	0	3	0	0	5	0	0	8	0	0
0.70	0	0	0	5	1	0	1	0	0	6	1	0
0.71	0	0	0	1	2	0	3	0	0	4	2	0
0.72	0	0	0	0	0	0	3	0	0	3	0	0
0.73	0	0	0	1	2	0	2	0	0	3	2	0
0.74	0	0	0	0	0	0	0	0	0	0	0	0
0.75	0	0	0	1	0	0	0	0	0	1	0	0
0.76	0	0	0	2	0	0	1	0	0	3	0	0
0.77	0	0	0	0	0	0	0	0	0	0	0	0
0.78	0	0	0	0	0	0	0	0	0	0	0	0
0.79	0	0	0	0	0	0	1	0	0	1	0	0
0.80	0	0	0	2	1	0	1	0	0	3	1	0
0.81	0	0	0	2	1	0	2	0	0	3	1	0
0.82	0	0	0	1	0	0	1	0	0	2	0	0
0.83	0	0	0	0	0	0	1	0	0	1	0	0
0.84	0	0	0	1	0	0	0	0	0	1	0	0
0.85	0	0	0	0	0	0	1	0	0	1	0	0
0.86	0	0	0	2	0	0	1	0	0	2	0	0
0.87	0	0	0	0	0	0	0	0	0	0	0	0
0.88	0	0	0	2	0	0	0	0	0	2	0	0
0.89	0	0	0	1	0	0	1	0	0	1	0	0
0.90	0	0	0	1	4	0	0	0	0	1	4	0
0.91	0	0	0	1	0	0	1	0	0	1	0	0
0.92	0	0	0	1	1	0	4	0	0	2	1	0
0.93	0	0	0	1	0	0	0	0	0	1	0	0
0.94	0	0	0	0	0	0	1	0	0	1	0	0
0.95	0	0	0	1	0	0	0	0	0	1	0	0
0.96	0	0	0	1	2	0	0	0	0	1	2	0
0.97	0	0	0	2	0	0	2	0	0	4	0	0
0.98	0	0	0	0	0	0	1	0	0	1	0	0
0.99	0	0	0	2	0	0	0	0	0	2	0	0
1.00	0	0	0	2	0	0	1	0	0	3	0	0
SUBTOTAL	4	0	0	60	19	1	62	10	0	126	29	1

~~TOP SECRET~~ [redacted]

Table A-1

~~TOP SECRET~~ [redacted]

MISSION • 1019-1 • INSTRUMENT • FWD 06-11-65 DENSITY FREQ DISTR

DENSITY VALUE	PRIMARY MIN	PRIMARY MAX	PRIMARY LIM	INTERMEDIATE MIN	INTERMEDIATE MAX	INTERMEDIATE LIM	FULL MIN	FULL MAX	FULL LIM	ALL LEVELS MIN	ALL LEVELS MAX	ALL LEVELS LIM
1.01	0	0	0	3	2	0	0	3	0	3	5	0
1.02	0	0	0	1	0	0	0	1	0	1	1	0
1.03	0	0	0	0	2	0	0	1	0	0	3	0
1.04	0	0	0	2	0	0	0	1	0	0	2	0
1.05	0	0	0	3	0	0	0	2	0	0	5	0
1.06	0	0	0	0	0	0	0	0	0	0	0	0
1.07	0	0	0	1	2	0	0	1	0	0	3	0
1.08	0	0	0	2	0	0	0	1	0	0	2	0
1.09	0	0	0	1	0	0	0	1	0	0	1	0
1.10	0	0	0	0	0	0	0	0	0	0	0	0
1.11	0	0	0	1	0	0	0	1	0	0	1	0
1.12	1	0	0	0	0	0	0	0	0	1	0	0
1.13	1	0	0	0	0	0	0	0	0	1	0	0
1.14	0	0	0	0	0	0	0	0	0	0	0	0
1.15	0	0	0	0	0	0	0	0	0	0	0	0
1.16	0	0	0	0	0	0	0	0	0	0	0	0
1.17	0	0	0	1	1	0	0	1	0	1	1	0
1.18	0	0	0	1	0	0	0	1	0	1	1	0
1.19	0	0	0	1	1	0	0	1	0	1	1	0
1.20	0	0	0	1	0	0	0	1	0	1	1	0
1.21	0	0	0	0	0	0	0	0	0	0	0	0
1.22	0	0	0	0	0	0	0	0	0	0	0	0
1.23	0	0	0	0	0	0	0	0	0	0	0	0
1.24	0	0	0	0	0	0	0	0	0	0	0	0
1.25	0	0	0	0	0	0	0	0	0	0	0	0
1.26	0	0	0	0	2	0	0	0	0	0	2	0
1.27	0	0	0	0	0	0	0	0	0	0	0	0
1.28	0	0	0	1	0	0	0	0	0	1	0	0
1.29	1	0	0	3	0	0	0	0	0	1	3	0
1.30	0	0	0	0	0	0	0	0	0	0	0	0
1.31	0	0	0	1	0	0	0	0	0	1	0	0
1.32	0	0	0	0	0	0	0	0	0	0	0	0
1.33	0	0	0	1	0	0	0	0	0	1	0	0
1.34	0	0	0	5	1	0	0	0	0	0	1	0
1.35	0	0	0	0	0	0	0	0	0	0	0	0
1.36	0	0	0	1	0	0	0	0	0	1	0	0
1.37	0	0	0	0	0	0	0	0	0	0	0	0
1.38	0	0	0	3	0	0	0	0	0	3	0	0
1.39	0	0	0	0	0	0	0	0	0	0	0	0
1.40	0	0	0	2	1	0	0	0	0	2	1	0
1.41	0	0	0	1	0	0	0	0	0	1	0	0
1.42	0	0	0	1	0	0	0	0	0	1	0	0
1.43	0	0	0	0	0	0	0	0	0	0	0	0
1.44	0	0	0	1	0	0	0	0	0	1	0	0
1.45	0	0	0	0	0	0	0	0	0	0	0	0
1.46	0	0	0	0	2	0	0	0	0	0	2	0
1.47	0	0	0	1	0	0	0	0	0	1	0	0
1.48	0	0	0	1	0	0	0	0	0	1	0	0
1.49	0	0	0	1	0	0	0	0	0	1	0	0
1.50	0	0	0	1	1	0	0	0	0	1	1	0
SUBTOTAL	3	1	0	35	30	7	3	63	3	41	94	10

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Table A-1

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MISSION • 1019-1 • INSTRUMENT • FWD 06-11-65 DENSITY FREQ DISTR

DENSITY-VALUE	PRIMARY MIN	PRIMARY MAX	PRIMARY LIM	INTERMECIATE MIN	INTERMECIATE MAX	INTERMECIATE LIM	FULL MIN	FULL MAX	FULL LIM	ALL LEVELS MIN	ALL LEVELS MAX	ALL LEVELS LIM
1.51	0	0	0	0	4	0	0	2	0	0	6	0
1.52	0	0	0	1	3	1	0	1	0	1	4	1
1.53	0	0	0	0	1	0	0	0	0	0	1	0
1.54	0	0	0	0	1	2	0	0	0	0	1	2
1.55	0	0	0	0	2	0	0	0	0	0	2	0
1.56	0	0	0	0	3	1	0	0	0	0	4	1
1.57	0	0	0	0	1	0	0	0	0	0	1	0
1.58	0	0	0	0	3	0	0	1	0	0	4	0
1.59	0	0	0	0	3	0	0	2	0	0	5	0
1.60	0	0	0	2	3	2	0	1	0	2	4	3
1.61	0	0	0	0	3	1	0	0	0	0	3	1
1.62	0	0	1	1	3	1	0	0	0	0	3	2
1.63	0	0	1	0	3	1	0	0	0	0	3	2
1.64	0	0	1	0	2	1	0	0	0	0	2	1
1.65	0	0	1	0	2	1	0	0	0	0	2	1
1.66	0	0	0	0	1	1	0	1	0	0	2	1
1.67	0	0	0	0	1	1	0	0	0	0	1	1
1.68	0	0	0	0	1	0	0	0	0	0	1	0
1.69	0	0	1	0	4	1	0	0	0	0	4	1
1.70	0	0	1	0	3	1	0	0	0	0	3	1
1.71	0	0	0	0	2	1	0	0	0	0	2	1
1.72	0	0	1	0	2	1	0	0	0	0	2	1
1.73	0	0	0	0	1	0	0	0	0	0	1	0
1.74	0	0	0	0	2	0	0	0	0	0	2	0
1.75	0	0	0	0	1	0	0	0	0	0	1	0
1.76	0	0	1	0	2	1	0	0	0	0	2	1
1.77	0	0	1	0	1	1	0	0	0	0	1	1
1.78	0	0	0	0	1	0	0	0	0	0	1	0
1.79	0	0	0	0	4	0	0	0	0	0	4	0
1.80	0	0	0	2	2	2	0	0	0	2	2	2
1.81	0	0	0	2	4	2	0	0	0	2	4	2
1.82	0	0	1	3	4	2	0	0	1	3	4	3
1.83	0	0	0	1	3	1	0	0	0	1	3	1
1.84	0	0	1	0	2	1	0	0	0	0	2	1
1.85	0	0	1	0	3	1	0	0	0	0	3	1
1.86	0	0	0	1	1	1	0	0	1	1	2	2
1.87	0	0	0	1	1	1	0	0	1	1	2	2
1.88	0	0	0	1	1	1	0	0	1	1	2	2
1.89	0	0	0	3	3	1	0	0	1	3	6	4
1.90	0	0	0	0	1	4	0	0	0	0	1	4
1.91	0	0	0	1	2	1	0	0	0	1	2	2
1.92	0	0	0	1	1	1	0	0	0	1	2	2
1.93	0	0	0	0	1	0	0	0	0	0	1	0
1.94	0	0	0	0	0	0	0	0	0	0	0	0
1.95	0	0	0	0	2	0	0	0	0	0	2	0
1.96	0	0	0	2	3	2	0	0	0	2	3	2
1.97	0	0	0	2	3	2	0	0	0	2	3	2
1.98	0	0	0	2	2	1	0	0	0	2	2	1
1.99	0	0	0	1	2	1	0	0	0	1	2	1
2.00	0	0	0	1	3	1	0	1	0	1	3	1
SUBTOTAL	0	8	6	4	78	71	0	20	25	4	106	102

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Table A-1

~~TOP SECRET~~ [redacted]

MISSION • 1019-1 • INSTRUMENT • FWD 06-11-65 DENSITY FREQ DISTR

DENSITY VALUE	PRIMARY MIN	PRIMARY MAX	PRIMARY LIM	INTERMEDIATE MIN	INTERMEDIATE MAX	INTERMEDIATE LIM	FULL MIN	FULL MAX	FULL LIM	ALL LEVELS MIN	ALL LEVELS MAX	ALL LEVELS LIM
2.01	0	0	0	0	1	1	0	0	1	0	1	2
2.02	0	0	0	0	1	3	0	0	2	0	1	3
2.03	0	0	0	0	0	2	0	0	1	0	0	3
2.04	0	0	0	0	0	1	0	0	0	0	0	2
2.05	0	0	0	0	0	0	0	0	1	0	0	2
2.06	0	0	0	0	0	7	0	0	0	0	0	9
2.07	0	0	0	0	1	1	0	0	1	0	0	2
2.08	0	0	0	0	0	2	0	0	0	0	0	4
2.09	0	0	0	0	1	2	0	0	1	0	0	4
2.10	0	0	0	0	0	9	0	0	9	0	0	18
2.11	0	0	0	0	0	1	0	0	6	0	0	6
2.12	0	0	0	0	1	2	0	0	5	0	0	6
2.13	0	0	0	0	0	3	0	0	3	0	0	5
2.14	0	0	0	0	1	3	0	0	4	0	0	7
2.15	0	0	0	0	1	2	0	0	2	0	0	5
2.16	0	0	0	0	0	2	0	0	2	0	0	4
2.17	0	0	0	0	0	0	0	0	2	0	0	2
2.18	0	0	0	0	0	3	0	0	2	0	0	5
2.19	0	0	0	0	0	2	0	0	3	0	0	5
2.20	0	0	0	0	0	0	0	0	0	0	0	0
2.21	0	0	0	0	0	0	0	0	0	0	0	0
2.22	0	0	0	0	0	0	0	0	0	0	0	0
2.23	0	0	0	0	0	0	0	0	0	0	0	0
2.24	0	0	0	0	0	0	0	0	0	0	0	0
2.25	0	0	0	0	0	0	0	0	0	0	0	0
2.26	0	0	0	0	0	0	0	0	0	0	0	0
2.27	0	0	0	0	0	0	0	0	0	0	0	0
2.28	0	0	0	0	0	0	0	0	0	0	0	0
2.29	0	0	0	0	0	0	0	0	0	0	0	0
2.30	0	0	0	0	0	0	0	0	0	0	0	0
2.31	0	0	0	0	0	0	0	0	0	0	0	0
2.32	0	0	0	0	0	0	0	0	0	0	0	0
2.33	0	0	0	0	0	0	0	0	0	0	0	0
2.34	0	0	0	0	0	0	0	0	0	0	0	0
2.35	0	0	0	0	0	0	0	0	0	0	0	0
2.36	0	0	0	0	0	0	0	0	0	0	0	0
2.37	0	0	0	0	0	0	0	0	0	0	0	0
2.38	0	0	0	0	0	0	0	0	0	0	0	0
2.39	0	0	0	0	0	0	0	0	0	0	0	0
2.40	0	0	0	0	0	0	0	0	0	0	0	0
2.41	0	0	0	0	0	0	0	0	0	0	0	0
2.42	0	0	0	0	0	0	0	0	0	0	0	0
2.43	0	0	0	0	0	0	0	0	0	0	0	0
2.44	0	0	0	0	0	0	0	0	0	0	0	0
2.45	0	0	0	0	0	0	0	0	0	0	0	0
2.46	0	0	0	0	0	0	0	0	0	0	0	0
2.47	0	0	0	0	0	0	0	0	0	0	0	0
2.48	0	0	0	0	0	0	0	0	0	0	0	0
2.49	0	0	0	0	0	0	0	0	0	0	0	0
2.50	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	0	0	0	0	7	43	0	4	63	0	11	106

~~TOP SECRET~~ [redacted]

Table A-1

~~TOP SECRET~~ [redacted]

MISSION • 1019-1 • INSTRUMENT • FWD 06-11-65 DENSITY FREQ DISTR

DENSITY VALUE	PRIMARY MIN	PRIMARY MAX	PRIMARY LIM	INTERMECIATE MIN	INTERMECIATE MAX	INTERMECIATE LIM	FULL MIN	FULL MAX	FULL LIM	ALL LEVELS MIN	ALL LEVELS MAX	ALL LEVELS LIM
2.51	C	C	0	C	0	0	0	0	0	0	0	0
2.52	C	C	0	C	0	0	0	0	0	0	0	0
2.53	C	C	0	C	0	0	0	0	0	0	0	0
2.54	C	C	0	C	0	0	0	0	0	0	0	0
2.55	C	C	0	C	0	0	0	0	0	0	0	0
2.56	C	C	0	C	0	0	0	0	0	0	0	0
2.57	C	C	0	C	0	0	0	0	0	0	0	0
2.58	C	C	0	C	0	0	0	0	0	0	0	0
2.59	C	C	0	C	0	0	0	0	0	0	0	0
2.60	C	C	0	C	0	0	0	0	0	0	0	0
2.61	C	C	0	C	0	0	0	0	0	0	0	0
2.62	C	C	0	C	0	0	0	0	0	0	0	0
2.63	C	C	0	C	0	0	0	0	0	0	0	0
2.64	C	C	0	C	0	0	0	0	0	0	0	0
2.65	C	C	0	C	0	0	0	0	0	0	0	0
2.66	C	C	0	C	0	0	0	0	0	0	0	0
2.67	C	C	0	C	0	0	0	0	0	0	0	0
2.68	C	C	0	C	0	0	0	0	0	0	0	0
2.69	C	C	0	C	0	0	0	0	0	0	0	0
2.70	C	C	0	C	0	0	0	0	0	0	0	0
SUBTOTAL	C	C	0	0	0	0	0	0	0	0	0	0
TOTAL	9	9	6	134	134	122	97	97	91	240	240	219

MISSION 1019-1 INSTR - FWD 06-11-65 PROCESSING AND EXPOSURE ANALYSI

PROCESS LEVEL	SAMPLE SIZE	UNDER EXPOSED	UNDER PROCESSED	CORRECT EXP+PROC	OVER PROCESSED	OVER EXPOSED
PRIMARY	9	0 PC	11 PC	44 PC	0 PC	44 PC
INTERMEDIATE	134	C PC	12 PC	51 PC	26 PC	10 PC
FULL	97	1C PC	0 PC	84 PC	6 PC	0 PC
ALL LEVELS	240	4 PC	7 PC	64 PC	17 PC	7 PC

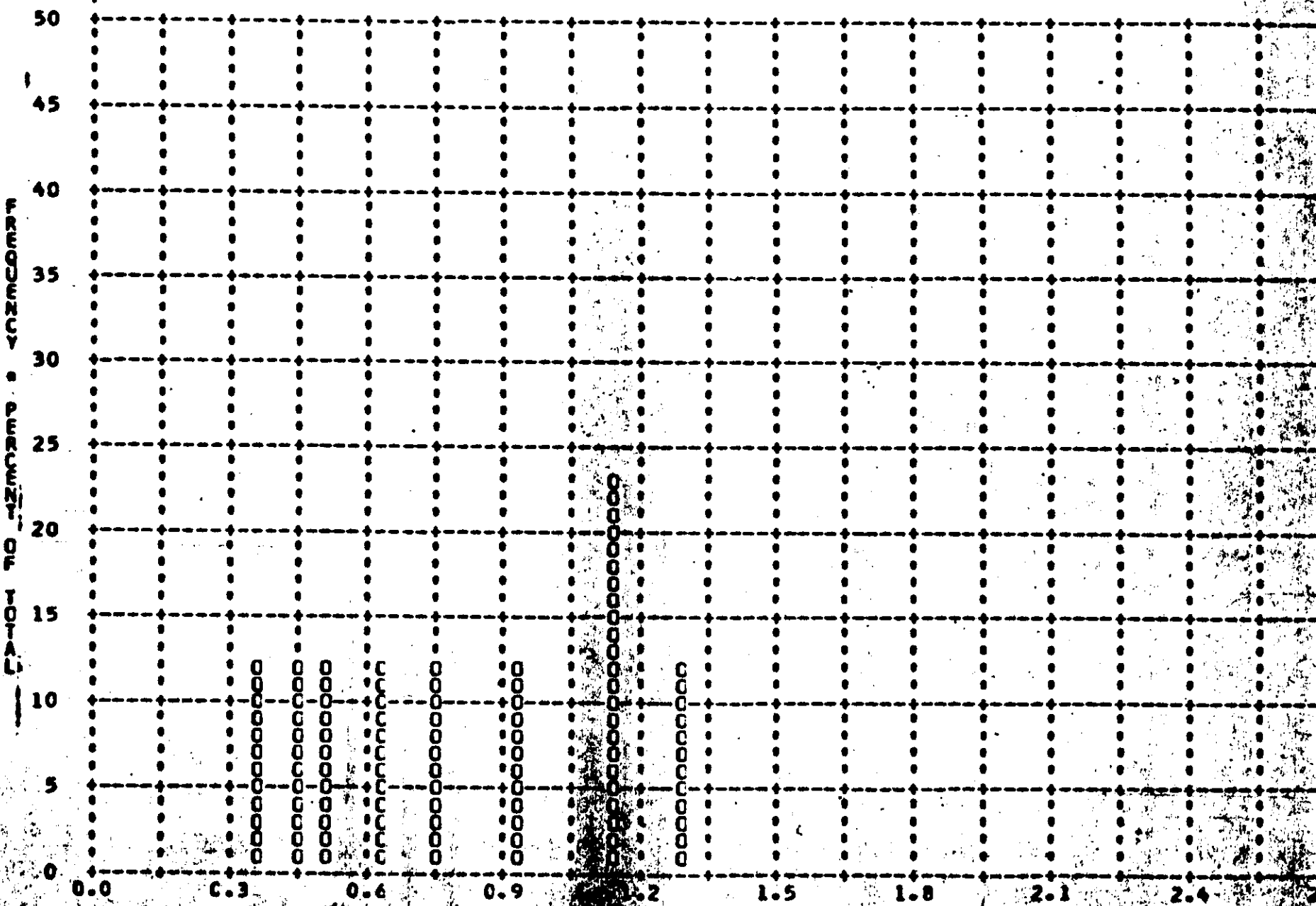
PROCESS LEVEL	BASE + FOG	UNDER EXPOSED	UNDER PROCESSED	CORRECT EXP+PROC	OVER PROCESSED	OVER EXPOSED
PRIMARY	0.01-C.09	0.01-0.13	0.14-0.39	0.40-0.90	----------	0.91 AND UP
INTERMED	0.10-C.17	0.01-0.20	0.21-0.39	0.40-0.90	0.91-1.34	1.35 AND UP
FULL	0.18 AND UP	0.01-0.39	----------	0.40-0.90	0.91-1.69	1.70 AND UP

~~TOP SECRET~~ [redacted]

Table A-1

MISSION • 1019-1 • INSTR • FWD • 06-11-65 PLOT OF D MIN • TERRAIN • PROCESSING • PRIMARY

ARITH MEAN • 0.79 • MEDIAN • 0.74 • STD DEV • 0.34 • RANGE • 0.35 TO 1.29 WITH 9 SAMPLES



MISSION • 1019-1 • INSTR • FWD • 06-11-65 PLOT OF D MAX • TERRAIN • PROCESSING • PRIMARY

ARITH MEAN • 1.72 • MEDIAN • 1.77 • STD DEV • 0.22 • RANGE • 1.18 TO 1.89 WITH 9 SAMPLES

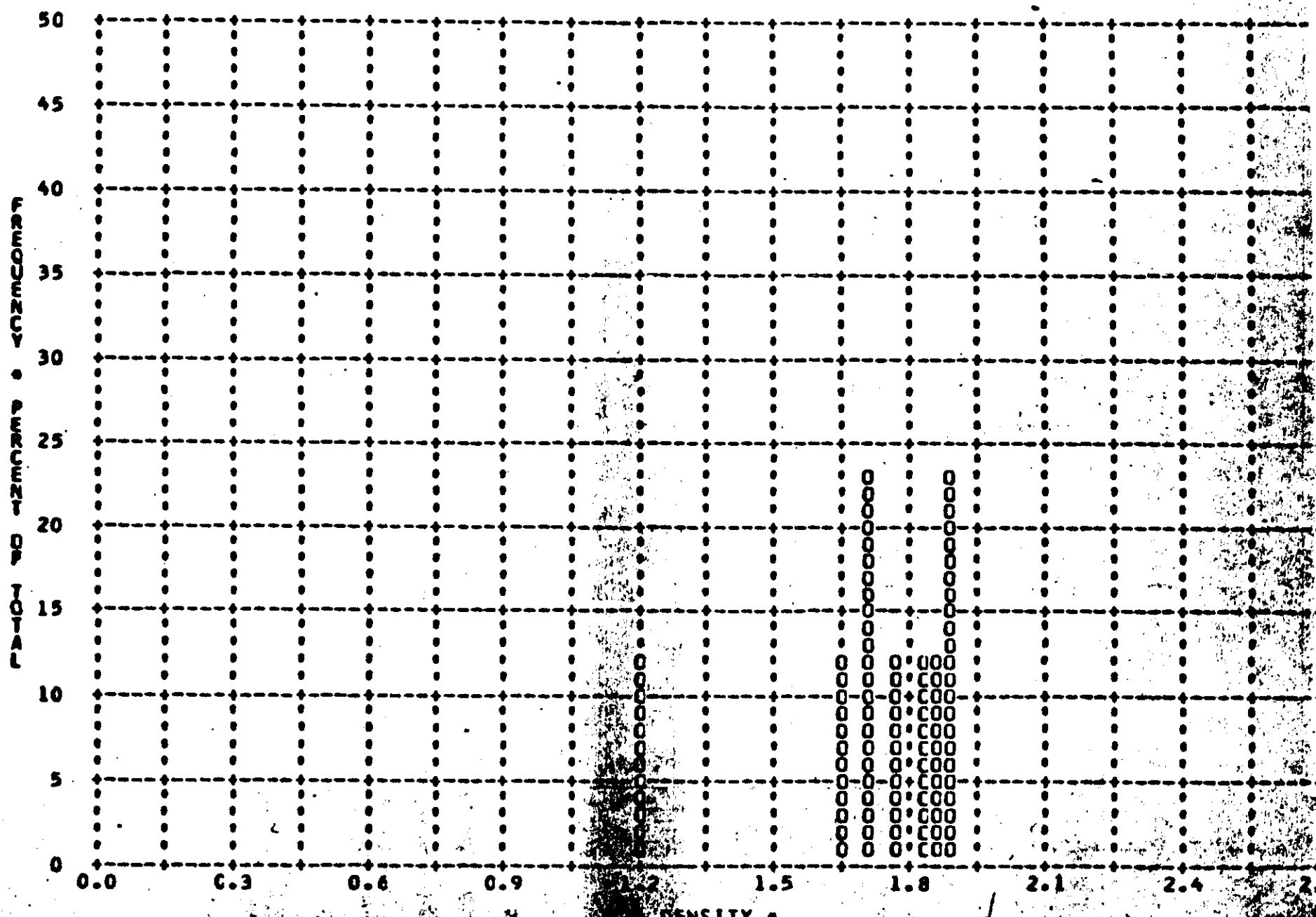
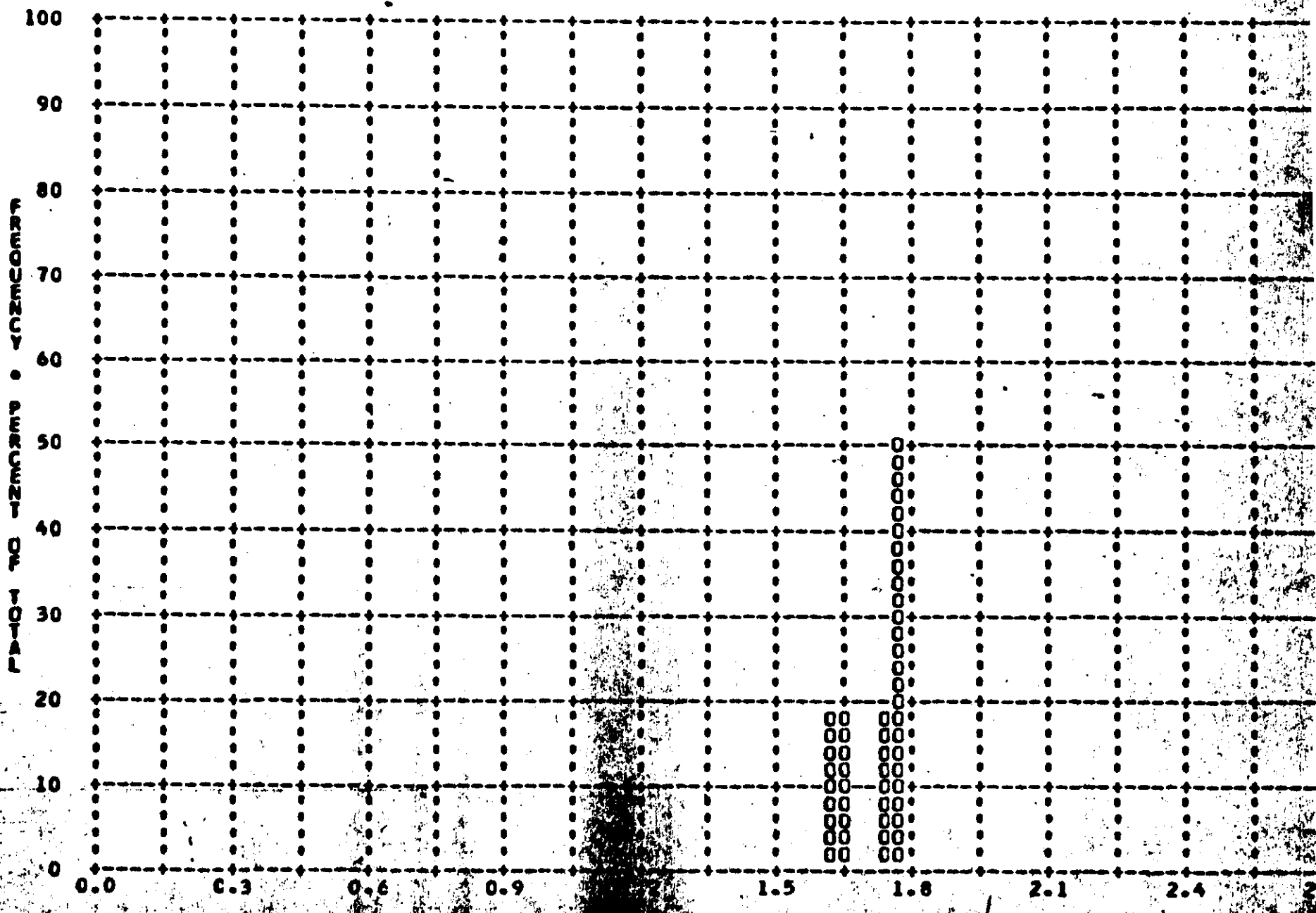


Figure A-2

MISSION • 1019-1 • INSTR • FWD • 06-11-65 PLOT OF D MAX • CLOUD • PROCESSING • PRIMARY

ARITH MEAN • 1.71 • MEDIAN • 1.75 • STD DEV • 0.07 • RANGE • 1.62 TO 1.77 WITH 6 SAMPLES



MISSION • 1019-1 • INSTR • FWD • 06-11-65 PLOT OF D MIN • TERRAIN • PROCESSING • INTERMEDIAT

ARITH MEAN • 0.75 • MEDIAN • 0.70 • STD DEV • 0.37 • RANGE • 0.26 TO 1.92 WITH 134 SAMPLES

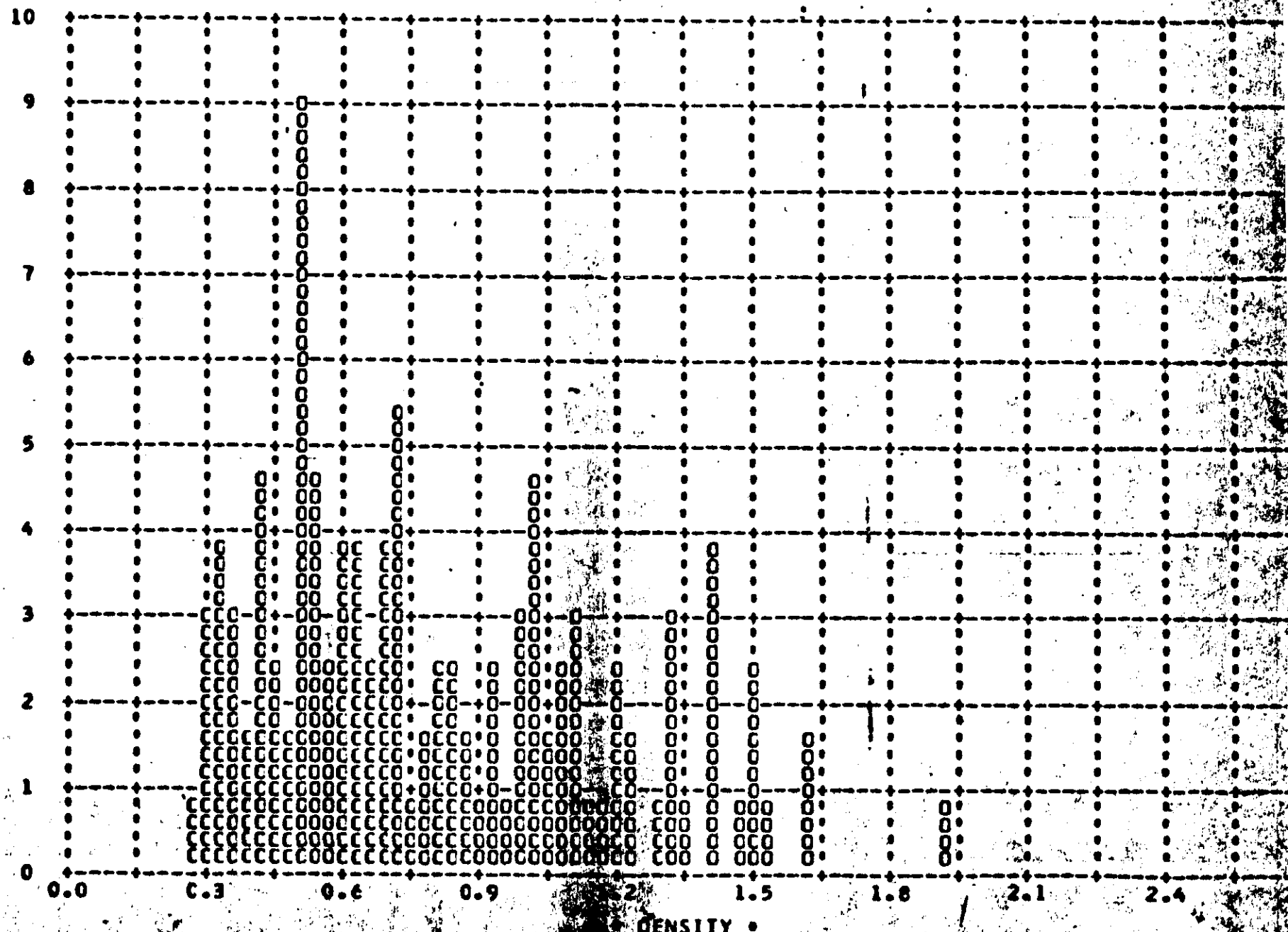


Figure A-4

MISSION • 1019-1 • INSTR • FWD • 06-11-65 PLOT OF D MAX • TERRAIN • PROCESSING • INTERMEDIATE

ARITH MEAN • 1.51 • MEDIAN • 1.60 • STD DEV • 0.39 • RANGE • 0.60 TO 2.15 WITH 134 SAMPLES

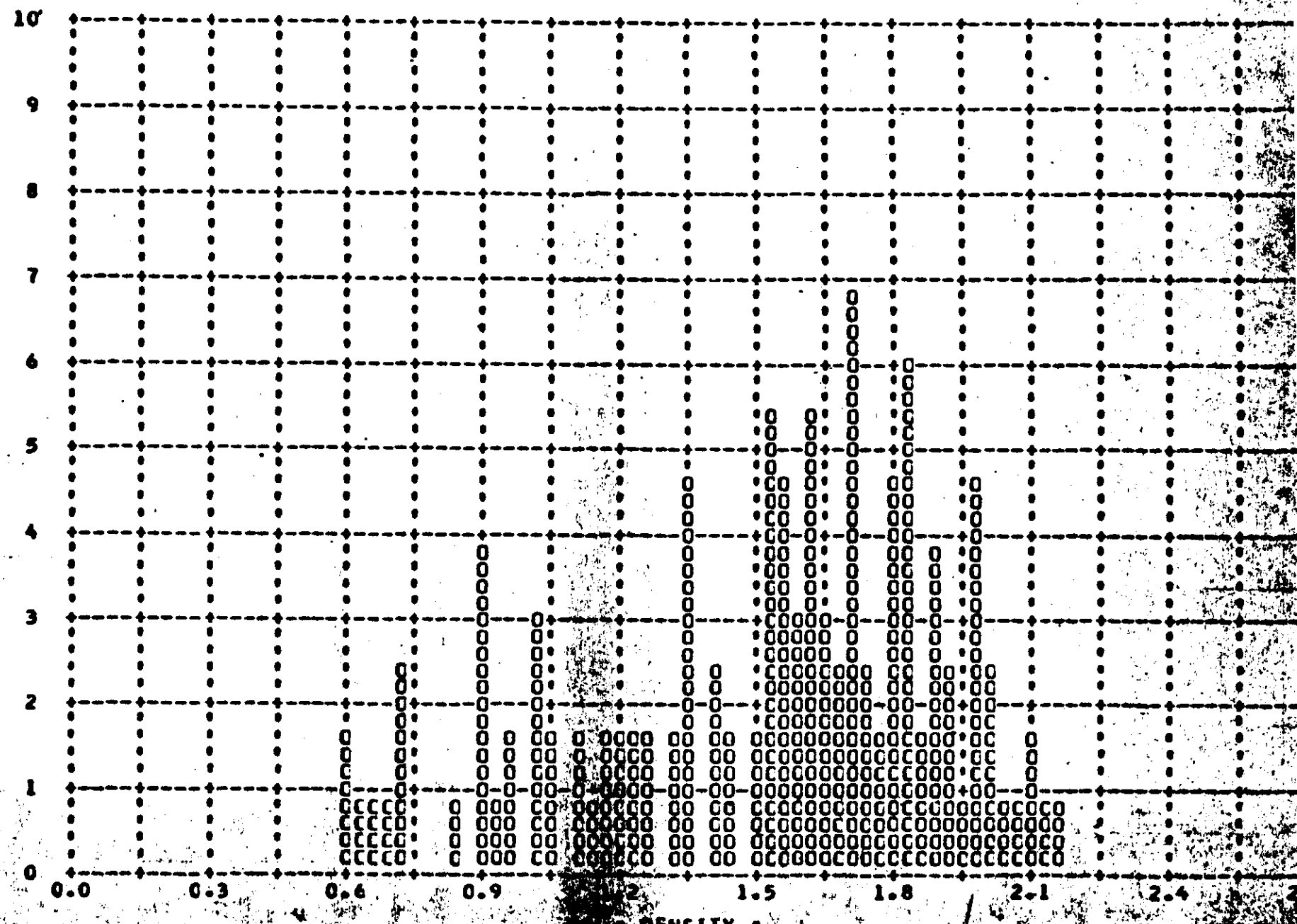


Figure A-5

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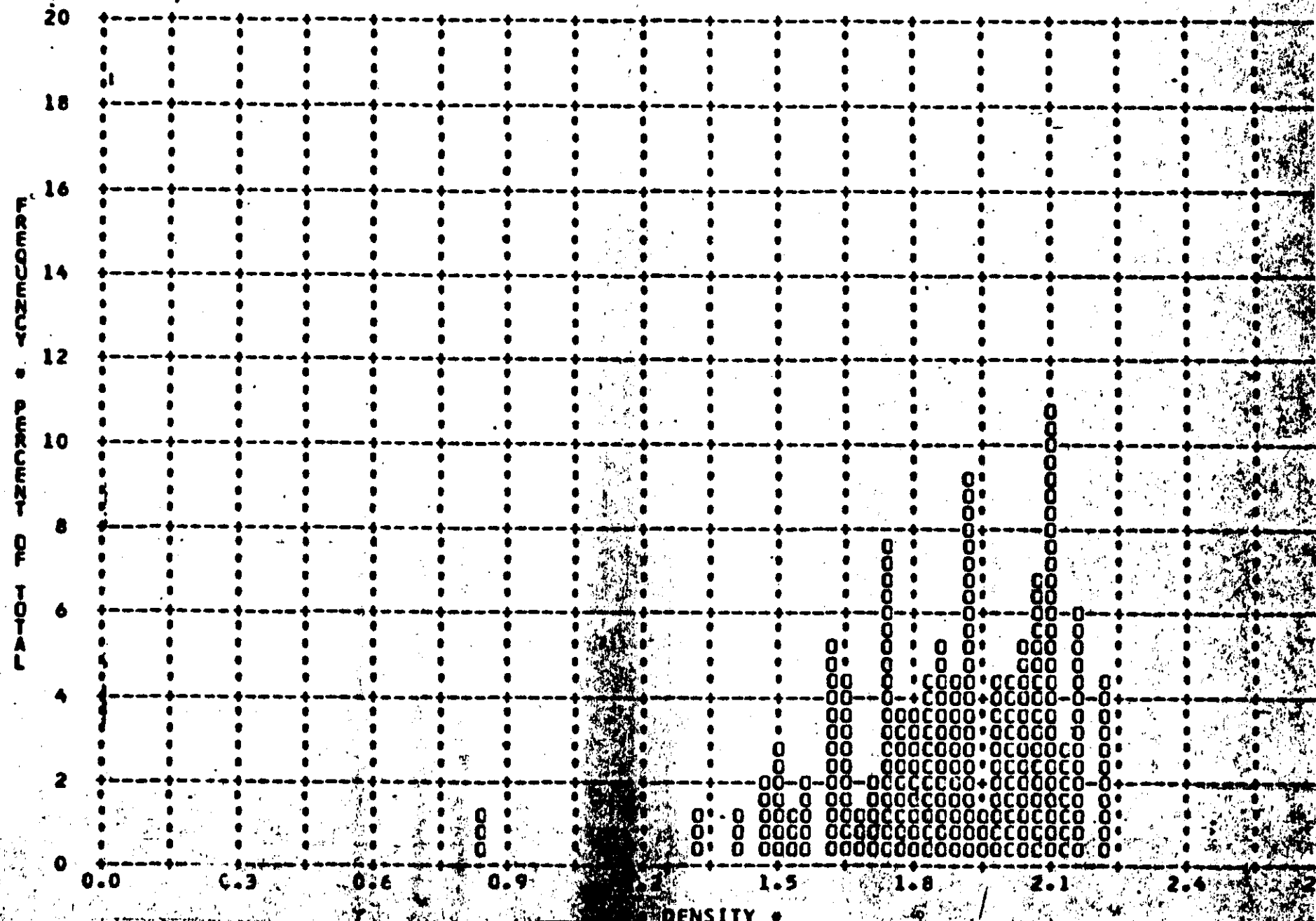
MISSION • 1019-1 • INSTR • FWD • 06-11-65 PLOT OF D MAX • CLOUD • PROCESSING • INTERMEDIATE

ARITH MEAN • 1.88 • MEDIAN • 1.91 • STD DEV • 0.23 • RANGE • 0.84 TO 2.21 WITH 122 SAMPLES



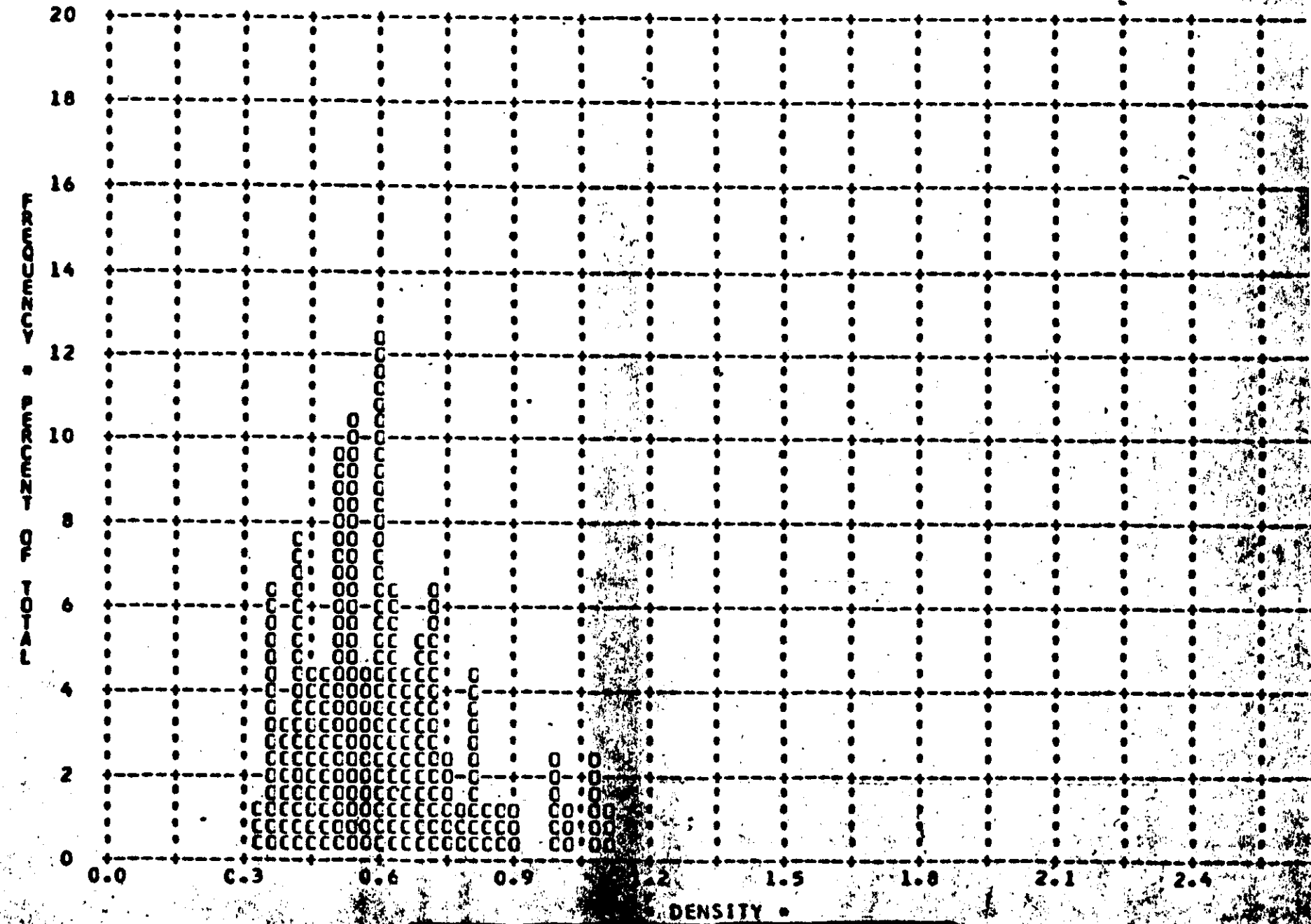
[redacted] ~~TOP SECRET~~

Figure A-6

A-12

MISSION • 1019-1 • INSTR • FWD • 06-11-65 PLOT OF D MIN • TERRAIN • PROCESSING • FULL.

ARITH MEAN • 0.59 • MEDIAN • 0.58 • STD DEV • 0.17 • RANGE • 0.33 TO 1.10 WITH 97 SAMPLES



MISSION • 1019-1 • INSTR • FWD • 06-11-65 PLOT OF D MAX • TERRAIN • PROCESSING • FULL

ARITH MEAN • 1.34 • MEDIAN • 1.34 • STD DEV • 0.30 • RANGE • 0.83 TO 2.13 WITH 97 SAMPLES

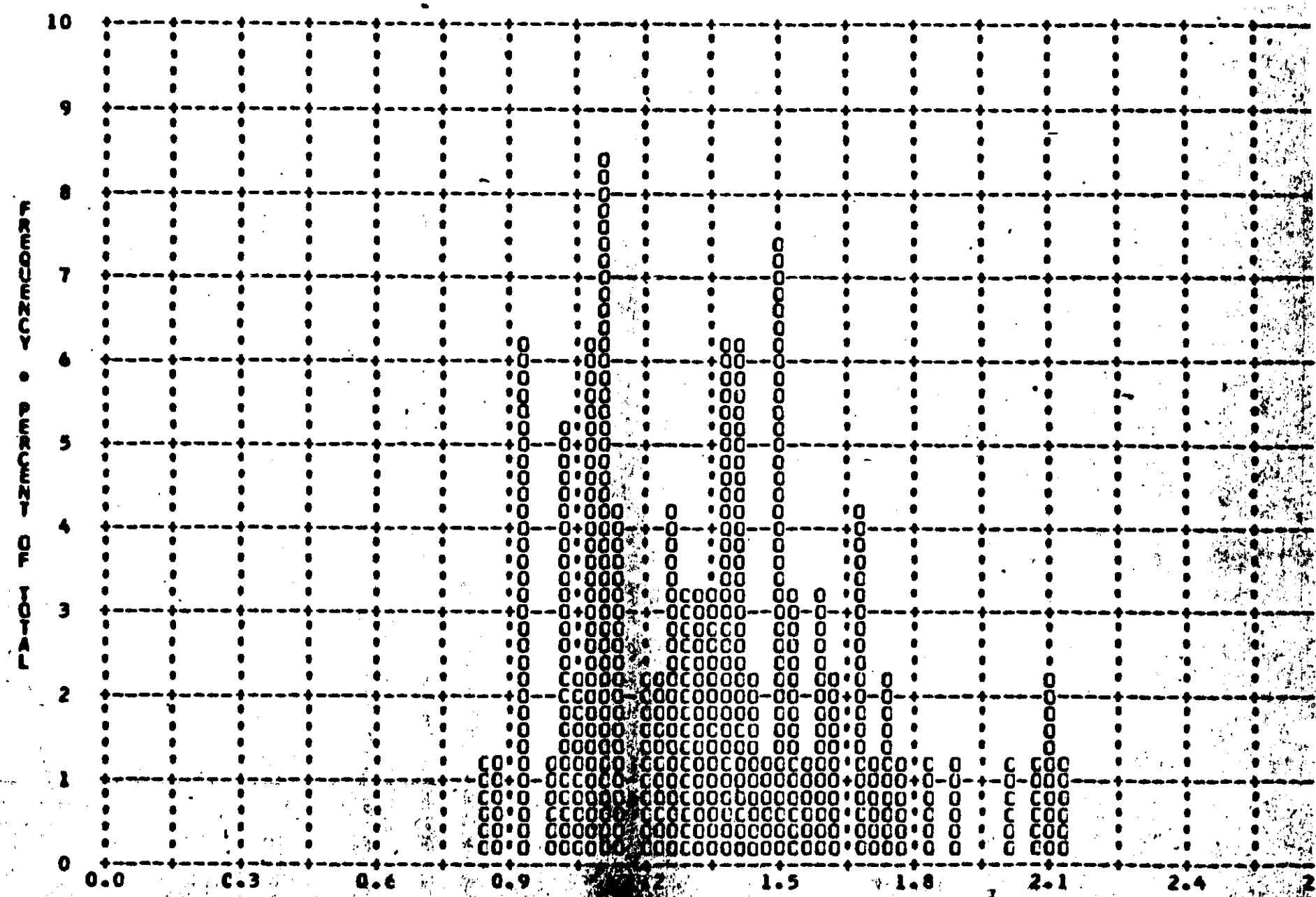
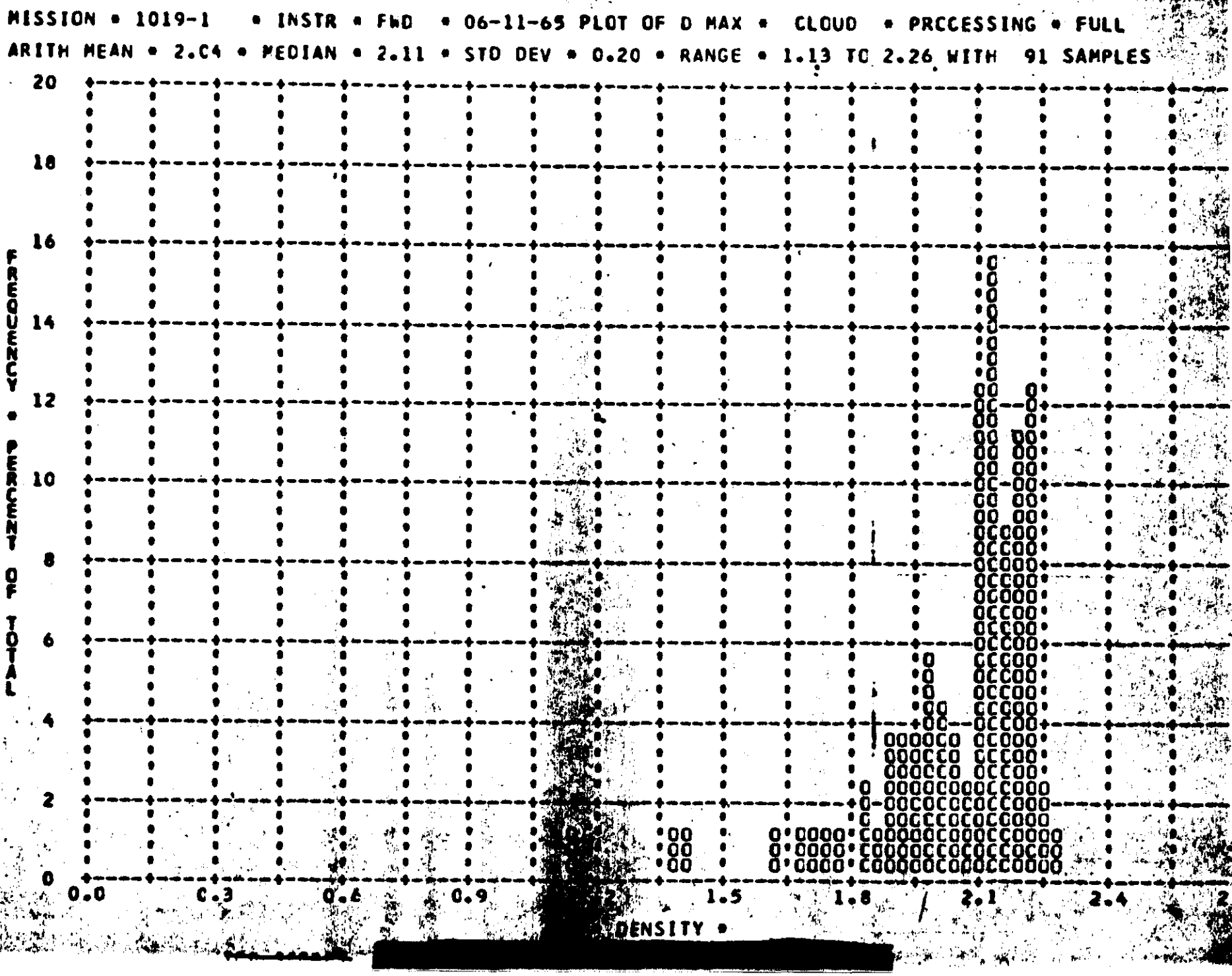


Figure A-8

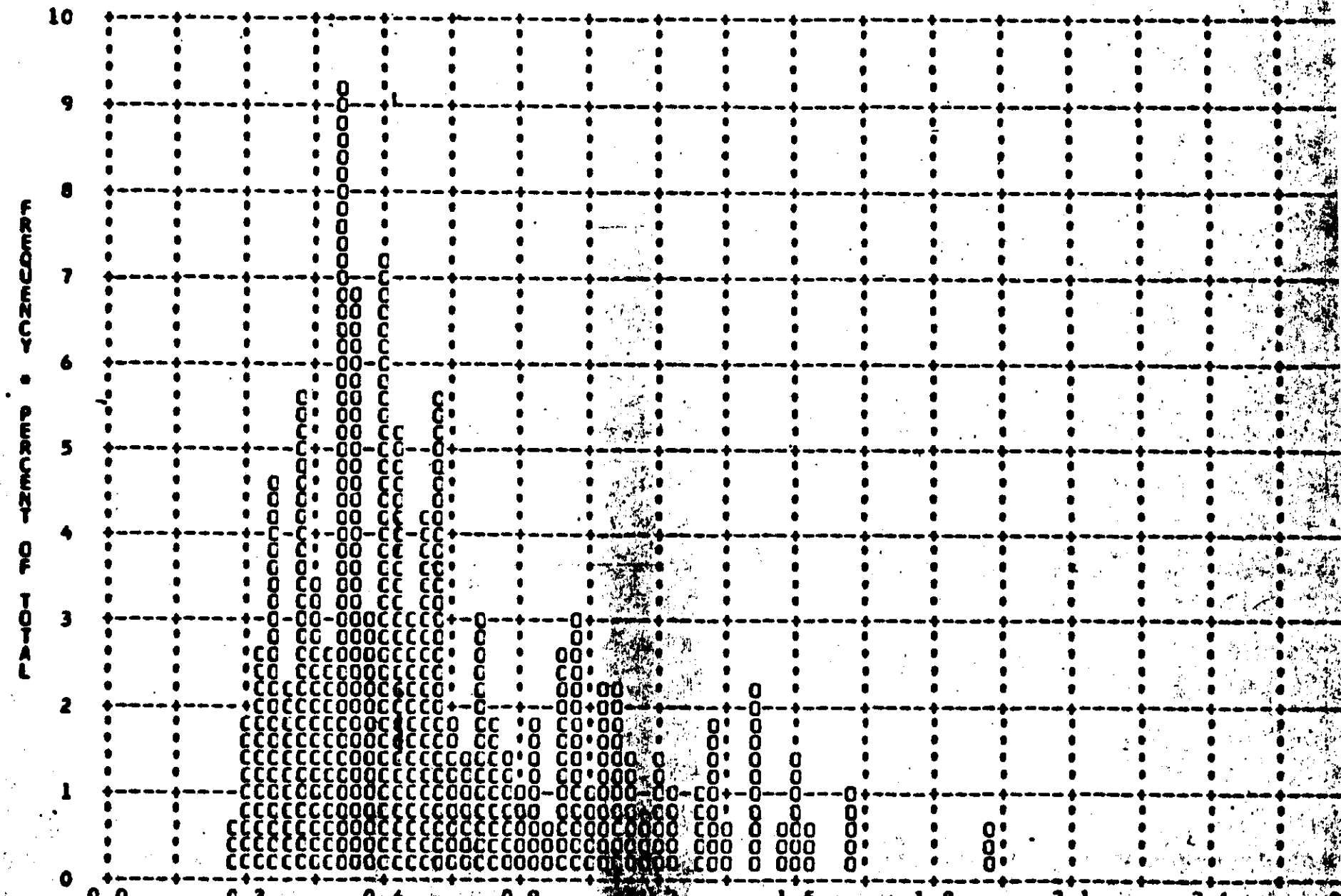
~~TOP SECRET~~ [redacted]



[redacted]

MISSION • 1019-1 • INSTR • FWD • 06-11-65 PLOT OF D MIN • TERRAIN • PROCESSING • ALL LEVELS

ARITH MEAN • 0.71 • MEDIAN • C.61 • STD DEV • 0.32 • RANGE • 0.26 TO 1.92 WITH 240 SAMPLES



MISSION • 1019-1 • INSTR • FWD • 06-11-65 PLOT OF D MAX • TERRAIN • PROCESSING • ALL LEVELS

ARITH MEAN • 1.45 • MEDIAN • 1.50 • STD DEV • 0.36 • RANGE • 0.60 TO 2.15 WITH 240 SAMPLES

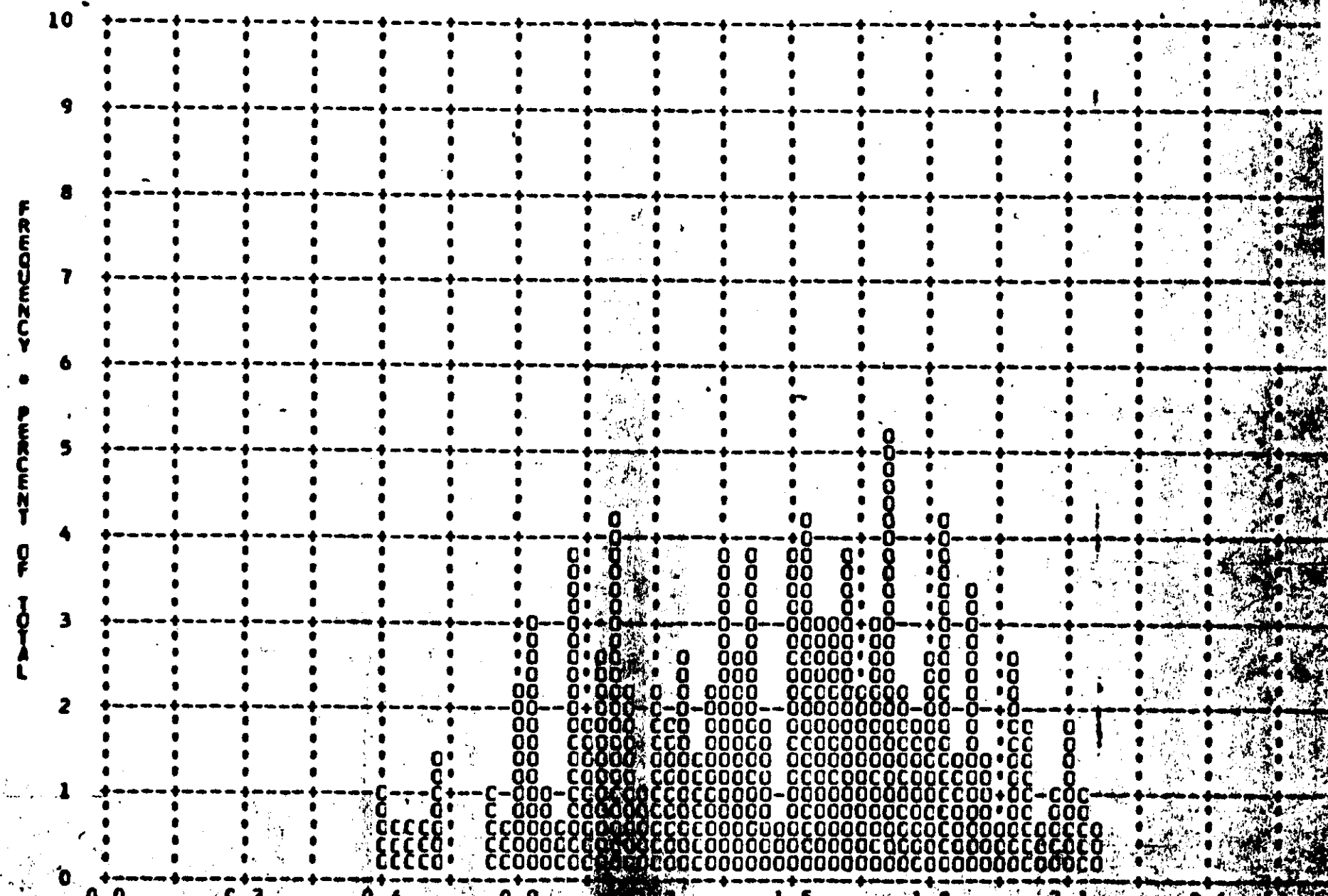
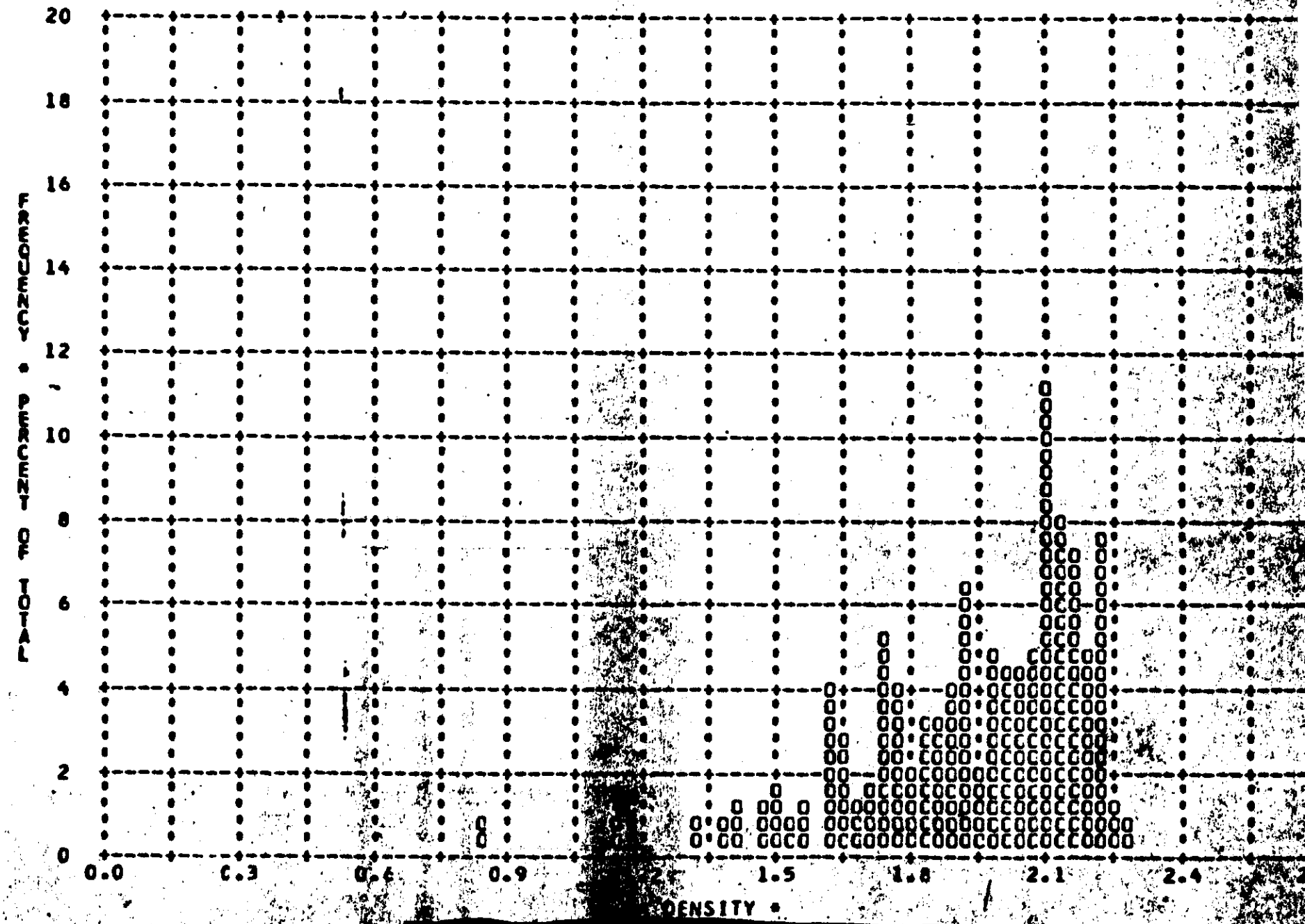


Figure A-11

MISSION • 1019-1 • INSTR • FWD • 06-11-65 PLOT OF D MAX • CLOUD • PROCESSING • ALL LEVELS

ARITH MEAN • 1.54 • MEDIAN • 2.00 • STD DEV • 0.23 • RANGE • 0.84 TO 2.26 WITH 219 SAMPLES



MISSION • 1019-1 • INSTRUMENT • AFT 06-11-65 DENSITY FREQ DISTR

DENSITY VALUE	PRIMARY MIN	PRIMARY MAX	PRIMARY LIM	INTERMEDIATE MIN	INTERMEDIATE MAX	INTERMEDIATE LIM	FULL MIN	FULL MAX	FULL LIM	ALL LEVELS MIN	ALL LEVELS MAX	ALL LEVELS LIM
0.01	0	0	0	0	0	0	0	0	0	0	0	0
0.02	0	0	0	0	0	0	0	0	0	0	0	0
0.03	0	0	0	0	0	0	0	0	0	0	0	0
0.04	0	0	0	0	0	0	0	0	0	0	0	0
0.05	0	0	0	0	0	0	0	0	0	0	0	0
0.06	0	0	0	0	0	0	0	0	0	0	0	0
0.07	0	0	0	0	0	0	0	0	0	0	0	0
0.08	0	0	0	0	0	0	0	0	0	0	0	0
0.09	0	0	0	0	0	0	0	0	0	0	0	0
0.10	0	0	0	0	0	0	0	0	0	0	0	0
0.11	0	0	0	0	0	0	0	0	0	0	0	0
0.12	0	0	0	0	0	0	0	0	0	0	0	0
0.13	0	0	0	0	0	0	0	0	0	0	0	0
0.14	0	0	0	0	0	0	0	0	0	0	0	0
0.15	0	0	0	0	0	0	0	0	0	0	0	0
0.16	0	0	0	0	0	0	0	0	0	0	0	0
0.17	0	0	0	0	0	0	0	0	0	0	0	0
0.18	0	0	0	0	0	0	0	0	0	0	0	0
0.19	0	0	0	0	0	0	0	0	0	0	0	0
0.20	0	0	0	0	0	0	0	0	0	0	0	0
0.21	0	0	0	0	0	0	0	0	0	0	0	0
0.22	0	0	0	0	0	0	0	0	0	0	0	0
0.23	0	0	0	0	0	0	0	0	0	0	0	0
0.24	0	0	0	0	0	0	0	0	0	0	0	0
0.25	0	0	0	0	0	0	0	0	0	0	0	0
0.26	0	0	0	0	0	0	0	0	0	0	0	0
0.27	0	0	0	0	0	0	0	0	0	0	0	0
0.28	0	0	0	0	0	0	0	0	0	0	0	0
0.29	0	0	0	0	0	0	0	0	0	0	0	0
0.30	0	0	0	0	0	0	0	0	0	0	0	0
0.31	0	0	0	0	0	0	0	0	0	0	0	0
0.32	0	0	0	0	0	0	0	0	0	0	0	0
0.33	0	0	0	0	0	0	0	0	0	0	0	0
0.34	0	0	0	0	0	0	0	0	0	0	0	0
0.35	0	0	0	0	0	0	0	0	0	0	0	0
0.36	0	0	0	0	0	0	0	0	0	0	0	0
0.37	0	0	0	0	0	0	0	0	0	0	0	0
0.38	0	0	0	0	0	0	0	0	0	0	0	0
0.39	0	0	0	0	0	0	0	0	0	0	0	0
0.40	0	0	0	0	0	0	0	0	0	0	0	0
0.41	0	0	0	0	0	0	0	0	0	0	0	0
0.42	0	0	0	0	0	0	0	0	0	0	0	0
0.43	0	0	0	0	0	0	0	0	0	0	0	0
0.44	0	0	0	0	0	0	0	0	0	0	0	0
0.45	0	0	0	0	0	0	0	0	0	0	0	0
0.46	0	0	0	0	0	0	0	0	0	0	0	0
0.47	0	0	0	0	0	0	0	0	0	0	0	0
0.48	0	0	0	0	0	0	0	0	0	0	0	0
0.49	0	0	0	0	0	0	0	0	0	0	0	0
0.50	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	2	0	0	62	1	0	8	0	0	72	1	0

Table A-2

~~TOP SECRET~~ [redacted]

MISSION • 1019-1 • INSTRUMENT • AFT 06-11-65 DENSITY FREQ DISTR

DENSITY VALUE	PRIMARY MIN	PRIMARY MAX	PRIMARY LIM	INTERMEDIATE MIN	INTERMEDIATE MAX	INTERMEDIATE LIM	FULL MIN	FULL MAX	FULL LIM	ALL LEVELS MIN	ALL LEVELS MAX	ALL LEVELS LIM
0.51	0	0	0	3	0	0	0	0	0	3	0	0
0.52	0	0	0	3	0	0	0	0	0	3	0	0
0.53	0	0	0	4	0	0	0	0	0	4	0	0
0.54	0	0	0	6	0	0	0	0	0	6	0	0
0.55	0	0	0	7	0	0	1	0	0	8	0	0
0.56	0	0	0	4	0	0	1	0	0	5	0	0
0.57	0	0	0	1	0	0	1	0	0	2	0	0
0.58	0	0	0	7	0	0	0	0	0	7	0	0
0.59	0	0	0	4	0	0	0	0	0	4	0	0
0.60	0	0	0	8	0	0	0	0	0	8	0	0
0.61	0	0	0	3	0	0	0	0	0	3	0	0
0.62	0	0	0	7	0	0	1	0	0	8	0	0
0.63	0	0	0	4	0	0	1	0	0	5	0	0
0.64	0	0	0	4	0	0	1	0	0	5	0	0
0.65	0	0	0	2	0	0	1	0	0	3	0	0
0.66	0	0	0	3	0	0	0	0	0	3	0	0
0.67	0	0	0	0	0	0	3	0	0	3	0	0
0.68	0	0	0	1	0	0	3	0	0	4	0	0
0.69	0	0	0	2	0	0	0	0	0	2	0	0
0.70	0	0	0	1	0	0	0	0	0	1	0	0
0.71	0	0	0	6	0	0	0	0	0	6	0	0
0.72	0	0	0	0	0	0	0	0	0	0	0	0
0.73	0	0	0	3	0	0	0	0	0	3	0	0
0.74	0	0	0	2	0	0	0	0	0	2	0	0
0.75	0	0	0	2	0	0	3	0	0	5	0	0
0.76	0	0	0	2	0	0	0	0	0	2	0	0
0.77	0	0	0	0	0	0	3	0	0	3	0	0
0.78	1	0	0	4	0	0	1	0	0	6	0	0
0.79	0	0	0	1	0	0	0	0	0	1	0	0
0.80	0	0	0	4	0	0	0	0	0	4	0	0
0.81	0	0	0	2	0	0	0	0	0	2	0	0
0.82	0	0	0	0	0	1	0	0	0	0	0	1
0.83	0	0	0	1	0	0	1	0	0	2	0	0
0.84	0	0	0	3	0	0	0	0	0	3	0	0
0.85	0	0	0	0	0	1	0	0	0	0	0	1
0.86	0	0	0	1	0	0	0	0	0	1	0	0
0.87	0	0	0	2	0	0	0	0	0	2	0	0
0.88	0	0	0	0	0	0	0	0	0	0	0	0
0.89	0	0	0	1	0	0	0	0	0	1	0	0
0.90	0	0	0	1	0	0	1	0	0	2	0	0
0.91	0	0	0	0	0	0	0	0	0	0	0	0
0.92	0	0	0	2	0	0	1	0	0	3	0	0
0.93	0	0	0	1	0	0	0	0	0	1	0	0
0.94	0	0	0	1	0	0	0	0	0	1	0	0
0.95	0	0	0	2	0	0	0	0	0	2	0	0
0.96	0	0	0	0	0	0	1	0	0	1	0	0
0.97	0	0	0	2	0	0	0	0	0	2	0	0
0.98	0	0	0	1	0	0	0	0	0	1	0	0
0.99	0	0	0	3	0	0	0	0	0	3	0	0
1.00	0	0	0	1	0	0	0	0	0	1	0	0
SUBTOTAL	1	1	0	125	12	2	14	3	0	140	16	2

~~TOP SECRET~~ [redacted]

Table A-2

~~TOP SECRET~~ [redacted]

MISSION • 1019-1 • INSTRUMENT • AFT 06-11-65 DENSITY FREQ DISTR

DENSITY VALUE	PRIMARY MIN	PRIMARY MAX	PRIMARY LIM	INTERMEDIATE MIN	INTERMEDIATE MAX	INTERMEDIATE LIM	FULL MIN	FULL MAX	FULL LIM	ALL LEVELS MIN	ALL LEVELS MAX	ALL LEVELS LIM
1.01	0	0	0	0	1	0	1	0	0	1	1	0
1.02	0	0	0	1	2	0	0	0	0	1	2	0
1.03	0	0	0	0	2	0	0	1	0	0	3	0
1.04	0	0	0	2	1	0	0	0	0	1	3	0
1.05	0	0	0	0	4	0	0	1	0	1	5	0
1.06	0	0	0	1	1	0	0	0	0	1	5	0
1.07	0	0	0	0	2	0	0	0	0	0	5	0
1.08	0	0	0	1	2	0	0	0	0	1	5	0
1.09	0	0	0	0	1	0	0	0	0	0	5	0
1.10	0	0	0	4	2	0	0	0	0	4	5	0
1.11	0	0	0	2	2	0	0	0	0	2	5	0
1.12	0	0	0	0	2	0	0	0	0	0	5	0
1.13	0	0	0	1	2	0	0	0	0	1	5	0
1.14	0	0	0	0	2	0	0	0	0	0	5	0
1.15	0	0	0	1	2	0	0	0	0	1	5	0
1.16	0	0	0	0	4	0	0	0	0	0	5	0
1.17	0	0	0	1	1	0	0	0	0	1	5	0
1.18	0	0	0	0	2	0	0	0	0	0	5	0
1.19	0	0	0	3	1	0	0	0	0	4	5	0
1.20	0	0	0	0	3	0	0	0	0	0	5	0
1.21	0	0	0	0	0	0	0	0	0	0	5	0
1.22	0	0	0	0	0	0	0	0	0	0	5	0
1.23	0	0	0	0	0	0	0	0	0	0	5	0
1.24	0	0	0	0	0	0	0	0	0	0	5	0
1.25	0	0	0	0	0	0	0	0	0	0	5	0
1.26	0	0	0	0	2	0	0	0	0	0	5	0
1.27	0	0	0	0	3	0	0	0	0	0	5	0
1.28	0	0	0	1	3	0	0	1	0	0	5	0
1.29	0	0	0	0	1	0	0	0	0	0	5	0
1.30	0	0	0	1	7	0	0	0	0	1	5	0
1.31	0	0	0	0	3	0	0	0	0	0	5	0
1.32	0	0	0	1	6	0	0	0	0	1	5	0
1.33	0	0	0	0	6	0	0	0	0	0	5	0
1.34	0	0	0	1	2	0	0	1	0	1	5	0
1.35	0	0	0	0	4	0	0	0	0	0	5	0
1.36	0	0	0	0	2	0	0	0	0	0	5	0
1.37	0	0	0	0	3	0	0	0	0	0	5	0
1.38	0	0	0	2	1	0	0	0	0	2	5	0
1.39	0	0	0	0	3	0	0	0	0	0	5	0
1.40	0	0	0	1	3	0	0	0	0	1	5	0
1.41	0	0	0	0	4	0	0	0	0	0	5	0
1.42	0	0	0	0	3	0	0	1	0	0	5	0
1.43	0	0	0	0	5	0	0	0	0	0	5	0
1.44	0	0	0	1	5	0	0	0	0	1	5	0
1.45	0	0	0	0	4	0	0	0	0	0	5	0
1.46	0	0	0	0	3	0	0	0	0	0	5	0
1.47	0	0	0	0	3	0	0	0	0	0	5	0
1.48	0	0	0	0	3	0	0	0	0	0	5	0
1.49	0	0	0	0	3	0	0	0	0	0	5	0
1.50	0	1	0	0	3	0	0	0	0	0	4	0
SUBTOTAL	3	4	0	20	109	7	2	6	0	25	119	7

~~TOP SECRET~~ [redacted]

Table A-2

~~TOP SECRET~~ [redacted]

MISSION • 1019-1 • INSTRUMENT • AFT 06-11-65 DENSITY FREQ DISTR

DENSITY VALUE	PRIMARY MIN	PRIMARY MAX	PRIMARY LIM	INTERMEDIATE MIN	INTERMEDIATE MAX	INTERMEDIATE LIM	FULL MIN	FULL MAX	FULL LIM	ALL LEVELS MIN	ALL LEVELS MAX	ALL LEVELS LIM
1.51	0	0	0	0	3	0	0	0	0	0	3	0
1.52	0	0	0	0	5	0	0	2	0	0	7	0
1.53	0	0	1	0	0	0	0	0	0	0	0	1
1.54	0	0	0	0	1	0	0	0	0	0	1	0
1.55	0	0	0	0	1	0	0	0	0	0	1	0
1.56	0	0	0	0	1	0	0	0	0	0	1	0
1.57	0	0	0	0	1	2	0	0	0	0	1	2
1.58	0	0	0	0	3	2	0	0	0	0	3	2
1.59	0	0	0	0	3	1	0	0	0	0	4	1
1.60	0	0	0	0	8	0	0	0	0	0	9	0
1.61	0	0	0	0	2	1	0	0	0	0	3	1
1.62	0	0	0	0	1	1	0	0	0	0	3	1
1.63	0	0	0	0	1	2	0	0	0	0	5	2
1.64	0	0	0	0	2	1	0	0	0	0	5	1
1.65	0	0	0	0	2	1	0	0	0	0	5	1
1.66	0	0	0	0	2	2	0	0	0	0	7	2
1.67	0	0	0	0	2	1	0	0	0	0	7	1
1.68	0	0	0	0	2	2	0	0	0	0	9	2
1.69	0	0	0	0	1	0	0	0	0	0	9	0
1.70	0	0	0	0	3	2	0	0	0	0	12	2
1.71	0	0	0	0	2	0	0	0	0	0	12	0
1.72	0	0	0	0	1	1	0	0	0	0	13	1
1.73	0	0	0	0	0	0	0	0	0	0	13	0
1.74	0	0	0	0	1	1	0	0	0	0	14	1
1.75	0	0	0	0	0	0	0	0	0	0	14	0
1.76	0	0	0	0	3	1	0	0	0	0	17	1
1.77	0	0	0	0	1	0	0	0	0	0	17	0
1.78	0	0	0	0	4	1	0	0	0	0	18	1
1.79	0	0	0	0	1	2	0	0	0	0	20	2
1.80	0	0	0	0	2	0	0	0	0	0	20	0
1.81	0	0	0	0	2	0	0	0	0	0	20	0
1.82	0	0	0	0	4	0	0	0	0	0	24	0
1.83	0	0	0	0	3	0	0	0	0	0	24	0
1.84	0	0	0	0	3	1	0	0	0	0	27	1
1.85	0	0	0	0	1	1	0	0	0	0	28	1
1.86	0	0	0	0	1	1	0	0	0	0	29	1
1.87	0	0	0	0	1	0	0	0	0	0	29	0
1.88	0	0	0	0	1	0	0	0	0	0	30	0
1.89	0	0	0	0	0	0	0	0	0	0	30	0
1.90	0	0	0	0	5	—	0	0	—	0	35	—
1.91	0	0	0	0	2	2	0	0	0	0	37	2
1.92	0	0	0	0	2	1	0	0	0	0	39	1
1.93	0	0	0	0	1	0	0	0	0	0	40	0
1.94	0	0	0	0	0	4	0	0	0	0	44	4
1.95	0	0	0	0	0	1	0	0	0	0	45	1
1.96	0	0	0	0	0	7	0	0	0	0	52	7
1.97	0	0	0	0	1	1	0	0	0	0	53	1
1.98	0	0	0	0	1	2	0	0	0	0	55	2
1.99	0	0	0	0	3	2	0	0	0	0	58	2
2.00	0	0	0	0	3	11	0	0	0	0	61	11
SUBTOTAL	0	1	4	1	77	81	0	13	4	1	91	89

~~TOP SECRET~~ [redacted]

Table A-2

~~TOP SECRET~~ [redacted]

MISSION • 1019-1 • INSTRUMENT • AFT 06-11-65 DENSITY FREQ DISTR

DENSITY VALUE	PRIMARY MIN	PRIMARY MAX	PRIMARY LIM	INTERMEDIATE MIN	INTERMEDIATE MAX	INTERMEDIATE LIM	FULL MIN	FULL MAX	FULL LIM	ALL LEVELS MIN	ALL LEVELS MAX	ALL LEVELS LIM
2.01	0	0	0	0	1	1	0	0	1	0	1	2
2.02	0	0	0	0	1	1	0	0	0	0	1	1
2.03	0	0	0	0	1	1	0	0	0	0	1	1
2.04	0	0	0	0	3	3	0	0	1	0	3	4
2.05	0	0	0	0	7	7	0	0	0	0	4	4
2.06	0	0	0	0	2	2	0	0	0	0	3	3
2.07	0	0	0	0	9	9	0	0	0	0	2	2
2.08	0	0	0	0	1	1	0	0	1	0	1	2
2.09	0	0	0	0	0	0	0	0	0	0	1	1
2.10	0	0	0	0	0	0	0	0	0	0	1	1
2.11	0	0	0	1	0	1	0	0	0	0	1	1
2.12	0	0	0	0	0	0	0	0	0	0	1	1
2.13	0	0	0	0	0	0	0	0	0	0	2	2
2.14	0	0	0	0	0	0	0	0	0	0	3	3
2.15	0	0	0	0	0	0	0	0	0	0	6	6
2.16	0	0	0	0	0	0	0	0	0	0	3	3
2.17	0	0	0	0	0	0	0	0	0	0	7	7
2.18	0	0	0	0	0	0	0	0	0	0	3	3
2.19	0	0	0	0	0	0	0	0	0	0	10	10
2.20	0	0	0	0	0	0	0	0	0	0	6	6
2.21	0	0	0	0	0	0	0	0	0	0	10	10
2.22	0	0	0	0	0	0	0	0	0	0	6	6
2.23	0	0	0	0	0	0	0	0	0	0	10	10
2.24	0	0	0	0	0	0	0	0	0	0	6	6
2.25	0	0	0	0	0	0	0	0	0	0	10	10
2.26	0	0	0	0	0	0	0	0	0	0	6	6
2.27	0	0	0	0	0	0	0	0	0	0	10	10
2.28	0	0	0	0	0	0	0	0	0	0	6	6
2.29	0	0	0	0	0	0	0	0	0	0	10	10
2.30	0	0	0	0	0	0	0	0	0	0	6	6
2.31	0	0	0	0	0	0	0	0	0	0	10	10
2.32	0	0	0	0	0	0	0	0	0	0	6	6
2.33	0	0	0	0	0	0	0	0	0	0	10	10
2.34	0	0	0	0	0	0	0	0	0	0	6	6
2.35	0	0	0	0	0	0	0	0	0	0	10	10
2.36	0	0	0	0	0	0	0	0	0	0	6	6
2.37	0	0	0	0	0	0	0	0	0	0	10	10
2.38	0	0	0	0	0	0	0	0	0	0	6	6
2.39	0	0	0	0	0	0	0	0	0	0	10	10
2.40	0	0	0	0	0	0	0	0	0	0	6	6
2.41	0	0	0	0	0	0	0	0	0	0	10	10
2.42	0	0	0	0	0	0	0	0	0	0	6	6
2.43	0	0	0	0	0	0	0	0	0	0	10	10
2.44	0	0	0	0	0	0	0	0	0	0	6	6
2.45	0	0	0	0	0	0	0	0	0	0	10	10
2.46	0	0	0	0	0	0	0	0	0	0	6	6
2.47	0	0	0	0	0	0	0	0	0	0	10	10
2.48	0	0	0	0	0	0	0	0	0	0	6	6
2.49	0	0	0	0	0	0	0	0	0	0	10	10
2.50	0	0	0	0	0	0	0	0	0	0	6	6
SUBTOTAL	0	0	1	0	9	92	0	2	14	0	11	107

~~TOP SECRET~~ [redacted]

Table A-2

~~TOP SECRET~~ [redacted]

MISSION • 1019-1 • INSTRUMENT • AFT 06-11-65 DENSITY FREQ DISTR

DENSITY VALUE	PRIMARY MIN	PRIMARY MAX	PRIMARY LIM	INTERMEDIATE MIN	INTERMEDIATE MAX	INTERMEDIATE LIM	FULL MIN	FULL MAX	FULL LIM	ALL LEVELS MIN	ALL LEVELS MAX	ALL LEVELS LIM
2.51	C	C	0	0	0	0	0	0	0	0	0	0
2.52	C	C	0	C	0	0	0	0	0	0	0	0
2.53	C	C	0	C	0	0	0	0	0	0	0	0
2.54	C	C	0	C	0	0	0	0	0	0	0	0
2.55	C	C	0	C	0	0	0	0	0	0	0	0
2.56	C	C	0	C	0	0	0	0	0	0	0	0
2.57	C	C	0	C	0	0	0	0	0	0	0	0
2.58	C	C	0	C	0	0	0	0	0	0	0	0
2.59	C	C	0	C	0	0	0	0	0	0	0	0
2.60	C	C	0	C	0	0	0	0	0	0	0	0
2.61	C	C	0	C	0	0	0	0	0	0	0	0
2.62	C	C	0	C	0	0	0	0	0	0	0	0
2.63	C	C	0	C	0	0	0	0	0	0	0	0
2.64	C	C	0	C	0	0	0	0	0	0	0	0
2.65	C	C	0	C	0	0	0	0	0	0	0	0
2.66	C	C	0	C	0	0	0	0	0	0	0	0
2.67	C	C	0	C	0	0	0	0	0	0	0	0
2.68	C	C	0	C	0	0	0	0	0	0	0	0
2.69	C	C	0	C	0	0	0	0	0	0	0	0
2.70	C	C	0	C	0	0	0	0	0	0	0	0
SUBTOTAL	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	6	6	5	208	208	182	24	24	16	238	238	[redacted]

MISSION 1019-1 INSTR - AFT 06-11-65 PROCESSING AND EXPOSURE ANALYS

PROCESS LEVEL	SAMPLE SIZE	UNDER EXPOSED	UNDER PROCESSED	CORRECT EXP+PROC	OVER PROCESSED	OVER EXPOSED
PRIMARY	6	0 PC	33 PC	17 PC	0 PC	50 PC
INTERMEDIATE	208	0 PC	13 PC	69 PC	15 PC	2 PC
FULL	24	4 PC	0 PC	88 PC	8 PC	0 PC
ALL LEVELS	238	1 PC	13 PC	70 PC	14 PC	3 PC

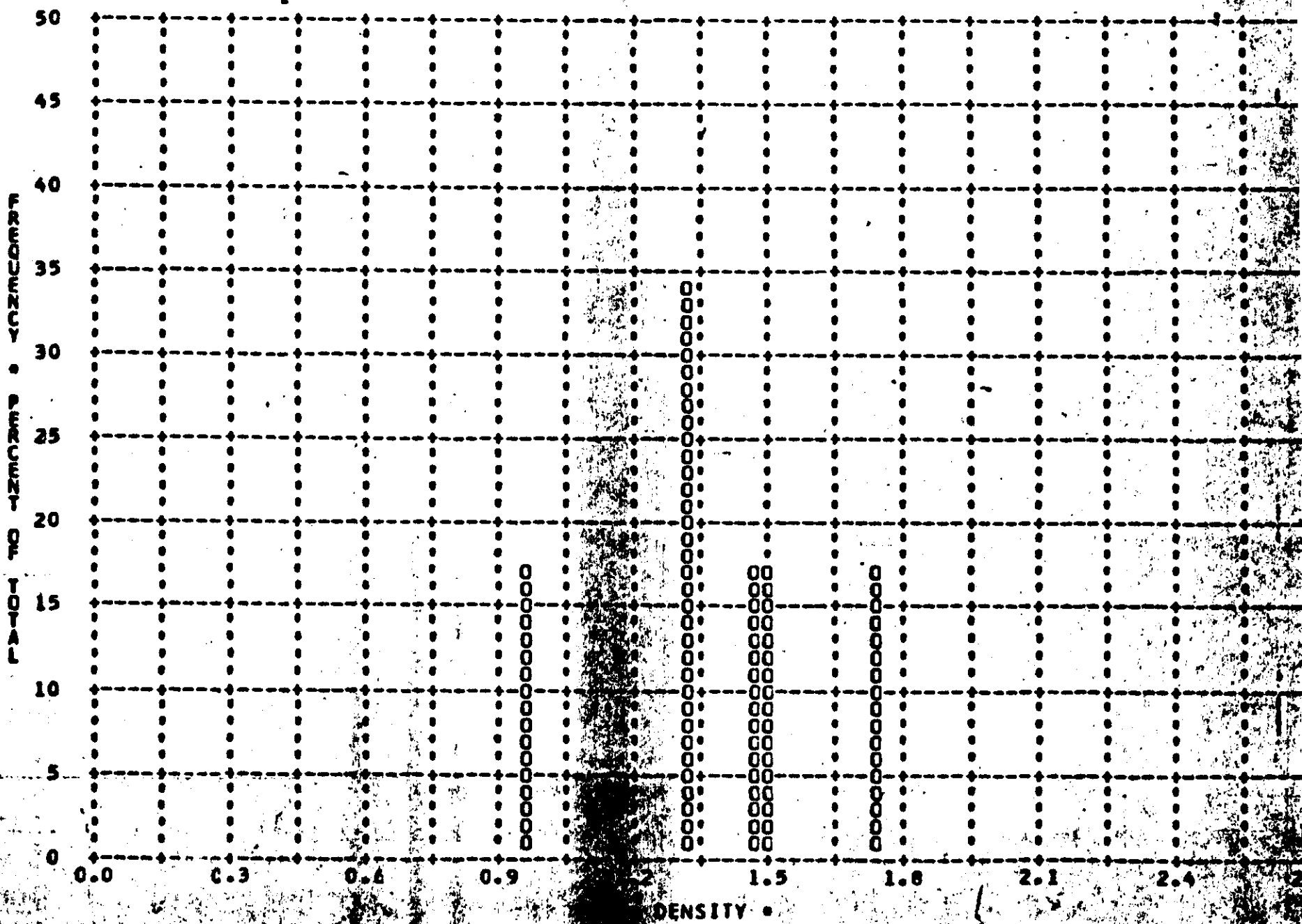
PROCESS LEVEL	BASE + FOG	UNDER EXPOSED	UNDER PROCESSED	CORRECT EXP+PROC	OVER PROCESSED	OVER EXPOSED
PRIMARY	0.01-0.09	0.01-0.13	0.14-0.39	0.40-0.90	---------	0.91 AND U
INTERMED	0.10-0.17	0.01-0.20	0.21-0.39	0.40-0.90	0.91-1.34	1.35 AND U
FULL	0.18 AND UP	0.01-0.39	---------	0.40-0.90	0.91-1.69	1.70 AND U

~~TOP SECRET~~ [redacted]

Table A-2

MISSION • 1019-1 • INSTR • AFT • 06-11-65 PLOT OF D MAX • TERRAIN • PROCESSING • PRIMARY

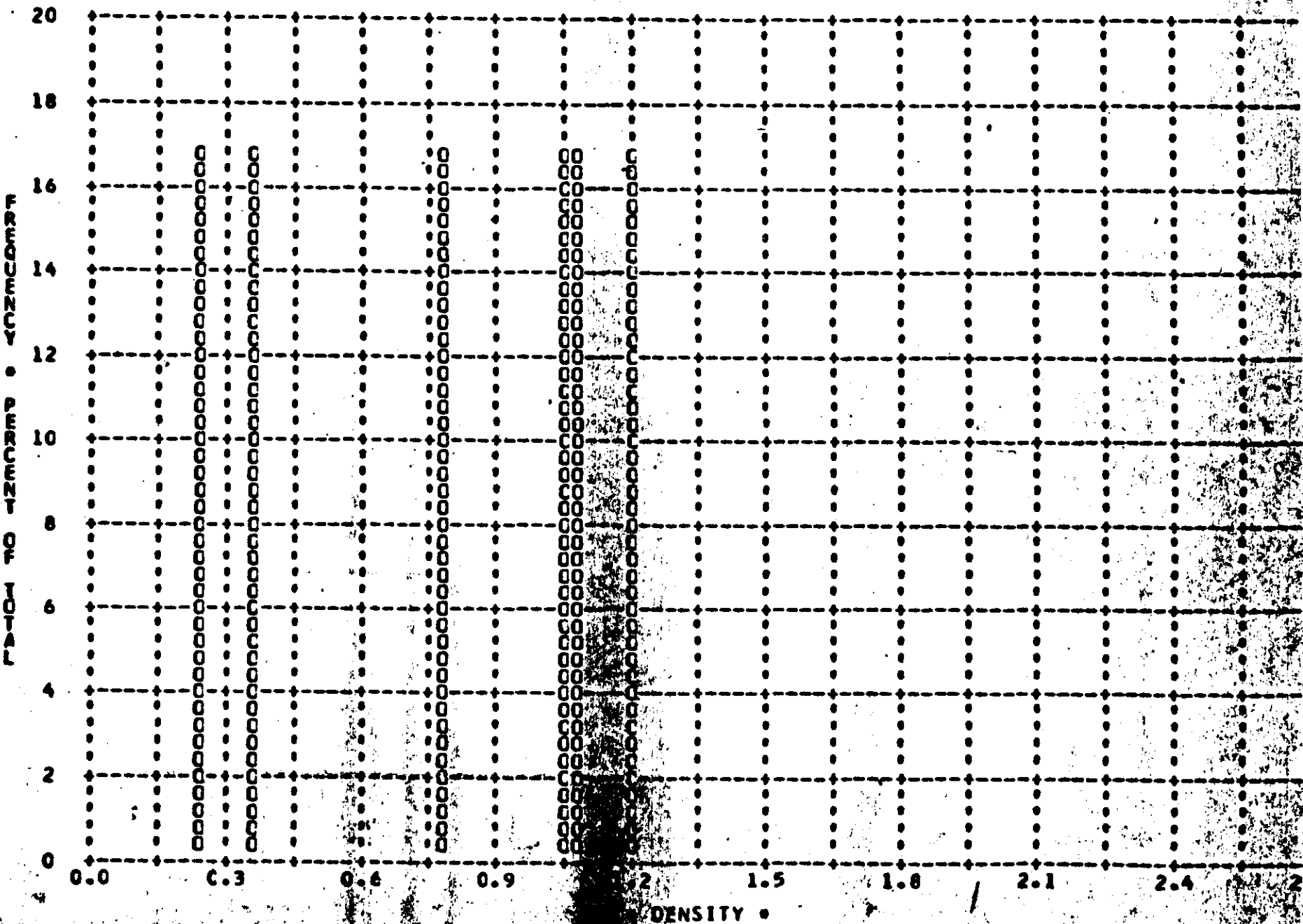
ARITH MEAN • 1.38 • MEDIAN • 1.46 • STD DEV • 0.26 • RANGE • 0.96 TO 1.74 WITH 6 SAMPLES



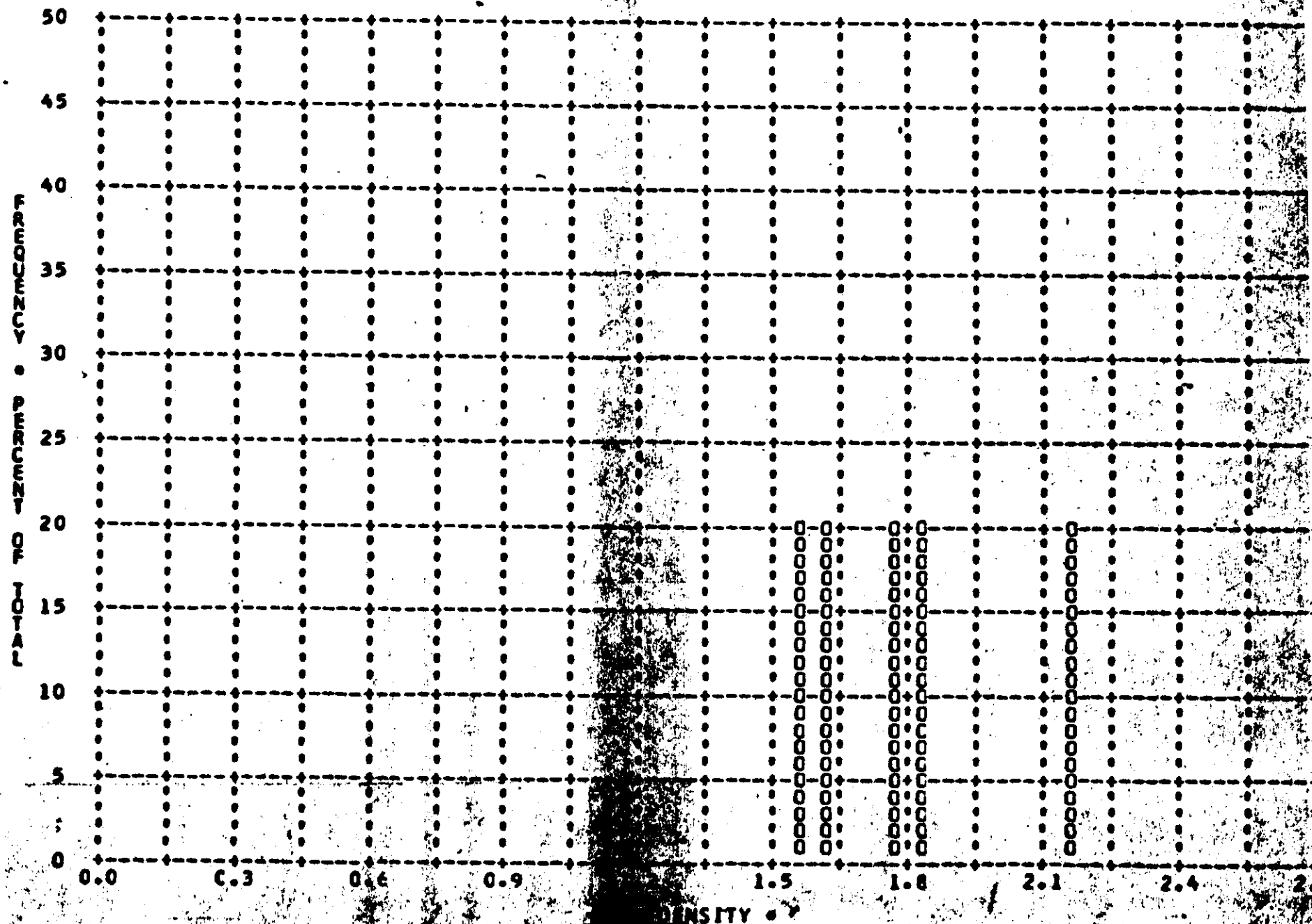
A-26

MISSION • 1019-1 • INSTR • AFT • 06-11-65 PLOT OF D MIN • TERRAIN • PROCESSING • PRIMARY

ARITH MEAN • 0.78 • MEDIAN • 1.04 • STD DEV • 0.40 • RANGE • 0.24 TO 1.20 WITH 6 SAMPLES

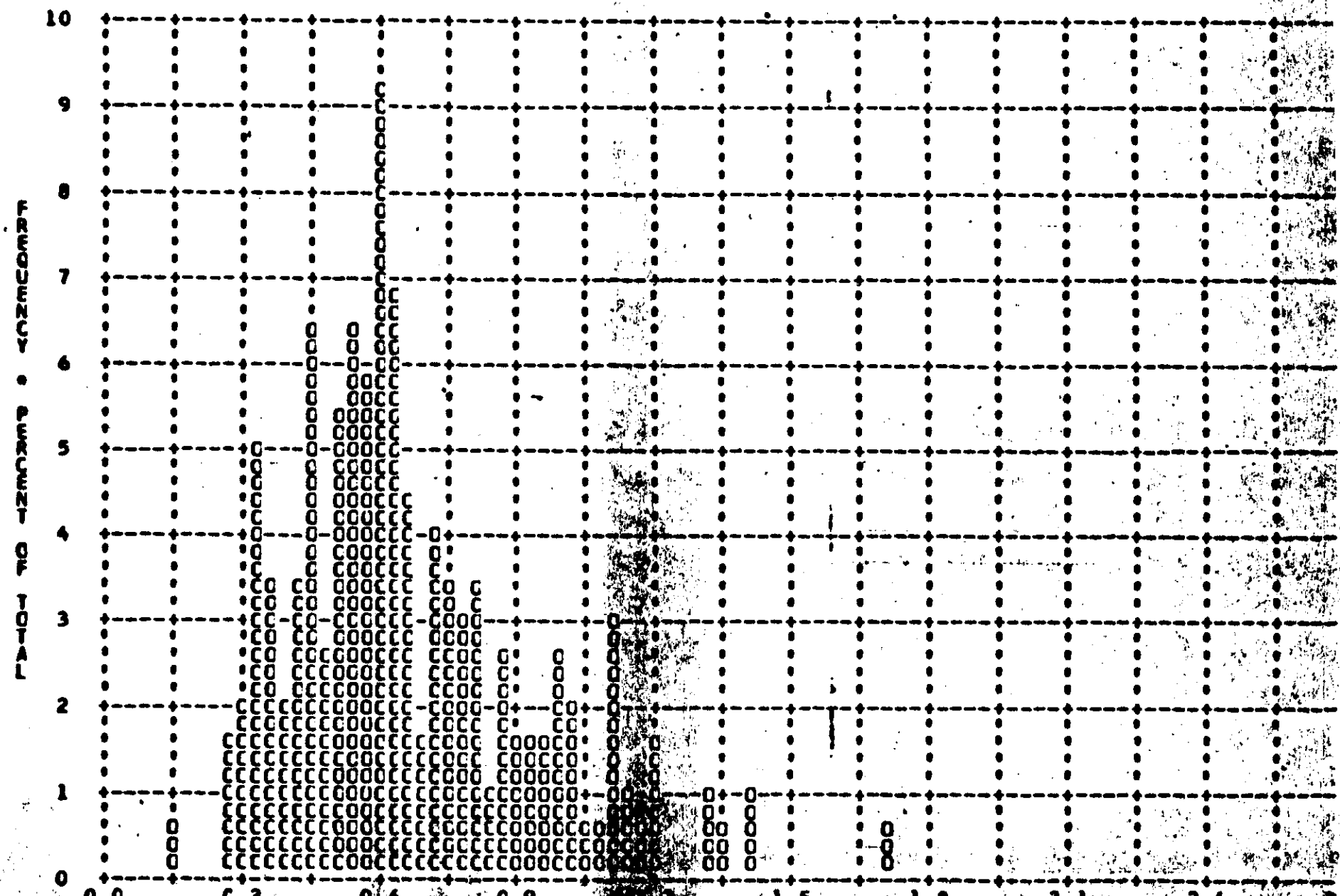


MISSION • 1019-1 • INSTR • AFT • 06-11-65 PLOT OF D MAX • CLOUD • PROCESSING • PRIMARY •
ARITH MEAN • 1.77 • MEDIAN • 1.75 • STD DEV • 0.24 • RANGE • 1.54 TO 2.14 WITH 5 SAMPLES



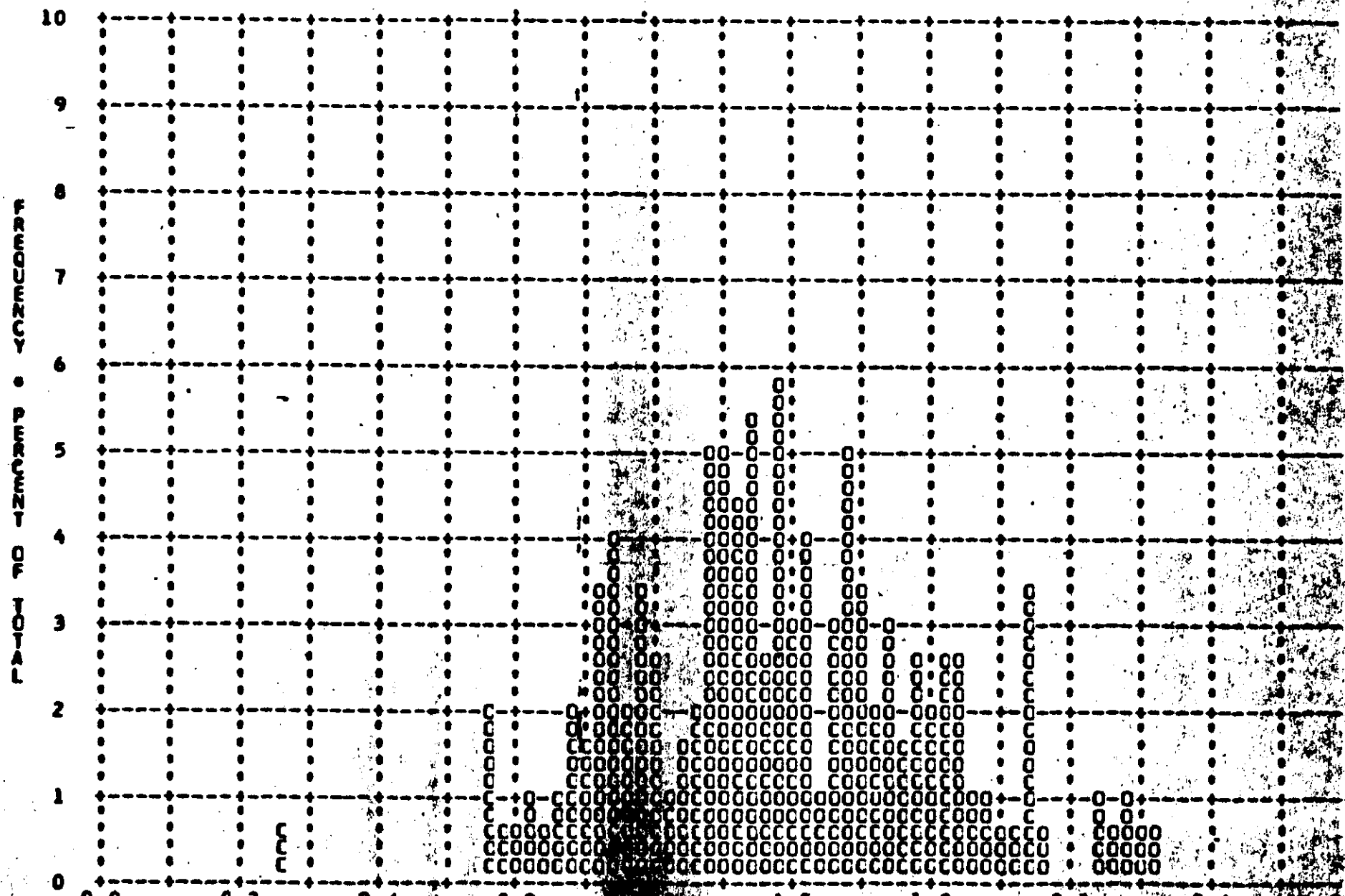
MISSION • 1019-1 • INSTR • AFT • 06-11-65 PLOT OF D MIN • TERRAIN • PRCCESSING • INTERMEDIATE

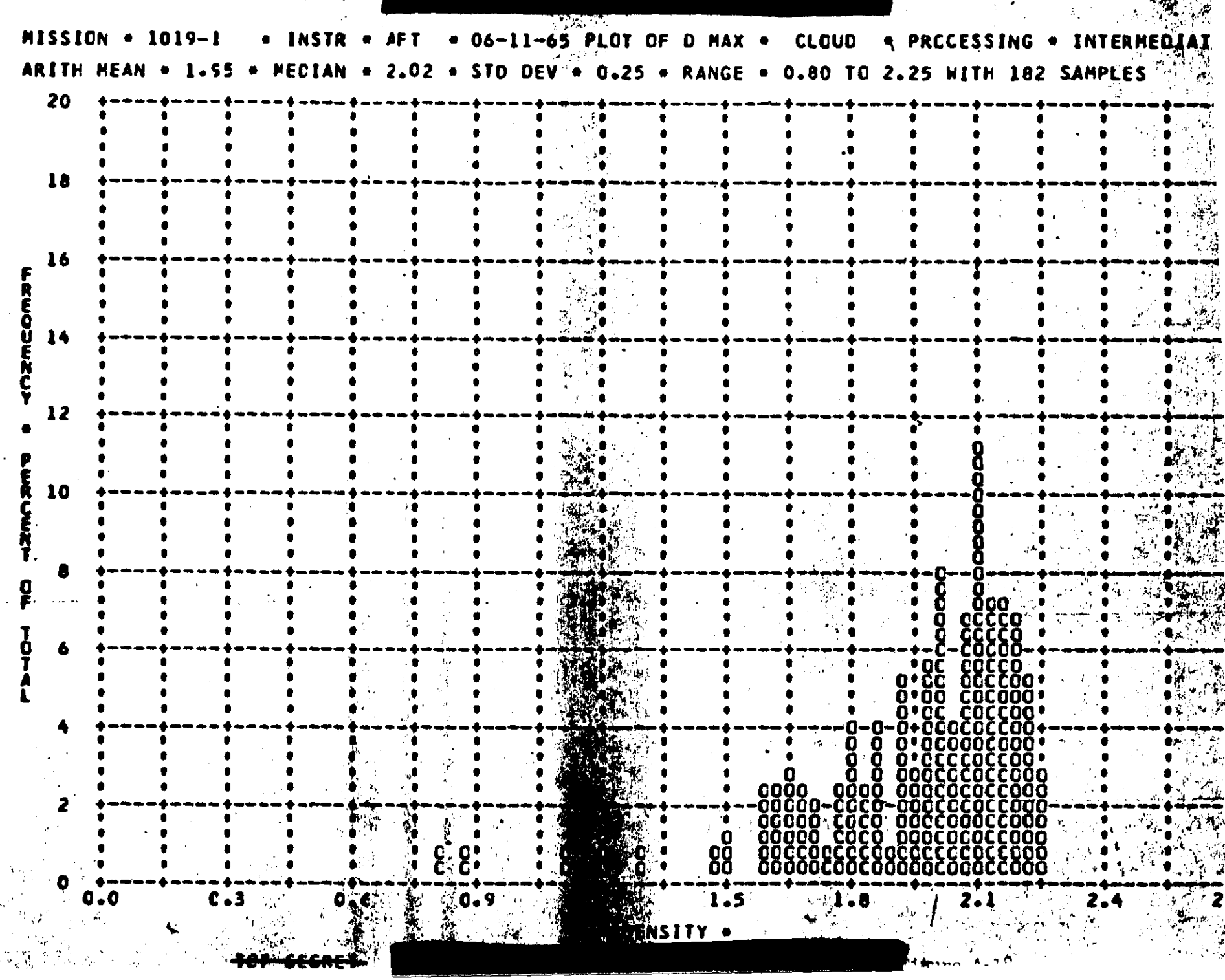
ARITH MEAN • 0.65 • MEDIAN • C.60 • STD DEV • 0.26 • RANGE • 0.13 TC 1.70 WITH 208 SAMPLES



MISSION • 1019-1 • INSTR • AFT • 06-11-65 PLOT OF D MAX • TERRAIN • PROCESSING • INTERMEDIATE

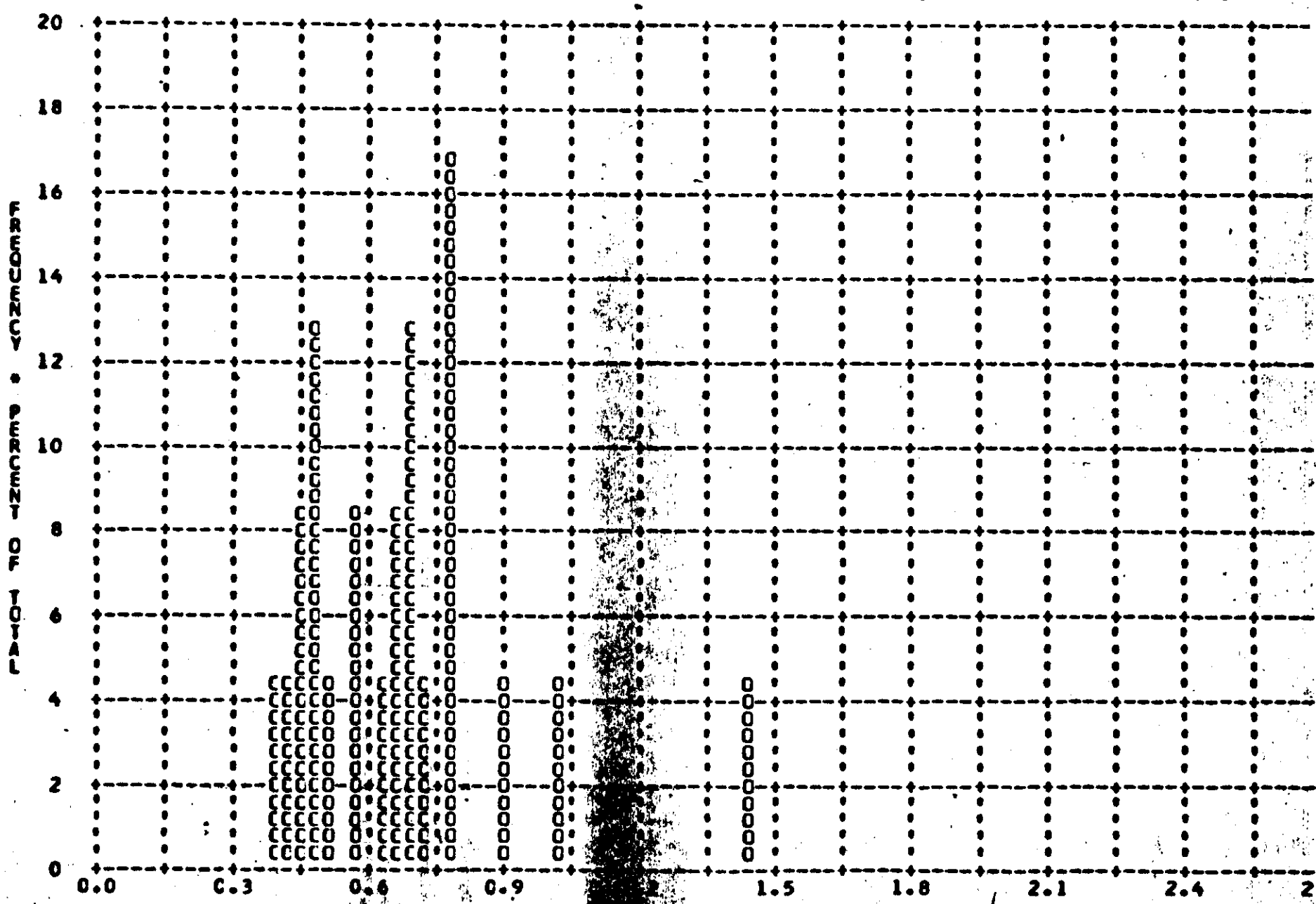
ARITH MEAN • 1.46 • MEDIAN • 1.45 • STD DEV • 0.32 • RANGE • 0.39 TO 2.26 WITH 208 SAMPLES




MISSION • 1019-1 • INSTR • AFT • 06-11-65 PLOT OF D MAX • CLOUD ¶ PRCCESSING • INTERMEDIAT
ARITH MEAN • 1.55 • MEDIAN • 2.02 • STD DEV • 0.25 • RANGE • 0.80 TO 2.25 WITH 182 SAMPLES
FREQUENCY • PERCENT OF TOTAL
20
18
16
14
12
10
8
6
4
2
0
0.0
0.3
0.6
0.9
1.5
1.8
2.1
2.4
ENSITY •

MISSION • 1019-1 • INSTR • AFT • 06-11-65 PLOT OF D MIN • TERRAIN • PROCESSING • FULL

ARITH MEAN • 0.65 • MEDIAN • 0.65 • STD DEV • 0.23 • RANGE • 0.38 TO 1.43 WITH 24 SAMPLES



MISSION • 1019-1 • INSTR • AFT • 06-11-65 PLOT OF D MAX • TERRAIN • PROCESSING • FULL

ARITH MEAN • 1.51 • MEDIAN • 1.59 • STD DEV • 0.36 • RANGE • 0.81 TO 2.08 WITH 24 SAMPLES

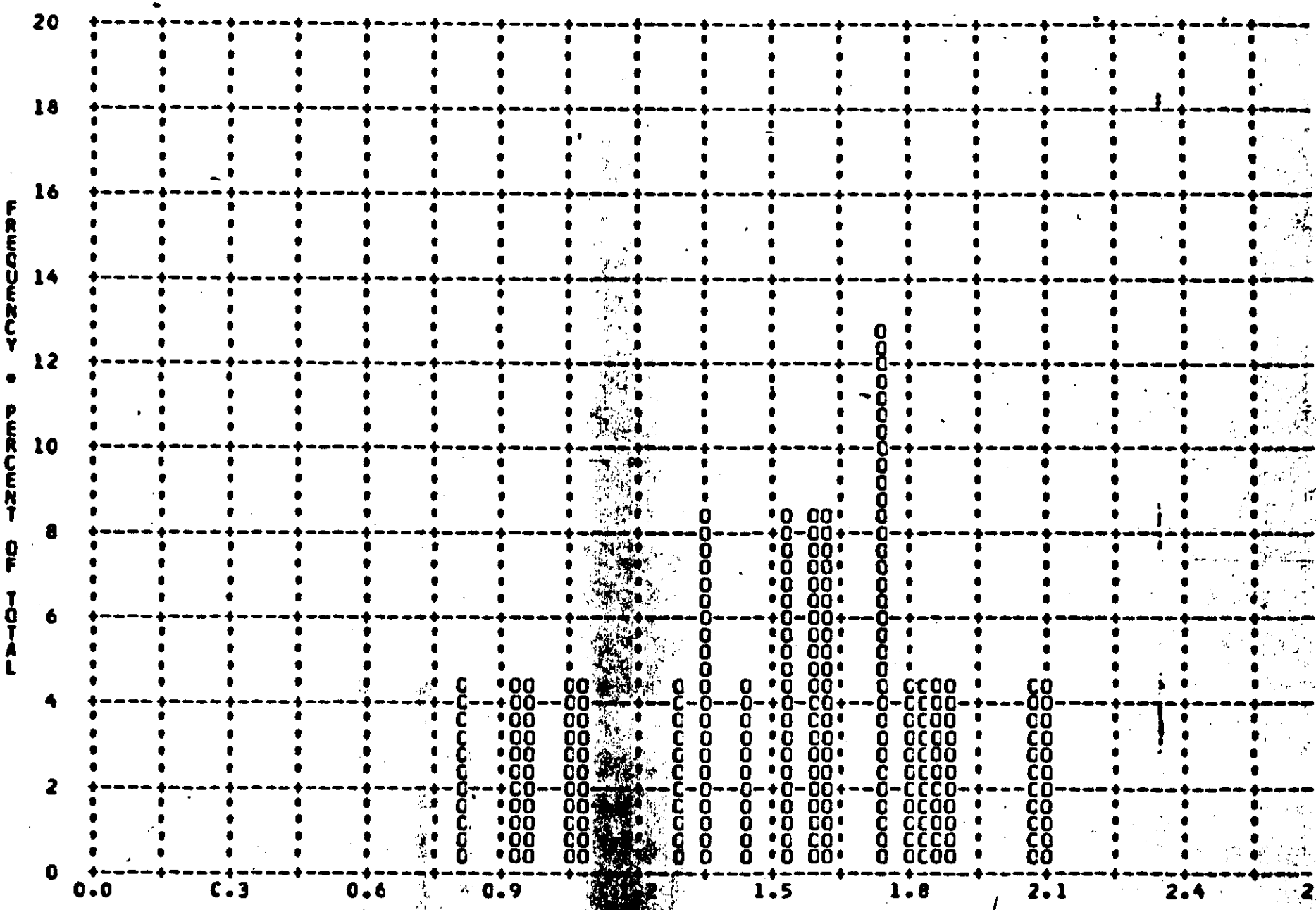


Figure A-20

MISSION • 1019-1 • INSTR • AFT • 06-11-65 PLOT OF D MAX • CLOUD • PROCESSING • FULL

ARITH MEAN • 2.10 • MEDIAN • 2.10 • STD DEV • 0.13 • RANGE • 1.77 TO 2.30 WITH 18 SAMPLES

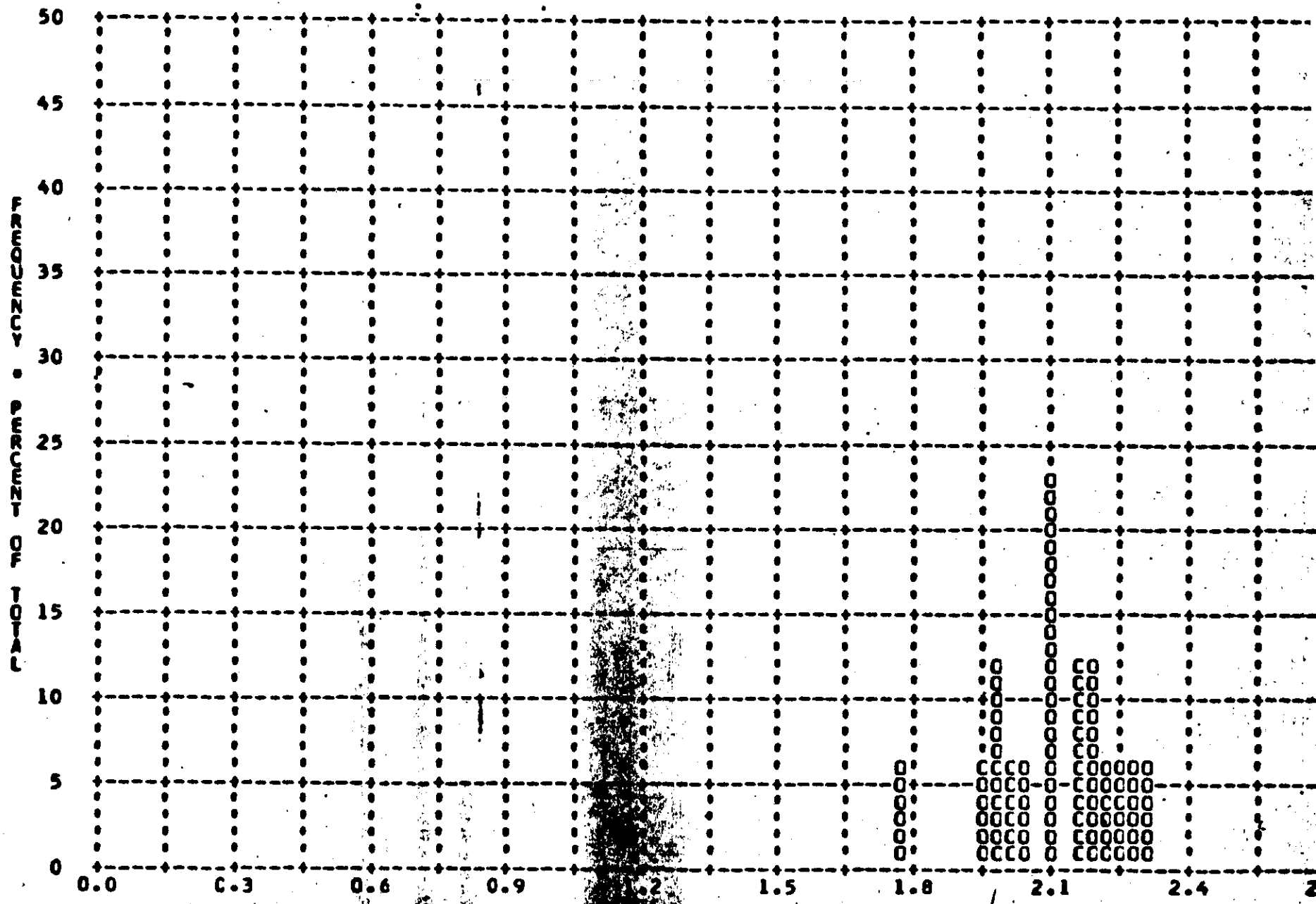
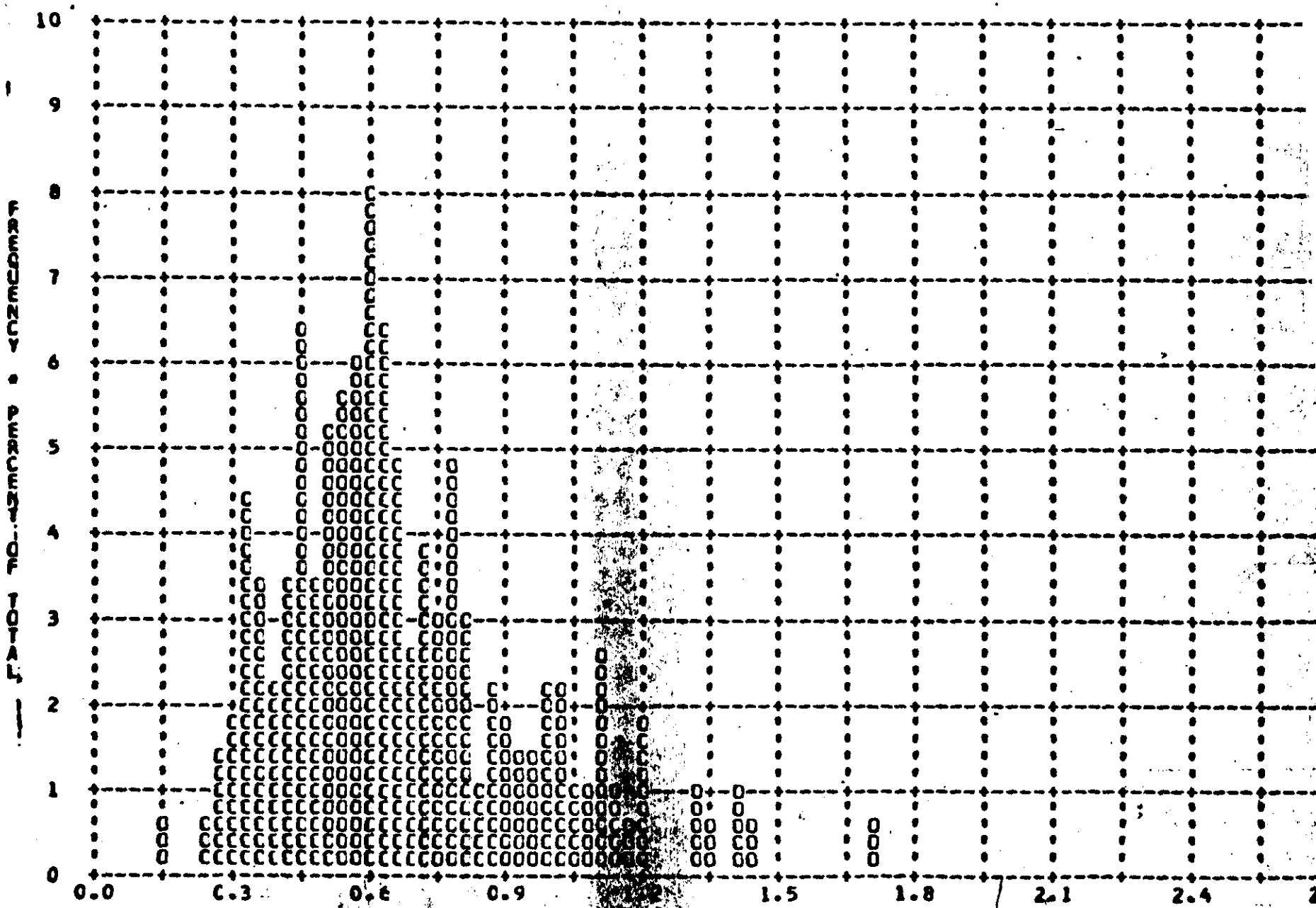


Figure A-21

MISSION • 1019-1 • INSTR • AFT • 06-11-65 PLOT OF D MIN • TERRAIN • PROCESSING • ALL LEVELS

ARITH MEAN • 0.66 • MEDIAN • 0.60 • STD DEV • 0.26 • RANGE • 0.13 TO 1.70 WITH 238 SAMPLES



MISSION • 1019-1 • INSTR • AFT • 06-11-65 PLOT OF D MAX • TERRAIN • PROCESSING • ALL LEVELS

ARITH MEAN • 1.46 • MEDIAN • 1.45 • STD DEV • 0.32 • RANGE • 0.39 TO 2.26 WITH 238 SAMPLES

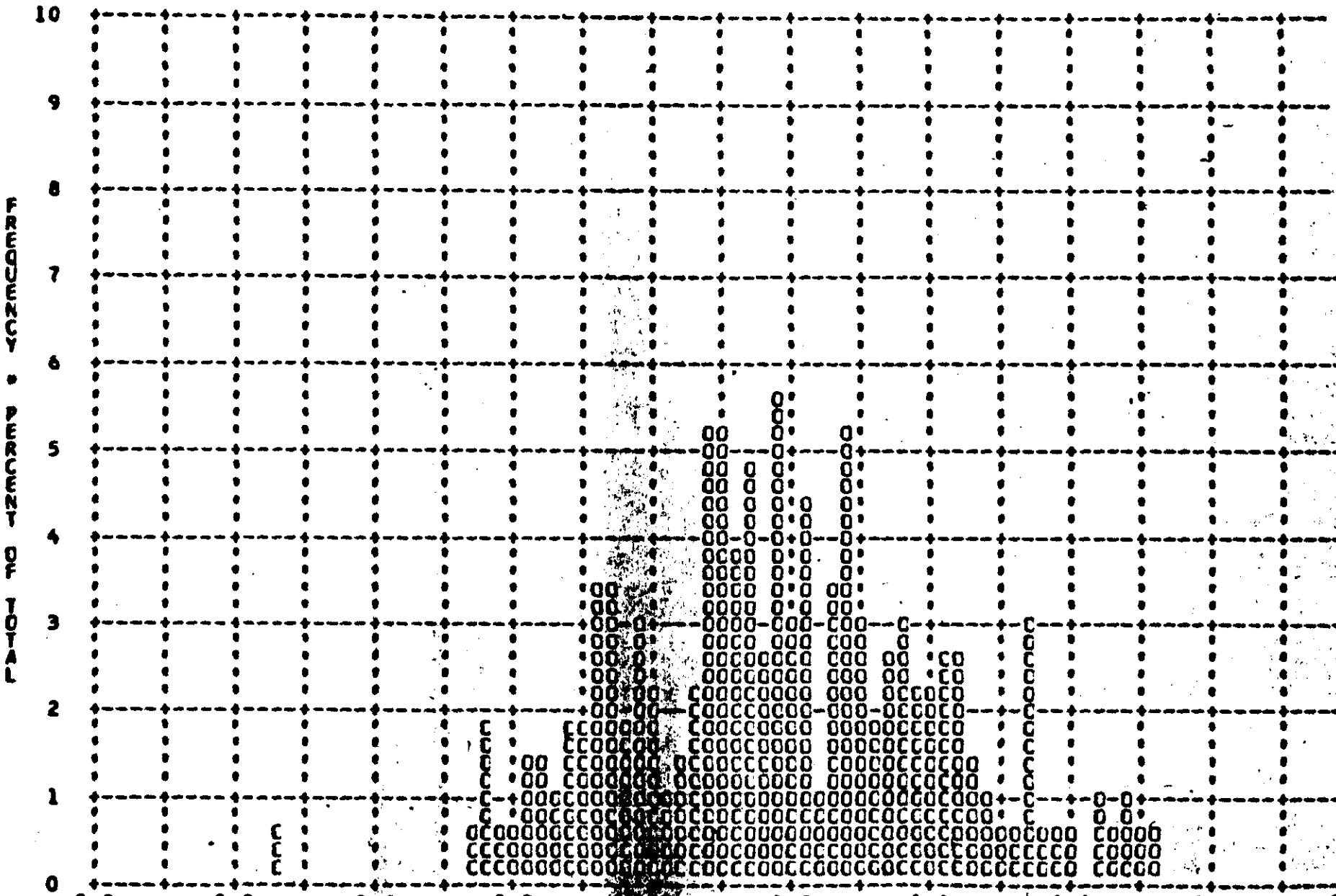


Figure A-23

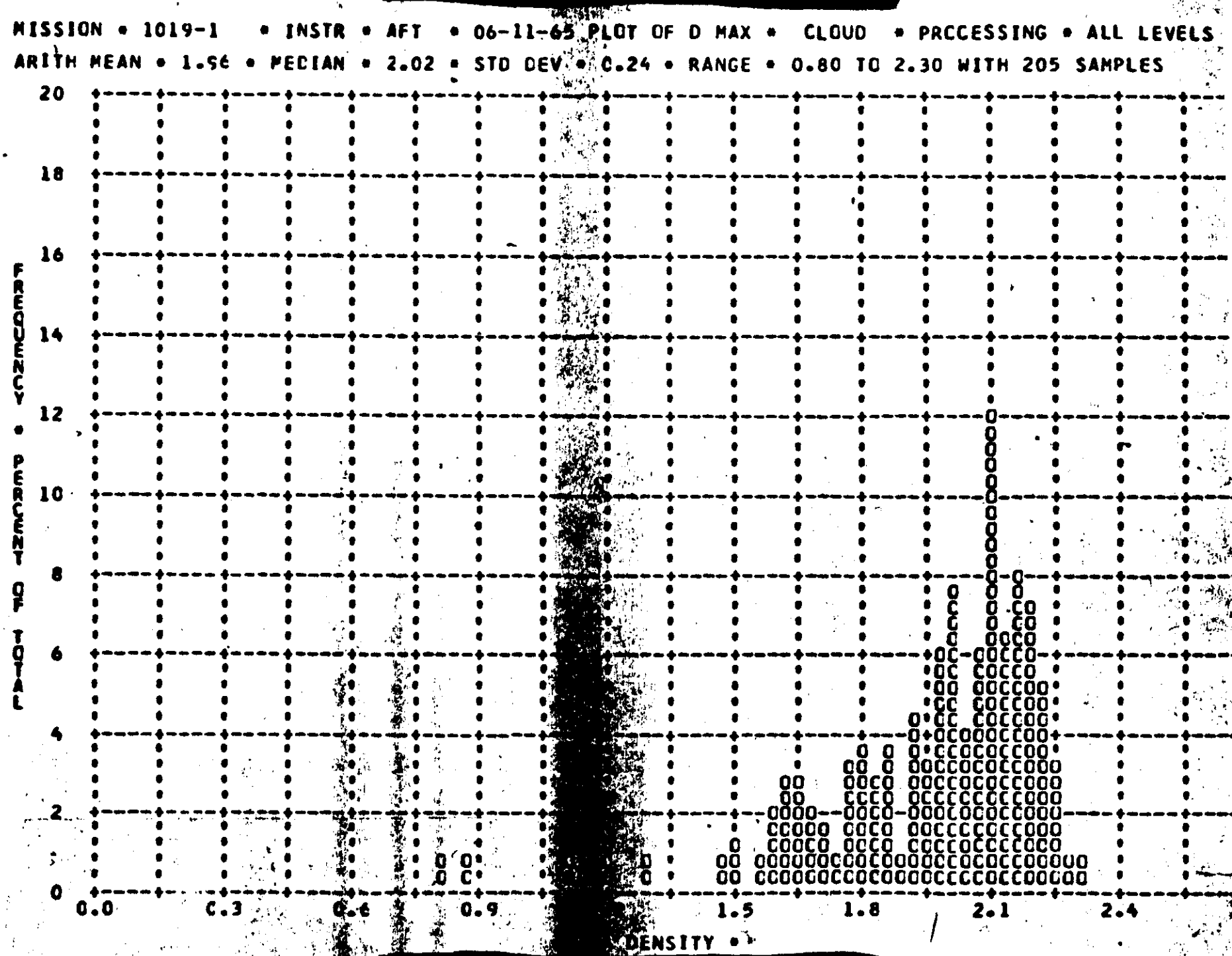

MISSION • 1019-1 • INSTR • AFT • 06-11-65 PLOT OF D MAX • CLOUD • PROCESSING • ALL LEVELS
ARITH MEAN • 1.56 • MEDIAN • 2.02 • STD DEV • 0.24 • RANGE • 0.80 TO 2.30 WITH 205 SAMPLES
FREQUENCY • PERCENT OF TOTAL
20
18
16
14
12
10
8
6
4
2
0
0.0
0.3
0.6
0.9
1.5
1.8
2.1
2.4
DENSITY •

Figure A-24

Distribution

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