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CORONA J

PERFORMANCE EVALUATION REPORT

MISSION 1031-1 and 1031-2

FTV 1627, J-30

29 December 1966

Approved [redacted]
Manager
Advanced Projects

Approved [redacted]
Mgr.
Program

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FOREWORD

This report details the performance of the payload system during the operational phase of the Program [redacted] Flight Test Vehicle 1627.

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 payload test and performance evaluation report for Missions 1031-1 and 1031-2 which was launched on 7 April 1966.

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INTRODUCTION

This report presents the final performance evaluation of Missions 1031-1 and 1031-2 of the Corona Program. The purpose of this report is to define the performance characteristics of the J-30 payload system and to 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.

SECTION I

SYSTEM PERFORMANCE

A. MISSION OBJECTIVES

The payload section of Mission 1031, placed into orbit by Flight Test Vehicle #1627 and LV-2A booster #474, 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 of the J-30 payload system. This Corona "J" system is designed to acquire search and reconnaissance photography of selected areas of the earth from orbital altitudes. The planned mission was a six day photographic period followed by a five day photographic period.

B. MISSION DESCRIPTION

The payload was launched from Vandenberg Air Force Base (VAFB) at 2202:55 Z (1402:55 PST) on 7 April 1966. 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 1031-1 consisted of seven days operation and was completed by air recovery on 14 April 1966. Mission 1031-2 followed immediately with no deactivate period and consisted of four days operation and was completed by air recovery on 18 April 1966.

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

ORBITAL PARAMETERS

Parameter	Predicted	Orbit 52 Actuals
Period (Min.)	89.87	89.55
Perigee (N.M.)	107.7	104.55
Apogee (N.M.)	184.4	170.39
Inclination (Deg.)	75.0	75.072
Perigee Latitude (Deg. N.)	21.0	23.303
Eccentricity	0.0107	0.00919

SCHEMATIC INBOARD PROFILE - CORONA J SYSTEM

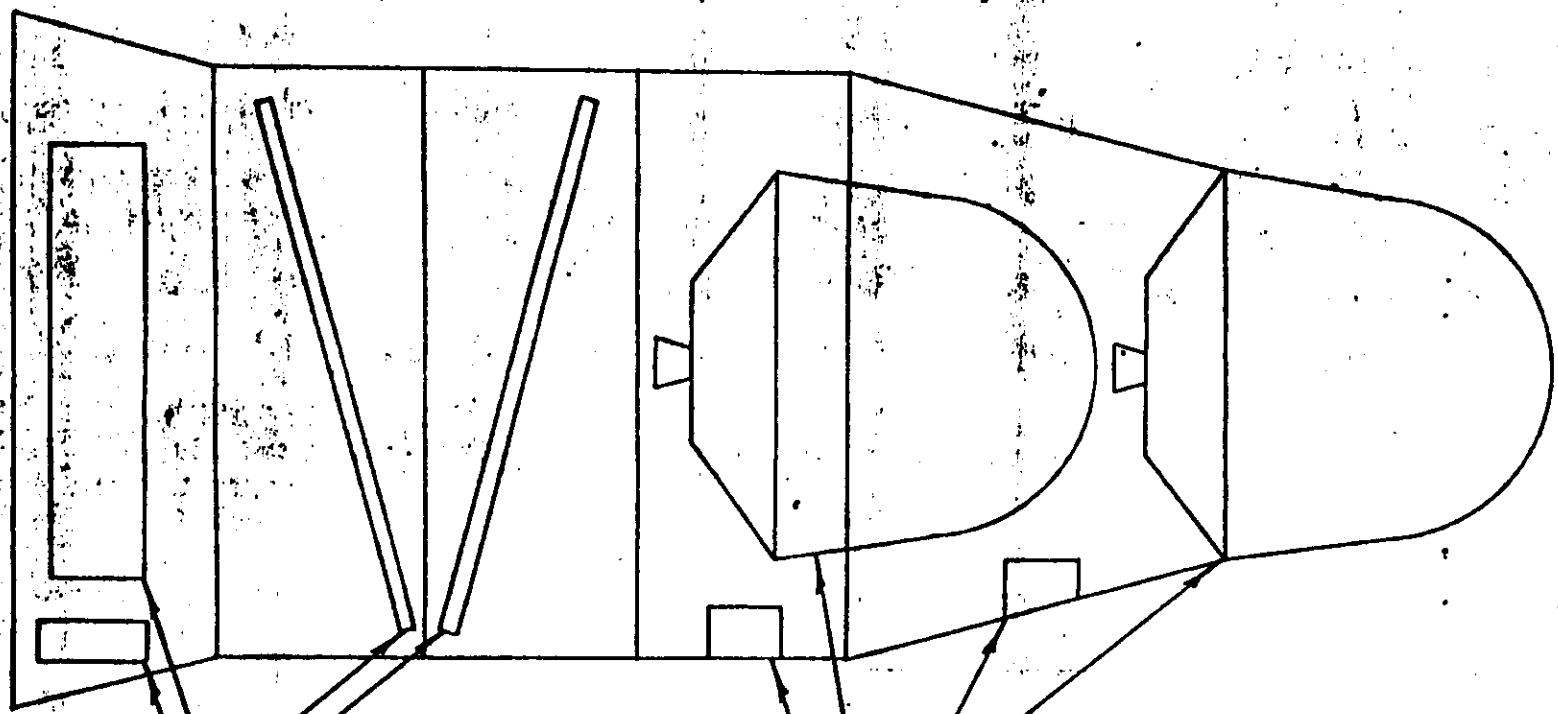

FIGURE 1-1

C. PANORAMIC CAMERAS

The photographic quality of the forward looking camera was exceptionally good and judged to be superior to the aft instrument. The slave camera failed during the cut and wrap sequence.

D. STELLAR-INDEX CAMERAS

The D-83 camera functioned properly throughout the -1 mission and produced good imagery.

The D-86 camera produced usable stellar imagery and good index photography. There was heavy flare fog on the stellar film and 16 frames were lost due to the early activation of the hot wire cutter.

E. OTHER SUB-SYSTEMS

The command, control and instrumentation systems operated normally. The clock accuracy was satisfactory, the pressure make-up system operation was normal, the thermal environment was within tolerance and both recovery systems performed successfully.

SECTION 2

PRE-FLIGHT SYSTEMS TEST

A. ENVIRONMENTAL TESTING

1. Test Objective

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

2. Test Summary

The J-30 TASC test was conducted at Sunnyvale from 11-16-65 through 11-24-65. The test was a basic chamber program modified to perform a special high and low temperature test on the -1 take-up cassette.

Performance of the payload system was generally satisfactory.

Instrument cycle periods varied from 3.4% fast to 2.6% slow. Cycle period data are tabulated in Table 2-1. A plot of % error versus instrument thermocouple temperature is included and indicates a possible correlation between temperature and cycle period error. See Figure 2-3.

Excessive coasting was observed for the master instrument at fast cycle rates. The instrument coasted to approximately the center of format monitor "make" position. (The center of format closure was the first step noted at start-up on the next operation.)

The -1 Stellar-Index metering occurred in .6 second during the first portion of the test. Metering time was normal 1.6 seconds by the end of the test. The -2 Stellar-Index operation was satisfactory.

2. Test Summary (continued)

The clock accuracy was satisfactory. However, spurious serial readouts occurred during the test. See Table 2-2.

The pressure make-up system operated normally. Average gas consumption was 6.0 lbs/min.

The command system functioned properly for both missions with no evidence of any malfunctions.

Transfer was given prior to arm in the -1 recovery sequence. The system was reset and the sequence was reinitiated. Cut and wrap and switchover to the -2 recovery system was normal. The -2 recovery sequence was normal.

The horizon idlers for both instruments were noisy. The lens rotation monitor for the slave instrument was intermittent.

Both film footage pots for both take-up cassettes were in error from the calibration data. Post test evaluation indicates the pots were calibrated using a 200K shunt simulating the voltage control oscillator load. The normal shunt is 1 meg. Recalibration was accomplished.

Instrument #184 exhibited excessive corona. The film metering rollers were replaced and in retest the system met the specifications for corona marking.

Temperature data at various times were taken and compared with the thermocouple data for the master and slave instruments. These data indicate good correlation. The average instrument temperatures are an average of all temp sensors on the instrument. See Table 2-3.

The thermal objectives of the high and low temperature tests were not fully met. No adverse effect was evident on the payload system with the exception of the possible effect on the cycle periods as noted above.

B. RESOLUTION TEST

Resolution and theodolite tests were performed on 7 December 1965. Results of the thru-focus resolution tests of pan instruments 184 and 185 show the following characteristics:

Master Pan Instrument No. 184

Maximum high contrast resolution 157 lines/mm at + .000 focal position.

Maximum low contrast resolution 95 lines/mm at + .000 focal position.

Slave Instrument No. 185

Maximum high contrast resolution 167 lines/mm at + .001 focal position.

Maximum low contrast resolution 108 lines/mm at + .001 focal position.

The test data for both instruments is shown in Figures 2-1 and 2-2. Both instruments met the system requirements specification.

C. LIGHT LEAK TEST

The new light board; T5-6310, was used for the first time to flood light the J-30 system during the scheduled light leak test. The test was performed January 12, and the exhibit analyzed January 13, 1966.

The soak period was extended from 30 minutes to 1 hour for J-30 system and up. The illumination level at the barrel surfaces was approximately 1250 foot candles.

The light fog patterns encountered in both master and slave film exhibits are attributed to minor camera drum-felt seal leaks associated with basic camera design. The density of the fogged areas ranged from 0.2 to 1.3 above the 0.18 base plus fog level. The total area affected was not more than 6 square inches on each instrument.

ITEK personnel performed the usual rework steps taken when leaks are found. The affected areas are restricted to startup and shutdown frames. It was recommended that the results of this test be accepted.

The duration and intensity of light employed in this test using 3401 type film approximates the exposure of the system to two ninety minute orbits of non-operation around the earth allowing 45 minutes of solar illumination per orbit. The light leak fog marks on the test film exhibits approach the appearance of in-flight results.

D. FLIGHT LOADING AND CERTIFICATION

Film from the flight readiness operation was examined on 4/1/66. The 200 pps timing track was missing in both master and slave. Subsequent investigation disclosed the source of the problem to be low voltage at the 400 cycle power supply in the console. This was corrected and the operation re-run. All data was present and acceptable on the film from the re-run.

During flight loading, the primary spool, #136 designated for the slave, was found to be defective. The flanges pinched the film on one side and had a .2 inch gap on the opposite side, indicating a possible deformed flange. Whether this was due to faulty spooling (side loading) or actual bent spool flange, has not been determined.

The secondary spool #130B was loaded. J-30 system audit was conducted and the system certified for flight on 3 April 1966.

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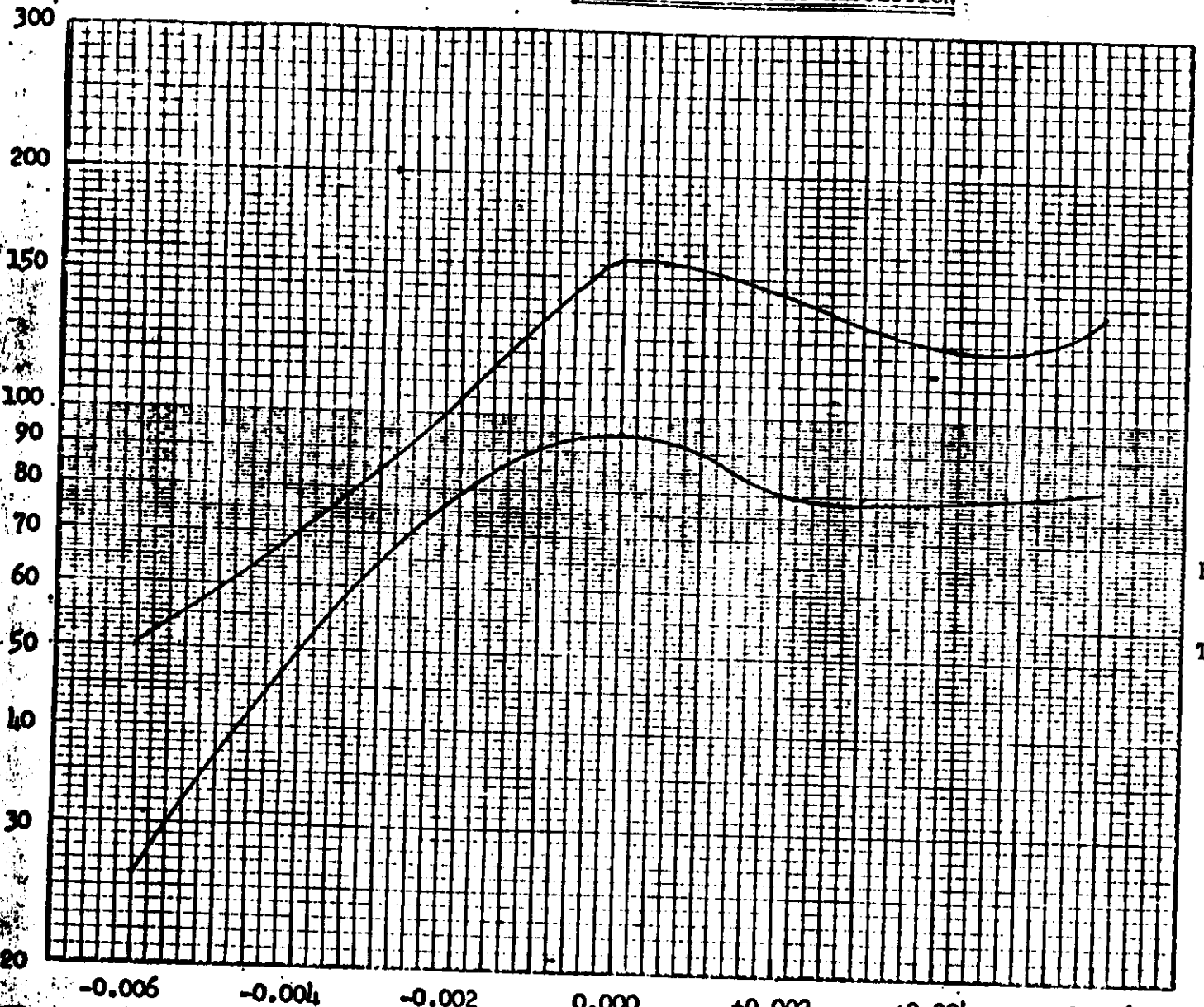
PRE-FLIGHT DYNAMIC RESOLUTION



Camera No: 184

Payload No: J-30

Resolution (l/mm)

High Contrast: 157

Low Contrast: 95

Film Type: 3404

Test Date: 12/7/65

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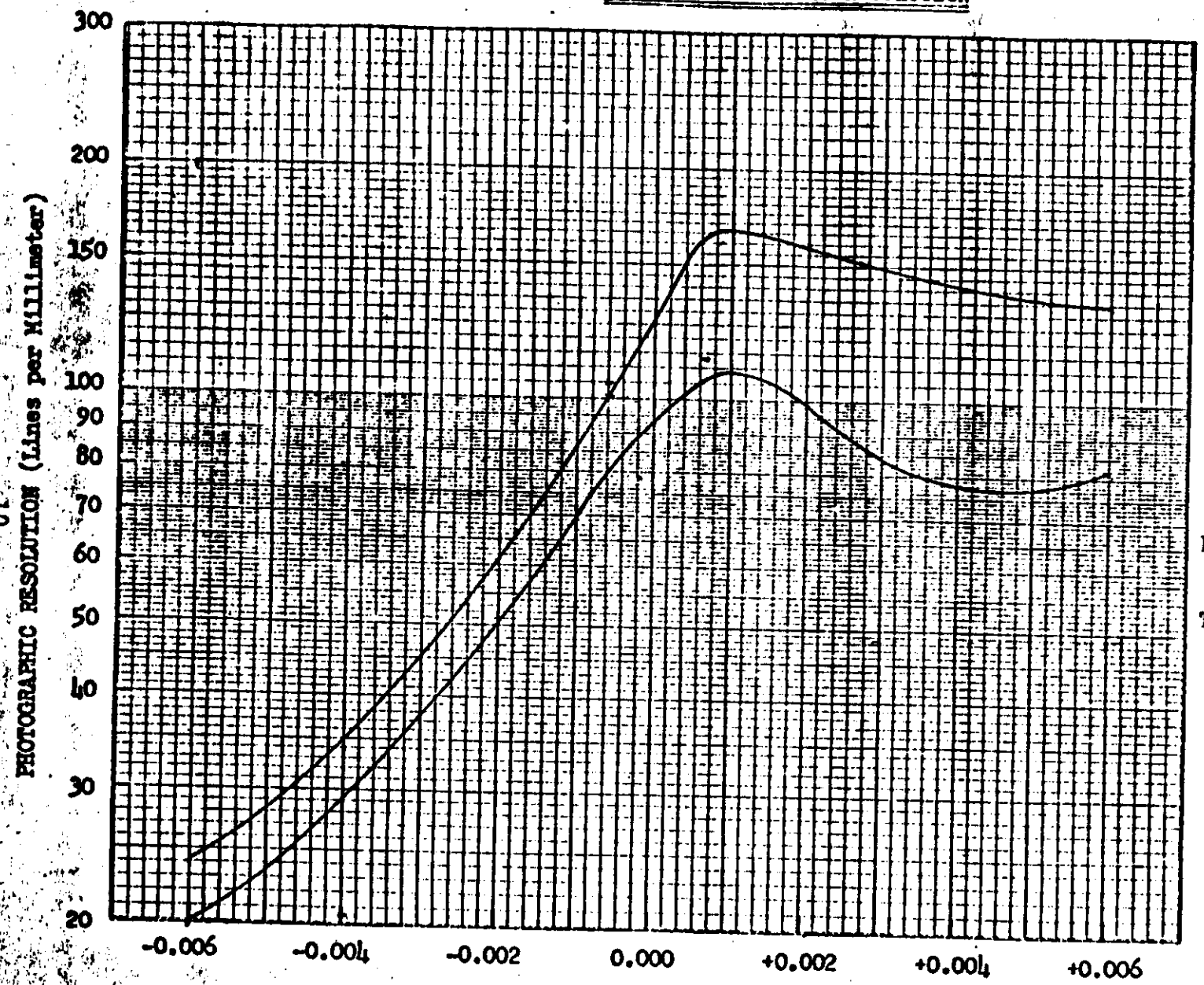
Figure 2-1

PRE-FLIGHT DYNAMIC RESOLUTION



Camera No: 185

Payload No: J-30

Resolution (l/mm)

High Contrast: 167

Low Contrast: 108

Film Type: 3404

Test Date: 12/7/65

Figure 2-2

J-30 184/185 TASC CYCLE RATES 11/29/65

REV/MODE	RAMP	T.U.R.	INST 184 ACT.	CAL.	DEV.	INST 185 ACT.	CAL.	DEV.	184/185 DIFF.
1 A	7 7	390	3.493	3.518	0.70F	3.468	3.505	1.04F	-0.72
1 A	7 7	2215	2.528	2.534	0.24F	2.513	2.524	0.44F	-0.59
02 A	4 1	1550	2.183	2.215	1.44F				
02 A	4 1	1740				2.183	2.208	1.11F	
02 A	4 1	2150	2.155	2.204	2.24F	2.168	2.208	1.82F	0.60
02 A	5 8	735	2.837	2.887	1.73F	2.827	2.876	1.71F	-0.35
03 A	5 8	1555	2.393	2.446	2.16F	2.393	2.436	1.76F	-0.00
4 A	7 7	2274	2.513	2.561	1.86F	2.500	2.551	1.98F	-0.52
4 A	8 2	241	5.230	5.404	3.22F	5.193	5.379	3.46F	-0.71
5 A	11 1	1462	2.683	2.653	1.14S	2.663	2.643	0.78S	-0.75
6 A	11 1	1940	2.303	2.263	1.79S	2.283	2.254	1.30S	-0.87
6 A	5 8	1095	2.760	2.694	2.45S	2.750	2.684	2.47S	-0.36
6 A	5 8	1445	2.530	2.492	1.52S	2.507	2.482	1.00S	-0.91
07 A	1 11	-0	2.330	2.281	2.15S	2.303	2.271	1.40S	-1.16
07 A	1 11	-0	2.330	2.281	2.15S	2.300	2.271	1.27S	-1.29
07 A	1 11	-0	2.335	2.281	2.37S	2.305	2.271	1.49S	-1.28
07 A	1 11	-0	2.343	2.281	2.72S	2.305	2.271	1.49S	-1.62
07 A	7 7	1181	2.980	2.881	3.42S	2.938	2.870	2.35S	-1.41
07 A	7 7	1591	2.633	2.565	2.65S	2.608	2.555	2.08S	-0.95

Table 2-1

REV/MODE	RAMP	T.U.R.	INST 184 ACT.	CAL.	DEV.	INST 185 ACT.	CAL.	DEV.	184/185 DIFF.
08 A	7 7	2428	2.743	2.652	3.42S	2.720	2.642	2.95S	-0.84
08 A	4 1	877	3.100	3.001	3.31S	3.067	2.989	2.59S	-1.06
09 A	11 1	890	4.645	4.511	2.97S	4.665	4.493	3.83S	0.43
10 A	11 1	1880	2.320	2.268	2.31S	2.283	2.258	1.10S	-1.59
10 A	11 1	2970	4.520	4.447	1.64S	4.455	4.429	0.58S	-1.44
10 A	7 7	340	3.625	3.544	2.29S	3.580	3.531	1.39S	-1.24
10 A	7 7	1910	2.487	2.479	0.34S	2.467	2.469	0.07F	-0.80
10 A	7 7	2220	2.570	2.536	1.33S	2.560	2.526	1.33S	-0.39
11 A	8 2	1157	2.968	3.000	1.06F	2.948	2.989	1.36F	-0.67
12 A	8 2	853	3.658	3.723	1.74F	3.625	3.709	2.26F	-0.90
01 B	7 7	390	3.490	3.517	0.78F	3.465	3.504	1.12F	-0.72
01 B	7 7	2385	2.627	2.623	0.14S	2.620	2.613	0.26S	-0.27
01 B	4 1	0	4.350	4.429	1.78F	4.350	4.411	1.39F	-0.00
02 B	5 8	727	2.880	2.891	0.38F	2.860	2.880	0.70F	-0.69
03 B	5 8	1590	2.400	2.433	1.37F	2.390	2.424	1.38F	-0.42
03 B	5 8	0	3.120	3.102	0.58S	3.100	3.091	0.30S	-0.64
04 B	7 7	2280	2.590	2.564	1.03S	2.600	2.553	1.82S	0.39
04 B	8 2	445	4.960	4.914	0.94S	4.925	4.893	0.65S	-0.71
05 B	8 2	1930	2.245	2.233	0.52S				
05 B	8 2	2460				2.510	2.492	0.74S	
06 B	11 1	1460	2.655	2.656	0.05F	2.645	2.646	0.04F	-0.38
06 B	11 1	2140	2.330	2.329	0.05S	2.325	2.319	0.26S	-0.21

Table 2-1

REV/MODE	RAMP	T.U.R.	INST 184 ACT.	INST 184 CAL.	INST 184 DEV.	INST 185 ACT.	INST 185 CAL.	INST 185 DEV.	184/185 DIFF.
06 B	1 11	-0	2.300	2.281	0.84S	2.290	2.271	0.83S	-0.43
06 B	1 11	-0	2.300	2.281	0.84S	2.290	2.271	0.83S	-0.43

DEV. AND DIFF. ARE IN PERCENT
THE (-) SIGN INDICATES THAT INST 1 IS SLOWER THAN INST 2
F=FAST AND S=SLOW

Table 2-1

J-30 CLOCK/IRIG TIME CHECK

REV	IRIG DAY-HR-MIN-SEC	IRIG SECONDS	CLOCK SECONDS	DELTA IRIG	DELTA CLOCK	ERROR
01	321 8 16 34.683	27764194.683	499404.071	---	---	---
03	321 12 10 59.127	27778259.127	513468.513	14064.444	14064.442	-0.002
	0 3 54 24.444-DELTA TIME			TOTAL ACCUM. ERROR		-0.002
08	324 9 52 54.175	28029174.175	504931.663	---	---	---
10	324 13 29 39.140	28042179.140	517936.605	13004.965	13004.942	-0.023
14	326 10 11 15.500	28203075.500	141962.059	160896.358	160896.366	0.008
02	327 9 10 55.526	28285855.526	224742.081	82780.025	82780.021	-0.004
06	327 16 13 44.727	28311224.727	250111.262	25369.201	25369.181	-0.020
	3 6 20 50.552-DELTA TIME			TOTAL ACCUM. ERROR		-0.039

Table 2-2

INSTRUMENT - THERMOCOUPLE TEMPERATURE CORRELATION

Date Time	Avg. Instrument Temperature Master	Slave	T/C Temperature Master	Slave
11-17-65 11:13	92	89	90	95
11-18-65 12:04	45	46	52	50
11-20-65 12:32	47	53	49	49
11-21-65 09:18	90	90	89	89
11-23-65 12:49	54	53	58	56

Table 2-3

CYCLE PERIOD DATA

J-30 Temperature versus Cycle Period Error - TASC Test

⊙ - Master
⊡ - Slave

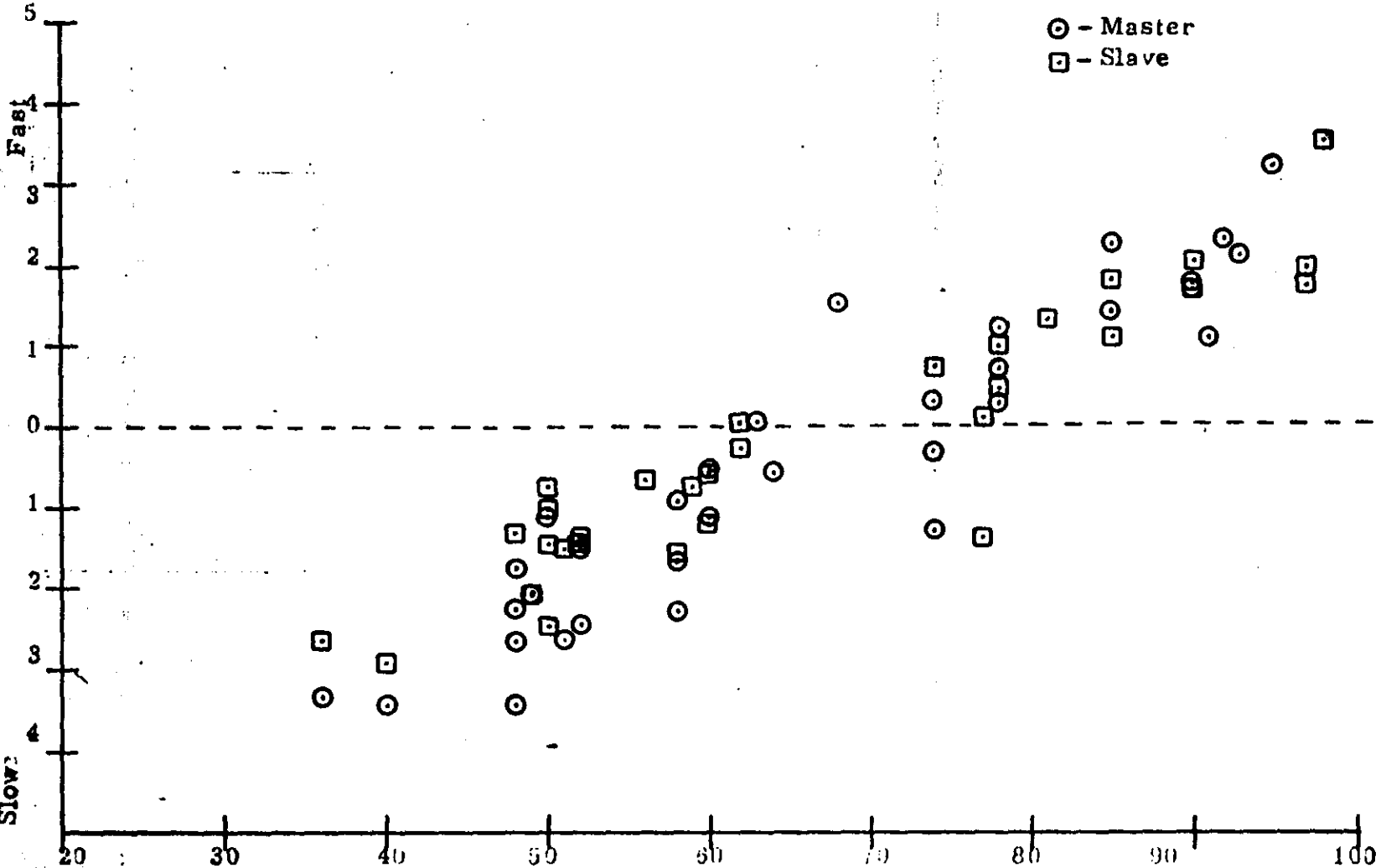


Figure 2-3

SECTION 3

FLIGHT OPERATIONS

A. INTRODUCTION

FTV 1627 was an Agena (SS01-B) and an improved Thor booster (S/N 474). The vehicle was a dual recovery, D/R capability, tail first in orbit configuration. This vehicle was the first of the 1625-1635 series configuration flown. Among the vehicle modifications were: a new life boat system with redesigned circuitry and relocated gas sphere, a tighter dead band on the primary guidance system ($\pm 0.3^{\circ}$ vs. $\pm 0.5^{\circ}$ on previous vehicles), no redundant 3 phase and 1 phase 400 cps type XII A inverter, numerous instrumentation changes, type 3C S-band beacon and XIIIA decoder. Vehicle anomalies noted during the flight operation included failure of the solenoid isolation valve between the primary and life boat gas systems allowing both gas systems to supply control gas throughout the mission and the usual case of sub-cycle counter monitor skipping. Vehicle malfunctions did not compromise the primary mission.

The payload system was dual recovery reconnaissance camera system J-30 consisting of panoramic cameras 184 and 185 and stellar index cameras D 83/101/89 and D 86/106/86.

Payload modifications included: blossom telemetry radiation on ascent, increased range of fairing temperature sensors (500°F vs. 250°F), delay circuit for elimination of mono coverage at start-up and shut-down of the camera system, and a panoramic camera film chute attached to the parachute cover to eliminate light leaks due to the translucent characteristics of the ablative shield.

The nominal mission plan was 6 days for -1 and 5 days for -2 with no deactivation planned. The actual mission was 7 days for -1 and 4 days for -2 with no deactivation. Both missions were terminated by successful air catch recoveries.

B. SUMMARY

All launch, ascent and injection events occurred as programmed. The orbit attained was within 3 sigma dispersion with apogee height and period near the lower limits.

The master panoramic camera operated normally throughout both missions of the flight. The slave panoramic camera operated normally for the -1 mission and failed during the cut and wrap sequence due to a postulated film hangup on the -1 thrust cone.

Both stellar/index cameras operated normally. All shutter and metering functions occurred as programmed.

The command, control, and instrumentation systems operated normally including the mono elimination delay.

Clock accuracy was satisfactory. However, discontinuities of 32.768 seconds occurred between revs 64 and 73 and 143 and 152.

The pressure makeup system operation was normal with pressure decreasing from 2570 psi at launch to 600 psi at the end of the flight.

The thermal environment was within tolerance. The high range temperature sensors on the fairing indicated temperatures of approximately 400°F at launch + 165 seconds, (first acquisition of temperature data) and decreased to approximately 300°F at fade.

The blossom telemetry radiation experiment on ascent was satisfactory with signal strength ranging from -35 DBM at launch to -80 DBM at fade.

Both recovery systems were successfully recovered by air catch on revs 113 and 177 respectively. The -1 blossom telemetry system failed to operate during recovery due to a telemetry battery failure. The impact point of the -1 system was approximately 83 miles down range as a result of a postulated hangup of the slave camera film. The impact point of the -2 system was within tolerance.

C. PANORAMIC CAMERA PERFORMANCE

The master panoramic camera operated normally throughout both the -1 and -2 missions. Cut and wrap and switchover to the -2 mission were normal. The 99/101% clutch ratios, start-up, shut-down and transport functions were normal on the engineering passes.

The slave panoramic camera operated normally throughout the -1 mission the 99/101% clutch ratios, start-up, shut-down and transport functions were normal on the engineering passes.

The slave panoramic camera failed during the cut and wrap operation. An engineering operation was taken on pass 111 at VAFB which was the last operation prior to cut and wrap. The camera system dynamics were normal in all respects. The cut and wrap data indicated normal command sequencing, however, there was little or no slave take-up film motion during the 7 second reduced torque period or the programmed four cycle cut and wrap operation. Input metering to the camera was present. The next engineering pass was rev 120. Approximately 600 cycles were programmed between cut and wrap and rev 120. The rev 120 engineering pass data indicated the slave camera was still operating, however, no film was being transported and the lens rotation and center-of-format monitors were phase shifted. Cassette rotation was indicated by variations in the film footage monitor voltage resulting from the puck-arm bouncing over the threading rollers in the hub. The recovered film from the -1 mission indicated a clean cut and the proper length of film from the engineering pass on rev 111. This eliminates two areas as possible causes of the failure; (1) malfunctioning of the cutter, and (2) misthreading of the -2 cassette. The -2 recovery system verified the cassette had rotated from the index point.

Analysis of the data has resulted in several firm facts about the failure.

(1) The slave instrument failed due to lack of cassetting, that is to say, the failure resulted from film accumulating within the instrument. The telemetry data indicated that film was not being removed from the system, resulting in a loss of tension and the subsequent film wrap-up around the metering rollers.

(2) The -2 cassette brake and motor were found to be functioning both in orbit and in the recovered capsule. The telemetry data on rev 120 indicated the cassette was "free running" with no film on the hub. The recovered cassette was tested and found to function properly. No film was returned in the cassette.

Analysis of telemetry data has developed the following sequence resulting in the camera failure. At the "Arm" signal, the low torque voltage was placed on the take-up cassette, and the -1 capsule film cutter fired. As the cassette started to rotate, the film end became bound in the area of the panoramic film chute (within the thrust cone), thus restricting rotation of the slave cassette. It is believed that the slave cassette rotated approximately 90° and "cinched" the film and cassette. After seven seconds of reduced torque, four frames were metered into the camera, during the 23 second cut and wrap operation. None of this film was taken up by the cassette. As a result, the camera lost system tension and the film eventually double wrapped about the frame metering roller.

At the -1 capsule separation the film hang-up was freed, but the tension loss had already failed the camera. On the engineering pass on rev 120 the lens rotation monitor and center-of-format monitor had changed phase by approximately 180°.

It is believed that the film "hang-up" within the chute area also resulted in altering the capsule pitch-down angle and resulted in the capsule impact point overshoot.

Cycle period data for both cameras are tabulated in Table 3-1.

PANORAMIC FILM CONSUMPTION - FRAMES

	Nominal	Actual	
		Master	Slave
Pre-launch	100	139	130
-1 Mission	3000	3074	3071
-2 Mission	2929	2816	0
TOTAL	6029	6029	3201

FMC MATCH

The FMC match was good throughout the flight. The following settings of RTC 6, 8 and 10 were used to attain the best FMC match during the mission:

RTC 6	8	10	COMMENTS
7	6	6	Launch settings
6	7	8	Changed at Rev 9 to compensate for orbit dispersions at launch.
6	5	7	Changed at Rev 64 to compensate for slow cycle rate.

D. STELLAR/INDEX CAMERA PERFORMANCE

The stellar index cameras for both the -1 and -2 missions operated normally throughout the flight.

E. INSTRUMENTATION AND COMMAND SYSTEM PERFORMANCE

The instrumentation and command system operated satisfactorily throughout both missions with no anomalies evident. Mono delay time was within tolerance and operated normally.

F. CLOCK PERFORMANCE

Two discontinuities of 32.768 seconds occurred during the flight. The first occurred in the -1 mission between revs 64 and 73 and the other occurred in the -2 mission between revs 143 and 152. The clock output was apparently incremented by the 16th bit in both cases. Clock accuracy was satisfactory with the exception of the above discontinuities. Table 3-2 is a tabulation of the time correlation data for the flight.

G. PRESSURE MAKE-UP SYSTEM PERFORMANCE

The pressure make-up system performed normally throughout both missions. Average gas consumption was 8.0 lbs/min for a total of 245 minutes of operate time. The gas supply decreased from 2570 PSI at launch to 600 PSI at the end of the -2 mission.

H. THERMAL ENVIRONMENT

Temperature data for the [redacted] acquisitions are included in Table 3-3. The average instrument temperatures ranged from a high of 92° for the master and 83° for the slave at rev 9 to a low of 66° and 57° at the end of the flight for the master and slave respectively.

Data from the fairing temperature sensors (Launch + 245 seconds) show temperatures ranging from 235 to 440°F at acquisition decreasing to 220 to 330°F on fairing temperature sensors 4 and 2 respectively. Figure 3-1.

J-30 184/185

REV. MODE	CP	RAMP R	RAMP A	TUR SECS	SYSTEM CALIB.	INST. 184 ACTUAL	INST. 184 UNIT DEV.	INST. 184 SYSTEM DEV.	INST. 185 ACTUAL	INST. 185 UNIT DEV.	INST. 185 SYSTEM DEV.	184/185 DIFF.
9	A	6	7	321	3.351	3.360	0.67S	0.86S	3.360	0.45S	0.26S	-0.59
16	A	6	7	1577	2.444	2.468	0.80S	1.00S	2.467	1.16S	0.96S	-0.04
32	A	6	7	1611	2.428	2.452	0.79S	1.00S	2.440	0.71S	0.50S	-0.49
48	A	6	7	1640	2.415	2.420	0.02F	0.19S	2.411	0.02S	0.19F	-0.37
79	A	6	5	1752	2.246	2.260	0.79S	0.64S	2.250	0.05S	0.19S	-0.44
95	A	6	5	1750	2.246	2.260	0.78S	0.64S	2.250	0.04S	0.19S	-0.44
111	A	6	5	1830	2.243	2.265	1.11S	0.97S	2.260	0.60S	0.74S	-0.22
120	B	6	5	318	3.732	3.730	0.24F	0.05F	4.060	9.00S	8.80S	8.85
127	B	6	5	2045	2.243	2.252	0.53S	0.39S				
143	B	6	5	1900	2.242	2.260	0.93S	0.79S				
159	B	6	5	1900	2.242	2.265	1.15S	1.01S				

DEV. AND DIFF. ARE IN PERCENT
THE (-) SIGN INDICATES THAT INST 1 IS SLOWER THAN INST 2
F=FAST AND S=SLOW

Table 3-1

CLOCK SUMMARY

ORDER FIT 1

SYS TIME I/P	CL TIME I/P	COMP SYS TM	DELTA ST	REV	STA
0.400996780 05	0.120214586D 06	0.400996795D 05	-0.0015	9	
0.793107980 05	0.159425683D 06	0.793107931D 05	0.0049	16	
0.397472600 05	0.206262125D 06	0.397472549D 05	0.0051	25	
0.789338860 05	0.245448743D 06	0.789338895D 05	-0.0035	32	
0.393443780 05	0.292259221D 06	0.393443873D 05	-0.0093	41	
0.785317280 05	0.331446544D 06	0.785317268D 05	0.0012	48	
0.389324680 05	0.378247271D 06	0.389324736D 05	-0.0056	57	
0.781445780 05	0.417459350D 06	0.781445692D 05	0.0088	64	

A0=-0.80114957300 05 A1= 0.1000000422830 01
SIGMA=0.00538 NO. POINTS= 8
RATIO OF CLOCK TIME TO SYS TIME= 0.9999995771710 00

ORDER FIT 1

SYS TIME I/P	CL TIME I/P	COMP SYS TM	DELTA ST	REV	STA
0.384801480 05	0.464227670D 06	0.384801440D 05	0.0040	73	
0.721987430 05	0.497946250D 06	0.721987398D 05	0.0032	79	
0.380225120 05	0.132990830D 05	0.380225092D 05	0.0028	89	
0.717120830 05	0.469886360D 05	0.717120779D 05	0.0051	95	
0.375371230 05	0.992136560D 05	0.375371223D 05	0.0007	105	
0.712547980 05	0.132931340D 06	0.712548220D 05	-0.0240	111	
0.314978190 05	0.179574323D 06	0.314978268D 05	-0.0078	120	
0.706742100 05	0.218750689D 06	0.706742111D 05	-0.0011	127	
0.309566980 05	0.265433147D 06	0.309566909D 05	0.0071	136	
0.701181180 05	0.304594546D 06	0.701181082D 05	0.0098	143	

A0=-0.42574774270 06 A1= 0.1000000466900 01
SIGMA=0.00877 NO. POINTS= 10
RATIO OF CLOCK TIME TO SYS TIME= 0.9999995330970 00

ORDER FIT 1

SYS TIME I/P	CL TIME I/P	COMP SYS TM	DELTA ST	REV	STA
0.304205690 05	0.351329747D 06	0.304205705D 05	-0.0015	152	
0.695179980 05	0.390427157D 06	0.695179957D 05	0.0023	159	
0.298221300 05	0.437131271D 06	0.298221279D 05	0.0021	168	
0.352762330 05	0.442585377D 06	0.352762360D 05	-0.0030	169	

A0=-0.32090931340 06 A1= 0.1000000389480 01
SIGMA=0.00205 NO. POINTS= 4
RATIO OF CLOCK TIME TO SYS TIME= 0.9999996105180 00

Table 3-2

CLOCK SUMMARY

ORDER FIT 2

SYS TIME I/P	CL TIME I/P	COMP SYS TM	DELTA ST	REV	STA
0.400996780 05	0.120214586D 06	0.4009968330 05	-0.0053	9	
0.793107980 05	0.159425683D 06	0.7931079380 05	0.0042	16	
0.397472600 05	0.206262125D 06	0.3974725320 05	0.0068	25	
0.789338860 05	0.245448743D 06	0.7893388670 05	-0.0007	32	
0.393443780 05	0.292259221D 06	0.3934438450 05	-0.0065	41	
0.785317280 05	0.331446544D 06	0.7853172510 05	0.0029	48	
0.389324680 05	0.378247271D 06	0.3893247430 05	-0.0063	57	
0.781445780 05	0.417459350D 06	0.7814457300 05	0.0050	64	

A0=-0.80114938120 05 A1= 0.1000000258230 01
A2= 0.3061320482755D-12
SIGMA=0.00482 NO. POINTS= 8

ORDER FIT 2

SYS TIME I/P	CL TIME I/P	COMP SYS TM	DELTA ST	REV	STA
0.384801480 05	0.464227670D 06	0.3848015290 05	-0.0049	73	
0.721987430 05	0.497946250D 06	0.7219874370 05	-0.0007	79	
0.380225120 05	0.132990830D 05	0.3802250720 05	0.0048	89	
0.717120830 05	0.469886360D 05	0.7171207340 05	0.0096	95	
0.375371230 05	0.992136560D 05	0.3753711590 05	0.0071	105	
0.712547980 05	0.132931340D 06	0.7125481570 05	-0.0177	111	
0.314978190 05	0.179574323D 06	0.3149782210 05	-0.0031	120	
0.706742100 05	0.218750689D 06	0.7067420930 05	0.0007	127	
0.309566980 05	0.265433147D 06	0.3095669430 05	0.0037	136	
0.701161180 05	0.304594546D 06	0.7011811740 05	0.0006	143	

A0=-0.42574756360 06 A1= 0.9999998974110 00
A2= 0.4368166742065D-12
SIGMA=0.00692 NO. POINTS= 10

ORDER FIT 2

SYS TIME I/P	CL TIME I/P	COMP SYS TM	DELTA ST	REV	STA
0.304205690 05	0.351329747D 06	0.3042056880 05	0.0002	152	
0.695179980 05	0.390427157D 06	0.6951799850 05	-0.0005	159	
0.298221300 05	0.437131271D 06	0.2982212770 05	0.0023	168	
0.352762330 05	0.442585377D 06	0.3527623490 05	-0.0019	169	

A0=-0.32090963940 06 A1= 0.1000002041190 01
A2=-0.2073105871991D-11
SIGMA=0.00135 NO. POINTS= 4

Table 3-2

TABLE 3-3

J-30 TEMPERATURE SUMMARY

SENSOR	ORBITS ACQUIRED																					
Master Camera	0	9	16	25	32	41	48	57	64	73	79	89	95	105	112	120	127	136	143	152	159	169	176
3	66	84	82	84	82	85	82	81	78	80	77	80	76	76	75	71	65	69	61	67	63	67	62
4	66	88	88	90	87	90	86	88	84	86	83	86	82	83	79	77	69	75	67	72	67	74	66
5	62	91	89	91	88	92	88	88	85	87	84	86	82	82	79	78	71	74	67	72	68	73	66
6	61	96	93	95	92	94	91	91	88	89	86	87	85	83	80	78	71	74	67	70	67	69	64
7	59	89	87	87	87	88	87	85	84	83	83	83	81	80	78	73	68	70	65	67	65	67	64
8	67	93	91	93	90	94	90	90	86	89	84	87	84	84	81	81	72	76	64	74	70	74	74
9	63	96	92	94	91	95	91	92	88	89	86	88	84	85	81	80	73	77	69	74	69	74	64
10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
11	67	96	97	96	95	95	94	91	90	88	86	87	84	82	82	75	69	71	64	68	64	67	61
12	70	89	85	88	85	89	86	87	82	85	82	84	81	82	79	78	70	75	67	79	69	75	71
13	61	94	93	92	91	92	90	89	87	86	85	85	83	82	88	74	69	70	65	67	65	67	63
AVG		92	90	91	89	91	88	88	85	86	83	85	82	82	80	76	70	73	67	71	67	71	66
Slave Camera																							
3	60	84	85	88	84	83	83	83	79	78	77	76	74	72	70	66	58	60	54	56	52	56	51
4	61	84	81	84	80	84	80	81	77	80	74	78	74	74	70	69	61	64	57	61	56	61	55
5	64	88	86	89	85	88	86	86	83	85	82	85	81	81	78	76	70	71	66	70	66	70	65
6	57	81	79	80	80	81	80	79	76	78	76	78	75	74	72	67	63	63	58	60	59	61	58
7	58	84	82	84	83	83	82	80	78	78	78	78	77	74	74	69	64	64	60	61	60	62	60
8	62	84	81	83	81	84	81	82	77	82	77	80	76	77	73	72	64	67	60	65	60	65	59
9	66	85	82	84	82	85	83	83	79	82	79	82	78	80	76	75	68	71	65	70	66	71	66
10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
11	65	77	76	77	76	76	77	76	74	74	72	73	74	70	69	67	58	60	55	58	56	59	56
12	65	89	85	87	84	87	83	85	79	82	78	81	77	77	73	73	64	67	59	64	59	63	56
13	55	78	76	77	77	77	76	74	73	73	73	73	72	69	69	63	59	59	54	56	56	57	54
AVG		83	81	83	81	83	81	81	78	79	77	78	76	75	72	70	65	65	60	63	61	63	57
Supply Spool																							
1	64	65	66	65	67	69	69	69	66	68	67	68	66	64	63	62	57	58	52	56	54	56	53
2	64	73	72	74	72	74	73	74	70	72	69	72	68	68	66	65	58	60	55	57	55	57	53

TABLE 3-3

J-30 TEMPERATURE SUMMARY

SENSOR	ORBITS ACQUIRED																					
Fwd ("A") Bracket #1 (°F)	0	9	16	25	32	41	48	57	64	73	79	89	95	105	112	120	127	136	143	152	159	169	176
	317	57	74	57	74	36	74	30	74	30	59	30	59	14	59	20	39	20	36	20	39	17	39
	339	9	OBL	9	9	24	9	2	9	9	9	9	9	0	16	56	60	56	60	56	69	56	75
	246	4	OBL	4	--	--	-18	-10	-10	-5	18	OBL	4	0	18	70	123	67	126	64	125	62	131
	226	47	47	40	47	40	47	32	47	32	40	32	40	17	47	30	69	27	56	20	33	17	43
	249	62	62	47	55	40	55	40	47	40	47	40	40	16	40	22	32	22	26	16	29	9	22
	248	91	97	33	97	33	91	41	84	33	71	33	56	9	71	--	--	--	--	--	--	--	--
Aft ("B") Bracket #1 (°F)																							
	136	47	71	44	65	41	62	38	53	36	53	36	44	21	47	14	30	11	24	11	21	8	17
	138	41	115	45	112	38	109	38	103	35	89	35	83	22	80	25	61	22	48	18	45	12	38
	223	91	122	57	125	57	130	60	133	60	91	60	122	47	133	57	113	60	116	57	116	54	122
	233	50	50	53	53	50	56	53	53	53	56	56	62	46	68	50	56	56	62	53	68	53	74
	209	61	61	55	73	55	64	49	61	49	64	52	64	43	61	31	46	34	37	31	46	31	46
Aft ("B") Bracket #2 (°F)																							
1	150	46	65	46	62	39	59	39	49	36	46	32	39	22	32	16	16	16	9	9	9	6	6
1	91	73	71	73	71	69	73	71	67	69	69	69	67	59	65	57	53	57	51	53	53	53	51
2	94	71	69	71	69	69	71	69	67	67	67	69	67	61	63	55	53	59	51	53	51	53	49
Fwd Cone "A" to "B" BRV																							
1	117	46	43	43	41	41	41	42	39	40	40	40	38	35	35	62	57	59	53	57	55	57	53
2	76	66	62	63	58	61	56	58	52	56	54	55	47	49	48	69	65	65	61	62	61	62	58
Fwd Index "A" to "B"																							
1	78	60	63	57	57	57	60	57	51	54	54	51	54	41	48	53	53	53	41	47	47	44	41
2	66	63	57	57	54	57	57	54	48	51	51	51	48	42	45	49	46	49	40	46	43	43	40
Aft Battery "B" BRV																							
	68	74	76	78	79	79	79	76	74	75	75	75	74	69	71	81	75	81	78	80	78	84	80
Aft Connector "A" BRV																							
2	97	75	71	71	71	72	72	73	71	71	71	68	71	70	70	--	--	--	--	--	--	--	--

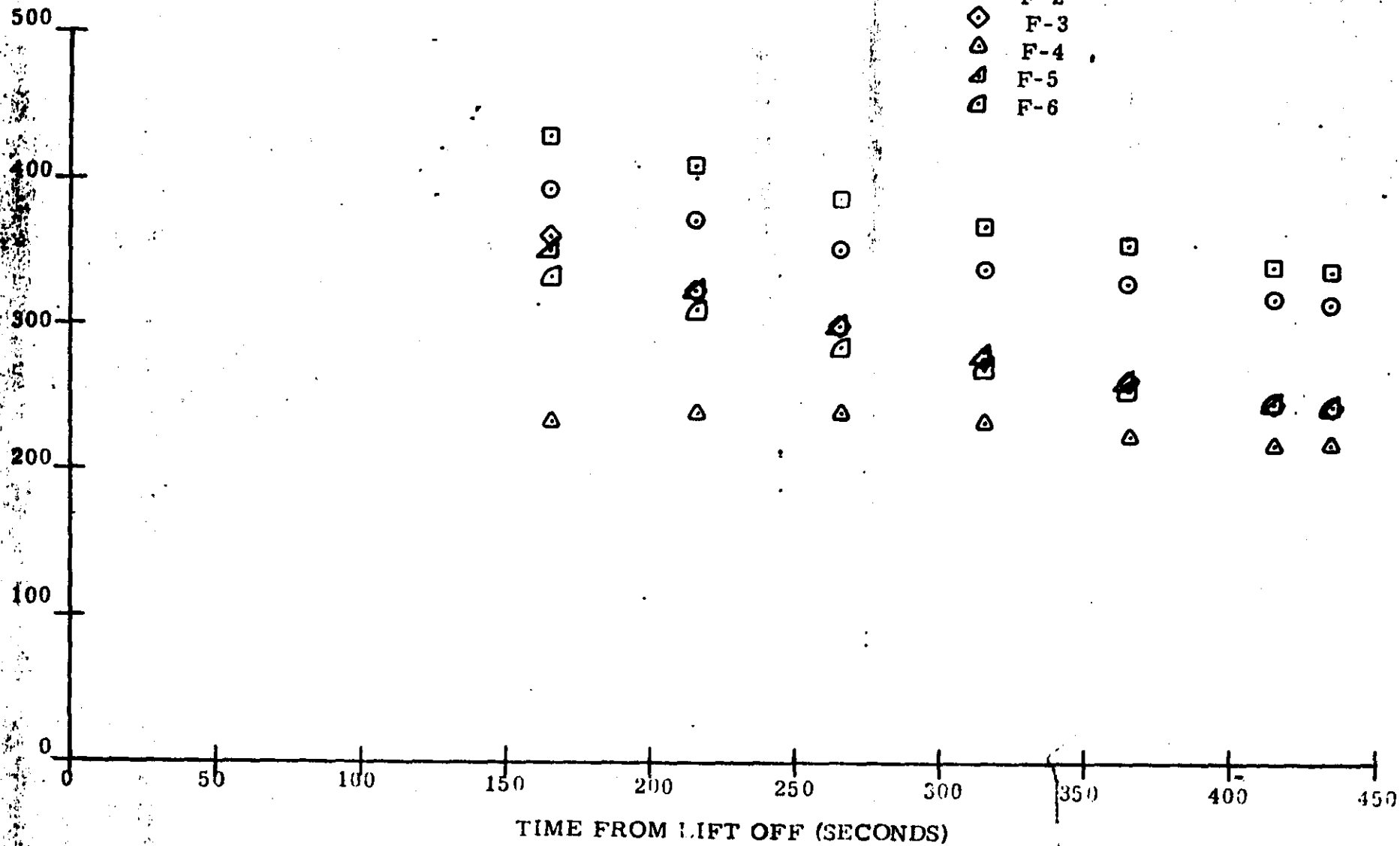

J-30 Fairing Temp. Data Lift-off
F-1
F-2
F-3
F-4
F-5
F-6
TEMPERATURE °F
500
400
300
200
100
0
0
50
100
150
200
250
300
350
400
450
TIME FROM LIFT OFF (SECONDS)

Figure 3-4

SECTION 4

MISSION 1031-1 RECOVERY SYSTEM

SRV #711 was received at A/P on 30 July 1965. The receiving inspection weight was 150.4 pounds. After modifications and incorporation of outstanding E.O.'s, the SRV was delivered to Systems Test for incorporation into the J-30 system.

The capsule was delivered to VAFB on 2 March 1966.

A blossom telemetry radiation experiment on ascent was conducted with the -1 blossom telemetry. Operation of the telemetry system was normal during ascent with signal strength as plotted in Figure 4-1.

The -1 recovery system was successfully recovered by air catch during rev 113 on 14 April 1966.

Predicted Impact	21° 56.6' N/149° 25.2' W
Actual Impact	20° 32' N/148° 49' W

The following factors in the recovery dynamics have been considered and found to be within tolerance:

(1) Event Times:

The vehicle event times for D timer start, arm, transfer, and separate were verified and found to be within tolerance. Capsule event times were not monitored due to failure of the capsule telemetry battery. Event times monitored are tabulated in Table 4-1.

(2) Vehicle Attitude at Separation:

Vehicle attitude was determined to be correct, based on pitch down time, rate, and magnetometer data. Separation appeared clean on the vehicle control system monitors.

(3) Recovery System Weight:

The computed weight of the separated capsule was based on a suspended weight of 176.17 lbs. The recovered unit was weighed at 177 lbs when returned to A/P.

(4) Re-entry Trajectory:

The predicted weights were input to a separate re-entry trajectory computation and found to agree within 2 N. miles to the operational trajectory.

Due to the absence of any "Cross" track dispersion in conjection with the intrack dispersion, it is postulated the over shoot was a result of a film hang-up of the panoramic system within the area of the capsule between the film cutter and the back edge of the thrust cone. This resulted in a capsule pitch angle of approximately 40° nose down instead of the nominal 60° nose down angle required for normal re-entry.

The failure of the capsule telemetry to radiate was conclusively found to be the result of a battery failure. At the time the battery is energized, a pyrotechnic device is fired which forces the stored electrolyte (after rupturing two diaphragms) into a distribution manifold and then into the battery cells.

The recovered battery was dissected by the manufacturer and found to have a failed pyro gas generator housing which separated the pyro from the chamber. This prevented rupture of the second diaphragm precluding actuation of the battery.

The present design will be retained, however the structural retention integrity of the gas generator was improved particularly in the manner in which the pyro is installed and secured.

MISSION 1031-1

RECOVERY SEQUENCE OF EVENTS

Event	Delta Time (Seconds) Actual	Nominal
*Arm	77.24	77.0 ± 1.0
**Transfer	2.2	2.0 ± 0.25
Electrical Disconnect	N/A	$0.900^{+0.430}_{-0.400}$
Separation	---	---
**Spin	N/A	3.4 ± 0.30
Retro	N/A	7.55 ± 0.45
Despin	N/A	10.75 ± 0.59
T/C Separation	N/A	1.5 ± 0.15
***"G" Switch Open	N/A	469.7
Parachute Cover Off	N/A	34.0 ± 1.5
Drogue Chute Deployed	N/A	0.63 ± 0.08
Main Chute Bag Separate	N/A	10.25 ± 1.5
Main Chute Deployed	N/A	0.52 ± 0.13
Main Chute Disreef	N/A	4.5 ± 0.80

*From Separation
**From Electrical Disconnect
***From Retro
N/A (Not Available)
Capsule telemetry battery failed.

TABLE 4-1

J-30 - 1627 Capsule Telemetry
Signal Strength on Ascent

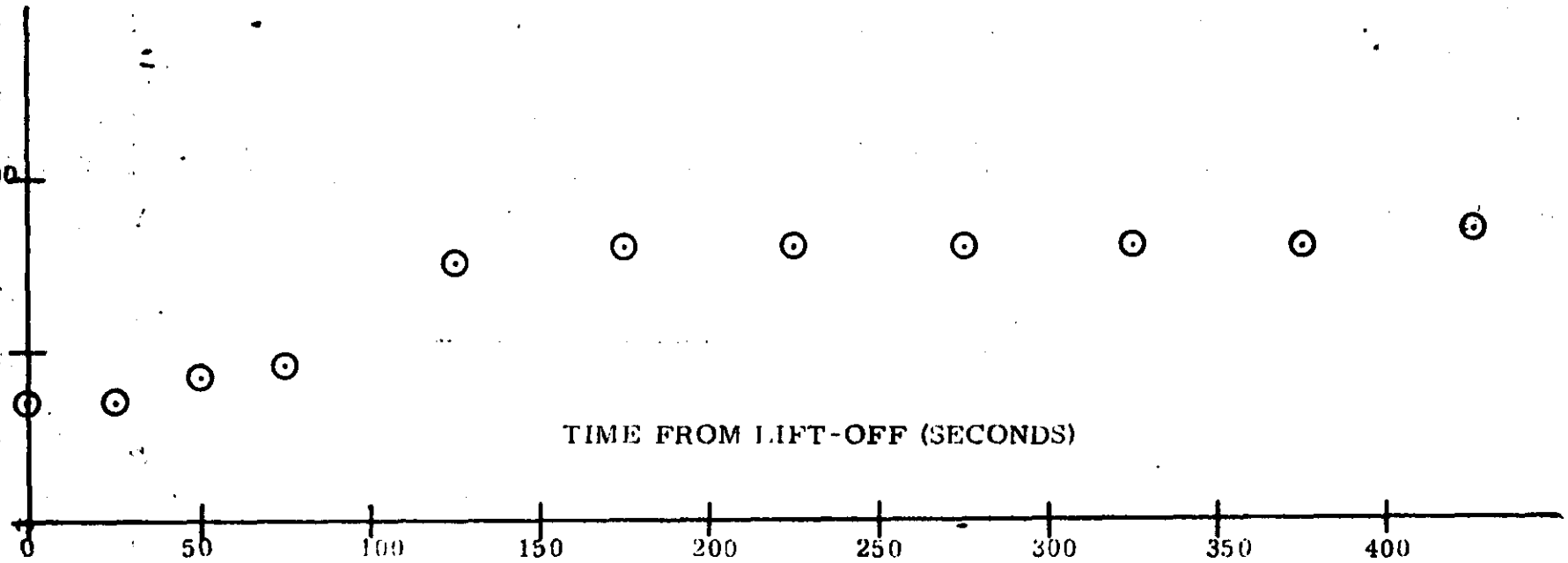


Figure 4-1

SECTION 5

MISSION 1031-2 RECOVERY SYSTEM

SRV #712 was received at A/P on 30 July 1965 at a receiving weight of 150.0 pounds. After modification and incorporation of outstanding E.O.'s the capsule was delivered to Systems Test for incorporation into the J-30 system.

The capsule was delivered to VAFB on 2 March 1966.

A successful air recovery was executed during orbit 177 on 18 April 1966. The impact point was within nominal dispersion tolerances. Table 5-1 lists the sequence of monitored re-entry and recovery events.

The predicted impact point was 21° 0.38' N, 152° 14.3' W and the actual impact point was 20° 57' N, 152° 12'W.

The condition of the recovered capsule was satisfactory with damage limited to normal paint blistering due to the re-entry environment.

MISSION 1031-2

RECOVERY SEQUENCE OF EVENTS

Event	Delta Time (Seconds) Actual	Nominal
*Arm	77.00	77.0 ± 1.0
*Transfer	2.00	2.0 ± 0.25
Electrical Disconnect	0.96	$0.900^{+0.430}_{-0.400}$
Separation	---	---
** Spin	3.42	3.4 ± 0.30
Retro	7.52	7.55 ± 0.45
Despin	10.75	10.75 ± 0.59
T/C Separation	1.50	1.5 ± 0.15
*** "G" Switch Open	477.94	469.7
Parachute Cover Off	33.89	34.0 ± 1.5
Drogue Chute Deployed	0.61	0.63 ± 0.08
Main Chute Bag Separate	10.08	10.25 ± 1.5
Main Chute Deployed	0.56	0.52 ± 0.13
Main Chute Disreef	4.42	4.45 ± 0.80

* From Separation
** From Electrical Disconnect
*** From Retro

Spin Rate (RPM) 66.0
Despin Rate (RPM) 11.5
Retro Velocity (Ft/sec.) 1104.0

Table 5-1

SECTION 6

MASTER (FWD) PANORAMIC CAMERA

A. COMPONENT ASSIGNMENT

Component	Serial Number
Main Camera	184
Main Camera Lens	1872435
Supply Horizon Camera	283-G6
Supply Horizon Camera Lens	E12867
Take-up Horizon Camera	283-G5
Take-up Horizon Camera Lens	E12859
Supply Cassette	SC 42

B. CAMERA DATA AND FLIGHT SETTINGS

Main Camera:	
Lens	24" f/3.5
Slit Width	0.225"
Filter Type	Wratten 23A
Film Type	Eastman Type 3404
Supply (Port) Horizon Camera:	
Lens	55 mm f/6.3
Aperture Setting	f/6.3
Exposure Time	1/100 second
Filter Type	Wratten 25
Take-up (Starboard) Horizon Camera:	
Lens	55 mm f/6.3
Aperture Setting	f/8.0
Exposure Time	1/100 second
Filter Type	Wratten 25

C. POST FLIGHT PERFORMANCE EVALUATION

The Master camera operated properly through both phases of the mission. The complete film supply was metered into the take-up cassettes.

The photographic quality of the panoramic pictures was exceptionally good for a forward looking camera. The photography was superior to that observed from Mission 1030 and among the best from recent missions.

The degradations resulting from system light leaks was the least to date. A film chute was incorporated at the Mission 1031-1 capsule to eliminate the fogging from the translucent ablative material. The film also showed the usual degree of fine scratches in the area of the data block.

The horizon cameras functioned properly through both missions. The starboard looking camera imagery was veiled from pass D-01 through D-31 and clear for the remainder of the mission. (The veiling has been subsequently eliminated by the application of low reflective paint in the camera boot.) The fiducials were slightly bloomed but useable for preliminary attitude determination.

The data block failed to expose on three occasions during Mission 1031-1. These failures were not in conjunction with a camera start or stop. There were no comparable failures in the Slave camera. The cause of this failure is attributed to the extremely random failure of a switch closure. Bit 29 in the data block was faint on many occasions during both missions.

Examination of the processing summary showed no correlation between the occurrence of the faint bit and primary level processing.

SECTION 7

SLAVE (AFT) PANORAMIC CAMERA

A. COMPONENT ASSIGNMENT

Component	Serial Number
Main Camera	185
Main Camera Lens	1452435
Supply Horizon Camera	288-G6
Supply Horizon Camera Lens	E12832
Take-up Horizon Camera	288-G5
Take-up Horizon Camera Lens	E12872
Supply Cassette	SC-42

B. CAMERA DATA AND FLIGHT SETTINGS

Main Camera:	
Lens	24" f/3.5
Slit Width	0.150
Filter Type	Wratten 21
Film Type	Eastman Type 3404
Supply (Starboard) Horizon Camera:	
Lens	55 mm f/6.3
Aperture Setting	f/8.0
Exposure Time	1/100 second
Filter Type	Wratten 25
Take-up (Port) Horizon Camera:	
Lens	55 mm f/6.3
Aperture Setting	f/6.3
Exposure Time	1/100 second
Filter Type	Wratten 25

C. POST FLIGHT PERFORMANCE EVALUATION

The slave camera functioned properly during Mission 1031-1 but failed to meter film during 1031-2. The postulated failure mode is discussed in Section 3. The camera metered 8133 feet of film during Mission 1031-1 and produced good, high resolution photography. The quality was somewhat inferior but comparable to the Master camera photography.

The film contained excessive scratches parallel to the major axis. These scratches were noted in the horizon formats as well as the main format. This anomaly was attributed to the recovery system film chute however the absence of film from Mission 1031-2 precludes a definitive answer.

The data block, time track and horizon camera fiducials operated properly during the mission. Bit 27 was faint on occasion however no cause could be determined. It is possible that the intermittent deposition of foreign material over the lamp caused the reduced intensity. This phenomenon has occurred during systems test at A/P.

The horizon cameras functioned properly during the mission. The starboard camera imagery was clear during pass D-01. All subsequent imagery was veiled.

SECTION 8

PANORAMIC CAMERA EXPOSURE

The exposure parameters of the panoramic cameras were 0.225 inch wide slit with a Wratten 23A filter on the Master camera and a 0.150 inch wide slit with a Wratten 21 filter on the Slave camera. These conditions place the nominal exposure between the intermediate and full level processing curves, as published by [redacted] for their 3404 emulsion.

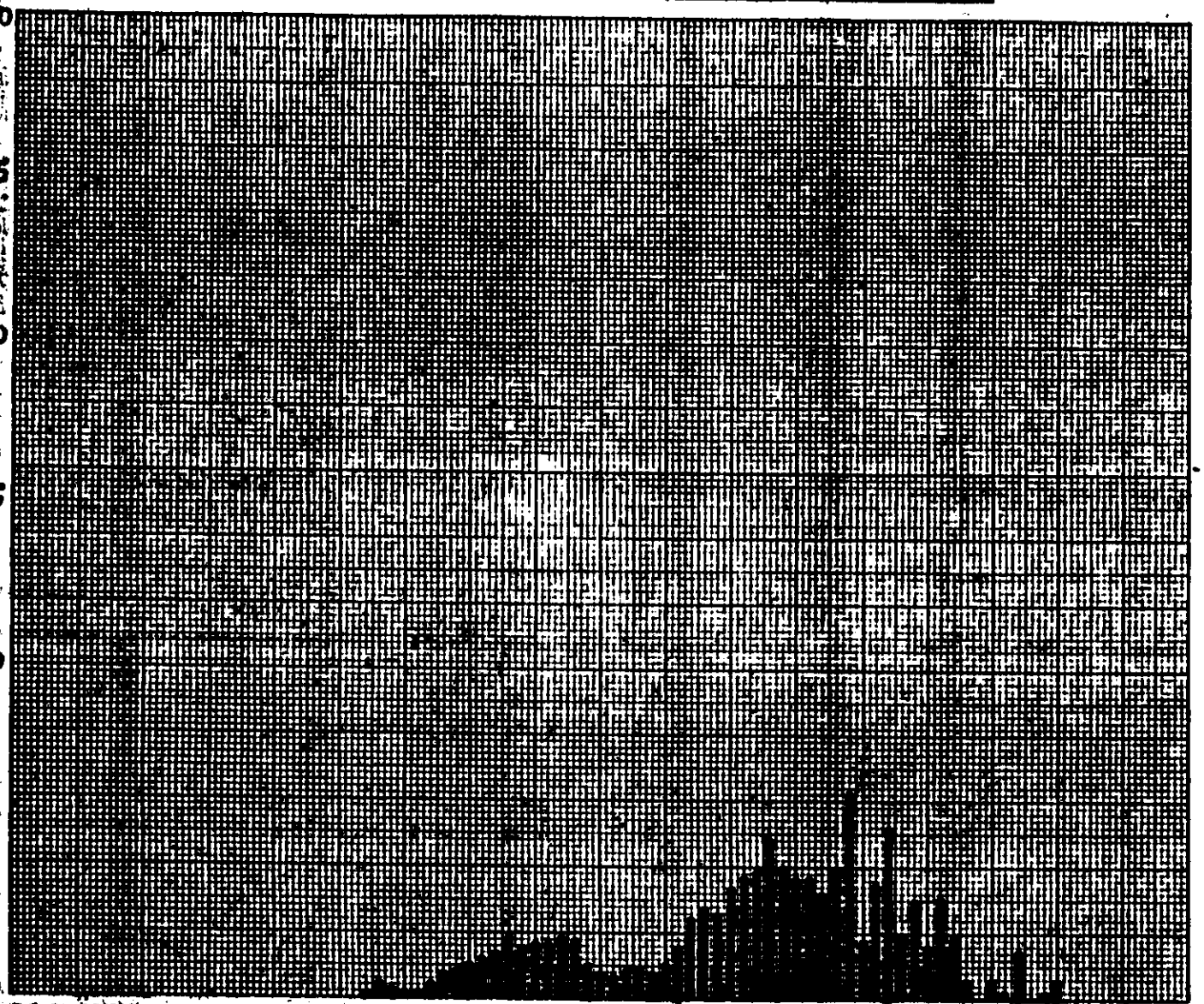
The frequency distributions of the solar elevations and solar azimuths encountered during the photographic operations are shown in Figures 8-1 through 8-4.

The nominal exposure times are shown as a function of latitude for passes D-9, D-41, D-73 and D-105 in Figures 8-5 through 8-8 for the Master camera and in Figures 8-9 through 8-12 for the Slave camera. 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
1031-1	FWD	Predicted	0.0	100	0.0
		Reported	18.0	34.0	48.0
1031-1	AFT	Predicted	0.0	22.2	67.8
		Reported	15.0	43.0	42
1031-2	FWD	Predicted	0.0	99.0	1.0
		Reported	7.6	53.2	39.2

The nominal exposure for both cameras was, in general, half way between the Intermediate and Full processing curves. The variations between the predicted and reported values are therefore not considered significant as small changes in topography, weather and haze would become the predominant factors in the choice of processing level.

SOLAR ELEVATION FREQUENCY DISTRIBUTION



Mission No: 1031-1

Payload No: J-30

Camera No: 184

Launch Date: 4/7/66

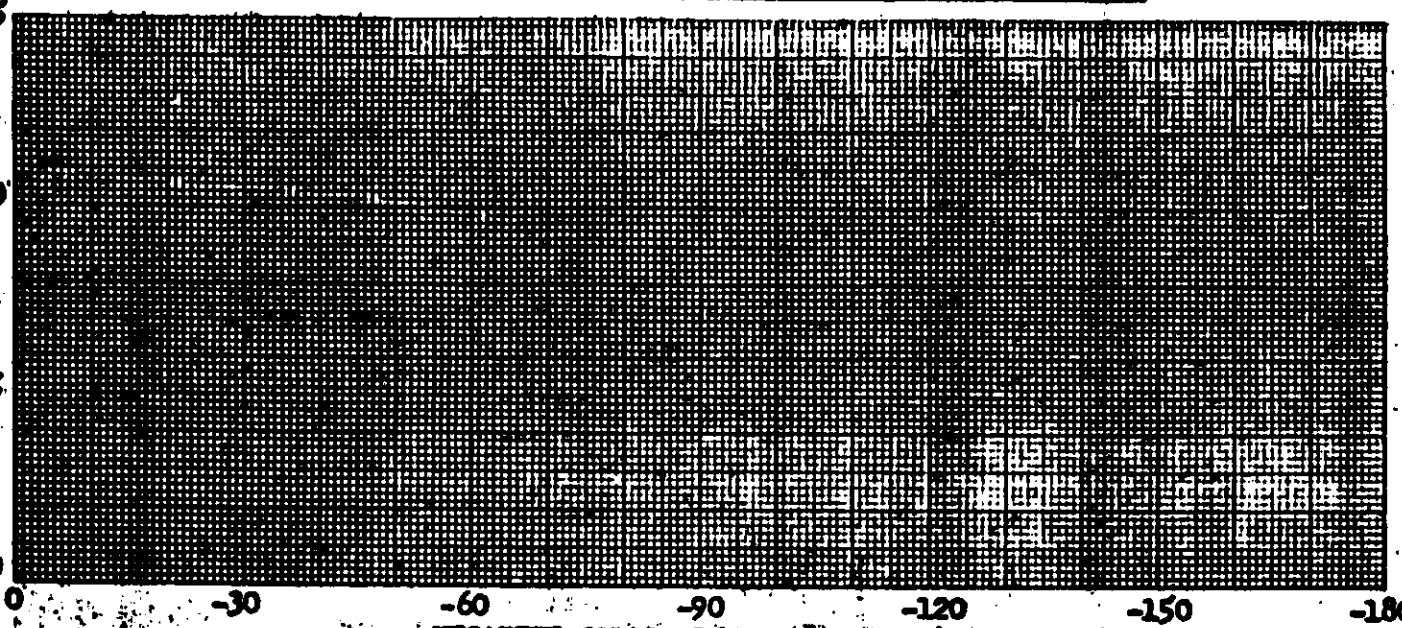
Launch Time: 2202 Z

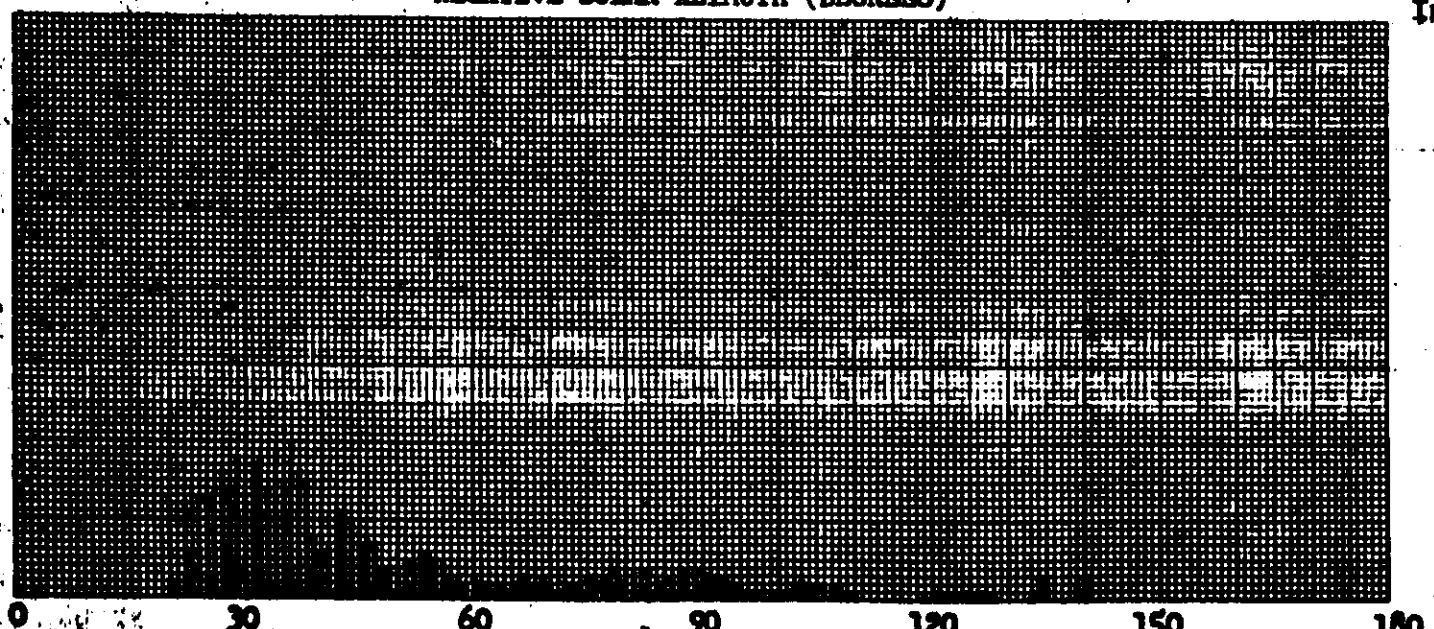
Inclination: 75°

Figure 8-1

TOP SECRET C[redacted]
No. [redacted]

SOLAR AZIMUTH FREQUENCY DISTRIBUTION





Mission No: 1031-1

Payload No: J-30

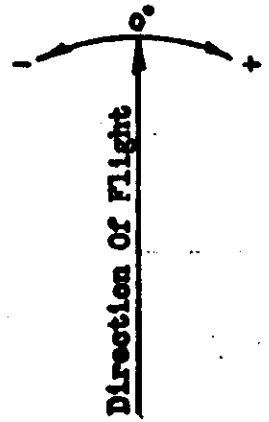
Camera No: 184

Launch Date: 4/7/66

Launch Time: 2202 Z

Inclination: 75°

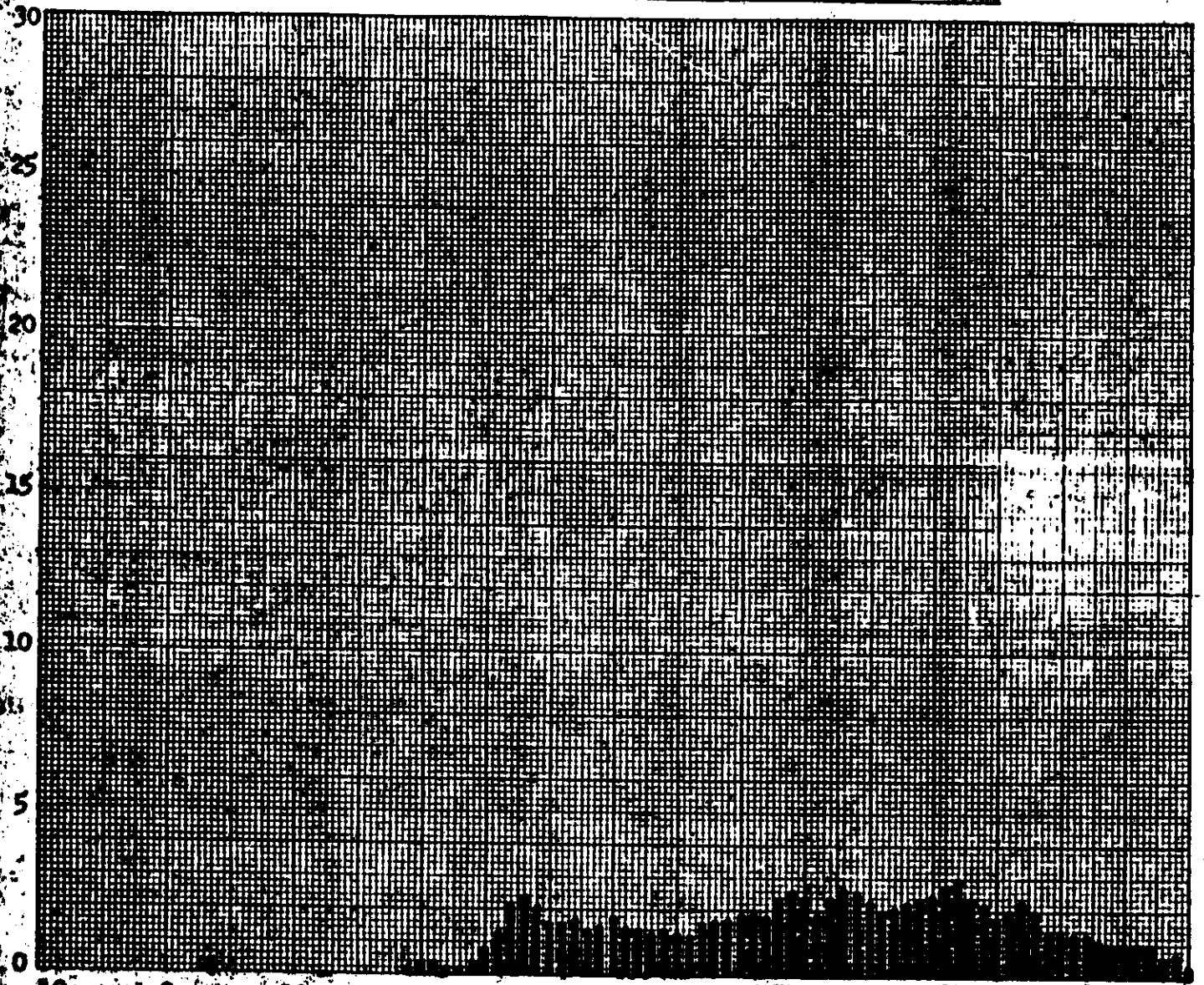
SIGN NOTATION



[redacted]

~~TOP SECRET C~~ [redacted]
No. [redacted]

SOLAR ELEVATION FREQUENCY DISTRIBUTION



Mission No: 1031-2

Payload No: J-30

Camera No: 184

Launch Date: 4/7/66

Launch Time: 2202 Z

Inclination: 75°

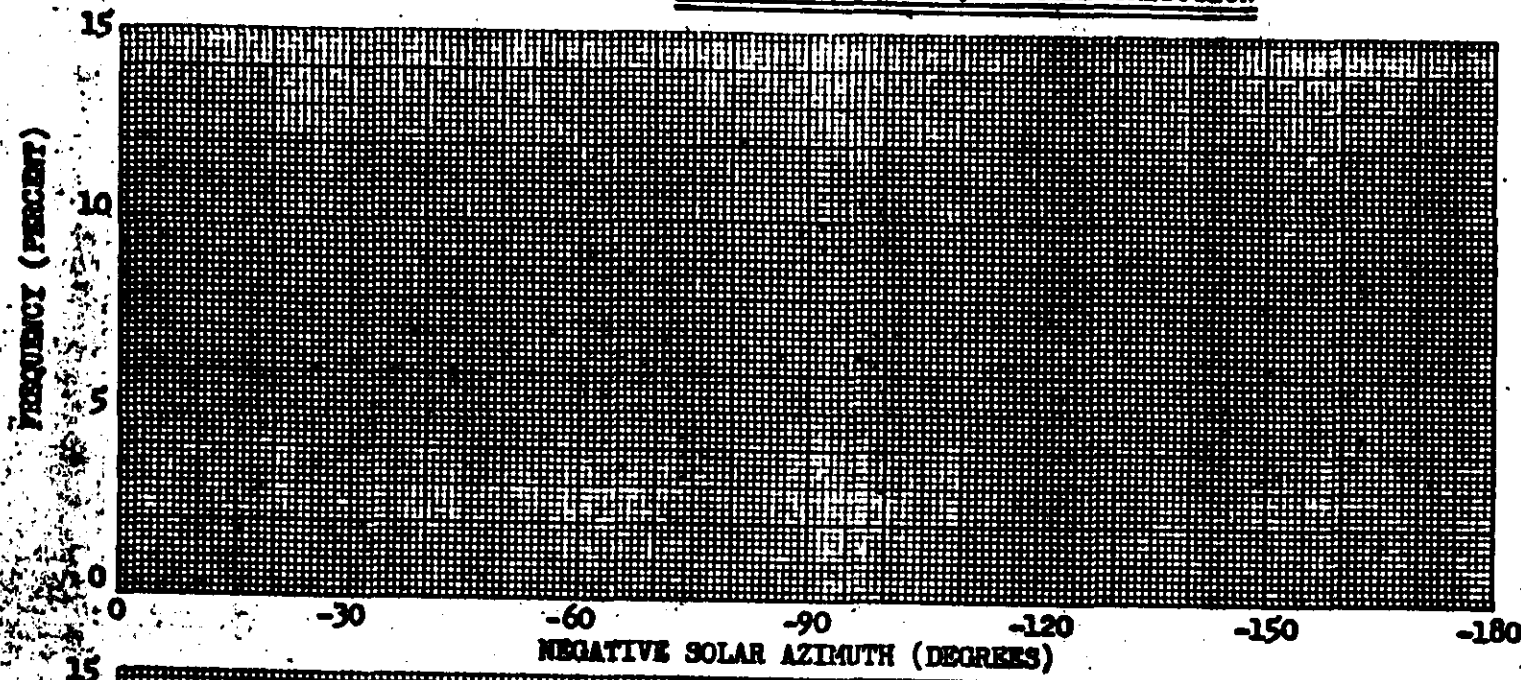
~~TOP SECRET C~~ [redacted]

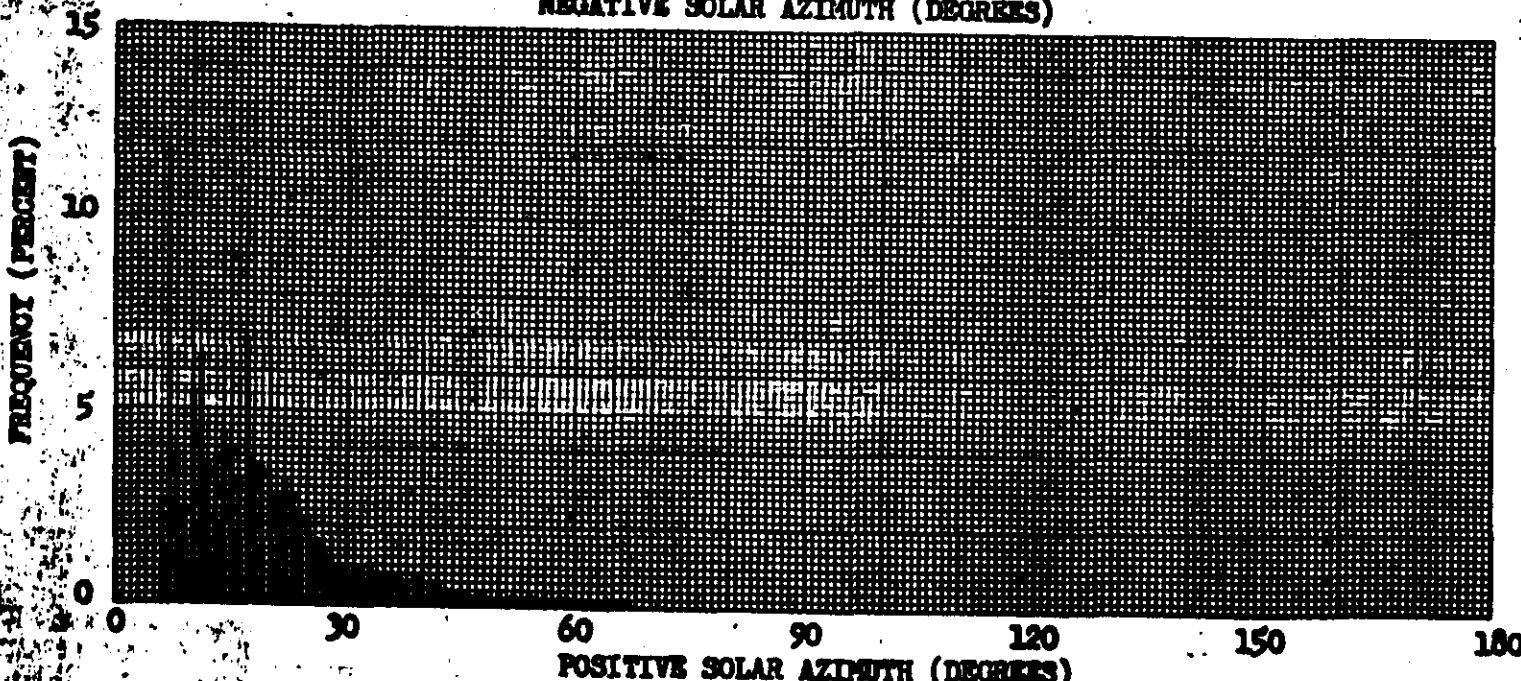
Figure 8-3

~~TOP SECRET~~

No. [redacted]

SOLAR AZIMUTH FREQUENCY DISTRIBUTION





Mission No: 1031-2

Payload No: J-30

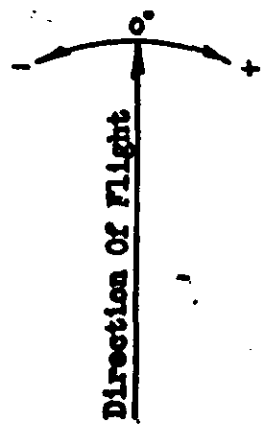
Camera No: 184

Launch Date: 4/7/66

Launch Time: 2202 Z

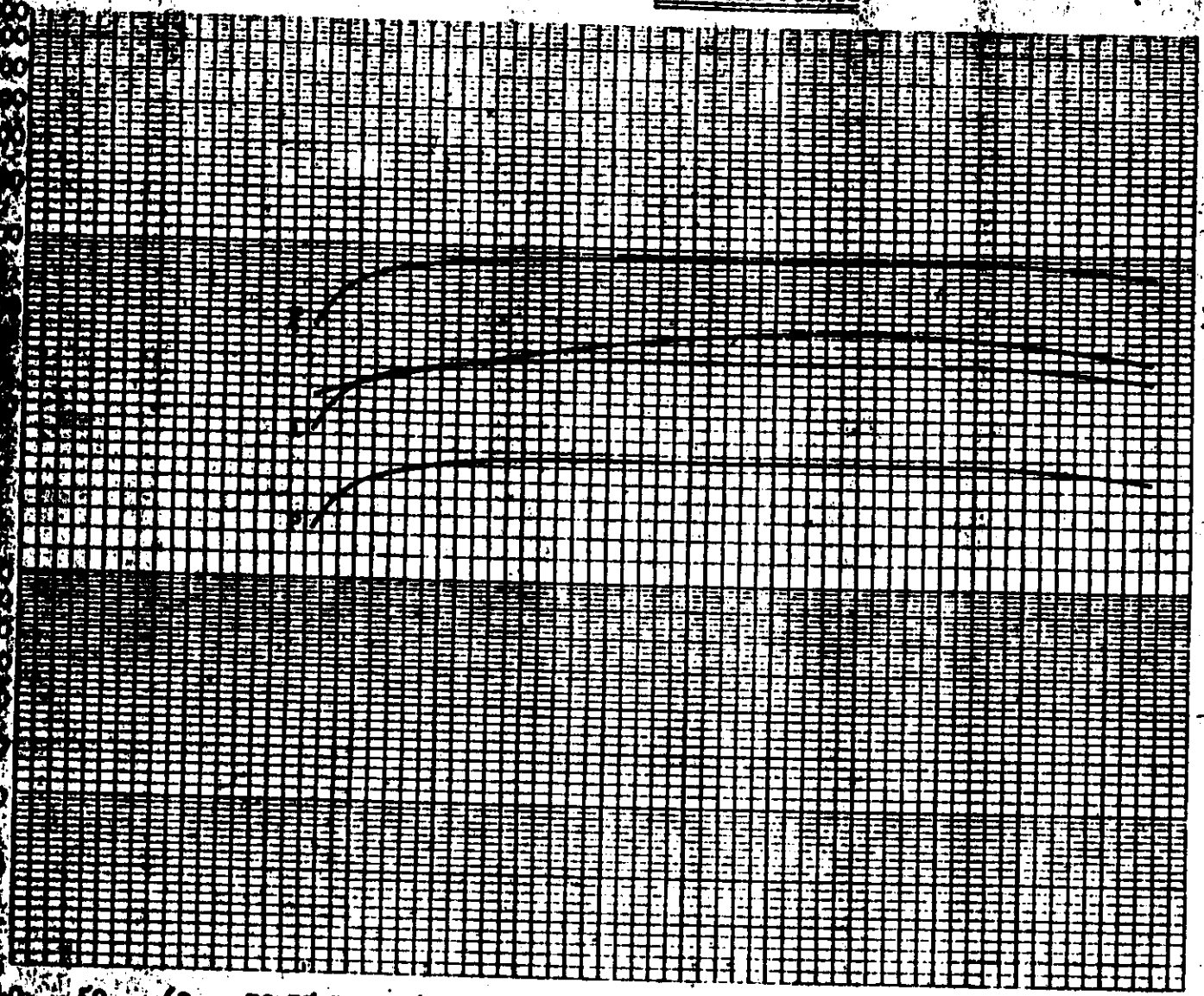
Inclination: 75°

SIGN NOTATION



~~TOP SECRET~~ [redacted]

EXPOSURE POINTS



Mission No: 1031

Payload No: J-30

Camera No: 184

Pass No: 9

Launch Date: 9/7/66

Launch Time: 2203 Z

Slit Width: .225

Filter Type: Wratten 23

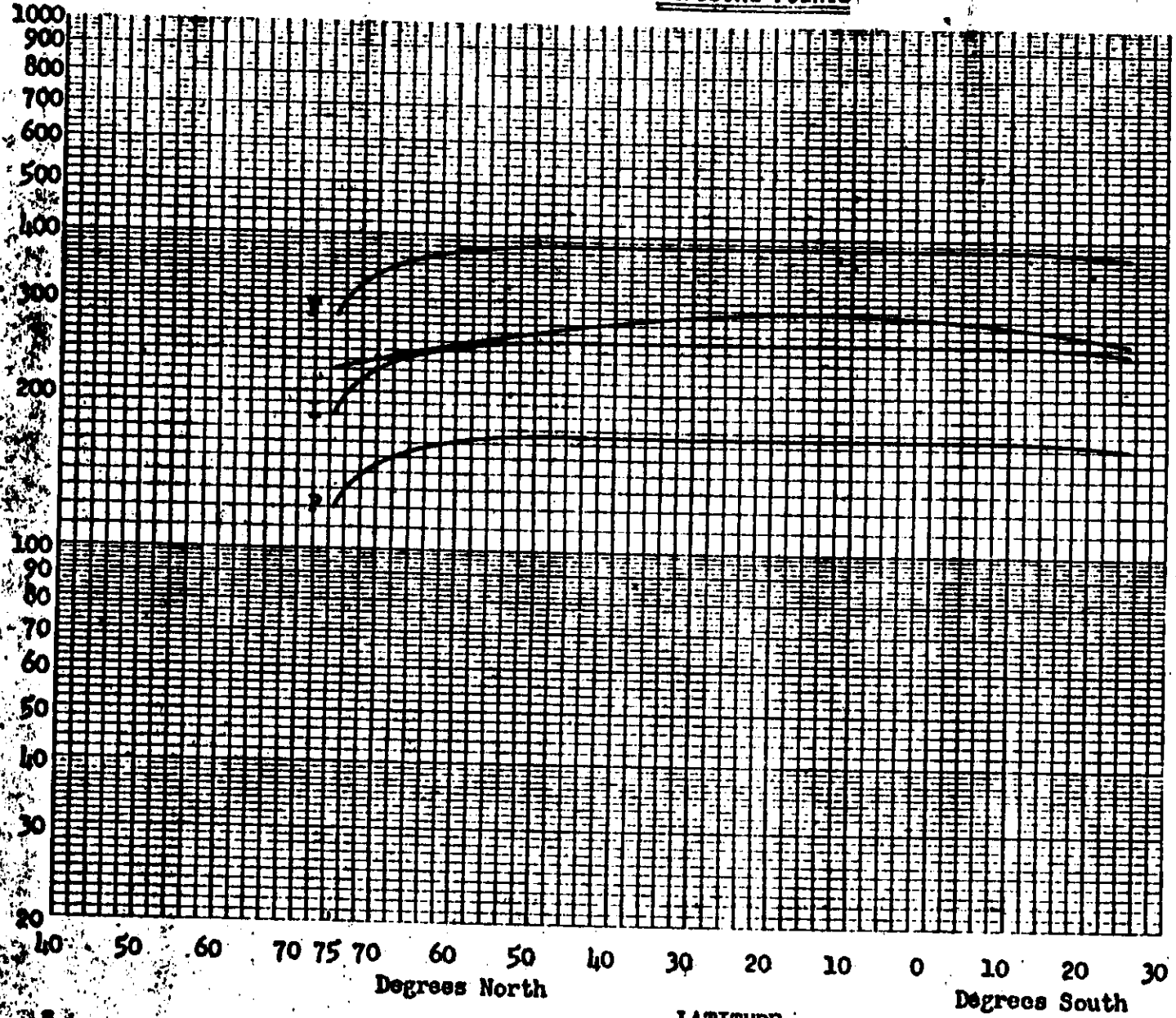
Film Type: 3404

Figure 8-5

~~TOP SECRET~~ C[redacted]

No. [redacted]

EXPOSURE POINTS



Mission No: 1031

Payload No: J-30

Camera No: 184

Pass No: 41

Launch Date: 4/7/66

Launch Time: 2203 Z

Slit Width: .225

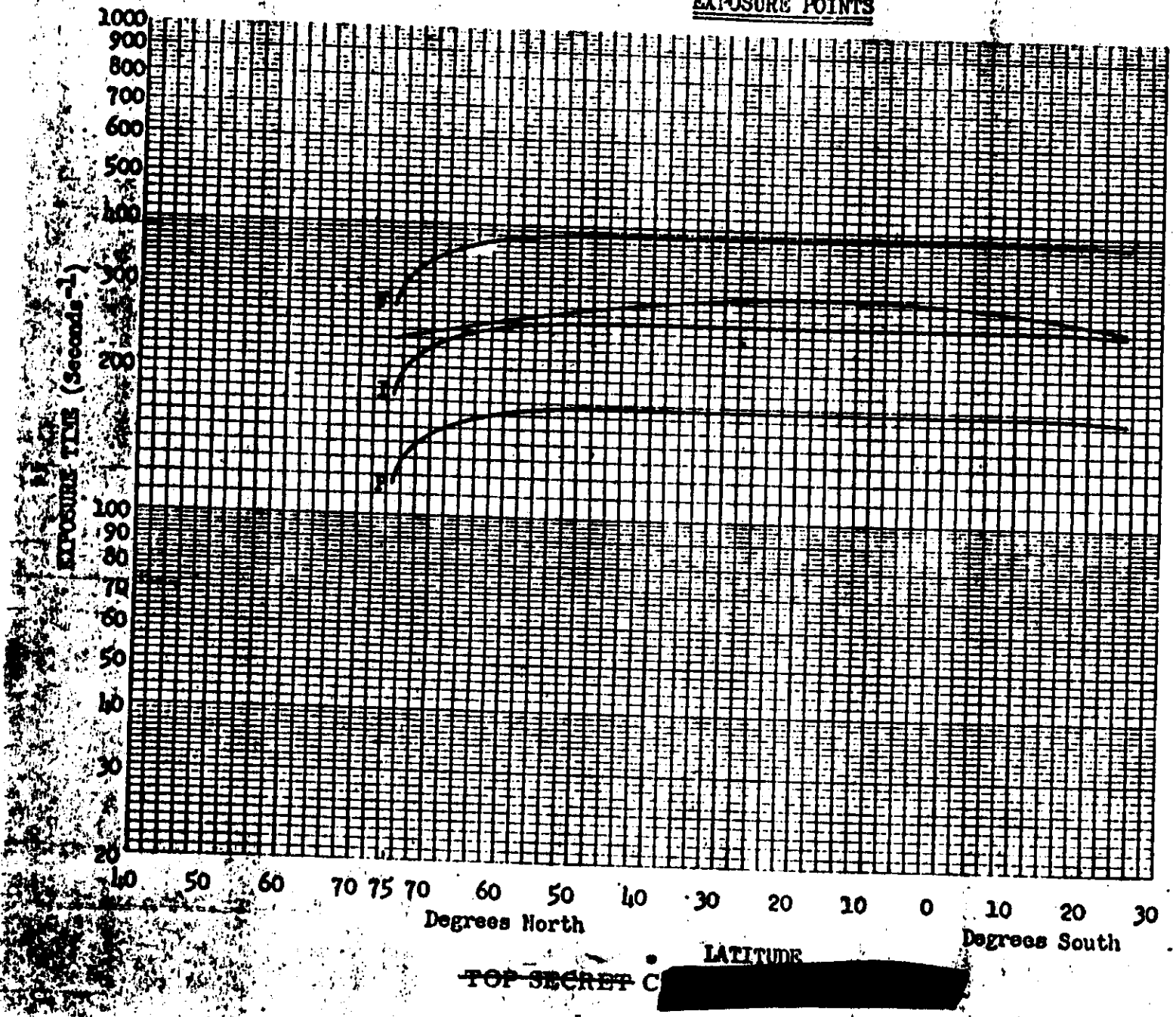
Filter Type: Wratten 23

Film Type: 3404

~~TOP SECRET~~ C[redacted]

Figure 8-8

EXPOSURE POINTS



Mission No: 1031

Payload No: J-30

Camera No: 184

Pass No: 73

Launch Date: 4/7/66

Launch Time: 2203

Slit Width: .225

Filter Type: Wratten 23

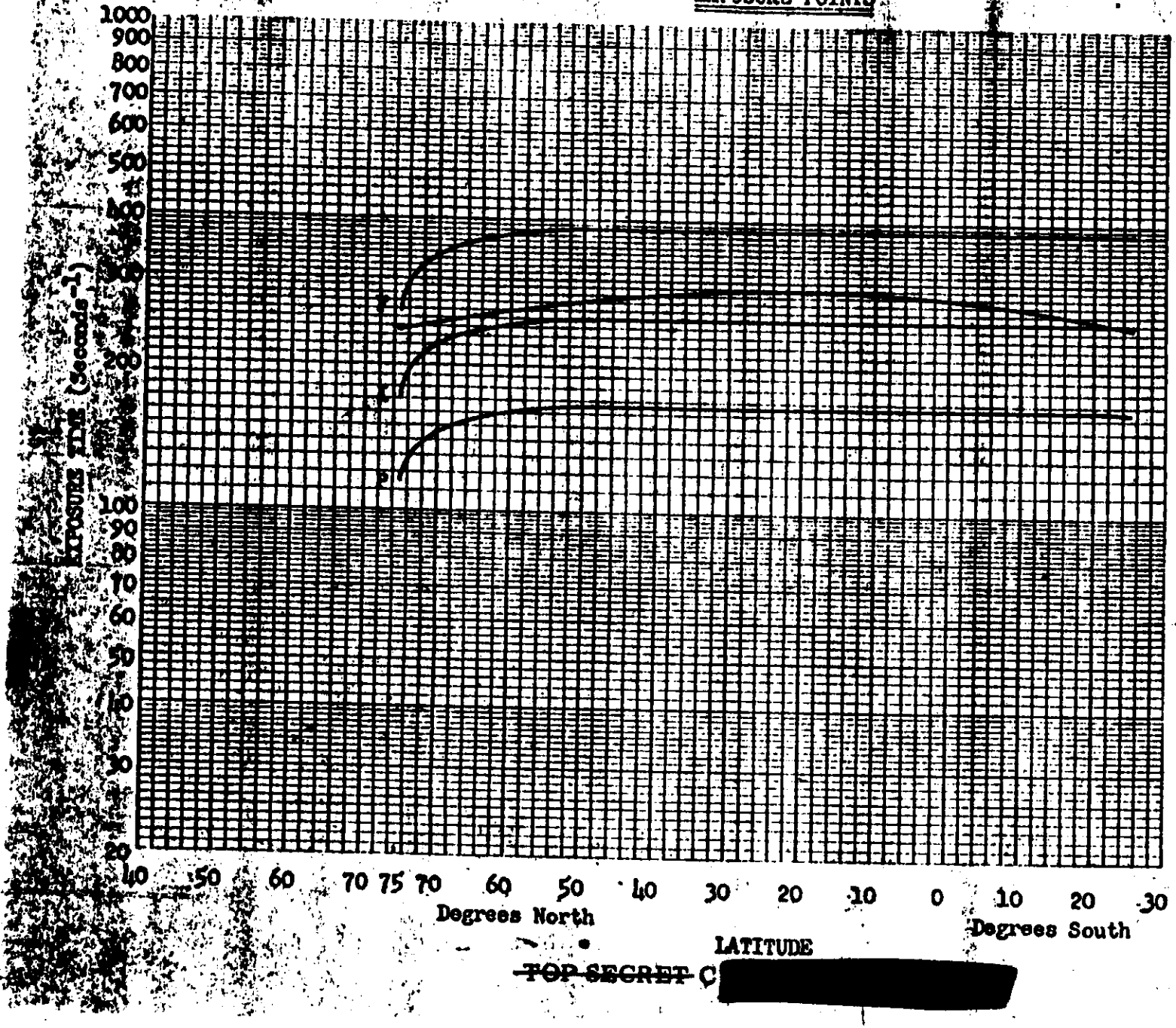
Film Type: 3404

Figure 8-7

TOP SECRET C [redacted]

No. [redacted]

EXPOSURE POINTS



Mission No: 1031

Payload No: J-30

Camera No: 184

Pass No: 105

Launch Date: 4/7/66

Launch Time: 2203 Z

Slit Width: .225

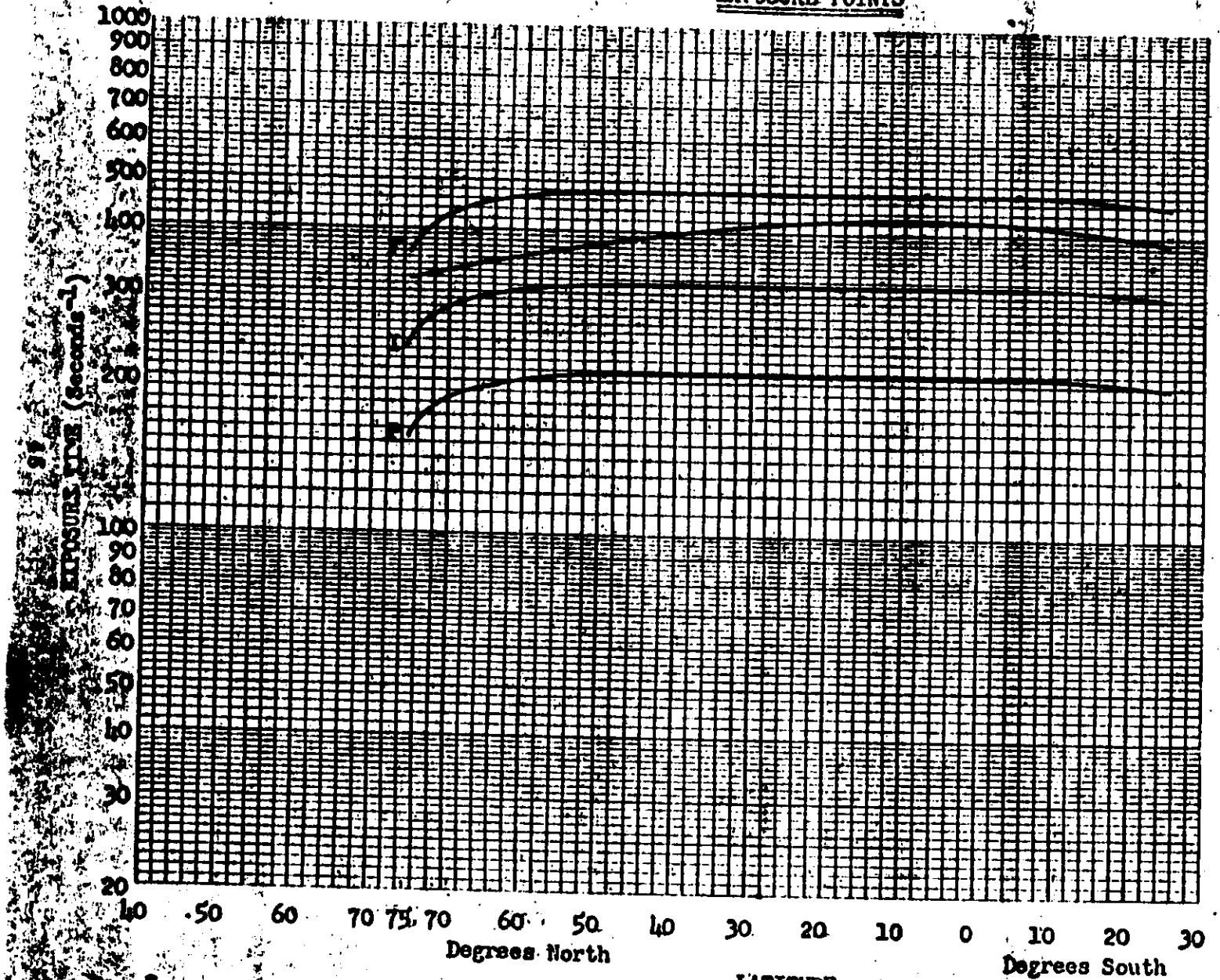
Filter Type: Wratten 23

Film Type: 3404

TOP SECRET C [redacted]

Figure 8-8

EXPOSURE POINTS



Mission No: 1031

Payload No: J-30

Camera No: 185

Pass No: 9

Launch Date: 4/7/66

Launch Time: 2203 Z

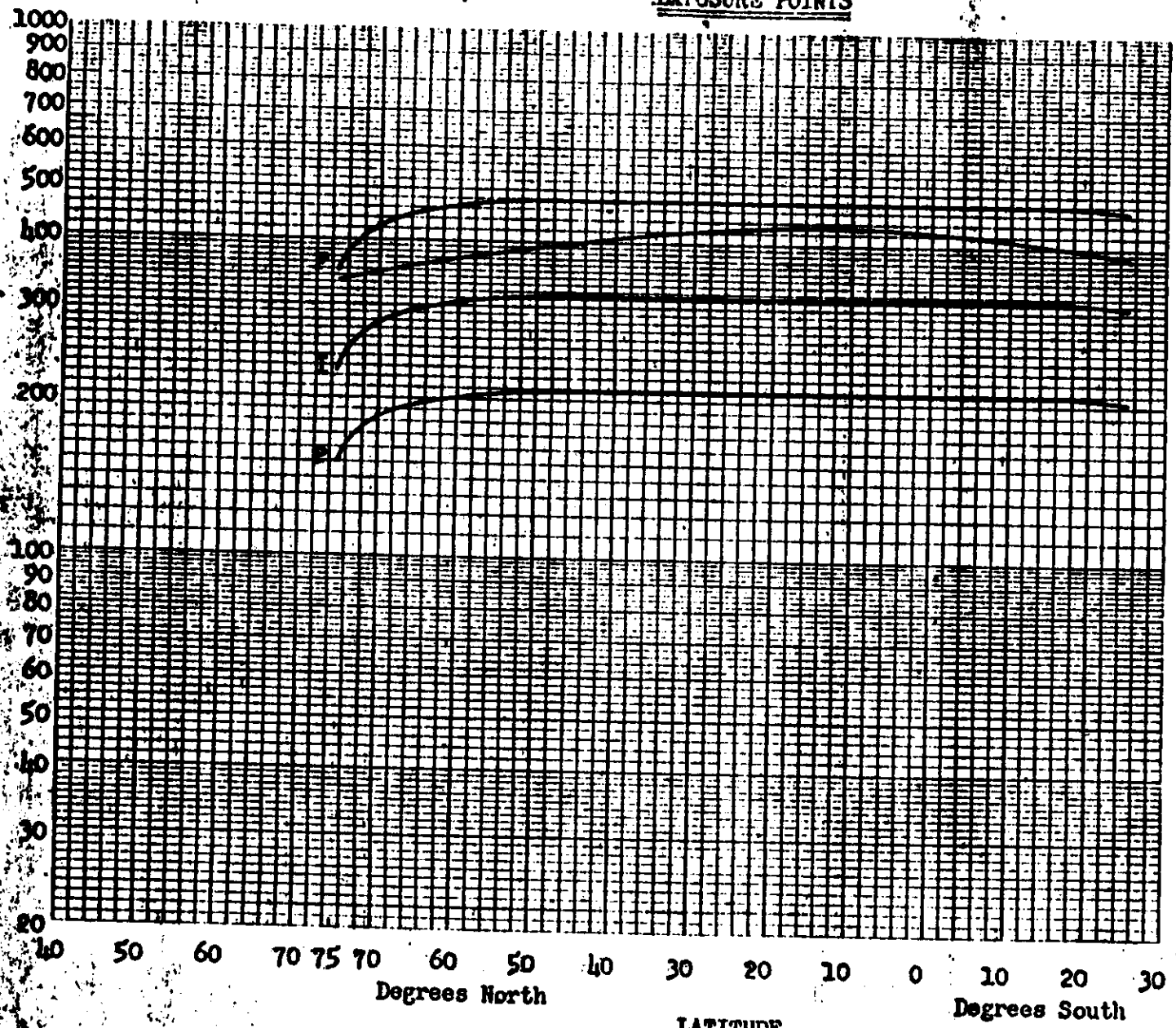
Slit Width: .150

Filter Type: Wratten 21

Film Type: 3404

Figure 8-9

EXPOSURE POINTS



Mission No: 103

Payload No: J-30

Camera No: 185

Pass No: 41

Launch Date: 4/7/66

Launch Time: 2203 Z

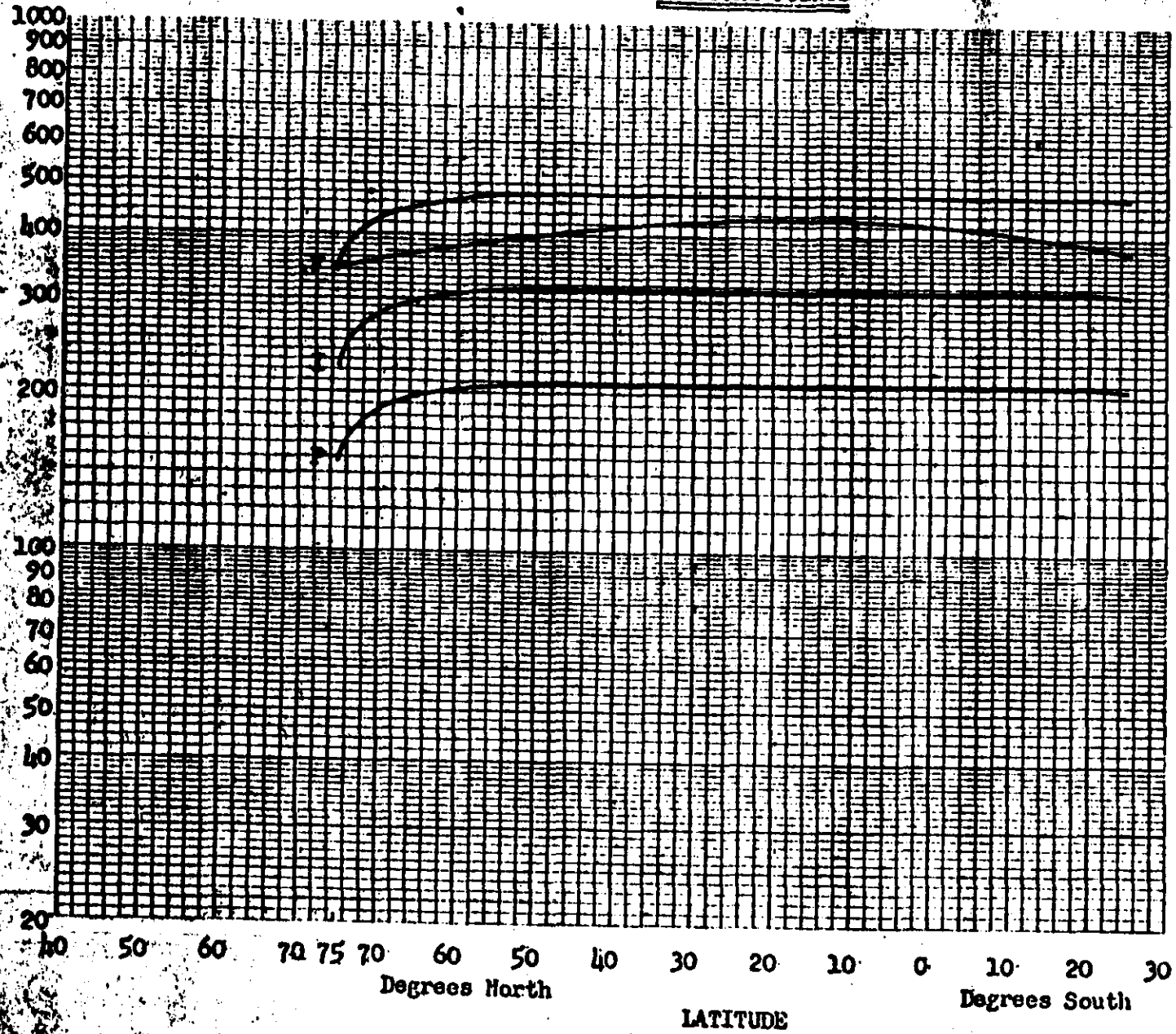
Slit Width: .150

Filter Type: Wratten 21

Film Type: 3404

Figure 8-10

EXPOSURE POINTS



Mission No: 1031

Payload No: J-30

Camera No: 185

Pass No: 73

Launch Date: 4/7/66

Launch Time: 2203 Z

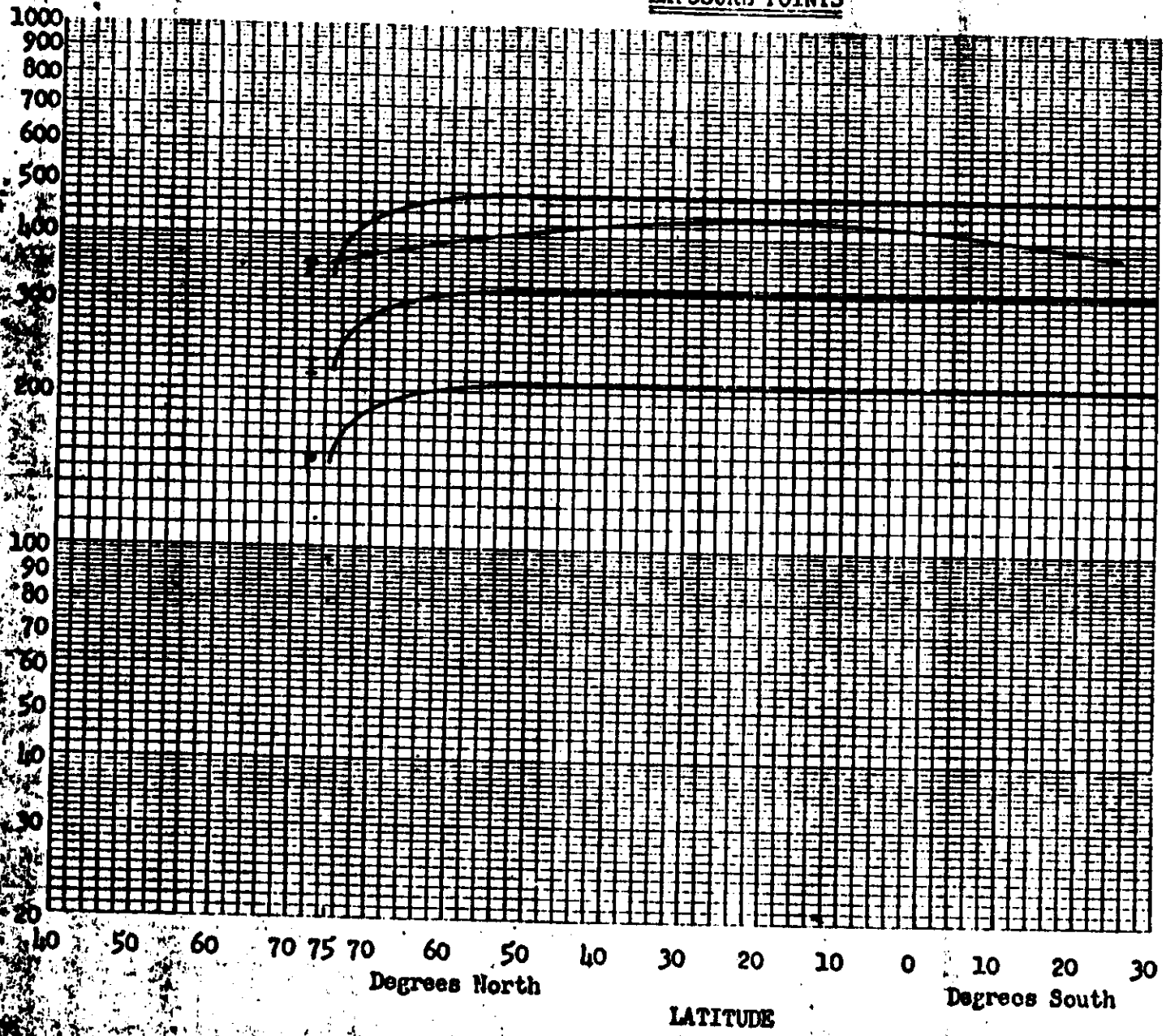
Slit Width: .150

Filter Type: Wratten 21

Film Type: 3404

Figure 8-11

EXPOSURE POINTS



Mission No: 1031

Payload No: J-30

Camera No: 185

Pass No: 105

Launch Date: 4/7/66

Launch Time: 2203 Z

Slit Width: .150

Filter Type: Wratten 21

Film Type: 3404

Figure 8-12

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 plus 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
1031-1	FWD	Predicted	0.0	100	0.0
		Reported	18.0	34.0	48.0
		Computed	0.0	51.0	49.0
	AFT	Predicted	0.0	22.2	67.8
		Reported	15.0	43.0	42.0
		Computed	0.0	47.0	53.0
1031-2	FWD	Predicted	0.0	99.0	1.0
		Reported	7.6	53.2	39.2
		Computed	0.0	60.0	40.0

The tabulations of density frequency distributions for Missions 1031-1 and 1031-2 are included in Appendix A, Table A-1 thru A-3. The graphical presentation of the density distribution are computer plotted in Appendix A Figures A-1 thru A-27.

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. The area measured for D-Min is selected subjectively and is not necessarily the absolute D-Min in the photography.

Density range charts for J missions 1004 to 1031 are included in this report. See Figures 9-1 to 9-5. Subsequent reports will only include the chart containing the data for the mission being reported on.

These charts are produced from the same density measurements previously mentioned in this section. The computer produced the mean, median and range figures for the various processing levels used. The chart includes the number of frames (samples) in which the density measurements were made. These measurements are made on approximately every tenth frame throughout the mission.

~~TOP SECRET~~ [redacted] CONTROL NO. [redacted]

MISSION 1031-1 INSTR - FWD 8/25/66 PROCESSING AND EXPOSURE ANALYSIS

PROCESS LEVEL	SAMPLE SIZE	UNDER EXPOSED	UNDER PROCESSED	CORRECT EXP+PROC	OVER PROCESSED	OVER EXPOSED
PRIMARY	0	0 PC	0 PC	0 PC	0 PC	0 PC
INTERMEDIATE	128	0 PC	15 PC	59 PC	20 PC	5 PC
FULL	124	3 PC	0 PC	82 PC	15 PC	0 PC
ALL LEVELS	252	2 PC	8 PC	70 PC	17 PC	3 PC

MISSION 1031-1 INSTR - AFT 8/25/66 PROCESSING AND EXPOSURE ANALYSIS

PROCESS LEVEL	SAMPLE SIZE	UNDER EXPOSED	UNDER PROCESSED	CORRECT EXP+PROC	OVER PROCESSED	OVER EXPOSED
PRIMARY	0	0 PC	0 PC	0 PC	0 PC	0 PC
INTERMEDIATE	117	0 PC	9 PC	59 PC	26 PC	6 PC
FULL	134	7 PC	0 PC	81 PC	12 PC	0 PC
ALL LEVELS	251	4 PC	4 PC	70 PC	18 PC	4 PC

MISSION 1031-2 INSTR - FWD 8/25/66 PROCESSING AND EXPOSURE ANALYSIS

PROCESS LEVEL	SAMPLE SIZE	UNDER EXPOSED	UNDER PROCESSED	CORRECT EXP+PROC	OVER PROCESSED	OVER EXPOSED
PRIMARY	0	0 PC	0 PC	0 PC	0 PC	0 PC
INTERMEDIATE	130	0 PC	8 PC	67 PC	25 PC	4 PC
FULL	86	1 PC	0 PC	74 PC	23 PC	1 PC
ALL LEVELS	216	0 PC	5 PC	69 PC	22 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	0.14-0.19	0.41-0.80	----------	0.81 AND UP
INTERMED	0.10-0.17	0.01-0.20	0.21-0.33	0.41-0.80	0.81-1.34	1.35 AND UP
FULL	0.18 AND UP	0.01-0.39	----------	0.41-0.80	0.81-1.69	1.70 AND UP

~~TOP SECRET~~ [redacted] CONTROL NO. [redacted]

TABLE 9-1

J MISSION DENSITY RANGES

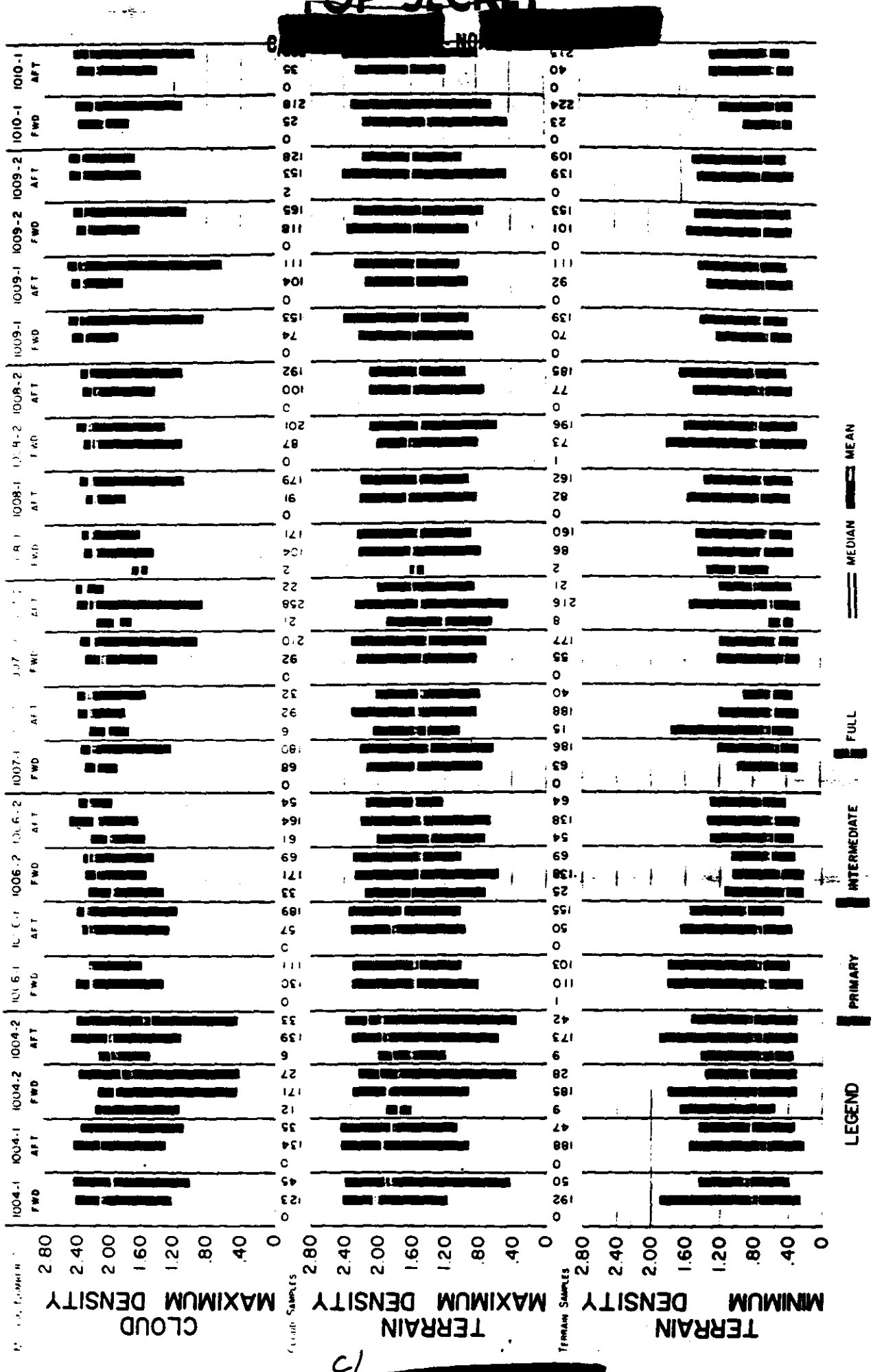


FIGURE 9-1

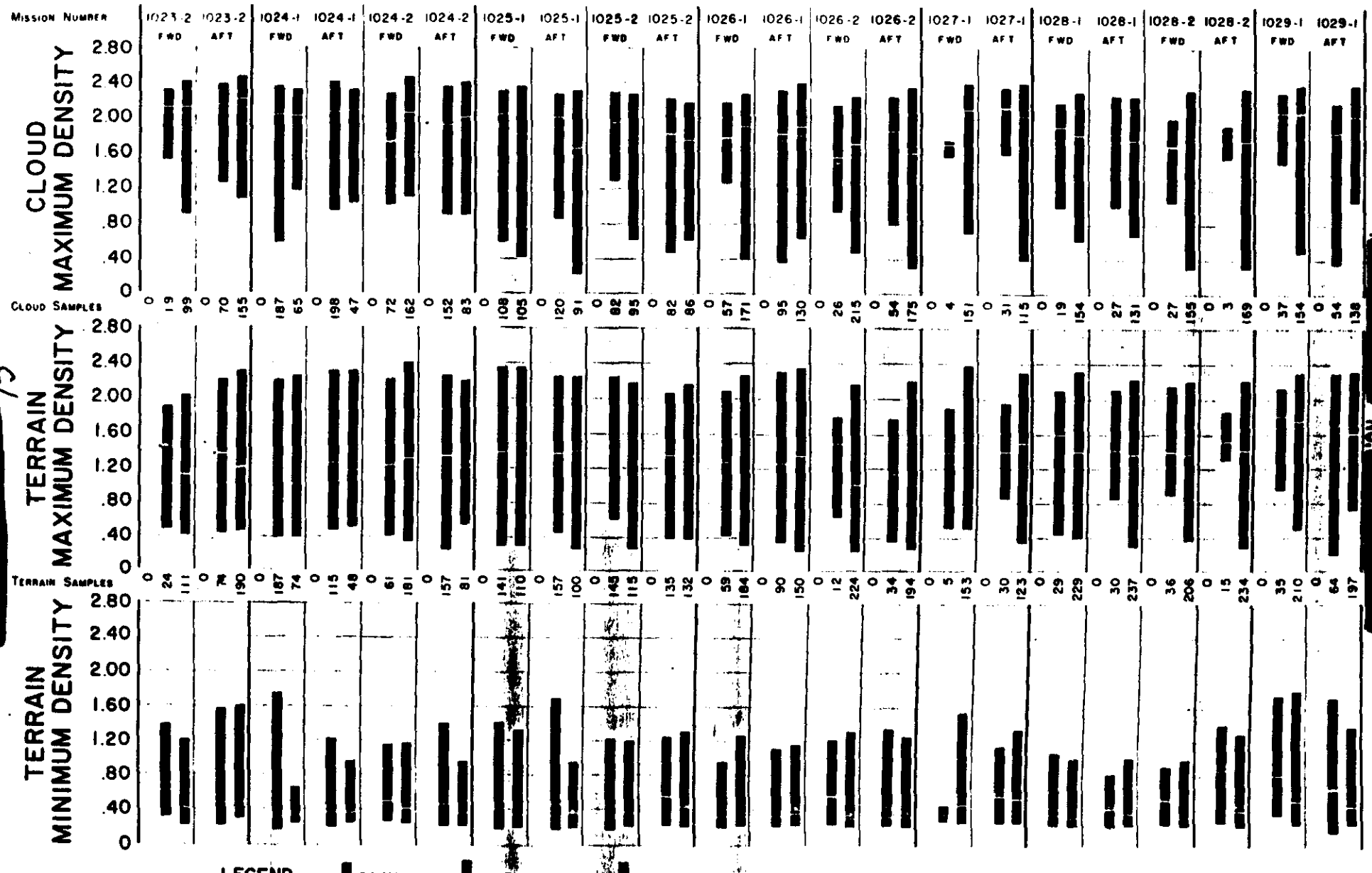
J MISSION DENSITY RANGES

FIGURE 9-2

J MISSION DENSITY RANGES

FIGURE 9-3

J MISSION DENSITY RANGES



J MISSION DENSITY RANGES

FIGURE 9-5

[redacted]

SECTION [redacted]

PERFORMANCE MEASUREMENTS

The photography acquired during Missions 1031-1 and 1031-2 [redacted] an MIP rating of 85. A summary is tabulated [redacted] average MTF/AD resolution values measured by AFSPPF and [redacted]. The micrometer densitometer slit used by both organizations was 1 micron wide and 50 microns long.

Mission	Camera	AFSPPF	[redacted]
1031-1	FWD	[redacted]	80
1031-1	AFT	71	66
1031-2	FWD	94	74

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

The ground resolution determined from the average AFSPPF MTF/AD resolution was 14.7 feet on the forward looking camera and 17.2 feet on the aft looking camera.

SECTION [redacted]

OBSERVED DATA

Photography from engineering operations on Mission 1031 is not suitable for a meaningful evaluation of system performance. All operations were conducted over desert terrain containing very little culture.

Part One operations were conducted on passes 79 and 95 over New Mexico. No culture was found that would permit a valid comparison between forward and aft photography.

Part Two operations were conducted on passes 113, 127, 143, and 159, all over southern Arizona. No film was recovered from the aft camera.

The fixed CORN target at Fort Huachuca was photographed by the forward camera on pass 159. The high contrast target could be resolved to 11 feet along track and 13 feet across track.

[redacted]

SECTION 12

MISSION 1031-I STELLAR-INDEX CAMERA

A. COMPONENT ASSIGNMENT

Component	Serial Number
Camera	D 83
Index Reseau	101
Stellar Reseau	10

B. CAMERA DATA AND FLIGHT SETTINGS

Stellar Camera:

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

Index Camera:

Lens	38 mm f/4.5
Exposure Time	1/500 second
Filter Type	Wratten [redacted]
Film Type	Eastman Type 3400

C. POST FLIGHT EVALUATION

The Stellar-Index camera functioned properly throughout the mission. The stellar formats contained approximately 20 star images in all frames and had a low flare from non-image forming light. The majority of the images were slightly smeared as a result of panoramic camera unbalance. The Index camera photography was also good during the mission.

C[redacted]

[redacted]

SECTION X

MISSION 1031-2 STELLAR-INDEX CAMERA

A. COMPONENT ASSIGNMENT

Component	Serial Numbers
Camera	D86
Index Reseau	106
Stellar Reseau	[redacted]

B. CAMERA DATA AND FLIGHT SETTINGS

Stellar Camera:

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

Index Camera:

Lens	39 mm f/4.5
Exposure Time	1/500 second
Filter Type	Wratten 21
Film Type	Eastman Type 3400

C. POST FLIGHT EVALUATION

The camera produced 410 Stellar frames and 426 frames during the mission. Investigation of the cause of the Stellar camera film to be short by approximately 16 frames uncovered an error in the recovery sequence circuitry. The sequence of events at the "ARM" signal should include the slewing of the S/I film; at "TRANSFER", nominally 75 seconds later, the water seal closes and the back-up hot wire cutter is activated. The error caused the hot wire cutter to be activated at the "ARM" signal thus leaving the last frames in the camera. The hot wire cutter heats to a point that it becomes incandescent. This accounts for the heavy fog on the last 13 inches of both films.

[redacted]

NO.

The Stellar camera film contained heavy fog from first to last of the mission. The shutter malfunctioned during the last half of the mission and remained open during part of the film transport. Despite these problems the film was satisfactory for the determination of vehicle attitude. Approximately 20 stars were imaged during the first half of the mission and 12 imaged during the last half. As usual the images were slightly smeared as the result of panoramic camera unbalance during exposure.

The heavy fog pattern has been attributed to the incomplete assembly of the stellar baffle. It was observed, during a subsequent assembly, that the neoprene hinge cover was missing. This would permit some light to pass through the hinge and cause the fogging. The assembly and installation drawings were found to be vague as to the hinge cover placement. These drawings have been revised.

The Index camera functioned properly throughout the mission. Examination of the photography showed a noticeable fall off in image quality at the edges. It was concluded that the focal plane was not in the optimum position for maximum AWAR[illegible]

The last 50 Index frames had a continuous plus density streak between the camera serial number and the film edge. This anomaly has occurred previously and is considered to be an abrasion mark probably caused by the camera. This problem has never been encountered in test. Examination of the camera has not uncovered the problem area. Since the marking always occurs in an area that contains no data further investigation does not appear to be warranted.

SECTION 14

VEHICLE ATTITUDE

The vehicle attitude errors for both Mission 1031-1 and 1031-2 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 1031-1 and Figures 14-7 through 14-12 for Mission 1031-2.

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

Value	Mission 1031-1 90%	Mission 1031-1 Range	Mission 1031-2 90%	Mission 1031-2 Range
Pitch Error (°)	0.50	0.02 to 0.76	[illegible]	[illegible]
Roll Error (°)	0.47	-0.06 to +0.66	0.20	-0.30 to +0.62
Yaw Error (°)	0.96	0.34 to 1.32	0.75	0.26 to 1.02
Pitch Rate (°/hr.)	16.23	-95 to +85	19.00	-36 to [illegible]
Roll Rate (°/hr.)	17.25	-72 to +58	19.27	-58 to +64
Yaw Rate (°/hr.)	26.62	-76 to +48	15.66	-46 to +68

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.

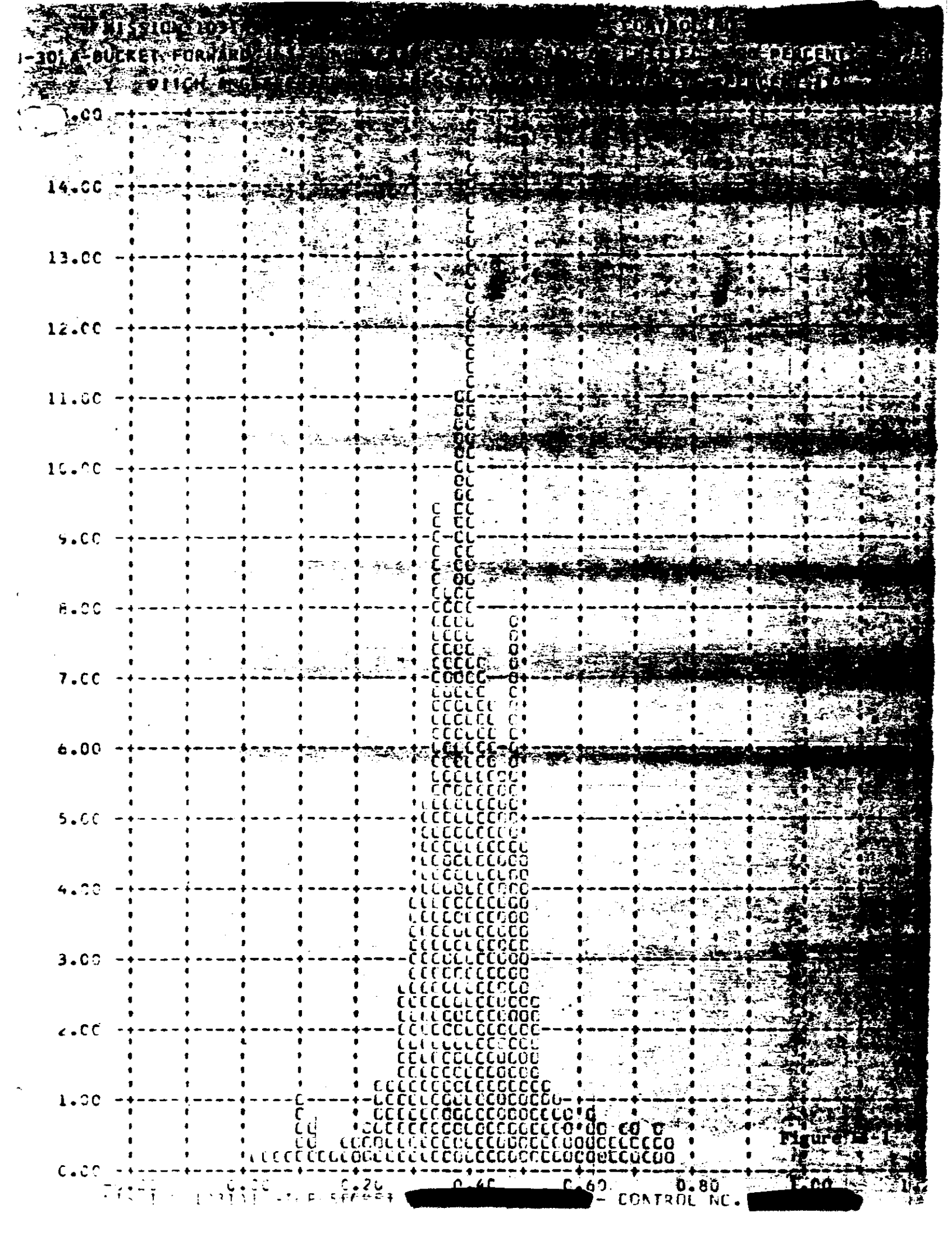


Figure [illegible]

[illegible] CONTROL NO. [illegible]

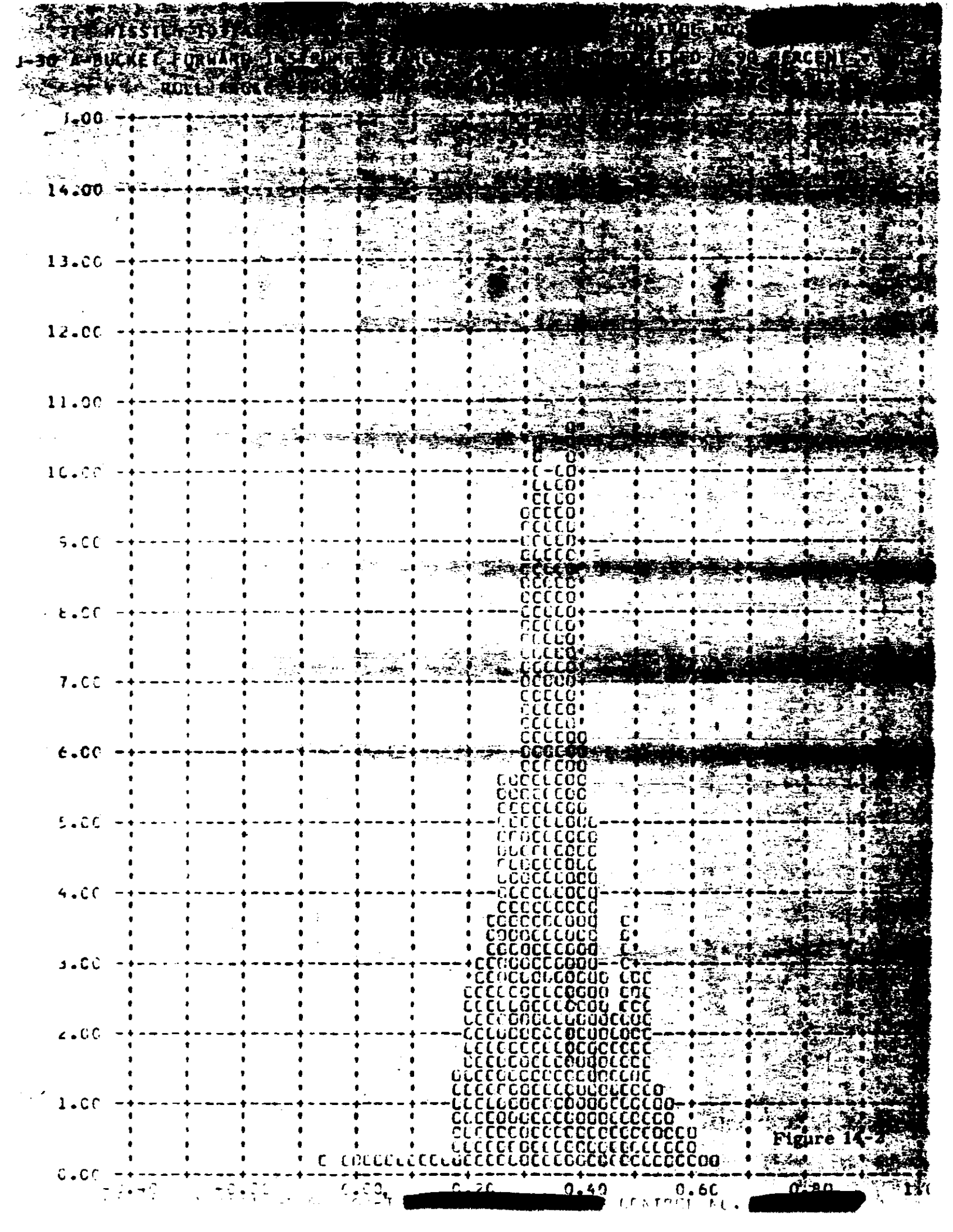
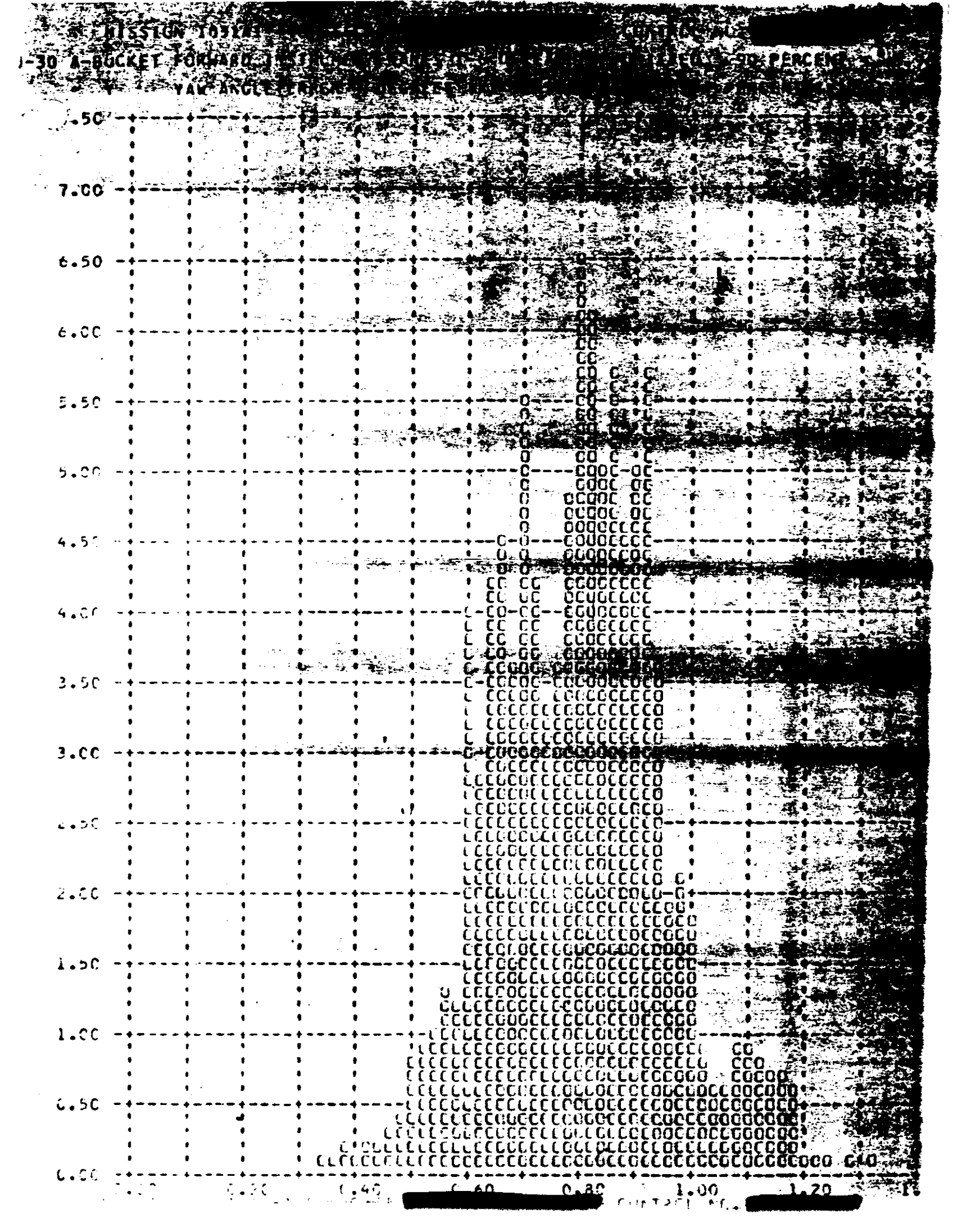
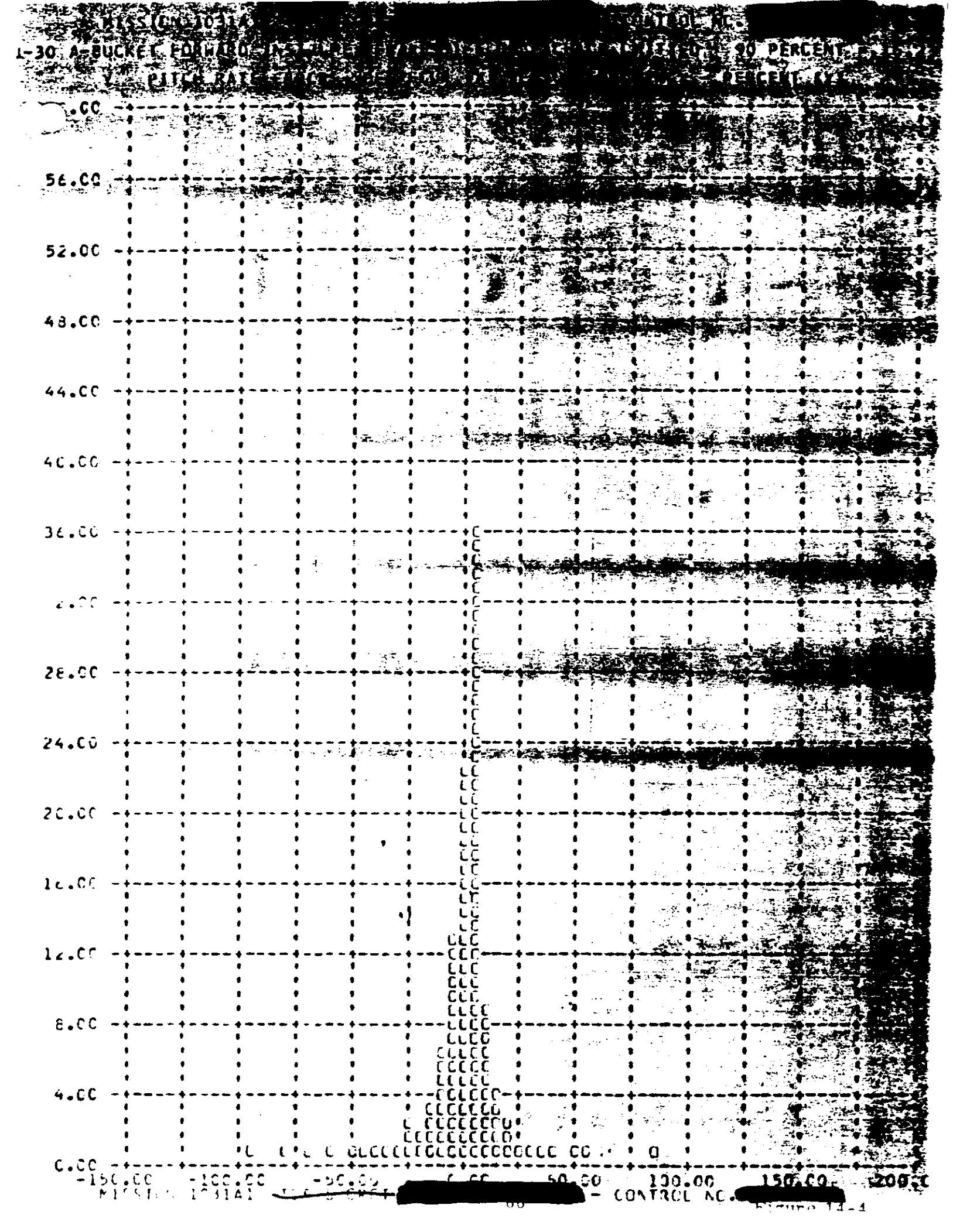
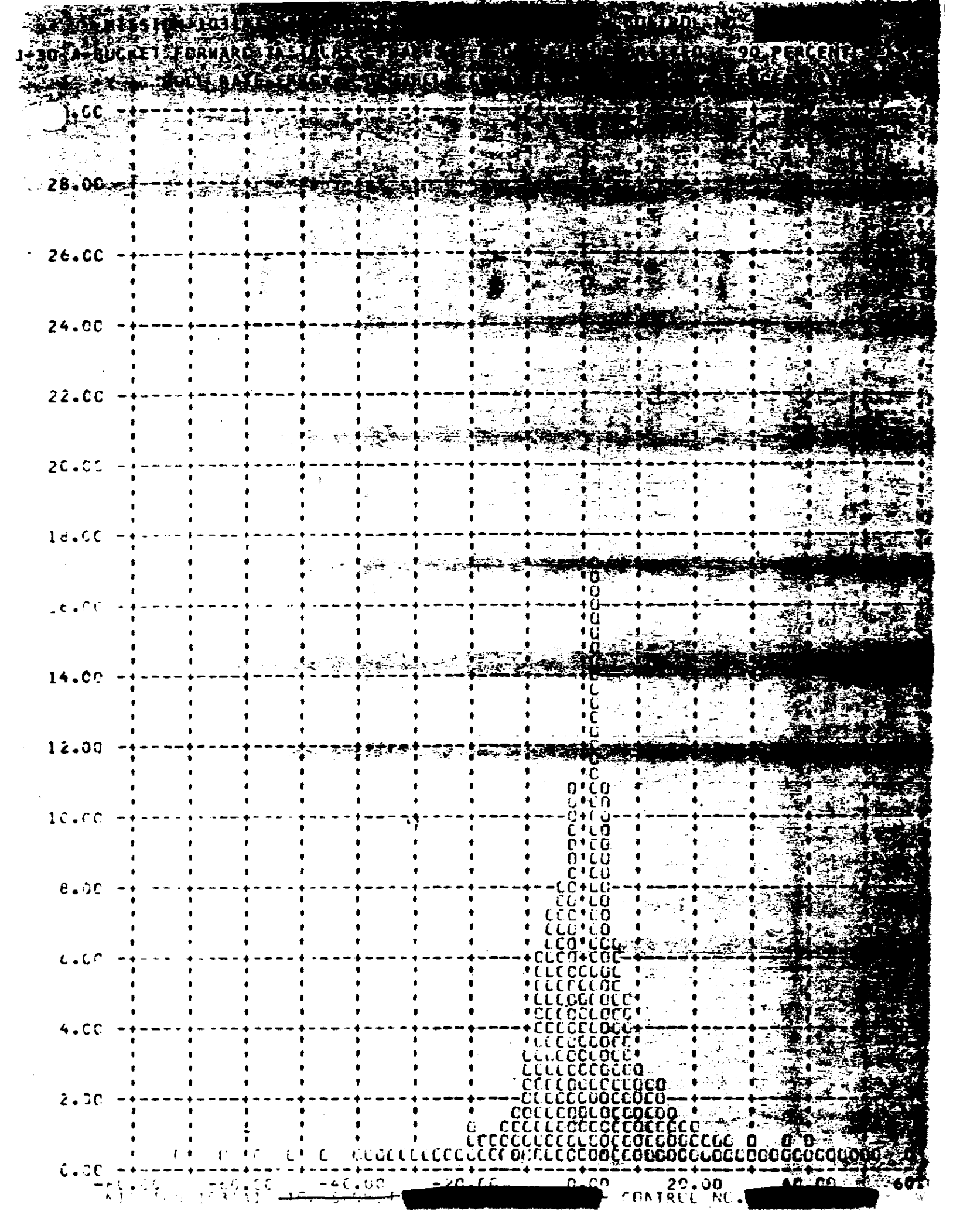
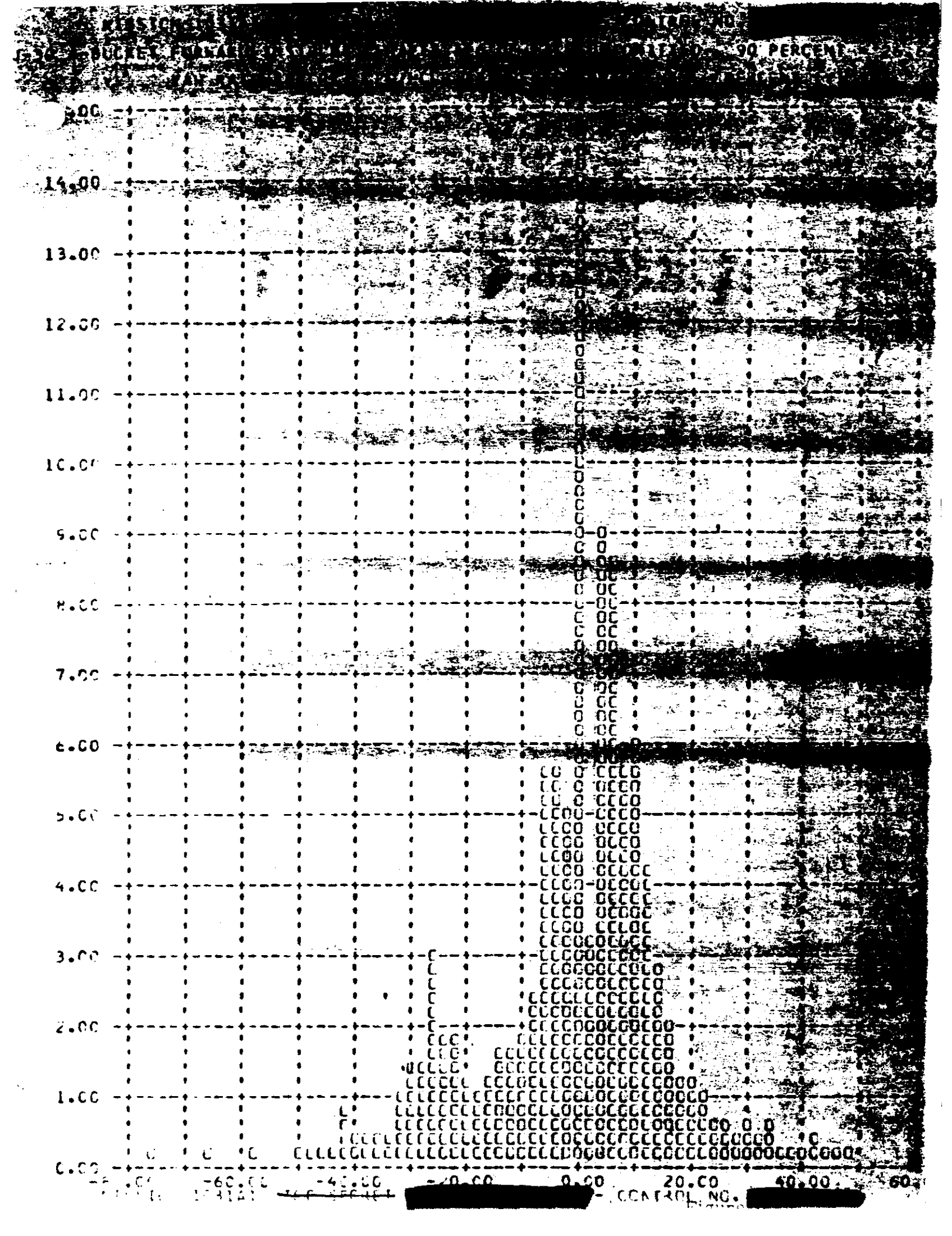

J-30 A-BUCKET FORWARD
14.00
13.00
12.00
11.00
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
0.20
0.40
0.60
0.80

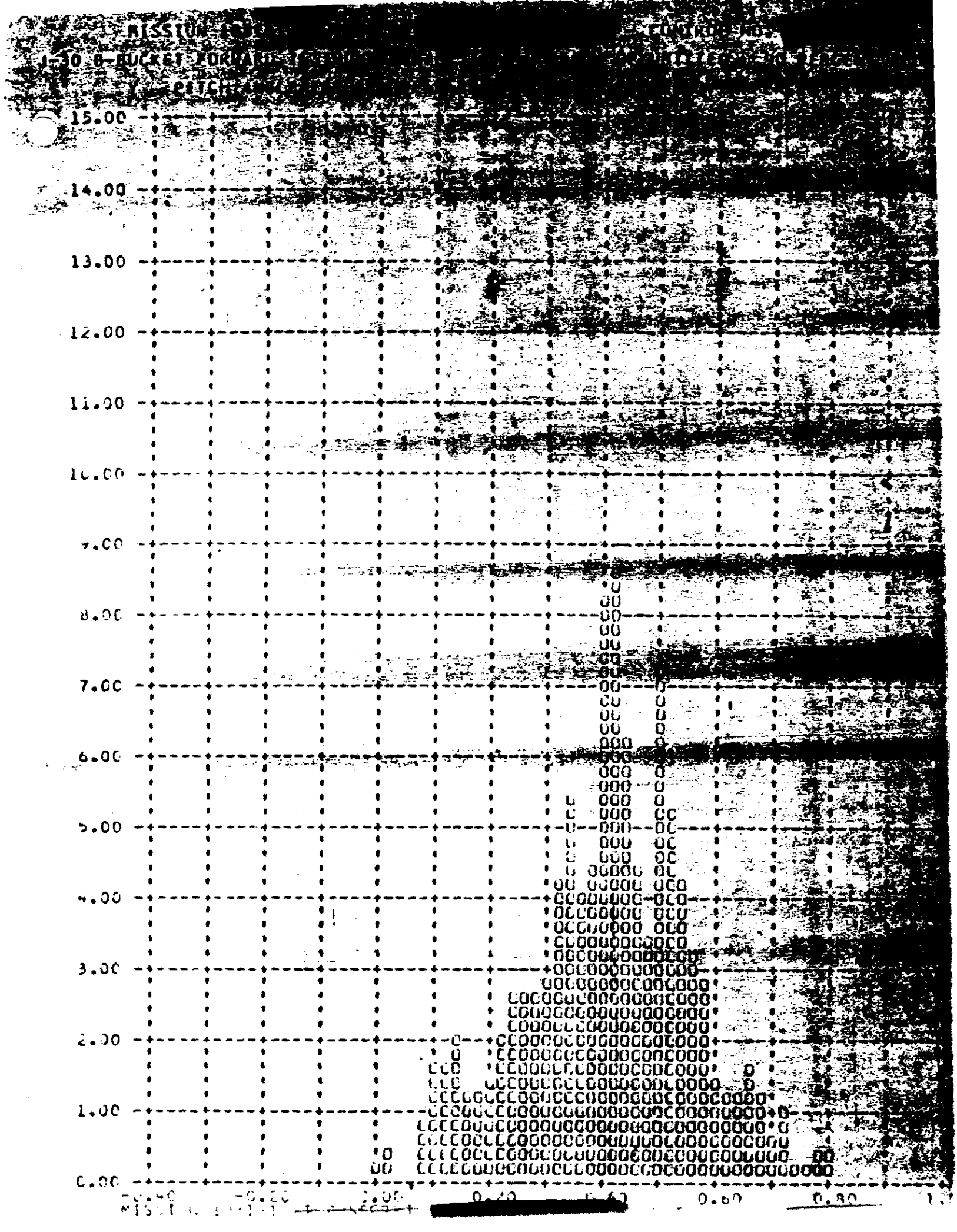
Figure 14-2




MISSION NO. 10-14
1-30 A-BUCKET FORWARD
PITCH RATE
90 PERCENT
56.00
52.00
48.00
44.00
40.00
36.00
28.00
24.00
20.00
16.00
12.00
8.00
4.00
0.00
-150.00
-100.00
-50.00
50.00
100.00
150.00
200.00
CONTROL NO.


30.00
28.00
26.00
24.00
22.00
20.00
18.00
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
-40.00
-20.00
0.00
20.00
40.00
60.00
CONTROL NO.

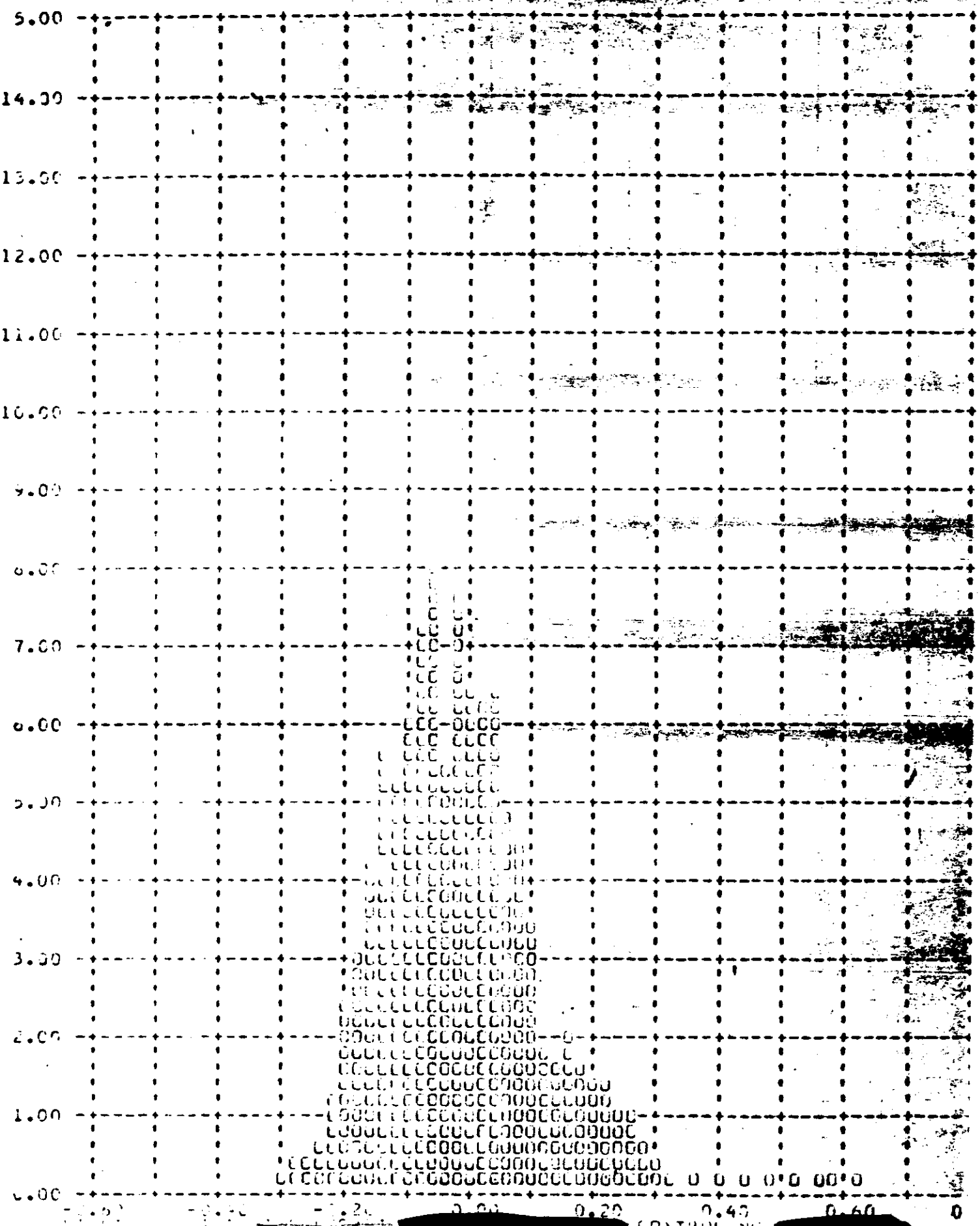

90 PERCENT
14.00
13.00
12.00
11.00
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
-60.00
-40.00
-20.00
0.00
20.00
40.00
60.
CONTROL NO.


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
0.60
0.80

MISSION 10318 - TOP SECRET [redacted] - CONTROL NO. [redacted]

J-30 B-BUCKET FORWARD INSTRUME FRAMES 1-6 OF EACH DP OMITTED 90 PERCENT = 0.2

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

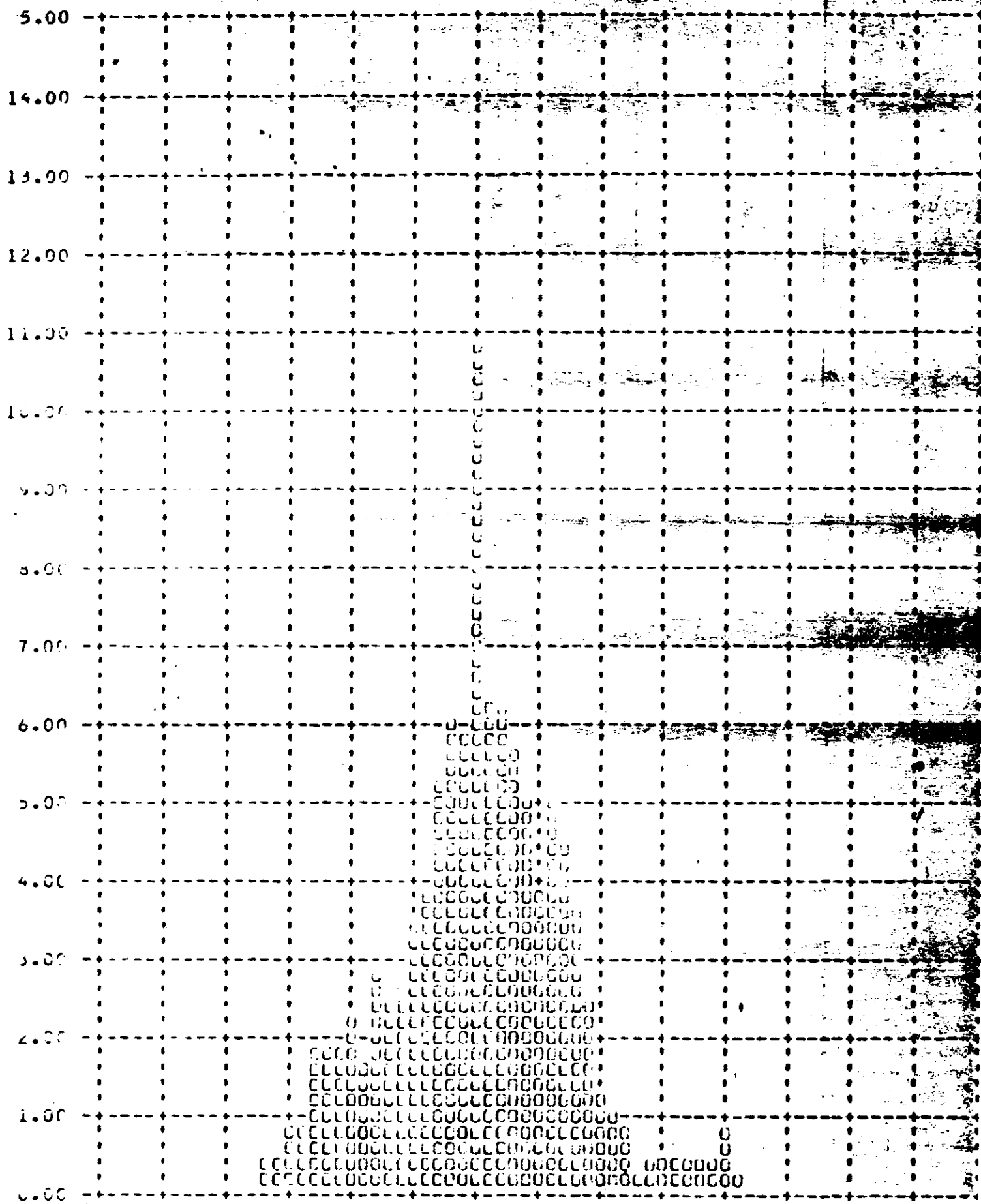


[redacted] CONTROL NO. [redacted]

MISSION 10318I [redacted] CONTROL NO. [redacted]

J-30 B-BUCKET FORWARD INSTRUME FRAMES 1-6 OF EACH OP OMITTED 90 PERCENT = 0.1

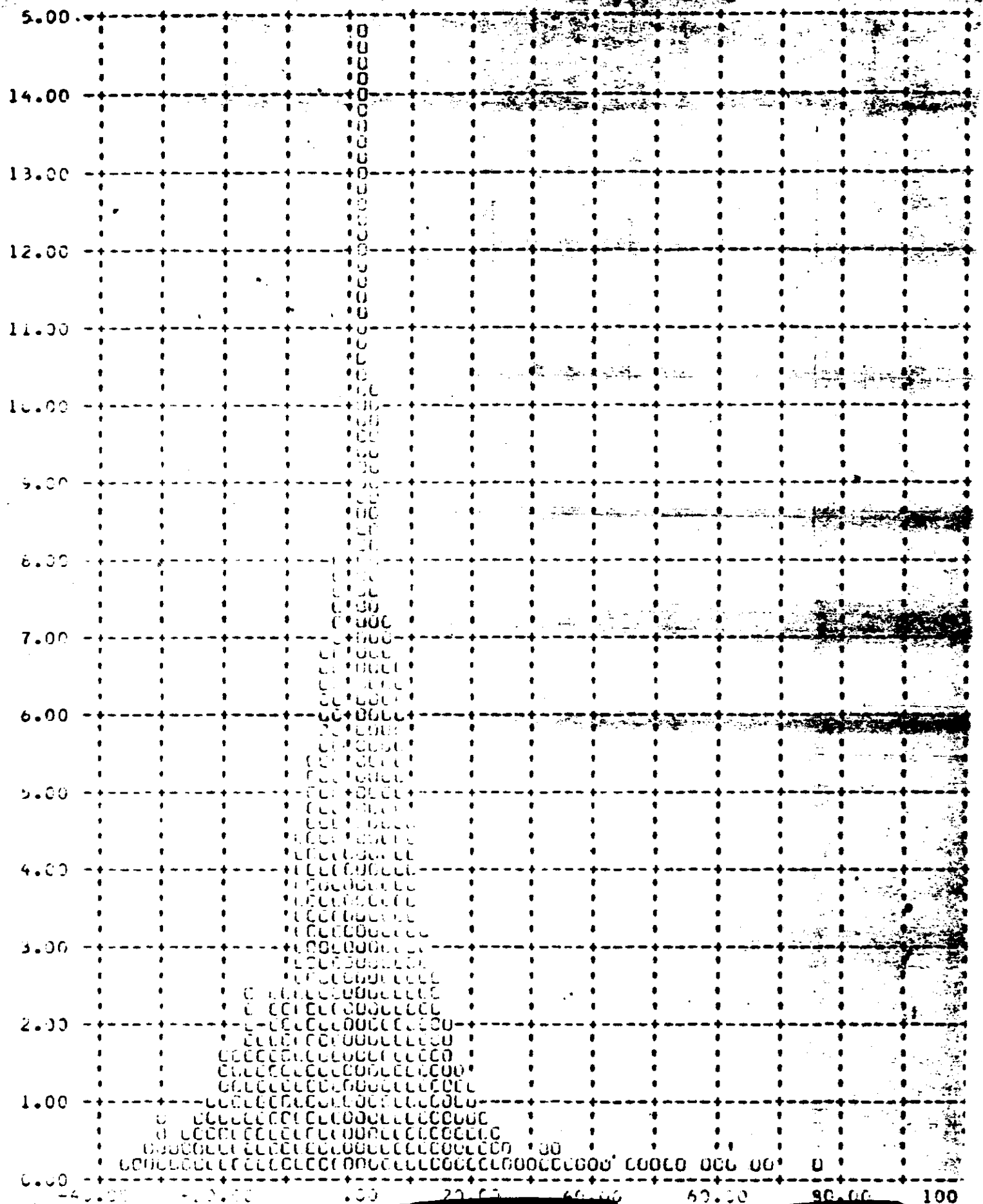
Y = YAW ANGLE ERROR - DEGREES EXHAUST FREQUENCY - PERCENT (X)



[redacted] CONTROL NO. [redacted]

J-30 B-BUCKET FORWARD INSTRUME- FRAMES 1-6 OF EACH OP. OMITTED 90 PERCENT = 19.00

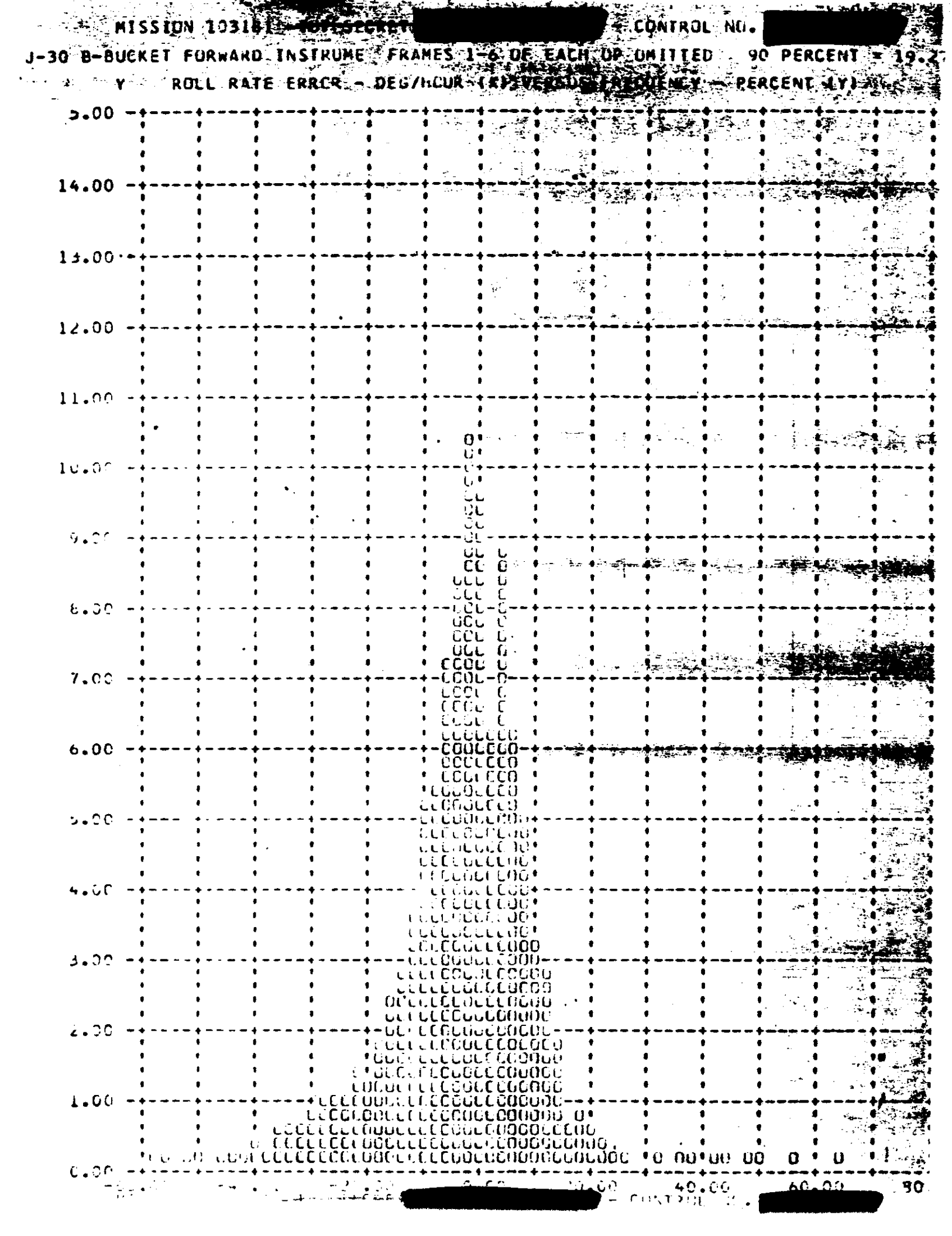
Y PITCH RATE ERROR - DEG/HOUR (X) VERSUS FREQUENCY - PERCENT (Y)



MISSION 10316 [redacted] CONTROL NO. [redacted]

J-30 B-BUCKET FORWARD INSTRUME FRAMES 1-6 OF EACH OP OMITTED 90 PERCENT = 19.2

Y ROLL RATE ERROR - DEG/HOUR (EXPANDED) FREQUENCY - PERCENT (Y)

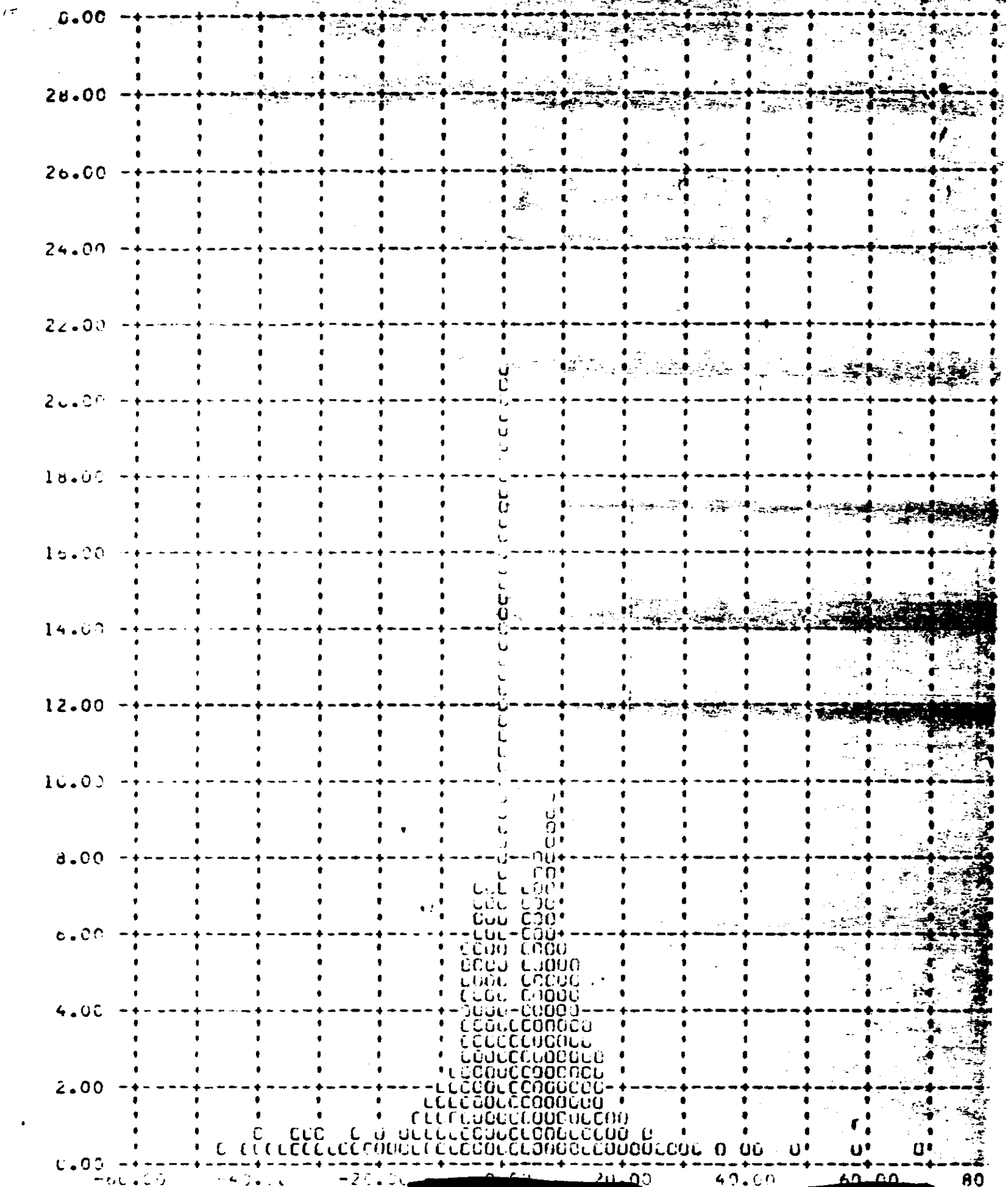


[redacted] CONTROL [redacted]

MISSION 103[redacted] CONTROL NO. [redacted]

J-30 B-BUCKET FORWARD INSTRUME FRAMES 1 TO OF EACH OP OMITTED 90 PERCENT = 15.66

Y YAW RATE ERROR, DEG/HOUR, LATERAL FREQUENCY = PERCENT (Y)



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 error and resolution limits are computer plotted and are shown in Figures 15-1 through 15-9.

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

The variation between the forward and aft camera data is a result of the slower exposure time in the forward camera to compensate for filter and slit width differences between instruments.

The along track resolution was satisfactory before pass 64. At pass 64 an RTC was given to the FMC programmer which over corrected for a slow camera cycle rate. The result was lower along track resolution.

MISSION 1031

V/h RATIO AND RESOLUTION LIMITS

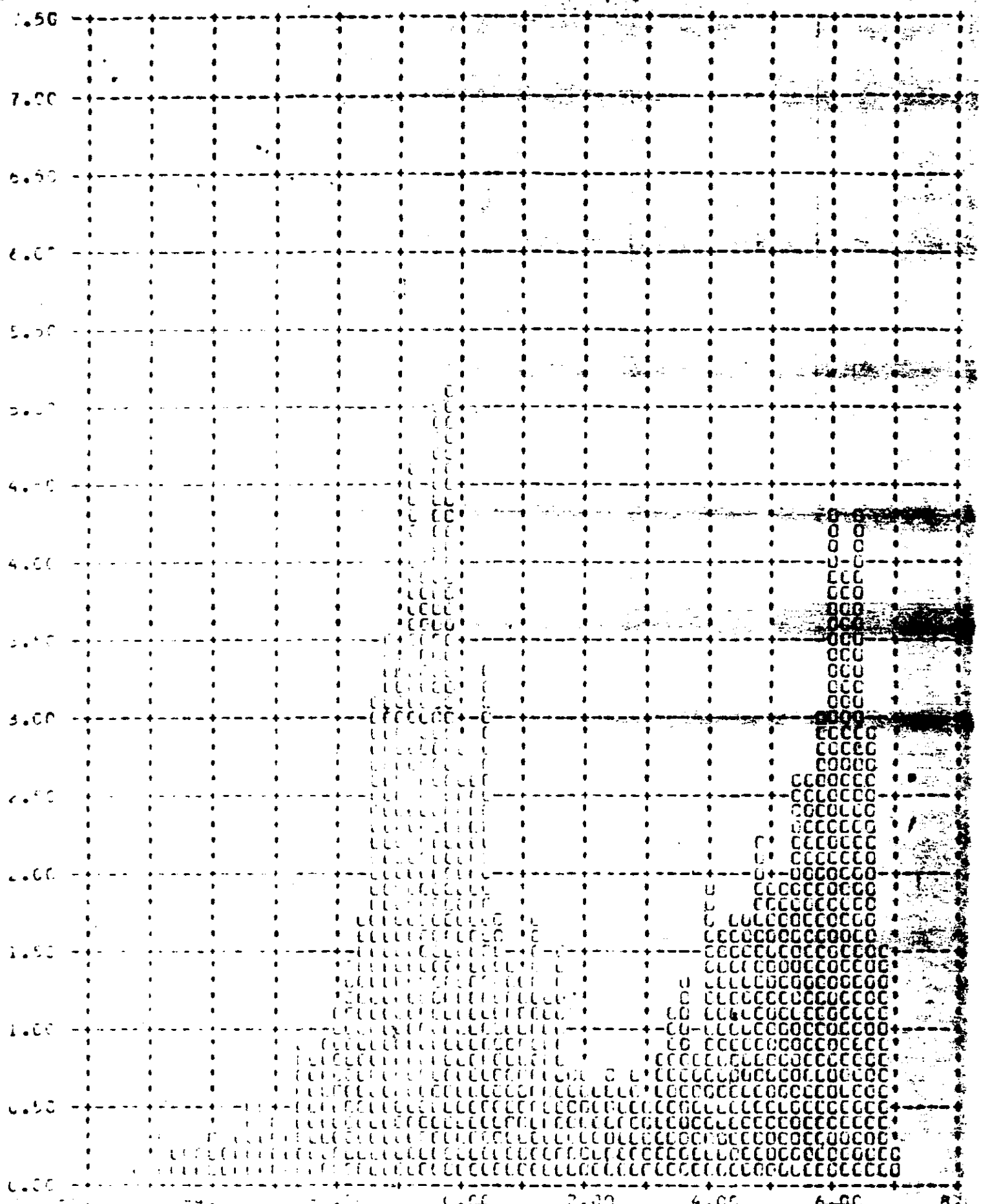
VALUE	UNITS	CAMERA	Mission 1031-1 90%	Mission 1031-1 Range	Mission 1031-2 90%	Mission 1031-2 Range
V/H Ratio Error	%	FWD	6.14	-5.2 to +7.0	5.35	-5.4 to +6.6
		AFT	5.98	-13 to +7.5	NO FILM	
Along Track Resolution Limit	Feet	FWD	13.80	0.5 to 15.0	10.29	0.2 to 11.8
		AFT	12.04	0.5 to 14.5	NO FILM	
Cross Track Resolution Limit	Feet	FWD	6.37	0.2 to 8.4	4.93	0.2 to 5.6
		AFT	5.62	0.2 to 7.0	NO FILM	

TABLE 15-1

MISSION 1031A1 -TOP SECRET [redacted] - CONTROL NO. [redacted]

J-30 A-BUCKET FORWARD INSTRUNE ERRORS 1-6 OF EACH OP OMITTED 90 PERCENT = 6.14

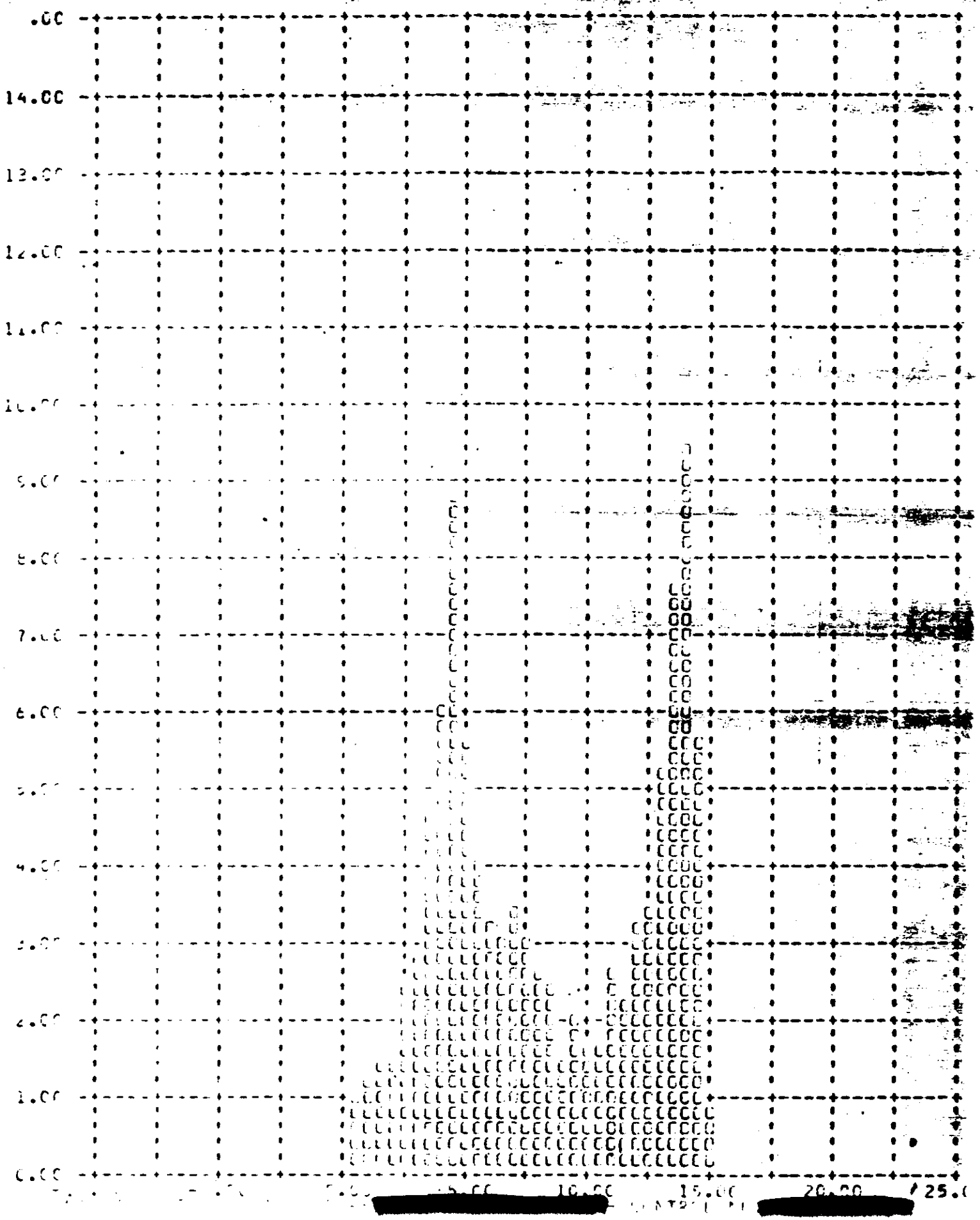
Y Y/H RATIO ERROR = PERCENT (X) VERSUS FREQUENCY = PERCENT (Y)



MISSION 1031AT [redacted] CONTROL NO. [redacted]

J-30 A-BUCKET FORWARD 1P STRIKE FRAMES 1-6 OF EACH CP LIMITED 90 PERCENT = 13.80

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

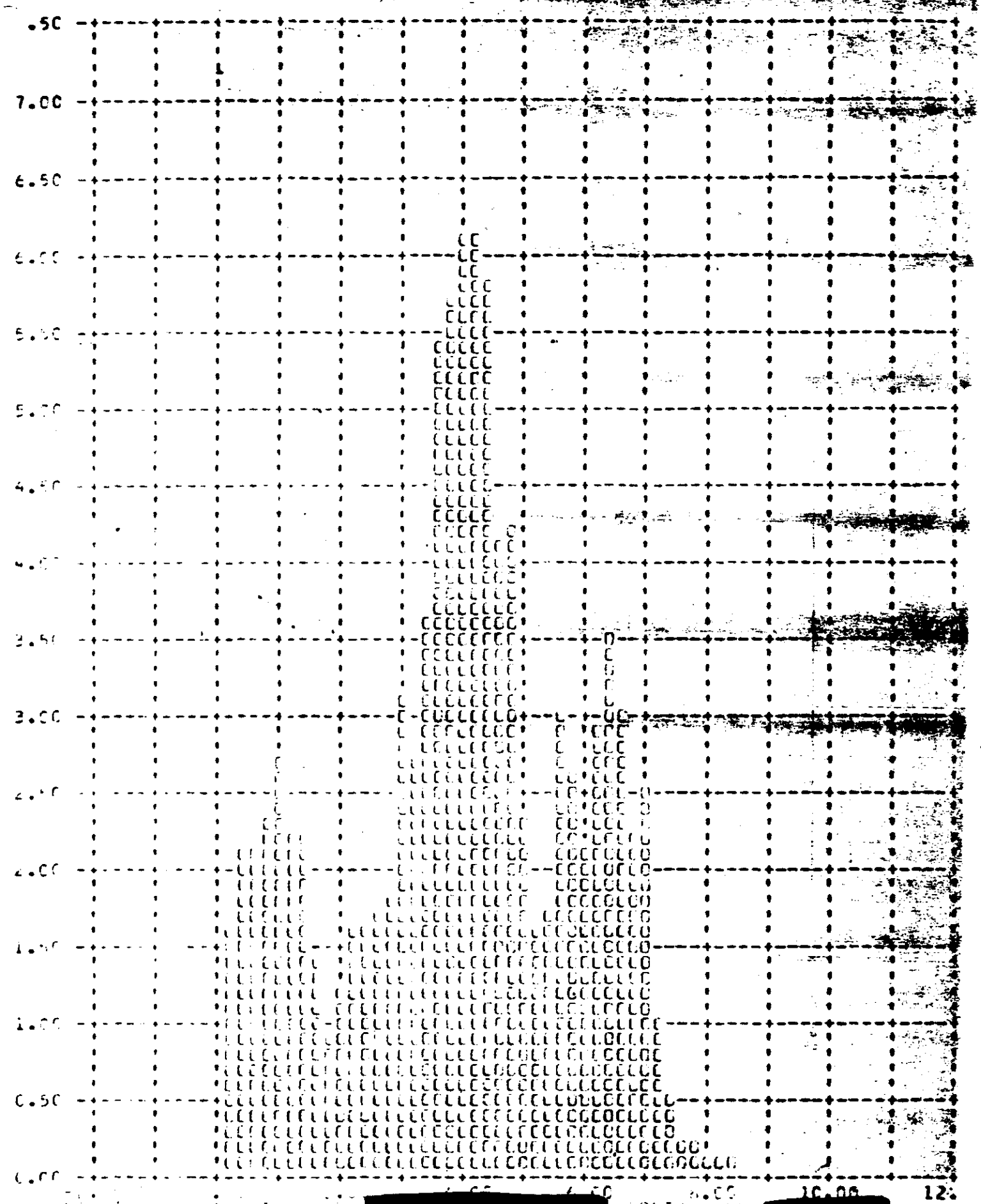


[redacted]

MISSION 1031A1 [redacted] CONTROL NO. [redacted]

J-30 A-BUCKET FORWARD INSTRUME FRAMES 1-6 CE EACH CP OMITTED 90 PERCENT = 6.37

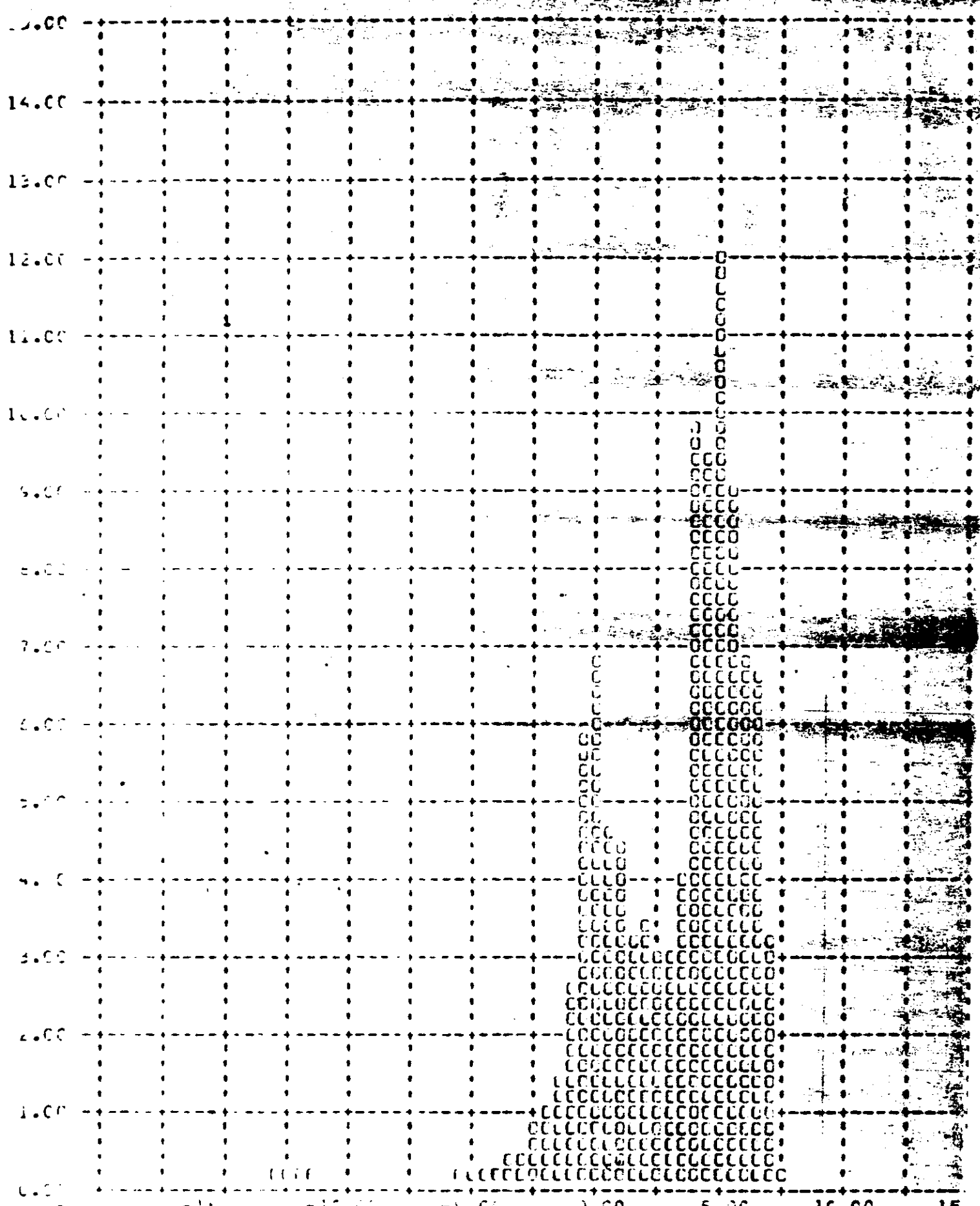
Y CROSS TRACK RESOLUTION LIMIT -- FEET IX VERSUS FREQUENCY - PERCENT LY



[redacted] CONTROL NO. [redacted]

-30 A-BLCKET AFT INSTRUMENT - FRAMES 1-6 OF EACH OR OMITTED - 90 PERCENT = 5.98

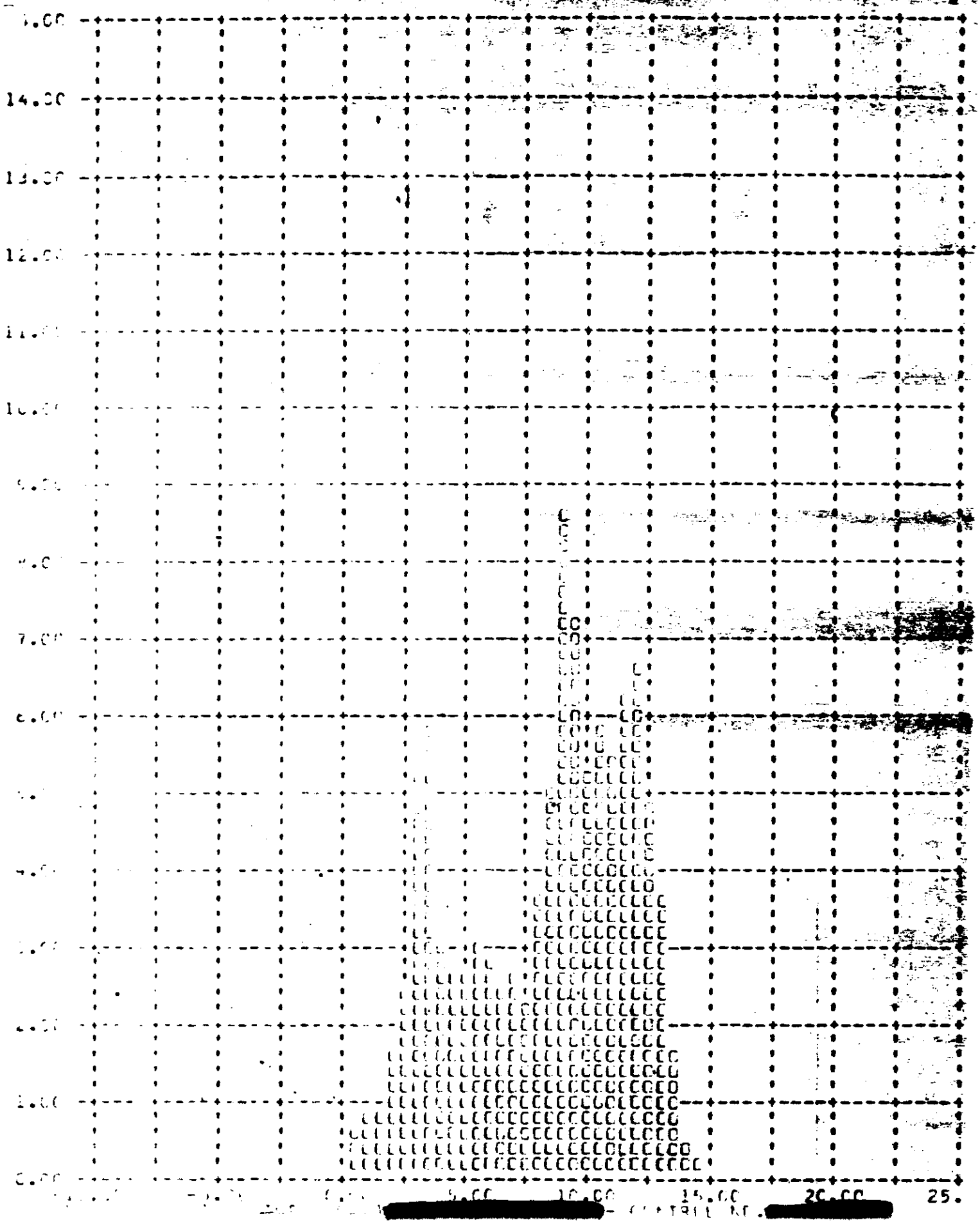
Y V/F RATIO FRACT - PERCENT (X) OVERSUSPENSION - PERCENT (X)



MISSION 103IA2 [redacted] CONTROL NO. [redacted]

J-30 A-BUCKET AFT INSTRUMENT - FRAMES 1-6 OF EACH OR OMITTED - 90 PERCENT = 12.04

Y ALONG TRACK RESOLUTION LIMIT - FEET - INVERSE SPATIAL FREQUENCY - PERCENT (Y)



[redacted] - CROSS TRACK

MISSION 1031A2 [redacted] CONTROL NO. [redacted]

1-30 A-BUCKET AFT INSTRUMENT FRAMES 1-6 OF EACH UP OMITTED 90 PERCENT = 5.62

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

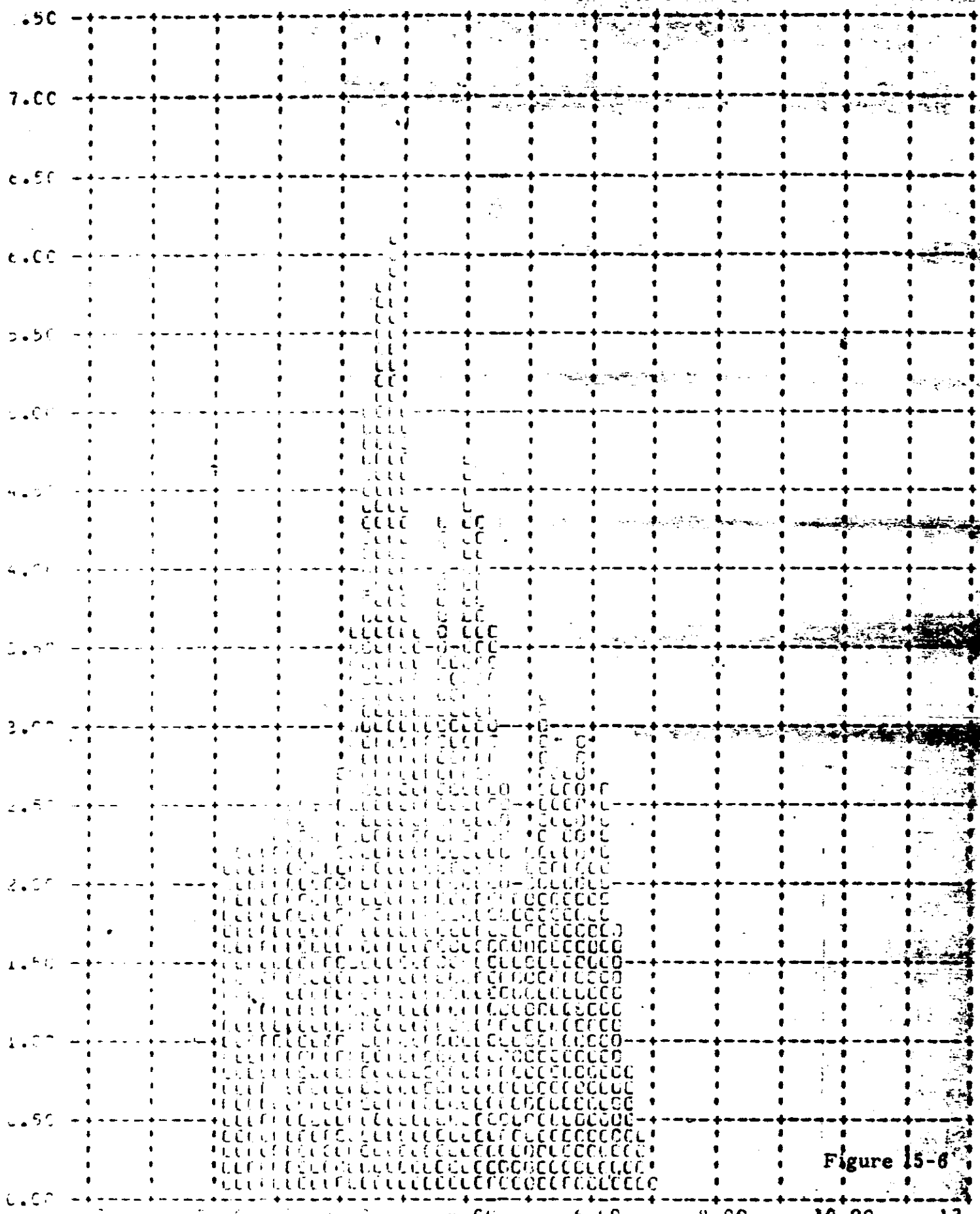
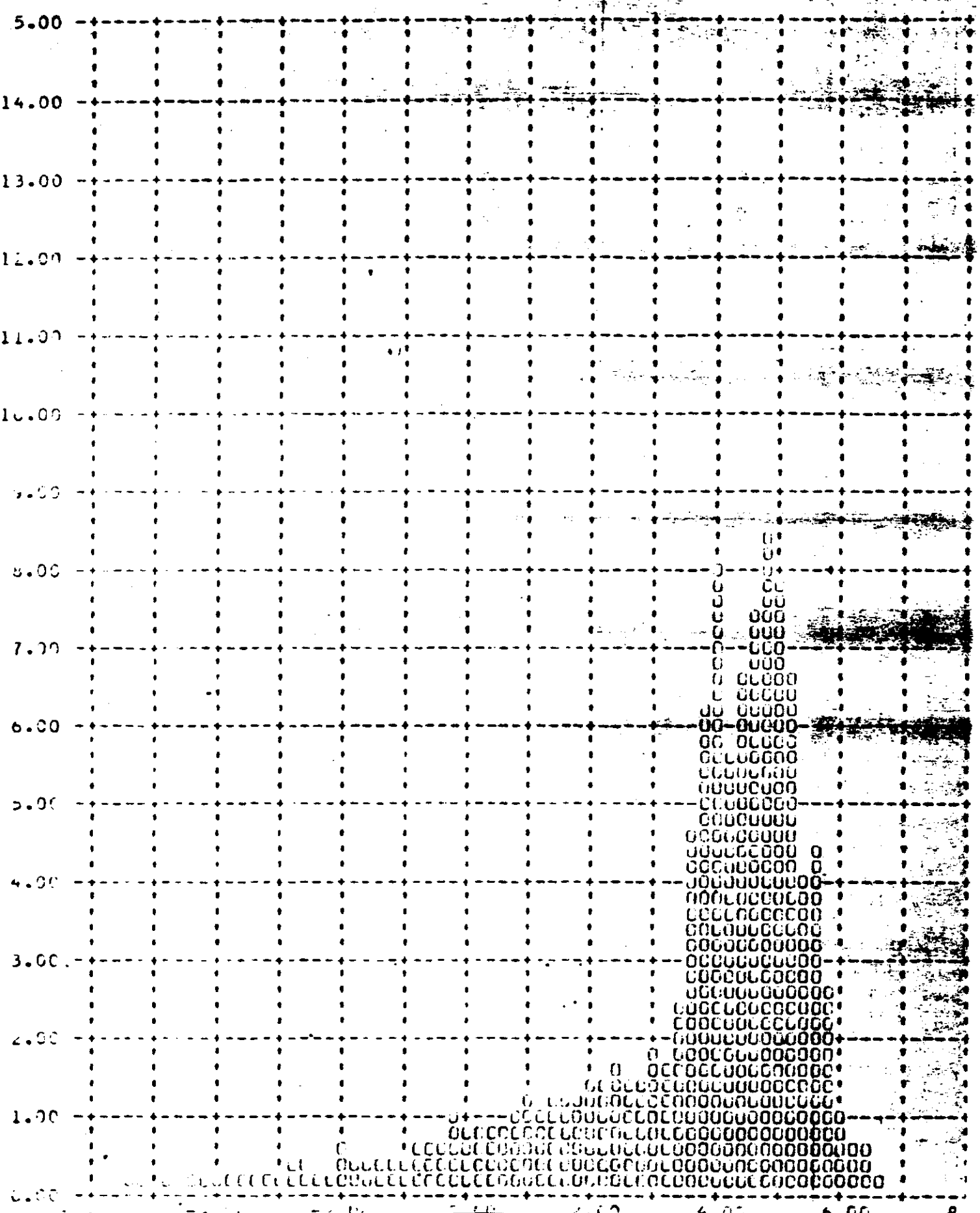


Figure 15-6

MISSION 103181 TOP SECRET [redacted] - CONTROL NO. [redacted]

J-30 B-BUCKET FORWARD INSTRUME FRAMES 1-6 OF EACH OP UNITED 90 PERCENT = 5.3

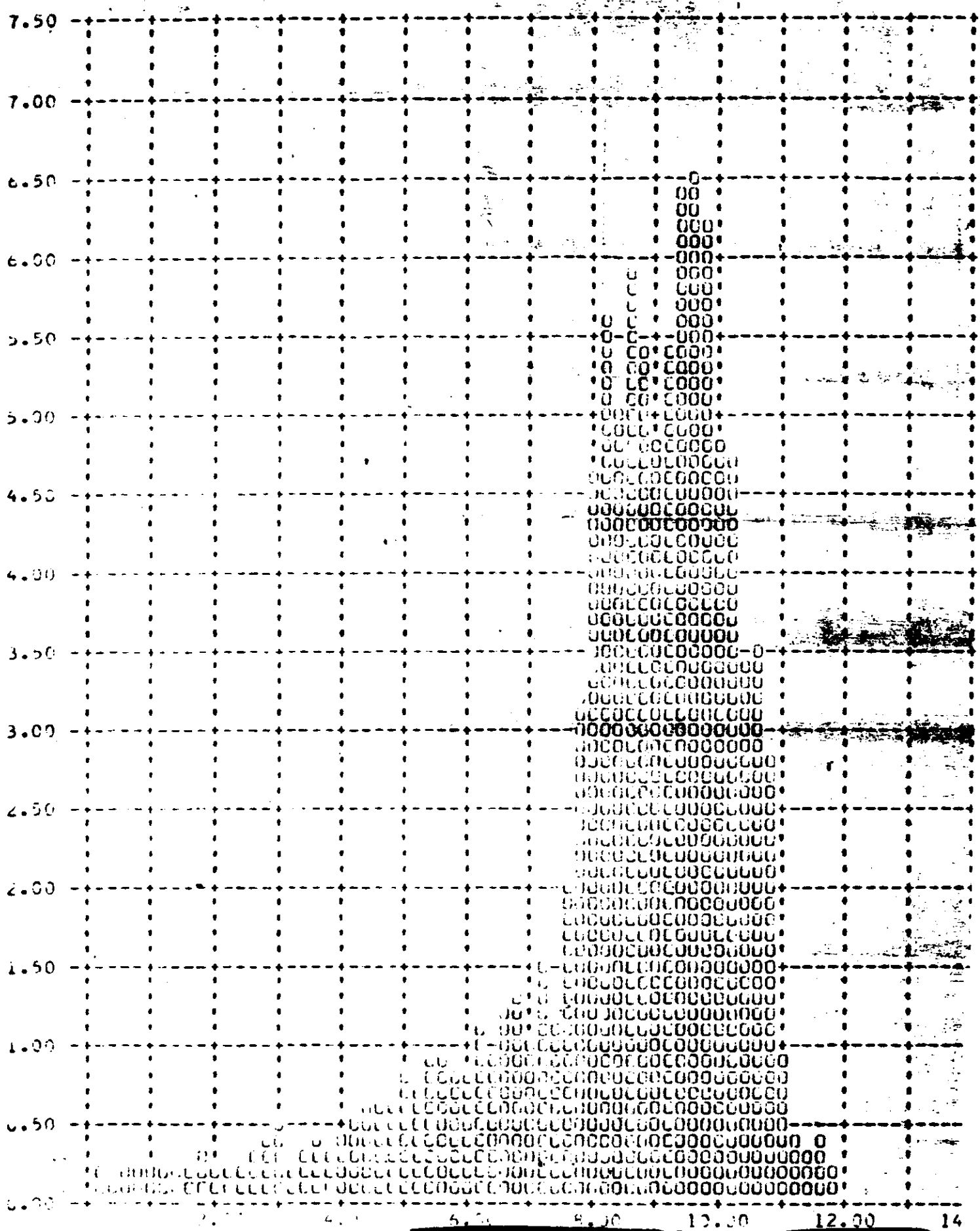
Y V/H RATIO ERROR - PERCENT (X) VERSUS FREQUENCY - PERCENT (Y)



MISSION 1031B1 [redacted] CONTROL NO: [redacted]

J-30 B-BUCKET FORWARD INSTRUME FRAMES 1-6 OF EACH OP OMITTED 90 PERCENT = 10.29

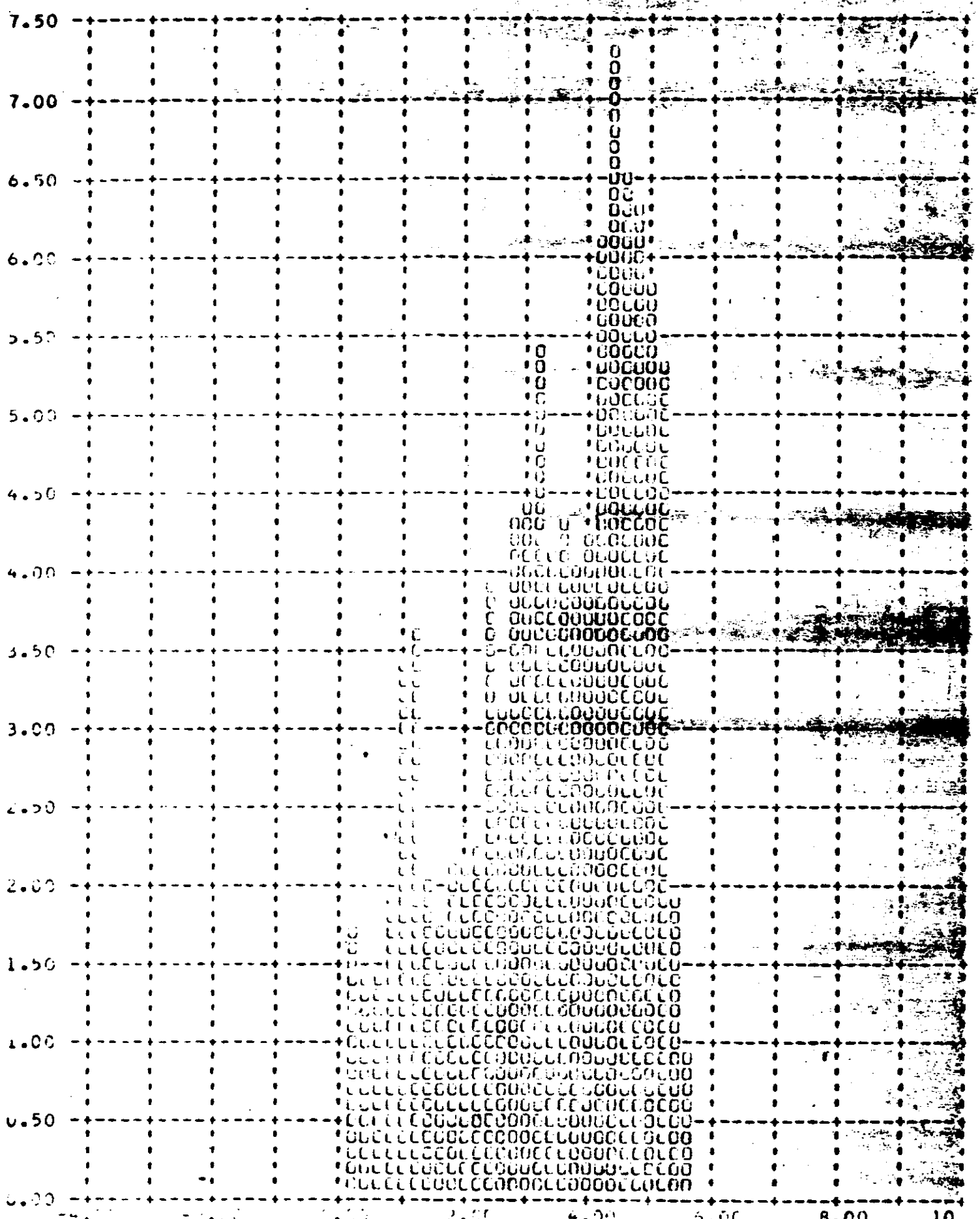
Y ALONG TRACK RESOLUTION LIMIT - FEET (X) VERSUS FREQUENCY - PERCENT (Y)



MISSION 19318I [redacted] CONTROL NO. [redacted]

J-30 B-BUCKET FORWARD INSTRUMP FRAMES 1-6 OF EACH UP UNITTED 90 PERCENT = 4.93

Y CRUSS TRACK RESOLUTION LIMIT - FEET VERSUS FREQUENCY - PERCENT 1.75



SECTION 16

RADIATION DOSAGE

Each recovery system flown on a Corona mission contains a sealed packet of Eastman Type 3401 and Royal X Pan emulsions 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 plus fog readings for the dosimeter strips and the radiation level equivalents.

Emulsion	B + F Density	Radiation
Mission 1031-1		
Type 3401	0.14	0.3R
Royal X Pan	0.18	0.20R
Mission 1031-2		
Type 3401	0.15	0.40R
Royal X Pan	0.23	0.30R

The mean total radiation seen by the take-up cassettes during both missions was approximately 0.3 roentgens. This level is essentially the same as received during recent missions and is below the level that will degrade the panoramic photography.

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 reliability 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 missions functions are horizon camera operation excluding catastrophic open shutter failure mode, auxiliary data recording, and stellar-index camera operation.

Panoramic Camera Reliability

Sample Size - 143 opportunities to operate.
One failure - S/I Programmer on System J-19.
Assume - 3000 cycles per camera per mission.
Estimated Reliability - 98.8% at 50% confidence level.

Main Camera Door Reliability

Sample Size - 49 vehicles x 2 doors = 98 opportunities to operate.
Estimated Reliability = 99.3% at 50% confidence level.

Payload Command & Control Reliability

Sample Size - 7704 hours operation.
2 failures
Estimated Reliability = 96.7% at 50% confidence level.

Payload Clock Reliability

Sample Size - 7704 hours operation.
No failures
Estimated Reliability = 99.1% at 50% confidence level.

Estimated Reliability of Payload Functioning on orbit: 96.9% at 50% confidence level.

Recovery System Reliability

63 opportunities to recover
1 failure - improper separation due to water seal - cutter failure.
Estimated Reliability = 97.3% at 50% confidence level.

Stellar-Index Camera Reliability

Sample begins with J-5.
Sample Size = 18,280
Number of failures - 4
Estimated Reliability = 89.7% at 50% confidence level.

Horizon Camera Reliability

Sample includes J5A and up
Sample Size - 76,500
Estimated Reliability of Single Camera = 98.6% at 50% confidence level.
Estimated Reliability of Four Horizon Cameras at a Parallel Redundant System = 99.9% at 50% confidence level.

~~TOP SECRET~~ C [redacted]

No [redacted]

ESTIMATED RELIABILITY SUMMARY

(AT 50% CONFIDENCE LEVEL)

MISSION NUMBER	PRIMARY FUNCTIONS						SECONDARY FUNCTIONS	
	PANORAMIC CAMERA	PANORAMIC CAMERA DOORS	COMMAND & CONTROL SYSTEM	PAYLOAD CLOCK	ON - ORBIT FUNCTIONS	RECOVERY SYSTEM	STELLAR - INDEX CAMERAS	HORIZON CAMERAS
	SAMPLE / FAILURES / RELIABILITY	SAMPLE / FAILURES / RELIABILITY	SAMPLE / FAILURES / RELIABILITY	SAMPLE / FAILURES / RELIABILITY	RELIABILITY	SAMPLE / FAILURES / RELIABILITY	SAMPLE / FAILURES / RELIABILITY	SAMPLE / FAILURES / RELIABILITY
9038 to 1008	60 / 1 / 97.3	52 / 0 / 98.6	3124 / 0 / 98.0	3124 / 0 / 98.0	96.1	16 / 1 / 90.7	3400 / 3 / 83.1	18,000 / 0 / 91.7
1009	64 / 1 / 97.4	54 / 0 / 98.7	3216 / 0 / 98.0	3216 / 0 / 98.0	96.2	20 / 1 / 91.8	4250 / 3 / 88.3	18,000 / 0 / 93.4
1010	66 / 1 / 97.6	54 / 0 / 98.8	3432 / 0 / 98.1	3432 / 0 / 98.1	96.4	22 / 1 / 92.6	5100 / 3 / 73.7	18,000 / 0 / 94.4
1011	72 / 1 / 97.7	58 / 0 / 98.9	3600 / 0 / 98.1	3600 / 0 / 98.1	96.8	24 / 1 / 93.0	5625 / 0* / 94.7	21,000 / 0 / 95.2
1012	76 / 1 / 97.8	60 / 0 / 98.9	3720 / 0 / 98.2	3720 / 0 / 98.2	96.9	26 / 1 / 93.5	5625 / 0 / 94.7	24,000 / 0 / 95.5
1013	78 / 1 / 97.8	62 / 0 / 99.0	3840 / 1 / 96.9	3840 / 0 / 98.3	96.0	28 / 1 / 94.0	5880 / 0 / 95.1	28,500 / 0 / 96.0
1014	82 / 1 / 97.9	64 / 0 / 99.0	4056 / 1 / 96.1	4056 / 0 / 98.3	96.1	30 / 1 / 94.4	6375 / 1 / 89.8	28,500 / 0 / 96.0
1015	86 / 1 / 98.0	66 / 0 / 99.0	4320 / 1 / 96.3	4320 / 0 / 98.4	96.1	32 / 1 / 94.6	7225 / 1 / 89.4	34,500 / 0 / 96.7
1016	90 / 1 / 98.1	68 / 0 / 99.0	4560 / 1 / 96.5	4560 / 0 / 98.5	96.4	34 / 1 / 94.8	7650 / 1 / 91.0	34,500 / 0 / 97.0
1017	94 / 1* / 98.3	70 / 0 / 99.0	4760 / 1 / 96.7	4760 / 0 / 98.6	97.6	36 / 1 / 95.4	8925 / 1 / 92.3	37,500 / 0 / 97.3
1018	98 / 1 / 98.3	72 / 0 / 99.1	4920 / 1 / 96.8	4920 / 0 / 98.7	96.7	38 / 1 / 95.6	8950 / 1 / 92.3	40,500 / 0 / 97.5
1019	102 / 1 / 98.4	76 / 0 / 99.1	5136 / 1 / 96.9	5136 / 0 / 98.7	96.8	40 / 1 / 95.8	8975** / 1 / 92.3	43,500 / 0 / 97.6

* [redacted]

** [redacted]

[redacted]

[redacted]

ESTIMATED RELIABILITY SUMMARY

(AT 50% CONFIDENCE LEVEL)

MISSION NUMBER	PRIMARY FUNCTIONS						SECONDARY FUNCTIONS	
	PANORAMIC CAMERA	PANORAMIC CAMERA DOORS	COMMAND & CONTROL SYSTEM	PAYLOAD CLOCK	ON-ORBIT FUNCTIONS	RECOVERY SYSTEM	STELLAR-INDEX CAMERAS	HORIZON CAMERAS
	SAMPLE / FAILURES / RELIABILITY	SAMPLE / FAILURES / RELIABILITY	SAMPLE / FAILURES / RELIABILITY	SAMPLE / FAILURES / RELIABILITY	RELIABILITY	SAMPLE / FAILURES / RELIABILITY	SAMPLE / FAILURES / RELIABILITY	SAMPLE / FAILURES / RELIABILITY
1020	108 / 1 / 98.5	78 / 0 / 99.1	5544 / 1 / 97.1	5544 / 0 / 98.9	96.9	43 / 1 / 96.1	10,680 / 2 / 89.9	48,000 / 0 / [illegible]
1021	104 / 1 / 98.8	76 / 0 / 99.1	5376 / 1 / 97.0	5376 / 0 / 98.8	96.9	41 / 1 / 96.0	9630 / 2 / 89.1	46,800 / 0 / 97.8
1022	112 / 1 / 98.5	80 / 0 / 99.2	5784 / 1 / 97.3	5784 / 0 / 98.9	96.9	45 / 1 / 96.3	11,550 / 2 / 90.7	51,000 / 0 / 98.0
1023	114 / 1 / 98.6	82 / 0 / 99.2	6000 / 2 / 98.8	6000 / 0 / 98.9	96.2	47 / 1 / 96.8	12,190 / 2 / 91.1	54,000 / 0 / 98.1
1024	118 / 1 / 98.6	84 / 0 / 99.2	6240 / 2 / 96.0	6240 / 0 / 98.9	96.3	49 / 1 / 96.6	13,040 / 2 / 91.8	57,000 / 0 / 98.2
1025	122 / 1 / 98.6	86 / 0 / 99.2	6480 / 2 / 96.1	6480 / 0 / 99.0	96.4	51 / 1 / 96.7	13,890 / 2 / 92.1	60,000 / 0 / 98.3
1026	126 / 1 / 98.7	88 / 0 / 99.2	6720 / 2 / 96.3	6720 / 0 / 99.0	96.5	53 / 1 / 96.8	14,740 / 2 / 92.6	63,000 / 0 / 98.4
1027	128 / 1 / 98.7	90 / 0 / 99.2	6744 / 2 / 96.3	6744 / 0 / 99.0	96.5	55 / 1 / 97.0	15,165 / 3 / 90.0	64,800 / 0 / 98.4
1028	132 / 1 / 98.7	92 / 0 / 99.2	6960 / 2 / 96.4	6960 / 0 / 99.0	96.7	57 / 1 / 97.1	16,015 / 3 / 90.7	67,800 / 0 / 98.5
1029	136 / 1 / 98.8	94 / 0 / 99.3	7200 / 2 / 96.8	7200 / 0 / 99.1	96.8	59 / 1 / 97.1	16,880 / 4 / 88.7	70,800 / 0 / 98.5
1030	140 / 1 / 98.9	96 / 0 / 99.3	7440 / 2 / 96.8	7440 / 0 / 99.1	96.9	61 / 1 / 97.2	17,430 / 4 / 89.3	73,800 / 0 / 98.6
1031	143 / 1 / 98.9	98 / 0 / 99.3	7704 / 2 / 96.9	7704 / 0 / 99.1	96.9	63 / 1 / 97.3	18,280 / 4 / 89.7	76,800 / 0 / 98.6

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.

~~TOP SECRET~~ C[redacted]

No. [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-05	1174	2/15/64	2138 Z	74.9	99.9	29.0	49/118	124	0.250	W-21	125	0.250	W-21	[redacted]
1006	J-09	1178	6/4/64	2256 Z	79.9	84.0	63.2	65/128	148	0.200	W-21	149	0.200	W-21	[redacted]
1007	J-07	1606	6/19/64	2318 Z	85.0	99.2	41.5	65/128	144	0.250	W-25	145	0.200	W-21	[redacted]
1008	J-10	1177	7/10/64	2314 Z	85.0	99.4	40.6	49/112	180	0.200	W-21	181	0.200	W-21	[redacted]
1009	J-12	1606	8/5/64	2318 Z	80.1	99.6	38.5	49/128	184	0.200	W-21	185	0.200	W-21	[redacted]
1010	J-11	1178	9/14/64	2254 Z	84.9	97.4	42.5	65/144	152	0.175	W-21	153	0.175	W-21	[redacted]
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	[redacted]
1012	J-13	1179	10/17/64	2206 Z	75.0	96.2	32.4	49/81	156	0.200	W-21	157	0.200	W-21	[redacted]
1013	J-18	1173	11/2/64	2130 Z	80.0	100.0	25.0	65/81	188	0.225	W-21	189	0.225	W-21	[redacted]
1014	J-16	1180	11/18/64	2036 Z	70.0	103.2	65.6	81/145	162	0.250	W-25	139	0.175	W-21	[redacted]
1015	J-17	1607	12/15/64	2110 Z	74.9	96.7	21.5	81/178	138	0.250	W-25	141	0.175	W-21	[redacted]
1016	J-18	1606	1/15/65	2101 Z	74.9	99.4	30.2	81/159	132	0.250	W-25	133	0.175	W-21	[redacted]
1017	J-14	1611	2/25/65	2144 Z	75.0	97.2	25.9	81/148	140	0.250	W-25	169	0.175	W-21	[redacted]
1018	J-19	1612	3/25/65	2111 Z	96.0	100.2	40.5	65/99	122	0.250	W-25	123	0.175	W-21	[redacted]
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	[redacted]
1020	J-20	1615	5/19/65	2158 Z	75.1	97.1	30.6	97/113	136	0.250	W-25	137	0.175	W-21	[redacted]
1021	J-21	1616	6/16/65	1606 Z	75.0	109.2	84.3	81/161	166	0.175	W-21	167	0.250	W-25	[redacted]
1022	J-22	1617	7/15/65	2201 Z	85.0	99.7	30.3	65/144	168	0.250	W-25	169	0.175	W-21	[redacted]
1023	J-23	1618	8/17/65	2100 Z	70.0	97.8	29.0	81/144	170	0.225	W-25	171	0.150	W-21	[redacted]
1024	J-24	1619	9/22/65	2121 Z	80.0	98.9	40.4	81/161	172	0.225	W-25	173	0.150	W-21	[redacted]
[redacted]															

[redacted]

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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
1029	J-27	1625	2/2/66	2132 Z	75.1	99.5	22.5	81 / 150	178	0.275	W-25	179	0.175	W-21	079/94/91 / 078/79/84
1030	J-29	1622	3/9/66	2202 Z	75.0	97.5	18.7	81 / 159	182	0.275	W-25	183	0.175	W-21	084/100/107 / [illegible]
1031	J-30	1627	4/7/66	2202 Z	75.1	104.5	23.3	115 / 177	184	0.225	W-23A	186	0.150	W-21	083/101/89 / [illegible]

TOP SECRET CA[redacted]

No. [redacted]

PERFORMANCE SUMMARY

MISSION NUMBER	CAMERA	SERIAL NUMBER	M I P VALUE	VISUAL RES	AFSPPL MTF/AIM SLIT (μ)	AFSPPL MTF/AIM AVERAGE	SLIT (μ)	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
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	9.1	7.7	[redacted]
	AFT			86		80		96		117	124									
1004-2	FWD	125	85	76		88		113		82	90	0 74	0 50	0 91	44.0	30 0	29 0	4.9	6.8	6.8
	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	8.7
	AFT			74		71		90		87	92									
1006-2	FWD	149	90	88		64		81		84	90	0 49	0 40	1 08	31.1	27.9	30.0	11.6	10 1	7.6
	AFT			83		72		90		87	94									
1007-1	FWD	144	85	80	350	60	43	87	320	82	91	0 58	0 46	1 43	27.6	23.9	29.9	3 6	3 1	9.4
	AFT			86		63		83		97	110							4.6	2 1	7.8
1007-2	FWD	145	85	79		72		81		68	74	0 64	0 47	—	43.0	25.8	—	3.2	2 4	—
	AFT			81		77		92		74	81							4.2	1 8	—
1008-1	FWD	150	85	80	350	86	43	95	320	81	89	0 59	0 39	0 94	43 8	23.9	29 6	2.9	4.9	8.9
	AFT			76		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	2.6	4 2	8.4
	AFT			79		91		83		85	91									
1009-1	FWD	154	85	92	350	80	—	—	80	75	88	0 65	0 65	0.71	29 2	22.7	27 6	3.3	9 3	8.8
	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	8.8
	AFT			87		87				72	79									
1010-1	FWD	182	85	90	350	90	80	88	80	87	96	0.93	0.80	0.87	38.1	23 6	30.8	4.8	2.8	[redacted]
	AFT			88		86		80		92	103									
1010-2	FWD	183	85	92		81		82		82	93	0.59	0 70	1.21	46.4	23.6	30.7	4.6	7.8	8.8
	AFT			90		82		85		87	98									
1011-1	FWD	180	90	84	350	78	80	96	80	78	87	0.77	0.39	0.97	43.1	28.9	31.1	2.3	8.3	8.8
	AFT	181		84		77		86		83	93									
1012-1	FWD	156	85	92	—	—	80	91	80	84	98	0.65	0.81	—	47.1	33.2	—	1.8	4.8	—
	AFT			91				87		89	100									
1012-2	FWD	157	85	91				89		84	91	0.97	0.77	0.81	46.2	30.7	30.4	6.9	3.3	8.9
	AFT			89				96		85	98									
1013-1	FWD	158	85	88	—	—	80	84	80	85	99	0 64	0.32	1 34	36.9	29 0	32 3	3 7	7.8	[redacted]
	AFT	159		77				97		81	103	0.64	0.32	1 34	36.9	29.0	32.3	4.6	6.8	8.8
1014-1	FWD	162	80	87	—	—	80	78	80	74	86	0.62	0.41	1.46	38.0	36.1	38.8	2.2	6.8	8.8
	AFT			83				80		95	107	0.62	0.41	1.44	34.8	36.0	38.3	3.3	8.8	8.8
1014-2	FWD	139	80	83				75		70	77	1.06	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	8.2	—
1015-1	FWD	138	85	87	—	—	80	78	80	90		0.65	0.38	0.53	47.0	29.4	38.2	5.0	8.8	7.8
	AFT			87				78		97	—	0.64	0.38	0.53	46.9	29.2	38.2	6.3	8.4	8.8
1015-2	FWD	141	85	83				72		89		0.50	0.61	0.64	39.1	27.1	36.2	3.2	6.8	7.8
	AFT			82				78		90		0.50	0.61	0.64	39.1	27.0	36.3	3.3	4.8	8.3
1016-1	FWD	132	85	88	—	—	80	86	80	81		0.72	0.83	2.01	48.9	30.2	40.4	2.0	8.8	10.8
	AFT			83				81		94		0.72	0.83	2.01	48.4	30.1	40.4	2.8	3.4	7.4
1016-2	FWD	133	85	90				85		92	—	0.83	0.93	2.19	42.2	27.2	38.9	1.8	4.9	8.8
	AFT			91				86		91		0.83	0.93	2.19	42.2	27.3	38.9	2.3	3.8	7.1
1017-1	FWD	140	88	72	—	—	80	87	80	78	86	0.49	0.76	2.80	38.8	32.8	38.4	3.3	9.8	11.8
	AFT			75				70		94	107	0.49	0.76	2.49	38.3	32.0	36.8	4.3	8.3	8.1
1017-2	FWD	168	85	88				68		80	94	0.69	0.45	—	38.8	34.0	—	1.8	6.8	—
	AFT			86				89		86	101	0.69	0.48	—	36.3	33.8	—	2.3	8.3	—
1018-1	FWD	122	85	79	—	—	80	79	80	82	92	0.91	0.48	—	47.4	36.7	—	3.4	8.8	—
	AFT			77				74		96	109	0.90	0.47	—	48.2	36.2	—	3.2	3.7	—
1018-2	FWD	123	85	84				78		77	89	0.84	0.63	—	34.7	30.7	—	3.1	8.6	—
	AFT			86				71		91	103	0.86	0.63	—	34.8	30.7	—	[redacted]	4.1	—

[redacted]

Table 10-2

PERFORMANCE SUMMARY

~~TOP SECRET C~~ [redacted]

No. [redacted]

MISSION NUMBER	CAMERA	SERIAL NUMBER	M I P VALUE	VISUAL RES	AFSPPF MTF/AIM SLIT (μ)	AFSPPF MTF/AIM AVERAGE	SLIT (μ)	AVERAGE	SLIT (μ)	AVERAGE ALL	AVERAGE HIGH	90% ATTITUDE ERROR (°) PITCH	ROLL	YAW	90% ATTITUDE RATES (°/HR) PITCH	ROLL	YAW	90% V/H ERROR (%)	90% RESOLUTION LIMIT (FEET) ALONG TRACK	CROSS TRACK
1019-1	FWD	118	85	81	—	—	80	76	80	89	104	0.43	0.36	0.97	31.6	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
1020-1	FWD	136	80	88	—	—	80	69	80	78	90	0.46	0.35	0.78	37.4	31.8	28.7	5.4	5.8	8.4
1020-2	AFT			89				82		94	105	0.46	0.35	0.78	37.4	31.8	28.7	5.3	4.2	8.9
	FWD	137	—	—				—		—	—	0.41	0.17	1.06	42.6	23.8	42.5	5.5	6.4	7.6
	AFT			—				—		—	—	0.41	0.17	1.06	42.6	23.8	42.5	3.4	4.8	8.8
1021-1	FWD	166	85	88	—	—	80	77	80	86	99	0.55	0.37	0.81	34.9	32.6	28.2	2.7	8.8	8.0
1021-2	AFT			90				90		98	109	0.55	0.38	0.81	34.8	33.0	28.3	5.4	8.6	8.8
	FWD	167	85	85				74		88	112	0.59	0.65	—	44.7	50.6	—	3.1	9.2	—
	AFT			74				62		—	—	—	—	—	—	—	—	—	—	—
1022-1	FWD	168	85	88	—	—	80	66	80	78	91	0.47	0.51	0.89	28.3	27.1	23.8	3.5	9.8	8.8
1022-2	AFT			91				83		101	111	0.47	0.51	0.90	27.9	26.6	23.8	3.0	6.2	8.1
	FWD	169	85	90				68		74	84	0.40	0.51	0.90	29.4	27.3	31.0	2.6	9.0	8.4
	AFT			92				92		99	110	0.40	0.51	0.90	29.4	27.3	31.1	1.8	4.9	8.9
1023-1	FWD	170	85		—	—	80	94	80	97	110	0.49	0.33	0.50	33.0	28.7	23.5	3.4	4.0	8.4
1023-2	AFT							87		83	101	0.49	0.33	0.50	32.9	28.7	23.5	3.5	2.7	4.3
	FWD	171	85					71		76	87	0.42	0.36	0.53	29.7	21.0	28.6	2.4	3.9	6.3
	AFT							89		68	76	0.43	0.37	0.53	29.6	21.3	28.6	2.5	2.7	4.2
1024-1	FWD	172	85		—	—	80	79	80	90	102	0.42	0.25	0.62	32.2	24.9	30.5	2.6	5.9	6.8
1024-2	AFT							95		94	105	0.42	0.25	0.62	32.2	24.9	30.4	2.1	3.8	4.9
	FWD	173	85					86		89	101	0.36	0.31	0.93	30.4	24.5	36.4	5.5	4.7	8.4
	AFT							95		100	114	0.36	0.31	0.93	30.6	23.6	36.4	8.1	3.3	3.6
1025-1	FWD	142	85		—	—	80	87	80	80	97	0.50	0.41	0.85	28.1	28.7	25.9	2.0	3.9	6.7
1025-2	AFT							97		101	114	0.51	0.42	0.85	28.8	29.7	25.7	3.2	2.8	6.8
	FWD	127	85					85		96	107	0.52	0.44	0.82	29.0	26.1	29.0	1.7	4.7	6.9
	AFT							91		89	103	0.52	0.44	0.82	28.1	26.0	29.0	1.8	6.7	6.9
1026-1	FWD	174	85		—	—	80	76	80	80	92	0.65	0.24	0.70	37.9	33.2	28.5	6.1	13.8	8.2
1026-2	AFT							88		98	113	0.65	0.24	0.70	37.9	33.2	28.8	6.1	9.1	4.1
	FWB	175	85					85		92	104	0.55	0.56	0.87	41.1	46.5	30.8	6.1	8.8	6.7
	AFT							93		90	103	0.59	0.65	0.88	43.3	50.0	27.7	6.7	3.3	4.8
1027-1	FWD	164	85	—	—	—	80	69	80	80	—	0.51	0.37	0.74	47.2	25.5	28.4	4.7	10.8	7.2
	AFT	163						79		92		0.51	0.37	0.74	47.3	25.2	28.2	3.8	6.0	8.2
1028-1	FWD	176	85		—	—	80	81	80	89		0.52	0.37	0.50	36.6	28.0	30.5	3.9	4.8	8.0
1028-2	AFT							92		93	—	0.52	0.37	0.50	36.6	28.0	30.5	3.1	4.0	8.8
	FWD	177	85					88		87		0.76	0.52	—	42.7	25.7	—	3.2	4.2	—
	AFT							77		84		0.76	0.52	—	42.5	25.6	—	2.9	3.3	—
1029-1	FWD	178	85		—	80	85	81	80	77		0.67	0.34	0.77	29.1	31.3	34.4	2.9	7.8	7.4
1029-2	AFT						91	95		73	—	0.68	0.33	0.77	28.5	30.6	34.6	4.6	3.3	4.8
	FWD	179	85				83	82		77		0.64	0.48	0.44	38.8	32.5	25.7	2.3	7.8	7.8
	AFT						91	94		81		0.65	0.48	0.44	37.5	32.1	25.7	3.6	2.9	4.9
1030-1	FWD	182	85		—	80	95	76	80	66		0.67	0.25	0.89	29.6	22.7	36.1	3.9	8.9	6.6
1030-2	AFT						74	79		77	—	0.67	0.25	0.89	29.6	22.8	35.9	5.4	8.1	9.6
	FWD	183	85				77	81		71		0.70	0.27	0.87	28.4	22.7	36.3	4.9	11.2	8.8
	AFT						91	74		71		0.70	0.26	0.87	28.2	21.9	36.3	8.0	6.6	8.8
1031-1	FWD	184	85		—	80	85	76	80	80		0.50	0.47	0.96	16.2	17.3	26.6	6.1	13.8	8.4
1031-2	AFT						57	71		68	—	0.54	0.41	0.91	18.1	18.7	22.8	6.0	12.0	9.8
	FWD	185	85				91	94		74		0.57	0.20	0.75	19.0	19.3	15.7	5.4	10.3	4.8
	AFT						—	—		—		—	—	—	—	—	—	—	—	—

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 (%) I	PREDICTED PROCESSING (%) F	REPORTED PROCESSING (%) P	REPORTED PROCESSING (%) I	REPORTED PROCESSING (%) F	COMPUTED PROCESSING (%) P	COMPUTED PROCESSING (%) I	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 & PRO (%)	OVER PROCESSED (%)	OVER EXPOSED (%)	CLOUD COVER (%)
1004-1	FWD	-3	61	28	124	5	76	19	4	79	17	0	79	21	0.26	1.89	0.83	0.78	0.43	2.43	1.97	2.02	1.00	2.43	2.04	2.08	0	4	60	31	5	35
	AFT	-3	61	25	124	5	74	21	4	79	17	0	80	20	0.22	1.56	0.76	0.70	0.93	2.45	1.92	1.94	1.08	2.43	1.98	2.03	1	4	67	26	3	35
1004-2	FWD	-4	68	10	131	7	76	17	37	50	13	4	83	13	0.29	1.80	0.83	0.76	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	36
1006-1	FWD	38	58	82	140	1	99	0	1	51	48	0	51	49	0.23	1.81	0.71	0.68	0.80	2.31	1.58	1.52	1.31	2.40	2.20	2.24	0	5	72	21	1	80
	AFT	38	58	82	140	1	99	0	0	23	77	0	24	76	0.36	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	80
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	48
	AFT	32	64	36	147	2	98	0	35	40	25	21	54	25	0.26	1.34	0.62	0.58	0.65	2.19	1.48	1.47	1.56	2.50	2.12	2.16	0	11	77	8	3	48
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	2.20	1.44	1.40	1.22	1.38	2.17	2.21	20	8	67	5	0	80
	AFT	11	49	48	102	0	100	0	10	42	48	8	77	17	0.26	1.78	0.86	0.55	0.78	2.31	1.52	1.52	1.54	2.39	2.20	2.24	1	13	80	5	1	80
1007-2	FWD	32	57	43	112	0	25	75	3	28	69	0	26	74	0.26	1.23	0.51	0.48	0.70	2.32	1.44	1.40	0.90	2.37	2.18	2.20	18	9	71	2	0	66
	AFT	31	57	38	111	0	100	0	19	41	40	3	88	9	0.24	1.56	0.60	0.56	0.44	2.27	1.50	1.52	0.84	2.41	2.17	2.25	1	18	74	8	1	65
1008-1	FWD	30	51	80	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	48
	AFT	30	51	80	102	0	100	0	4	27	69	0	34	66	0.32	1.57	0.71	0.69	0.81	2.21	1.57	1.58	1.08	2.37	2.21	2.24	1	1	84	13	0	48
1008-2	FWD	29	56	42	105	0	100	0	3	31	66	0	27	73	0.14	1.81	0.76	0.72	0.57	2.10	1.54	1.55	1.09	2.40	2.20	2.25	2	1	73	23	1	66
	AFT	29	56	42	108	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	2.38	2.18	2.22	1	3	69	27	1	66
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	80
	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	80
1009-2	FWD	23	58	38	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	2.48	2.25	2.30	4	4	74	17	0	66
	AFT	23	58	38	138	2	98	0	4	47	49	0	56	44	0.26	1.47	0.69	0.64	0.44	2.42	1.61	1.60	1.81	2.50	2.31	2.34	1	4	77	18	0	66
1010-1	FWD	18	47	48	83	0	21	79	0	13	87	0	9	91	0.28	1.14	0.52	0.47	0.43	2.32	1.38	1.32	1.11	2.42	2.16	2.20	18	8	78	4	0	48
	AFT	18	47	48	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	48
1010-2	FWD	18	52	38	78	0	50	50	0	16	84	0	13	87	0.26	1.51	0.85	0.50	0.52	2.36	1.41	1.38	1.00	2.44	2.14	2.20	22	4	87	8	0	48
	AFT	18	52	38	78	0	50	50	0	23	77	0	25	75	0.20	1.48	0.88	0.56	0.30	2.40	1.47	1.45	1.28	2.48	2.18	2.22	13	3	76	8	0	48
1011-1	FWD	2	55	33	86	0	64	36	2	23	75	2	23	75	0.18	0.99	0.50	0.46	0.56	2.36	1.48	1.43	0.78	2.40	2.07	2.16	17	11	70	2	0	40
	AFT	2	55	33	86	0	67	33	3	47	50	0	37	63	0.24	1.48	0.60	0.56	0.50	2.38	1.57	1.55	0.74	2.37	2.11	2.16	3	7	81	8	0	40
1012-1	FWD	0	45	38	71	0	64	36	7	58	37	0	68	38	0.25	1.30	0.59	0.53	0.54	2.39	1.40	1.42	0.90	2.38	1.93	2.00	6	17	68	10	0	60
	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	8	10	74	11	0	60
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	1.48	0.67	2.34	1.91	2.00	4	9	80	7	0	40
	AFT	0	57	34	106	0	77	23	5	15	82	0	10	90	0.30	1.27	0.68	0.62	0.48	2.33	1.55	1.56	0.70	2.38	1.98	2.02	4	0	72	23	0	40
1013-1	FWD	0	56	28	83	0	64	36	0	42	58	0	58	42	0.20	1.66	0.56	0.36	0.52	2.29	1.56	1.59	1.21	2.41	2.03	2.10	7	13	76	4	0	47
	AFT	0	56	28	82	0	64	36	2	7	91	0	33	67	0.28	1.56	0.66	0.46	0.64	2.28	1.59	1.63	1.10	2.36	1.97	2.03	8	8	74	18	0	47
1014-1	FWD	0	59	15	71	0	21	79	1	38	61	0	63	37	0.17	0.99	0.40	0.36	0.28	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	0	36	64	0.18	1.26	0.51	0.48	0.25	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	0.23	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	1.48	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	8	68	18	68	0	8	92	2	2	96	0	2	98	0.28	1.70	0.64	0.47	0.54	2.28	1.44	1.46	0.46	2.41	1.88	1.90	28	0	65	7	0	48
	AFT	4	66	18	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	1.88	14	0	77	8	0	48
1015-2	FWD	0	80	-2	71	0	10	90	0	11	89	0	11	89	0.22	1.10	0.50	0.46	0.34	2.07	1.29	1.30	0.28	2.34	1.69	1.78	26	4	68	5	0	40
	AFT	0	79	-2	71	0	21	79	0	9	91	0	9	91	0.26	1.21	0.89	0.52	0.36	2.22	1.37	1.38	0.38	2.40	1.74	1.80	17	1	70	12	0	40
1016-1	FWD	8	69	13	76	0	7	93	1	41	58	0	59	41	0.13	1.55	0.61	0.45	0.70	2.45	1.67	1.68	0.85	2.44	1.91	1.90	19	17	58	8	1	48
	AFT	4	69	12	76	0	27	73	0	26	74	0	42	58	0.22	1.65	0.64	0.58	0.62	2.34	1.69	1.72	0.98	2.46	1.90	1.92	11	9	62	17	1	48
1016-2	FWD	1	84	-4	76	0	8	92	0	31	69	0	48	52	0.18	1.56	0.48	0.44	0.29	2.38	1.48	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	0.58	0.49	0.26	2.32	1.52	1.60	0.30	2.49	1.75	1.82	23	8	65	8	1	40
1017-1	FWD	-11	60	21	99	0	0	100	13	63	24	0	82	18	0.20	1.65	0.68	0.61	0.46	2.23	1.74	1.78	0.60	2.32	1.93	2.00	1	8	77	13	1	28
	AFT	-1	57	19	96	0	17	83	24	58	18	4	90	6	0.20	1.62	0.64	0.60	0.60	2.29	1.75	1.75	1.18	2.38	1.89	1.90	1	13	74	11	2	28
1017-2	FWD	1	78	9	139	0	0	100	5	62	33	7	77	16	0.22	1.22	0.58	0.58	0.37	2.30	1.70	1.80	0.86	2.37	1.93	1.94	3	14	74	9	0	30
	AFT	1	78	7	135	0	7	93	18	62	20	0	89	11	0.20	1.94	0.64	0.62	0.30	2.30	1.62	1.68	0.38	2.34	1.85	1.92	2	13	74	10	1	30
1018-1	FWD	6	77	13	134	0	0	100	9	63	28	1	83	16	0.19	1.46	0.66	0.62	0.84	2.22	1.66	1.73	1.00	2.32	1.96	1.99	2	19	71	7	0	36
	AFT	6	78	10	126	0	22	78	9	53	38	8	78	22	0.18	1.36	0.62	0.56	0.68	2.20	1.68	1.80	1.03	2.28	1.86	2.00	1	12	77	9	2	36
1018-2	FWD	8	77	14	134	0	0	100	18	74	8	17	79	4	0.16	1.78	0.67	0.49	0.50	2.26	1.80	1.84	0.80	2.28	1.85	1.91	1	31	56	9	4	48
	AFT	8	77	10	132	0	15	85	1	50	49	0	74	26	0.22	1.80	0.71	0.79	0.54	2.28	1.70	1.74	1.09	2.35	1.88	2.04	0	8	58	17	8	49

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	I	F	REPORTED PROCESSING (%) P	I	F	COMPUTED PROCESSING (%) P	I	F	TERRAIN D-MIN RANGE LOW	RANGE HIGH	MEAN	MEDIAN	TERRAIN D-MAX RANGE LOW	RANGE HIGH	MEAN	MEDIAN	CLOUD D-MAX RANGE LOW	RANGE HIGH	MEAN	MEDIAN	UNDER EXPOSED (%)	UNDER PROCESSED (%)	NOMINAL EXP & PRO (%)	OVER PROCESSED (%)	OVER EXPOSED (%)	CLOUD COVER (%)
1019-1	FWD	24	70	24	152	0	21	79	22	32	46	4	56	40	0.26	1.92	0.71	0.61	0.60	2.15	1.45	1.50	0.84	2.26	1.94	2.00	4	7	64	17	7	48
	AFT	23	70	21	152	0	92	8	26	55	19	3	87	10	0.13	1.70	0.66	0.60	0.39	2.28	1.46	1.45	0.80	2.30	1.96	2.02	1	13	70	14	3	48
1020-1	FWD	30	75	19	156	0	19	81	13	48	39	1	58	41	0.23	1.30	0.55	0.52	0.80	2.28	1.57	1.54	1.40	2.38	2.10	2.16	1	18	78	4	0	48
	AFT	29	75	17	156	0	64	36	15	56	29	0	74	26	0.23	1.20	0.55	0.54	0.70	2.20	1.47	1.46	1.22	2.29	2.04	2.10	0	18	76	6	0	48
1020-2	FWD	47	69	18	35	INSUFFICIENT DATA																										
	AFT	46	68	17	33																											
1021-1	FWD	15	66	-148	-23	0	68	32	14	39	47	1	52	47	0.25	1.90	0.64	0.56	0.74	2.18	1.50	1.50	0.97	2.36	1.92	2.00	9	9	72	11	3	36
	AFT	14	66	-147	-25	0	99	1	15	38	47	0	57	43	0.17	1.70	0.65	0.57	0.54	2.24	1.45	1.42	0.85	2.30	1.90	2.00	5	5	75	12	3	38
1021-2	FWD	13	52	-133	-41	0	29	71	13	41	46	0	57	43	0.18	1.52	0.54	0.50	0.60	2.36	1.38	1.34	1.05	2.23	1.82	1.85	14	13	66	6	0	20
	AFT	13	52	-133	-41	0	100	0	53	25	22	0	50	50	0.33	1.38	0.76	0.78	0.70	2.30	1.52	1.50	1.30	2.36	1.94	1.94	6	0	71	21	1	20
1022-1	FWD	28	67	30	150	0	36	64	8	36	56	0	42	58	0.18	1.49	0.45	0.40	0.54	2.42	1.57	1.60	1.32	2.55	2.24	2.29	30	19	47	3	0	38
	AFT	27	67	26	150	0	89	11	7	42	51	0	53	47	0.24	1.48	0.57	0.50	0.52	2.30	1.63	1.68	1.30	2.47	2.21	2.25	4	15	71	9	1	38
1022-2	FWD	29	74	24	152	0	8	92	1	37	62	0	43	57	0.20	0.99	0.39	0.35	0.62	2.65	1.45	1.45	1.16	2.45	2.23	2.28	36	28	39	1	0	48
	AFT	28	74	19	152	0	100	0	10	44	46	0	53	47	0.21	1.40	0.48	0.44	0.50	2.32	1.51	1.52	1.45	2.49	2.25	2.28	10	25	61	4	0	48
1023-1	FWD	22	82	8	164	0	5	95	19	54	27	0	72	28	0.15	1.26	0.39	0.35	0.43	2.41	1.22	1.22	0.87	2.41	2.06	2.11	20	44	34	2	0	38
	AFT	20	81	5	163	0	11	89	0	39	61	0	42	58	0.20	1.40	0.53	0.48	0.41	2.21	1.31	1.37	0.94	2.46	2.15	2.20	13	14	65	7	0	38
1023-2	FWD	29	81	-13	177	0	7	93	0	19	81	0	18	82	0.22	1.38	0.48	0.42	0.41	2.03	1.18	1.22	0.90	2.41	2.03	2.11	38	2	60	2	1	38
	AFT	28	80	-13	178	0	3	97	0	34	66	0	28	72	0.22	1.60	0.82	0.48	0.44	2.31	1.24	1.24	1.08	2.46	2.10	2.17	13	10	73	4	0	36
1024-1	FWD	10	61	24	137	0	0	100	0	57	43	0	72	28	0.17	1.74	0.35	0.32	0.40	2.25	1.22	1.15	0.58	2.34	1.97	2.03	27	49	23	0	0	38
	AFT	9	61	21	136	0	0	100	0	28	72	0	82	18	0.20	1.22	0.40	0.37	0.48	2.32	1.30	1.24	0.94	2.40	1.97	2.06	18	46	39	2	0	38
1024-2	FWD	9	79	11	151	0	0	100	12	19	69	0	25	75	0.24	1.17	0.46	0.42	0.35	2.40	1.30	1.27	1.01	2.48	1.91	1.99	36	3	58	2	0	38
	AFT	8	79	9	151	0	0	100	1	22	77	0	66	34	0.20	1.39	0.47	0.40	0.29	2.28	1.31	1.32	0.90	2.40	1.89	1.95	20	28	50	2	0	38
1025-1	FWD	1	70	-123	-18	0	68	32	10	41	49	0	56	44	0.18	1.42	0.43	0.37	0.29	2.36	1.37	1.39	0.42	2.35	1.81	1.92	33	28	36	4	1	36
	AFT	0	70	-121	-19	0	72	28	8	49	43	0	61	39	0.18	1.69	0.49	0.42	0.26	2.26	1.33	1.38	0.23	2.32	1.75	1.90	28	20	47	7	1	38
1025-2	FWD	0	56	-124	-31	0	71	29	3	42	55	0	56	44	0.18	1.22	0.45	0.39	0.26	2.24	1.32	1.33	0.63	2.29	1.78	1.89	29	21	48	4	0	22
	AFT	0	56	-122	-33	0	73	27	3	45	52	0	51	49	0.21	1.32	0.53	0.48	0.39	2.16	1.31	1.35	0.48	2.23	1.71	1.79	19	12	61	8	0	22
1026-1	FWD	0	57	-23	135	0	4	96	0	21	79	0	24	76	0.20	1.26	0.38	0.33	0.31	2.27	1.22	1.22	0.40	2.28	1.77	1.87	57	13	28	2	0	48
	AFT	0	57	-21	135	0	5	95	0	4	96	0	38	62	0.20	1.16	0.39	0.34	0.24	2.36	1.29	1.30	0.37	2.40	1.78	1.86	39	27	33	1	0	48
1026-2	FWD	1	72	-8	84	0	0	100	1	5	94	0	5	95	0.19	1.32	0.36	0.30	0.23	2.17	1.05	1.02	0.48	2.24	1.63	1.70	78	2	19	1	0	50
	AFT	0	57	-13	78	0	0	100	2	5	93	0	15	85	0.21	1.35	0.39	0.32	0.27	2.20	1.08	1.03	0.30	2.28	1.61	1.70	60	12	25	3	0	50
1027-1	FWD	3	63	26	110	0	0	100	0	0	100	0	3	97	0.26	1.54	0.52	0.46	0.50	2.38	1.45	1.52	0.71	2.39	2.03	2.10	38	2	56	4	0	50
	AFT	2	63	26	108	0	0	100	0	21	79	0	20	80	0.26	1.34	0.58	0.53	0.34	2.30	1.46	1.46	0.40	2.40	1.96	2.06	12	3	78	7	0	50
1028-1	FWD	3	73	15	138	0	4	96	0	4	96	0	11	89	0.22	1.08	0.37	0.32	0.40	2.32	1.42	1.42	0.62	2.30	1.77	1.83	65	8	28	1	0	30
	AFT	1	73	14	133	0	5	95	0	16	84	0	11	89	0.20	1.01	0.41	0.36	0.30	2.23	1.35	1.40	0.68	2.26	1.72	1.77	56	8	37	1	0	30
1028-2	FWD	2	81	5	48	0	3	97	1	9	90	0	15	85	0.23	0.98	0.40	0.35	0.37	2.20	1.36	1.38	0.30	2.33	1.72	1.77	59	3	37	1	0	30
	AFT	1	80	5	43	0	10	90	0	6	94	0	6	94	0.22	1.40	0.80	0.40	0.28	2.21	1.40	1.43	0.30	2.35	1.69	1.75	47	1	44	7	1	30
1029-1	FWD	3	63	18	130	0	8	92	1	16	83	0	14	86	0.25	1.80	0.64	0.54	0.50	2.30	1.72	1.76	0.48	2.39	2.03	2.08	20	0	62	14	3	38
	AFT	2	62	16	128	0	20	80	0	21	79	0	25	75	0.16	1.73	0.57	0.48	0.20	2.32	1.62	1.65	0.36	2.40	1.91	1.95	24	8	59	10	1	38
1029-2	FWD	0	80	4	146	0	4	96	2	28	70	0	20	80	0.22	1.68	0.84	0.45	0.31	2.35	1.58	1.59	0.45	2.40	1.88	2.00	33	5	50	11	2	28
	AFT	0	80	3	145	0	10	90	2	24	74	0	25	75	0.20	1.58	0.98	0.49	0.30	2.34	1.52	1.60	0.34	2.40	1.87	1.93	23	8	59	11	2	28
1030-1	FWD	8	63	27	130	0	58	42	3	32	65	1	52	47	0.30	1.86	0.81	0.75	0.61	2.34	1.75	1.79	0.78	2.38	2.01	2.06	4	3	61	28	3	40
	AFT	4	63	22	129	0	53	47	0	46	54	0	71	29	0.25	1.64	0.76	0.69	0.66	2.30	1.69	1.74	1.00	2.40	1.97	2.05	1	8	64	22	4	40
1030-2	FWD	3	78	10	158	1	42	57	0	53	47	0	70	30	0.24	1.65	0.64	0.57	0.76	2.26	1.69	1.70	1.17	2.36	1.98	2.05	5	9	71	15	2	30
	AFT	2	78	7	157	1	23	76	0	28	72	0	30	70	0.34	1.94	0.82	0.77	0.83	2.40	1.79	1.82	0.83	2.43	2.06	2.10	2	0	66	30	2	30
1031-1	FWD	17	70	80	140	0	98	1	18	34	48	0	51	49	0.25	1.67	0.71	0.63	0.72	2.33	1.74	1.80	1.36	2.44	2.10	2.18	2	8	70	17	3	48
	AFT	17	70	18	140	0	14	86	18	43	42	0	47	53	0.24	1.66	0.71	0.62	0.53	2.35	1.69	1.70	1.15	2.38	2.00	2.05	4	4	70	18	4	48
1031-2	FWD	19	82	6	67	0	99	1	8	53	39	0	60	40	0.26	1.88	0.80	0.72	0.46	2.34	1.73	1.82	1.40	2.87	2.05	2.09	0	8	64	22	9	40
	AFT	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

[redacted]

Table 18-X

SECTION A

APPENDIX

[redacted] CONTROL NO. [redacted]

MISSION • 1051-1 • INSTRUMENT • FRND • 07297[redacted] 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
0.51	0	0	0	0	0	0	0	0	0	0	0	0
0.52	0	0	0	0	0	0	0	0	0	0	0	0
0.53	0	0	0	0	0	0	0	0	0	0	0	0
0.54	0	0	0	0	0	0	0	0	0	0	0	0
0.55	0	0	0	0	0	0	0	0	0	0	0	0
0.56	0	0	0	0	0	0	0	0	0	0	0	0
0.57	0	0	0	0	0	0	0	0	0	0	0	0
0.58	0	0	0	0	0	0	0	0	0	0	0	0
0.59	0	0	0	0	0	0	0	0	0	0	0	0
0.60	0	0	0	0	0	0	0	0	0	0	0	0
0.61	0	0	0	0	0	0	0	0	0	0	0	0
0.62	0	0	0	0	0	0	0	0	0	0	0	0
0.63	0	0	0	0	0	0	0	0	0	0	0	0
0.64	0	0	0	0	0	0	0	0	0	0	0	0
0.65	0	0	0	0	0	0	0	0	0	0	0	0
0.66	0	0	0	0	0	0	0	0	0	0	0	0
0.67	0	0	0	0	0	0	0	0	0	0	0	0
0.68	0	0	0	0	0	0	0	0	0	0	0	0
0.69	0	0	0	0	0	0	0	0	0	0	0	0
0.70	0	0	0	0	0	0	0	0	0	0	0	0
0.71	0	0	0	0	0	0	0	0	0	0	0	0
0.72	0	0	0	0	0	0	0	0	0	0	0	0
0.73	0	0	0	0	0	0	0	0	0	0	0	0
0.74	0	0	0	0	0	0	0	0	0	0	0	0
0.75	0	0	0	0	0	0	0	0	0	0	0	0
0.76	0	0	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0
0.80	0	0	0	0	0	0	0	0	0	0	0	0
0.81	0	0	0	0	0	0	0	0	0	0	0	0
0.82	0	0	0	0	0	0	0	0	0	0	0	0
0.83	0	0	0	0	0	0	0	0	0	0	0	0
0.84	0	0	0	0	0	0	0	0	0	0	0	0
0.85	0	0	0	0	0	0	0	0	0	0	0	0
0.86	0	0	0	0	0	0	0	0	0	0	0	0
0.87	0	0	0	0	0	0	0	0	0	0	0	0
0.88	0	0	0	0	0	0	0	0	0	0	0	0
0.89	0	0	0	0	0	0	0	0	0	0	0	0
0.90	0	0	0	0	0	0	0	0	0	0	0	0
0.91	0	0	0	0	0	0	0	0	0	0	0	0
0.92	0	0	0	0	0	0	0	0	0	0	0	0
0.93	0	0	0	0	0	0	0	0	0	0	0	0
0.94	0	0	0	0	0	0	0	0	0	0	0	0
0.95	0	0	0	0	0	0	0	0	0	0	0	0
0.96	0	0	0	0	0	0	0	0	0	0	0	0
0.97	0	0	0	0	0	0	0	0	0	0	0	0
0.98	0	0	0	0	0	0	0	0	0	0	0	0
0.99	0	0	0	0	0	0	0	0	0	0	0	0
1.00	0	0	0	0	0	0	0	0	0	0	0	0
SUM TOTAL	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	37	0	0	71	0	0

[redacted] CONTROL NO. [redacted]

TABLE A-1

[redacted]

MISSION • 1031-1 • INSTRUMENT • FRND • [redacted] DENSITY FREQ DISTR.

DENSITY VALUE	PRIMARY MIN	PRIMARY MAX	PRIMARY LIM	INTERMEDIATE MIN	INTERMEDIATE MAX	INTERMEDIATE LIM	[redacted] MIN	[redacted] MAX	[redacted] LIM	ALC LEVELS MIN	ALC LEVELS MAX	ALC LEVELS LIM
0.51	0	0	0	1	0	0	14	0	0	2	0	0
0.52	0	0	0	3	0	0	6	0	0	9	0	0
0.53	0	0	0	1	0	0	5	0	0	4	0	0
0.54	0	0	0	2	0	0	3	0	0	5	0	0
0.55	0	0	0	4	0	0	3	0	0	7	0	0
0.56	0	0	0	2	0	0	4	0	0	6	0	0
0.57	0	0	0	1	0	0	1	0	0	2	0	0
0.58	0	0	0	1	0	0	0	0	0	1	0	0
0.59	0	0	0	3	0	0	3	0	0	4	0	0
0.60	0	0	0	3	0	0	5	0	0	8	0	0
0.61	0	0	0	1	0	0	1	0	0	2	0	0
0.62	0	0	0	3	0	0	2	0	0	5	0	0
0.63	0	0	0	2	0	0	1	0	0	2	0	0
0.64	0	0	0	2	0	0	2	0	0	3	0	0
0.65	0	0	0	2	0	0	2	0	0	4	0	0
0.66	0	0	0	2	0	0	1	0	0	5	0	0
0.67	0	0	0	2	0	0	3	0	0	2	0	0
0.68	0	0	0	3	0	0	1	0	0	5	0	0
0.69	0	0	0	2	0	0	1	0	0	5	0	0
0.70	0	0	0	3	0	0	2	0	0	5	0	0
0.71	0	0	0	2	0	0	1	0	0	4	0	0
0.72	0	0	0	3	0	0	3	0	0	4	0	0
0.73	0	0	0	3	0	0	1	0	0	4	0	0
0.74	0	0	0	4	0	0	3	0	0	5	0	0
0.75	0	0	0	3	0	0	1	0	0	3	0	0
0.76	0	0	0	4	0	0	1	0	0	6	0	0
0.77	0	0	0	3	0	0	2	0	0	3	0	0
0.78	0	0	0	4	0	0	1	0	0	6	0	0
0.79	0	0	0	4	0	0	2	0	0	6	0	0
0.80	0	0	0	4	0	0	2	0	0	3	0	0
0.81	0	0	0	4	0	0	2	0	0	5	0	0
0.82	0	0	0	2	0	0	2	0	0	3	0	0
0.83	0	0	0	2	0	0	1	0	0	2	0	0
0.84	0	0	0	2	0	0	2	0	0	1	0	0
0.85	0	0	0	2	0	0	1	0	0	1	0	0
0.86	0	0	0	2	0	0	1	0	0	1	0	0
0.87	0	0	0	2	0	0	1	0	0	1	0	0
0.88	0	0	0	2	0	0	1	0	0	1	0	0
0.89	0	0	0	2	0	0	1	0	0	1	0	0
0.90	0	0	0	2	0	0	1	0	0	1	0	0
0.91	0	0	0	2	0	0	1	0	0	1	0	0
0.92	0	0	0	2	0	0	1	0	0	1	0	0
0.93	0	0	0	2	0	0	1	0	0	1	0	0
0.94	0	0	0	2	0	0	1	0	0	1	0	0
0.95	0	0	0	2	0	0	1	0	0	1	0	0
0.96	0	0	0	2	0	0	1	0	0	1	0	0
0.97	0	0	0	2	0	0	1	0	0	1	0	0
TOTAL	0	0	0	72	0	0	72	0	0	144	0	0

[redacted] - CONTROL NO. [redacted]

TABLE A-1

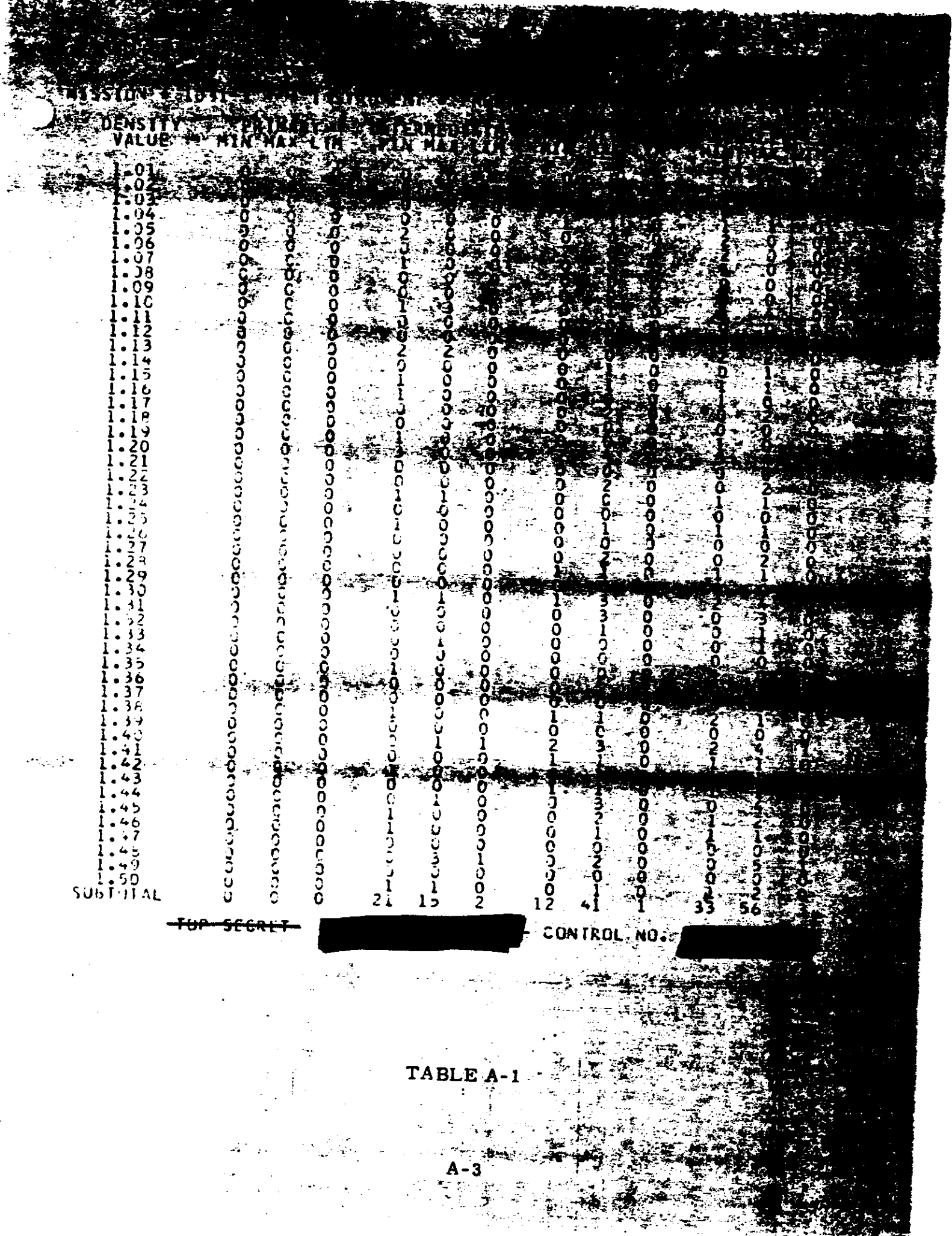


TABLE A-1

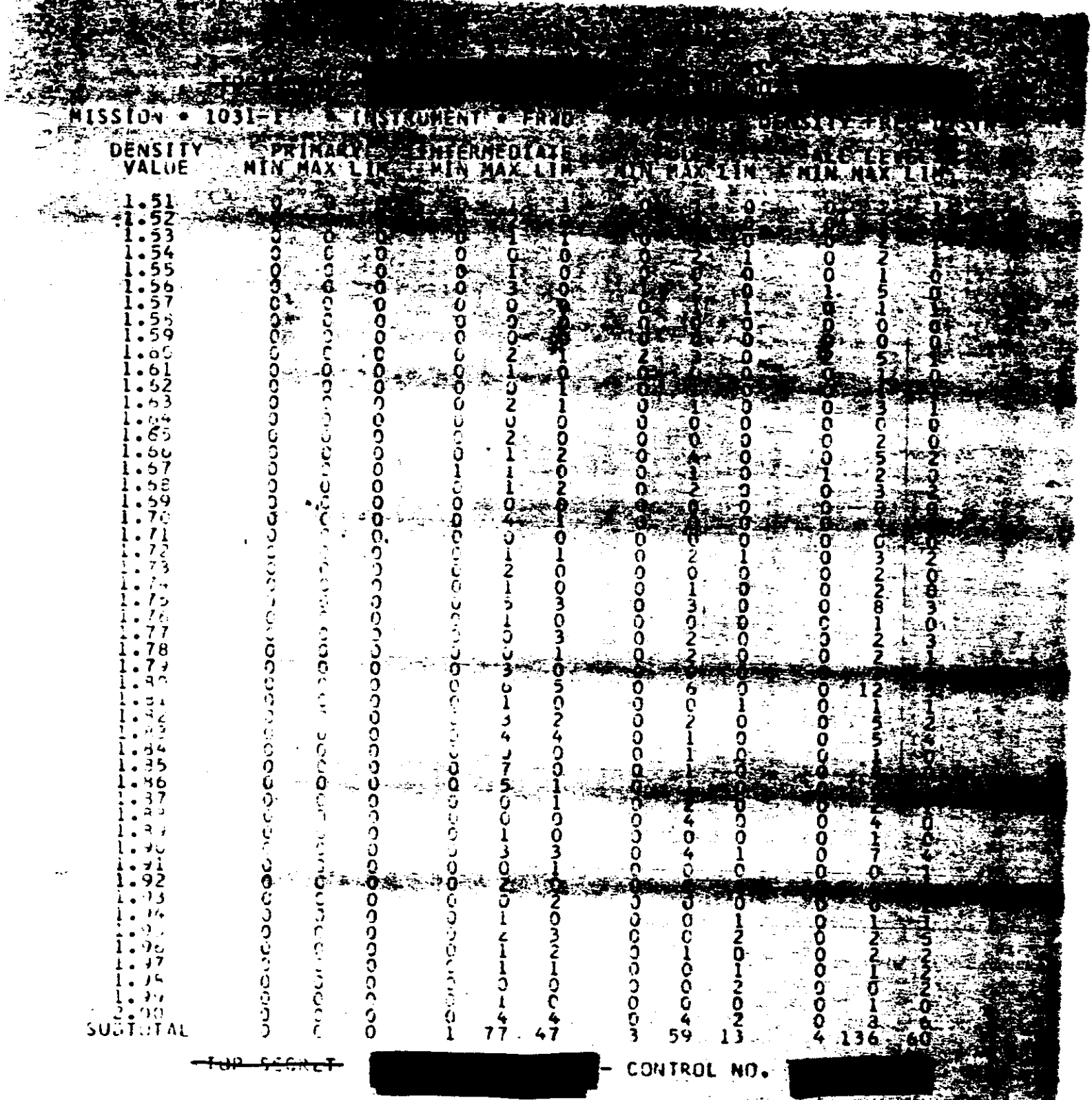
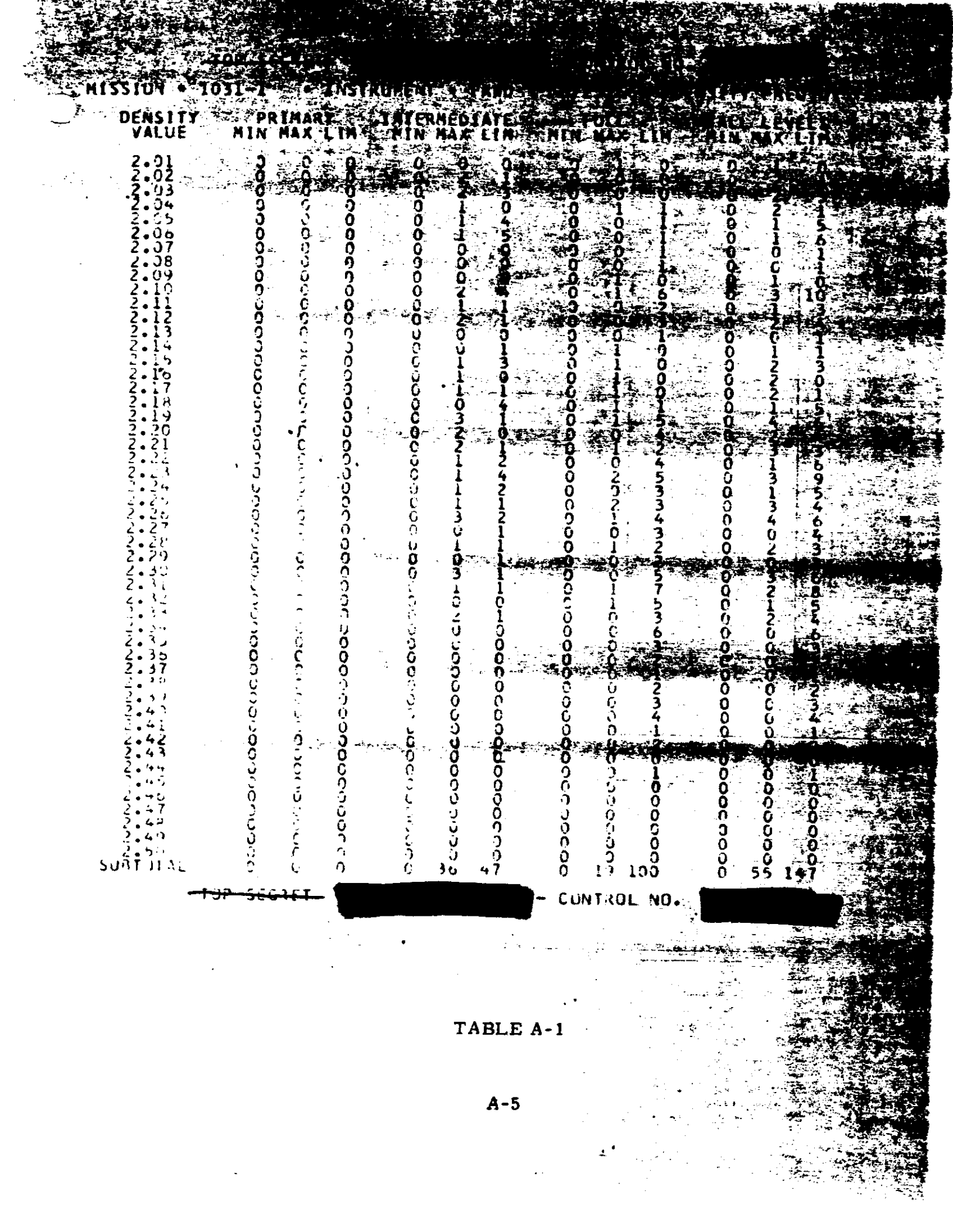

MISSION • 1031-F • INSTRUMENT • PRIM
DENSITY VALUE
PRIMARY
INTERMEDIATE
MIN MAX LIM
1.51
1.52
1.53
1.54
1.55
1.56
1.57
1.58
1.59
1.60
1.61
1.62
1.63
1.64
1.65
1.66
1.67
1.68
1.69
1.70
1.71
1.72
1.73
1.74
1.75
1.76
1.77
1.78
1.79
1.80
1.81
1.82
1.83
1.84
1.85
1.86
1.87
1.88
1.89
1.90
1.91
1.92
1.93
1.94
1.95
1.96
1.97
1.98
1.99
2.00
SUBTOTAL
1 77 47
3 59 13
4 136 60
TOP SECRET
CONTROL NO.

TABLE A-1



MISSION • 1031-1 • INSTRUMENT

DENSITY VALUE	PRIMARY MIN	PRIMARY MAX	PRIMARY LIM	INTERMEDIATE MIN	INTERMEDIATE MAX	INTERMEDIATE LIM	FOCAL PLANE MIN	FOCAL PLANE MAX	FOCAL PLANE LIM	RADIANCE LEVEL MIN	RADIANCE LEVEL MAX	RADIANCE LEVEL LIM
2.01	0	0	0	0	0	0	0	0	0	0	1	1
2.02	0	0	0	0	1	1	0	0	0	0	2	2
2.03	0	0	0	0	2	2	0	0	0	0	3	3
2.04	0	0	0	0	3	3	0	0	0	0	4	4
2.05	0	0	0	0	4	4	0	0	0	0	5	5
2.06	0	0	0	0	5	5	0	0	0	0	6	6
2.07	0	0	0	0	6	6	0	0	0	0	7	7
2.08	0	0	0	0	7	7	0	0	0	0	8	8
2.09	0	0	0	0	8	8	0	0	0	0	9	9
2.10	0	0	0	0	9	9	0	0	0	0	10	10
2.11	0	0	0	0	10	10	0	0	0	0	11	11
2.12	0	0	0	0	11	11	0	0	0	0	12	12
2.13	0	0	0	0	12	12	0	0	0	0	13	13
2.14	0	0	0	0	13	13	0	0	0	0	14	14
2.15	0	0	0	0	14	14	0	0	0	0	15	15
2.16	0	0	0	0	15	15	0	0	0	0	16	16
2.17	0	0	0	0	16	16	0	0	0	0	17	17
2.18	0	0	0	0	17	17	0	0	0	0	18	18
2.19	0	0	0	0	18	18	0	0	0	0	19	19
2.20	0	0	0	0	19	19	0	0	0	0	20	20
2.21	0	0	0	0	20	20	0	0	0	0	21	21
2.22	0	0	0	0	21	21	0	0	0	0	22	22
2.23	0	0	0	0	22	22	0	0	0	0	23	23
2.24	0	0	0	0	23	23	0	0	0	0	24	24
2.25	0	0	0	0	24	24	0	0	0	0	25	25
2.26	0	0	0	0	25	25	0	0	0	0	26	26
2.27	0	0	0	0	26	26	0	0	0	0	27	27
2.28	0	0	0	0	27	27	0	0	0	0	28	28
2.29	0	0	0	0	28	28	0	0	0	0	29	29
2.30	0	0	0	0	29	29	0	0	0	0	30	30
2.31	0	0	0	0	30	30	0	0	0	0	31	31
2.32	0	0	0	0	31	31	0	0	0	0	32	32
2.33	0	0	0	0	32	32	0	0	0	0	33	33
2.34	0	0	0	0	33	33	0	0	0	0	34	34
2.35	0	0	0	0	34	34	0	0	0	0	35	35
2.36	0	0	0	0	35	35	0	0	0	0	36	36
2.37	0	0	0	0	36	36	0	0	0	0	37	37
2.38	0	0	0	0	37	37	0	0	0	0	38	38
2.39	0	0	0	0	38	38	0	0	0	0	39	39
2.40	0	0	0	0	39	39	0	0	0	0	40	40
2.41	0	0	0	0	40	40	0	0	0	0	41	41
2.42	0	0	0	0	41	41	0	0	0	0	42	42
2.43	0	0	0	0	42	42	0	0	0	0	43	43
2.44	0	0	0	0	43	43	0	0	0	0	44	44
2.45	0	0	0	0	44	44	0	0	0	0	45	45
2.46	0	0	0	0	45	45	0	0	0	0	46	46
2.47	0	0	0	0	46	46	0	0	0	0	47	47
SUBTOTAL	0	0	0	0	47	47	0	19	100	0	55	147

TOP SECRET [redacted] - CONTROL NO. [redacted]

TABLE A-1

[redacted]

MISSION • 1031-1 • INSTRUMENT • FRMD • [redacted] DENSITY FREQ DIST

DENSITY VALUE	PRIMARY MIN	MAX	LIM	INTERMEDIATE MIN	MAX	LIM	FULL MIN	MAX	LIM	ALL LEVELS MIN	MAX	LIM
2.51	0	0	0	0	0	0	0	0	0	0	0	0
2.52	0	0	0	0	0	0	0	0	0	0	0	0
2.53	0	0	0	0	0	0	0	0	0	0	0	0
2.54	0	0	0	0	0	0	0	0	0	0	0	0
2.55	0	0	0	0	0	0	0	0	0	0	0	0
2.56	0	0	0	0	0	0	0	0	0	0	0	0
2.57	0	0	0	0	0	0	0	0	0	0	0	0
2.58	0	0	0	0	0	0	0	0	0	0	0	0
2.59	0	0	0	0	0	0	0	0	0	0	0	0
2.60	0	0	0	0	0	0	0	0	0	0	0	0
2.61	0	0	0	0	0	0	0	0	0	0	0	0
2.62	0	0	0	0	0	0	0	0	0	0	0	0
2.63	0	0	0	0	0	0	0	0	0	0	0	0
2.64	0	0	0	0	0	0	0	0	0	0	0	0
2.65	0	0	0	0	0	0	0	0	0	0	0	0
2.66	0	0	0	0	0	0	0	0	0	0	0	0
2.67	0	0	0	0	0	0	0	0	0	0	0	0
2.68	0	0	0	0	0	0	0	0	0	0	0	0
2.69	0	0	0	0	0	0	0	0	0	0	0	0
2.70	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	126	128	96	124	124	114	252	252	210

MISSION 1031-1 INSTR - FRMD 8/25/66 PROCESSING AND EXPOSURE ANALYSIS

PROCESS LEVEL	SAMPLE SIZE	UNDER EXPOSED	UNDER PROCESSED	CORRECT EXP+PROC	OVER PROCESSED	OVER EXPOSED
PRIMARY	0	0 PC	0 PC	0 PC	0 PC	0 PC
INTERMEDIATE	128	0 PC	16 PC	59 PC	20 PC	5 PC
FULL	124	3 PC	0 PC	82 PC	15 PC	0 PC
ALL LEVELS	252	2 PC	8 PC	70 PC	17 PC	[illegible]

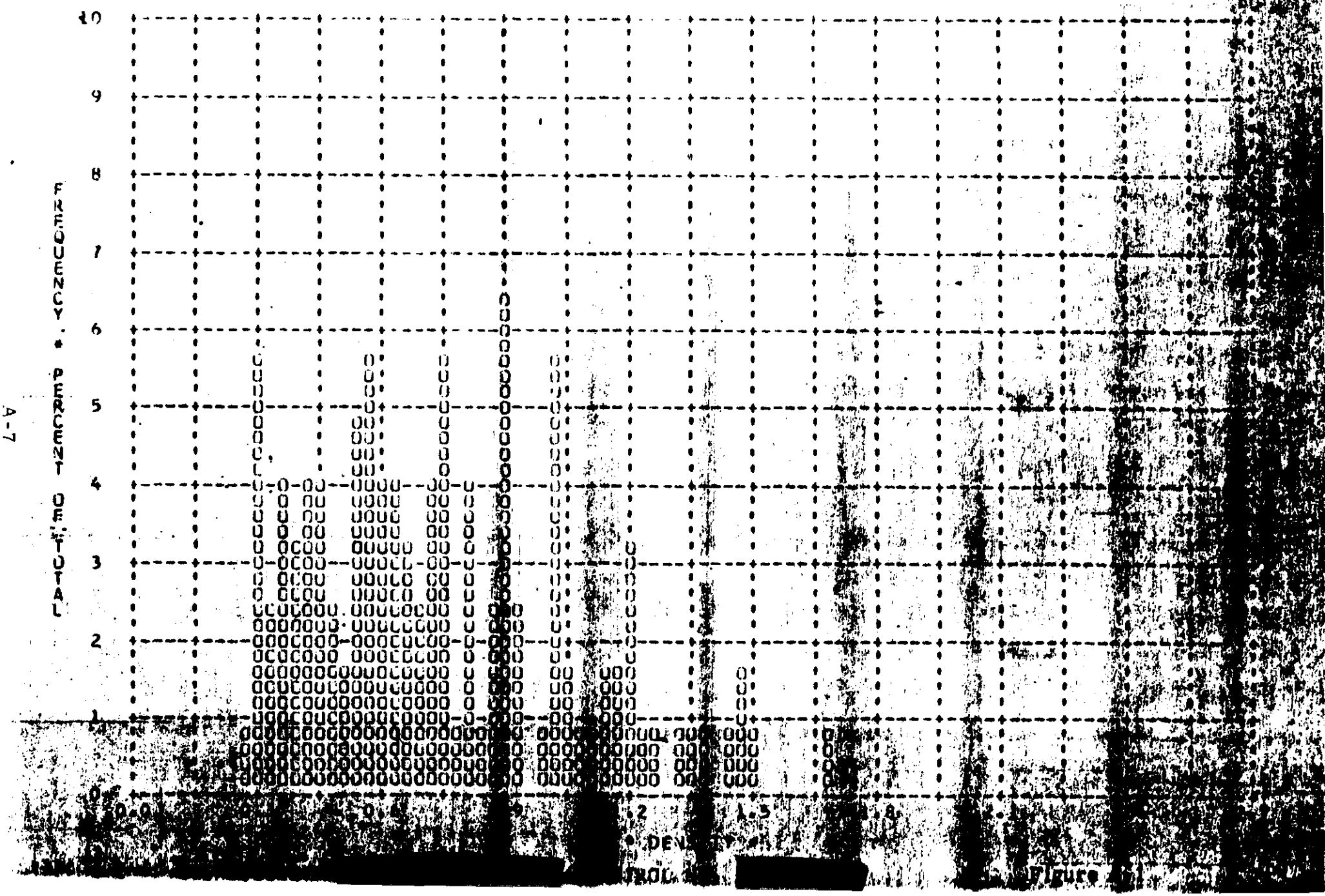
PROCESS LEVEL	BASE + PCS	UNDER EXPOSED	UNDER PROCESSED	CORRECT EXP+PROC	OVER PROCESSED	OVER EXPOSED
PRIMARY	0.01-0.09	0.01-0.13	0.14-0.39	0.40-0.90	---------	0.91 AND UP
INTERMED	0.10-0.17	0.01-0.20	0.21-0.39	0.40-0.90	0.91-1.34	1.35 AND UP
FULL	0.18 AND UP	0.01-0.39	---------	0.40-0.90	[illegible]	[illegible]

~~TOP SECRET~~ [redacted] CONTROL NO. [redacted]

TABLE A-1

MISSION • 1031-1 • INSTR • IRMD • 8/25/66 PLOT OF D MIN • TERRAIN • PROCESSING • INTERMEDIATE

ARITH MEAN • 0.73 • MEDIAN • 0.68 • STD DEV • 0.32 • RANGE • 0.25 TO 1.67 WITH 128 SAMPLES



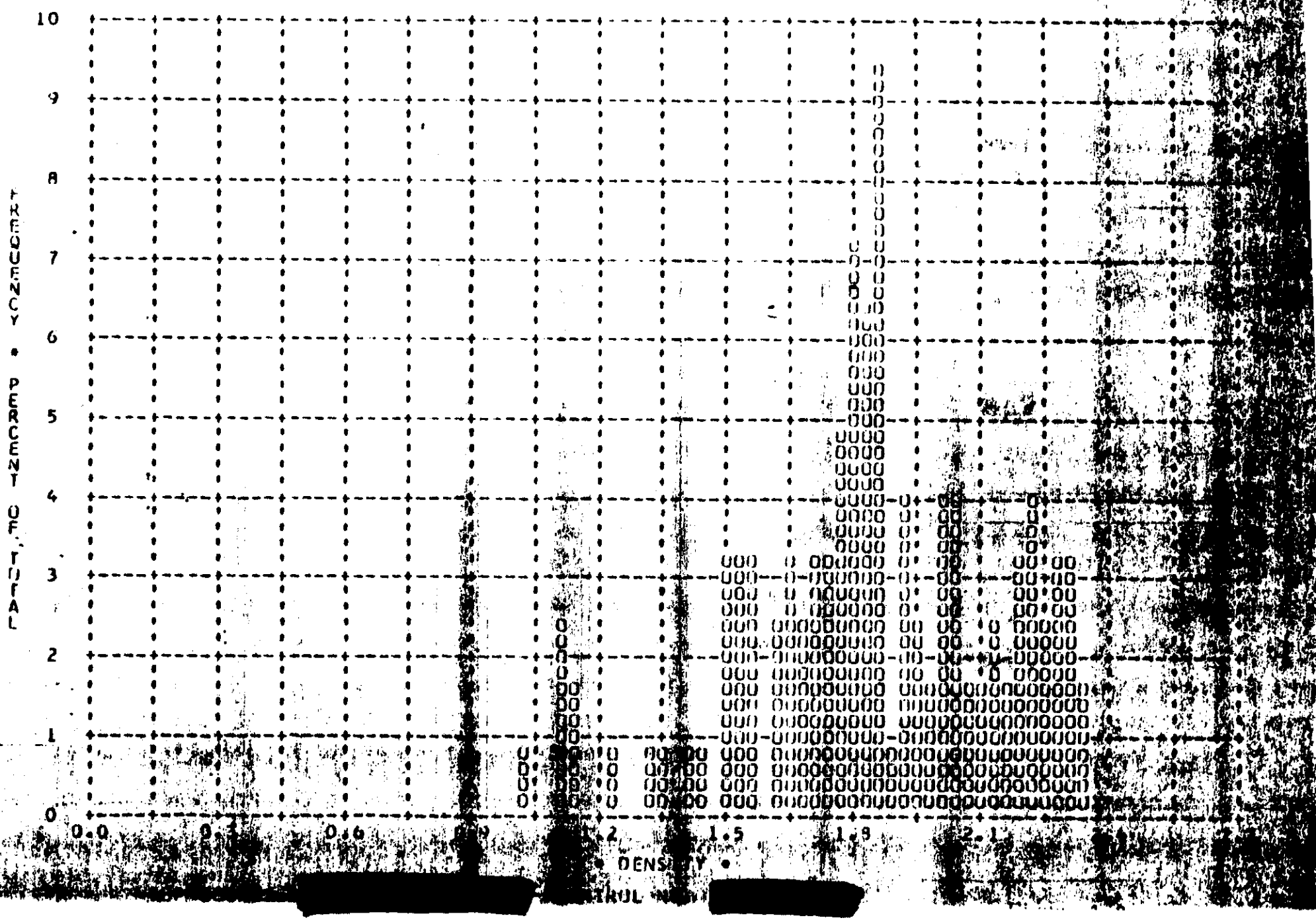
[redacted]

Figure [redacted]

[redacted] - CONTROL NO. [redacted]

MISSION • 1031-1 • USER • RWO • 8/25/76 PLOT OF D MAX • TERRAIN • PROCESSING • INTERMEDIATE •

ARITH MEAN • 1.94 • MEDIAN • 1.95 • STD DEV • 0.30 • RANGE • 1.02 TO 2.33 WITH 128 SAMPLES

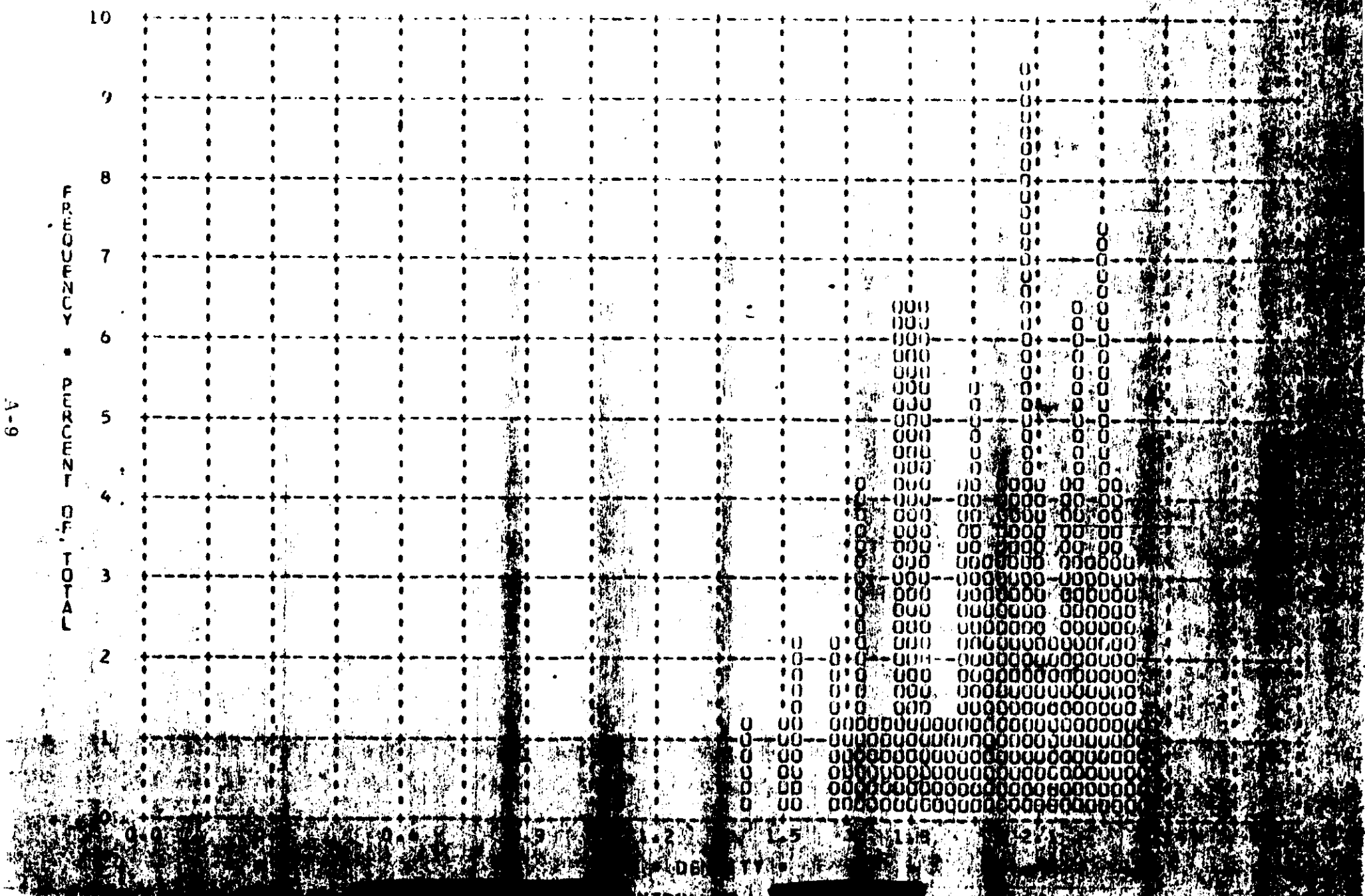


[redacted] CONTROL NO. [redacted]

[redacted] - CONTR NO. [redacted]

MISSION • 1031-1 • INSTR • ERWD • 9/25/76 PLOT OF D MAX • CLOUD • PROCESSING • INTERMEDIATE

ARITH MEAN • 1.88 • MEDIAN • 2.00 • STD DEV • 0.22 • RANGE • 1.40 TO 2.33 WITH 96 SAMPLES



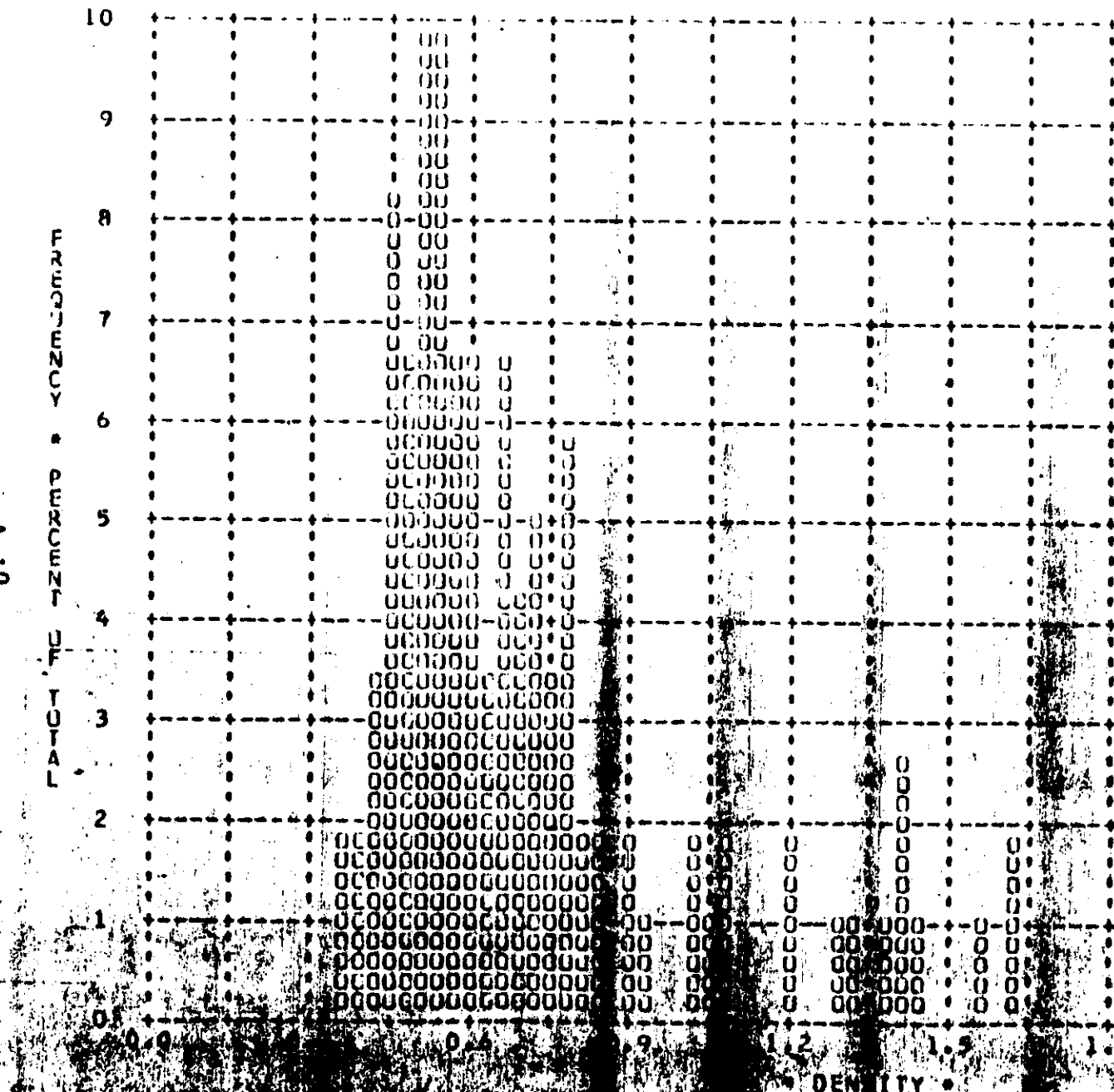
[redacted]

Figure A-5

[redacted] CONTR NO. [redacted]

MISSION • 1031-1 • LASER • FRMD • 8/25/66 PLOT OF 0 MIN • TERRAIN • PROCESSING • FULL

ARITH MEAN • 0.69 • MEDIAN • 0.69 • STD DEV • 0.24 • RANGE • 0.34 TO 1.60 WITH 124 SAMPLES



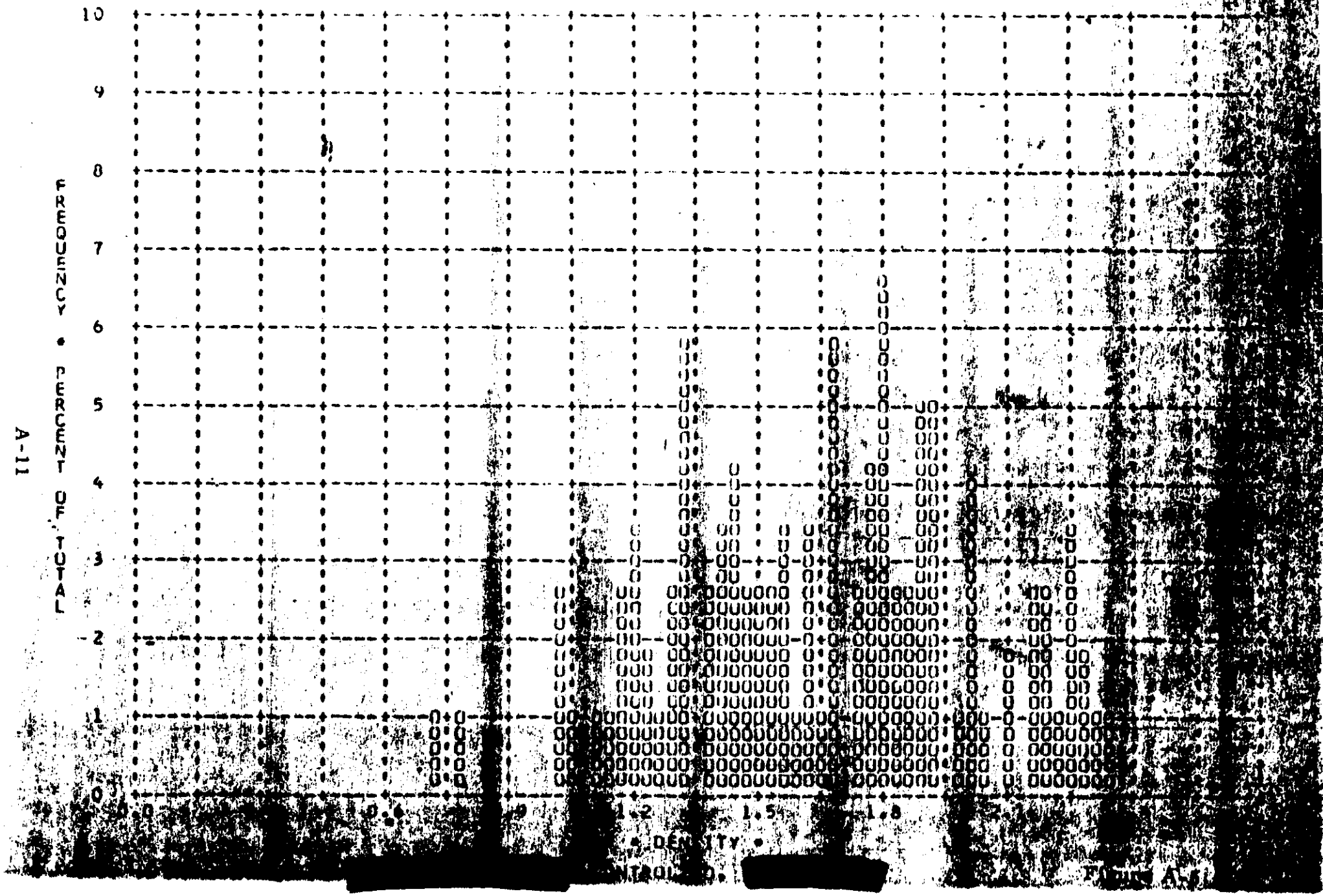
[redacted]

Figure A-4

[redacted] - COPY ID. [redacted]

MISSION • 1031-1 • ESSA • FRWD • 972 766 PLOT OF D MAX • TERRAIN • PROCESSING • FULL

ARITH MEAN • 1.65 • MEDIAN • 1.66 • STD DEV • 0.36 • RANGE • 0.72 TO 2.32 WITH 124 SAMPLES

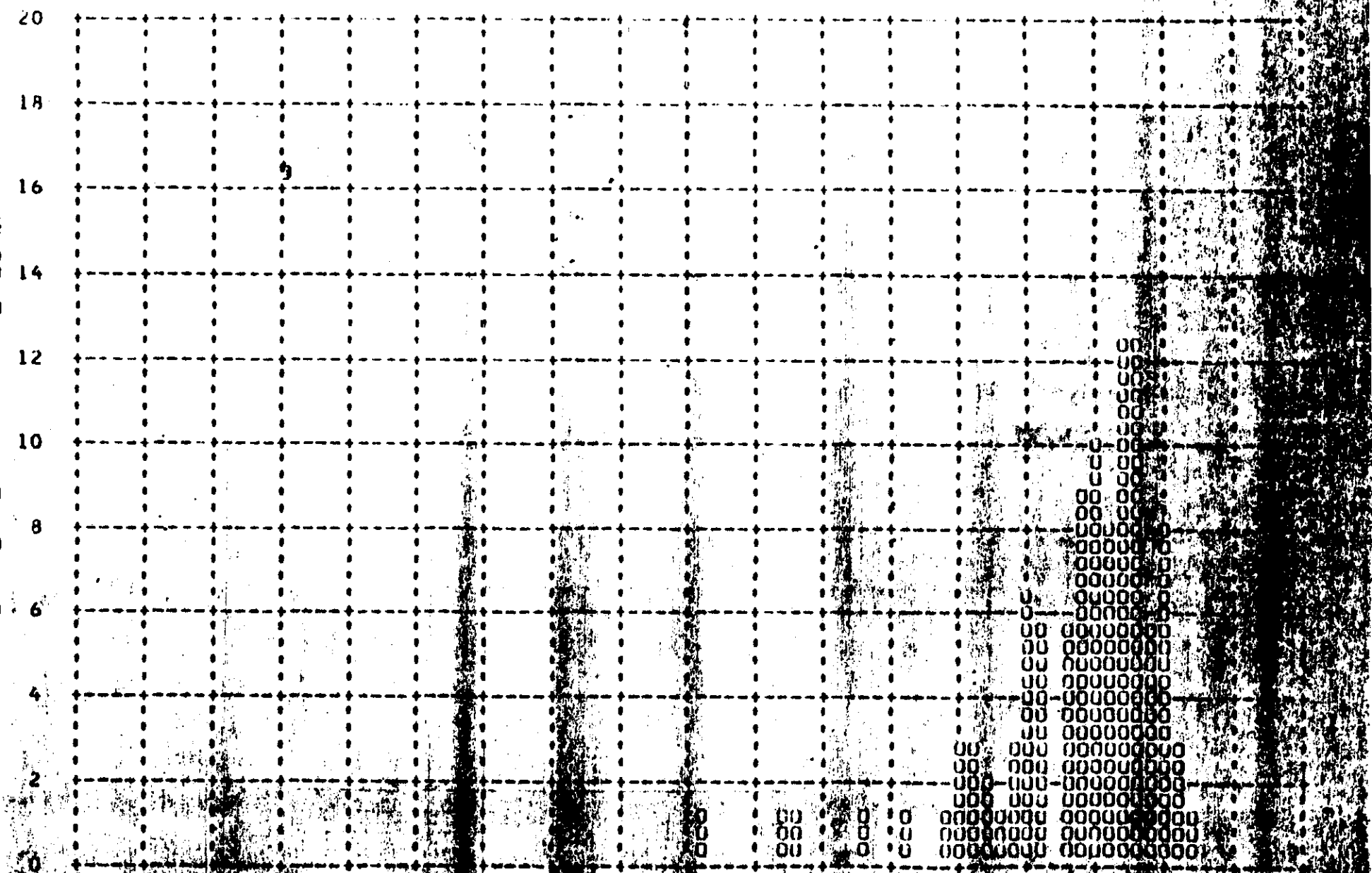


[redacted]

[redacted] CONTR NO. [redacted]

MISSION • 1031-1 • INSTR • FRMB • 4/25/66 PLOT OF D MAX • CLOUD • PROCESSING • FULL

ARITH MEAN • 2.21 • MEDIAN • 2.25 • STD DEV • 3.14 • RANGE • 1.36 TO 2.44 WITH 114 SAMPLES



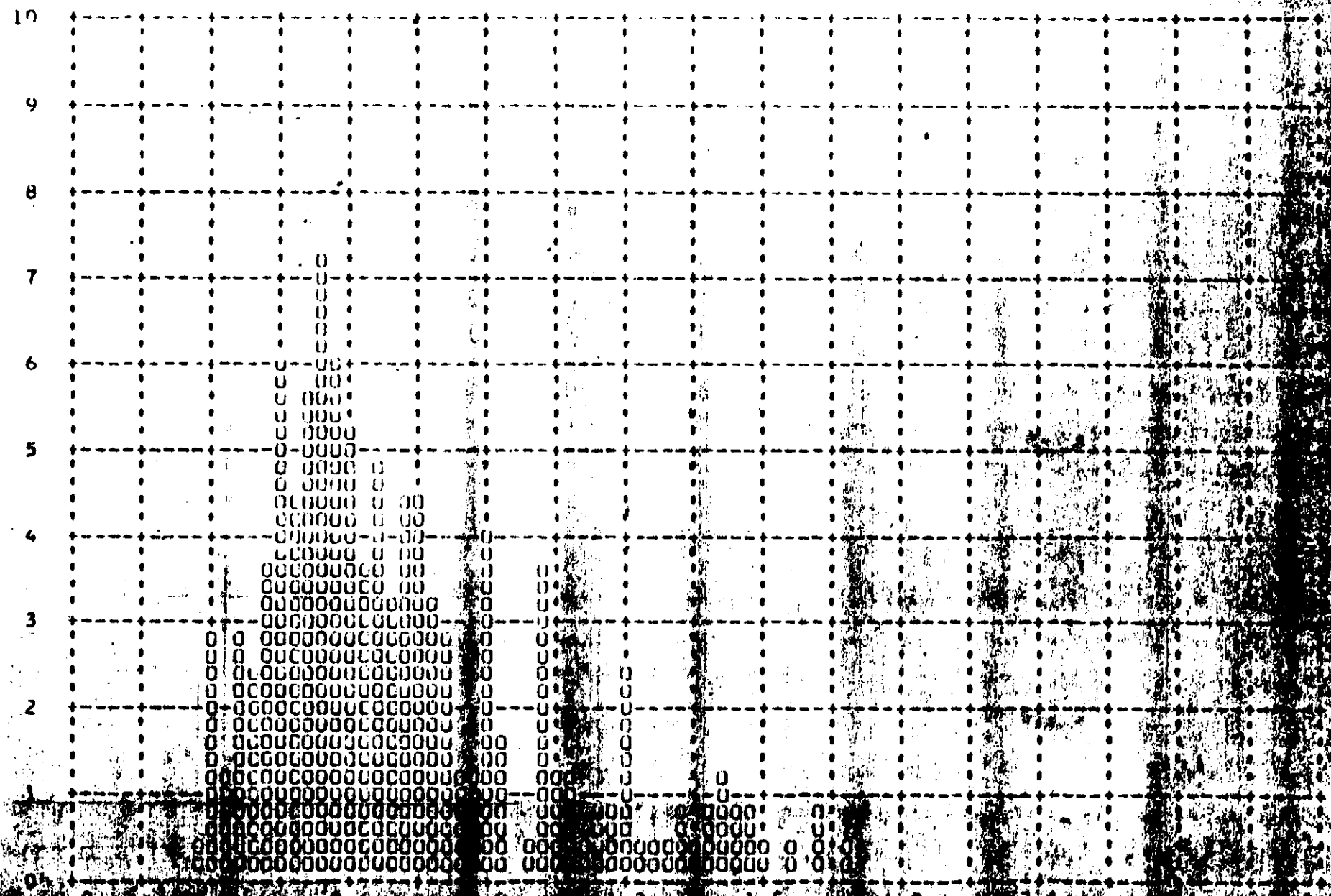
[redacted] CONTROL NO. [redacted]

Figure A-8

[redacted] - CONTR NO. [redacted]

MISSION • 1031-1 • INSTR • ERNO • [illegible] PLOT OF D MIN • TERRAIN • PROCESSING • ALL LEVELS

ARITH MEAN • 0.71 • MEDIAN • [illegible] • STD DEV • 0.33 • RANGE • 0.25 TO 1.67 WITH 252 SAMPLES



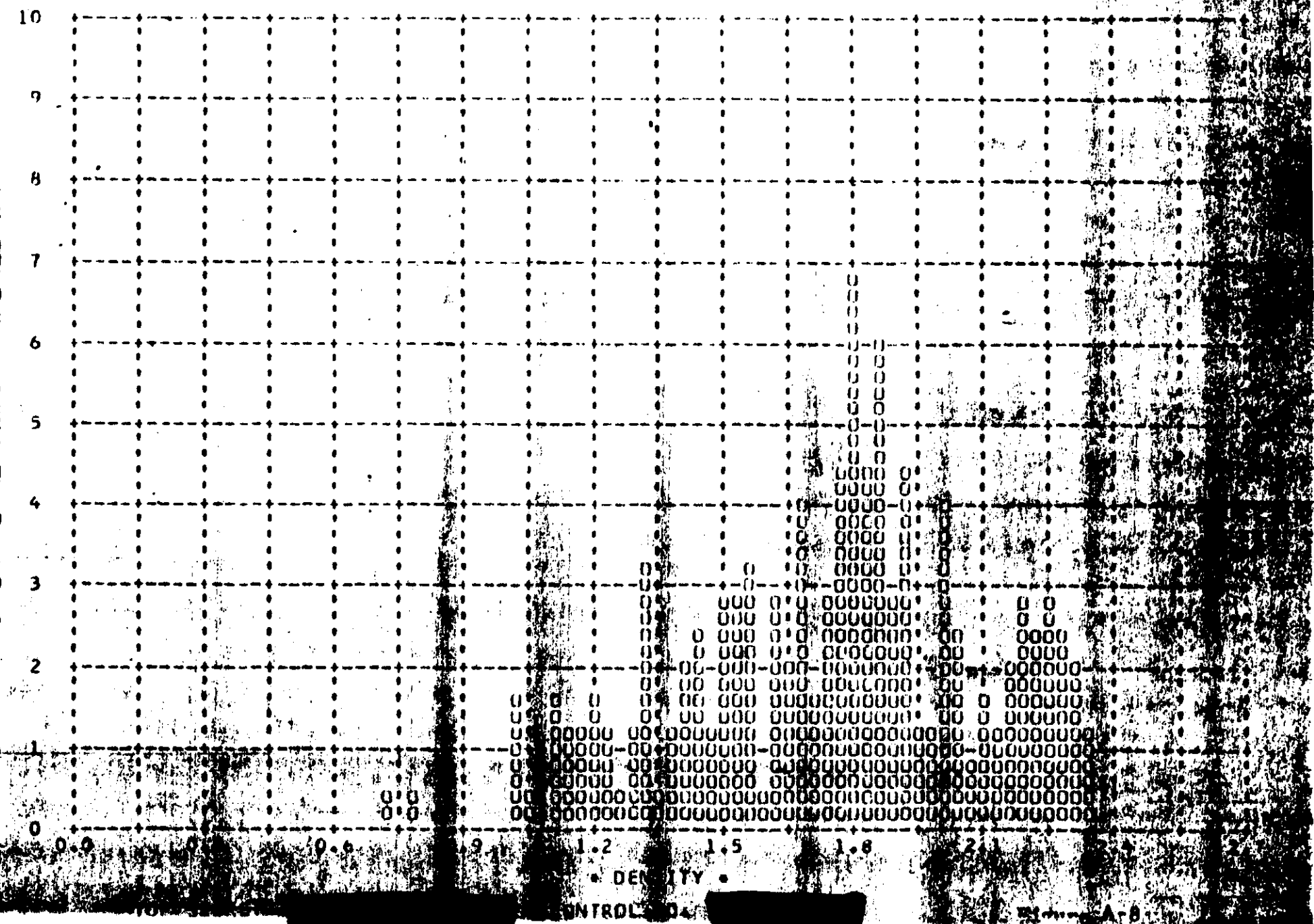
[redacted] CONTROL NO. [redacted]

Figure A-7

[redacted] - COPTER NO. [redacted]

MISSION • 1941-1 • INSTR • FRWD • 8/25/66 PLOT OF D MAX • TERRAIN • PROCESSING • ALL LEVELS

ARITH MEAN • 1.74 • MEDIAN • 1.80 • STD DEV • 0.34 • RANGE • 0.72 TO 2.33 WITH 252 SAMPLES



[redacted] CONTROL [redacted]

MISSION • 1031-1 • INSTR • FRWD • 8/25/66 PLOT OF D MAX • CLOUD • PROCESSING • ALL LEVELS

ARITH MEAN • 2.10 • MEDIAN • 2.18 • STD DEV • 0.23 • RANGE • 1.36 TO 2.44 WITH 210 SAMPLES

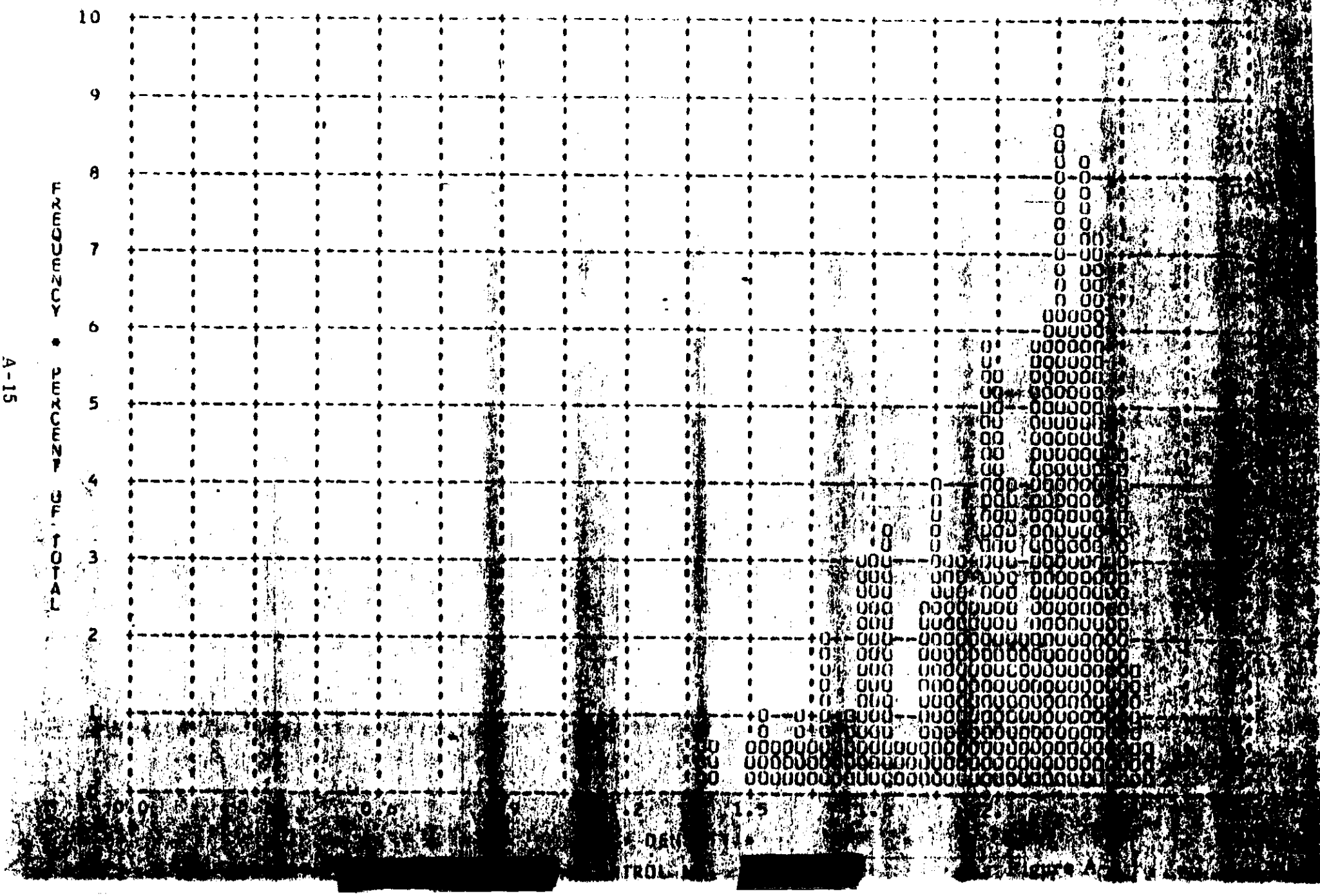


Figure A

MISSION • 1031-1 • INSTRUMENT • AE [redacted]

DENSITY VALUE	PRIMARY MIN	PRIMARY MAX	PRIMARY LIN	INTERMEDIATE MIN	INTERMEDIATE MAX	INTERMEDIATE LIN	[illegible] MIN	[illegible] MAX	[illegible] LIN	[illegible] LEVEL MIN	[illegible] LEVEL MAX	[illegible] LEVEL LIN
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	0	0	0	25	0	0	49	0	0	77	0	0

TOP SECRET [redacted] - CONTROL NO. [redacted]

TABLE A-2

MISSION # 1031-1

DENSITY VALUE	PRIMARY MIN	PRIMARY MAX LIM	INTERMED MIN	INTERMED MAX LIM	MIN	MIN LIM	MAX	MAX LIM
0.51	0	0	0	0	0	0	0	0
0.52	0	0	0	0	0	0	0	0
0.53	0	0	0	0	0	0	0	0
0.54	0	0	0	0	0	0	0	0
0.55	0	0	0	0	0	0	0	0
0.56	0	0	0	0	0	0	0	0
0.57	0	0	0	0	0	0	0	0
0.58	0	0	0	0	0	0	0	0
0.59	0	0	0	0	0	0	0	0
0.60	0	0	0	0	0	0	0	0
0.61	0	0	0	0	0	0	0	0
0.62	0	0	0	0	0	0	0	0
0.63	0	0	0	0	0	0	0	0
0.64	0	0	0	0	0	0	0	0
0.65	0	0	0	0	0	0	0	0
0.66	0	0	0	0	0	0	0	0
0.67	0	0	0	0	0	0	0	0
0.68	0	0	0	0	0	0	0	0
0.69	0	0	0	0	0	0	0	0
0.70	0	0	0	0	0	0	0	0
0.71	0	0	0	0	0	0	0	0
0.72	0	0	0	0	0	0	0	0
0.73	0	0	0	0	0	0	0	0
0.74	0	0	0	0	0	0	0	0
0.75	0	0	0	0	0	0	0	0
0.76	0	0	0	0	0	0	0	0
0.77	0	0	0	0	0	0	0	0
0.78	0	0	0	0	0	0	0	0
0.79	0	0	0	0	0	0	0	0
0.80	0	0	0	0	0	0	0	0
0.81	0	0	0	0	0	0	0	0
0.82	0	0	0	0	0	0	0	0
0.83	0	0	0	0	0	0	0	0
0.84	0	0	0	0	0	0	0	0
0.85	0	0	0	0	0	0	0	0
0.86	0	0	0	0	0	0	0	0
0.87	0	0	0	0	0	0	0	0
0.88	0	0	0	0	0	0	0	0
0.89	0	0	0	0	0	0	0	0
0.90	0	0	0	0	0	0	0	0
0.91	0	0	0	0	0	0	0	0
0.92	0	0	0	0	0	0	0	0
0.93	0	0	0	0	0	0	0	0
0.94	0	0	0	0	0	0	0	0
0.95	0	0	0	0	0	0	0	0
0.96	0	0	0	0	0	0	0	0
0.97	0	0	0	0	0	0	0	0
0.98	0	0	0	0	0	0	0	0
0.99	0	0	0	0	0	0	0	0
1.00	0	0	0	0	0	0	0	0
SUBTOTAL	0	0	0	61	8	0	75	9	0	136	17	0

~~TOP SECRET~~ [redacted] - CONTROL NO. [redacted]

TABLE A-2

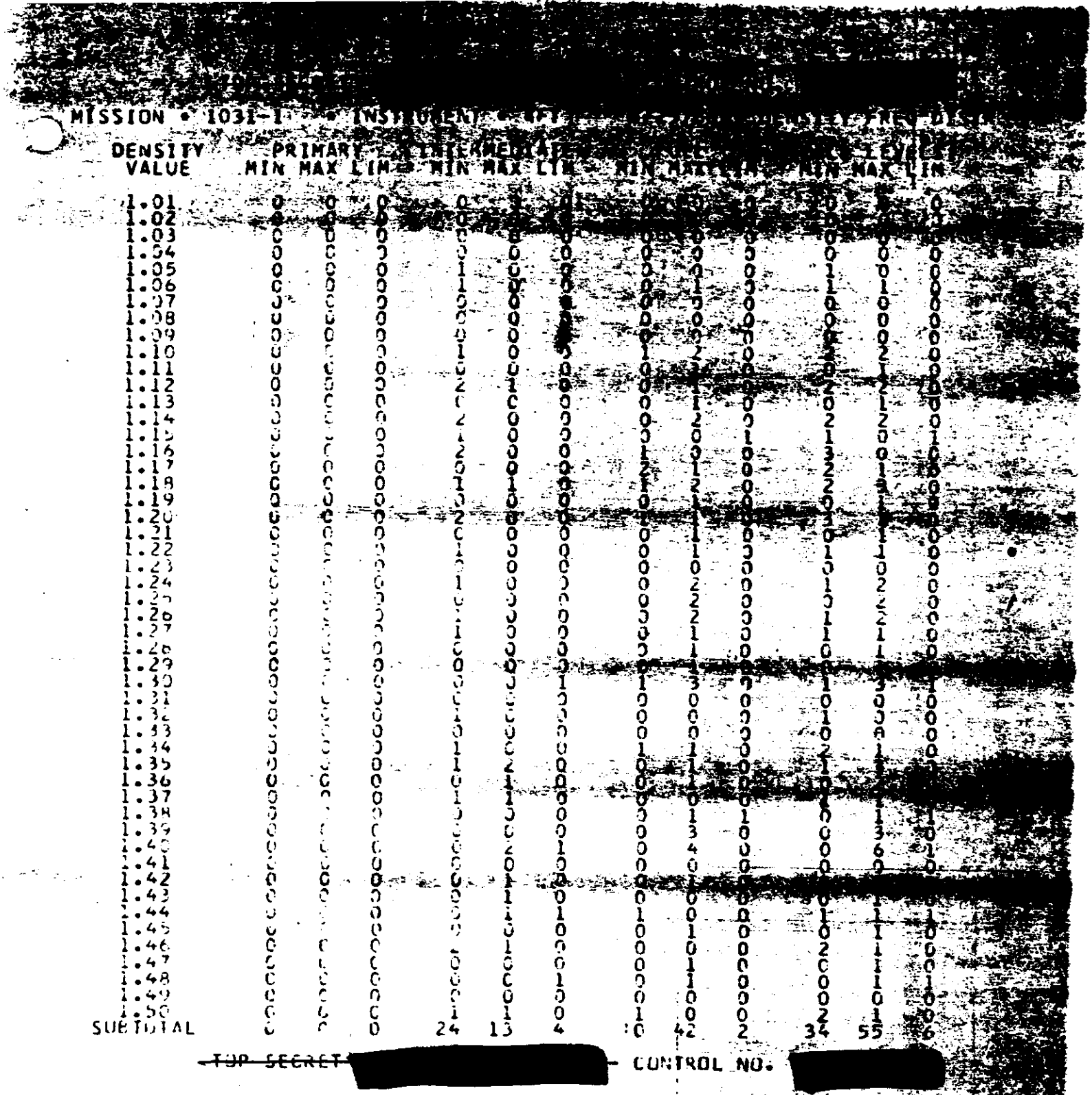

MISSION • 1031-I
DENSITY VALUE
PRIMARY
MIN MAX LIM
SUBTOTAL
TOP SECRET
CONTROL NO.

TABLE A-2

MISSION • 1031-I • INSTRUMENT [illegible] DENSITY FREQ DI

DENSITY VALUE	PRIMARY MIN	PRIMARY MAX	PRIMARY LIM	INTERMEDIATE MIN	INTERMEDIATE MAX	INTERMEDIATE LIM	FULL MIN	FULL MAX	FULL LIM	REF LEVEL MIN	REF LEVEL MAX	REF LEVEL LIM
1.51	0	0	0	0	0	0	0	0	0	0	0	0
1.52	0	0	0	0	0	0	0	0	0	0	0	0
1.53	0	0	0	0	1	0	0	1	0	0	2	0
1.54	0	0	0	0	2	0	0	2	0	0	2	1
1.55	0	0	0	0	2	0	0	0	0	0	2	1
1.56	0	0	0	0	2	0	0	4	0	0	2	2
1.57	0	0	0	0	0	0	0	4	0	0	6	2
1.58	0	0	0	0	0	0	0	1	0	0	1	2
1.59	0	0	0	0	0	0	0	0	0	0	0	2
1.60	0	0	0	0	4	0	0	4	0	0	8	2
1.61	0	0	0	0	1	0	0	1	0	0	0	2
1.62	0	0	0	0	0	0	0	0	0	0	1	2
1.63	0	0	0	0	2	0	0	3	0	0	1	2
1.64	0	0	0	0	4	0	0	1	0	0	5	2
1.65	0	0	0	0	1	0	0	2	0	0	3	2
1.66	0	0	0	0	5	0	0	1	0	0	6	2
1.67	0	0	0	0	1	0	0	0	0	0	1	2
1.68	0	0	0	0	0	0	0	1	0	0	0	2
1.69	0	0	0	0	2	0	0	0	0	0	2	2
1.70	0	0	0	0	2	0	0	2	1	0	1	2
1.71	0	0	0	0	2	0	0	1	1	0	3	2
1.72	0	0	0	0	2	0	0	3	1	0	3	2
1.73	0	0	0	0	2	0	0	1	0	0	2	2
1.74	0	0	0	0	3	0	0	3	0	0	2	3
1.75	0	0	0	0	3	0	0	0	0	0	3	3
1.76	0	0	0	0	2	0	0	1	1	0	1	3
1.77	0	0	0	0	2	0	0	2	1	0	3	3
1.78	0	0	0	0	1	0	0	0	2	0	3	3
1.79	0	0	0	0	4	0	0	6	2	0	3	4
1.80	0	0	0	0	3	0	0	3	1	0	4	4
1.81	0	0	0	0	3	0	0	1	0	0	4	4
1.82	0	0	0	0	3	0	0	2	1	0	4	4
1.83	0	0	0	0	1	0	0	1	0	0	2	4
1.84	0	0	0	0	2	0	0	1	0	0	2	4
1.85	0	0	0	0	1	0	0	2	0	0	2	4
1.86	0	0	0	0	2	0	0	1	0	0	2	4
1.87	0	0	0	0	2	0	0	2	1	0	0	4
1.88	0	0	0	0	3	0	0	1	0	0	4	4
1.89	0	0	0	0	5	0	0	1	0	0	4	5
1.90	0	0	0	0	3	0	0	0	0	0	1	5
1.91	0	0	0	0	3	0	0	0	3	0	2	5
1.92	0	0	0	0	3	0	0	1	3	0	2	5
1.93	0	0	0	0	4	1	0	1	3	0	1	5
1.94	0	0	0	0	1	0	0	0	2	0	0	5
1.95	0	0	0	0	1	0	0	0	2	0	1	5
1.96	0	0	0	0	1	0	0	0	5	0	1	6
1.97	0	0	0	0	1	0	0	1	1	0	2	6
1.98	0	0	0	0	2	0	0	0	0	0	2	6
1.99	0	0	0	0	0	0	0	0	0	0	0	6
2.00	0	0	0	0	5	0	0	3	4	0	8	6
SUBTOTAL	0	0	0	4	76	57	0	61	35	4	137	92

TOP SECRET [redacted] CONTROL NO. [redacted]

TABLE A-2

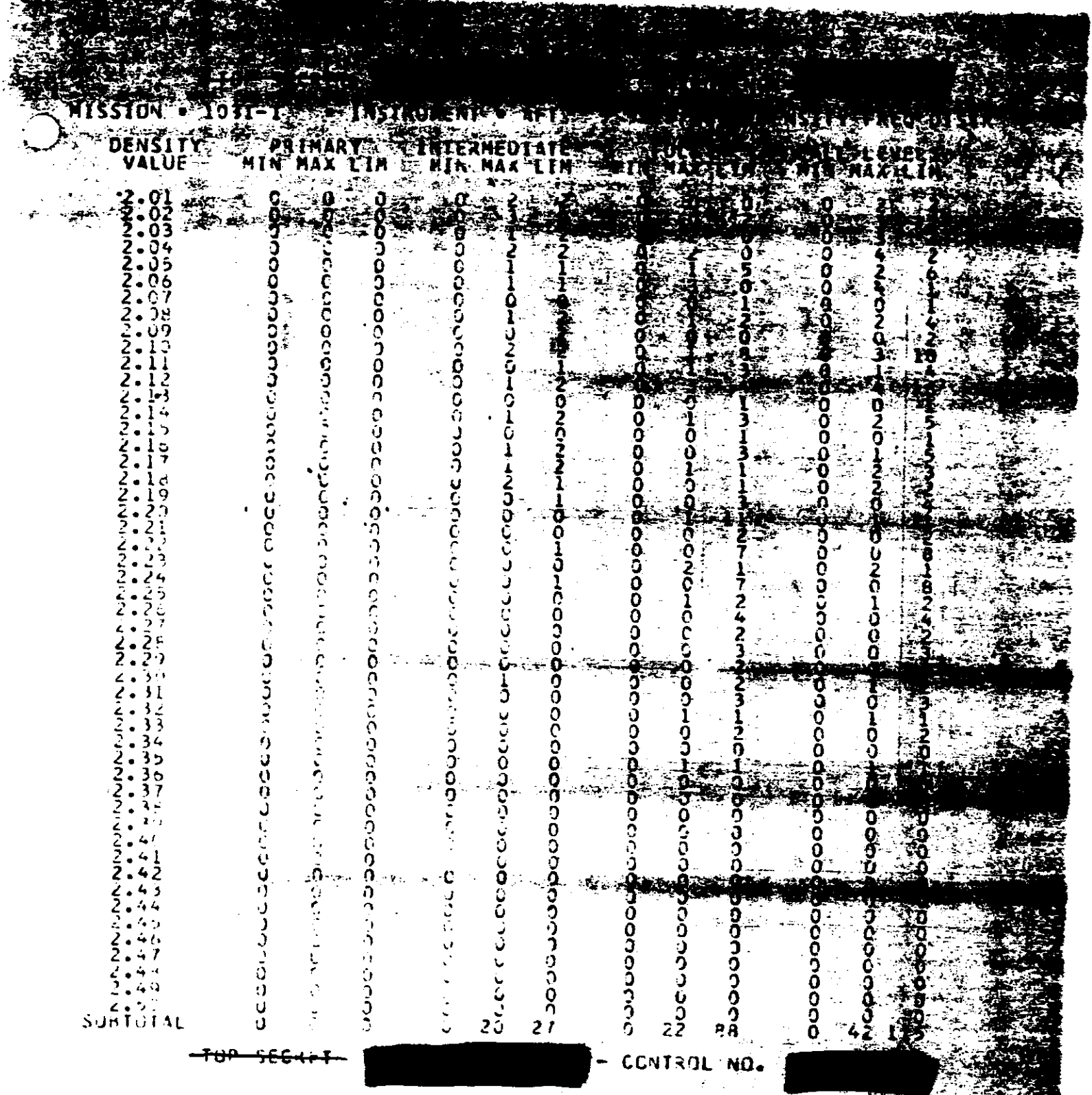

DENSITY VALUE
PRIMARY
INTERMEDIATE
MIN MAX LIM
SUBTOTAL
TOP SECRET
CONTROL NO.

TABLE A-2

MISSION • 1031-1 • INSTRUMENT • AFT

DENSITY VALUE	PRIMARY MIN	PRIMARY MAX	PRIMARY LIN	INTERMEDIATE MIN	INTERMEDIATE MAX	INTERMEDIATE LIN	[illegible] MIN	[illegible] MAX	[illegible] LIN	[illegible] MIN	[illegible] MAX	[illegible] LIN
2.51	0	0	0	0	0	0						
2.52	0	0	0	0	0	0						
2.53	0	0	0	0	0	0	0	0	0	0	0	0
2.54	0	0	0	0	0	0	0	0	0	0	0	0
2.55	0	0	0	0	0	0	0	0	0	0	0	0
2.56	0	0	0	0	0	0	0	0	0	0	0	0
2.57	0	0	0	0	0	0	0	0	0	0	0	0
2.58	0	0	0	0	0	0	0	0	0	0	0	0
2.59	0	0	0	0	0	0	0	0	0	0	0	0
2.60	0	0	0	0	0	0	0	0	0	0	0	0
2.61	0	0	0	0	0	0	0	0	0	0	0	0
2.62	0	0	0	0	0	0	0	0	0	0	0	0
2.63	0	0	0	0	0	0	0	0	0	0	0	0
2.64	0	0	0	0	0	0	0	0	0	0	0	0
2.65	0	0	0	0	0	0	0	0	0	0	0	0
2.66	0	0	0	0	0	0	0	0	0	0	0	0
2.67	0	0	0	0	0	0	0	0	0	0	0	0
2.68	0	0	0	0	0	0	0	0	0	0	0	0
2.69	0	0	0	0	0	0	0	0	0	0	0	0
2.70	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	117	117	88	134	134	125	251	251	213

MISSION 1031-1 INSTR - AFT 3/25/66 PROCESSING AND EXPOSURE [illegible]

PROCESS LEVEL	SAMPLE SIZE	UNDER EXPOSED	UNDER PROCESSED	CORRECT EXP+PROC	OVER PROCESSED	OVER EXPOSED
PRIMARY	0	0 PC	0 PC	0 PC	0 PC	0 PC
INTERMEDIATE	117	0 PC	9 PC	58 PC	26 PC	6 PC
FULL	134	7 PC	0 PC	81 PC	12 PC	0 PC
ALL LEVELS	251	4 PC	4 PC	70 PC	18 PC	3 PC

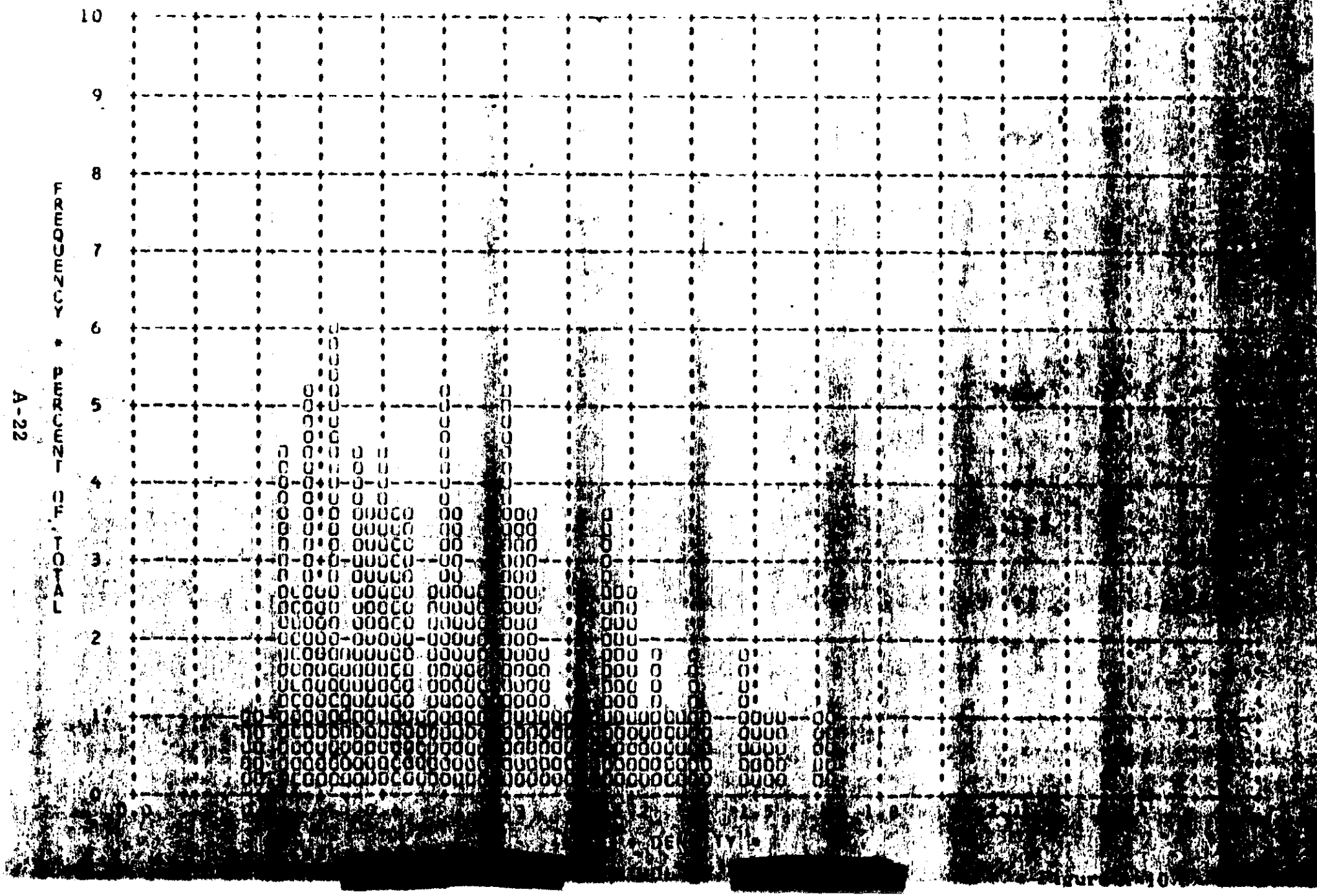
PROCESS LEVEL	BASE + FOG	UNDER EXPOSED	UNDER PROCESSED	CORRECT EXP+PROC	OVER PROCESSED	OVER EXPOSED
PRIMARY	0.01-0.09	0.01-0.13	0.14-0.39	0.40-0.90	----------	0.91-[illegible]
INTERMED	0.10-0.17	0.01-0.20	0.21-0.39	0.40-0.90	0.91-1.[illegible]	[illegible]
FULL	0.18 AND UP	0.01-0.39	----------	----------	----------	----------

~~TOP SECRET~~ [redacted] - CONTROL NO. [redacted]

TABLE A-2

MISSION • 1041-1 • [illegible] • APR • [illegible] PLOT IF 0 MIN • TERRAIN • PROCESSING • INTERMEDIATE

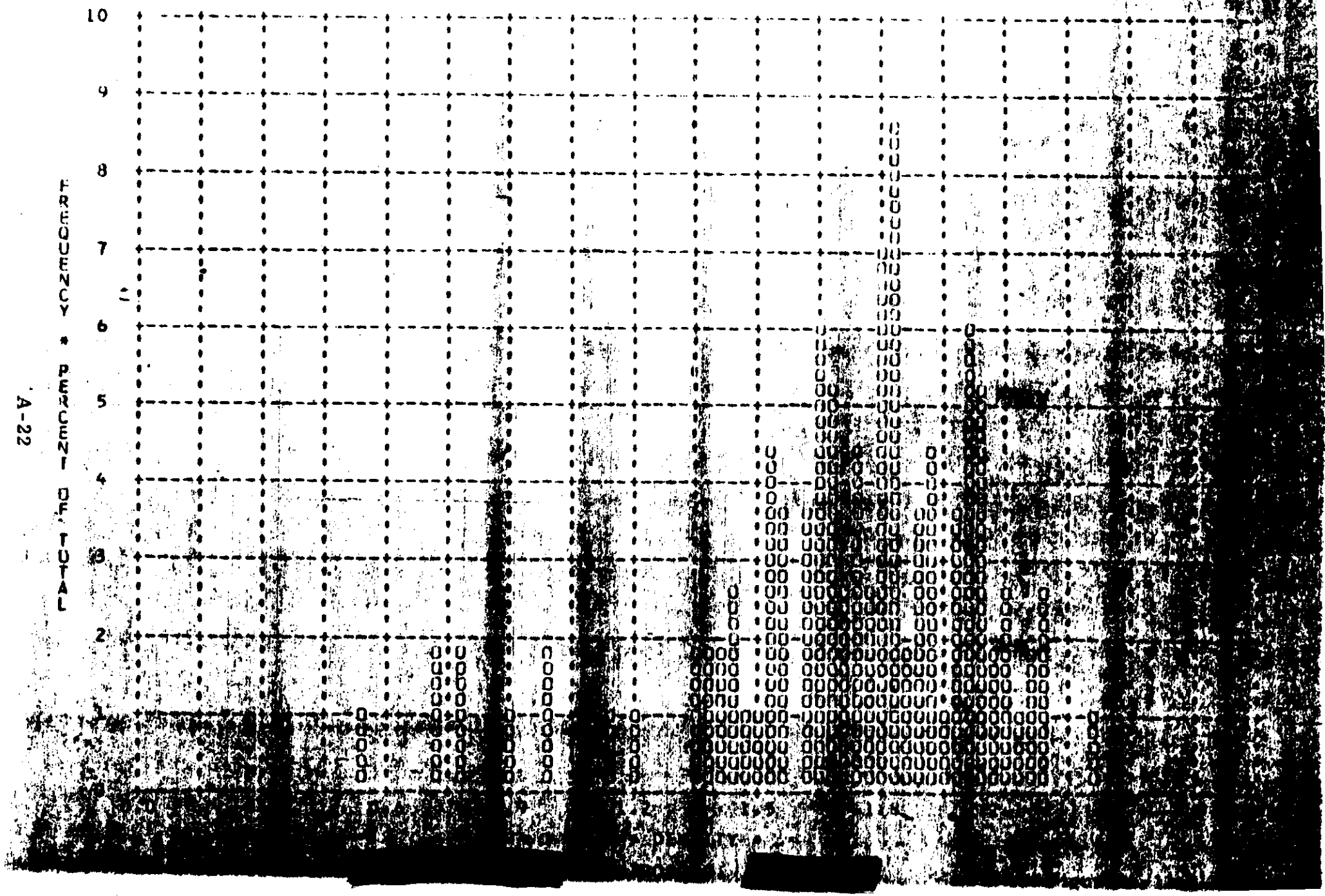
ARITH MEAN • 0.40 • MEDIAN • [illegible] • STD DEV • 0.34 • RANGE • 0.27 TO 1.66 WITH 117 SAMPLES



[redacted] - CONTROL NO. [redacted]

MISSION • 1031-2 • INSTR • AFT • 07/27/66 PLOT OF D MAX • TERRAIN • PROCESSING • INTERMEDIATE

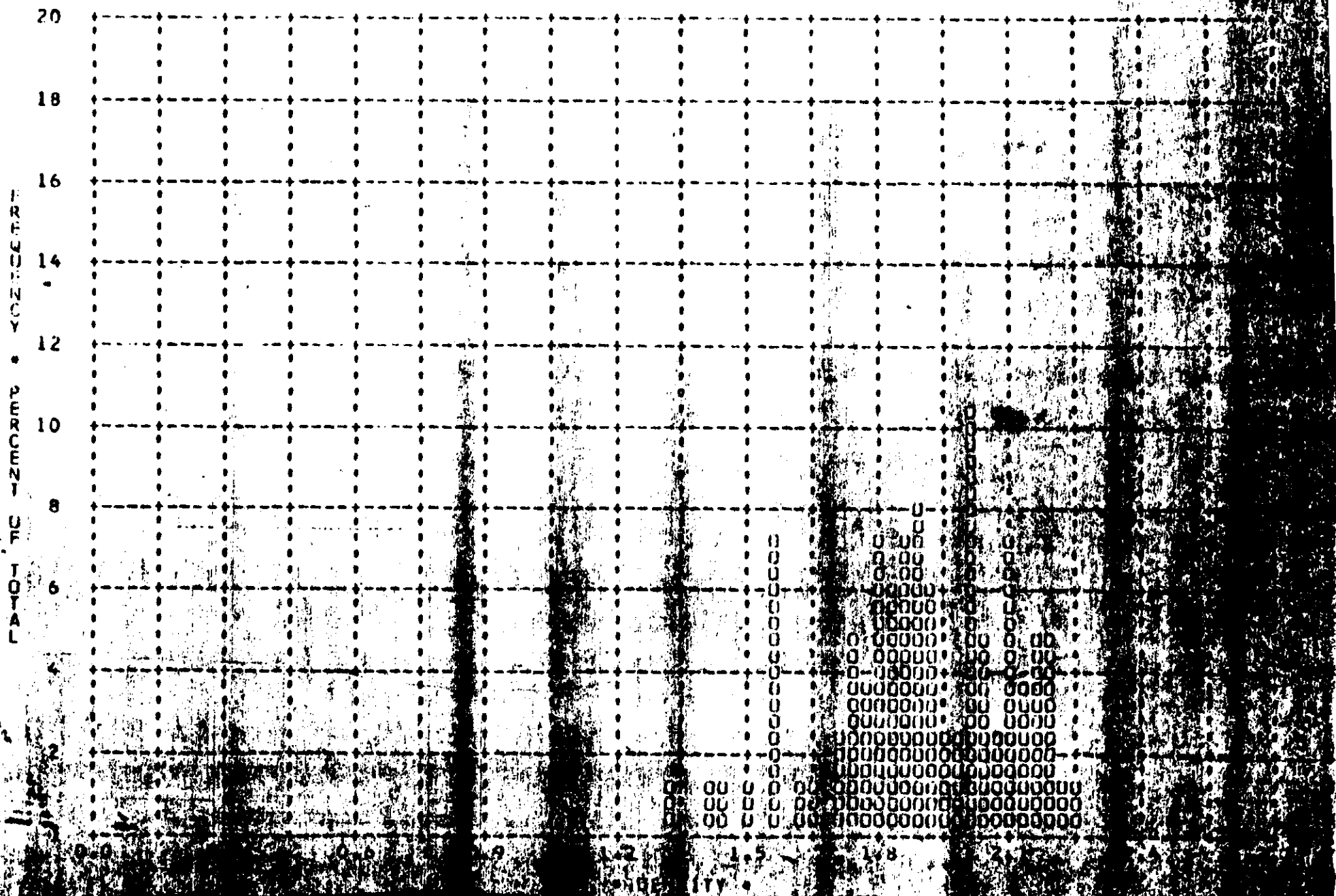
ARITH MEAN • 1.71 • MEDIAN • 1.73 • STD DEV • [illegible] • RANGE • 0.33 TO 2.33 WITH 117 SAMPLES



[redacted] - CONTR . NO. [redacted]

MISSION • 1041-L • INSTR • AFT • 4/25/66 PLOT OF D MAX • CLOUD • PROCESSING • INTERMEDIATE

ARITH MEAN • 1.93 • MEDIAN • 1.98 • STD DEV • [illegible] • RANGE • 1.40 TO 2.24 WITH 88 SAMPLES

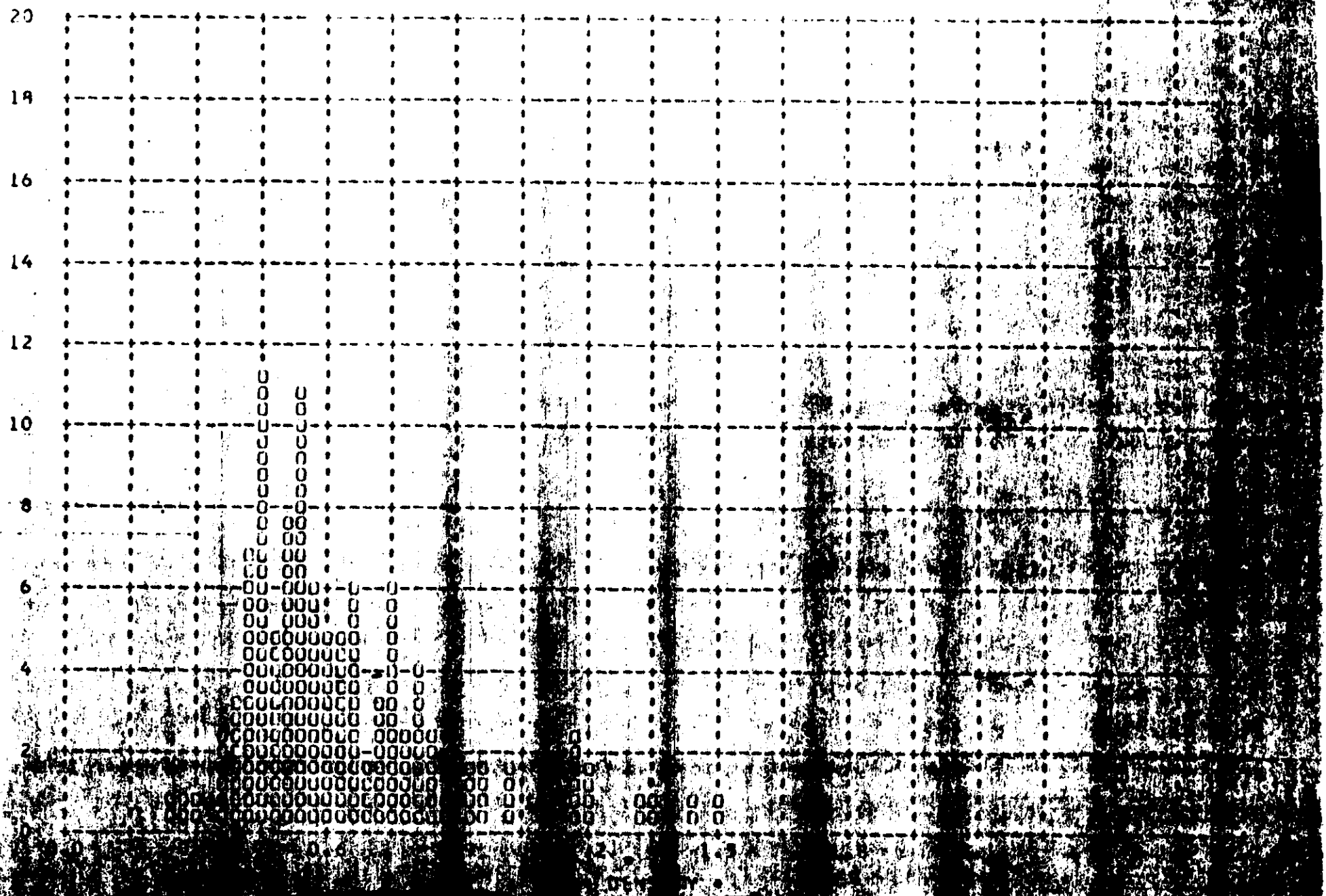


[redacted] CONTROL NO. [redacted]

Figure A-5.

MISSION • 1981-1 • INSTR • AET • 3/15/56 PLOT OF D MEN • TERRAIN • PROCESSING • FULL

ARITH MEAN • 0.63 • MEDIAN • [illegible] • STD [illegible] • RANGE • 0.24 TO 1.50 WITH 134 SAMPLES



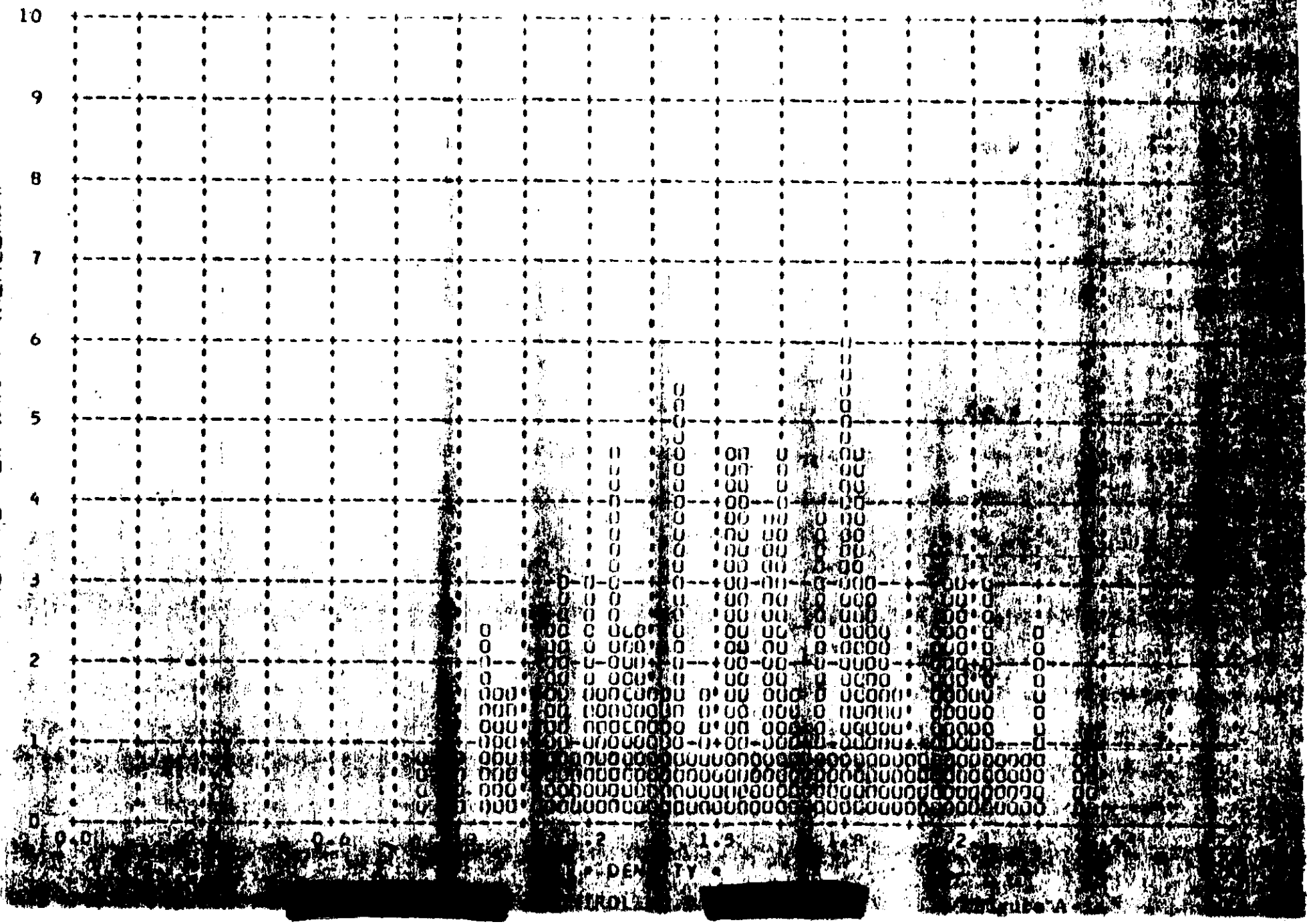
[redacted]

Figure 13

[redacted] CONTRL NO. [redacted]

MISSION • 1031-1 • [redacted] • AFT • 8/15/66 PLOT OF D MAX • TERRAIN • PROCESSING • FULL

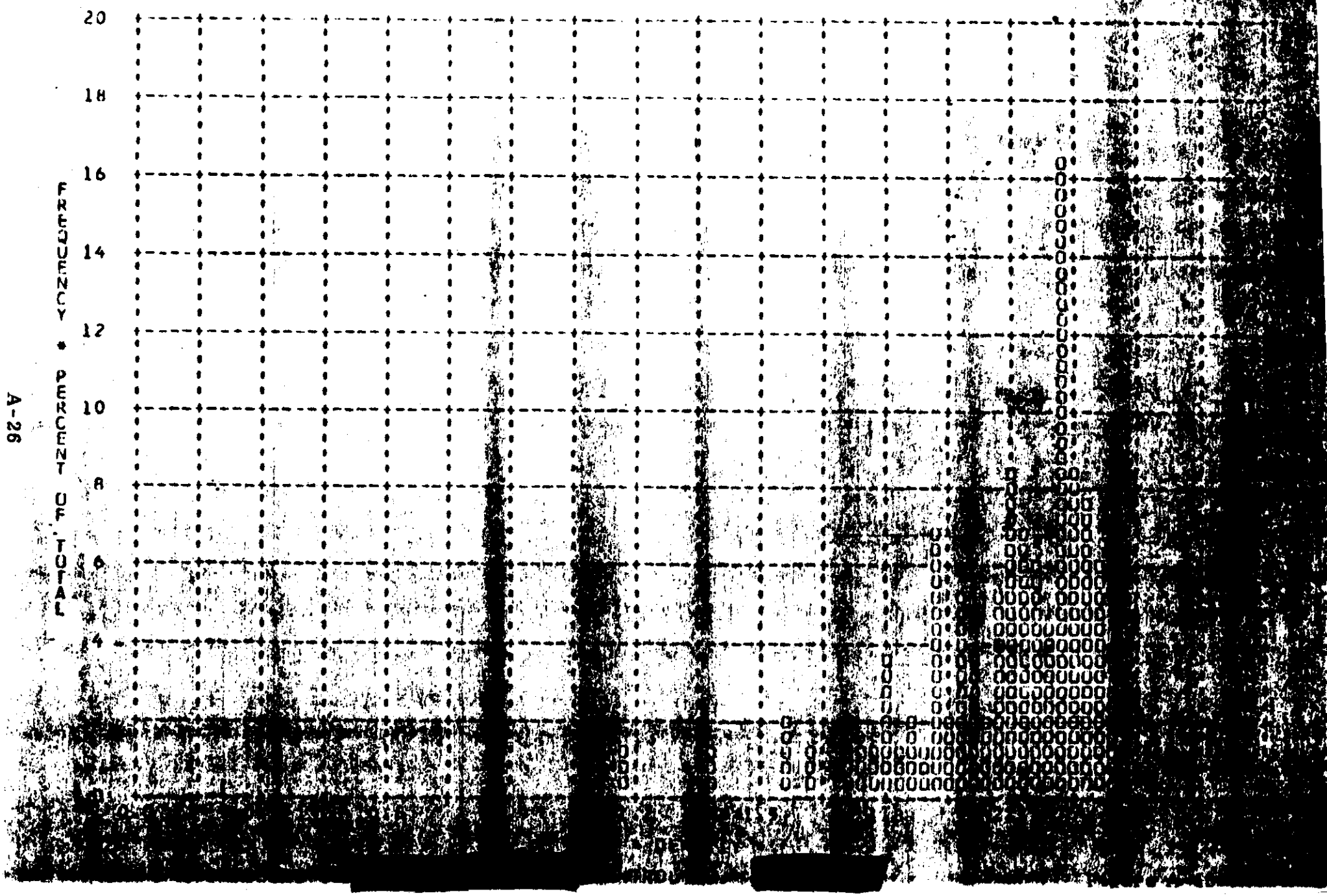
ARITH MEAN • 1.60 • MEDIAN • 1.65 • STD DEV • [illegible] • RANGE • 0.80 TO 2.35 WITH 134 SAMPLES



[redacted] [redacted]

MISSION • 1031-1 • INSTR • AFT • 8/29/66 PLOT OF D MAX • CLOUD • PROCESSING • FULL

ARITH MEAN • 2.08 • MEDIAN • 2.14 • STD DEV • [illegible] • RANGE • 1.15 TO 2.35 WITH 125 SAMPLES



[redacted] - CUTTING NO. [redacted]

MISSION * 1041-1 * INSTR * AFT * 8/25/66 PLOT OF DOSE * FORMAT * PROCESSING * ALL LEVELS *

ARITH MEAN * 0.71 * MEDIAN * 0.62 * STD DEV * [illegible] * RANGE * 0.24 TO 1.66 WITH 251 SAMPLES *

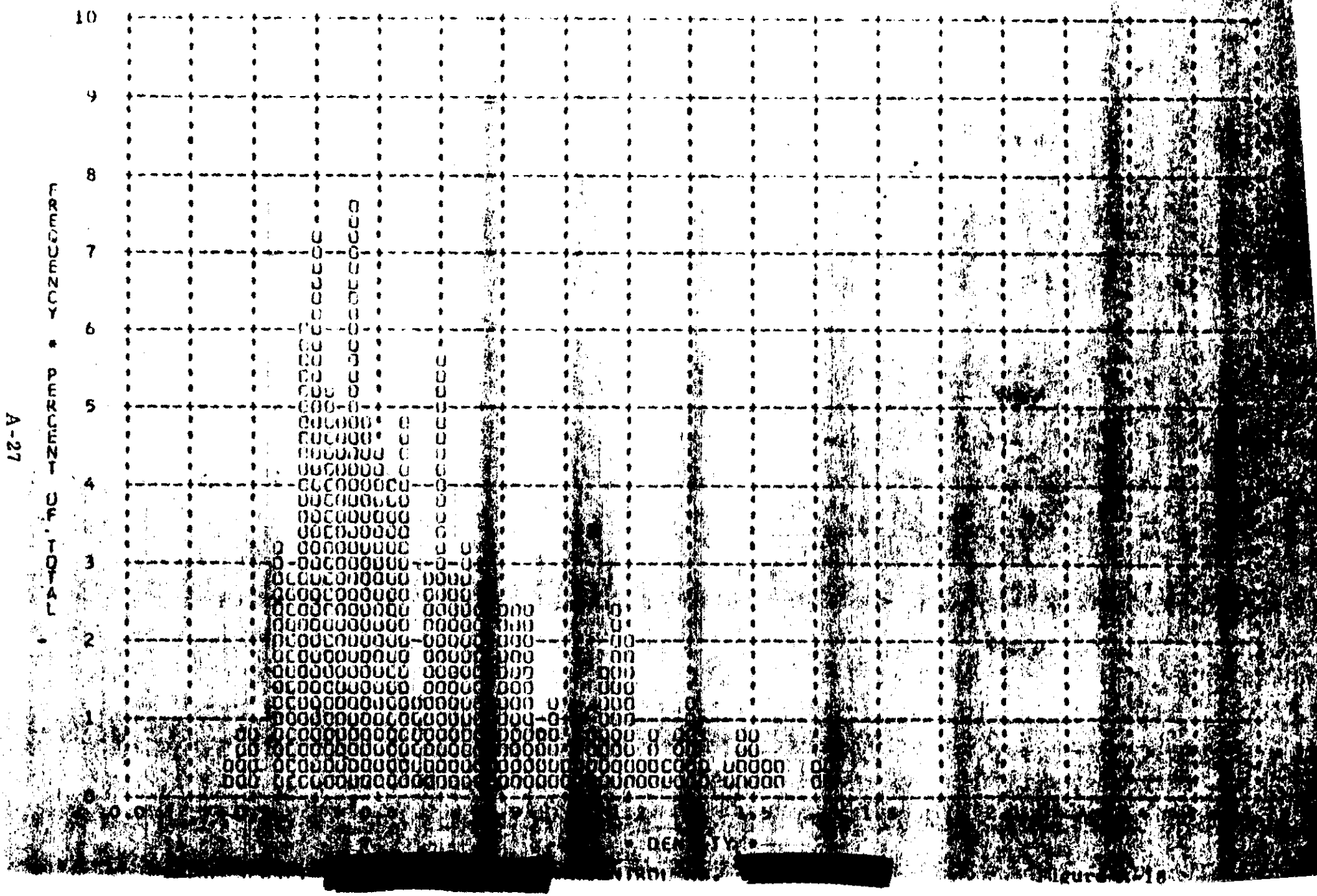
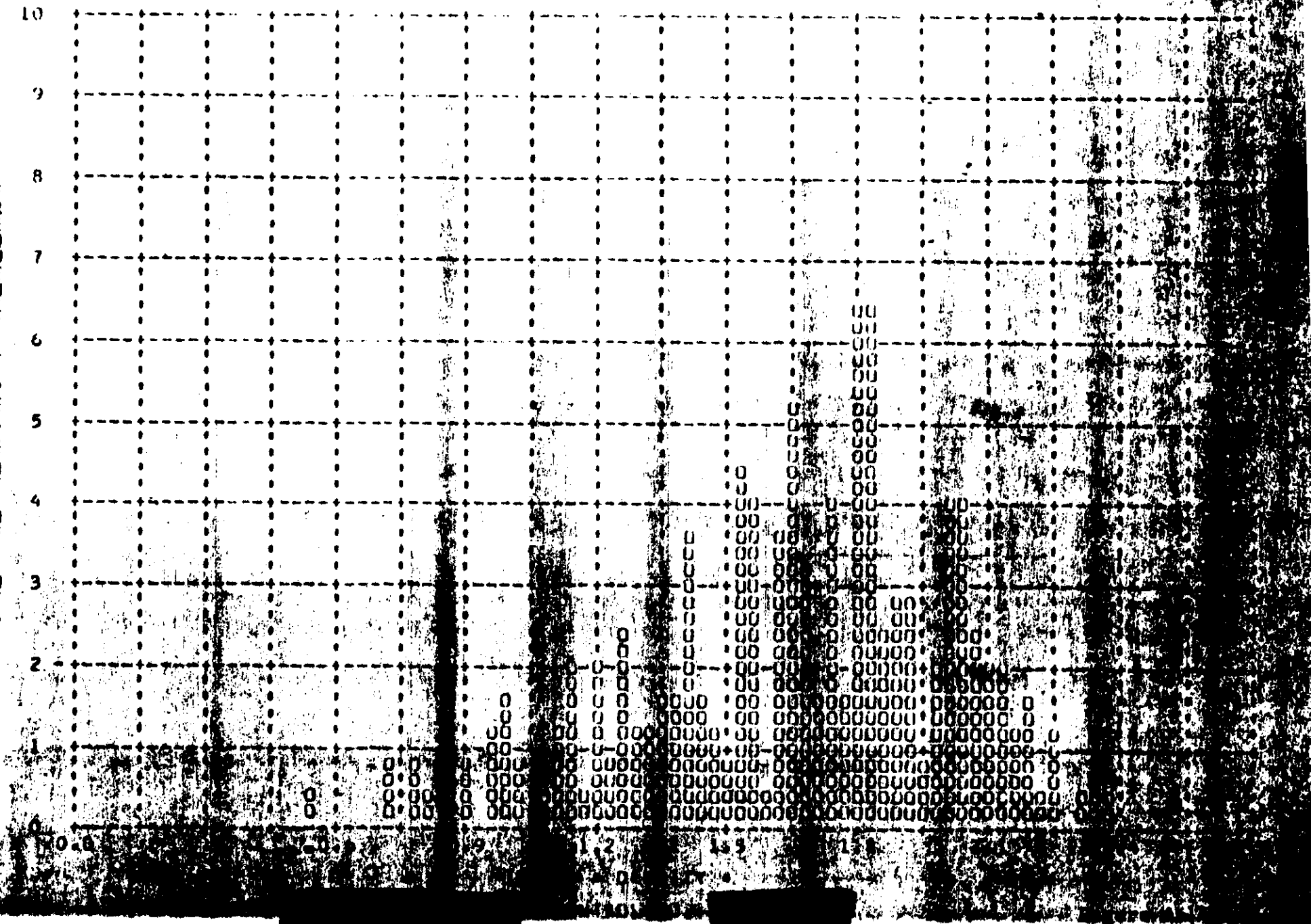


Figure [illegible]

MISSION • 1031-1 • [illegible] • ALT • [illegible] PLOT OF D MAX • TERRAIN • PROCESSING • ALL LEVELS

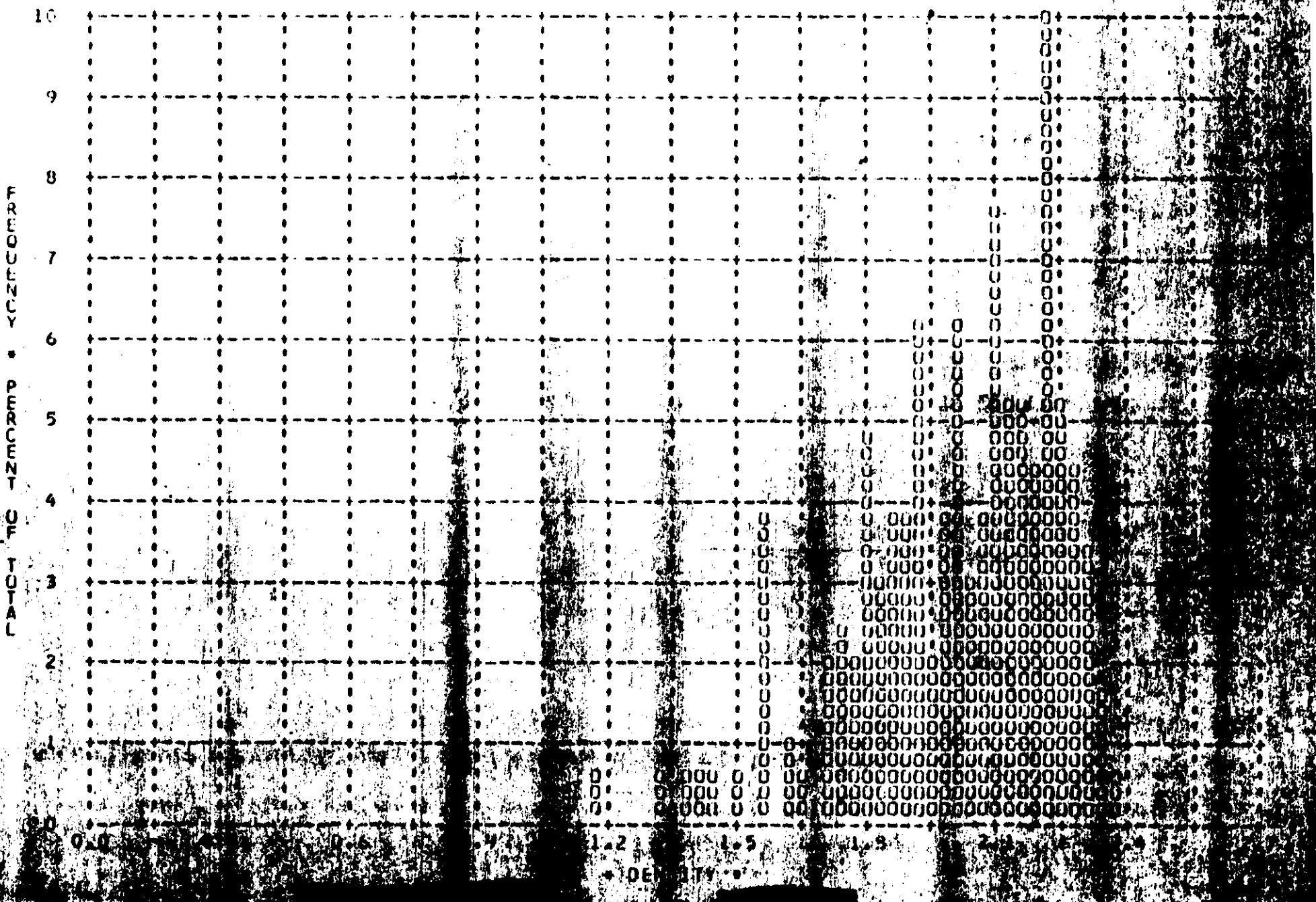
ARITH MEAN • 1.65 • MEDIAN • 1.70 • STD DEV • [illegible] • RANGE • [illegible] TO 2.35 WITH 251 SAMPLES



[redacted] CONTROL NO. [redacted]

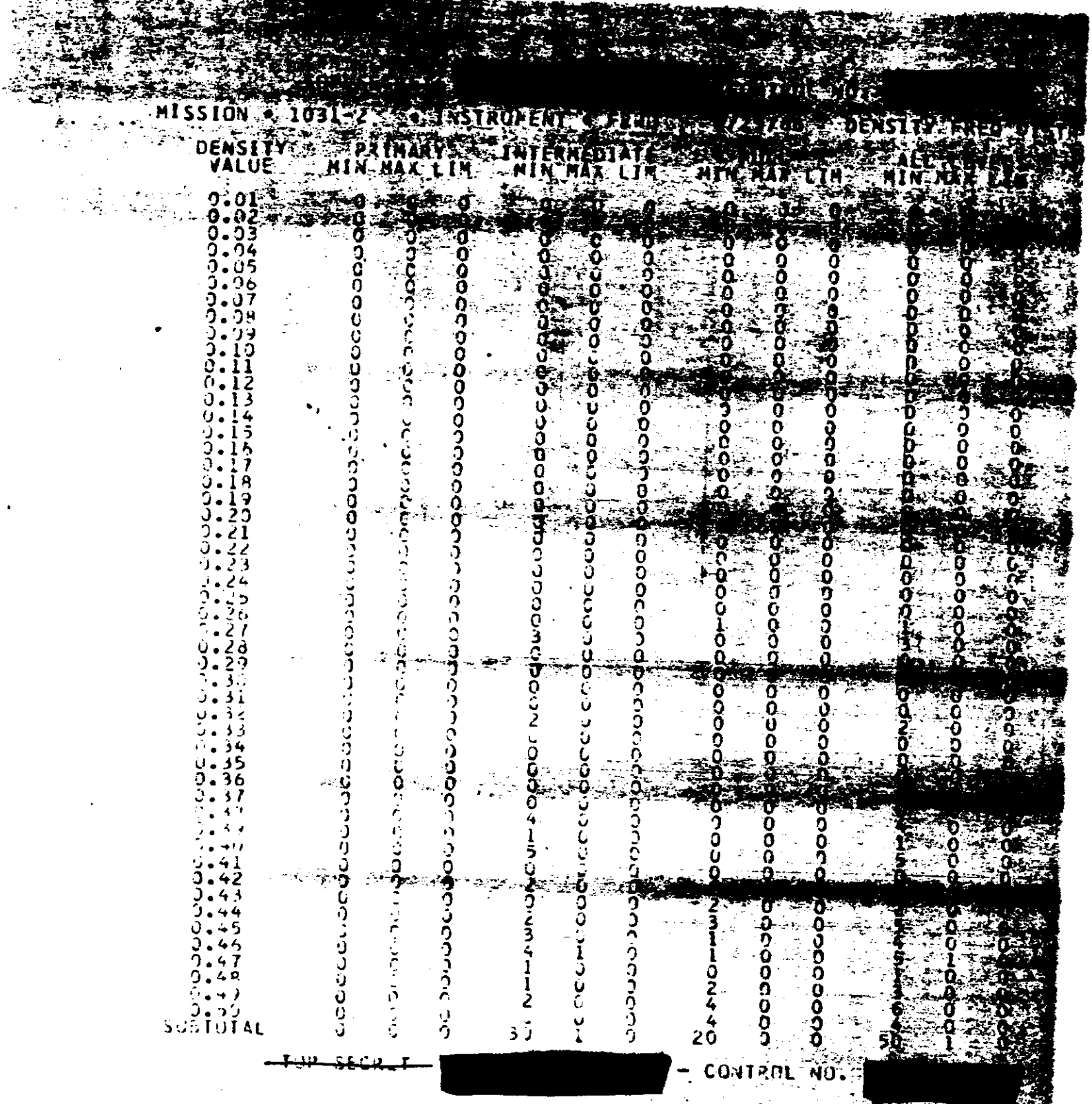
MISSION * 1031-1 * [redacted] * AFT * 8/25/66 PLOT OF D MAX * CLOUD * PROCESSING * ALL LEVELS *

ARITH MEAN * 2.00 * MEDIAN * 2.05 * STD DEV * .25 * RANGE * 1.15 TO 2.35 WITH 213 SAMPLES



[redacted] CONTROL [redacted]

Figure A-18



TAB LE A-3

[redacted] CONTROL NO. [redacted]

MISSION • 1031-2 • INSTRUMENT • [redacted] • DENSITY FREQ DISTR

DENSITY VALUE	PRIMARY MIN	PRIMARY MAX	PRIMARY LIM	INTERMEDIATE MIN	INTERMEDIATE MAX	INTERMEDIATE LIM	MIN	MAX	LIM	ALL LEVELS MIN	ALL LEVELS MAX	ALL LEVELS LIM
0.51	0	0	0	3	0	3	0	0	0	4	0	4
0.52	0	0	0	0	0	0	0	0	0	0	0	0
0.53	0	0	0	0	0	0	1	0	1	1	0	1
0.54	0	0	0	1	0	1	0	0	0	1	0	1
0.55	0	0	0	0	0	0	1	0	1	1	0	1
0.56	0	0	0	1	0	1	1	0	1	2	0	2
0.57	0	0	0	2	0	2	1	0	1	3	0	3
0.58	0	0	0	1	0	1	2	0	2	3	0	3
0.59	0	0	0	2	0	2	1	0	1	3	0	3
0.60	0	0	0	4	0	4	3	0	3	5	0	5
0.61	0	0	0	2	0	2	3	0	3	5	0	5
0.62	0	0	0	2	0	2	[redacted]					
0.63	0	0	0	1	0	1	4	0	4	5	0	5
0.64	0	0	0	1	0	1	4	0	4	5	0	5
0.65	0	0	0	1	0	1	4	0	4	5	0	5
0.66	0	0	0	1	0	1	4	0	4	5	0	5
0.67	0	0	0	1	0	1	4	0	4	5	0	5
0.68	0	0	0	1	0	1	4	0	4	5	0	5
0.69	0	0	0	1	0	1	4	0	4	5	0	5
0.70	0	0	0	1	0	1	4	0	4	5	0	5
0.71	0	0	0	1	0	1	4	0	4	5	0	5
0.72	0	0	0	1	0	1	4	0	4	5	0	5
0.73	0	0	0	1	0	1	4	0	4	5	0	5
0.74	0	0	0	1	0	1	4	0	4	5	0	5
0.75	0	0	0	1	0	1	4	0	4	5	0	5
0.76	0	0	0	1	0	1	4	0	4	5	0	5
0.77	0	0	0	1	0	1	4	0	4	5	0	5
0.78	0	0	0	1	0	1	4	0	4	5	0	5
0.79	0	0	0	3	0	3	4	0	4	7	0	7
[illegible]												
0.82	0	0	0	3	0	3	4	0	4	7	0	7
0.83	0	0	0	3	0	3	4	0	4	7	0	7
0.84	0	0	0	3	0	3	4	0	4	7	0	7
0.85	0	0	0	3	0	3	4	0	4	7	0	7
0.86	0	0	0	3	0	3	4	0	4	7	0	7
0.87	0	0	0	3	0	3	4	0	4	7	0	7
[illegible]												
[illegible]												
0.92	0	0	0	2	0	2	3	0	3	5	0	5
0.93	0	0	0	2	0	2	3	0	3	5	0	5
[illegible]												
[illegible]												
0.97	0	0	0	2	0	2	3	0	3	5	0	5
0.98	0	0	0	2	0	2	3	0	3	5	0	5
[illegible]												
1.00	0	0	0	2	0	2	3	0	3	5	0	5
SUBTOTAL	0	0	0	82	0	82	97	0	97	109	0	109

~~TOP SECRET~~ [redacted] - CONTROL NO. [redacted]

TABLE A-3

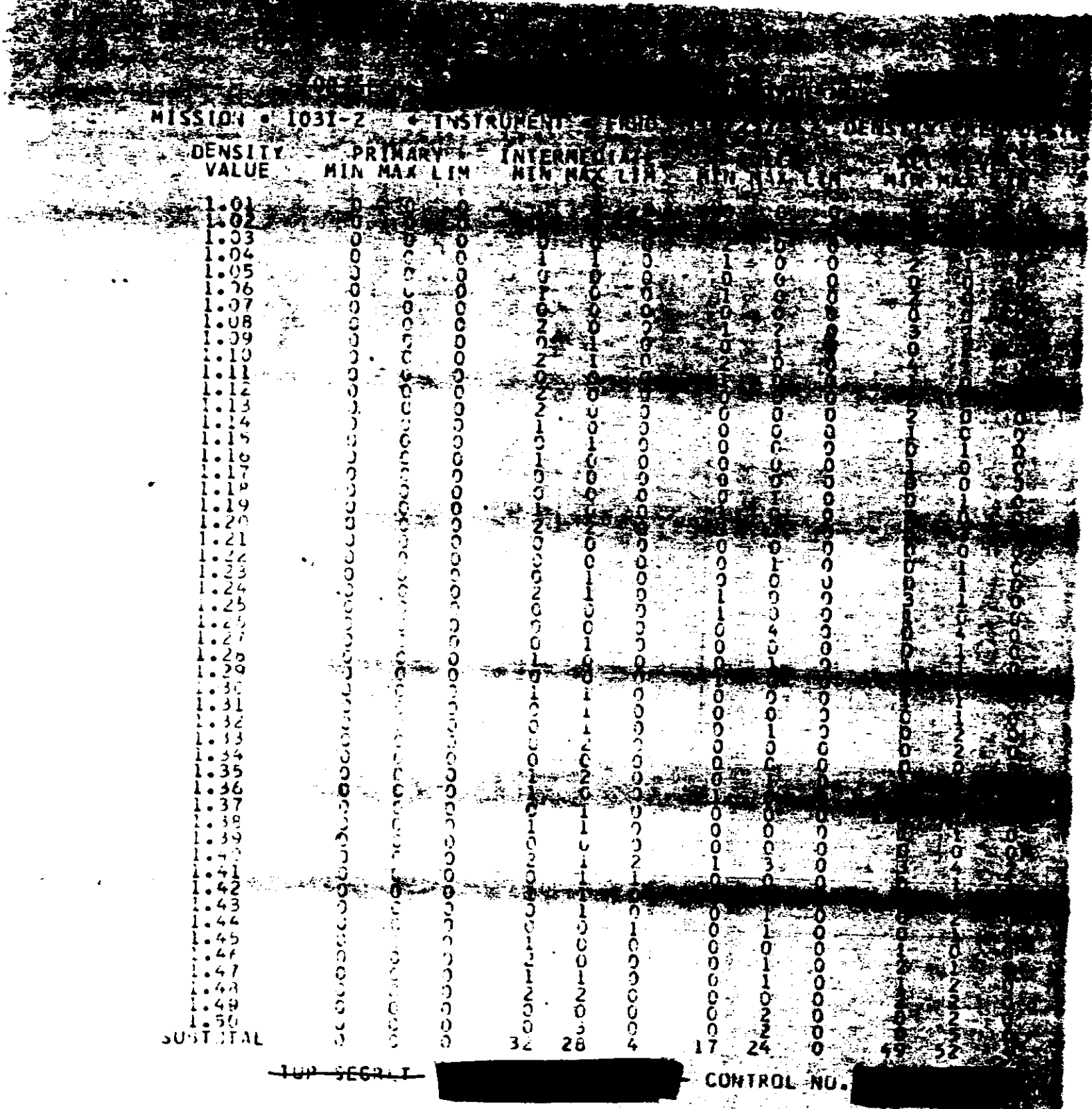

MISSION • 1031-2 • INSTRUMENT
DENSITY VALUE
PRIMARY
INTERMEDIATE
MIN MAX LIM
SUBTOTAL
32 28 4 17 24 0 59 52
TOP SECRET
CONTROL NO.

TABLE A-8

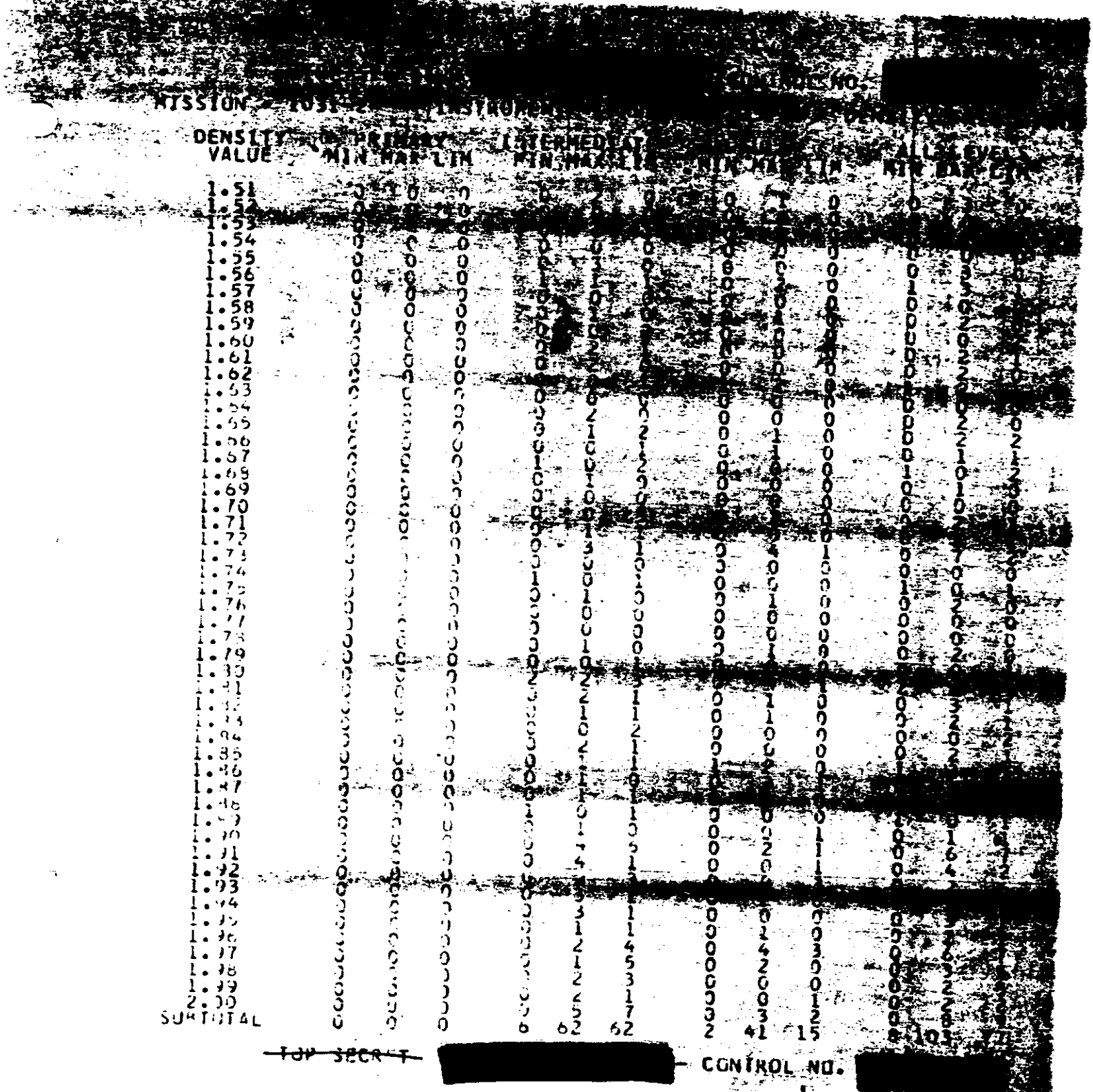
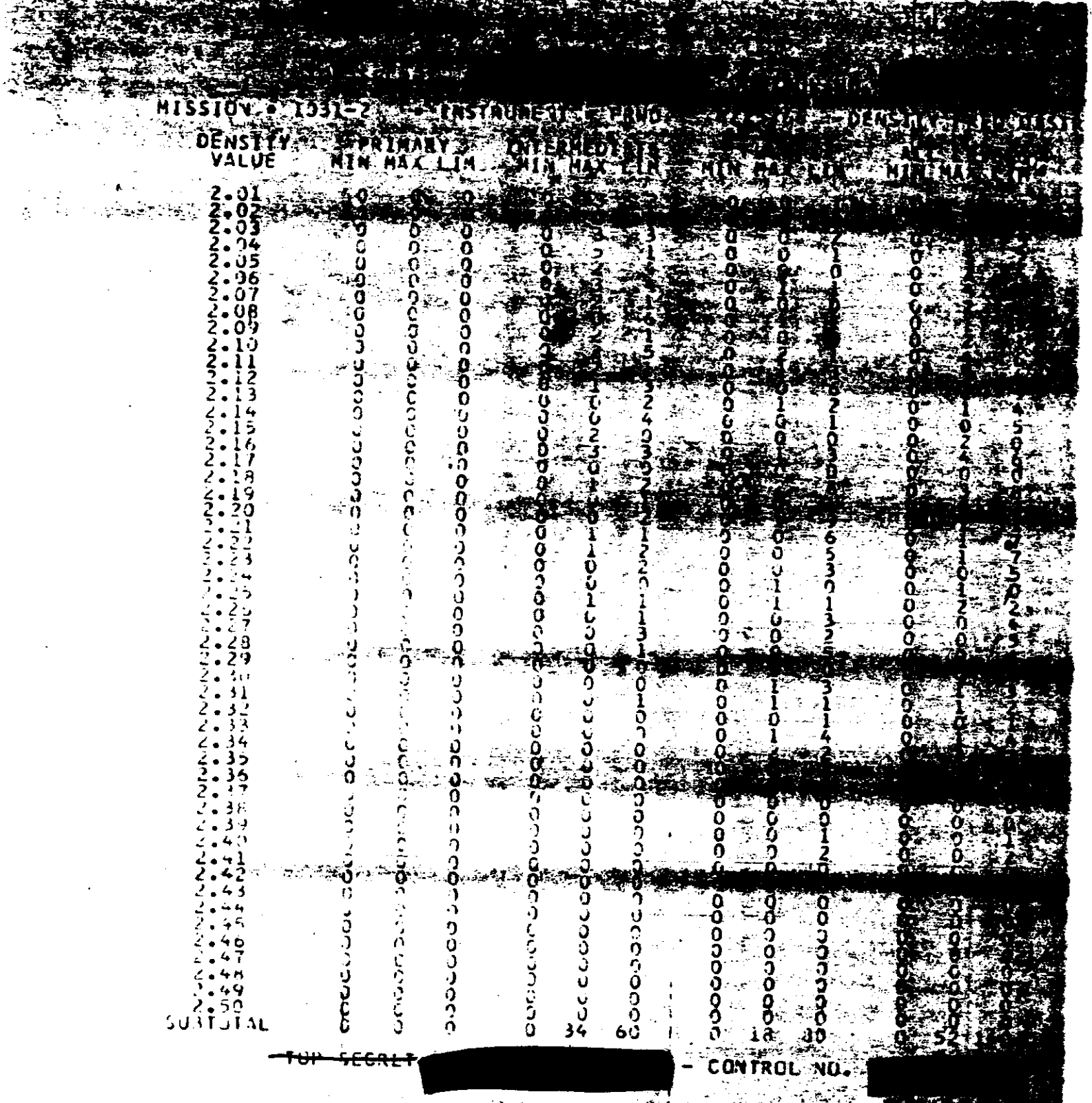

CONTROL NO.
MISSION
DENSITY VALUE
PRIMARY
INTERMEDIATE
ALL EVENTS
MIN MAX LIM
SUBTOTAL
TOP SECRET
CONTROL NO.

TABLE A-3



TOP SECRET [redacted] - CONTROL NO. [redacted]

TABLE A-3

MISSION = 1031-2 INSTRUMENT = PRO

DENSITY VALUE	PRIMARY MIN	MAX	LIN	INTERMEDIATE MIN	MAX	LIN	FULL MIN	MAX	LIN	ALL LEVELS MIN	MAX	LIN
2.51	2	0	0	0	0	0	0	0	0	0	0	0
2.52	1	0	0	0	0	0	0	0	0	0	0	0
2.53	0	0	0	0	0	0	0	0	0	0	0	0
2.54	0	0	0	0	0	0	0	0	0	0	0	0
2.55	0	0	0	0	0	0	0	0	0	0	0	0
2.56	0	0	0	0	0	0	0	0	0	0	0	0
2.57	0	0	0	0	0	0	0	0	0	0	0	0
2.58	0	0	0	0	0	0	0	0	0	0	0	0
2.59	0	0	0	0	0	0	0	0	0	0	0	0
2.60	0	0	0	0	0	0	0	0	0	0	0	0
2.61	0	0	0	0	0	0	0	0	0	0	0	0
2.62	0	0	0	0	0	0	0	0	0	0	0	0
2.63	0	0	0	0	0	0	0	0	0	0	0	0
2.64	0	0	0	0	0	0	0	0	0	0	0	0
2.65	0	0	0	0	0	0	0	0	0	0	0	0
2.66	0	0	0	0	0	0	0	0	0	0	0	0
2.67	0	0	0	0	0	0	0	0	0	0	0	0
2.68	0	0	0	0	0	0	0	0	0	0	0	0
2.69	0	0	0	0	0	0	0	0	0	0	0	0
2.70	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	0	0	0	0	0	0	0	0	1	0	0	1
TOTAL	1	0	0	13	130	126	86	86	96	216	216	222

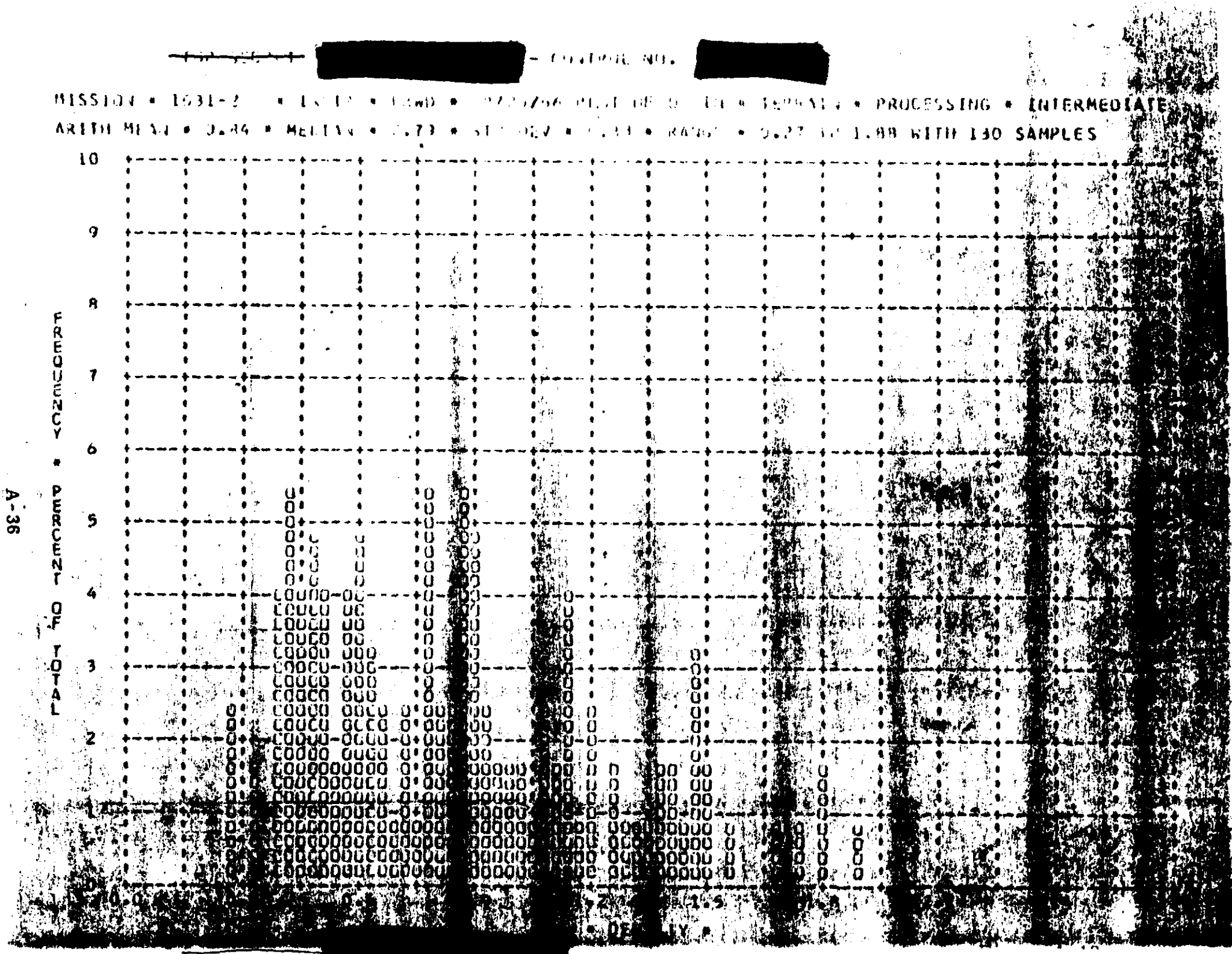
MISSION 1031-2 INSTR - PRO 5/25/76 PROCESSING AND EXPOSURE ANALYSI

PROCESS LEVEL	SAMPLE SIZE	UNDER EXPOSED	UNDER PROCESSED	UNDER EXP+PROC	OVER PROCESSED	OVER EXP
PRIMARY	3	0 PC	0 PC	0 PC	0 PC	0 PC
INTERMEDIATE	130	0 PC	8 PC	57 PC	22 PC	14 PC
FULL	86	1 PC	0 PC	74 PC	23 PC	[illegible]
ALL LEVELS	216	0 PC	5 PC	64 PC	22 PC	[illegible]

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	0.01-0.29	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	[illegible]	[illegible]	[illegible]	[illegible]

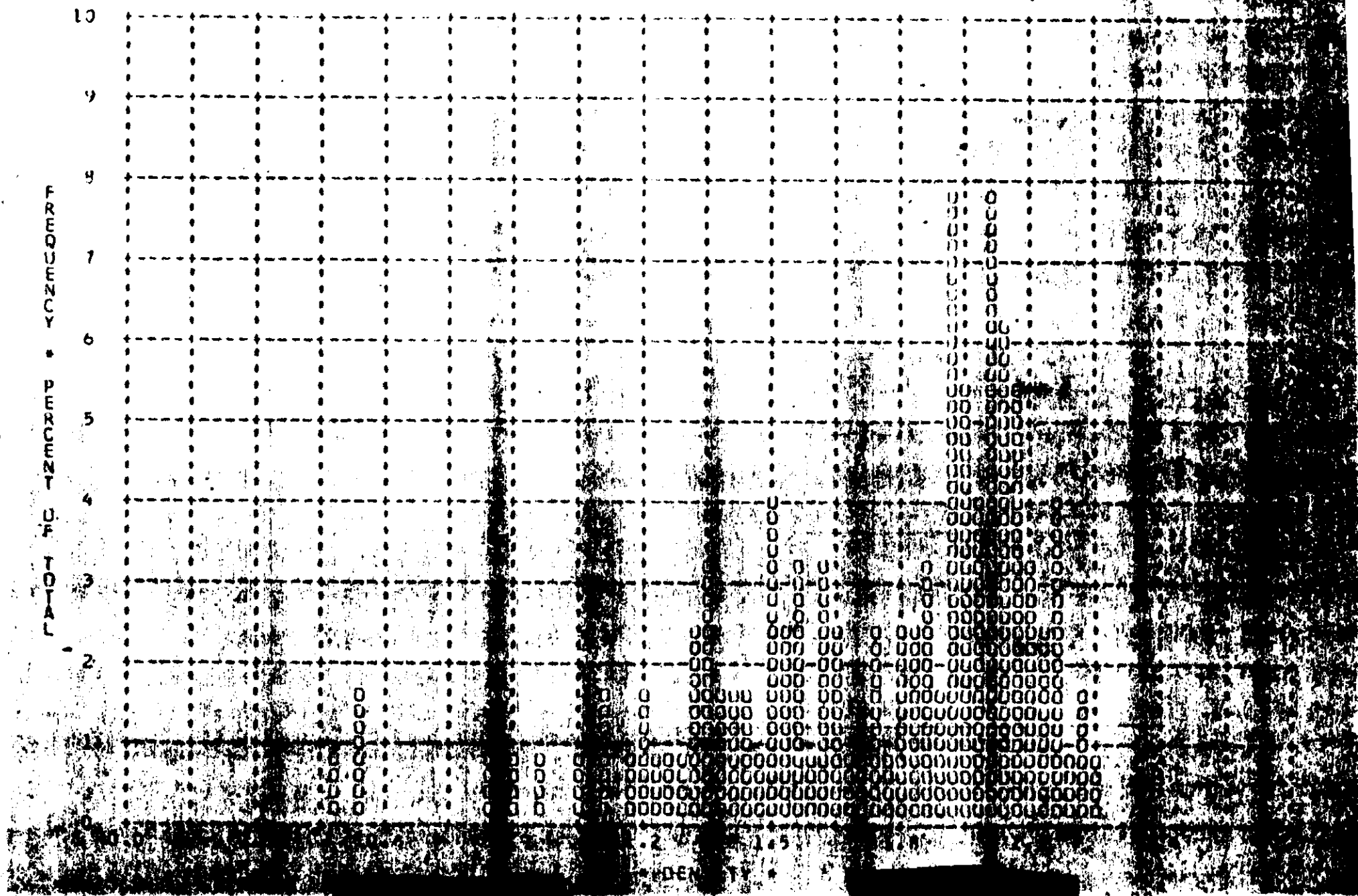
[illegible] - CONTROL NO. [illegible]

TABLE A-3


[redacted] - CONTRACT NO. [redacted]
MISSION • 1631-2 • [illegible] • [illegible] • [illegible] PLANE OF [illegible] • [illegible] • PROCESSING • INTERMEDIATE
ARITH MEAN • 0.84 • MEDIAN • 0.73 • [illegible] • [illegible] • RANGE • 0.27 TO 1.88 WITH 130 SAMPLES
FREQUENCY • PERCENT OF TOTAL
10
9
8
7
6
5
4
3
2
1
0
0.0
1.5
• DENSITY •

MISSION • 1031-2 • INSTR • PMQ • 4/25/66 PLOT OF D MAX • TERRAIN • PROCESSING • INTERMEDIATE

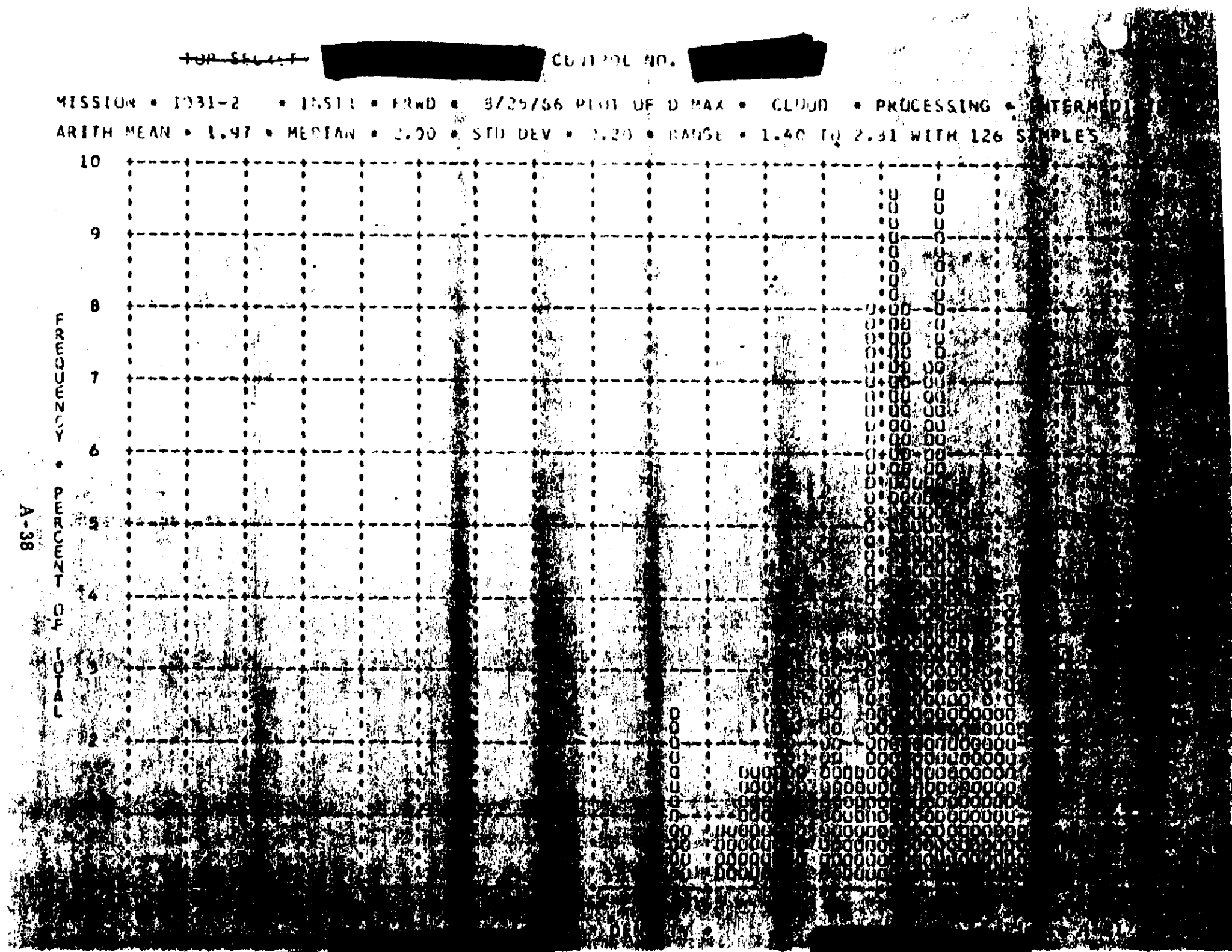
ARITH MEAN • 1.73 • MEDIAN • 1.77 • STD DEV • .37 • RANGE • 0.46 TO 2.25 WITH 130 SAMPLES



[redacted]

MISSION • 1031-2 • INSTR • FRWD • 8/25/66 PLOT OF D MAX • CLOUD • PROCESSING • INTERMEDI

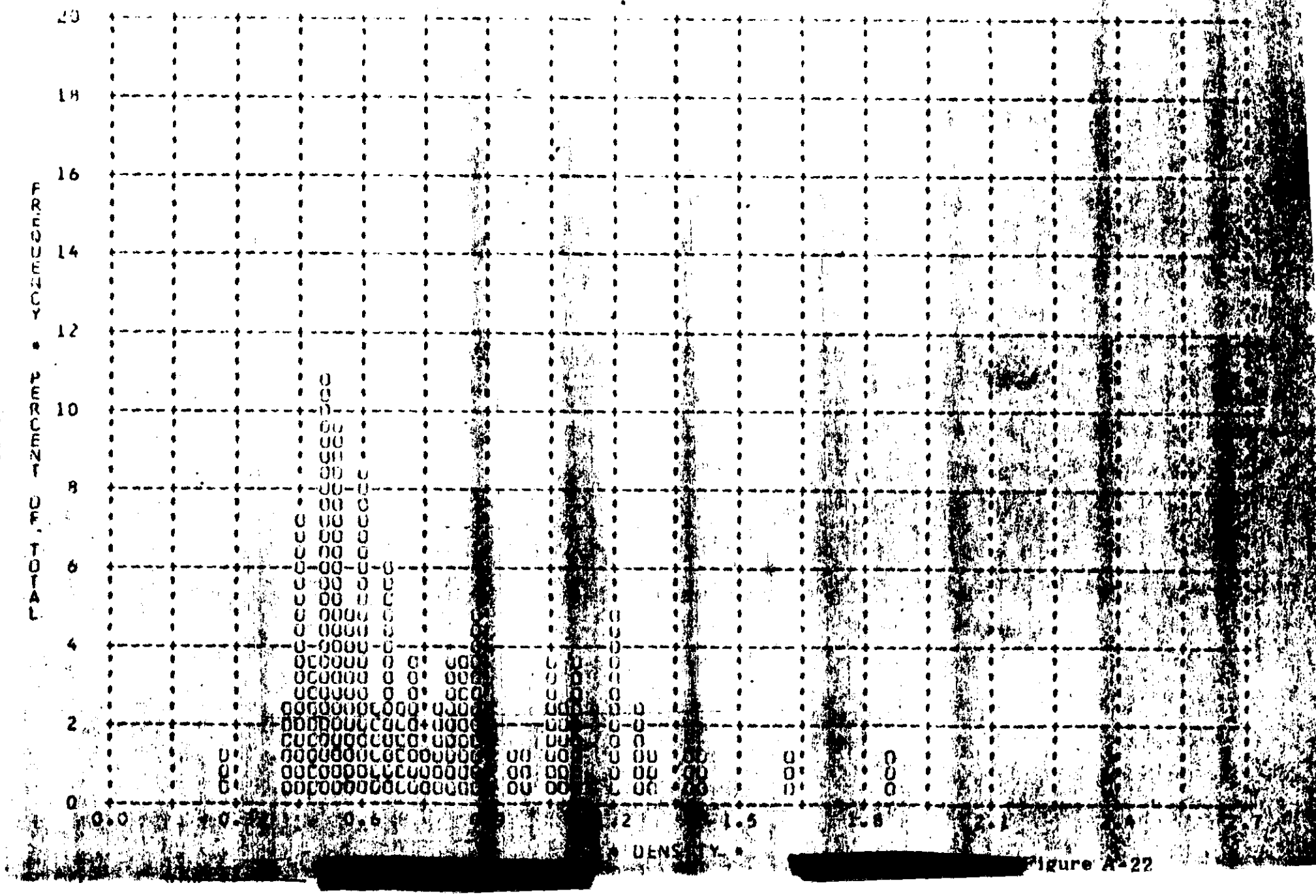
ARITH MEAN • 1.97 • MEDIAN • 2.00 • STD DEV • 1.20 • RANGE • 1.40 TO 2.31 WITH 126 SAMPLES



[redacted] CONTROL NO. [redacted]

MISSION • 1'31-2 • LASER • 19MD • 27 JUNE 66 POST IF DETECTOR TEMPERATURE • PROCESSING • FULL

ARITHMEAN • 0.74 • MEDIAN • 0.64 • STD DEV • .31 • RANGE • 0.25 TO 1.85 WITH 80 SAMPLES



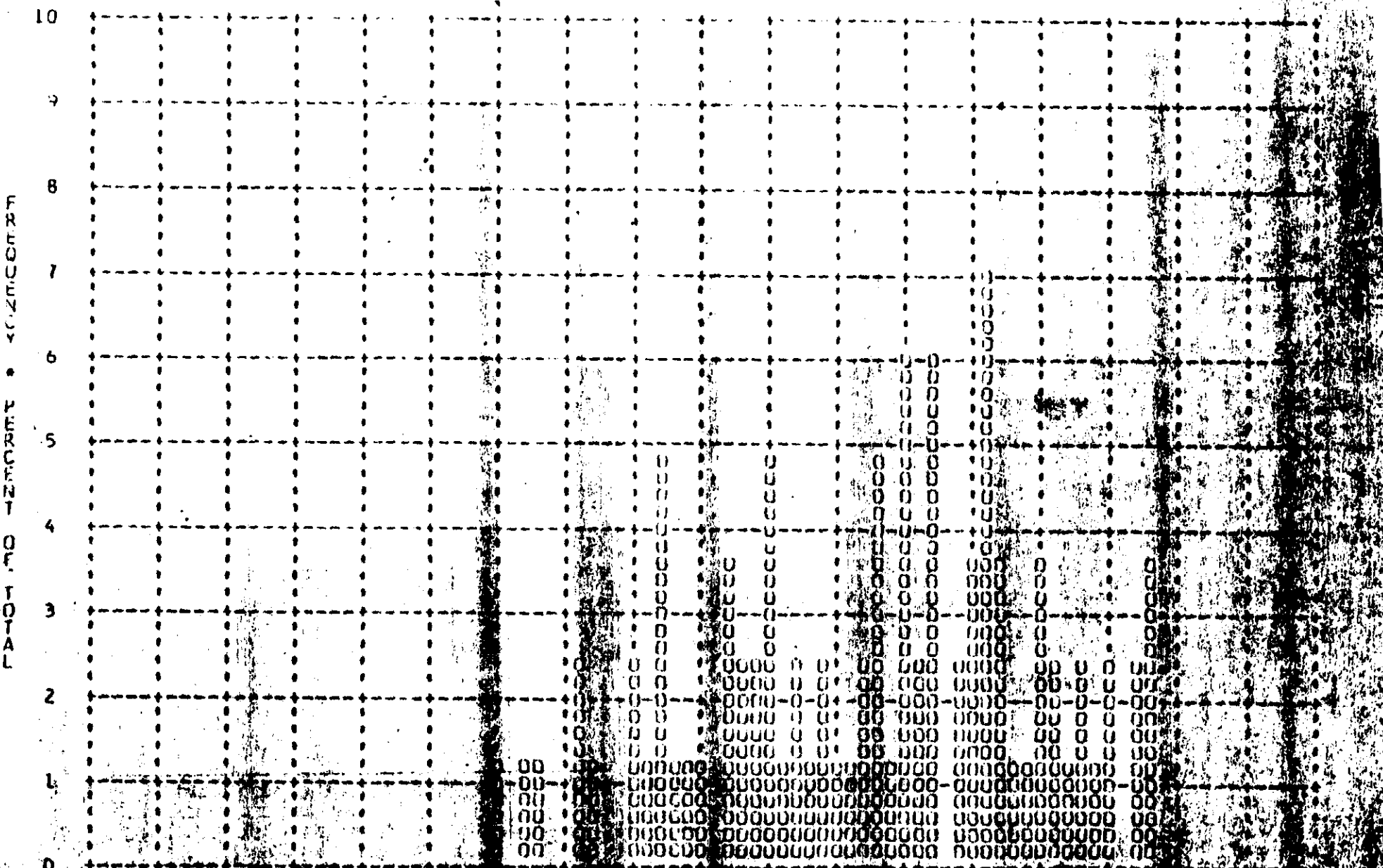
[redacted]

Figure A-22

[redacted] Contract NO. [redacted]

MISSION • [illegible] • DATA • LOAD • [illegible] MODE 2 MAX • [illegible] • PROCESSING • FULL

ARITH MEAN • 1.72 • MEDIAN • 1.69 • STD DEV • [illegible] • RANGE • 1.01 TO 2.34 WITH 86 SAMPLES

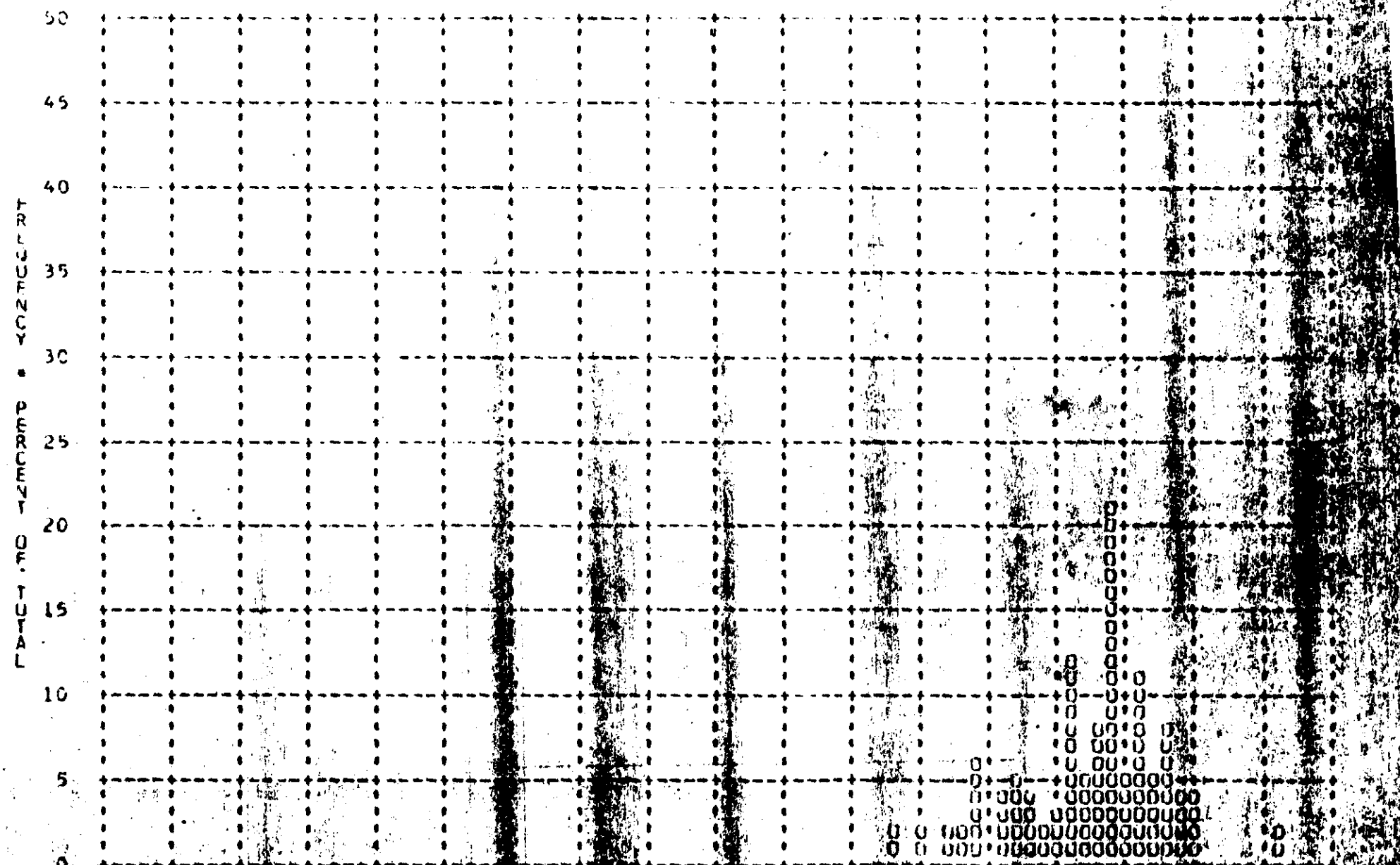


[redacted]

[redacted] - CELL OL NO. [redacted]

MISSION * 1031-2 * LVETR * FRWD * [illegible] MODE OF L MAX * CLOUD * PROCESSING * FULL

ARITH MEAN * 2.17 * MEDIAN * 2.20 * STD DEV * [illegible] * RANGE * 1.72 TO 2.57 WITH 96 SAMPLES

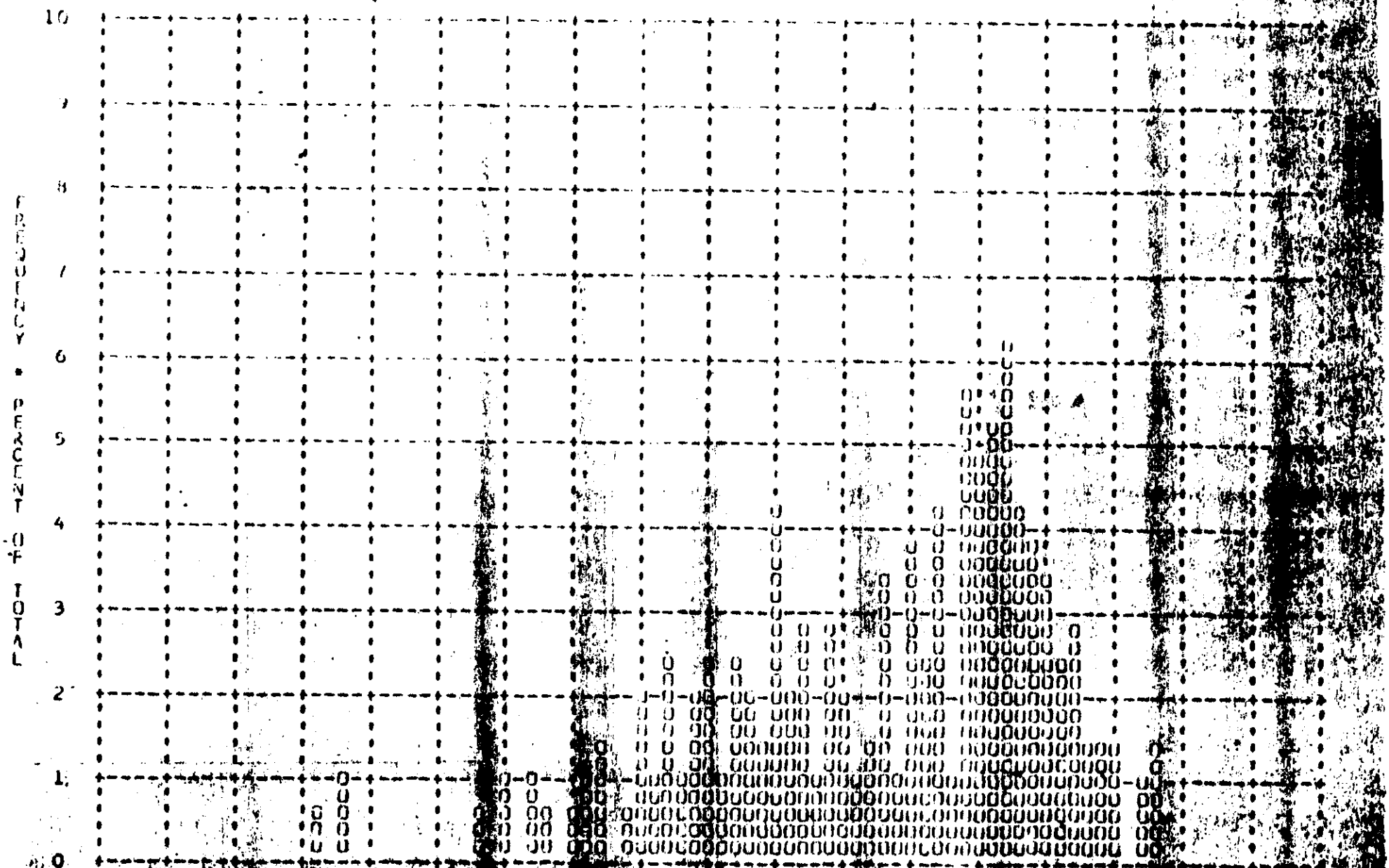


[redacted] ure A-24

[redacted] CONTRACT NO. [redacted]

MISSION • 1031-2 • ESTC • 1240 • 472:466 PLOT OF L MAX • TERRAIN • PROCESSING • ALL LEVELS •

ARITH MEAN • 1.73 • MEDIAN • 1.32 • STD DEV • .37 • RANGE • 0.46 TO 2.34 WITH 216 SAMPLES



[redacted] re A-26

MISSION • 1031-2 • SYSTEM • PRWD • 07/05/66 PLOT OF D MAX • CLOUD • PROCESSING • ALL LEVELS

ARITH MEAN • 2.05 • MEDIAN • 2.09 • STD DEV • 1.21 • RANGE • 1.40 TO 2.97 WITH 222 SAMPLES

PERCENT OF TOTAL

20
18
16
14
12
10
8
6
4
2

DENSITY

[redacted]

Distribution:

Copy No.	To
[redacted]	