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CORONA J

PERFORMANCE EVALUATION REPORT

MISSION 1014-1 and 1014-2

FTV 1180; J-16

8 April 1966

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NO. [redacted]

5 May 1966

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SUBJECT: MISSION 1014-1 AND 1014-2 FINAL REPORT

Enclosed is the Final Performance Evaluation Report for Mission 1014-1 and 1014-2.

[redacted]
Advanced Projects

IF ENCLOSURES ARE WITHDRAWN OR NOT ATTACHED THE CLASSIFICATION OF THIS DOCUMENT WILL BE CHANGED TO UNCLASSIFIED.

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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 1180.

Lockheed Missiles and Space Company has the responsibility for evaluating payload performance under the Systems Integration and "J" System contracts.

This document is the final payload test and performance evaluation report for Missions 1014-1 and 1014-2 which was launched on 18 November 1964.

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INTRODUCTION

This report presents the final performance evaluation of Missions 1014-1 and 1014-2 of the Corona Program. The purpose of this report is to define the performance characteristics of the J-16 payload system, to identify the source of in-flight anomalies and recommend the appropriate corrective action.

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, visual RES values 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 1

SYSTEM PERFORMANCE

A. MISSION OBJECTIVES

The payload section of Mission 1014, placed into orbit by Flight Test Vehicle #1180 and LV-2A booster #416, 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-16 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 5 day Phase 1 and a 4 day Phase 2.

B. MISSION DESCRIPTION

The payload was launched from Vandenberg Air Force Base (VAFB) at 2035:54 Z (1235:54 PST) on 18 November 1964. Ascent and injection were normal and the achieved orbit was 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. The planned mission was successfully accomplished.

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

ORBIT PARAMETERS

Parameter	Predicted	Orbit 1 Actuals
Period (Min.)	89.77	89.80
Perigee (N. M.)	104.93	103.25
Apogee (N. M.)	197.18	200.75
Inclination (Deg.)	70.00	70.03
Perigee Latitude (Deg. N.)	65.017	65.645
Eccentricity	0.01286	0.01359

C. PANORAMIC CAMERAS

The Master and Slave panoramic cameras operated throughout both missions with no significant problems. The cloud cover observed in the photography averaged 40% for the entire flight. The photographic quality was lower than the best missions due to atmospheric conditions, low sun elevations and a 10 to 20% decrease in scale.

D. STELLAR-INDEX CAMERAS

The Phase I Stellar/Index camera operated satisfactorily. The Phase II Stellar/Index camera metering became erratic during the operation on orbit 116 and remained in this condition for the duration of the mission.

This failure was first observed on the engineering operation on orbit 127. The stellar/index was programmed for 3 metering cycles but the first metering cycle did not occur. The last two metering cycles of the operation were normal. The cause of this condition is unknown.

E. OTHER SUB-SYSTEMS

The instrumentation and command systems performance was satisfactory. The clock and the pressure make-up system operated successfully on both missions. The PMU used more gas than normally probably due to a leak. Both recovery units were air recovered.

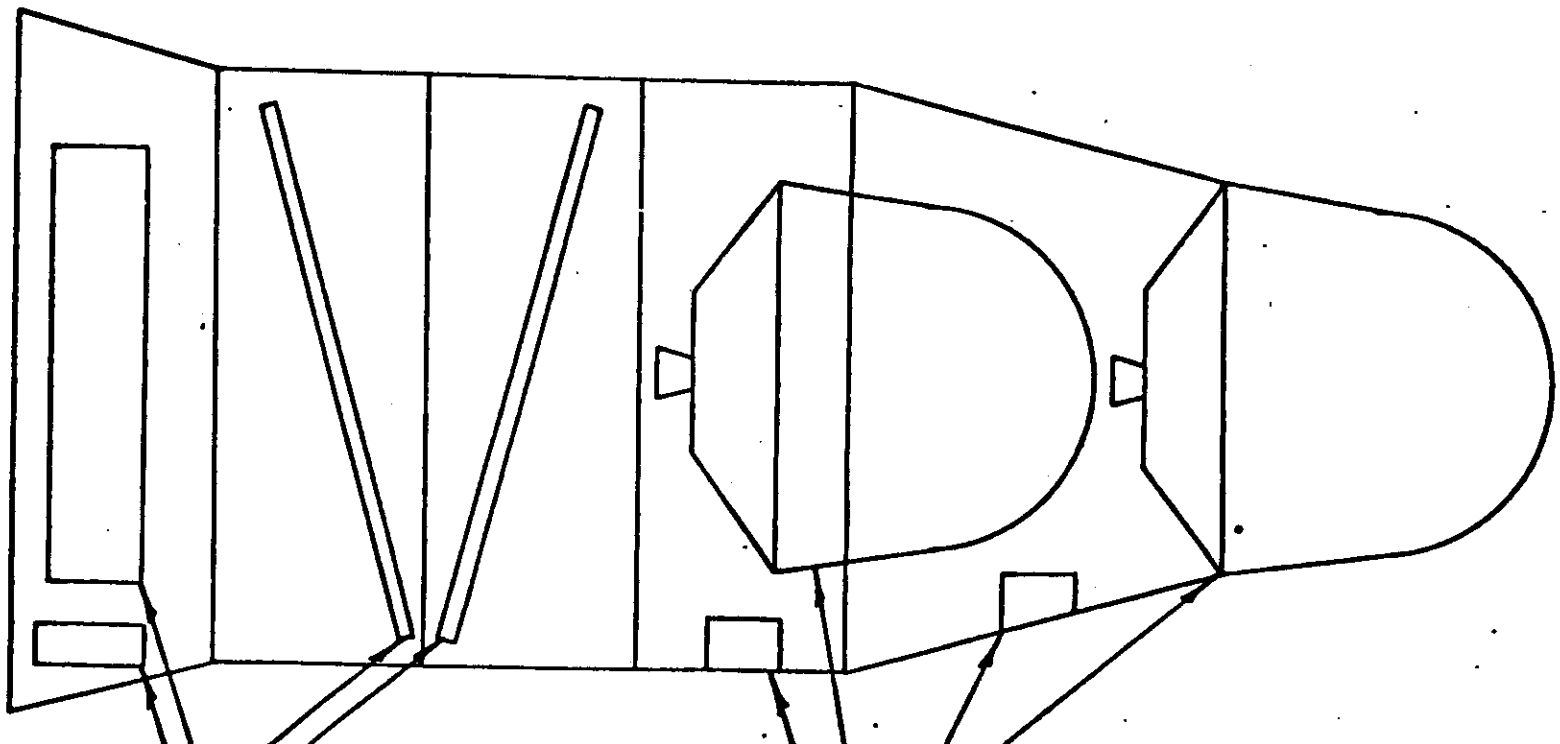
F. CONCLUSIONS

The acquired panoramic photography was of acceptable quality. The Stellar/Index photography was satisfactory except instrument D50 produced some multiple exposures after frame 118 in the B mission.

The objective of improving image contrast from the Master camera through the use of a Wratten 25 filter appears to have been successful.

SCHEMATIC INBOARD PROFILE - CORONA J SYSTEM

MISSION 1014



Master Camera No: 162

Slave Camera No: 139

Supply Cassette No: SC-21

Clock No: 520

Yaw Programmer No: None

"A" Recovery Subsystem No: 659

"A" Stellar-Index Camera No: D53/59/49

"B" Recovery Subsystem No: 660

"B" Stellar-Index Camera No: D50/44/46

Pressure Make-up Unit No: 116

FIGURE 1-1

SECTION 2

PRE-FLIGHT SYSTEMS TESTS

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 susceptability to corona discharge. Such discharge fogs the film thus degrading the operational photography.

2. Test Summary

The J-16 payload system was subjected to a Special Corona Test in the HIVOS Chamber on 31 August 1964. A three-day operational program was utilized with the instrument system operated between the hours of 0800 and 1700 of each day and soaked from 1700 to 0800 each night. The test was originally scheduled for four days of operation, but was aborted after three days due to an oil leak from the diffusion pumps of the altitude chamber.

The test was considered unsatisfactory because the payload system failed to achieve the internal payload pressure of 0.5 microns, which was the desired test objective.

J-16 was again altitude tested from 18 through 22 October to determine the Corona susceptibility of a new film metering roller design not heretofore tested as part of any J system. The metering roller design improvements consisted of a rubber covered pressure roller installed on the master instrument only. In previous J systems, the pressure roller has had a metallic surface with a corrosion resistant coating.

During test, J-16 film metering roller Corona was limited to the camera start-up variety for both the master and slave instruments. The film from the master instrument exhibited less than a maximum of six inches of electrostatic Corona fog for most camera starts.

Some master instrument starts contained no Corona. The slave instrument generally exhibited 2 to 3 cycles of start-up Corona for most camera operations. The last slave instrument operation contained 5 cycles of Corona. The 3rd, 4th, 5th, 9th, and 23rd frames of slave photography from the last operation were Corona marked to a density of 0.18 above the base and fog level. Both instruments were tested down to 0.7 microns pressure.

J-16 master and slave Corona was rated acceptable.

3. Panoramic Camera Performance

Both instruments operated satisfactorily throughout the test.

B. RESOLUTION TEST

The dynamic resolution test of the J-16 payload system was performed at the A/P facility on 5 October 1964. Each panoramic camera photographed high and low contrast resolution targets. The resulting through focus resolution data is shown in Figure 2-1 for the Master camera and in Figure 2-2 for the Slave camera.

C. LIGHT LEAK TEST

The examination of the film threaded in the J-16 system during the light leak test determined that the light tight integrity of the system was acceptable for flight.

[redacted]

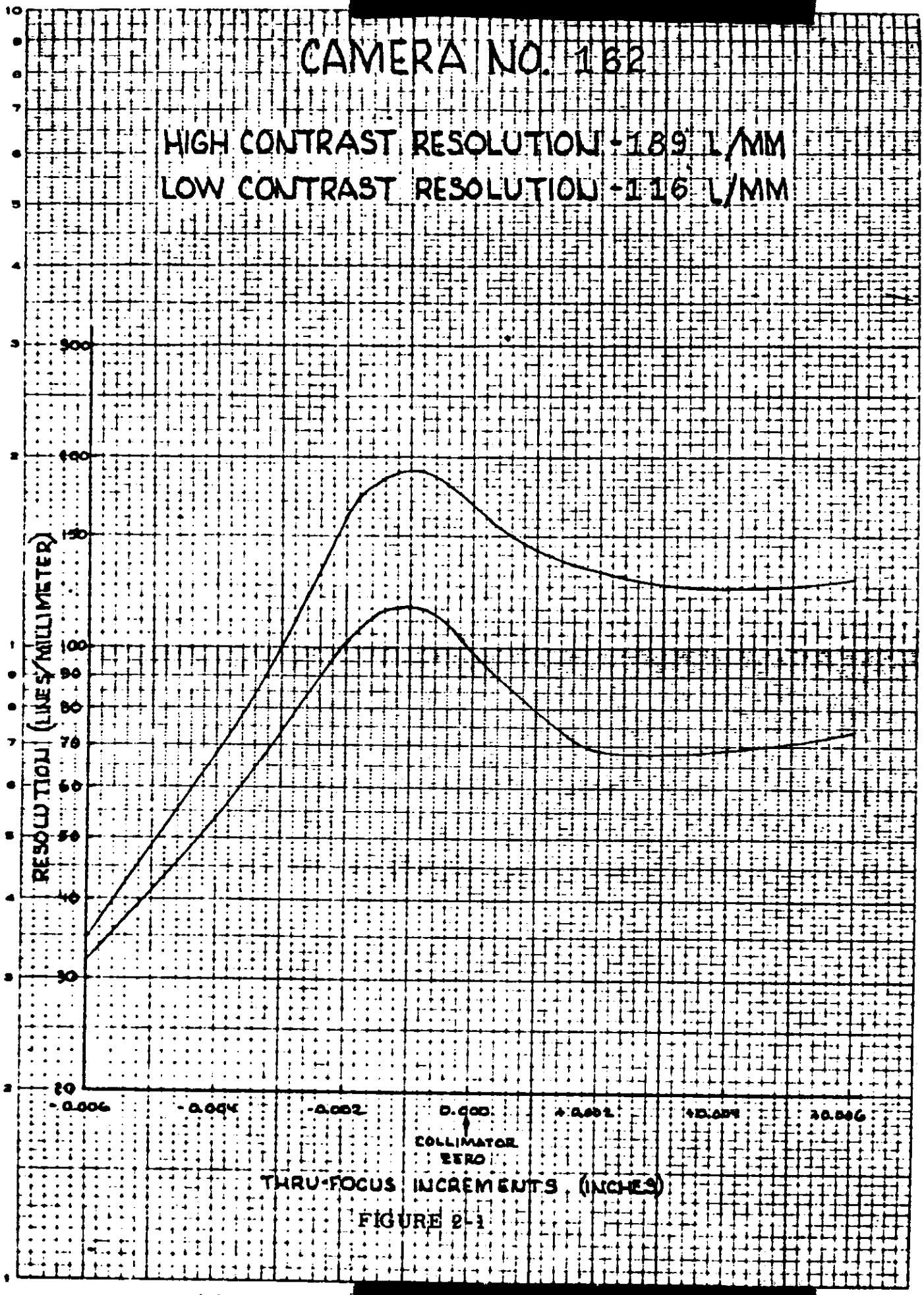


FIGURE 2-1

EUGENE DIETZGEN CO
MADE IN U.S.A.
NO. 340R L210 DIETZGEN SEMI-LOGARITHMIC
2 CYCLES X 10 DIVISIONS PER INCH

[redacted]

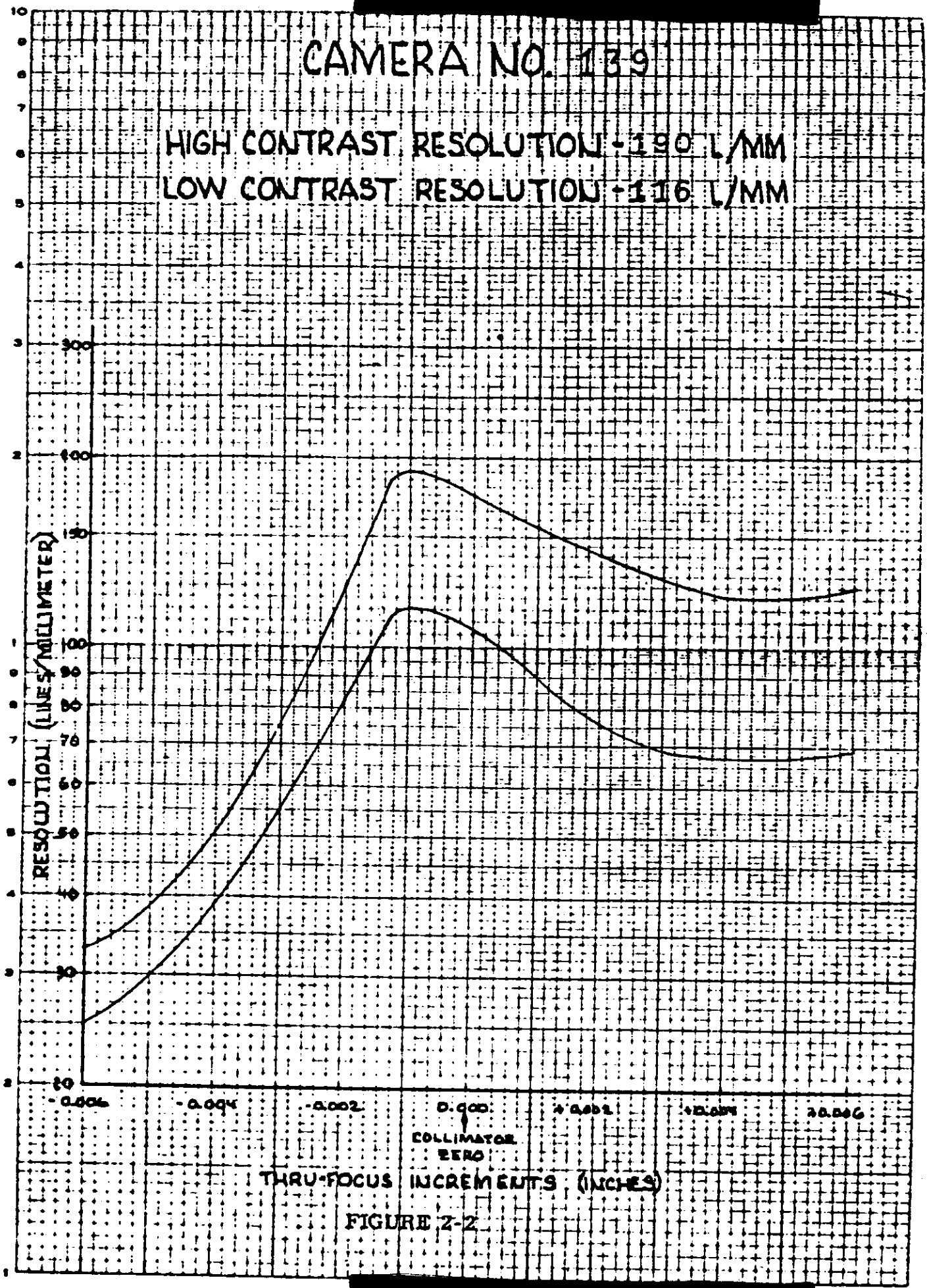


FIGURE 2-2

[redacted]

SECTION 3

FLIGHT OPERATIONS

A. INSTRUMENTATION AND COMMAND PERFORMANCE

All instrumentation systems operated satisfactorily throughout both phases of the mission. All monitors operated properly with the exception of the following:

1) The fairing separation monitor (13-1-49) changed from a normal voltage of 1.3 volts to 4.7 volts at T+94 seconds. This monitor remained in this condition until T+170 seconds, then changed to the normal 1.3 volts. This condition indicates that the switch was sensitive to vibration.

2) The pressure make-up system operated satisfactorily for the duration of the flight. However, the rate of gas consumption for this mission was higher than expected. By comparison with the J-missions, it is concluded that a leak occurred in the system.

A comparative analysis of this system and previous J systems indicated that a difference of approximately 500 lbs. PSIA existed between J-16 and previous J-systems after a comparable period of operating time. The J-16 PMU gas would have been depleted after approximately 250 minutes of operation.

B. PANORAMIC CAMERA PERFORMANCE

Both panoramic cameras operated satisfactorily throughout Phase 1 and Phase 2 of the mission. Camera operation was observed on 10 engineering operations during Phase 1 and 6 engineering operations during Phase 2 of the mission. No camera anomalies were present in either Phase 1 or Phase 2. The following camera observations are significant:

1) The maximum cycle rate deviations were 0.9% slow to 1.3% fast on the master camera and 3.0% slow to 0.4% slow on the slave camera.

2) The cut and wrap operation was normal.

3) The Total film consumption for Phase 1 was 2932 frames on the master instrument and 2853 frames on the slave instrument. The total film consumption for Phase 2 was 2950 frames for the master instrument and 2889 frames for the slave instrument.

Utilizing nominal values for payload consumption, the cycle counters on the master instrument indicated that the master camera payload should have been depleted during the last operation of Phase 2. However, the film supply was not depleted during the last operation on orbit 143. This is attributed to the supply spool length being greater than the nominal value of 16000 ft (± 80 ft.).

The slave camera did not deplete the film supply. Approximately 368 feet of film was left on orbit after the last camera operation on orbit 143. The total film supply was based on the total film supply of the master camera.

The following is a tabulation of camera payload consumption for this mission:

	Master	Slave
Off Spool	0	0
Control Sample	93	93
Phase 1 - Recovered	8193	7985
Phase 2 - Recovered	7814	7654
Left on Orbit	*	368
Total	16,100	16,100**

Note: All categories are listed in feet. Nominal supply spool length is 16000 ft. ± 80 ft.

* Unknown

** Total film length is based on total film length of master camera.

Table 3-1 is a tabulation of cycle rate errors observed on all engineering passes during Phase 1 and Phase 2 of the mission.

CYCLE RATE DATA FOR RAMP 6 AMPLITUDE 6

Orbit & Station	Time Up The Ramp	Nominal	Actual No. 1	Actual No. 2	% Error No. 1	% Error No. 2
			PHASE 1			
01[redacted]	2060	2.322	2.320	2.340	0	0.8S
09[redacted]	825	3.137	3.095	3.150	1.3 F	0.4S
16[redacted]	2275	2.412	2.412	2.448	0	1.5S
32[redacted]	2290	2.421	2.425	2.460	0.2S	1.6S
41[redacted]	875	3.084	3.060	3.120	0.8F	1.2S
48[redacted]	2313	2.437	2.440	2.470	0.1S	1.4S
57[redacted]	904	3.057	3.034	3.094	0.8F	1.2S
64[redacted]	2325	2.444	2.465	2.490	0.9S	1.9S
73[redacted]	925	3.032	3.025	3.090	0.2F	1.9S
79[redacted]	2452	2.540	2.536	2.580	0.2F	1.6S
			PHASE 2			
89[redacted]	948	3.007	3.012	3.084	0.2S	2.6S
95[redacted]	2391	2.491	2.500	2.510	0.4S	0.8S
111[redacted]	2428	2.519	2.525	2.586	0.2S	2.7S
127[redacted]	2513	2.598	2.620	2.672	0.8S	2.8S
137[redacted]	1007	2.956	2.968	3.040	0.4S	2.8S
143[redacted]	2469	2.563	2.580	2.640	0.7S	3.0S

F = FAST S = SLOW

TABLE 3-1

The vehicle was not de-activated after the Phase 2 recovery. The stored orbital program was depleted one day after the Phase 2 recovery. This precluded instrument operation after the Phase 2 recovery in order to monitor camera payload depletion.

The vehicle battery was depleted between orbit 177 and orbit 181.

The vehicle re-entered on orbit 281 on 6 December 1964.

C. STELLAR/INDEX PERFORMANCE

The Phase 1 Stellar/Index camera operated satisfactorily. The Phase 2 Stellar/Index camera metering became erratic during the operation on orbit 116 and remained in this condition for the duration of the mission.

This failure was first observed on the engineering operation on orbit 127. The stellar/index was programmed for 3 metering cycles but the first metering cycle did not occur. The last two metering cycles of the operation were normal. The cause of this condition is unknown.

The Index camera film supply was depleted during the last engineering operation of Phase 1.

The Phase 2 slewing of the Stellar/Index camera was observed on orbit 145 over the [redacted] Tracking Station. The telemetry monitors indicated that film was available after completion of the slewing operation. It is unknown how much payload was left on orbit.

D. CLOCK PERFORMANCE

The clock system operation was satisfactory throughout the mission.

Time correlation was made utilizing the slant range to correct for T/M transmission time. The correction for each readout is included in Table 3-2.

The data was fitted to a first and second degree polynomial which is included in Table 3-3 and Table 3-4. By comparison of the two sigma values, it was concluded that the linear fit data was preferable.

AYLOAD J-16 VEH 1180 MISSIONS 1014-1,-2 TIME CORRELATION

S. T. INPUT	COR SYS TIME	R ST COR	RANGE	REV
0.35026075000000000D 05	0.35026069942391340D 05	.00505761	818.66	9
0.74148570999999990D 05	0.74148569615194540D 05	.00138481	224.15	16
0.34690472999999990D 05	0.34690470295665340D 05	.00270433	437.74	25
0.73898960000000000D 05	0.73898957804890950D 05	.00219511	355.31	32
0.34523997999999990D 05	0.34523994209429630D 05	.00379057	613.57	41
0.73628281999999990D 05	0.73628278980491410D 05	.00301951	488.76	48
0.34229196999999990D 05	0.34229193997646970D 05	.00300235	485.98	57
0.73334064999999990D 05	0.73334061139312610D 05	.00386069	624.92	64
0.33937685000000000D 05	0.33937682054672590D 05	.00294533	476.75	73
0.67733269999999990D 05	0.67733266035467400D 05	.00396453	641.72	79
0.33607922000000000D 05	0.33607919210442920D 05	.00278956	451.54	89
0.67085619999999990D 05	0.67085614909583050D 05	.00509042	823.97	95
0.32960869999999990D 05	0.32960864653561090D 05	.00534644	865.41	105
0.67032236999999980D 05	0.67032234072433850D 05	.00292757	473.87	111
0.32870781000000000D 05	0.32870777994994450D 05	.00300501	486.41	121
0.66643768999999990D 05	0.66643766446641340D 05	.00255336	413.30	127
0.32466892999999990D 05	0.32466889649536000D 05	.00335046	542.33	137
0.66232632999999990D 05	0.66232630494401310D 05	.00250560	405.57	143

TABLE 3-2

YLGAD J-16 VEH 1180 MISSIONS 1014-1,-2 TIME CORRELATION

ORDER FIT 1

SYS TIME I/P	CL TIME I/P	COMP SYS TM	DELTA ST	REV	STA
68994.7579	310459.3679	68994.7599	-0.001912	0	1
69081.6479	310546.2559	69081.6479	0.000093	0	1
35026.0699	362890.6819	35026.0709	-0.001023	9	1
74148.5696	402013.1799	74148.5667	0.002849	16	1
34690.4702	448955.0859	34690.4701	0.000167	25	1
73898.9578	488163.5759	73898.9579	-0.000120	32	1
34523.9942	535188.6069	34523.9862	0.007928	41	1
73628.2789	37421.9939	73628.2830	-0.004103	48	1
34229.1939	84422.9059	34229.1924	0.001555	57	1
73334.0611	123527.7789	73334.0632	-0.002105	64	1
33937.6820	170531.4059	33937.6876	-0.005548	73	1
67733.2660	204326.9879	67733.2677	-0.001668	79	1
33607.9192	256601.6419	33607.9187	0.000445	89	1
67085.6149	290079.3349	67085.6098	0.005026	95	1
32960.8646	342354.6049	32960.8769	-0.012292	105	1
67032.2340	376425.9569	67032.2270	0.007041	111	1
32870.7779	428664.5069	32870.7740	0.003900	121	1
66643.7664	462437.4989	66643.7641	0.002250	127	1
32466.8896	514660.6279	32466.8902	-0.000612	137	1
66232.6304	11555.4599	66232.6323	-0.001870	143	1

A0=-0.24146459060 06 A1= 0.999999943797D 00

SIGMA=0.00427 NO. POINTS= 20

RATIO OF CLOCK TIME TO SYS TIME= 0.100000005620D 01

TABLE 3-3

AYLOAD J-16 VEH 1180 MISSIONS 1014-1,-2 TIME CORRELATION

ORDER FIT 2

SYS TIME I/P	CL TIME I/P	COMP SYS TM	DELTA ST	REV	STA
68994.7579	310459.3679	68994.7601	-0.002142	0	1
69081.6479	310546.2559	69081.6481	-0.000137	0	1
35026.0699	362890.6819	35026.0710	-0.001149	9	1
74148.5696	402013.1799	74148.5668	0.002789	16	1
34690.4702	448955.0859	34690.4701	0.000176	25	1
73898.9578	488163.5759	73898.9578	-0.000063	32	1
34523.9942	535188.6069	34523.9861	0.008031	41	1
73628.2789	37421.5939	73628.2829	-0.003971	48	1
34229.1939	84422.9059	34229.1922	0.001711	57	1
73334.0611	123527.7789	73334.0630	-0.001940	64	1
33937.6820	170531.4059	33937.6874	-0.005382	73	1
67733.2660	204326.9879	67733.2675	-0.001509	79	1
33607.9192	256601.6419	33607.9186	0.000581	89	1
67085.6149	290079.3349	67085.6097	0.005138	95	1
32960.8646	342354.6049	32960.8768	-0.012228	105	1
67032.2340	376425.9569	67032.2270	0.007065	111	1
32870.7779	428664.5069	32870.7741	0.003850	121	1
66643.7664	462437.4989	66643.7643	0.002144	127	1
32466.8896	514660.6279	32466.8904	-0.000817	137	1
66232.6304	11555.4599	66232.6326	-0.002147	143	1

A0=-0.24146458950 06 A1= 0.999999939948D 00
A2= 0.28023914209170-14

SIGMA=0.00427 NO. POINTS= 20

TABLE 3-4

E. TEMPERATURE ENVIRONMENT

Temperature data was obtained from real time orbits acquired by the [redacted] Tracking Station. The self heating corrections utilized were established from data acquired during Environmental Testing in the HIVOS Chamber. All temperatures were corrected for errors due to voltage biases in the supply voltage.

This system was the fourth payload system to utilize the universal paint pattern. After temperature stabilization, the master instrument temperature average for Phase 1 and Phase 2 was 61°F and 50°F respectively. The slave instrument temperature average for Phase 1 and Phase 2 was 58°F and 46°F. Refer to Table 3-5 and 3-6.

A comparison of the actual versus the predicted temperature environment is included in Figures No. 3-1 to 3-3.

The recovery cassette temperature sensor in Phase 1 indicated the recovery system was approximately 28°F. This temperature was approximately 10 - 15°F cooler than previously encountered by other systems. However, this condition apparently did not degrade the system performance. The temp sensor was subjected to a post flight ground test and the original flight calibration was verified to be correct.

TABLE 3-5

J-16 TEMPERATURE SUMMARY

SENSOR	ORBITS ACQUIRED																		
Master Camera	0	9	16	25	32	42	48	57	64	73	79	89	95	105	111	121	127	137	143
3	67	57	55	58	53	55	52	53	51	51	50	46	45	45	44	46	44	46	44
4	71	65	62	66	60	63	59	59	56	59	55	53	52	51	51	52	50	51	50
5	68	66	64	68	61	65	59	59	58	58	56	53	51	51	49	51	49	51	48
6	67	73	72	72	68	69	66	66	63	63	62	46	55	55	54	54	53	52	52
7	66	69	67	68	64	67	63	63	61	62	60	55	54	55	53	54	53	53	53
8	72	67	66	70	62	67	60	62	59	61	58	55	52	54	50	52	50	52	50
9	65	70	67	69	63	67	61	63	59	61	58	54	52	51	50	51	48	50	48
10	66	63	62	63	59	61	58	58	55	56	54	51	50	50	48	50	47	48	47
11	98	77	72	78	66	70	66	68	61	65	60	58	53	60	53	55	53	55	52
12	72	56	54	61	53	58	51	53	50	53	49	48	44	48	43	47	43	48	42
13	69	70	69	71	63	65	63	62	60	62	59	54	53	50	52	49	52	50	50
AVG	68	65	64	67	61	64	59	61	57	59	56	51	51	51	49	50	49	50	48
Slave Camera																			
3	66	72	66	69	62	66	60	60	56	56	53	51	46	49	43	45	41	43	42
4	67	69	63	69	59	64	58	59	52	57	52	51	45	49	43	46	41	44	41
5	66	64	60	65	57	61	56	56	51	54	51	49	45	49	44	46	42	44	43
6	68	62	60	62	58	59	57	57	52	56	53	50	48	49	47	48	45	47	47
7	72	61	62	67	60	62	59	61	56	59	55	53	50	55	50	51	48	50	48
8	66	65	58	63	55	60	55	56	52	54	51	49	45	48	43	45	43	45	43
9	67	59	53	58	51	55	51	52	50	51	47	46	43	45	42	44	42	45	42
10	67	59	58	60	56	57	54	56	51	53	51	48	46	50	44	44	44	45	43
11	90	61	61	61	58	58	56	56	55	54	53	49	47	47	46	47	45	46	45
12	67	71	63	69	60	66	58	60	55	58	52	53	46	51	43	46	42	45	42
13	67	60	62	62	59	59	58	57	56	55	56	49	49	45	47	44	47	45	47
AVG	67	64	60	64	58	61	57	57	53	55	52	50	46	50	45	46	44	46	44
Supply Spool																			
1	69	53	56	58	56	55	52	53	52	52	50	48	44	48	42	43	41	43	41
2	67	62	60	63	58	61	57	58	56	56	53	49	46	49	42	44	43	43	42

TABLE 3-6

J-16 TEMPERATURE SUMMARY

SENSOR	ORBITS ACQUIRED																		
	0	9	16	25	32	42	48	57	64	73	79	89	95	105	111	121	127	137	143
Fairing (A) Barrel #1 (B)																			
1		43	27	43	24	40	21	40	80	40	24	-7	0	0	-3	0	0	3	0
2		9	-4	9	-4	9	-4	9	-4	12	-4	0	-7	7	-3	10	3	13	3
3		-1	2	2	2	-1	-1	-1	-4	2	2	22	18	28	19	22	18	22	18
4	206	56	47	53	47	50	44	47	40	50	40	28	25	28	22	22	16	19	9
5	220	79	72	79	66	72	60	69	53	66	50	28	28	28	21	24	21	21	18
6	199	66	66	66	57	60	47	57	41	54	38	-	-	-	-	-	-	-	-
Barrel #2																			
1	133	49	59	49	56	43	46	36	40	36	33	24	20	20	17	17	14	17	14
2	127	49	71	49	62	43	53	36	46	33	43	27	27	27	21	21	17	14	11
3	161	17	27	20	23	17	20	14	17	14	24	11	14	20	24	14	17	14	14
4	194	0	-6	0	-10	0	-10	0	-6	3	-3	0	-10	3	-3	7	0	10	3
5	174	13	13	13	13	13	13	13	13	16	13	0	6	6	6	10	6	16	6
Conic Adapter																			
1	145	76	73	76	66	70	60	60	51	57	48	38	28	35	25	32	22	28	19
Clock																			
1	95	75	71	75	71	73	69	71	69	71	67	60	56	58	56	58	54	60	54
2	97	73	69	73	69	71	67	69	65	67	65	58	54	56	52	56	50	56	52
Thrust Cone "A" to "B" SRV																			
1	116	47	42	44	39	41	39	42	36	41	37	56	55	54	54	54	54	55	54
2	78	66	60	61	56	56	54	55	51	52	50	57	55	55	54	52	52	52	52
Stellar/Index "A" to "B"																			
1	82	66	61	64	61	61	58	54	54	54	54	46	49	52	46	46	46	49	46
2	75	63	60	60	57	60	57	57	54	54	54	47	47	43	43	47	47	43	43
Recovery Battery "B" SRV																			
1	72	74	73	72	71	71	71	69	69	66	67	92	88	81	85	92	94	83	81
Master Cassette "A" SRV																			
2	89	38	31	32	25	29	25	30	26	28	26	-	-	-	-	-	-	-	-

J-16

PREDICTED AND ACTUAL TEMPERATURES

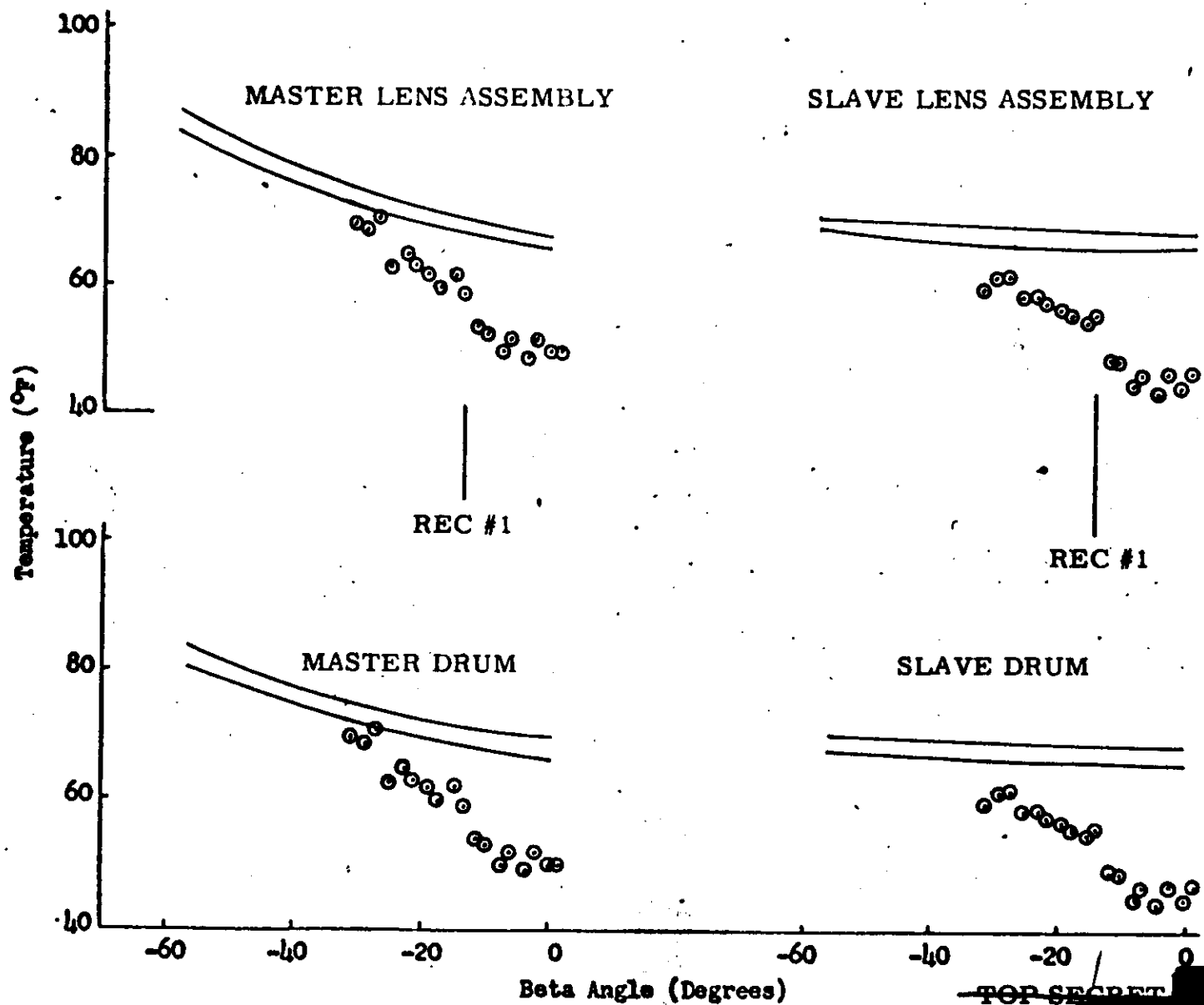


FIGURE 3-1

J-16

PREDICTED AND ACTUAL TEMPERATURES

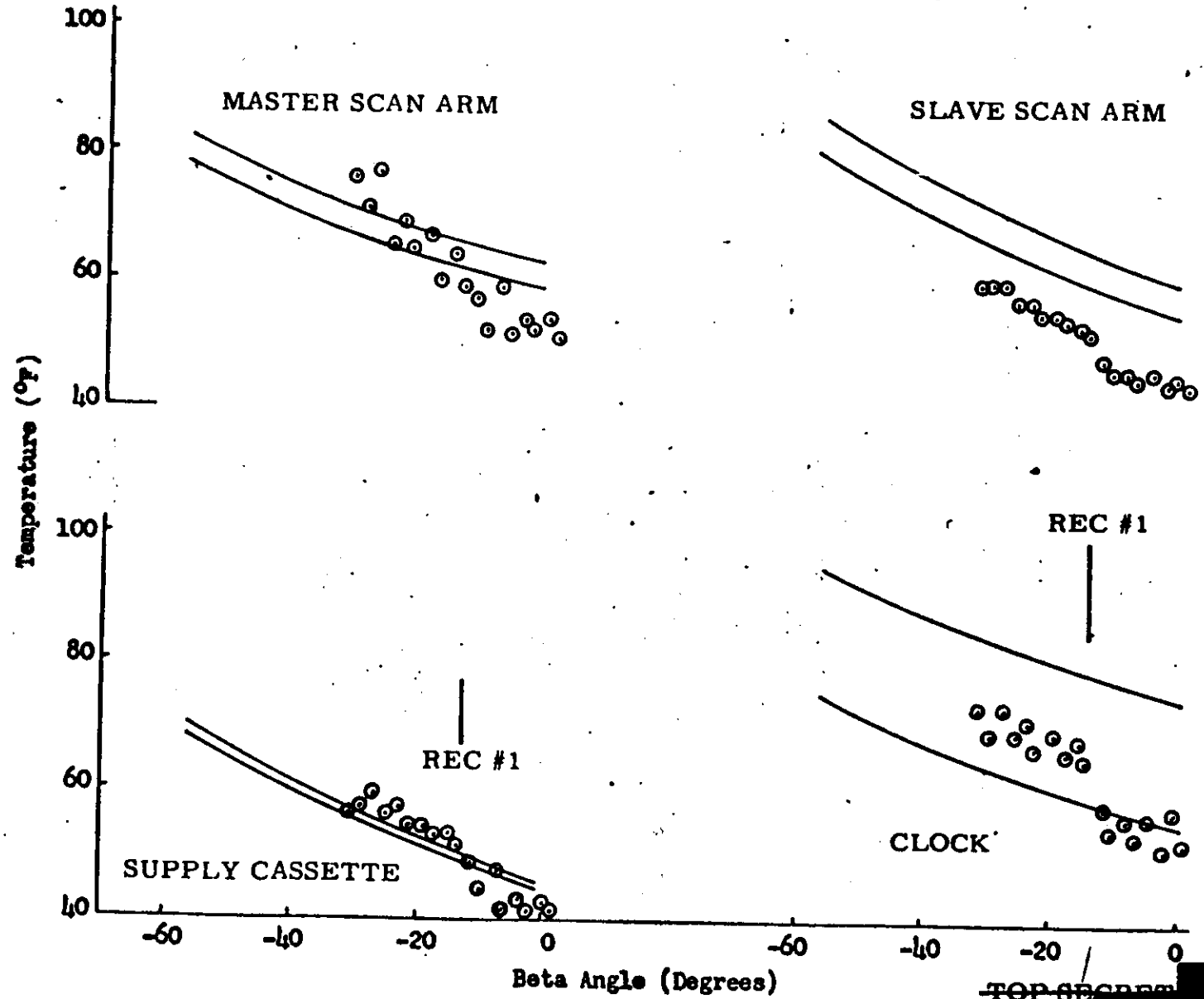


FIGURE 3-2

J-16
PREDICTED AND ACTUAL TEMPERATURES

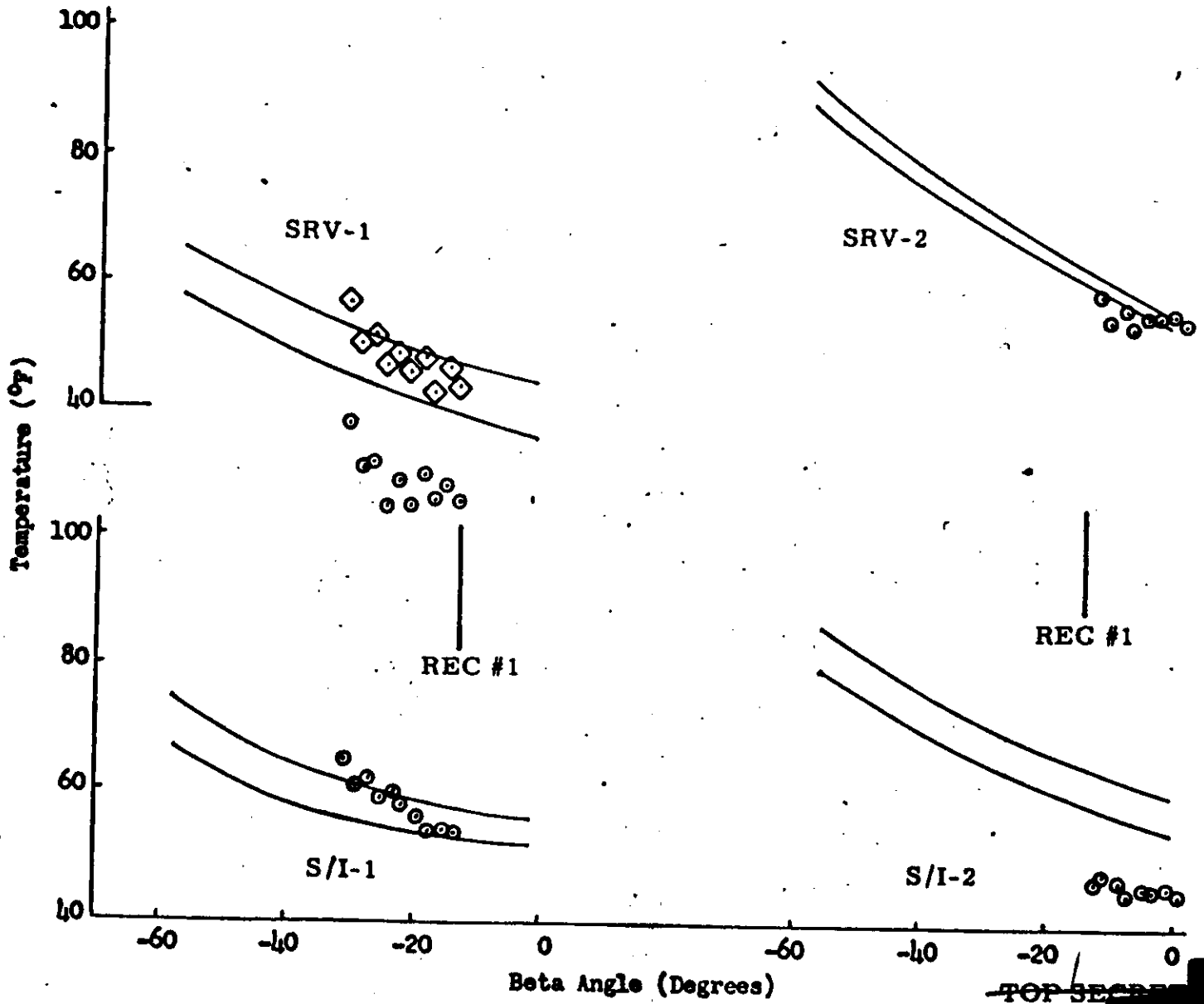


FIGURE 3-3

SECTION 4

MISSION 1014-1 RECOVERY SYSTEM

SRV #659 was received at A/P on 4 June 1964. The receiving weight was 159.5 pounds. After modification and incorporation of outstanding E.O.'s, the SRV was delivered to Systems Test for mating to the J-16 system. The capsule was delivered to VAFB on 26 October 1964.

A successful air catch was accomplished on orbit 81. The impact point was approximately 50 miles south of the predicted impact point. However, this distance is within the normal prediction tolerances. The payload weights utilized in the calculation of the predicted impact point were verified to be correct. All capsule re-entry events were within the prediction tolerances for each event. The sequence of events is contained in Table 4-1.

The amplitude of Channel 7 changed during retro from 2.1 to 3.3 volts. The amplitude also decreased to 3.0 volts at the initial firing of the "thrust cone" separate bolts. This condition is indicative of a possible grounding of the de-spin monitor line at the firing of the "thrust cone" bolts.

A ground test was conducted to duplicate the aforementioned condition, but this condition could not be duplicated.

Post flight inspection indicated that normal paint blistering was the only damage of the recovered capsule. Refer to Figures Nos. 4-1 and 4-2 for the temperature environment encountered during re-entry.

MISSION 1014-1

RECOVERY SEQUENCE OF EVENTS

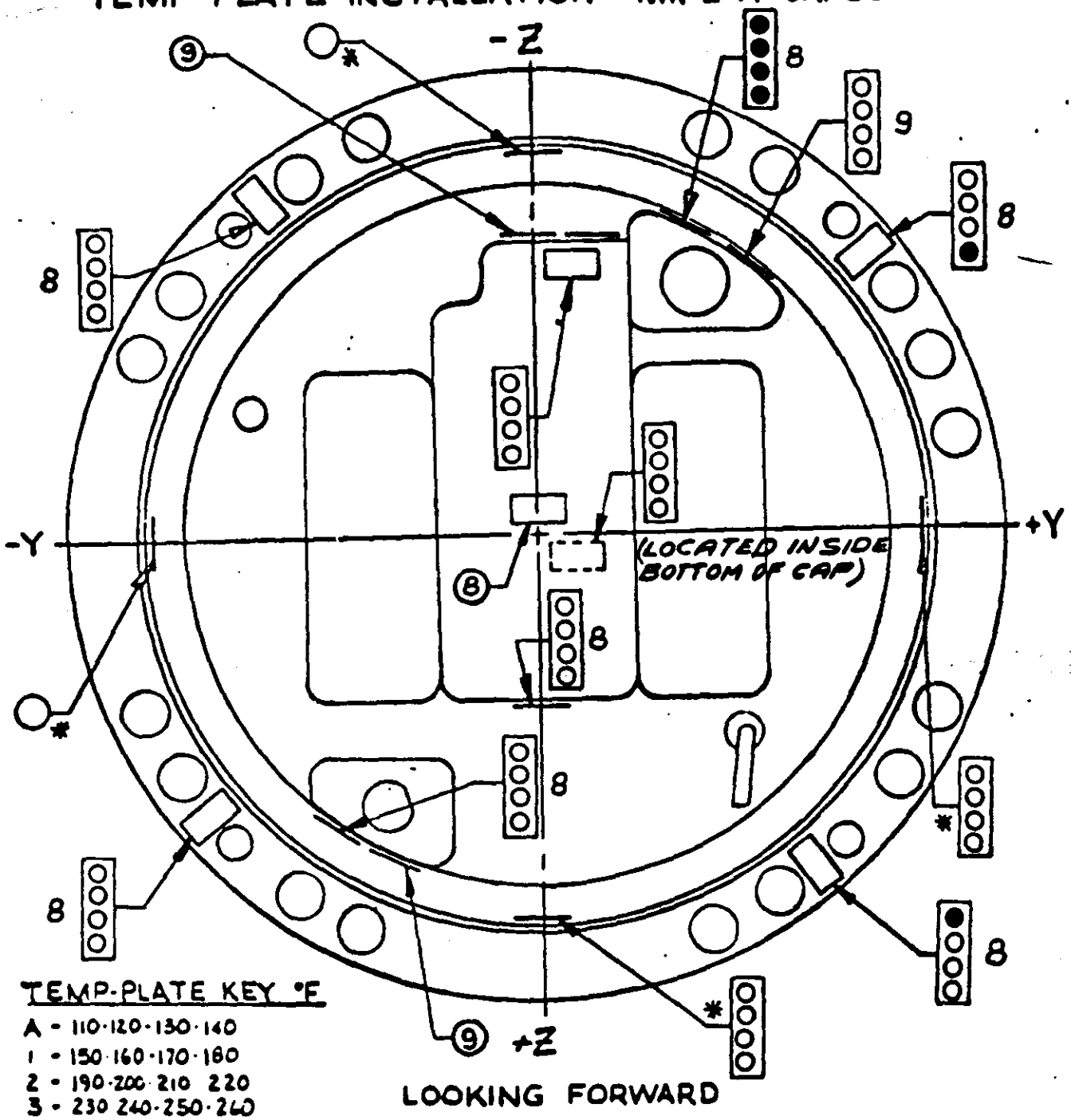
Event	Delta Time (Seconds) Actual	Nominal Events + ΔT	
Transfer			
Electrical Disconnect	0.94	0.900	+ 0.430 - 0.400
* Separation	1.96	2.0	± 0.250
** Spin	3.60	3.4	± 0.30
Retro	7.32	7.55	± 0.45
Despin	10.74	10.75	± 0.54
T/C Separation	1.50	1.5	± 0.15
"G" Switch Open	567.77	514.0	+ 65.0 - 50.0
Parachute Cover Off	32.88	34.0	± 1.5
Drogue Chute Deployed	0.66	0.63	+ 0.08 - 0.06
Drogue Chute Release	10.09	10.14	+ .48 - .40
Main Chute Deployed	0.55	0.52	+ .13 - .12
Main Chute Disreefed	4.79	4.46	+ .49 - .29

* From Transfer
** From Electrical Disconnect

Spin Rate: 66 RPM
Despin Rate: 4.1 RPM
Retro Velocities: 1059.2 Ft/Sec.

TABLE 4-1

TEMP-PLATE INSTALLATION - Mk V-A CAPSULE



TEMP-PLATE KEY °F

A - 110·120·130·140
1 - 150·160·170·180
2 - 190·200·210 220
3 - 230 240·250·260
4 - 270 280·290·300
5 - 310·320 330 340
6 - 350·360·370 380
7 - 390·410·435·450
8 - 100·150·200·250
9 - 300·350·400·450

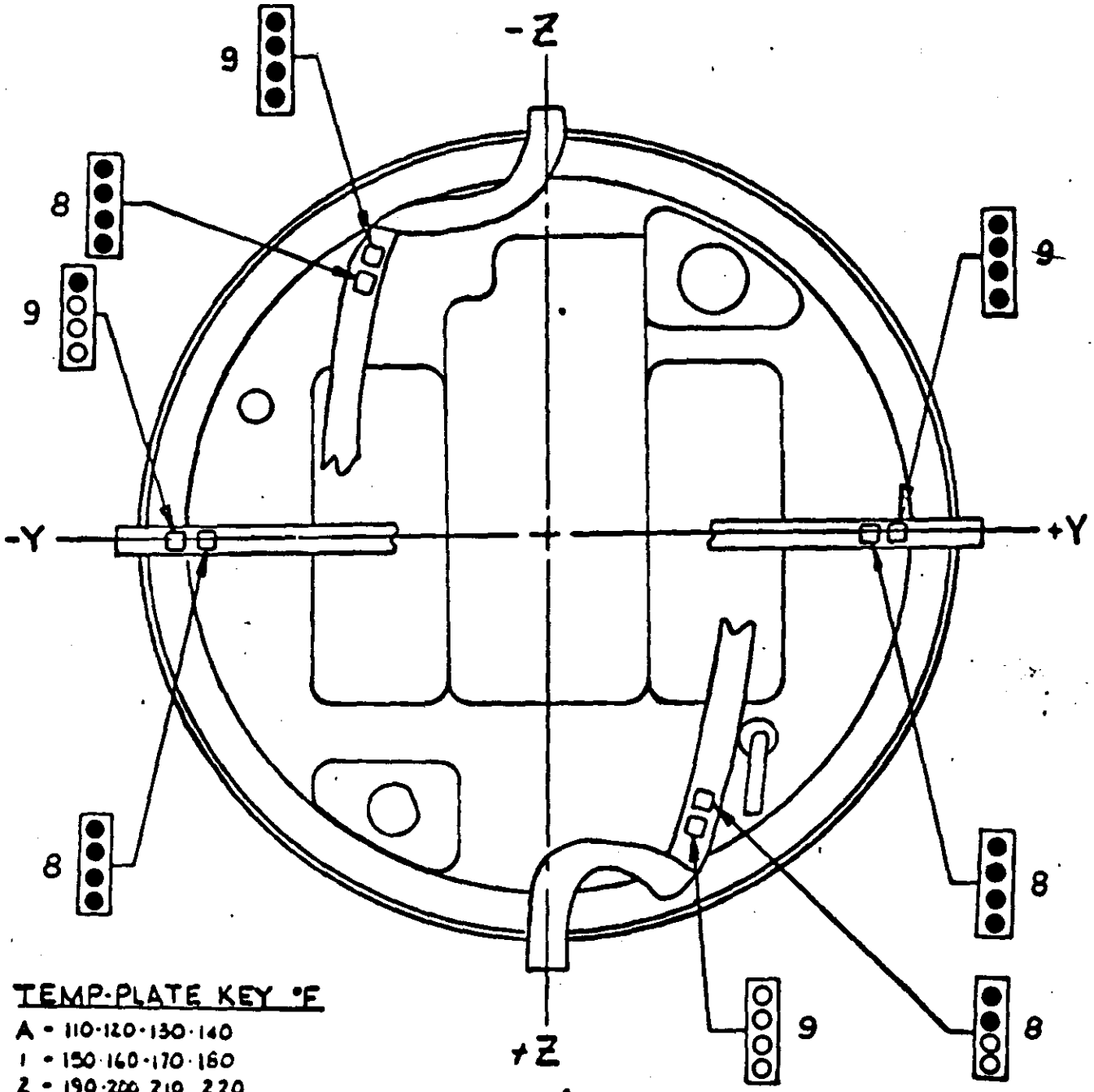
* LOCATED [illegible]

● INDICATOR TURNED BLACK TEMP REACHED OR EXCEEDED INDICATED LEVEL

1014-1

FIGURE 4-1

TEMP-PLATE INSTALLATION - Mk V-A CAPSULE



TEMP-PLATE KEY °F

A - 110-120-130-140
1 - 150-160-170-180
2 - 190-200-210-220
3 - 230-240-250-260
4 - 270-280-290-300
5 - 310-320-330-340
6 - 350-360-370-380
7 - 390-410-435-450
8 - 100-150-200-250
9 - 300-350-400-450

LOOKING FORWARD

USE OF TEMP PLATES ON PARACHUTE SHROUDS

● INDICATOR TURNED BLACK TEMP REACHED OR EXCEEDED INDICATED LEVEL

1014-1

FIGURE 4-2

SECTION 5

MISSION 1014-2 RECOVERY SYSTEM

SRV #660 was received at A/P on 14 August 1964. The receiving weight was 152.1 pounds. After modification and incorporation of outstanding E.O.'s the SRV was delivered to Systems Test for mating to the J-16 system. The capsule was delivered to VAFB on 4 November 1964.

A successful air catch was accomplished on orbit 145. The point of impact was nominal. All capsule re-entry events occurred within the specified tolerances for each event, with the exception of main chute separation which occurred 0.55 seconds early. See Table 5-1.

The Channel 7 condition present during Phase 1 was also present during Phase 2. A ground test was conducted to try and duplicate the aforementioned condition, but this condition could not be duplicated.

Post flight inspection indicated that normal paint blistering was the only damage of the recovered capsule. Refer to Figure Nos. 5-1 and 5-2 for the temperature environment encountered during re-entry.

MISSION 1014-2

RECOVERY SEQUENCE OF EVENTS

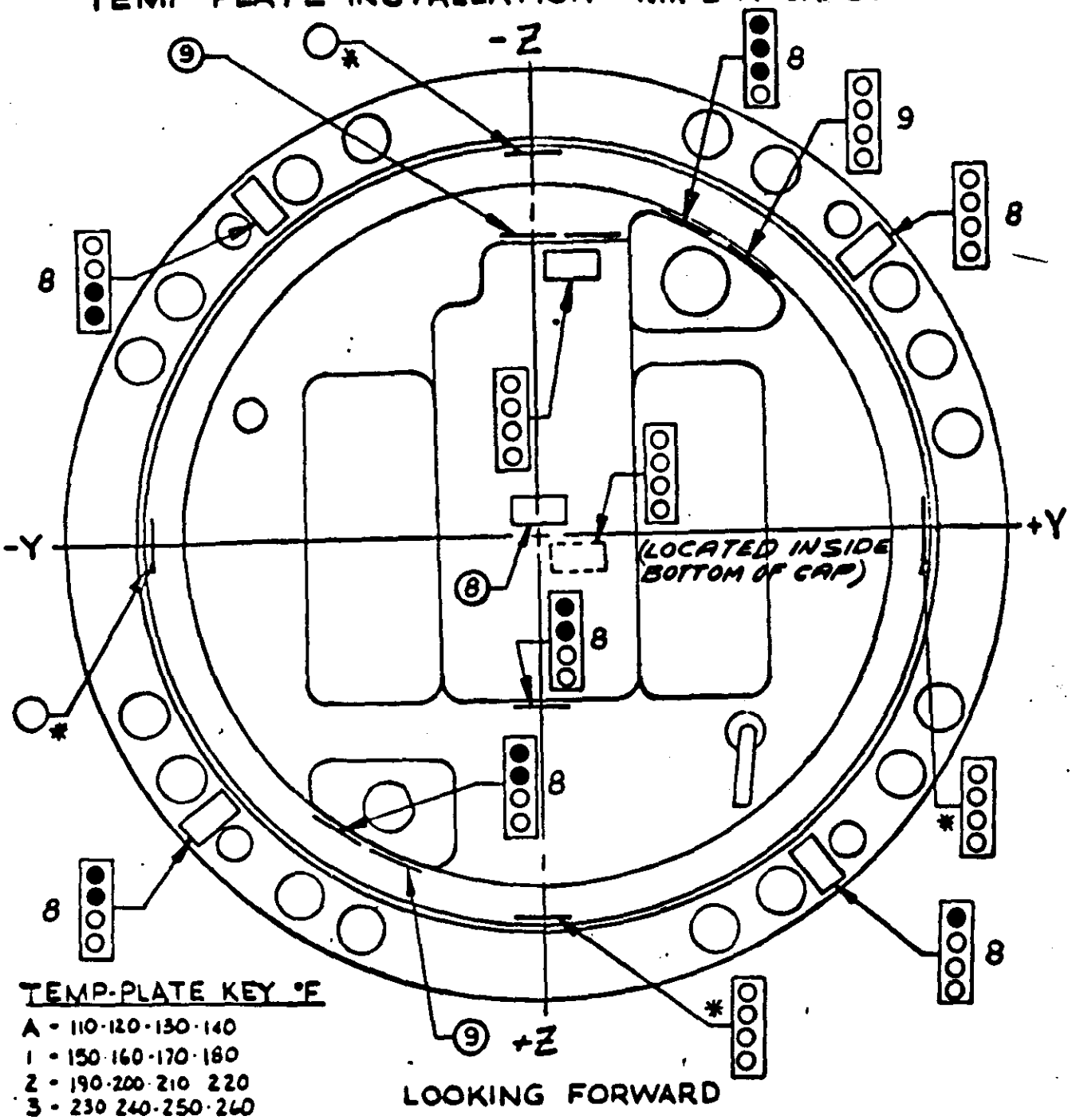
Event	Delta Time (Seconds) Actual	Nominal Events + ΔT	
Transfer			
Electrical Disconnect	0.98	0.900	+ 0.430 - 0.400
* Separation	2.0	2.0	± 0.250
** Spin	3.45	3.4	± 0.30
Retro	7.55	7.55	± 0.45
Despin	10.68	10.75	± 0.54
T/C Separation	1.50	1.5	± 0.15
"G" Switch Open	567.50	514.0	+ 65.0 - 50.0
Parachute Cover Off	33.09	34.0	± 1.5
Drogue Chute Deployed	0.68	0.63	+ .08 - .06
Drogue Chute Release	9.59	10.14	+ .48 - .40
Main Chute Deployed	0.56	0.52	+ .13 - .12
Main Chute Disreefed	4.33	4.46	+ .49 - .29

* From Transfer
** From Electrical Disconnect

Spin Rate: 66 RPM
Despin Rate: 6.0 RPM
Retro Velocity: 1088 Ft/Sec.

TABLE 5-1

TEMP-PLATE INSTALLATION - Mk V-A CAPSULE



TEMP-PLATE KEY °F

A - 110-120-130-140
1 - 150-160-170-180
2 - 190-200-210 220
3 - 230 240-250-260
4 - 270 280-290-300
5 - 310-320 330 340
6 - 350-360-370 380
7 - 390 410-435-450
8 - 100-150-200-250
9 - 300-350-400-450

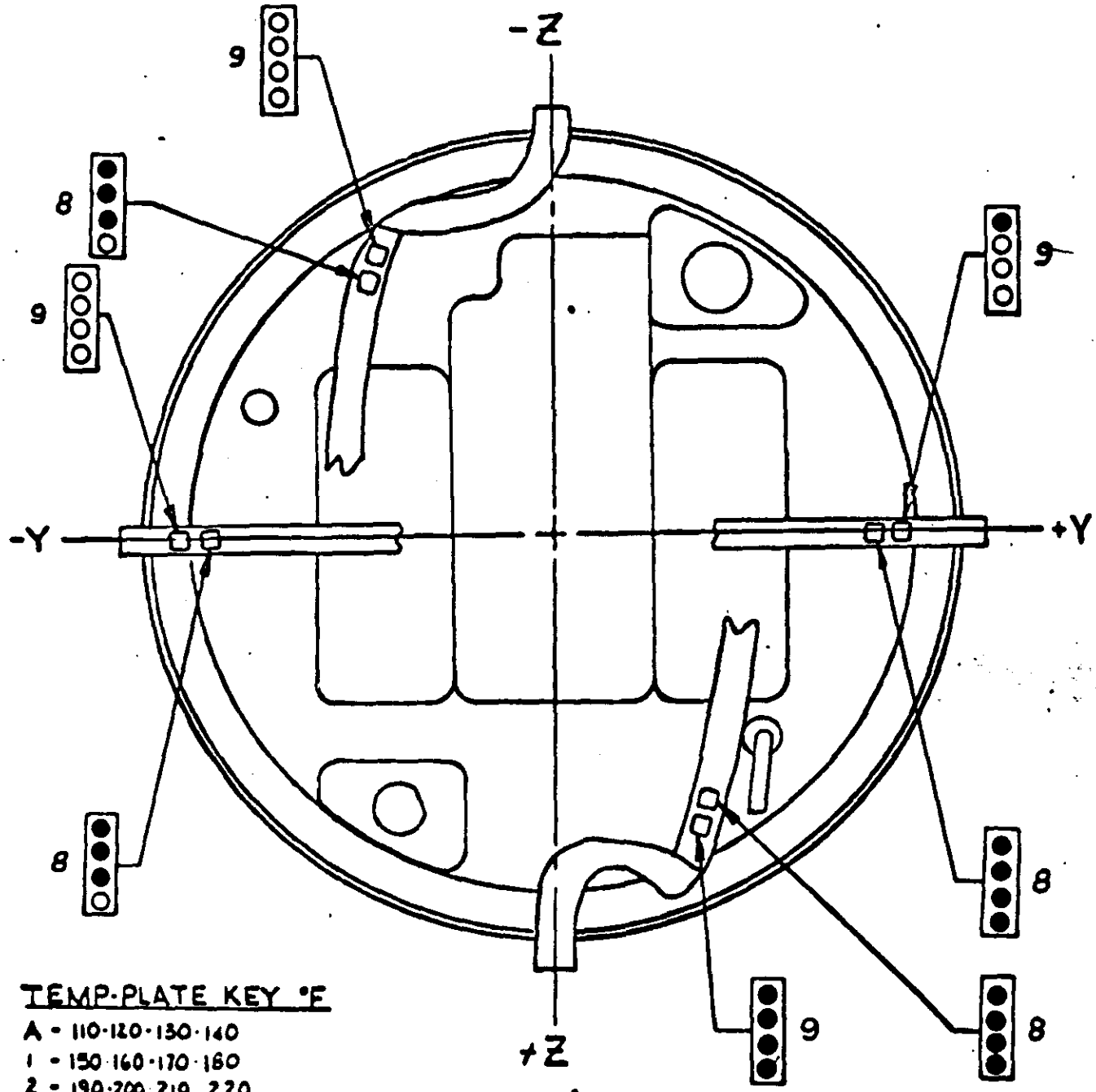
* LOCATED INSIDE CAPSULE ON NOSE WALL

● INDICATOR TURNED BLACK TEMP REACHED OR EXCEEDED INDICATED LEVEL

1014-2

FIGURE 5-1

TEMP-PLATE INSTALLATION - Mk V-A CAPSULE



TEMP-PLATE KEY °F

A - 110-120-130-140
1 - 150-160-170-180
2 - 190-200-210-220
3 - 230-240-250-260
4 - 270-280-290-300
5 - 310-320-330-340
6 - 350-360-370-380
7 - 390-410-435-450
8 - 100-150-200-250
9 - 300-350-400-450

LOOKING FORWARD

USE OF TEMP PLATES ON PARACHUTE SHROUDS

● INDICATOR TURNED BLACK TEMP REACHED OR EXCEEDED INDICATED LEVEL

1014-2

FIGURE 5-2

SECTION 6

MASTER PANORAMIC CAMERA

A. COMPONENT ASSIGNMENT

Component	Serial Number
Main Camera	162
Main Camera Lens	1372435
Supply Horizon Camera	169B
Supply Horizon Camera Lens	814016
Take-up Horizon Camera	169A
Take-up Horizon Camera Lens	812284
Supply Cassette	SC-21

B. CAMERA DATA AND FLIGHT SETTINGS

Main Camera:

Lens	24" f/3.5
Slit Width	0.250"
Filter Type	Wratten 25
Film Type	Eastman Type 4404

Supply (Port) Horizon Camera:

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

Take-up (Starboard) Horizon Camera:

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

C. POST FLIGHT PERFORMANCE EVALUATION - FWD Camera

This camera produced 2932 frames (8193 feet, including preflight test footage) of photography during Mission 1014-1, and 2950 frames (7814 feet) of photography during Mission 1014-2. The overall photographic quality was judged to be about the same for both missions, but somewhat lower than the best missions observed to date.

Image contrast of the Master camera was slightly greater than that of the Slave camera but the increase in information content did not appear to be very significant. Customer personnel using the material expressed a general preference for that from the Master camera. This preference is unique among winter missions to date.

The principal reasons for the less than optimum image quality appear to be: (1) an increased orbit altitude producing image scales generally 5% or more, less than those usually encountered, (2) poor atmospheric conditions over most of the coverage areas, and (3) an unusually large portion of the coverage was at very low sun angles. Although the orbit was designed for low latitude coverage, most of the material was exposed at the usual higher latitudes. The three conditions enumerated above combined in such a way that none of the exposure conditions would produce imagery with maximum ground detail. Thus coverage at higher latitudes had poor atmospheric conditions and low sun angles producing low image contrasts although vehicle altitudes were near normal. At low latitudes where solar elevations were adequate and atmospheric conditions might be presumed to be good, vehicle altitudes were 20% and more higher than recent missions.

Several additional factors have been identified as possible sources of image degradation and will be investigated as appropriate information becomes available. One of these factors, focal shifts due to temperature changes has already received preliminary examination due to an indicated decline in temperature through the missions (mid-sixties on early orbits to low fifties and high forties at the end of 1014-2). There is no apparent basis for believing temperature conditions did adversely affect image quality since the quality obtained from both pan cameras is very consistent throughout the mission. In the opinion of both customer and contractor evaluators, if any quality trend exists, it is toward an improvement in quality toward the end of the mission. Other factors to be examined include forward motion compensation, vehicle attitude, and instrument dynamics. The effects of filters, slit widths, and processing are discussed in Part VII Panoramic Camera Exposure.

The master panoramic camera and its auxiliary equipment operated in a generally normal and satisfactory manner throughout both missions. The 200 cycle timing marks were clearly readable and functioned normally until pass D-101 of Mission 1014-2, when a malfunction of the stellar-index equipment caused erratic smear pulses intermittently to the end of the mission. Rail scratches were continuous throughout both missions. Also on both missions there were scratches in the format near the data block edge, apparently caused by the end of a scan head roller. These scratches were in the vicinity of the take-up end and the serial number. Minus density streaks were observed intermittently throughout both missions. Such streaks are probably caused by scraped emulsion material in the exposure slit. Light leaks on the master panoramic camera film were very minor, being confined to the immediate vicinity of the instrument during shutdown periods.

SECTION 7

SLAVE PANORAMIC CAMERA

A. COMPONENT ASSIGNMENT

Component	Serial Number
Main Camera	139
Main Camera Lens	1232435
Supply Horizon Camera	172B
Supply Horizon Camera Lens	814024
Take-up Horizon Camera	159A
Take-up Horizon Camera Lens	812305
Supply Cassette	SC-21

B. CAMERA DATA AND FLIGHT SETTINGS

Main Camera:

Lens	24" f/3.5
Slit Width	0.175
Filter Type	Wratten 21
Film Type	Eastman Type 4404

Supply (Starboard) Horizon Camera:

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

Take-up (Port) Horizon Camera:

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

C. POST FLIGHT PERFORMANCE EVALUATION - AFT Camera

This camera produced 2853 frames (7985 feet, including preflight test footage) of photography during Mission 1014-1 and 2889 frames (7654 feet) of photography during Mission 1014-2. The overall photographic quality was judged to be about the same for both missions, but somewhat lower than the best missions to date. A discussion of the factors affecting image quality is presented in Section 6, Master Panoramic Camera #162.

Operation of the slave panoramic camera system was generally normal. the binary data block, serial number, fiducial marks, timing marks, and horizon cameras operated normally throughout both missions. There was some vignetting of both horizon blocks apparently caused by the vehicle frame, but this effect was not functionally significant. A double end of pass mark appeared for most operations, that is, at shut-down and at start. Rail scratches were continuous throughout both missions. Other scratches were noted in the format near the data block and in the region of the timing marks opposite the data block. Minus density streaks, apparently caused by scraped emulsion in the exposure slit, were observed intermittently throughout both missions.

Several small light leaks were noted in association; with camera off periods between most passes. These leaks occurred on the first five and last four frames of passes indicating some light leaks in both the frame and instrument.

SECTION 8

PANORAMIC CAMERA EXPOSURE

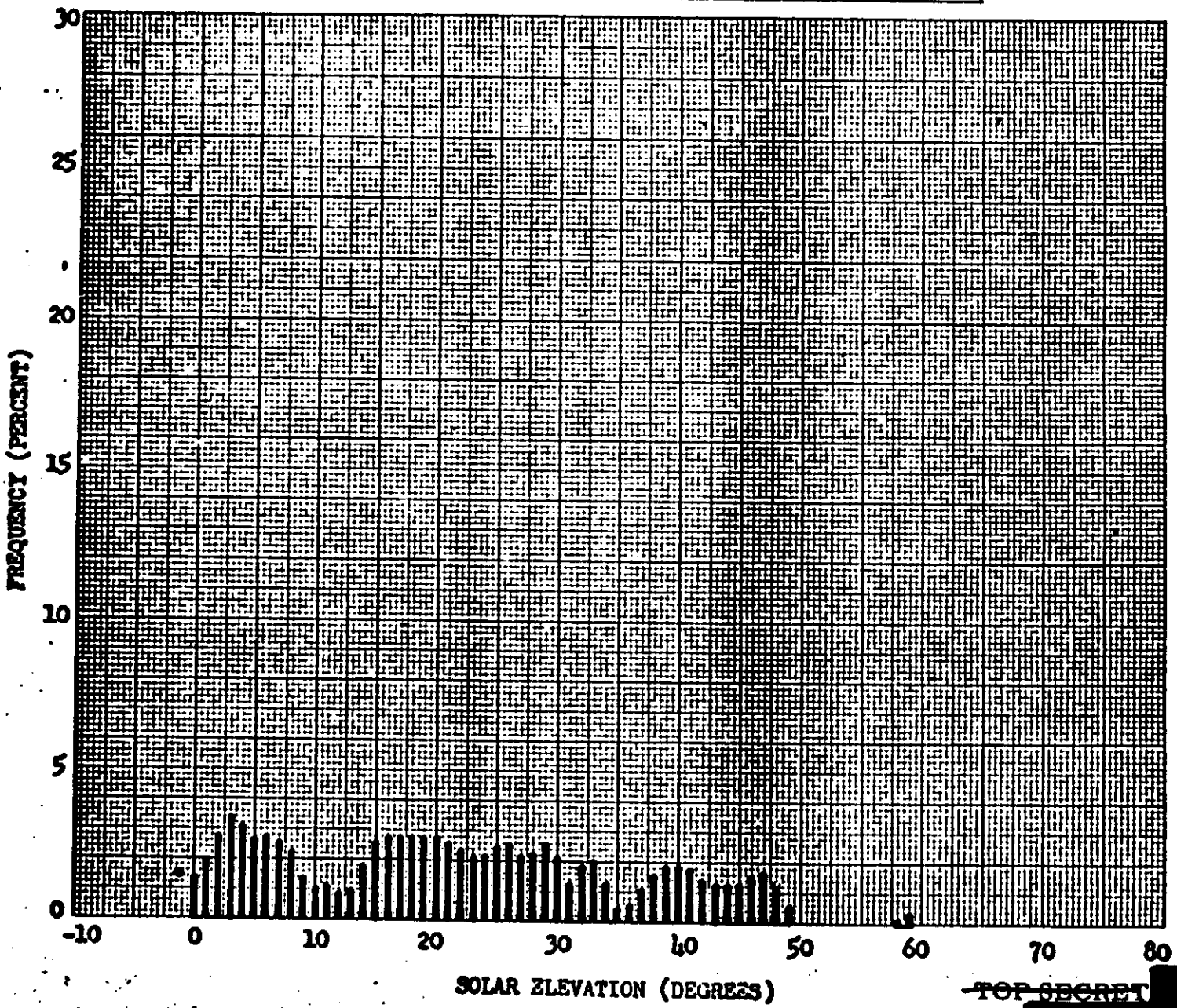
The Master camera contained a 0.250 inch slit with a Wratten 25 filter while the Slave camera used a 0.175 inch slit with a Wratten 21 filter. The nominal exposure times for the Master and Slave instruments are shown as a function of latitude for passes 1, 8, 40, 72, 104, 136 and 143 in Figures 8-5 to 8-18. The frequency distributions of the solar elevations and solar azimuths encountered during photographic operations are shown in Figures 8-1 to 8-4.

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
1014-1/Master	Predicted	0%	21%	79%
	Actual	0.6%	38.4%	61%
1014-1/Slave	Predicted	0%	31%	69%
	Actual	0%	13%	87%
1014-2/Master	Predicted	0%	21%	79%
	Actual	0%	26%	74%
1014-2/Slave	Predicted	0%	29%	71%
	Actual	0%	5%	95%

The original negative was not available at the time of evaluation. However, examination of duplicate positives and preliminary review of sensitometric data indicates that the density was good, considering the specific conditions of the missions. The Wratten 25 filter on the Master camera was used to improve image contrast for the condition of the subsolar point directly ahead of the vehicle path. This objective was achieved. The missions were unusual for the large percentage of coverage programmed for solar elevations below 10 degrees. The resulting underexposed coverage produced better image quality than had been expected.

SOLAR ELEVATION FREQUENCY DISTRIBUTION



Mission No: 1014-1

Payload No: J-16

Camera No: 162

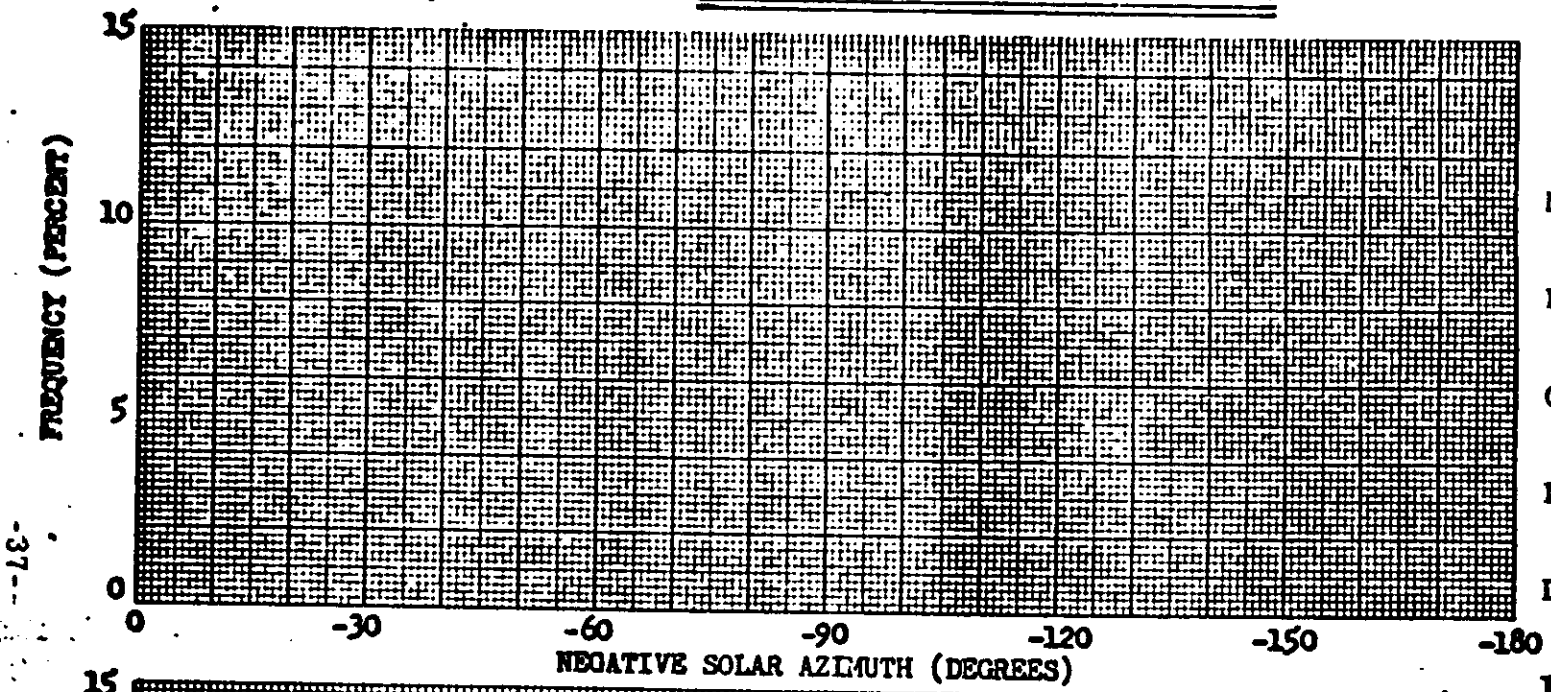
Launch Date: 11/18/64

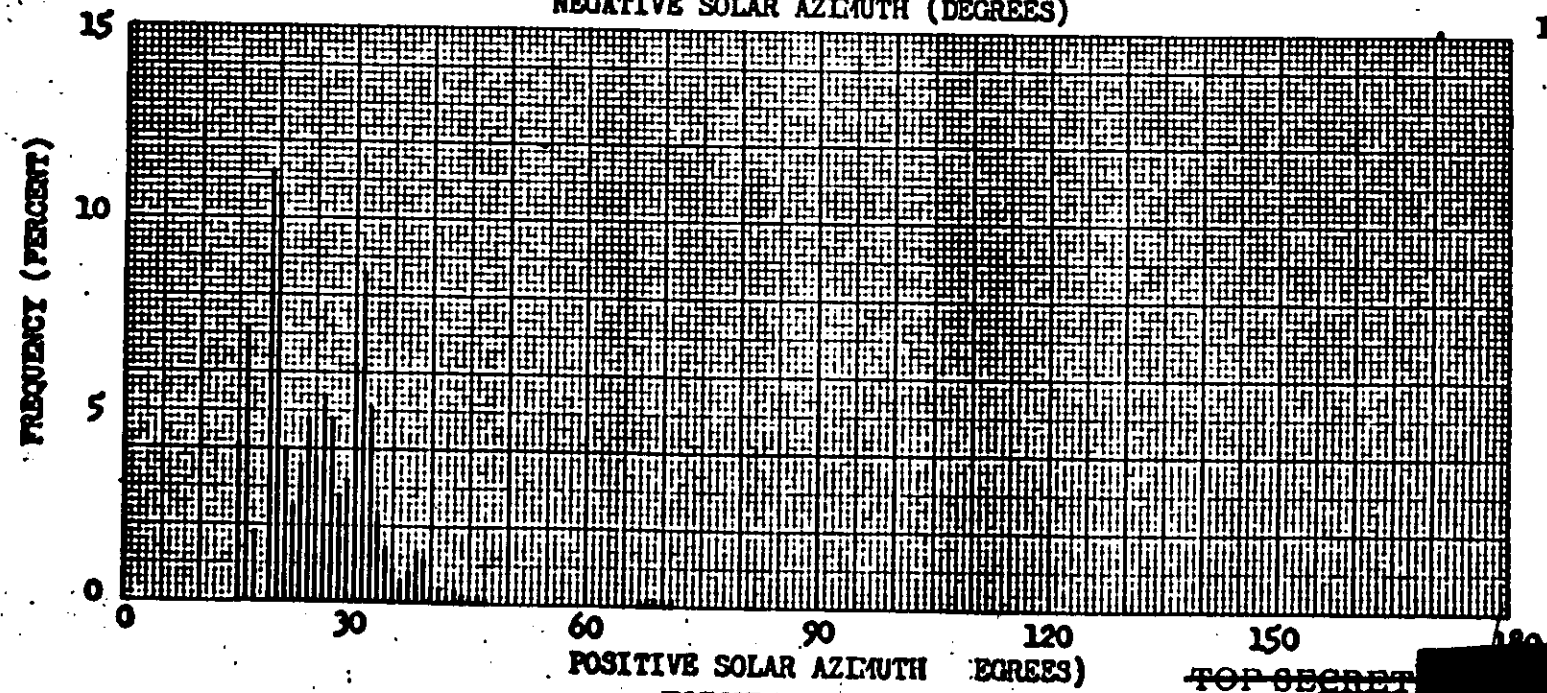
Launch Time: 2036 Z

Inclination: 70°

FIGURE 8-1

SOLAR AZIMUTH FREQUENCY DISTRIBUTION





Mission No: 1014-1

Payload No: J-16

Camera No: 162

Launch Date: 11/18/64

Launch Time: 2036 Z

Inclination: 70°

SIGN NOTATION

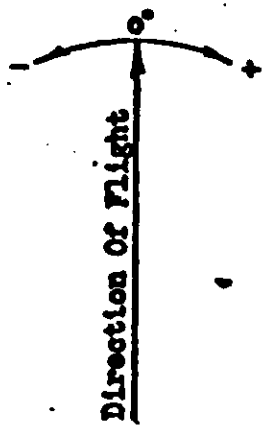
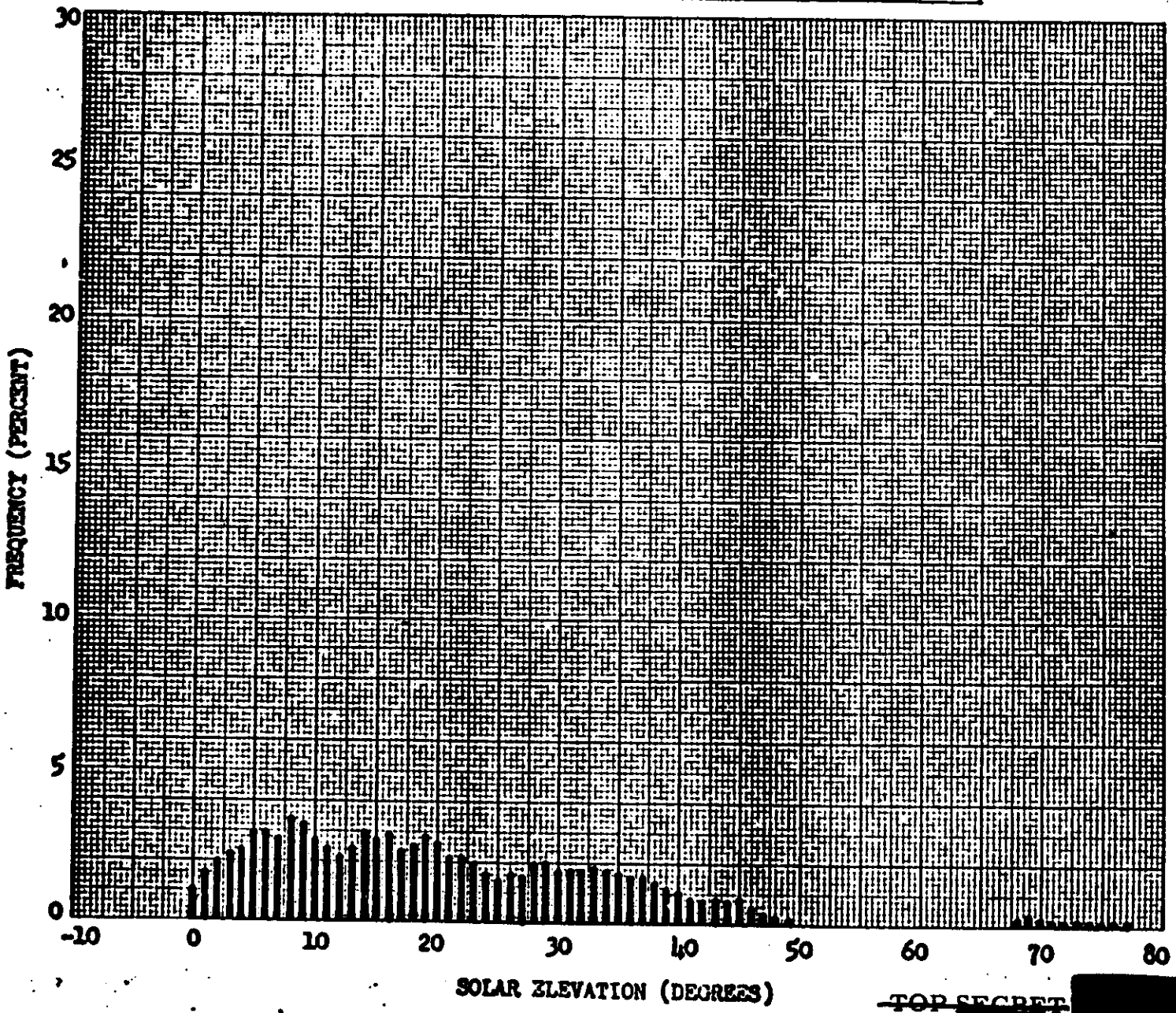


FIGURE 8-2

SOLAR ELEVATION FREQUENCY DISTRIBUTION



Mission No: 1014-2

Payload No: J-16

Camera No: 162

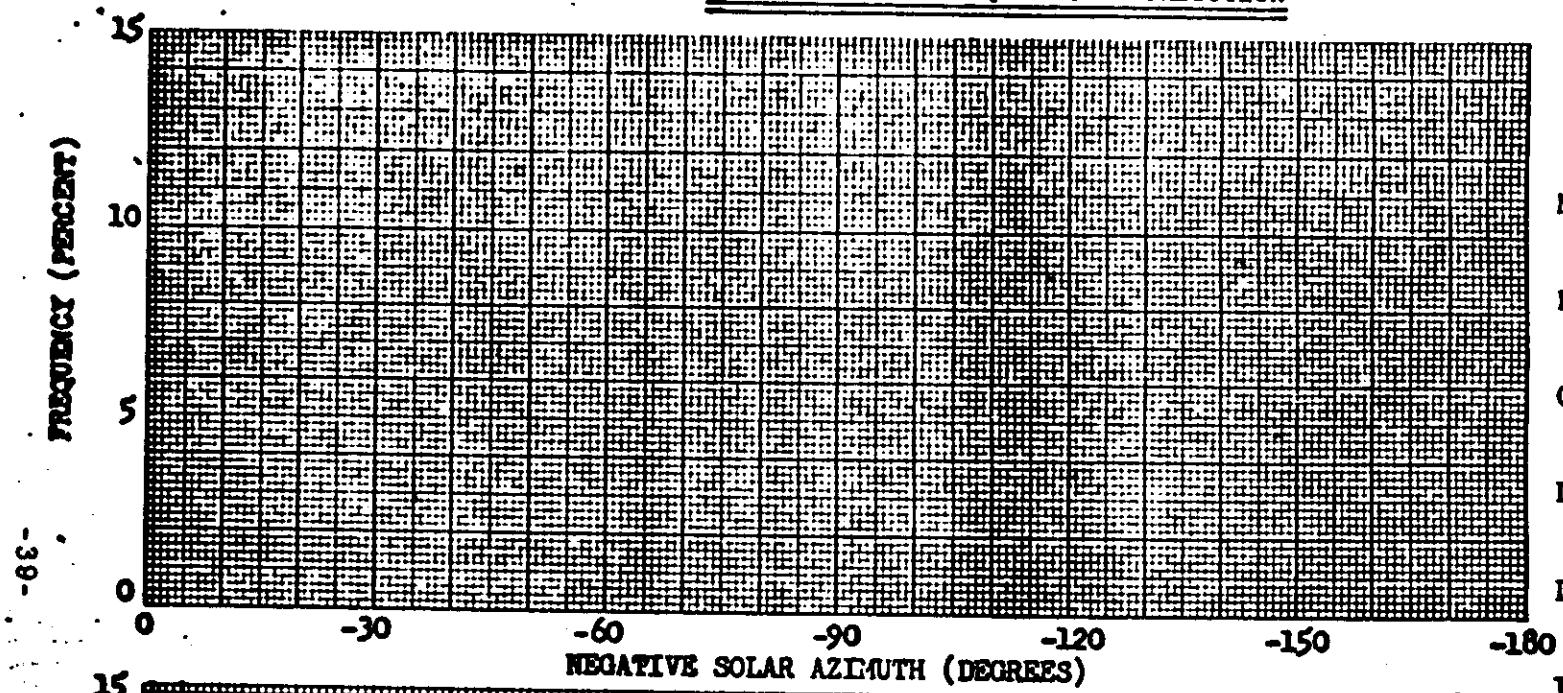
Launch Date: 11/18/64

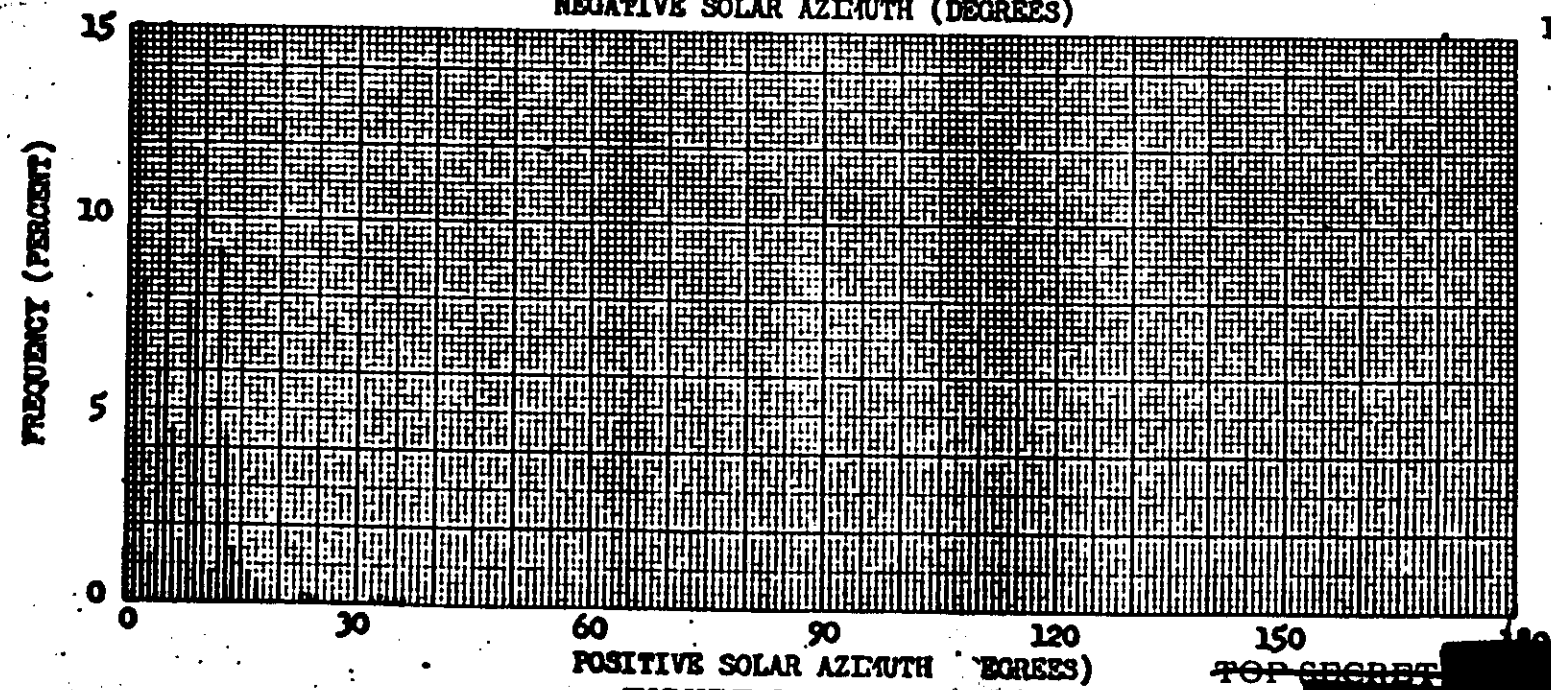
Launch Time: 2036 Z

Inclination: 70°

FIGURE 8-3

SOLAR AZIMUTH FREQUENCY DISTRIBUTION





Mission No: 1014-2

Payload No: J-16

Camera No: 162

Launch Date: 11/18/64

Launch Time: 2036 Z

Inclination: 70°

SIGN NOTATION

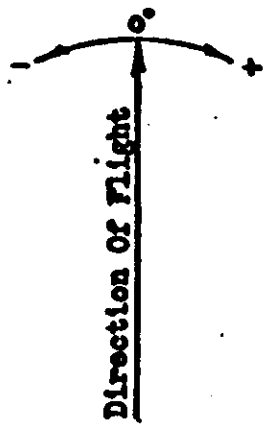
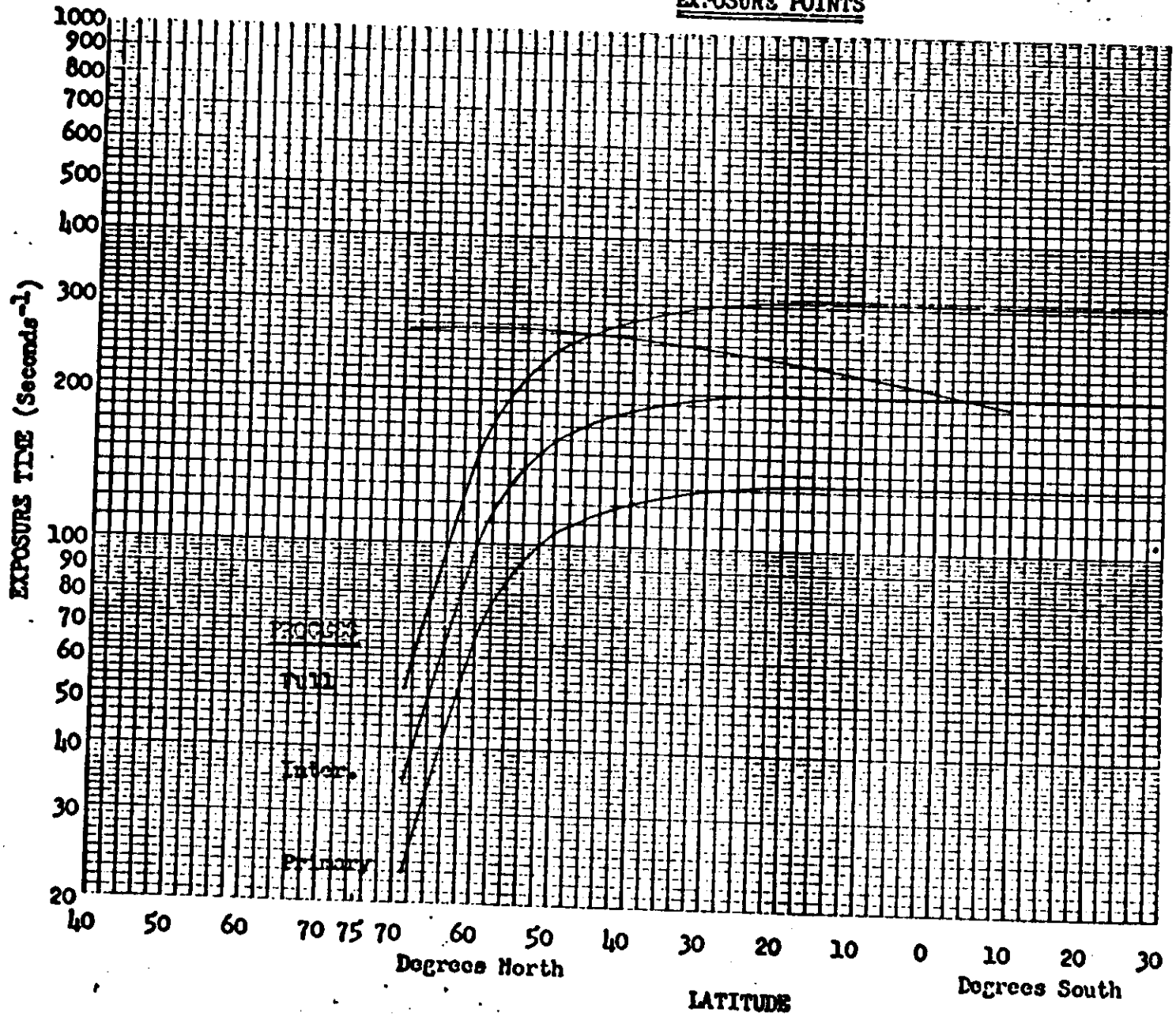


FIGURE 8-4

EXPOSURE POINTS



Mission No: 1014

Payload No: J-16

Camera No: 162

Pass No: 1

Launch Date: 11/18/64

Launch Time: 2036Z

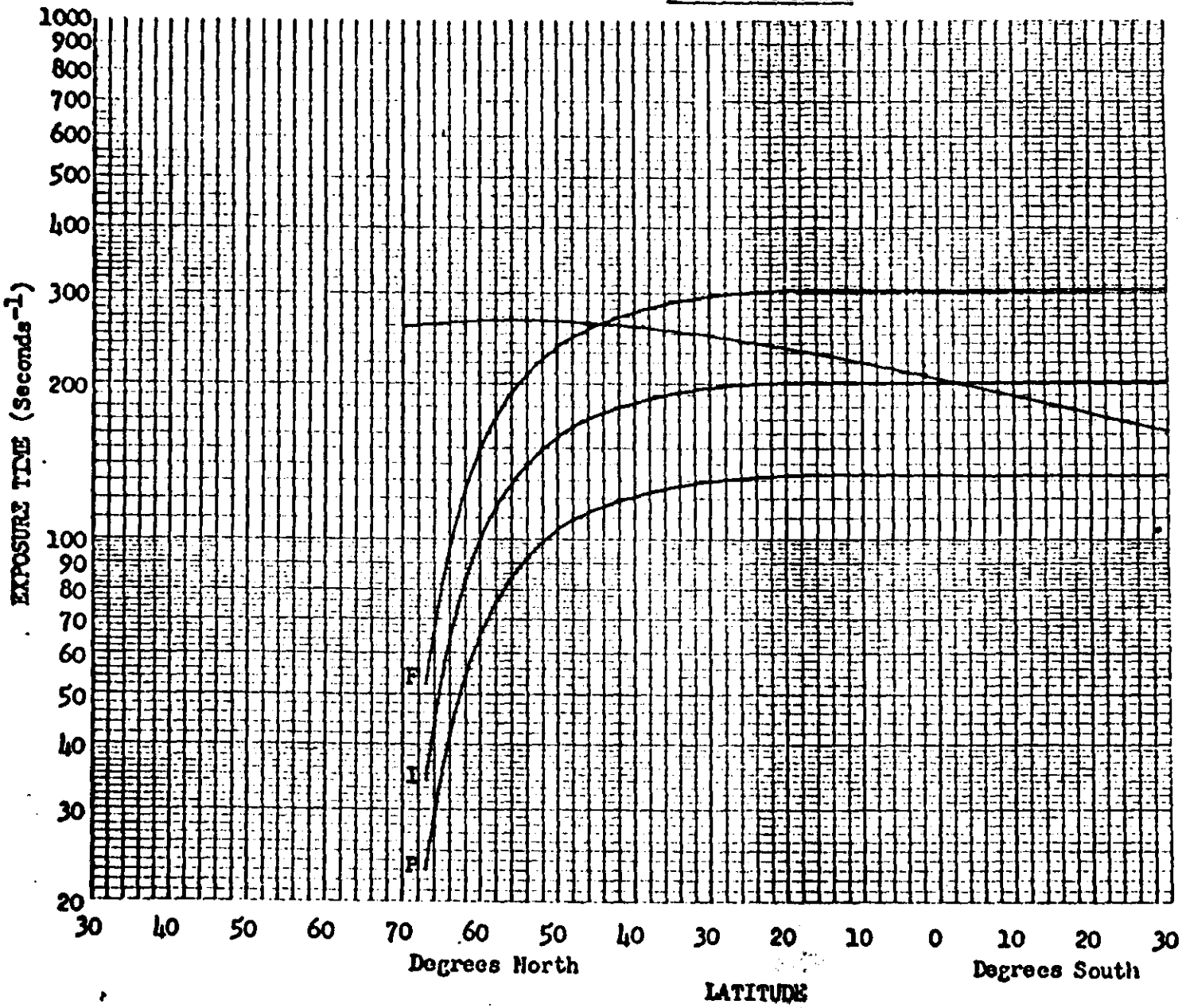
Slit Width: .250

Filter Type: Wratten 25

Film Type: 4404

FIGURE 8-5

EXPOSURE POINTS



Mission No: 1014

Payload No: J-16

Camera No: 162

Pass No: 8

Launch Date: 11/18/64

Launch Time: 2036 Z

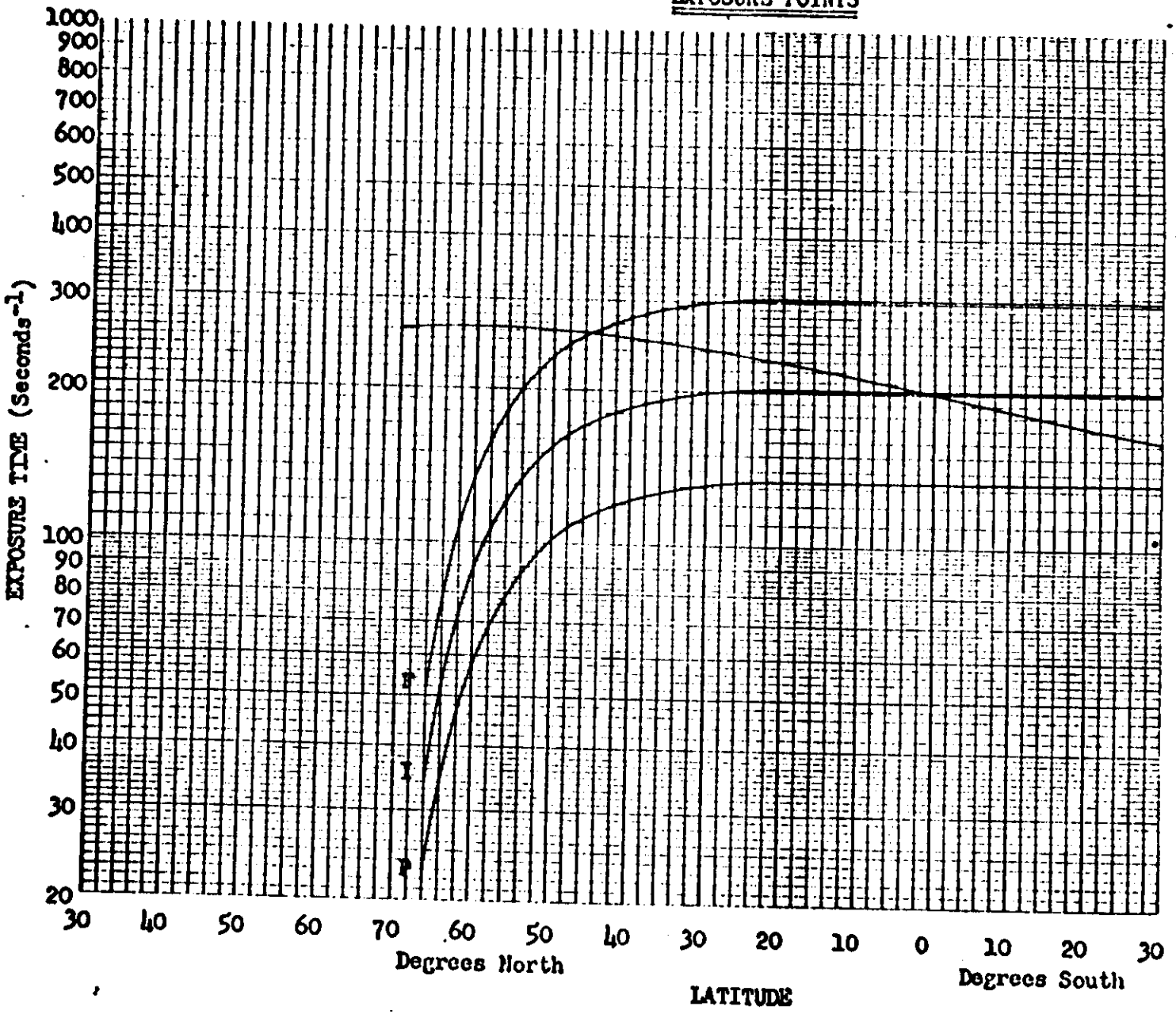
Slit Width: 0.250"

Filter Type: Wratten 25

Film Type: 4404

FIGURE 8-6

EXPOSURE POINTS



Mission No: 1014

Payload No: J-16

Camera No: 162

Pass No: 40

Launch Date: 11/18/64

Launch Time: 2036 Z

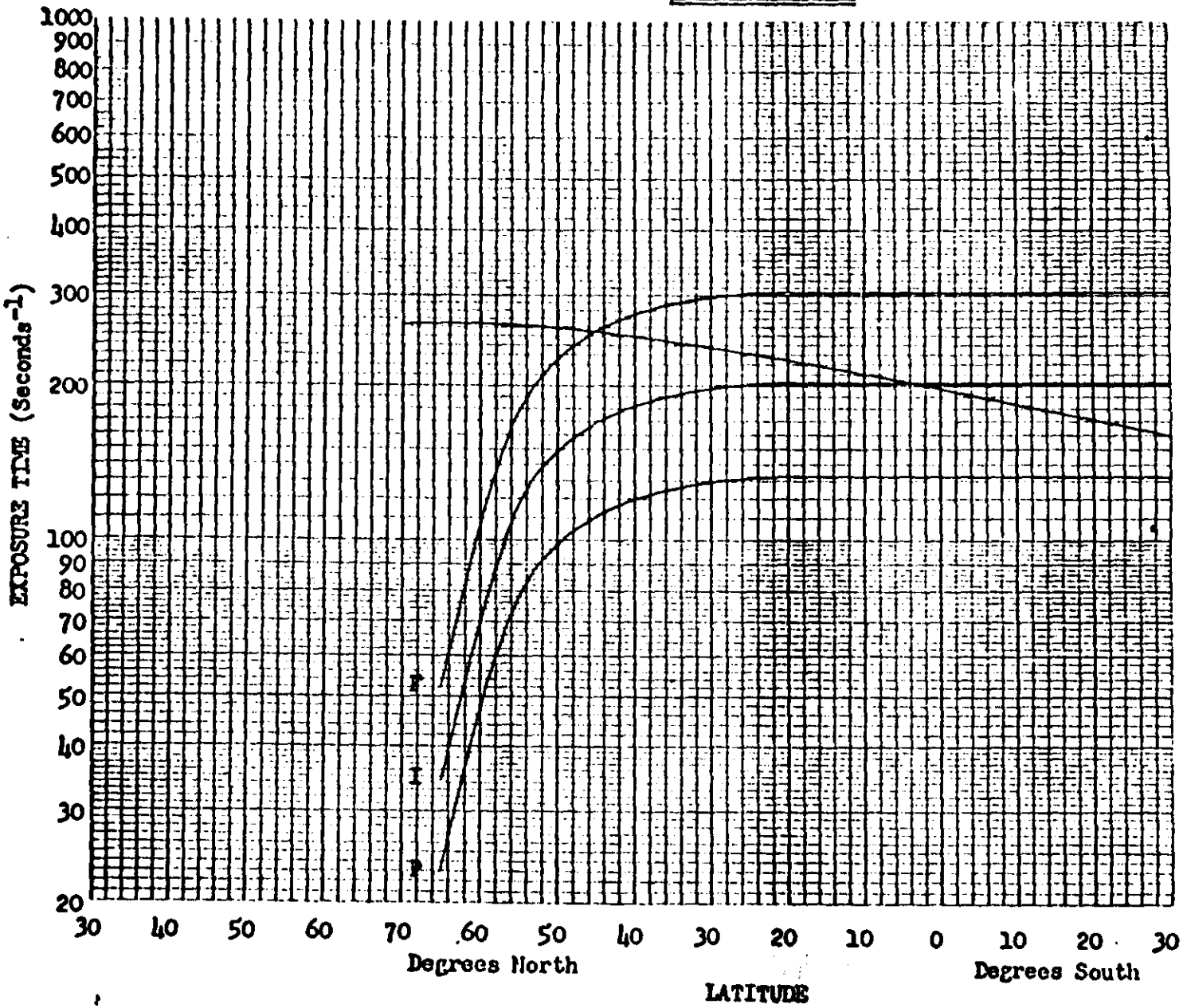
Slit Width: 0.250"

Filter Type: Wratten 25

Film Type: 4404

FIGURE 8-7

EXPOSURE POINTS



Mission No: 1014

Payload No: J-16

Camera No: 162

Pass No: 72

Launch Date: 11/18/64

Launch Time: 2036 Z

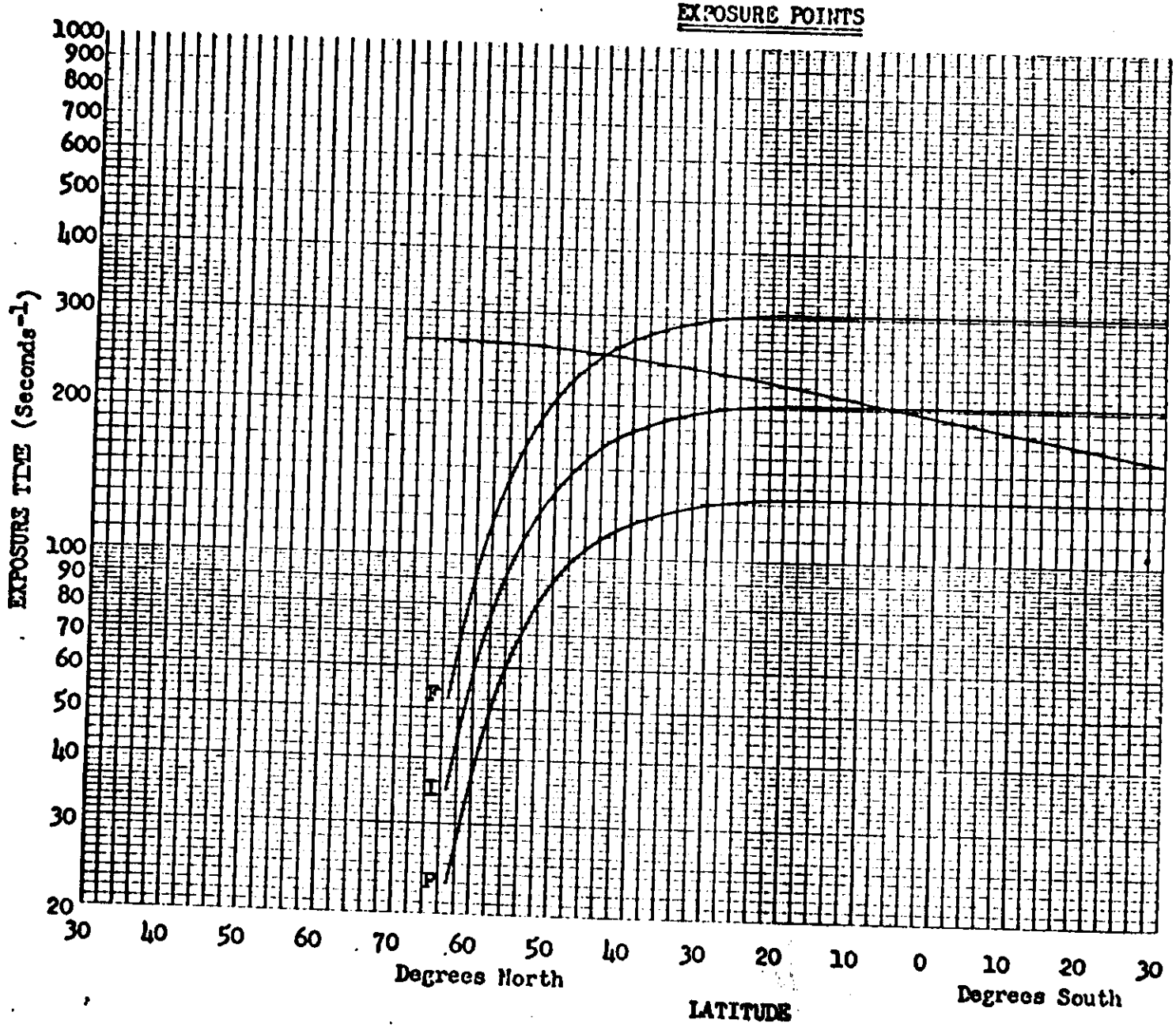
Slit Width: 0.250"

Filter Type: Wratten 25

Film Type: 4404

FIGURE 8-8

EXPOSURE POINTS



Mission No: 1014

Payload No: J-16

Camera No: 162

Pass No: 104

Launch Date: 11/18/64

Launch Time: 2036 Z

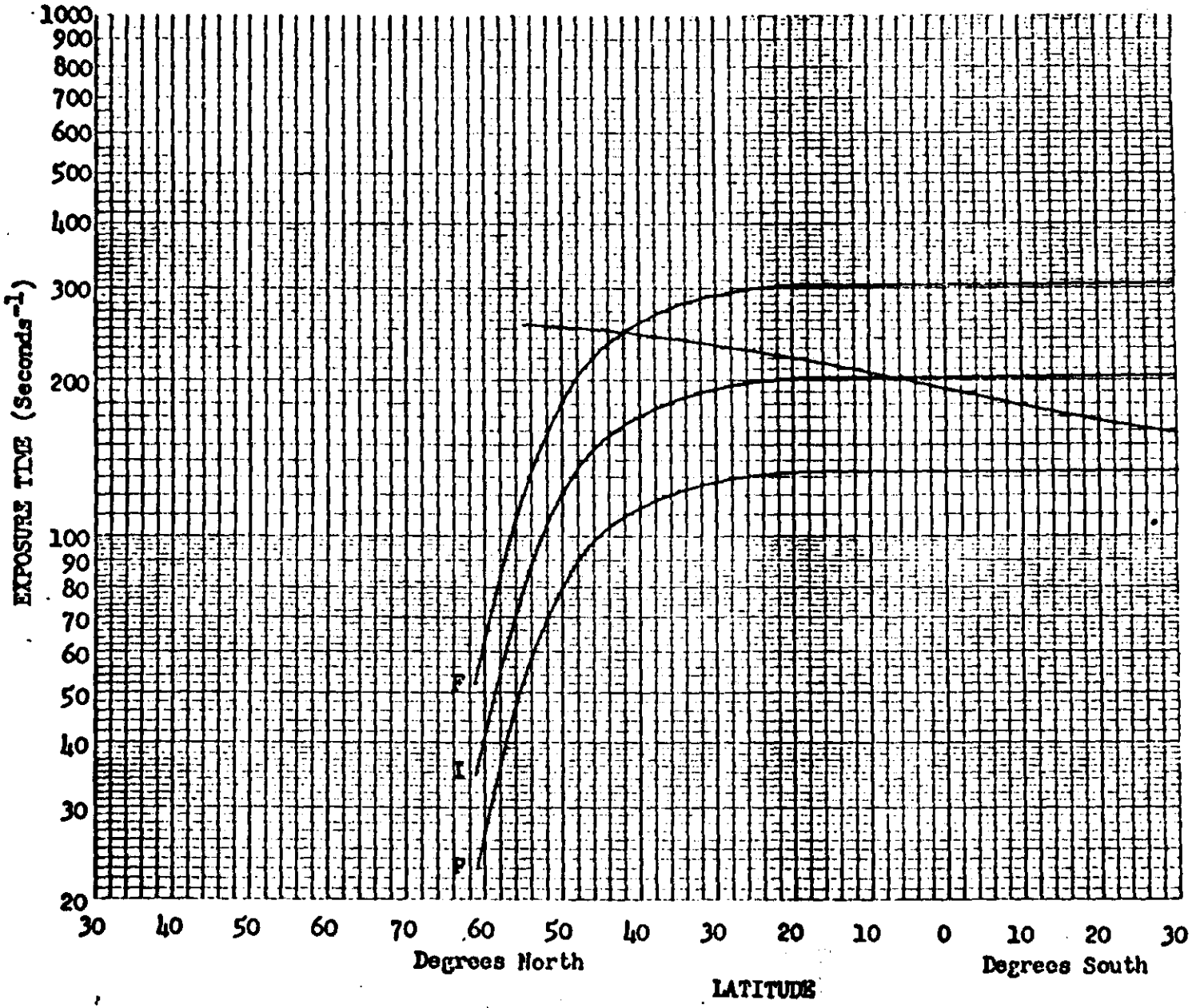
Slit Width: 0.250"

Filter Type: Wratten 25

Film Type: 4404

FIGURE 8-9

EXPOSURE POINTS



Mission No: 1014

Payload No: J-16

Camera No: 162

Pass No: 136

Launch Date: 11/18/64

Launch Time: 2036 Z

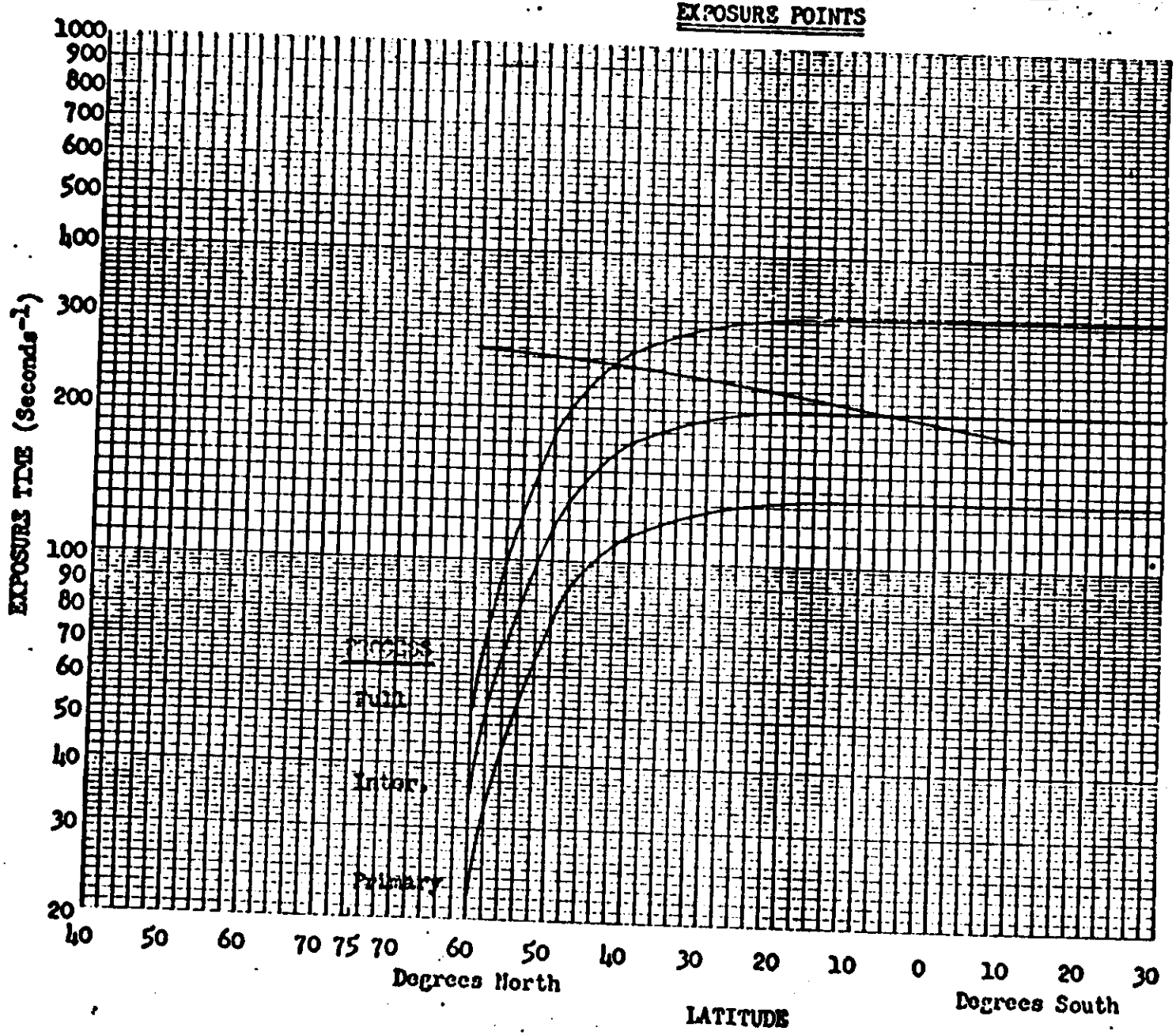
Slit Width: 0.250"

Filter Type: Wratten 25

Film Type: 4404

FIGURE 8-10

EXPOSURE POINTS



Mission No: 1014

Payload No: J-16

Camera No: 162

Pass No: 143

Launch Date: 11/18/64

Launch Time: 2036Z

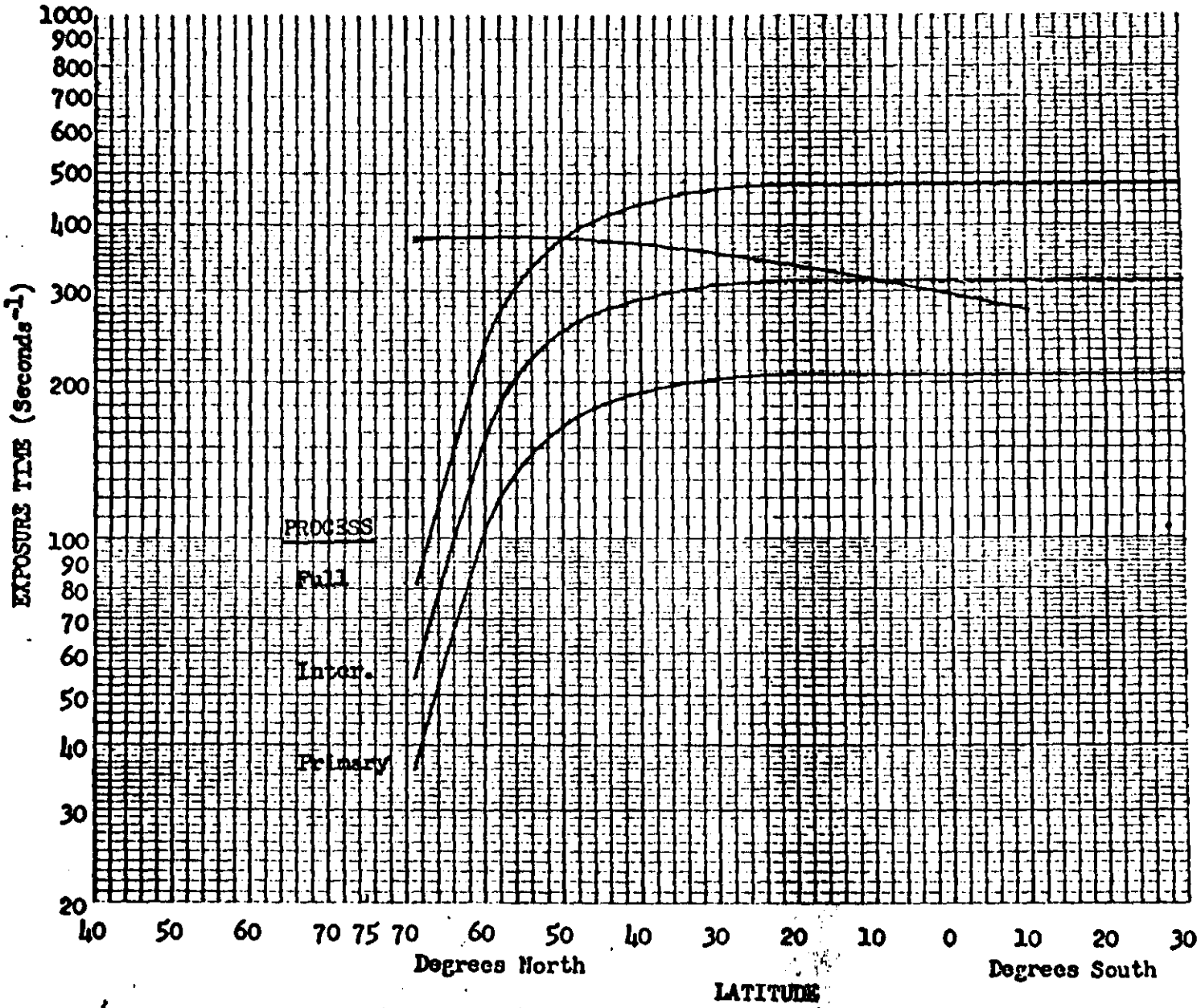
Slit Width: .250

Filter Type: Wratten 25

Film Type: 4404

FIGURE 8-11

EXPOSURE POINTS



Mission No: 1014

Payload No: J-16

Camera No: 139

Pass No: 1

Launch Date: 11/18/64

Launch Time: 2036Z

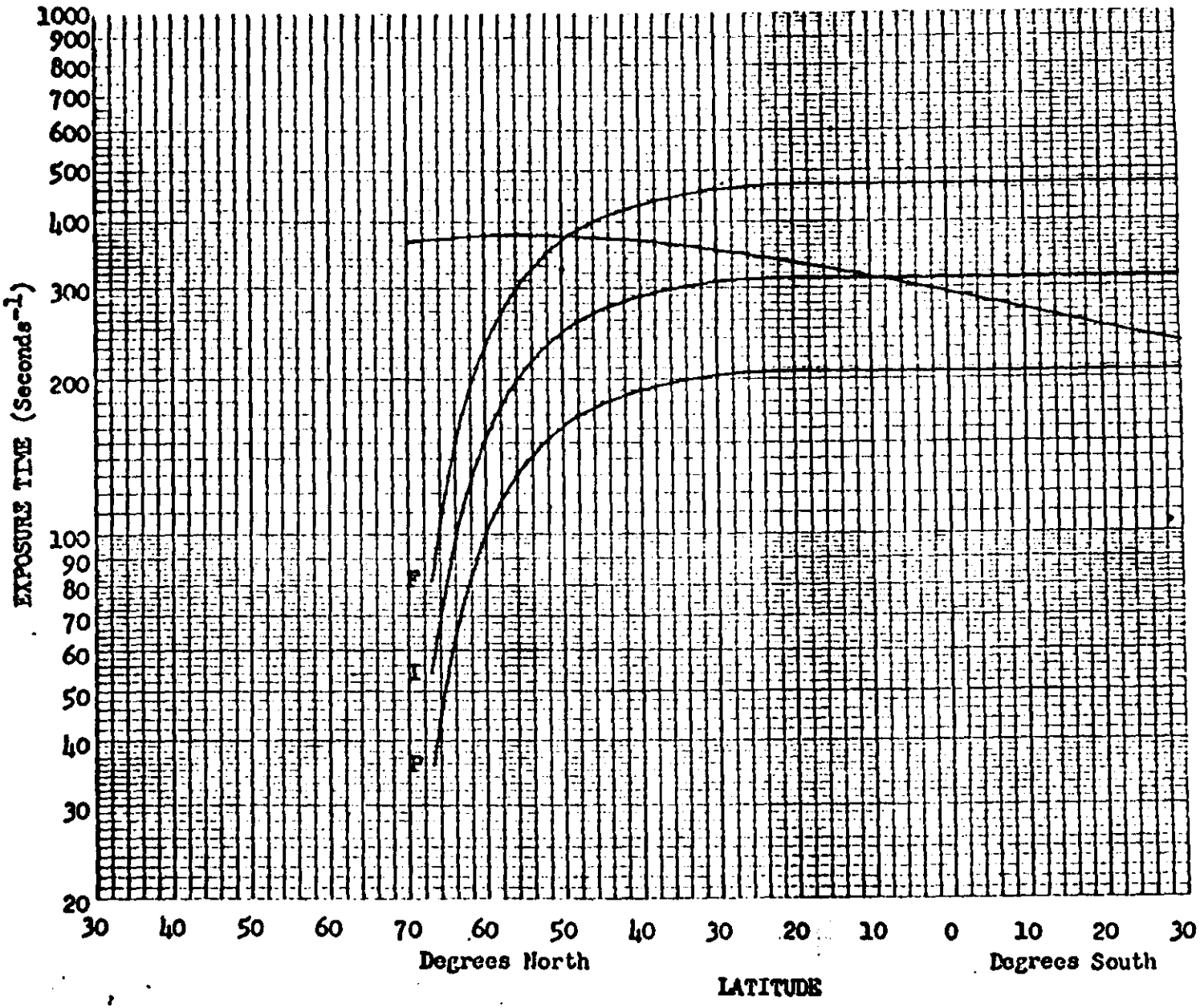
Slit Width: .175

Filter Type: Wratten 21

Film Type: 4404

FIGURE 8-12

EXPOSURE POINTS



Mission No: 1014

Payload No: J-16

Camera No: 139

Pass No: 8

Launch Date: 11/18/64

Launch Time: 2036 Z

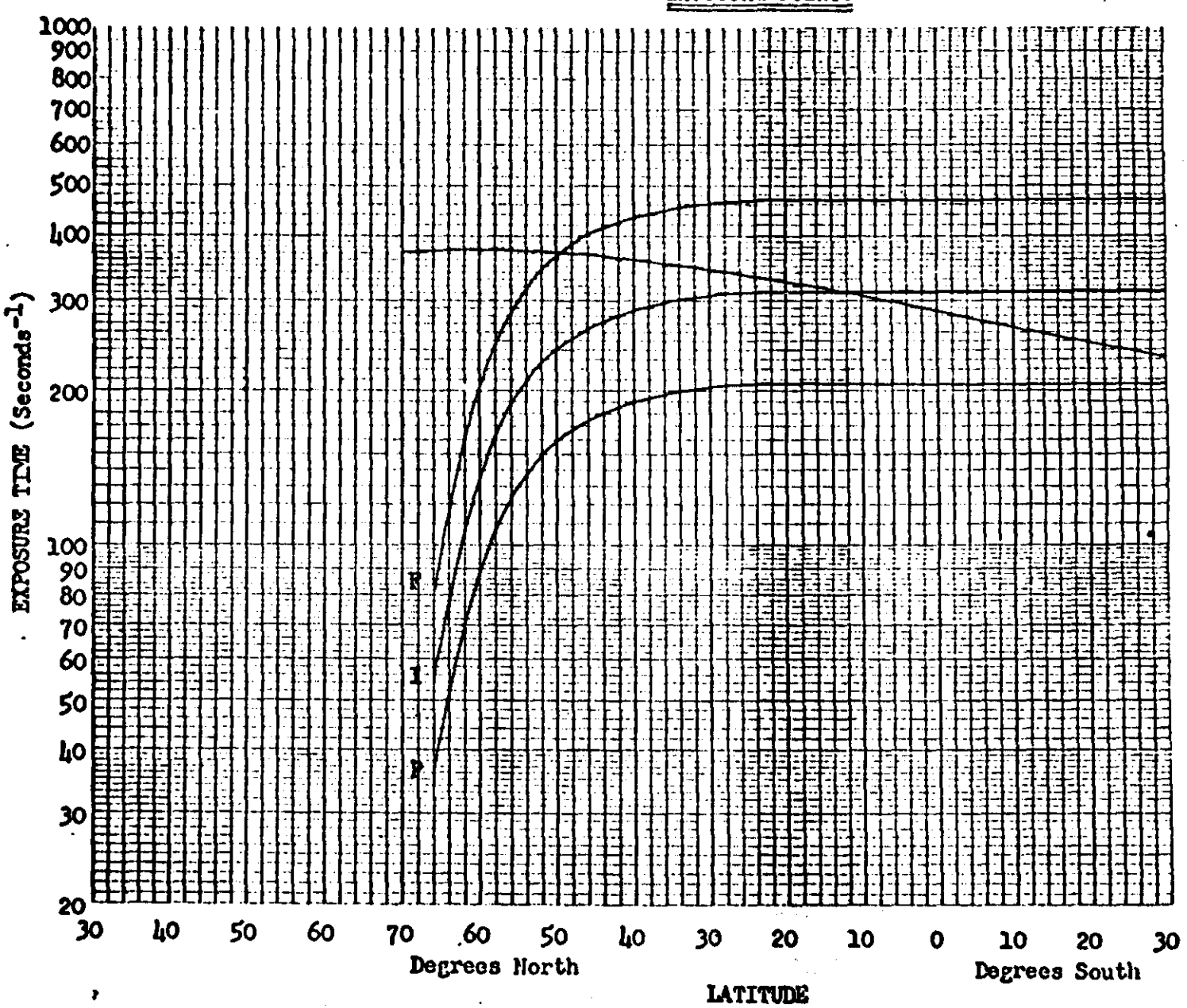
Slit Width: 0.175"

Filter Type: Wratten 21

Film Type: 4404

FIGURE 8-13

EXPOSURE POINTS



Mission No: 1014

Payload No: J-16

Camera No: 139

Pass No: 40

Launch Date: 11/18/64

Launch Time: 2036 Z

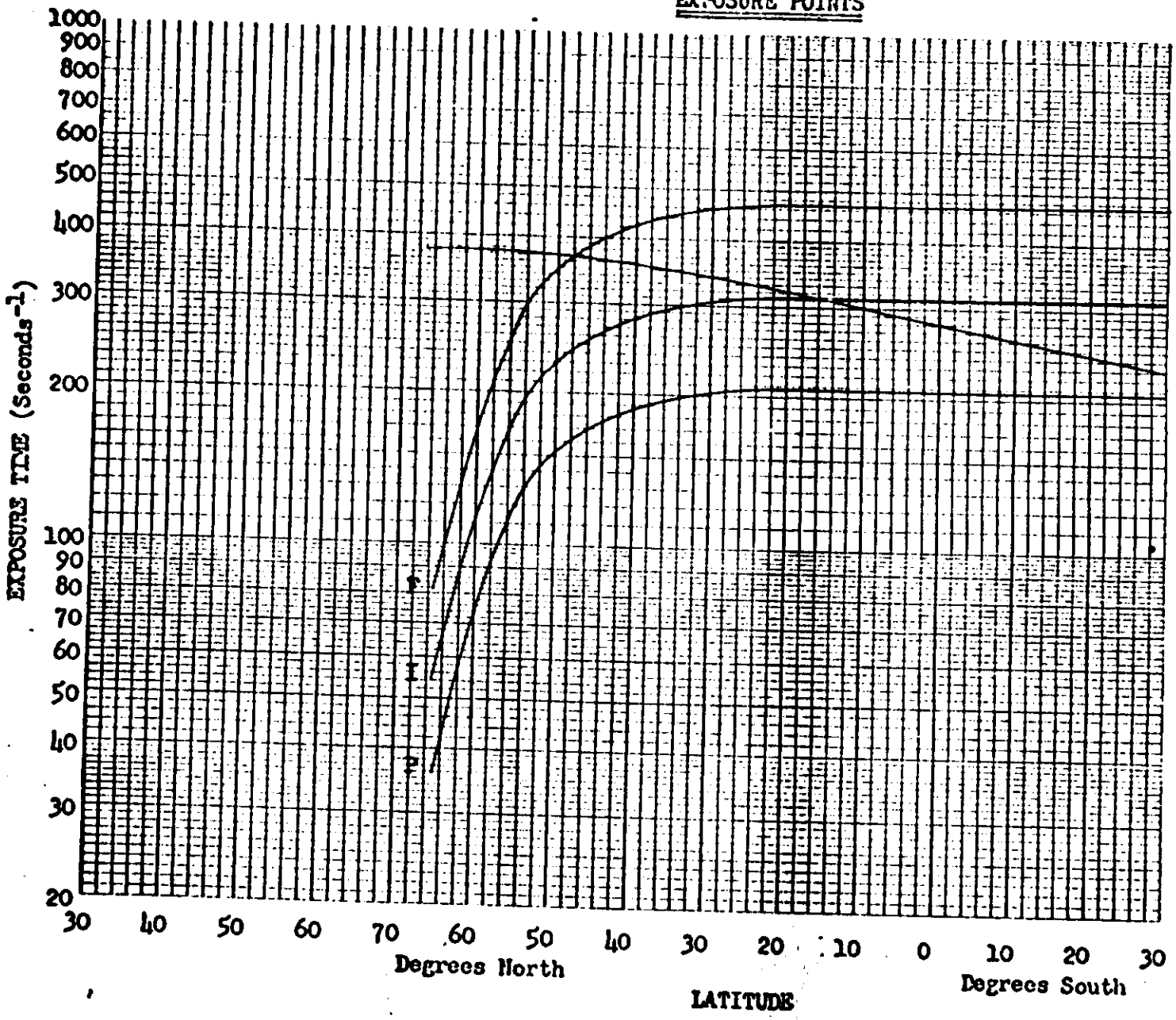
Slit Width: 0.175"

Filter Type: Wratten 21

Film Type: 4404

FIGURE 8-14

EXPOSURE POINTS



Mission No: 1014

Payload No: J-16

Camera No: 139

Pass No: 72

Launch Date: 11/18/64

Launch Time: 2036 Z

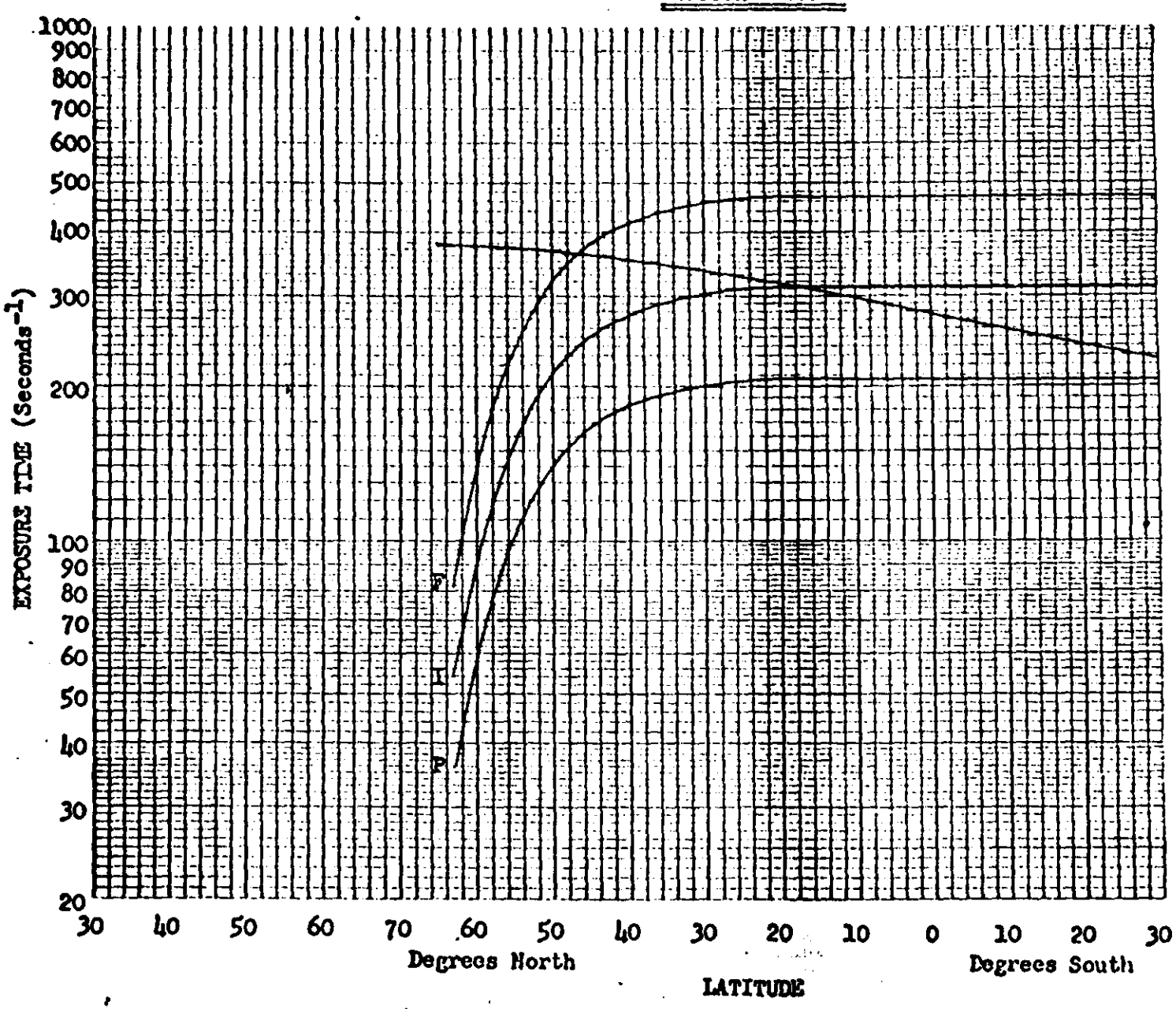
Slit Width: 0.175"

Filter Type: Wratten 21

Film Type: 4404

FIGURE 8-15

EXPOSURE POINTS



Mission No: 1014

Payload No: J-16

Camera No: 139

Pass No: 104

Launch Date: 11/18/64

Launch Time: 2036 Z

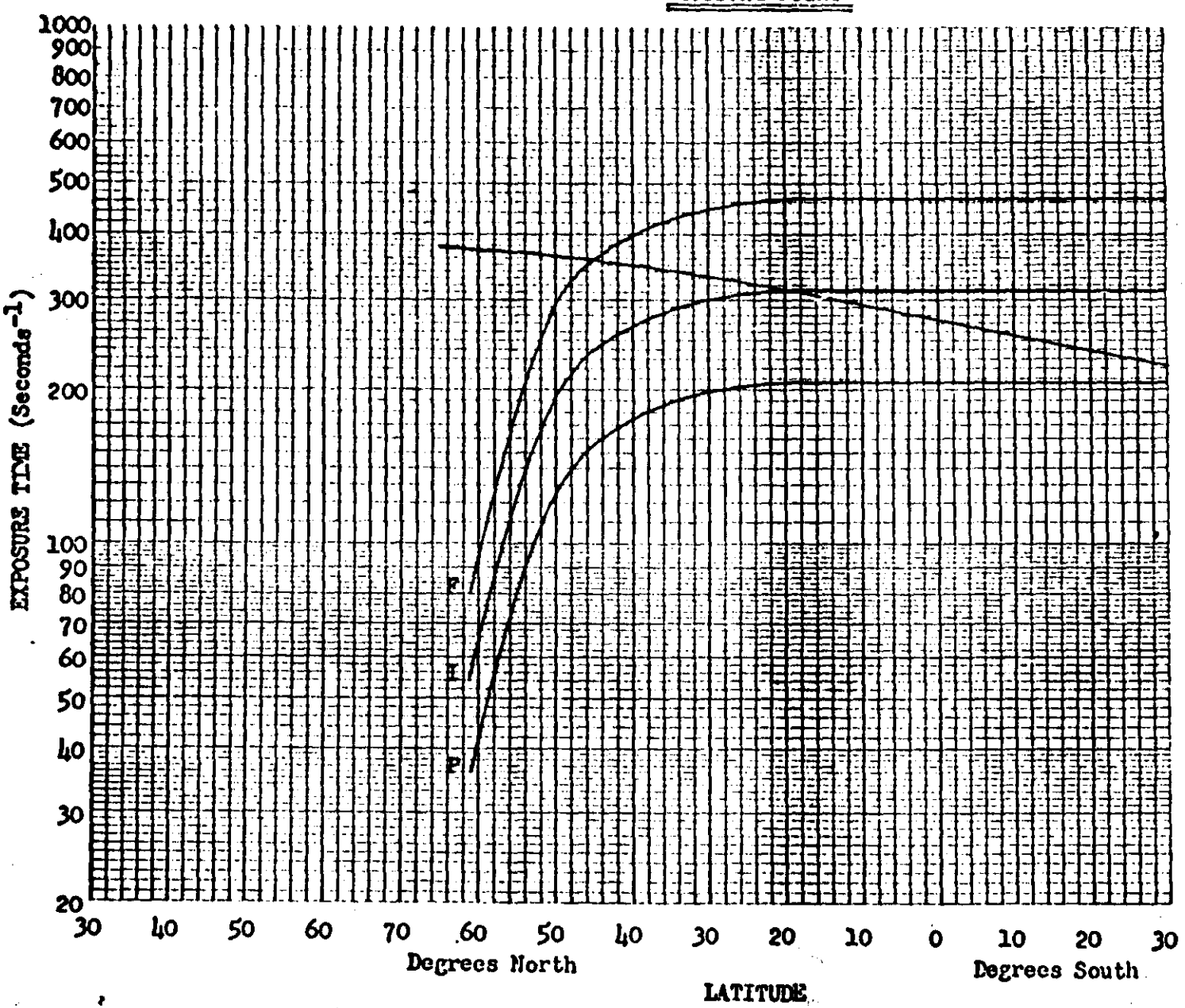
Slit Width: 0.175"

Filter Type: Wratten 21

Film Type: 4404

FIGURE 8-16

EXPOSURE POINTS



Mission No: 1014

Payload No: J-16

Camera No: 139

Pass No: 136

Launch Date: 11/18/64

Launch Time: 2036 Z

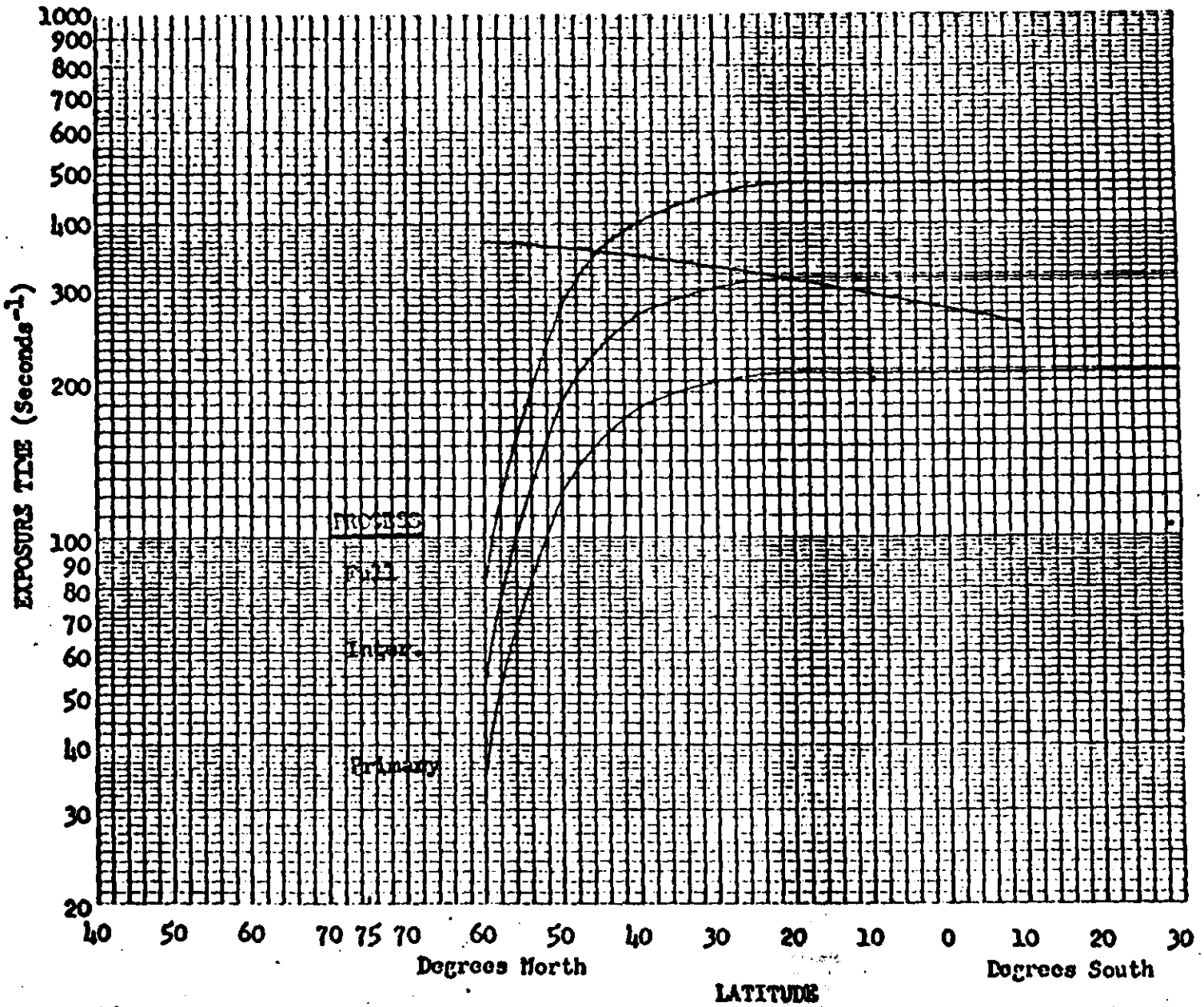
Slit Width: 0.175"

Filter Type: Wratten 21

Film Type: 4404

FIGURE 8-17

EXPOSURE POINTS



Mission No: 1014

Payload No: J-16

Camera No: 139

Pass No: 143

Launch Date: 11/18/64

Launch Time: 2036Z

Slit Width: .175

Filter Type: Wratten 21

Film Type: 4404

FIGURE 8-18

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
1014-1	FWD	Predicted	0	21	79
		Reported	0.6	38.4	61
		Computed	1	62	37
1014-1	AFT	Predicted	0	31	69
		Reported	0	13	87
		Computed	0	36	64
1014-2	FWD	Predicted	0	21	79
		Reported	0	26	74
		Computed	0	61	39
1014-2	AFT	Predicted	0	29	71
		Reported	0	5	
		Computed	0	68	32

The tabulations of density frequency distributions for Mission 1014-1 and 1014-2 are shown in Tables 9-1 through 9-4. The graphical presentation of the density distribution are computer plotted in Figures 9-1 through 9-39.

Table 9-5 shows the distribution of the minimum terrain density measurements that are within and outside of the control range of 0.40 to 0.90 density. There is an unusually high percentage of underexposed (24%) and also underprocessed (28%) footage. The underexposures are a result of the orbit being designed for low latitude coverage, however a large portion of the material was exposed at high latitudes with the attendant low sun elevations. Atmospheric conditions and the low sun elevations produced low contrast imagery which can lead to misjudgement of the required processing level to obtain a 0.40 minimum density.

[redacted] [redacted] [redacted]

MISSION • 1014-1 • INSTRUMENT • FRWD 01/18/65 DENSITY FREQ DISTR

DENSITY VALUE	PRIMARY MIN	PRIMARY MAX	PRIMARY LIM	INTERMEDIATE MIN	INTERMEDIATE MAX	INTERMEDIATE LIM	FULL MIN	FULL MAX	FULL LIM	ALL LEVELS MIN	ALL LEVELS MAX	ALL LEVELS LIM
0.01	0	0	0	0	0	0	0	0	0	0	0	0
0.02	0	0	0	0	0	0	0	0	0	0	0	0
0.03	0	0	0	0	0	0	0	0	0	0	0	0
0.04	0	0	0	0	0	0	0	0	0	0	0	0
0.05	0	0	0	0	0	0	0	0	0	0	0	0
0.06	0	0	0	0	0	0	0	0	0	0	0	0
0.07	0	0	0	0	0	0	0	0	0	0	0	0
0.08	0	0	0	0	0	0	0	0	0	0	0	0
0.09	0	0	0	0	0	0	0	0	0	0	0	0
0.10	0	0	0	0	0	0	0	0	0	0	0	0
0.11	0	0	0	0	0	0	0	0	0	0	0	0
0.12	0	0	0	0	0	0	0	0	0	0	0	0
0.13	0	0	0	0	0	0	0	0	0	0	0	0
0.14	0	0	0	0	0	0	0	0	0	0	0	0
0.15	0	0	0	0	0	0	0	0	0	0	0	0
0.16	0	0	0	0	0	0	0	0	0	0	0	0
0.17	1	0	0	0	0	0	0	0	0	1	0	0
0.18	0	0	0	2	0	0	0	0	0	2	0	0
0.19	0	0	0	1	0	0	2	0	0	3	0	0
0.20	0	0	0	4	0	0	1	0	0	5	0	0
0.21	0	0	0	4	0	0	1	0	0	5	0	0
0.22	0	0	0	3	0	0	1	0	0	4	0	0
0.23	0	0	0	2	0	0	0	0	0	2	0	0
0.24	0	0	0	3	0	0	5	0	0	8	0	0
0.25	0	0	0	3	0	0	5	0	0	8	0	0
0.26	0	0	0	3	1	0	4	0	0	7	1	0
0.27	0	0	0	2	0	0	1	0	0	3	0	0
0.28	0	0	0	7	0	0	3	0	0	10	0	0
0.29	0	0	0	3	0	0	0	0	0	3	0	0
0.30	0	0	0	8	0	0	3	0	0	11	0	0
0.31	0	0	0	1	0	0	0	0	0	1	0	0
0.32	0	0	0	10	0	0	6	0	0	16	0	0
0.33	0	0	0	2	0	0	1	0	0	3	0	0
0.34	0	0	0	3	0	0	4	0	0	7	0	0
0.35	0	0	0	1	0	0	4	0	0	5	0	0
0.36	0	0	0	5	0	0	2	0	0	7	0	0
0.37	0	0	0	2	0	0	2	0	0	4	0	0
0.38	0	0	0	8	1	0	5	0	0	13	1	0
0.39	0	0	0	1	0	0	0	0	0	1	0	0
0.40	0	0	0	4	0	0	1	0	0	5	0	0
0.41	0	0	0	7	0	0	2	0	0	9	0	0
0.42	0	0	0	2	0	0	3	0	0	5	0	0
0.43	0	0	0	2	0	0	0	0	0	2	0	0
0.44	0	0	0	1	0	0	0	0	0	1	0	0
0.45	0	0	0	1	0	0	2	0	0	3	0	0
0.46	0	0	0	4	0	0	0	0	0	4	0	0
0.47	0	0	0	3	1	0	0	0	0	3	1	0
0.48	0	0	0	2	1	0	4	2	0	6	3	0
0.49	0	0	0	1	0	0	0	0	0	1	0	0
0.50	0	0	0	2	0	0	1	0	0	[illegible]	[illegible]	[illegible]
SUBTOTAL	1	0	0	107	4	0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[redacted] [redacted] [redacted]

TABLE 9-1

[redacted]

MISSION • 1014-1 • INSTRUMENT • FRWD 01/18/65 DENSITY FREQ DISTR

DENSITY VALUE	PRIMARY MIN	PRIMARY MAX	PRIMARY LIM	INTERMEDIATE MIN	INTERMEDIATE MAX	INTERMEDIATE LIM	FULL MIN	FULL MAX	FULL LIM	ALL LEVELS MIN	ALL LEVELS MAX	ALL LEVELS LIM
0.51	0	0	0	0	0	0	0	0	0	0	0	0
0.52	0	0	0	4	0	0	1	1	0	5	1	0
0.53	0	0	0	1	0	0	0	0	0	1	0	0
0.54	0	0	0	3	0	0	0	0	0	3	0	0
0.55	0	0	0	1	0	0	0	0	0	1	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	1	0	0	1	0
0.58	0	0	0	0	0	0	4	1	0	4	1	0
0.59	0	0	0	0	0	0	0	2	0	0	2	0
0.60	0	0	0	1	1	0	1	0	0	2	1	0
0.61	0	0	0	1	0	0	0	0	0	1	0	0
0.62	0	0	0	4	1	0	1	0	0	5	1	0
0.63	0	0	0	0	0	0	0	0	0	0	0	0
0.64	0	0	0	0	0	0	1	0	0	1	0	0
0.65	0	0	0	0	0	0	4	0	0	4	0	0
0.66	0	0	0	1	0	0	0	1	0	1	1	0
0.67	0	0	0	0	1	0	0	0	0	0	1	0
0.68	0	0	0	1	1	0	0	0	0	1	1	0
0.69	0	0	0	0	0	0	0	0	0	0	0	0
0.70	0	0	0	0	0	0	1	1	0	1	1	0
0.71	0	0	0	0	0	0	0	1	0	0	1	0
0.72	0	0	0	0	1	0	1	1	0	1	2	0
0.73	0	0	0	1	0	0	0	0	0	1	0	0
0.74	0	0	0	0	1	0	0	0	0	0	1	0
0.75	0	0	0	1	0	0	0	0	0	1	0	0
0.76	0	0	0	1	0	0	0	0	0	1	0	0
0.77	0	0	0	0	0	0	0	0	0	0	0	0
0.78	0	0	0	1	0	0	0	0	0	1	0	0
0.79	0	0	0	0	0	0	0	0	0	0	0	0
0.80	0	0	0	2	1	0	0	0	0	2	1	0
0.81	0	0	0	0	0	0	0	0	0	0	0	0
0.82	0	0	0	0	1	0	0	2	0	0	3	0
0.83	0	0	0	0	0	0	0	0	0	0	0	0
0.84	0	0	0	0	1	0	0	0	0	0	1	0
0.85	0	0	0	0	0	0	0	0	0	0	0	0
0.86	0	0	0	1	0	0	0	0	0	1	0	0
0.87	0	0	0	1	0	0	0	0	0	1	0	0
0.88	0	0	0	0	0	0	1	1	0	1	1	0
0.89	0	0	0	0	0	0	0	1	0	0	1	0
0.90	0	0	0	0	1	0	1	0	0	1	1	0
0.91	0	0	0	0	0	0	0	0	0	0	0	0
0.92	0	0	0	1	3	0	0	0	0	1	3	0
0.93	0	0	0	0	0	0	0	0	0	0	0	0
0.94	0	0	0	0	2	0	0	0	0	0	2	0
0.95	0	0	0	0	0	0	0	0	0	0	0	0
0.96	0	0	0	0	0	0	0	1	0	0	1	0
0.97	0	0	0	0	0	0	1	0	0	1	0	0
0.98	0	0	0	0	2	0	0	0	0	0	2	0
0.99	0	0	0	1	0	0	0	0	0	1	0	0
1.00	0	0	0	0	3	0	0	1	0	0	4	0
SUBTOTAL	0	0	0	27	20	0	17	15	0	44	35	0

[redacted] [redacted] [redacted]

TABLE 9-1

[redacted]

MISSION • 1014-1 • INSTRUMENT • FRWD 01/18/65 DENSITY FREQ DISTR

DENSITY VALUE	PRIMARY MIN	PRIMARY MAX	PRIMARY LIM	INTERMEDIATE MIN	INTERMEDIATE MAX	INTERMEDIATE LIM	FULL MIN	FULL MAX	FULL LIM	ALL LEVELS MIN	ALL LEVELS MAX	ALL LEVELS LIM
1.01	0	0	0	0	0	0	0	0	1	0	0	1
1.02	0	0	0	0	0	0	0	0	0	0	0	0
1.03	0	0	0	0	0	0	0	1	0	0	1	0
1.04	0	0	0	0	1	0	0	1	0	0	2	0
1.05	0	0	0	0	1	0	0	0	0	0	1	0
1.06	0	0	0	0	0	0	0	1	1	0	1	1
1.07	0	0	0	0	0	0	0	0	0	0	0	0
1.08	0	0	0	0	2	1	0	1	0	0	3	1
1.09	0	0	0	0	0	0	0	1	0	0	1	0
1.10	0	1	0	0	3	1	0	3	2	0	7	3
1.11	0	0	0	0	0	0	0	0	0	0	0	0
1.12	0	0	0	0	0	0	0	0	0	0	0	0
1.13	0	0	0	0	0	0	0	0	0	0	0	0
1.14	0	0	0	0	1	1	0	0	1	0	1	2
1.15	0	0	0	0	0	0	0	0	0	0	0	0
1.16	0	0	0	0	3	0	0	1	0	0	4	0
1.17	0	0	0	0	1	0	0	0	0	0	1	0
1.18	0	0	0	0	6	0	0	0	0	0	6	0
1.19	0	0	0	0	0	0	0	0	0	0	0	0
1.20	0	0	0	0	5	0	0	0	1	0	5	1
1.21	0	0	0	0	0	0	0	0	0	0	0	0
1.22	0	0	0	0	1	1	0	1	0	0	2	1
1.23	0	0	0	0	0	0	0	1	0	0	1	0
1.24	0	0	0	0	1	0	0	0	0	0	1	0
1.25	0	0	0	0	0	0	0	1	0	0	1	0
1.26	0	0	0	0	2	0	0	1	0	0	3	0
1.27	0	0	0	0	0	0	0	2	0	0	2	0
1.28	0	0	0	0	1	0	0	1	0	0	2	0
1.29	0	0	0	0	0	0	0	0	0	0	0	0
1.30	0	0	0	0	1	0	0	1	0	0	2	0
1.31	0	0	0	0	0	0	0	0	0	0	0	0
1.32	0	0	0	0	3	0	0	2	0	0	5	0
1.33	0	0	0	0	1	0	0	0	0	0	1	0
1.34	0	0	0	0	3	0	0	1	0	0	4	0
1.35	0	0	0	0	0	0	0	0	0	0	0	0
1.36	0	0	0	0	1	0	0	0	0	0	1	0
1.37	0	0	0	0	0	0	0	0	0	0	0	0
1.38	0	0	0	0	2	2	0	2	1	0	4	3
1.39	0	0	0	0	1	0	0	0	0	0	1	0
1.40	0	0	0	0	3	2	0	0	1	0	3	3
1.41	0	0	0	0	0	0	0	0	0	0	0	0
1.42	0	0	0	0	4	1	0	1	0	0	5	1
1.43	0	0	0	0	0	0	0	0	0	0	0	0
1.44	0	0	0	0	1	1	0	0	0	0	1	1
1.45	0	0	0	0	0	1	0	1	0	0	1	1
1.46	0	0	0	0	1	0	0	1	0	0	2	0
1.47	0	0	0	0	0	0	0	0	0	0	0	0
1.48	0	0	0	0	1	1	0	0	2	0	1	3
1.49	0	0	0	0	0	0	0	0	0	0	0	0
1.50	0	0	0	0	2	2	0	1	2	0	3	[illegible]
SUBTOTAL	0	1	0	0	52	14	0	26	12	0	79	[illegible]

[redacted] [redacted] [redacted]

TABLE 9-1

[redacted] [redacted] [redacted]

MISSION • 1014-1 • INSTRUMENT • FRWD 01/18/65 DENSITY FREQ DISTR

DENSITY VALUE	PRIMARY MIN	PRIMARY MAX	PRIMARY LIM	INTERMEDIATE MIN	INTERMEDIATE MAX	INTERMEDIATE LIM	FULL MIN	FULL MAX	FULL LIM	ALL LEVELS MIN	ALL LEVELS MAX	ALL LEVELS LIM
1.51	0	0	0	0	0	0	0	0	0	0	0	0
1.52	0	0	0	0	3	0	0	0	0	0	3	0
1.53	0	0	0	0	0	0	0	0	0	0	0	0
1.54	0	0	0	0	4	1	0	2	0	0	6	1
1.55	0	0	0	0	1	0	0	1	0	0	2	0
1.56	0	0	0	0	2	0	0	0	0	0	2	0
1.57	0	0	0	0	0	0	0	0	0	0	0	0
1.58	0	0	0	0	2	1	0	1	0	0	3	1
1.59	0	0	0	0	0	0	0	0	0	0	0	0
1.60	0	0	0	0	5	0	0	1	0	0	6	0
1.61	0	0	0	0	0	0	0	0	0	0	0	0
1.62	0	0	0	0	1	0	0	3	1	0	4	1
1.63	0	0	0	0	0	0	0	2	0	0	2	0
1.64	0	0	0	0	4	1	0	0	0	0	4	1
1.65	0	0	0	0	0	1	0	2	1	0	2	2
1.66	0	0	0	0	0	1	0	0	0	0	0	1
1.67	0	0	0	0	0	0	0	0	0	0	0	0
1.68	0	0	0	0	0	2	0	2	1	0	2	3
1.69	0	0	0	0	0	0	0	0	0	0	0	0
1.70	0	0	0	0	3	1	0	0	0	0	3	1
1.71	0	0	0	0	1	0	0	2	0	0	3	0
1.72	0	0	0	0	1	2	0	0	1	0	1	3
1.73	0	0	0	0	0	0	0	0	0	0	0	0
1.74	0	0	0	0	2	5	0	1	0	0	3	5
1.75	0	0	0	0	0	0	0	2	1	0	2	1
1.76	0	0	0	0	1	3	0	0	0	0	1	3
1.77	0	0	0	0	0	0	0	0	0	0	0	0
1.78	0	0	0	0	0	0	0	0	1	0	0	1
1.79	0	0	0	0	0	0	0	0	0	0	0	0
1.80	0	0	0	0	3	5	0	0	2	0	3	7
1.81	0	0	0	0	0	0	0	0	0	0	0	0
1.82	0	0	0	0	1	0	0	2	1	0	3	1
1.83	0	0	0	0	0	0	0	0	0	0	0	0
1.84	0	0	0	0	1	1	0	2	1	0	3	2
1.85	0	0	0	0	1	1	0	0	0	0	1	1
1.86	0	0	0	0	1	0	0	4	2	0	5	2
1.87	0	0	0	0	0	0	0	0	1	0	0	1
1.88	0	0	0	0	0	1	0	0	1	0	0	2
1.89	0	0	0	0	0	2	0	0	0	0	0	2
1.90	0	0	0	0	2	5	0	2	0	0	4	5
1.91	0	0	0	0	0	0	0	0	0	0	0	0
1.92	0	0	0	0	1	1	0	0	1	0	1	2
1.93	0	0	0	0	1	0	0	0	0	0	1	0
1.94	0	0	0	0	3	0	0	1	0	0	4	0
1.95	0	0	0	0	1	2	0	0	1	0	1	3
1.96	0	0	0	0	0	1	0	0	1	0	0	2
1.97	0	0	0	0	0	1	0	0	0	0	0	1
1.98	0	0	0	0	1	2	0	0	0	0	1	2
1.99	0	0	0	0	0	0	0	0	0	0	0	0
2.00	0	0	0	0	2	3	0	3	2	0	5	5
SUBTOTAL	0	0	0	0	48	43	0	33	19	0	81	62

[redacted] [redacted] [redacted]

TABLE 9-1

[redacted] [redacted] [redacted]

MISSION • 1014-1 • INSTRUMENT • FRWD 01/18/65 DENSITY FREQ DISTR

DENSITY VALUE	PRIMARY MIN	PRIMARY MAX	PRIMARY LIM	INTERMEDIATE MIN	INTERMEDIATE MAX	INTERMEDIATE LIM	FULL MIN	FULL MAX	FULL LIM	ALL LEVELS MIN	ALL LEVELS MAX	ALL LEVELS LIM
2.01	0	0	0	0	0	0	0	0	0	0	0	0
2.02	0	0	0	0	0	3	0	1	0	0	1	3
2.03	0	0	0	0	0	0	0	0	0	0	0	0
2.04	0	0	0	0	1	1	0	0	2	0	1	3
2.05	0	0	0	0	1	5	0	0	1	0	1	6
2.06	0	0	0	0	0	3	0	0	1	0	0	4
2.07	0	0	0	0	0	1	0	0	0	0	0	1
2.08	0	0	0	0	1	2	0	0	4	0	1	6
2.09	0	0	0	0	0	1	0	0	3	0	0	4
2.10	0	0	0	0	0	7	0	0	2	0	0	9
2.11	0	0	0	0	0	1	0	0	0	0	0	1
2.12	0	0	0	0	1	2	0	1	3	0	2	5
2.13	0	0	0	0	0	1	0	0	0	0	0	1
2.14	0	0	0	0	0	2	0	0	4	0	0	6
2.15	0	0	0	0	0	2	0	0	1	0	0	3
2.16	0	0	0	0	1	1	0	0	0	0	1	1
2.17	0	0	0	0	0	0	0	0	0	0	0	0
2.18	0	0	0	0	1	3	0	1	1	0	2	4
2.19	0	0	0	0	0	0	0	0	0	0	0	0
2.20	0	0	0	0	1	6	0	1	1	0	2	7
2.21	0	0	0	0	0	1	0	0	1	0	0	2
2.22	0	0	0	0	1	5	0	0	0	0	1	5
2.23	0	0	0	0	0	0	0	0	0	0	0	0
2.24	0	0	0	0	0	6	0	0	1	0	0	7
2.25	0	0	0	0	0	1	0	0	2	0	0	3
2.26	0	0	0	0	0	3	0	0	2	0	0	5
2.27	0	0	0	0	1	1	0	0	1	0	1	2
2.28	0	0	0	0	0	1	0	0	2	0	0	3
2.29	0	0	0	0	0	2	0	0	0	0	0	2
2.30	0	0	0	0	0	4	0	0	2	0	0	6
2.31	0	0	0	0	0	0	0	0	0	0	0	0
2.32	0	0	0	0	0	2	0	0	1	0	0	3
2.33	0	0	0	0	0	0	0	0	0	0	0	0
2.34	0	0	0	0	0	0	0	0	1	0	0	1
2.35	0	0	0	0	0	1	0	0	0	0	0	1
2.36	0	0	0	0	1	0	0	0	0	0	1	0
2.37	0	0	0	0	0	0	0	0	0	0	0	0
2.38	0	0	0	0	0	1	0	0	0	0	0	1
2.39	0	0	0	0	0	0	0	0	0	0	0	0
2.40	0	0	0	0	0	0	0	0	0	0	0	0
2.41	0	0	0	0	0	0	0	0	0	0	0	0
2.42	0	0	0	0	0	0	0	0	0	0	0	0
2.43	0	0	0	0	0	0	0	0	0	0	0	0
2.44	0	0	0	0	0	0	0	0	0	0	0	0
2.45	0	0	0	0	0	0	0	0	0	0	0	0
2.46	0	0	0	0	0	0	0	0	0	0	0	0
2.47	0	0	0	0	0	0	0	0	0	0	0	0
2.48	0	0	0	0	0	0	0	0	0	0	0	0
2.49	0	0	0	0	0	0	0	0	0	0	0	0
2.50	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	0	0	0	0	10	69	0	4	36	0	14	105

[redacted] [redacted] [redacted]

TABLE 9-1

[redacted] [redacted] [redacted]

MISSION • 1014-1 • INSTRUMENT • FRWD 01/18/65 DENSITY FREQ DISTR

DENSITY VALUE	PRIMARY MIN	PRIMARY MAX	PRIMARY LIM	INTERMEDIATE MIN	INTERMEDIATE MAX	INTERMEDIATE LIM	FULL MIN	FULL MAX	FULL LIM	ALL LEVELS MIN	ALL LEVELS MAX	ALL LEVELS LIM
2.51	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	1	1	0	134	134	126	80	80	67	215	215	193

MISSION 1014-1 INSTR - FRWD 01/18/65 PROCESSING AND EXPOSURE ANALY

PROCESS LEVEL	SAMPLE SIZE	UNDER EXPOSED	UNDER PROCESSED	CORRECT EXP+PROC	OVER PROCESSED	OVER EXPOSED
PRIMARY	1	0 PC	100 PC	0 PC	0 PC	0 PC
INTERMEDIATE	134	5 PC	53 PC	40 PC	1 PC	0 PC
FULL	80	63 PC	0 PC	36 PC	1 PC	0 PC
ALL LEVELS	215	27 PC	33 PC	39 PC	1 PC	0 PC

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

[redacted] [redacted] [redacted]

TABLE 9-1

[redacted]

MISSION • 1014-1 • INSTR • FRWD • 01/18/65 PLOT OF D MIN • TERRAIN • PROCESSING • PRIMARY

ARITH MEAN • 0.17 • MEDIAN • 0.17 • STD DEV • 0.00 • RANGE • 0.17 TO 0.17 WITH 1 SAMPLES

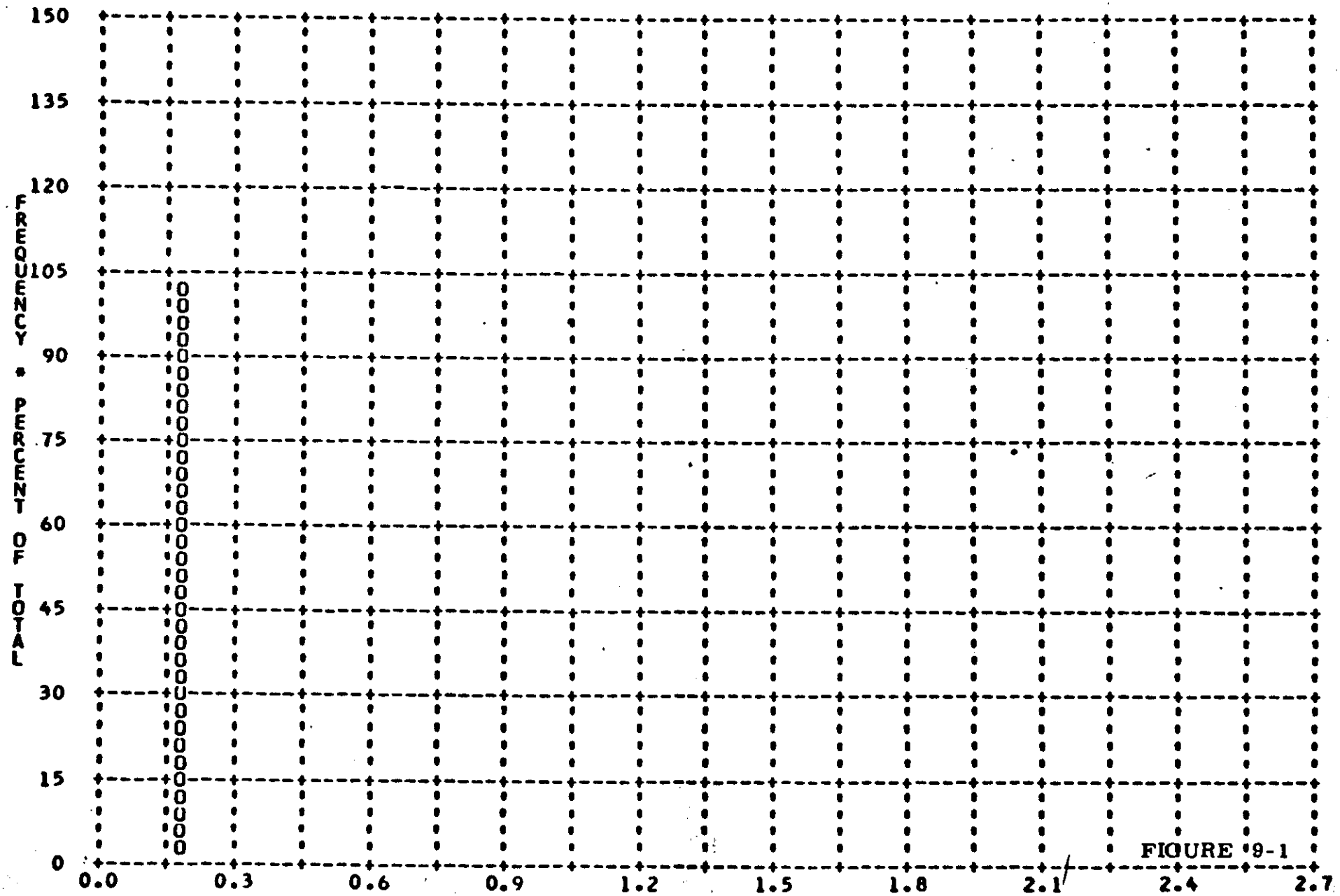


FIGURE 9-1

[redacted]

[redacted] ~~TOP SECRET~~ [redacted] [redacted]

MISSION • 1014-1 • INSTR • FRWD • 01/18/65 PLOT OF D MAX • TERRAIN • PROCESSING • PRIMARY

ARITH MEAN • 1.10 • MEDIAN • 1.10 • STD DEV • 0.00 • RANGE • 1.10 TO 1.10 WITH 1 SAMPLES

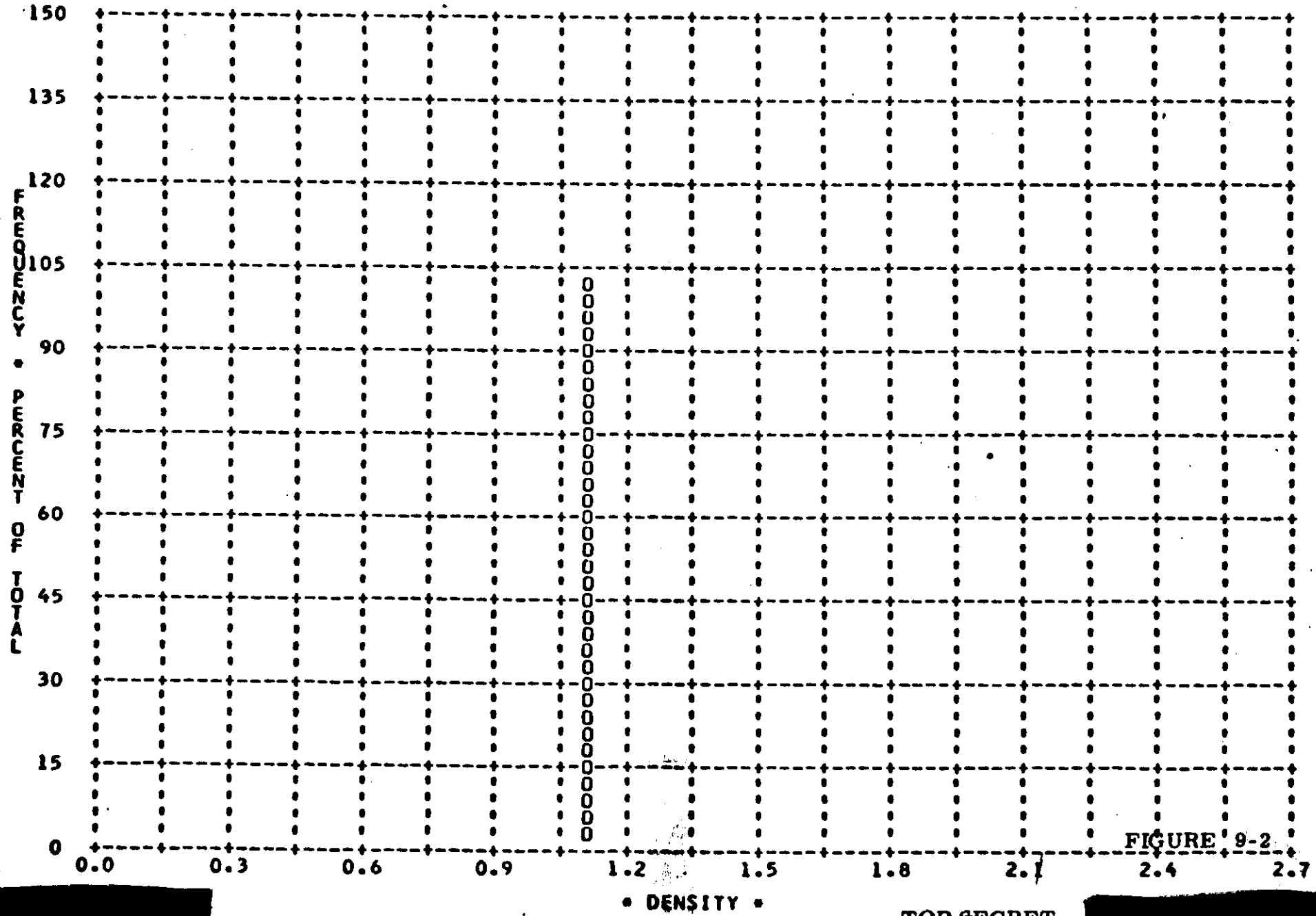


FIGURE 9-2

[redacted] ~~TOP SECRET~~ [redacted]

[redacted] ~~TOP SECRET~~ [redacted] [redacted]

MISSION • 1014-1 • INSTR • FRWD • 01/18/65 PLOT OF D MAX • CLOUD • PROCESSING • PRIMARY

ARITH MEAN • 0.00 • MEDIAN • 0.00 • STD DEV • 0.00 • RANGE • 2.70 TO 0.00 WITH 0 SAMPLES

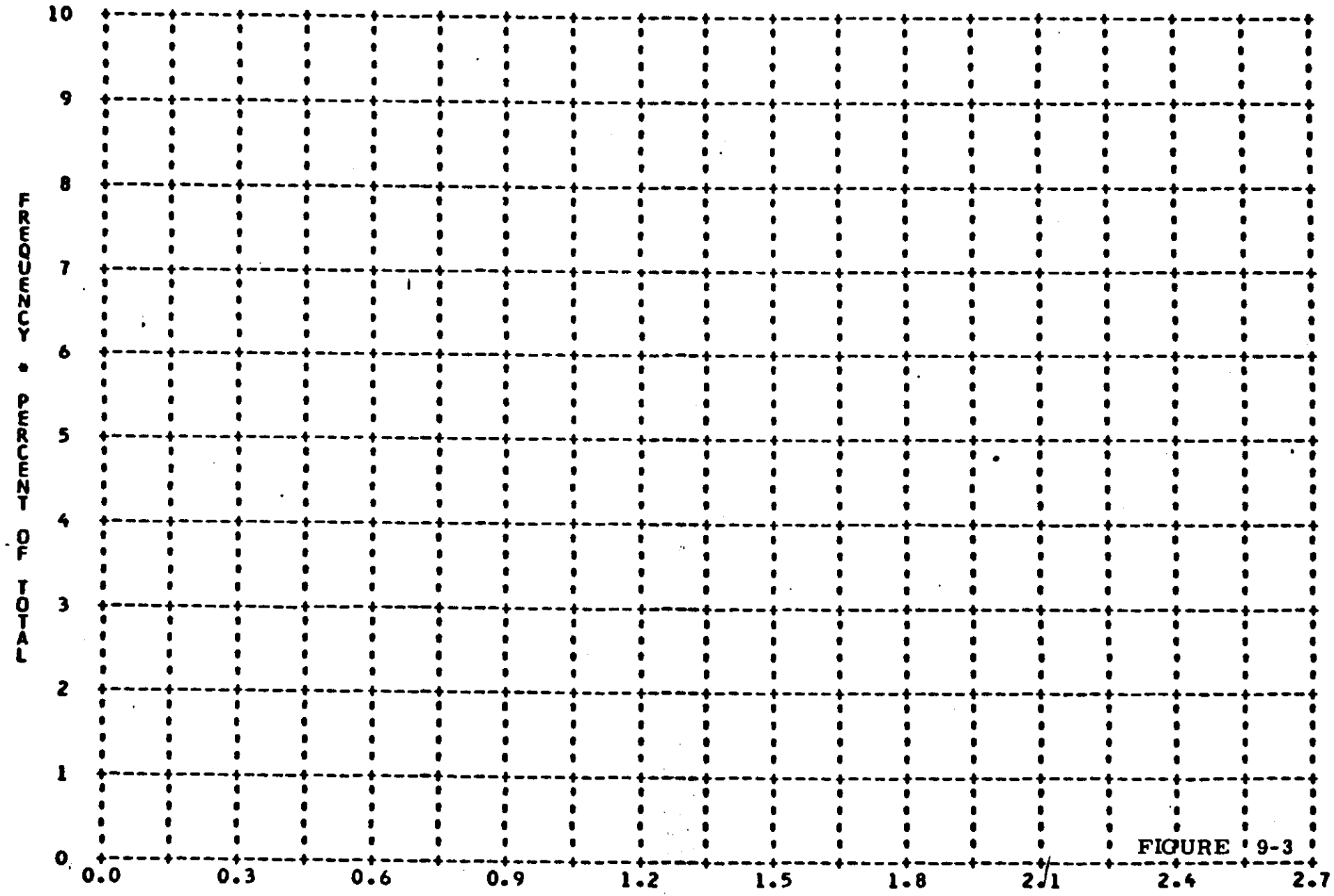


FIGURE 9-3

[redacted] ~~TOP SECRET~~ [redacted]

[redacted] ~~TOP SECRET~~ [redacted] [redacted]

MISSION • 1014-1 • INSTR • FRWD • 01/18/65 PLOT OF D MIN • TERRAIN • PROCESSING • INTERMEDIATE

ARITH MEAN • 0.40 • MEDIAN • 0.37 • STD DEV • 0.17 • RANGE • 0.18 TO 0.99 WITH 134 SAMPLES

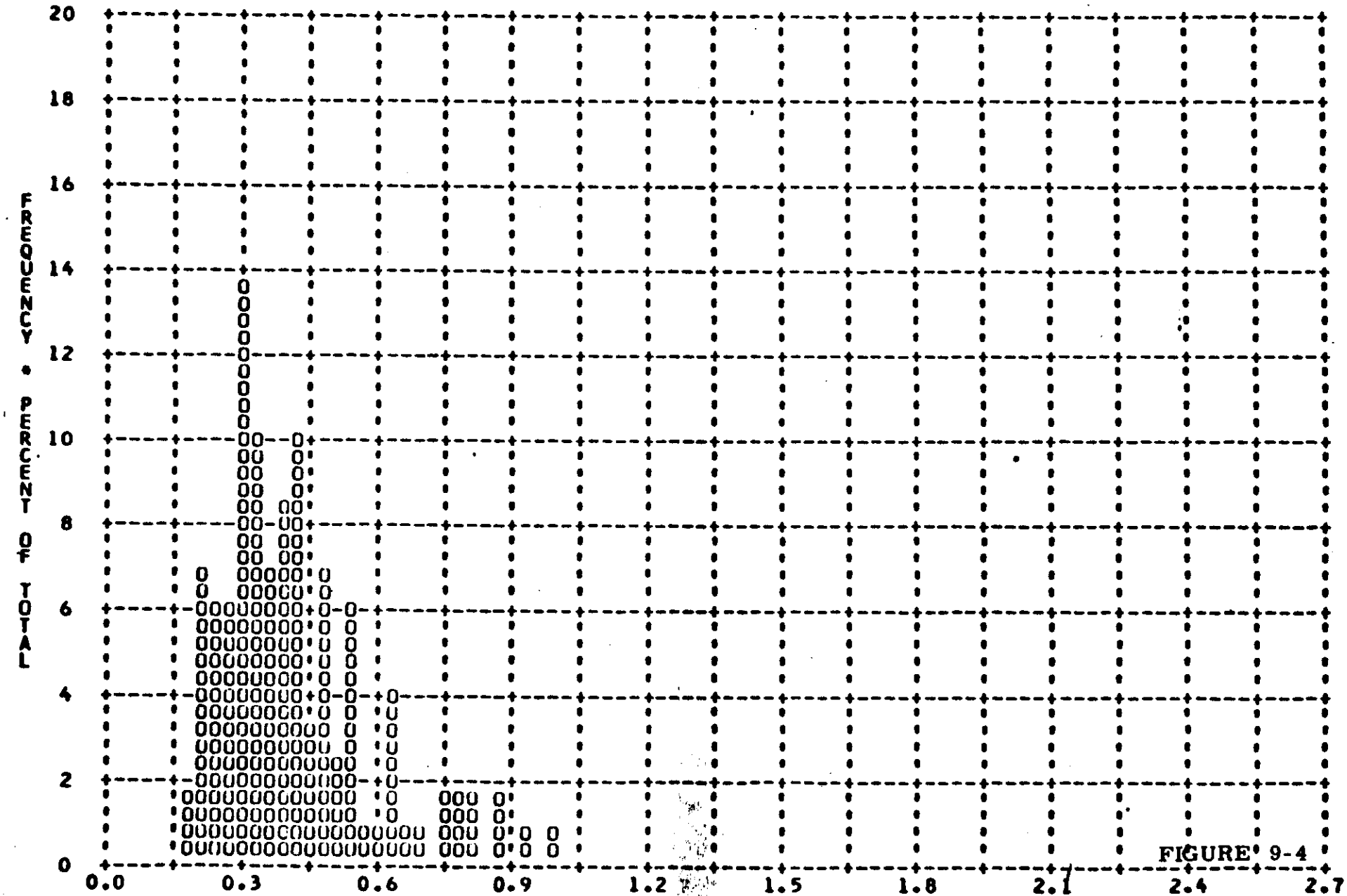


FIGURE 9-4

[redacted] ~~TOP SECRET~~ [redacted]

[redacted] ~~TOP SECRET~~ [redacted] [redacted]

MISSION • 1014-1 • INSTR • FRWD • 01/18/65 PLOT OF D MAX • TERRAIN • PROCESSING • INTERMEDIATE

ARITH MEAN • 1.41 • MEDIAN • 1.42 • STD DEV • 0.43 • RANGE • 0.26 TO 2.36 WITH 134 SAMPLES

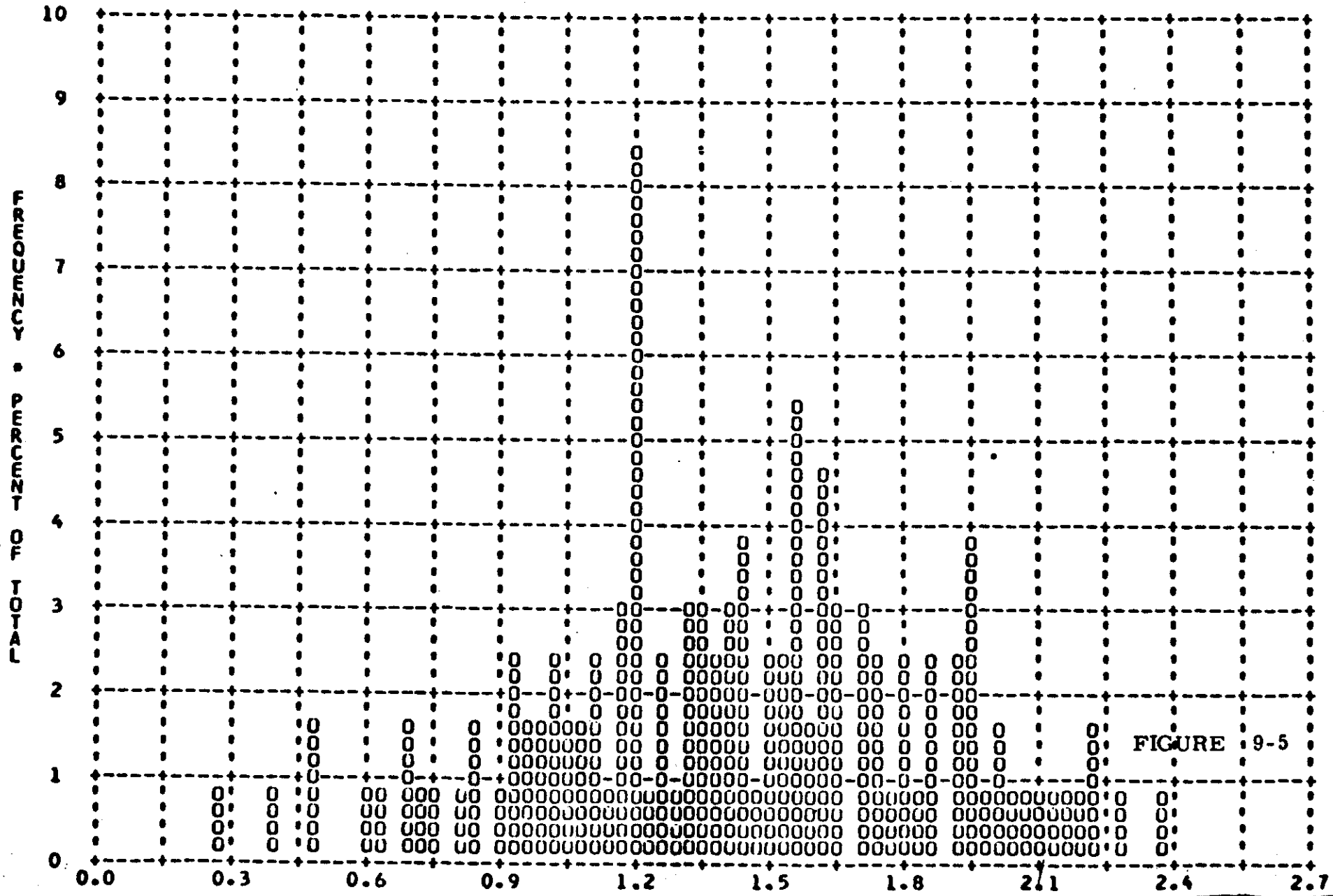


FIGURE 9-5

[redacted] ~~TOP SECRET~~ [redacted]

[redacted] ~~TOP SECRET~~ [redacted] [redacted]

MISSION • 1014-1 • INSTR • FRWD • 01/18/65 PLOT OF D MAX • CLOUD • PROCESSING • INTERMEDIATE

ARITH MEAN • 1.96 • MEDIAN • 2.05 • STD DEV • 0.29 • RANGE • 1.08 TO 2.38 WITH 126 SAMPLES

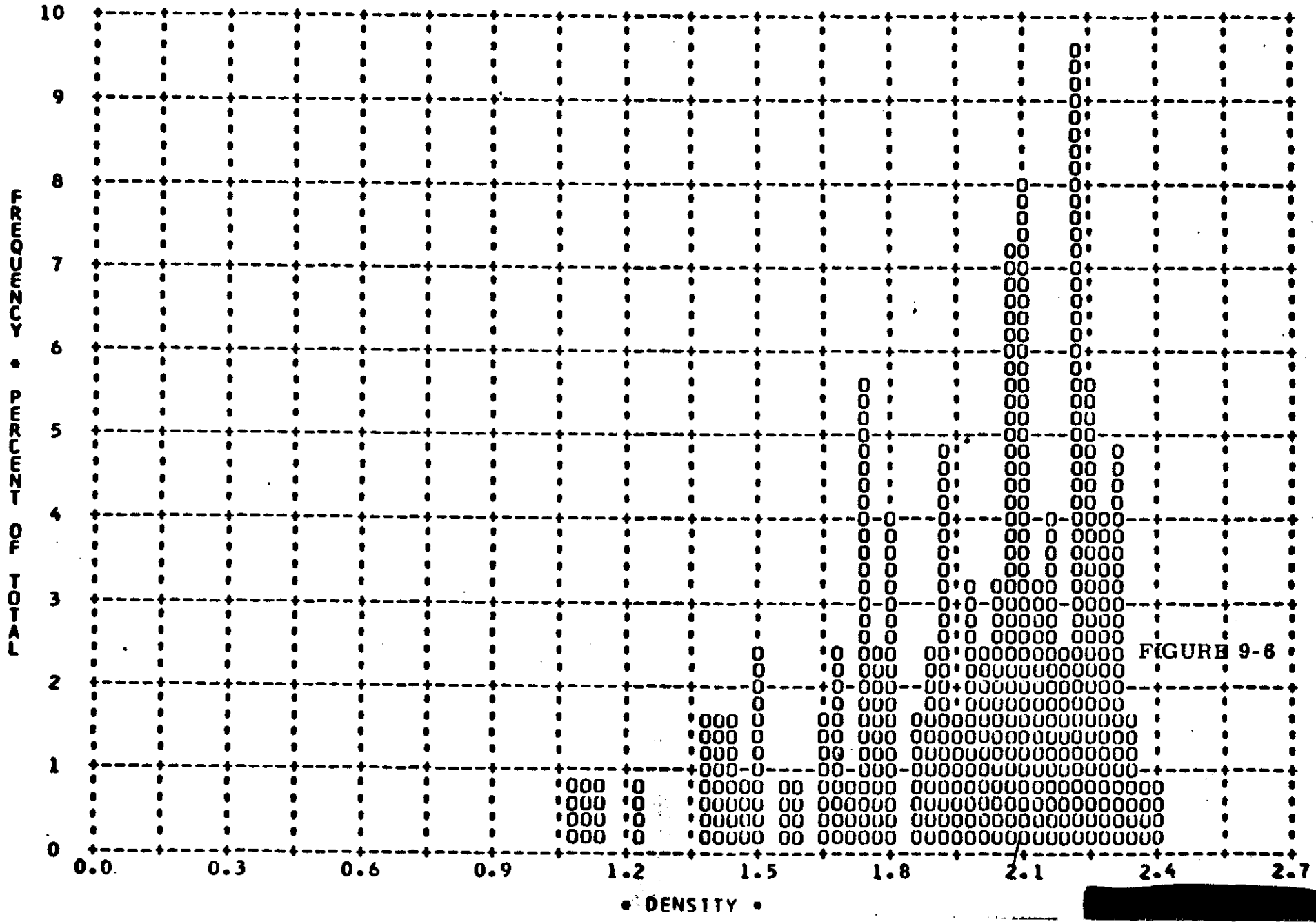


FIGURE 9-6

[redacted]

[redacted] ~~TOP SECRET~~ [redacted]

MISSION • 1014-1 • INSTR • FRWD • 01/10/65 PLOT OF 0 MIN • TERRAIN • PROCESSING • FULL

ARITH MEAN • 0.40 • MEDIAN • 0.35 • STD DEV • 0.17 • RANGE • 0.19 TO 0.97 WITH 80 SAMPLES

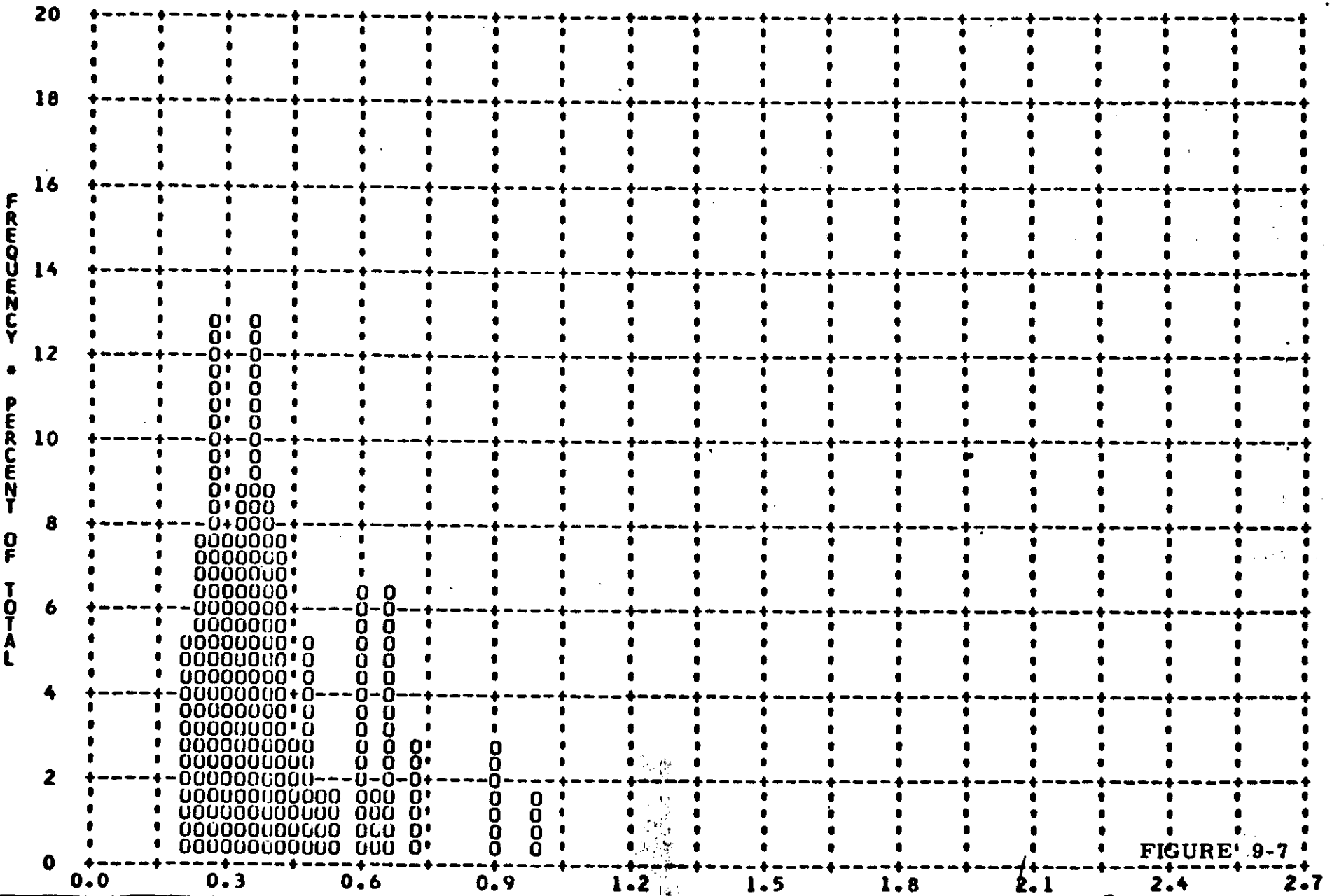


FIGURE 9-7

[redacted] [redacted]

[redacted] ~~TOP SECRET~~ [redacted]

MISSION • 1014-1 • INSTR • FRWD • 01/18/65 PLOT OF D MAX • TERRAIN • PROCESSING • FULL

ARITH MEAN • 1.38 • MEDIAN • 1.45 • STD DEV • 0.46 • RANGE • 0.48 TO 2.20 WITH 80 SAMPLES

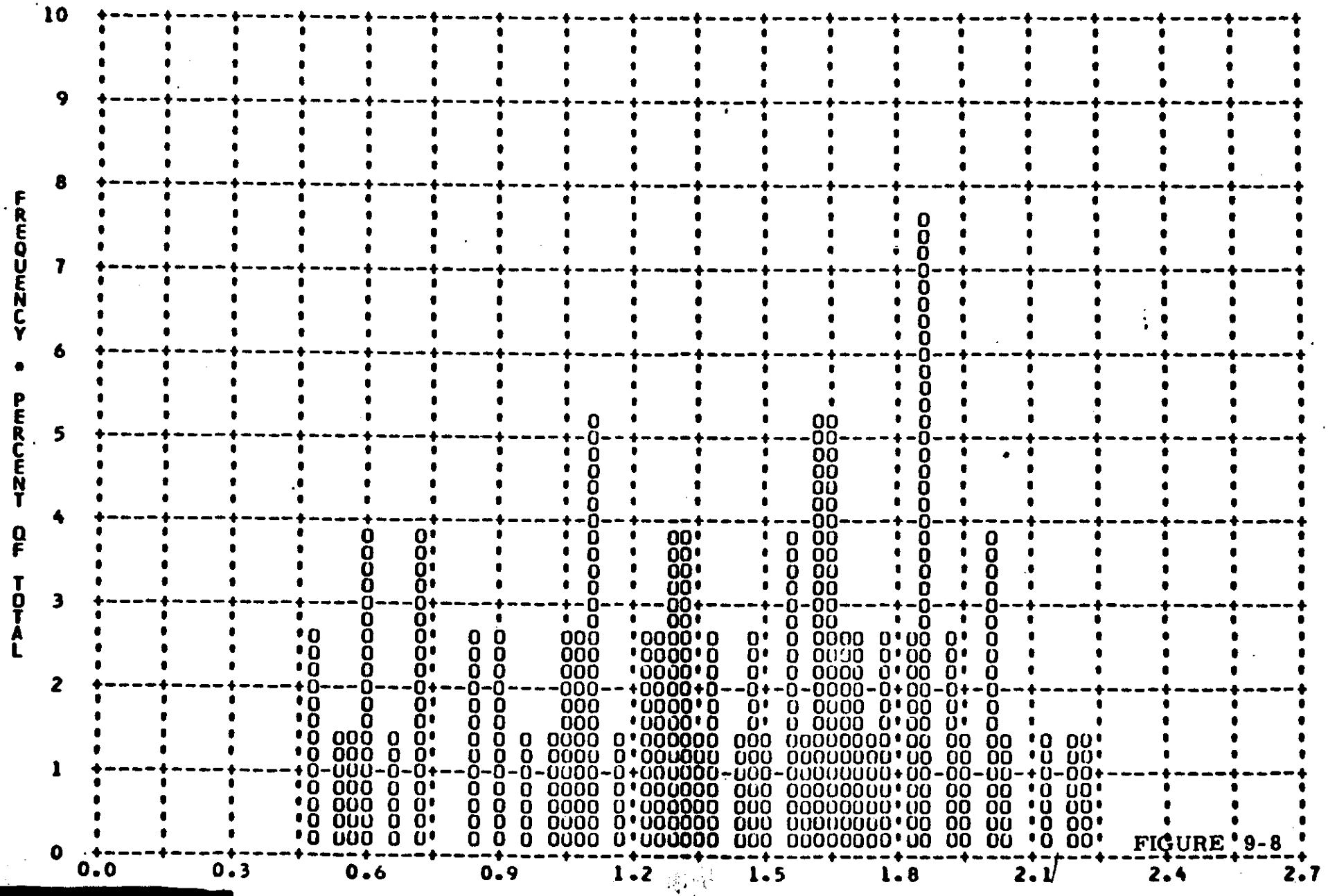


FIGURE 9-8

[redacted] ~~TOP SECRET~~ [redacted]

[redacted] ~~TOP SECRET~~ [redacted] [redacted]

MISSION • 1014-1 • INSTR • FRWD • 01/18/65 PLOT OF D MAX • CLOUD • PROCESSING • FULL

ARITH MEAN • 1.91 • MEDIAN • 2.05 • STD DEV • 0.35 • RANGE • 1.01 TO 2.34 WITH 67 SAMPLES

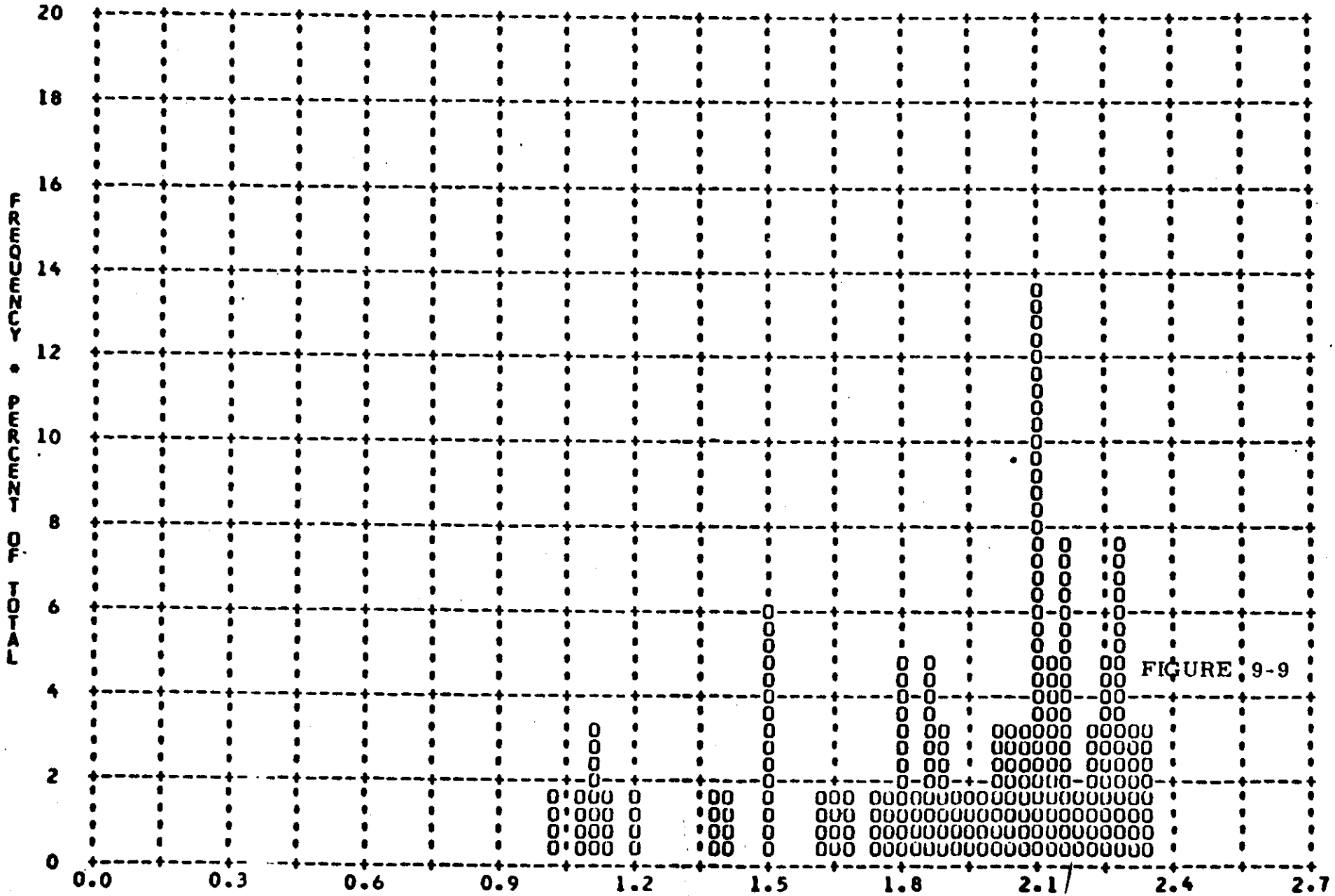


FIGURE 9-9

[redacted] ~~TOP SECRET~~ [redacted]

[redacted] ~~TOP SECRET~~ [redacted] [redacted]

MISSION • 1014-1 • INSTR • FRWD • 01/18/65 PLOT OF D MIN • TERRAIN • PROCESSING • ALL LEVELS

ARITH MEAN • 0.40 • MEDIAN • 0.36 • STD DEV • 0.17 • RANGE • 0.17 TO 0.99 WITH 215 SAMPLES

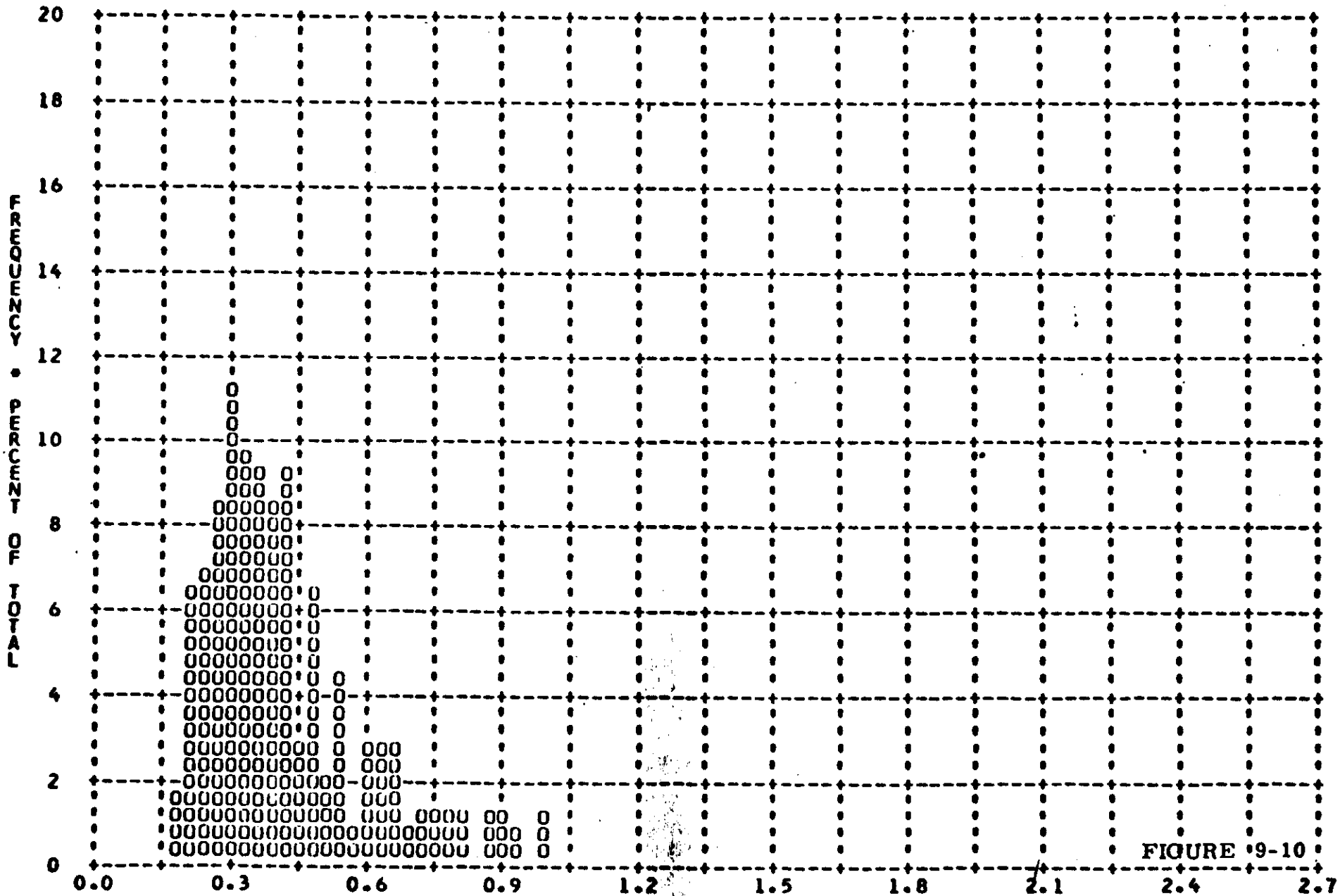


FIGURE 9-10

[redacted] ~~TOP SECRET~~ [redacted]

[redacted] ~~TOP SECRET~~ [redacted] [redacted]

MISSION • 1014-1 • INSTR • FRWD • 01/18/65 PLOT OF D MAX • TERRAIN • PROCESSING • ALL LEVELS

ARITH MEAN • 1.40 • MEDIAN • 1.42 • STD DEV • 0.44 • RANGE • 0.26 TO 2.36 WITH 215 SAMPLES

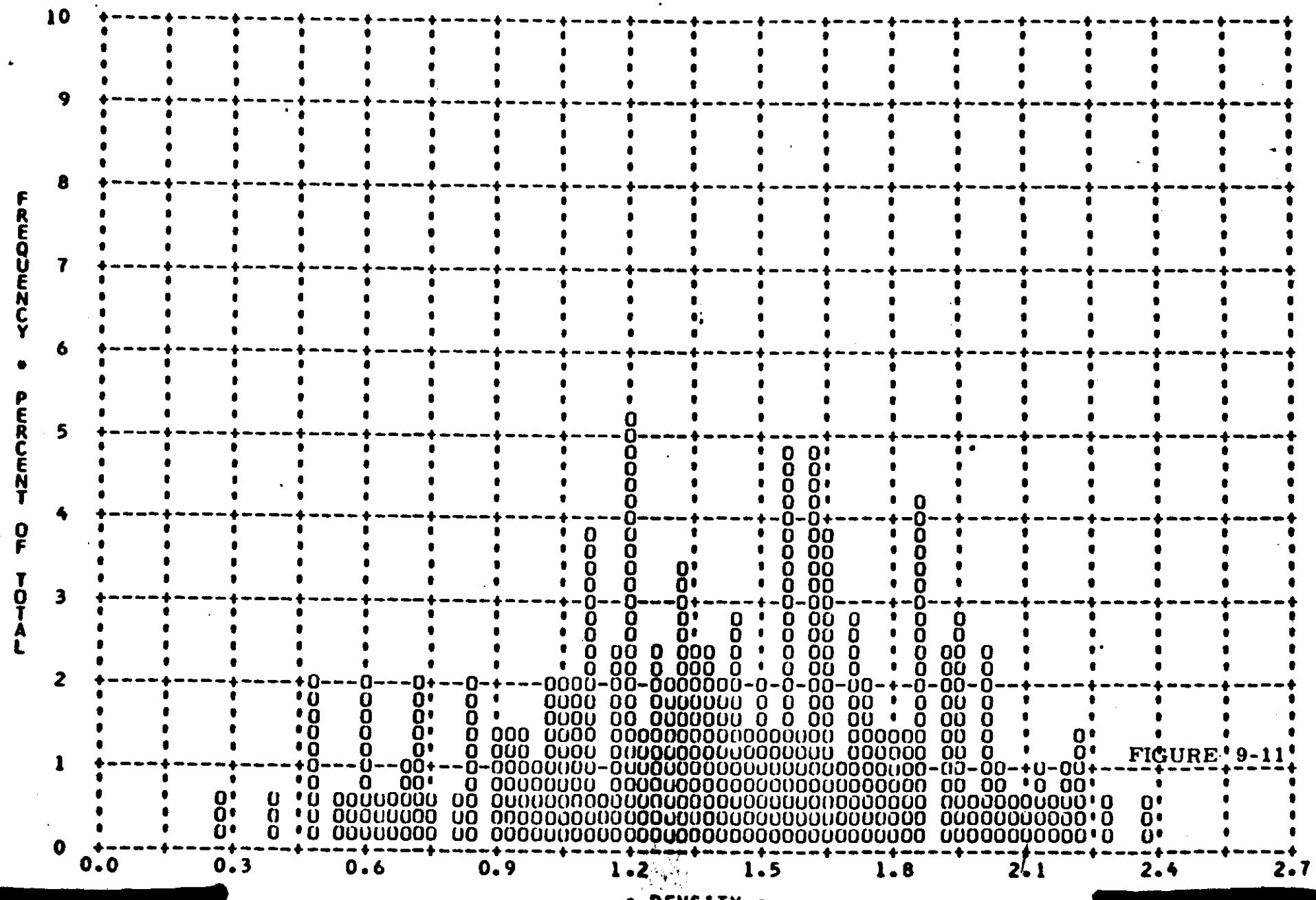


FIGURE 9-11

[redacted] ~~TOP SECRET~~ [redacted]

[redacted] ~~TOP SECRET~~ [redacted]

MISSION • 1014-1 • INSTR • FRWD • 01/18/65 PLOT OF D MAX • CLOUD • PROCESSING • ALL LEVELS

ARITH MEAN • 1.94 • MEDIAN • 2.05 • STD DEV • 0.32 • RANGE • 1.01 TO 2.38 WITH 193 SAMPLES

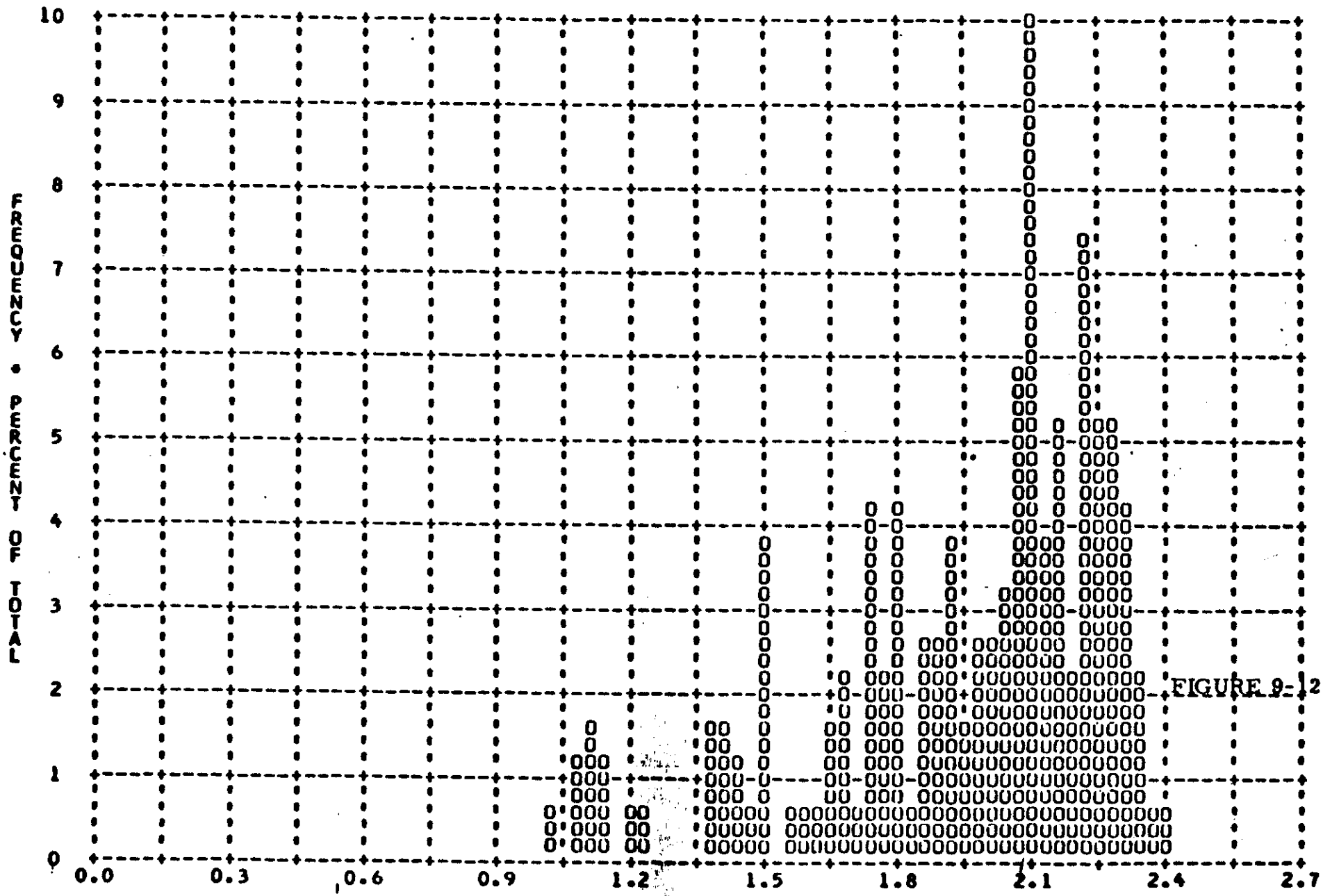


FIGURE 9-12

[redacted] ~~TOP SECRET~~ [redacted]

[redacted] [redacted] [redacted]

MISSION • 1014-1 • INSTRUMENT • AFT 01/18/65 DENSITY FREQ DISTR

DENSITY VALUE	PRIMARY MIN	PRIMARY MAX	PRIMARY LIM	INTERMEDIATE MIN	INTERMEDIATE MAX	INTERMEDIATE LIM	FULL MIN	FULL MAX	FULL LIM	ALL LEVELS MIN	ALL LEVELS MAX	ALL LEVELS LIM
0.01	0	0	0	0	0	0	0	0	0	0	0	0
0.02	0	0	0	0	0	0	0	0	0	0	0	0
0.03	0	0	0	0	0	0	0	0	0	0	0	0
0.04	0	0	0	0	0	0	0	0	0	0	0	0
0.05	0	0	0	0	0	0	0	0	0	0	0	0
0.06	0	0	0	0	0	0	0	0	0	0	0	0
0.07	0	0	0	0	0	0	0	0	0	0	0	0
0.08	0	0	0	0	0	0	0	0	0	0	0	0
0.09	0	0	0	0	0	0	0	0	0	0	0	0
0.10	0	0	0	0	0	0	0	0	0	0	0	0
0.11	0	0	0	0	0	0	0	0	0	0	0	0
0.12	0	0	0	0	0	0	0	0	0	0	0	0
0.13	0	0	0	0	0	0	0	0	0	0	0	0
0.14	0	0	0	0	0	0	0	0	0	0	0	0
0.15	0	0	0	0	0	0	0	0	0	0	0	0
0.16	0	0	0	0	0	0	0	0	0	0	0	0
0.17	0	0	0	0	0	0	0	0	0	0	0	0
0.18	0	0	0	4	0	0	0	0	0	4	0	0
0.19	0	0	0	1	0	0	0	0	0	1	0	0
0.20	0	0	0	5	0	0	0	0	0	5	0	0
0.21	0	0	0	2	0	0	2	0	0	4	0	0
0.22	0	0	0	3	0	0	2	0	0	5	0	0
0.23	0	0	0	1	0	0	1	0	0	2	0	0
0.24	0	0	0	1	0	0	1	0	0	2	0	0
0.25	0	0	0	1	1	0	0	0	0	1	1	0
0.26	0	0	0	3	0	0	4	0	0	7	0	0
0.27	0	0	0	1	0	0	1	0	0	2	0	0
0.28	0	0	0	2	0	0	0	0	0	2	0	0
0.29	0	0	0	1	0	0	1	0	0	2	0	0
0.30	0	0	0	1	1	0	3	2	0	4	3	0
0.31	0	0	0	1	1	0	1	0	0	2	1	0
0.32	0	0	0	0	1	0	2	1	0	2	2	0
0.33	0	0	0	0	0	0	1	0	0	1	0	0
0.34	0	0	0	2	0	0	1	0	0	3	0	0
0.35	0	0	0	1	0	0	3	0	0	4	0	0
0.36	0	0	0	2	0	0	3	0	0	5	0	0
0.37	0	0	0	1	0	0	3	0	0	4	0	0
0.38	0	0	0	2	1	0	3	0	0	5	1	0
0.39	0	0	0	0	1	0	0	0	0	0	1	0
0.40	0	0	0	2	0	0	7	2	0	9	2	0
0.41	0	0	0	1	0	0	0	0	0	1	0	0
0.42	0	0	0	2	1	1	4	0	0	6	1	1
0.43	0	0	0	1	0	0	2	0	0	3	0	0
0.44	0	0	0	2	0	0	1	0	0	3	0	0
0.45	0	0	0	1	0	0	3	1	0	4	1	0
0.46	0	0	0	1	0	0	6	1	0	7	1	0
0.47	0	0	0	0	0	0	4	0	0	4	0	0
0.48	0	0	0	2	1	0	6	0	0	8	1	0
0.49	0	0	0	0	0	0	3	0	0	3	0	0
0.50	0	0	0	4	0	1	2	0	0	6	0	1
SUBTOTAL	0	0	0	51	8	2	70	7	0	121	15	2

[redacted] [redacted] [redacted]

TABLE 9-2

[redacted] [redacted] [redacted]

MISSION • 1014-1 • INSTRUMENT • AFT 01/18/65 DENSITY FREQ DISTR

DENSITY VALUE	PRIMARY MIN	PRIMARY MAX	PRIMARY LIM	INTERMEDIATE MIN	INTERMEDIATE MAX	INTERMEDIATE LIM	FULL MIN	FULL MAX	FULL LIM	ALL LEVELS MIN	ALL LEVELS MAX	ALL LEVELS LIM
0.51	0	0	0	1	0	0	0	0	0	1	0	0
0.52	0	0	0	0	0	0	7	1	0	7	1	0
0.53	0	0	0	1	0	0	3	0	0	4	0	0
0.54	0	0	0	0	0	0	2	0	0	2	0	0
0.55	0	0	0	0	0	0	1	0	1	1	0	1
0.56	0	0	0	2	0	1	2	0	0	4	0	1
0.57	0	0	0	3	0	0	2	0	0	5	0	0
0.58	0	0	0	0	1	0	2	0	0	2	1	0
0.59	0	0	0	1	0	0	1	0	0	2	0	0
0.60	0	0	0	0	1	0	6	0	0	6	1	0
0.61	0	0	0	0	0	0	0	0	0	0	0	0
0.62	0	0	0	1	0	0	6	0	0	7	0	0
0.63	0	0	0	0	0	0	0	0	0	0	0	0
0.64	0	0	0	0	0	0	4	1	0	4	1	0
0.65	0	0	0	0	0	0	2	0	0	2	0	0
0.66	0	0	0	0	1	0	1	0	0	1	1	0
0.67	0	0	0	1	0	0	2	0	0	3	0	0
0.68	0	0	0	2	0	0	0	0	0	2	0	0
0.69	0	0	0	1	0	0	0	0	0	1	0	0
0.70	0	0	0	0	0	0	3	1	0	3	1	0
0.71	0	0	0	1	0	0	0	0	0	1	0	0
0.72	0	0	0	2	0	0	1	0	0	3	0	0
0.73	0	0	0	0	2	0	0	0	0	0	2	0
0.74	0	0	0	0	0	0	0	1	0	0	1	0
0.75	0	0	0	2	0	0	1	1	0	3	1	0
0.76	0	0	0	0	0	0	3	1	0	3	1	0
0.77	0	0	0	0	0	0	0	0	0	0	0	0
0.78	0	0	0	3	1	0	2	1	0	5	2	0
0.79	0	0	0	0	0	0	1	0	1	1	0	1
0.80	0	0	0	1	1	0	2	2	1	3	3	1
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	2	1	0	0	0	0	2	1	0
0.85	0	0	0	0	0	0	0	1	0	0	1	0
0.86	0	0	0	0	0	0	2	0	0	2	0	0
0.87	0	0	0	0	0	0	1	0	0	1	0	0
0.88	0	0	0	1	1	0	1	0	0	2	1	0
0.89	0	0	0	0	0	0	0	0	0	0	0	0
0.90	0	0	0	1	1	0	0	2	0	1	3	0
0.91	0	0	0	0	1	0	0	0	0	0	1	0
0.92	0	0	0	1	0	0	1	0	1	2	0	1
0.93	0	0	0	0	0	0	0	0	0	0	0	0
0.94	0	0	0	1	0	0	0	2	1	1	2	1
0.95	0	0	0	0	0	0	0	0	0	0	0	0
0.96	0	0	0	0	0	0	1	0	0	1	0	0
0.97	0	0	0	0	0	0	0	0	0	0	0	0
0.98	0	0	0	0	0	1	0	0	0	0	0	1
0.99	0	0	0	0	1	0	1	0	0	1	1	0
1.00	0	0	0	0	1	0	0	0	0	0	1	0
SUBTOTAL	0	0	0	28	13	2	61	14	5	89	27	7

[redacted] [redacted] [redacted]

TABLE 9-2

[redacted] [redacted] [redacted]

MISSION • 1014-1 • INSTRUMENT • AFT 01/18/65 DENSITY FREQ DISTR

DENSITY VALUE	PRIMARY MIN	PRIMARY MAX	PRIMARY LIM	INTERMEDIATE MIN	INTERMEDIATE MAX	INTERMEDIATE LIM	FULL MIN	FULL MAX	FULL LIM	ALL LEVELS MIN	ALL LEVELS MAX	ALL LEVELS LIM
1.01	0	0	0	0	0	0	0	0	0	0	0	0
1.02	0	0	0	0	2	0	0	1	0	0	3	0
1.03	0	0	0	0	1	0	0	0	0	0	1	0
1.04	0	0	0	0	1	0	1	0	0	1	1	0
1.05	0	0	0	0	0	0	0	0	1	0	0	1
1.06	0	0	0	0	0	0	1	0	0	1	0	0
1.07	0	0	0	0	0	0	0	1	0	0	1	0
1.08	0	0	0	0	0	0	0	0	0	0	0	0
1.09	0	0	0	0	0	0	1	0	0	1	0	0
1.10	0	0	0	0	0	0	1	1	1	1	1	1
1.11	0	0	0	0	0	0	0	1	0	0	1	0
1.12	0	0	0	0	1	1	0	0	1	0	1	2
1.13	0	0	0	0	0	0	0	2	0	0	2	0
1.14	0	0	0	0	1	0	0	1	0	0	2	0
1.15	0	0	0	0	0	0	0	0	0	0	0	0
1.16	0	0	0	0	1	0	0	0	0	0	1	0
1.17	0	0	0	0	0	0	0	0	0	0	0	0
1.18	0	0	0	0	1	0	0	0	0	0	1	0
1.19	0	0	0	0	0	0	0	0	0	0	0	0
1.20	0	0	0	0	1	0	1	4	0	1	5	0
1.21	0	0	0	0	0	0	0	1	0	0	1	0
1.22	0	0	0	0	0	0	0	0	0	0	0	0
1.23	0	0	0	0	0	0	0	1	0	0	1	0
1.24	0	0	0	0	1	0	0	0	0	0	1	0
1.25	0	0	0	0	0	0	0	3	0	0	3	0
1.26	0	0	0	0	1	0	1	1	0	1	2	0
1.27	0	0	0	0	0	0	0	0	0	0	0	0
1.28	0	0	0	0	1	1	0	1	0	0	2	1
1.29	0	0	0	0	0	0	0	0	0	0	0	0
1.30	0	0	0	0	2	0	0	4	1	0	6	1
1.31	0	0	0	0	0	0	0	0	0	0	0	0
1.32	0	0	0	0	1	0	0	1	1	0	2	1
1.33	0	0	0	0	0	0	0	0	0	0	0	0
1.34	0	0	0	0	0	0	0	0	0	0	0	0
1.35	0	0	0	0	0	0	0	1	0	0	1	0
1.36	0	0	0	0	0	0	0	2	0	0	2	0
1.37	0	0	0	0	0	0	0	0	0	0	0	0
1.38	0	0	0	0	2	0	0	1	0	0	3	0
1.39	0	0	0	0	1	0	0	0	0	0	1	0
1.40	0	0	0	0	1	1	0	4	2	0	5	3
1.41	0	0	0	0	0	0	0	0	0	0	0	0
1.42	0	0	0	0	1	2	0	4	0	0	5	2
1.43	0	0	0	0	0	1	0	0	0	0	0	1
1.44	0	0	0	0	0	0	0	1	0	0	1	0
1.45	0	0	0	0	2	1	0	2	0	0	4	1
1.46	0	0	0	0	1	0	0	1	0	0	2	0
1.47	0	0	0	0	0	0	0	1	1	0	1	1
1.48	0	0	0	0	1	0	0	2	0	0	3	0
1.49	0	0	0	0	1	1	0	0	0	0	1	1
1.50	0	0	0	0	1	0	0	6	1	0	7	1
SUBTOTAL	0	0	0	0	26	8	6	48	9	6	74	17

[redacted] [redacted] [redacted]

TABLE 9-2

[redacted] [redacted] [redacted]

MISSION • 1014-1 • INSTRUMENT • AFT 01/18/65 DENSITY FREQ DISTR

DENSITY VALUE	PRIMARY MIN	PRIMARY MAX	PRIMARY LIM	INTERMEDIATE MIN	INTERMEDIATE MAX	INTERMEDIATE LIM	FULL MIN	FULL MAX	FULL LIM	ALL LEVELS MIN	ALL LEVELS MAX	ALL LEVELS LIM
1.51	0	0	0	0	0	0	0	0	1	0	0	1
1.52	0	0	0	0	1	1	0	0	0	0	1	1
1.53	0	0	0	0	1	0	0	0	0	0	1	0
1.54	0	0	0	0	0	1	0	3	0	0	3	1
1.55	0	0	0	0	0	0	0	3	0	0	3	0
1.56	0	0	0	0	0	2	0	1	0	0	1	2
1.57	0	0	0	0	0	0	0	0	0	0	0	0
1.58	0	0	0	0	2	1	0	1	1	0	3	2
1.59	0	0	0	0	0	0	0	0	0	0	0	0
1.60	0	0	0	0	2	0	0	3	2	0	5	2
1.61	0	0	0	0	0	0	0	0	0	0	0	0
1.62	0	0	0	0	1	1	0	3	2	0	4	3
1.63	0	0	0	0	0	0	0	0	0	0	0	0
1.64	0	0	0	0	0	0	0	2	0	0	2	0
1.65	0	0	0	0	0	0	0	2	0	0	2	0
1.66	0	0	0	0	0	1	0	0	1	0	0	2
1.67	0	0	0	0	2	0	0	1	0	0	3	0
1.68	0	0	0	0	1	1	0	1	2	0	2	3
1.69	0	0	0	0	0	0	0	0	0	0	0	0
1.70	0	0	0	0	0	1	0	6	6	0	6	7
1.71	0	0	0	0	0	1	0	0	0	0	0	1
1.72	0	0	0	0	1	1	0	1	1	0	2	2
1.73	0	0	0	0	1	0	0	0	0	0	1	0
1.74	0	0	0	0	1	0	0	2	0	0	3	0
1.75	0	0	0	0	1	0	0	1	4	0	2	4
1.76	0	0	0	0	0	0	0	0	1	0	0	1
1.77	0	0	0	0	0	0	0	0	0	0	0	0
1.78	0	0	0	0	2	0	0	2	2	0	4	2
1.79	0	0	0	0	0	0	0	0	0	0	0	0
1.80	0	0	0	0	0	1	0	4	1	0	4	2
1.81	0	0	0	0	0	0	0	0	3	0	0	3
1.82	0	0	0	0	2	1	0	4	3	0	6	4
1.83	0	0	0	0	1	0	0	0	2	0	1	2
1.84	0	0	0	0	1	1	0	1	0	0	2	1
1.85	0	0	0	0	0	0	0	1	0	0	1	0
1.86	0	0	0	0	0	0	0	0	2	0	0	2
1.87	0	0	0	0	0	0	0	0	1	0	0	1
1.88	0	0	0	0	1	2	0	3	1	0	4	3
1.89	0	0	0	0	1	0	0	0	0	0	1	0
1.90	0	0	0	0	0	0	0	3	3	0	3	3
1.91	0	0	0	0	0	0	0	0	0	0	0	0
1.92	0	0	0	0	0	2	0	2	2	0	2	4
1.93	0	0	0	0	0	0	0	0	0	0	0	0
1.94	0	0	0	0	2	1	0	0	0	0	2	1
1.95	0	0	0	0	1	1	0	0	0	0	1	1
1.96	0	0	0	0	1	2	0	2	2	0	3	4
1.97	0	0	0	0	0	0	0	0	0	0	0	0
1.98	0	0	0	0	0	0	0	0	0	0	0	0
1.99	0	0	0	0	1	0	0	0	1	0	1	1
2.00	0	0	0	0	0	2	0	0	5	0	0	7
SUBTOTAL	0	0	0	0	27	24	0	52	49	0	79	73

[redacted] [redacted] [redacted]

TABLE 9-2

[redacted] [redacted] [redacted]

MISSION • 1014-1 • INSTRUMENT • AFT 01/18/65 DENSITY FREQ DISTR

DENSITY VALUE	PRIMARY MIN	PRIMARY MAX	PRIMARY LIM	INTERMEDIATE MIN	INTERMEDIATE MAX	INTERMEDIATE LIM	FULL MIN	FULL MAX	FULL LIM	ALL LEVELS MIN	ALL LEVELS MAX	ALL LEVELS LIM
2.01	0	0	0	0	0	1	0	1	0	0	1	1
2.02	0	0	0	0	1	1	0	1	1	0	2	2
2.03	0	0	0	0	0	0	0	0	0	0	0	0
2.04	0	0	0	0	0	5	0	1	2	0	1	7
2.05	0	0	0	0	0	0	0	0	1	0	0	1
2.06	0	0	0	0	0	1	0	1	1	0	1	2
2.07	0	0	0	0	0	0	0	0	0	0	0	0
2.08	0	0	0	0	0	2	0	1	1	0	1	3
2.09	0	0	0	0	0	0	0	0	0	0	0	0
2.10	0	0	0	0	0	2	0	2	2	0	2	4
2.11	0	0	0	0	0	0	0	0	0	0	0	0
2.12	0	0	0	0	0	1	0	1	5	0	1	6
2.13	0	0	0	0	0	1	0	0	0	0	0	1
2.14	0	0	0	0	0	0	0	1	2	0	1	2
2.15	0	0	0	0	1	0	0	1	0	0	2	0
2.16	0	0	0	0	0	0	0	0	2	0	0	2
2.17	0	0	0	0	0	0	0	0	3	0	0	3
2.18	0	0	0	0	1	2	0	2	1	0	3	3
2.19	0	0	0	0	0	0	0	0	1	0	0	1
2.20	0	0	0	0	0	2	0	0	1	0	0	3
2.21	0	0	0	0	0	0	0	0	1	0	0	1
2.22	0	0	0	0	0	2	0	1	1	0	1	3
2.23	0	0	0	0	0	0	0	0	0	0	0	0
2.24	0	0	0	0	0	2	0	1	0	0	1	2
2.25	0	0	0	0	0	2	0	0	0	0	0	2
2.26	0	0	0	0	0	5	0	0	3	0	0	8
2.27	0	0	0	0	1	0	0	0	2	0	1	2
2.28	0	0	0	0	0	5	0	0	4	0	0	9
2.29	0	0	0	0	0	1	0	0	1	0	0	2
2.30	0	0	0	0	0	2	0	1	6	0	1	8
2.31	0	0	0	0	0	1	0	0	0	0	0	1
2.32	0	0	0	0	0	0	0	0	3	0	0	3
2.33	0	0	0	0	0	0	0	0	0	0	0	0
2.34	0	0	0	0	0	0	0	1	1	0	1	1
2.35	0	0	0	0	0	1	0	0	1	0	0	2
2.36	0	0	0	0	0	2	0	0	2	0	0	4
2.37	0	0	0	0	0	0	0	0	0	0	0	0
2.38	0	0	0	0	1	1	0	0	1	0	1	2
2.39	0	0	0	0	0	0	0	0	2	0	0	2
2.40	0	0	0	0	0	1	0	0	0	0	0	1
2.41	0	0	0	0	0	0	0	0	1	0	0	1
2.42	0	0	0	0	0	0	0	0	0	0	0	0
2.43	0	0	0	0	0	0	0	0	1	0	0	1
2.44	0	0	0	0	0	0	0	0	0	0	0	0
2.45	0	0	0	0	0	0	0	0	0	0	0	0
2.46	0	0	0	0	0	0	0	0	0	0	0	0
2.47	0	0	0	0	0	0	0	0	0	0	0	0
2.48	0	0	0	0	0	0	0	0	0	0	0	0
2.49	0	0	0	0	0	0	0	0	0	0	0	0
2.50	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	0	0	0	0	5	43	0	16	53	0	21	96

[redacted] [redacted] [redacted]

TABLE 9-2

[redacted] [redacted] [redacted]

MISSION • 1014-1 • INSTRUMENT • AFT 01/18/65 DENSITY FREQ DISTR

DENSITY VALUE	PRIMARY MIN	PRIMARY MAX	PRIMARY LIM	INTERMEDIATE MIN	INTERMEDIATE MAX	INTERMEDIATE LIM	FULL MIN	FULL MAX	FULL LIM	ALL LEVELS MIN	ALL LEVELS MAX	ALL LEVELS LIM
2.51	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	79	79	79	137	137	116	216	216	195

MISSION 1014-1 INSTR - AFT 01/18/65 PROCESSING AND EXPOSURE ANALY

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	79	13 PC	32 PC	53 PC	3 PC	0 PC
FULL	137	23 PC	0 PC	70 PC	7 PC	0 PC
ALL LEVELS	216	19 PC	12 PC	64 PC	5 PC	0 PC

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

[redacted] [redacted] [redacted]

TABLE 9-2

[redacted] ~~TOP SECRET~~ [redacted] [redacted]

MISSION • 1014-1 • INSTR • AFT • 01/18/65 PLOT OF D MIN • TERRAIN • PROCESSING • INTERMEDIATE

ARITH MEAN • 0.46 • MEDIAN • 0.42 • STD DEV. • 0.22 • RANGE • 0.18 TO 0.94 WITH 79 SAMPLES

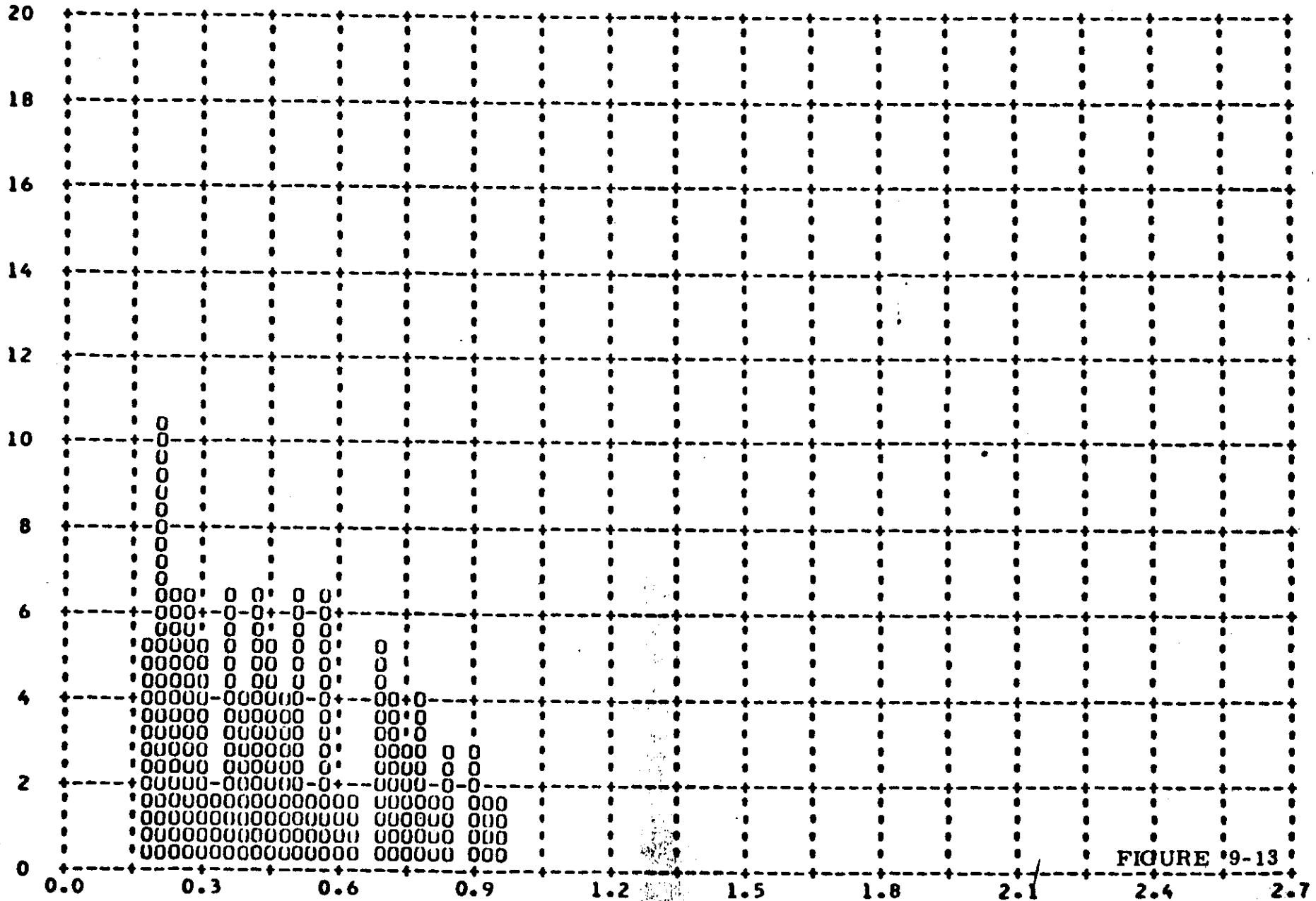


FIGURE 9-13

[redacted] [redacted]

[redacted] ~~TOP SECRET~~ [redacted] [redacted]

MISSION • 1014-1 • INSTR • AFT • 01/10/65 PLOT OF D MAX • TERRAIN • PROCESSING • INTERMEDIATE

ARITH MEAN • 1.33 • MEDIAN • 1.40 • STD DEV • 0.52 • RANGE • 0.25 TO 2.38 WITH 79 SAMPLES

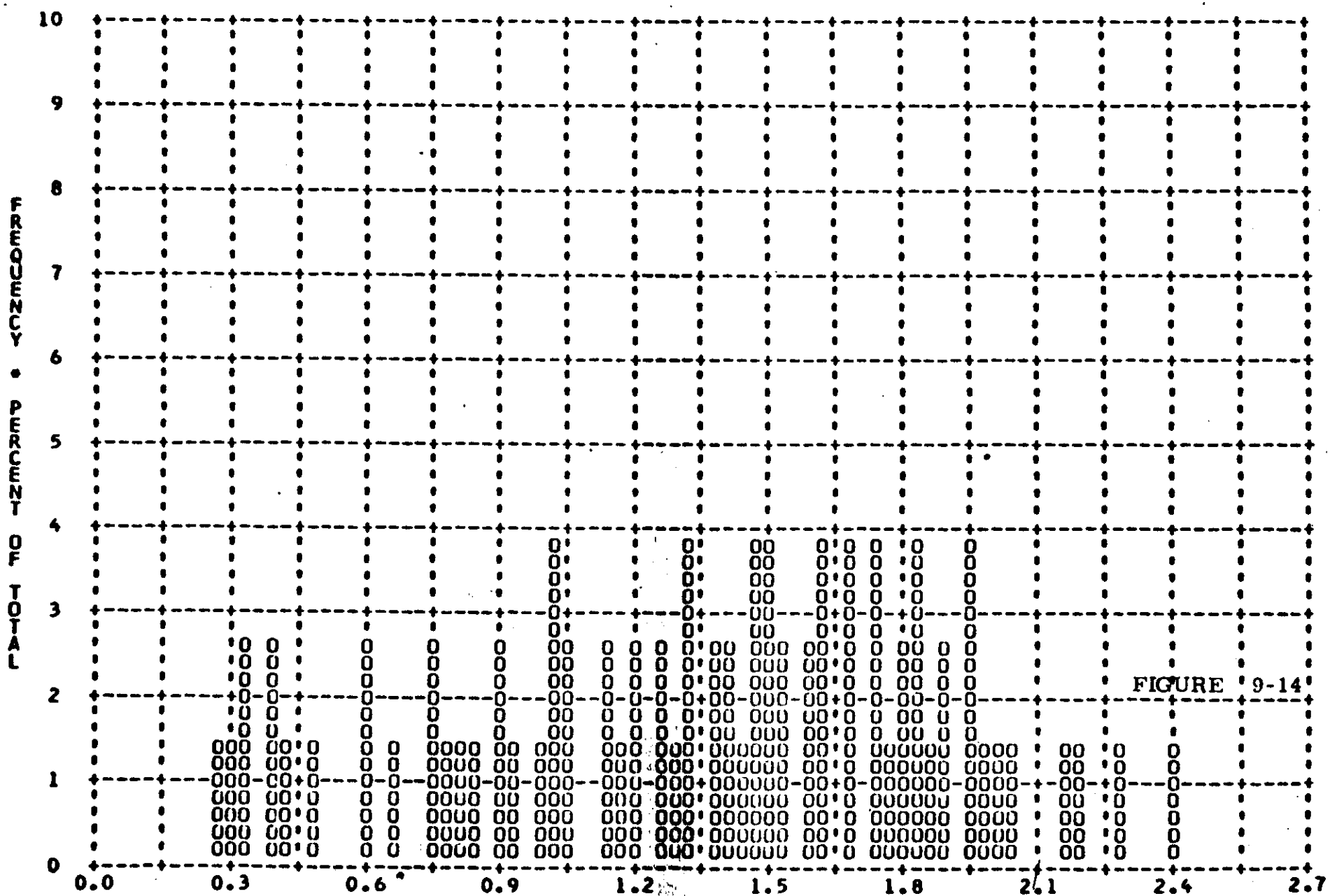


FIGURE 9-14

[redacted] ~~TOP SECRET~~ [redacted]

[redacted] ~~TOP SECRET~~ [redacted] [redacted]

MISSION • 1014-1 • INSTR • AFT • 01/18/65 PLOT OF D MAX • CLOUD • PROCESSING • INTERMEDIATE

ARITH MEAN • 1.91 • MEDIAN • 2.04 • STD DEV • 0.43 • RANGE • 0.42 TO 2.40 WITH 79 SAMPLES

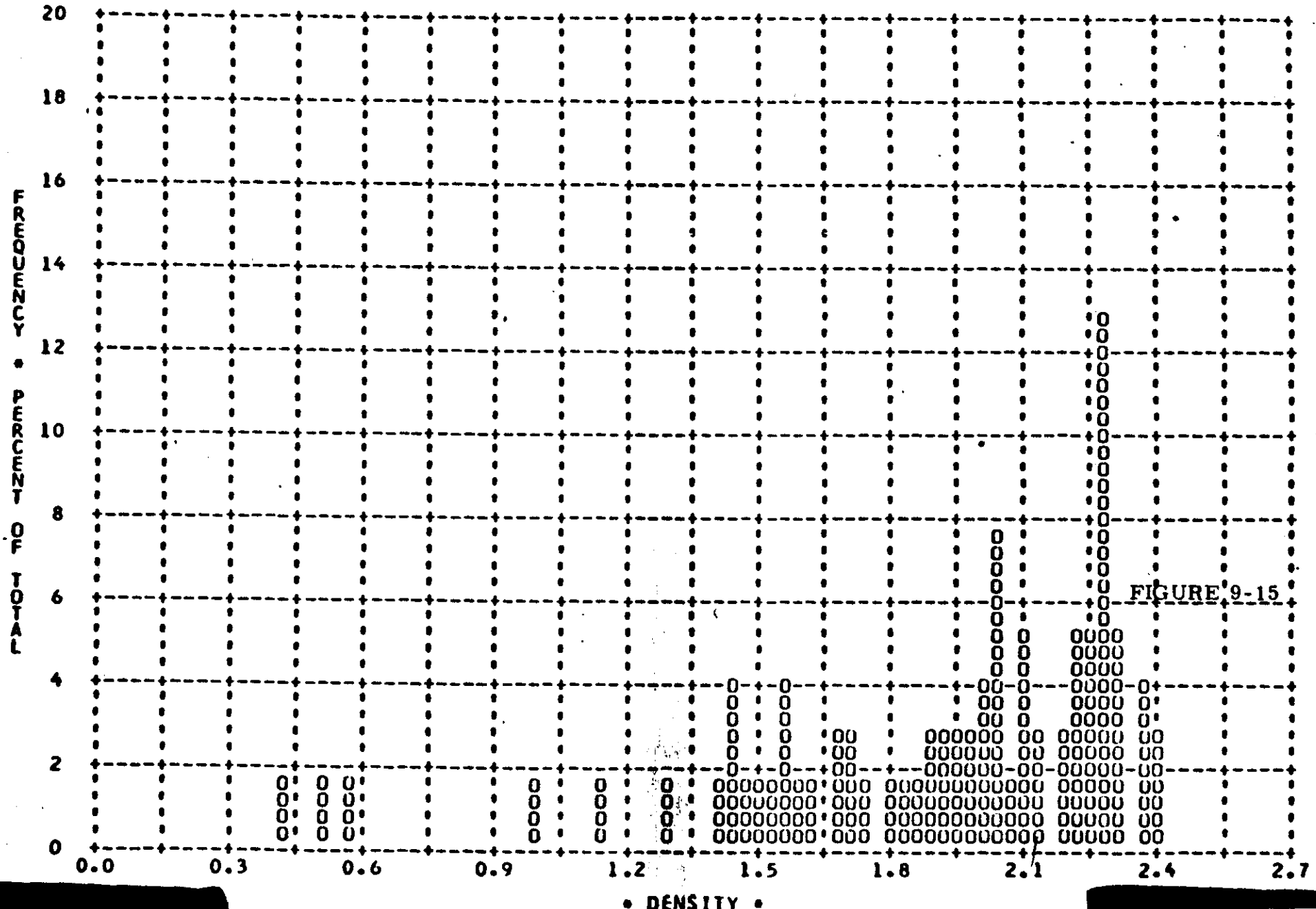


FIGURE 9-15

[redacted]

[redacted] ~~TOP SECRET~~ [redacted] [redacted]

MISSION • 1014-1 • INSTR • AFT • 01/18/65 PLOT OF D MIN • TERRAIN • PROCESSING • FULL

ARITH MEAN • 0.54 • MEDIAN • 0.50 • STD DEV • 0.21 • RANGE • 0.21 TO 1.26 WITH 137 SAMPLES

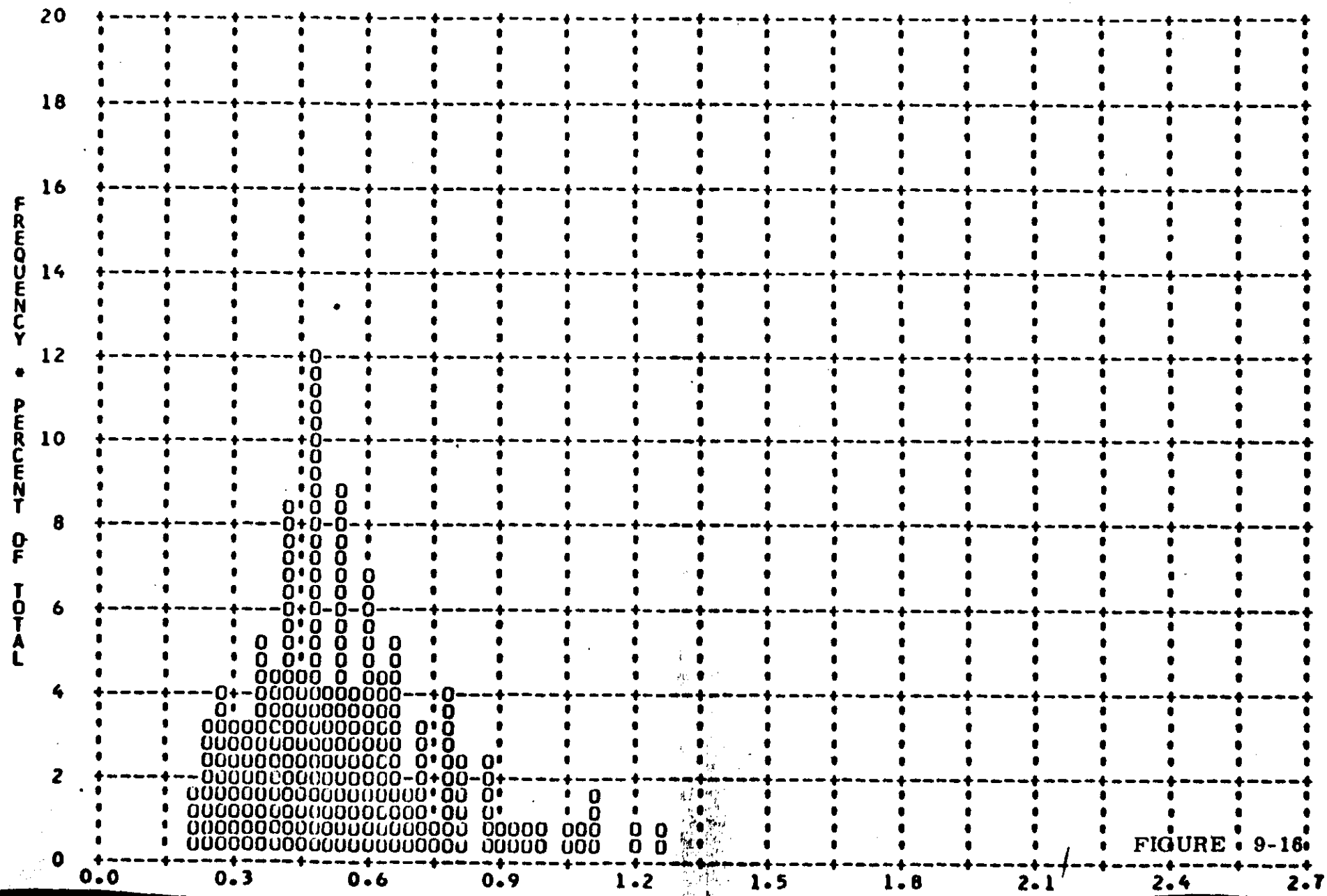


FIGURE 9-16

[redacted] [redacted]

[redacted] ~~TOP SECRET~~ [redacted] [redacted]

MISSION • 1014-1 • INSTR • AFT • 01/18/65 PLOT OF D MAX • TERRAIN • PROCESSING • FULL

ARITH MEAN • 1.47 • MEDIAN • 1.50 • STD DEV • 0.46 • RANGE • 0.30 TO 2.34 WITH 137 SAMPLES

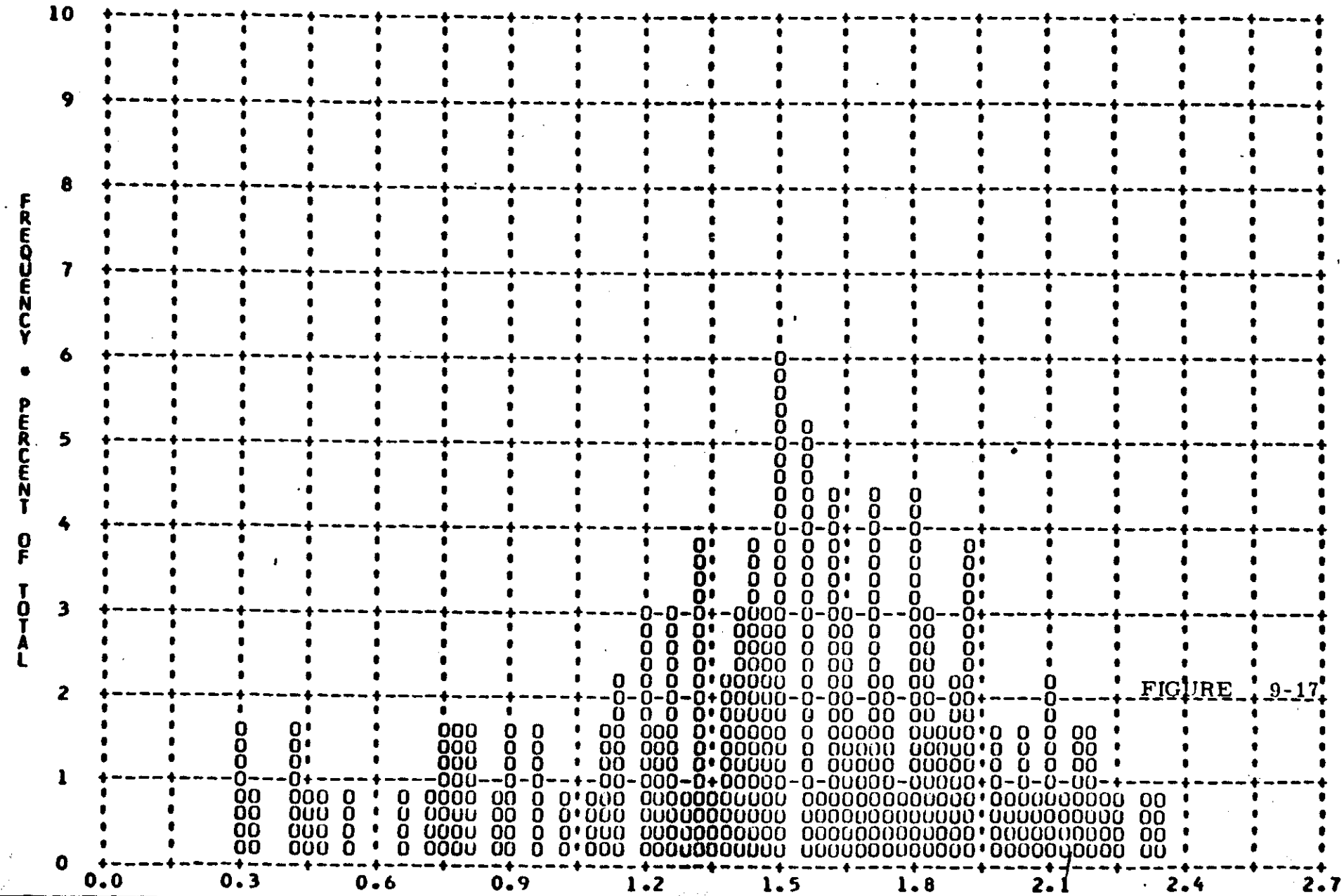


FIGURE 9-17

[redacted] ~~TOP SECRET~~ [redacted]

[redacted] ~~TOP SECRET~~ [redacted]

MISSION • 1014-1 • INSTR • AFT • 01/18/65 PLOT OF D MAX • CLOUD • PROCESSING • FULL

ARITH MEAN • 1.91 • MEDIAN • 2.00 • STD DEV • 0.39 • RANGE • 0.55 TO 2.43 WITH 116 SAMPLES

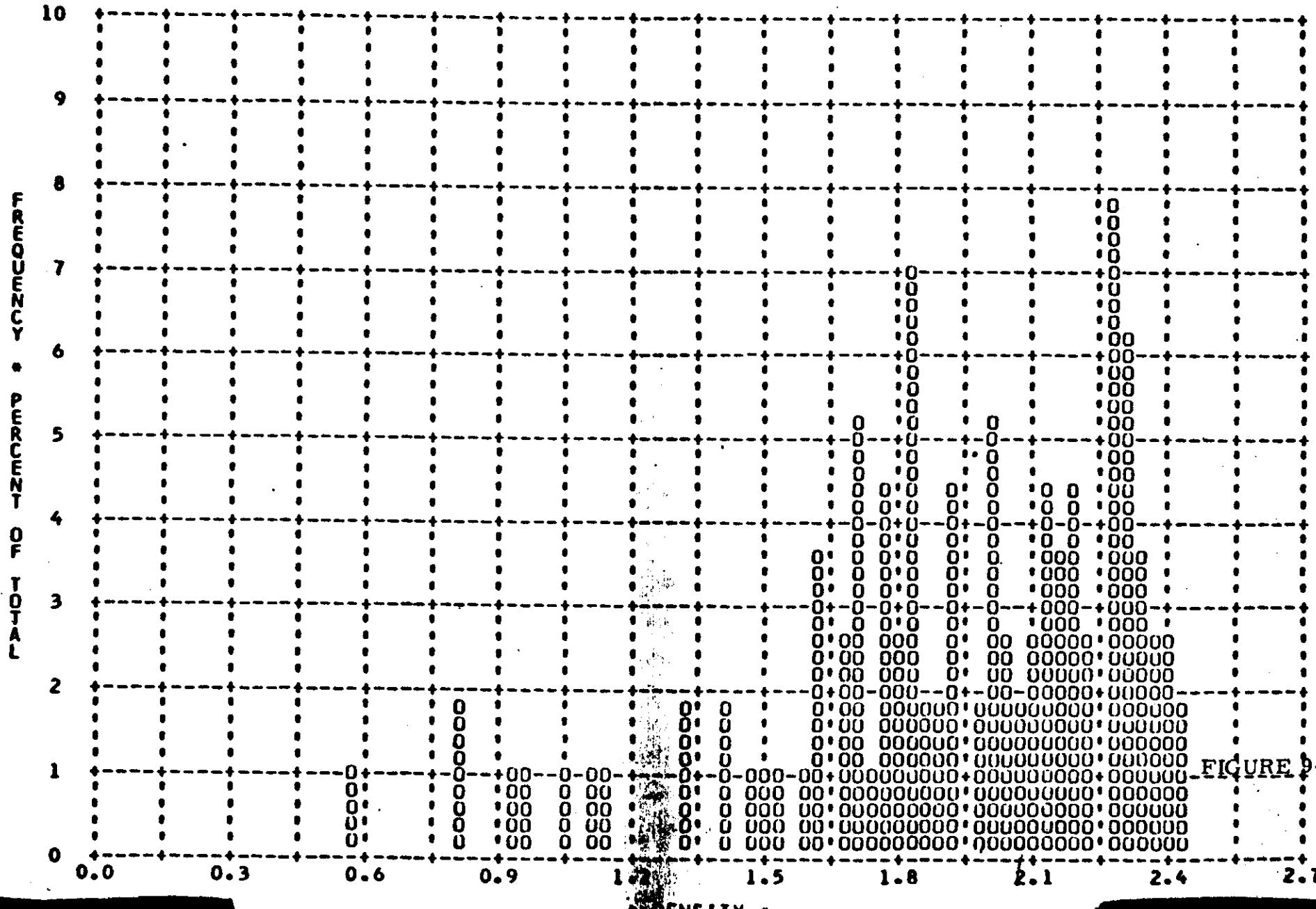


FIGURE 9-18

[redacted] ~~TOP SECRET~~ [redacted]

MISSION • 1014-1 • INSTR • AFT • 01/18/65 PLOT OF D MIN • TERRAIN • PROCESSING • ALL LEVELS

ARITH MEAN • 0.51 • MEDIAN • 0.48 • STD DEV • 0.22 • RANGE • 0.18 TO 1.26 WITH 216 SAMPLES

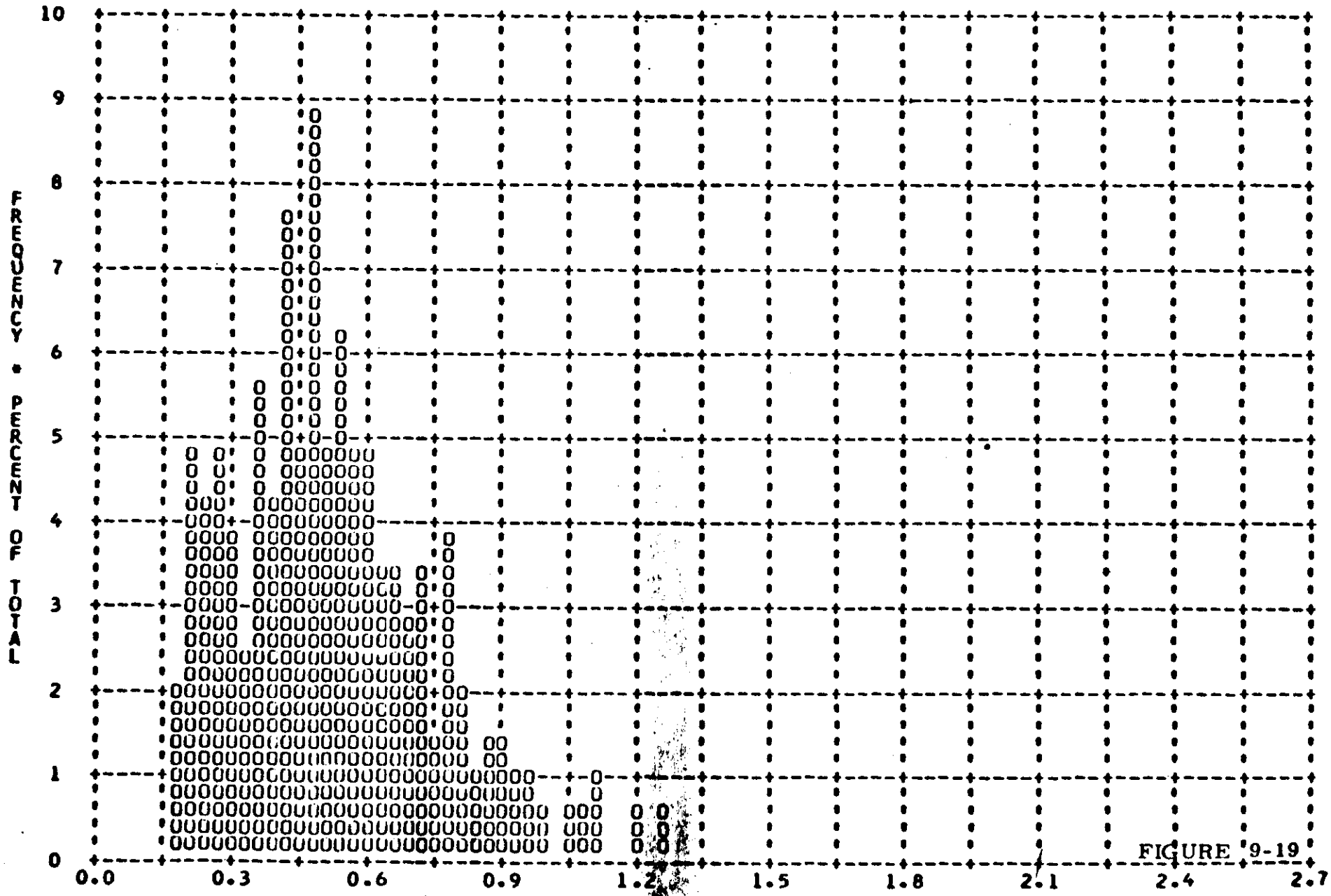


FIGURE 9-19

[redacted] ~~TOP SECRET~~ [redacted]

MISSION • 1014-1 • INSTR • AFT • 01/18/65 PLOT OF D MAX • TERRAIN • PROCESSING • ALL LEVELS

ARITH MEAN • 1.42 • MEDIAN • 1.49 • STD DEV • 0.49 • RANGE • 0.25 TO 2.38 WITH 216 SAMPLES

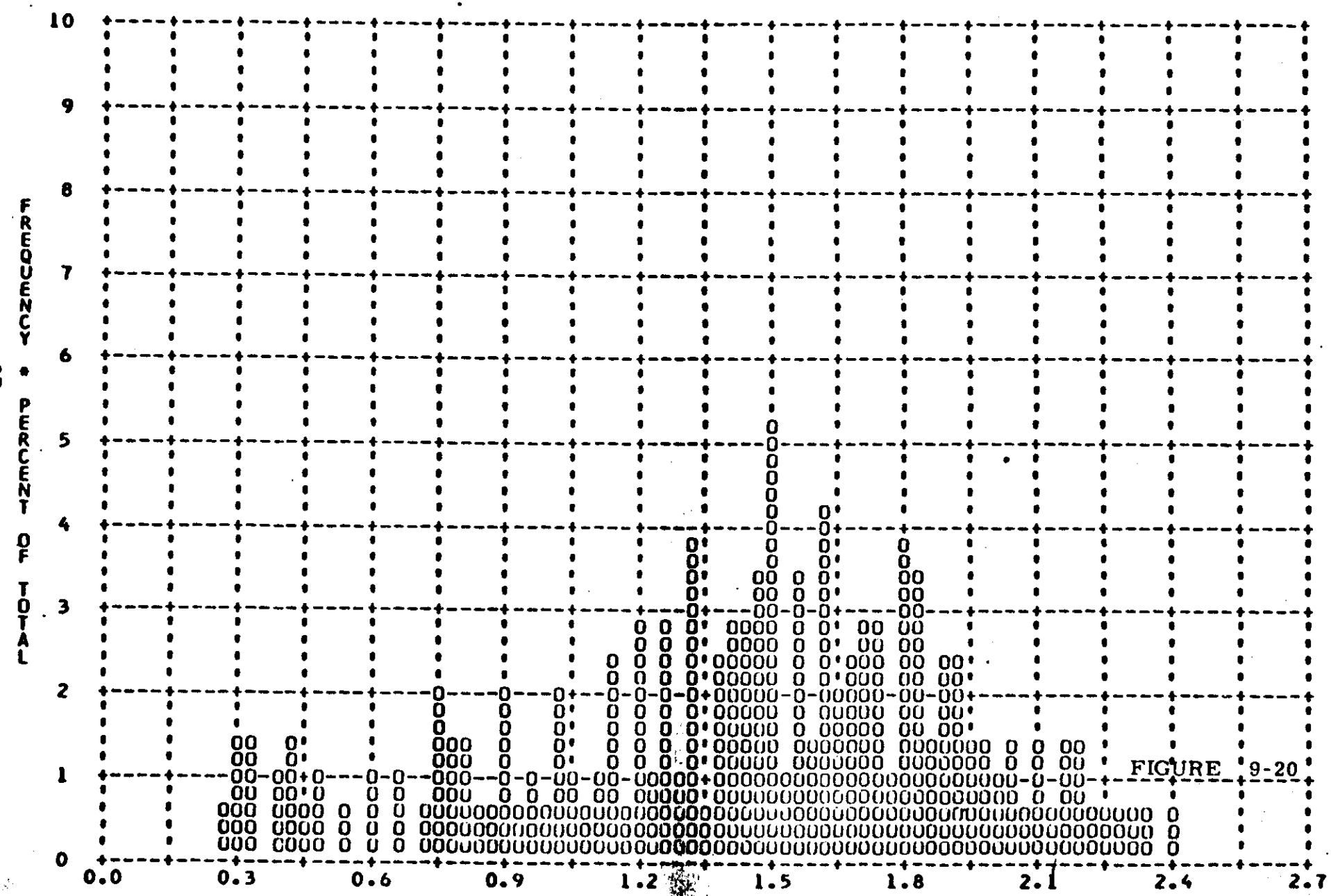


FIGURE 9-20

[redacted] ~~TOP SECRET~~ [redacted]

[redacted] ~~TOP SECRET~~ [redacted] [redacted]

MISSION • 1014-1 • INSTR • AFT • 01/18/65 PLOT OF D MAX • CLOUD • PROCESSING • ALL LEVELS

ARITH MEAN • 1.91 • MEDIAN • 2.00 • STD DEV • 0.41 • RANGE • 0.42 TO 2.43 WITH 195 SAMPLES

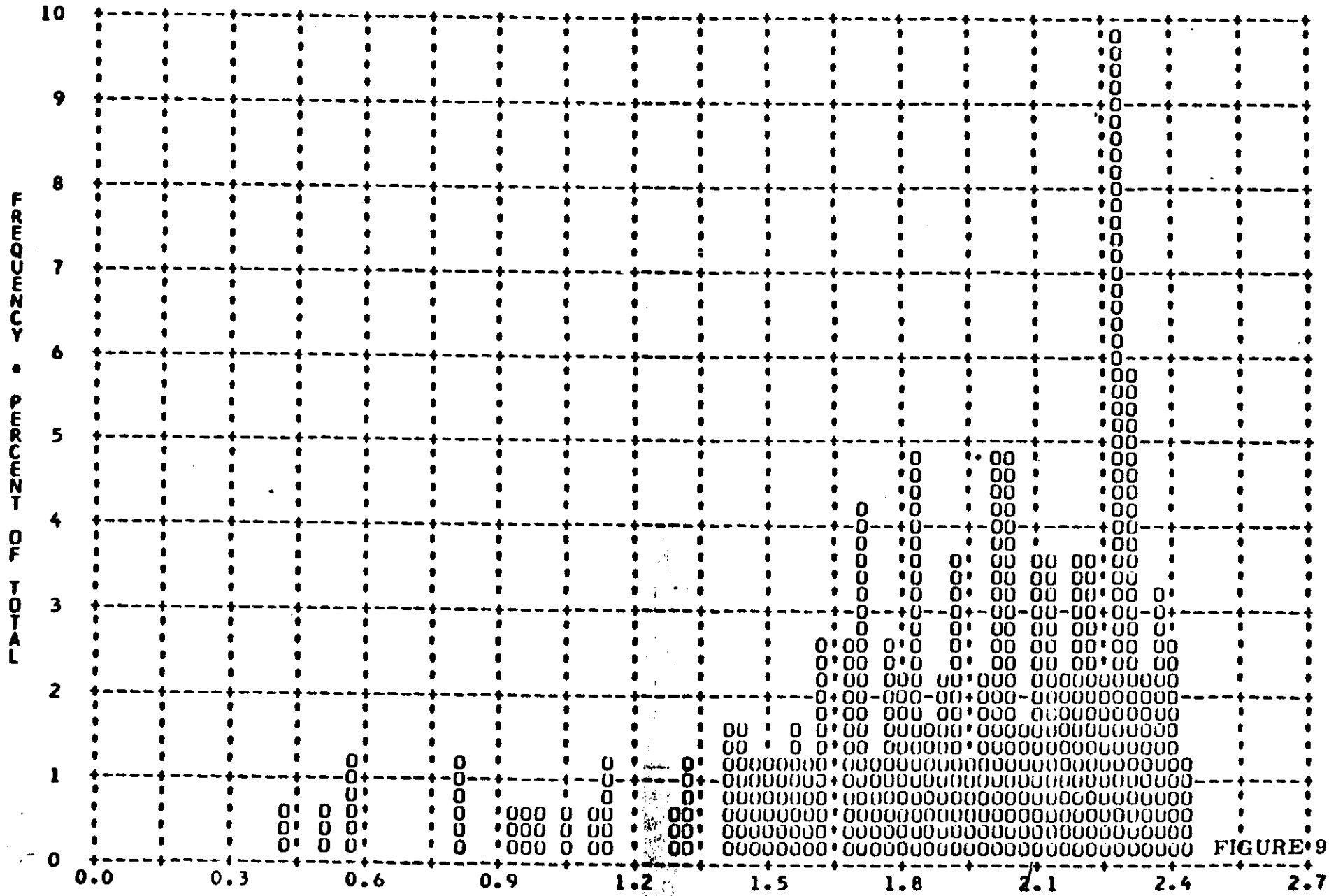


FIGURE 9-2

[redacted] ~~TOP SECRET~~ [redacted]

[redacted] [redacted] [redacted]

MISSION • 1014-2 • INSTRUMENT • FRWD 01/29/65 DENSITY FREQ DISTR

DENSITY VALUE	PRIMARY MIN	PRIMARY MAX	PRIMARY LIM	INTERMEDIATE MIN	INTERMEDIATE MAX	INTERMEDIATE LIM	FULL MIN	FULL MAX	FULL LIM	ALL LEVELS MIN	ALL LEVELS MAX	ALL LEVELS LIM
0.01	0	0	0	0	0	0	0	0	0	0	0	0
0.02	0	0	0	0	0	0	0	0	0	0	0	0
0.03	0	0	0	0	0	0	0	0	0	0	0	0
0.04	0	0	0	0	0	0	0	0	0	0	0	0
0.05	0	0	0	0	0	0	0	0	0	0	0	0
0.06	0	0	0	0	0	0	0	0	0	0	0	0
0.07	0	0	0	0	0	0	0	0	0	0	0	0
0.08	0	0	0	0	0	0	0	0	0	0	0	0
0.09	0	0	0	0	0	0	0	0	0	0	0	0
0.10	0	0	0	0	0	0	0	0	0	0	0	0
0.11	0	0	0	0	0	0	0	0	0	0	0	0
0.12	0	0	0	0	0	0	0	0	0	0	0	0
0.13	0	0	0	0	0	0	0	0	0	0	0	0
0.14	0	0	0	0	0	0	0	0	0	0	0	0
0.15	0	0	0	0	0	0	0	0	0	0	0	0
0.16	0	0	0	0	0	0	0	0	0	0	0	0
0.17	0	0	0	1	0	0	0	0	0	1	0	0
0.18	0	0	0	0	0	0	0	0	0	0	0	0
0.19	0	0	0	1	0	0	2	0	0	3	0	0
0.20	0	0	0	5	0	0	2	0	0	7	0	0
0.21	0	0	0	5	0	0	3	0	0	8	0	0
0.22	0	0	0	5	0	0	2	0	0	7	0	0
0.23	0	0	0	3	0	0	0	1	0	3	1	0
0.24	0	0	0	11	0	0	4	1	0	15	1	0
0.25	0	0	0	4	0	0	1	0	0	5	0	0
0.26	0	0	0	6	0	0	2	0	0	8	0	0
0.27	0	0	0	10	0	0	2	0	0	12	0	0
0.28	0	0	0	8	0	0	7	1	0	15	1	0
0.29	0	0	0	8	0	0	3	0	0	11	0	0
0.30	0	0	0	4	0	0	7	0	0	11	0	0
0.31	0	0	0	3	0	0	4	0	0	7	0	0
0.32	0	0	0	5	0	0	4	1	0	9	1	0
0.33	0	0	0	2	0	0	2	2	0	4	2	0
0.34	0	0	0	2	0	0	3	1	0	5	1	0
0.35	0	0	0	3	0	0	2	1	0	5	1	0
0.36	0	0	0	1	1	0	3	0	0	4	1	0
0.37	0	0	0	3	0	0	3	0	0	6	0	0
0.38	0	0	0	2	2	0	3	1	0	5	3	0
0.39	0	0	0	1	1	0	2	0	0	3	1	0
0.40	0	0	0	3	0	0	1	0	0	4	0	0
0.41	0	0	0	2	1	0	0	1	0	2	2	0
0.42	0	0	0	2	0	0	1	0	1	3	0	1
0.43	0	0	0	1	0	0	2	0	0	3	0	0
0.44	0	0	0	1	0	0	1	0	0	2	0	0
0.45	0	0	0	1	2	0	0	0	0	1	2	0
0.46	0	0	0	2	1	1	4	0	0	6	1	1
0.47	0	0	0	1	0	0	0	0	0	1	0	0
0.48	0	0	0	2	0	0	1	0	0	3	0	0
0.49	0	0	0	3	0	0	2	1	0	5	1	0
0.50	0	0	0	2	0	0	2	0	0	4	0	0
SUBTOTAL	0	0	0	113	8	1	75	11	1	188	19	2

[redacted] [redacted] [redacted]

TABLE 9-3

[redacted] [redacted] [redacted]

MISSION • 1014-2 • INSTRUMENT • FRWD 01/29/65 DENSITY FREQ DISTR

DENSITY VALUE	PRIMARY MIN	PRIMARY MAX	PRIMARY LIM	INTERMEDIATE MIN	INTERMEDIATE MAX	INTERMEDIATE LIM	FULL MIN	FULL MAX	FULL LIM	ALL LEVELS MIN	ALL LEVELS MAX	ALL LEVELS LIM
0.51	0	0	0	1	0	0	0	0	0	1	0	0
0.52	0	0	0	1	0	0	1	0	0	2	0	0
0.53	0	0	0	2	1	0	1	0	0	3	1	0
0.54	0	0	0	2	0	0	1	0	0	3	0	0
0.55	0	0	0	0	1	0	0	2	0	0	3	0
0.56	0	0	0	1	0	1	0	2	0	1	2	1
0.57	0	0	0	0	0	0	0	0	0	0	0	0
0.58	0	0	0	2	0	1	1	0	0	3	0	1
0.59	0	0	0	0	1	0	0	0	0	0	1	0
0.60	0	0	0	2	1	1	0	1	0	2	2	1
0.61	0	0	0	0	0	0	0	0	0	0	0	0
0.62	0	0	0	0	1	0	1	0	1	1	1	1
0.63	0	0	0	0	1	0	0	0	0	0	1	0
0.64	0	0	0	0	0	0	1	0	0	1	0	0
0.65	0	0	0	0	1	0	0	0	0	0	1	0
0.66	0	0	0	0	0	0	1	0	0	1	0	0
0.67	0	0	0	0	0	0	0	0	0	0	0	0
0.68	0	0	0	2	1	0	0	0	0	2	1	0
0.69	0	0	0	0	1	0	0	1	0	0	2	0
0.70	0	0	0	0	1	0	0	1	0	0	2	0
0.71	0	0	0	0	0	0	0	0	1	0	0	1
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	1	2	0	1	2	0
0.75	0	0	0	0	1	0	0	0	0	0	1	0
0.76	0	0	0	0	1	0	0	0	0	0	1	0
0.77	0	0	0	0	0	0	0	0	0	0	0	0
0.78	0	0	0	0	0	1	1	0	1	1	0	2
0.79	0	0	0	0	0	0	0	0	0	0	0	0
0.80	0	0	0	1	1	0	0	0	0	1	1	0
0.81	0	0	0	0	0	0	0	0	0	0	0	0
0.82	0	0	0	0	2	0	0	1	0	0	3	0
0.83	0	0	0	0	0	1	0	0	0	0	0	1
0.84	0	0	0	1	0	0	0	0	0	1	0	0
0.85	0	0	0	0	0	0	0	0	0	0	0	0
0.86	0	0	0	1	0	0	0	1	0	1	1	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	1	0	0	0	0	0	1	0
0.91	0	0	0	0	0	0	0	0	0	0	0	0
0.92	0	0	0	0	1	1	0	1	1	0	2	2
0.93	0	0	0	0	0	0	0	0	0	0	0	0
0.94	0	0	0	1	0	0	0	0	1	1	0	1
0.95	0	0	0	0	1	0	0	0	0	0	1	0
0.96	0	0	0	0	1	0	0	1	1	0	2	1
0.97	0	0	0	1	0	0	0	0	0	1	0	0
0.98	0	0	0	1	2	0	0	1	0	1	3	0
0.99	0	0	0	0	0	0	0	0	0	0	0	0
1.00	0	0	0	0	1	0	0	1	0	0	2	0
SUBTOTAL	0	0	0	19	22	6	9	15	6	28	37	12

[redacted] [redacted] [redacted]

TABLE 9-3

[redacted] [redacted] [redacted]

MISSION • 1014-2 • INSTRUMENT • FRWD 01/29/65 DENSITY FREQ DISTR

DENSITY VALUE	PRIMARY MIN	PRIMARY MAX	PRIMARY LIM	INTERMEDIATE MIN	INTERMEDIATE MAX	INTERMEDIATE LIM	FULL MIN	FULL MAX	FULL LIM	ALL LEVELS MIN	ALL LEVELS MAX	ALL LEVELS LIM
1.01	0	0	0	0	1	0	0	1	0	0	2	0
1.02	0	0	0	0	2	0	0	2	1	0	4	1
1.03	0	0	0	0	0	0	0	1	0	0	1	0
1.04	0	0	0	0	2	0	0	0	0	0	2	0
1.05	0	0	0	0	0	0	0	0	0	0	0	0
1.06	0	0	0	1	1	0	0	0	1	1	1	1
1.07	0	0	0	0	0	0	0	0	0	0	0	0
1.08	0	0	0	0	0	0	0	0	1	0	0	1
1.09	0	0	0	0	0	0	0	0	0	0	0	0
1.10	0	0	0	0	1	1	0	1	0	0	2	1
1.11	0	0	0	0	0	0	0	0	0	0	0	0
1.12	0	0	0	0	2	0	0	2	0	0	4	0
1.13	0	0	0	0	0	0	0	0	0	0	0	0
1.14	0	0	0	0	1	0	0	0	1	0	1	1
1.15	0	0	0	0	0	1	0	2	1	0	2	2
1.16	0	0	0	0	0	0	0	1	0	0	1	0
1.17	0	0	0	0	2	0	0	0	0	0	2	0
1.18	0	0	0	0	1	0	0	1	0	0	2	0
1.19	0	0	0	0	0	0	0	1	0	0	1	0
1.20	0	0	0	0	1	0	0	0	0	0	1	0
1.21	0	0	0	0	1	0	0	0	0	0	1	0
1.22	0	0	0	0	1	2	0	1	0	0	2	2
1.23	0	0	0	0	2	0	0	1	0	0	3	0
1.24	0	0	0	0	1	0	0	0	0	0	1	0
1.25	0	0	0	0	1	0	0	0	1	0	1	1
1.26	0	0	0	0	0	1	0	0	0	0	0	1
1.27	0	0	0	0	1	0	0	0	0	0	1	0
1.28	0	0	0	0	1	1	0	0	0	0	1	1
1.29	0	0	0	0	1	0	0	0	0	0	1	0
1.30	0	0	0	0	2	0	0	1	0	0	3	0
1.31	0	0	0	0	0	0	0	0	0	0	0	0
1.32	0	0	0	0	4	0	0	1	0	0	5	0
1.33	0	0	0	0	1	0	0	0	0	0	1	0
1.34	0	0	0	0	3	1	0	0	0	0	3	1
1.35	0	0	0	0	0	0	0	0	1	0	0	1
1.36	0	0	0	0	3	1	0	2	0	0	5	1
1.37	0	0	0	0	1	0	0	1	0	0	2	0
1.38	0	0	0	0	3	1	0	0	1	0	3	2
1.39	0	0	0	0	1	1	0	0	1	0	1	2
1.40	0	0	0	0	1	1	0	0	1	0	1	2
1.41	0	0	0	0	1	1	0	0	0	0	1	1
1.42	0	0	0	0	2	1	0	2	1	0	4	2
1.43	0	0	0	0	3	0	0	1	0	0	4	0
1.44	0	0	0	0	1	0	0	1	0	0	2	0
1.45	0	0	0	0	0	1	0	1	1	0	1	2
1.46	0	0	0	0	0	0	0	0	3	0	0	3
1.47	0	0	0	0	0	0	0	0	0	0	0	0
1.48	0	0	0	0	1	2	0	2	1	0	3	3
1.49	0	0	0	0	1	0	0	1	0	0	2	0
1.50	0	0	0	0	2	1	0	1	0	0	3	1
SUBTOTAL	0	0	0	1	53	17	0	28	16	1	81	33

[redacted] [redacted] [redacted]

TABLE 9-3

[redacted] [redacted] [redacted]

MISSION • 1014-2 • INSTRUMENT • FRWD 01/29/65 DENSITY FREQ DISTR

DENSITY VALUE	PRIMARY MIN	PRIMARY MAX	PRIMARY LIM	INTERMEDIATE MIN	INTERMEDIATE MAX	INTERMEDIATE LIM	FULL MIN	FULL MAX	FULL LIM	ALL LEVELS MIN	ALL LEVELS MAX	ALL LEVELS LIM
1.51	0	0	0	0	0	1	0	0	0	0	0	1
1.52	0	0	0	0	2	0	0	1	0	0	3	0
1.53	0	0	0	0	0	0	0	0	0	0	0	0
1.54	0	0	0	0	2	0	0	1	1	0	3	1
1.55	0	0	0	0	0	0	0	1	1	0	1	1
1.56	0	0	0	0	1	1	0	1	0	0	2	1
1.57	0	0	0	0	2	0	0	1	0	0	3	0
1.58	0	0	0	0	0	0	0	2	2	0	2	2
1.59	0	0	0	0	1	0	0	0	0	0	1	0
1.60	0	0	0	0	0	3	0	2	1	0	2	4
1.61	0	0	0	0	0	0	0	1	0	0	1	0
1.62	0	0	0	0	2	1	0	0	1	0	2	2
1.63	0	0	0	0	1	0	0	0	0	0	1	0
1.64	0	0	0	0	0	0	0	0	0	0	0	0
1.65	0	0	0	0	1	0	0	0	2	0	1	2
1.66	0	0	0	0	0	1	0	2	2	0	2	3
1.67	0	0	0	0	1	0	0	0	0	0	1	0
1.68	0	0	0	0	3	1	0	1	0	0	4	1
1.69	0	0	0	0	2	1	0	2	0	0	4	1
1.70	0	0	0	0	1	3	0	2	0	0	3	3
1.71	0	0	0	0	1	0	0	1	0	0	2	0
1.72	0	0	0	0	2	1	0	0	0	0	2	1
1.73	0	0	0	0	0	1	0	2	0	0	2	1
1.74	0	0	0	0	1	1	0	0	3	0	1	4
1.75	0	0	0	0	1	1	0	1	0	0	2	1
1.76	0	0	0	0	1	1	0	0	0	0	1	1
1.77	0	0	0	0	1	1	0	0	0	0	1	1
1.78	0	0	0	0	1	5	0	0	0	0	1	5
1.79	0	0	0	0	0	2	0	0	0	0	0	2
1.80	0	0	0	0	0	8	0	0	2	0	0	10
1.81	0	0	0	0	0	0	0	0	1	0	0	1
1.82	0	0	0	0	2	5	0	2	3	0	4	8
1.83	0	0	0	0	2	1	0	0	0	0	2	1
1.84	0	0	0	0	0	1	0	0	2	0	0	3
1.85	0	0	0	0	0	2	0	0	2	0	0	4
1.86	0	0	0	0	1	0	0	1	2	0	2	2
1.87	0	0	0	0	2	0	0	0	0	0	2	0
1.88	0	0	0	0	0	2	0	1	1	0	1	3
1.89	0	0	0	0	1	0	0	0	1	0	1	1
1.90	0	0	0	0	1	1	0	0	2	0	1	3
1.91	0	0	0	0	0	0	0	0	0	0	0	0
1.92	0	0	0	0	1	1	0	0	0	0	1	1
1.93	0	0	0	0	0	0	0	0	0	0	0	0
1.94	0	0	0	0	2	1	0	1	1	0	3	2
1.95	0	0	0	0	0	1	0	0	1	0	0	2
1.96	0	0	0	0	0	3	0	0	0	0	0	3
1.97	0	0	0	0	0	0	0	0	0	0	0	0
1.98	0	0	0	0	0	2	0	0	2	0	0	4
1.99	0	0	0	0	0	2	0	1	0	0	1	2
2.00	0	0	0	0	1	2	0	1	1	0	2	3
SUBTOTAL	0	0	0	0	40	57	0	28	34	0	68	91

[redacted] [redacted] [redacted]

TABLE 9-3

[redacted] [redacted] [redacted]

MISSION • 1014-2 • INSTRUMENT • FRWD 01/29/65 DENSITY FREQ DISTR

DENSITY VALUE	PRIMARY MIN	PRIMARY MAX	PRIMARY LIM	INTERMEDIATE MIN	INTERMEDIATE MAX	INTERMEDIATE LIM	FULL MIN	FULL MAX	FULL LIM	ALL LEVELS MIN	ALL LEVELS MAX	ALL LEVELS LIM
2.01	0	0	0	0	1	0	0	0	1	0	1	1
2.02	0	0	0	0	0	4	0	0	1	0	0	5
2.03	0	0	0	0	0	1	0	0	1	0	0	2
2.04	0	0	0	0	0	0	0	0	0	0	0	0
2.05	0	0	0	0	0	0	0	0	0	0	0	0
2.06	0	0	0	0	2	1	0	0	1	0	2	2
2.07	0	0	0	0	0	0	0	0	0	0	0	0
2.08	0	0	0	0	0	1	0	0	1	0	0	2
2.09	0	0	0	0	1	0	0	0	2	0	1	2
2.10	0	0	0	0	1	4	0	0	1	0	1	5
2.11	0	0	0	0	1	3	0	0	0	0	1	3
2.12	0	0	0	0	0	1	0	0	1	0	0	2
2.13	0	0	0	0	0	0	0	0	0	0	0	0
2.14	0	0	0	0	0	0	0	0	2	0	0	2
2.15	0	0	0	0	0	1	0	0	2	0	0	3
2.16	0	0	0	0	0	2	0	0	0	0	0	2
2.17	0	0	0	0	2	0	0	0	2	0	2	2
2.18	0	0	0	0	0	0	0	0	2	0	0	2
2.19	0	0	0	0	0	0	0	0	1	0	0	1
2.20	0	0	0	0	0	0	0	0	0	0	0	0
2.21	0	0	0	0	0	1	0	0	0	0	0	1
2.22	0	0	0	0	1	0	0	0	0	0	1	0
2.23	0	0	0	0	0	2	0	0	0	0	0	2
2.24	0	0	0	0	0	0	0	0	0	0	0	0
2.25	0	0	0	0	0	2	0	0	0	0	0	2
2.26	0	0	0	0	0	1	0	0	1	0	0	2
2.27	0	0	0	0	0	1	0	0	0	0	0	1
2.28	0	0	0	0	0	1	0	0	0	0	0	1
2.29	0	0	0	0	0	0	0	0	0	0	0	0
2.30	0	0	0	0	1	0	0	1	0	0	2	0
2.31	0	0	0	0	0	0	0	0	0	0	0	0
2.32	0	0	0	0	0	1	0	1	0	0	1	1
2.33	0	0	0	0	0	1	0	0	0	0	0	1
2.34	0	0	0	0	0	0	0	0	0	0	0	0
2.35	0	0	0	0	0	0	0	0	0	0	0	0
2.36	0	0	0	0	0	0	0	0	1	0	0	1
2.37	0	0	0	0	0	0	0	0	0	0	0	0
2.38	0	0	0	0	0	0	0	0	0	0	0	0
2.39	0	0	0	0	0	0	0	0	0	0	0	0
2.40	0	0	0	0	0	0	0	0	0	0	0	0
2.41	0	0	0	0	0	0	0	0	0	0	0	0
2.42	0	0	0	0	0	0	0	0	0	0	0	0
2.43	0	0	0	0	0	0	0	0	0	0	0	0
2.44	0	0	0	0	0	0	0	0	0	0	0	0
2.45	0	0	0	0	0	0	0	0	0	0	0	0
2.46	0	0	0	0	0	0	0	0	0	0	0	0
2.47	0	0	0	0	0	0	0	0	0	0	0	0
2.48	0	0	0	0	0	0	0	0	0	0	0	0
2.49	0	0	0	0	0	0	0	0	0	0	0	0
2.50	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	0	0	0	0	10	28	0	2	20	0	12	48

[redacted] [redacted] [redacted]

TABLE 9-3

[redacted] [redacted] [redacted]

MISSION • 1014-2 • INSTRUMENT • FRWD 01/29/65 DENSITY FREQ DISTR

DENSITY VALUE	PRIMARY MIN	PRIMARY MAX	PRIMARY LIM	INTERMEDIATE MIN	INTERMEDIATE MAX	INTERMEDIATE LIM	FULL MIN	FULL MAX	FULL LIM	ALL LEVELS MIN	ALL LEVELS MAX	ALL LEVELS LIM
2.51	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	133	133	109	84	84	77	217	217	186

MISSION 1014-2 INSTR - FRWD 01/29/65 PROCESSING AND EXPOSURE ANALYSI.

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	133	5 PC	65 PC	27 PC	3 PC	0 PC
FULL	84	73 PC	0 PC	27 PC	0 PC	0 PC
ALL LEVELS	217	31 PC	40 PC	27 PC	2 PC	0 PC

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

[redacted] [redacted] [redacted]

TABLE 9-3

[redacted] ~~TOP SECRET~~ [redacted] [redacted]

MISSION • 1014-2 • INSTR • FRWD • 01/29/65 PLOT OF D MIN • TERRAIN • PROCESSING • INTERMEDIATE

ARITH MEAN • 0.36 • MEDIAN • 0.29 • STD DEV • 0.17 • RANGE • 0.17 TO 1.06 WITH 133 SAMPLES

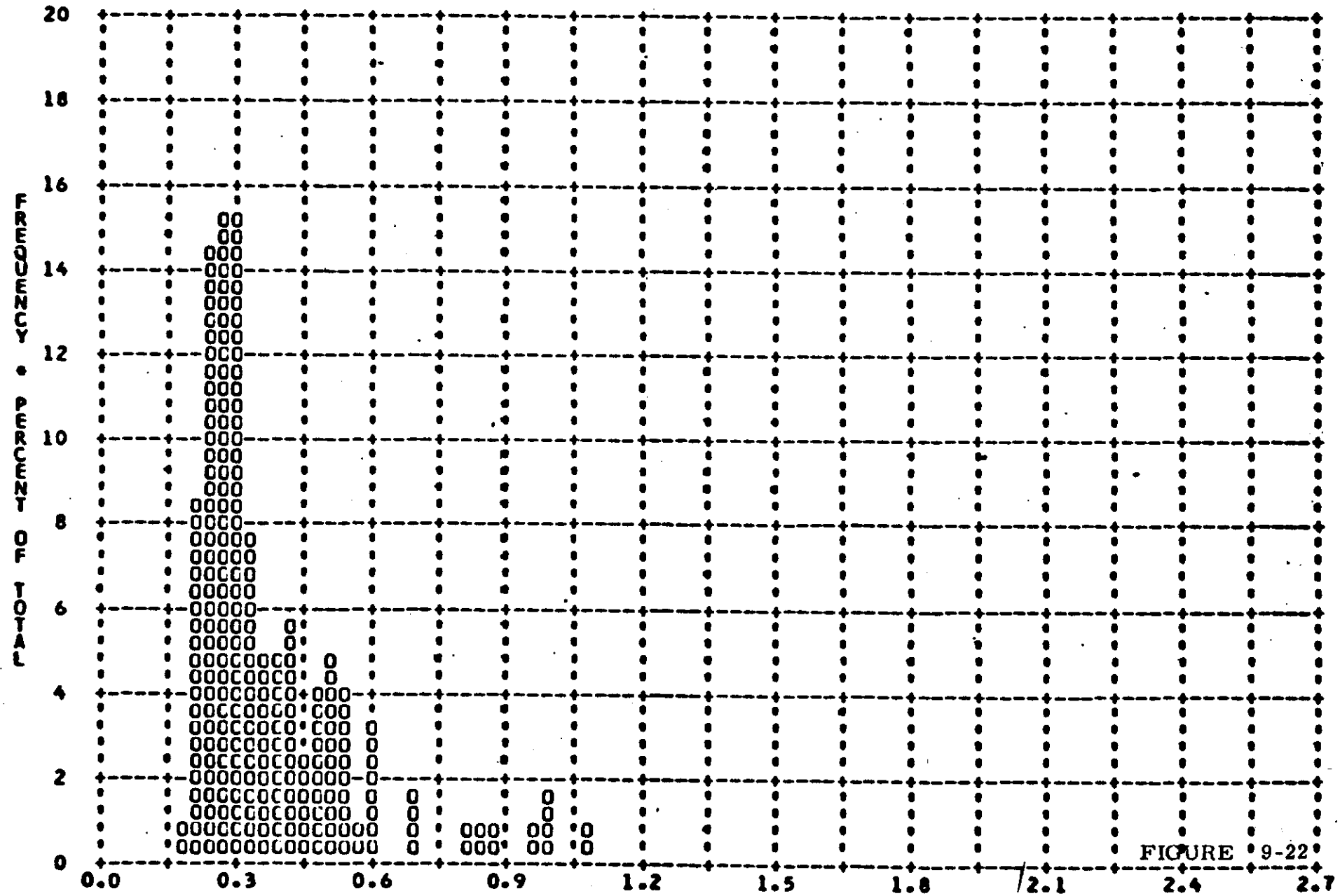


FIGURE 9-22

[redacted] ~~TOP SECRET~~ [redacted]

[redacted] ~~TOP SECRET~~ [redacted] [redacted]

MISSION • 1014-2 • INSTR • FRWD • 01/29/65 PLOT OF D MAX • TERRAIN • PROCESSING • INTERMEDIATE

ARITH MEAN • 1.34 • MEDIAN • 1.37 • STD DEV • 0.47 • RANGE • 0.36 TO 2.30 WITH 133 SAMPLES

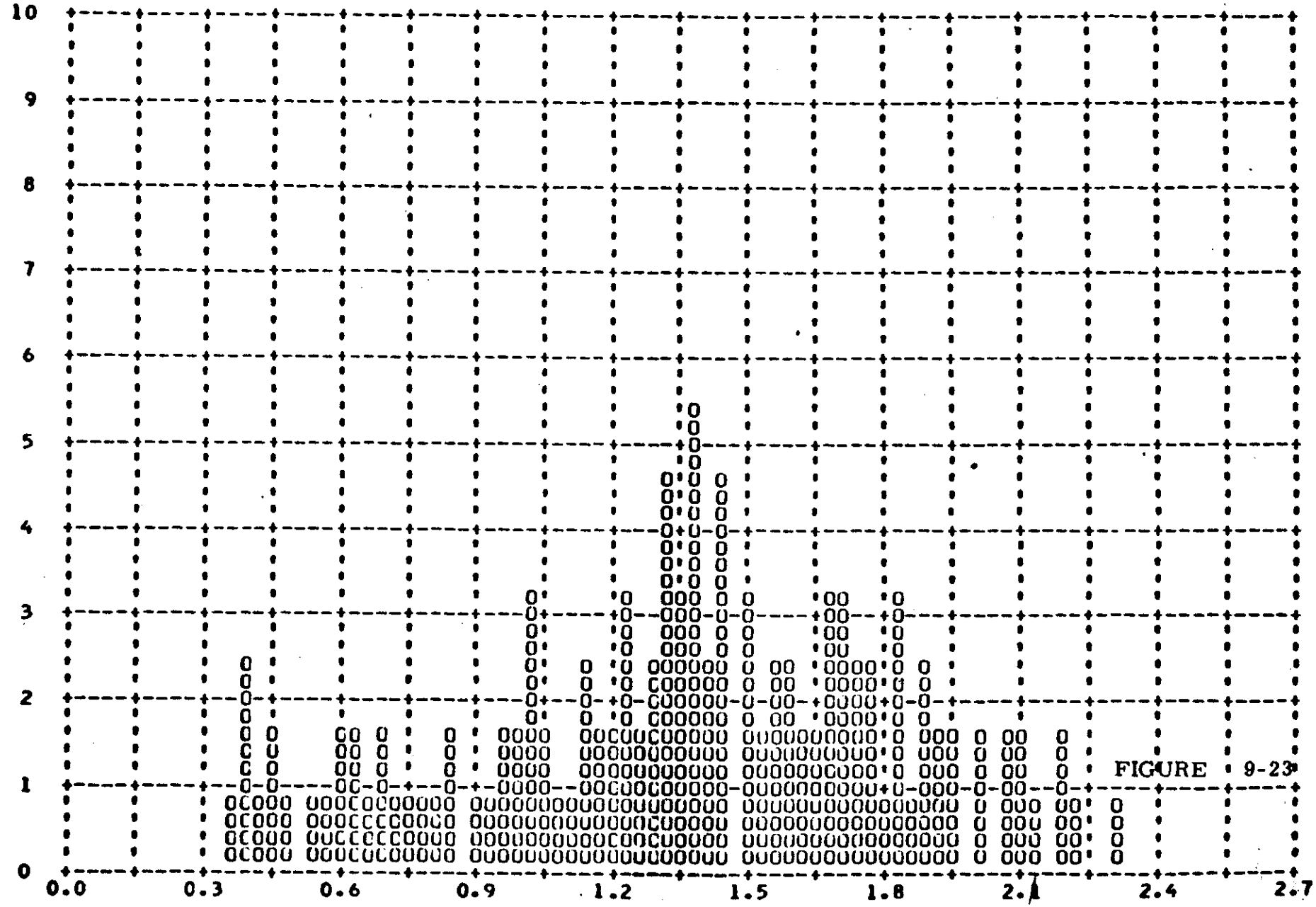


FIGURE 9-23

[redacted] ~~TOP SECRET~~ [redacted]

[redacted] ~~TOP SECRET~~ [redacted] [redacted]

MISSION • 1014-2 • INSTR • FRWD • 01/29/65 PLOT OF D MAX • CLOUD • PROCESSING • INTERMEDIATE

ARITH MEAN • 1.75 • MEDIAN • 1.80 • STD DEV • 0.40 • RANGE • 0.46 TO 2.33 WITH 109 SAMPLES

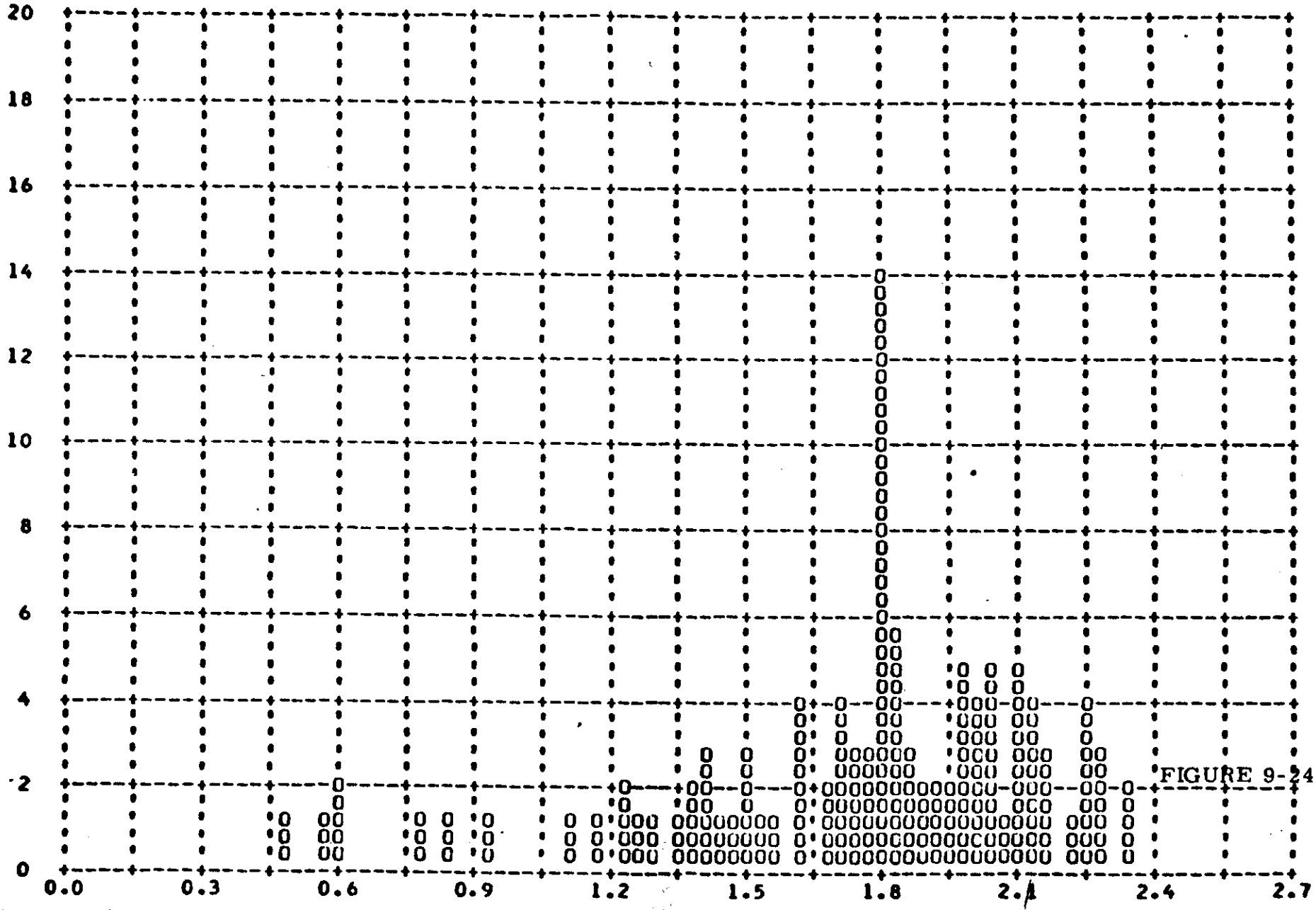


FIGURE 9-24

[redacted] ~~TOP SECRET~~ [redacted]

[redacted] ~~TOP SECRET~~ [redacted] [redacted]

MISSION • 1014-2 • INSTR • FRWD • 01/29/65 PLOT OF D MIN • TERRAIN • PROCESSING • FULL

ARITH MEAN • 0.36 • MEDIAN • 0.32 • STD DEV • 0.12 • RANGE • 0.19 TO 0.78 WITH 84 SAMPLES

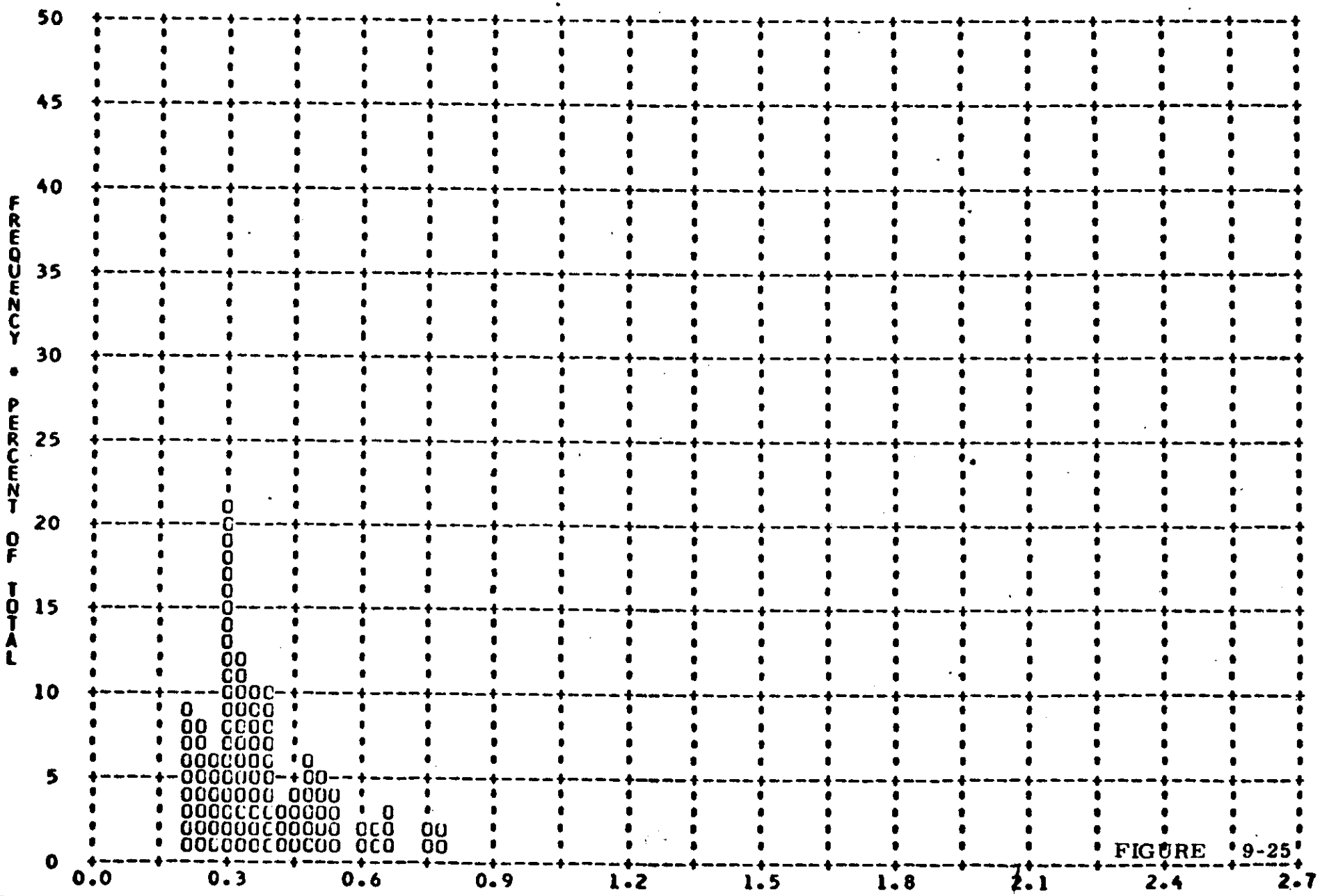


FIGURE 9-25

[redacted] ~~TOP SECRET~~ [redacted]

[redacted] ~~TOP SECRET~~ [redacted] [redacted]

MISSION • 1014-2 • INSTR • FRWD • 01/29/65 PLOT OF D MAX • TERRAIN • PROCESSING • FULL

ARITH MEAN • 1.22 • MEDIAN • 1.36 • STD DEV • 0.52 • RANGE • 0.23 TO 2.32 WITH 84 SAMPLES

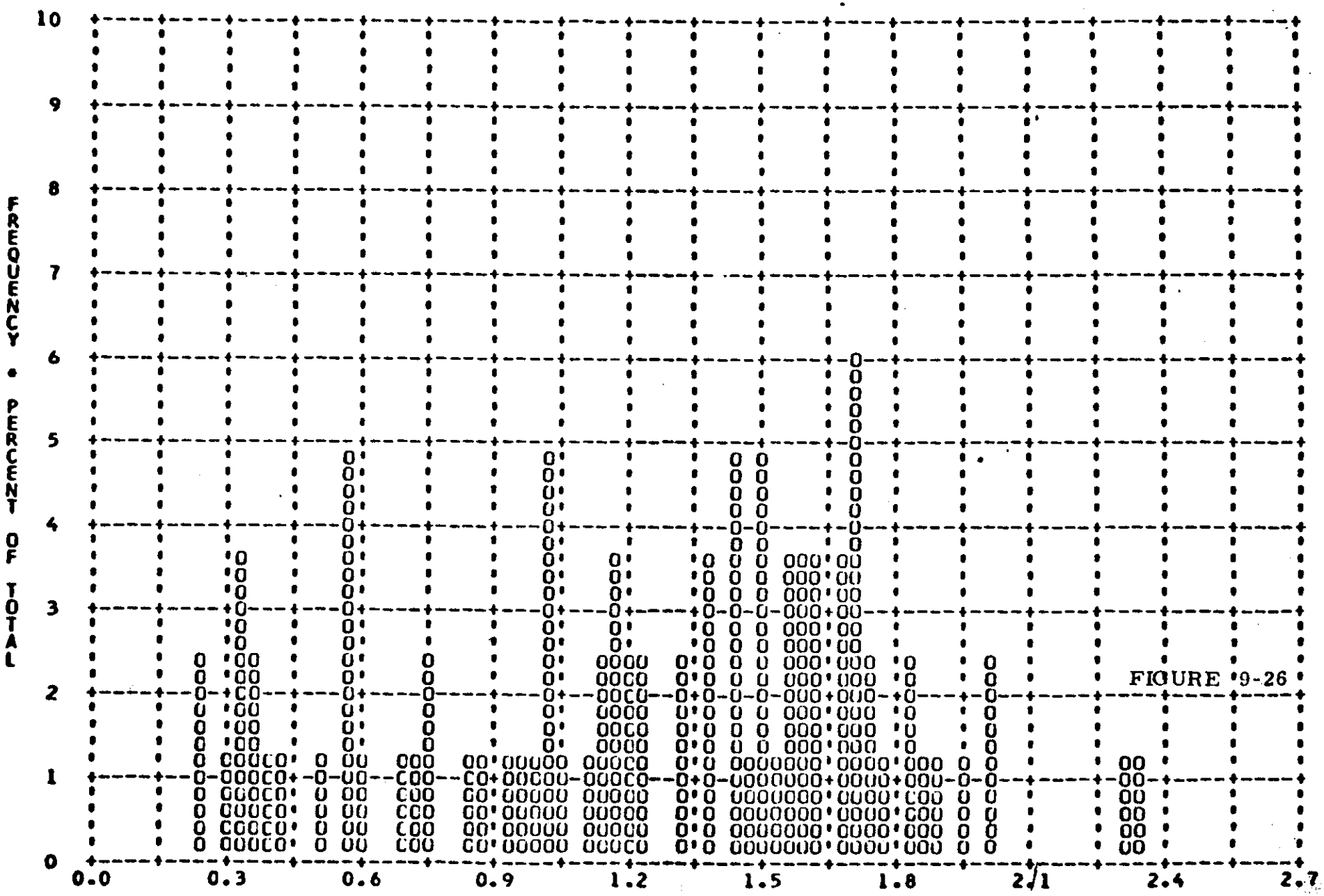


FIGURE 9-26

[redacted] ~~TOP SECRET~~ [redacted]

[redacted] ~~TOP SECRET~~ [redacted]

MISSION • 1014-2 • INSTR • FRWD • 01/29/65 PLOT OF D MAX • CLOUD • PROCESSING • FULL

ARITH MEAN • 1.68 • MEDIAN • 1.81 • STD DEV • 0.43 • RANGE • 0.42 TO 2.36 WITH 77 SAMPLES

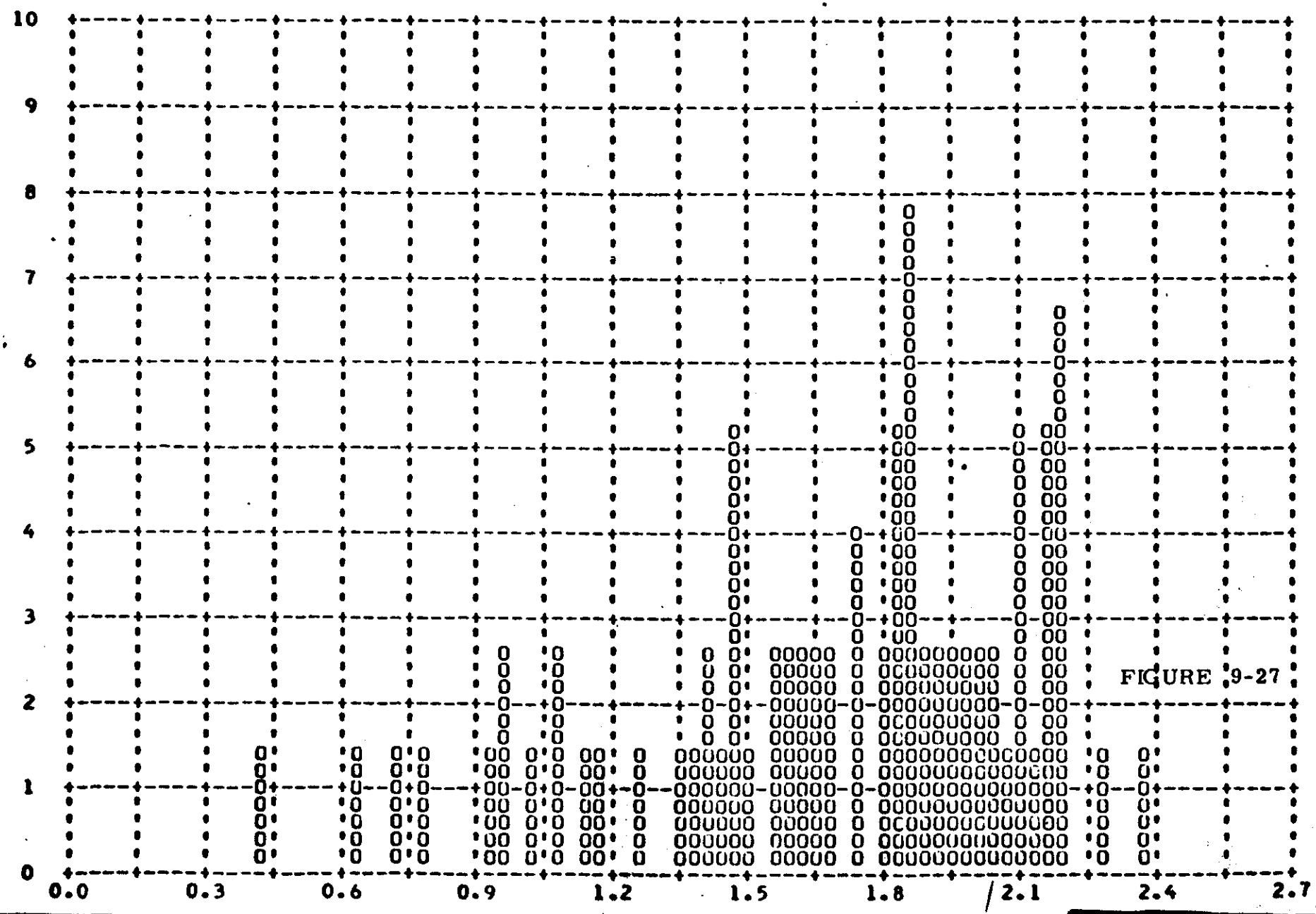


FIGURE 9-27

[redacted] ~~TOP SECRET~~ [redacted]

Notice of Missing Page(s)

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MISSION • 1014-2 • INSTR • FRWD • 01/29/65 PLOT OF D MAX • TERRAIN • PROCESSING • ALL LEVELS

ARITH MEAN • 1.30 • MEDIAN • 1.36 • STD DEV • 0.49 • RANGE • 0.23 TO 2.32 WITH 217 SAMPLES

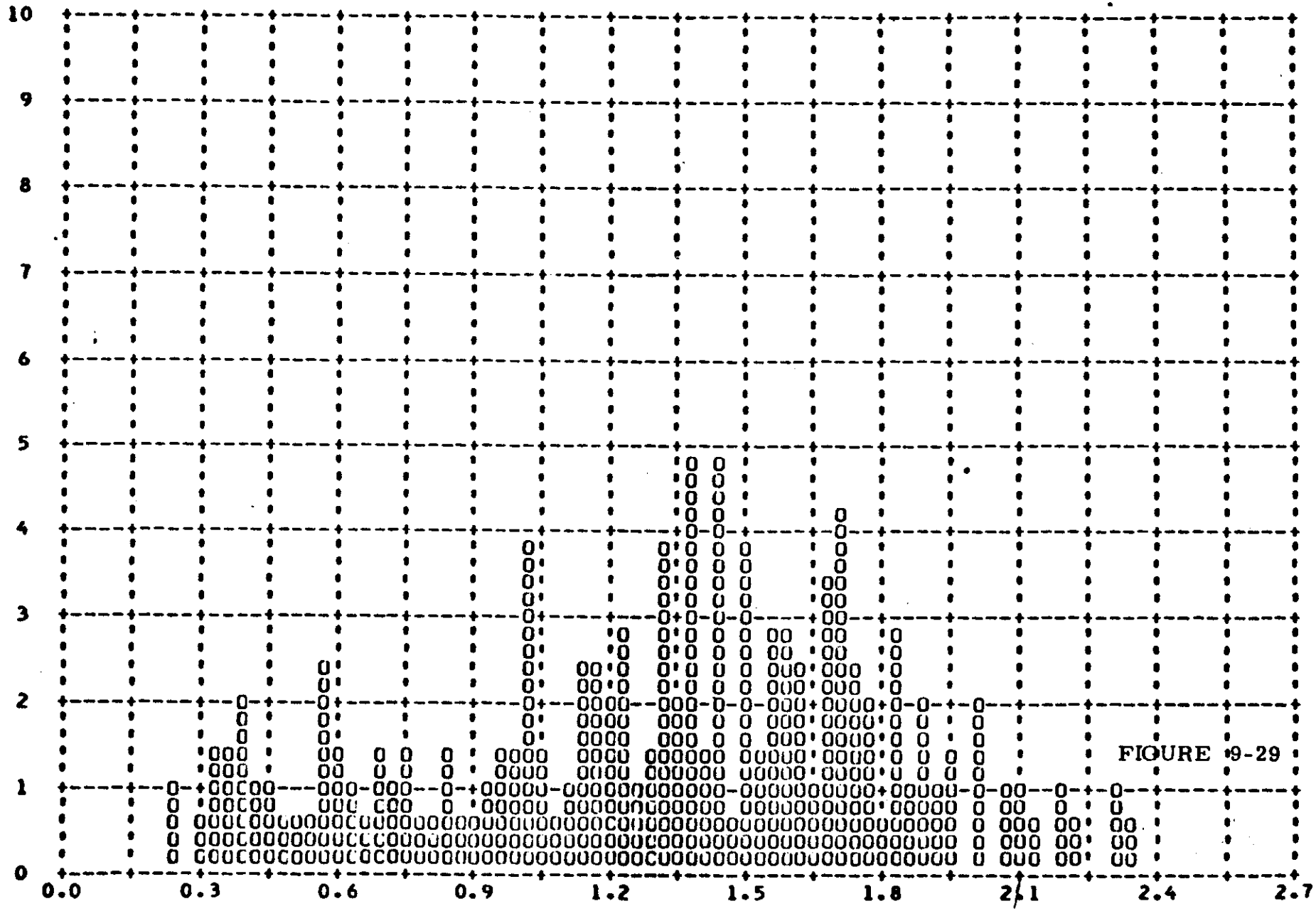

FIGURE 9-29

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MISSION • 1014-2 • INSTR • FRWD • 01/29/65 PLOT OF D MAX • CLOUD • PROCESSING • ALL LEVELS

ARITH MEAN • 1.72 • MEDIAN • 1.80 • STD DEV • 0.41 • RANGE • 0.42 TO 2.36 WITH 186 SAMPLES

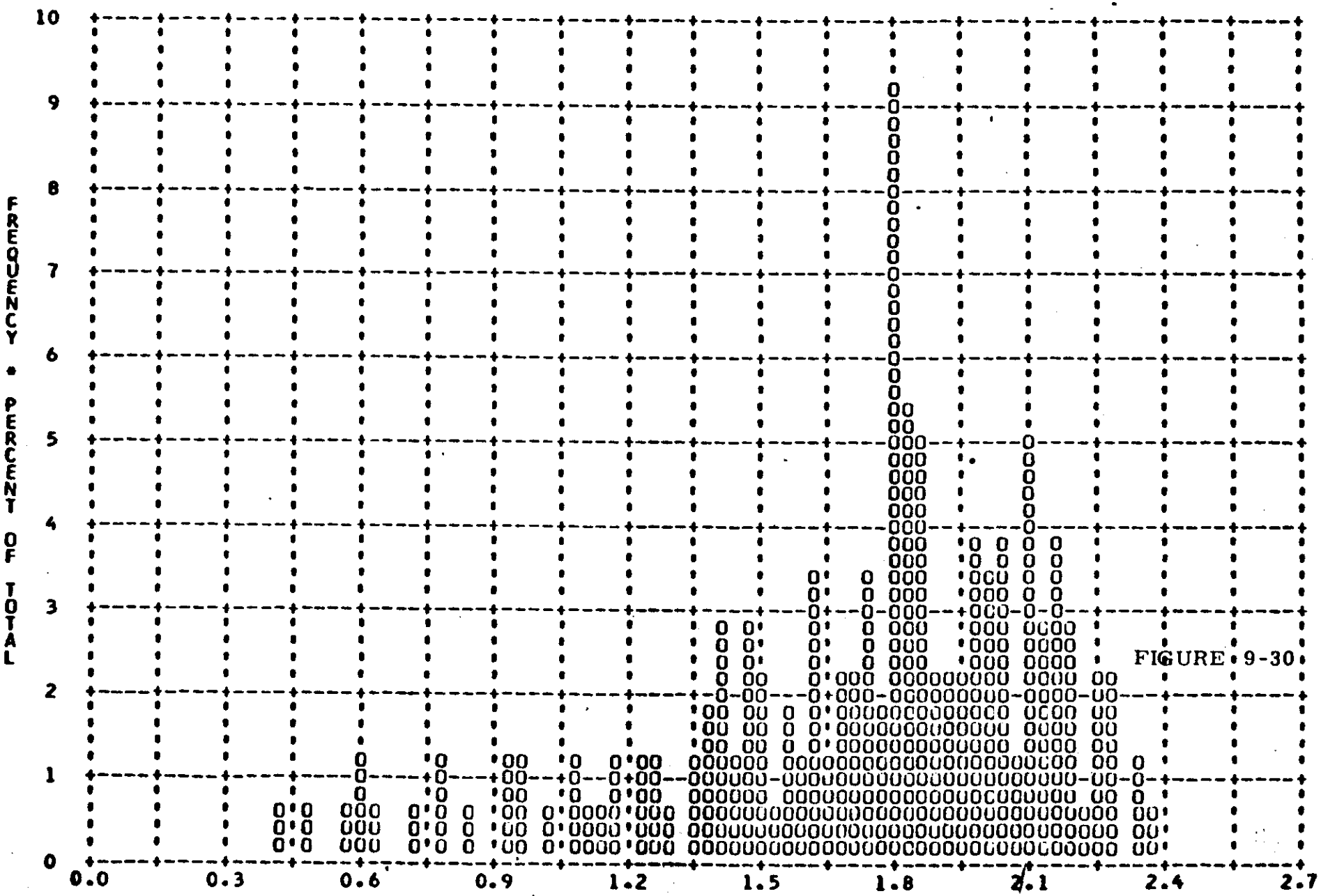

FIGURE 9-30

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[redacted] [redacted] [redacted]

MISSION • 1014-2 • INSTRUMENT • AFT 01/29/65 DENSITY FREQ DISTR

DENSITY VALUE	PRIMARY MIN	PRIMARY MAX	PRIMARY LIM	INTERMEDIATE MIN	INTERMEDIATE MAX	INTERMEDIATE LIM	FULL MIN	FULL MAX	FULL LIM	ALL LEVELS MIN	ALL LEVELS MAX	ALL LEVELS LIM
0.01	0	0	0	0	0	0	0	0	0	0	0	0
0.02	0	0	0	0	0	0	0	0	0	0	0	0
0.03	0	0	0	0	0	0	0	0	0	0	0	0
0.04	0	0	0	0	0	0	0	0	0	0	0	0
0.05	0	0	0	0	0	0	0	0	0	0	0	0
0.06	0	0	0	0	0	0	0	0	0	0	0	0
0.07	0	0	0	0	0	0	0	0	0	0	0	0
0.08	0	0	0	0	0	0	0	0	0	0	0	0
0.09	0	0	0	0	0	0	0	0	0	0	0	0
0.10	0	0	0	0	0	0	0	0	0	0	0	0
0.11	0	0	0	0	0	0	0	0	0	0	0	0
0.12	0	0	0	0	0	0	0	0	0	0	0	0
0.13	0	0	0	0	0	0	0	0	0	0	0	0
0.14	0	0	0	0	0	0	0	0	0	0	0	0
0.15	0	0	0	0	0	0	0	0	0	0	0	0
0.16	0	0	0	0	0	0	0	0	0	0	0	0
0.17	0	0	0	0	0	0	0	0	0	0	0	0
0.18	0	0	0	1	0	0	0	0	0	1	0	0
0.19	0	0	0	1	0	0	1	0	0	2	0	0
0.20	0	0	0	2	0	0	2	0	0	4	0	0
0.21	0	0	0	4	0	0	1	0	0	5	0	0
0.22	0	0	0	3	0	0	0	0	0	3	0	0
0.23	0	0	0	1	0	0	1	0	0	2	0	0
0.24	0	0	0	3	0	0	3	0	0	6	0	0
0.25	0	0	0	2	0	0	1	0	0	3	0	0
0.26	0	0	0	6	0	0	4	0	1	10	0	1
0.27	0	0	0	2	0	0	6	1	0	8	1	0
0.28	0	0	0	1	0	0	2	0	0	3	0	0
0.29	0	0	0	1	0	0	1	0	0	2	0	0
0.30	0	0	0	4	0	0	1	0	0	5	0	0
0.31	0	0	0	3	0	0	0	0	0	3	0	0
0.32	0	0	0	5	0	0	1	0	0	6	0	0
0.33	0	0	0	4	1	0	1	1	0	5	2	0
0.34	0	0	0	1	1	0	0	0	1	1	1	1
0.35	0	0	0	4	0	0	0	1	0	4	1	0
0.36	0	0	0	4	3	0	2	1	0	6	4	0
0.37	0	0	0	3	1	0	1	1	0	4	2	0
0.38	0	0	0	2	0	0	6	0	0	8	0	0
0.39	0	0	0	7	0	0	2	1	0	9	1	0
0.40	0	0	0	6	1	0	2	0	0	8	1	0
0.41	0	0	0	1	1	0	1	0	0	2	1	0
0.42	0	0	0	8	0	0	2	1	0	10	1	0
0.43	0	0	0	1	0	0	1	0	0	2	0	0
0.44	0	0	0	0	0	0	3	0	0	3	0	0
0.45	0	0	0	5	0	0	3	0	0	8	0	0
0.46	0	0	0	4	1	1	0	0	0	4	1	1
0.47	0	0	0	1	0	0	0	0	0	1	0	0
0.48	0	0	0	1	0	0	0	1	0	1	1	0
0.49	0	0	0	0	1	0	2	0	0	2	1	0
0.50	0	0	0	3	0	0	2	0	0	5	0	0
SUBTOTAL	0	0	0	94	10	1	52	8	2	146	18	3

[redacted] [redacted] [redacted]

TABLE 9-4

[redacted] [redacted] [redacted]

MISSION • 1014-2 • INSTRUMENT • AFT 01/29/65 DENSITY FREQ DISTR

DENSITY VALUE	PRIMARY MIN	PRIMARY MAX	PRIMARY LIM	INTERMEDIATE MIN	INTERMEDIATE MAX	INTERMEDIATE LIM	FULL MIN	FULL MAX	FULL LIM	ALL LEVELS MIN	ALL LEVELS MAX	ALL LEVELS LIM
0.51	0	0	0	1	0	0	0	0	0	1	0	0
0.52	0	0	0	2	0	2	1	0	0	3	0	2
0.53	0	0	0	1	0	0	0	0	0	1	0	0
0.54	0	0	0	3	1	0	0	0	0	3	1	0
0.55	0	0	0	2	0	0	0	0	0	2	0	0
0.56	0	0	0	3	1	1	0	0	1	3	1	2
0.57	0	0	0	1	2	0	0	0	0	1	2	0
0.58	0	0	0	3	3	0	1	0	0	4	3	0
0.59	0	0	0	3	1	0	0	1	0	3	2	0
0.60	0	0	0	2	0	0	2	2	0	4	2	0
0.61	0	0	0	2	0	0	0	0	0	2	0	0
0.62	0	0	0	5	2	0	1	0	0	6	2	0
0.63	0	0	0	0	0	0	0	0	0	0	0	0
0.64	0	0	0	1	0	1	0	0	1	1	0	2
0.65	0	0	0	2	0	0	0	0	0	2	0	0
0.66	0	0	0	2	0	0	1	0	0	3	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	1	0	0	1	0	0
0.70	0	0	0	2	1	1	2	1	0	4	2	1
0.71	0	0	0	2	1	0	0	0	0	2	1	0
0.72	0	0	0	0	0	1	1	1	0	1	1	1
0.73	0	0	0	0	0	0	0	1	0	0	1	0
0.74	0	0	0	2	3	0	0	0	0	2	3	0
0.75	0	0	0	0	0	0	0	0	1	0	0	1
0.76	0	0	0	2	1	0	0	0	0	2	1	0
0.77	0	0	0	1	0	0	0	0	0	1	0	0
0.78	0	0	0	2	0	0	0	1	0	2	1	0
0.79	0	0	0	0	0	0	0	0	0	0	0	0
0.80	0	0	0	0	0	0	1	1	0	1	1	0
0.81	0	0	0	0	0	0	0	0	0	0	0	0
0.82	0	0	0	1	0	0	0	0	0	1	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	1	1	0	1	1	0	2	2
0.87	0	0	0	0	0	0	0	0	0	0	0	0
0.88	0	0	0	0	0	0	1	0	0	1	0	0
0.89	0	0	0	0	0	0	0	0	0	0	0	0
0.90	0	0	0	0	1	1	0	0	0	0	1	1
0.91	0	0	0	0	0	0	0	1	1	0	1	1
0.92	0	0	0	0	0	2	0	0	1	0	0	3
0.93	0	0	0	0	0	0	0	0	0	0	0	0
0.94	0	0	0	0	1	0	0	1	0	0	2	0
0.95	0	0	0	0	0	0	0	0	0	0	0	0
0.96	0	0	0	0	1	0	0	0	0	0	1	0
0.97	0	0	0	0	0	0	0	0	0	0	0	0
0.98	0	0	0	0	0	1	0	0	0	0	0	1
0.99	0	0	0	1	0	1	0	0	0	1	0	1
1.00	0	0	0	1	0	0	0	0	0	1	0	0
SUBTOTAL	0	0	0	47	20	12	12	11	6	59	31	18

[redacted] [redacted] [redacted]

TABLE 9-4

[redacted] [redacted] [redacted]

MISSION • 1014-2 • INSTRUMENT • AFT 01/29/65 DENSITY FREQ DISTR

DENSITY VALUE	PRIMARY MIN	PRIMARY MAX	PRIMARY LIM	INTERMEDIATE MIN	INTERMEDIATE MAX	INTERMEDIATE LIM	FULL MIN	FULL MAX	FULL LIM	ALL LEVELS MIN	ALL LEVELS MAX	ALL LEVELS LIM
1.01	0	0	0	0	2	1	0	0	0	0	2	1
1.02	0	0	0	0	0	0	1	1	0	1	1	0
1.03	0	0	0	0	0	0	0	0	0	0	0	0
1.04	0	0	0	0	0	0	0	0	0	0	0	0
1.05	0	0	0	0	0	0	0	0	0	0	0	0
1.06	0	0	0	0	0	0	0	2	0	0	2	0
1.07	0	0	0	0	0	0	0	0	1	0	0	1
1.08	0	0	0	0	0	0	1	0	0	1	0	0
1.09	0	0	0	0	0	0	0	0	0	0	0	0
1.10	0	0	0	0	0	0	0	0	1	0	0	1
1.11	0	0	0	0	2	1	0	0	0	0	2	1
1.12	0	0	0	0	3	0	0	0	0	0	3	0
1.13	0	0	0	0	0	0	0	0	0	0	0	0
1.14	0	0	0	0	1	1	0	0	0	0	1	1
1.15	0	0	0	0	0	0	0	0	0	0	0	0
1.16	0	0	0	0	1	0	0	0	1	0	1	1
1.17	0	0	0	0	0	0	0	1	0	0	1	0
1.18	0	0	0	0	2	0	0	0	0	0	2	0
1.19	0	0	0	0	0	0	0	1	0	0	1	0
1.20	0	0	0	0	0	0	0	2	0	0	2	0
1.21	0	0	0	0	0	0	0	0	0	0	0	0
1.22	0	0	0	0	2	0	0	1	0	0	3	0
1.23	0	0	0	0	0	0	0	0	0	0	0	0
1.24	0	0	0	0	2	1	0	0	0	0	2	1
1.25	0	0	0	0	1	0	0	0	1	0	1	1
1.26	0	0	0	0	0	0	0	0	1	0	0	1
1.27	0	0	0	0	0	0	0	1	0	0	1	0
1.28	0	0	0	0	1	0	0	0	1	0	1	1
1.29	0	0	0	0	2	1	0	0	0	0	2	1
1.30	0	0	0	0	0	0	0	1	1	0	1	1
1.31	0	0	0	0	1	1	0	0	0	0	1	1
1.32	0	0	0	0	5	2	0	1	0	0	6	2
1.33	0	0	0	0	0	0	0	0	0	0	0	0
1.34	0	0	0	0	1	1	0	0	0	0	1	1
1.35	0	0	0	0	0	0	0	0	0	0	0	0
1.36	0	0	0	0	2	1	0	2	0	0	4	1
1.37	0	0	0	0	0	0	0	0	0	0	0	0
1.38	0	0	0	0	2	1	0	1	1	0	3	2
1.39	0	0	0	0	0	0	0	0	0	0	0	0
1.40	0	0	0	0	3	1	0	2	2	0	5	3
1.41	0	0	0	0	1	0	0	1	0	0	2	0
1.42	0	0	0	0	2	1	0	0	0	0	2	1
1.43	0	0	0	0	1	1	0	1	1	0	2	2
1.44	0	0	0	0	0	0	0	0	0	0	0	0
1.45	0	0	0	0	3	0	0	0	0	0	3	0
1.46	0	0	0	0	0	0	0	0	0	0	0	0
1.47	0	0	0	0	1	0	0	0	0	0	1	0
1.48	0	0	0	0	3	0	0	0	0	0	3	0
1.49	0	0	0	0	2	0	1	1	0	1	3	0
1.50	0	0	0	0	2	0	0	2	1	0	4	1
SUBTOTAL	0	0	0	0	48	14	3	21	12	3	69	26

[redacted] [redacted] [redacted]

TABLE 9-4

[redacted] [redacted] [redacted]

MISSION • 1014-2 • INSTRUMENT • AFT 01/29/65 DENSITY FREQ DISTR

DENSITY VALUE	PRIMARY MIN	PRIMARY MAX	PRIMARY LIM	INTERMEDIATE MIN	INTERMEDIATE MAX	INTERMEDIATE LIM	FULL MIN	FULL MAX	FULL LIM	ALL LEVELS MIN	ALL LEVELS MAX	ALL LEVELS LIM
1.51	0	0	0	0	1	0	0	0	0	0	1	0
1.52	0	0	0	0	8	1	0	1	1	0	9	2
1.53	0	0	0	0	1	0	0	2	0	0	3	0
1.54	0	0	0	0	1	1	0	0	1	0	1	2
1.55	0	0	0	0	1	1	0	0	0	0	1	1
1.56	0	0	0	0	0	1	0	0	1	0	0	2
1.57	0	0	0	0	0	0	0	0	0	0	0	0
1.58	0	0	0	0	4	4	0	1	0	0	5	4
1.59	0	0	0	0	2	0	0	2	0	0	4	0
1.60	0	0	0	0	1	4	0	0	1	0	1	5
1.61	0	0	0	0	0	0	0	0	0	0	0	0
1.62	0	0	0	0	1	0	0	2	0	0	3	0
1.63	0	0	0	0	0	2	0	1	0	0	1	2
1.64	0	0	0	0	1	1	0	0	2	0	1	3
1.65	0	0	0	0	0	1	0	0	0	0	0	1
1.66	0	0	0	0	0	0	0	0	0	0	0	0
1.67	0	0	0	0	2	0	0	1	1	0	3	1
1.68	0	0	0	0	1	0	0	1	1	0	2	1
1.69	0	0	0	0	2	0	0	1	0	0	3	0
1.70	0	0	0	0	1	1	0	1	2	0	2	3
1.71	0	0	0	0	1	3	0	0	0	0	1	3
1.72	0	0	0	0	1	0	0	1	2	0	2	2
1.73	0	0	0	0	1	1	0	0	0	0	1	1
1.74	0	0	0	0	1	2	0	0	0	0	1	2
1.75	0	0	0	0	0	0	0	1	1	0	1	1
1.76	0	0	0	0	2	1	0	1	0	0	3	1
1.77	0	0	0	0	0	0	0	0	0	0	0	0
1.78	0	0	0	0	2	0	0	1	1	0	3	1
1.79	0	0	0	0	3	1	0	0	0	0	3	1
1.80	0	0	0	0	0	2	0	2	2	0	2	4
1.81	0	0	0	0	1	1	0	0	1	0	1	2
1.82	0	0	0	0	1	1	0	0	0	0	1	1
1.83	0	0	0	0	0	0	0	0	0	0	0	0
1.84	0	0	0	0	2	2	0	0	0	0	2	2
1.85	0	0	0	0	0	1	0	1	1	0	1	2
1.86	0	0	0	0	2	0	0	0	2	0	2	2
1.87	0	0	0	0	0	0	0	0	0	0	0	0
1.88	0	0	0	0	0	2	0	0	0	0	0	2
1.89	0	0	0	0	0	2	0	2	0	0	2	2
1.90	0	0	0	0	3	6	0	0	2	0	3	8
1.91	0	0	0	0	0	0	0	0	0	0	0	0
1.92	0	0	0	0	4	1	0	0	1	0	4	2
1.93	0	0	0	0	0	2	0	0	0	0	0	2
1.94	0	0	0	0	1	0	0	0	0	0	1	0
1.95	0	0	0	0	1	1	0	1	1	0	2	2
1.96	0	0	0	0	0	3	0	1	0	0	1	3
1.97	0	0	0	0	1	0	0	0	2	0	1	2
1.98	0	0	0	0	0	1	0	0	1	0	0	2
1.99	0	0	0	0	1	0	0	0	0	0	1	0
2.00	0	0	0	0	2	4	0	0	2	0	2	6
SUBTOTAL	0	0	0	0	57	54	0	24	29	0	81	83

[redacted] [redacted] [redacted]

TABLE 9-4

[redacted] [redacted] [redacted]

MISSION * 1014-2 * INSTRUMENT * AFT 01/29/65 DENSITY FREQ DISTR

DENSITY VALUE	PRIMARY MIN	PRIMARY MAX	PRIMARY LIM	INTERMEDIATE MIN	INTERMEDIATE MAX	INTERMEDIATE LIM	FULL MIN	FULL MAX	FULL LIM	ALL LEVELS MIN	ALL LEVELS MAX	ALL LEVELS LIM
2.01	0	0	0	0	0	1	0	0	1	0	0	2
2.02	0	0	0	0	0	2	0	1	0	0	1	2
2.03	0	0	0	0	0	0	0	0	1	0	0	1
2.04	0	0	0	0	2	0	0	0	0	0	2	0
2.05	0	0	0	0	0	0	0	0	0	0	0	0
2.06	0	0	0	0	1	1	0	0	3	0	1	4
2.07	0	0	0	0	1	0	0	0	0	0	1	0
2.08	0	0	0	0	0	2	0	0	0	0	0	2
2.09	0	0	0	0	0	0	0	0	0	0	0	0
2.10	0	0	0	0	0	6	0	0	1	0	0	7
2.11	0	0	0	0	0	4	0	0	0	0	0	4
2.12	0	0	0	0	0	4	0	0	1	0	0	5
2.13	0	0	0	0	0	1	0	0	0	0	0	1
2.14	0	0	0	0	0	1	0	1	0	0	1	1
2.15	0	0	0	0	0	0	0	0	0	0	0	0
2.16	0	0	0	0	0	4	0	0	0	0	0	4
2.17	0	0	0	0	0	1	0	0	1	0	0	2
2.18	0	0	0	0	0	2	0	0	2	0	0	4
2.19	0	0	0	0	1	0	0	0	1	0	1	1
2.20	0	0	0	0	1	5	0	0	1	0	1	6
2.21	0	0	0	0	0	0	0	0	0	0	0	0
2.22	0	0	0	0	0	1	0	0	0	0	0	1
2.23	0	0	0	0	0	0	0	0	0	0	0	0
2.24	0	0	0	0	0	2	0	0	0	0	0	2
2.25	0	0	0	0	0	2	0	0	1	0	0	3
2.26	0	0	0	0	0	1	0	0	1	0	0	2
2.27	0	0	0	0	0	0	0	0	0	0	0	0
2.28	0	0	0	0	0	0	0	1	1	0	1	1
2.29	0	0	0	0	0	1	0	0	0	0	0	1
2.30	0	0	0	0	0	0	0	0	0	0	0	0
2.31	0	0	0	0	0	0	0	0	0	0	0	0
2.32	0	0	0	0	0	0	0	0	0	0	0	0
2.33	0	0	0	0	0	0	0	0	0	0	0	0
2.34	0	0	0	0	0	0	0	0	0	0	0	0
2.35	0	0	0	0	0	0	0	0	0	0	0	0
2.36	0	0	0	0	0	0	0	0	0	0	0	0
2.37	0	0	0	0	0	0	0	0	0	0	0	0
2.38	0	0	0	0	0	0	0	0	0	0	0	0
2.39	0	0	0	0	0	1	0	0	0	0	0	1
2.40	0	0	0	0	0	0	0	0	0	0	0	0
2.41	0	0	0	0	0	0	0	0	0	0	0	0
2.42	0	0	0	0	0	0	0	0	0	0	0	0
2.43	0	0	0	0	0	0	0	0	0	0	0	0
2.44	0	0	0	0	0	0	0	0	1	0	0	1
2.45	0	0	0	0	0	0	0	0	0	0	0	0
2.46	0	0	0	0	0	0	0	0	0	0	0	0
2.47	0	0	0	0	0	0	0	0	0	0	0	0
2.48	0	0	0	0	0	0	0	0	0	0	0	0
2.49	0	0	0	0	0	0	0	0	0	0	0	0
2.50	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	0	0	0	0	6	42	0	3	16	0	9	58

[redacted] [redacted] [redacted]

TABLE 9-4

[redacted] [redacted] [redacted]

MISSION • 1014-2 • INSTRUMENT • AFT 01/29/65 DENSITY FREQ DISTR

DENSITY VALUE	PRIMARY MIN	PRIMARY MAX	PRIMARY LIM	INTERMEDIATE MIN	INTERMEDIATE MAX	INTERMEDIATE LIM	FULL MIN	FULL MAX	FULL LIM.	ALL LEVELS MIN	ALL LEVELS MAX	ALL LEVELS LIM
2.51	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	141	141	123	67	67	65	208	208	188

MISSION 1014-2 INSTR - AFT 01/29/65 PROCESSING AND EXPOSURE ANALYS.

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	141	3 PC	43 PC	53 PC	1 PC	0 PC
FULL	67	54 PC	0 PC	42 PC	4 PC	0 PC
ALL LEVELS	208	19 PC	29 PC	50 PC	2 PC	0 PC

PROCESS LEVEL	BASE + FUG	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	0.91-1.69	1.70 AND UP

[redacted] [redacted] [redacted]

TABLE 9-4

MISSION • 1014-2 • INSTR • AFT • 01/29/65 PLOT OF D MIN • TERRAIN • PROCESSING • INTERMEDIATE

ARITH MEAN • 0.44 • MEDIAN • 0.41 • STD DEV • 0.17 • RANGE • 0.18 TO 1.00 WITH 141 SAMPLES

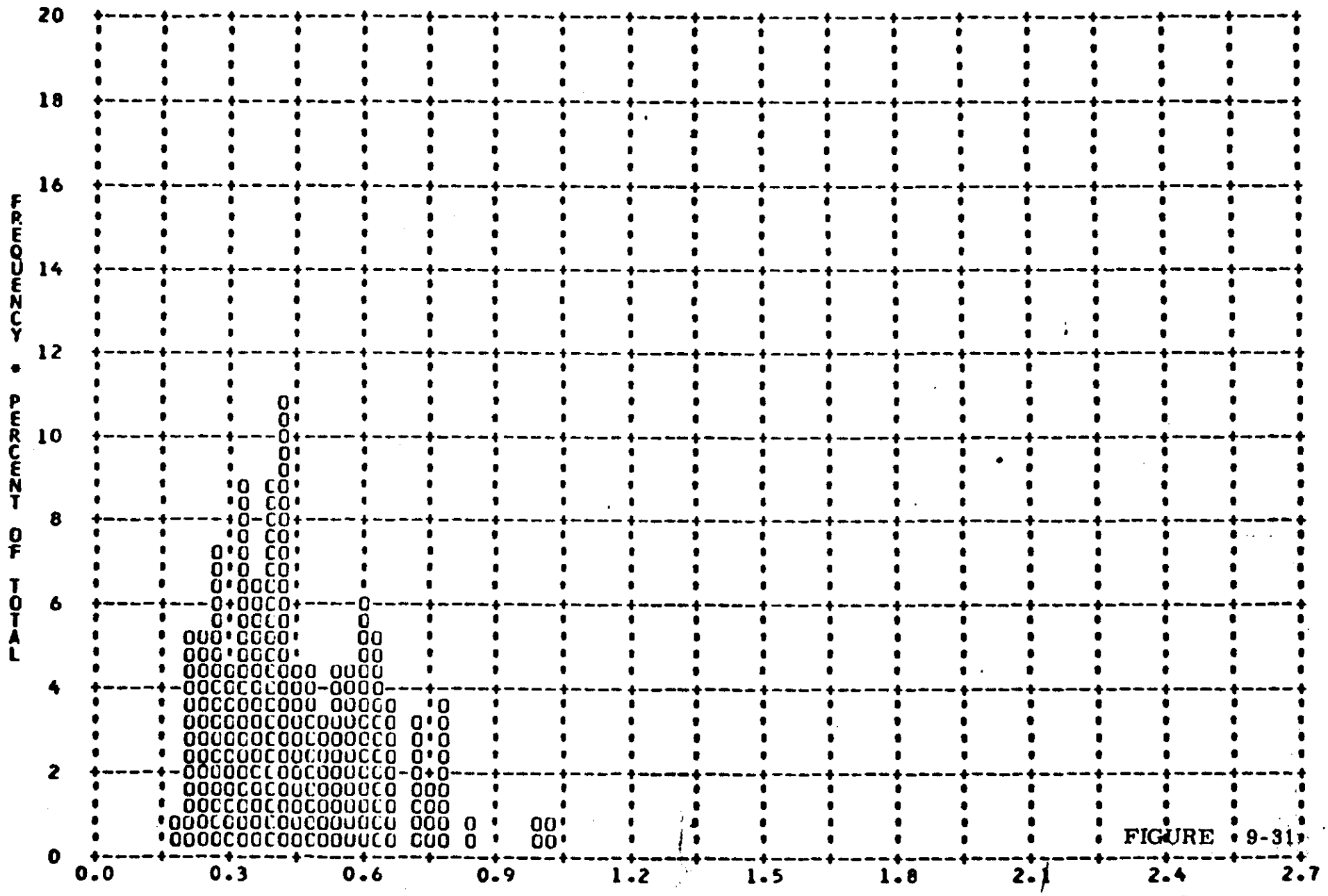

FIGURE 9-31

[redacted] ~~TOP SECRET~~ [redacted]

MISSION • 1014-2 • INSTR • AFT • 01/29/65 PLOT OF D MAX • TERRAIN • PROCESSING • INTERMEDIATE

ARITH MEAN • 1.36 • MEDIAN • 1.47 • STD DEV • 0.48 • RANGE • 0.33 TO 2.20 WITH 141 SAMPLES

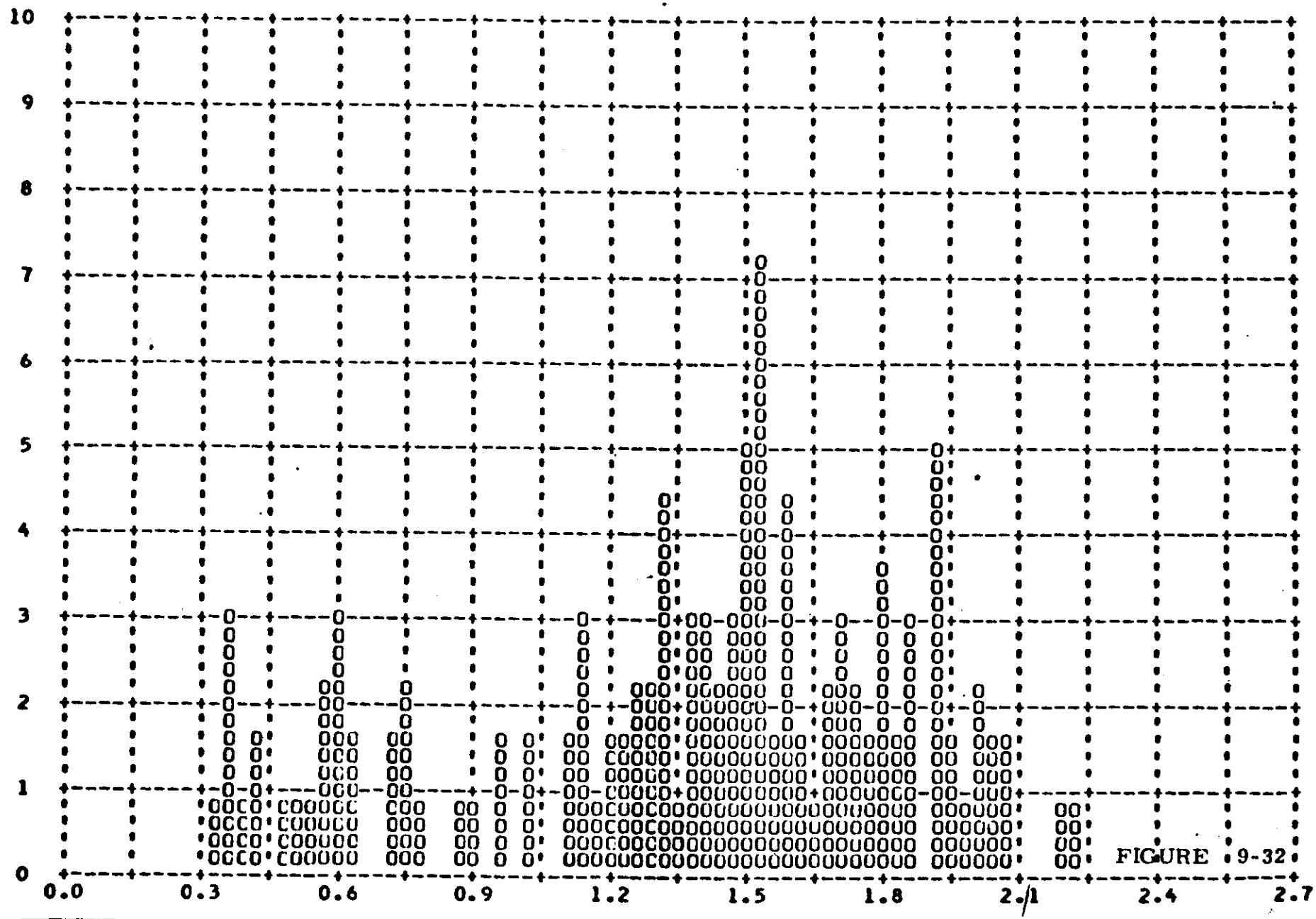

FIGURE 9-32

[redacted] ~~TOP SECRET~~ [redacted]

[redacted] ~~TOP SECRET~~ [redacted] [redacted]

MISSION • 1014-2 • INSTR • AFT • 01/29/65 PLOT OF D MAX • CLOUD • PROCESSING • INTERMEDIATE

ARITH MEAN • 1.74 • MEDIAN • 1.89 • STD DEV • 0.45 • RANGE • 0.46 TO 2.39 WITH 123 SAMPLES

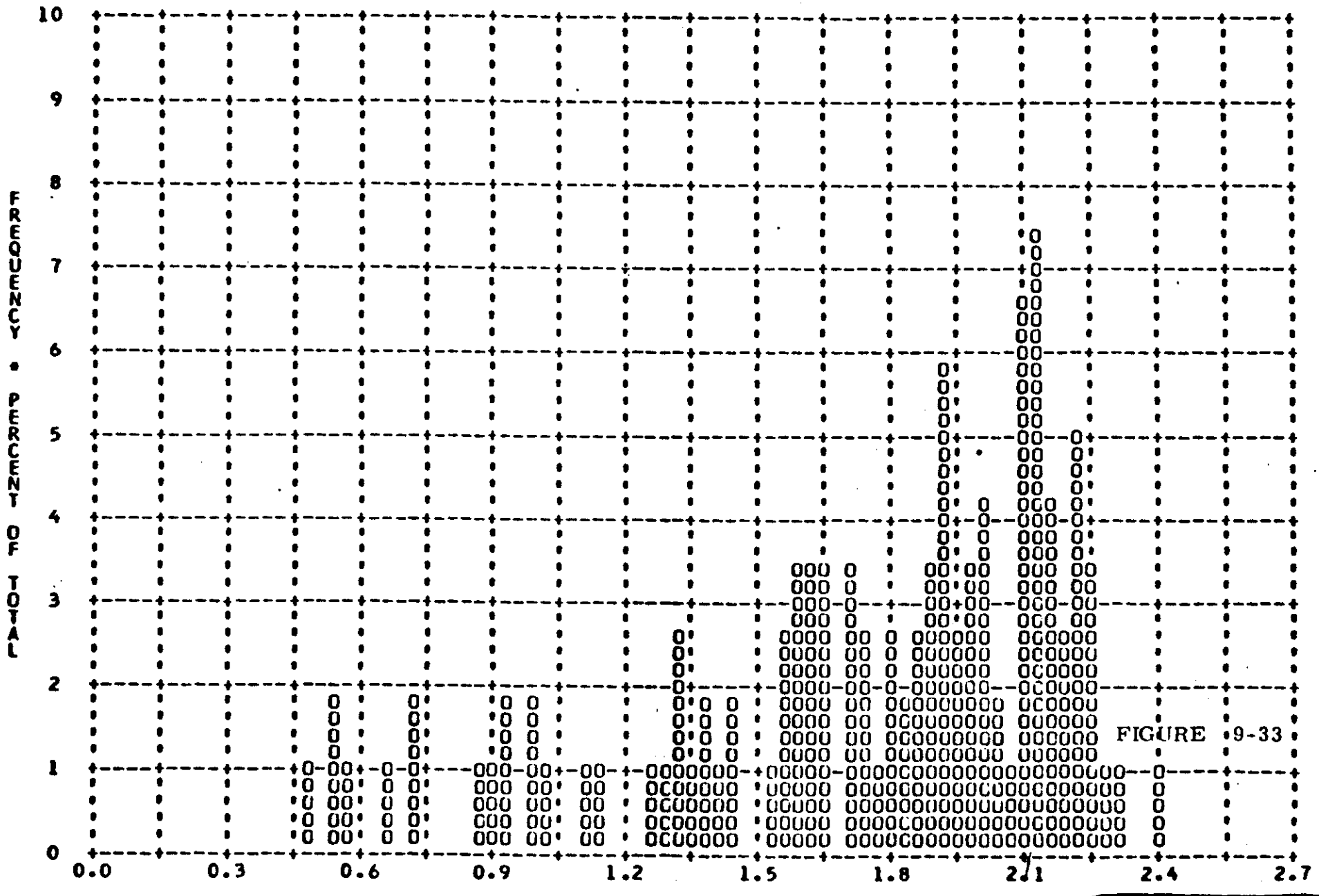

FIGURE 9-33

[redacted] ~~TOP SECRET~~ [redacted]

[redacted] ~~TOP SECRET~~ [redacted] [redacted]

MISSION • 1014-2 • INSTR • AFT • 01/29/65 PLOT OF D MIN • TERRAIN • PROCESSING • FULL

ARITH MEAN • 0.44 • MEDIAN • 0.38 • STD DEV • 0.23 • RANGE • 0.19 TO 1.49 WITH 67 SAMPLES

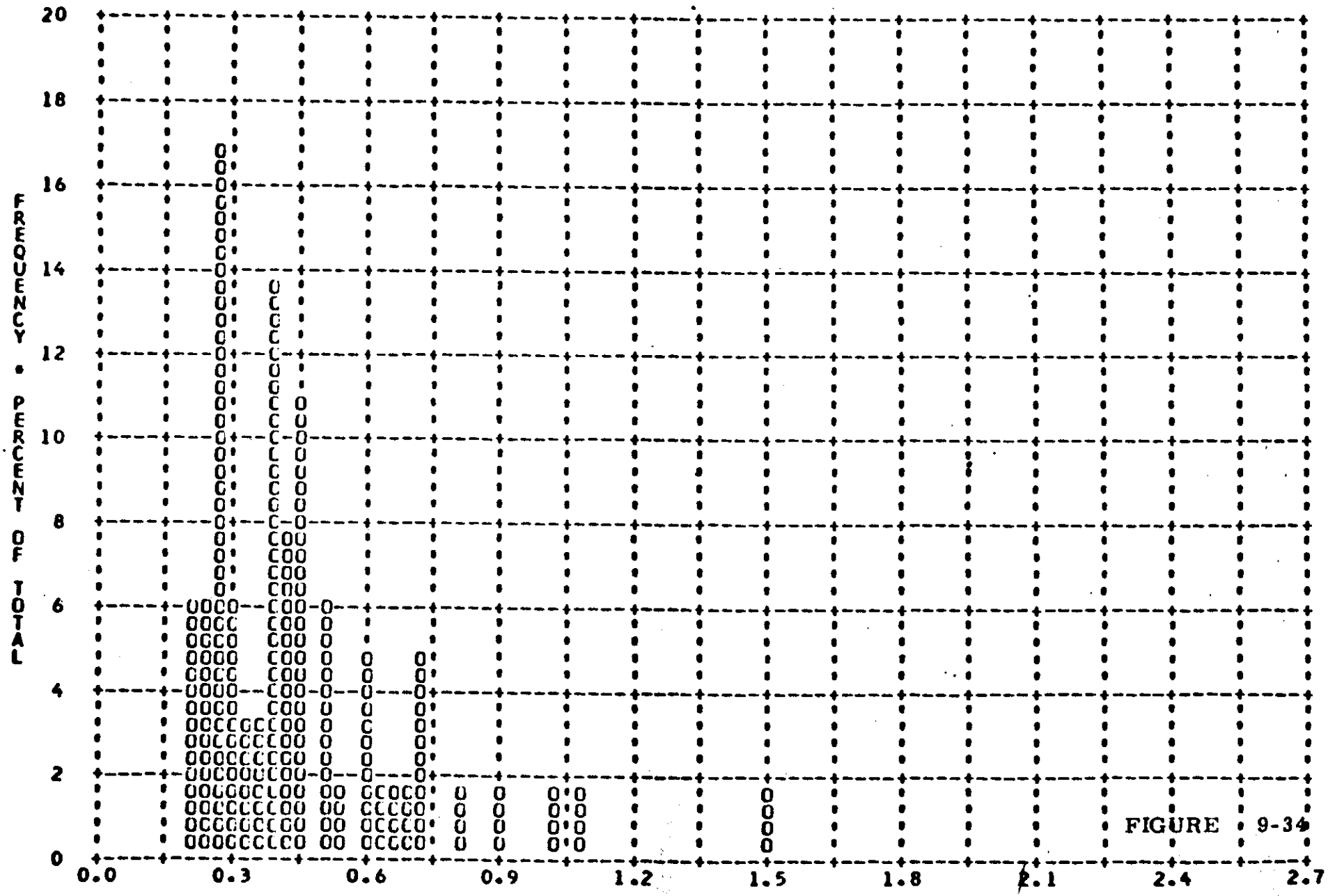

FIGURE 9-34

[redacted] ~~TOP SECRET~~ [redacted]

MISSION • 1014-2 • INSTR • AFT • 01/29/65 PLOT OF D MAX • TERRAIN • PROCESSING • FULL

ARITH MEAN • 1.28 • MEDIAN • 1.40 • STD DEV • 0.52 • RANGE • 0.27 TO 2.28 WITH 67 SAMPLES

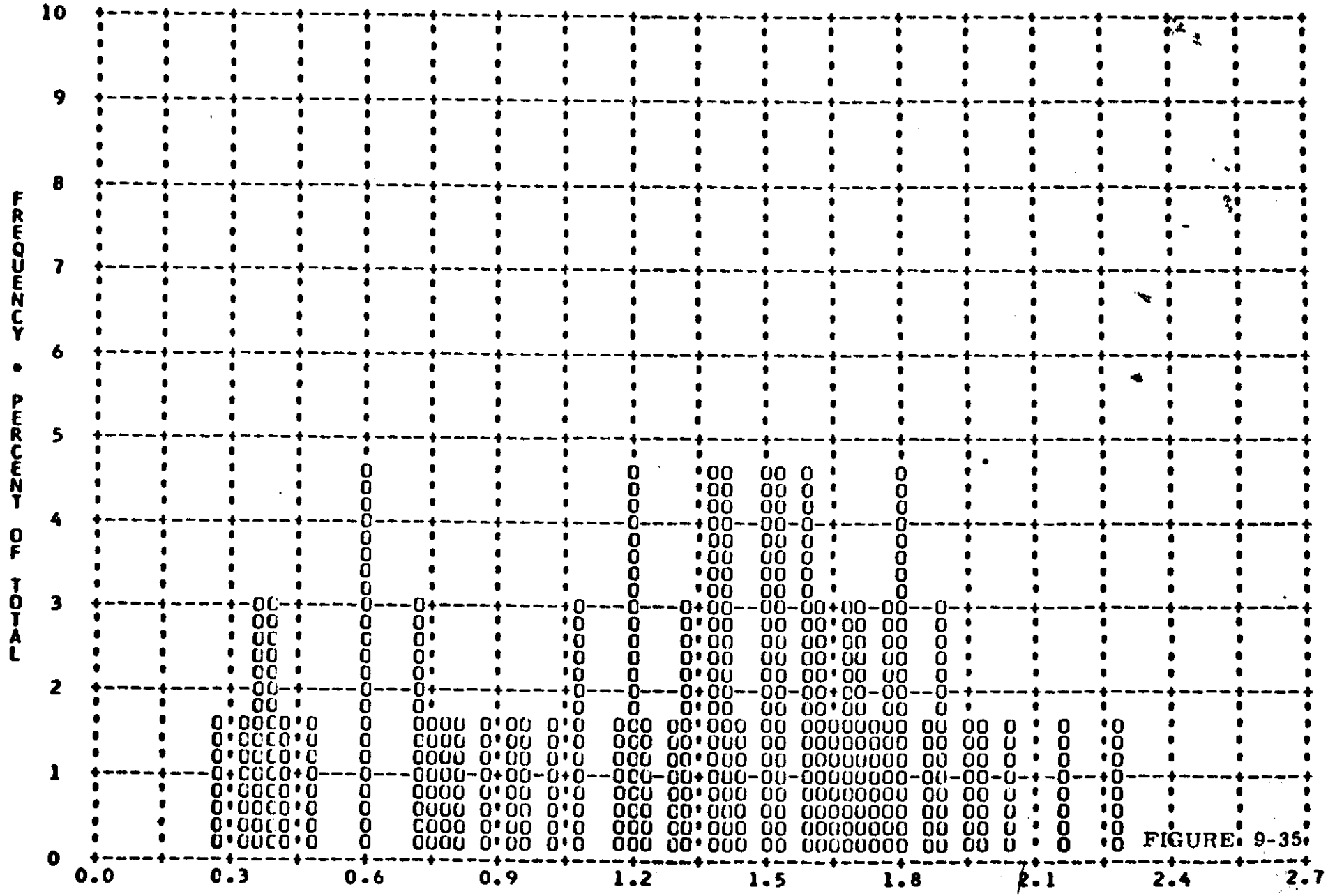

FIGURE 9-35

[redacted] ~~TOP SECRET~~ [redacted] [redacted]

MISSION • 1014-2 • INSTR • AFT • 01/29/65 PLOT OF D MAX • CLOUD • PROCESSING • FULL

ARITH MEAN • 1.65 • MEDIAN • 1.75 • STD DEV • 0.49 • RANGE • 0.26 TO 2.44 WITH 65 SAMPLES

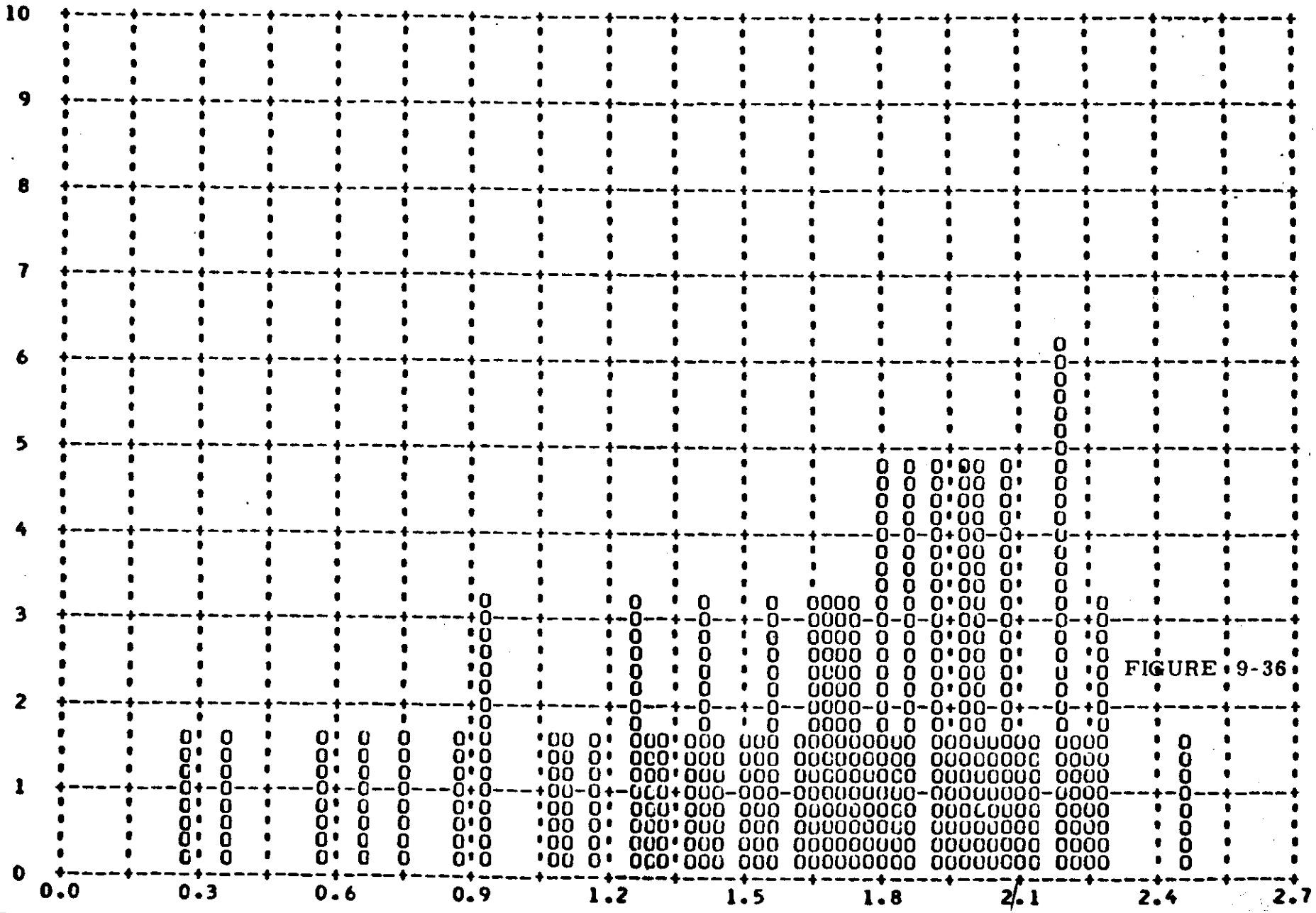

FIGURE 9-36

[redacted] ~~TOP SECRET~~ [redacted]

MISSION • 1014-2 • INSTR • AFT • 01/29/65 PLOT OF D MIN • TERRAIN • PROCESSING • ALL LEVELS

ARITH MEAN • 0.44 • MEDIAN • 0.40 • STD DEV • 0.19 • RANGE • 0.18 TO 1.49 WITH 208 SAMPLES

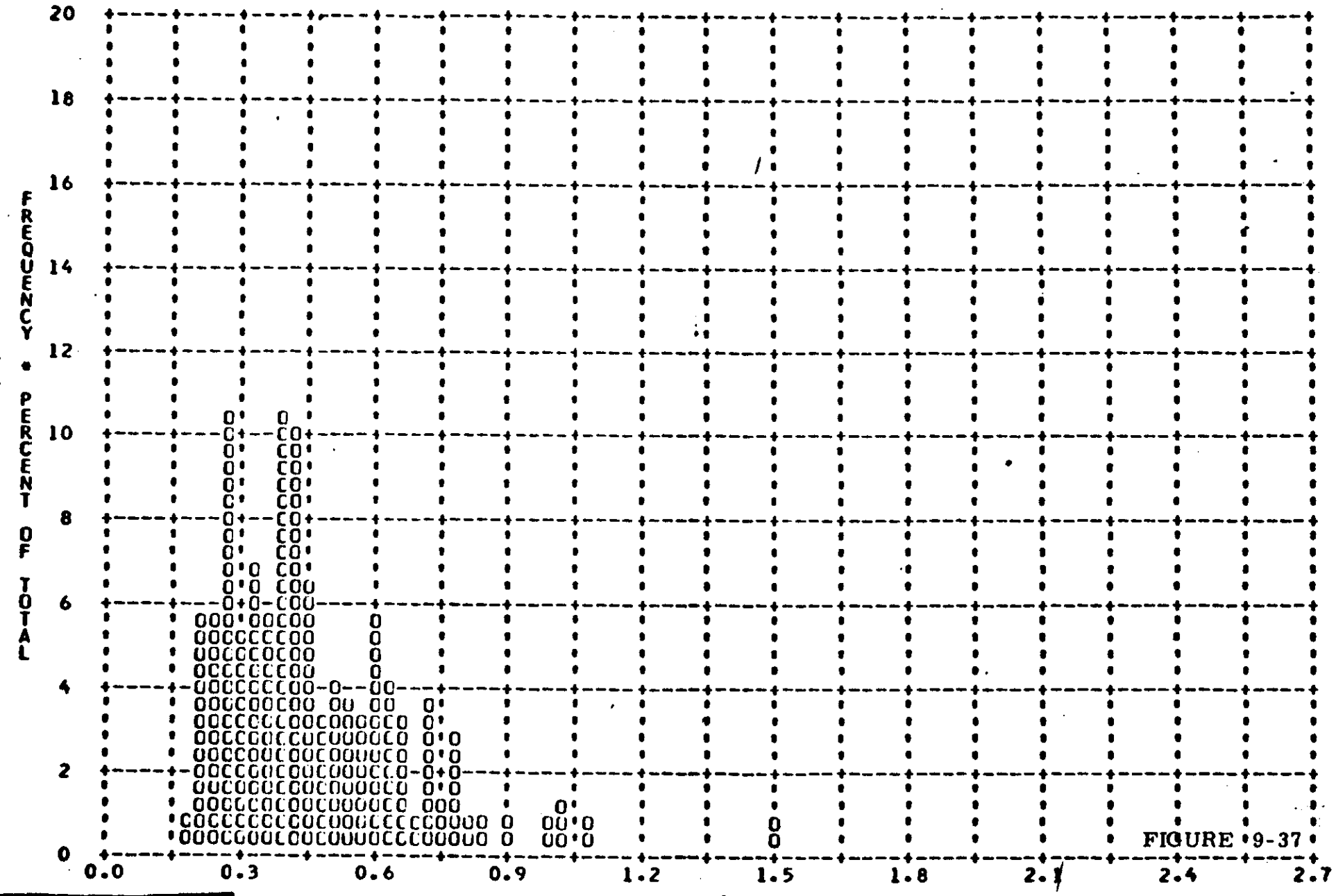

FIGURE 9-37

[redacted] ~~TOP SECRET~~ [redacted] [redacted]

MISSION • 1014-2 • INSTR • AFT • 01/29/65 PLOT OF D MAX • TERRAIN • PROCESSING • ALL LEVELS

ARITH MEAN • 1.34 • MEDIAN • 1.45 • STD DEV • 0.49 • RANGE • 0.27 TO 2.28 WITH 208 SAMPLES

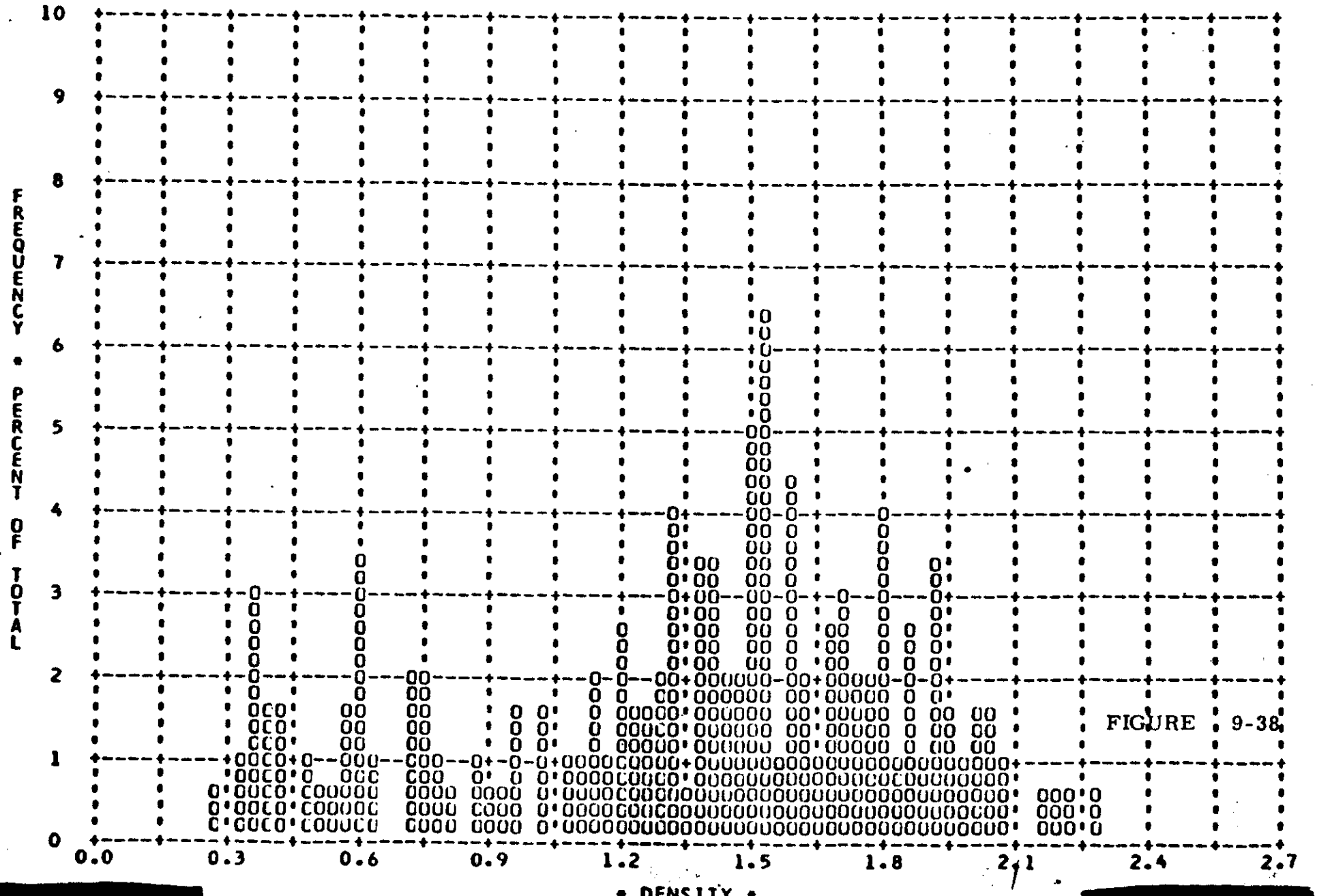

FIGURE 9-38

[redacted] ~~TOP SECRET~~ [redacted]

[redacted] ~~TOP SECRET~~ [redacted] [redacted]

MISSION • 1014-2 • INSTR • AFT • 01/29/65 PLOT OF D MAX • CLOUD • PROCESSING • ALL LEVELS

ARITH MEAN • 1.71 • MEDIAN • 1.84 • STD DEV • 0.47 • RANGE • 0.26 TO 2.44 WITH 188 SAMPLES

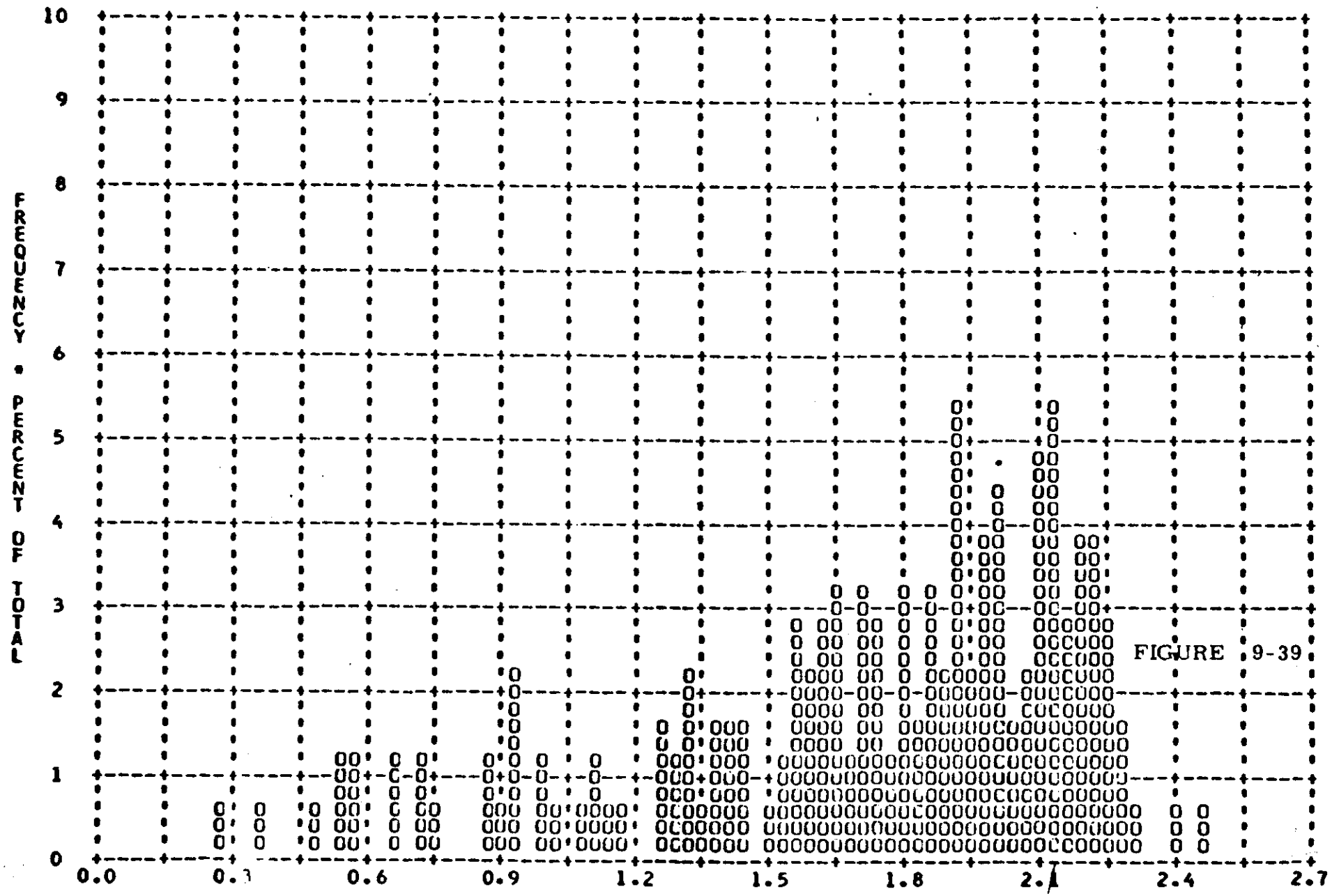

FIGURE 9-39

[redacted] ~~TOP SECRET~~ [redacted]

[redacted] [redacted] [redacted]

MISSION 1014-1 INSTR - FRWD 01/18/65 PROCESSING AND EXPOSURE ANALYSIS

PROCESS LEVEL	SAMPLE SIZE	UNDER EXPOSED	UNDER PROCESSED	CORRECT EXP+PROC	OVER PROCESSED	OVER EXPOSED
PRIMARY	1	0 PC	100 PC	0 PC	0 PC	0 PC
INTERMEDIATE	134	5 PC	53 PC	40 PC	1 PC	0 PC
FULL	80	63 PC	0 PC	36 PC	1 PC	0 PC
ALL LEVELS	215	27 PC	33 PC	39 PC	1 PC	0 PC

MISSION 1014-1 INSTR - AFT 01/18/65 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	79	13 PC	32 PC	53 PC	3 PC	0 PC
FULL	137	23 PC	0 PC	70 PC	7 PC	0 PC
ALL LEVELS	216	19 PC	12 PC	64 PC	5 PC	0 PC

MISSION 1014-2 INSTR - FRWD 01/29/65 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	133	5 PC	65 PC	27 PC	3 PC	0 PC
FULL	84	73 PC	0 PC	27 PC	0 PC	0 PC
ALL LEVELS	217	31 PC	40 PC	27 PC	2 PC	0 PC

MISSION 1014-2 INSTR - AFT 01/29/65 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	141	3 PC	43 PC	53 PC	1 PC	0 PC
FULL	67	54 PC	0 PC	42 PC	4 PC	0 PC
ALL LEVELS	208	19 PC	29 PC	50 PC	2 PC	0 PC

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

[redacted] [redacted] [redacted]

TABLE 9-5

SECTION 10

PERFORMANCE MEASUREMENTS

The photography acquired by both panoramic cameras during Missions 1014-1 and 1014-2 received a MIP rating of 80. A summary is tabulated below of the average visual RES values and MTF/AIM resolution values measured by AFSPPF and the MTF/AIM resolution values made by [redacted] The microdensitometer slit used by AFSPPF and [redacted] was 80 microns by one micron.

Mission	Camera	Visual RES	AFSPPF	[redacted]
1014-1	FWD	87	78	74
1014-1	AFT	83	80	95
1014-2	FWD	83	75	70
1014-2	AFT	86	84	80

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

SECTION 11

OBSERVED DATA

Daylight photography for engineering purposes was obtained on several passes of Mission 1014 over continental United States.

Cloud cover on the mission as a whole has been described elsewhere in this report as 40%. This estimate appears to be too high for the ZI engineering passes. When image degrading haze is considered, less than 25% was suitable for evaluating the system performance capability.

Some ground resolution targets were photographed and provide a fair estimate of on-orbit system capability where no degrading factors, (i.e., haze, "facing-illumination", etc.) were present.

Holloman photographic range was covered on Pass D47. Here, the third element of the northern "B" target was resolved by the Aft looking camera only. This corresponds to 9 feet ground resolution.

Pass D111 covered Edwards AFB fixed target site. All groups were resolved on the medium contrast "C" target for 12 feet 8 inch ground resolution. In addition, Group 1 along-track and Group 2 cross-track were resolved on the high contrast (low contrast, as seen by the camera) "B2" target. This indicates a ground resolution of 11 feet and 10 feet respectively, which translates to camera/film resolution of approximately 110 L/MM. This compares, roughly, with the system resolution, obtained during pre-flight dynamic testing, of 115 L/MM, low contrast for both panoramic cameras.

At Webster AFB, Maryland, the Aft looking camera, as above, produced 10 feet ground resolution. However, because of haze and "facing-illumination" the forward looking camera could resolve only 12.5 feet or 90 L/MM.

No other ground resolution targets were contained in the duplicate positive prints supplied to A/P.

A subjective evaluation of photography obtained on Mission 1014 shows that even though the system capability was as high or higher than previous systems, actual performance was not quite as good as the past 3 missions. Though pre-flight testing showed the pan cameras to be nearly identical

in performance, in on-orbit performance the Aft produced slightly better photography. Under low contrast conditions, the Aft performance was nearly equal to the results obtained under the controlled conditions of pre-flight dynamic testing. The poorer performance of the Forward looking camera is attributed principally to the higher scattering of "facing-illumination", and is evidenced in reduced contrast. This reduced contrast is manifested by increased light level on the darker points of the image and not by attenuation of the lighter parts. The situation can be stated as a high "noise-level", and is not the same as experienced when a small light object with detail structure beyond the resolving power of the system fills in the darker parts of the fine detail by light scattering at several steps in the over all process. The relationship between "contrast" and "resolution" is not a linear one. An interesting demonstration of this non-linear relationship can be found in Pass D62. A railroad bridge across the Ohio river near Ciro, Illinois is a fabricated steel truss and painted white, or, more probably, aluminum. The bright lacy detail of the bridge against the gray of the river is almost completely filled in, however in the shadow of the bridge, which is very low visual contrast black-on-gray, the main members of the bridge were quite discernable even though the smaller dimensions are not likely to exceed 2 to 3 feet.

SECTION 12

MISSION 1014-1 STELLAR-INDEX CAMERA

A. COMPONENT ASSIGNMENT

Component	Serial Number
Camera	D-53
Index Reseau	59
Stellar Reseau	49

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 4401
Index Camera:	
Lens	38 mm f/4.5
Exposure Time	1/500 second
Filter Type	Wratten 21
Film Type	Eastman Type 4400

C. POST FLIGHT EVALUATION

A. Stellar Camera

The camera exposed 419 frames on 50 foot of film with no operational problems. The last eight feet of film had minor abrasions.

B. Index Camera

The index camera exposed 419 frames on 90 feet of film. A minor continuous scratch was noted outside the index format and two narrow minus density streaks passed near the format centers. Image quality was slightly inferior to that obtained on recent missions. The condition may be the result of atmospheric conditions, but the cause is not definitely known.

SECTION 13

MISSION 1014-2 STELLAR-INDEX CAMERA

A. COMPONENT ASSIGNMENT

Component	Serial Number
Camera	D-50
Index Reseau	44
Stellar Reseau	46

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 4401
Index Camera:	
Lens	38 mm f/4.5
Exposure Time	1/500 second
Filter Type	Wratten 21
Film Type	Eastman Type 4400

C. POST FLIGHT EVALUATION

A. Stellar Camera

The camera produced 351 frames of photography on 54 feet of film. A double exposure was evident on the first frame of the mission. This occurrence on the first operation is not a malfunction. The camera then functioned normally for 118 frames, after which time there were many intermittent double and triple exposures.

It had been predicted from pre-flight calculations that the 5 inch baffle used on this stellar camera might become sunstruck on the first day of 1014-2. Examination of the stellar imagery showed that where

the instrument functioned normally the effects of flare were no greater than on 1014-1 and usable stellar images were produced.

B. Index Camera

This camera produced 351 frames of photography on 91 feet of film. After frame #119 there were many multiple exposures. Image quality from the index camera was degraded similar to that on 1014-1.

Density	35% low	55% med.	10% high
Contrast	55% low	40% med.	5% high

SECTION 14

VEHICLE ATTITUDE

The vehicle attitude errors for both Mission 1014-1 and 1014-2 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 1014-1 and Figures 14-7 through 14-10 for Mission 1014-2.

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

	Mission 1014-1		Mission 1014-2	
Value	90%	Range	90%	Range
Pitch Error (^{o})	0.62	-1.75 to +1.35	1.06	-1.40 to +.40
Roll Error (^{o})	0.41	-0.60 to +0.75	0.59	-0.85 to +0.50
Yaw Error (^{o})	1.46	-2.0 to +1.10	Not Available	
Pitch Rate (^{o}/hr.)	35.02	-95 to + 100	38.37	-85 to +100
Roll Rate (^{o}/hr.)	36.12	-65 to +95	36.40	-60 to +90
Yaw Rate (^{o}/hr.)	38.50	-65 to 70	Not Available	

The performance of the attitude control system is comparable to the control systems used on recent missions, except that the pitch error in the "B" mission is higher than normally experienced. The panoramic photography was not degraded by the attitude control system.

J-16 A BUCKET - FWD INSTR FRAMES 1-6 OF EACH OP OMITTED 90 PERCENT = 0.62

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

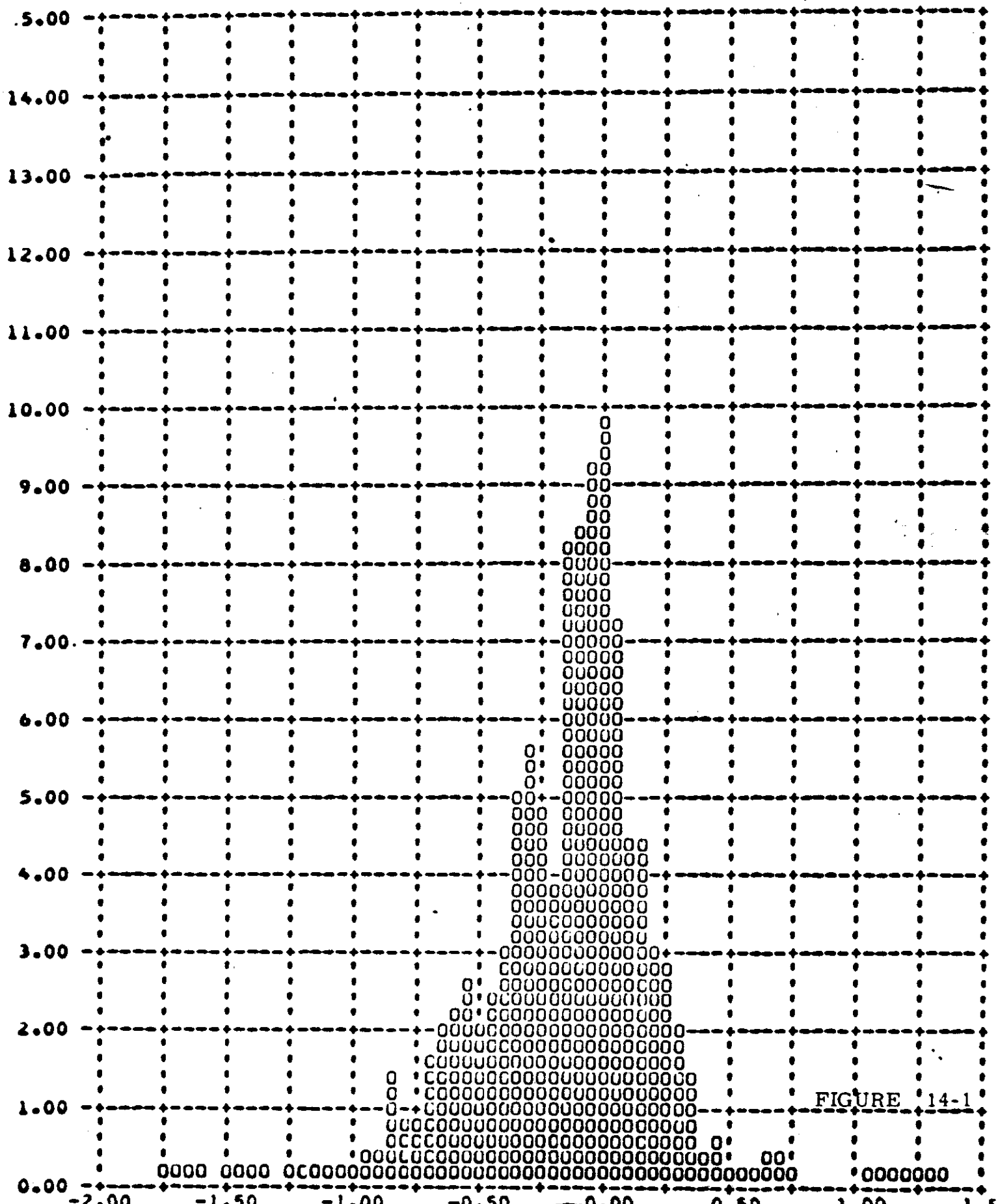

FIGURE 14-1

J-16 A BUCKET - FWD INSTR FRAMES 1-6 OF EACH OP OMITTED 90 PERCENT = 0.41

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

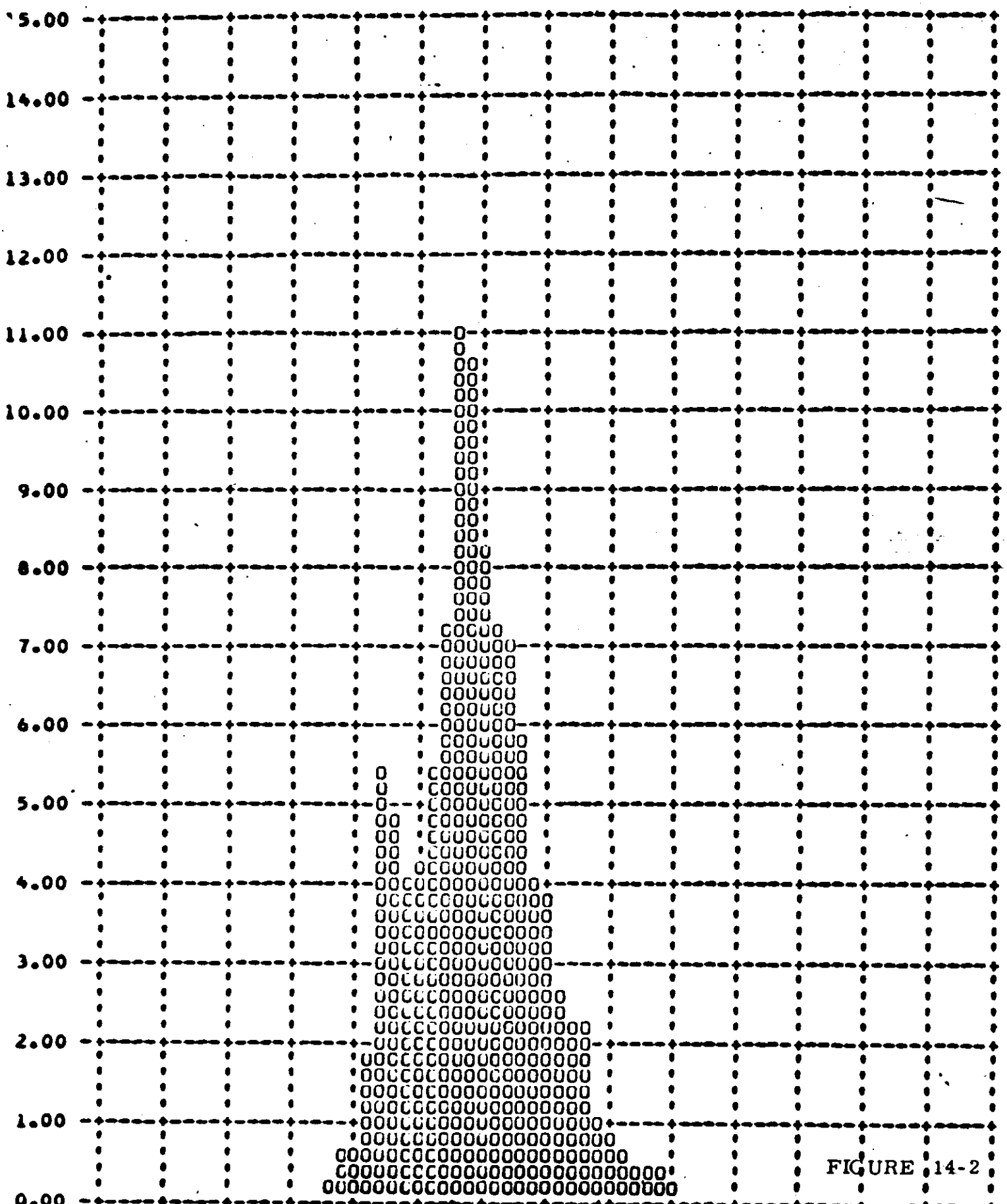

FIGURE 14-2

J-16 A BUCKET - FWD INSTR FRAMES 1-6 OF EACH OP OMITTED 90 PERCENT = 1.4

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

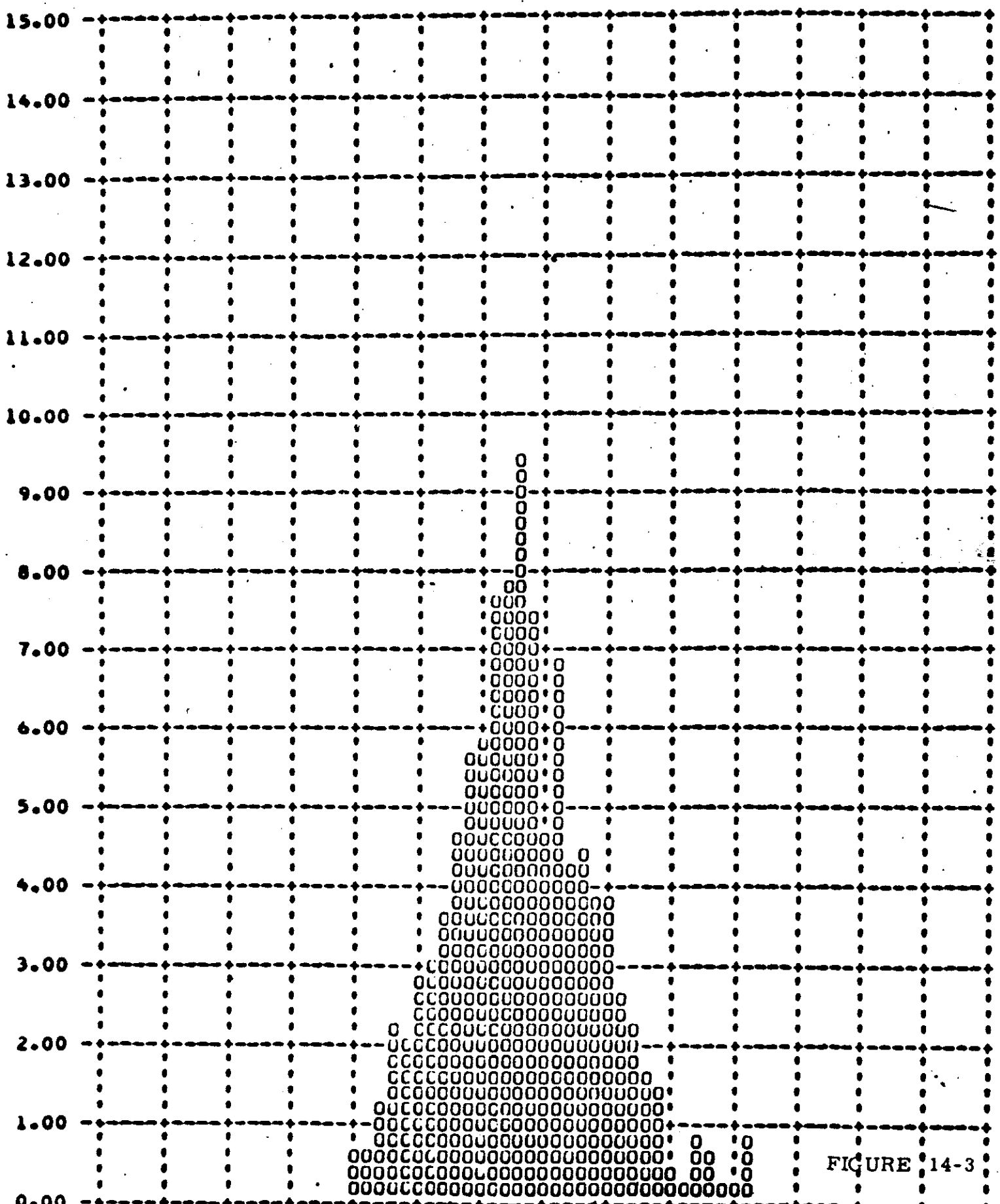

FIGURE 14-3

J-16 A BUCKET - FWD INSTR FRAMES 1-6 OF EACH OP OMITTED 90 PERCENT = 35.0

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

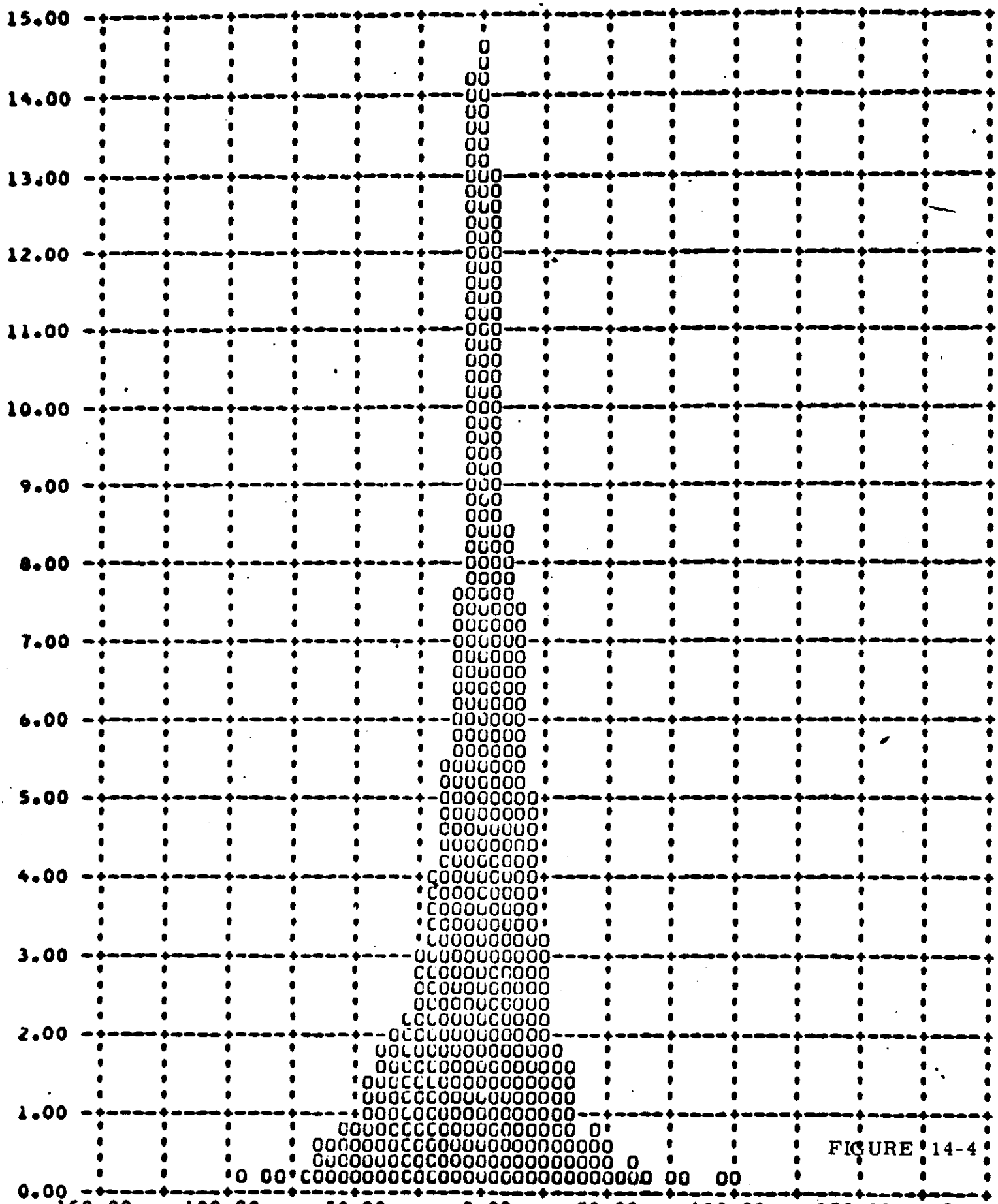

FIGURE 14-4

J-16 A BUCKET - FWD INSTR FRAMES 1-6 OF EACH OP OMITTED 90 PERCENT = 36.12

Y ROLL RATE ERRCR - DEG/HOUR (X) VERSUS FREQUENCY - PERCENT (Y)

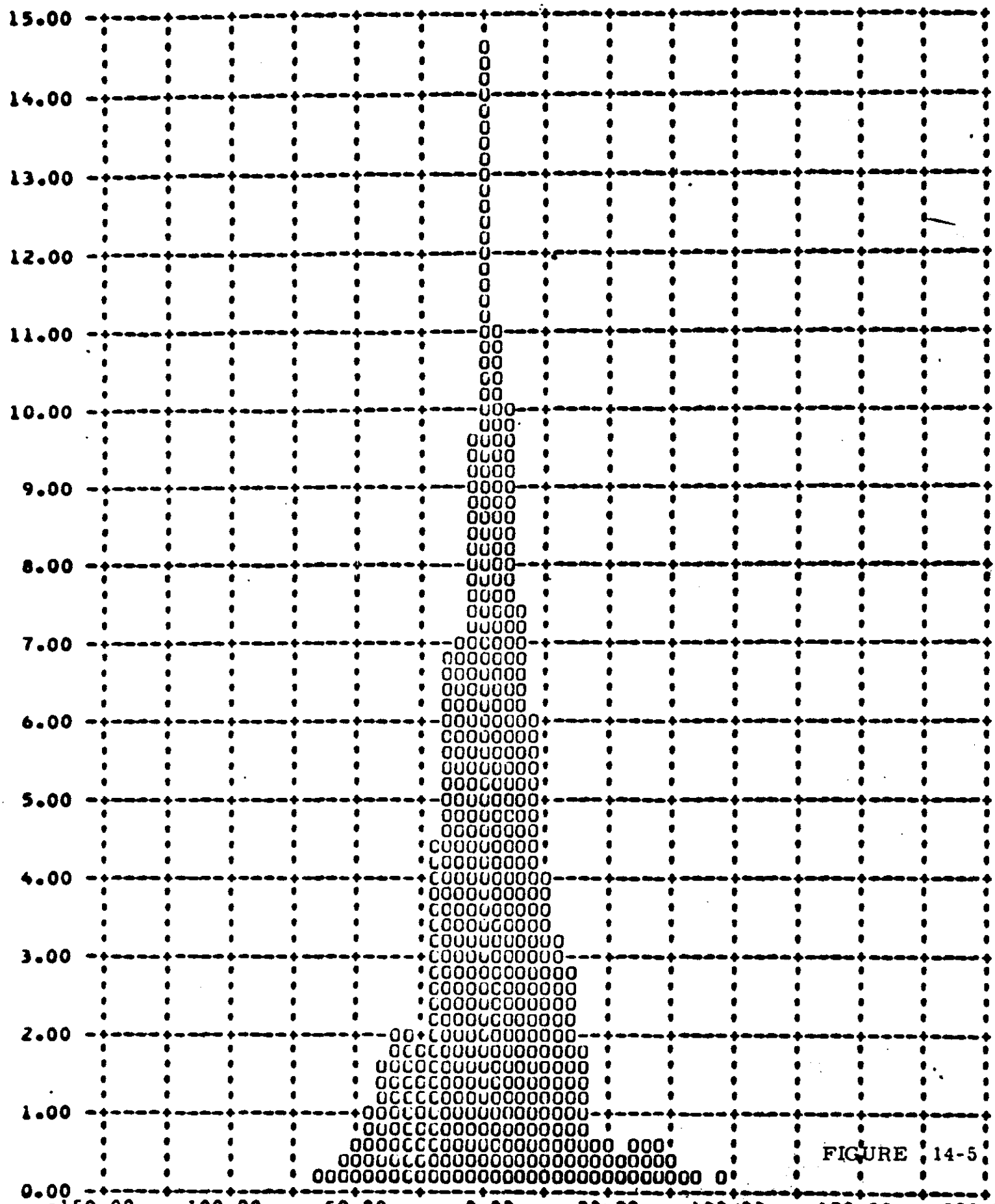

FIGURE 14-5

J-16 A BUCKET - FWD INSTR FRAMES 1-6 OF EACH OP OMITTED 90 PERCENT = 38.5

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

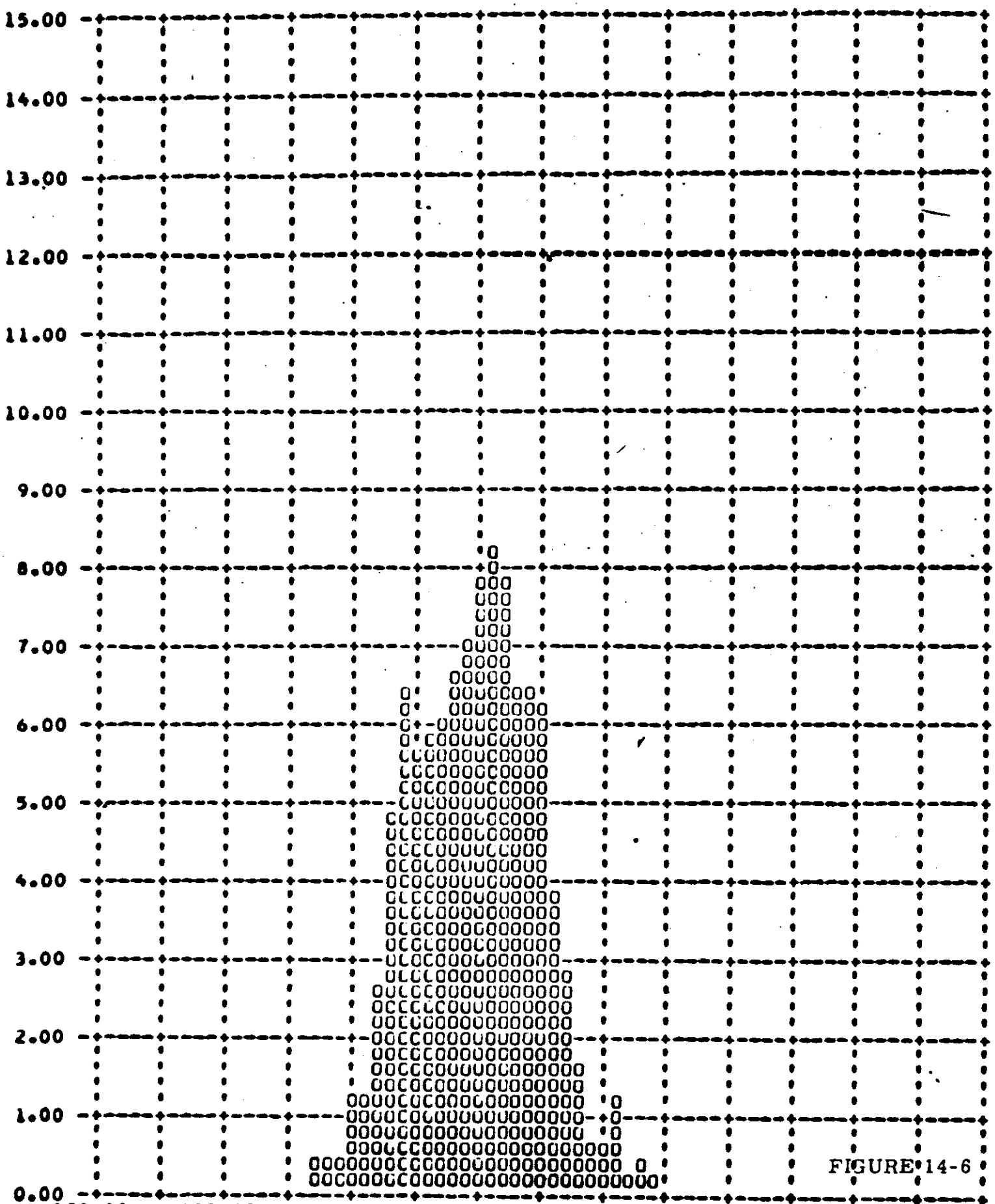

FIGURE 14-6

[redacted]

J-16 B BUCKET - FWD INSTR FRAMES 1-6 OF EACH OP OMITTED 90 PERCENT = 1.0

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

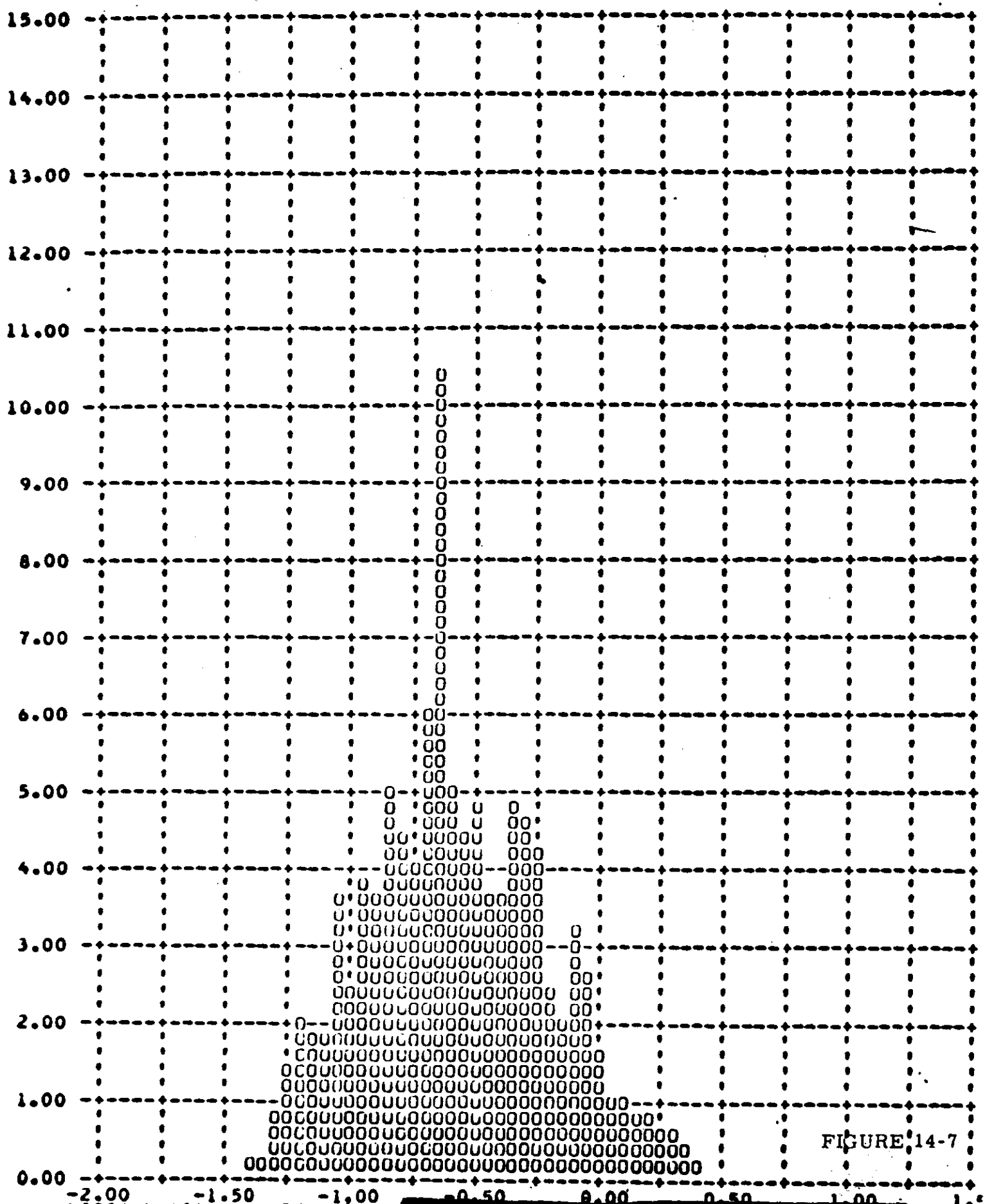

FIGURE 14-7

MISSION 101481 ~~TOP SECRET~~ [redacted]

J-16 B BUCKET - FWD INSTR FRAMES 1-6 OF EACH OP OMITTED 90 PERCENT = 0.5

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

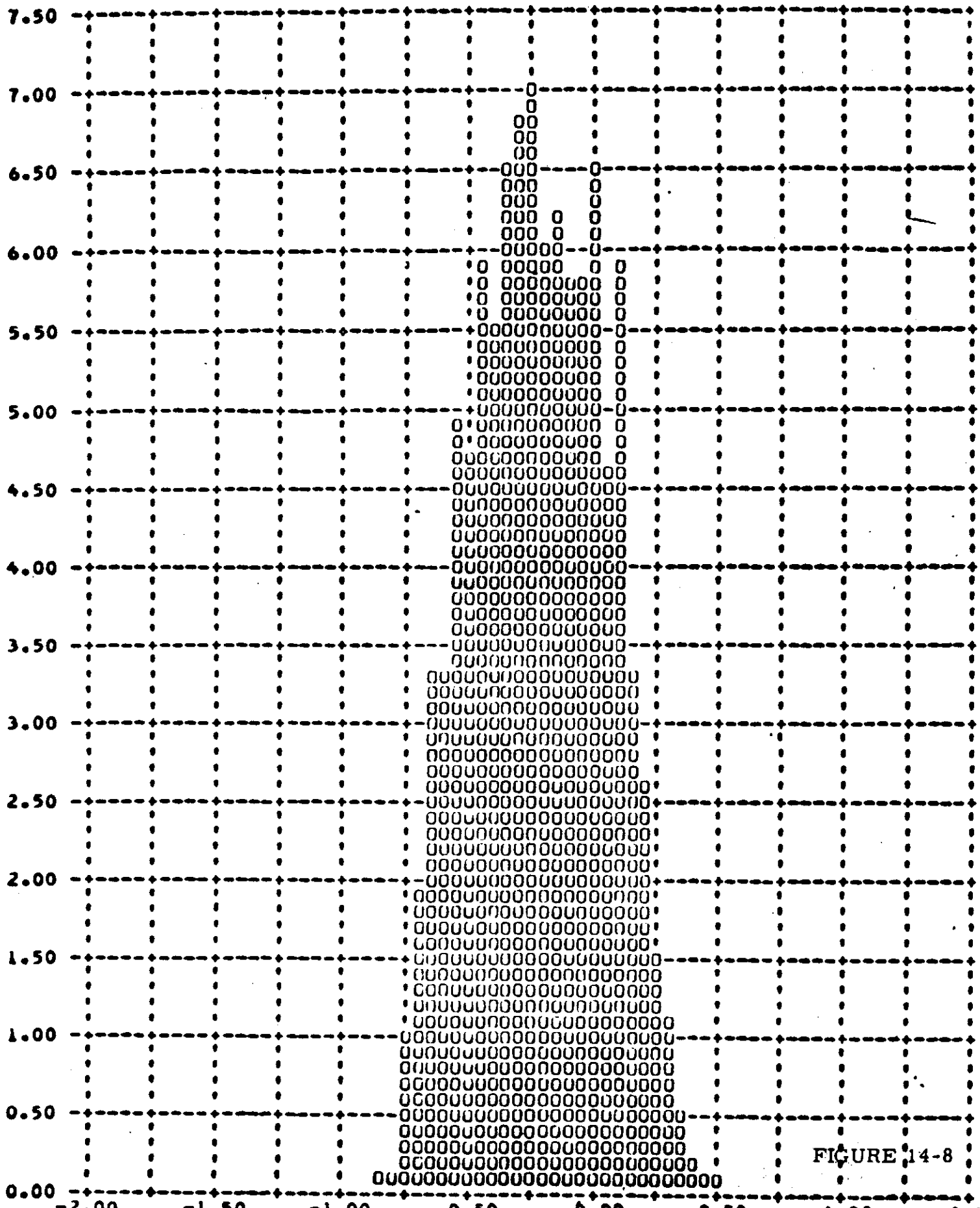

FIGURE 14-8

J-16 B BUCKET - FWD INSTR FRAMES 1-6 OF EACH OP OMITTED 90 PERCENT = 38.3

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

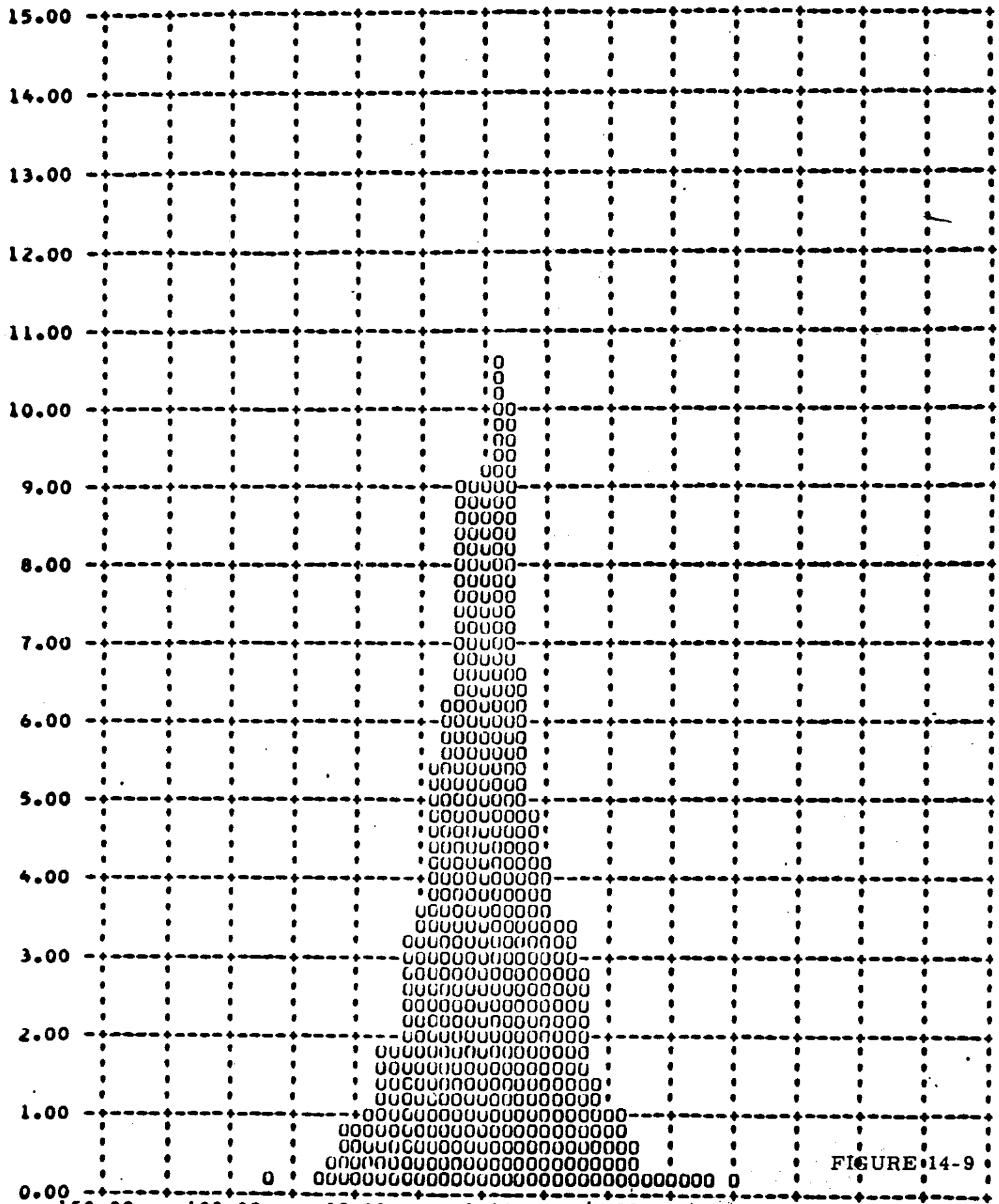

FIGURE 14-9

J-16 B BUCKET - FWD INSTR FRAMES 1-6 OF EACH OP OMITTED 90 PERCENT = 36.4

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

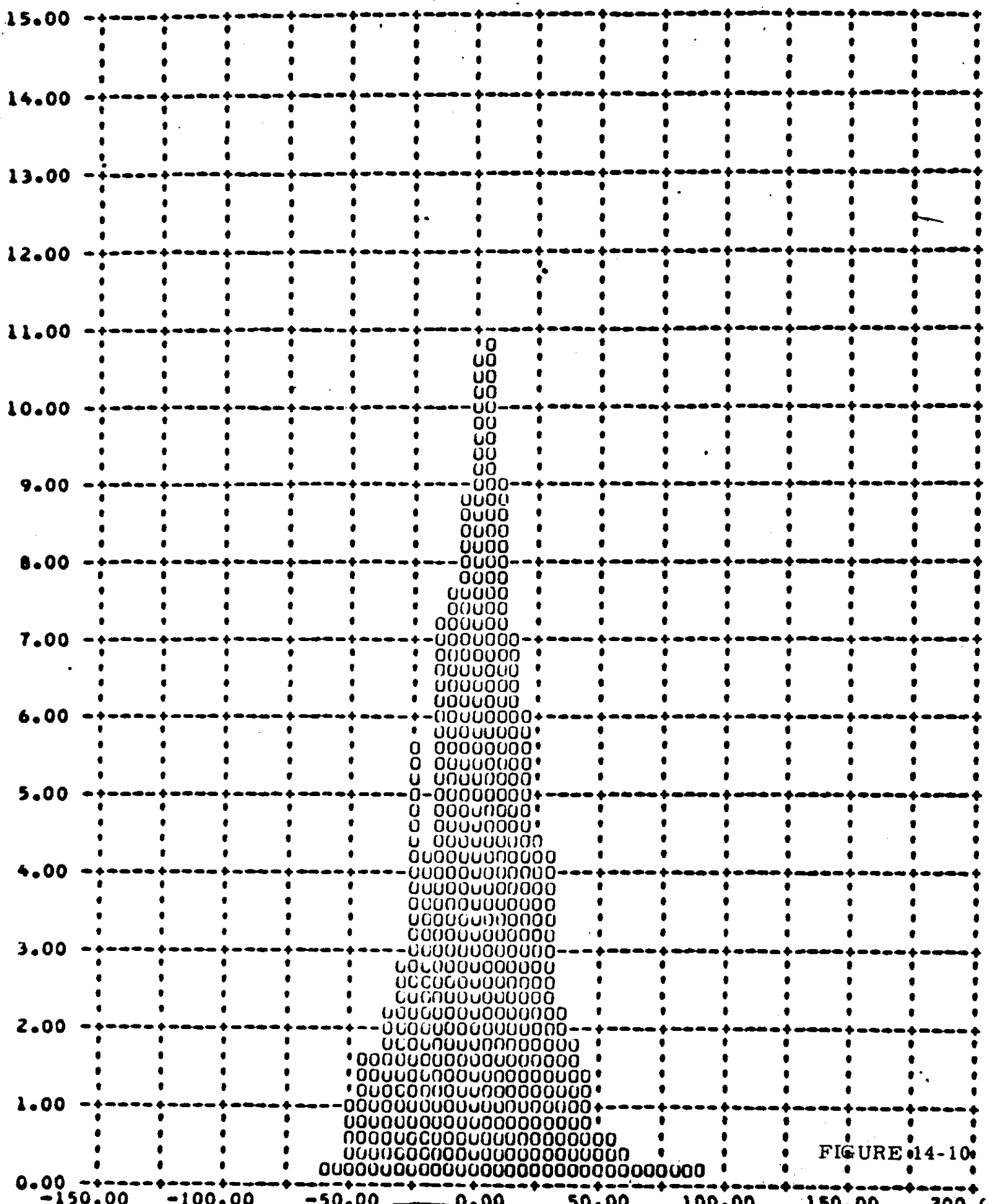

FIGURE 14-10

SECTION 15

IMAGE SMEAR ANALYSIS

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

The computer rejects the first six frames of all operations as the large V/h error induced by camera start-up is not representative of the overall system operations. The frequency distribution of the V/h errors and resolution limits are computer plotted and are shown in Figures 15-1 through 15-10.

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

MISSION 1014

V/h RATIO AND RESOLUTION LIMITS

Value	Units	Camera	Mission 1014-1 90%	Mission 1014-1 Range	Mission 1014-2 90%	Mission 1014-2 Range
V/h Ratio Error	%	FWD	2.18	-4.8 to +2.2	1.36	-6.0 to +2.0
		AFT	3.34	-5.8 to +0.4	3.19	-7.2 to -0.4
Along Track Resolution Limit	Feet	FWD	6.18	0.2 to 10.6	6.39	0.2 to 11.0
		AFT	2.79	0.2 to 5.6	2.17	0.2 to 4.8
Cross Track Resolution Limit	Feet	FWD	8.75	1.6 to 11.8	N/A	
		AFT	6.25	1.2 to 8.4	N/A	

TABLE 15-1

J-16 A BUCKET - FWD INSTR FRAMES 1-6 OF EACH OP OMITTED 90 PERCENT = 2.1

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

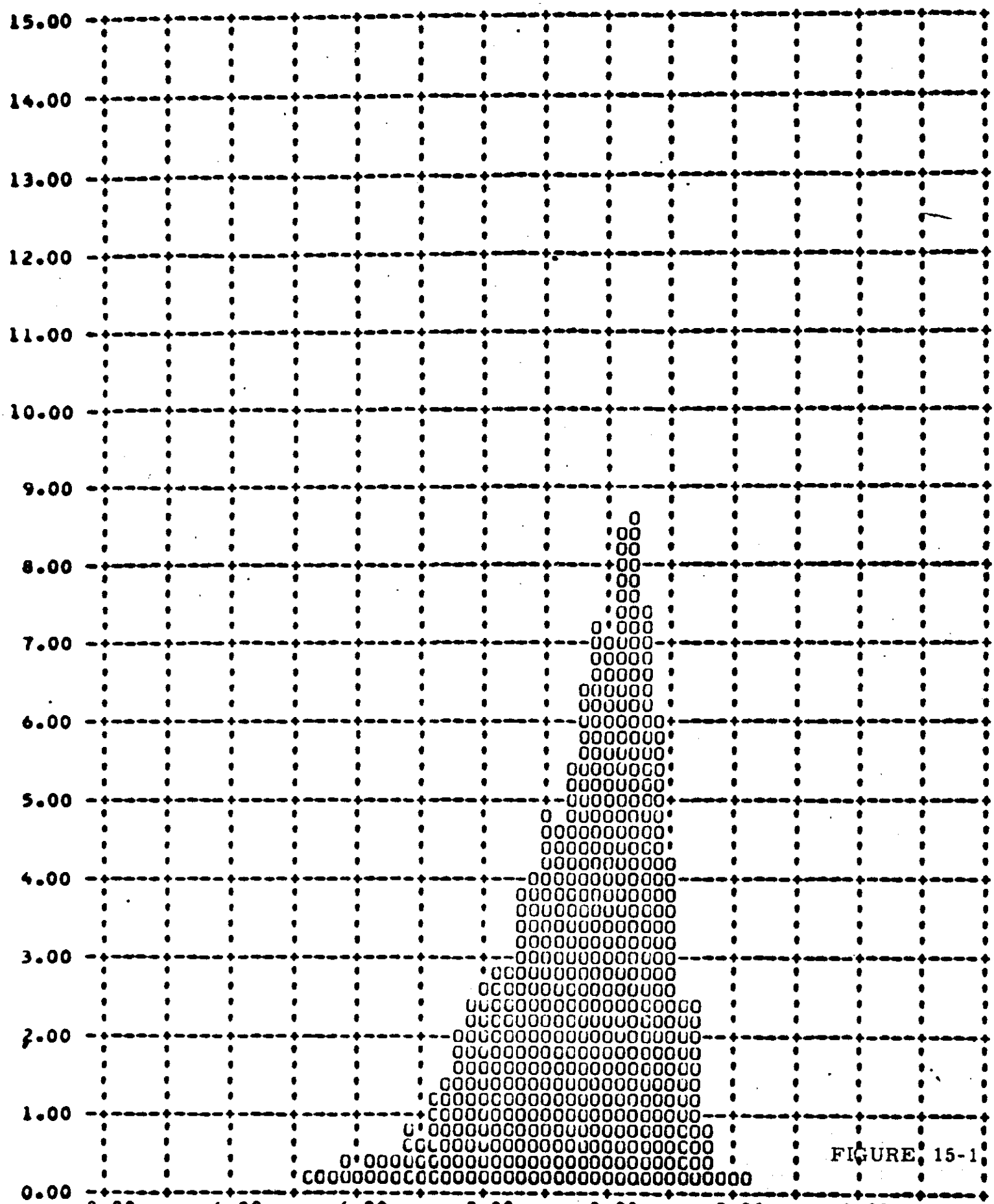

FIGURE 15-1

J-16 A BUCKET - FWD INSTR FRAMES 1-6 OF EACH OP OMITTED 90 PERCENT = 6.1

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

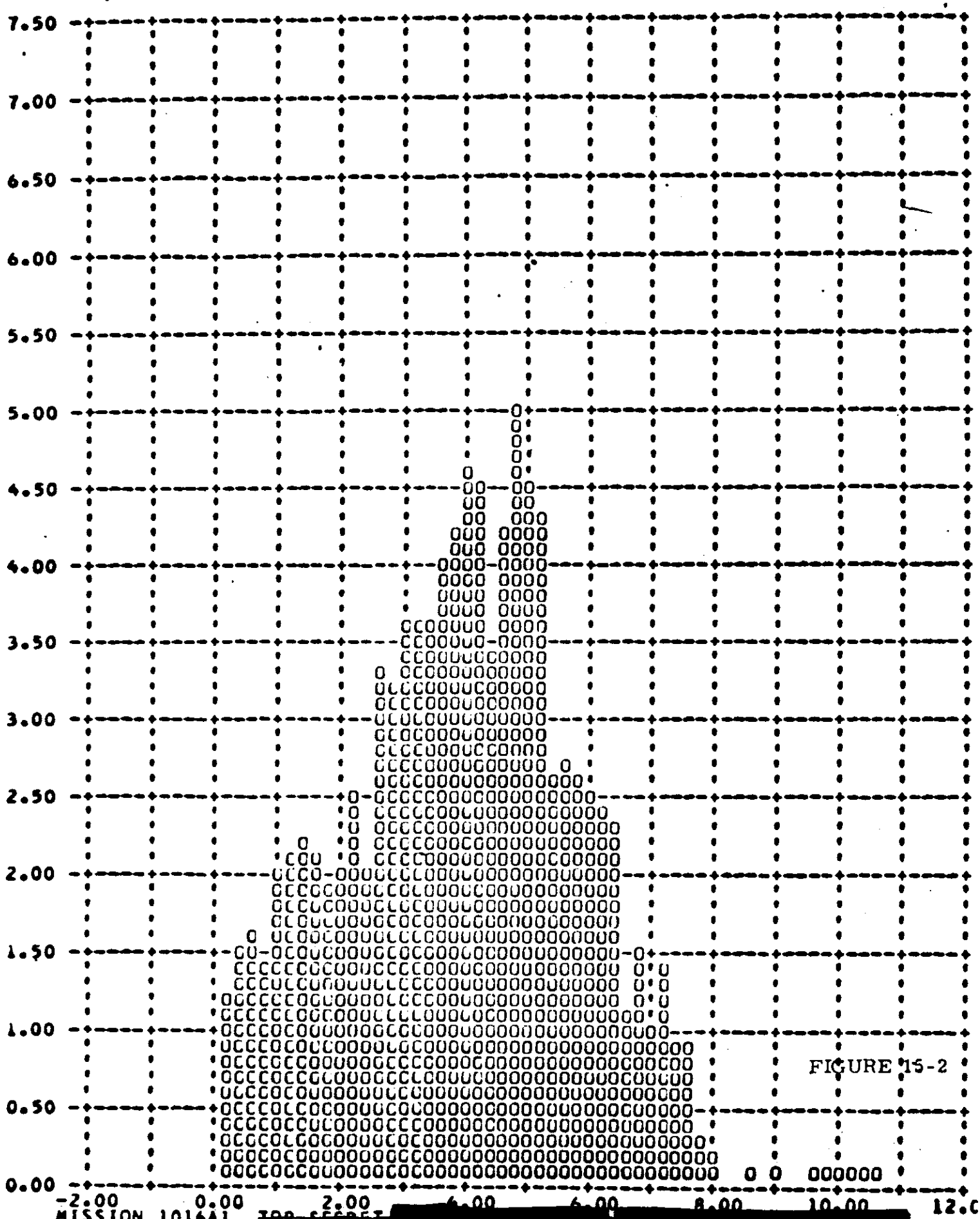

FIGURE 15-2

J-16 A BUCKET - FWD INSTR FRAMES 1-6 OF EACH OP OMITTED 90 PERCENT = 8.75

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

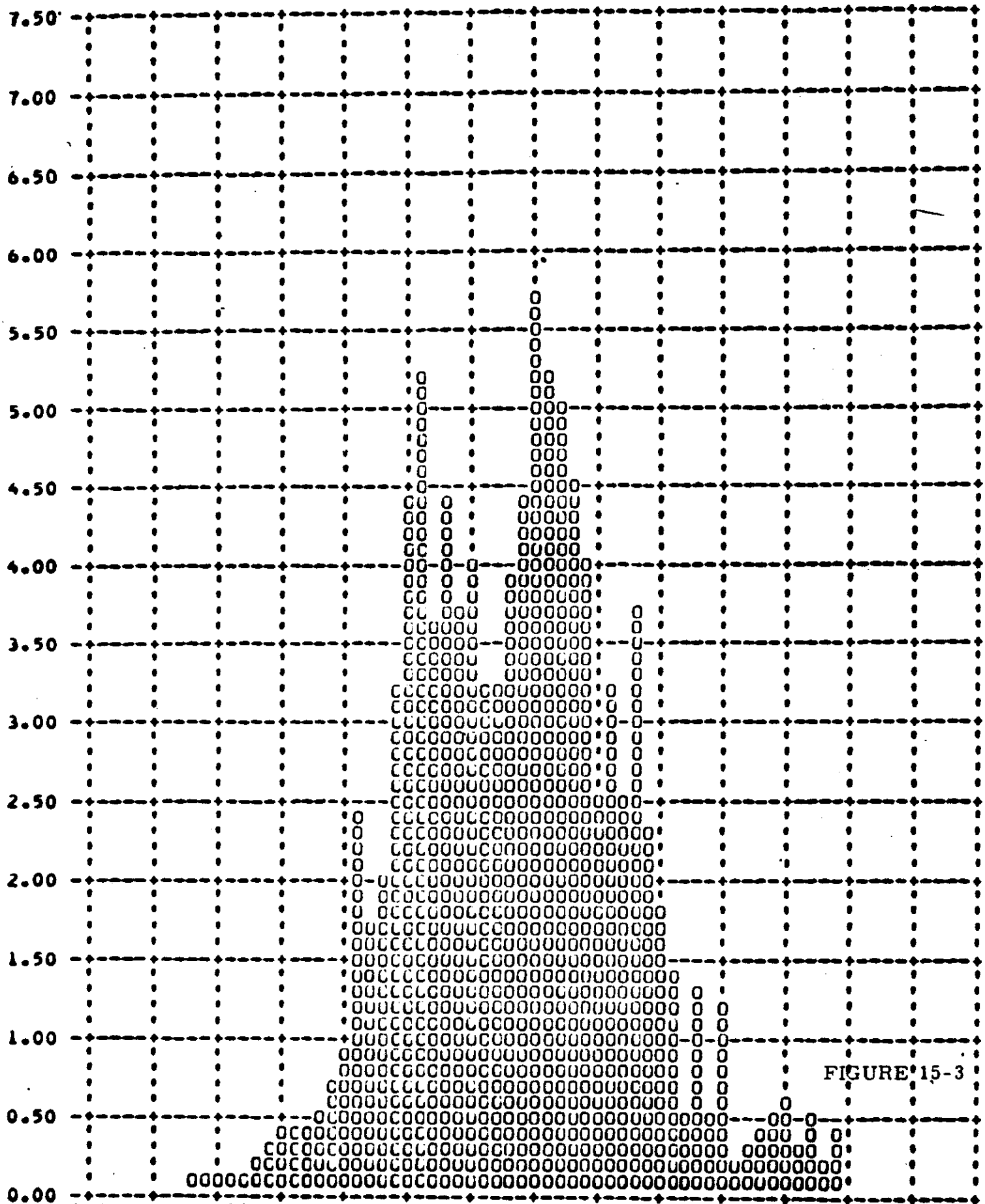

FIGURE 15-3

J-16 A BUCKET - AFT INSTR FRAMES 1-6 OF EACH OP OMITTED 90 PERCENT = 3.3

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

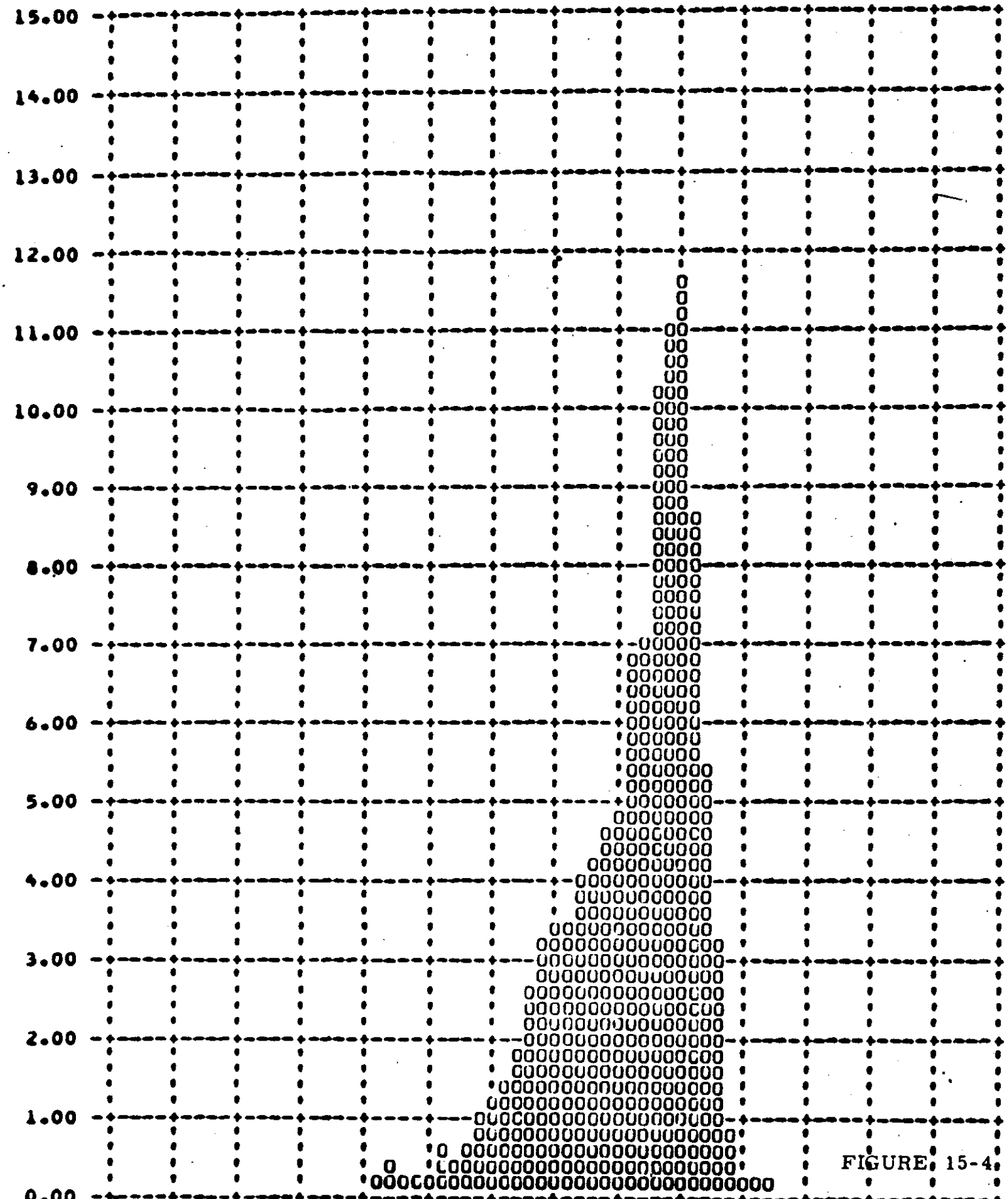

FIGURE 15-4

J-16 A BUCKET - AFT INSTR FRAMES 1-6 OF EACH OP OMITTED 90 PERCENT = 2.7

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

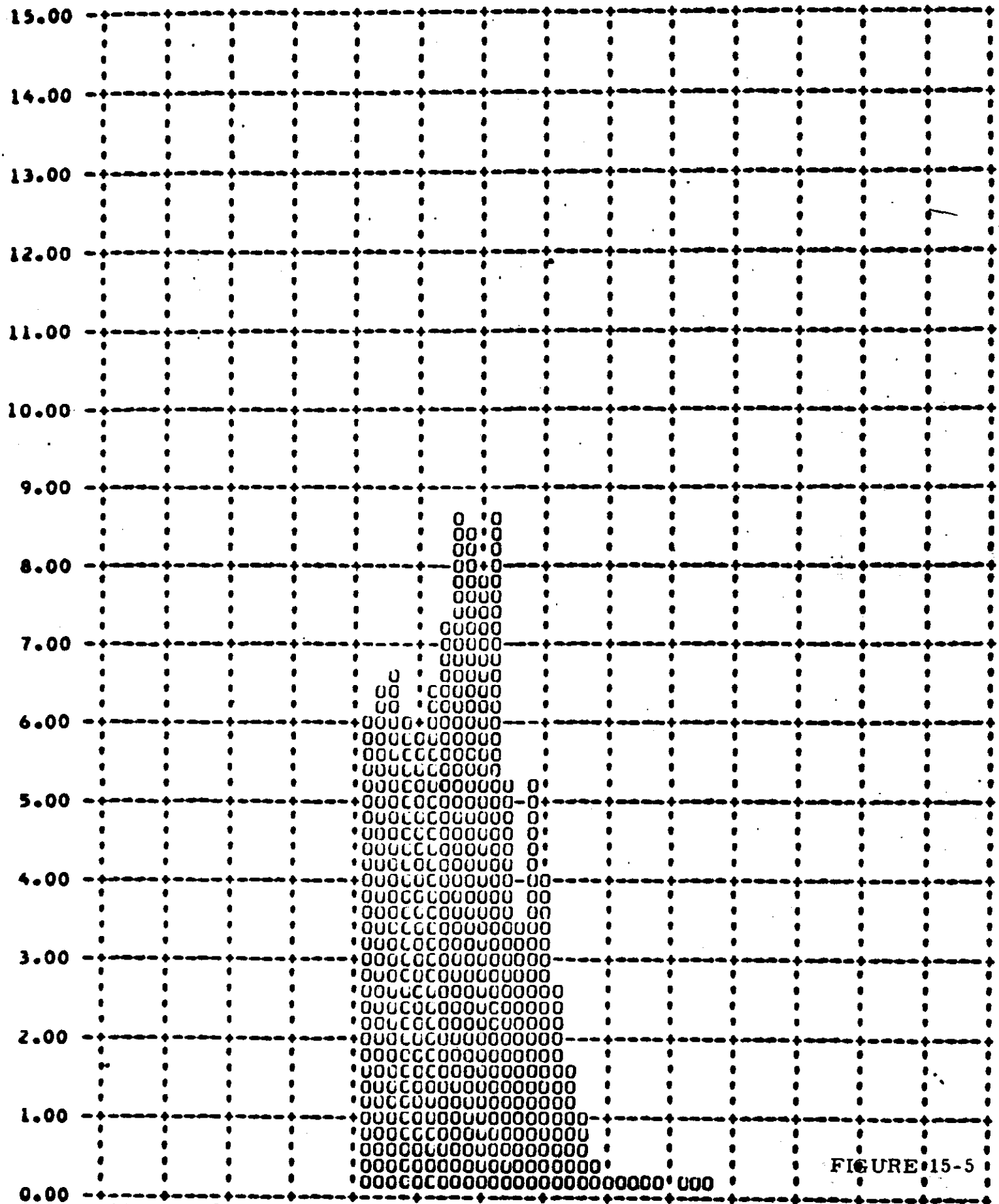

FIGURE 15-5

J-16 A BUCKET - AFT INSTR FRAMES 1-6 OF EACH OP OMITTED 90 PERCENT = 6.2

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

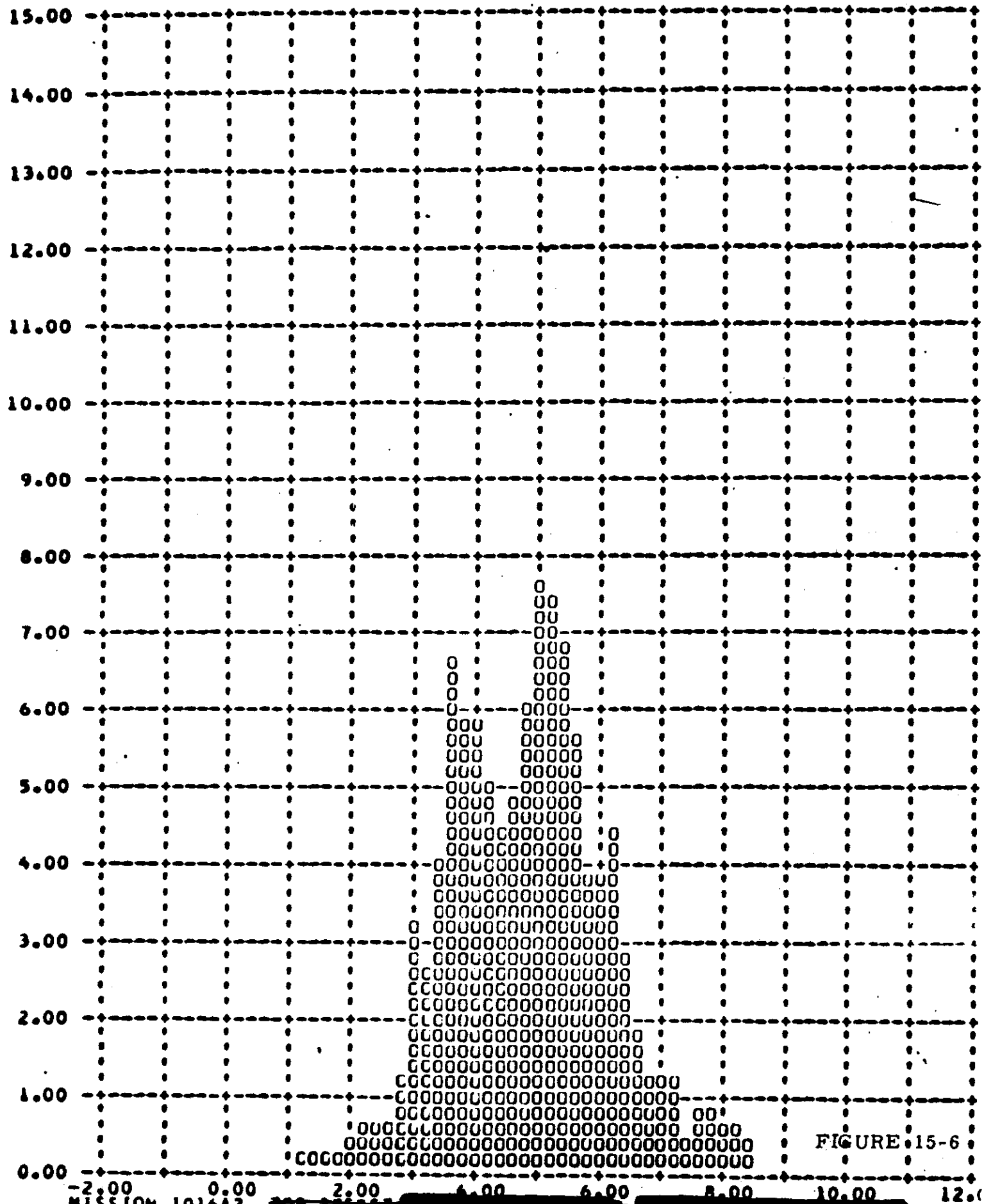

FIGURE 15-6

J-16 B BUCKET - FWD INSTR FRAMES 1-6 OF EACH OP OMITTED 90 PERCENT = 1.3

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

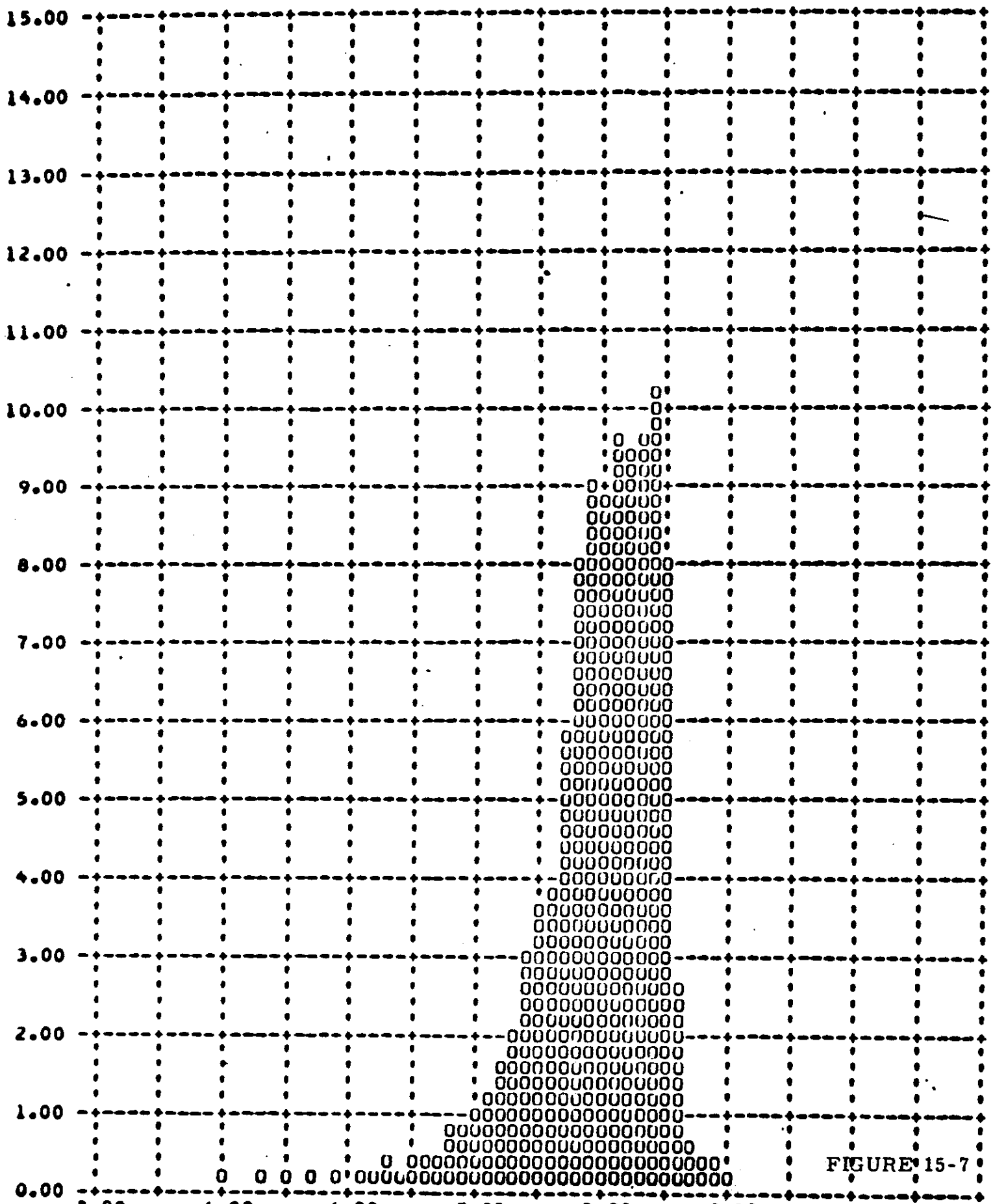

FIGURE 15-7

J-16 B BUCKET - FWD INSTR FRAMES 1-6 OF EACH OP OMITTED 90 PERCENT = 6.3

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

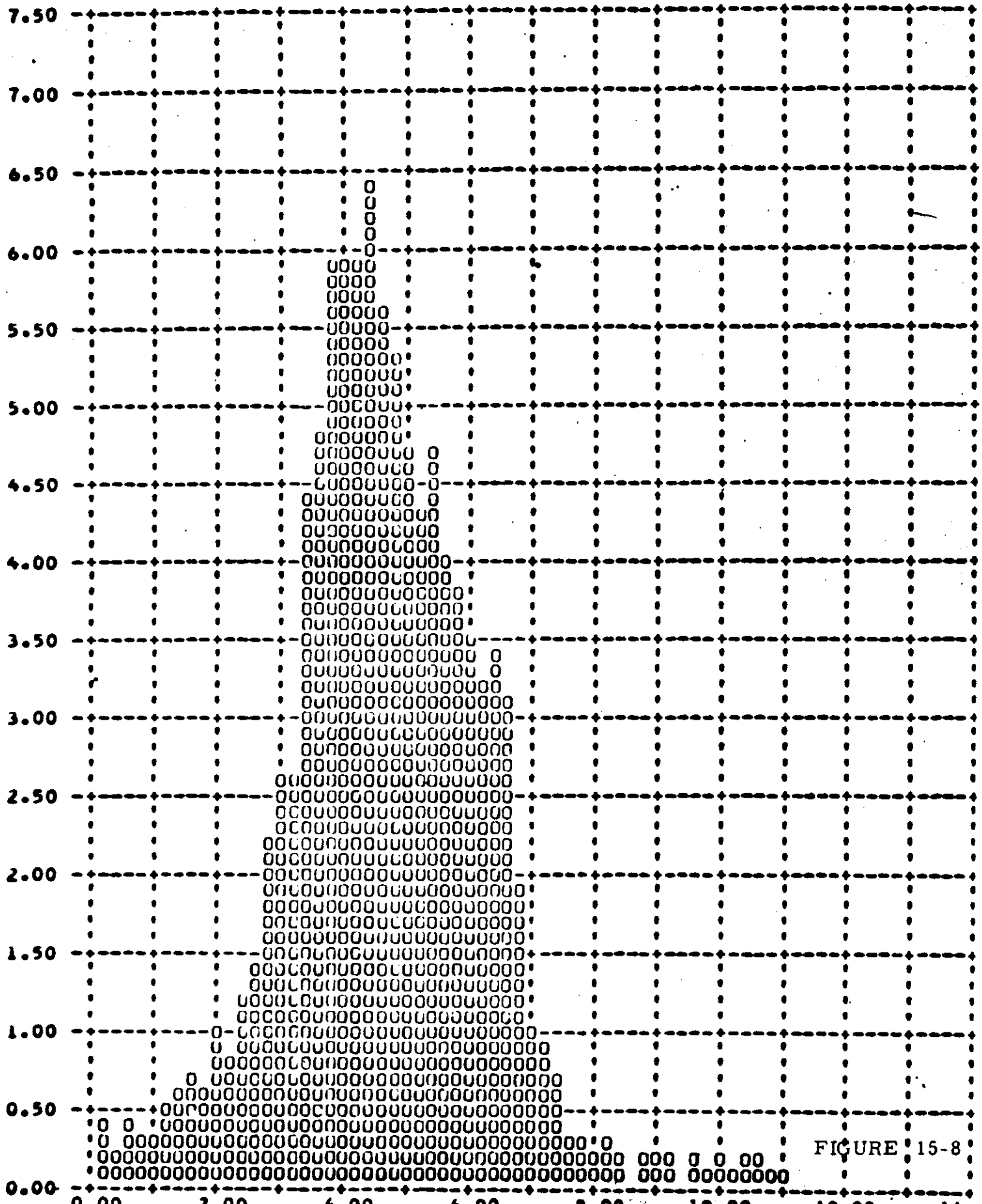

FIGURE 15-8

J-16 B BUCKET - AFT INSTR FRAMES 1-6 OF EACH OP OMITTED 90 PERCENT = 3.1

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

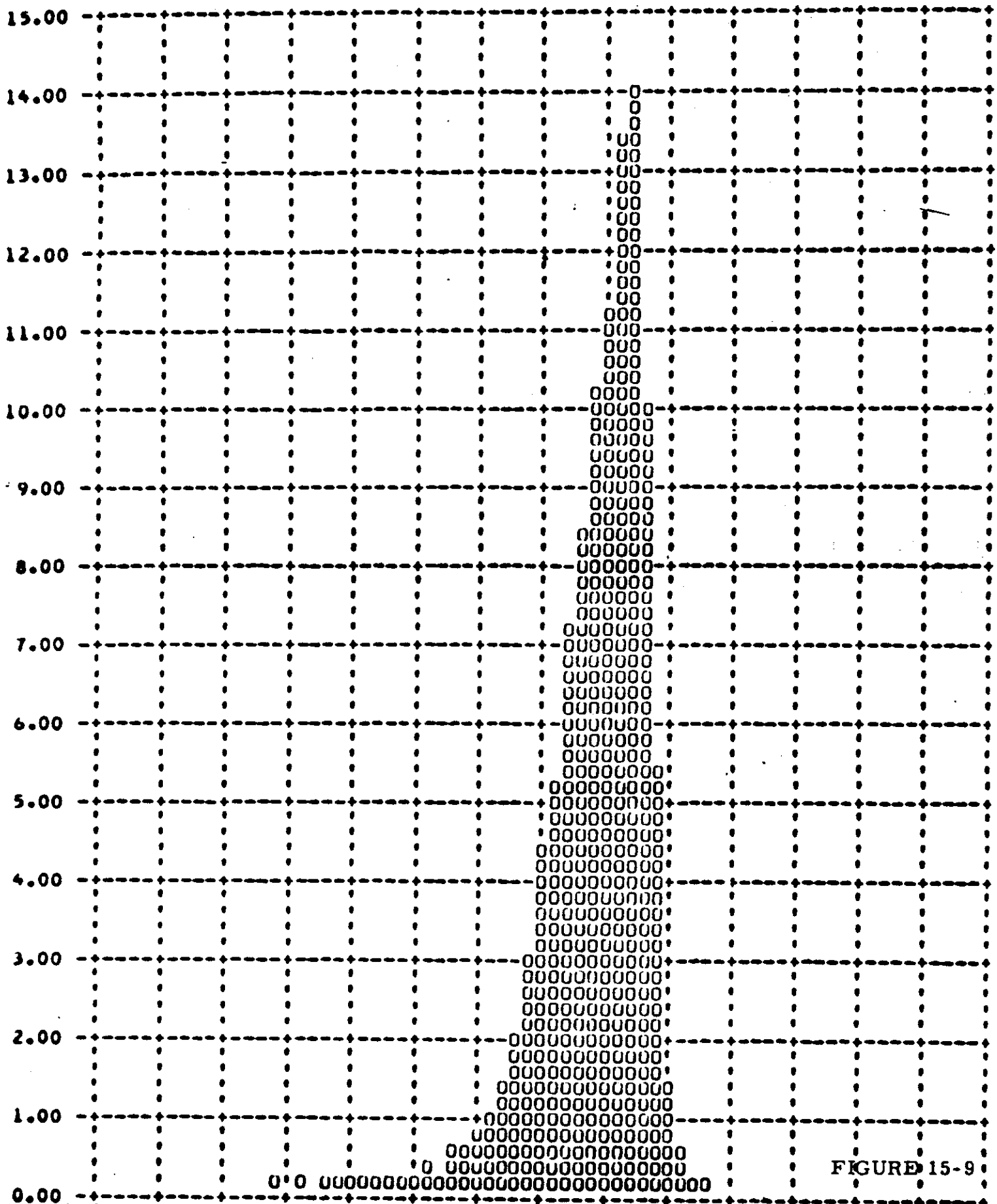

FIGURE 15-9

J-16 B BUCKET - AFT INSTR FRAMES 1-6 OF EACH OP OMITTED 90 PERCENT = 2.1

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

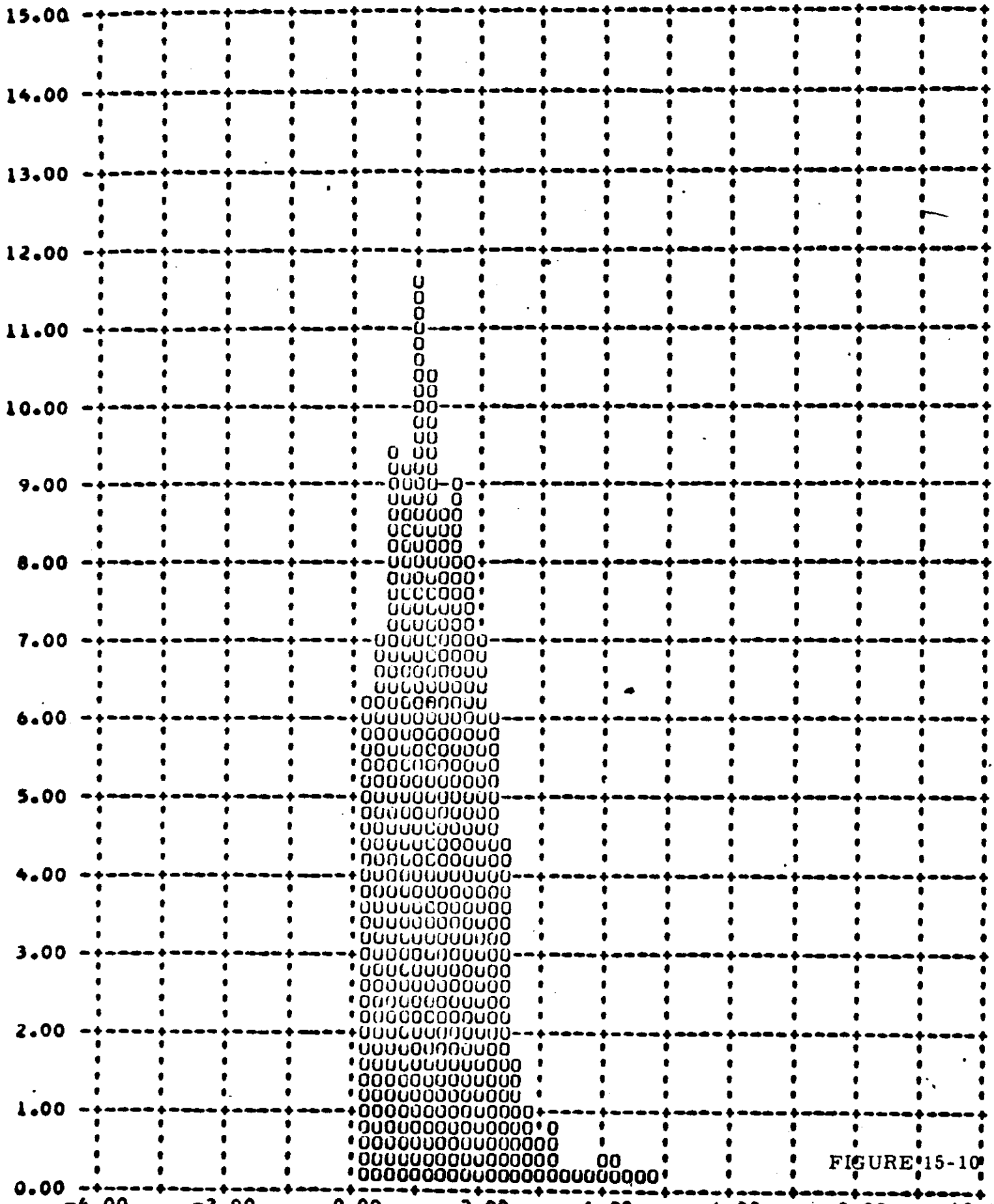

FIGURE 15-10

SECTION 16

RADIATION DOSAGE

Each recovery system flown on a Corona mission contains a sealed packet of Eastman Type 4401 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.

	Mission 1014-1		Mission 1014-2	
Emulsion	B + F Density	Radiation	B + F Density	Radiation
Type 4401	0.15	0.4 R	0.15	0.4 R
Royal X Pan	0.17	0.2 R	0.17	0.2 R

The mean total radiation seen by the take-up cassettes during both missions was approximately 0.3 roentgens. This level is somewhat less than 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 mission functions are horizon camera operation excluding catastrophic open shutter failure mode, auxiliary data recording, and stellar-index camera operation.

Panoramic Camera Reliability

Sample Size - 82 opportunities to operate.
One failure - capping shutter on slave instrument on system M-7.
Assume - 3000 cycles per camera per mission.
Estimated Reliability = 97.9% at 50% confidence level

Main Camera Door Reliability

Sample Size - 32 vehicles x 2 doors = 64 opportunities to operate.
Estimated Reliability = 99.0% at 50% confidence level.

Payload Command and Control

Sample Size - 4056 hours operation in sample.
One failure
Estimated Reliability = 96.1% at 50% confidence level.

Payload Clock Reliability

Sample Size - 4056 hours operation in sample.
No failures.
Estimated Reliability = 98.3% at 50% confidence level.

Estimated Reliability of Payload Functioning on orbit = 96.1% at 50% confidence level.

Recovery System Reliability

30 opportunities to recover
1 failure - improper separation due to water seal - cutter failure.
Estimated Reliability = 94.4% at 50% confidence level.

Stellar-Index Camera Reliability

Sample begins with J5
Sample size = 6,375 cycles
One failure.
Estimated Reliability = 89.6% at 50% confidence level.

Horizon Camera Reliability

Sample begins with J-5.
Sample size - 28,500 cycles
Estimated Reliability of Single Camera = 96.4% at 50% confidence level.
Estimated Reliability of Four Horizon Cameras at a Parallel Redundant System = 99.9% at 50% confidence level.

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 18-4.

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.

MISSION SUMMARY

~~TOP SECRET~~ [redacted]

TOP SECRET [redacted]

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 / 112	124	0.250	W-21	125	0.250	W-21	029/29/29 / 042/42/43
1006	J-08	1176	6/4/64	2259 Z	79.9	84.0	63.2	65 / 128	148	0.200	W-21	149	0.200	W-21	049/53/42 / 045/47/45
1007	J-07	1609	6/19/64	2318 Z	85.0	99.2	41.5	65 / 128	144	0.250	W-25	145	0.200	W-21	043/43/43 / 054/56/51
1008	J-10	1177	7/10/64	2314 Z	85.0	99.4	40.8	49 / 112	150	0.200	W-21	151	0.200	W-21	048/49/48 / 033/28/33
1009	J-12	1605	8/5/64	2316 Z	80.1	99.6	39.8	49 / 128	154	0.200	W-21	155	0.200	W-21	036/34/36 / 038/38/34
1010	J-11	1178	9/14/64	2254 Z	84.9	97.4	42.8	65 / 144	152	0.175	W-21	153	0.175	W-21	041/41/41 / 044/46/44
1011	J-03	1170	10/9/64	2150 Z	79.9	99.3	20.9	65 / —	160	0.175	W-21	161	0.175	W-21	030/30/30 / 037/37/37
1012	J-13	1179	10/17/64	2202 Z	75.0	96.2	32.4	49 / 81	156	0.200	W-21	157	0.200	W-21	031/31/47 / 046/52/53
1013	J-18	1173	11/2/64	2150 Z	80.0	100.0	25.0	65 / —	158	0.225	W-21	159	0.225	W-21	052/49/55 / 047/48/54
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	055/59/49 / 050/44/46

~~TOP SECRET~~ [redacted]

TABLE 18-1

PERFORMANCE SUMMARY

MISSION NUMBER	CAMERA	SERIAL NUMBER	MTF VALUE	VISUAL RES	AFSPPL MTF/AIM SLIT (μ)	AFSPPL MTF/AIM AVERAGE	MTF/AIM SLIT (μ)	MTF/AIM AVERAGE	[redacted] SLIT (μ)	[redacted] MTF/AIM AVERAGE ALL	[redacted] MTF/AIM AVERAGE HIGH	90% ATTITUDE ERROR (°) PITCH	90% ATTITUDE ERROR (°) ROLL	90% ATTITUDE ERROR (°) YAW	90% ATTITUDE RATES (7HR) PITCH	90% ATTITUDE RATES (7HR) ROLL	90% ATTITUDE RATES (7HR) YAW	90% V/H ERROR (%)	90% RESOLUTION LIMIT (FEET) ALONG TRACK	90% RESOLUTION LIMIT (FEET) CROSS TRACK
1004-1	FWD	124	85	78	350	97	43	109	320	115	127	0.45	0.42	1.08	30.0	25.0	21.0	5.1	7.7	6.1
	AFT			84		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	8.5
	AFT			73		83		106		89	95									
1006-1	FWD	148	90	78	350	65	43	88	320	84	97	0.41	0.42	1.14	26.8	28.5	27.8	15.4	13.8	6.7
	AFT			74		71		90		87	92									
1006-2	FWD	149	90	85		64		81		84	90	0.49	0.40	1.08	31.1	27.9	30.0	11.6	10.1	7.0
	AFT			83		72		90		87	94									
1007-1	FWD	144	85	80	350	60	43	87	320	82	91	0.58	0.46	1.43	37.6	23.9	29.9	3.6	3.1	9.4
	AFT			86		63		83		97	110							4.8	2.1	7.6
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	80	43	95	320	81	89	0.59	0.39	0.94	43.8	23.9	29.6	2.9	4.9	5.9
	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	2.8	4.2	5.4
	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	5.3	5.8
	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	5.9
	AFT			87		87				72	79									
1010-1	FWD	152	85	90	350	90	80	88	80	87	96	0.93	0.30	0.87	39.1	23.6	30.8	4.5	2.3	4.4
	AFT			88		86		80		92	105									
1010-2	FWD	153	85	92		81		82		82	93	0.59	0.70	1.21	45.4	23.6	30.7	4.6	7.5	3.8
	AFT			90		82		85		87	98									
1011-1	FWD	160	90	84	350	76	80	96	80	78	87	0.77	0.39	0.97	43.1	28.9	31.1	2.3	5.3	5.8
	AFT	161		84		77		86		83	93									
1012-1	FWD	156	85	92	—	—	80	91	80	84	98	0.65	0.51	—	47.1	33.2	—	1.5	4.8	—
	AFT			91				87		89	100									
1012-2	FWD	157	85	91				89		84	91	0.97	0.77	0.51	45.2	30.7	20.4	5.9	3.3	8.9
	AFT			89				96		85	98									
1013-1	FWD	158	85	89	—	—	80	94	80	85	99	0.64	0.32	1.34	36.9	29.0	32.3	3.7	7.8	8.3
	AFT	159		77				97		81	103	0.64	0.32	1.34	36.9	29.0	32.3	4.5	5.8	8.2
1014-1	FWD	162	80	87	—	—	80	78	80	74	86	0.62	0.41	1.46	35.0	36.1	38.5	2.2	6.2	6.8
	AFT			85				80		95	107	0.62	0.41	1.44	34.8	36.0	38.3	3.3	2.8	8.3
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	2.2	—

TABLE 18-2

EXPOSURE - PROCESSING SUMMARY

MISSION NUMBER	CAMERA	SOLAR ELEVATION RANGE (°)		SOLAR AZIMUTH RANGE (°)		PREDICTED PROCESSING (%)			REPORTED PROCESSING (%)			COMPUTED PROCESSING (%)			TERRAIN D-MIN				TERRAIN D-MAX				CLOUD D-MAX				UNDER EXPOSED (%)	UNDER PROCESSED (%)	NOMINAL EXP & PRO (%)	OVER PROCESSED (%)	OVER EXPOSED (%)	CLOUD COVER (%)
															RANGE				RANGE				RANGE									
		LOW	HIGH	LOW	HIGH	P	I	F	P	I	F	P	I	F	LOW	HIGH	MEAN	MEDIAN	LOW	HIGH	MEAN	MEDIAN	LOW	HIGH	MEAN	MEDIAN						
1004-1	FWD	-3	61	25	124	5	78	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	0.78	0.36	2.30	1.84	1.90	0.41	2.37	1.87	1.93	0	4	59	27	9	35
	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	35
1006-1	FWD	38	56	52	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	60
	AFT	38	56	52	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	60
1006-2	FWD	32	64	36	147	2	98	0	30	41	29	11	59	30	0.21	1.14	0.53	0.50	0.56	2.28	1.49	1.50	1.30	2.33	2.11	2.16	2	21	72	4	0	45
	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	41	77	9	3	48
1007-1	FWD	12	49	50	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	1.36	2.17	2.21	20	8	67	5	0	60
	AFT	11	49	48	102	0	100	0	10	42	48	6	77	17	0.26	1.76	0.58	0.55	0.78	2.31	1.52	1.52	1.54	2.39	2.20	2.24	1	13	80	5	1	60
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	2.15	2.20	18	9	71	2	0	65
	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	16	74	9	1	65
1008-1	FWD	50	51	50	102	0	100	0	4	32	64	1	35	64	0.32	1.48	0.66	0.62	0.78	2.24	1.55	1.54	1.46	2.35	2.21	2.24	2	2	86	3	1	45
	AFT	50	51	50	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	45
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	65
	AFT	29	56	42	105	0	100	0	3	30	67	0	29	71	0.32	1.64	0.77	0.76	0.73	2.10	1.55	1.55	1.10	2.35	2.18	2.22	1	3	69	27	0	65
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	50
	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	5	73	20	0	50
1009-2	FWD	23	58	35	138	2	98	0	3	21	76	0	40	60	0.29	1.55	0.69	0.64	0.73	2.37	1.53	1.53	1.06	2.45	2.25	2.30	4	4	74	17	0	55
	AFT	23	58	35	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	1.61	2.50	2.31	2.34	1	4	77	18	0	55
1010-1	FWD	18	47	45	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	3	75	4	0	48
	AFT	18	47	45	83	0	21	79	0	19	81	0	16	84	0.27	1.25	0.57	0.52	0.78	2.42	1.45	1.41	0.96	2.46	2.20	2.26	9	4	81	6	0	48
1010-2	FWD	15	52	38	76	0	50	50	0	16	84	0	13	87	0.26	1.51	0.55	0.50	0.52	2.36	1.41	1.38	1.00	2.44	2.14	2.20	22	4	67	6	0	45
	AFT	15	52	38	76	0	50	50	0	23	77	0	25	75	0.20	1.48	0.59	0.56	0.30	2.40	1.47	1.45	1.29	2.48	2.18	2.22	13	3	76	8	0	45
1011-1	FWD	2	55	33	66	0	64	36	2	23	75	2	23	75	0.18	0.99	0.50	0.46	0.56	2.36	1.48	1.43	0.78	2.40	2.07	2.16	17	11	70	2	0	40
	AFT	2	55	33	66	0	67	33	3	47	50	0	37	63	0.24	1.48	0.60	0.56	0.50	2.35	1.57	1.55	0.74	2.37	2.11	2.18	3	7	81	8	0	40
1012-1	FWD	0	45	38	71	0	64	36	7	56	37	0	65	35	0.25	1.30	0.59	0.53	0.54	2.39	1.40	1.42	0.90	2.39	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	5	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	1.42	0.67	2.34	1.91	2.00	4	9	80	7	0	40
	AFT	0	57	34	106	0	77	23	3	15	82	0	10	90	0.30	1.27	0.68	0.62	0.48	2.33	1.55	1.58	0.70	2.38	1.96	2.02	4	0	72	23	0	40
1013-1	FWD	0	56	28	83	0	64	36	0	42	58	0	55	45	0.20	1.66	0.56	0.36	0.52	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	0.48	0.64	2.28	1.59	1.63	1.10	2.36	1.97	2.03	5	8	74	16	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	0.26	2.36	1.40	1.42	1.01	2.38	1.94	2.05	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	8	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	78	0	34	0	29	71	0	5	95	0	68	32	0.18	1.49	0.44	0.40	0.27	2.28	1.34	1.45	0.26	2.44	1.71	1.84	19	29	50	2	0	40

TABLE 18-3

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 SPECIMENS / 1 / 97.3	52 DOORS / 0 / 98.6	3124 HOURS / 0 / 98.0	3124 HOURS / 0 / 98.0	96.1	18 CAPSULES / 1 / 90.7	3400 CYCLES / 3 / 83.1	12,000 CYCLES / 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 / 89.3	15,000 / 0 / 93.4
1010	68 / 1 / 97.6	56 / 0 / 98.8	3432 / 0 / 98.1	3432 / 0 / 98.1	96.4	22 / 1 / 92.5	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	96.6	24 / 1 / 93.0	5525 / 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 / 93.8	5525 / 0 / 94.7	24,000 / 0 / 95.8
1013	78 / 1 / 97.8	62 / 0 / 99.0	3940 / 1 / 95.9	3940 / 0 / 98.3	96.0	28 / 1 / 94.0	5950 / 0 / 95.1	25,500 / 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 / 96.4

TABLE 18-4

* DESIGN FIX NEGATED PREVIOUS FAILURE CONSIDERATIONS

** ONE SAMPLE OUT OF REQUIREMENT

Distribution

[redacted]