

SECRET



MODEL C'''




13 Pages
(Including cover sheet)


FLIGHT INSTRUMENT DATA BOOK

INSTRUMENT NO. 56

VEHICLE NO. 1115

MISSION NO. 9025

Prepared by: 

Checked by: 

Approved by: 
(Engineering Manager)

Approved by: 
(Project Manager)

Declassified and Released by the N R C

In Accordance with E. O. 12958

NOV 26 1997

SECRET
SECRET



~~SECRET~~

INSTRUMENT NO. 56

Page 2 of 13

VEHICLE NO. 1115

MISSION NO. 9025

TABLE OF CONTENTS

	Page No.
General Data	3
Pre-Launch Settings	4
Performance Estimate	5
Cycle Period (Pre-Flight Measurements)	6
Cycle-Period (Verification In Flight)	6
Cycle Period Plot	7
Lens Data Summary (Main Camera)	8
Lens Data Summary (Horizon Camera)	9
Definition of Format Calibration	10 11
Format Dimensions	12
Format Layout	13

~~SECRET~~

~~SECRET~~
~~SECRET~~

INSTRUMENT NO. 56

Page 3 of 13

VEHICLE NO. 1115

MISSION NO. 9025

GENERAL FLIGHT DATA:

Discoverer No. XXXII

Booster No. 328

Fairing No. NOT AVAILABLE

Recovery Capsule No. USE-555

Cassette No. 56

Launch Time 19 22 34.27 GMT

Recovery Time 11 07 00 GMT

Recovery Revolution No. 18

Orbital Parameters (Rev. 10)

Period 90.834 MIN. Eccentricity 0.01268

Perigee 128 NM Perigee Latitude 16.85° N

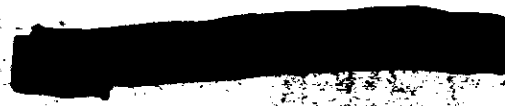
Apogee 222 NM Inclination Angle 81.63°

REMARKS:

NONE

~~SECRET~~
~~SECRET~~

~~SECRET~~



INSTRUMENT NO. 56

Page 4 of 13

VEHICLE NO. 1115

MISSION NO. 9025

PRE-LAUNCH SETTINGS:

V/h Ramp Setting 4 At Launch

Main Optics Slit Width 0.200 Inches

Horizon Camera Exposure Time:

Port (Take-Up) 1/100 Seconds

Starboard (Supply) 1/100 Seconds

Film:

Type J23 (50132)

Length 7600 FT.

Weight 38.8 Lbs.

Supply Spool No. 15

No. of Splices 3

Emulsion Mfg. Data 9-4-7-1

Box Serial No. 1076



~~SECRET~~

INSTRUMENT NO. 56
 VEHICLE NO. 1113
 MISSION NO. 9025

~~SECRET~~
~~SECRET~~

11/17/50
 11/17/50 (Inf/Sec)

PERFORMANCE ESTIMATE [REDACTED]

OP. NO.	Ramp	Estimated Latitude		Approx On Time (GMT) Day Hr Min	Duration of Operation			Exposure Time milliseconds	
		ON	OFF		Sec	Frames	Feet	ON	OFF
<i>PRE-ARRANGED</i>						109	288		
1DE	4	55	49	13 20 52	94	24	63	5.2	5.2
2D	4	72	63	13 22 19	143	44	117	4.4	4.2
3D	4	61	56	13 23 53	78	25	67	4.1	4.0
4D	4	55	45	14 01 25	151	51	136	4.0	3.8
5D1	4	74	71	14 02 51	50	15	40	4.5	4.4
5D2	4	54	38	14 02 56	241	84	223	4.0	3.7
7D1	4	73	65	14 05 53	128	39	104	4.4	4.2
7D2	4	60	42	14 05 56	273	93	247	4.1	3.7
8D	4	70	36	14 07 25	520	176	465	4.3	3.7
9A _E	4	35	38	14 08 37	47	12	32	5.2	5.2
9D	4	62	43	14 08 58	289	98	259	4.1	3.7
10D	4	54	48	14 10 31	92	31	83	3.9	3.8
15D	4	45	39	14 18 07	90	33	86	3.7	3.7
17D	4	72	64	14 21 02	127	40	105	4.3	4.1
18D	4	71	62	14 22 23	143	45	120	4.3	4.1

~~SECRET~~

[REDACTED]

INSTRUMENT NO. 56
 VEHICLE NO. 1115
 MISSION NO. 9025

~~SECRET~~

CYCLE PERIOD (PRE-FLIGHT MEASUREMENTS)

V/h Ramp	Cycle Period Seconds	FMC Rate		Scan Rate		
		Rad. Per Second	In. Per Second	Rad. Per Second	In. Per Second	Seconds Exposure
4 START	3.92	0.022	0.517	1.603	38.47	0.0052
4 FINISH	2.76	0.031	0.734	2.276	54.64	0.0036

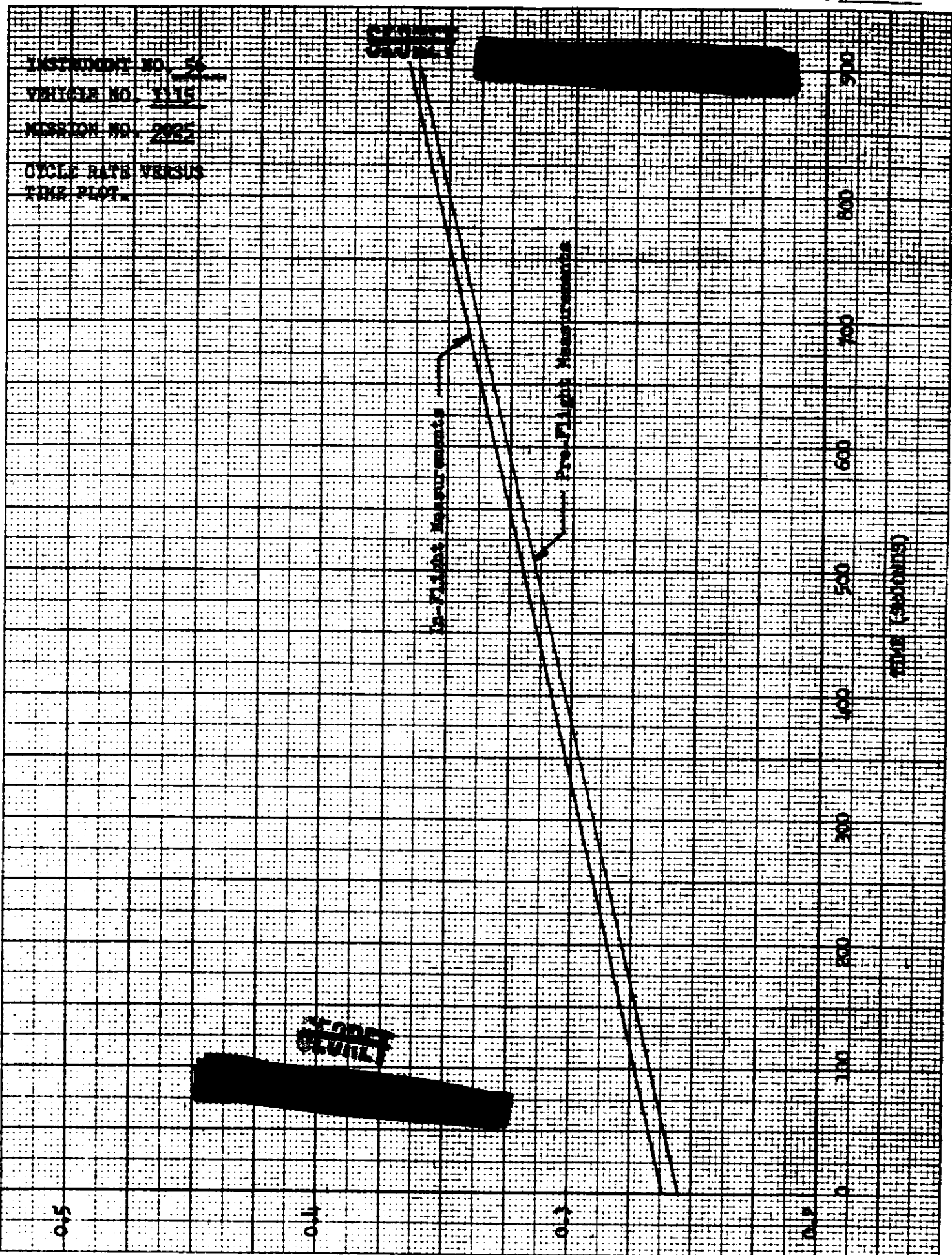
CYCLE PERIOD (IN-FLIGHT VERIFICATION)

Rev.No.	V/h Ramp	Cycle Period Seconds	FMC Rate		Scan Rate		
			Rad. Per Second	In. Per Second	Rad. Per Second	In. Per Second	Seconds Exposure
9AE	4 START	3.83	0.022	0.528	1.640	39.38	0.0052
15D	4 FINISH	2.73	0.031	0.742	2.301	55.24	0.0037

~~SECRET~~

INSTRUMENT NO. 54
 VEHICLE NO. 1115
 MISSION NO. 2025
 CYCLE RATE VERSUS
 TIME PLOT

SECRET
SECRET



SECRET
SECRET

CYCLE RATE (CPS)

TIME (SECONDS)

~~SECRET~~




LENS DATA SUMMARY (Main Camera)

Lens Serial No. F-9

Filter Type WRATTEN 21

Equivalent Operational Focal Length 24.0026 INCHES

Resolution: 168 lines/MM (Reported in )

Operational Message No. 

Static:

	<u>Lines/MM</u>	<u>Film Type</u>	<u>Target Contrast</u>
Bench Test		<u>NOT AVAILABLE</u>	

Dynamic:

	<u>Lines/Mi</u>	<u>Film Type</u>	<u>Target Contrast</u>
ITEK Pre-Vibration	<u>160.4</u>	<u>NOT AVAILABLE</u>	
ITEK Post-Vibration	<u>158.8</u>	<u>NOT AVAILABLE</u>	
L/H Pre-HATS		<u>NOT AVAILABLE</u>	
L/H Post-HATS	<u>168</u>	<u>J23</u>	<u>1000:1</u>
Other	<u>181</u>	<u>J23</u>	<u>1000:1</u>

Distortion - Positive (pincushion) in MM

357	357 1/2	358	359	0	1	2	2 1/2	3
.057	.033	.018	.002	.000	.000	.010	.025	.048

Note: Distortion and resolution data other than that performed at L/H are taken from ITEK Acceptance test procedure Test Data Sheets.

~~SECRET~~



INSTRUMENT NO. 56
 VEHICLE NO. 1115
 MISSION NO. 9025



LENS DATA SUMMARY: (HORIZON CAMERAS)

	Port (Take-Up)	Starboard (Supply)
Serial No.	<u>803303</u>	<u>803308</u>
Filter Type	<u>WRITTEN 25A</u>	<u>WRITTEN 25A</u>
Equivalent Operational Focal Length	<u>88.8 MM</u>	<u>88.95 MM</u>

Radial Distortion:

10° off Axis	<u>+0.004</u>	MM	<u>+0.004</u>	MM
20° off Axis	<u>+0.035</u>	MM	<u>+0.036</u>	MM
Tangential Distortion (Max Vector)	<u>+0.011</u>	MM	<u>+0.010</u>	MM

Resolution:

ANGLE OFF AXIS	0	5	10	15	20		0	5	10	15	20
RESOLUTION	56	44	36	29	20		56	44	39	34	31

NOTE:

- Distortion and resolution as measured at equivalent operational focal length.
- Resolution is in lines per MM on SUPER XX film and 1000:1 contrast target.



INSTRUMENT NO. 36
VEHICLE NO. 1175
MISSION NO. 9025

~~SECRET~~
~~SECRET~~

Page 10 of 13

DEFINITIONS OF FORMAT CALIBRATIONS

1. Measurements are made with respect to collimator targets fixed with respect to the mechanical interface between the total payload assembly and the Agena vehicle.
2. Three targets are aligned to be coplanar within $\pm 5''$ arc; the plane is set with the plane normal at $1.500^\circ \pm 5''$ to the Z axis (longitudinal vehicle axis) of the interface.
 - 2.1 One target, Target 1, is in the ZY plane (Nadir), imaging on the terrain format.
 - 2.2 The second and third targets are at $75^\circ \pm 5''$ from Target 1, imaged in horizon formats.
3. The indicated principal points of the two horizon cameras are the points of intersection of lines joining opposite fiducials.
4. The indicated center of format of the main, panoramic, camera is given by the intersection of a line through the center of mass of the central shrinkage marker drawn normal to the nearest edge of format and a line which is the best fit through the four horizon fiducials defining the X axes of the two horizon cameras.
5. X_{v0} and Y_{v0} are the offsets of Target 1, (i.e., in-flight "vertical") from the indicated center of format as defined in 4.
6. X_s , Y_s , and X_p , Y_p are offsets of the 75° targets from the indicated principal points of the two horizon cameras.

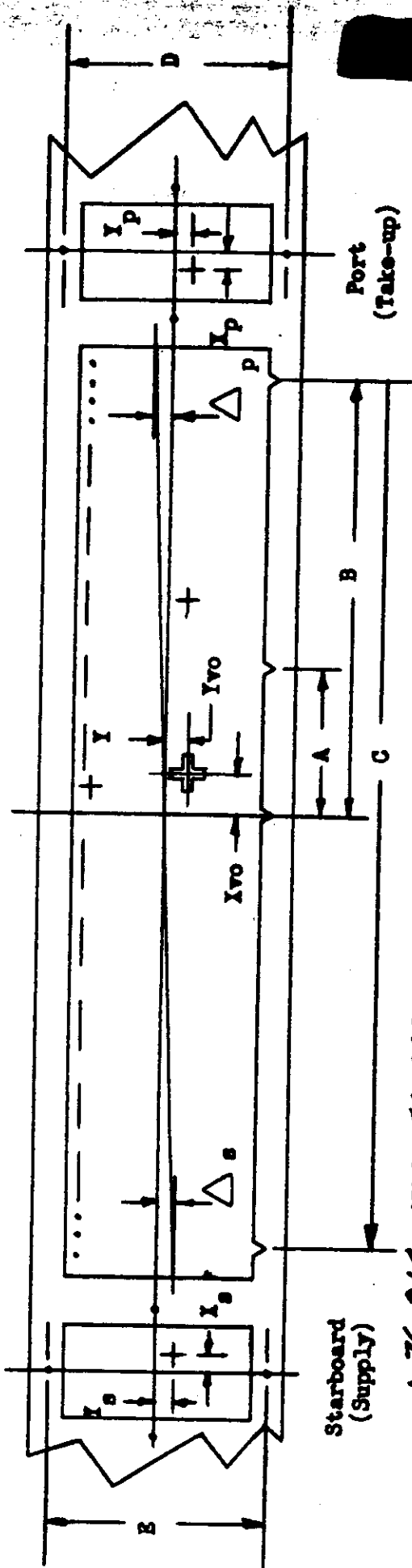
~~SECRET~~
~~SECRET~~

~~SECRET~~

7. The principal line of the panoramic camera is controlled by the IMC cam. ΔS and ΔP are the magnitude of the Y displacement of the principal line with respect to the x-axis (fiducial) as defined in 4, measured at the ends of format. The control equation at offset of the principal line is:
- $$\Delta y = .3223 \sin 0.00164x \quad 0.00164x \text{ is in radians}$$
- where
- Δy is the offset
- x is the distance along x axis (fiducial line) from the indicated center of format, in millimeters.
- It is assumed that the principal line passes through the indicated center of format. No measurement is made of these quantities.
8. Flight direction indicated is the direction of camera travel. The forward portion of the main format is on the side opposite to the shrinkage markers.
9. Dimensions A, B, and C are the spacings of the shrinkage markers. Techniques for exact measurement of these distances have not been developed. The figures quoted are measurements made on film without control of shrinkage.
10. The format dimensions are measured to the best estimate of format edge.
11. Measurement of the angle between the indicated axis on the horizon cameras and the line of intersection of the plane defined in para. 2 on the format is not currently available. It is assumed to be "0" but is uncontrolled.
12. Similarly, the angle between the plane and the indicated x axis on the main format is uncontrolled and assumed to be "0".

~~SECRET~~

View With Emulsion Down (Negative)



A 76.014 MM D 56.443 MM
 B 354.892 MM E 56.522 MM
 C 710.527 MM

Flight Direction

Note: All X fiducials may not lie in single line.

Tabulation In Millimeters

Horison Readings

X_p +0.936 I_p +0.668
 X_s +0.392 I_s +0.148

Vertical Offset

I_{vo} +1.329 I_{vo} 2.124

Format Dimensions In Millimeters
 Starboard Main Port
 (Supply) Format (Take-up)

Height 53.5 57.325 53.3
 Width 22.9 757.33 22.8

$\Delta p = .155 \pm .015$ Note: Those data controlled by DMC cam. Nominals are shown.
 $\Delta s = .155 \pm .015$

INSTRUMENT NO. 56
 VEHICLE NO. 115
 MISSION NO. 9025

Page 12 of 13

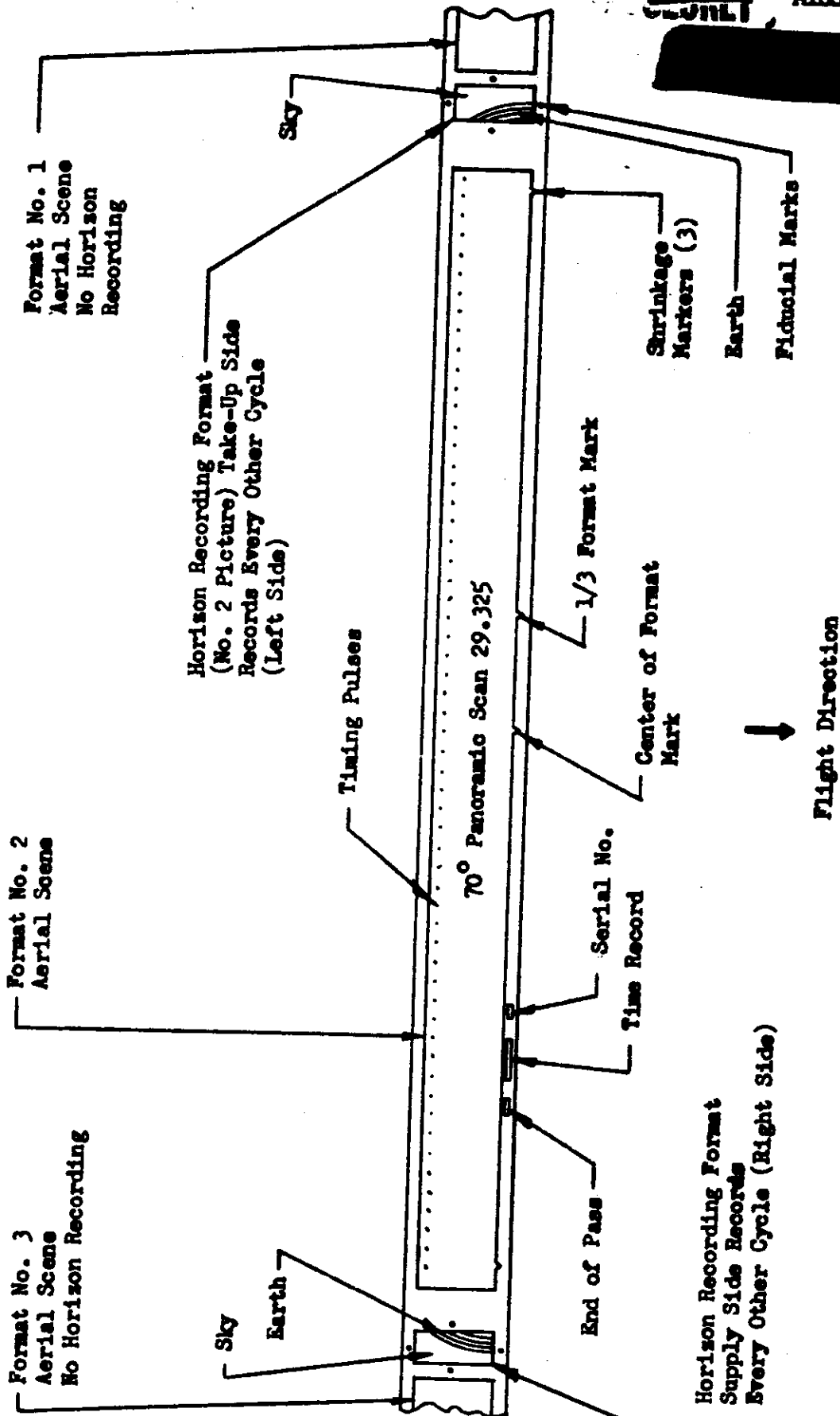
FORMAT LAYOUT

INSTRUMENT NO. 50

VEHICLE NO. NLS

MISSION NO. 9023

SECRET

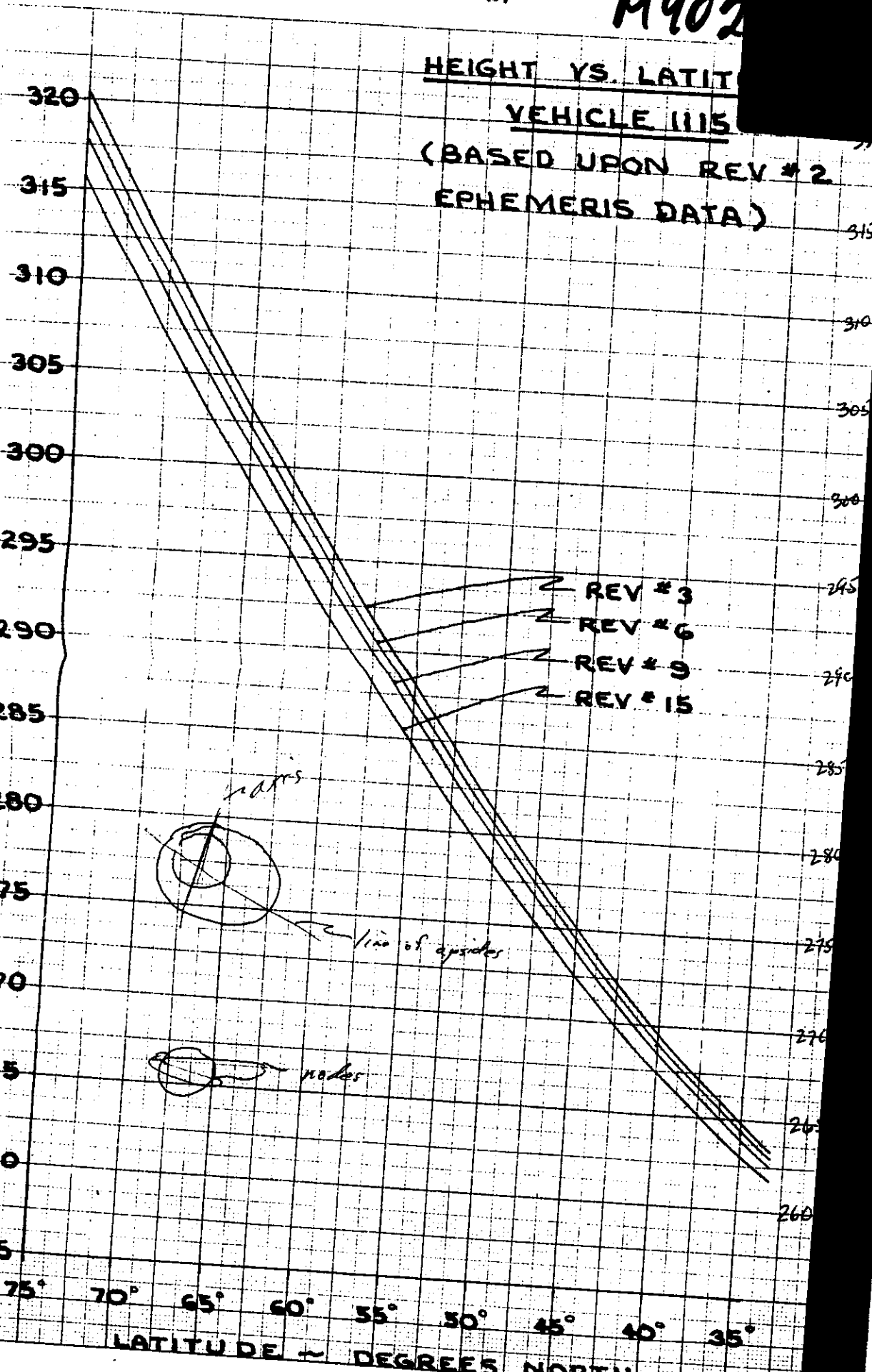


SECRET

SECRET

M902

HEIGHT VS. LATITUDE
VEHICLE 1115
(BASED UPON REV # 2
EPHEMERIS DATA)



SECRET

SECURITY CLASSIFICATION

LOCKHEED AIRCRAFT CORPORATION-MISSILES and SPACE DIVISION

FLASH REPORT

OF TEST

DATE 9/11/61	NEXT ASSEMBLY	SUBS	EN	PART NUMBER		NAME AND PART TESTED Inst. #56	
REQ. DEPT.	TEST TITLE Post HATS Resolution (s		cial)	TEST START 9/4/61	TEST COMP. 9/4/61	TEST RT. NO. FR-72	MODEL NO.
TESTING AGENCY Test Services, Dept. 62-68		LOC L/	ON	L ISON ENGINEER		TEST ENGINEER	FINAL RPT NO.
TEST AUTHORIZATION AND SPECIFICATIONS							
FILE 3							DATE 9-18-61
Dept. Mgr. 62-65							DATE 9-18-61
Dept. Mgr. 62-60							DATE 9-18-61
Dept. Mgr. 62-68							DATE 9-18-61

TEST OBJECTIVES

Instrument Type C 118

Serial No. 56

Test Objective: Post HATS Resolution (Special)

TEST RESULTS

Resolution: 168
181
 Fig. of merit Boston

Lines/mm. Theodolite: N/A

Lamps:

Fiducials: L OK R OK

Frequency: Not present

Digitote: OK

End of Pass: OK

Serial No: Present - but not readable

Blocking Pulse: Not present

Comments on Test: This test is conducted to evaluate the corrections made to

(a) the field flattener and (b) the lens out tove indent.

(USE ADDITIONAL SHEETS, IF NECESSARY)

REMARKS: Processed: D-19 Developer, 90°F 4 ft/min or 1 min. (Hand)
 Machine G-6) processed. No. ft processed: 100. Type film: J-23 (SC-132) Step wedges
 plotted: None

SECRET

v/h	1 BOTTOM						4 BOTTOM						8 BOTTOM						8 TOP					
	22°		0°		22°		22°		0°		22°		22°		0°		22°		0°		22°			
	I	S	I	S	I	S	I	S	I	S	I	S	I	S	I	S	I	S	I	S	I	S		
1	162	182	204	162	204	162	182	204	162	182	204	162	182	204	144	182	204	162	182	204	162	182		
2	204	182	204	182	182	204	144	144	182	182	204	162	182	204	204	182	182	182	182	182	204	182		
3	204	144	204	162	182	144	182	182	182	182	204	204	204	204	182	182	182	182	182	182	182	182		
4	204	128	204	182	182	144	144	204	204	204	204	182	182	182	182	182	182	182	182	182	182	182		
5	204	144	182	144	182	128	182	182	182	182	204	204	182	182	182	182	182	182	182	182	182	182		
6	182	182	182	162	162	144	204	182	182	182	182	182	182	182	182	182	182	182	182	182	182	182		
7	182	144	162	162	162	144	162	128	204	182	182	182	182	182	182	182	182	182	182	182	182	182		
8	204	128	204	182	162	128	204	204	204	162	182	182	182	182	182	182	182	182	182	182	182	182		
9	182	128	182	182	182	182	182	182	182	182	182	182	182	182	182	182	182	182	182	182	182	182		
10	204	162	182	162	182	144	182	182	182	182	182	182	182	182	182	182	182	182	182	182	182	182		
Total	1932	1524	1910	1724	1804	1502	1910	1776	1944	1822	1792	1756	1908	1854	1790	1610	1890	1746	1824	1932	1982	1774		
Average	1932/1524	1910	1724	1804	1502	1910	1776	1944	1822	1792	1756	1908	1854	1790	1610	1890	1746	1824	1932	1982	1774	1774		

Shutter Speed _____ Date 9/6/61

I = IMC Direction Film Type J-23

S = Scan Direction

Test Best-HATS - (ITER) Figure of Merit 181.5
 (Average all positions)



Lens No. F-9

Target _____

Type HYAC-II

Film 50 1213

Resolution in lines/MM - Tangential/Radial

Focal Position	LEFT				RIGHT		
	3°	2°	1°	0°	1°	2°	3°
Inches ↓ Focal Increments = Away From Lens	167/149	167/211	188/188	167/188	188/149	167/211	119/188
	133/133	133/133	149/149	149/167	167/167	149/167	133/167
	149/149	133/149	167/167	211/188	167/188	188/188	149/149
	149/149	149/149	149/167	167/188	149/167	149/167	149/167
	106/149	167/211	188/211	233/211	211/211	211/211	188/188
	119/167	211/188	188/167	211/188	188/167	167/188	188/188



V/h	1 BOTTOM						4 BOTTOM						8 BOTTOM						8 TOP							
	22°		0°		22°		22°		0°		22°		22°		0°		22°		22°		0°		22°			
	I	S	I	S	I	S	I	S	I	S	I	S	I	S	I	S	I	S	I	S	I	S	I	S		
1	128	162	144	114	114	102	162	204	204	162	204	162	182	228	228	182	182	182	144	144	162	162	182	182	228	
2	162	144	162	182	204	144	204	162	204	128	144	228	228	228	228	228	162	162	162	162	162	162	162	162	182	228
3	162	182	162	144	204	144	182	128	128	162	162	204	144	182	144	144	162	162	162	162	162	162	162	162	144	228
4	144	228	144	162	144	144	228	182	182	162	182	182	182	182	182	144	144	144	144	144	144	144	144	144	144	228
5	128	162	144	162	182	162	182	162	162	162	182	162	228	228	162	162	162	162	162	162	162	162	162	162	162	182
6	144	182	204	162	162	162	162	204	204	162	228	182	182	228	228	228	228	228	228	228	228	228	228	228	228	182
7	128	162	128	162	204	128	162	204	204	162	228	182	182	182	182	182	182	182	182	182	182	182	182	182	182	228
8	144	162	204	162	128	162	162	182	182	162	182	182	182	228	228	144	144	144	144	144	144	144	144	144	144	204
9	144	182	162	182	144	128	128	162	228	228	182	182	182	182	182	182	182	182	182	182	182	182	182	182	182	204
10	162	182	182	162	144	162	144	182	182	144	182	182	182	182	182	182	182	182	182	182	182	182	182	182	182	228
Total	146	148	154	154	156	164	130	172	192	162	162	174	178	194	208	200	174	186	162	184	184	184	184	184	184	220
Average	146	148	154	154	156	164	130	172	192	162	162	174	178	194	208	200	174	186	162	184	184	184	184	184	184	216

Date 9/11/61

Film Type J23 (50132)

Shutter Speed

I - IMC Direction

S - Scan Direction

Test Spec 18 / Bst Hnts

Figure of Merit 168

(Average all positions)