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Copy No. 23 Pages
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CORONA "M" FLIGHT DATA BOOK

SYSTEM NO. M7

VEHICLE NO. 1151

MISSION NO. 9030

Prepared by: [REDACTED]

Checked by: [REDACTED]

Approved by: [REDACTED]
(Engineering Manager)

Approved by: [REDACTED]
(Project Manager)

Approved by: [REDACTED]
(Sgt)

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on NOV 26 1997

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SYSTEM NO. 147
VEHICLE NO. 1151
MISSION NO. 0036
CAMERA NOS. 84 & 85

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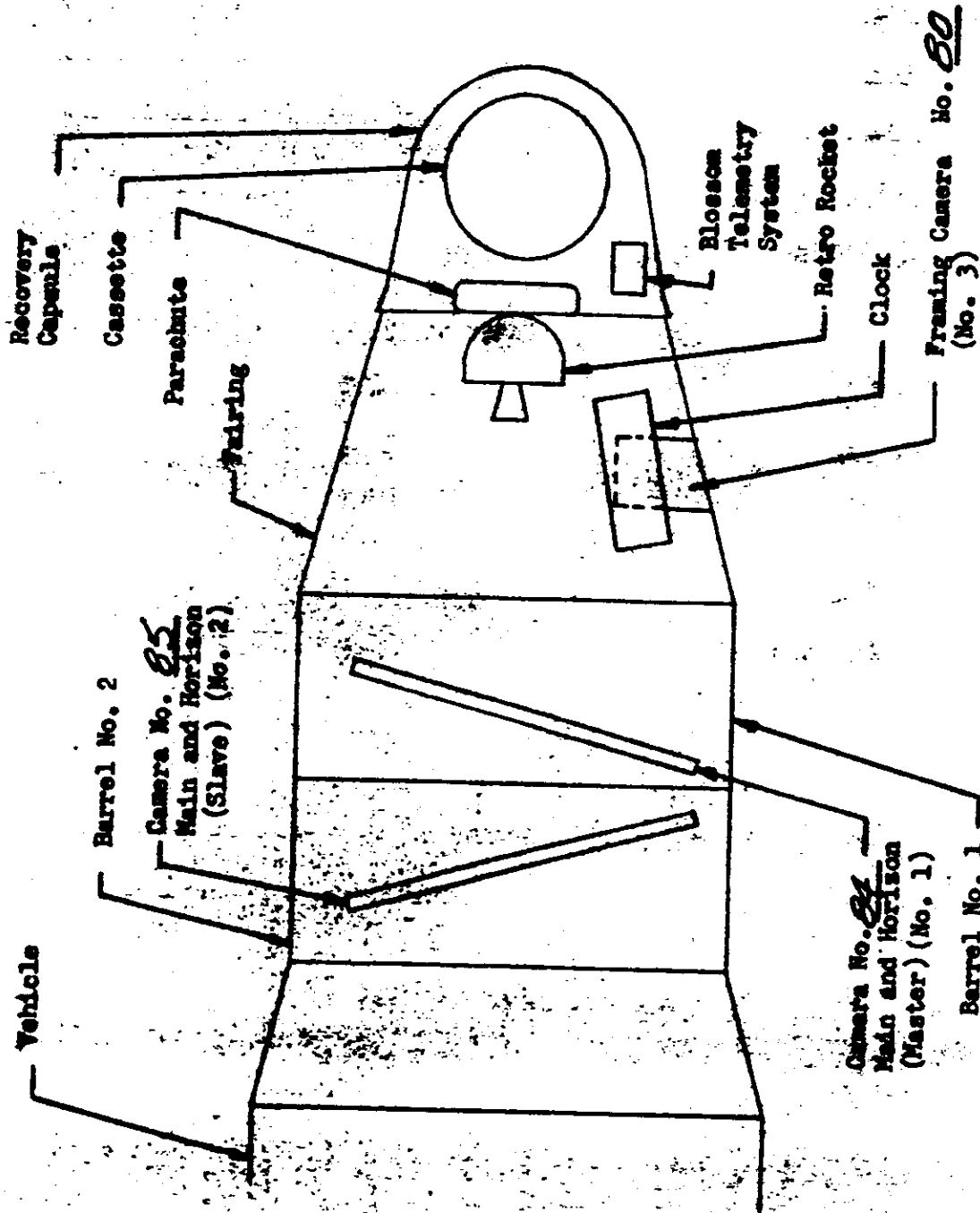
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SYSTEM NO. 117
VEHICLE NO. 1151
MISSION NO. 9038
CAMERA NOS. 11 105

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VEHICLE LAYOUT:



SYSTEM NO. 147
VEHICLE NO. 151
MISSION NO. 9038
CAMERA NOS. 21405

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GENERAL FLIGHT DATA:

Discoverer No. 45
Main Camera No. 1 Serial No. 84
Main Camera No. 2 Serial No. 85
Framing Camera Serial No. 80
Launch Date 6/27/62

Orbital Parameters: (Rev. 41)

Period 93.65 Min. Eccentricity .0365
Perigee 112 NM Perigee Latitude 36.79 Deg. N
Apogee 382 NM Inclination Angle 76.05 Deg. N

Recovery Revolution No. 63
Recovery Date 7/1/62

REMARKS:

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SYSTEM NO. 47
VEHICLE NO. 1151
MISSION NO. 9038
CAMERA NOS. 84 & 85

PRE-LAUNCH INFORMATION:

V/H Programmer Set On Step 5 At Launch

Main Camera Settings:

	Camera No. <u>84</u>	Camera No. <u>85</u>
Main Optics Slit Width	<u>.200</u> in.	<u>.200</u> in.
Horizon Optics Exposure Time	<u>1/25</u> Sec.	<u>1/50</u> Sec.
Horizon Optics Aperture	<u>F6.8</u>	<u>F8.0</u>

Framing Camera Settings:

Exposure Time 1/250 Sec.

Aperture F6.3

Ratio: One Framing Camera Frame Per 7 Camera No. 1 Frames

FILES:

	Camera No. <u>84</u>	Camera No. <u>85</u>	Framing Camera
Type	<u>7123 (SO132)</u>	<u>7123 (SO132)</u>	<u>71-30 (SO130)</u>
Length	<u>7800</u> Ft.	<u>7800</u> Ft.	<u>135</u> Ft.
No. of Splices	<u>2</u>	<u>2</u>	<u>None</u>
Emulsion Data	<u>27-146-N-9-52</u>	<u>27-981-N-52</u>	<u>15-2-4-2</u>

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SYSTEM NO. M7
 VEHICLE NO. 1151
 MISSION NO. 9030
 CAMERA NOS. 84 & 85
 FRAMING CAMERA NO. 80

FOR REPORT

PERFORMANCE ESTIMATE

Pass No.	Frame			Foot			Latitude		Time On	Dur	Solar		Exp. Time		Ramp No.	Instr. On Sec
	Camera No.	Camera No.	Camera No.	Camera No.	Camera No.	Camera No.	On	Off			Angle	MilliSec	On	Off		
PL	106	107	15	279	282	30	-	-	-	-	-	-	-	-	-	-
ODE	8	8	1	21	21	.2	15	12	28/019	45	13	12	6.9	6.9	3	0
1AX1	24	24	3	63	63	.6	22	29	02-19	107	22	26	6.0	5.7	3	258
1AX2	31	31	5	82	82	1.0	32	40	02-22	128	19	22	5.6	5.3	3	407
1DE	22	22	3	58	58	.6	74	72	02-38	66	37	36	3.8	3.7	3	1389
(repeat) 1DE	24	24	3	63	63	.6	56	58	02-38	68	32	32	3.6	3.5	3	1435
2AX1	74	73	11	195	192	2.2	44	60	03-53	300	24	32	5.5	4.8	3	307
7DY1	123	124	17	324	327	3.4	62	41	12-02	346	34	27	3.8	3.4	8	1283
8DY1	109	107	16	287	282	3.2	67	49	13-34	324	35	31	4.0	3.6	8	1192
9AE	10	10	2	26	26	.4	35	37	14-49	50	20	21	6.6	6.5	8	67
9DY1	76	76	10	200	200	2.0	59	45	15-10	212	33	29	3.6	3.4	8	1321
14AX1	49	49	7	129	129	1.4	40	54	22-39	242	22	30	6.7	6.0	1	271
15AX1	17	18	3	45	47	.6	37	42	29-00-12	93	21	23	6.8	6.5	1	240
15AX2	33	33	5	87	87	1.0	47	55	00-15	159	26	30	6.3	5.9	1	394
15DE	17	17	2	45	45	.4	38	36	00-38	48	26	25	3.4	3.4	1	1789
16AX1	19	19	3	50	50	.6	40	44	01-46	94	22	24	6.6	6.4	1	293
16AX2	41	42	6	108	111	1.2	48	59	01-49	195	26	32	6.2	5.7	1	432
17AY1	22	22	3	58	58	.6	42	49	03-21	117	29	27	6.8	6.5	6	214
17AY2	33	33	5	87	87	.8	52	60	03-23	155	29	32	6.4	5.9	6	273
17AY3	26	26	4	57	57	.9	60	71	03-28	110	24	26	6.7	6.4	6	230
22DY1	64	63	9	183	182	2.6	55	55	03-28	110	24	26	6.7	6.4	6	230

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SYSTEM NO. M7
 PHOTO NO. 1151
 MOUNTING NO. 9038
 CAMERA NOS. 84 & 83
 FRAMING CAMERA NO. 80

PERFORMANCE ESTIMATE

Pass No.	Frame No.			Frame No.			Latitude		Time On	Time Off	Solar Angle		Exp. Time		Ramp No.	Instr. On Sec
	84	85	80	84	85	80	On	Off			On	Off	On	Off		
23DX1	84	83	12	22	29	24	1.6	52	29-12-59	242	35	31	3.8	3.6	3	1244
23DX2	46	46	7	121	121	14	49	42	13-04	126	30	28	3.5	3.4	3	1528
24DY1	113	112	16	298	295	32	62	44	14-54	314	34	29	3.7	3.4	8	1309
25AE	10	10	2	26	26	4	36	38	15-48	50	20	21	6.4	6.2	8	67
29AX1	28	29	4	74	76	.8	54	60	22-08	133	30	32	6.0	5.6	1	449
30AX1	67	68	9	177	179	.8	35	54	23-36	326	20	30	6.6	5.7	1	270
31AX1	32	33	5	84	87	1.0	33	42	30-01-09	171	28	33	6.8	6.3	1	224
31AX2	28	28	4	74	74	.8	47	52	01-13	130	26	29	6.1	5.7	1	456
31DE	16	16	2	42	42	.4	37	34	01-37	48	25	23	3.7	3.7	1	1855
32AX1	53	53	8	140	140	1.6	48	60	02-47	232	26	32	5.9	5.3	1	460
33AY1	35	35	5	92	92	1.0	53	60	04-22	143	29	32	5.3	5.0	8	451
34AY1	63	63	9	166	166	1.8	48	61	05-54	248	26	32	5.3	4.7	8	451
35AY1	42	42	6	111	111	1.2	63	70	07-32	152	33	35	4.7	4.4	8	726
36DY1	43	42	6	113	111	1.2	53	47	09-20	118	32	30	3.6	3.4	8	1492
37DY1	71	70	10	187	184	2.0	59	47	10-52	198	33	30	3.7	3.4	8	1404
37DY2	42	41	6	111	108	1.2	43	36	10-57	110	28	25	3.4	3.3	8	1670
38DX1	53	53	7	140	140	1.4	72	65	12-22	160	37	35	3.9	3.7	3	1165
38DX2	122	121	11	322	319	3.6	66	41	12-26	336	33	27	3.6	2.3	3	1394
39DY1	129	127	18	310	305	5.5	61	41	13-59	346	34	27	3.6	3.3	8	1364
40AE	10	10	2	26	26	.4	35	37	15-13	50	20	21	6.0	5.8	8	165
41AX1	40	40	2	105	105	1.2	43	51	16-08	100	24	26	5.4	5.4	1	363

SYSTEM NO. 47
 VEHICLE NO. 1151
 MISSION NO. 903B
 CAMERA NOS. 8485

PRE-FLIGHT CYCLE PERIOD: (CAMERA NO. 84)

V/H Ramp	Cycle Period Seconds	FMC Rate		Scan Rate		
		Rad. Per Second	In. Per Second	Rad. Per Second	In. Per Second	Exposure Millisec
1 Start	6.33	.013	.320	.993	23.822	8.40
1 End	2.72	.031	.744	2.310	55.439	3.61
3 Start	5.22	.016	.388	1.204	28.888	6.92
3 End	2.52	.033	.804	2.493	59.839	3.34
6 Start	6.30	.013	.321	.997	23.936	8.36
6 End	2.70	.031	.750	2.327	55.850	3.58
8 Start	5.18	.016	.391	1.213	29.111	6.87
8 End	2.50	.034	.810	2.513	60.318	3.32

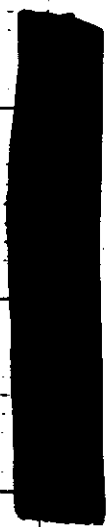
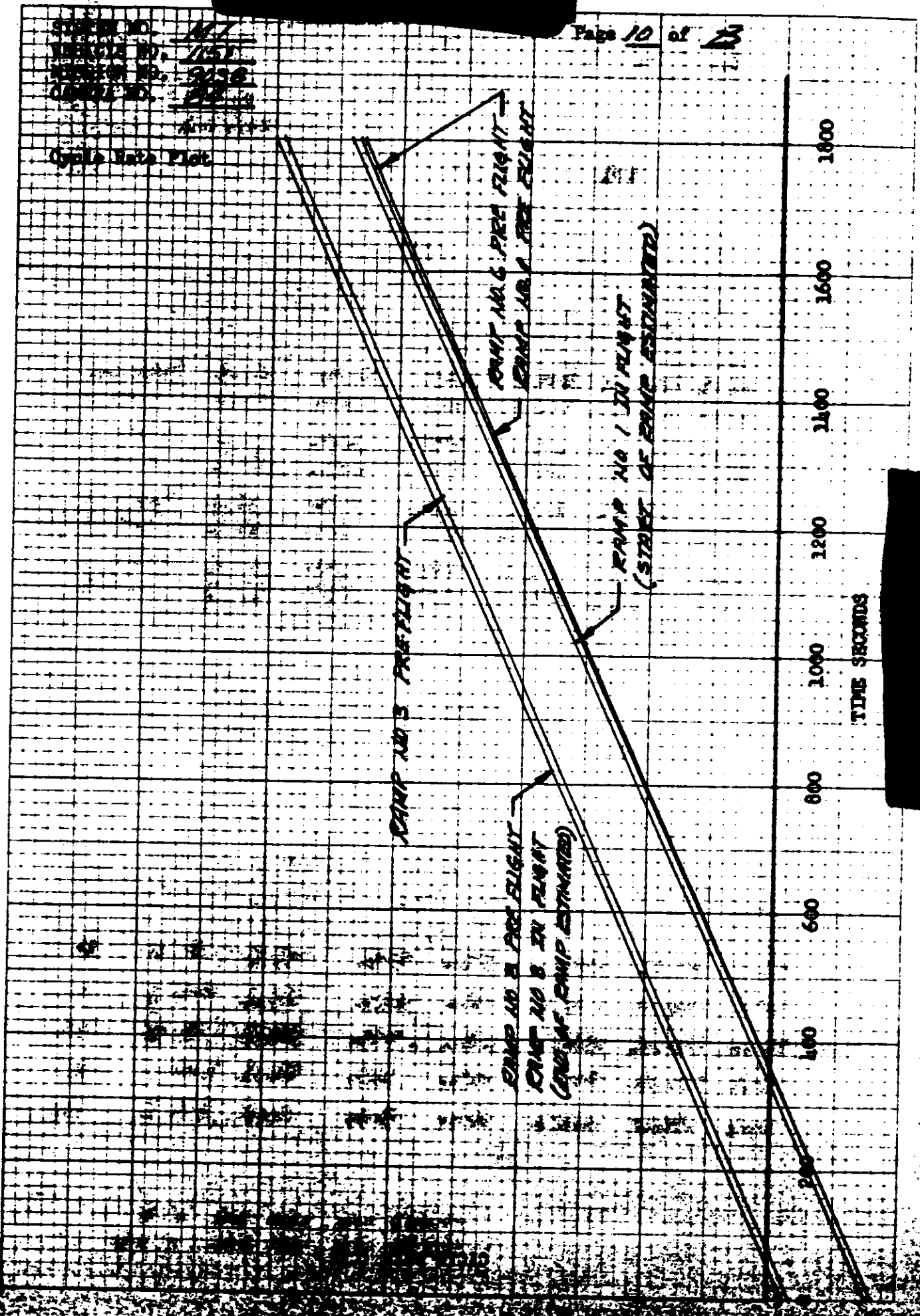
IN-FLIGHT CYCLE PERIOD: (CAMERA NO. 84)

Rev.No.	V/H Ramp	Cycle Period Seconds	FMC Rate		Scan Rate		
			Rad. Per Second	In. Per Second	Rad. Per Second	In. Per Second	Exposure Millisec
9	8 ^{100 Sec} up Ramp	4.90	.017	.413	1.282	30.774	6.50
15	1 End	2.70	.031	.750	2.327	55.850	3.58
25	8 ^{100 Sec} up Ramp	4.86	.017	.417	1.293	31.028	6.45
38	1 End	2.72	.031	.744	2.309	55.439	3.61
40	8 ^{100 Sec} up Ramp	4.60	.018	.440	1.366	32.781	6.10

END OF REPORT
 FOR CAMERA

Serial No. 147
Mission No. 1151
Bomb No. 9438
Bomb No. 9439
Bomb No. 9440

Graph Data Plot



SYSTEM NO. M7
 VEHICLE NO. N51
 MISSION NO. 9038
 CAMERA NOS. B4 B5

PRE-FLIGHT CYCLE PERIOD: (CAMERA NO. B5)

V/H Ramp	Cycle Period Seconds	FMC Rate		Scan Rate		
		Rad. Per Second	In. Per Second	Rad. Per Second	In. Per Second	Exposure Millisec
1 Start	6.27	.013	.323	1.002	24.050	8.32
1 End	2.77	.030	.751	2.268	54.438	3.67
3 Start	5.21	.016	.389	1.206	28.943	6.91
3 End	2.55	.033	.794	2.464	59.135	3.38
6 Start	6.21	.014	.326	1.012	24.283	8.24
6 End	2.74	.031	.739	2.293	55.094	3.63
8 Start	5.16	.016	.392	1.218	29.224	6.84
8 End	2.53	.033	.800	2.483	59.603	3.36

IN-FLIGHT CYCLE PERIOD: (CAMERA NO. B5)

Rev. No.	V/H Ramp	Cycle Period Seconds	FMC Rate		Scan Rate		
			Rad. Per Second	In. Per Second	Rad. Per Second	In. Per Second	Exposure Millisec
9	B *	4.90	.017	.413	1.282	30.774	6.50
15	1 END	2.66	.032	.761	2.362	56.690	3.53
25	B *	4.88	.017	.415	1.288	30.900	6.47
38	1 End	2.68	.031	.756	2.344	56.267	3.55
40	B **	4.60	.018	.440	1.366	32.781	6.10

* = 100 sec of Ramp
 ** = 180 sec of Ramp

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SPRINT NO. 114
TIME IN SECS. 1151
CAMP NO. 2078
DATE 25

Cable Rate Plot

CAMP NO. B PRE FLIGHT
CAMP NO. B IN FLIGHT
(END OF CAMP ESTIMATED)

CAMP NO. 3 PRE FLIGHT

CAMP NO. 1 PRE FLIGHT

CAMP NO. 6 PRE FLIGHT

CAMP NO. 1 IN FLIGHT
(START OF CAMP ESTIMATED)

TIME SECONDS

200 400 600 800 1000 1200 1400 1600 1800



SYSTEM NO. M7
 VEHICLE NO. 1151
 MISSION NO. 903B
 CAMERA NOS. 84 & 85

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LENS DATA SUMMARY: (Main Camera No. 84)

Lens Serial No. 022435

Filter Type KIRATTEN 21

Equivalent Operational Focal Length 609.668 MM

Resolution:

Static:

	Lines/MM	Film Type	Target Contrast
Bench Test	<u>223</u>	<u>50243</u>	<u>High</u>
Other	<u>NONE</u>		

Dynamic:

Itek Pre-Vibration	<u>160</u>	<u>50132</u>	<u>High</u>
Itek Post Vibration	<u>165</u>	<u>50132</u>	<u>High</u>
AP Pre-HATS	<u>156</u>	<u>50132</u>	<u>High</u>
AP Post-HATS	<u>1523</u>	<u>50132</u>	<u>High</u>
Other	<u>NONE</u>		

Note: Itek Post Vibration Resolution of 165 lines/MM Reported In
 Message No. [REDACTED] dated 6/29/62

Distortion - Positive (Pincushion)

Angle Off Axis Deg.	3	2	1	0	359	358	357		
Distortion Millimeters	<u>.005</u>	<u>.002</u>	<u>.000</u>	<u>.000</u>	<u>.000</u>	<u>.002</u>	<u>.007</u>		

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SYSTEM NO. M
VEHICLE NO. 1151
MISSION NO. 9038
CAMERA NOS. 82285

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LENS DATA SUMMARY: (Horizon Cameras for Main Camera No. 84)

	Take-Up	Supply
Lens Serial No.	<u>007551</u>	<u>007551</u>
Exposure Time	<u>1/25</u> Sec.	<u>1/25</u> Sec.
Filter Type	<u>NONE</u>	<u>NONE</u>
Aperture	<u>F6.8</u>	<u>F6.8</u>
Operational Focal Length	<u>89.00</u> MM	<u>89.0</u> MM
Radial Distortion:		
10° off Axis	<u>.010</u> MM	<u>.014</u> MM
20° off Axis	<u>.054</u> MM	<u>.059</u> MM
Tangential Distortion (Maximum Vector)	<u>.004</u> MM	<u>.003</u> MM
Resolution:		

Angle off Axis Deg.	0	5	10	15	20	25	27.5	0	5	10	15	20	25	27.5
Radial Resolution	56	47	44	39	32	34	37	51	44	40	35	32	28	34
Tangential Resolution	51	44	44	36	36	29	19	51	44	40	34	34	31	20

38.5 Lines/MM Avg.

37.7 Lines /MM Avg.

Note:

1. Distortion and resolution are read at equivalent operational focal length.
2. Resolution is lines per mm on Source X film and High contrast target.

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SYSTEM NO. M7
 VEHICLE NO. 1151
 FUNCTION NO. 9038
 CAMERA NOS. 02245

LENS DATA SUMMARY: (Main Camera No. 85)

Lens Serial No. 0292435

Filter Type UNATTEN 21

Equivalent Operational Focal Length 609.526 MM

Resolution:

Static:

	Lines/MM	Film Type	Target Contrast
Bench Test	<u>230.2</u>	<u>S0243</u>	<u>High</u>
Other	<u>NONE</u>		

Dynamic:

Itek Pre-Vibration	<u>160</u>	<u>S0132</u>	<u>High</u>
Itek Post Vibration	<u>158</u>	<u>S0132</u>	<u>High</u>
AP Pre-HATS	<u>174.4</u>	<u>S0132</u>	<u>High</u>
AP Post-HATS	<u>164</u>	<u>S0132</u>	<u>High</u>
Other	<u>NONE</u>		

Note: Itek Post Vibration Resolution of 158 lines/MM Reported In
 Message No. [REDACTED] dated 6/27/62

Distortion - Positive (Pincushion)

Angle Off Axis Deg	3	2	1	0	359	358	357		
Distortion Millimeters	<u>.07</u>	<u>.006</u>	<u>.001</u>	<u>.000</u>	<u>.000</u>	<u>.000</u>	<u>.002</u>		

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SYSTEM NO. NT
VEHICLE NO. 12
DIVISION NO. 9032
CAMERA NOS. 21105

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LENS DATA SUMMARY: (Horizon Cameras for Main Camera No. 85)

	Take-Up	Supply
Lens Serial No.	<u>807540</u>	<u>807560</u>
Exposure Time	<u>1/50</u> Sec.	<u>1/50</u> Sec.
Filter Type	<u>WOTTEN 25</u>	<u>WOTTEN 25</u>
Aperture	<u>F8.0</u>	<u>F8.0</u>
Operational Focal Length	<u>89.3</u> MM	<u>89.0</u> MM
Radial Distortion:		
10° off Axis	<u>.009</u> MM	<u>.003</u> MM
20° off Axis	<u>.047</u> MM	<u>.023</u> MM
Tangential Distortion (Maximum Vector)	<u>.003</u> MM	<u>.005</u> MM
Resolution:		

Angle off Axis Deg.	0	5	10	15	20	25	27.5	0	5	10	15	20	25	27.5
Radial Resolution	56	49	42	37	34	31	30	56	49	39	36	30	28	28
Tangential Resolution	51	44	42	35	31	27	20	51	42	42	34	30	23	16

32.9 Lines/MM Avg.

55.6 Lines /MM Avg.

Note:

1. Distortion and resolution are read at equivalent operational focal length.
2. Resolution is taken on Small film and High contrast target.

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MISSION NO. 9030
CAMERA NOS. 02485

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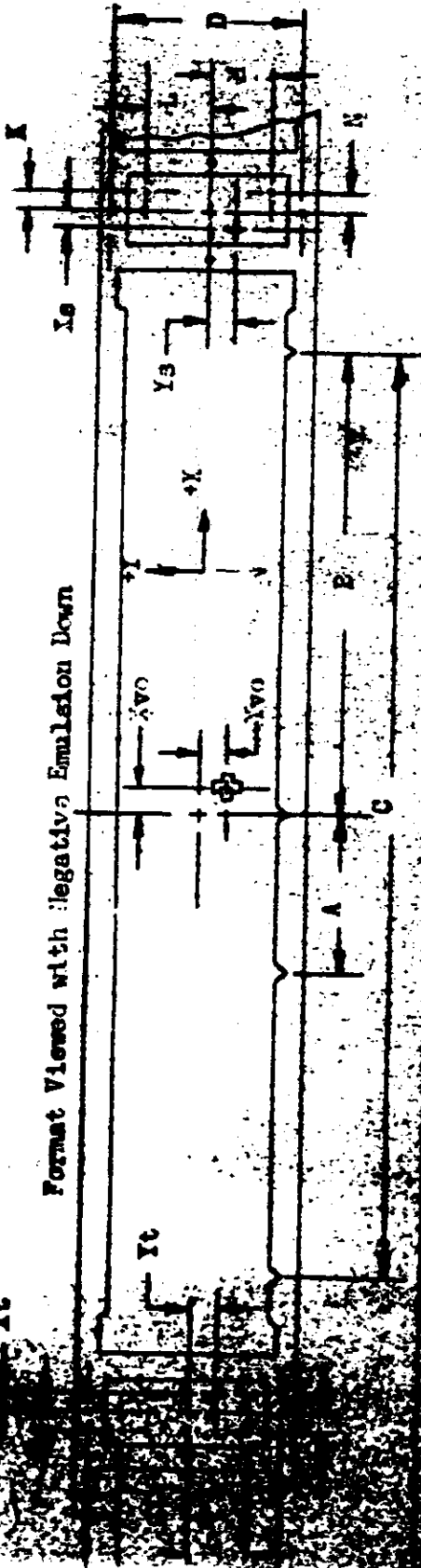
DEFINITION OF MAIN CAMERA FORMAT CALIBRATIONS:

- 1.0 Measurements are made with respect to collimator targets fixed with respect to the mechanical interface between the total payload assembly and the Agena vehicle with the position of the total payload being changed for each instrument calibration.
- 2.0 Three targets are aligned to be coplanar within $\pm 5''$ of arc. The longitudinal axis of the vehicle (Z axis) is so positioned to form an angle of $105.00^\circ \pm 5''$ to the target plane for camera number one calibrations and an angle of $75.00^\circ \pm 5''$ to the target plane for camera number two calibrations.
 - 2.1 One target, Target 1, is in the ZX plane (Nadir) imaging on the Terrain format.
 - 2.2 The second and third targets are at angles of $75.00^\circ \pm 5''$ from target one and are imaged on the horizon formats.
- 3.0 The indicated center of format of the main cameras is given by the intersection of a line through the center of mass of the central shrinkage marker drawn normal to the edge of format containing the shrinkage marker and a line parallel to the same edge located at a position half-way between the format edges.
- 4.0 The indicated principal points of the horizon cameras are the points of intersection of lines joining opposite fiducials.
- 5.0 Ivo and Ivo are the offsets of Target 1 from the indicated center of format as defined in paragraph 3.
- 6.0 Is, Is and It, It are the offsets of Targets 2 and 3 from the indicated principal points of the supply and take-up horizon cameras respectively.
- 7.0 The indicated flight direction is the direction of vehicle travel during orbit. The forward edge of format is the edge opposite the shrinkage markers for camera number one and is the edge containing the shrinkage markers for camera number two.
- 8.0 Dimensions A, B, and C are the spacings of the shrinkage markers. Dimensions D and E are the spacings of the X axis fiducials. Techniques for exact measurement of these dimensions have not been developed. The figures quoted are measurements made on hand processed film without control of shrinkage.
- 9.0 The format dimensions are measured to the best estimate of format edge.
- 10.0 Measurement of the angle between the longitudinal axis of the main cameras and the line of intersection of the plane defined in Para. 2 on the format is not currently available. This angle is to be zero, but is uncontrolled.
- 11.0 Measurement of the angle between the longitudinal axis of the horizon cameras and the line of intersection of the plane defined in Para. 2 on the format is made by positioning the targets for both horizon format normal $\pm 5''$ of arc to the plane of the main camera. Dimensions I, J, K, L, M and N are

SYSTEM NO. M7
 VEHICLE NO. 1151A
 MISSION NO. 9038
 CAIPEA NOS. 84505

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FORMAT DIMENSIONS: (MAIN CAMERAS)



Camera No.	Vehicle No.	Scan Direction
A	76.130	H - 23.090
B	355.361	J - 4.884
C	710.617	K + 2.977
D	56.576	L + 23.649
E	56.498	M - 23.937
X	76.92	O + 23.803
Y	7.155	P + 3.106

Format Dimensions:

Main Take-Up Supply

Height	53.4
Width	752.5

All dimensions are in millimeters and are average dimensions of three formats.

Height of main format is taken at center of format.

Format sign convention

X-Y
Z-W

Camera No.	Vehicle No.	Scan Direction
A	76.130	H - 23.090
B	355.361	J - 4.884
C	710.617	K + 2.977
D	56.576	L + 23.649
E	56.498	M - 23.937
X	76.92	O + 23.803
Y	7.155	P + 3.106

Format Dimensions:

Main Take-Up Supply

Height	53.4
Width	752.5

All dimensions are in millimeters and are average dimensions of three formats.

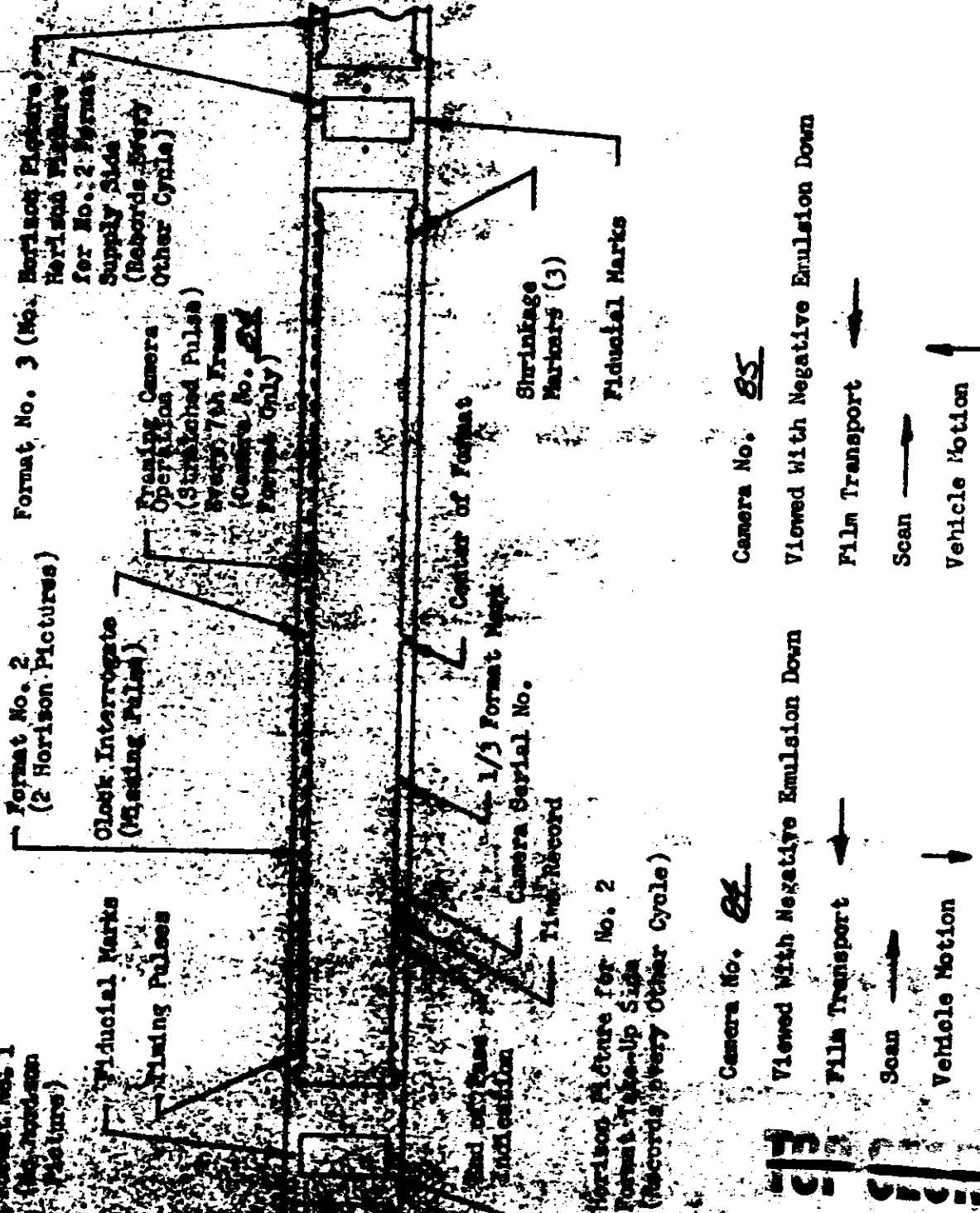
Height of main format is taken at center of format.

Format sign convention

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FORMAT LAYOUT: (MAIN CAMERAS)



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SYSTEM NO. 47
VEHICLE NO. 156
MISSION NO. 9030
CAMERA NOS. 8805

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LENS DATA SUMMARY: (Framing Camera No. 80)

Lens Serial No. 3471795
Rear Serial No. 80
Filter Type WRITTEN 21
Aperture F6.3
Exposure Time 1/250 Sec.
Equivalent Focal Length 38.57 MM
Resolution: 106 Lines/MM AWAR

Angle off axis	0	10	20	30	35
Resolution L/M					
High Contrast	162	144	128	114	83
Resolution L/M					
Low Contrast					

Note: Resolution data read from 50132 Film

Distortion Not Available

Angle off Axis Deg.									
Distortion Millimeters									

Perpendicularity of Rear to Optical Axis Not Available

Date of Stellar Calibration 4/15/62

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SYSTEM NO. 117
 VEHICLE NO. 1151
 MISSION NO. 9020
 CAMERA NOS. 01163
 FRAMING CAMERA NO. 80

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DEFINITION OF FRAMING CAMERA FORMAT CALIBRATIONS:

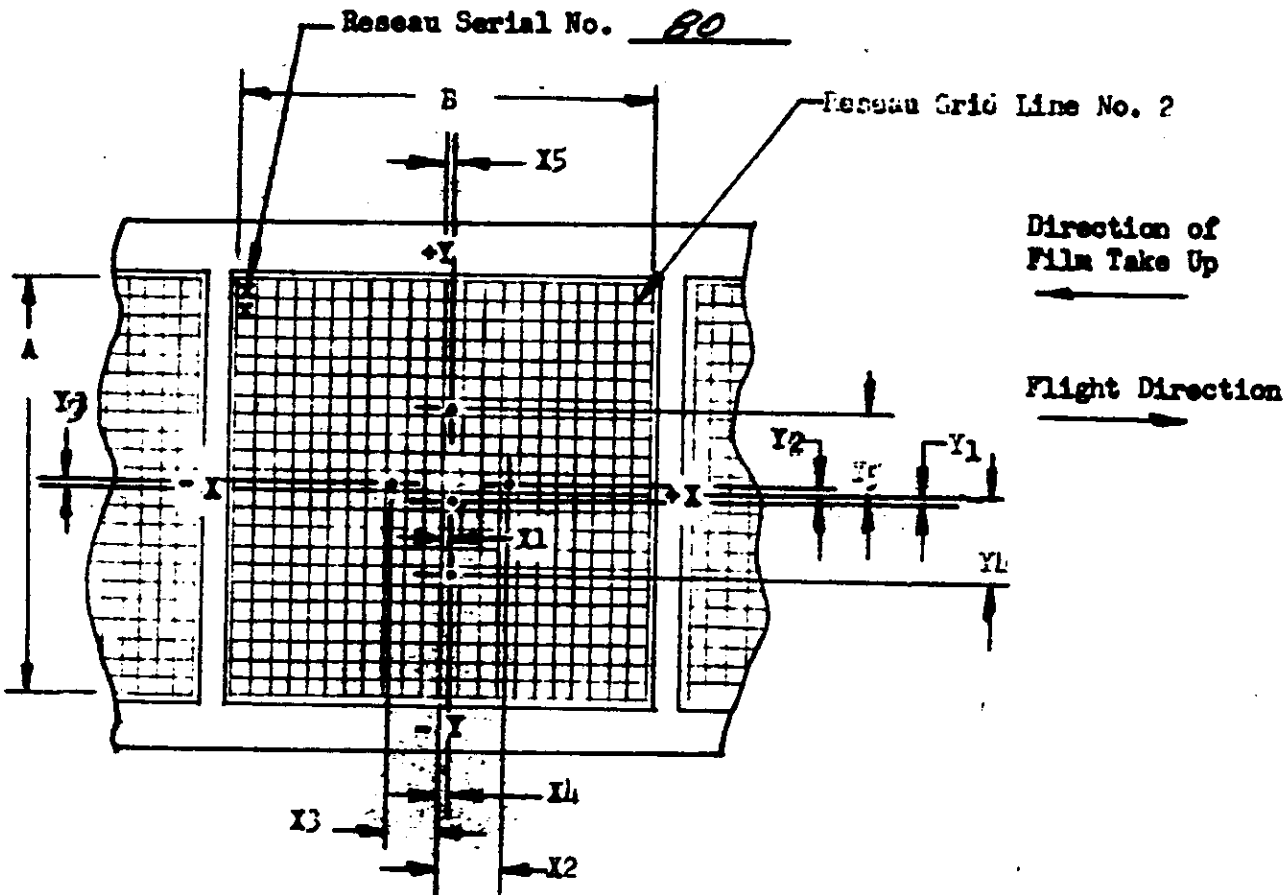
1. Measurements are made with respect to targets fixed perpendicular to the mechanical interface between the total payload and the Agena vehicle and parallel to the plane formed by the vehicle Z Y axes.
2. Three targets, targets 1, 4 and 5 form a horizontal line parallel $\pm 5^\circ$ of arc to the light plane or target plane used for main camera calibrations. Targets 4 and 5 are equidistant to target No. 1.
3. Three targets, targets 1, 2 and 3 form a vertical line perpendicular $\pm 5^\circ$ of arc to the light plane or target plane used for main camera calibrations. Targets 2 and 3 are equidistant to target No. 1.
4. Target 1 is common to the lines defined in Para. 2 and 3 and forms the point of intersection of these lines.
5. The vehicle Z axis is in a vertical position during framing camera calibration.
6. The framing camera is mounted in the fairing in a pitched attitude of $1\frac{1}{2}$ degrees to compensate for the in orbit pitch of the Agena E vehicle. The targets defined in Paras. 2 and 3 will normally be biased toward the plus X half of the format as a result of this pitch.
7. The indicated flight direction is the direction of camera motion with respect to the ground during orbit.
8. X_1, Y_1, X_2, Y_2 , etc. are the offsets of target 1, target 2, etc. These measurements are referenced to the Reseau grid lines 12X and 12Y.
9. Dimensions A and B are the overall dimensions of the Reseau grid taken at Reseau grid lines 12X and 12Y.

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SYSTEM NO. M7
 VEHICLE NO. 1151
 MISSION NO. 9038
 CAMERA NOS. 86 & 85

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FRAMING CAMERA FORMAT DIMENSIONS: FRAMING CAMERA NO. 80
 (Format viewed with negative emulsion side up.)



Location of Principal Points:

X -.32 MM
 Y + .32 MM

Offset Dimensions:

X1 _____ Y3 _____
 Y1 _____ X4 _____
 X2 _____ Y4 _____
 Y2 _____ X4 _____
 X3 _____ Y4 _____

Grid Dimensions:

A _____ B _____

Notes:

1. Offset dimension and target locations shown exaggerated for clarity.
2. Grid dimensions A and B are taken at Grid lines 12X and 12Y.

Note:

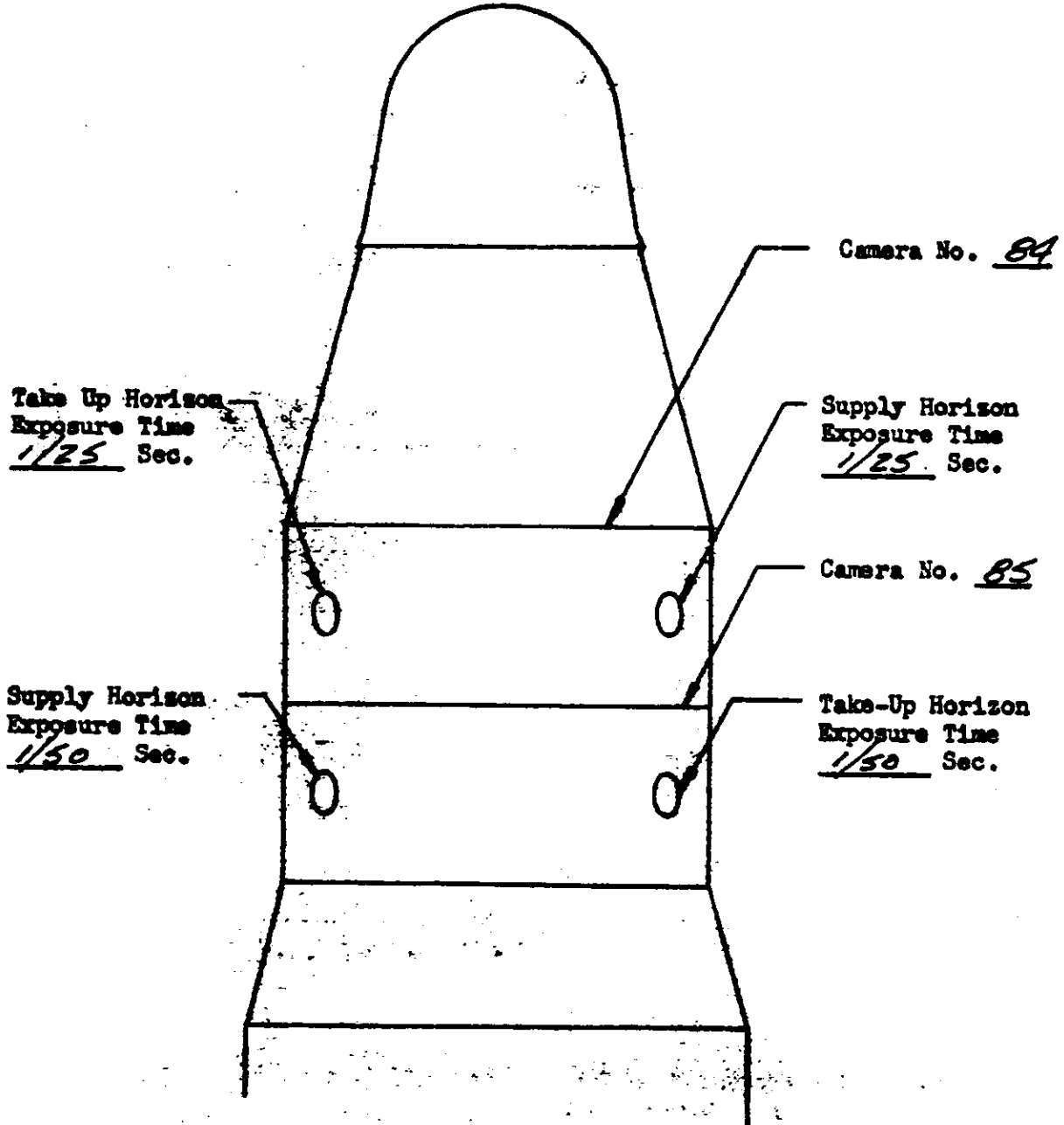
No Angular calibration between framing camera and Panoramic camera for this system.

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SYSTEM NO. 117
VEHICLE NO. 1151
MISSION NO. 9038
CAMERA NOS. 84 & 85

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HORIZON LENS SETTINGS (Viewed from top of vehicle in flight)



Flight Direction

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