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22 Pages
(Including Cover Sheet)

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CORONA "M" FLIGHT DATA BOOK

SYSTEM NO. M9

VEHICLE NO. 1131

MISSION NO. 9040

Prepared by: [redacted]

Checked by: [redacted]

Approved by: [redacted]
(Engineering Manager)

Approved by: [redacted]
(Project Manager)

Approved by: [redacted]
(SETD)

[redacted]

[redacted]

[redacted]

SYSTEM NO. MQ
VEHICLE NO. 1137
MISSION NO. 9040
CAMERA NOS. 82 & 83

SECRET

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SYSTEM NO. M9
VEHICLE NO. 1131
MISSION NO. 9021
CAMERA NOS. 82 & 83

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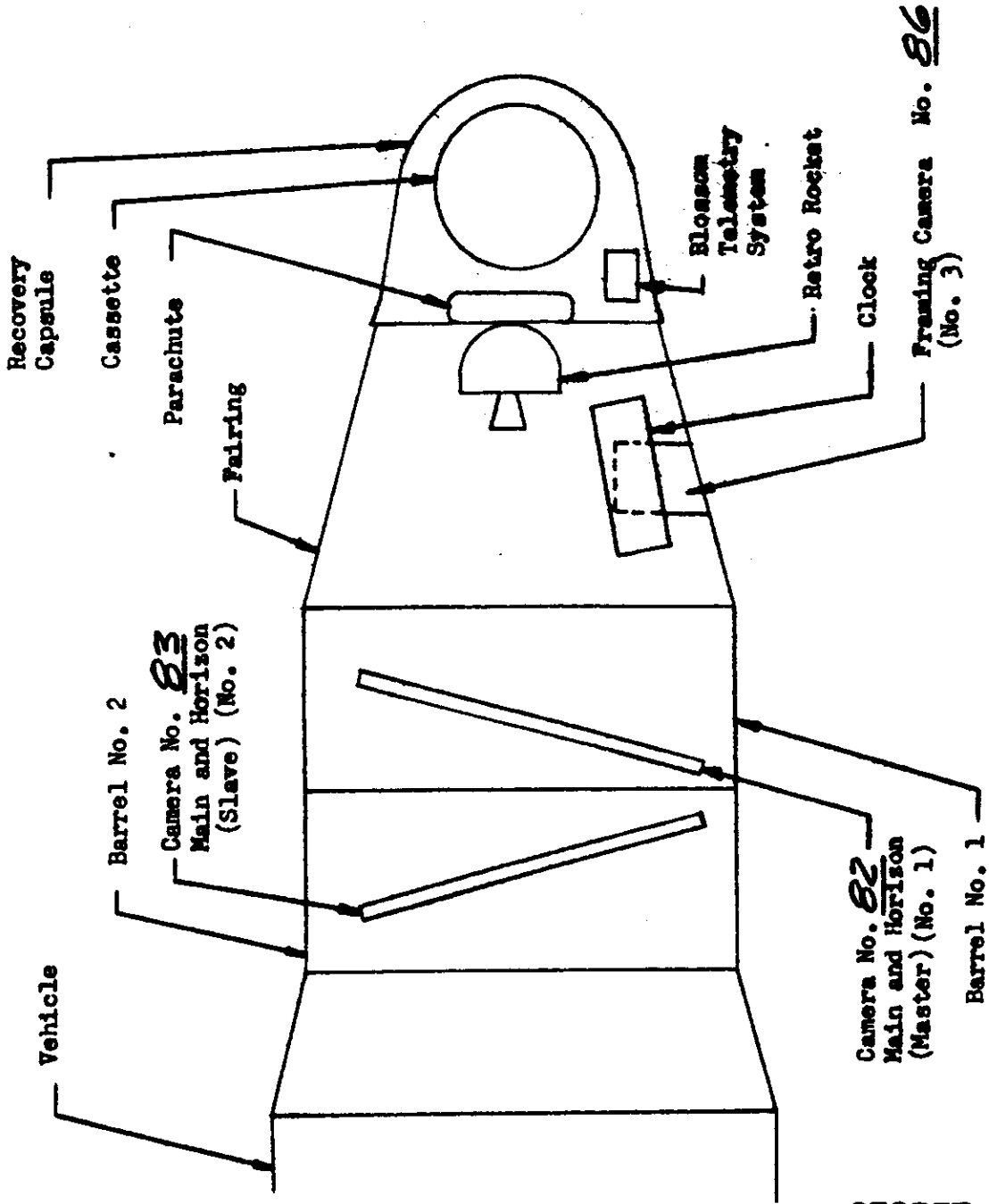
VEHICLE LAYOUT:



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SYSTEM NO. 119
VEHICLE NO. 1137
MISSION NO. 9089
CAMERA NOS. 82&83

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GENERAL FLIGHT DATA:

Discoverer No. 47

Main Camera No. 1 Serial No. 82

Main Camera No. 2 Serial No. 83

Framing Camera Serial No. 86

Launch Date 7/27/62

Orbital Parameters: (Rev. 26)

Period 90.7 Min. Eccentricity .0158

Perigee 111 NM Perigee Latitude 23.85 Deg. N

Apogee 225 NM Inclination Angle 71.04 Deg. N

Recovery Revolution No. 65

Recovery Date 7/31/62

REMARKS:

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SYSTEM NO. M9
VEHICLE NO. 1131
MISSION NO. 9040
CAMERA NOS. 82 & 83

PRE-LAUNCH INFORMATION:

V/H Programmer Set On Step 3 At Launch

Main Camera Settings: ?

	Camera No. 82	Camera No. 83
Main Optics Slit Width	.200 in.	.200 in.
Horizon Optics Exposure Time	1/200 Sec.	1/200 Sec.
Horizon Optics Aperture	F 6.8	F 8.0

Framing Camera Settings:

Exposure Time 1/250 Sec.

Aperture F6.3

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

Film:

	Camera No. 82	Camera No. 83	Framing Camera
Type	SO 132	SO 132	SO130
Length	7800 Ft.	7800 Ft.	135 Ft.
No. of Splices	2	2	None
Emulsion Data	31-4-5-5-2	31-4-1-2-62	15-2-4-2

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SYSTEM NO. M9
VEHICLE NO. 1131
MISSION NO. 9040
CAMERA NOS. 82, 83
FRAMING CAMERA NO. 86

SECRET

PERFORMANCE ESTIMATE

Pass No.	Frames Camera No.			Feet Camera No.			Latitude Degrees		Time On	Day	Solar Angle		Exp. Time		Lamp	Instr. On Sec Up Ramp
	82	83	86	82	83	86	On	Off	Hr. Min.	Sec.	On	Off	On	Off	No.	
PRE-LAUNCH	113	113		298	298		—	—	— —	—	—	—	—	—	—	—
ODE	9	9		24	24		8	5	28/0042	51	21	19	7.2	7.2	3	—
1AX1	58	59		153	155		48	60	0142	246	21	29	5.8	5.2	3	389
1DE	15	15		40	40		51	49	0200	45	45	44	3.8	3.7	3	1486
2AX1	63	64		166	169		45	61	0313	265	18	30	5.9	5.2	3	376
7DY1	49	49		129	129		62	55	1101	150	42	45	4.1	3.9	8	1256
7DY2	42	43		111	113		51	45	1105	125	45	42	3.8	3.7	8	1456
8DY1	91	93		240	245		59	46	1232	272	43	43	4.0	3.7	8	1277
9AE	11	10		29	26		38	40	1345	51	13	15	6.4	6.3	3	196
9DX1	88	89		232	235		57	43	1404	255	44	41	3.9	3.6	3	1349
15DE	17	17		45	45		41	39	2313	49	40	39	3.6	3.5	3	1704
16AX1	31	31		82	82		36	44	29/0020	144	12	18	6.3	5.9	3	246
16AX2	54	54		142	142		50	60	0023	220	22	29	5.6	5.1	3	475
17AX1	161	163		425	430		36	69	0150	657	12	37	6.3	4.6	3	250
17DX1	49	49		129	129		70	65	0205	156	39	41	4.3	4.0	3	1133
23DY1	74	75		195	198		64	54	1112	227	42	46	4.2	3.9	8	1221
23DY2	42	42		111	111		51	45	1116	122	45	42	3.8	3.7	8	1485
24DY1	125	126		330	332		64	45	1243	366	41	42	4.1	3.6	8	1244
25AE	10	10		26	26		38	40	1356	51	13	15	6.7	6.5	3	222
25DX1	99	100		261	264		57	41	1416	284	44	40	3.9	3.6	3	1380

SECRET

SYSTEM NO. M9
VEHICLE NO. 1131
MISSION NO. 9040
CAMERA NOS. 82, 83
FRAMING CAMERA NO. 86

[redacted]

PERFORMANCE ESTIMATE

Pass No.	Frames Camera No.			Feet Camera No.			Latitude Degrees		Time On Hr. Min.	Dur Sec.	Solar Angle		Exp. Time (Milliseconds)		Lamp No.	Instr. On Sec Up Read
	82	83	86	82	83	86	On	Off			On	Off	On	Off		
30AY1	36	36		95	95		42	50	2131	156	16	22	5.9	5.5	8	377
31AY1	52	52		137	137		47	57	2303	215	20	27	5.7	5.2	8	467
31DE	17	17		45	45		41	39	2324	49	40	40	3.7	3.7	3	1753
32AX1	46	47		121	124		52	60	30/0035	184	23	29	5.4	5.0	3	560
32AX2	43	43		113	113		64	69	0039	155	33	37	4.9	4.6	3	798
33AY1	29	30		76	79		43	50	0203	131	17	22	6.0	5.6	8	403
33AY2	43	43		113	113		53	61	0206	174	24	30	5.5	5.1	8	573
40AE	10	10		26	26		38	40	1237	51	13	15	6.6	6.5	8	247
40DY1	39	40		103	105		63	58	1254	122	42	44	4.1	3.9	8	1291
40DY2	64	65		169	171		54	45	1257	184	46	42	3.9	3.7	8	1452
41DY1	49	50		129	132		54	47	1428	143	46	43	3.8	3.7	8	1460
45AY1	36	36		95	95		50	57	2014	146	22	27	5.5	5.2	8	590
46AX1	58	59		153	156		41	53	2141	245	15	24	5.8	5.2	3	409
46AX2	85	86		224	227		59	70	2147	306	29	38	5.0	4.4	3	732
47AX1	84	85		221	224		48	64	2314	329	20	33	5.5	4.8	3	534
49AX1	111	113		293	298		37	61	31/0213	452	12	30	5.9	4.8	3	364
49DX1	101	102		266	269		71	66	0224	321	38	41	4.4	3.9	3	1063
50AX1	90	91		237	240		44	61	0345	355	18	30	5.6	4.8	3	473
50AX2	31	32		82	84		66	69	0352	112	34	37	4.7	4.5	3	896
50DX1	40	41		105	108		61	56	0402	116	42	45	3.8	3.7	3	1472

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SYSTEM NO. M9
VEHICLE NO. 1131
MISSION NO. 9040
CAMERA NOS. 82, 83
FRAMING CAMERA NO. 86

PERFORMANCE ESTIMATE

Pass No.	Frames Camera No.			Feet Camera No.			Latitude Degrees		Time On	Day	Solar Angle		Ramp Time		Ramp No.	Instr. On Sec Up Ramp
	82	83	86	82	83	86	On	Off	Hr. Min. Sec.		On	Off	On	Off		
51AX1	124	126		327	332		50	69	0518	457	22	37	5.3	4.4	3	596
51DX1	49	49		129	129		55	49	0534	136	45	44	3.7	3.5	3	1574
52AX1	32	32		84	84		66	69	0654	117	34	37	4.9	4.6	3	794
52DX1	62	63		163	166		69	63	0659	196	39	42	4.3	4.0	3	1132
52DX2	104	105		274	277		58	42	0704	293	44	41	3.9	3.5	3	1402
53DX1	42	42		111	111		70	68	0829	136	38	40	4.3	4.1	3	1078
53DX2	76	76		200	200		62	51	0833	222	42	45	4.0	3.7	3	1332
54DX1	159	161		419	424		68	46	1001	470	40	43	4.2	3.6	3	1176
63AY1	43	44		113	116		50	56	23 38	190	22	26	5.7	5.2	B	470

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SYSTEM NO. M9
VEHICLE NO. 1131
MISSION NO. 9040
CAMERA NOS. 82 & 83

PRE-FLIGHT CYCLE PERIOD: (CAMERA NO. 82)

V/H Ramp	Cycle Period Seconds	FMC Rate		Scan Rate		
		Rad. Per Second	In. Per Second	Rad. Per Second	In. Per Second	Exposure Millisec
3 START	5.32	.016	.381	1.181	28.345	7.06
3 END	2.53	.033	.800	2.483	59.603	3.36
8 START	5.34	.016	.379	1.177	28.238	7.08
8 END	2.52	.035	.804	2.493	59.839	3.34

IN-FLIGHT CYCLE PERIOD: (CAMERA NO. 82)

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	3 (240)	4.68	.018	.433	1.343	32.221	6.21
15	3 (1710)	2.64	.032	.767	2.380	57.119	3.50
25	3 (260)	4.73	.018	.428	1.328	31.880	6.27
31	3 (1775)	2.64	.032	.767	2.380	57.119	3.50
40	8 (285)	4.62	.018	.438	1.360	32.639	6.13

NOTE: NUMBER IN PARENTHESIS IS APPROXIMATE TIME UP RAMP AT TIME CYCLE PERIOD WAS MEASURED.

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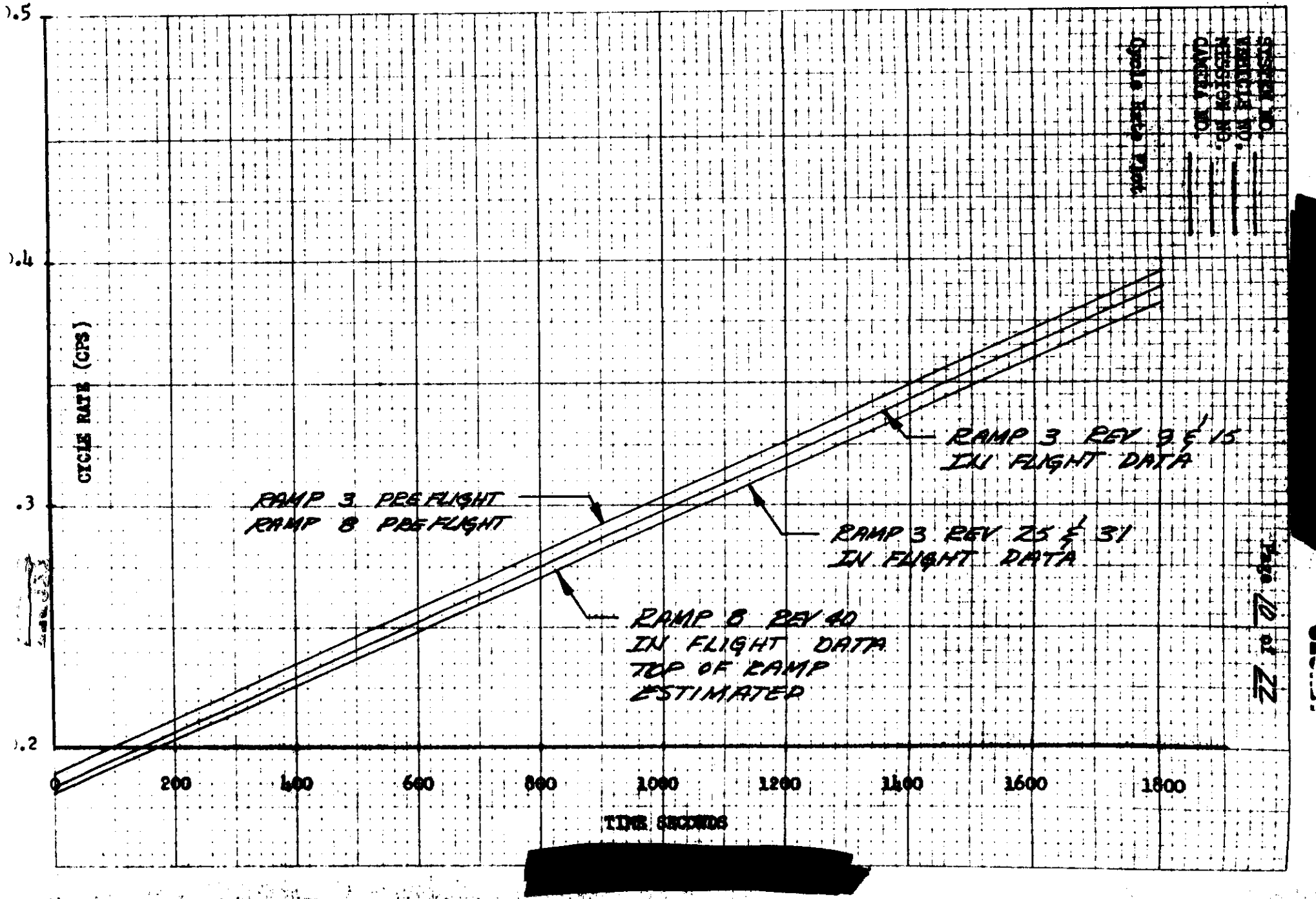

.5
.4
.3
.2
CYCLE RATE (CPS)
RAMP 3 PREFLIGHT
RAMP 8 PREFLIGHT
RAMP 3 REV 9 & 15
IN FLIGHT DATA
RAMP 3 REV 25 & 31
IN FLIGHT DATA
RAMP 8 REV 40
IN FLIGHT DATA
TOP OF RAMP
ESTIMATED
0
200
400
600
800
1000
1200
1400
1600
1800
TIME SECONDS

[redacted]

SECRET

SYSTEM NO. M9
VEHICLE NO. 1131
MISSION NO. 9040
CAMERA NOS. B2 & B3

PRE-FLIGHT CYCLE PERIOD: (CAMERA NO. B3)

V/H Ramp	Cycle Period Seconds	FMC Rate		Scan Rate		
		Rad. Per Second	In. Per Second	Rad. Per Second	In. Per Second	Exposure Millisec
3 START	5.23	.016	.387	1.201	28.833	6.94
3 END	2.48	.034	.817	2.534	60.804	3.29
8 START	5.24	.016	.386	1.199	28.777	6.95
8 END	2.47	.034	.820	2.544	61.050	3.27

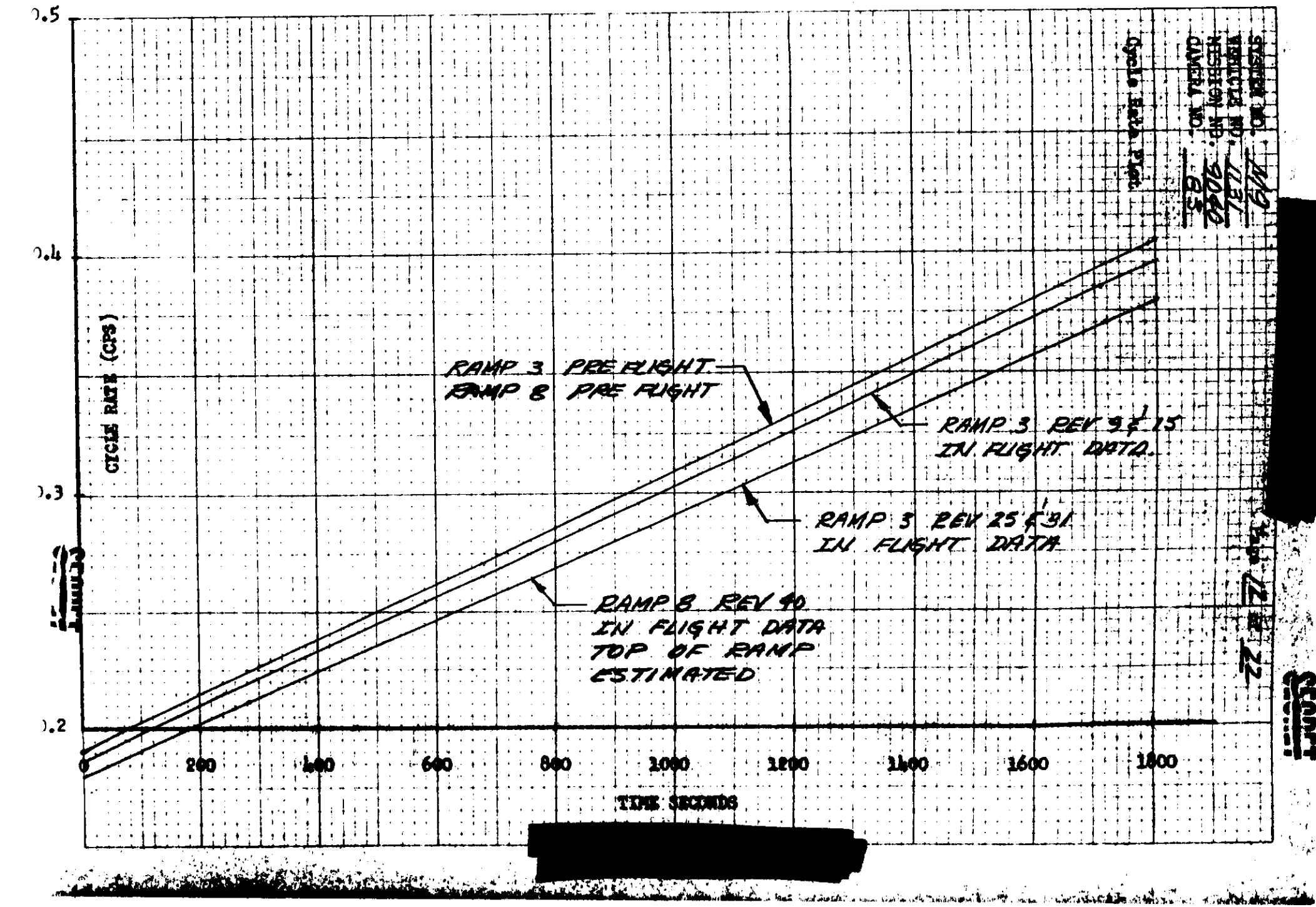
IN-FLIGHT CYCLE PERIOD: (CAMERA NO. B3)

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	3(240)	4.63	.018	.437	1.357	32.569	6.14
15	3(1710)	2.60	.032	.779	2.417	57.998	3.45
25	3(260)	4.80	.018	.422	1.309	31.416	6.37
31	3(1775)	2.66	.032	.761	2.362	56.690	3.53
45	8(285)	4.67	.018	.434	1.345	32.290	6.19

NOTE: NUMBER IN PARENTHESIS IS APPROXIMATE TIME UP RAMP AT TIME CYCLE PERIOD WAS MEASURED.

[redacted]

SECRET


0.5
0.4
0.3
0.2
CYCLE RATE (CPS)
RAMP 3 PRE FLIGHT
RAMP 8 PRE FLIGHT
RAMP 3 REV 9 & 15
IN FLIGHT DATA
RAMP 3 REV 25 & 31
IN FLIGHT DATA
RAMP 8 REV 10
IN FLIGHT DATA
TOP OF RAMP
ESTIMATED
200
400
600
800
1000
1200
1400
1600
1800
TIME SECONDS

SYSTEM NO. M9
VEHICLE NO. 1131
MISSION NO. 9040
CAMERA NOS. 82 & 83

LENS DATA SUMMARY: (Main Camera No. 82)

Lens Serial No. 0242435

Filter Type WRATTEN 21

Equivalent Operational Focal Length 609.602 MM

Resolution:

Static:

	Lines/MM	Film Type	Target Contrast
Bench Test	224	SO243	HIGH
Other			

Dynamic:

Itek Pre-Vibration	135	SO132	HIGH
Itek Post Vibration	152	SO132	HIGH
AF	156	SO132	HIGH
AP	90	SO132	LOW
Other			

Note: Itek Post Vibration Resolution of 152 lines/MM Reported In Message No. [redacted] dated 7/27/62

Distortion - Positive (Pincushion)

Angle Off Axis Deg.	3	2	1	0	359	358	357		
Distortion Millimeters	.005	.003	.001	.000	.000	.004	.010		

[redacted]

SYSTEM NO. M9 [redacted] Page 14 of 22
VEHICLE NO. 1137
MISSION NO. 9040
CAMERA NOS. 82 & 83

SECRET

LENS DATA SUMMARY: (Horizon Cameras for Main Camera No. 82)

	Take-Up	Supply
Lens Serial No.	807569	807552
Exposure Time	1/200 Sec.	1/200 Sec.
Filter Type	WRATTEN 25	WRATTEN 25
Aperture	F 6.8	F 6.8
Operational Focal Length	89.0 MM	89.0 MM
Radial Distortion:		
10° off Axis	.010 MM	.002 MM
20° off Axis	.048 MM	.027 MM
Tangential Distortion (Maximum Vector)	.003 MM	.009 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	30	34	31	28	51	47	42	32	32	34	29
Tangential Resolution	51	44	42	32	31	26	18	51	44	42	32	29	25	22

36.7 Lines/MM Avg. 36.6 Lines /MM Avg.

Note:

1. Distortion and resolution are read at equivalent operational focal length.
2. Resolution in lines per mm on SUPER XX film and HIGH contrast target.

SECRET

[redacted]

SYSTEM NO. M9
VEHICLE NO. 1131
MISSION NO. 9040
CAMERA NOS. B2 & B3

[redacted]

SECRET

LENS DATA SUMMARY: (Main Camera No. 83)

Lens Serial No. 0212435

Filter Type WRATTEN 21

Equivalent Operational Focal Length 609.653 MM

Resolution:

Static:

	Lines/MM	Film Type	Target Contrast
Bench Test	213	SO243	HIGH
Other			

Dynamic:

Itek Pre-Vibration	123	SO132	HIGH
Itek Post Vibration	162	SO132	HIGH
AP	154	SO132	HIGH
AP	97	SO132	LOW
Other			

Note: Itek Post Vibration Resolution of 162 lines/MM Reported In Message No. [redacted] dated 7/27/62

Distortion - Positive (Pincushion)

Angle Off Axis Deg.	3	2	1	0	359	358	357		
Distortion Millimeters	.002	.002	.000	.000	.002	.005	.010		

SECRET

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SYSTEM NO. 119 [redacted] Page 16 of 22
VEHICLE NO. 1131
MISSION NO. 9040
CAMERA NOS. 82 & 83

SECRET

LENS DATA SUMMARY: (Horizon Cameras for Main Camera No. 83)

	Take-Up	Supply
Lens Serial No.	807537	807538
Exposure Time	1/200 Sec.	1/200 Sec.
Filter Type	NONE	NONE
Aperture	F8.0	F8.0
Operational Focal Length	89.1 MM	89.15 MM
Radial Distortion:		
10° off Axis	.012 MM	.009 MM
20° off Axis	.045 MM	.039 MM
Tangential Distortion (Maximum Vector)	.006 MM	.004 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	47	37	32	32	29	51	40	35	30	29	30	30
Tangential Resolution	51	47	44	36	30	27	22	51	40	32	34	28	27	20

38.5 Lines/MM Avg. 34.1 Lines /MM Avg.

Note:

1. Distortion and resolution are read at equivalent operational focal length.
2. Resolution in lines per mm on SUPER XX film and HIGH contrast target.

SECRET

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SYSTEM NO. 119
VEHICLE NO. 1137
MISSION NO. 9040
CAMERA NOS. 82383

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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 ± 5" of arc. The longitudinal axis of the vehicle (Z axis) is so positioned to form an angle of 105.00° ± 5" to the target plane for camera number one calibrations and an angle of 75.00° ± 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° ± 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 Xvo and Yvo are the offsets of Target 1 from the indicated center of format as defined in paragraph 3.

6.0 Xs, Ys and Xu, Yu 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 Y 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.

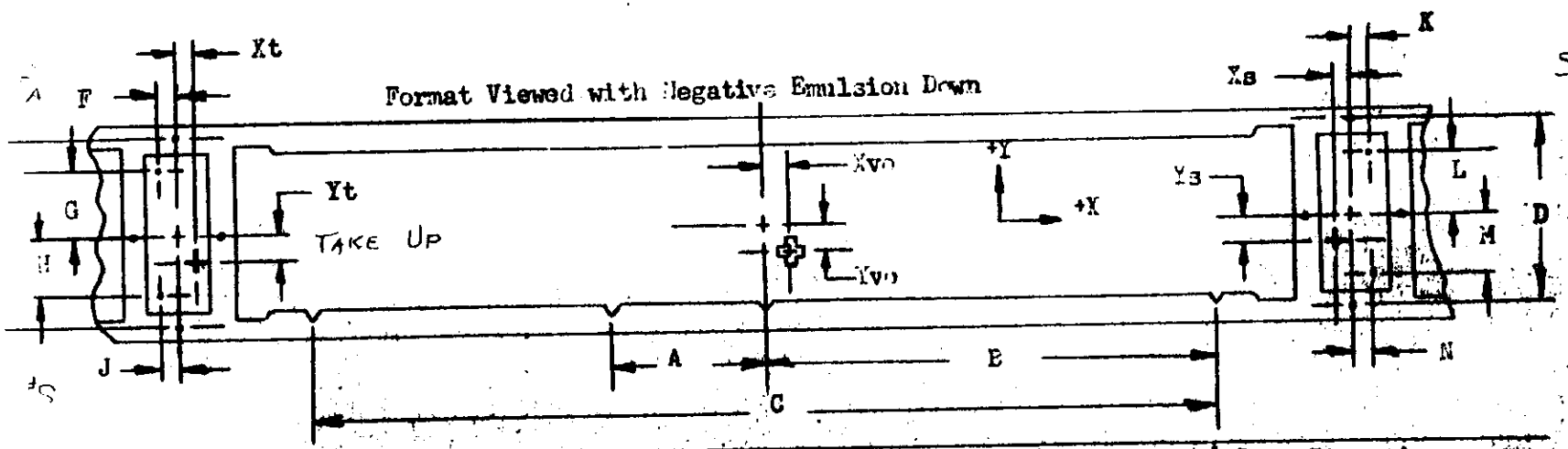
10.0 Measurement of the angle between the indicated axis of the main cameras and the line of intersection of the plane dfined in Para. 2 on the format is not currently available. It is assumed to be zero, but is uncontrolled.

11.0 Measurement of the angle between the indicated axis of the horizon cameras and the line of intersection of the plane defined in Para. 2 on the format is made by positioning two targets for each horizon format normal ± 5" of arc to the plane defined in Para. 2. Dimensions F, G, H, J, K, L, M and N are the offsets of these targets.

SECRET

SYSTEM NO. 110
VEHICLE NO. 113
MISSION NO. 9040
CAMERA NOS. 82 83

FORMAT DIMENSIONS (MAIN CAMERAS)



Camera No. 82 Vehicle Motion → Scan Direction →

A	76.130	Xs	-1.421	H	-24.240
B	355.120	Ys	-.110	J	-4.912
C	710.510	Xvo	±.163	K	+3.640
D	56.517	Yvo	-.131	L	±23.069
E	56.399	F	-4.994	M	-23.268
	-.013	G	±23.359	N	+3.530
Yt	-.339				

Format Dimensions:

	Main	Take-Up	Supply
Height	55.8	Not Available	
Width	754.7	Not Available	

Camera No. 83 Vehicle Motion → Scan Direction →

A	76.158	Xs	±1.787	H	-23.127
B	355.213	Ys	-.254	J	-4.667
C	710.517	Xvo	±.478	K	+3.028
D	56.512	Yvo	±1.008	L	±23.588
E	56.379	F	-4.486	M	-24.064
Xt	±.489	G	±23.274	N	+3.148
Yt	±.105				

Format Dimensions:

	Main	Take-Up	Supply
Height	56.0	Not Available	
Width	755.2	Not Available	

Note: 1. All dimensions are in millimeters and are average dimensions of three formats.
2. Height of main format is taken at center of format.
3. Format sign convention

-X+Y	+X+Y
-X-Y	+X-Y

Note: Dim "A", "Xvo", "Yvo" ± .015 Due to Poor Reference.

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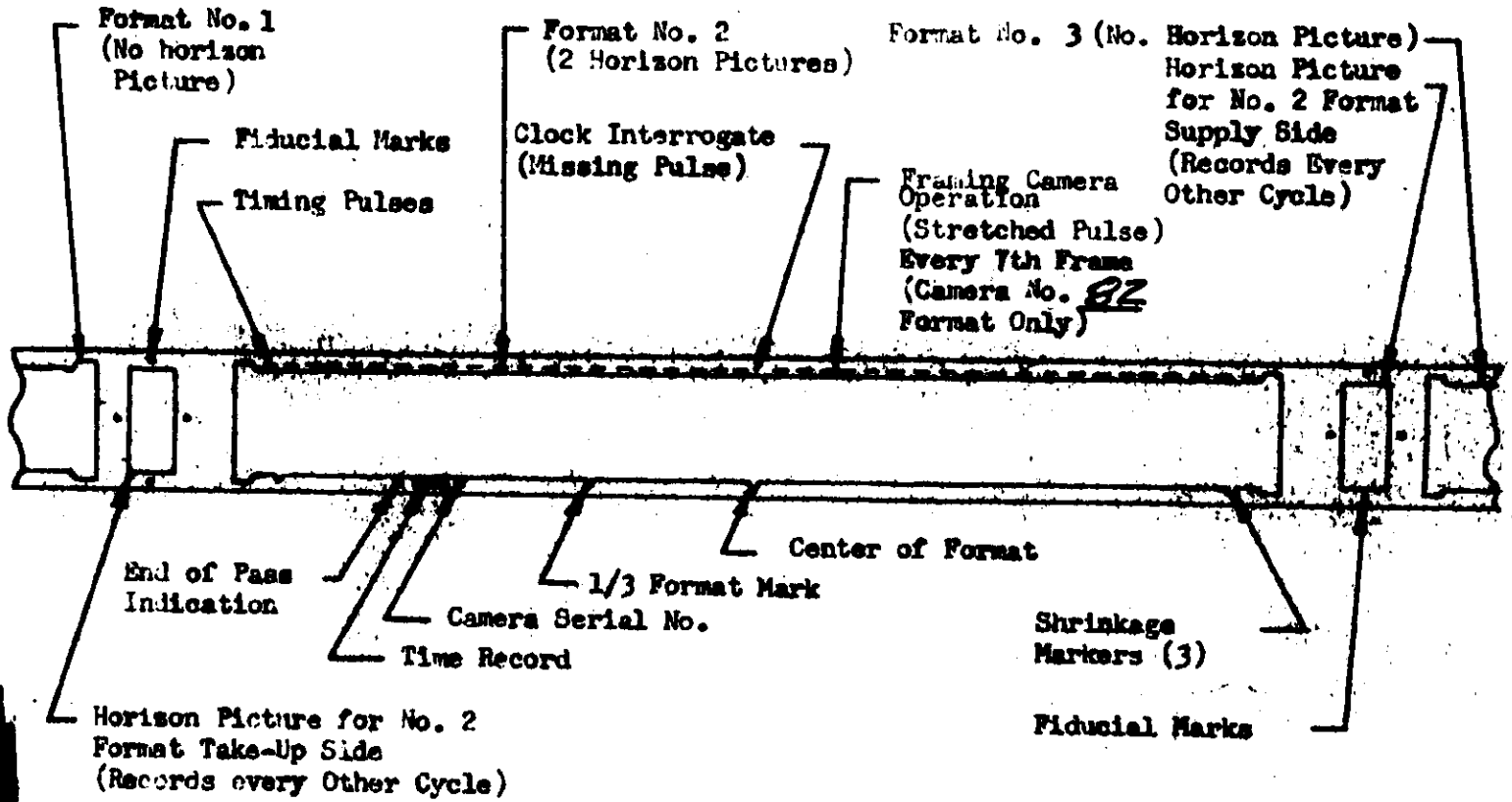

Camera No. 82

Viewed With Negative Emulsion Down

Film Transport

Scan

Vehicle Motion

Camera No. 83

Viewed With Negative Emulsion Down

Film Transport

Scan

Vehicle Motion

SYSTEM NO. 119
VEHICLE NO. 131
MISSION NO. 9020
CAMERA NOS. 82 83

FORMAT LAYOUT (MAIN CAMERAS)

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SYSTEM NO. 119
VEHICLE NO. 1131
MISSION NO. 9040
CAMERA NOS. 82 & 83

SECRET

LENS DATA SUMMARY: (Framing Camera No. 86)

Lens Serial No. 2827819

Reseau Serial No. 84

Filter Type WRATTEN 21

Aperture F 6.3

Exposure Time 1/250 Sec.

Equivalent Focal Length 38.60 MM A.F.L 38.69 MM

Resolution: 85 Lines/MM AWAR

Angle off axis	0	10	20	30	35
Resolution L/MM High Contrast	143	129	110	93	82
Resolution L/MM Low Contrast	69	63	60	48	47

Note: Resolution data read from SO 130 Film

Distortion:

Angle off Axis Deg.	325	330	340	350	0	10	20	30	35
Distortion Millimeters	.158	.128	.050	.016	.000	.011	.048	.114	.156

Perpendicularity of Reseau to Optical Axis .035 MM IN 57.15 MM

Date of Stellar Calibration 5/26/62

Location of Principal Point:

X -.08 MM

Y -.03 MM

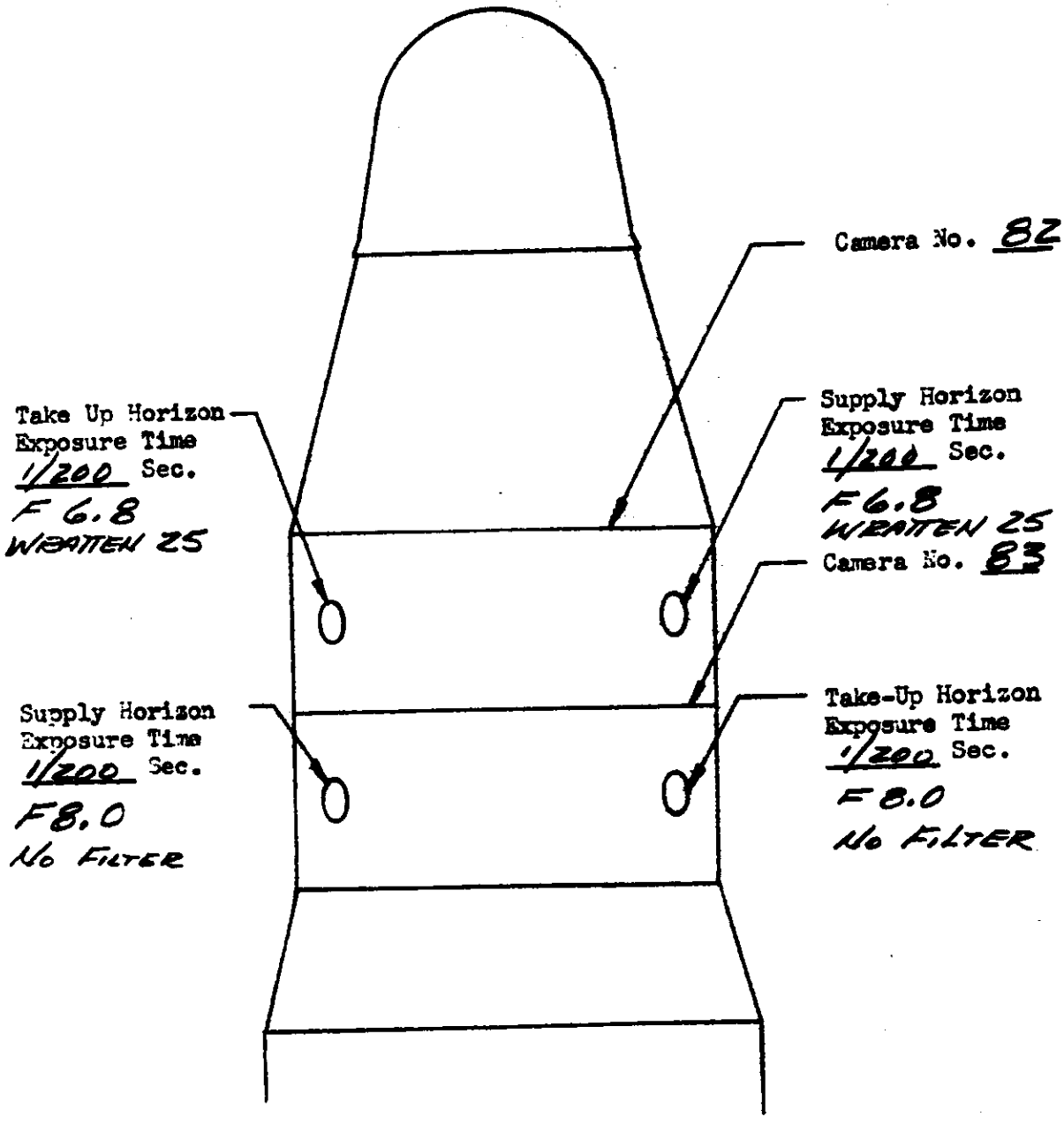
NOTE: NO ANGULAR CALIBRATION BETWEEN FRAMING AND PANORAMIC CAMERAS FOR THIS SYSTEM.

SECRET

SYSTEM NO. M9
VEHICLE NO. 1131
MISSION NO. 9040
CAMERA NOS. 82 & 83

DRAFT

HORIZON LENS SETTINGS (Viewed from top of vehicle inflight)



DRAFT

SYSTEM NO. 119
VEHICLE NO. 1131
MISSION NO. 9040
CAMERA NOS. B2 & B3

PRELIMINARY CLOCK CORRELATION:

Rev. No.	System Time	Clock Time	Delta Sys. Time	Delta Clock Time	Diff.
LAUNCH	2270.064	138815.068	———	———	———
9	49527.819	186072.829	47257.755	47257.741	+.006
15	83630.272	220175.274	34102.453	34102.445	-.008
25	50197.204	273142.214	52966.932	52966.940	+.008
31	84298.693	307243.704	34,101.489	34,101.490	+.001
40	45423.063	354768.074	47524.370	47524.370	0
56	45821.767	441566.793	86798.704	86798.719	+.015

NOTE: ALL TIMES ARE IN SECONDS
DELTA TIMES ARE TAKEN FROM PRECEDING READING.

SECRET