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23 Pages
(Including Cover Sheet)

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CORONA "M" FLIGHT DATA BOOK

SYSTEM NO. M14

VEHICLE NO. 1136

MISSION NO. 9047

Prepared by: [redacted]

Checked by: [redacted]

Approved by: [redacted]
(Engineering Manager)

Approved by: [redacted]
(Project Manager)

Approved by: [redacted]

[redacted]

TOP SECRET

SYSTEM NO. M14
VEHICLE NO. 1136
MISSION NO. 9047
CAMERA NOS. 98 & 99

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SYSTEM NO. 1114
VEHICLE NO. 1136
MISSION NO. 9047
CAMERA NOS. 98 & 99

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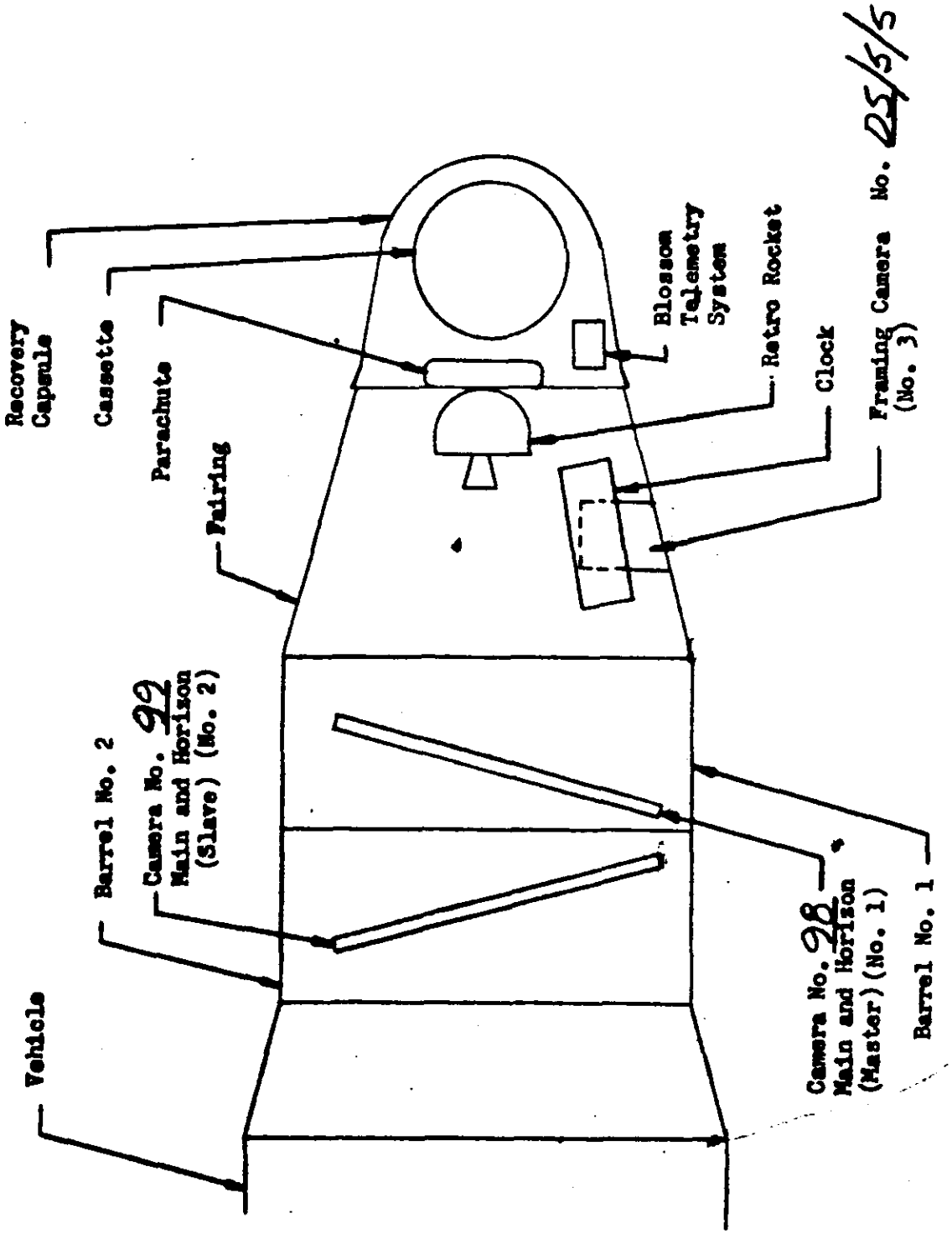
VEHICLE LAYOUT:



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SYSTEM NO. M14
VEHICLE NO. 1136
MISSION NO. 9027
CAMERA NOS. 98 & 99

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GENERAL FLIGHT DATA:

Main Camera No. 1 Serial No. 98

Main Camera No. 2 Serial No. 99

Framing Camera Serial No. D5/5/5

Launch Date 11/5/62

Orbital Parameters: (Rev. 23)

Period 90.72 Min. Eccentricity .0155

Perigee 112 NM Perigee Latitude 24.95 Deg. N

Apogee 225 NM Inclination Angle 74.99 Deg. N

Recovery Revolution No. 65

Recovery Date 11/9/62

REMARKS:

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SYSTEM NO. 414
VEHICLE NO. 1136
MISSION NO. 9047
CAMERA NOS. 98 & 99

PRE-LAUNCH INFORMATION:

V/H Programmer Set On Step 3 At Launch

Main Camera Settings:

	Camera No. 98	Camera No. 99
Main Optics Slit Width	.200 in.	.200 in.
Horizon Optics Exposure Time	1/100 Sec.	1/100 Sec.
Horizon Optics Aperture	F6.8	F6.8

Framing Camera Settings:	Terrain Lens	Stellar Lens
Exposure Time	1/125 Sec.	1/2 Sec.
Aperture	F 4.5	F 1.9

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

Film:

	Camera No. 98	Camera No. 99	Framing Camera Terrain	Framing Camera Stellar
Type	S0132	S0132	S0206	S0130
Length	7800 Ft.	7800 Ft.	135 Ft.	——— Ft.
No. of Splices	3	2	———	———
Emulsion Data	26-10-2-5-2	27-3-26-5-2	1-9-2	1-4-9-2

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SYSTEM NO. M14
VEHICLE NO. 1136
MISSION NO. 9047
CAMERA NOS. 98 & 99
FRAMING CAMERA NO. D565/5

TOP SECRET
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PERFORMANCE ESTIMATE

PASS NO.	FRAMES CAMERA NO.		FEET CAMERA NO.		LATITUDE DEGREES		TIME ON	SOLAR ANGLE		EXP. TIME MILLISEC		RAMP NO.	INST ON SEC. UP RAMP	DUR.
	98	99	98	99	ON	OFF	HR. MIN.	ON	OFF	ON	OFF			
Pre Launch	112	112	295	295	---	---	---	---	---	---	---	---	---	---
1DX1	43	43	113	113	71	65	5/2329	3	9	4.2	4.0	3	12.38	133
2DX1	33	33	87	87	66	61	6/0102	8	13	4.1	4.0	3	1324	104
3DY1	27	27	71	71	72	70	0230	2	4	4.2	4.1	8	1191	87
3DY2	66	66	174	174	60	50	0234	14	21	3.9	3.7	8	1430	190
4DY1	52	52	137	137	55	47	0406	18	24	3.8	3.6	8	1529	147
5DY1	56	56	148	148	56	46	0537	17	24	3.8	3.6	8	1526	157
5DY2	57	57	150	150	44	34	0540	26	32	3.5	3.4	8	1719	152
6DY1	60	60	158	158	60	50	0706	14	21	3.9	3.7	8	1453	173
7DY1	51	51	134	134	61	52	0837	13	20	3.9	3.7	8	1445	147
7DY2	53	53	140	140	49	41	0840	22	28	3.6	3.5	8	1628	144
8DY1	127	126	335	332	67	46	1006	7	24	4.0	3.6	8	1334	361
9AE	10	10	26	26	38	41	1119	—	—	6.0	5.9	3	312	49
9DX1	113	112	298	295	61	43	1138	13	26	4.0	3.6	3	1440	321
15DE	16	17	42	45	40	38	2048	28	30	3.5	3.5	3	1790	47
17DX1	42	42	111	111	70	64	2341	4	10	4.2	4.0	3	1277	133
22DX1	49	49	129	129	70	63	7/0715	4	11	4.1	3.9	3	1280	150
22DX2	70	70	185	185	58	47	0718	15	24	3.8	3.6	3	1492	198
22DX3	101	101	266	266	44	28	0722	26	36	3.6	3.5	3	1726	272
23DY1	56	56	148	148	60	52	0848	14	20	3.8	3.6	8	1461	158
23DY2	57	57	150	150	50	41	0852	21	28	3.6	3.4	8	1658	153

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SYSTEM NO. M-14
VEHICLE NO. 1136
MISSION NO. 9047
CAMERA NOS. 98 & 99
FRAMING CAMERA NO. DS/S-5

TOP SECRET

PERFORMANCE ESTIMATE

PASS NO.	FRAMES CAMERA NO.		FEET CAMERA NO.		LATITUDE DEGREES		TIME ON	SOLAR ANGLE		EXP. TIME MILLISEC		RAMP NO.	INST ON SEC. UP RAMP	DUR.
					ON	OFF	HR. MIN.	ON	OFF	ON	OFF			
24DY1	111	111	293	293	64	46	10 18	10	24	3.8	3.5	8	1428	307
25AE	10	10	26	26	37	41	11 31	30	28	6.5	6.3	8	3.51	49
25DY1	67	67	177	177	57	46	1151	16	24	3.8	3.6	8	1550	187
33DX1	35	35	92	92	69	63	2353	5	11	4.1	4.0	3	1341	109
34DY1	20	20	53	53	63	58	0126	11	15	3.8	3.7	8	1507	58
36DY1	84	84	221	221	55	41	0430	18	28	3.7	3.5	8	1624	225
37DY1	57	57	150	150	59	49	0559	14	22	3.7	3.6	8	1555	159
38DY1	74	74	195	195	61	48	0729	13	23	3.8	3.5	8	1532	206
39DY1	53	53	140	140	71	64	0856	3	10	4.0	3.8	8	1308	158
39DY2	60	60	158	158	62	52	0859	12	20	3.8	3.6	8	1501	171
39DY3	54	54	142	142	50	41	0903	21	28	3.5	3.4	8	1708	143
40DY1	99	99	261	261	62	47	1030	12	23	3.8	3.5	8	1503	272
41AE	10	10	26	26	38	40	1142	—	—	6.3	6.3	3	391	49
41DX1	51	51	134	134	55	47	1203	18	23	3.8	3.6	3	1636	143
49DX1	35	35	92	92	68	62	0005	6	12	3.9	3.8	3	1421	105
50DX1	37	37	98	98	73	70	0133	1	4	4.1	4.0	3	1279	115
50DX2	62	62	163	163	61	57	0137	13	21	3.8	3.6	3	1546	173
51DX1	40	40	105	105	56	49	0310	17	22	3.7	3.6	3	1638	111
52DX1	113	112	298	295	55	37	0440	18	30	3.7	3.5	3	1647	304
53DX1	68	68	179	179	59	49	0610	14	22	3.8	3.5	3	1569	189
53DX2	145	144	382	380	43	19	0614	26	40	3.5	3.5	3	1841	385
54DX1	190	189	501	498	71	42	0737	3	27	4.0	3.5	3	1359	529
55DX1	183	182	482	480	71	42	0908	3	27	4.0	3.5	3	1361	513
56DX1	119	118	314	311	61	43	1042	13	26	3.7	3.5	3	1556	321

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SYSTEM NO. M 14
VEHICLE NO. 1136
MISSION NO. 9047
CAMERA NOS. 98 & 99
FRAMING CAMERA NO. D5/5/5

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PERFORMANCE ESTIMATE

PASS NO.	FRAMES CAMERA		FEET CAMERA	
	TERRAIN	STELLAR	TERRAIN	STELLAR
PRE LAUNCH	16	16	3.17	1.58
1 DX1	6	6	1.19	0.59
2 DX1	4	4	0.79	0.40
3 DY1	4	4	0.79	0.40
3 DY2	10	10	1.98	0.99
4 DY1	7	7	1.39	0.69
5 DY1	8	8	1.58	0.79
5 DY2	8	8	1.58	0.79
6 DY1	9	9	1.78	0.89
7 DY1	7	7	1.39	0.69
7 DY2	8	8	1.58	0.79
8 DY1	18	18	3.56	1.78
9 AE	1	1	0.20	0.10
9 DX1	16	16	3.17	1.58
15 DE	3	3	0.59	0.30
17 DX1	6	6	1.19	0.59
22 DX1	7	7	1.39	0.69
22 DX2	10	10	1.98	0.99
22 DX3	14	14	2.77	1.39
23 DY1	8	8	1.58	0.79
23 DY2	8	8	1.58	0.79
24 DY1	17	17	3.36	1.68
25 AE	2	2	0.40	0.20

PASS NO.	FRAMES CAMERA		FEET CAMERA	
	TERRAIN	STELLAR	TERRAIN	STELLAR
25 DY1	9	9	1.78	0.89
33 DX1	5	5	0.99	0.49
34 DY1	3	3	0.59	0.30
36 DY1	12	12	2.38	1.19
37 DY1	8	8	1.58	0.79
38 DY1	11	11	2.18	1.09
39 DY1	7	7	1.39	0.69
39 DY2	9	9	1.78	0.89
39 DY3	8	8	1.58	0.79
40 DY1	14	14	2.77	1.39
41 AE	1	1	0.20	0.10
41 DX1	7	7	1.39	0.69
49 DX1	5	5	0.99	0.49
50 DX1	6	6	1.19	0.59
50 DX2	9	9	1.78	0.89
51 DX1	5	5	0.99	0.49
52 DX1	16	16	3.17	1.58
53 DX1	10	10	1.98	0.99
53 DX2	21	21	4.16	2.08
54 DX1	27	27	5.34	2.67
55 DX1	27	27	5.34	2.67
56 DX1	17	17	3.36	1.68

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SYSTEM NO. MH
VEHICLE NO. N36
MISSION NO. 9047
CAMERA NOS. 9BF99
FRAMING CAMERA NO. D/5/5/5

TOP SECRET

PERFORMANCE ESTIMATE

PASS NO.	FRAMES CAMERA NO.		FEET CAMERA NO.		LATITUDE DEGREES		TIME ON	SOLAR ANGLE		EXP. TIME MILLISEC		RAMP NO.	INST ON SEC. UP RAMP	DUR.
					ON	OFF	HR. MIN.	ON	OFF	ON	OFF			
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SYSTEM NO. M14
VEHICLE NO. 1136
MISSION NO. 9047
CAMERA NOS. 98 & 99

PRE-FLIGHT CYCLE PERIOD: (CAMERA NO. 98)

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	5.39	.016	.376	1.166	27.977	7.15
3 END	2.55	.033	.794	2.464	59.135	3.38
8 START	5.37	.016	.377	1.170	28.081	7.12
8 END	2.51	.034	.807	2.503	60.077	3.33

IN-FLIGHT CYCLE PERIOD: (CAMERA NO. 98)

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 (360)	4.60	.018	.440	1.366	32.781	6.10
15	3 END	2.61	.032	.776	2.407	57.776	3.46
25	8 (400)	4.45	.019	.445	1.412	33.886	5.90
41	3 (440)	4.39	.019	.461	1.431	34.350	5.82

NO. IN PARENTHESIS EQUALS TIME UP RAMP

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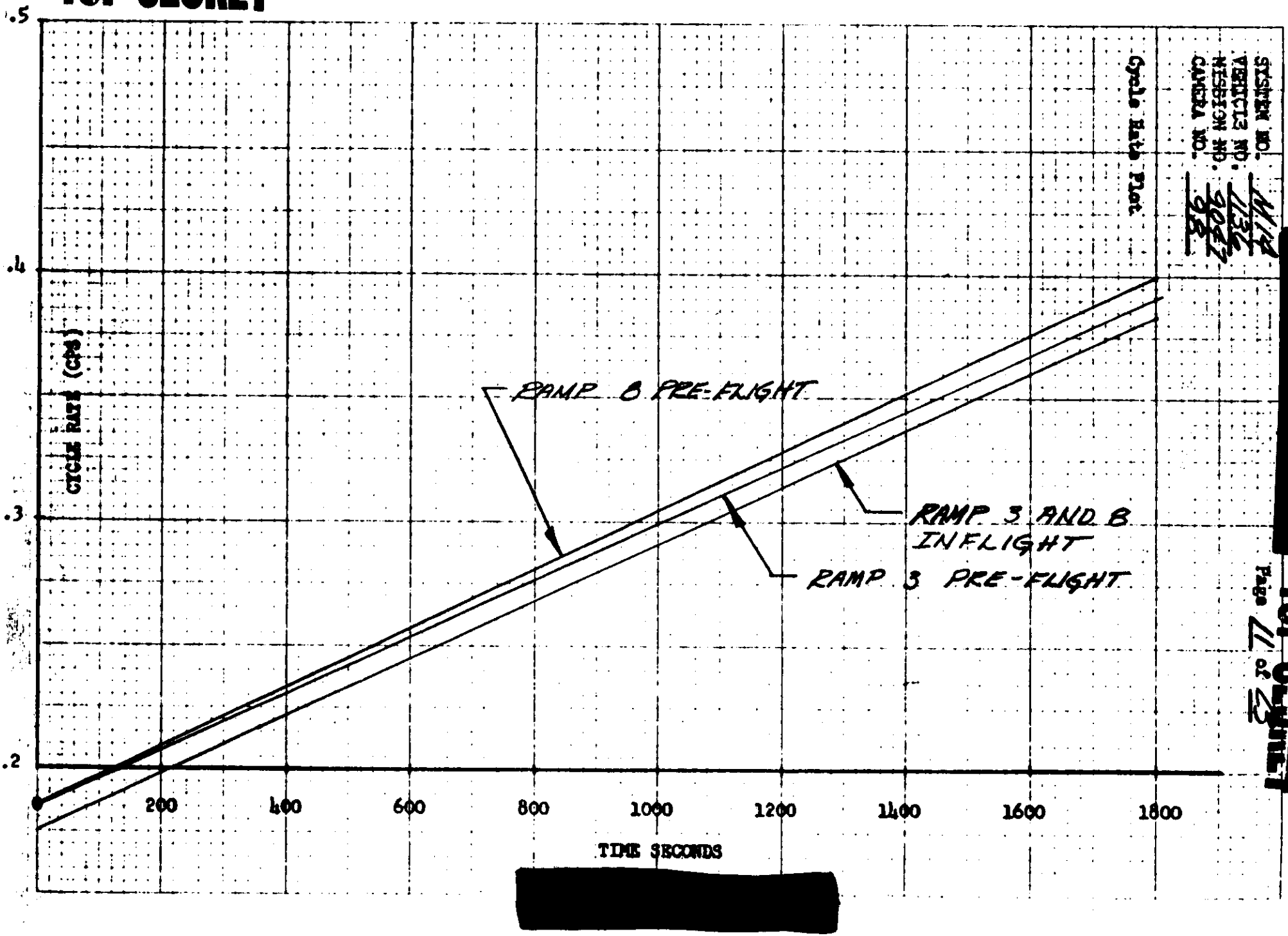
.5
.4
.3
.2
CYCLE RATE (CPS)
200
400
600
800
1000
1200
1400
1600
1800
TIME SECONDS
Cycle Rate Plot
SYSTEM NO. MK 2
VEHICLE NO. 1136
MISSION NO. 9067
CAMERA NO. 952
RAMP 0 PRE-FLIGHT
RAMP 3 AND 0 INFLIGHT
RAMP 3 PRE-FLIGHT

[redacted]

SYSTEM NO. M14
VEHICLE NO. 1136
MISSION NO. 9047
CAMERA NOS. 98 & 99

TOP SECRET

PRE-FLIGHT CYCLE PERIOD: (CAMERA NO. 99)

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	5.43	.016	.373	1.157	27.770	7.20
3 END	2.56	.033	.791	2.454	58.904	3.40
8 START	5.42	.016	.373	1.160	27.822	7.19
8 END	2.53	.033	.800	2.483	59.603	3.36

IN-FLIGHT CYCLE PERIOD: (CAMERA NO. 99)

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(360)	4.65	.018	.436	1.351	32.429	6.17
15	3 END	2.63	.032	.770	2.389	57.336	3.49
25	8(400)	4.49	.019	.451	1.399	33.584	5.96
91	3(440)	4.45	.019	.455	1.412	33.886	5.90

No IN PARENTHESIS EQUALS TIME UP RAMP

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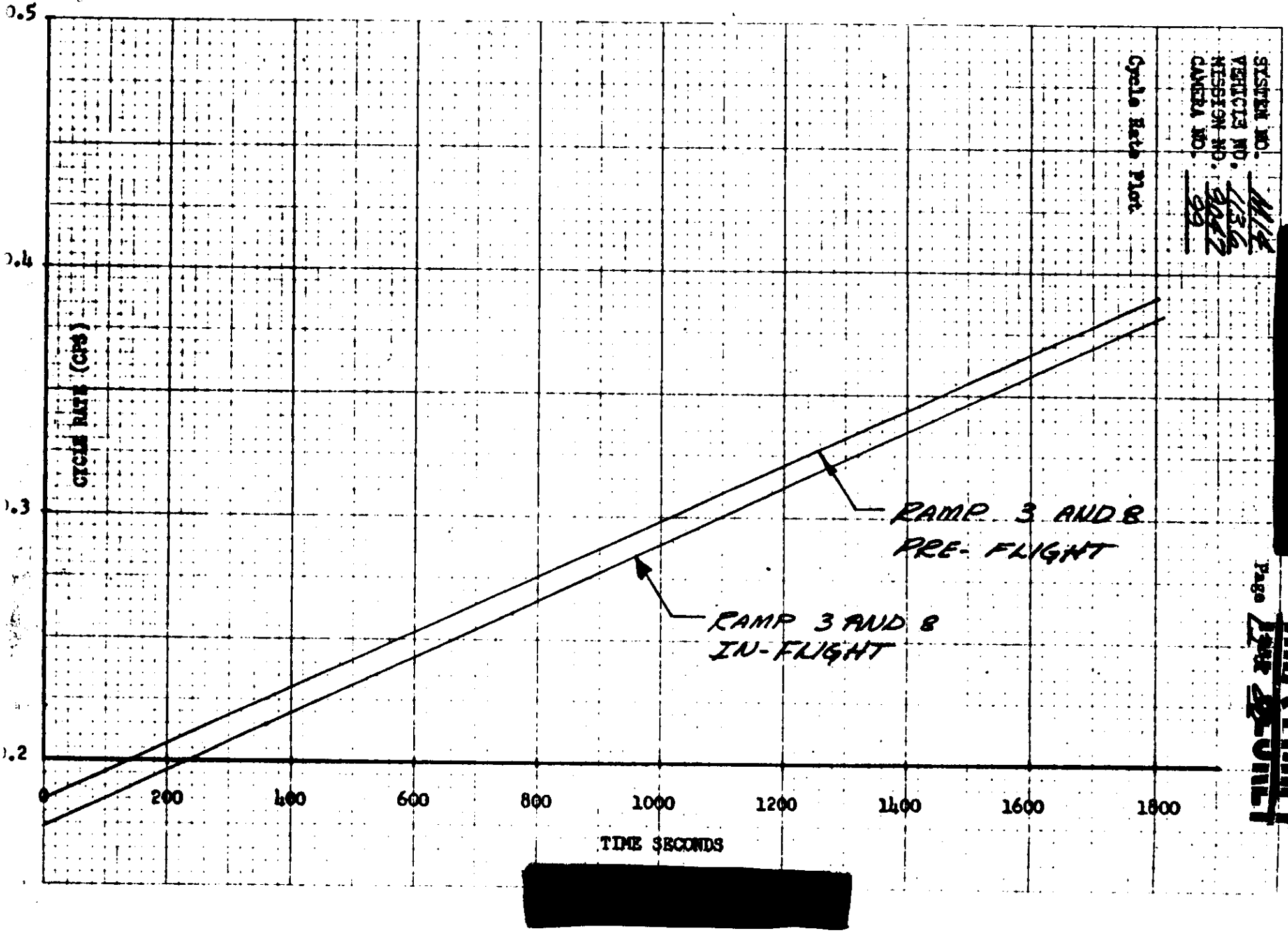

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LENS DATA SUMMARY: (Main Camera No. 98)

Lens Serial No. 0392435

Filter Type WRATTEN 21

Equivalent Operational Focal Length 609.602 MM

Resolution:

Static:

	Lines/MM	Film Type	Target Contrast
Bench Test	230	S0243	HIGH
Other			

Dynamic:

Itek Pre-Vibration	161	S0132	HIGH
Itek Post Vibration	157	S0132	HIGH
AP	162	S0132	HIGH
AP	91.5	S0132	LOW
Other			

Note: Itek Post Vibration Resolution of 157 lines/MM Reported In Message No. _____ dated _____

Distortion - Positive (Pincushion)

Angle Off Axis Deg.	3	2	1	0	359	358	357		
Distortion Millimeters	.009	.006	.003	.000	.002	.004	.006		

TOP SECRET

LENS DATA SUMMARY: (Horizon Cameras for Main Camera No. 98)

	Take-Up	Supply
Lens Serial No.	808624	807549
Exposure Time	1/100 Sec.	1/100 Sec.
Filter Type	WRATTEN 25	WRATTEN 25
Aperture	F6.8	F6.8
Operational Focal Length	89.0 MM	89.2 MM
Radial Distortion:		
10° off Axis	.013 MM	.001 MM
20° off Axis	.053 MM	.038 MM
Tangential Distortion (Maximum Vector)	.004 MM	.003 MM
Resolution:		

Angle off Axis Deg.	0	5	10	15	20	25	27.5	0	5	10	15	20	25	27.5
Radial Resolution	51	41	42	35	32	32	24	63	49	44	34	32	31	30
Tangential Resolution	51	39	39	35	30	25	22	56	47	46	38	31	29	30

35.6 Lines/MM Avg. 40 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.

TOP SECRET [redacted]

LENS DATA SUMMARY: (Main Camera No. 99)

Lens Serial No. 0382435

Filter Type WRATTEN 21

Equivalent Operational Focal Length 609.577 MM

Resolution:

Static:

	Lines/MM	Film Type	Target Contrast
Bench Test	247	SO243	HIGH
Other			

Dynamic:

Itek Pre-Vibration	160	SO132	HIGH
Itek Post Vibration	168	SO132	HIGH
AP	161	SO132	HIGH
AP	87	SO132	LOW
Other			

Note: Itek Post Vibration Resolution of 168 lines/MM Reported In Message No. _____ dated _____

Distortion - Positive (Pincushion)

Angle Off Axis Deg.	3	2	1	0	359	358	357		
Distortion Millimeters	.005	.002	.001	000	.001	.001	.005		

SYSTEM NO. M14 [redacted] Page 17 of 23
VEHICLE NO. 1130
MISSION NO. 9071
CAMERA NOS. 98 & 99

TOP SECRET

LENS DATA SUMMARY: (Horizon Cameras for Main Camera No. 99)

	Take-Up	Supply
Lens Serial No.	807090	807549
Exposure Time	1/100 Sec.	1/100 Sec.
Filter Type	WRATTEN 25	WRATTEN 25
Aperture	F6.8	F6.8
Operational Focal Length	89.3 MM	89.1 MM
Radial Distortion:		
10° off Axis	.016 MM	.008 MM
20° off Axis	.063 MM	.043 MM
Tangential Distortion (Maximum Vector)	.012 MM	.004 MM

Resolution:

Angle off Axis Deg.	0	5	10	15	20	25	27.5	0	5	10	15	20	22.5	
Radial Resolution	56	49	35	26	31	32	34	51	47	42	27	22	21	
Tangential Resolution	51	53	42	33	31	31	24	51	44	39	27	23	20	

37.0 Lines/MM Avg. 34.5 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.

[redacted]

DEFINITION OF MAIN CAMERA FILM 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) framing 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 from normal to the edge of format containing the shrinkage marker and a line parallel to that same edge located at a position halfway 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 Xt, Yt 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.

SYSTEM NO. 114
VEHICLE NO. 136
MISSION NO. 967
CAMERA NOS. 98 & 99

FORMAT DIMENSIONS (MAIN CAMERAS)

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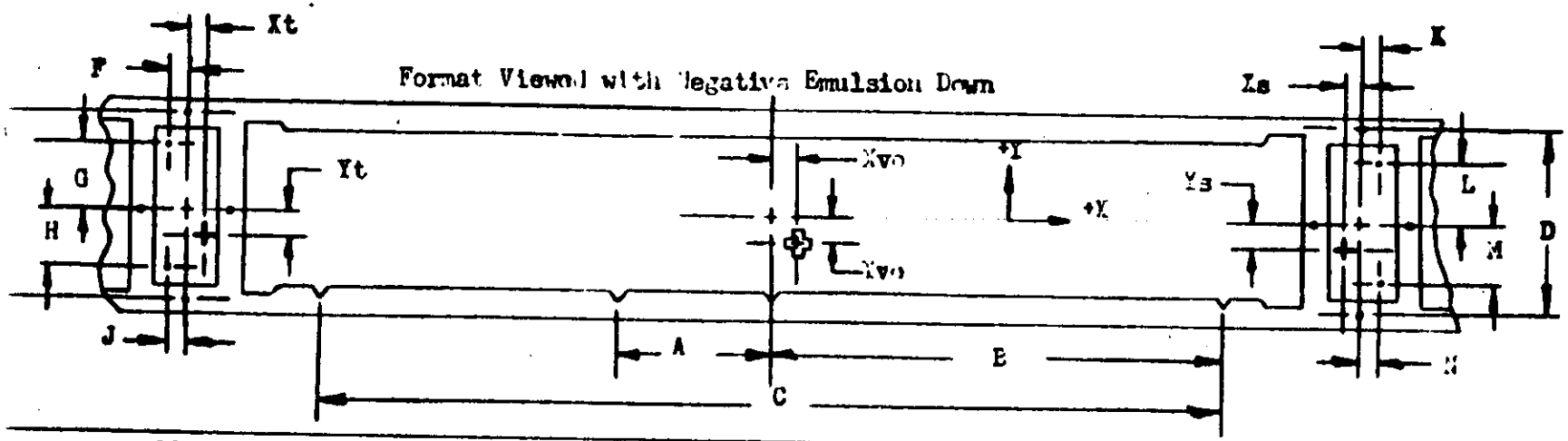


Camera No. 98 Vehicle Motion → Scan Direction →

A	76.107	Xs	-.101	H	-23.652
B	354.910	Ys	-.330	J	-4.346
C	709.995	Xvo	-1.174	K	+4.836
D	56.434	Yvo	-.350	L	+22.916
E	56.333	F	-4.686	M	-23.497
Xt	+.386	G	+24.017	N	+5.118
Yt	+.275				

Format Dimensions:

	Main	Take-Up	Supply
Height	56.1		
Width	753.4		

Camera No. 99 Vehicle Motion → Scan Direction →

A	76.102	Xs	-.483	H	-23.040
B	355.157	Ys	-.045	J	-4.649
C	710.205	Xvo	+.988	K	+4.466
D	56.379	Yvo	-.138	L	+23.716
E	56.482	F	-4.713	M	-23.843
Xt	+.422	G	+23.513	N	+4.353
Yt	+.271				

Format Dimensions:

	Main	Take-Up	Supply
Height	56.3		
Width	753.8		

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

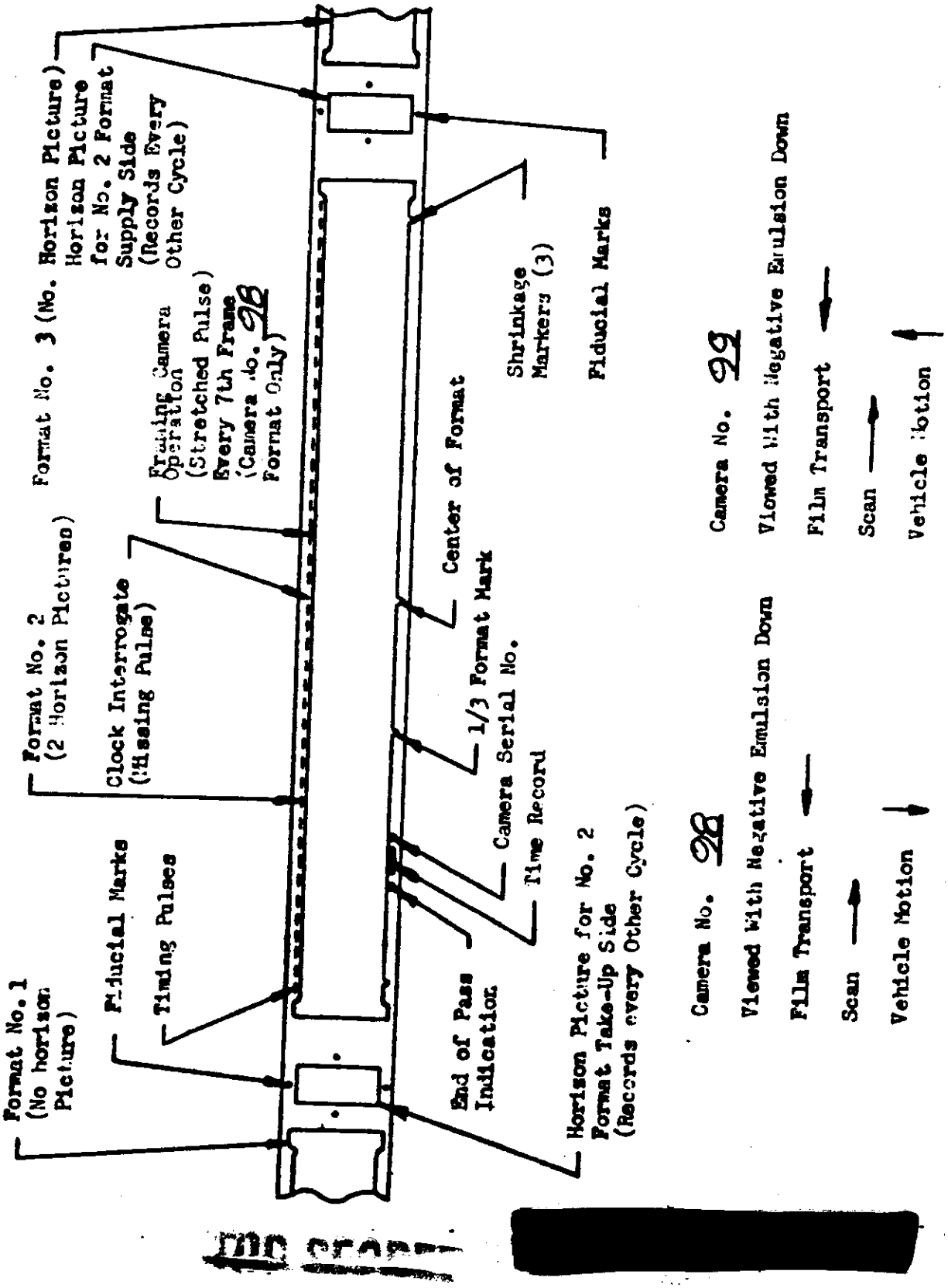
IMAGERY NOT USABLE

[redacted]

SYSTEM NO. 114
VEHICLE NO. 1136
MISSION NO. 2027
CAMERA NOS. 98 & 99

FOR SECRET

FORMAT LAYOUT: (MAIN CAMERAS)



FOR SECRET

[redacted] TRW CRAFT

LENS DATA SUMMARY: (Framing Camera No. 05) (Terrain Lens)

Lens Serial No. 2552631

Reseau Serial No. 5

Filter Type WRATTEN 21

Aperture F4.5

Exposure Time 1/125 Sec.

Equivalent Focal Length 38.45 MM O.F.L. 38.50 MM

Resolution: 80 Lines/MM AWAR

Angle off axis	0	10	20	30	35
Resolution L/MM High Contrast	120/120	117/114	104/92	72/43	58/33
Resolution L/MM Low Contrast	68/68	70/66	66/58	53/23	44/32

Note: Resolution data read from S0130 Film

Distortion:

Angle off Axis Deg.	0	10	20	30	35				
Distortion Millimeters	.000	.014	.055	.139	.194				

Perpendicularity of Reseau to Optical Axis .070 MM IN 57.15 MM

Date of Stellar Calibration Not Reported

Knee calibration Not Reported

Location of Principal Point:

X −.049 MM

Y −.173 MM

SYSTEM NO. M14
VEHICLE NO. 1136
MISSION NO. 9047
CAMERA NOS. 98 299

[redacted]

LENS DATA SUMMARY: (Framing Camera No. 05) (Stellar Lens)

Lens Serial No. 80044

Reseau Serial No. 5

Filter Type NONE

Aperture F 1.9

Exposure Time 1/2 Sec.

Equivalent Focal Length 83.67 MM O.F.L. 83.66 MM

Resolution: NOT REPORTED Lines/MM AVAR

Angle off axis					
Resolution L/MM High Contrast					
Resolution L/MM Low Contrast					

Note: Resolution data read from _____ Film

Distortion:

Angle off Axis Deg.	0	2.5	5	7.5					
Distortion Millimeters	.000	.000	.006	.009					

Perpendicularity of Reseau to Optical Axis .058 MM IN 35 MM

Date of Stellar Calibration NOT REPORTED

Knee Calibration NOT REPORTED

Location of Principal Point:

X -.008 MM

Y -.044 MM

[redacted]

TOP SECRET

[redacted]

SYSTEM NO. M14
VEHICLE NO. 136
MISSION NO. 9047
CAMERA NOS. 98 & 99

PRELIMINARY CLOCK CORRELATION:

Rev. No.	System Time	Clock Time	Delta Sys. Time	Delta Clock Time	Diff.
9	40803.075	518895.073	———	———	———
15	74898.143	16119.211	34095.068	34095.049	-.019
25	41484.629	69105.211	52986.486	52986.410	-.076
41	42178.405	156199.311	87093.776	87093.690	-.086

[redacted]

TRW CRAFT