



CORONA "M" FLIGHT DATA BOOK

SYSTEM NO. M 21

VEHICLE NO. 1161

MISSION NO. 9054

Prepared by: [Redacted]

Checked by: [Redacted]

Approved by: [Redacted]

Approved by: [Redacted]

Approved by: [Redacted]
(SBD)

Declassified and Released by the N R O

In Accordance with E. O. 12958

on NOV 26 1997



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SYSTEM NO. 1121
VEHICLE NO. 1161
MISSION NO. 9058
CAMERA NOS. 112 & 113

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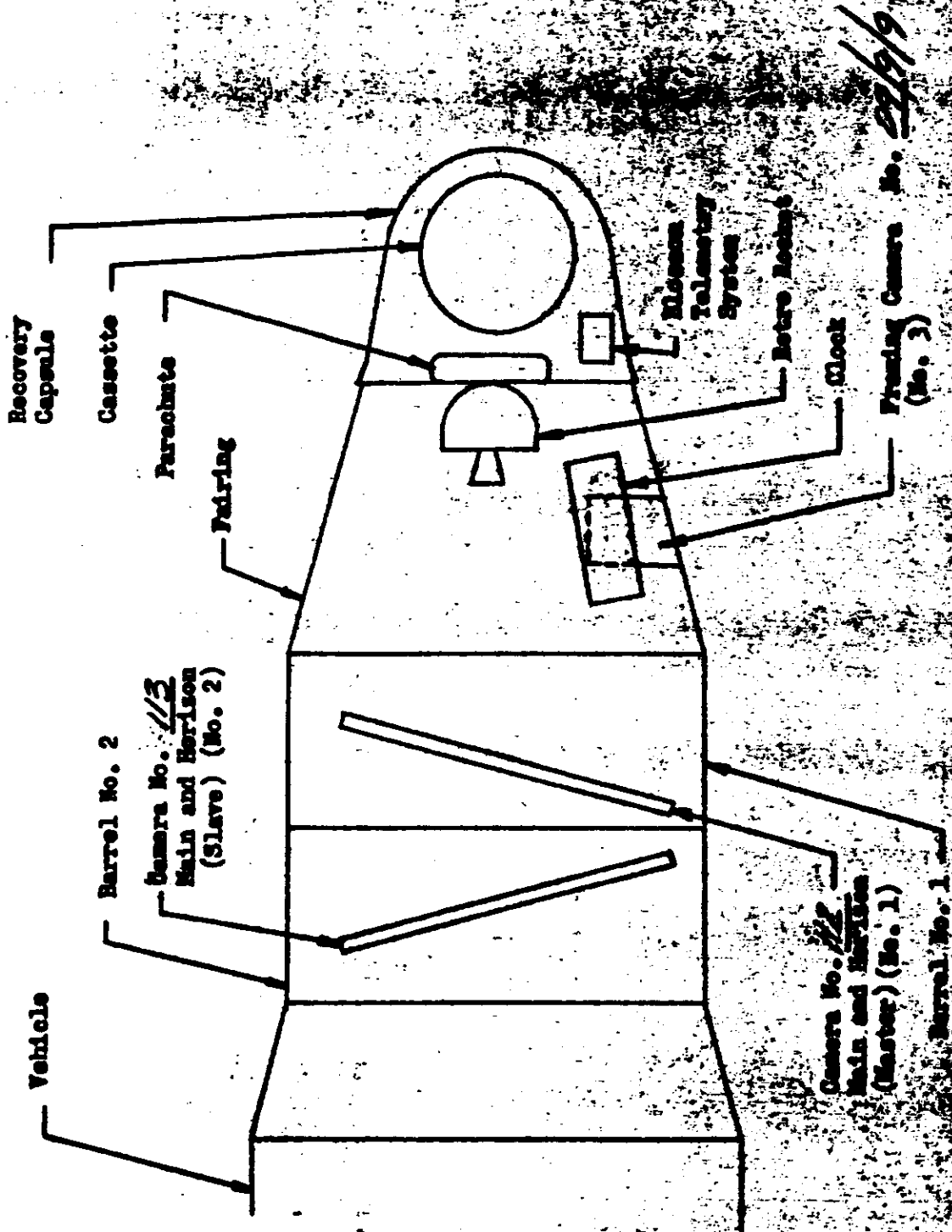
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SYSTEM NO. 112
VEHICLE NO. 51161
MISSION NO. 9033
CAMERA NOS. 112 2113

VEHICLE LAYOUT:



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SYSTEM NO. 121
VEHICLE NO. 1167
MISSION NO. 9053.1
CAMERA NOS. 112 & 113

GENERAL FLIGHT DATA:

Main Camera No. 1 Serial No. 112
Main Camera No. 2 Serial No. 113
Framing Camera Serial No. 09/9/9
Launch Date 6/12/63

Orbital Parameters: (Rev. 40)

Period 90.75 Min. Eccentricity 0.01818
Perigee 100.36 NM Perigee Latitude 51.05 Deg. N
Apogee 237.68 NM Inclination Angle 01.83 Deg. N

Recovery Revolution No. 65
Recovery Date 6/17/63

REMARKS:

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SYSTEM NO. N21
 VEHICLE NO. 1161
 MISSION NO. 9039
 CAMERA NOS. 112 & 113

PRE-LAUNCH INFORMATION:

Command settings at launch:

Command	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>14</u>	<u>15</u>
Setting	<u>2</u>	<u>1</u>	<u>3</u>	<u>4</u>	<u>11</u>	<u>4</u>	<u>1</u>

Main Camera Settings:

Camera NO. 112 Camera NO. 113

Main Optics Slit Width .200 in. .200 in.

Main Optics Filter Type WEATEN 21 WEATEN 21

Horizon Optics Exp. Time 1/100 sec. 1/100 sec.

Horizon Optics Aperture F6.8 F6.8

Horizon Optics Filter Type WEATEN 25 WEATEN 25

Framing Camera (S/I) Settings: Terrain Lens

Stellar Lens

Exposure Time 1/500 sec. 2 sec.

Aperture Setting F4.5 F1.9

Filter Type WEATEN 21 NONE

Ratio: One Framing Camera (S/I) Frame Per 7 Camera No. 1 Frames.

Files:

Camera No. 112 Camera No. 113 Framing Camera (S/I)
 Terrain Stellar

Type 50132(7J23) 50132(7J23) 50134(7J33) 50102/50130

Length 7800 ft. 7800 ft. 135 ft. 75 ft.

Splices 2 2 NONE 1

Emul. Data 15-2-5-8-1-3 15-4-6-1-3 1-6-2-3 4401/4400

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SYSTEM NUMBER M-21
 VEHICLE NUMBER 1161
 MISSION NUMBER 9054
 PANORAMIC CAMERA NUMBERS 112 AND 113
 STELLAR/INDEX CAMERA NUMBER 009/09/09

REVISED
 PERFORMANCE ESTIMATE

REV	PROG	CAM NO.	PAN FR.	SI FR.	LAT. ON	LAT. OFF	TIME ON ZD-H-M	TUR NO	DUR SEC.	SOLAR SEC ON	SOLAR SEC OFF	EXPOS. ON	EXPOS. OFF
LAUNCH		112	177	25									
LAUNCH		113	174										
1-	1-1	112	22	3	155	161	130110	2	410	93	12	15	5.8 5.5
1-	1-1	113	22		154	159	130110	2	410	93	11	14	5.9 5.6
1-	1-2	112	25	4	178	181	130117	2	780	86	26	29	4.7 4.5
1-	1-2	113	24		176	180	130117	2	780	86	25	28	4.9 4.7
2-	1-1	112	58	8	154	168	130241	2	402	231	11	20	5.7 5.1
2-	1-1	113	56		152	167	130241	2	402	231	10	19	5.8 5.1
2-	1-2	112	54	8	271	261	130254	2	1189	157	37	39	3.9 3.7
2-	1-2	113	54		272	262	130254	2	1189	157	36	39	3.9 3.7
4-	1-1	112	32	4	181	281	130550	2	1018	101	29	30	4.2 4.0
4-	1-1	113	32		181	282	130550	2	1018	101	29	30	4.2 4.1
4-	1-2	112	32	5	273	268	130555	2	1294	89	36	38	3.8 3.6
4-	1-2	113	31		274	269	130555	2	1294	89	36	37	3.8 3.7
4-	1-3	112	46	6	253	246	130600	2	1607	114	40	40	3.3 3.2
4-	1-3	113	45		254	247	130600	2	1607	114	40	40	3.4 3.2
6-	2-1	112	41	6	255	249	130900	2	1520	141	40	40	4.7 4.5
6-	2-1	113	41		260	250	130900	2	1520	141	39	40	4.7 4.5
6-	2-2	112	72	10	243	232	130904	2	1760	154	39	37	4.3 4.1
6-	2-2	113	72		244	233	130904	2	1760	154	40	38	4.4 4.2
6-	2-3	112	42	6	203	312	130914	2	0	236	25	16	7.6 7.6
6-	2-3	113	41		206	310	130914	2	0	236	26	17	7.6 7.6
7-	2-1	112	58	9	271	264	131028	2	1406	114	37	39	4.8 4.6
7-	2-1	113	56		272	265	131028	2	1406	114	37	39	4.9 4.7
7-	2-2	112	93	13	256	240	131032	2	1609	262	40	39	4.4 4.1
7-	2-2	113	92		255	241	131032	2	1609	262	40	39	4.5 4.1
8-	2-1	112	80	11	261	248	131201	2	1554	201	39	40	4.1 3.8
8-	2-1	113	80		262	249	131201	2	1554	201	39	40	4.1 3.8
9-	0-0	112	10	1	139	142	131313	2	329	45	1	3	6.1 5.9
9-	0-0	113	9		137	140	131313	2	329	45	0	2	6.8 6.6
9-	2-1	112	72	11	252	240	131335	2	1642	186	40	39	3.5 3.3
9-	2-1	113	75		253	241	131335	2	1642	186	40	39	3.4 3.2
9-	2-2	112	51	7	235	227	131339	2	1896	124	38	36	3.3 3.3
9-	2-2	113	52		236	228	131339	2	1896	124	38	36	3.2 3.2
15-	2-1	112	38	5	151	160	132220	2	570	144	9	15	5.3 4.9
15-	2-1	113	37		150	159	132220	2	570	144	8	14	5.4 5.0
16-	2-1	112	25	4	158	164	132353	2	581	99	12	16	5.4 5.2
16-	2-1	113	24		156	162	132353	2	581	99	11	15	5.7 5.4
17-	2-1	112	33	5	154	162	130123	2	552	129	10	15	5.3 5.0
17-	2-1	113	32		153	161	130123	2	552	129	9	14	5.5 5.1
18-	1-1	112	103	14	148	171	130252	2	543	373	6	21	5.3 4.4
18-	1-1	113	101		147	170	130252	2	543	373	5	21	5.4 4.5
18-	1-2	112	39	6	268	251	130307	2	1469	103	39	40	3.5 3.4
18-	1-2	113	38		269	252	130307	2	1469	103	38	40	3.6 3.5
23-	2-1	112	38	5	271	264	141040	2	1450	114	38	40	4.1 3.9



23-	2-1	113	37		272	265	141040	2	1450	114	37	39	4.2	4.0
23-	2-2	112	127	18	261	242	141043	2	1606	291	40	41	3.9	3.5
23-	2-2	113	126		262	243	141043	2	1606	291	40	41	3.9	3.6
24-	0-0	112	11	1	139	141	141154	2	442	46	0	1	5.7	5.5
24-	0-0	113	10		137	140	141154	2	442	46	-1	0	6.2	6.1
25-	1-1	112	154	22	260	237	141345	2	1641	341	40	40	4.5	4.0
25-	1-1	113	151		261	238	141345	2	1641	341	40	41	4.5	4.1
25-	1-2	112	32	5	232	225	141352	2	2059	100	39	37	4.2	4.2
25-	1-2	113	32		233	226	141352	2	2059	100	39	38	4.2	4.2
30-	2-1	112	28	4	149	156	142101	2	616	113	6	11	5.4	5.1
30-	2-1	113	29		147	154	142101	2	616	113	5	10	5.3	5.0
30-	2-2	112	40	6	169	177	142107	2	933	135	20	25	4.7	4.4
30-	2-2	113	41		168	176	142107	2	933	135	19	24	4.6	4.3
31-	2-1	112	25	3	153	159	142233	2	622	98	9	13	5.3	5.1
31-	2-1	113	25		151	158	142233	2	622	98	8	12	5.4	5.1
32-	2-1	112	26	4	153	159	150004	2	625	97	8	12	5.1	4.9
32-	2-1	113	25		152	158	150004	2	625	97	7	11	5.3	5.1
33-	2-1	112	34	5	154	162	150135	2	644	129	9	14	5.2	4.9
33-	2-1	113	34		153	161	150135	2	644	129	8	13	5.2	4.9
33-	2-2	112	34	5	178	182	150141	2	1043	109	26	30	4.3	4.1
33-	2-2	113	34		177	181	150141	2	1043	109	25	30	4.3	4.1
34-	1-1	112	54	7	149	164	150304	2	561	237	5	15	6.2	5.5
34-	1-1	113	53		147	162	150304	2	561	237	4	14	6.4	5.6
34-	1-2	112	25	4	166	172	150309	2	833	98	17	21	5.4	5.2
34-	1-2	113	24		165	171	150309	2	833	98	16	20	5.5	5.3
34-	1-3	112	43	6	270	262	150319	2	1436	134	38	41	4.2	4.0
34-	1-3	113	43		271	263	150319	2	1436	134	38	41	4.3	4.1
36-	1-1	112	34	5	280	275	150617	2	1309	110	33	36	4.4	4.2
36-	1-1	113	33		281	276	150617	2	1309	110	32	36	4.5	4.3
36-	1-2	112	29	4	265	260	150622	2	1571	86	40	41	4.0	3.9
36-	1-2	113	28		266	261	150622	2	1571	86	40	41	4.1	4.0
36-	1-3	112	118	17	253	240	150625	2	1754	204	43	43	3.8	3.5
36-	1-3	113	115		254	241	150625	2	1754	204	42	43	3.9	3.6
39-	2-1	112	35	5	271	265	151052	2	1485	113	38	40	4.4	4.2
39-	2-1	113	34		272	266	151052	2	1485	113	37	40	4.5	4.3
39-	2-2	112	40	6	262	254	151055	2	1640	124	41	43	4.2	4.0
39-	2-2	113	40		263	255	151055	2	1640	124	41	42	4.2	4.1
39-	2-3	112	68	9	250	243	151058	2	1817	109	43	43	3.9	3.8
39-	2-3	113	66		251	244	151058	2	1817	109	43	43	4.0	3.9
40-	0-0	112	11	1	134	137	151205	2	483	50	-4	-2	6.0	5.9
40-	0-0	113	10		132	135	151205	2	483	50	-5	-3	6.7	6.5
44-	1-1	112	31	4	154	162	151813	2	644	118	9	14	5.2	4.9
44-	1-1	113	31		153	160	151813	2	644	118	8	13	5.3	5.0
44-	1-2	112	25	4	166	172	151816	2	833	89	17	21	4.8	4.6
44-	1-2	113	25		165	170	151816	2	833	89	16	20	4.8	4.6
46-	1-1	112	23	3	150	155	152114	2	629	89	6	10	5.3	5.1
46-	1-1	113	22		148	154	152114	2	629	89	5	9	5.6	5.3
47-	1-1	112	61	9	147	158	152244	2	614	164	4	11	3.7	3.4
47-	1-1	113	31		146	156	152244	2	614	164	3	10	7.4	6.8
47-	1-2	112	47	7	169	175	152249	2	946	108	19	23	3.2	3.0
47-	1-2	113	24		167	174	152249	2	946	108	18	22	6.3	6.0
48-	2-1	112	0	0										





48-	2-1	113	22		151	158	160016	2	676	113	6	11	7.2	6.8
50-	1-1	112	21	3	153	159	160317	2	689	102	7	12	6.5	6.1
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50-	1-2	112	28	4	165	172	160321	2	877	122	16	21	5.9	5.6
50-	1-2	113	28		164	171	160321	2	877	122	15	20	6.0	5.7
50-	1-3	112	25	3	272	267	160330	2	1469	88	38	40	4.6	4.5
50-	1-3	113	25		273	268	160330	2	1469	88	38	40	4.7	4.5
52-	1-1	112	18	3	280	278	160629	2	1334	67	32	35	4.9	4.7
52-	1-1	113	18		281	278	160629	2	1334	67	32	34	4.9	4.8
52-	1-2	112	25	3	275	271	160631	2	1437	85	36	39	4.7	4.5
52-	1-2	113	24		276	272	160631	2	1437	85	36	38	4.7	4.6
52-	1-3	112	138	20	255	239	160636	2	1761	248	44	44	4.2	3.9
52-	1-3	113	136		256	239	160636	2	1761	248	43	44	4.2	3.9
55-	1-1	112	161	23	266	242	161106	2	1624	358	41	44	4.4	3.9
55-	1-1	113	160		267	243	161106	2	1624	358	40	44	4.5	4.0
55-	1-2	112	36	5	240	232	161112	2	2016	113	44	43	4.1	4.1
55-	1-2	113	36		241	232	161112	2	2016	113	44	43	4.2	4.2
56-	0-0	112	11	1	139	141	161218	2	522	46	-2	0	5.9	5.8
56-	0-0	113	11		137	140	161218	2	522	46	-3	-1	5.9	5.8
56-	2-1	112	65	9	251	241	161240	2	1845	155	44	44	3.2	3.2
56-	2-1	113	64		252	242	161240	2	1845	155	44	44	3.2	3.2
59-	2-1	112	32	5	162	169	161656	2	811	114	14	19	4.7	4.5
59-	2-1	113	32		161	168	161656	2	811	114	13	18	4.8	4.5
61-	2-1	112	31	4	148	155	161954	2	653	113	4	9	5.1	4.8
61-	2-1	113	31		147	154	161954	2	653	113	3	8	5.1	4.9
63-	1-1	112	44	6	149	159	162256	2	667	164	4	11	5.1	4.7
63-	1-1	113	44		147	158	162256	2	667	164	3	10	5.1	4.7
67-	1-2	112	28	4	167	172	162300	2	951	89	17	21	4.4	4.3
67-	1-2	113	27		165	171	162300	2	951	89	16	20	4.5	4.3

AAA BB C DDD EEE FF GHH GII JJJJJJ KK LLLL MMM NN OO PPP QQQ

- A. DEV. NUMBER
- B. PROGRAM NUMBER (1 IS X)
- C. OPERATION NUMBER
- D. PAN. CAMERA SERIAL NUMBER (MASTER IS ODD, SLAVE IS EVEN)
- E. EST. NO OF PAN FRAMES, BASED ON COUNTER READINGS INFLITE
- F. EST. NUMBER OF STELLAR/INDEX FRAMES
- G. QUADRANT (QUAD 1 IS NORTHBOUND FROM ASCENDING NODE)
- H. EST. LATITUDE OF FIRST FORMAT CENTER IN PASS
- I. EST. LATITUDE OF LAST FORMAT CENTER IN PASS
- J. EST. GMT AT OPERATE COMMAND ON
- K. RAMP NUMBER
- L. EST. TIME UP RAMP IN SECONDS TO OPERATE COMMAND
- M. EST. SECONDS DURATION OF OPERATION, BETWEEN ON AND OFF
- N. SOLAR ELEVATION AT ITEM H
- O. SOLAR ELEVATION AT ITEM I
- P. EST. MILLISECONDS EXPOSURE TIME AT ITEM H
- Q. EST. MILLISECONDS EXPOSURE TIME AT ITEM I

FRAMES TO FEET, PAN X 2.636, STELLAR X 0.099, INDEX X 0.198



FOOTNOTES

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SYSTEM NO. M-20
VEHICLE NO. 1161
MISSION NO. 9054
CAMERA NOS. 112, 113

PRE-FLIGHT CYCLE PERIOD. (CAMERA NO. 112)

V/H NO.	RAMP TIME	CYCLE PERIOD SECONDS	FMC RATE		SCAN RATE		EXPOSURE MILLISEC
			RAD./ SECOND	IN./ SECOND	RAD./ SECOND	IN./ SECOND	
2	0	5.74	.014	.352	1.094	26.271	7.613
2	1800	2.36	.035	.858	2.662	63.896	3.130

IN-FLIGHT CYCLE PERIOD. (CAMERA NO. 112)

REV NO.	V/H NO.	RAMP TIME	CYCLE PERIOD SECONDS	FMC RATE		SCAN RATE		EXPOSURE MILLISEC
				RAD./ SECOND	IN./ SECOND	RAD./ SECOND	IN./ SECOND	
9	2	370	4.44	.019	.456	1.415	33.963	5.889
24	2	495	4.16	.020	.486	1.510	36.249	5.517
40	2	515	4.01	.021	.505	1.566	37.605	5.318
56	2	550	4.04	.020	.501	1.555	37.325	5.358

PRE-FLIGHT CYCLE PERIOD. (CAMERA NO. 113)

V/H NO.	RAMP TIME	CYCLE PERIOD SECONDS	FMC RATE		SCAN RATE		EXPOSURE MILLISEC
			RAD./ SECOND	IN./ SECOND	RAD./ SECOND	IN./ SECOND	
2	0	5.76	.014	.351	1.090	26.179	7.639
2	1800	2.37	.035	.854	2.651	63.627	3.143

IN-FLIGHT CYCLE PERIOD. (CAMERA NO. 113)

REV NO.	V/H NO.	RAMP TIME	CYCLE PERIOD SECONDS	FMC RATE		SCAN RATE		EXPOSURE MILLISEC
				RAD./ SECOND	IN./ SECOND	RAD./ SECOND	IN./ SECOND	
9	2	370	4.48	.018	.452	1.402	33.659	5.942
24	2	495	4.21	.020	.481	1.492	35.818	5.584
40	2	515	4.08	.020	.496	1.539	36.959	5.411
56	2	550	4.13	.020	.490	1.521	36.512	5.478

10000
1000
100
10
1
0.1
0.01
0.001

10000
1000
100
10
1
0.1
0.01
0.001

Cycle Rate Plot

Cycle Rate (CR)

0.5

0.4

0.3

0.2

Curve 1 (PROBABILITY)

REV 06
REV 00
REV 2A
REV 9 J

ALL FLIGHT DATA POINTS

600

600

1000

1200

1100

1400

1500

DATE

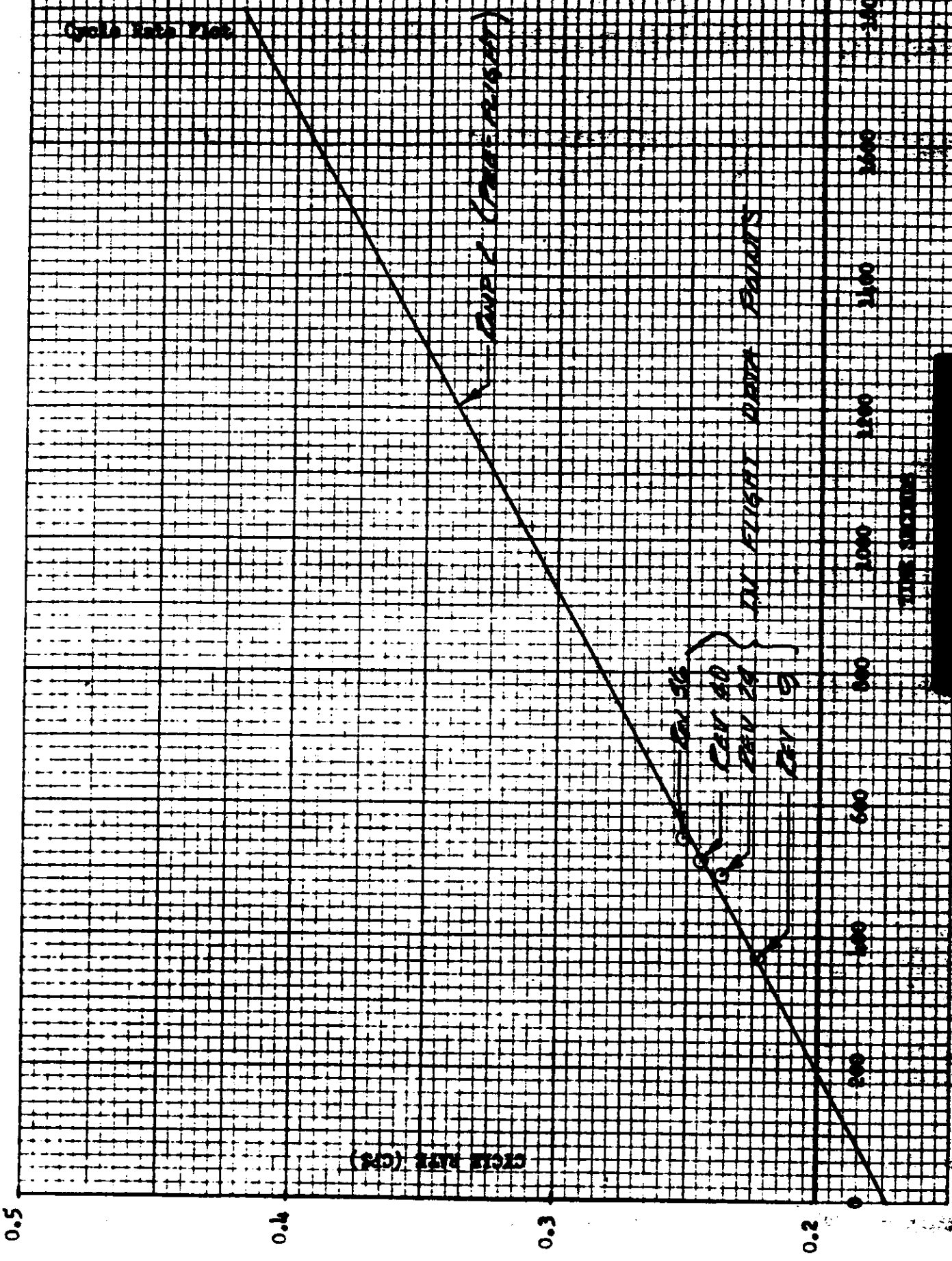
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DETAILS
OF
CONSTRUCTION
OF
THIS
GRAPH

Cycle Rate Plot



VEHICLE NO. 1101
 MISSION NO. 9039
 CAMERA NOS. 112 & 113

LENS DATA SUMMARY: (Main Camera No. 112)

Lens Serial No. 0482455

Filter Type WEATHER 21

Equivalent Operational Focal Length 109.625 MM

Resolution:

Static:

	Lines/MM	Film Type	Target Contrast
Bench Test	<u>160</u>	<u>50243</u>	<u>HIGH</u>
Other	_____	_____	_____

Dynamic:

Itek Pre-Vibration	<u>148</u>	<u>50132</u>	<u>HIGH</u>
Itek Post Vibration	<u>143</u>	<u>50132</u>	<u>HIGH</u>
AP	<u>171.6</u>	<u>50132</u>	<u>HIGH</u>
AP	<u>92.5</u>	<u>50132</u>	<u>Low</u>
Other	_____	_____	_____

Note: Itek Post Vibration Resolution of 143 lines/MM Reported In
 Message No. [REDACTED] dated 6/12/63

Distortion - Positive (Pincushion)

Angle Off Axis Deg.	<u>3</u>	<u>2</u>	<u>1</u>	<u>0</u>	<u>359</u>	<u>358</u>	<u>357</u>		
Distortion Millimeters	<u>.007</u>	<u>.003</u>	<u>.001</u>	<u>.000</u>	<u>.001</u>	<u>.003</u>	<u>.008</u>		



SYSTEM NO. 112
 VEHICLE NO. 112
 MISSION NO. 253
 CAMERA NOS. 112 3 112

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LENS DATA SUMMARY: (Horizon Cameras for Main Camera No. 112)

	Take-Up	Supply
Lens Serial No.	<u>807097</u>	<u>80928</u>
Exposure Time	<u>1/100</u> Sec.	<u>1/100</u> Sec.
Filter Type	<u>None</u> 25	<u>None</u> 25
Aperture	<u>F6.8</u>	<u>F6.8</u>
Operational Focal Length	<u>89.25</u> MM	<u>89.20</u> MM
Radial Distortion:		
10° off Axis	<u>.013</u> MM	<u>.010</u> MM
20° off Axis	<u>.054</u> MM	<u>.042</u> MM
Tangential Distortion (Maximum Vector)	<u>.012</u> MM	<u>.004</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	51	44	42	31	32	29	27	56	51	35	30	30	34	29
Tangential Resolution	51	44	44	32	31	25	20	51	51	39	34	34	30	20

36.0 Lines/MM Avg. 37.4 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.



VEHICLE NO. 1161
 MISSION NO. 9052
 CAMERA NOS. 112 & 113

LENS DATA SUMMARY: (Main Camera No. 113)

Lens Serial No. 0552435

Filter Type KIRATTEN 21

Equivalent Operational Focal Length 600.965 mm

Resolution:

Static:

	Lines/MM	Film Type	Target Contrast
Bench Test	<u>236</u>	<u>S0243</u>	<u>HIGH</u>
Other	_____	_____	_____

Dynamic:

Itek Pre-Vibration	<u>153</u>	<u>S0132</u>	<u>HIGH</u>
Itek Post Vibration	<u>151</u>	<u>S0132</u>	<u>HIGH</u>
AP	<u>161.4</u>	<u>S0132</u>	<u>HIGH</u>
AP	<u>90</u>	<u>S0132</u>	<u>LOW</u>
Other	_____	_____	_____

Note: Itek Post Vibration Resolution of 151 lines/MM Reported In
 Message No. [REDACTED] dated 6/12

Distortion - Positive (Pincushion)

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



SYSTEM NO. 112 Page 16 of 22
 VEHICLE NO. 1161
 MISSION NO. 9039
 CAMERA NOS. 112 113

LENS DATA SUMMARY: (Horizon Cameras for Main Camera No. 113)

	Take-Up	Supply
Lens Serial No.	<u>807096</u>	<u>803311</u>
Exposure Time	<u>1/100</u> Sec.	<u>1/100</u> Sec.
Filter Type	<u>WENTON 25</u>	<u>WENTON 25</u>
Aperture	<u>F6.8</u>	<u>F6.8</u>
Operational Focal Length	<u>89.2</u> MM	<u>89.2</u> MM
Radial Distortion:		
10° off Axis	<u>.009</u> MM	<u>.009</u> MM
20° off Axis	<u>.055</u> MM	<u>.045</u> MM
Tangential Distortion (Maximum Vector)	<u>.012</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	51	47	35	30	31	34	29	51	49	42	29	29	30	29
Tangential Resolution	51	47	42	40	34	33	24	51	42	44	34	30	25	20

37.6 Lines/MM Avg. 36.1 Lines /MM Avg.

Note:

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



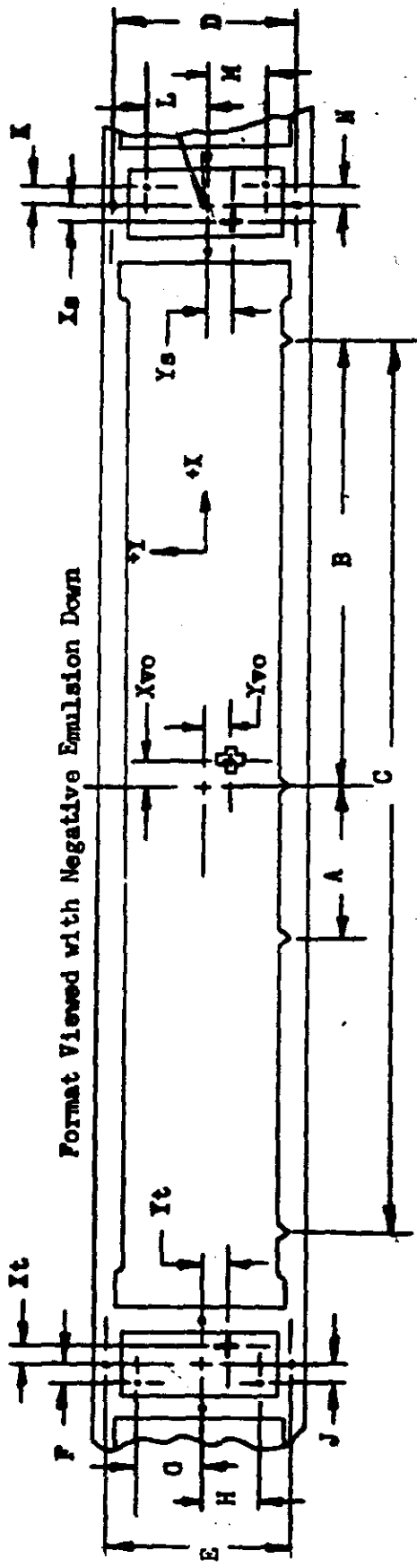
VEHICLE NO. 161
MISSION NO. 9054
CAMERA NOS. 1124113

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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 with $\pm 5^\circ$ of arc. The longitudinal axis of the vehicle (Z axis) is so positioned to form an angle of $105.00^\circ \pm 5^\circ$ to the target plane for camera number one calibrations and an angle of $75.00^\circ \pm 5^\circ$ 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 $75.00^\circ \pm 5^\circ$ 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 drum 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 X_{v0} and Y_{v0} are the offsets of Target 1 from the indicated center of format as defined in Paragraph 3.
- 6.0 X_s , Y_s and X_t , Y_t 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 defined in Paragraph 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 Paragraph 2 on the format is made by positioning two targets for each horizon format normal $\pm 5^\circ$ of arc to the plane defined in Paragraph 2. Dimensions F, G, H, J, K, L, M and N are the offset of these targets.

FORMAT DIMENSIONS: (MAIN CAMERAS)



Camera No.	Vehicle Motion	Scan Direction
A	<u>76.125</u>	<u>Is - .222</u>
B	<u>355.240</u>	<u>Is - .105</u>
C	<u>710.790</u>	<u>Xvo - .240</u>
D	<u>56.455</u>	<u>Yvo + 1.260</u>
E	<u>56.465</u>	<u>F - 4.181</u>
Xt	<u>+ 1.805</u>	<u>O + 23.173</u>
Yt	<u>- .008</u>	

Camera No.	Vehicle Motion	Scan Direction
A	<u>76.130</u>	<u>Is - .299</u>
B	<u>355.200</u>	<u>Is - .412</u>
C	<u>710.370</u>	<u>Xvo + .220</u>
D	<u>56.477</u>	<u>Yvo + .070</u>
E	<u>56.484</u>	<u>F - 4.677</u>
Xt	<u>+ 1.227</u>	<u>O + 23.599</u>
Yt	<u>- .278</u>	

Format Dimensions:

Main Take-Up Supply

Height	<u>56.7</u>
Width	<u>755.6</u>

Format Dimensions:

Main Take-Up Supply

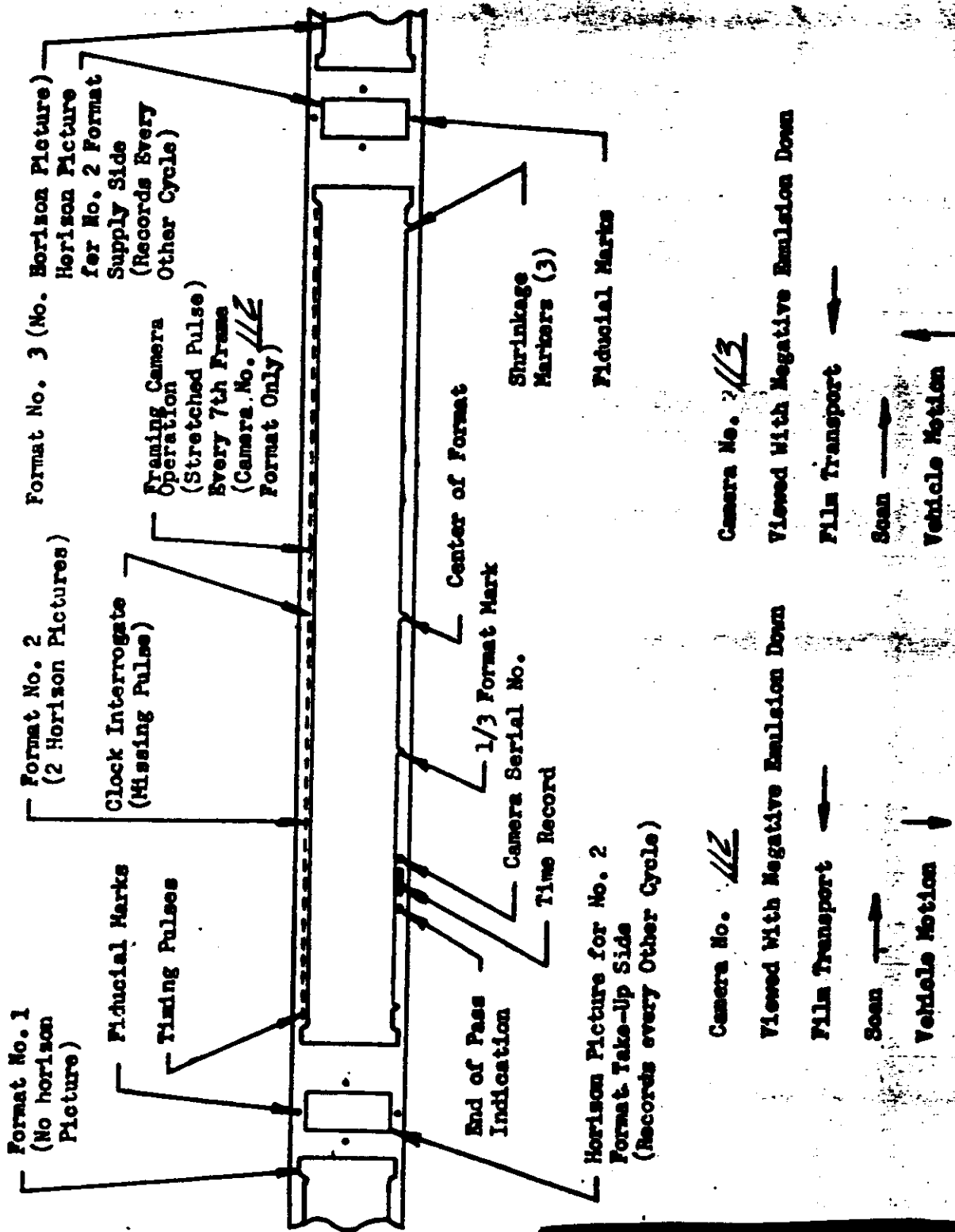
Height (?)	<u>56.0</u>
Width	<u>756.7</u>

- 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

1-1
 2-1
 3-1

SYSTEM NO. M21
 VEHICLE NO. 1161
 MISSION NO. 9039
 CAMERA NOS. 112 & 113

FORMAT LAYOUT: (MAIN CAMERAS)



PHOTOCOPY

SYSTEM NO. 121
VEHICLE NO. 1161
MISSION NO. 9039
CAMERA NOS. 112 113

(INDEX)

LENS DATA SUMMARY: (Focusing Camera No. 09) (TERRAIN Lens)

Lens Serial No. 809929

Reseau Serial No. 9

Filter Type WRITTEN 21

Aperture F 4.5

Exposure Time 1/500 Sec.

Equivalent Focal Length 38.37 MM Operational Focal Length 38.40 MM

Resolution: 70.2 Lines/MM AMAR

Angle off axis	0	10	20	30	35
Resolution L/MM High Contrast	143	131	101	60	48
Resolution L/MM Low Contrast	113	103	72	46	36

Note: Resolution data read from SO130 Film

Distortion:

Angle off Axis Deg.	0	10	20	30	35				
Distortion Millimeters	.000	.012	.053	.141	.170				

Perpendicularity of Reseau to Optical Axis .012 MM IN 57.15 MM

Date of Stellar Calibration NOT REPORTED

Knee Calibration NOT REPORTED Deg. _____ Min. _____ Sec. _____

Location of Principal Point:

X +0.015 MM Y +0.013 MM



SYSTEM NO. M21
 VEHICLE NO. 1161
 MISSION NO. 9056
 CAMERA NOS. 112 & 113

21 & 22

LENS DATA SUMMARY: (Focusing Camera No. 09) (STELLAR Lens)

Lens Serial No. 80104

Reseau Serial No. 9

Filter Type NONE

Aperture F 1.9

Exposure Time 2 Sec.

Equivalent Focal Length 83.73 MM Operational Focal Length 83.70 MM

Resolution: _____ Lines/MM MMAR

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	.002	.006				

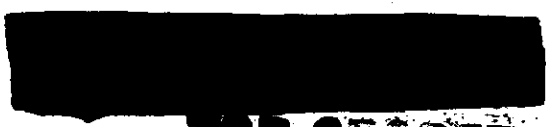
Perpendicularity of Reseau to Optical Axis .000 MM IN 35 MM

Date of Stellar Calibration _____

Knee Calibration _____ Deg. _____ Min. NOT REPORTED Sec.

Location of Principal Point:

X f.121 MM Y f.033 MM





PRELIMINARY CLOCK CORRELATION.

~~TOP SECRET~~
~~TOP SECRET~~

REV.	SYSTEM TIME	CLOCK TIME	DELTA SYSTEM TIME	DELTA CLOCK TIME	ERROR
00	00355.112	497693.189			
09	47598.488	008063.682	47243.375	47243.405	+0.030
24	42917.668	089784.867	81719.180	81719.180	+0.005
40	43652.462	176919.672	87134.794	87134.794	+0.011
56	44334.845	264002.052	87082.383	87082.380	-0.003

~~TOP SECRET~~
~~TOP SECRET~~