[redacted]

[redacted]

[redacted] "M" FLIGHT DATA BOOK

SYSTEM NO. M4

VEHICLE NO. 1122

MISSION NO. 9035

Prepared by: [redacted]

Checked by: [redacted]

Approved by: [redacted]
([redacted] Manager)

Approved by [redacted]
([redacted])

Approved by: [redacted]

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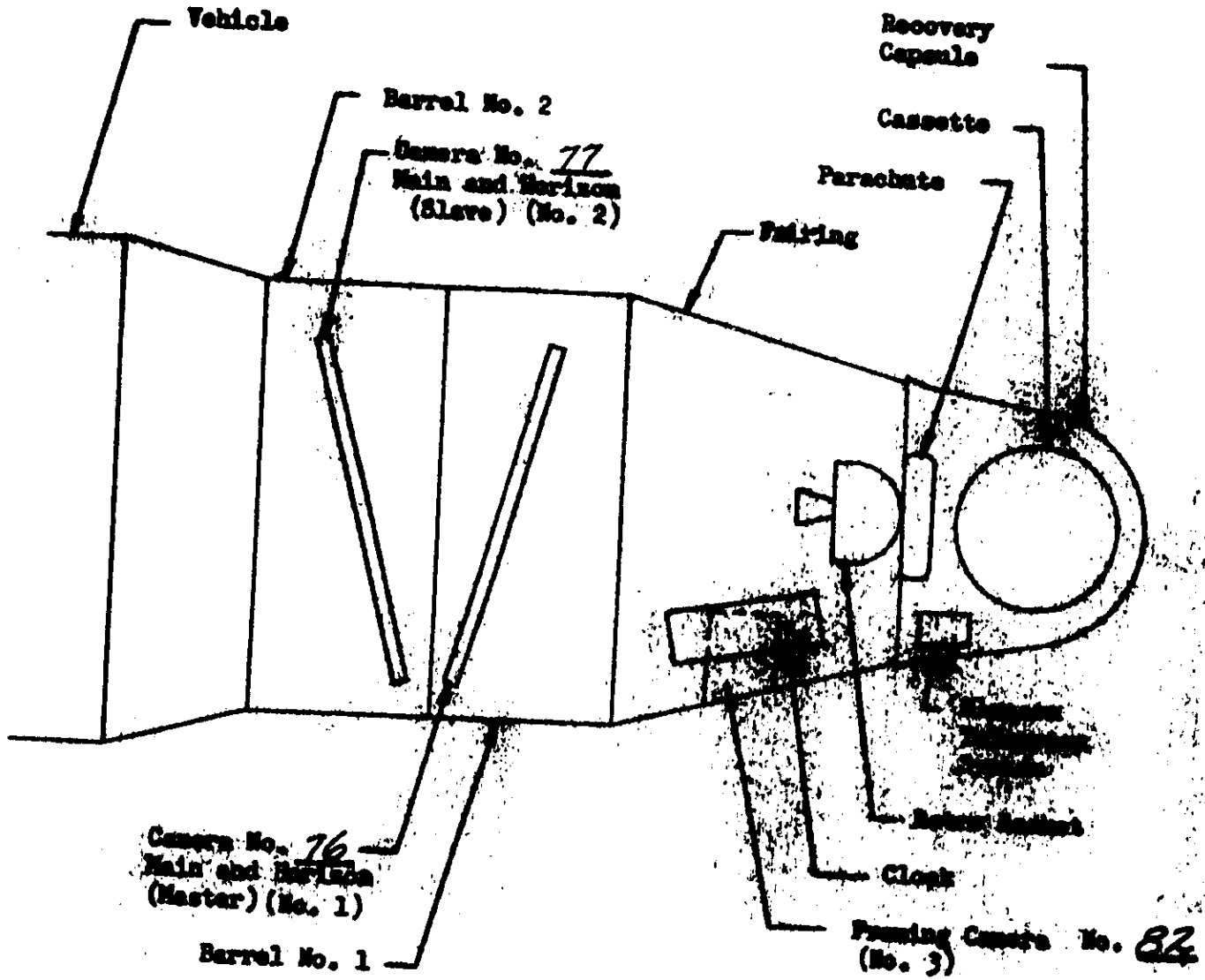
Vehicle
Barrel No. 2
Camera No. 77
Main and Horizon
(Slave) (No. 2)
Fairing
Recovery
Capsule
Cassette
Parachute
Camera No. 76
Main and Horizon
(Master) (No. 1)
Barrel No. 1
Clock
Framing Camera No. 82
(No. 3)

SYSTEM NO. M4
VEHICLE NO. 1128
MISSION NO. 9035
CAMERA NOS. 76 & 77

GENERAL FLIGHT DATA:

Discoverer No. 42

Main Camera No. 1 Serial No. 76

Main Camera No. 2 Serial No. 77

Framing Camera Serial No. 82

Launch Date 5/29/62

Orbital Parameters: (Rev. 11)

Period	90.02 Min.	Eccentricity	0.0124
Perigee	104 NM	Perigee Latitude	.68 Deg. N
Apogee	192 NM	Inclination Angle	74.15 Deg. N

Recovery Revolution No. 49

Recovery Date 6/1/62

REMARKS:

[redacted]

[redacted] M4
[redacted] 1128
[redacted] 9035
[redacted] 76 & 77

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PRE-LAUNCH INFORMATION:

V/H Programmer Set On Step 3 At Launch

Main Camera Settings:

	Camera No. 76	Camera No. 77
Main Optics Slit Width	.200 In.	.200 In.
Horizon Optics Exposure Time	1/50 Sec.	1/50 Sec.
Horizon Optics Aperture	F8.0 TAKE UP F6.8 SUPPLY	F8.0 TAKE UP F6.8 SUPPLY

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. 76	Camera No. 77	Framing Camera
Type	SO132-(JZ3)	SO132(JZ3)	SO130
Length	7800 Ft.	7800 Ft.	135 Ft.
No. of Splices	2	2	NONE
Emulsion Data	27-2-5-2	27-2-3-52	15-2-4-2

[redacted]

[redacted]

SPACECRAFT NO. M4
MISSION NO. 9035
CAMERA NOS. 76, 77
FRAMING CAMERA NO. 22 (FRAMING CAMERA DID NOT OPERATE ON THIS MISSION)

Pass No.	Camera No. 76	77													
PRE-LAUNCH	125	126		330	332		—	—	—	—	—	—	—	—	—
1AX1	22	22		58	58		46	51	0101	10	[illegible]	9	[illegible]	6.5	[illegible]	3	78
1AX2	29	29		75	75		55	61	0113	188	11	21	6.0	5.6	3	227
1DE	23	23		60	60		56	53	0129	66	45	45	3.8	3.7	3	1265
2AX1	66	65		174	171		46	62	0240	288	9	21	6.4	5.5	3	116
2DX1	34	34		90	90		66	62	0256	103	42	43	4.0	3.9	3	1072
3AY1	47	47		124	124		58	68	0414	194	19	27	5.9	5.3	8	305
3DY1	60	60		158	158		59	49	0428	171	43	45	3.9	3.7	8	1181
4AY1	48	48		126	126		71	74	0549	175	29	33	5.0	4.6	8	581
5DY1	50	50		132	132		54	45	0730	140	45	44	3.8	3.6	8	1259
5DY2	46	46		121	121		43	34	0733	122	43	41	3.6	3.4	8	1449
6DY1	42	41		111	108		58	51	0859	123	44	45	3.9	3.7	8	1186
7DX1	154	153		406	403		69	44	1025	418	41	43	3.9	3.3	3	1041
8DY1	105	103		277	272		67	49	1156	312	41	45	4.2	3.8	8	1067
9AE	8	8		21	21		35	38	1308	48	1	3	7.1	7.0	8	—
9DY1	76	75		200	198		59	46	1328	204	44	44	3.7	3.4	8	1210
14AX1	55	54		145	142		42	56	2040	239	5	16	6.0	5.3	3	230
15AY1	18	18		47	47		39	45	2209	89	3	9	6.6	6.3	3	51
15AX2	35	35		91	91		49	57	2212	152	12	17	6.1	5.6	3	199
15DE	17	17		45	45		40	35	2234	46	43	40	3.4	3.3	3	1564
16AX1	20	20		53	53		43	47	2340	91	7	10	5.9	5.6	3	252

[redacted]

[redacted] NO. MA[redacted]
[redacted] NO. 1126
MISSION NO. 9035
CAMERA NOS. 76, 77
TRACKING CAMERA NO. 82

Pass No.	Camera No.		Frames												
	76	77	76	77											
16AY2	43	42	113	111	51	60	2345	170	13	20	5.5	5.0	3	402
19AY1	50	50	132	132	54	64	31/0A13	207	15	25	5.9	5.5	8	282
19DY1	30	30	79	79	59	54	0428	90	44	45	3.9	3.7	8	1217
20AY1	34	34	90	90	73	74	0550	181	32	33	4.7	4.5	8	717
20DY1	47	47	124	124	53	47	0600	130	45	44	3.7	3.6	8	1314
21DY1	44	44	116	116	55	48	0730	124	45	44	3.8	3.6	8	1295
21DY2	41	40	108	105	42	36	0733	106	43	41	3.5	3.4	8	1501
22DY1	43	42	113	111	58	51	0858	123	44	45	3.8	3.7	8	1239
22DY2	45	45	118	118	45	39	0902	120	43	42	3.6	3.4	8	1448
23DX1	82	81	216	213	65	53	1026	233	42	45	4.0	3.7	3	1116
23DX2	45	45	118	118	50	43	1031	121	45	43	3.6	3.5	3	1387
25DY1	50	50	132	132	52	46	1329	137	45	44	3.7	3.5	8	1345
29AY1	24	24	63	63	56	61	1913	102	17	21	5.6	5.3	8	365
30AY1	31	30	82	79	50	56	2041	135	12	17	6.0	5.5	8	258
31AY1	34	34	89	89	36	44	2207	164	1	9	6.8	6.2	8	36
31AY2	27	27	71	71	50	56	2211	119	12	17	6.0	5.6	8	262
31DE	18	18	47	47	37	35	2233	46	42	41	3.4	3.3	8	1604
32AY1	28	28	74	74	54	60	2342	120	18	20	5.7	5.3	8	350
33AX1	72	71	190	187	43	61	01/0109	305	7	21	6.1	5.2	8	186
33DX1	42	42	111	111	68	63	0124	128	41	43	4.1	3.8	3	1072
34AY1	122	121	319	316	45	70	0239	488	9	28	6.2	4.8	8	193

[redacted]

[redacted]

Pass No.	[redacted]															
	76	[redacted]		76	[redacted]											
34DY1	25	25		66	66		59	56	01/0257	74	44	45	3.8	3.7	8	1237
36DY1	78	78		206	206		51	40	0559	207	45	42	3.6	3.4	8	1369
37DY1	39	39		103	103		74	71	0720	130	35	39	4.4	4.2	8	883
37DY2	38	38		100	100		53	48	0728	108	45	44	3.7	3.6	8	1334
37DY3	40	40		105	105		42	36	0731	106	43	41	3.5	3.4	8	1524
38DY1	36	36		95	95		67	63	0854	112	42	43	4.1	3.9	8	1081
38DY2	110	110		290	290		57	39	0857	298	45	42	3.8	3.4	8	1279
39DY1	121	121		319	319		59	40	1026	333	44	42	3.8	3.4	8	1230
40AE	9	9		24	24		39	41	1137	48	3	4	6.5	6.3	8	91
40DY1	121	121		319	319		59	40	1156	333	44	42	3.9	3.4	8	1216
46AX1	49	49		129	129		53	64	2040	208	14	23	5.9	5.3	3	270
47AX1	29	29		76	76		45	52	2208	138	9	13	6.3	5.9	3	129
47AX2	50	50		132	132		57	67	2211	204	17	25	5.6	5.1	3	341
47DE	18	18		47	47		29	27	2233	46	39	38	3.3	3.3	3	1643
48AX1	73	73		192	192		51	66	2339	306	13	25	6.0	5.1	3	231
49AX1	63	63		166	166		56	69	02/0110	257	17	27	5.7	5.0	3	314
49DX1	29	40		76	105		61	53	0124	124	44	45	4.0	3.8	3	1111

[redacted]

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STRIP NO. M4
VEHICLE NO. 1128
MISSION NO. 2033
CAMERA NOS. 24 77

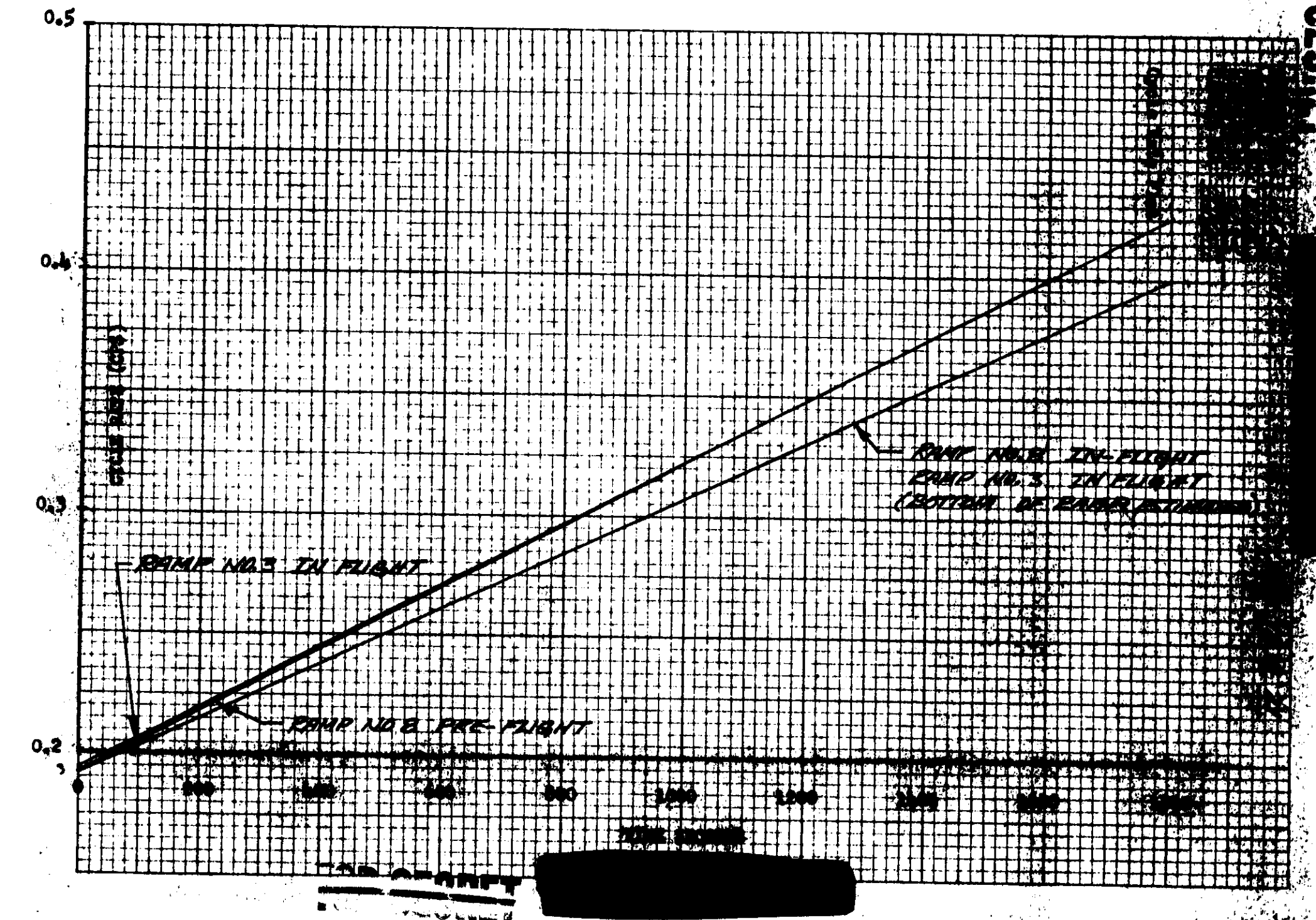
PRE-FLIGHT CYCLE PERIOD: (CAMERA NO. 76)

V/H Ramp	Cycle Period Seconds	FMC Rate		Scan Rate		
		Rad. Per Second	In. Per Second	Rad. Per Second	In. Per Second	Exposure Milliseconds
3 START	5.06	.017	.400	1.242	29.805	6.71
3 END	2.35	.036	.862	2.674	64.176	3.12
8 START	5.15	.016	.393	1.220	29.284	6.83
8 END	2.35	.036	.862	2.674	64.176	3.12

IN-FLIGHT CYCLE PERIOD: (CAMERA NO. 76)

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 Milliseconds
9	8 START	5.16	.016	.392	1.217	29.227	6.84
31	8 END	2.50	.034	.810	2.513	60.325	3.32
40	8 140 Sec up Ramp	4.77	.018	.425	1.317	31.617	6.32
47	3 END	2.50	.034	.810	2.513	60.325	3.32

TOP SECRET [redacted]



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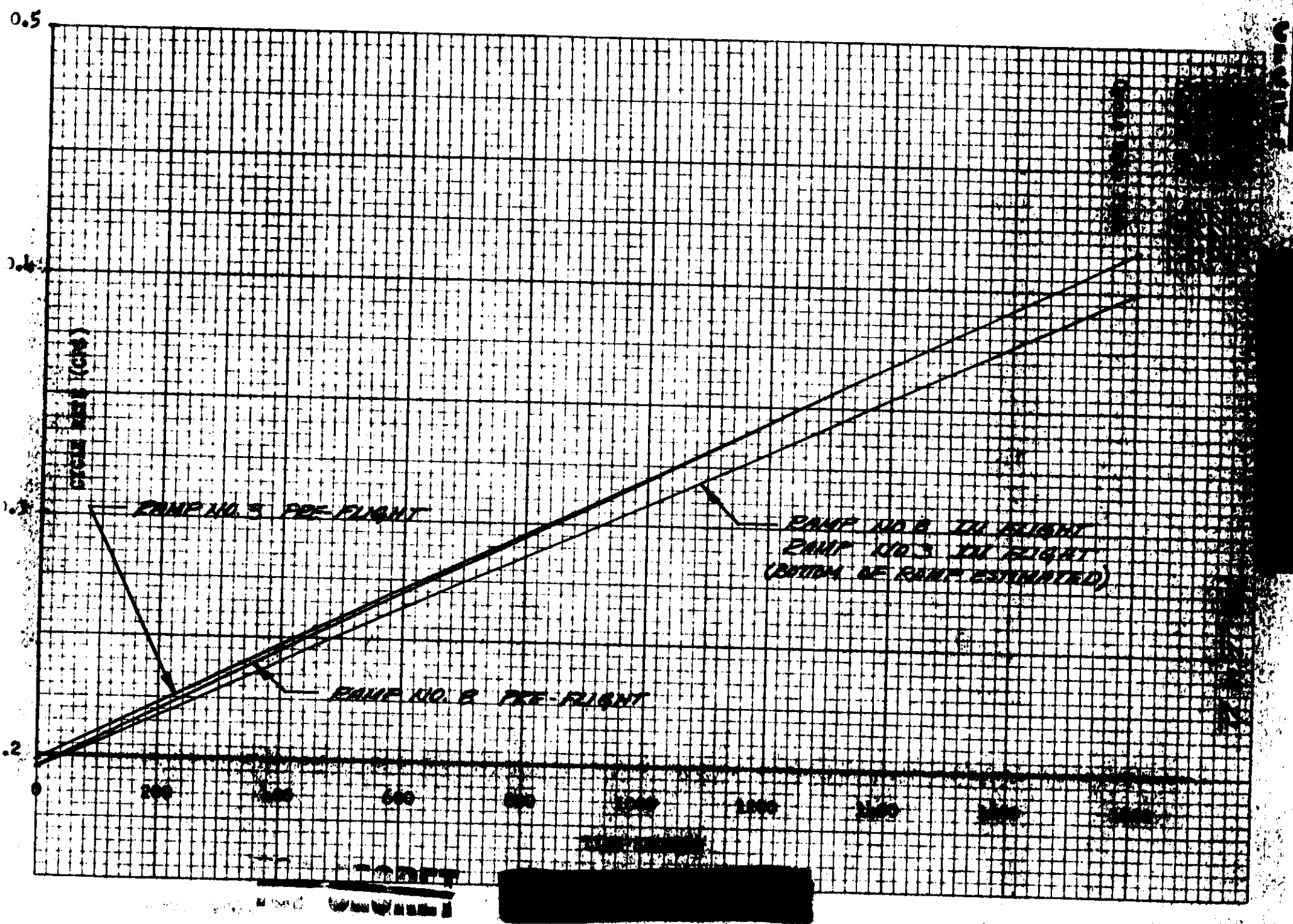
PRE-FLIGHT CYCLE PERIOD: (CAMERA NO. 77)

V/H Ramp	Cycle Period Seconds	FMC Rate Rad. Per Second	FMC Rate In. Per Second	Scan Rate Rad. Per Second	Scan Rate In. Per Second	Exposure Milliseconds
3 START	5.05	.017	.401	1.244	29.864	6.70
3 END	2.40	.035	.844	2.618	62.839	3.18
8 START	5.10	.016	.397	1.232	29.571	6.76
8 END	2.40	.035	.844	2.618	62.839	3.18

IN-FLIGHT CYCLE PERIOD: (CAMERA NO. 77)

Rev.No.	V/H Ramp	Cycle Period Seconds	FMC Rate Rad. Per Second	FMC Rate In. Per Second	Scan Rate Rad. Per Second	Scan Rate In. Per Second	Exposure Milliseconds
9	8 START	5.12	.016	.396	1.227	29.456	6.79
31	8 END	2.50	.034	.810	2.513	60.325	3.32
40	8 140 Sec UP Ramp	4.77	.018	.425	1.317	31.617	6.32
47	3 END	2.50	.034	.810	2.513	60.325	3.32

[redacted]



CAMERA NOS. 76 177

LENS DATA SUMMARY: (Main Camera No. 76)

Lens Serial No. 0122435 (I3)

Filter Type WRATTEN 21

Equivalent Operational Focal Length 609.617 MM

Resolution:

Static:

	Lines/MM	Film Type	Target Contrast
Bench Test	198	SO 243	HIGH
Other	NONE		

Dynamic:

Itek Pre-Vibration	NOT AVAILABLE		
Itek Post Vibration	NOT AVAILABLE		
AP Pre-HATS	155.7	SO 132	HIGH
AP Post-HATS	181	SO 132	HIGH
Other			

Note: A/P ~~Itek~~ Post HATS ~~Vibration~~ Resolution of 181 lines/MM Reported In Message No. [redacted] dated _____

Distortion - Positive (Pincushion)

Angle Off Axis Deg.	3	2	1	0	359	358	357		
Distortion Millimeters	.005	.003	.003	0	0	.003	.011		

TOP SECRET [redacted]

[redacted] 14 of 21

LENS DATA SUMMARY: (Horizon Cameras for Main Camera No. 76)

	Take-Up	Supply
Lens Serial No.	[redacted]	807530
Exposure Time	1/50 Sec.	1/50 Sec.
Filter Type	WRATTEN 25	WRATTEN 25
Aperture	F8.0	F.6.8
Operational Focal Length	89.1 MM	89.2 MM
Radial Distortion:		
10° off Axis	.005 MM	.003 MM
20° off Axis	.041 MM	.032 MM
30° off Axis	.157 MM	.131 MM
Tangential Distortion (Maximum Vector)	.009 MM	.006 MM

Resolution:

Angle off Axis Deg.	0	5	10	15	20	25
Radial Resolution	51	49	38	32	27	27
Tangential Resolution	44	44	37	34	31	29

36.9 Lines/MM Avg.

0	5	10	15	20	25
56	49	40	31	30	29
56	49	39	32	32	27

36.9 Lines /MM Avg.

Note:

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

TOP SECRET [redacted]

LENS DATA SUMMARY: (Main Camera No. 77)

Lens Serial No. 0152435 (P7)

Filter Type WRATTEN 21

Equivalent Operational Focal Length 609.597 MM

Resolution:

Static:

	Lines/MM	Film Type	Target Contrast
Bench Test	242	SO243	HIGH
Other	NONE		

Dynamic:

	Lines/MM	Film Type	Target Contrast
Itek Pre-Vibration	Not Available		
Itek Post Vibration	Not Available		
AP Pre-HATS	150	SO132	HIGH
AP Post-HATS	186.4	SO132	HIGH
Other	NONE		

Note: ~~Itek~~ A/P Post ~~Vibration~~ HATS Resolution of 186.4 lines/MM Reported In Message No. [redacted] dated ______

Distortion - Positive (Pincushion)

Angle Off Axis Deg.	357	358	359	0	1	2	3		
Distortion Millimeters	.010	.004	.000	.000	.000	.002	.002		

[redacted] 1/6 24

CAMERA NOS. [redacted] 77

LENS DATA SUMMARY: (Harison Cameras for This Camera No. 77)

	Take-Up	Supply
Lens Serial No.	806539	806562
Exposure Time	1/50 Sec.	1/50 Sec.
Filter Type	WRATTEN 25	WRATTEN 25
Aperture	F8.0	F6.8
Operational Focal Length	89 MM	89 MM
Radial Distortion:		
10° off Axis	0 MM	.005 MM
20° off Axis	.035 MM	.034 MM
30° off Axis	.147 MM	
Tangential Distortion (Maximum Vector)	.008 MM	.002 MM

Resolution:

Angle off Axis Deg.	0	5	10	15	20	22.5
Radial Resolution	56	56	47	39	30	31
Tangential Resolution	51	49	47	42	32	31

42.6 Lines/MM Avg.

0	5	10	15	20
56	49	44	34	32
51	49	44	32	29

42 Lines/MM Avg.

Note:

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

TOP SECRET [redacted]

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 space 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 [redacted] 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 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.

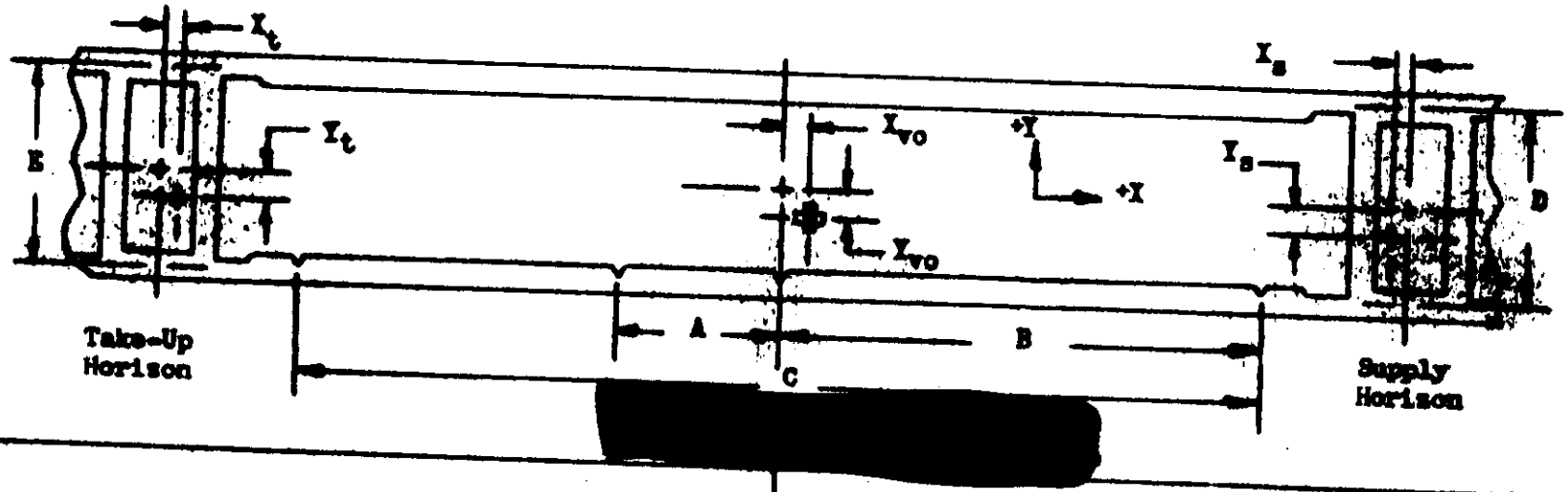
7.0 The indicated flight direction is the direction of vehicle travel during orbit. The forward edge of format is the edge opposite the shrinkage markers for camera number one and is the edge containing the shrinkage markers for camera number two.

8.0 Dimensions A, B, and C are the spacings of the shrinkage markers. Dimensions D and E are the spacings of the 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 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 zero, but is uncontrolled.

11.0 Similarly, the angle between the plane and the indicated axis on the main format is uncontrolled and assumed to be zero.



Camera No. 76 Format Viewed with Negative Emulsion Down

Vehicle Motion ↓ Scan Direction →

X_t	+.035	Y_t	-.269	A	76.116
X_s	-.894	Y_s	+.474	B	355.077
X_{vo}	-.015	Y_{vo}	-.262	C	710.200
D	56.412	E	56.418		

Format Dimensions:

	Supply	Main	Take-Up
Height	53.3	56.4	53.4
Width	23.0	154.1	23.0

Camera No. 77 Format Viewed with Negative Emulsion Down

Vehicle Motion ↑ Scan Direction →

X_t	+.101	Y_t	-.027	A	76.048
X_s	-.302	Y_s	-.024	B	354.930
X_{vo}	-.185	Y_{vo}	+.435	C	709.750
D	56.451	E	56.526		

Format Dimensions:

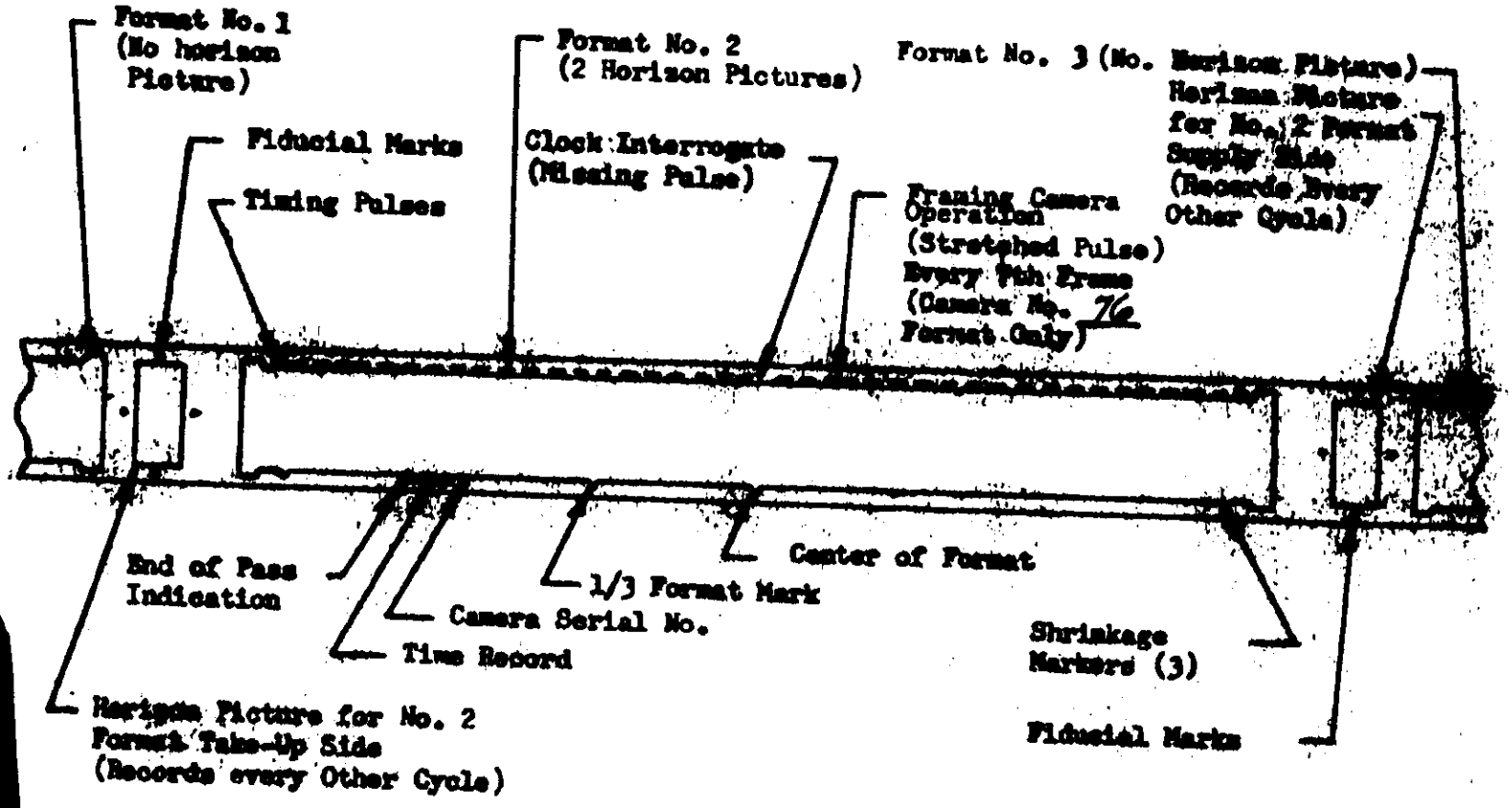
	Supply	Main	Take-Up
Height	53.4	56.9	53.4
Width	22.9	153.8	22.9

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

DRAFT

FORMAT DIMENSIONS: (METRIC CAMERAS)



Camera No. 16

Viewed With Negative Emulsion Down

Film Transport →

Scan →

Vehicle Motion ↓

Camera No. 77

Viewed With Negative Emulsion Down

Film Transport →

Scan →

Vehicle Motion ↑

FORMAT (FWD CAMERA)

[redacted] M4
[redacted] 1252
CAMERA NO. 1477

LENS DATA SUMMARY: (Framing Camera No. 82)

Lens Serial No. 2552612

Reseau Serial No. 82

Filter Type WRATTEN 21

Aperture F6.3

Exposure Time 1/250 Sec.

Equivalent Focal Length 38.48 MM

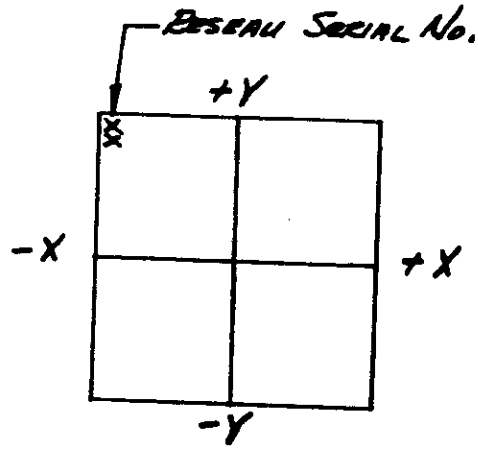
Resolution: 94.3 Lines/MM AMAR SO-132
68.9 Lines/MM AWAR J-30

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

Note: Resolution data read from _____ Film

Distortion: (Not Available) No Stellar Calibrations.

Angle off Axis Deg.									
Distortion Millimeters									



← FILM TAKE-UP DIRECTION
→ CAMERA MOTION DIRECTION

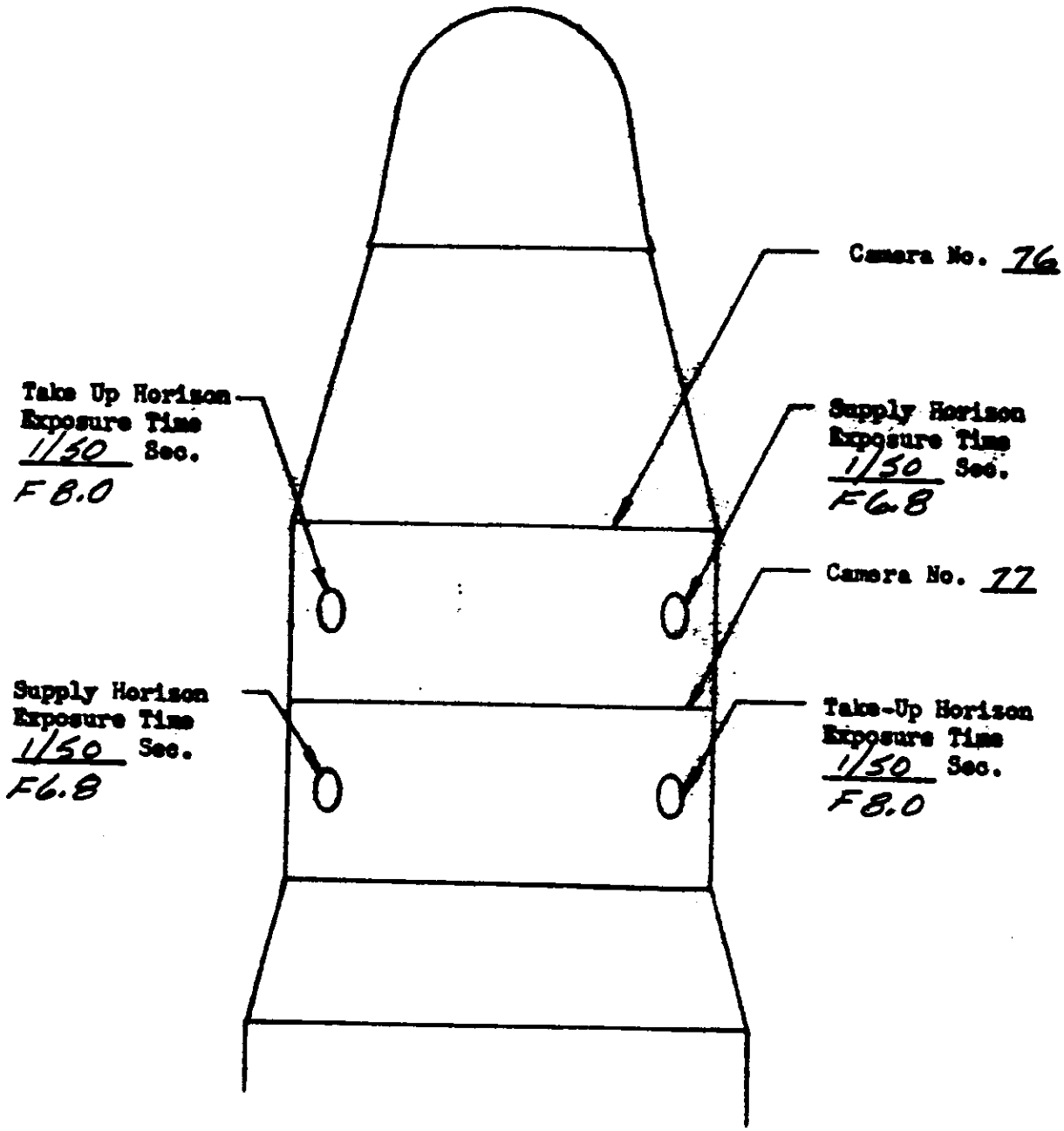
LOCATION OF OPTICAL AXIS:
X = -.046 MM
Y = +.02 MM

FILM SHOWN NEGATIVE EMULSION SIDE DOWN

[redacted]

[redacted] MA
SHIP
NO. 1036
CAMERA NOS. 76 & 77

HORIZON LENS SETTINGS (Viewed from top of vehicle inflight)



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