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TECHNICAL PUBLICATION

PHOTOGRAPHIC EVALUATION REPORT

MISSION 1035-1

20-25 SEPTEMBER 1966

MISSION 1035-2

25-30 SEPTEMBER 1966

[redacted]

MARCH 1967

COPY [redacted]

101 PAGES

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[redacted]

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NATIONAL PHOTOGRAPHIC INTERPRETATION CENTER

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TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

APPENDIX B. DENSITY READINGS

APPENDIX C. PAN GEOMETRY

APPENDIX D. CLOUD COVER ANALYSIS

APPENDIX E. MISSION COVERAGE STATISTICS

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LIST OF ILLUSTRATIONS

SYNOPSIS

Mission 1035 was launched on 20 September 1966 at 2114Z. Recovery of both re-entry vehicles was achieved by air catch, the first on 25 September 1966 at 0019Z and the second at 2341Z on 30 September 1966. The mission accomplished 75 operational, 16 domestic, and 2 engineering passes.

Mission 1035 is the first "J" system flown with the photogrammetric configuration (Pan Geometry Modification). See Appendix "C" for the Pan Geometry operation.

All cameras operated satisfactorily throughout the mission. No major anomalies were noted. Fog patterns due to light leaks are less dense and less numerous than on recent missions of this system. It is suspected that improved main camera seals are the major factor.

The image quality of both main cameras was consistently good and equal to the best of recent missions. Unusually good atmospheric conditions are considered to be the primary reason for the high quality. Also, a yaw programmer was used for the first time in over a year. The improved image motion compensation is probably another factor contributing to the quality of the mission. Both parts of Mission 1035 were assigned an MIP of 85.

A new stellar/index control arrangement which switches control from the master to the slave when only the latter is operating was initiated on this mission. This new control arrangement will be installed on all future "J" systems.

The stellar/index cameras functioned properly. No major degradations were noted on either record. The stellar camera produced point type images, and no difficulty was encountered in the reduction process. The quality of the index camera material is equivalent to the best received from this system to date.

GENERAL FLIGHT DATA

Launch and Recovery Dates

Launch Date, Mission 1035	20 September 1966/2115Z
Recovery Date, Mission 1035-1	25 September 1966/0019Z
Reactivation Date, Mission 1035-2	25 September 1966
Recovery Date, Mission 1035-2	30 September 1966/2341Z

Orbital Parameters (Actual)

	Mission 1035-1 (Rev 41)	Mission 1035-2 (Rev 120)
Period	90.755 min	90.601 min
Perigee	98.748 nm	100.718 nm
Apogee	[illegible] nm	238.820 nm
Eccentricity	0.01974	0.01915
Inclination Angle	85.055°	85.054°
Perigee Latitude	29.100°N	48.780°N

Photographic Operations

	Mission 1035-1	Mission 1035-2
Operational Passes	35	40
Domestic Passes	6	10
Domestic/Operational Passes	0	0
Engineering Passes	1	1
Recovery Orbits	81	160

[redacted]

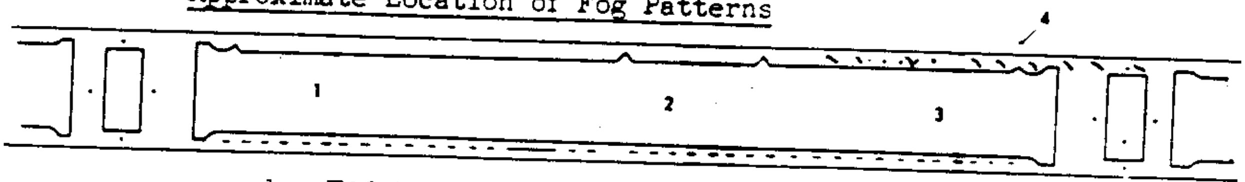
PART I. CAMERA OPERATIONS

1. Forward-Looking (Master) Panoramic Camera No 188

The forward-looking panoramic camera functioned properly throughout the mission. The photography, however, was affected by the following degradations.

a. Fog patterns, due to light leaks and long camera sit periods, are less dense and less numerous than on recent missions of this system. The improved main camera seals could be a contributing factor. The location of these fogged areas is illustrated below.

Approximate Location of Fog Patterns



1. Fifth frame of most camera operations.

2. Second to last frame of most camera operations. Associated with camera sit periods.

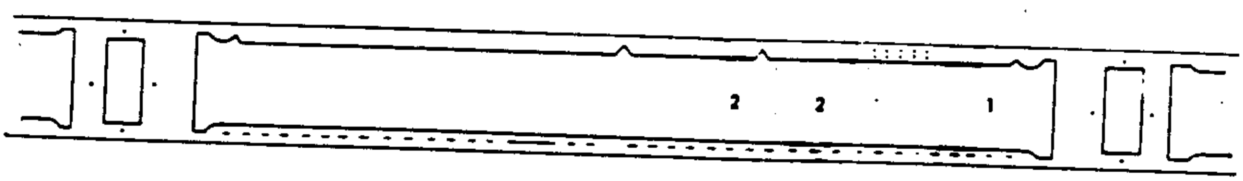
3. Fifth frame of a few camera operations. Less dense than number 1.

4. Crescent-shaped fog appears intermittently along the camera number edge adjacent to both the panoramic and horizon camera formats. These fog patterns dissipate approximately half way through Mission 1035-1.

2. Aft-Looking (Slave) Panoramic Camera No 189

a. The aft-looking panoramic camera functioned properly throughout the mission. Degradation to the photography due to light leaks is minor. The location of these patterns is illustrated below.

Approximate Location of Fog Patterns



1. Second to last frame of some camera operations. Density varies with "camera off" duration.

2. Third to last frame of a few camera operations. Density varies with "camera off" duration.

3. Forward-Looking (Master) Horizon Cameras

a. The port horizon camera operated satisfactorily throughout the mission.

b. The starboard horizon camera functioned properly throughout the mission. Although the densities of the starboard horizons appeared to be greater than those of the port, they are in a normal and acceptable range.

4. Aft-Looking (Slave) Horizon Cameras

a. The port horizon camera operated satisfactorily throughout the mission.

b. The starboard horizon camera functioned properly throughout the mission. The same density difference reported for the horizon camera exposures of the master camera applies to the horizon camera exposures of the slave camera.

5. Stellar Camera No D95/112/113 (Mission 1035-1)

The stellar camera operated satisfactorily throughout the mission, producing 435 frames. Flare degradations are minimal and stellar images can be detected in the flared areas. A small particle of foreign matter is recorded in the same area throughout. The particle is out of focus, indicating that it adhered to the surfaces of the reseau plate opposite the film. A fine plus density line, between the correlation lamp and the stellar format, is present on the last 42 frames. At least 15 stellar images can be detected on each frame. Plus density streaks, previously referred to as "jettisoned fuel particles," are present intermittently throughout the mission.

6. Stellar Camera No D96/104/116 (Mission 1035-2)

The stellar camera functioned properly throughout the mission, producing 475 frames. Earth flare was minor and stellar images could be detected within the flared areas. A particle of foreign matter is recorded in the same area throughout. Two areas of crescent-shaped flare are present around the format perimeters. They extend approximately 0.10 inch into the format. Although these areas are of high density, they do not affect the stellar field. The last 13 frames contain the usual

[redacted]

abrasions, gouges, emulsion cracking, and fog patterns associated with film supply depletion. A fine plus density line, between the correlation lamp and the stellar format, runs parallel to the film edges for the last 76 frames of the mission. At least 15 stellar images can be detected on each exposure.

7. Index Camera No D95/112/113 (Mission 1035-1)

The index camera operated satisfactorily throughout the mission. No degradations were noted. The image quality is good and comparable to the best received to date from this system.

8. Index Camera No D96/104/116 (Mission 1035-2)

The index camera functioned properly throughout the mission. Small comet-shaped static discharges were present in the border along the reseau number edge intermittently throughout the mission. The image quality is comparable to that received from Mission 1035-1.

9. Associated Equipment

This equipment records part of the information required for correlation and mensuration of the panoramic cameras.

a. A streaked timing pulse was observed on the slave camera material for the first time. This condition is the normal result of a new stellar index control arrangement which switches control from the master to slave camera when only the latter is operating. This new control arrangement will be installed on all future "J" systems.

b. The camera number and binary index lamp adjacent to the camera number are bloomed but readable on both cameras.

c. Mission 1035 is the first "J" system flown with the photogrammetric configuration (Pan Geometry Modification). This modification consists of 3 nodal traces, appearing in the image format as lines of plus density, and 73 holey rail dots appearing in the borders, one centimeter apart on both film edges of both main cameras. See Appendix "C" for the Pan Geometry operation.

[redacted]

FIGURE 1. EXPLANATION OF PHOTOGRAPHIC DATA

The data pertaining to photographs contained in this publication are defined as follows:

PASS: A pass is the operational portion of an orbital revolution. A suffix D indicates that the photography was acquired during the descending portion, a suffix A indicates that the photography was acquired during the ascending portion, and a suffix M indicates that the photography was acquired during a pass that includes both ascending and descending portions. An additional suffix E indicates that the pass was an engineering operation or that a portion of the pass has been edited.

DATE OF PHOTOGRAPHY: The date of photography indicates the day, month, and year (GMT) that the photography was acquired.

UNIVERSAL GRID COORDINATES: These coordinates are included to locate the illustrated photography within the panoramic format.

ENLARGEMENT FACTOR: The enlargement factor is included to indicate the number of diameters the original material has been enlarged in the photographic illustration.

GEOGRAPHIC COORDINATES: These coordinates are included to indicate the latitude and longitude of the panoramic format.

ALTITUDE: This measurement is the vertical distance from the vehicle to the Hough Ellipsoid at the time of the acquisition of the photography.

PITCH: Rotation of the camera about its transverse axis. Using appropriate aeronautical terminology, positive readings indicate nose-up attitude and negative readings indicate nose-down attitude.

ROLL: Rotation of the camera about its longitudinal axis. Using appropriate aeronautical terminology, positive readings indicate left wing-up attitude and negative readings indicate right wing-up attitude.

YAW: Rotation of the camera about its vertical axis. Positive readings indicate counterclockwise rotation when viewing the ground nadir from the vehicle-mounted camera in-flight.

LOCAL SUN TIME: This time is included to present to the viewer a realistic time of acquisition of the photography illustrated.

<u>SOLAR ELEVATION</u>: The solar elevation is the angular elevation of the sun above a plane tangent to the surface of the earth at the center of the panoramic format. A negative solar elevation indicates that the sun is below the plane.

<u>SOLAR AZIMUTH</u>: The solar azimuth is the angular measurement of the rays of the sun measured from true north in a clockwise direction.

<u>EXPOSURE</u>: The exposure is the duration of the photographic exposure expressed in a fraction of a second and is computed from the scan rate and slit width.

<u>VEHICLE AZIMUTH</u>: The vehicle azimuth is the angle of ground track with respect to geodetic coordinates.

<u>PROCESSING LEVEL</u>: The processing level is pertinent to the referenced frame and is extracted from the contractor's processing report.

FIGURE 2. FOREIGN MATTER IN STELLAR FORMATS

Present on stellar exposures of Missions 1035-1 and 1035-2. A small foreign particle has adhered to the surfaces of the reseau plate opposite the film in each stellar camera, and thus the particle appears somewhat out of focus. It remains in the same position for the entire record of both missions.

[redacted]

Mission Number 1035-1
Stellar Frame Numbers. 210, 211, 212
Correlates with Fwd Camera Frames. . 80, 87, 94
Pass 37D
Date of Photography. . . . . 23 Sep 66
Enlargement Factor 2.5X
Exposure Time. . . . . 1 sec

[redacted]

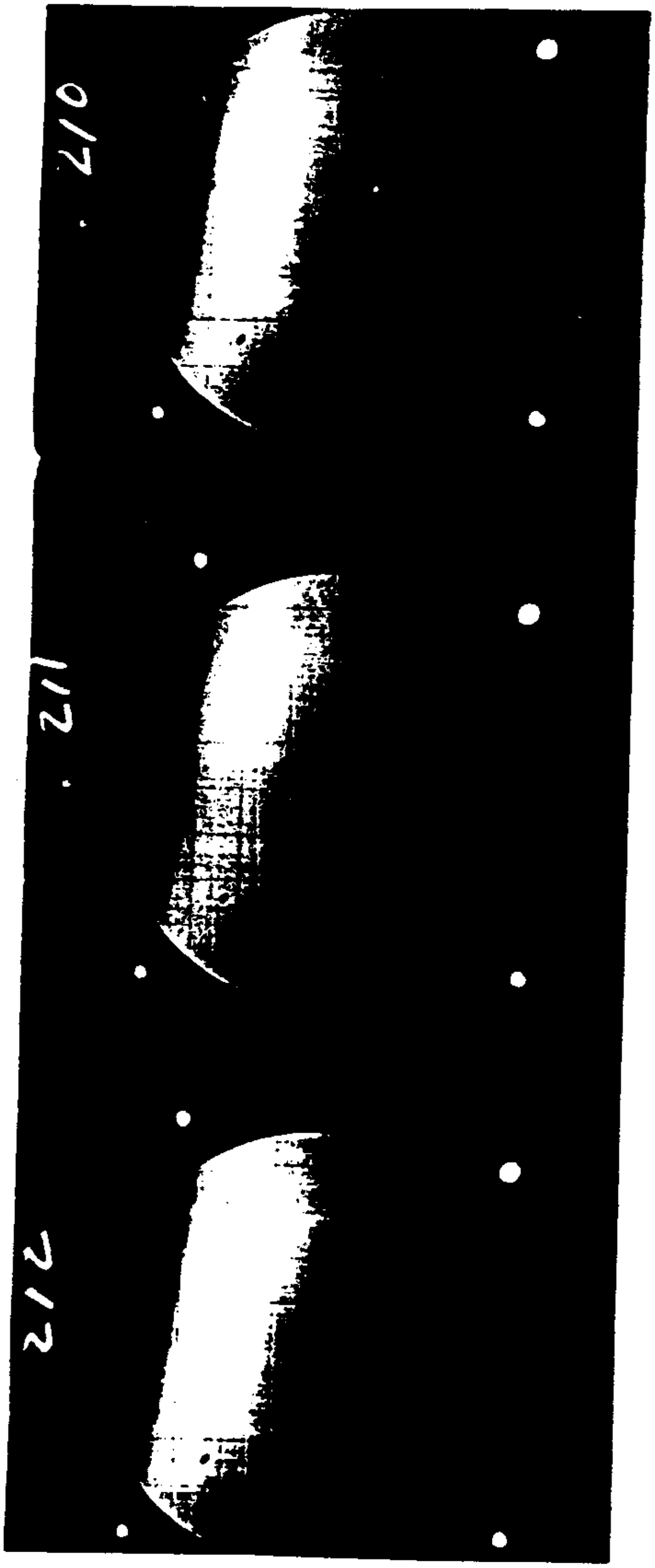


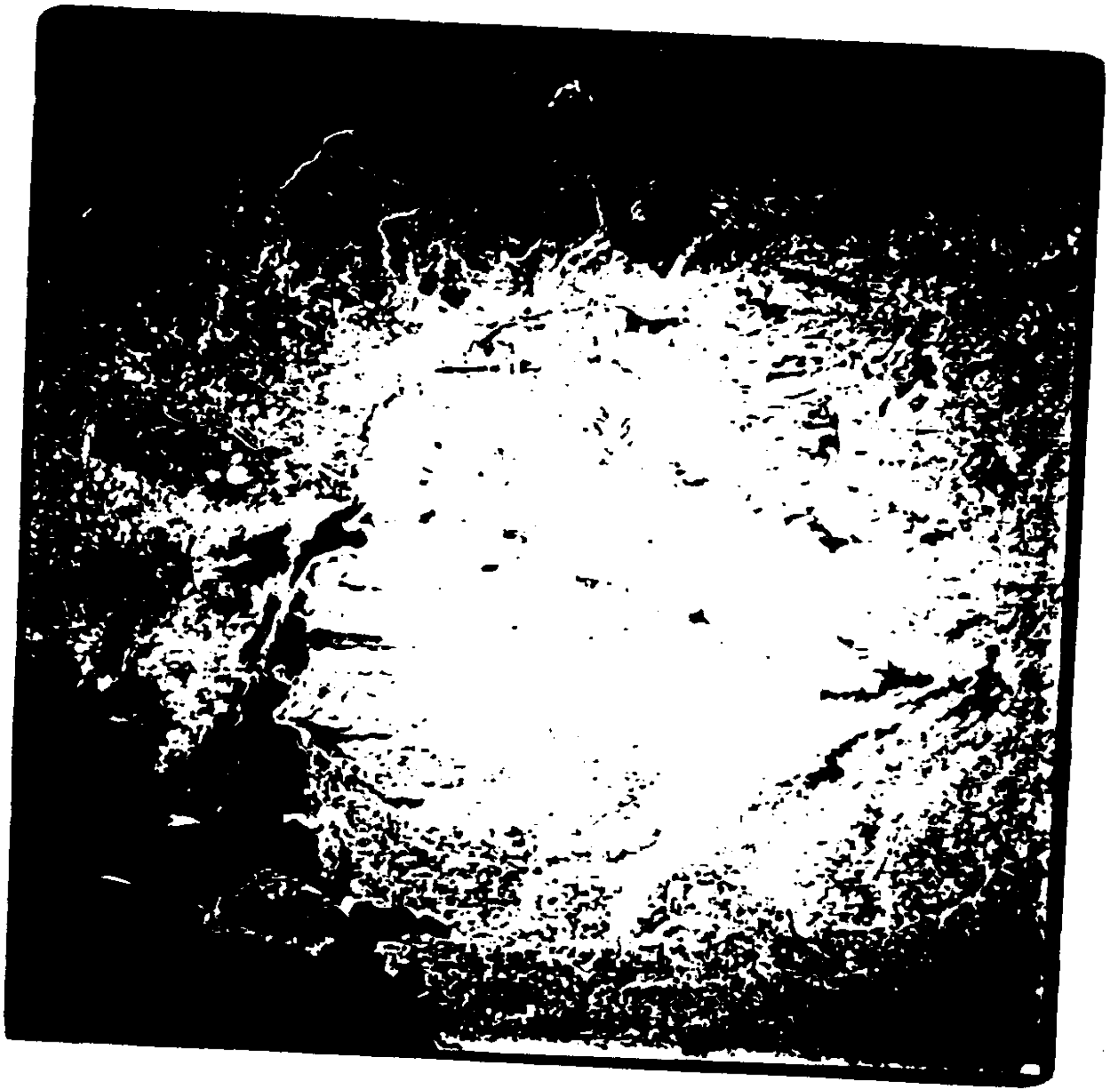
FIGURE 3. INDEX PHOTOGRAPHY, GOOD QUALITY

This photograph is indicative of the good quality photography produced by the index camera for Missions 1035-1 and 1035-2.

[redacted]

[redacted]

Mission Number	1035-1
Index Frame Number	152
Correlates with Fwd Camera Frame . .	33
Pass	25D
Date of Photography.	22 Sep 60
Enlargement Factor	2.5X
Exposure	1/500 sec



PART II. FILM

1. Film Processing

This section provides an evaluation of processing, density, contrast, and physical conditions of the original negatives.

a. The master and slave material from Missions 1035-1 and 1035-2 were processed in the Trenton processor. Infrared densitometry was employed to determine the optimum level of development for all portions of both panoramic records. The following information indicates the percentage of film processed at each level of development and the number of processing level changes:

	Mission 1035-1		Mission 1035-2	
Development Level	Master	Slave	Master	Slave
Primary	0%	1%	4%	1%
Intermediate	11%	14%	18%	20%
Full	89%	85%	78%	79%
Process Changes	16	23	35	36

b. The filter/slit width combination for each panoramic camera provided adequate exposure except where low solar elevations prevailed. A Wratten 23A filter combined with a 0.225 inch slit width was used on the master panoramic camera and a Wratten 21 filter combined with a 0.175 inch slit width was used on the slave panoramic camera. Most of the photography from both panoramic cameras was of medium density and contrast.

c. The stellar record from Missions 1035-1 and 1035-2 was processed with a Yardleigh processor. A modified film path was utilized to provide single step, viscous development. The exposure of the stellar records was adequate to detect stellar images.

d. The index records for both parts of Mission 1035 were processed with the Drape processor. The exposure of the index records was generally adequate. However, where low solar elevation prevailed the exposure was less than optimum. In general, the photography from both index cameras was of medium contrast and density.

2. Film Footage (Processed)

Camera	Mission 1035-1	Mission 1035-2
Master (Forward-Looking) Panoramic No 188	7,876	8,13[illegible]
Slave (Aft-Looking) Panoramic No 189	7,939	8,083
Stellar No D95/113	60	NA
Index No D95/112	112	NA
Stellar No D96/116	NA	60
Index No D96/104	NA	125

3. Frame Totals (Titled)

Camera	Mission 1035-1	Mission 1035-2
Master (Forward-Looking) Panoramic No 188	2,841	3,079
Slave (Aft-Looking) Panoramic No 189	2,861	3,058
Stellar No D95/113	435	NA
Index No D95/112	435	NA
Stellar No D96/116	NA	475
Index No D96/104	NA	475

4. Physical Film Degradations

The degradations to the original negative of this mission are similar to those noted on previous missions. Rail scratches are present along both edges of the film throughout. Minus density streaks appear intermittently on the material from both main cameras. These streaks appear along the scan direction and indicate a bias in the IMC direction. The cause appears to be a loose particle of foreign matter randomly in contact with the field flattener. Dendritic fog resulting from static discharges is present intermittently along both film edges of both main cameras. This fog extends into the format on occasions but generally is confined to the borders. The camera number edge of both main cameras is ragged from the take up end of each frame to the second shrinkage marker. This was caused by an emulsion buildup on the film guide rails. Beginning with "J-37" (Mission 1037), all "J" systems will have polished rails. This should reduce the amount of emulsion removed from the film. A minus density streak on the master camera material appears randomly throughout the mission. This streak is different than the one described earlier, in that it does not extend the full length of the format but extends across unexposed areas between formats as well as through the horizon formats. While this anomaly could result from a manufacturing defect, it is probably processing induced. In Mission 1035-2, the last 2 feet of the master material and the last 8 feet of the slave material were contaminated by a small amount of electrolite (potassium hydroxide) which spilled from the recovery battery at the time of air recovery. A new vent device has been designed to prevent recurrence of this condition. In general, the photographic record of Mission 1035 is considered to have fewer significant anomalies than any "J" mission to date.

PART III. IMAGE QUALITY

1. Definition of Photographic Interpretation (PI) Suitability

PI suitability is an assessment of the information content of photographic reconnaissance material and its interpretability. A number of interrelated factors are involved, such as the quality of the photography, the extent of target coverage, scale, and weather limitations. However, the fundamental criteria for assigning a PI suitability rating may be reduced to (a) the scope of the photographic coverage and (b) the degree to which a photographic interpreter may extract useful and reliable information from the material.

PI suitability ratings are: Excellent, Good, Fair, Poor, and Unuseable. These ratings refer to the overall interpretive value of the photography obtained from a particular reconnaissance mission. Individual targets may also be assigned PI suitability ratings. The standards that determine assignment of the various ratings are:

Excellent: The photography is free of degradations by camera malfunctions or processing faults and weather conditions are favorable throughout. The imagery contains sharp, well-defined edges and corners with no unusual distortions. Contrast is optimum and shadow details, as well as details in the highlight areas, are readily detectable. Observation of small objects and a high order of mensuration are made possible by the consistently good quality of the photography.

Good: The photography is relatively free of degradations or limiting atmospheric conditions. Edges and corners are well defined. No unusual distortions are present. Detection and accurate mensuration of small objects are feasible, but to a lesser degree than in material rated as Excellent.

Fair: Degradation is present and the acuity of the photography is less than optimum. Edges and corners are not crisply defined, and there is loss of detail in shadow or highlight areas. Detection and identification of small objects are possible but accuracy of mensuration is limited by the fall-off in image quality and the less-than-optimum contrast.

Poor: Camera-induced degradations or weather limitations severely reduce the effectiveness of the photography. Definition of edges and corners are not well defined. Only gross terrain features and culture may be detected or identified and distortion of form may exist. Accurate mensuration of even large objects is doubtful.

Unuseable: Degradation of photography completely precludes detection, identification, and mensuration of cultural details.

2. PI Suitability, Missions 1035-1 and 1035-2

The PI suitability is good for the operational portions of Missions 1035-1 and 1035-2. A total of 173 targets was reported on during the preliminary readout. Fifty-nine of the 173 targets were given a poor quality rating. The poor quality ratings were generally the result of overcast weather conditions over the target area.

It should be noted that this report is of a preliminary nature and represents the initial scan results, accomplished in a short period of time. A more detailed study of the photography may produce additional information and alter portions of the preliminary report.

3. Definition of Mission Information Potential (MIP)

The MIP is an arbitrary number, not limited by terminal values, which is subjectively assigned to the panoramic photography of a mission and which compares it to the other missions. It is meant to be a measure of the camera's maximum capability for recording information, discounting adverse atmospheric conditions, minimum solar elevations, camera malfunctions, or other factors which reduce the quality of the photography.

The MIP is based on the best photography found in a mission, even though the photography may be limited to a few frames. Since these frames are considered to be the best in the mission, they do not indicate the overall success, average quality, or general interpretability of the photography.

Criteria for selection of the MIP frame:

a. Eliminate all portions of the mission affected by system malfunctions.

b. Select frames which are free of clouds or atmospheric attenuation.

c. Eliminate the first 10 frames and last frame of a pass because these may be affected by incorrect scan speed.

d. Select frames that are in a continuous strip of approximately 10 cloud-free frames because cloud shadows from weather fronts are cast for great distances.

e. Determine from the horizon cameras that the panoramic photography is not affected by apparent vehicle perturbations.

[redacted]

[redacted]

[redacted]

f. Select targets that are near the center of the format and on frames as close as possible to perigee for scale purposes and to eliminate obliquity.

g. Select frames having near optimum solar elevation.

h. Select a high-contrast target (preferably an airfield) and compare the target to a previous mission which has been given an MIP rating.

[illegible]. <u>MIP, Missions 1035-1 and 1035-2</u>

The MIP frame for Mission 1035-1 was selected from the slave camera material, frame 10, pass 63D. Coverage of the same area was provided by the master camera, frame 10, pass 63D. An MIP rating of 85 was assigned. The detail in both photographs is good. However, the detail in the slave camera material is slightly better probably due to a greater amount of haze transmission by the master camera optics. It is also noted that the slave camera had a narrower slit, providing a shorter exposure duration.

Aft frame 86, pass 151D was selected as the MIP frame for Mission 1035-2. Coverage of the same area was provided by the master camera, frame 86, pass 151D. An MIP rating of 85 was assigned.

The image quality of Missions 1035-1 and 1035-2 is consistently good and comparable to the best of any recent missions. A primary reason for the high quality is considered to be unusually good atmospheric conditions. Also, a yaw programmer was used for the first time in over a year. The improved image motion compensation is also a probable factor contributing to the quality of the mission.

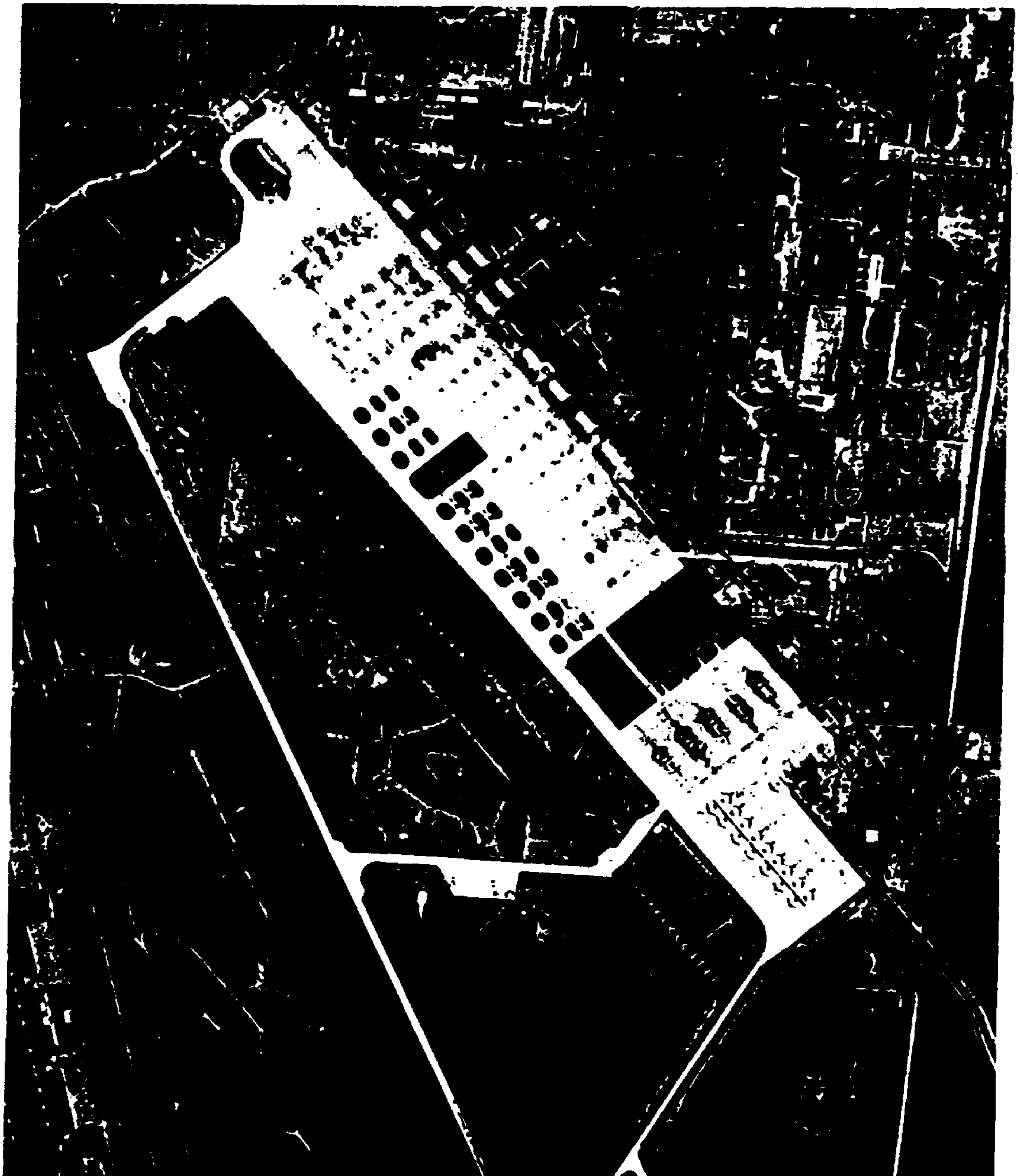
FIGURE 4. MIP PHOTOGRAPHY, SLAVE CAMERA, MISSION 1035-1

FIGURE 5. PHOTOGRAPHY OF MIP AREA, MASTER CAMERA, MISSION 1035-1

The following photographs provide stereo coverage of the MIP area. The photography from both panoramic cameras is good. However, the slave camera (aft-looking) photography contains greater detail than the master camera photography.

[redacted] [redacted]

	FIGURE 4	FIGURE 5
Camera	Aft	Fwd
Pass	63D	63D
Frame	10	10
Date of Photography	24 Sep 66	24 Sep 66
Universal Grid Coordinates	54.3 - 12.7	37.3 - 11.3
Enlargement Factor	20X	20X
Geographic Coordinates	33-56N 116-58W	33-56N 116-55W
Altitude	603,613'	604,374'
Camera Attitude		
Pitch	-15°04'	15°11'
Roll	0°34'	0°40'
Yaw	-1°41'	-1°40'
Local Sun Time	1256	1256
Solar Elevation	52°51'	52°51'
Solar Azimuth	154°	154°
Exposure	1/378 sec	1/294 sec
Vehicle Azimuth	176°59'	176°54'
Processing Level	Full	Full



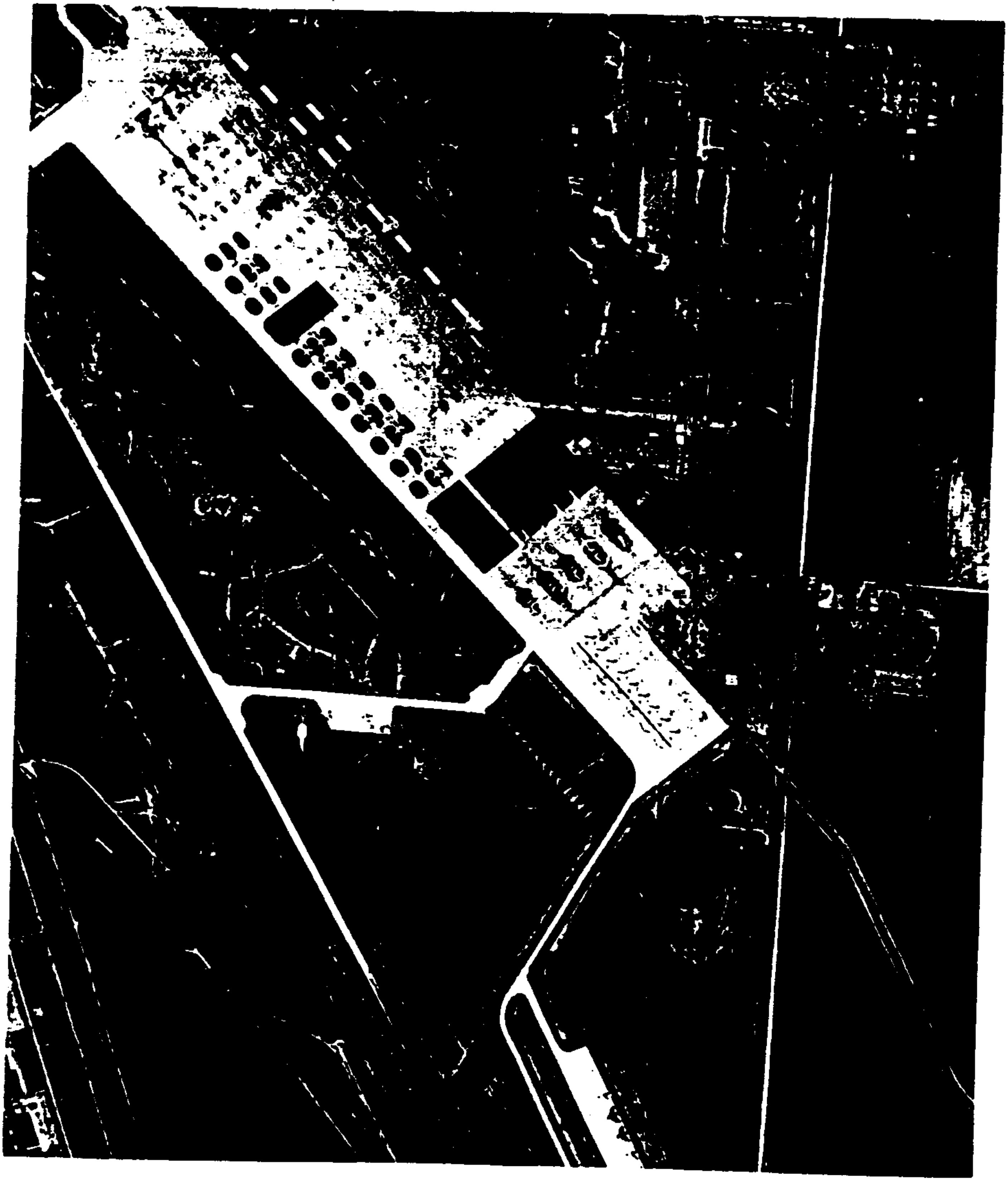


FIGURE 6. MIP PHOTOGRAPHY, SLAVE CAMERA, MISSION 1035-2

FIGURE 7. PHOTOGRAPHY OF MIP AREA, MASTER CAMERA, MISSION 1035-2

The following photographs provide stereo coverage of the MIP area of Mission 1035-2.

[redacted] [redacted]

	FIGURE 6	FIGURE 7
Camera	Aft	Fwd
Pass	151D	151D
Frame	86	86
Date of Photography	30 Sep 66	30 Sep 66
Universal Grid Coordinates	43.8 - 12.6	47.5 - 12.1
Enlargement Factor	20X	20X
Geographic Coordinates	45-01N 036-55E	45-00N 036-58E
Altitude	610,458'	610,135'
Camera Attitude		
Pitch	-15°01'	14°58'
Roll	-0°22'	-0°21'
Yaw	-01°7'	-1°10'
Local Sun Time	1156	1156
Solar Elevation	42°15'	42°16'
Solar Azimuth	180°	180°
Exposure	1/380 sec	1/296 sec
Vehicle Azimuth	175°33'	175°25'
Processing Level	Full	Full

[redacted]

[redacted]

[redacted]

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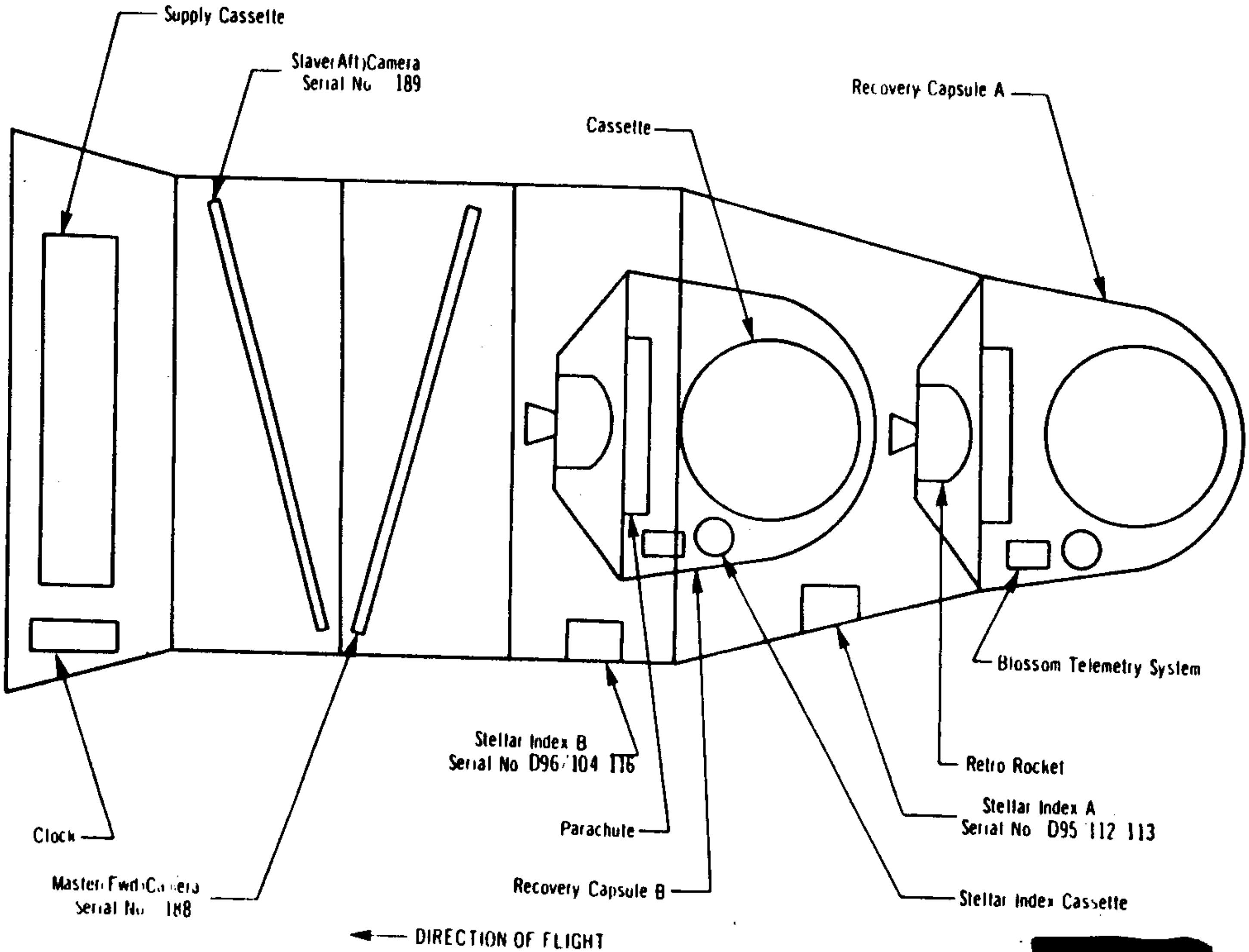
APPENDIX A. SYSTEM SPECIFICATIONS

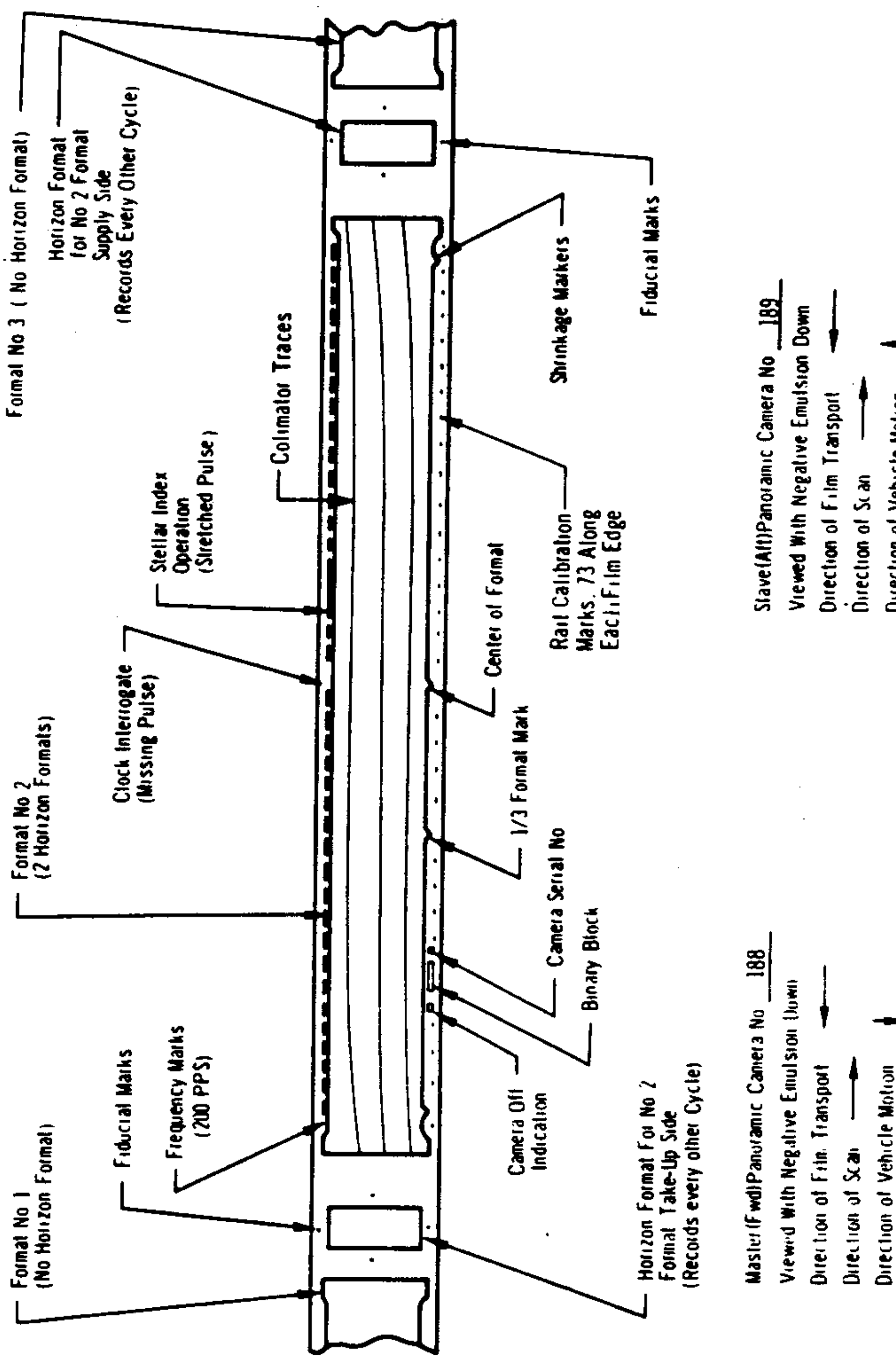
1. Cameras	Fwd Camera	Fwd Take-Up Horizon	Fwd Supply Horizon	Aft Camera	Aft Take-Up Horizon	Aft Supply Horizon	Mission 103[illegible]-1 Stellar	Mission 103[illegible]-1 Index	Mission 103[illegible]-2 Stellar	Mission 103[illegible]-2 Index
Camera Number	1[illegible]	NA	NA	1[illegible]9	NA	NA	D9[illegible]/112/113		D96/104/11[illegible]	
Reseau Number	NA	NA	NA	NA	NA	NA	113	112	116	104
Lens Serial Number	20[illegible]4[illegible]	12[illegible]93	129[illegible]	212243[illegible]	12[illegible]	12[illegible]3[illegible]	113[illegible]	82[illegible]1[illegible]4	10721	81[illegible].97
Slit Width (in)	0.[illegible]	NA	NA	[illegible].17[illegible]	NA	NA	NA	NA	NA	NA
Aperture	3.[illegible]	[illegible].0	[illegible].3	3.[illegible]	[illegible].3	[illegible].0	1.8	4.[illegible]	1.8	4.[illegible]
Exposure Time Sec	1/25[illegible] avg	1/1[illegible]	1/1[illegible]	1/34[illegible] avg	1/1[illegible]	1/1[illegible]	1 sec	.05 sec	1 sec	.0[illegible] sec
Filter (Wratten)	23A	25	25	21	[illegible]	[illegible]	None	21	None	21
Focal Length (mm)	60[illegible].60[illegible]	[illegible].[illegible]	[illegible]4.[illegible]	60[illegible].602	[illegible].[illegible]	[illegible]4.[illegible]	83.84	38.3	[illegible]4.02	38.32
Film Length (ft)	16,[illegible]00	NA	NA	16,00[illegible]	NA	NA	75	13[illegible]	7[illegible]	13[illegible]
Splices	3	NA	NA	3	NA	NA	None	None	None	None
Emulsion	2[illegible]4-[illegible]4-5-[illegible]	2[illegible]4-[illegible]4-5-6	2[illegible]4-[illegible]4-[illegible]-6	2[illegible]4-[illegible]4-5-6	2[illegible]4-[illegible]4-[illegible]-6	2[illegible]4-[illegible]4-[illegible]-6	151-4[illegible]-4-[illegible]	113-2-4-6	1[illegible]1-43-4-[illegible]	113-2-4-6
Film Type	3404	34[illegible]4	3404	3404	34[illegible]4	3404	3401	34[illegible]	3401	340[illegible]
Resolution Data (L/mm)										
Static										
High Contrast	26[illegible]	[illegible]	2[illegible]9	2[illegible]1	2[illegible]	2[illegible]9	*	72 AWAR	*	71 AWAR
Low Contrast	157	*	*	1[illegible]3	*	*	*	*	*	*
Dynamic										
I High Contrast	1[illegible]1	*	*	171	*	*	*	*	*	*
I Low Contrast	121	*	*	11[illegible]	*	*	*	*	*	*
F High Contrast	1[illegible]	*	*	174	*	*	*	*	*	*
F Low Contrast	117	*	*	11[illegible]	*	*	*	*	*	*

NA - Not Applicable.
* - Not Measured.

2. VEHICLE CONFIGURATION AND EQUIPMENT LAYOUT



3. PANORAMIC FORMAT CONFIGURATION



[redacted]

APPENDIX B. DENSITY READINGS

The following density readings were taken using a Macbeth Quantalog Densitometer, Model EP 1000, with an ET 20 attachment and a 0.5 mm aperture. All values include gross fog. The frames selected for this analysis are the first and last of each pass. The density values are presented here in the interest of further analysis.

STELLAR CAMERA MISSION 1035-1

Pass	Frame	Dmax	Dmin	Delta	Gross Fog
1D	1	0.92	0.22	0.70	0.19
	2	0.99	0.23	0.76	0.20
3D	3	0.90	0.22	0.68	0.20
	5	0.95	0.21	0.74	0.19
4D	6	0.72	0.22	0.50	0.19
	10	0.54	0.18	0.36	0.17
5D	11	0.82	0.19	0.63	0.17
	21	1.00	0.21	0.79	0.17
6D	22	0.82	0.20	0.62	0.19
	39	0.84	0.19	0.65	0.17
7D	40	0.62	0.19	0.43	0.18
	55	1.04	0.21	0.83	0.17
A08E	56	NR	NR	NR	0.17
	57	NR	NR	NR	0.18
8D	58	1.10	0.22	0.88	0.21
	64	0.79	0.20	0.59	0.17
9D	65	0.82	0.29	0.53	0.16
	88	0.96	0.22	0.74	0.17
14D	89	0.62	0.21	0.41	0.18
	90	0.64	0.18	0.46	0.17
16D	91	0.70	0.20	0.50	0.16
	93	0.72	0.18	0.54	0.15
19D	94	0.89	0.20	0.69	0.15
	96	0.84	0.21	0.63	0.16
21D	97	0.81	0.18	0.63	0.15
	117	1.21	0.23	0.98	0.17
22D	118	0.60	0.18	0.42	0.17
	134	0.94	0.20	0.74	0.17
23D	135	0.84	0.21	0.63	0.18
	146	0.98	0.21	0.77	[illegible]
25D	147	0.86	0.20	0.66	[illegible]
	160	0.93	0.21	0.72	0.18
27D	161	0.96	0.22	0.74	[illegible]
	165	0.98	0.22	0.76	0.18
30D	166	1.19	0.24	0.95	[illegible]
	170	1.04	0.24	0.80	0.19
31D	171	1.12	0.23	0.89	0.20
	176	0.83	0.21	0.62	0.19
32D	177	0.80	0.20	0.60	0.18
	179	0.74	0.20	0.54	0.18
36D	180	0.99	0.20	0.73	0.17
	186	0.77	0.29	0.48	[illegible]

Pass	Frame	Dmax	Dmin	Delta	Gross Fog
37D	199	0.74	0.19	0.55	0.17
	229	0.96	0.21	0.75	0.17
38D	230	0.82	0.20	0.62	0.17
	233	0.72	0.19	0.53	0.18
39D	234	0.80	0.21	0.59	0.17
	243	1.18	0.23	0.95	0.16
40D	244	0.92	0.22	0.70	0.16
	251	0.90	0.22	0.68	0.19
41D	252	0.98	0.22	0.76	0.18
	258	0.89	0.22	0.67	0.18
45D	259	0.62	0.19	0.43	0.17
	261	0.61	0.21	0.40	0.18
46D	262	0.74	0.23	0.51	0.18
	266	0.72	0.22	0.50	0.18
47D	267	0.93	0.22	0.71	0.18
	272	0.92	0.21	0.71	0.18
52D	273	0.72	0.20	0.52	0.18
	290	0.82	0.19	0.63	0.18
53D	291	0.62	0.20	0.42	0.18
	321	0.74	0.20	0.54	0.17
54D	322	0.78	0.19	0.59	0.17
	333	1.01	0.22	0.79	0.17
55D	334	0.80	0.19	0.61	0.17
	343	0.94	0.21	0.73	0.16
56D	344	1.02	0.20	0.82	0.16
	349	1.00	0.21	0.79	0.18
57D	350	0.94	0.22	0.72	0.18
	352	0.96	0.22	0.74	0.18
58D	353	0.99	0.20	0.79	0.18
	358	0.94	0.22	0.72	0.18
59D	359	0.82	0.22	0.60	0.18
	360	0.76	0.21	0.55	0.18
60D	361	1.08	0.22	0.86	[illegible]
	366	0.85	0.22	0.63	[illegible]
63D	367	0.93	0.23	0.70	[illegible]
	368	0.98	0.22	0.76	[illegible]
67D	369	0.90	0.21	0.69	0.18
	371	1.04	0.22	0.82	[illegible]
68D	372	1.01	0.20	0.81	0.18
	384	1.06	0.23	0.83	[illegible]
69D	385	0.84	0.21	0.63	0.16
	412	0.93	0.20	0.73	0.16
70D	413	0.91	0.19	0.72	0.16
	435	0.92	0.22	0.70	[illegible]

INDEX CAMERA MISSION 1035-1

Pass	Limiting				Gross Fog	Terrain		
	Frame	Dmax	Dmin	Delta		Dmax	Dmin	Delta
1D	1	1.58	0.29	1.29	0.07	NR	NR	-
	2	1.75	0.40	1.35	0.08	NR	NR	-
3D	3	1.62	0.39	1.23	0.08	NR	NR	-
	5	1.73	0.28	1.45	0.08	NR	NR	-
4D	6	1.75	0.19	1.56	0.08	0.72	[illegible]	.23
	10	1.21	0.15	1.06	0.08	0.98	0.25	0.73
5D	11	1.58	0.25	1.33	0.09	0.75	0.25	0.50
	21	1.18	0.22	0.96	0.10	0.84	0.22	0.62
6D	22	1.31	0.26	1.55	0.10	0.58	0.26	0.32
	39	1.40	0.70	0.70	0.10	1.40	0.70	0.70
7D	40	0.69	0.30	0.39	0.10	0.69	0.30	0.39
	55	2.08	0.22	1.86	0.08	1.12	0.52	0.60
A08E	56	NR	NR	-	0.08	NR	NR	-
	57	NR	NR	-	0.08	NR	NR	-
8D	58	1.91	0.56	1.35	0.08	NR	NR	-
	64	1.55	0.52	1.03	0.08	1.31	0.52	0.79
9D	65	1.58	0.22	1.36	0.08	NR	NR	-
	88	1.86	0.33	1.53	0.08	1.63	0.33	1.30
14D	89	1.18	0.32	0.86	0.08	1.18	0.32	0.86
	90	1.40	0.14	1.26	0.08	1.40	0.50	0.90
16D	91	1.90	0.30	1.60	0.08	NR	NR	-
	93	1.95	0.22	1.73	0.07	NR	NR	-
19D	94	1.52	0.16	1.36	[illegible]	NR	NR	-
	96	1.72	0.15	1.57	[illegible]	NR	NR	-
21D	97	1.72	0.35	1.37	0.08	0.70	0.35	0.35
	117	2.12	0.40	1.72	0.08	0.94	0.62	0.32
22D	118	1.10	0.25	0.85	0.08	0.57	0.25	0.32
	134	2.09	0.55	1.54	0.07	2.09	0.72	1.37
23D	135	1.32	0.50	0.82	0.08	1.32	0.50	0.82
	146	1.82	0.42	1.40	0.08	1.35	0.42	0.93
25D	147	1.50	0.55	0.95	0.08	NR	NR	-
	160	1.67	0.52	1.15	0.08	1.67	0.52	[illegible]
27D	161	1.82	0.23	1.59	0.08	1.62	1.28	.34
	165	1.54	0.30	1.24	0.08	1.54	[illegible]	.55
30D	166	2.02	0.40	1.62	0.08	NR	NR	-
	170	2.00	0.36	1.64	0.08	NR	NR	-
31D	171	2.10	0.34	1.76	0.08	1.00	0.30	[illegible]
	176	1.42	0.21	1.21	0.08	1.42	0.21	1.21
32D	177	1.20	0.35	0.85	0.08	NR	NR	-
	179	1.42	0.17	1.25	0.08	0.62	0.17	0.45

		Limiting				Terrain		
Pass	Frame	Dmax	Dmin	Delta	Gross Fog	Dmax	Dmin	Delta
36D	180	1.57	0.32	1.25	0.08	0.62	0.32	0.30
	198	1.98	0.68	1.30	0.08	1.60	0.68	0.92
37D	199	0.70	0.25	0.45	0.08	0.70	0.25	0.45
	229	1.58	0.16	1.42	0.08	NR	NR	-
38D	230	1.30	0.17	1.13	0.08	0.42	0.17	0.25
	233	1.55	0.24	1.31	0.08	0.95	0.24	0.71
39D	234	1.42	0.40	1.02	0.08	1.42	0.40	1.02
	243	1.72	0.39	1.33	0.08	1.31	0.39	0.92
40D	244	1.52	0.60	0.92	0.08	1.52	0.60	0.92
	251	1.71	0.82	0.89	0.08	NR	NR	-
41D	252	1.75	0.24	1.51	0.08	0.91	0.31	0.60
	258	1.71	0.29	1.42	0.08	1.10	0.40	0.60
45D	259	1.32	0.32	1.00	0.07	0.98	0.32	0.66
	261	1.96	0.31	1.65	0.07	1.04	0.31	0.73
46D	262	0.80	0.18	0.62	0.07	0.80	0.18	0.62
	266	0.78	0.23	0.55	0.08	0.78	0.23	0.55
47D	267	2.12	0.31	1.81	0.08	1.06	0.32	0.74
	272	1.32	0.52	0.80	0.07	1.32	0.52	0.80
52D	273	1.46	0.28	1.18	0.07	1.18	0.28	0.90
	290	1.46	0.74	0.72	0.07	1.46	0.74	0.72
53D	291	1.10	0.30	0.80	0.08	0.68	0.30	0.38
	321	1.62	0.26	1.36	0.08	0.92	0.34	0.58
54D	322	1.49	0.52	0.97	0.08	1.49	0.52	0.97
	333	2.00	0.34	1.66	0.07	2.00	0.34	1.66
55D	334	1.74	0.50	1.24	0.07	1.74	0.50	1.24
	343	1.42	0.61	0.81	0.07	1.42	0.61	0.81
56D	344	1.64	0.99	0.65	0.07	NR	NR	-
	349	1.60	0.68	0.92	0.08	1.36	0.68	0.68
57D	350	1.64	0.52	1.12	0.08	0.70	0.52	0.18
	352	1.97	0.30	1.67	0.08	1.01	0.44	0.57
58D	353	1.78	1.14	0.64	0.08	NR	NR	-
	358	1.58	0.82	0.76	0.08	NR	NR	-
59D	359	1.79	0.38	1.41	0.08	1.42	0.38	[illegible]
	360	1.60	0.17	1.43	0.08	1.60	0.48	1.12
60D	361	1.65	0.61	1.04	0.08	0.92	0.61	0.31
	366	1.10	0.44	0.66	0.08	1.10	0.44	0.66
63D	367	1.44	0.38	1.06	0.08	[illegible]	0.38	1.06
	368	1.20	0.38	0.82	0.07	1.20	0.38	0.82
67D	369	1.40	0.36	1.04	0.08	NR	NR	-
	371	1.98	0.78	1.20	0.08	NR	NR	-
68D	372	1.72	0.38	1.34	0.08	NR	NR	-
	384	1.42	0.38	1.04	0.08	0.81	0.42	[illegible]
69D	385	1.50	0.22	1.28	0.08	0.62	0.22	0.40
	412	2.14	0.30	1.84	0.08	0.94	0.41	0.53
70D	413	1.22	0.31	0.91	0.07	0.74	0.31	0.43
	435	1.52	0.20	1.32	0.08	1.52	0.20	1.32

Mission 1035-1

Average Terrain Dmax	1.13
Average Limiting Dmax	1.58
Average Terrain Dmin	0.42
Average Limiting Dmin	0.38
Terrain Dmax Range	0.42 - 2.09
Limiting Dmax Range	0.69 - 2.14
Terrain Dmin Range	0.17 - 1.28
Limiting Dmin Range	0.14 - 1.14
Average Gross Fog	0.08

STELLAR CAMERA MISSION 1035-2

Pass	Frame	Dmax	Dmin	Delta	Gross Fog
76D	1	1.14	0.36	0.78	0.23
	10	1.52	0.37	1.15	0.30
77D	11	1.30	0.42	0.88	0.28
	19	1.03	0.44	0.59	0.30
79D	20	1.04	0.44	0.60	0.32
	21	1.18	0.40	0.78	0.32
81D	22	1.78	0.49	1.29	0.30
83D	23	1.20	0.42	0.78	0.29
	28	1.08	0.40	0.68	0.30
84D	29	1.26	0.42	0.84	0.32
	35	1.97	0.44	1.53	0.34
86D	36	2.04	0.44	1.60	0.30
	45	1.92	0.50	1.42	0.30
87D	46	1.50	0.44	1.06	0.29
	49	1.68	0.48	1.20	0.34
88D	50	1.74	0.38	1.66	0.30
	58	1.45	0.38	1.07	0.32
92D	59	1.12	0.40	0.72	0.30
	62	1.26	0.40	0.86	0.30
94D	63	1.30	0.38	0.92	0.32
	70	1.55	0.43	1.12	0.29
95D	71	1.48	0.42	1.06	0.30
	72	1.44	0.47	0.97	0.32
99D	73	1.46	0.34	1.12	0.30
	76	1.58	0.40	1.18	0.30
100D	77	1.16	0.40	0.76	0.30
	97	1.19	0.39	0.80	0.29
101D	98	1.34	0.39	0.95	0.28
	102	1.45	0.35	1.10	0.28
102D	103	1.36	0.36	1.00	0.28
	111	1.48	0.38	1.10	0.28
103D	112	1.50	0.42	1.08	0.26
	120	1.62	0.42	1.20	0.28
104D	121	1.01	0.34	0.67	0.26
	133	1.22	0.32	0.90	0.23
105D	134	1.50	0.40	1.10	0.24
	138	1.20	0.42	0.78	0.26
107D	139	1.50	0.38	1.12	0.27
	142	1.60	0.44	1.16	0.27
108D	143	1.41	0.40	1.01	0.28
	155	1.29	0.37	0.92	0.29

Pass	Frame	Dmax	Dmin	Delta	Gross Fog
109D	156	1.76	0.52	1.24	0.29
	158	1.64	0.54	1.10	0.30
110D	159	1.50	0.56	0.94	0.30
	161	1.41	0.49	0.92	0.29
115D	162	1.38	0.44	0.94	0.30
	173	1.12	0.35	0.77	0.28
116D	174	1.56	0.43	1.13	0.30
	185	1.24	0.37	0.87	0.27
117D	186	1.18	0.38	0.80	0.30
	206	1.78	0.55	1.23	0.28
118D	207	1.42	0.35	1.07	0.28
	220	1.24	0.37	0.87	0.27
119D	221	1.40	0.39	1.01	0.28
	242	1.58	0.32	1.26	0.27
120D	243	1.52	0.42	1.10	0.27
	249	1.56	0.48	1.08	0.27
121D	250	1.48	0.31	1.17	0.28
	256	1.51	0.46	1.05	0.27
122D	257	1.73	0.29	1.44	0.28
	260	1.32	0.32	1.00	0.28
123D	261	1.12	0.30	0.82	0.28
	266	1.52	0.34	1.18	0.29
124D	267	1.38	0.36	1.02	0.28
	273	1.45	0.39	1.06	0.28
126D	274	1.14	0.34	0.80	0.25
	275	1.42	0.36	1.06	0.25
131D	276	1.36	0.37	1.01	0.26
	281	1.22	0.38	0.84	0.27
132D	282	1.10	0.34	0.76	0.27
	288	1.36	0.39	0.97	0.29
133D	289	1.38	0.40	0.98	0.27
	312	1.60	0.47	1.13	0.25
134D	313	1.43	0.36	1.07	0.24
	323	1.12	0.38	0.74	0.25
135D	329	1.54	0.45	1.09	0.28
	349	1.12	0.43	0.69	0.28
136D	350	1.25	0.40	[illegible]	0.27
	358	1.26	0.40	0.86	0.30
137D	359	1.42	0.40	1.02	0.28
	363	1.42	0.40	1.02	0.27
140D	364	1.28	0.37	0.91	0.29
	373	1.32	0.39	0.93	0.25
141D	374	1.36	0.42	0.94	0.30
	375	1.30	0.40	0.90	0.30

INDEX CAMERA MISSION 1035-2

Pass	Frame	Limiting Dmax	Limiting Dmin	Limiting Delta	Gross Fog	Terrain Dmax	Terrain Dmin	Terrain Delta
76D	1	1.80	0.78	1.02	0.12	NR	NR	-
	10	1.74	0.54	1.20	0.14	1.00	0.54	0.46
77D	11	1.92	0.82	1.10	0.14	NR	NR	-
	19	1.96	0.36	1.60	0.11	0.64	0.36	0.25
79D	20	1.70	0.25	1.42	0.13	NR	NR	-
	21	1.32	0.46	0.86	0.13	NR	NR	-
81D	22	1.52	0.38	1.14	0.12	NR	NR	-
83D	23	1.30	0.58	0.72	0.14	1.30	0.58	0.72
	28	1.36	0.35	1.01	0.12	0.50	0.35	0.15
84D	29	1.94	0.38	1.56	0.12	0.50	0.38	0.12
	35	0.90	0.38	0.52	0.11	0.90	0.38	0.52
86D	36	1.42	0.31	1.11	0.10	NR	NR	-
	45	1.78	0.46	1.32	0.14	1.78	0.46	1.32
87D	46	1.44	0.50	0.94	0.14	1.44	0.50	0.94
	49	1.76	0.32	1.44	0.14	1.60	0.70	0.90
88D	50	1.72	0.60	1.12	0.13	1.34	0.60	0.74
	58	1.30	0.38	0.92	0.14	1.30	0.38	0.92
92D	59	2.10	0.62	1.48	0.14	1.06	0.62	0.44
	62	1.98	0.74	1.24	0.13	0.90	0.74	0.16
94D	63	1.20	0.43	0.77	0.13	1.20	0.43	0.77
	70	1.13	0.23	0.90	0.14	0.92	0.23	0.69
95D	71	1.03	0.34	0.69	0.14	NR	NR	-
	72	1.72	0.26	1.46	0.14	NR	NR	-
99D	73	2.12	0.62	1.50	0.15	1.22	0.62	0.60
	76	1.76	0.68	1.08	0.14	[illegible]	[illegible]	0.16
100D	77	1.18	0.24	0.94	0.14	1.18	0.24	0.94
	97	1.96	0.35	1.61	0.13	[illegible]	0.35	0.55
101D	98	1.68	0.43	1.25	0.15	NR	NR	-
	102	1.60	0.42	1.18	0.15	1.08	0.42	0.66
102D	103	1.38	0.23	1.15	0.13	1.38	0.23	1.15
	111	1.42	0.36	1.06	0.12	1.42	0.36	1.06
103D	112	1.70	0.50	1.20	0.12	1.70	0.50	1.20
	120	1.92	0.30	1.62	0.13	NR	NR	-
104D	121	1.91	0.76	1.15	0.12	0.85	0.76	0.09
	133	1.08	0.50	0.58	0.13	1.08	0.50	0.58
105D	134	2.00	0.76	1.24	0.12	1.56	0.76	0.80
	138	1.52	0.84	0.79	0.12	1.52	0.84	0.79
107D	139	1.30	0.35	0.95	0.12	1.30	0.35	[illegible]
	142	1.40	0.18	1.22	0.12	NR	NR	-

		Limiting				Terrain		
Pass	Frame	Dmax	Dmin	Delta	Gross Fog	Dmax	Dmin.	Delta
108D	143	1.68	0.34	1.34	0.12	NR	NR	-
	155	0.90	0.52	0.38	0.12	0.90	0.52	0.38
109D	156	1.94	0.48	1.46	0.13	NR	NR	-
	158	1.92	0.46	1.46	0.12	NR	NR	-
110D	159	2.06	0.72	1.34	0.12	NR	NR	-
	161	1.75	0.66	1.09	0.12	1.40	0.66	0.74
115D	162	1.48	0.34	1.14	0.11	NR	NR	-
	173	1.16	0.39	0.77	0.18	1.16	0.39	0.77
116D	174	1.38	0.44	0.94	0.17	NR	NR	-
	185	1.76	0.40	1.36	0.15	NR	NR	-
117D	186	1.10	0.24	0.86	0.15	1.10	0.24	0.86
	206	1.76	0.32	1.44	0.15	NR	NR	-
118D	207	1.12	0.30	0.82	0.18	NR	NR	-
	220	1.06	0.40	0.66	0.15	1.06	0.40	0.66
119D	221	1.82	0.52	1.30	0.17	1.78	0.52	1.26
	242	1.63	0.36	1.27	0.15	1.22	0.36	0.86
120D	243	1.74	0.30	1.44	0.13	NR	NR	-
	249	1.82	0.30	1.52	0.13	0.84	0.30	0.54
121D	250	1.55	0.62	0.93	0.13	1.55	0.62	0.93
	256	1.44	0.86	0.58	0.12	NR	NR	-
122D	257	0.52	0.16	0.36	0.12	0.52	0.16	0.36
	260	0.92	0.26	0.66	0.12	0.92	0.26	0.66
123D	261	0.92	0.20	0.72	0.13	0.92	0.20	0.72
	266	1.06	0.28	0.78	0.13	1.06	0.28	0.78
124D	267	1.68	0.50	1.16	0.12	NR	NR	-
	273	1.42	0.36	1.06	0.13	1.04	0.36	0.68
126D	274	1.82	0.36	1.46	0.14	1.04	0.36	0.68
	275	1.62	0.34	1.28	0.13	0.98	0.34	0.64
131D	276	1.12	0.20	0.92	0.12	1.12	0.20	0.92
	281	0.75	0.20	0.55	0.13	0.75	0.20	0.55
132D	282	1.64	0.30	1.34	0.13	0.90	0.30	0.60
	288	1.86	0.38	1.48	0.13	NR	NR	-
133D	289	1.46	0.27	1.19	0.13	NR	NR	-
	312	1.94	0.30	1.64	0.13	0.96	0.30	0.66
134D	313	1.12	0.24	0.88	0.13	NR	NR	-
	328	1.14	0.21	0.93	0.12	1.14	0.21	0.93
135D	329	1.40	0.26	1.14	0.14	1.14	0.26	0.88
	349	1.86	0.22	1.64	0.12	1.34	0.22	1.12
136D	350	1.80	0.23	1.57	0.13	0.66	0.23	0.43
	358	1.06	0.46	0.60	0.14	1.06	0.46	0.60
137D	359	1.50	0.52	0.98	0.15	1.23	0.52	0.71
	363	1.94	0.46	1.48	0.14	NR	NR	-

Pass	Frame	Limiting Dmax	Limiting Dmin	Limiting Delta	Gross Fog	Terrain Dmax	Terrain Dmin	Terrain Delta
140D	364	1.72	0.34	1.38	0.14	1.03	0.34	0.79
	373	1.40	0.60	0.80	0.12	NR	NR	-
141D	374	1.74	0.32	1.42	0.15	1.74	0.32	1.42
	375	1.52	0.27	1.25	0.15	0.83	0.27	0.56
142D	376	1.56	0.39	1.17	0.14	1.10	0.39	1.17
	378	1.84	0.52	1.32	0.13	1.50	0.52	0.98
147D	379	1.38	0.22	1.16	0.15	0.82	0.22	0.60
	385	1.04	0.23	0.81	0.15	1.04	0.23	0.81
148D	386	1.06	0.20	0.86	0.14	0.53	0.20	0.33
	406	1.52	0.31	1.21	0.14	1.06	0.31	0.75
149D	407	1.82	0.50	1.32	0.13	NR	NR	-
	416	1.08	0.31	0.77	0.13	1.08	0.31	0.77
150D	417	1.11	0.26	0.85	0.13	1.11	0.26	0.85
	426	1.20	0.51	0.69	0.13	1.20	0.51	0.69
151D	427	1.42	0.22	1.20	0.13	1.42	0.22	1.20
	456	1.59	0.23	1.36	0.13	0.90	0.23	0.67
152D	457	1.68	0.36	1.32	0.14	1.13	0.36	0.77
	473	2.03	0.54	1.49	0.15	1.32	0.54	0.78
158D	474	1.80	0.32	1.48	0.15	1.20	0.32	0.88
	475	1.68	0.20	1.48	0.15	0.88	0.20	0.68

Mission 1035-2

Average Terrain Dmax	1.11
Average Limiting Dmax	1.53
Average Terrain Dmin	0.41
Average Limiting Dmin	0.40
Terrain Dmax Range	0.50 - 1.79
Limiting Dmax Range	0.52 - 2.12
Terrain Dmin Range	0.16 - 0.94
Limiting Dmin Range	0.16 - 0.96
Average Gross Fog	0.13

APPENDIX C. PAN GEOMETRY

1. Introduction

1. Mission 1035 is the first "J" system flown with the Pan Geometry modification. This modification consists of 73 holes in each platen rail which are illuminated by lights on the scan head as the photograph is being taken. The holes are about 25 microns in diameter, spaced at one centimeter intervals, approximately 1/8th inch from the edge of the film. There is also a collimator mounted on the main lens. This collimator provides 3 traces, 25 to 50 microns wide, along the major axis of the film defining the IMC "S"-shaped curve. The Pan Geometry modification is designed to provide geometric calibration of the panoramic cameras.

2. Holey Rail Dots (Operation)

Of the 73 programmed dots along each format edge of both panoramic cameras, one dot on each edge of the master camera material cannot be detected. Counting from the take up end of each frame, the 40th dot along the camera number edge and the 11th dot along the time track edge were not recorded throughout the mission. During the mission, 13 additional rail hole images were lost. On the slave panoramic camera material, all the dots on both edges are recorded at the beginning of the mission. A total of 3 dots was missing at the end of the mission. The loss of the rail hole images was correlated to the passage of manufacturing splices which apparently dislodged micro particles of emulsion from the rail surface, filling the rail holes. The build-up of emulsion particles on the film guide rails should be greatly reduced with the use of polished rails. This new innovation will be initiated on the next "J" system and will be used on all subsequent "J" system missions.

The holey rail light source causes 4 fogged areas in the borders at the beginning and end of each frame throughout the mission. These fogged areas extend from the format to the edges of the film and are approximately 0.75 inch long. They do not enter the main camera format or the horizon camera areas.

Cross frame titling was necessary on this mission because of the holey rail images in the film borders.

FIGURE 8. Fogged areas at the beginning and end of each frame. Cross frame titling.

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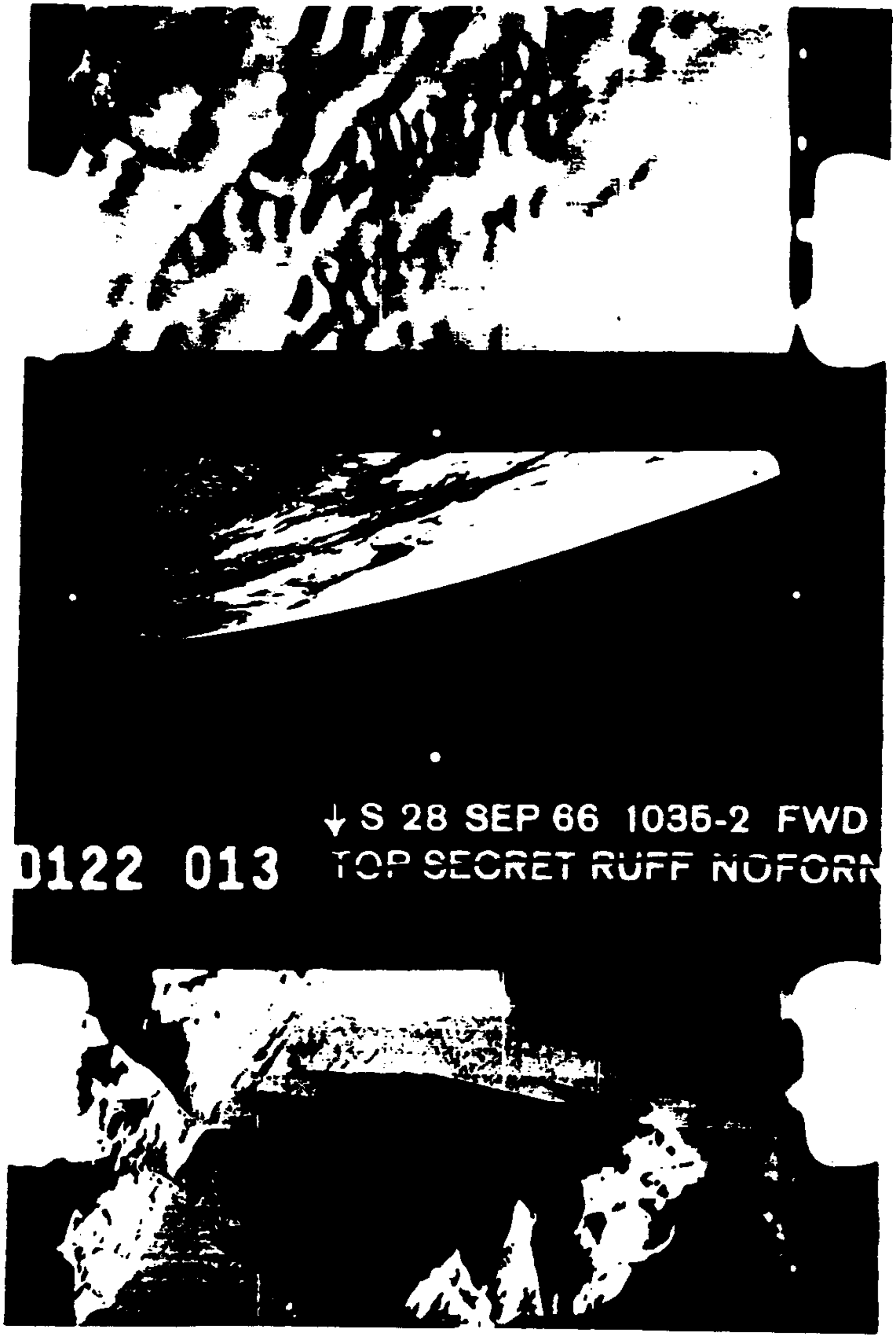

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3. Quality (Original Negative)

In general, the master camera produced consistently better quality rail hole images than the slave camera. The rail hole images on the camera number edge of the master camera material are generally smaller but of a less circular configuration than those exposed on the time track edge. The slave camera produced generally noncircular, oval images. These images exhibit poorer overall image quality and degraded edge sharpness, compared to the master camera images.

The densities of the rail hole images on the camera number edge of the master camera compare favorably with the densities of the images on the camera number edge of the slave camera. Also, the densities of the rail hole images on the time track edge of the master camera compare with the densities of the images on the time track edge of the slave camera.

4. Isodensitometric and Microdensitometric Traces

Isodensitometric traces were generated by the Joyce-Lobel Double Beam Recording Microdensitometer Mark III CS to objectively illustrate the deviations from "normal" in the images of the "holey rail" dots. Dots were selected from the forward and aft material of frame 10, pass 27D. The 37th through the 41st dots from the take-up end of the frame were traced on both edges of the film.

Graphic 2 is a composite trace of the dots on the forward material. Graphic 3 is a composite trace of the dots on the aft material.

In addition, microdensitometric traces were made over these same dots, utilizing the same instrument as mentioned above, to indicate graphically their relative density above base plus fog. Machine parameters were held constant for both types of traces (isodensitometric and microdensitometric).

Graphics 4, 5, 6, and 7 are the dots traced on the camera number edge and time track edge of the forward material and those on the camera number edge and time track edge of the aft material, respectively.

5. Explanation of Isodensitometry

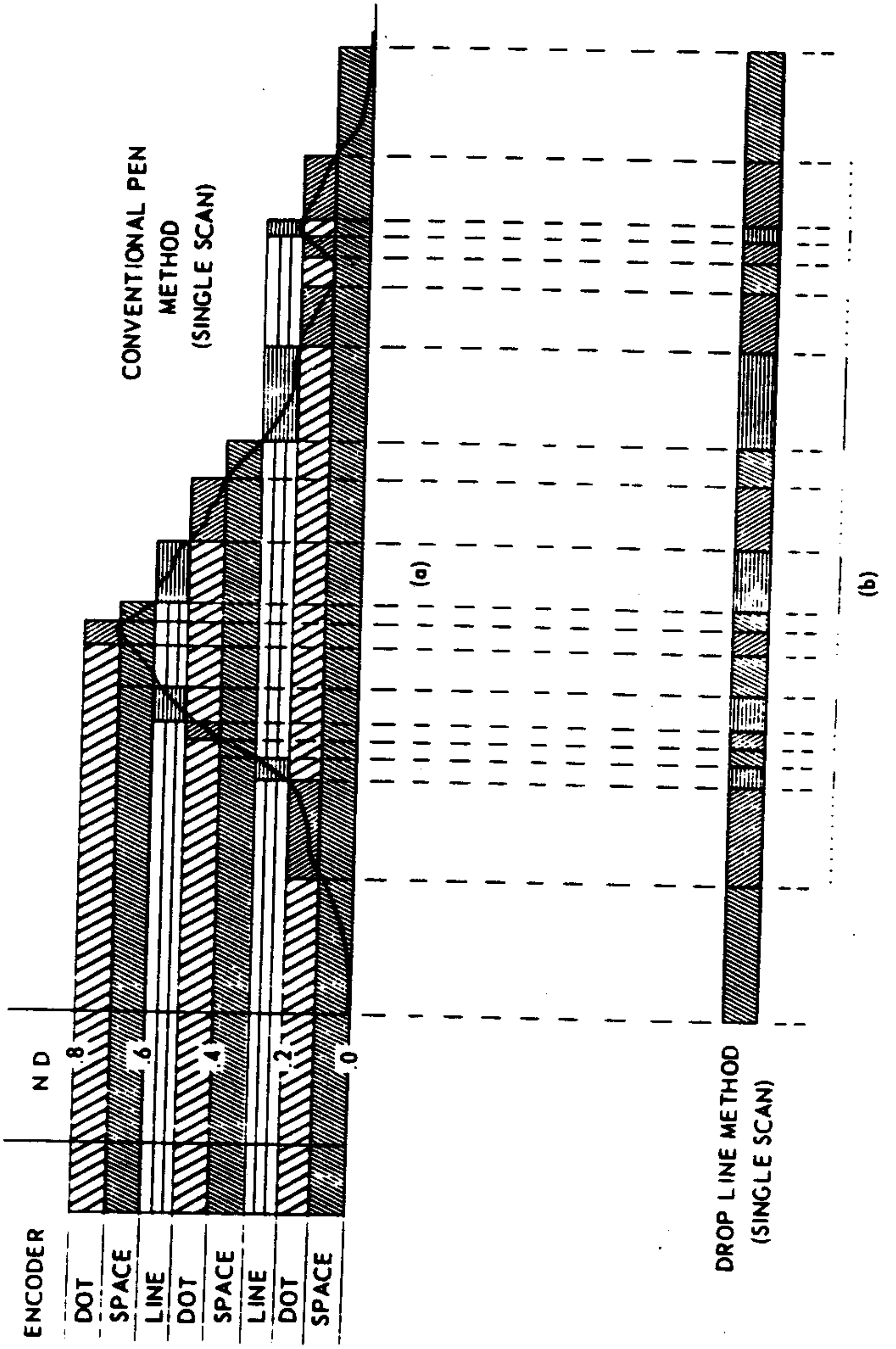
An isodensity trace is a contour map of the subject specimen. Conventional microdensitometers yield a graph of the optical density (pen deflection) versus distance across a single line of the subject. The isodensitracer (IDT), by means of the "dropped line" technique, yields a chart of successive microdensitometric scans across the subject. The code in the recorded lines indicates the amount of density change in known preset increments and also shows whether the density is increasing or decreasing. When density is increasing, the 3-symbol code is printed in the sequence: blank-dot-line-blank-dot-line. When the density is decreasing, the symbol sequence changes to: line-dot-blank-line-dot-blank. Each symbol in the sequence represents a density increment and is continuously plotted until the density in the specimen changes by that increment. Then the next symbol in the sequence is plotted.

When the IDT has completed a scan, the pen lifts from the recording paper and both the specimen table and the recording table return to the starting x position while simultaneously stepping in the y direction. Then the next scan is begun. This sequence is repeated automatically until the instrument has mapped the density of the specimen area. Contours are formed by adjacent-like symbols.

Graphic 1 illustrates how a conventional microdensitometric trace is portrayed as a 3-symbol code line by the IDT. Each successive scan is a code line and is printed parallel to (b).

The information contained in the coded isodensity trace is directly related to the density of the image that is scanned. The trace effectively portrays the density contours of the image at a greatly expanded scale. By this high magnification of the image, small density changes and patterns are made evident but the small image degradations caused by limitations in the photographic system also become evident. Therefore, caution is recommended in establishing whether any minute density gradient in the trace relates directly to a change in the subject reflectivity.

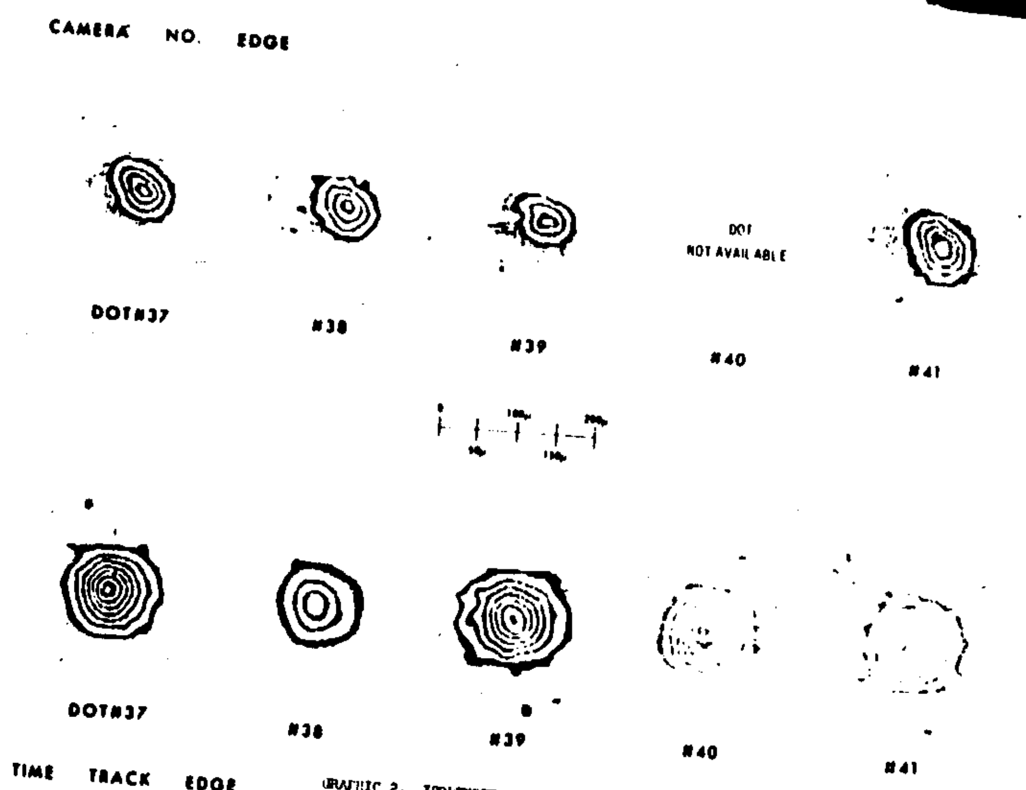
[redacted]



GRAPHIC 1

DESCRIPTION OF ISODENSITOMETRIC CODE.

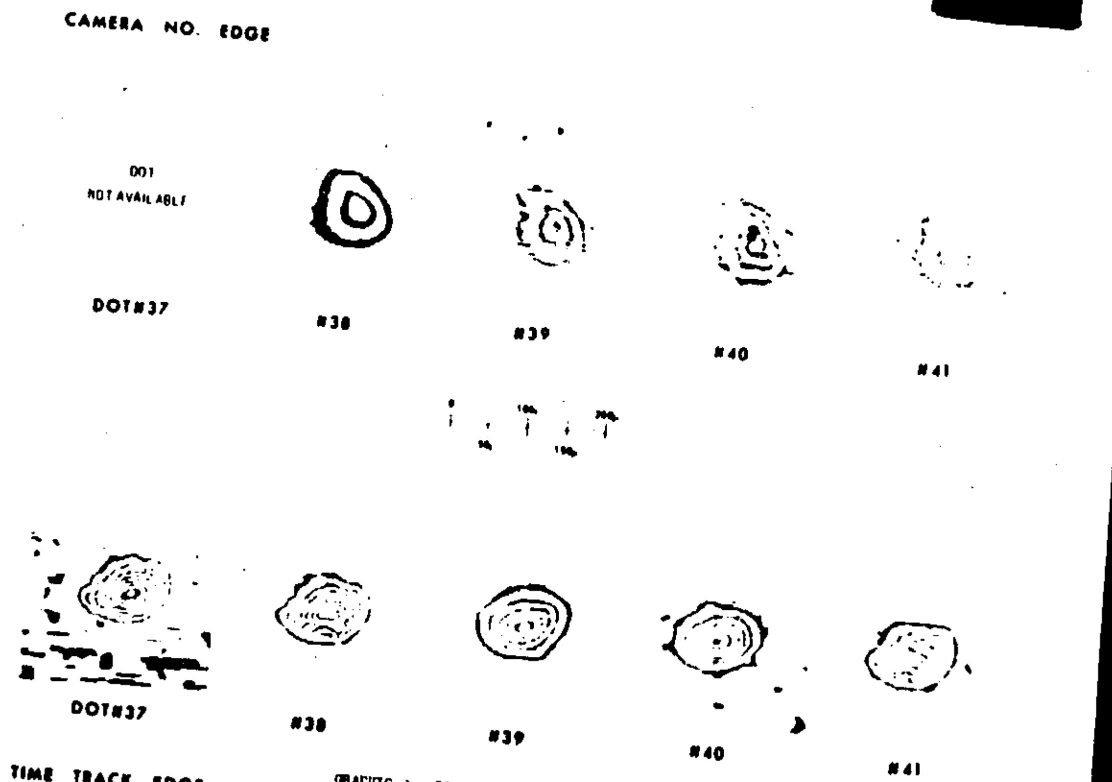
[redacted]



GRAPHIC 2. ISODENSITOMETRIC TRACE OF THE MASTER CAMERA II LEFT RAIL IMAGES

[redacted]

[redacted]

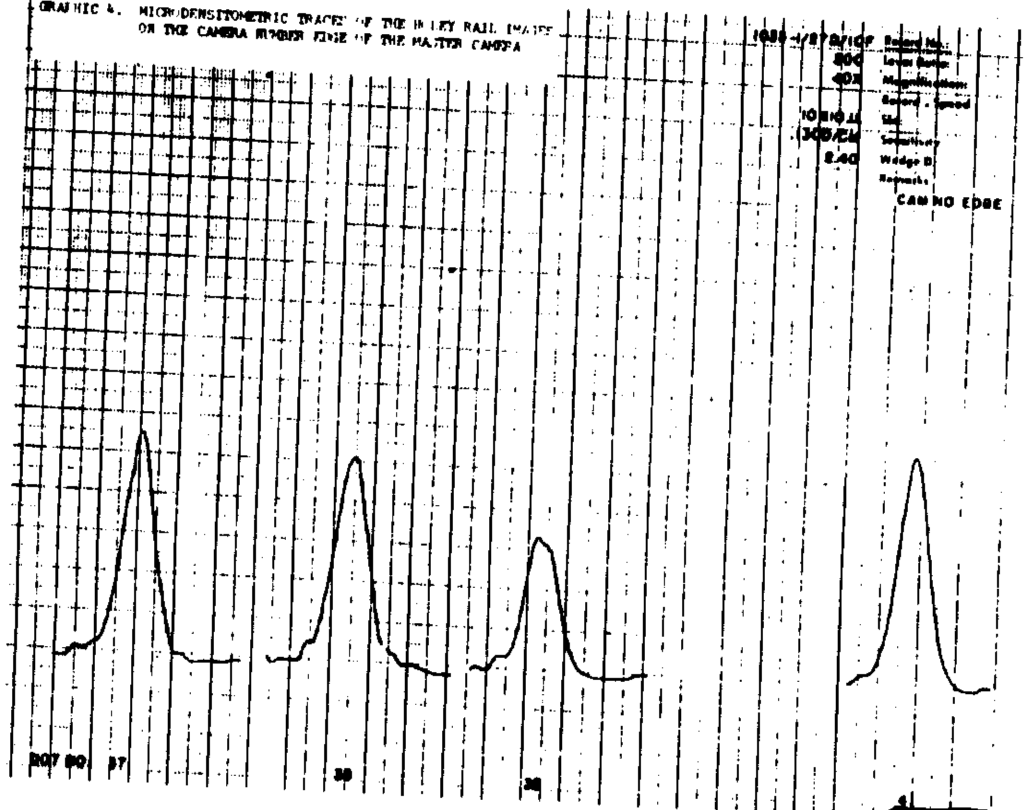


GRAPHIC 3. ISODENSITOMETRIC TRACE OF THE [illegible]AVE CAMERA PELLET RAIL IMAGES

[redacted]

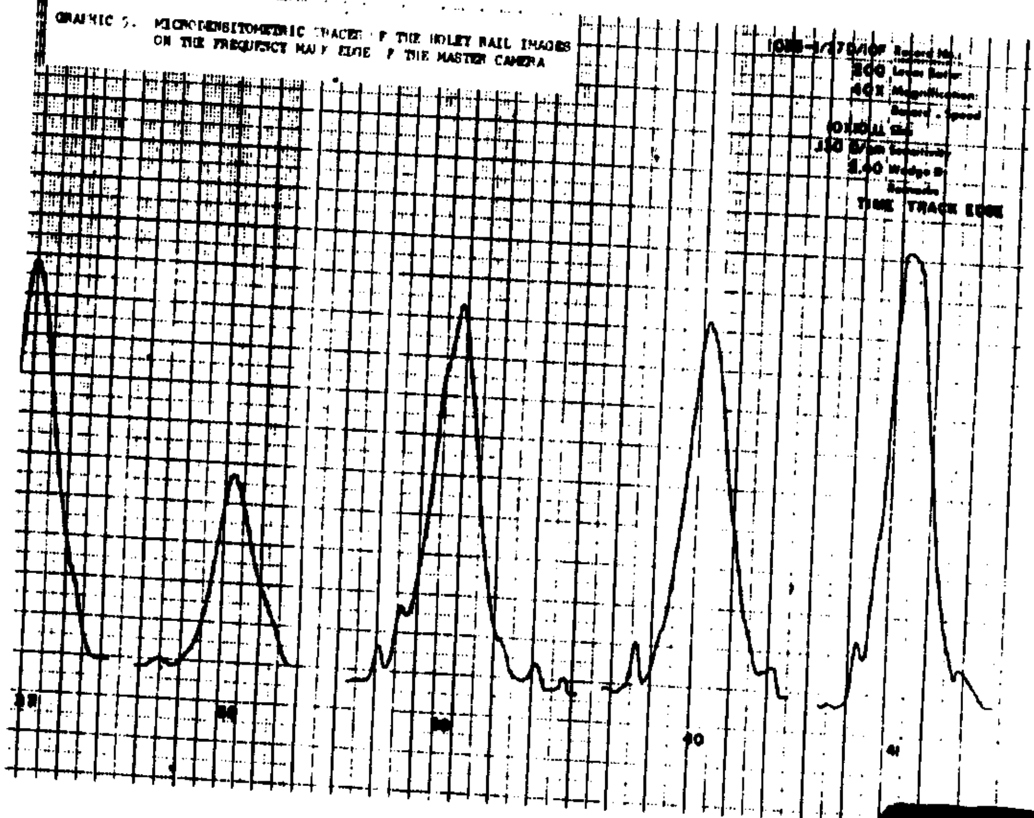
[redacted]

GRAPHIC 4. MICRODENSITOMETRIC TRACES OF THE PULLEY RAIL IMAGES ON THE CAMERA NUMBER EDGE OF THE MASTER CAMERA



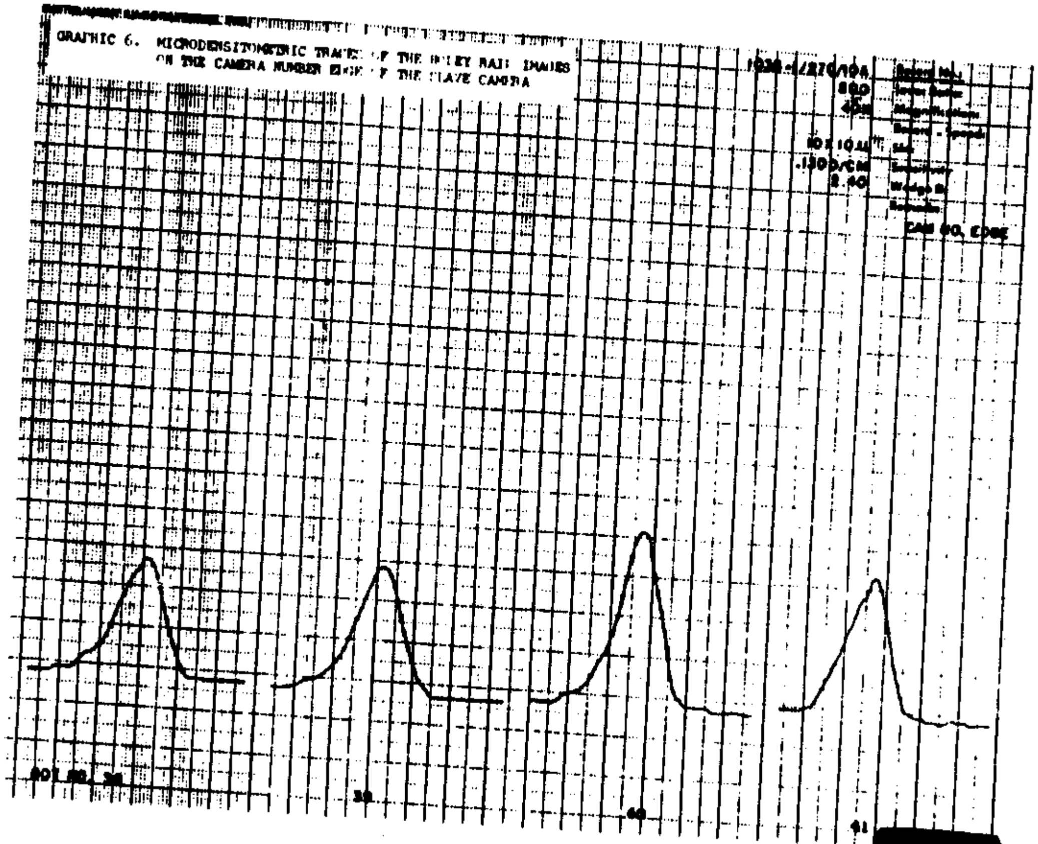
[redacted]

GRAPHIC 5. MICRODENSITOMETRIC TRACES OF THE HOLEY RAIL IMAGES ON THE FREQUENCY MARK EDGE OF THE MASTER CAMERA



[redacted]

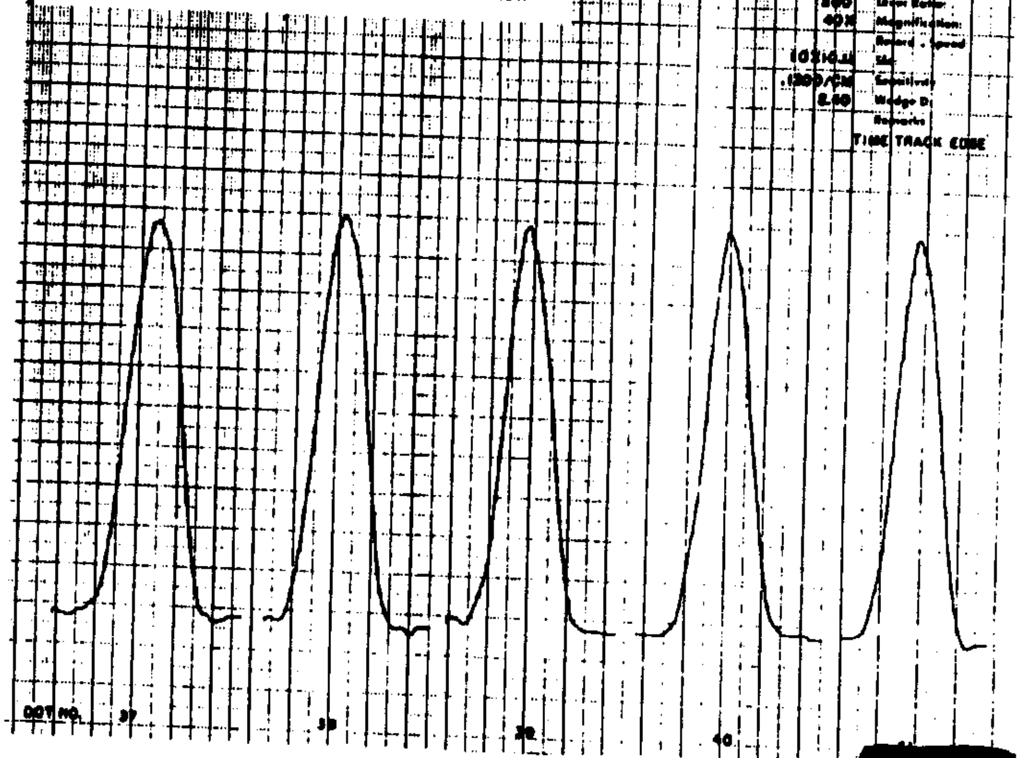
[redacted]



GRAPHIC 6. MICRODENSITOMETRIC TRACE OF THE RULEY RAIL IMAGES ON THE CAMERA NUMBER EDGE OF THE SLAVE CAMERA

[redacted]

GRAPHIC 7. MICRODENSITOMETRIC TRACES OF THE HOLEY RAIL IMAGES ON THE FREQUENCY MARK EDGE OF THE SLAVE CAMERA



[redacted]

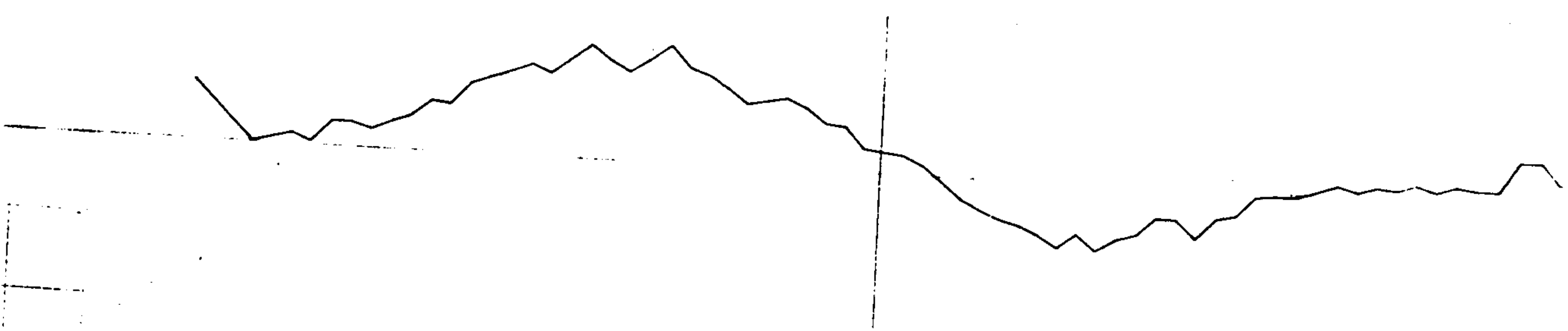
[redacted]

6. <u>Quality (Duplicate Positive)</u>

The size and readability of the rail hole images on the duplicate positive is more variable than on the original negative. The principle cause for this variation in hole image quality is due to the wide range of printing conditions which may occur as a result of optimizing the terrain imagery with no regard to the hole imagery. In addition, any foreign matter introduced in the reproduction process which may result in a minus density pinhole image may create a readability problem.

7. <u>Mensuration (Holey Rail Dots)</u>

A plot of the holey rail dots showing their variation from a straight line was accomplished on a Nistri comparator. Plots were made from the master and slave camera records, using a duplicate positive. The following graphs illustrate this variation.



GRAPHIC [illegible] PLOT OF [illegible] LEY BALL (CAPPA [illegible]), [illegible]
FRAME [illegible]

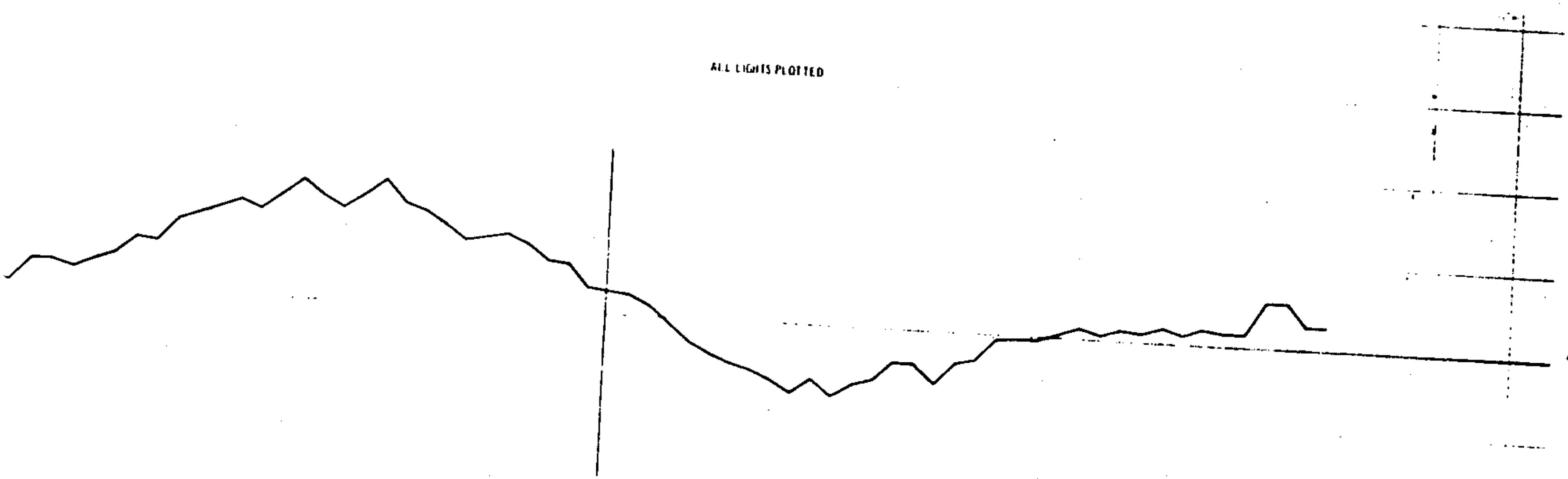
The [illegible]

[redacted]

2 sheets

[redacted]

ALL LIGHTS PLOTTED



[redacted]

[illegible] FLIGHT [illegible] RAIL (CAMERA NUMBER [illegible]), [illegible] CAMERA, [illegible]

The [illegible] straight line [illegible] the [illegible] the [illegible] The coordinates [illegible]

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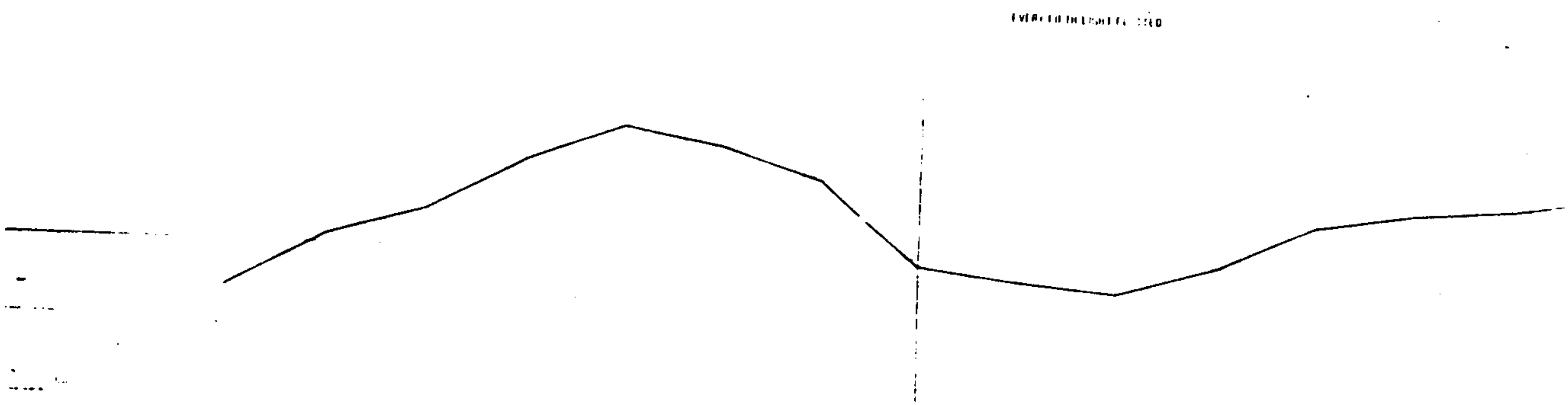
[redacted]

TOP SECRET RUFF

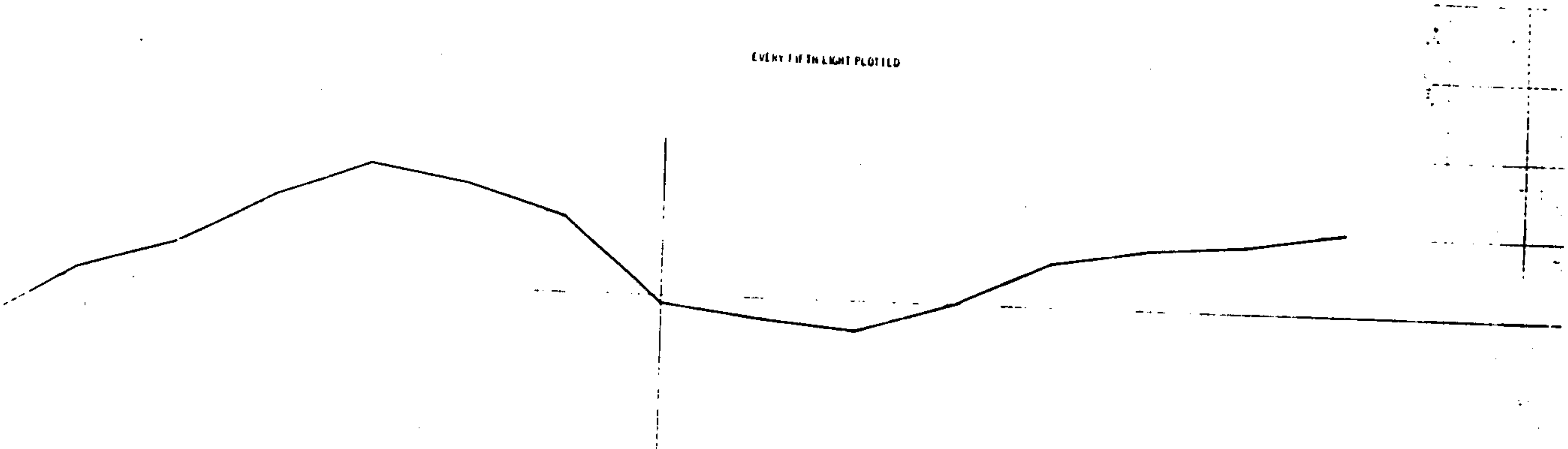


[illegible]

TOP SECRET RUFF

[redacted]

EVERY FIFTH LIGHT PLOTTED

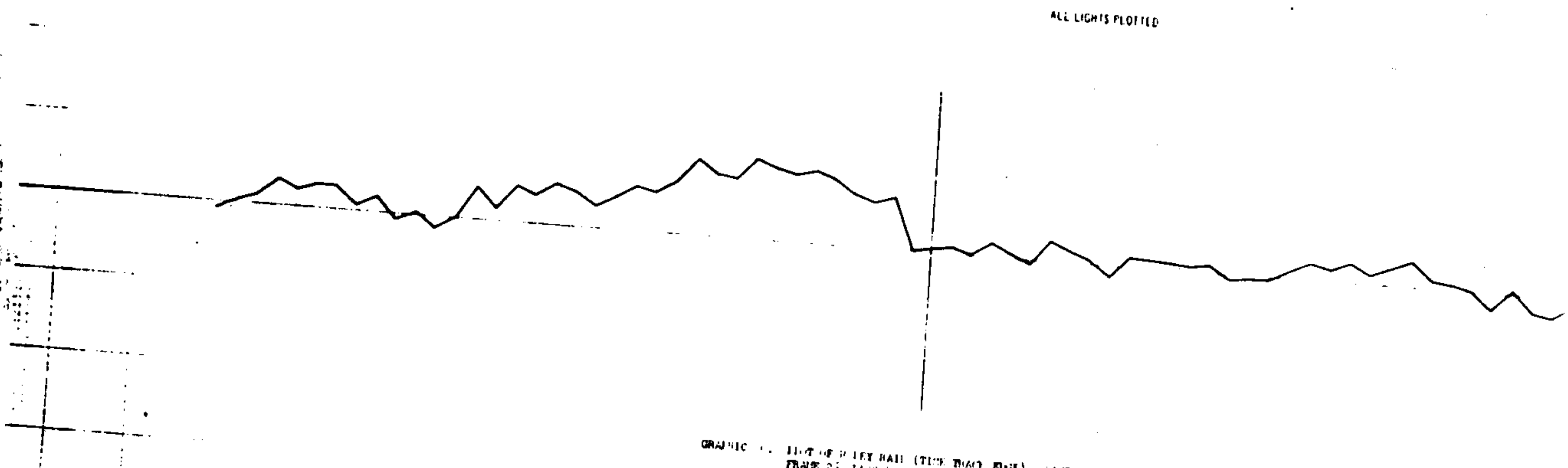


[illegible] (CAMERA [illegible] EDGE), FORWARD CAMERA,
[illegible]

[illegible] straight line approximation of the [illegible] the graph. [illegible] graph, when [illegible] [illegible]

[redacted]

Control System Only

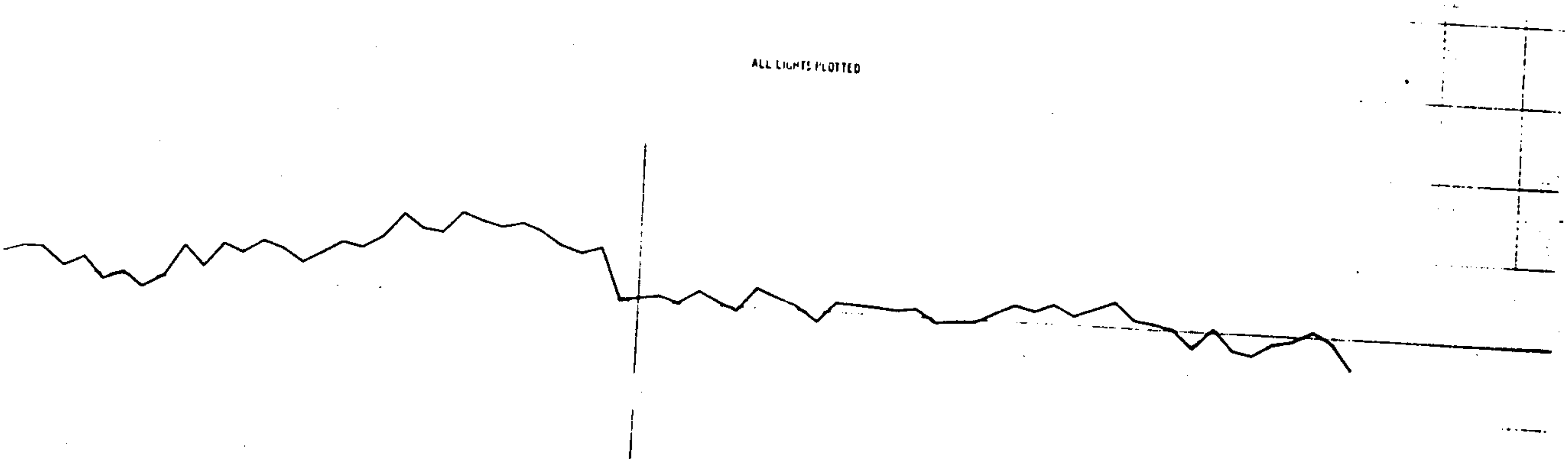


GRAPHIC [illegible] PLOT OF [illegible] (TIME [illegible]), [illegible] CAMERA, FRAME 25, [illegible]

The [illegible] was [illegible] the [illegible] represented by the [illegible] The coordinates of each [illegible] are plotted.

[redacted]

ALL LIGHTS PLOTTED



[illegible] HAII (TIME [illegible]), [illegible] CAMERA, [illegible]

[illegible] are plotted.

[redacted]

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8. Nodal Traces (Operation)

The nodal traces were present on all passes where programmed. The expected decrease in trace width from 40 to 50 microns during ambient testing to approximately 25 microns in flight is apparent. On the master camera material, there were instances where the traces started approximately 6 to 12 inches after the beginning of scan. Instances of complete trace absence for several frames at a time were noted on the material from both main cameras. Also noted on both main camera materials were trace undulations for short periods within a frame. These undulations can be attributed in part to the lens-to-stove interlock and in part to the imbalance of the main lens and collimator assemblies. It should be noted that the validity of the trace as a record of the position of the optical axis is not affected by the undulations.

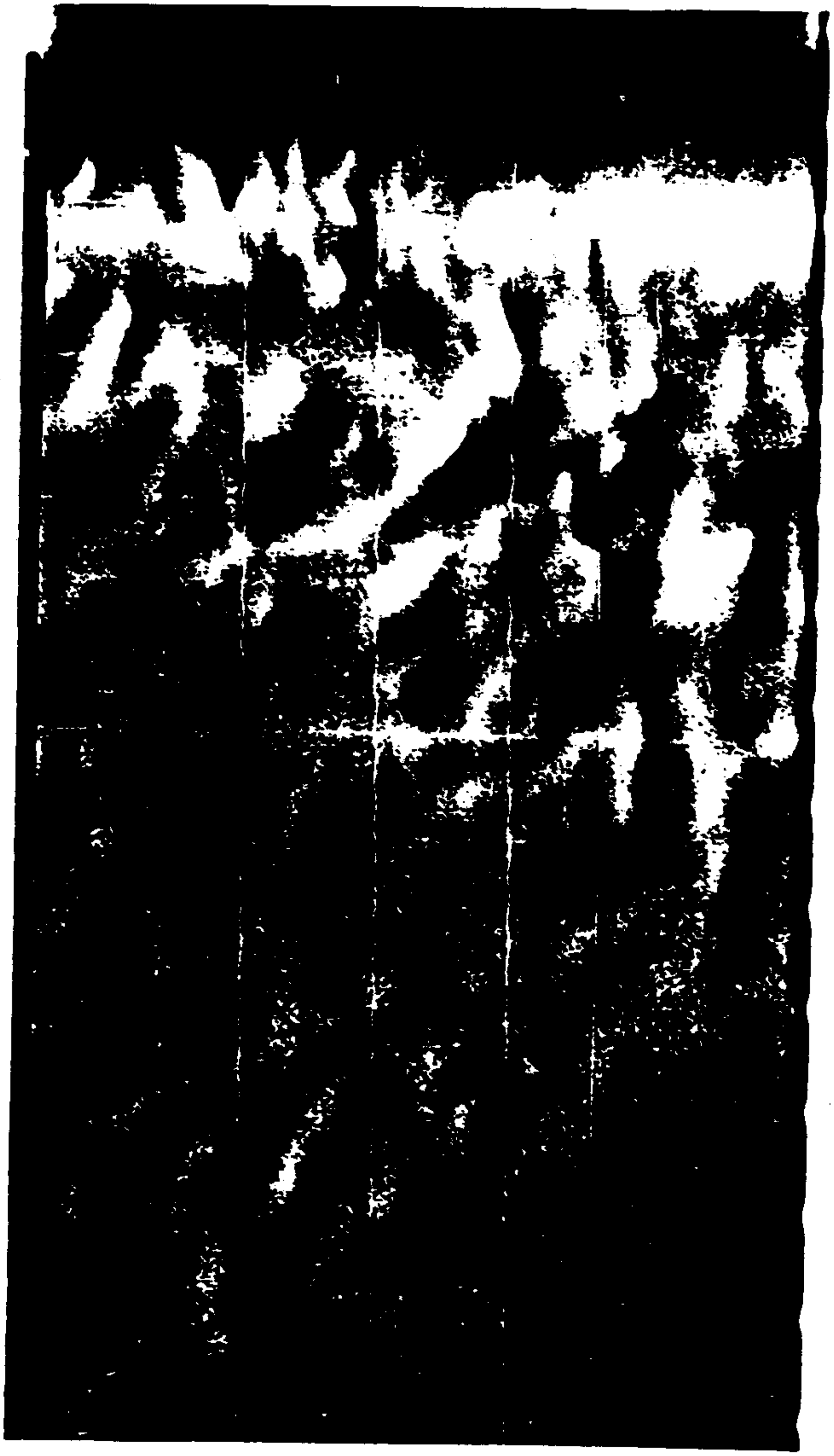
FIGURE 9. UNDULATION OF NODAL TRACES, MASTER CAMERA, FRAME 19, PASS 122D

[redacted]

[redacted]

[redacted]

Camera	Fwd
Pass	122D
Frame.	19
Date of Photography.	28 Sep 66
Universal Grid Coordinates . . .	74.51 - 11.14
Enlargement Factor	2X
Geographic Coordinates	01-06N 049-16W
Altitude	703,373'
Camera Attitude	
Pitch	11°46'
Roll.	-0°30'
Yaw	0°55'
Local Sun Time	1016
Solar Elevation.	6°12'
Solar Azimuth.	NA
Exposure	1/258 sec
Vehicle Azimuth.	144°55'
Processing Level	Full



9. Photo Interpreter Report (Nodal Traces)

The nodal traces do not appear to obscure terrain detail as much as had been anticipated. While the traces are quite distinct, except in extremely dense image areas, it is still possible to see underlying detail. A preliminary report from the photo interpreters resulted in the following conclusions:

a. During the preliminary readout of Mission 1035, no difficulty was experienced in analyzing the photography due to the nodal traces.

b. Providing the width and intensity of the traces becomes no greater than that experienced on Mission 1035, it is believed that the probability of a trace hindering interpretability would decrease as the photo scale increased.

10. Mensuration (Nodal Traces)

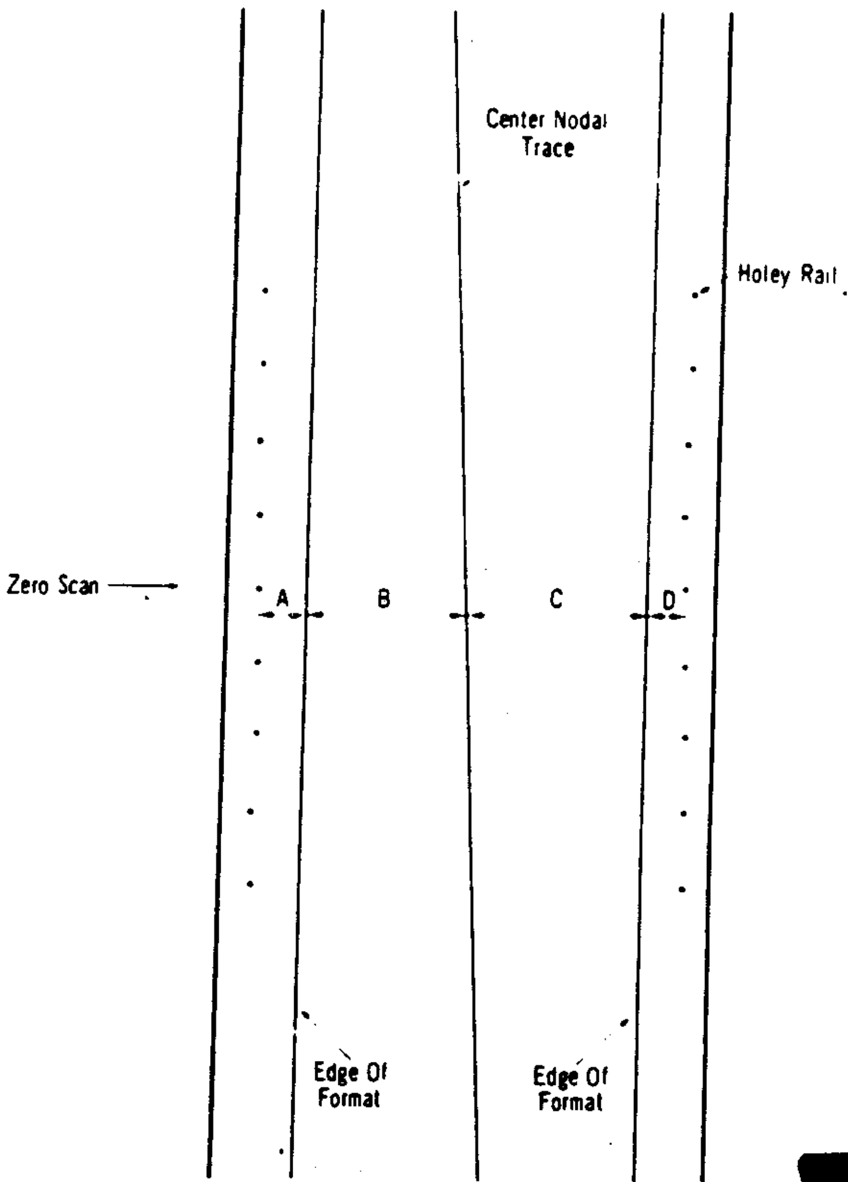
An examination was made of 11 consecutive frames to determine the consistency of the relative positions of the holey rail image's and the nodal traces. Graphic 11 shows the distances that were calculated and Graphics 12 and 13 are the tables that list the results.

[redacted]

[redacted]

GRAPHIC 11. ILLUSTRATION OF POINTS SELECTED FOR DISTANCE CALCULATIONS.

Measurements across the format at zero scan were made on 10 consecutive frames. Distances were measured from the holey rail to the edge of the format (a), from the edge of the format to center nodal trace (b), from the center nodal trace to edge of format (c), and the edge of format to holey rail (d). The format edges were fuzzy and difficult to point.



[redacted]

GRAPHIC 12. TABLE NO 1. (Microns)

Results of measurements for the master camera, Frames 19-28, Pass 4D

		Fwd A	4D B	C	D	(A&B)	(C&D)
Frame	19	3,274	28,452	26,776	[illegible]	31,726	32,0[illegible]
	20	3,286	28,444	26,750	5,2[illegible]	31,730	32,026
	21	3,270	28,448	26,752	5,26[illegible]	31,71[illegible]	32,020
	22	3,276	28,444	26,71[illegible]	[illegible]	31,720	32,020
	23	3,272	28,456	26,[illegible]2	[illegible]	31,728	32,018
	24	3,274	28,448	26,[illegible]	[illegible]	31,722	32,032
	25	3,250	28,468	26,7[illegible]	[illegible]	31,71[illegible]	32,030
	26	3,252	28,464	26,[illegible]	5,22[illegible]	31,716	32,036
	27	3,278	28,442	26,740	5,2[illegible]	31,720	32,032
	28	3,272	28,454	26,[illegible]2	5,166	31,726	32,028
Average		3,27[illegible]	28,452	26,7[illegible]	5,24[illegible]	31,724	32,028
Standard deviation		10.6	26.1	57.[illegible]	[illegible].2	[illegible].8	6.9

GRAPHIC 13. TABLE NO 2. (Microns)

Results of measurements for slave camera, Frames 21-30, Pass 4D

		Aft A	4D B	C	D	(A&B)	(C&D)
Frame	21	3,342	28,922	26,5[illegible]	5,20[illegible]	32,26[illegible]	31,[illegible]4
	22	3,298	28,960	26,628	5,2[illegible]6	32,258	31,834
	23	3,306	28,920	26,[illegible]	5,224	32,226	31,840
	24	3,314	28,922	26,[illegible]	5,15[illegible]	32,236	31,[illegible]
	25	3,324	28,926	26,65[illegible]	5,[illegible]	32,250	31,[illegible]
	26	3,272	28,974	26,5[illegible]	5,222	32,2[illegible]	[illegible]
	27	3,320	28,932	26,54[illegible]	5,266	32,252	31,8[illegible]
	28	3,294	28,942	26,544	5,260	32,236	31,8[illegible]
	29	3,288	28,956	26,614	5,198	32,244	31,8[illegible]2
	30	3,330	28,920	26,610	5,218	32,250	31,828
Average		3,318	28,937	26,608	5,213	32,248	31,821
Standard deviation		25	18.6	3[illegible].4	33.2	14.9	[illegible]

11. Microdensitometric Record of Nodal Traces

Microdensitometric records were also made over the nodal traces of frame 5 forward and frame 6 aft of Pass 16D, utilizing the Mann 1032T Trichromatic Microdensitometer. The parameters of the records are as follows:

Slit	8μ x 40μ
Scan Speed	.25 mm/min
Chart Speed	2"/min

Two feet on the chart is a graphical presentation of 250μ of the image.

Graphic 14 is a composite of these records comparing forward and aft. The annotated density values refer to optical density.

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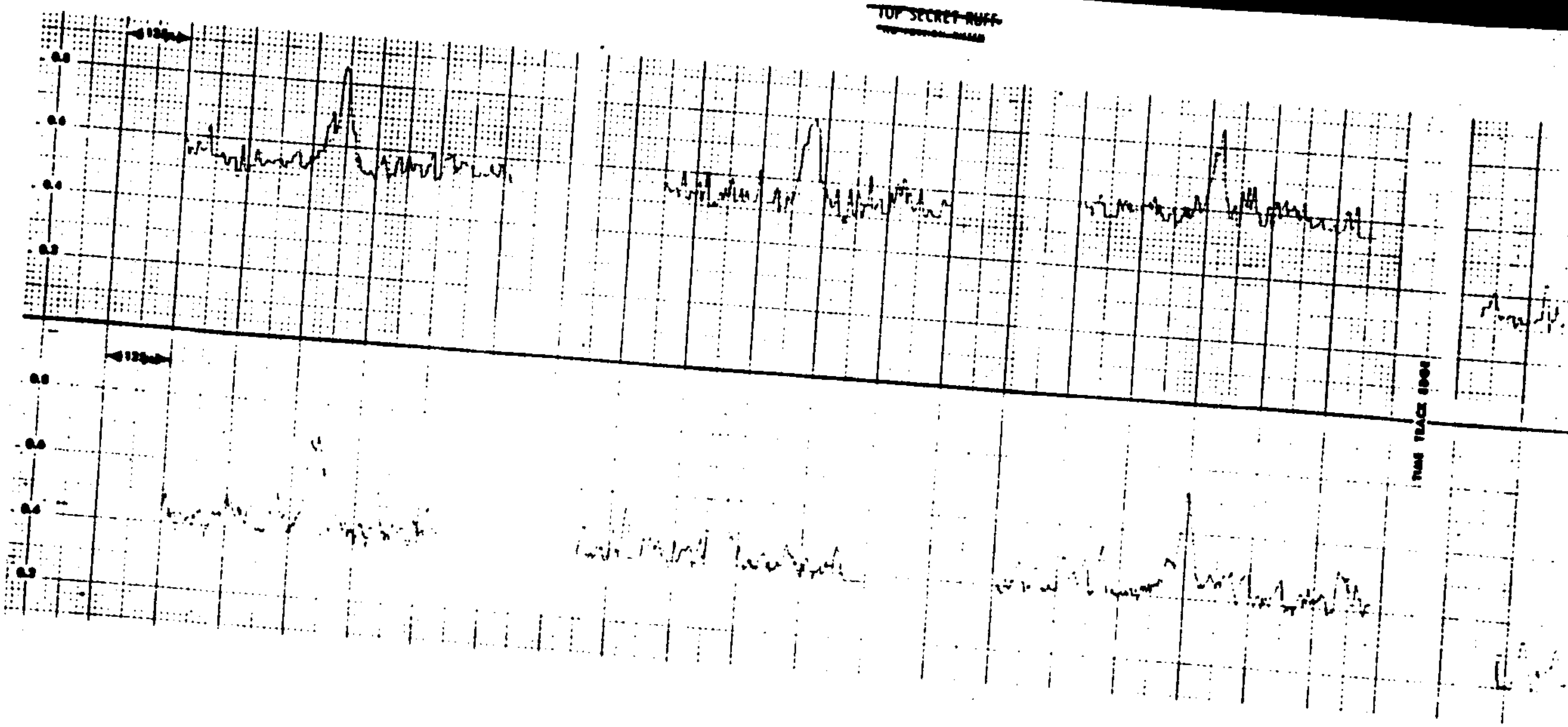

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[redacted]

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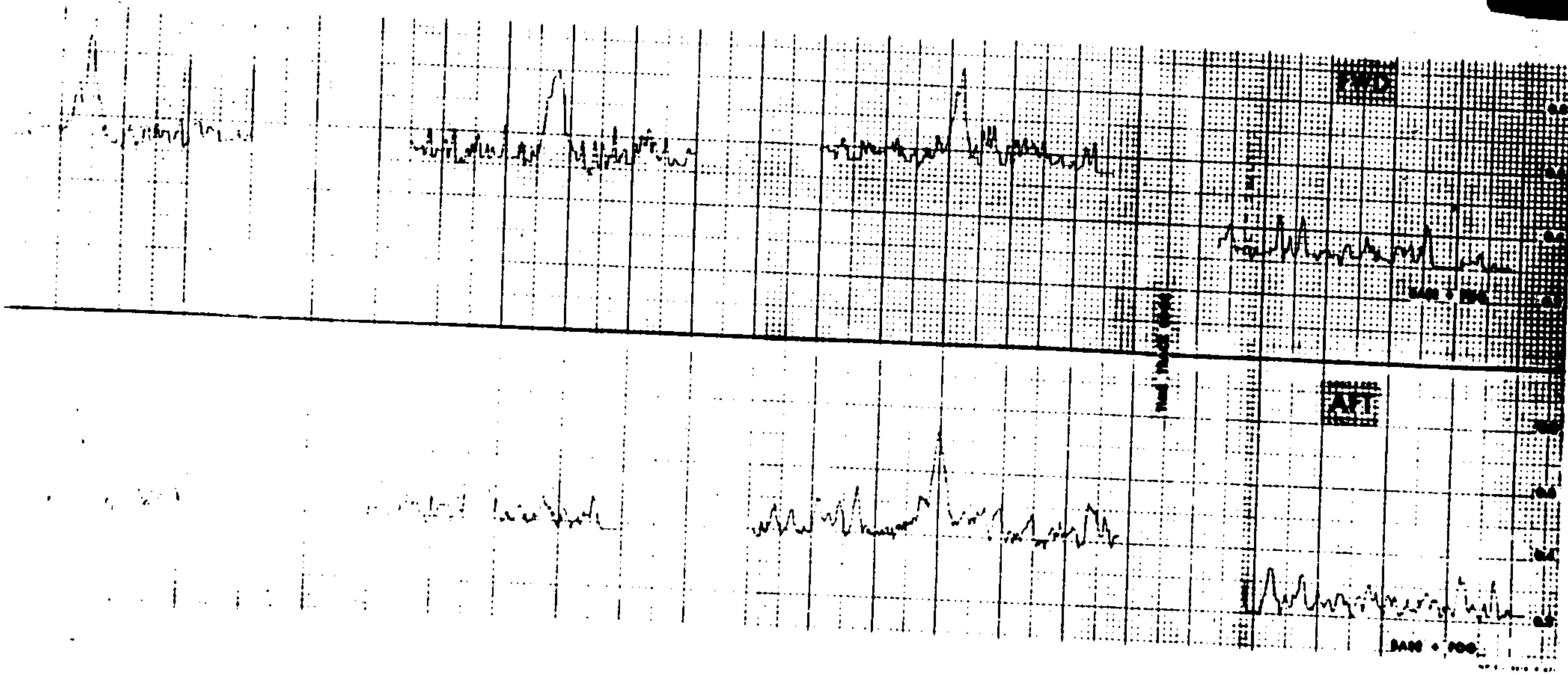

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APPENDIX D. CLOUD COVER ANALYSIS

1. Introduction

This study represents a statistical analysis of the cloud cover on the photography of Mission 1035. The basis of this study is the cloud cover data for each quarter segment of every individual frame of photography. The data is obtained by analysts specifically trained in estimating cloud cover by designated categories.

Five cloud categories have been formulated for use in KEYHOLE photography (Reference, Table 1). These categories allow for the wide latitude of cloud cover conditions commonly found on a frame of this photography. Note in Table 1 that a mean cloud percentage value has been calculated for each category for use in determining a combined cloud cover percentage for all operational passes of the mission.

The occurrence of each cloud category within an operational pass is expressed as a percentage of 100 and appears in Table 2. Each percentage is a ratio of the number of occurrences of a given cloud cover category to the total number of cloud observations in a photo pass. For example: If the number of category 1 occurrences in a given pass is 200 out of a total of 1,000 (250 frames x 4 quarters), all categories combined, then 20 percent of the pass would be classed as category 1.

Also a cloud cover percentage per pass is included in the last column of Table 2 under "cloud cover percentage per pass." This value is determined by the summation of the products of category percentage in each pass and the mean cloud percentage for that category as established in Table 1. For example: If it is determined that the following percentages exist in a given pass:

20% Category 1
15% Category 2
30% Category 3
25% Category 4
10% Category 5

Then, by using the mean cloud percentage established in Table 1 the following computations are made:

CLOUD COVER CATEGORIES

Category Number	Percent of Cloud Cover	Description	Mean Cloud Percentage
1	Less than 10%	Clear	5%
2	10% - 25%	Small scattered Clouds	17.5%
3	26% - 50%	Large scattered Clouds	38%
4	51% - 99%	Broken or Connected Clouds	75%
5	100%	Complete overcast	100%

2. Cloud Cover Data, Missions 1035-1 and 1035-2

Mission 1035-1

Pass Number	1	2	3	4	5	Cloud Cover % Per Pass
3D	0.0	7.1	14.3	75.0	3.6	66.5
4D	62.9	15.3	11.3	6.5	4.0	19.0
5D	59.0	10.5	12.2	14.9	3.4	24.0
6D	78.5	18.5	2.8	0.2	0.0	8.4
7D	78.2	7.4	6.3	8.1	0.0	13.7
8D	55.8	12.2	11.5	20.5	0.0	[illegible]
9D	53.4	16.2	13.3	17.1	0.0	23.4
19D	0.0	69.1	[illegible]	[illegible]	[illegible]	[illegible]
21D	57.0	4.1	[illegible]	[illegible]	2.1	29.2
22D	100.0	0.0	0.0	0.0	0.0	5.0
23D	61.8	25.0	11.9	1.3	0.0	13.0
25D	[illegible]	11.3	[illegible]	15.2	0.6	21.5
27D	39.6	20.1	23.0	[illegible]	0.0	[illegible]
30D	0.9	6.5	28.8	[illegible]	[illegible]	65.5
36D	46.8	7.0	10.3	19.2	16.7	38.8
37D	74.2	13.1	10.8	1.9	0.0	11.5
38D	8.9	14.3	32.1	44.7	0.0	[illegible]
39D	100.0	0.0	0.0	0.0	0.0	5.0
40D	100.0	0.0	0.0	0.0	0.0	5.0
41D	50.6	12.8	15.1	21.5	0.0	26.6
45D	100.0	0.0	0.0	0.0	0.0	5.0
52D	73.8	6.6	4.4	13.4	1.8	[illegible]
53D	70.9	14.8	9.6	4.7	0.0	13.3
54D	72.8	9.6	9.9	7.7	0.0	14.9
55D	100.0	0.0	0.0	0.0	0.0	5.0
56D	61.9	17.0	8.0	13.1	0.0	[illegible]
57D	45.3	25.0	18.8	10.9	0.0	22.0
58D	72.9	27.1	0.0	0.0	0.0	8.4
60D	100.0	0.0	0.0	0.0	0.0	5.0
67D	0.0	1.3	17.5	81.2	0.0	67.8
68D	82.4	6.6	3.2	7.8	0.0	12.3
69D	61.8	14.5	8.1	14.4	1.2	20.7
70D	76.9	12.3	8.7	2.1	0.0	[illegible]
	68.0*	11.3*	8.7*	10.5*	1.5*	18.1**

*Average percentage by category for mission.
**Overall mission cloud cover percentage.

[redacted]

Mission 1035-2

Pass Number	1	2	3	4	5	Cloud Cover % Per Pass
76D	79.7	6.4	9.3	4.6	0.0	12.1
77D	0.0	3.6	46.4	50.0	0.0	55.8
83D	2.1	8.5	6.7	70.2	12.2	69.0
84D	72.3	8.0	11.7	8.0	0.0	15.5
86D	32.1	18.3	19.4	30.2	0.0	34.8
87D	48.0	26.0	17.3	8.7	0.0	20.0
88D	32.5	35.9	19.3	12.3	0.0	24.5
92D	25.9	15.7	29.7	28.7	0.0	36.9
95D	0.0	1.9	67.3	38.5	0.0	49.0
99D	0.0	0.0	21.0	67.0	12.0	70.2
100D	81.4	10.2	5.3	3.1	0.0	10.2
101D	23.3	12.5	49.2	15.0	0.0	33.3
102D	31.9	23.0	17.2	27.9	0.0	33.1
103D	30.3	8.8	13.2	47.7	0.0	43.8
104D	50.2	21.2	19.6	9.0	0.0	20.4
105D	26.5	28.0	19.7	25.8	0.0	33.1
108D	[illegible]	6.0	90.7	3.3	0.0	38.0
115D	48.1	11.3	6.7	24.1	9.8	34.8
116D	18.9	8.3	15.4	54.2	3.2	52.1
117D	40.6	11.5	11.7	33.9	2.3	36.2
118D	18.9	20.6	22.6	36.6	3.3	43.1
119D	22.1	16.7	20.9	37.2	3.1	43.0
120D	24.0	13.0	19.7	43.3	0.0	43.1
121D	1.8	4.3	14.0	67.7	12.2	69.1
124D	0.0	0.6	20.7	78.7	0.0	67.0
131D	81.9	8.1	7.5	2.5	0.0	10.2
132D	42.9	20.8	13.1	19.0	4.2	29.2
133D	60.2	11.9	9.1	18.8	0.0	22.7
134D	49.8	7.4	13.1	24.0	5.7	32.5
135D	25.0	7.6	18.1	48.2	1.1	46.7
136D	50.4	21.8	4.0	20.6	3.2	26.5
137D	0.0	0.8	35.8	63.4	0.0	61.3
140D	0.0	0.0	9.7	89.5	0.8	71.6
147D	67.7	14.6	16.7	1.0	0.0	13.0
148D	23.0	22.3	24.6	27.2	2.9	37.7
149D	10.2	8.6	21.3	57.4	2.5	55.7
150D	77.1	9.2	6.3	7.9	0.0	13.8
151D	29.8	9.5	27.1	33.6	0.0	38.7
152D	1.7	13.3	16.3	56.4	12.3	63.2
	35.0*	12.5*	19.3*	31.1*	2.1*	36.7**

*Average percentage by category for mission.
**Overall mission cloud cover percentage.

APPENDIX E. MISSION COVERAGE STATISTICS

1. Summary of Plottable Photographic Coverage, Mission 1035-1

Country	Forward Camera		Aft Camera		Totals	
	Lin nm	Sq nm	Lin nm	Sq nm	Lin nm	Sq nm
Afghanistan	115	[illegible]	115	18,170	230	[illegible]
Alaska, US	99	17,028	[illegible]	[illegible]	198	[illegible]
Albania	44	3,300	[illegible]	3,300	88	6,600
Australia	682	[illegible]	682	[illegible]	1,364	[illegible]
Bhutan	25	3,750	25	3,750	50	[illegible]
Bolivia	[illegible]	25,296	[illegible]	25,296	[illegible]	[illegible]
Brazil	360	64,800	[illegible]	64,800	720	[illegible]
Bulgaria	249	37,350	[illegible]	[illegible]	[illegible]	[illegible]
Canada	211	38,896	[illegible]	[illegible]	422	77,792
China	7,375	[illegible]	[illegible]	[illegible]	14,750	[illegible]
Costa Rica	[illegible]	12,464	[illegible]	[illegible]	234	[illegible]
Egypt	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Ethiopia	336	[illegible]	336	[illegible]	672	[illegible]
Finland	18	2,700	[illegible]	2,700	36	5,400
Greece	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Greenland	[illegible]	25,456	[illegible]	25,456	[illegible]	[illegible]
India	[illegible]	39,176	[illegible]	39,176	536	[illegible]
Iran	[illegible]	[illegible]	139	[illegible]	[illegible]	[illegible]
Iraq	164	[illegible]	[illegible]	23,944	[illegible]	[illegible]
Kashmir	102	[illegible]	[illegible]	14,892	[illegible]	[illegible]
Kenya	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Kuwait	25	2,920	25	[illegible]	[illegible]	[illegible]
Mali	[illegible]	26,134	[illegible]	26,134	[illegible]	[illegible]
Mauritania	[illegible]	15,768	[illegible]	15,768	310	[illegible]
Mexico	[illegible]	[illegible]	[illegible]	8,732	[illegible]	[illegible]
Mongolia	1,754	269,852	1,754	[illegible]	[illegible]	[illegible]
N. Vietnam	225	[illegible]	225	[illegible]	[illegible]	[illegible]
Nepal	45	6,670	[illegible]	6,670	[illegible]	[illegible]
Nicaragua	[illegible]	11,400	[illegible]	11,400	[illegible]	[illegible]
Pakistan	[illegible]	[illegible]	[illegible]	22,484	[illegible]	[illegible]
Panama	24	[illegible]	[illegible]	3,648	[illegible]	[illegible]
Poland	133	[illegible]	133	20,748	[illegible]	[illegible]
Rumania	246	34,500	246	34,500	[illegible]	[illegible]
Saudia Arabia	656	[illegible]	656	[illegible]	[illegible]	[illegible]
Spanish Sahara	155	[illegible]	155	[illegible]	[illegible]	[illegible]
Sudan	336	51,072	336	51,072	[illegible]	[illegible]
Upper Volta	119	17,374	119	17,374	[illegible]	[illegible]
USSR	[illegible]	1,203,916	8,061	1,203,916	16,122	[illegible]
Wake Island	10	3	10	3	20	[illegible]

[redacted]

Mission 1035-1

Country	Forward Camera		Aft Camera		Totals	
	Lin nm	Sq nm	Lin nm	Sq nm	Lin nm	Sq nm
Yugoslavia	129	13,350	129	13,350	358	26,700
TOTAL	23,905	3,529,145	23,905	3,529,145	47,810	7,058,290
Continental US	1,124	146,964	1,124	146,964	2,248	293,928
GRAND TOTAL	25,029	3,676,109	25,029	3,676,109	50,058	7,352,218

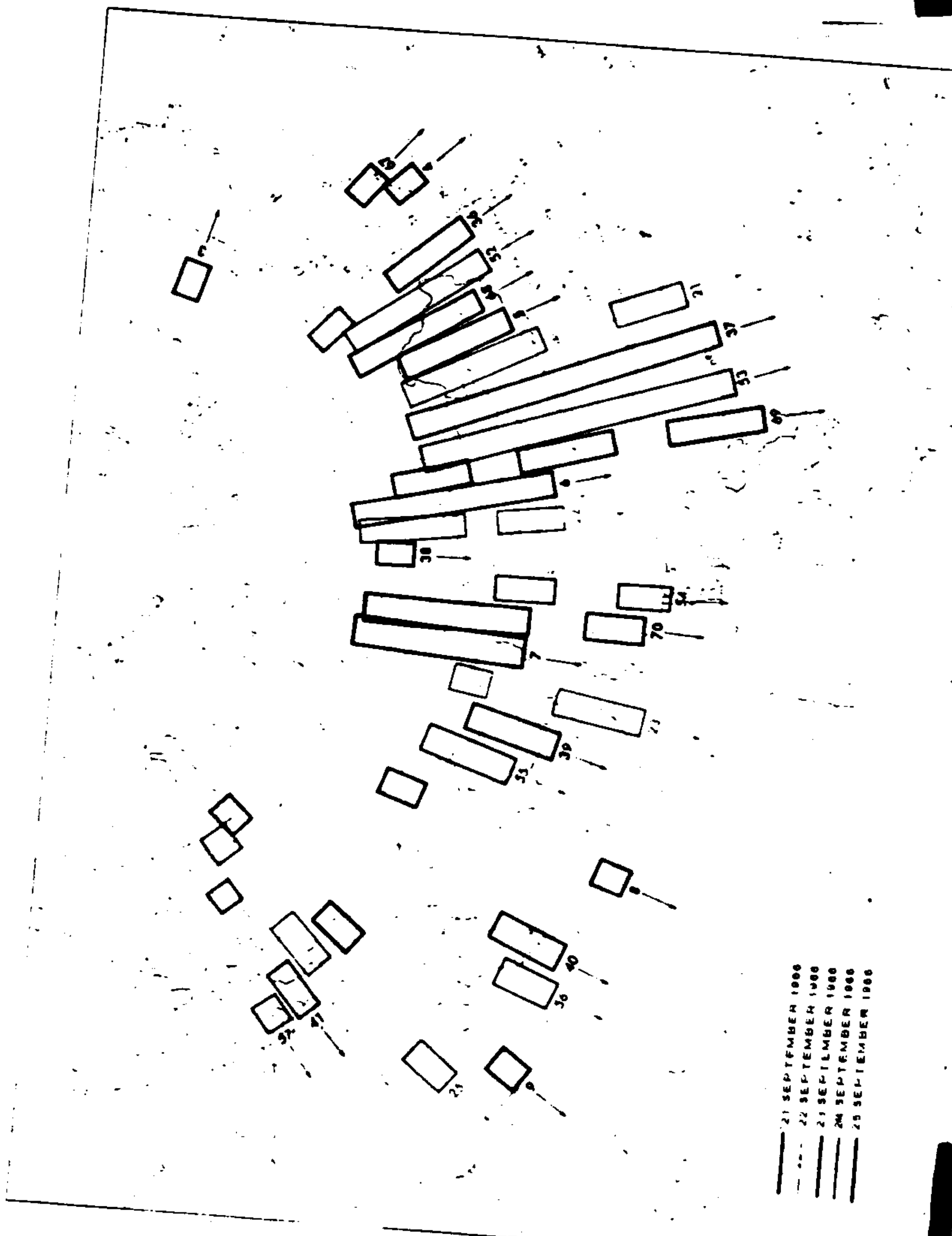
2. Summary of Plottable Photographic Coverage, Mission 1035-2

Country	Forward Camera Lin nm	Forward Camera Sq nm	Aft Camera Lin nm	Aft Camera Sq nm	Totals Lin nm	Totals Sq nm
Aden	123	9,150	123	9,150	246	18,300
Afghanistan	35	5,110	35	5,110	70	10,220
Alaska, US	10	312	10	312	20	624
Algeria	411	60,006	411	60,006	822	120,012
Australia	632	120,080	632	120,080	1,264	240,160
Austria	86	12,900	86	12,900	172	25,800
Bhutan	19	2,774	19	2,774	38	5,548
Bolivia	112	20,160	112	20,160	224	40,320
Brazil	2,132	372,347	2,132	372,347	4,264	744,694
British Guiana	141	21,150	141	21,150	282	42,300
Bulgaria	123	18,450	123	18,450	246	36,900
Canada	570	68,628	570	68,628	1,140	137,256
Chad	101	15,352	101	15,352	202	30,704
China	5,430	804,620	5,430	804,620	10,860	1,609,240
Colombia	37	6,210	37	6,210	74	12,420
Congo	99	17,820	99	17,820	198	35,640
Czechoslovakia	243	36,732	243	36,732	486	73,464
E. Germany	41	6,150	41	6,150	82	12,300
Ecuador	15	2,700	15	2,700	30	5,400
Ethiopia	160	24,000	160	24,000	320	48,000
Ghana	59	8,968	59	8,968	118	17,936
Greenland	1,004	149,296	1,004	149,296	2,008	298,592
Hungary	98	14,724	98	14,724	196	29,448
India	61	8,906	61	8,906	122	17,812
Iran	67	10,556	67	10,556	134	21,112
Kashmir	27	4,266	27	4,266	54	8,532
Kenya	273	35,745	273	35,745	546	71,490
Laos	25	3,650	25	3,650	50	7,300
Mali	10	1,520	10	1,520	20	3,040
Mongolia	123	18,696	123	18,696	246	37,392
Mozambique	510	52,560	510	52,560	1,020	105,120
N. Korea	36	5,100	36	5,100	72	10,200
Nepal	111	16,206	111	16,206	222	32,412
Niger	256	37,436	256	37,436	512	74,872
Pakistan	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Peru	420	75,600	420	75,600	840	151,200
Poland	333	50,492	333	50,492	666	100,984
Rhodesia	496	59,250	496	[illegible]	992	[illegible]
Rumania	267	40,050	267	40,050	534	80,100
Saudia Arabia	308	43,500	308	43,500	616	87,000
Somali Republic	887	108,360	887	108,360	1,774	216,720
Tanganyika	431	52,830	431	52,830	862	105,660

Mission 1035-2

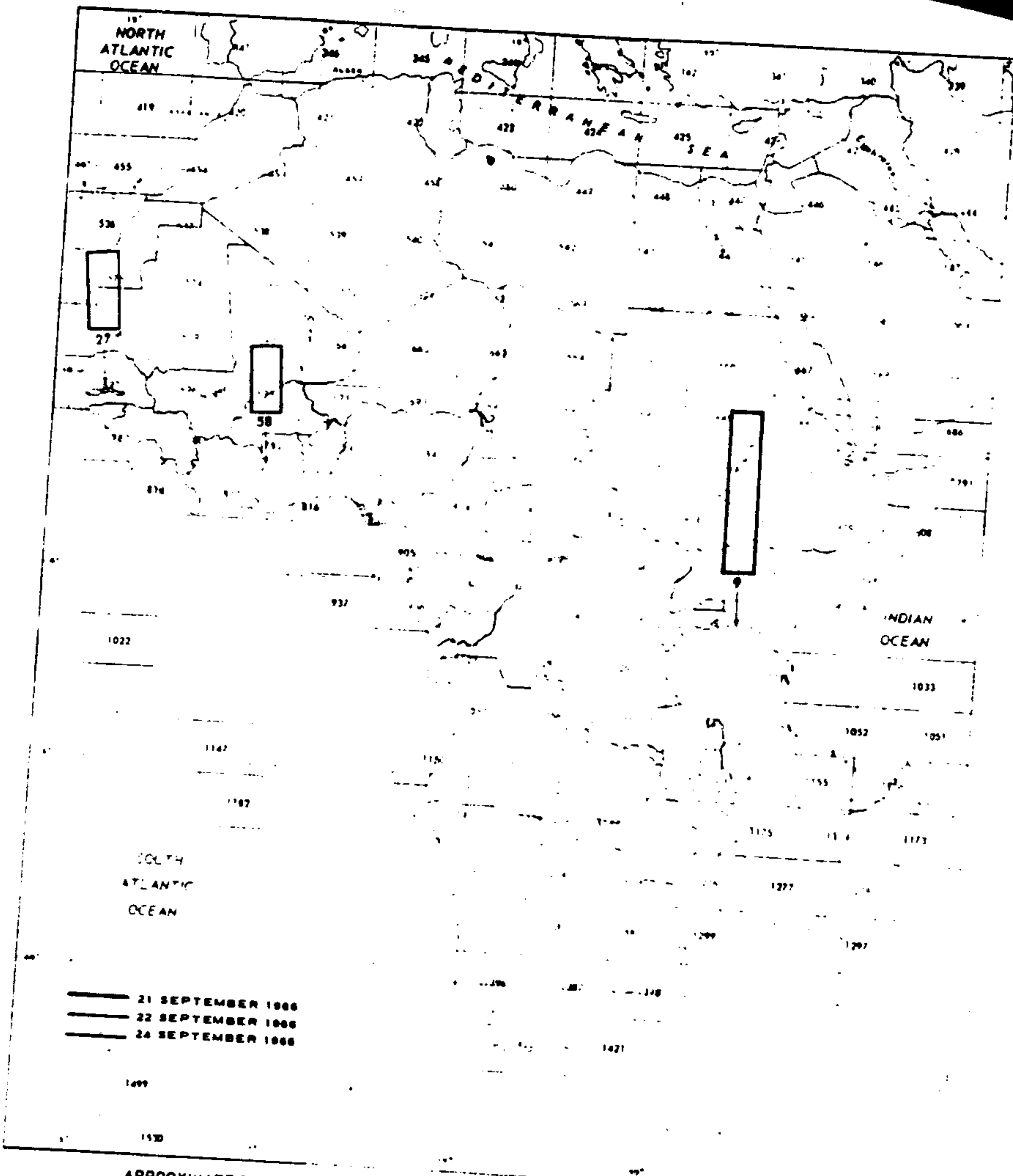
Country	Forward Camera Lin nm	Forward Camera Sq nm	Aft Camera Lin nm	Aft Camera Sq nm	Totals Lin nm	Totals Sq nm
Thailand	221	32,266	221	32,266	442	64,532
Togo	15	2,280	15	2,280	30	4,560
Turkey	41	6,150	41	6,150	82	12,300
Uganda	149	24,585	149	24,585	298	49,170
UN Cen African Republic	11	1,672	11	1,672	22	3,344
UN of South Africa	99	17,820	99	17,820	198	35,640
Upper Volta	178	27,056	178	27,056	356	54,112
USSR	8,721	1,288,592	8,721	1,288,592	17,442	2,577,184
Venezuela	457	60,298	457	60,298	914	120,596
Yugoslavia	362	46,500	362	46,500	724	93,000
TOTAL	26,940	4,000,959	26,940	4,000,959	53,880	8,001,918
Continental US	756	114,738	756	114,738	1,512	229,476
GRAND TOTAL	27,696	4,115,697	27,696	4,115,697	55,392	8,231,394

3. Mission Coverage Tracks



APPROXIMATE TRACK AND COVERAGE OF MISSION 1035-1, 21-25 SEPTEMBER OVER USSR, FAR AND MIDDLE EAST

[redacted]



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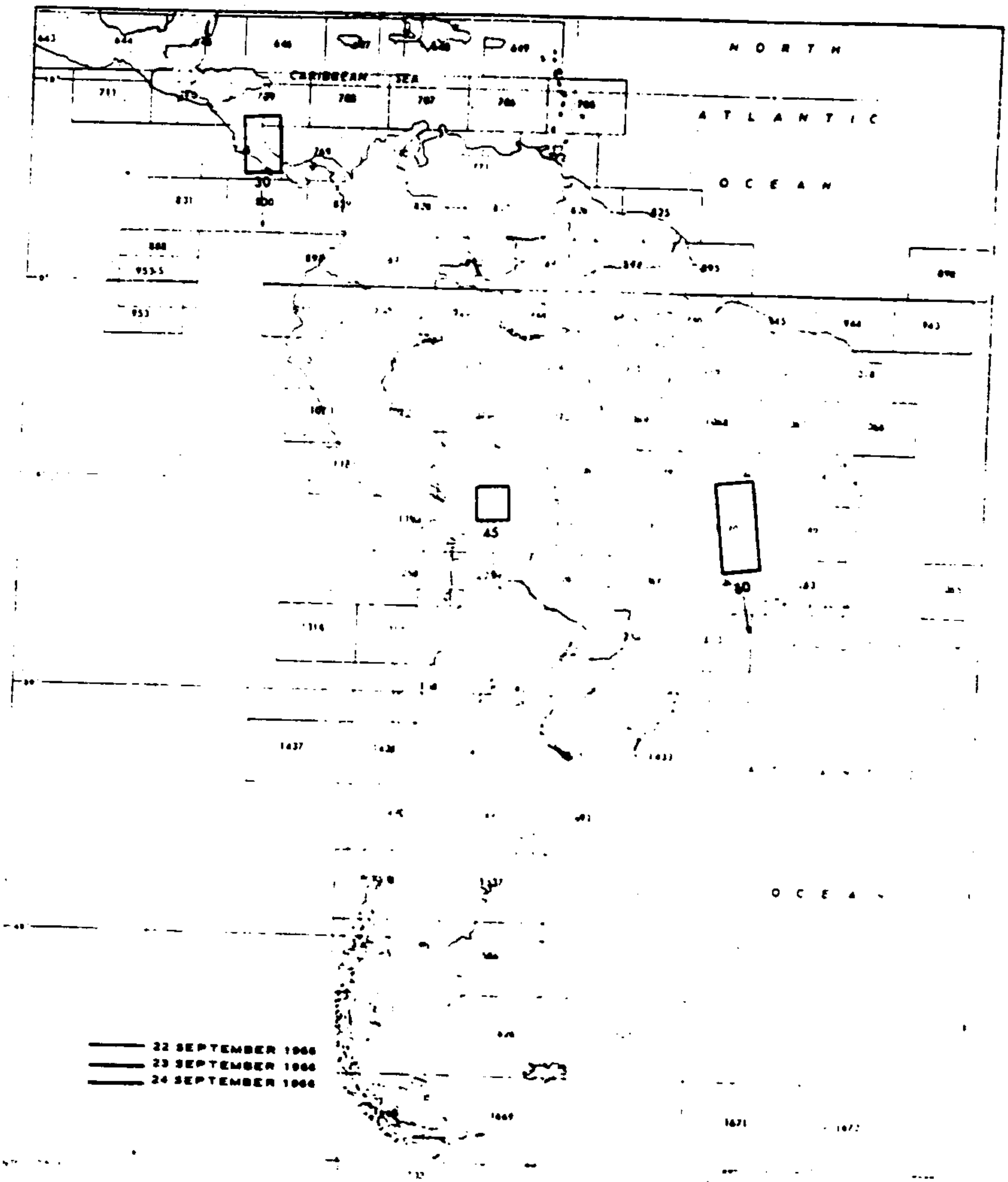

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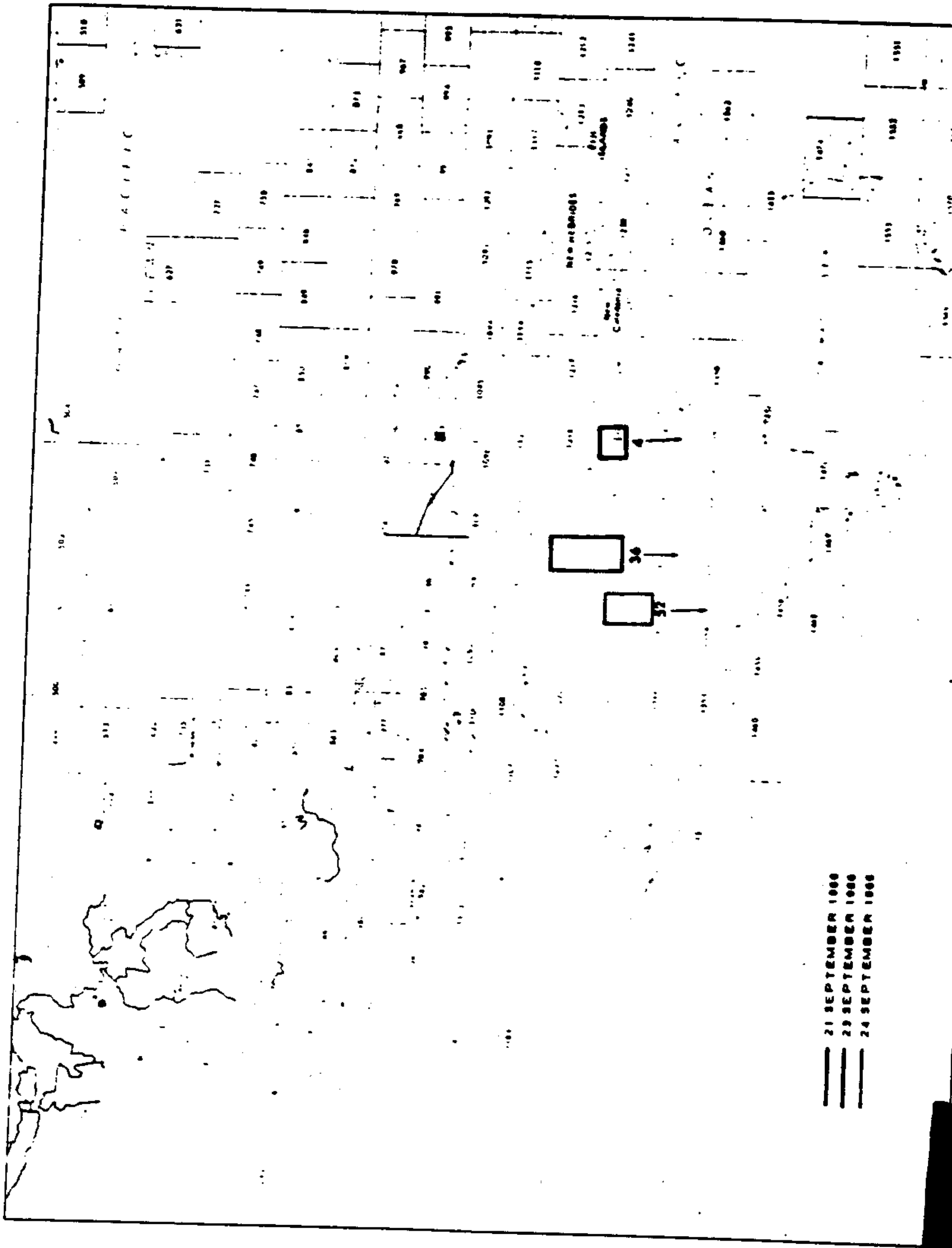

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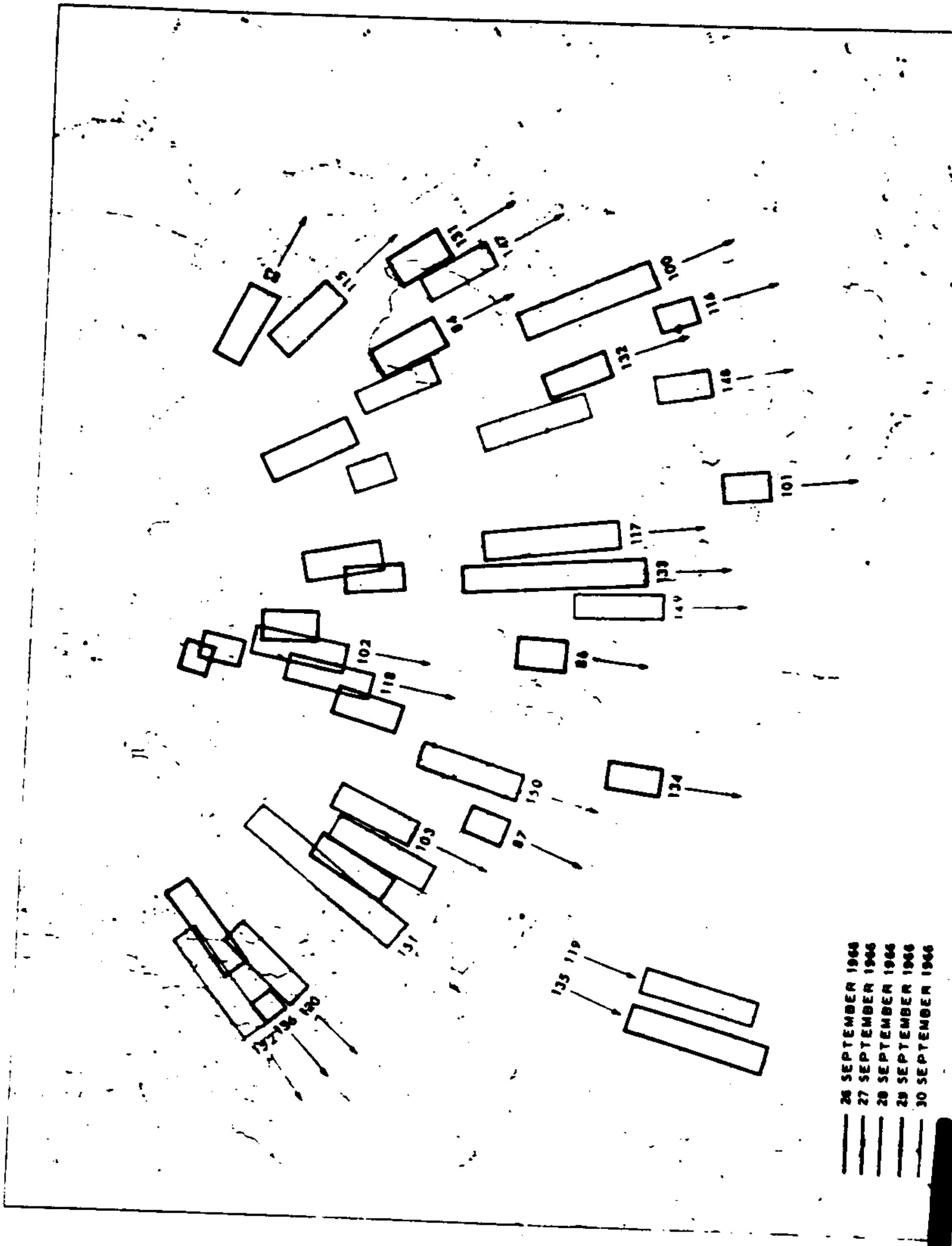
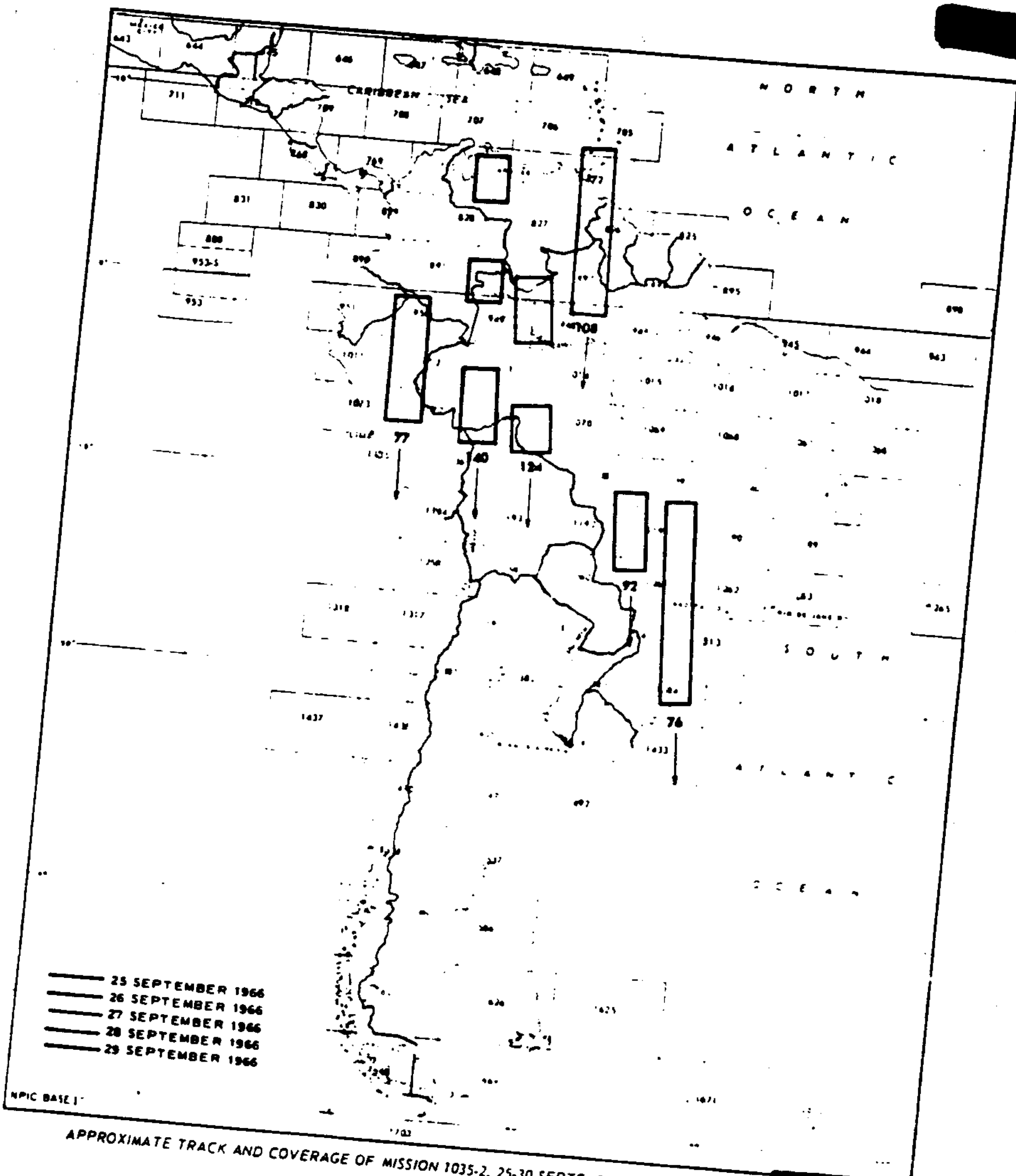


[redacted]

APPROXIMATE TRACK AND COVERAGE OF MISSION 1035-2, 25-30 SEPTEMBER 1966 OVER USSR, FAR AND MIDDLE EAST

[redacted]



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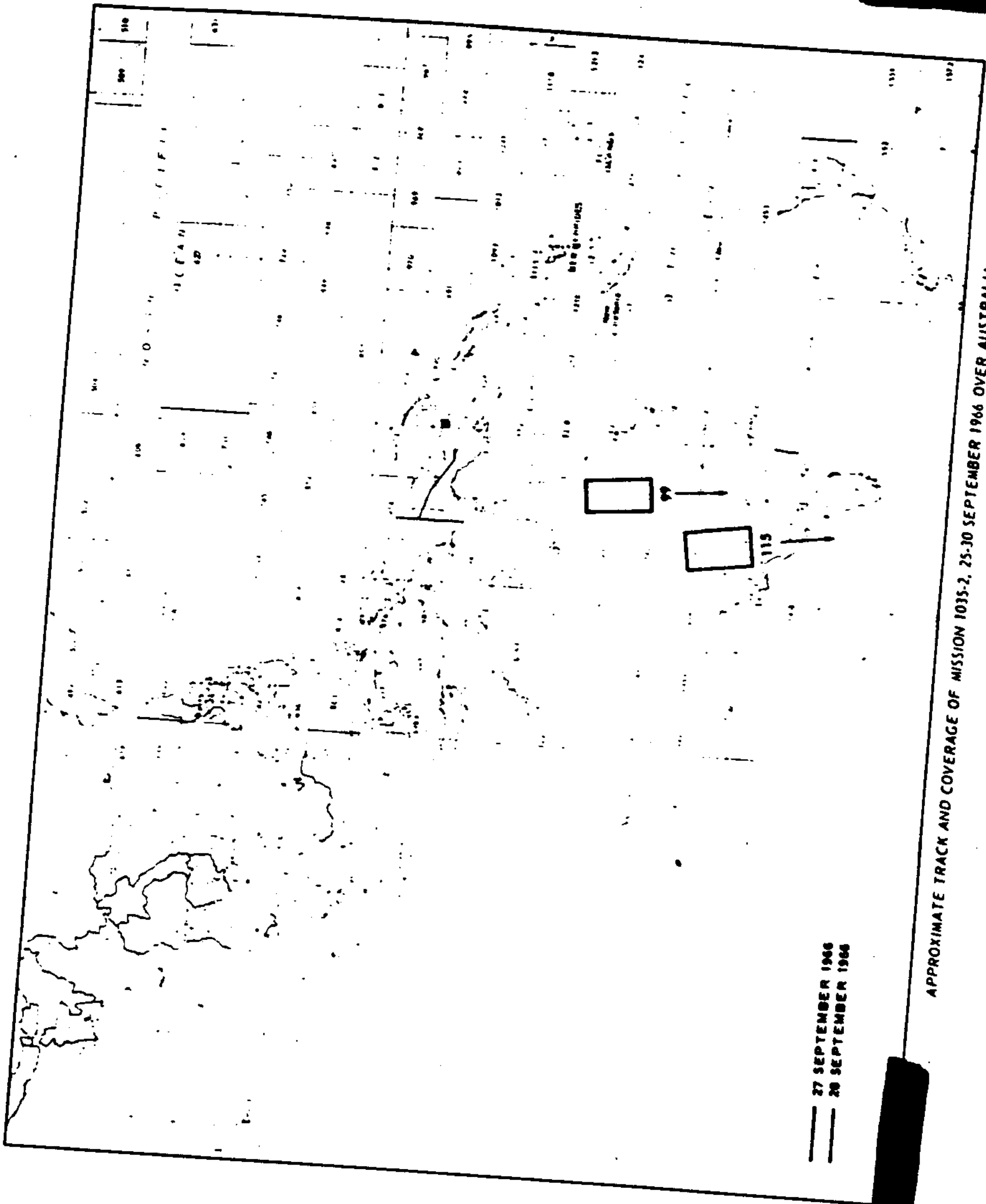

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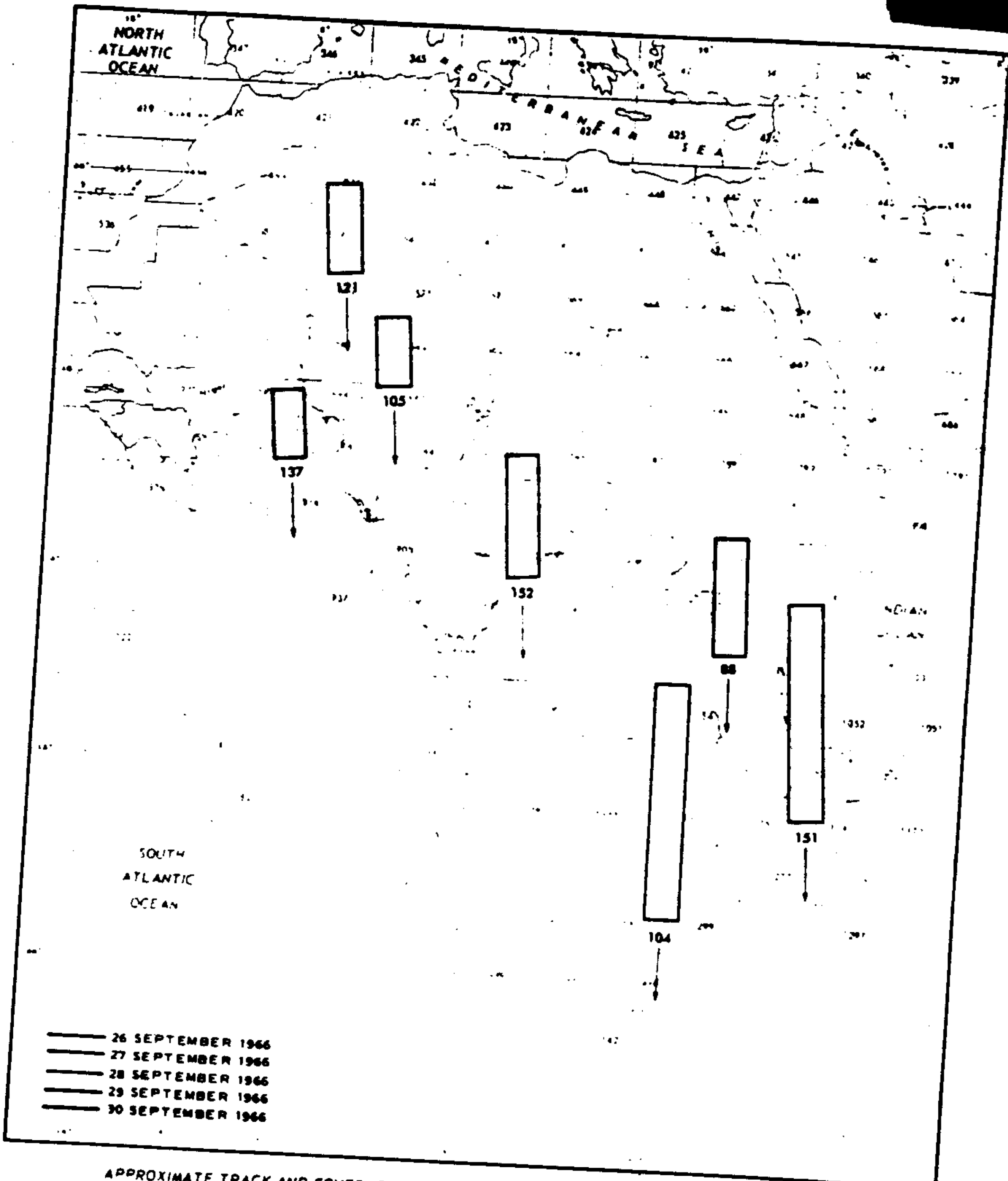

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