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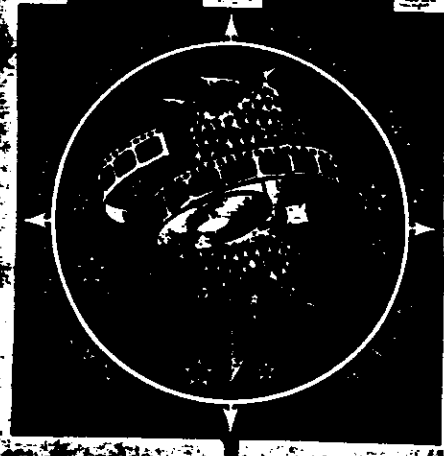

PHOTOGRAPHIC EVALUATION REPORT

MISSION 1038

[redacted]

APRIL 1967

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37 PAGES

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TECHNICAL PUBLICATION

PHOTOGRAPHIC EVALUATION REPORT

MISSION 1038

This Photographic Evaluation Report reflects a format revision designed to expedite production, increase information content, and provide reports to the community on a more timely basis.

While the new PER format does not include a depth analysis of all anomalies or malfunctions, provisions have been made to include special studies to dwell upon conditions requiring detailed analyses. These reports will appear, if and when warranted, as attachments to basic PERs. Time permitting, attachments will be made to the mission PER in which the anomaly occurs; otherwise they will be published with a subsequent PER. Each special study will be identified on the cover of the PER to which it is attached. In addition, an index of the PERs and the associated special studies will appear in each report.

Publication schedules may cause some subsequent PERs to appear in the old format.

APRIL 1967

NATIONAL PHOTOGRAPHIC INTERPRETATION CENTER

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GLOSSARY OF TERMS

ABSOLUTE HEIGHT	Vertical distance from the vehicle to the mean ground level of the area being photographed.
ACUITY	Sharpness - Edge definition.
ACUTANCE	Measure of the ability of a lens to reproduce sharp images.
AIR BASE	Ground distance between 2 exposure stations.
ALTITUDE	Vertical distance from the vehicle to the Hough Ellipsoid at the time of exposure.
AZIMUTH OF THE PRINCIPAL RAY	Horizontal clockwise angle, measured from true north to the camera principal ray.
BASE HEIGHT RATIO	Ratio between the air base and the absolute attitude of a stereoscopic pair of photographs.
CAMERA NADIR	Geodetic latitude and longitude of a point vertically beneath the perspective center of the camera lens on the Hough Ellipsoid.
CONE ANGLE	Angle between the principal ray and the vehicle nadir.
COPY GENERATION	Number of reproductive steps by which a negative or positive photographic copy is separated from the original, i.e. the original negative is copy 1, a positive made from the original negative is copy 2, etc.
DATE OF PHOTOGRAPHY	Indicates the day, month, and year (GMT) that the photography was acquired.

EXPOSURE*	Total quantity of light received per unit area on a sensitized plate or film.
EXPOSURE DURATION	Time during which a light-sensitive material is subjected to the influence of light. Expressed in this text in fractions of a second. Formula: Exposure Time (sec) = $\frac{\text{Slit Width (in)}}{\text{Scan Rate (in per sec)}}$
EXPOSURE STATION	Position occupied by the camera lens at the moment of exposure.
FIDUCIAL MARK	A standard geometrical reference point imaged at the margin of a photograph. The intersection of the primary fiducial marks usually defines the principal point.
FOCAL LENGTH: CALIBRATED	Adjusted value of the equivalent focal length. Computed to distribute the effect of lens distortion over the entire field.
FOCAL LENGTH: EQUIVALENT	Distance measured along the lens axis from the rear nodal point to the plane of best average definition over the entire field. Points other than the rear nodal point may be used but must be specified for correct interpretation of data.
FOCAL PLANE	Plane perpendicular to the lens axis, in which images of points in the object field of the lens are focused.
FRAME	One of a series of full-format photographs comprising a roll of film.
GROUND RESOLUTION*	Resolved ground distance as determined from standard bar target resolution targets. A target is considered to be resolved when a grouping of 3 bars can be distinguished as 3 distinct lines. The lines need not have linear form.

HOLEY RAIL DOTS	Images of the rail holes associated with the pan geometry calibration of the camera.
IMC (Image Motion Compensation)	Correction for the forward motion of the vehicle while photographing the terrain.
ISODENSITOMETER	An instrument which is basically a microdensitometer with the capability of repeatedly scanning an image at pre-set intervals. Its output is in the form of a plot representing distance along 2 axes and density differences as code changes within each scan line.
LOCAL SUN TIME	Time of day computed from the position of the sun relative to the imaged terrain.
MICRODENSITOMETER	An instrument which measures the optical density of very small areas in an image. Its output is in the form of a continuous plot of density versus distance across an image. The microdensitometer used in NPIC can accurately measure distances as small as 1 micron and densities up to 5.0+.
NOD INDICATORS	A series of marks imaged in the border area of each frame for the purpose of defining the relative orientation of the optical axis and the ground scene.
NODAL TRACE	A continuous line imaged along the major axis of each frame to define the optical axis of the lens relative to any given instant of exposure.
PANORAMIC CAMERA	Photographs a partial or complete panorama of the terrain in a transverse direction through a scanning motion of the lens system.
PARALLAX	Apparent displacement of the position of an object in relation to a reference point, caused by a change in the point of observation.

PASS	Operational portion of an orbital revolution. A suffix D indicates the descending node and a suffix A indicates the ascending node. An additional suffix E indicates that the associated photography was generated for engineering purposes.
PITCH	Rotation of the camera about its transverse axis. Positive pitch indicates nose-up attitude.
PROCESSING LEVEL	Degree of development. Three levels of processing are currently employed: Primary, intermediate, and full.
PRINCIPAL RAY	That ray of light which emanates from a point in object space and passes undeviated through the lens to become imaged at the principal point of the camera system. It is co-incident with the optical axis of the lens.
RESOLUTION	Measure of the smallest array of point objects distinguishable as independent point images, expressed in lines/mm.
ROLL	Rotation of the camera about its longitudinal axis. Positive roll indicates left wing up attitude.
SHADOW FACTOR	A constant for each frame, used to calculate heights from shadow lengths.
SHRINKAGE MARKERS	Calibrated reference points used to calculate deformations of the photographic material.
SOLAR ELEVATION	Vertical angle measured from a plane (tangent to the surface of the earth at the point of intersection of the principal ray) to the sun, the vertex being at the center of the format.
STELLAR CAMERA	Used simultaneously with the index camera to photograph stars in order to determine vehicle attitude.

SYSTEM TIME LABEL	Binary presentation of the accumulative system time.
UNIVERSAL GRID	X, Y coordinate system used to locate images on photographic formats.
VEHICLE AZIMUTH	Clockwise horizontal angle measured from true north to the vehicle ground track.
VIGNETTING	Gradual reduction in density of parts of a photographic image due to the stopping of some of the rays entering the lens.
YAW	Rotation of the camera about its vertical axis. Positive yaw represents nose-left attitude, as viewed from the top of the camera.

*Defined differently than in the "Glossary of NPIC Terminology."

INDEX OF PHOTOGRAPHIC EVALUATION REPORTS AND SPECIAL STUDIES

PER	DOCUMENT NUMBER	SPECIAL STUDY
1037	[redacted]	None
1038	[redacted]	None

SYNOPSIS

Mission 1038 was launched on 14 January 1967 at 2128Z. The first capsule was recovered dry on revolution 81, 19 January 1967. The second capsule was recovered dry on revolution 193, 26 January 1967. A total of 96 photographic passes was accomplished by the 12-day mission.

Both main cameras operated satisfactorily throughout the mission. The image quality of the photography is poor for this camera system. An MIP of 80 was assigned. It is the opinion of the Performance Evaluation Team (PET) that atmospherics are the major factor contributing to the poor image quality. However, it is possible that other system factors peculiar to this mission could have added to the overall poor quality. A Wratten 23A filter which causes slightly reduced lens performance was used on the master camera. Also a higher than normal thermal environment was experienced on both parts of the mission. The significance of these factors cannot be readily identified.

The starboard-looking horizon camera imagery of the aft-looking material is veiled at the start of the mission and continues through pass 86D where a gradual clearing begins. The imagery is sharp and well defined at the end of the mission.

The index cameras functioned properly through both parts of the mission. However, double exposures were noted on frame 229 of part one and frames 4 and 16 of part 2. The image quality is good and equal to that obtained by recent missions of this system.

The stellar cameras operated satisfactorily throughout the mission with the exception of the double exposures reported for the index camera. Approximately 50 percent of each format on part 1 and 20 percent of each format on part 2 is affected by earth flare. The stellar images are clear and distinct, and no problems were encountered in the reduction process.

The second part of Mission 1038 was processed at a Special Projects Production Facility of the US Air Force. Visual examination of the original negative revealed no detectable difference between the 2 parts due to processing.

PART I. GENERAL SYSTEM INFORMATION

A. Camera Numbers

Forward-Looking Panoramic Camera 192
Aft-Looking Panoramic Camera 193
Stellar/Index Camera (Mission 1038-1) D93/86/112
Stellar/Index Camera (Mission 1038-2) D90/111/108

B. Launch and Recovery Dates

	Mission 1038-1	Mission 1038-2
Launch	2128Z/14 Jan 67	-
Recovery	2343Z/19 Jan 67	2327Z/26 Jan 67

C. Orbit Elements

Element	Planned	Rev No 42	Rev No 120	Photo Range
Period (min)	NA	90.088	89.919	*
Perigee (nm)	NA	97 nm	98 nm	97 nm (rev no 42)
Apogee (nm)	NA	208 nm	204 nm	156 nm (rev no 141)
Eccentricity	NA	0.01546	0.01471	*
Inclination (deg)	NA	80.075	80.074	*
Perigee Latitude	NA	29°N	46°30'N	*

NA - Not Available.
* - Not Applicable.

D. Photographic Operations

1. Panoramic Cameras

Type	Mission 1038-1 Revs	Mission 1038-1 Frames	Mission 1038-2 Revs	Mission 1038-2 Frames	Total Revs	Total Frames
Operational						
Fwd	39	2,833	47	2,912	86	5,745
Aft	39	2,834	47	2,918	86	5,752
Operational/Domestic						
Fwd	0	0	0	0	0	0
Aft	0	0	0	0	0	0
Domestic						
Fwd	2	26	5	91	7	117
Aft	2	26	5	90	7	117
Engineering (no imagery)						
Fwd	1	10	2	26	3	36
Aft	1	10	2	26	3	36
Totals						
Fwd	42	2,869	54	3,029	96	5,898
Aft	42	2,870	54	3,034	96	5,904

2. Secondary Cameras

Camera	Frames
Stellar (Mission 1038-1)	438
Index (Mission 1038-1)	438
Stellar (Mission 1038-2)	468
Index (Mission 1038-2)	468

E. Film Usage

	Film Load (TOTAL)	Pre-Flight Footage	Processed Footage
Fwd-Looking (Mission 1038-1)	16,000*	333	7,950
Aft-Looking (Mission 1038-1)	16,000*	331	7,954
Fwd-Looking (Mission 1038-2)	NA	0	8,035
Aft-Looking (Mission 1038-2)	NA	0	8,046
Stellar (Mission 1038-1)	75	15	59
Stellar (Mission 1038-2)	135	11	109
Index (Mission 1038-1)	75	12	50
Index (Mission 1038-2)	135	10	102

*Total load for both buckets.
NA - Not Applicable.

PART II. IMAGE ANALYSIS

A. Fwd-Looking Panoramic Camera

1. Density: The density of the original negative of Mission 1038 is generally medium. However, heavier densities were noted on a larger percentage of this mission than on recent missions of this system. These heavier densities are directly attributed to the heavy snow cover present in the target areas.

2. Contrast: In general, the contrast of the original negative of Mission 1038 is medium. It is comparable to previous missions of this system. The slightly heavier density of the original negative had little or no effect on the overall contrast of this mission.

3. Acuity: The imagery of the forward camera material displays degraded edge sharpness compared to that obtained from recent missions. A 20X enlargement is the maximum magnification possible without a noticeable loss of detail. Atmospherics are considered to be the major factor contributing to this degradation.

4. Imaged Degradations

a. Light Leaks: Light leak induced fog patterns are nearly identical to those observed on recent missions. There is fog present on frame 5 of most camera operations. This fog appears as a streak projecting across the width of the film approximately 4 inches from the supply end of the frame. A similar streak of fog is occasionally present about 2 inches from the take up end of frame 5 throughout the mission. The densities of these fog patterns varies with the duration of camera off periods. An illustration of these patterns is on page 10, graphic number 1.

b. Static: Very minor dendritic fog patterns resulting from static discharges are present along both edges of the film intermittently, beginning on pass 71D and continuing through the end of the mission.

c. Other: None.

5. Physical Degradations: Rail scratches are heavier than normal and continuous along both film edges throughout the mission. A crease is present along the time track edge of frame 139, pass 38D. It continues into frame 141 where it leaves the material at the time track edge. The crease extends about one quarter of an inch into the formats. Frame 142 of pass 38D contains a manufacturing splice. A similar defect has been noted on at

least one previous mission. It is explained by a mistracking of the film in the camera system resulting from a tension transient caused by splice adhesive interfering with the removal of film from the supply spool. Scratches, caused by the scan head rollers, are present intermittently within the formats throughout the mission.

The format at the camera number edge is ragged from the take up end of each frame through the second shrinkage marker. This anomaly is caused by emulsion build up on the film guide rails. The tendency for emulsion scraping on this mission is attributed largely to unpolished rails. Flight systems with serial numbers larger than J-36 (Mission 1035) have polished rails. Based on material analysis from Mission 1037 (J-38) there has been a noticeable improvement in instrument cleanliness.

6. Product Quality: The effects of the above degradations on the overall product quality are minimal.

B. Aft-Looking Panoramic Camera

1. Density: Same as reported for the forward-looking camera.

2. Contrast: Similar to the forward-looking camera.

3. Acuity: The edge sharpness of the imagery from the aft camera material is better than that from the forward camera. This condition is attributed to the use of a Wratten 23A filter on the forward-looking camera which is known to cause slightly reduced lens performance.

4. Image Degradations

a. Light Leaks: Light leak induced fog patterns are present on the first, fifth, and second to last frame of most camera operations. An illustration of these fog patterns is located on page 10, graphic number 2.

b. Static: Dendritic fog patterns resulting from static discharges are present along both edges of the film intermittently throughout the mission.

c. Other: Immediately following a manufacturing splice in frame 72, pass 73D a very fine plus density line appears about one quarter of an inch into the format from the camera number edge of the material. It is visible at varying density on all material until the next manufacturing splice in frame 47 of pass 119D. The streak was apparently caused by a defect in the film before exposure.

5. Physical Degradations: Same as reported for the forward-looking camera with the exception of the crease noted in pass 38D.

6. Product Quality: The imaged degradations listed for the aft-looking panoramic camera are generally of a minor nature and do not significantly affect the overall product quality.

C. Stellar Camera (Mission 1038-1)

1. Density: Adequate for the detection of stellar images.

2. Contrast: Adequate for the detection of stellar images.

3. Image Shape: The stellar images appear elongated rather than point type.

4. Images Per Frame: Approximately 15 stellar images can be detected in each format.

5. Flare Level: Approximately 50 percent of each format is affected by flare. Stellar images are detectable in the flared areas.

6. Image Degradations

a. Light Leaks: None noted.

b. Static: None noted.

c. Other: Frame 229 is double exposed.

7. Physical Degradations: There is a fine plus density streak parallel to the major axis of the film, between the correlation lamp and the format on the last 54 frames. The last 13 frames are affected by the usual scratches, gouges, and pinholes associated with film supply depletion.

8. Product Quality: The overall quality of the stellar record is good. No problems were encountered in the reduction process. The stellar images are clear and distinct. The stellar field provided good geometry.

D. Stellar Camera (Mission 1038-2)

1. Density: Adequate for the detection of stellar images.

2. Contrast: Adequate for the detection of stellar images.

3. Image Shape: The stellar images appear slightly elongated rather than point type.

4. Images Per Frame: Approximately 20 stellar images are detectable in each format.

5. Flare Level: Twenty percent of each format is affected by flare. However, stellar images are detectable in the flare areas.

6. Image Degradations

a. Light Leaks: None noted.

b. Static: None noted.

c. Other: Frames 4 and 16 are double exposed.

7. Physical Degradations: The last 71 frames contain a fine plus density line, parallel to the major axis of the film, between the correlation lamp and the format edge.

8. Product Quality: The overall quality of the stellar record is good. Stellar images were clear and distinct. No problems were encountered in the reduction process.

E. Index Camera (Mission 1038-1)

1. Density: The density of the photography from the index camera is generally medium.

2. Contrast: Medium.

3. Acuity: The acuity of the index record is good. However, a fall off in image quality is apparent at the format edges.

4. Imaged Degradations

a. Light Leaks: None noted.

b. Static: None noted.

c. Other: Frame 229 is double exposed.

5. Physical Degradations: None noted.

6. Product Quality: The product quality is good. The image quality is comparable to that obtained from recent missions of this system.

F. Index Camera (Mission 1038-2)

1. Density: Medium.

2. Contrast: Medium.

3. Acuity: Same as reported for 1038-1.

4. Imaged Degradations

a. Light Leaks: None noted.

b. Static: Small crescent-shaped fog patterns are present intermittently along the edge opposite the correlation lamp.

c. Other: Frames 4 and 16 are double exposed.

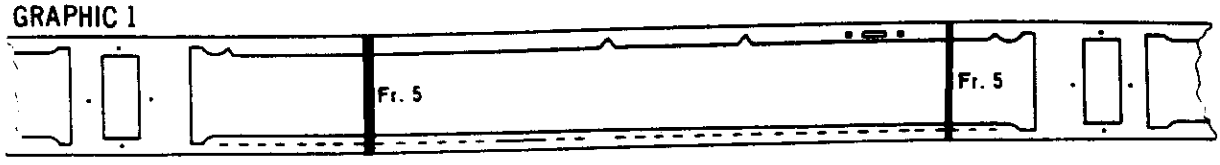
5. Physical Degradations: None noted.

6. Product Quality: The overall image quality is good and comparable to 1038-1.

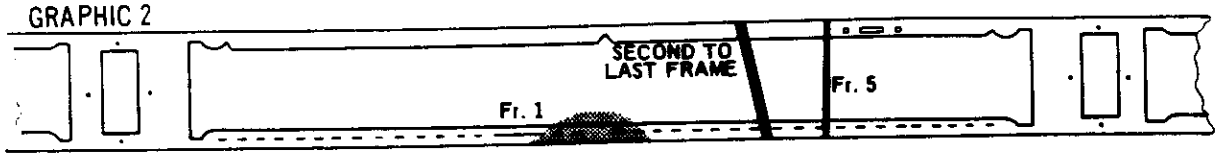
G. Graphic Display

The patterns illustrated below are referenced in the text of this report.

GRAPHIC 1



GRAPHIC 2



PART III. IMAGED AUXILIARY DATA

A. Fwd-Looking Panoramic Camera

1. Horizon Cameras

a. Starboard Looking

(1) Imagery: No veiling noted. The imagery is sharp and distinct.

(2) Fiducials: Sharp and well defined.

b. Port Looking

(1) Imagery: Good. Clear and distinct. No veiling noted.

(2) Fiducials: Sharp and well defined.

2. Frequency Marks: Operational throughout the mission.

3. Binary Time Word: All lights were of good quality. The only problems encountered were due to the drift of the binary block alignment on the special T.I. copy.

4. Binary Index: The binary index image is bloomed but readable.

5. Camera Number: The camera number image is slightly bloomed but readable.

6. Pan Geometry Dots: Not applicable.

7. Nodal Traces: Not applicable.

8. Nod Indicators: Not applicable.

B. Aft-Looking Panoramic Camera

1. Horizon Cameras

a. Starboard Looking

(1) Imagery: Veiling of the starboard-looking horizon camera imagery is present beginning on pass 5D and continuing through pass 86D where a gradual clearing begins. The imagery is cleared and sharp at the end of the mission.

(2) Fiducials: Sharp and well defined.

b. Port Looking

(1) Imagery: Sharp and well defined. No veiling noted.

(2) Fiducials: Sharp and well defined.

2. Frequency Marks: Operational throughout the mission.

3. Binary Time Word: All images of all lights are of good quality. The only problems encountered were due to the drift of the binary block alignment on the special T.I. copy.

4. Binary Index: The binary index image was bloomed but readable.

5. Camera Number: The camera number is slightly bloomed but readable.

6. Pan Geometry Dots: Not Applicable.

7. Nodal Traces: Not Applicable.

8. Nod Indicators: Not Applicable.

C. Stellar Camera (Mission 1038-1)

1. Grid Image Quality: Sharp and well defined.

2. Correlation Lamp Image Quality: Sharp and distinct.

D. Stellar Camera (Mission 1038-2)

1. Grid Image Quality: Sharp and well defined.

2. Correlation Lamp Image Quality: Sharp and distinct.

E. Index Camera (Mission 1038-1)

1. Grid Image Quality: Sharp and well defined.

2. Correlation Lamp Image Quality: Sharp and distinct.

3. Camera Number Legibility: Bloomed but readable.

F. Index Camera (Mission 1038-2)

1. Grid Image Quality: Sharp and well defined.

2. Correlation Lamp Image Quality: Sharp and distinct.

3. Camera Number Legibility: Bloomed but readable.

PART IV. MENSURATION QUALITY

A. Fwd-Looking Panoramic Camera

There were a total of 8 requests for mensuration on this mission. No problems were encountered. The image quality is considered to be fair for mensuration purposes.

B. Aft-Looking Panoramic Camera

Same as above.

PART V. FILM PROCESSING

A. Processing Machines and Process Gamma

Film	Part: Entire Mission Machine	Gamma	Part: N/A Machine	Gamma
Fwd (Mission 1038-1)	Trenton	2.22	N/A	N/A
Aft (Mission 1038-1)	Trenton	2.22	N/A	N/A
Fwd (Mission 1038-2)	Trenton	*	N/A	N/A
Aft (Mission 1038-2)	Trenton	*	N/A	N/A
Stellar (Mission 1038-1)	Yardleigh	*	N/A	N/A
Stellar (Mission 1038-2)	*	*	N/A	N/A
Index (Mission 1038-1)	Drape	1.21	N/A	N/A
Index (Mission 1038-2)	*	*	N/A	N/A

B. Processing Levels

1. Panoramic Cameras

Film	Primary	Intermediate	Full	Transition	Processing Changes
Fwd (Mission 1038-1)	2%	10%	76%	12%	30
Aft (Mission 1038-1)	1%	7%	81%	11%	23
Fwd (Mission 1038-2)	0%	10%	81%	9%	*
Aft (Mission 1038-2)	0%	24%	70%	6%	*

*Not Available.

2. Secondary Cameras

a. Stellar Cameras: No interruption in processing.

b. Index Cameras: No interruption in processing.

Film	Primary	Intermediate	Full	Transition	Processing Changes
Index (Mission 1038-1)		Not applicable.			
Index (Mission 1038-2)		Not applicable.			

C. Film Handling Summary

1. Fwd-Looking Camera

a. Capsule De-Filming

(1) Mission 1038-1: Accomplished without incident.

(2) Mission 1038-2: Accomplished without incident.

b. Pre-Processing Inspection

(1) Mission 1038-1: No problems encountered.

(2) Mission 1038-2: No problems encountered.

c. Manufacturing Splices

(1) Mission 1038-1: Pass 38D, frame 142; pass 11D, frame 29.

(2) Mission 1038-2: Pass 86D, frame 23; pass 125D, frame 30; pass 37D, frame 34.

d. Processing Splices

(1) Mission 1038-1: None.

(2) Mission 1038-2: None.

e. Manufacturing Defects

(1) Mission 1038-1: None noted.

(2) Mission 1038-2: None noted.

f. Processing Anomalies

The end of pass marker, on both panoramic camera records, appears at the beginning of each camera operation rather than at the end. This anomaly caused a few incorrect cuts during processing breakdown.

g. Breakdown: No problems encountered.

2. Aft-Looking Camera

a. Capsule De-Filming

(1) Mission 1038-1: Accomplished without incident.

(2) Mission 1038-2: Accomplished without incident.

b. Pre-Processing Inspection

(1) Mission 1038-1: No problems encountered.

(2) Mission 1038-2: No problems encountered.

c. Manufacturing Splices

(1) Mission 1038-1: Pass 36D, frame 11.

(2) Mission 1038-2: Pass 73D, frame 72.

d. Processing Splices

(1) Mission 1038-1: None.

(2) Mission 1038-2: None.

e. Manufacturing Defects

(1) Mission 1038-1: None noted.

(2) Mission 1038-2: None noted.

f. Processing Anomalies

The end of pass marker, on both panoramic camera records, appears at the beginning of each camera operation rather than at the end. This anomaly caused a few incorrect cuts during processing breakdown.

g. Breakdown: No problems encountered.

3. Index Camera

a. Capsule De-Filming

(1) Mission 1038-1: Accomplished without incident.

(2) Mission 1038-2: Accomplished without incident.

b. Pre-Processing Inspection

(1) Mission 1038-1: No problems encountered.

(2) Mission 1038-2: No problems encountered.

c. Manufacturing Splices

(1) Mission 1038-1: None.

(2) Mission 1038-2: None.

d. Processing Splices

(1) Mission 1038-1: None.

(2) Mission 1038-2: None.

e. Manufacturing Defects

(1) Mission 1038-1: None.

(2) Mission 1038-2: None.

f. Processing Anomalies: None.

g. Breakdown: Normal.

4. Stellar Camera

a. Capsule De-Filming

(1) Mission 1038-1: Accomplished without incident.

(2) Mission 1038-2: Accomplished without incident.

b. Pre-Processing Inspection

(1) Mission 1038-1: No problems encountered.

(2) Mission 1038-2: No problems encountered.

c. Manufacturing Splices

(1) Mission 1038-1: None.

(2) Mission 1038-2: None.

d. Processing Splices

(1) Mission 1038-1: None.

(2) Mission 1038-2: None.

e. Manufacturing Defects

(1) Mission 1038-1: None.

(2) Mission 1038-2: None.

f. Processing Anomalies: None.

g. Breakdown: Normal.

D. Timetable

Film	Recovered	Received at Processing Site	*Spec Ship at NPIC Recd	Priority 1A at NPIC Recd
Fwd (Mission 1038-1)	2343Z/19 Jan 67	0100Z/20 Jan 67	None	2315Z/22 Jan 6
Aft (Mission 1038-1)	" "	" "	"	" "
Stellar (Mission 1038-1)	" "	" "	"	" "
Index (Mission 1038-1)	" "	" "	"	" "
Fwd (Mission 1038-2)	2327Z/26 Jan 67	1510Z/27 Jan 67	"	0215Z/31 Jan 6
Aft (Mission 1038-2)	" "	" "	"	" "
Stellar (Mission 1038-2)	" "	" "	"	" "
Index (Mission 1038-2)	" "	" "	"	" "

*There was no special shipment associated with this mission.

PART VI. PI SUITABILITY

A. Definition of Photographic Interpretation (PI) Suitability

The 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 categorized as 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 the 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 degradation 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 and/or highlight areas. Detection and identification of small objects are possible, but accuracy of mensuration is reduced by the fall-off in image quality and the less-than-optimum contrast that prevails.

Poor: Camera-induced degradations and/or weather limitations severely reduce the effectiveness of the photography. Definition of edges and corners is not sharp. 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.

B. PI Statistics

1. Target Coverage

	Mission 1038-1	Mission 1038-2	Totals
Priority 1 Targets Programmed	164	172	336
Priority 1 Targets Covered	121	107	228

2. PI Quality Appraisal

Rating	Missiles	Nuclear Energy	Air Facilities	Ports	Elect Commo	Military Activity	Complex
Good	12	0	11	0	0	29	2
Fair	35	7	20	3	0	36	6
Poor	22	0	28	0	1	15	0
Totals	69	7	59	3	1	80	8

3. Summary of PI Quality Ratings (Percentage)

Good: 54 or 23.8%
Fair: 107 or 47.1%
Poor: 66 or 29.1%
227

64
7
57
3
1
80
15
227

C. PI Comments

1. Atmospheric Attenuation

The following list is a weather analysis of the 228 priority 1 targets taken from the OAK report.

Clear	165 or 72.3 percent
Scattered Clouds	33 or 14.5 percent
Heavy Clouds	13 or 5.7 percent
Haze	15 or 6.6 percent
Cloud Shadow	2 or 0.9 percent

2. Terrain Conditions

The terrain conditions on this mission are normal for this time of year with a slightly higher percentage of snow covered terrain.

3. Product Interpretability

The interpretability of the photography from this mission was reported as being fair to poor by the photo interpreters. A 20X enlargement was the maximum magnification obtained without a considerable loss in acuity.

4. Resolution Target Analysis

RESOLUTION TARGET DATA

	A	A1	B	B1	C	C1	D	D1
Target Designator	No targets covered.							
Camera (Looking)								
Pass								
Frame								
Date of Photography								
Universal Grid Coordinates								
Geographic Coordinate of Format Center								
Altitude (ft)								
Camera								
Pitch (deg)								
Roll (deg)								
Yaw (deg)								
Local Sun Time								
Solar Elevation (deg)								
Solar Azimuth (deg)								
Exposure (fraction of second)								
Processing Level								
Vehicle Azimuth (deg)								
Filter (Wratten)								
Target Type								
Target Contrast								
Weather Conditions								

GROUND RESOLUTION IN FEET AS DETERMINED FROM THE ORIGINAL NEGATIVE

Target Designator	Observer Number 1		Observer Number 2		Observer Number 3	
	Along Track	Across Track	Along Track	Across Track	Along Track	Across Track
A						
A1						
B						
B1						
C						
C1						

PART VII. MISSION DATA

	Pan	Master Take-up Horizon	Master Supply Horizon	Slave Pan	Slave Take-up Horizon	Slave Supply Horizon	Mission 1038-1 Stellar	Mission 1038-1 Index	Mission 1038-2 Stellar	Mission 1038-2 Index
Camera Number	192	NA	NA	193	NA	NA	D93/86/112		D90/111/108	
Peseau Number	NA	NA	NA	NA	NA	NA	112	86	108	111
Lens Serial Number	1792435	12881	12858	1982435	12852	12857	11910	819192	10742	819958
Slit Width	.225	NA	NA	.175	NA	NA	NA	NA	NA	NA
Aperture	NA	F8.0	F6.3	NA	F6.3	F8.0	F1.8	F4.5	F1.8	F4.5
Exposure Time (sec)	NA	1/100	1/100	NA	1/100	1/100	2.0	1/500	2.0	1/500
Filter (Wratten)	23A	25	25	21	25	25	NA	21	NA	21
Focal Length (mm)	609.602	54.93	55.00	609.602	55.00	55.00	84	38.54	84	38.54
Film Length (ft)	16,000	NA	NA	16,000	NA	NA	75	135	75	135
Splices	5	NA	NA	4	NA	NA	0	0	0	0
Emulsion	268-6-10-6	NA	NA	268-6-10-6	NA	NA	151-48-4-6	116-8-5-6	151-48-4-6	116-8-5-6
Film Type	3404	NA	NA	3404	NA	NA	3401	3400	3401	3400
Resolution Data (L/mm)										
Static										
High Contrast	262	NA	NA	265	NA	NA	NA	72 (A)	NA	70 (A)
Low Contrast	157	NA	NA	152	NA	NA	NA	NA	NA	NA
Dynamic										
I High Contrast	181	NA	NA	201	NA	NA	NA	NA	NA	NA
I Low Contrast	118	NA	NA	123	NA	NA	NA	NA	NA	NA
P High Contrast	169	NA	NA	165	NA	NA	NA	NA	NA	NA
P Low Contrast	108	NA	NA	118	NA	NA	NA	NA	NA	NA

NA - Not Applicable.
A - AWAR.