TECHNICAL PUBLICATION

PHOTOGRAPHIC EVALUATION REPORT

MISSION 1040

[redacted]
MAY 1967
COPY [redacted]
35 PAGES

This document contains information referring to Project Corona

Notice of Missing Page(s)

Pages ii, iv, and xii of the original document were blank and unnumbered.

TECHNICAL PUBLICATION

PHOTOGRAPHIC EVALUATION REPORT

MISSION 1040

MAY 1967

NATIONAL PHOTOGRAPHIC INTERPRETATION CENTER

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1039		None
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[redacted]

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	The distance between 2 exposure stations. (Points in space occupied by the camera lens at the moment of exposure.)
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.

[redacted]

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.

[redacted]

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+.

[redacted]

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.
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 coincident with the optical axis of the lens.
PROCESSING LEVEL	Degree of development. Three levels of processing are currently employed--primary, intermediate, and full.

[redacted]

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."

SYNOPSIS

Mission 1040 was launched on 30 March 1967 at 1854Z. Both capsules were recovered dry, the first at 2117Z on 4 April 1967 and the second at 2124Z on 8 April 1967. A total of 78 operational, 9 domestic, and 2 engineering passes was accomplished on the 9-day mission.

Mission 1040 was flown with the vehicle moving nose forward through orbit instead of in the usual tail-first manner of flight. The reason for this change was a faulty yaw-around programmer. As a result, the following variations in normal system parameters should be noted.

1. At the descending node, the stellar camera now looks westward instead of eastward.

2. The master panoramic camera, instrument 196, is the aft-looking camera and the slave panoramic camera, instrument 197, is the fwd-looking camera.

All cameras operated satisfactorily throughout the mission. Fog patterns on the panoramic camera material are minor and similar to those reported on recent missions of this system.

The best image quality on this mission is comparable to the best obtained by recent missions; however, the overall quality is affected by an intermittent band of image smearing in the flight direction on both panoramic camera records. This area is about 1.5 inches wide, starting 3.5 inches from the take-up end of the frame. It is present on about 30 percent of the frames.

The stellar/index cameras functioned properly. No major degradations were noted. However, the flare level on the stellar record of bucket "A" is lower than normal. As a result, about 30 percent of the reseau grid is not detectable. The index camera produced good quality imagery.

[redacted]

PART I. GENERAL SYSTEM INFORMATION

A. Camera Numbers

Forward-Looking Panoramic Camera 197
Aft-Looking Panoramic Camera 196
Stellar/Index Camera (Mission 1040-1) D78/95/96
Stellar/Index Camera (Mission 1040-2) D92/79/110

B. Launch and Recovery Dates

	Mission 1040-1	Mission 1040-2
Launch	30 Mar 67/1854Z	--
Recovery	4 Apr 67/2117Z	8 Apr 67/2124Z

C. Orbit Elements

Element	Planned	Actual 1040-1 (42D)	Actual 1040-2 (110D)	Photo Range
Period (min)	NA	90.265	90.901	*
Perigee (nm)	NA	99.668	100.603	99.656 (Rev No 54D)
Apogee (nm)	NA	214.130	210.450	155.213 (Rev No 109D)
Eccentricity	NA	0.01591	0.01529	*
Inclination (deg)	NA	85.054	85.054	*
Perigee Latitude	NA	28.271 deg N	45.391 deg N	*

NA - Not Available.
* - Not Applicable.

[redacted]

D. Photographic Operations

1. Panoramic Cameras

Type	Mission 1040-1 Revs	Mission 1040-1 Frames	Mission 1040-2 Revs	Mission 1040-2 Frames	Total Revs	Total Frames
Operational						
Fwd	40	2,596	38	3,097	78	5,693
Aft	40	2,640	37	3,014	77	5,654
Operational/Domestic						
Fwd	0	-	1	50	1	50
Aft	0	-	1	50	1	50
Domestic						
Fwd	4	127	5	60	9	187
Aft	4	129	4	47	8	176
Engineering (no imagery)						
Fwd	1	11	1	4	2	15
Aft	1	11	1	4	2	15
Totals						
Fwd	45	2,734	45	3,211	90	5,945
Aft	45	2,780	43	3,115	88	5,895

2. Secondary Cameras

Camera	Frames
Stellar (Mission 1040-1)	439
Index (Mission 1040-1)	439
Stellar (Mission 1040-2)	498
Index (Mission 1040-2)	498

[redacted]

E. Film Usage

	Film Load (Total)	Pre-Flight Footage	Processed Footage
Fwd-Looking (Mission 1040-1)	16,000*	397.0	7,650
Aft-Looking (Mission 1040-1)	16,000*	391.5	7,780
Fwd-Looking (Mission 1040-2)	NA	NA	8,347
Aft-Looking (Mission 1040-2)	NA	NA	8,226
Stellar (Mission 1040-1)	75	2.08	55
Stellar (Mission 1040-2)	135	10.0	67
Index (Mission 1040-1)	75	4.16	114
Index (Mission 1040-2)	135	8.7	117

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

[redacted]

PART II. IMAGE ANALYSIS

A. Fwd-Looking Panoramic Camera

1. Density: Sixty percent of the forward-looking camera material is of medium density.

2. Contrast: The contrast is medium with approximately 40 percent of the mission falling in the low and high categories.

3. Acuity: The edge sharpness of the imagery is generally good; however, a band of image smearing in the flight direction is present on both panoramic camera records. It occurs intermittently, and is located 3.5 inches from the take-up end of the frame. The area is about 1.5 inches wide, is perpendicular to the major axis of the film, and extends from format edge to format edge. This anomaly appears to be caused by an obstruction to the field flattener movement, resulting in a deflection of the lens cone and/or lens perpendicular to the scan direction. This band of smeared imagery appears on approximately 30 percent of the frames of this mission.

4. Imaged Degradations

a. Light Leaks: Light leak induced fog is present on the first frame and second to last frame of most camera operations. (See Graphic No 1). These fog patterns are minor and their density varies with camera off durations.

b. Static: None noted except that associated with manufacturing splices.

c. Other: Parallel minus density streaks, generally in groups of 3, are present on most frames of the forward-looking camera. They are approximately one-sixteenth to one-eighth inch wide and follow the path of the field flattener, along the scan direction. The streaks are out of focus and appear to be the result of dirt particles on the front surface of the sixth element.

5. Physical Degradation: Rail scratches are present throughout the mission. A small impression, spaced at 6.25 inch intervals, three-quarters of an inch from the camera number edge is present throughout the forward-looking camera record. The impression originates from the base side of the film, causing a small minus density spot, and at times is severe enough to crack the emulsion. It diminishes gradually until it is barely detectable at the end of the mission.

6. Product Quality: The imaged degradations and physical degradations noted above are minor and do not affect the overall product quality.

B. Aft-Looking Panoramic Camera

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

2. Contrast: Same as reported for the forward-looking camera.

3. Acuity: Same as reported for the forward-looking camera.

4. Imaged Degradations

a. Light Leaks: Minor fog patterns are present on the fifth frame and the next-to-last frame of most camera operations. (See Graphic No 2). The density of these patterns is commensurate with camera off durations.

b. Static: Same as reported for the forward-looking camera.

c. Other: A minus density streak up to 0.25 inch wide occurs intermittently but frequently throughout the mission. This streak appears along the scan direction and follows the path of the field flattener. It appears to be caused by a foreign particle which was randomly in contact with the field flattener.

5. Physical Degradations: Rail scratches are present along both film edges throughout the mission.

6. Product Quality: Same as reported for the forward-looking camera.

C. Stellar Camera (Mission 1040-1)

1. Density: The density of the original negative is lower than that experienced on recent missions. Due to this lower density, approximately 30 percent of the reseau grid is not detectable.

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

3. Image Shape: The stellar images appear as point type images.

4. Images Per Frame: There are 20 or more stellar images on each frame.

5. Flare Level: Twenty percent of each frame is affected by flare; however, the flare level is less dense than on previous missions.

6. Image Degradations

a. Light Leaks: None noted.

b. Static: Edge fog is present along both film edges throughout the mission.

c. Other: None.

7. Physical Degradations: None noted.

8. Product Quality: The product quality is good. No problems were encountered in the data reduction process.

D. Stellar Camera (Mission 1040-2)

1. Density: Adequate to detect stellar images.

2. Contrast: Adequate to detect stellar images.

3. Image Shape: The stellar images appear as point type images.

4. Images Per Frame: Twenty or more stellar images are present on each frame.

5. Flare Level: Approximately 25 percent of each format is affected by flare. The flare level is sufficient to expose the entire grid.

6. Image Degradation

a. Light Leaks: None noted.

b. Static: Edge fog is present along both edges of the film.

c. Other: Two plus density lines appear parallel to the major axis of the film, in the border, along the camera number edge throughout the mission.

7. Physical Degradations: Irregular plus density spots occur intermittently along the edge opposite the camera number. The spots appear to be caused by moisture which affected the material before processing.

8. Product Quality: The product quality is good with the exception of the above-mentioned plus density spots. No problems were encountered in the data reduction process.

E. Index Camera (Mission 1040-1)

1. Density: Medium.

2. Contrast: Medium.

3. Acuity: Good. Comparable to recent missions.

4. Image Degradations

a. Light Leaks: None noted.

b. Static: None noted.

c. Other: None noted.

5. Physical Degradations: None noted.

6. Product Quality: Good.

F. Index Camera (Mission 1040-2)

1. Density: Medium.

2. Contrast: Medium.

3. Acuity: Good. Comparable to recent missions.

4. Imaged Degradations: None noted.

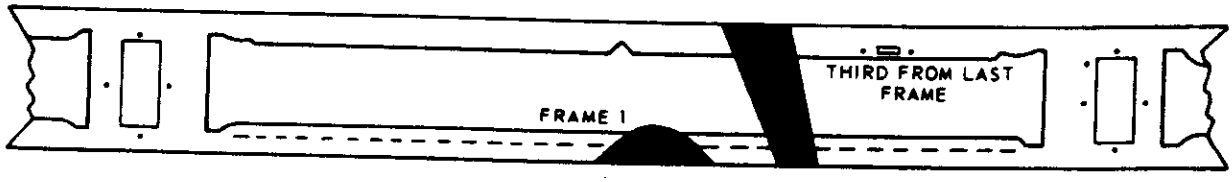
5. Physical Degradations: None noted.

6. Product Quality: Good.

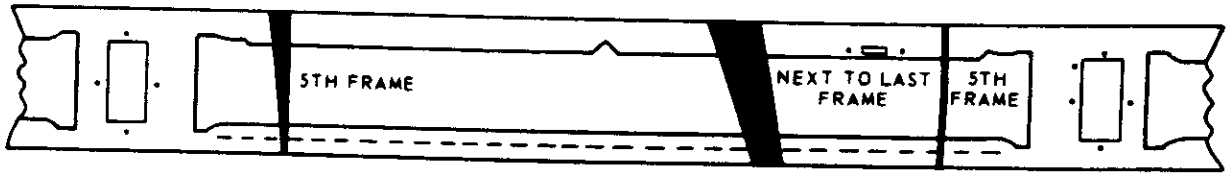
G. Graphic Display

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

GRAPHIC 1



GRAPHIC 2



[redacted]

PART III. IMAGED AUXILIARY DATA

A. Fwd-Looking Panoramic Camera

1. Horizon Cameras

a. Starboard-Looking

(1) Imagery: Clear and distinct.

(2) Fiducials: Sharp and well defined.

b. Port-Looking

(1) Imagery: Clear and distinct.

(2) Fiducials: Sharp and well defined.

2. Frequency Marks: Sharp and well defined.

3. Binary Time Work: No problems encountered.

4. Binary Index: Slightly bloomed but readable.

5. Camera Number: 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: Clear and distinct.

(2) Fiducials: Sharp and well defined.

b. Port-Looking

(1) Imagery: Sharp and well defined.

[redacted]

(2) Fiducials: Clear and distinct.

2. Frequency Marks: Sharp and well defined.

3. Binary Time Work: No problems encountered.

4. Binary Index: Slightly bloomed but readable.

5. Camera Number: Bloomed but readable.

6. Pan Geometry Dots: Not applicable.

7. Nodal Traces: Not applicable.

8. Nod Indicators: Not applicable.

C. Stellar Camera (Mission 1040-1)

1. Grid Image Quality: Thirty percent of the grid is not detectable due to low earth flare density.

2. Correlation Lamp Image Quality: Good.

D. Stellar Camera (Mission 1040-2)

1. Grid Image Quality: Sharp and well defined.

2. Correlation Lamp Image Quality: Good.

E. Index Camera (Mission 1040-1)

1. Grid Image Quality: Sharp and distinct.

2. Correlation Lamp Image Quality: Good.

3. Camera Number Legibility: Good.

F. Index Camera (Mission 1040-2)

1. Grid Image Quality: Sharp and distinct.

2. Correlation Lamp Image Quality: Good.

3. Camera Number Legibility: Good.

PART IV. MENSURATION QUALITY

A. Fwd-Looking Panoramic Camera

No problems were encountered in mensuration. The image quality is considered normal for measuring purposes. A total of 19 requests for mensuration was handled by the photogrammetric branch.

B. Aft-Looking Panoramic Camera

Same as above.

PART V. FILM PROCESSING

A. Processing Machines and Processing Gamma

Film	Part: Entire Mission Machine	Gamma	Part: * Machine	Gamma
Fwd (Mission 1040-1)	Trenton	2.37	*	*
Aft (Mission 1040-1)	Trenton	2.35	*	*
Fwd (Mission 1040-2)	Trenton	2.24	*	*
Aft (Mission 1040-2)	Trenton	2.28	*	*
Stellar (Mission 1040-1)	Yardleigh	1.77	*	*
Stellar (Mission 1040-2)	Yardleigh	1.84	*	*
Index (Mission 1040-1)	Drape	1.28	*	*
Index (Mission 1040-2)	Drape	1.26	*	*

B. Processing Levels

1. Panoramic Cameras

Film	Primary	Intermediate	Full	Transition	Processing Changes
Fwd (Mission 1040-1)	13%	25%	62%	NA	58
Aft (Mission 1040-1)	10%	44%	46%	NA	57
Fwd (Mission 1040-2)	6%	30%	64%	NA	NA
Aft (Mission 1040-2)	2%	34%	64%	NA	NA

NA - Not Available.
* - Not Applicable.

2. Secondary Cameras

a. Stellar Cameras: No interruption in processing.

b. Index Cameras: No interruption in processing.

[redacted]

Film	Primary	Intermediate	Full	Transition	Processing Changes
Index (Mission 1040-1)	Not applicable.				
Index (Mission 1040-2)	Not applicable.				

C. Film Handling Summary

1. Fwd-Looking Camera

a. Capsule De-Filming

(1) Mission 1040-1: At approximately 2,000 feet from the tail of the forward-looking camera record, a momentary flash of moderate intensity light filled the pre-splice room. The flash appeared to originate from the capsule. An inspection of the film at this point revealed a severe positive curl the size and shape of a half dollar. There were no other unusual occurrences during defilming.

(2) Mission 1040-2: Normal.

b. Pre-Processing Inspection

(1) Mission 1040-1: Normal.

(2) Mission 1040-2: Normal.

c. Manufacturing Splices

(1) Mission 1040-1: Frame 71, Pass 38D.

(2) Mission 1040-2: Frame 66, Pass 100D.

d. Processing Splices

(1) Mission 1040-1: Only those normal to the breakdown procedure.

(2) Mission 1040-2: Only those normal to the breakdown procedure.

e. Manufacturing Defects

(1) Mission 1040-1: None noted.

(2) Mission 1040-2: None noted.

f. Processing Anomalies

The forward roll was cut after processing 5,200 feet to determine if the processor was causing the impression mentioned under physical degradation in Part II of this report. A piece of reverse scratch check was attached to the balance of the roll in the processor which, upon inspection, showed no sign of the impression. After examining the processor in white light, another scratch test was run. It did not contain the impression, and therefore the balance of the mission was committed to the processor. The remainder of the roll contained the impression. It was decided that the impression was caused prior to processing. The roll was cut in frame 52 of pass 53D.

g. Breakdown: No problems encountered.

2. Aft-Looking Camera

a. Capsule De-Filming

(1) Mission 1040-1: Normal.

(2) Mission 1040-2: Normal.

b. Pre-Processing Inspection

(1) Mission 1040-1: Normal.

(2) Mission 1040-2: Normal.

c. Manufacturing Splices

(1) Mission 1040-1: Frame 16, Pass 45D.

(2) Mission 1040-2: Frame 29, Pass 87D, Frame 164, Pass 133D.

d. Processing Splices

(1) Mission 1040-1: None other than normal.

(2) Mission 1040-2: None other than normal.

e. Manufacturing Defects

(1) Mission 1040-1: None noted.

(2) Mission 1040-2: None noted.

f. Processing Anomalies: None.

g. Breakdown: No problems encountered.

3. Index Camera

a. Capsule De-Filming

(1) Mission 1040-1: No problems.

(2) Mission 1040-2: No problems.

b. Pre-Processing Inspection

(1) Mission 1040-1: Normal.

(2) Mission 1040-2: Normal.

c. Manufacturing Splices

(1) Mission 1040-1: None.

(2) Mission 1040-2: None.

d. Processing Splices

(1) Mission 1040-1: None other than those normal to processing.

(2) Mission 1040-2: None other than those normal to processing.

e. Manufacturing Defects

(1) Mission 1040-1: None noted.

(2) Mission 1040-2: None noted.

f. Processing Anomalies: None.

g. Breakdown: Normal.

4. Stellar Camera

a. Capsule De-Filming

(1) Mission 1040-1: No problems encountered.

(2) Mission 1040-2: No problems encountered.

b. Pre-Processing Inspection

(1) Mission 1040-1: Normal.

(2) Mission 1040-2: Normal.

c. Manufacturing Splices

(1) Mission 1040-1: None.

(2) Mission 1040-2: None.

d. Processing Splices

(1) Mission 1040-1: None.

(2) Mission 1040-2: None.

e. Manufacturing Defects

(1) Mission 1040-1: None noted.

(2) Mission 1040-2: None noted.

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 1040-1)	2117Z/4 Apr 67	1310Z/5 Apr 67	None	2243Z/7 Apr 67
Aft (Mission 1040-1)	"	"	"	"
Stellar (Mission 1040-1)	"	"	"	"
Index (Mission 1040-1)	"	"	"	"
Fwd (Mission 1040-2)	2124Z/8 Apr 67	1410Z/9 Apr 67	"	0109Z/12 Apr 67
Aft (Mission 1040-2)	"	"	"	"
Stellar (Mission 1040-2)	"	"	"	"
Index (Mission 1040-2)	"	"	"	"

*Special Shipment Explanation: There was no special handling 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.

[redacted]

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

B. PI Statistics

1. Target Coverage

	Mission 1040-1	Mission 1040-2	Totals
Priority 1 Targets Programmed	94	138	232
Priority 1 Targets Covered	59	82	141

2. PI Quality Appraisal

Rating	Missiles	Nuclear Energy	Air Facilities	Ports	Elect/ Commo	Military Activity	Complex
Good	6	0	4	0	0	3	0
Fair	46	1	10	0	0	6	0
Poor	40	5	8	3	0	9	0
Totals*	92	6	22	3	0	18	0

3. Summary of PI Quality Ratings (Percentage)

Good: 13 or 9.2%
Fair: 63 or 44.7%
Poor: 65 or 46.1%

*A discrepancy exists between the total number of targets covered and the total PI reports because several targets are covered more than once.

C. PI Comments

1. Atmospheric Attenuation: Listed below is the photo interpreters' report of weather conditions for the priority one targets covered on this mission.

a. Clear: 65 or 46.1 percent.
b. Scattered Clouds: 46 or 32.6 percent.
c. Heavy Clouds: 17 or 12.1 percent
d. Haze: 13 or 9.2 percent.
e. Cloud Shadow: 0.

2. Terrain Conditions

The terrain conditions were good for interpretation purposes. Less snow covered areas were noticed on this mission than on the previous 2 missions.

3. Product Interpretability

The PI suitability for both parts of Mission 1040 is fair to good. The photo interpreters originally reported the imagery as being fuzzy in areas away from the format center. However, these areas were correlated with the image smearing reported in Part II of this report.

4. Resolution Target Analysis

RESOLUTION TARGET DATA

Target Designator	A	A1	B	B1	C	C1	D	D1
Camera (Looking)	None covered.							
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						

TOP SECRET
CORONA
NO FOREIGN DISSEM

PART VII. MISSION DATA

	Pan	Master Take-up Horizon	Master Supply Horizon	Slave Pan	Slave Take-up Horizon	Slave Supply Horizon	Mission 1040-1 Stellar	Mission 1040-1 Index	Mission 1040-2 Stellar	Mission 1040-2 Index
Camera Number	196	NA	NA	197	NA	NA	D78/95/96		D92/79/110	
Recon. Number	NA	NA	NA	NA	NA	NA	96	95	110	79
Lens Serial Number	162435	12847	12851	197245	12994	12901	10757	819189	12000	820193
Slit Width (in)	.175	NA	NA	.225	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	1.0	1/500	2.0	1/500
Filter (Wratten)	21	25	25	23A	25	25	None	21	None	21
Focal Length (mm)	609.602	55.00	54.00	609.627	55.00	54.94	84 nominal	38.5	84 nominal	38.48
Film Length (ft)	16,000	NA	NA	16,000	NA	NA	75	135	75	135
Splices	2	NA	NA	3	NA	NA	None	None	None	None
Emulsion	276-2-1-7	NA	NA	276-2-1-7	NA	NA	169-49-7-6	122-6-7-6	169-49-7-6	122-6-7-6
Film Type	3404	3404	3404	3404	3404	3404	3401	3400	3401	3400
Resolution Data (l/mm)										
Static										
High Contrast	[illegible]	*	*	259	*	*	*	AWAR 73	*	AWAR 72
Low Contrast	158	*	*	156	*	*	*	*	*	*
Dynamic										
I High Contrast	201	*	*	140	*	*	*	*	*	*
I Low Contrast	122	*	*	119	*	*	*	*	*	*
F High Contrast	167	*	*	187	*	*	*	*	*	*
F Low Contrast	110	*	*	116	*	*	*	*	*	*

*Not Available.
NA - Not Applicable.

[redacted]