

TECHNICAL PUBLICATION

PHOTOGRAPHIC EVALUATION REPORT
MISSION 1023-1
17-22 AUGUST 1965
MISSION 1023-2
23-26 AUGUST 1965

DECEMBER 1965

NATIONAL PHOTOGRAPHIC INTERPRETATION CENTER

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SYNOPSIS

Mission 1023 (J-23) was launched 17 August 1965 at 2100Z. The initial phase, designated Mission 1023-1, accomplished 37 photographic revolutions, which included 6 domestic (North American Continent) and 3 engineering (dark side) passes. Air retrieval of the payload was executed on 22 August 1965 and second-phase operations were initiated with no intervening deactivation period. Mission 1023-2 also accomplished 37 photographic revolutions, including 3 engineering passes, but domestic coverage increased to 8 passes. Air recovery of the second payload on 26 August 1965 terminated the mission.

The master (fwd) panoramic camera failed to operate during passes 103D-132D but resumed operation at the end of pass 133D and functioned normally through pass 135D, the last operational sequence performed by this instrument. Monoscopic coverage was acquired by the slave (aft) camera during the master instrument's inactive periods. The slave unit functioned through pass 142D.

Missions 1023-1 and 1023-2 were assigned MIP ratings of 85. However, the master panoramic record contains small out-of-focus areas in each format, similar to those noted in a number of recent missions. In this case, the out-of-focus condition is observed on the frequency mark edge of each master panoramic frame but is limited to relatively small areas at the supply and/or take-up ends. Consequently, the overall degradation is relatively minor.

Clouds obscured 35 percent of the terrain covered in Mission 1023-1 and 34 percent in Mission 1023-2.



GENERAL FLIGHT DATA

Launch Date, Mission 1023-1	17 August 1965
Recovery Date, Mission 1023-1	22 August 1965
Activation Date, Mission 1023-2	23 August 1965
Recovery Date, Mission 1023-2	26 August 1965

Orbital Parameters

Mission	1023-1	1023-2
Revolution Number	40	105
Date	20 August 1965	24 August 1965
Period	90.38 Min	90.29 Min
Perigee	97.8 nm	98.54 nm
Apogee	223.8 nm	220.66 nm
Eccentricity	0.0175	0.0170
Inclination Angle	70.039° N	70.040° N

Photographic Operations

Mission	1023-1	1023-2
Operational Passes	28	26
Domestic Passes	6	8
Engineering Passes	3	3
Recovery Revolutions	81	144



PART I. CAMERA OPERATION

1. Master (Fwd) Panoramic Camera No 170

A probable electro-mechanical malfunction interrupted camera operation after pass 101D. The instrument functioned briefly during the final phase of pass 102D (only the last 34 frames were acquired) then failed again and remained dormant until just prior to the conclusion of pass 133D, when it recorded the last 2 frames. Operation was normal through passes 134D and 135D, the last photographic sequences obtained with this camera.

A small out-of-focus area is present at the supply and/or take-up ends of the frequency mark edge of each format. Similar conditions have been reported in the evaluation of a number of recent missions. However, unlike previous investigations which indicated an apparent connection between format pitch (alignment on the film stock) and the absence or presence of out-of-focus areas within the formats, examination of this material reveals that there are no perceptible pitch variations or misalignments. The pitch is stabilized at 0.265 inches (take-up end) and 0.220 inches (supply end) throughout the film. Departures from those values are so small and infrequent that no significance is attached to them. Consequently, there is no ready explanation for the presence of the degraded areas.

The first well-defined example of the out-of-focus condition is observed in pass 21D, frame 94, where several villages or small towns are present in the affected area at the supply end of the format. Previous passes offer little opportunity to detect the degradation, due to cloud cover, unfavorable solar elevations, and lack of culture. However, close examination of the photography indicates that the anomaly is present to some degree from the start of the mission.

The out-of-focus area in pass 21D, frame 94, is typical of the degradation found throughout the material acquired in this mission. The affected area measures approximately 3 inches along the edge of the format from a point located 1 inch from the end of the frame. The deepest penetration into the imagery seldom exceeds 0.15 inches at any place along the contour of the degradation within the format. Consequently, degradation is minor with reference to its effect on the photography as a whole. However, regardless of the physical extent of the degradation, the presence of an unexplained out-of-focus condition is disturbing.

An excellent example of a similarly-degraded area at the take-up ends of the formats is observed in pass 87D, frame 91. In this case, some degradation is also noted at supply but the condition appears to

be more prominent at take-up. There are indications that the severity of the degradation at the supply ends decreased gradually as the film was expended in Mission 1023-1 and emphasis shifted to the take-up ends in Mission 1023-2. Again, measurement of the format pitch values reveals no change or instability.

A narrow, transverse light trace extends from edge to edge across the take-up end of the fifth frame following most of the camera-on sequences in the mission. In a few cases, this light trace is observed at supply of the fourth frame after camera-on or between the fourth and fifth frames. A rare exception is noted in pass 47DE, where the trace strikes across take-up of the second frame at the head of the pass record. The fifth-from-last frames of most of the pass records acquired in Mission 1023-1 contain areas of uniform fog, approximately 6 inches wide, near the frame centers. These uniform fog patches are seldom present in the second-phase material. A splash-type light trace appears in a few pass records, usually in the second-from-last or next-to-last frames. Examples of this are found in passes 26D, 42D, 47DE, and 50D.

2. Slave (Aft) Panoramic Camera No 171

The camera was operational throughout the mission and photography was acquired through revolution 142. No out-of-focus areas are detectable in this material. Degradations are confined to relatively minor minus-density streaks and light traces, as follows:

An irregularly-configured minus-density streak is present intermittently. The streak varies in length and location. Examples are found in pass 5D, frame 18 and pass 53D, frame 15. Fine, linear, minus-density streaks, parallel to the major film axis and to each other, are detectable in the thin-to-medium density areas of a number of passes. These streaks are first observed in pass 8D and intermittently thereafter, but it is probable that they are present throughout the film and are noted only where the density of the material facilitates their detection.

A light trace is present in the first frame of a few pass records, such as 8D and 24D. The sixth-from-last frame of most passes contains a light trace at take-up, which occasionally is observed in the preceding frame at the supply end of the format or between those 2 frames. Examples are found in pass 2D, frame 30 and pass 26D, frame 69. A narrow, diagonal light trace strikes across the next-to-last frame in a few passes. A splash-type light trace, similar to that noted in the master material, signals the impending camera-off action at the end of most of the passes. This trace is generally observed between the second and third frames from the last and is quite prominent. It is also present prior to a camera-off action within a pass but is considerably more difficult to detect at that position. Good examples of this light trace



are found in pass 40D between frames 142/143 and in pass 31D, frames 23/24.

3. Master (Fwd) Horizon Cameras

The port (supply) and starboard (take-up) horizon cameras were operational throughout the mission except during passes 103D-133D when the master instrument failed to perform. In general, the quality of the horizon imagery is good. Exposure was satisfactory except where low solar elevations prevailed.

4. Slave (Aft) Horizon Cameras

The port (take-up) and starboard (supply) horizon cameras were operational throughout the mission. Image quality is good. Exposure was adequate except where low solar elevations precluded effective horizon photography.

5. Stellar Camera No D17/Reseau No 82 (Mission 1023-1)

The instrument was operational throughout the mission. At least 30 stellar images were recorded in each format. The stellar field change from pass to pass is minimal and geometric distribution of the images is good but flare restricts accurate mensuration to less than half of the format area in more than 50 percent of the frames. However, the quality of the stellar images outside of the flared areas is excellent, and stellar reduction was accomplished without difficulty.

6. Stellar Camera No D66/Reseau No 72 (Mission 1023-2)

The camera was operational during all of the master (fwd) panoramic camera's operational periods. Since activation of the stellar/index unit is dependent on action of the master panoramic camera, no stellar photography was acquired during the master camera's dormant periods in passes 103D-133D.

Flare conditions in Mission 1023-2 are considerably reduced. Relatively small portions of each format were effected and stellar reduction was accomplished without difficulty. Quality of the stellar images is good, with the exception of frames 167-172 and 194-197, where streaked and/or double images are present. The field of view covers 39 stars, and their geometric distribution is good.

7. Index Camera No D17/Reseau No 19 (Mission 1023-1)

The camera performed satisfactorily throughout the mission and good-quality terrestrial imagery was obtained. Edge fog appears intermittently on both edges, and the last 4 frames are slightly degraded by uniform fog.



Reseau plate reflections are present throughout the material. Numerous small bits of foreign matter adhered to the base side of the film and are present in varying amounts from head to tail of the index record.

8. Index Camera No 66/Reseau No 75 (Mission 1023-2)

The instrument was operational throughout the master (fwd) panoramic camera's operational periods. Quality of the photography is good. Edge fog appears intermittently on the correlation mark edge of the film. A few base rubs are present in the material. Two continuous emulsion scratches, parallel to each other and to the major axis of the film, are present from head to tail of the index record. These scratches first appear in the pre-flight material and gradually shift toward the camera number edge as the film is expended.

9. Associated Equipment

The binary data block failed to record in pass 21D, frame 87 and pass 117D, frame 46. The data block is smeared in pass 141D, frame 12. In general, alignment and intensity of the lamps are good but a few exceptions occur, as in pass 26D where the alignment is extremely poor. The top row of light images is occasionally clipped by the edge of the film in a number of passes. The index lamp adjacent to the camera number is overexposed. Double end-of-pass markers are present in most of the early passes (1D-21D) and appear intermittently thereafter, as in passes 26D, 37D, and 42D. The frequency marks are properly recorded outside of the formats but appear to be underexposed throughout most of the pass records.



FIGURE 1. DESCRIPTION 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 locate the illustrated photography within the panoramic format.

ENLARGEMENT FACTOR: The enlargement factor indicates the number of diameters the original material has been enlarged in the photographic illustration.

GEOGRAPHIC COORDINATES: These coordinates 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.

Handle Via
~~Patent KEYHOLE~~
Control System Only

~~TOP SECRET RUFF~~
~~NO FOREIGN DISSEM~~



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

~~TOP SECRET RUFF~~
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FIGURE 2. UNIDENTIFIED SPACE OBJECT RECORDED BY HORIZON CAMERA (1ST VIEW)

The unidentified object is located 0.50 inches inside the horizon arc and approximately 4 inches up from the bottom of the illustration format (nearly at photo-center).

NPIC K-5863 (12/65)

- 6c -

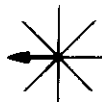
~~TOP SECRET RUFF~~
~~NO FOREIGN DISSEM~~

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~~Teletype KEYHOLE~~
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Camera 170
Pass 2D Fwd
Frame 2
Date of Photography 18 Aug 65
Universal Grid Coordinates 87.2 - 11.6
Enlargement Factor 10X
Geographic Coordinates 70-06N 126-10E
Altitude (feet) 840,600
Camera:
Pitch 15°06'
Roll 00°06'
Yaw -00°17'
Vehicle Azimuth 93°20'
Local Sun Time 0816
Solar Elevation 23°01'
Solar Azimuth Not Determined
Exposure f/8.0 @ 1/100 sec
Processing Level Intermediate



Approximate flight direction
on photograph



Approximate scan direction
on photograph

Approximate location of photograph in format. Negative viewed with emulsion side down.



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Control System Only



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~~NO FOREIGN DISSEM~~

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Control System Only

FIGURE 3. UNIDENTIFIED SPACE OBJECT RECORDED BY HORIZON CAMERA (2D VIEW)

The unidentified object is located approximately 0.60 inches inside the horizon arc and 4.75 inches up from the bottom of the illustration format.

NPIC K-5884 (12/65)

- 6e -



Camera 17C
Pass 2D FWD
Frame 6
Date of Photography 18 Aug 65
Universal Grid Coordinates 86.7 - 13.1
Enlargement Factor 10X
Geographic Coordinates 70-00N 128-45E
Altitude (feet) 835,144
Camera:
Pitch 15°02'
Roll 00°06'
Yaw -00°17'
Vehicle Azimuth 95°54'
Local Sun Time 0827
Solar Elevation 23°52'
Solar Azimuth Not Determined
Exposure f/8.0 @ 1/100 sec
Processing Level Intermediate

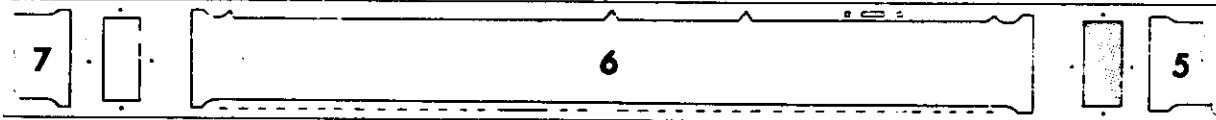


Approximate flight direction
on photograph



Approximate camera direction
on photograph

Approximate location of photograph in format. Negative viewed with emulsion side down.



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FIGURE 4. EXAMPLE OF INDEX CAMERA PHOTOGRAPHY

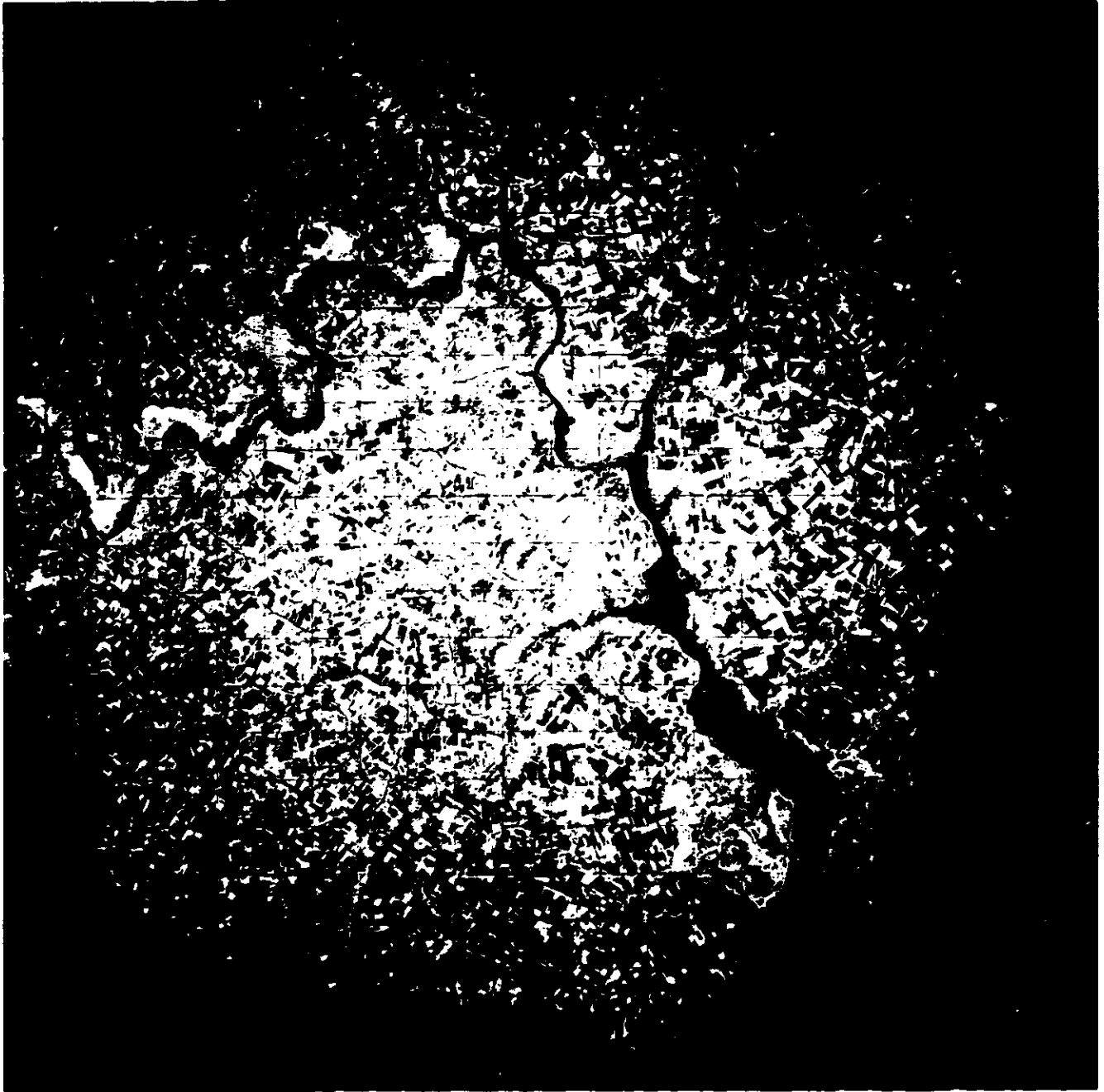
This frame is representative of the general photographic quality achieved by the index camera in this mission.

NPIC K-8865 (12/65)

- 06 -

Index Frame Number 49
Correlates with Fwd Camera:
 Pass 87D
 Frame 92
Date of Photography 23 Aug 65
Enlargement Factor 3X
Panoramic Camera Attitude:
 Pitch 15°06'
 Roll -00°30'
 Yaw 00°34'
Exposure Setting f/4.5 @ 1/500 sec

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PART II. FILM PROCESSING

1. Film Footage/Frame Totals

	<u>Mission 1023-1</u>	<u>Mission 1023-2</u>
Master (Fwd) Camera	8,150 feet/2,971 frames	3,953 feet/1,498 frames
Slave (Aft) Camera	8,164 feet/2,966 frames	7,815 feet/2,056 frames
Stellar Camera	46 feet/ 419 frames	30 feet/ 213 frames
Index Camera	90 feet/ 420 frames	52 feet/ 213 frames
Total Footage/Frames, Master (Fwd) Panoramic Camera 12,103 feet/4,460 frames		
Total Footage/Frames, Slave (Aft) Panoramic Camera 17,979 feet/5,922 frames		

2. Film Processing

Processing information is abstracted from records provided by the processing contractor. Pertinent data includes the number of development level changes executed in processing the panoramic film and the percent of film processed at each of the 3 development levels employed: primary, intermediate, and full. Infrared densitometry is utilized for determination of optimum processing requirements.

In Mission 1023-1, the master panoramic record received 28 development level changes and the slave material required 35 changes. However, an IR scanner malfunction was responsible for underprocessing of a significant portion of the master panoramic film. Notable examples are passes 2D, 6D, 9D, and 23D. No IR malfunction has previously been experienced, and it was not immediately detected. As soon as the malfunction was confirmed, the machine operators shifted to subjective evaluation of the material for determination of optimum development levels. Subsequent investigation revealed that a logic circuitry malfunction had biased the process level indications in the direction of decreased development.

In Mission 1023-2, only 10 processing level changes were made in putting through the master panoramic record but the slave material required 32 changes. The percentages of film processed at each level in both missions are as follows:

	Mission 1023-1		Mission 1023-2	
	<u>Master</u>	<u>Slave</u>	<u>Master</u>	<u>Slave</u>
Primary	19%	0%	0%	0%
Intermediate	54%	39%	19%	34%
Full	27%	61%	81%	66%

A subjective estimate of the overall density levels of the photography acquired in Mission 1023-1 and 1023-2 indicates the following:

Mission 1023-1

	<u>Thin</u>	<u>Medium</u>	<u>Heavy</u>
Master	20%	70%	10%
Slave	10%	75%	15%
Stellar Index	Adequate to determine the presence of stellar images		
	25%	70%	5%

Mission 1023-2

	<u>Thin</u>	<u>Medium</u>	<u>Heavy</u>
Master	20%	70%	10%
Slave	15%	75%	10%
Stellar Index	Adequate to determine the presence of stellar images		
	25%	65%	10%

3. Physical Film Degradations

The overall physical condition of the master and slave panoramic records acquired in Mission 1023-1 is good. A process machine malfunction occurred during the processing of the slave panoramic material from Mission 1023-2, and considerable film damage resulted. Details of the machine malfunction and resultant degradation of the material involved are as follows:

A roller malfunction allowed slack film footage to form up in the dryer. In turn, this caused the film to foul roller action elsewhere in the machine. Approximately 318 feet of film were damaged before the machine stoppage was cleared. All of pass 117D and 26 frames of pass 118D were affected to some degree. Severe stretching elongated frame 39 of pass 117D to 32 inches and reduced the film width to 50mm. Frames 90-94 of the same pass are heavily stained. Remaining damage consists of scratches, creases, minus-density streaks, and similar degradations. In addition, the cuts made to free the fouled film made it necessary to place opaque splices within a number of formats.

FIGURE 3. EXAMPLE OF VIGNETTING INSIDE THE HOPIZON FORMAT

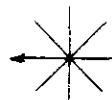
NPIC K-5824 (12/65)

- 8e -

Camera 166
Pass 25D
Frame. 73 aft
Date of Photography. 20 May 65
Universal Grid Coordinates Not Applicable
Enlargement Factor 3X
Geographic Coordinates 12-55N 038-13E
Altitude (feet). 663,490
Camera:
Pitch $-14^{\circ}45'$
Roll. $-0^{\circ}08'$
Yaw $0^{\circ}04'$
Local Sun Time 1014
Solar Elevation. $63^{\circ}14'$
Solar Azimuth. 66°
Exposure (fractions of second) $1/370$
Processing Level Full
Vehicle Azimuth. $168^{\circ}02'$

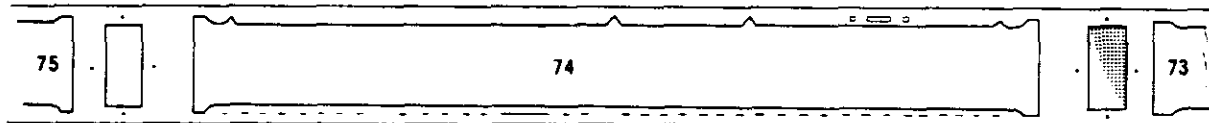


Approximate flight direction
on photograph



Approximate scan direction
on photograph

Approximate location of photograph in format. Negative viewed with emulsion side down.



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 (b) the degree to which a photo interpreter may extract useful and reliable information from the material.

PI suitability ratings are: Excellent, Good, Fair, Poor, and Unusable. 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 degradation 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 optimal 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 superior quality of the photography.

Good: The photography is relatively free of degradations, or limiting weather conditions. Edges and corners of objects 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 but the acuity of the photography is less than optimum. Edges and corners of objects 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 reduced the quality of the photography. 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.

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

2. PI Suitability, Missions 1023-1 and 1023-2

The PI suitability of the photography acquired in Missions 1023-1 and 1023-2 is good. A total of 240 targets was reported in the preliminary PI reports. Mission 1023-1 covered 133 targets and Mission 1023-2 107 targets. Highlights of the PI scan include new identification of 7 missile sites and/or complexes, 3 radar facilities, and 3 nuclear warhead storage sites and confirmation of airfield construction.

The quality of most of the photography is rated from fair to good. Poor-quality coverage is noted in a few cases. Degradation is primarily due to haze and/or cloud shadow effects. Obliquity is also a factor in reducing the effectiveness of the coverage in a number of instances.

The comparatively extensive coverage afforded numerous opportunities to confirm previously suspect activities and to make new identifications. However, the preliminary PI reports represent the initial scan results only, which are accomplished in a relatively short time and prior to final refinement of ephemeris data. Future, more detailed analysis usually develops additional information and may uncover matters of interest not noted in the preliminary scan.

3. Definition of Mission Information Potential (MIP)

The MIP rating assigned to a mission is an arbitrary figure intended to indicate the quality of the best photography obtained in the mission. It is representative of the camera system's maximum capability for recording information as demonstrated by the instruments employed in each mission. In consideration of the information the MIP is intended to convey, photography containing adverse factors such as low solar elevation, poor atmospheric conditions, and similar degradations is eliminated in selection of the MIP example. The MIP rating assigned to a mission is indicative solely of the camera system's photographic capability exclusive of degradations which are not camera-derived. The selected photography may constitute a portion of a frame containing a particular target, an entire frame, or several frames. In any case, the selections do not indicate the success, quality, or PI suitability of the mission as a whole but only the camera system's maximum effort. The criteria which govern selection of suitable MIP examples are as follows:

a. The photography must be comparatively free of cloud cover and/or atmospheric interference.

b. The selected targets should be at or near frame center in order to minimize the effects of obliquity and similar distortive

factors.

c. No photography affected by system malfunctions or inherent degradations can be considered for MIP selection. This eliminates the first few and last few frames of a pass, since these may contain image motion. In addition, the photography must be free of effects induced by vehicle pitch, roll, or yaw deviations from normal.

d. Solar elevation must be near optimum. Overexposed or underexposed photography is not suitable for MIP selections.

e. Preferably, good-contrast targets such as airfields are chosen for comparison with similar targets covered in previous missions.

4. MIP, Missions 1023-1 and 1023-2

Based on the foregoing criteria, frame 8 of pass 63D Fwd and frame 91 of pass 87D Fwd are selected as the MIP examples for Missions 1023-1 and 1023-2. In both cases, the targets that exemplify the MIP (rated at 85) are airfields. Examination of the photography acquired by both panoramic cameras indicates that the master instrument produced slightly better imagery, on the whole. As has been observed in previous missions, such superiority is not consistent. Since the photography is influenced by a number of factors and variables, departures from established quality levels are not uncommon, and a specific target or frame may, at times, appear sharper in the film from either camera, regardless of the general quality trend.

5. Resolution Target Analysis

A number of fixed and mobile resolution targets were covered in the domestic passes. The targets conform with Military Standard 150-A, which calls for an aspect ratio of 5:1. In addition, along-track and cross-track bar group alignments are provided.

The data given below were obtained by viewing the targets at 70X magnification of the original negatives and taking an average of the readings made by a team of 3 photographic analysts. The smallest readable bar widths are given in each case. No conversions to the equivalent lines/milimeter or to ground resolution were made.

Pass	47DE
Frame and Universal Grid Coordinates (Fwd)	2,54.6-12.3
Frame and Universal Grid Coordinates (Aft)	7,35.9-10.7
Target Type and Location	Fixed, Indian Springs, Nev.

Smallest Distinguishable Bar Width (Fwd)	None Distinguishable
Smallest Distinguishable Bar Width (Aft)	4' 3.625"
Pass	47DE
Frame and Universal Grid Coordinates (Fwd)	3, 35.3-11.8
Frame and Universal Grid Coordinates (Aft)	8, 55.3-11.3
Target Type and Location	Fixed, Pahrump, Nev.
Smallest Distinguishable Bar Width (Fwd)	4' 10"
Smallest Distinguishable Bar Width (Aft)	5' 5.125"
Pass	47DE
Frame and Universal Grid Coordinates (Fwd)	4, 34.7-13.5
Frame and Universal Grid Coordinates (Aft)	8, 56.3-14.8
Target Type and Location	Mobile, Pahrump, Nev.
Smallest Distinguishable Bar Width (Fwd)	None Distinguishable
Smallest Distinguishable Bar Width (Aft)	6' 0"
Pass	77D
Frame and Universal Grid Coordinates (Fwd)	4, 37.4-11.0
Frame and Universal Grid Coordinates (Aft)	10, 53.3-12.0
Target Type and Location	Mobile, Columbus, O.
Smallest Distinguishable Bar Width (Fwd)	8' 0"
Smallest Distinguishable Bar Width (Aft)	None Distinguishable

FIGURE 5. MIP SELECTION, MISSION 1023-1 (FWD CAMERA)

The photography is representative of the best achieved in this mission. The matching aft imagery (Figure 6) is presented for the purpose of comparing the quality of the fwd and aft takes.

NPIC K-5866 (12/65)

Camera	170
Pass	63D
Frame.	8 fwd
Date of Photography.	21 Aug 65
Universal Grid Coordinates	66.3 - 11.2
Enlargement Factor	20X
Geographic Coordinates	38-19N 122-01W
Altitude (feet).	608,477
Camera:	
Pitch	14°51'
Roll.	-00°06'
Yaw	00°18'
Vehicle Azimuth.	156°38'
Local Sun Time	1149
Solar Elevation.	63°11'
Solar Azimuth.	177°
Exposure	1/303 sec
Processing Level	Full

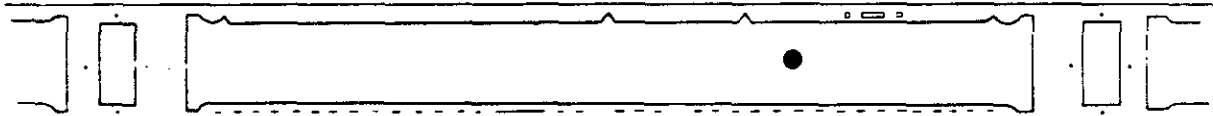


Approximate flight direction
on photograph



Approximate scan direction
on photograph

Approximate location of photograph in format. Negative viewed with emulsion side down.



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FIGURE 6. MIP MATCHING TARGET, MISSION 1023-1 (AFT CAMERA)

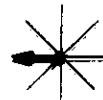
The aft imagery is slightly inferior to the fwd. In general, this is the case throughout the mission although the reverse is occasionally observed.

NPIC K-8667 (12/65)

Camera 171
Pass 63D
Frame 9 aft
Date of Photography 21 Aug 65
Universal Grid Coordinates 24.2-11.0
Enlargement Factor 20X
Geographic Coordinates 38-15N 122-01W
Altitude (feet). 606,781
Camera:
Pitch -14°52'
Roll 00°07'
Yaw 00°21'
Vehicle Azimuth. 157°01'
Local Sun Time 1149
Solar Elevation. 63°16'
Solar Azimuth. 177°
Exposure 1/442 sec
Processing Level Full



Approximate flight direction
on photograph



Approximate scan direction
on photograph

Approximate location of photograph in format. Negative viewed with emulsion side down.



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FIGURE 7. MIP SELECTION, MISSION 1023-2 (FWD CAMERA)

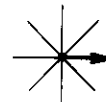
The aft match is presented in Figure 8. Again, the fwd photography is superior to the aft. Note the 5 objects aligned just off the taxiway. These are not recorded on the aft matching frame. (Located on the illustration at a point 3.35 inches in from the left margin and 4.40 inches up from the bottom).

NPIC K-5866 (12/65)

Camera 170
Pass 87D
Frame. 91 fwd
Date of Photography. 23 Aug 65
Universal Grid Coordinates 56.7 - 13.7
Enlargement Factor 20X
Geographic Coordinates 48-26N 43-24E
Altitude (feet). 629,564
Camera:
Pitch 15°06'
Roll. -00°30'
Yaw 00°34'
Vehicle Azimuth. 150°55'
Local Sun Time 1056
Solar Elevation. 50°10'
Solar Azimuth. 151°
Exposure 1/289 sec
Processing Level Full

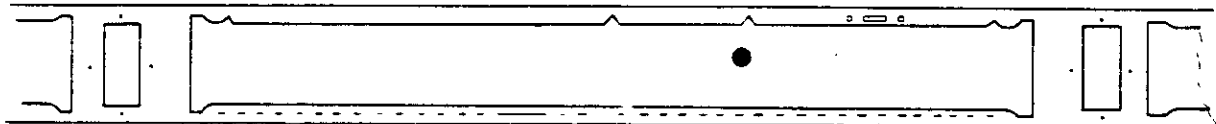


Approximate flight direction
on photograph



Approximate scan direction
on photograph

Approximate location of photograph in format. Negative viewed with emulsion side down.



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FIGURE 8. MIP MATCHING TARGET, MISSION 1023-2 (AFT CAMERA)

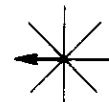
An unusual combination of camera viewing angle and local atmospheric conditions obliterate the 5 objects which are readily observed just off the taxiway in the fwd photography.

NPIC K-5669 (12/65)

Camera 171
Pass 87D
Frame 97 aft
Date of Photography 23 Aug 65
Universal Grid Coordinates 34.0 - 10.3
Enlargement Factor 20X
Geographic Coordinates 48-25N 43-22E
Altitude (feet) 627,078
Camera:
Pitch -13°37'
Roll -00°31'
Yaw 00°37'
Vehicle Azimuth 151°30'
Local Sun Time 1056
Solar Elevation 50°11'
Solar Azimuth 151°
Exposure 1/431 sec
Processing Level Full

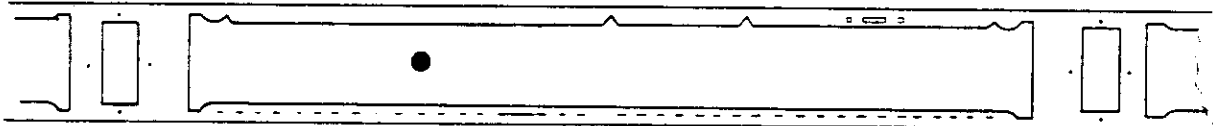


Approximate flight direction
on photograph



Approximate scan direction
on photograph

Approximate location of photograph in format. Negative viewed with emulsion side down.



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~~NO FOREIGN DISSEM~~

FIGURE 9. EXAMPLE OF OUT-OF-FOCUS PHOTOGRAPHY, FWD CAMERA

The out-of-focus area is located on the frequency mark edge of the take-up end of the frame. In Mission 1023-1, the out-of-focus condition is more prominent at the supply end.

NPIC K-5870 (12/65)

Camera 170
Pass 87D
Frame. 91 fwd
Date of Photography. 23 Aug 65
Universal Grid Coordinates 74.4 - 09.5
Enlargement Factor 20X
Geographic Coordinates 48-26N 43-24E
Altitude (feet). 629,564
Camera:
Pitch 15°06'
Roll. -00°30'
Yaw 00°34'
Vehicle Azimuth. 150°55'
Local Sun Time 1056
Solar Elevation. 50°10'
Solar Azimuth. 151°
Exposure 1/289 sec
Processing Level Full

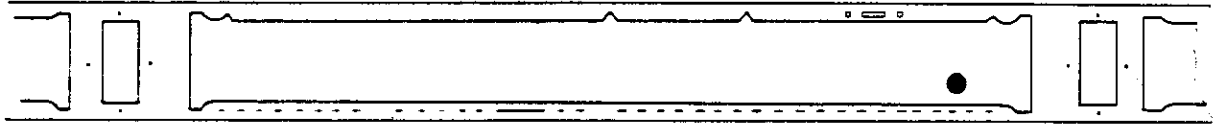


Approximate flight direction
on photograph



Approximate scan direction
on photograph

Approximate location of photograph in format. Negative viewed with emulsion side down.



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FIGURE 10. MATCHING IMAGERY TO OUT-OF-FOCUS EXAMPLE, AFT CAMERA

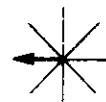
The photographic quality is good despite the proximity of this area to the edge of the format. The imagery in Figure 9 should have been as good or better.

NPIC K-5871 (12/65)

Camera 171
Pass 87D
Frame. 97 aft
Date of Photography. 23 Aug 65
Universal Grid Coordinates 15.7 - 09.5
Enlargement Factor 20X
Geographic Coordinates 48-25N 43-22E
Altitude (feet). 627,078
Camera:
Pitch $-13^{\circ}37'$
Roll. $-00^{\circ}31'$
Yaw $00^{\circ}37'$
Vehicle Azimuth. $151^{\circ}30'$
Local Sun Time 1056
Solar Elevation. $50^{\circ}11'$
Solar Azimuth. 151°
Exposure $1/431$ sec
Processing Level Full



Approximate flight direction
on photograph



Approximate scan direction
on photograph

Approximate location of photograph in format. Negative viewed with emulsion side down.

