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# PHOTOGRAPHIC EVALUATION REPORT

## MISSION 1014-1 18-23 NOVEMBER 1964

## MISSION 1014-2 23-27 NOVEMBER 1964

~~TALENT KEYHOLE COMMISSION~~

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NATIONAL PHOTOGRAPHIC INTERPRETATION CENTER



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## TABLE OF CONTENTS

### SYNOPSIS . . . . .

### GENERAL FLIGHT DATA . . . . .

### PART I. CAMERA OPERATIONS . . . . .

1. Master (FWD) Panoramic Camera No 162
2. Slave (AFT) Panoramic Camera No 139
3. Master (FWD) Horizon Cameras
4. Slave (AFT) Horizon Cameras
5. Stellar Camera No 49 (1014-1)
6. Stellar Camera No 46 (1014-2)
7. Index Camera No 53 (1014-1)
8. Index Camera No 50 (1014-2)
9. Associated Equipment

### PART II. FILM . . . . .

1. Film Footage/Frame Totals
2. Film Processing
3. Filter Transmission Data
4. Film Processing Curves
5. Physical Film Degradations

### PART III. IMAGE QUALITY . . . . .

1. Definition of Photographic Intergation (PI) and PI Rating
2. PI Suitability for Missions 1014-1 and 1014-2
3. Stellar Reduction Study
4. Definition of Mission Information Potential (MIP)
5. MIP Rating for Mission 1014-1
6. MIP Rating for Mission 1014-2

### APPENDIX A. SYSTEM SPECIFICATIONS . . . . .

1. Cameras
2. Vehicle Configuration and Equipment
3. Panoramic Format Configuration
4. Definition of Panoramic Camera Format
5. Panoramic Format Dimensions
6. Horizon Camera Settings

### APPENDIX B. OPERATIONAL DATA . . . . .

1. Sensor Locations
2. Temperature Readings

### APPENDIX C. STALLION DATA . . . . .

1. Stallion Camera Settings
2. Stellar Camera Settings

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3. Index Camera No D59 (1014-1)	52
4. Index Camera No D44 (1014-2)	54
APPENDIX D. STELLAR-INDEX-MASTER CAMERA FRAME CORRELATION (1014-2)	56
APPENDIX E. MICRODENSITOMETRY	60
1. Edge Spread Function	60
2. Edge Traces, Mission 1014-1	63
3. Edge Traces, Mission 1014-2	67
APPENDIX F. SUMMARY OF PHOTOGRAPHIC IMAGE EVALUATION PERFORMED BY THE PROCESSING CONTRACTOR	70
APPENDIX G. CLOUD COVER ANALYSIS	72
1. Introduction	72
2. cloud cover data, Missions 1014-1 and 1014-2	73
APPENDIX H. MISSION COVERAGE STATISTICS	77
1. Summary of Predictable Photographic Coverage Missions 1014-1 and 1014-2	77
2. Mission Coverage Tracks, Missions 1014-1 and 1014-2	79

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LIST OF ILLUSTRATIONS

	Page
Figure 1. Definition of Photographic Data . . . . .	2a
Figure 2. Imagery Partially Within the Out-Of-Focus Area. . . . .	4a
Figure 3. Typical Starboard Horizon Frame of the Slave (AFT) Panoramic Camera. . . . .	6a
Figure 4. Typical Port Horizon Frame of the Slave (AFT) Horizon Frame . . . . .	6c
Figure 5. Typical Stellar Format (Mission 1014-1) . . . . .	8a
Figure 6. Index Camera D44 (Mission 1014-2) Double Exposure . . . . .	8c
Figure 7. Fog Associated With a Vehicle Light Leak. . . . .	26a
Figure 8. Fog Induced By a Corona Static Discharge (Mission 9041) . . . . .	26c
Figure 9. Data On Resolution Targets, Webster Field NAS . . . . .	32a
Figure 10. Resolution Targets At Webster Field, NAS (Master Camera Coverage). . . . .	32e
Figure 11. Resolution Targets At Webster Field, NAS (Slave Camera Coverage). . . . .	32g
Figure 12. Photography Exposed At a Solar Elevation of 1°01' . . . . .	32i
Figure 13. Photography Exposed At a Solar Elevation of 1°06' . . . . .	32k
Figure 14. Photography Exposed At a Solar Elevation of 1°46' . . . . .	32m
Figure 15. Photography Exposed At a Solar Elevation of 1°42' . . . . .	32o
Figure 16. Photography Exposed At a Solar Elevation of 8°20' . . . . .	32q
Figure 17. Photography Exposed At a Solar Elevation of 8°27' . . . . .	32s
Figure 18. Photography Exposed At a Solar Elevation of 21°26' . . . . .	32u
Figure 19. Photography Exposed At a Solar Elevation of 21°19' . . . . .	32w
Figure 20. Photography Exposed At a Solar Elevation of 45°55' . . . . .	32y
Figure 21. Photography Exposed At a Solar Elevation of 46°00' . . . . .	32aa
Figure 22. MIP Frame, Mission 1014-1 . . . . .	34a
Figure 23. Slave (AFT) Panoramic Camera Coverage of the MIP Target . . . . .	34c
Figure 24. MIP Frame, Mission 1014-2 . . . . .	34e
Figure 25. Slave (AFT) Panoramic Camera Coverage of the MIP Target . . . . .	34g
Figure 26. Photograph Particularly Well Suited for Mensuration and Interpretation. . . . .	34i
Figure 27. Location of Edge Traces 1-3 . . . . .	62
Figure 28. Location of Edge Traces 4-6 . . . . .	62

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## SYNOPSIS

Mission 1014 was a two-part satellite reconnaissance mission. Photography was accomplished on 18-27 November 1964. The "A" bucket was recovered dry during orbital revolution 81, 23 November 1964, and the "B" bucket was recovered dry on revolution 145, 27 November 1964.

The satellite was launched at 2036Z. This is 4 hours earlier than the normal launch time and was intended to provide coverage of certain areas during times of more favorable solar elevations.

A filter experiment was conducted on this mission. The master (FWD) panoramic camera was equipped with a Wratten 25 filter, while the slave (AFT) panoramic camera had a Wratten 21 filter. The slit width of the master (FWD) panoramic camera was 0.250 inches; the slit width of the slave (AFT) panoramic camera was 0.175 inches. The resulting exposure was less than that which is normal, this time of year.

The result of the earlier launch time and the filter and slit width differences has not been fully analyzed. The degree of complexity involved in the evaluation of the experiment is discussed in the text of this report.

The imagery of the panoramic cameras is good; however, it is not as good as that of recent missions (1004, 1006, 1009, 1010, etc.). The photography is sharp but lacks the fine edge acuity we have come to expect from photography obtained from this system.

The photography of the master (FWD) panoramic camera is degraded by an out-of-focus condition. The affected area is confined to a band approximately 0.2 inches wide at the binary edge and take-up end. It extends about 4 inches toward supply from the take-up end. The condition appears to exist on each frame from the beginning through pass 1060. It is not present thereafter.

In the area not affected by the out-of-focus condition, the image quality of the film from the two panoramic cameras is about equal and consistent throughout the mission.

The quality of the stellar and index photography of Mission 1014-1 is good, but a malfunction rendered most of the stellar and index photography of Mission 1014-2 unusable for vehicle attitude determination.

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GENERAL FLIGHT DATA

Date of Launch 18 November 1964, 2036Z

Actual Orbital Parameters

	<u>Revolution 40</u>	<u>Revolution 110</u>
Period	89.7 minutes	89.6 minutes
Perigee	102.3 nm	101.4 nm
Perigee Latitude	67.8°N	70°N
Apogee	198.4 nm	194.2 nm
Eccentricity	0.0134	0.0129
Inclination Angle	70.03°	70°

Recovery

Mission 1014-1: 23 November 1964, 2217Z  
Mission 1014-2: 27 November 1964, 2151Z

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**FIGURE 1. DEFINITION OF PHOTOGRAPHIC DATA.**

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

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

**Date of Photography:** The date of photography indicates the day, month, and year (GMT) that the photography was acquired.

**Universal Grid Coordinates:** These coordinates are included to locate the illustrated photography within the panoramic format.

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

**Geographic Coordinates:** These coordinates are included to indicate the latitude and longitude of the panoramic format.

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

**Pitch:** The pitch is the rotation of the vehicle about the transverse axis. Positive readings indicate nose-up attitude, negative readings indicate nose-down attitude.

**Roll:** The roll is the rotation of the vehicle about the longitudinal axis. Positive readings indicate left wing-up attitude, negative readings indicate right wing-up attitude.

**Yaw:** The yaw is the rotation of the vehicle about the vertical axis. Positive readings indicate counterclockwise rotation when viewing the ground nadir from the vehicle.

**Local Sun Time:** This time is included to present to the viewer a specific time of the acquisition of the photographic illustration.

**Solar Elevation:** The solar elevation is the angular distance above a plane tangent to the surface of the Earth to the sun in the panoramic format. A negative solar elevation indicates the sun is below the plane.



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Solar Azimuth: The solar azimuth is the angular measurement of the rays of the sun measured from true north in a clockwise direction.

Vehicle Azimuth: The vehicle azimuth is the angle of ground track with respect to geodetic coordinates.

Exposure: The exposure is the duration of the photographic exposure expressed in a fraction of a second and is computed from the scan rate and slit width.

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## PART I. CAMERA OPERATIONS

### 1. Master (FWD) Panoramic Camera Number 162

The operation of the Master Panoramic Camera was normal throughout the mission. The following paragraphs denote the nature, frequency, location, and severity of the degradations associated with camera operations.

a. There are small emulsion scratches just inside the format edges under the camera number and also at the take-up end of most frames. Only the first frame of a camera operation appears to be unaffected. The amount of degradation caused by these scratches is minor.

b. Rail scratches along both film edges are continuous throughout the photography. They are outside of the format and have no effect on the imagery.

c. Light entering the camera around the lens housing, during camera off periods, caused the first and last frames of most passes to be partially fogged. The density of the fog is commensurate with the duration of the camera off period and the prevailing solar elevation.

d. Minus density streaks, approximately parallel to the path of the field flattener, are intermittent throughout the mission. The resulting degradation is minor. An example of these streaks can be found on pass 7D, frame 2.

e. There are minus density dots every 6.25 inches along the major axis throughout passes 7D and 8D. Each dot is 0.75 inches from the frequency mark edge of the format. The associated degradation is minor. The distance between the dots is very nearly the same as the circumference of the metering roller, indicating that a burr or foreign matter on the metering roller probably caused the anomaly.

f. There is an out-of-focus area on each frame, from the beginning of the mission through pass 105D. Although the affected area is confined to a strip approximately 0.2 inches wide and 4 inches long at the film edge and take-up end of the format, the degradation is severe within the area.

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**FIGURE 2. IMAGERY PARTIALLY WITHIN THE OUT-OF-FOCUS AREA.**

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