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25X1

TOP SECRET

3 JUL 1963 HFS
CS
AGE

25X1

TOP SECRET

(OUT 51422)

25X1

THE FOLLOWING TECHNICAL INFORMATION NECESSARY FOR THE REDUCTION OF QUANTITATIVE DATA OBTAINED FROM PHOTOGRAPHY OF MISSION 9056 IS FORWARDED FOR YOUR INFORMATION.

A. THIS PHOTOGRAPHY INVOLVES THE USE OF EIGHT CAMERAS: TWO MAIN CAMERAS, FOUR HORIZON CAMERAS, STELLAR CAMERA AND A INDEX CAMERA.

B. OPERATIONAL FOCAL LENGTHS

| | FWD UNIT | AFT UNIT |
|---|---|---|
| (1) MAIN LENS | 609.620 MM | 609.704 MM |
| (2) PORT HORIZON LENS | 89.0 MM | 88.9 MM |
| (3) STARBOARD HORIZON LENS | 89.0 MM | 89.1 MM |
| (4) STELLAR CAMERA | 83.71 MM | |
| (5) INDEX CAMERA | 38.45 MM | |

1963 JUL 3 17 43Z

DEFINITION: "OPERATIONAL FOCAL LENGTH" IS DEFINED AS THE DISTANCE FROM THE MAIN LENS NODAL POINT TO THE FILM SURFACE AS MEASURED ON THE LENS BENCH, AND THE DATA REDUCED FOR A VACUUM CONDITION. (OPERATIONAL FOCAL LENGTH IS EQUIVALENT FOCAL LENGTH CORRECTED FOR ENVIRONMENT.)

C. LENS DISTORTION (PIN CUSHION)

| (1) MAIN LENS | FWD UNIT | AFT UNIT |
|---|---|---|
| 3 DEGREES | .002 MM | .002 MM |
| 2 DEGREES | .001 MM | .002 MM |

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Declassification Review by NGA/DoD

TOP SECRET

GROUP 1
Excluded from automatic downgrading and declassification

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| | | |
|---|---|---|
| 1 DEGREES | .000 MM | .000 MM |
| 0 DEGREES | .000 MM | .000 MM |
| 359 DEGREES | .000 MM | .000 MM |
| 358 DEGREES | .001 MM | .001 MM |
| 357 DEGREES | .002 MM | .002 MM |

(2) PORT HORIZON CAMERA

| | | |
|---|---|---|
| (RADIAL DISTORTION) | | |
| 10 DEGREES | .001 MM | .005 MM |
| 20 DEGREES | .023 MM | .035 MM |
| (TANGENTIAL DISTORTION) | | |
| MAXIMUM VECTOR | .010 MM | .008 MM |

(3) STARBOARD HORIZON CAMERA

| | | |
|---|---|---|
| (RADIAL DISTORTION) | | |
| 10 DEGREES | .006 MM | .003 MM |
| 20 DEGREES | .021 MM | .034 MM |
| (TANGENTIAL DISTORTION) | | |
| MAXIMUM VECTOR | .008 MM | .003 MM |

D. DEPRESSION ANGLES OF HORIZON CAMERAS RELATIVE TO NOMINAL MAIN CAMERA.

(1) FWD UNIT

A. PORT HORIZON CAMERA - 14 DEGREES 45' 35"

B. STARBOARD HORIZON CAMERA - 15 DEGREES 01' 28"

(2) AFT UNIT

A. PORT HORIZON CAMERA - 15 DEGREES 07' 19"

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B. STARBOARD HORIZON CAMERA - 14 DEGREES 44' 32"

E. FILTER AND EXPOSURE DATA

| | | |
|---|---|---|
| (1) MAIN CAMERAS | FWD UNIT | AFT UNIT |
| FILTER | WRATTEN 21 | WRATTEN 21 |
| APERTURE | F 3.5 | F 3.5 |
| SLIT WIDTH | .200" | .200" |
| (2) PORT HORIZON CAMERAS | | |
| FILTER | WRATTEN 25 | WRATTEN 25 |
| APERTURE | F 6.8 | F 6.8 |
| EXPOSURE | 1/100 SEC. | 1/100 SEC. |
| (3) STARBOARD HORIZON CAMERAS | | |
| FILTER | WRATTEN 25 | WRATTEN 25 |
| APERTURE | F 6.8 | F 6.8 |
| EXPOSURE | 1/100 SEC. | 1/100 SEC. |
| (4) STELLAR CAMERA | | |
| FILTER | NONE | |
| APERTURE | F 1.9 | |
| EXPOSURE | 2 SEC. | |
| (5) INDEX CAMERA | | |
| FILTER | WRATTEN 21 | |
| APERTURE | F 4.5 | |
| EXPOSURE | 1/500 SEC. | |

F. RESOLUTION CAPABILITIES

(1) MAIN LENS

A. FWD UNIT - 161 (L/MM AVG)

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B. AFT UNIT - 174 (L/MM AVG)

(2) PORT HORIZON CAMERA

A. FWD UNIT - 35.6 (L/MM AVG)

B. AFT UNIT - 38.8 (L/MM AVG)

(3) STARBOARD HORIZON CAMERA

A. FWD UNIT - 36.0 (L/MM AVG)

B. AFT UNIT - 33.3 (L/MM AVG)

(4) INDEX CAMERA - 71 (L/MM AVAR)

G. TIMING MARKS

FREQUENCY MARKS WILL APPEAR ON THE FILM. RATE OF TIMING MARKS WILL BE 200 CYCLES PER SECOND.

H. FILM DATA

1. MAIN CAMERAS - SO 132
2. HORIZON CAMERAS - SO 132
3. STELLAR CAMERA - SO 130/102
4. INDEX CAMERA - SO 130

I. CALIBRATED ANGLES OF CAMERAS

1. CALIBRATED CONVERGENT ANGLE OF MAIN CAMERAS - 29 DEGREES 59.33 MIN.
2. CALIBRATED ANGLE BETWEEN FRAMING AND STELLAR CAMERAS - NOT AVAILABLE AT THIS TIME.
3. STELLAR

X EQUALS MINUS .045 MM

Y EQUALS PLUS .051 MM

NOTE: VIEWING POSITIVE, EMULSION UP, COORDINATE SYSTEM IS

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DEFINED AS PLUS "Y" IS IN DIRECTION OF FLIGHT. PLUS "X" IS TO THE LEFT AND PERPENDICULAR TO LINE OF FLIGHT.

4. INDEX

X EQUALS MINUS .019 MM

Y EQUALS MINUS .018 MM

NOTE: VIEWING POSITIVE, EMULSION UP, PLUS "X" IN DIRECTION OF FLIGHT AND MINUS "Y" TO THE RIGHT AND PERPENDICULAR TO DIRECTION OF FLIGHT.

J. IMAGE MOTION COMPENSATION DATA

1. RAMP DATA (30 MINUTE DURATION)

RAMP NO. 3

| FWD UNIT | BEGINNING | END |
|---|---|---|
| CYCLE PERIOD (SEC) | 4.74 | 2.49 |
| IMC RATE ("/SEC) | .427 | .813 |
| SCAN RATE ("/SEC) | 31.81 | 60.56 |
| AFT UNIT | | |
| CYCLE PERIOD (SEC) | 4.69 | 2.51 |
| IMC RATE ("/SEC) | .431 | .806 |
| SCAN RATE ("/SEC) | 32.15 | 60.08 |

RAMP NO. 8

| FWD UNIT | | |
|---|---|---|
| CYCLE PERIOD (SEC) | 5.03 | 2.49 |
| IMC RATE ("/SEC) | .402 | .813 |
| SCAN RATE ("/SEC) | 29.98 | 60.56 |
| AFT UNIT | | |

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| | | |
|---|---|---|
| CYCLE PERIOD (SEC) | 4.98 | 2.51 |
| IMC RATE ("/SEC) | .406 | .806 |
| SCAN RATE ("/SEC) | 30.28 | 60.08 |

NOTE: V/H RAMP 7 DATA TO FOLLOW ASAP

RAMP 3 PASSES

1A1 2D1 5D1

2A1 4D1 5D2

2A2 5M1

RAMP 8 PASSES

7D1 14A1 23D1 24D1 31A1

9D1 14D1 23D2 25D1

9D2 19D1 23D3 25D2

RAMP 7 PASSES

33A1 38D1 47A1 54D2 65A1

34A1 38D2 47A2 55D1 65A2

34D1 39D1 49A1 55D2

35D1 39D2 49A2 56D1

35D2 40D1 50A1 57D1

37D1 41D1 52D1 57D2

37D2 44A1 54D1 64A1

K. PROGRAM TIME DATA

| PASS | CAMERA | CAMERA ON TIME (ZEBRA TIME) DAY HOUR MIN | PROGRAM ON TIME UP RAMP (SEC) | PROGRAM DURATION (SEC) |
|---|---|---|---|---|
| --- | ----- | | | |

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| | | | | | | |
|---|---|---|---|---|---|---|
| 1A1 | FWD | 27 | 01 | 49 | 376 | 119 |
| 1A1 | AFT | 27 | 01 | 49 | [illegible] | 119 |
| 2A1 | FWD | 27 | 03 | 19 | 381 | 198 |
| 2A1 | AFT | 27 | 03 | 19 | 381 | 198 |
| 2A2 | FWD | 27 | 03 | 24 | 637 | 108 |
| 2A2 | AFT | 27 | 03 | 24 | 637 | 108 |
| 2D1 | FWD | 27 | 03 | 32 | 1132 | 107 |
| 2D1 | AFT | 27 | 03 | 32 | 1132 | 107 |
| 4D1 | FWD | 27 | 06 | 33 | 1036 | 101 |
| 4D1 | AFT | 27 | 06 | 33 | 1036 | 101 |
| 5M1 | FWD | 27 | 08 | 00 | 822 | 105 |
| 5M1 | AFT | 27 | 08 | 00 | 822 | 105 |
| 5D1 | FWD | 27 | 08 | 10 | 1433 | 185 |
| 5D1 | AFT | 27 | 08 | 10 | 1433 | 185 |
| 5D2 | FWD | 27 | 08 | 22 | 2129 | 124 |
| 5D2 | AFT | 27 | 08 | 22 | 2129 | 124 |
| 7D1 | FWD | 27 | 11 | 09 | 1428 | 248 |
| 7D1 | AFT | 27 | 11 | 09 | 1428 | 248 |
| 9D1 | FWD | 27 | 14 | 11 | 1513 | 171 |
| 9D1 | AFT | 27 | 14 | 11 | 1513 | 171 |
| 9D2 | FWD | 27 | 14 | 16 | 1781 | 111 |
| 9D2 | AFT | 27 | 14 | 16 | 1781 | 111 |
| 14A1 | FWD | 27 | 21 | 31 | 742 | 93 |

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| | | | | | | |
|---|---|---|---|---|---|---|
| 14A1 | AFT | 27 | 21 | 31 | 742 | 93 |
| 14D1 | FWD | 27 | 21 | 51 | 1950 | 114 |
| 14D1 | AFT | 27 | 21 | 51 | 1950 | 114 |
| 19D1 | FWD | 28 | 05 | 15 | 1443 | 113 |
| 19D1 | AFT | 28 | 05 | 15 | 1443 | 113 |
| 23D1 | FWD | 28 | 11 | 14 | 1225 | 172 |
| 23D1 | AFT | 28 | 11 | 14 | 1225 | 172 |
| 23D2 | FWD | 28 | 11 | 18 | 1481 | 100 |
| 23D2 | AFT | 28 | 11 | 18 | 1481 | 100 |
| 23D3 | FWD | 28 | 11 | 20 | 1616 | 176 |
| 23D3 | AFT | 28 | 11 | 20 | 1616 | 176 |
| 24D1 | FWD | 28 | 12 | 45 | 1286 | 426 |
| 24D1 | AFT | 28 | 12 | 45 | 1286 | 426 |
| 25D1 | FWD | 28 | 14 | 19 | 1460 | 311 |
| 25D1 | AFT | 28 | 14 | 19 | 1460 | 311 |
| 25D2 | FWD | 28 | 14 | 26 | 1880 | 144 |
| 25D2 | AFT | 28 | 14 | 26 | 1880 | 144 |
| 31A1 | FWD | 28 | 23 | 06 | 520 | 99 |
| 31A1 | AFT | 28 | 23 | 06 | 520 | 99 |
| 33A1 | FWD | 29 | 02 | 07 | 576 | 130 |
| 33A1 | AFT | 29 | 02 | 07 | 576 | 130 |
| 34A1 | FWD | 29 | 03 | 38 | 572 | 311 |
| 34A1 | AFT | 29 | 03 | 38 | 572 | 311 |

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| | | | | | | |
|---|---|---|---|---|---|---|
| 34D1 | FWD | 29 | 03 | 52 | 1437 | 87 |
| 34D1 | AFT | 29 | 03 | 52 | 1437 | 87 |
| 35D1 | FWD | 29 | 05 | 21 | 1322 | 107 |
| 35D1 | AFT | 29 | 05 | 21 | 1322 | 107 |
| 35D2 | FWD | 29 | 05 | 25 | 1562 | 146 |
| 35D2 | AFT | 29 | 05 | 25 | 1562 | 146 |
| 37D1 | FWD | 29 | 08 | 27 | 1647 | 115 |
| 37D1 | AFT | 29 | 08 | 27 | 1647 | 115 |
| 37D2 | FWD | 29 | 08 | 30 | 1841 | 292 |
| 37D2 | AFT | 29 | 08 | 30 | 1841 | 292 |
| 38D1 | FWD | 29 | 09 | 57 | 1581 | 143 |
| 38D1 | AFT | 29 | 09 | 57 | 1581 | 143 |
| 38D2 | FWD | 29 | 10 | 00 | 1793 | 111 |
| 38D2 | AFT | 29 | 10 | 00 | 1793 | 111 |
| 39D1 | FWD | 29 | 11 | 27 | 1587 | 113 |
| 39D1 | AFT | 29 | 11 | 27 | 1587 | 113 |
| 39D2 | FWD | 29 | 11 | 30 | 1739 | 97 |
| 39D2 | AFT | 29 | 11 | 30 | 1739 | 97 |
| 40D1 | FWD | 29 | 12 | 54 | 1392 | 514 |
| 40D1 | AFT | 29 | 12 | 54 | 1392 | 514 |
| 41D1 | FWD | 29 | 14 | 28 | 1602 | 192 |
| 41D1 | AFT | 29 | 14 | 28 | 1602 | 192 |
| 44A1 | FWD | 29 | 18 | 43 | 575 | 164 |
| 44A1 | AFT | 29 | 18 | 43 | 575 | 164 |

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| | | | | | | |
|---|---|---|---|---|---|---|
| 47A1 | FWD | 29 | 23 | 15 | 608 | 98 |
| 47A1 | AFT | 29 | 23 | 15 | 608 | 98 |
| 47A2 | FWD | 29 | 23 | 20 | 878 | 103 |
| 47A2 | AFT | 29 | 23 | 20 | 878 | 103 |
| 49A1 | FWD | 30 | 02 | 16 | 638 | 119 |
| 49A1 | AFT | 30 | 02 | 16 | 638 | 119 |
| 49A2 | FWD | 30 | 02 | 23 | 1030 | 107 |
| 49A2 | AFT | 30 | 02 | 23 | 1030 | 107 |
| 50A1 | FWD | 30 | 03 | 50 | 792 | 149 |
| 50A1 | AFT | 30 | 03 | 50 | 792 | 149 |
| 52D1 | FWD | 30 | 07 | 07 | 1772 | 157 |
| 52D1 | AFT | 30 | 07 | 07 | 1772 | 157 |
| 54D1 | FWD | 30 | 10 | 05 | 1634 | 128 |
| 54D1 | AFT | 30 | 10 | 05 | 1634 | 128 |
| 54D2 | FWD | 30 | 10 | 09 | 1859 | 113 |
| 54D2 | AFT | 30 | 10 | 09 | 1859 | 113 |
| 55D1 | FWD | 30 | 11 | 36 | 1567 | 128 |
| 55D1 | AFT | 30 | 11 | 36 | 1567 | 128 |
| 55D2 | FWD | 30 | 11 | 39 | 1750 | 111 |
| 55D2 | AFT | 30 | 11 | 39 | 1750 | 111 |
| 56D1 | FWD | 30 | 13 | 03 | 1355 | 529 |
| 56D1 | AFT | 30 | 13 | 03 | 1355 | 529 |
| 57D1 | FWD | 30 | 14 | 39 | 1701 | 111 |
| 57D1 | AFT | 30 | 14 | 39 | 1701 | 111 |

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| | | | | | | |
|---|---|---|---|---|---|---|
| 57D2 | FWD | 30 | 14 | 41 | 1850 | 97 |
| 57D2 | AFT | 30 | 14 | 41 | 1850 | 97 |
| 64A1 | FWD | 01 | 00 | 55 | 630 | 225 |
| 64A1 | AFT | 01 | 00 | 55 | 630 | 225 |
| 65A1 | FWD | 01 | 02 | 25 | 590 | 183 |
| 65A1 | AFT | 01 | 02 | 25 | 590 | 183 |
| 65A2 | FWD | 01 | 02 | 29 | 830 | 108 |
| 65A2 | AFT | 01 | 02 | 29 | 830 | 108 |

M. TIME CORRELATION (READINGS IN MILLISECONDS)

| PASS | SYSTEM TIME | BINARY CLOCK TIME | DIFFERENCE |
|---|---|---|---|
| 09 | 49818.667 | 74420.314 | |
| 25 | 50386.272 | 161387.924 | PLUS .005 |
| 40 | 45498.203 | 242899.869 | PLUS .014 |

T O P S E C R E T

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END OF MESSAGE

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