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CORONA J

PERFORMANCE EVALUATION REPORT

MISSION 1017-1 and 1017-2 [redacted]

FTV 1611, J-14

8 December 1966

Approved: [redacted]
Manager
Advanced Projects

Approved: [redacted]
Mgr.
Program



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# FOREWORD

This report details the performance of the payload system during the operational phase of the Program [redacted] Flight Test Vehicle 1611.

Lockheed Missiles and Space Company has the responsibility for evaluating payload performance under the Systems Integration and "J" System contracts.

This document is the final payload test and performance evaluation report for Missions 1017-1 and 1017-2 which was launched on 25 February 1965.

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# INTRODUCTION

This report presents the final performance evaluation of Missions 1017-1 and 1017-2 of the Corona Program. The purpose of this report is to define the performance characteristics of the J-14 payload system and to identify the source of in-flight anomalies.

The performance evaluation was jointly conducted by representatives of Lockheed Missiles and Space Company (LMSC) and ITEK at the facilities of NPIC and AFSPPF. The off-line evaluation using Corona engineering photography acquired over the United States was performed at the individual contractors plants.

The quantitative data used for this report is obtained from government organizations. The diffuse density data, and MTF/AIM resolution are produced by AFSPPF. The vehicle attitude error values, frame correlation times are made at NPIC who also supply the Processing Summary and MTF/AIM resolution reports published by [redacted]

Computer programs developed by A/P are utilized to calculate and plot the frequency distribution of the various contributors to image smear to permit analysis and correlation of the conditions of photography to the information content and quality of the acquired pictures. Computer analysis of the exposure, processing and illumination data provides the necessary data to analyze the exposure criteria selected for the mission.

## SECTION 1

## SYSTEM PERFORMANCE

### A. MISSION OBJECTIVES

The payload section of Mission 1017, placed into orbit by Flight Test Vehicle #1611 and LV-2A booster #432, consisted of two panoramic cameras, two Stellar-Index cameras, two Mark 5A recovery capsules and a space structure to enclose the cameras and provide mounting surfaces for all equipments. Figure 1-1 presents an inboard profile of the J-14 payload system. This Corona "J" system is designed to acquire search and reconnaissance photography of selected areas of the earth from orbital altitudes. The programmed -1 mission was 3/4/5 days and a -2 mission of 6/5/4 days with no deactivate period.

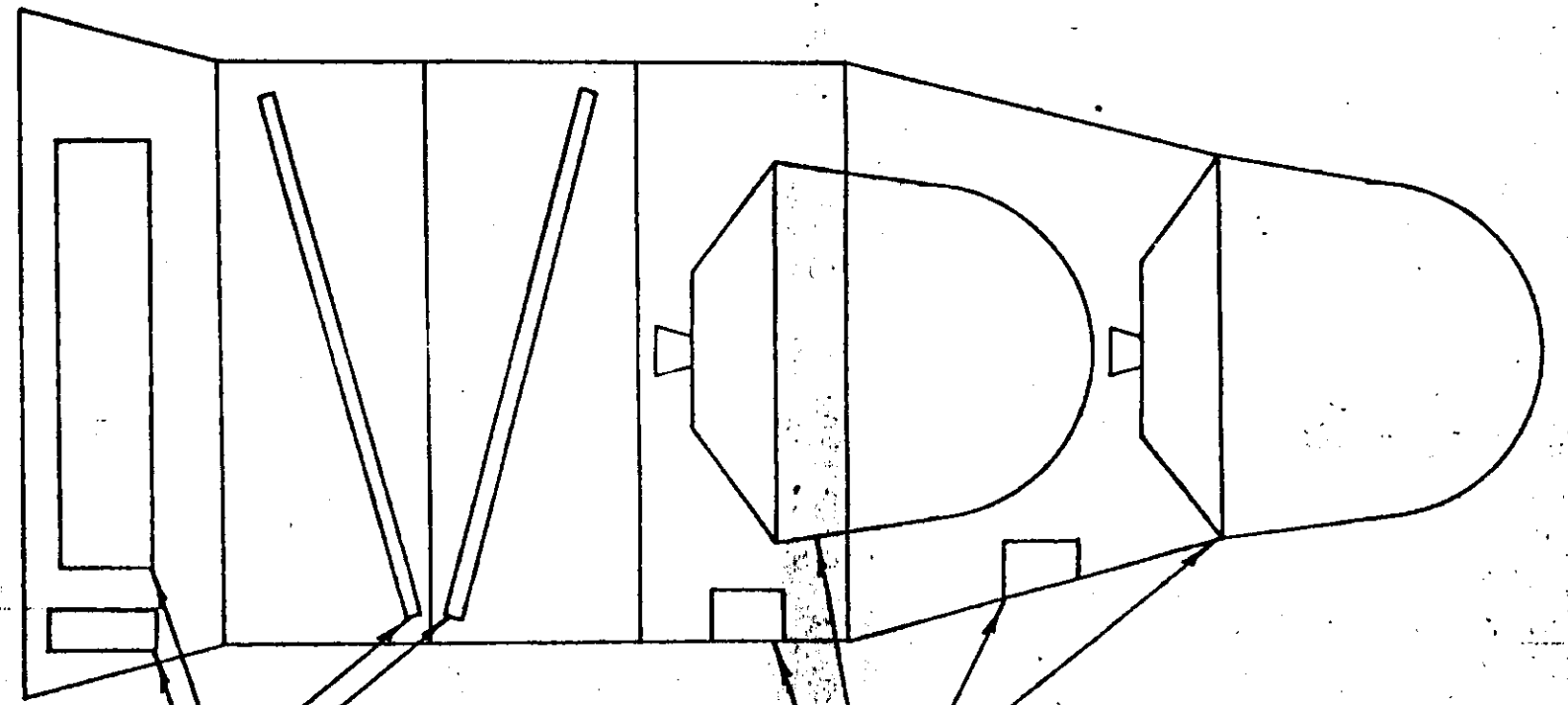
### B. MISSION DESCRIPTION

The payload was launched from Vandenberg Air Force Base (VAFB) [redacted] at 2144:55 Z (1344:55 PDT) on 25 February 1965. Ascent and injection were normal and the achieved orbit was within nominal tolerances. Tracking and command support was effected by the Air Force Satellite Control Facility consisting of tracking and command stations at [redacted] under central control of the Satellite Test Center at Sunnyvale, California. Mission 1017-1 consisted of a 5 day operation and was completed by air recovery on 2 March 1965. Mission 1017-2 was completed with an air recovery on 6 March 1965 following a 4 day photographic operation.

The comparison of the planned and actual orbit parameters is tabulated as follows:

SCHEMATIC INBOARD PROFILE - CORONA J SYSTEM

MISSION 1017



Master Camera No: 140

Slave Camera No: 165

Supply Cassette No: SC-24

Clock No: 531

Yaw Programmer No: 259

"A" Recovery Subsystem No: 623

"A" Stellar-Index Camera No: 21/21/21

"B" Recovery Subsystem No: 625

"B" Stellar-Index Camera No: 60/68/01

Pressure Make-up Unit No: 1009

FIGURE 1-1

## ORBITAL PARAMETERS

| Parameter | Predicted | Orbit 40 Actuals |
|---|---|---|
| Period (Min.) | 90.023 | 89.99 |
| Perigee (N.M.) | 99.99 | 97.29 |
| Apogee (N.M.) | 200.67 | 201.90 |
| Inclination (Deg.) | 75.00 | 75.07 |
| Perigee Latitude (Deg. N.) | 22.10 | 25.98 |
| Eccentricity | 0.0141 | 0.0145 |

C. PANORAMIC CAMERAS

Mission 1017-1 and 1017-2 produced excellent image detail for the forward and aft looking cameras. Information content was rated better than all recent flights and was judged to be comparable to Mission 1004. Much of the ground detail affected by the capping shutter failure in the aft camera was recovered by special dupe positive printing. The cloud cover averaged 30%.

D. STELLAR-INDEX CAMERAS

The -1 mission S/I operated satisfactorily and produced good photo quality.

The -2 mission S/I operated properly for only 10% of the mission.

E. OTHER SUB-SYSTEMS

The clock, instrumentation, pressure make-up, command and thermal control subsystems performed satisfactorily.

## SECTION 2

## PRE-FLIGHT SYSTEMS TEST

### A. ENVIRONMENTAL TESTING

1. Test Objective

As a standard procedure, the J payload systems are subjected to thermal/altitude environmental testing which simulates orbital environment. One of the purposes of this test is to demonstrate the system susceptibility to corona discharge. Such discharge fogs the film thus degrading the operational photography.

2. Test Summary

The J-14 System was tested at simulated altitude during the period 15-20 November 1964. During the approximately 131 hours of testing, a maximum capacity 32,000 feet of pre-dried, type 3404, payload was operated through the pair of pan cameras. During this test, the J-14 System consisted of pan cameras No. 164 and No. 165. Due to a capping shutter failure observed during this test, camera No. 164 was removed from the system and replaced by camera No. 140, which had been part of the M-27 system.

Operation of SRV No. 1 consisted of ten simulated passes on 15 November and special tests on 16 November. The pressure make-up unit (PMU) was used during all of SRV No. 1 pan camera operations. Typical internal system pressures ranged from 3 microns at the start of an operation to about 37 microns in stable operation. SRV No. 2 operations were performed in fifteen simulated passes during the period 18-20 November. During SRV No. 2 operations, the PMU was operated on alternate passes. With the PMU on, pressure ranges of less than one micron to about 37 microns were observed. With the PMU off, the range was about 0.1 micron to 1.5 microns. Thus the pressures achieved provided excellent conditions for detection of susceptibility to corona marking.

Master Camera #140. The camera operated satisfactorily during the 2 1/2 days HATS chamber test which started on 7 October 1964. The internal camera pressures ranged from 1.8 to 200 microns and the corona marking performance was flight acceptable. The cycle rate errors were less than ± 1.0% for two-thirds of the operations. The maximum error was 2.8% slow. The serial number, time word, blanked pulses, slurred pulse and horizon fiducials functioned normally.

Slave Camera #165. The serial number, time word and index, timing marks, blanked pulse, slurred pulse, and horizon fiducials all functioned normally. Some fogging is observed near the beginning of passes. This is traced to a light leak at the silver dollar. A subsequent light leak test verified the light-tight integrity of the system. Also, some dendritic static and abrasive marking is observed along the data block edge at many points. All of these cases appear to be due to handling during retrieval. In one [redacted] frame of the second mission, low density fog (0.2 o[redacted]) is observed. The frame is not near an end of pass and the cause of fog is not known. Corona discharge fog from start-up of a metering roller was detected in only one instance. The corona discharge characteristics of this instrument are considered acceptable for flight.

Small scratches were observed at the start of scan end of formats as well as in the vicinity of the data block. These scratches are attributed to the scan head rollers. The condition appeared to be corrected in subsequent system tests.

Stellar-Index Units D-21 and D-60. S/I Unit D-21 functioned normally and is acceptable for flight.

S/I Unit D-60 had a film take-up failure during the tests. Operation before the failure was normal and acceptable for flight. Functioning after repairs were verified during the system light leak test and it was accepted for flight.

B. RESOLUTION TEST

Resolution and theodolite tests were performed on 12 December 1964. Results of the thru-focus resolution tests of pan instruments 140 and 165 show the following characteristics:

Master Pan Instrument No. 140

Maximum high contrast resolution 171 lines/mm at zero focal position.

Maximum low contrast resolution 120 lines/mm at zero focal position.

Slave Instrument No. 165

Maximum high contrast resolution 182 lines/mm at zero focal position.

Maximum low contrast resolution 113 lines/mm at zero focal position.

The test data for both instruments is shown in Figures 2-1 and 2-2. Both instruments met the system requirements specification.

C. LIGHT LEAK TEST

Light leak tests using type 3401 payload were conducted on the J-14 system on two occasions. During the first test, on 30 November 1964, pan instruments 164 and 165 were installed. Instrument 164 was subsequently replaced by instrument 140 because of a capping shutter failure of the former instrument. A second light leak test was completed on 17 December 1964. In both tests, the payload samples were handled with sufficient care to avoid the handling damage that is typical of many of these tests. The payload test samples from each test showed the system to be entirely free from light leaks.

D. FLIGHT LOADING AND CERTIFICATION

J-14 was recertified for flight on 15 February 1965 at VAFB. Recertification was necessitated by changes to SRV #1 and #2 recommended by G. E. that required a repeat of the flight loading events performed for the first time on 22 January 1965.

3404 type film samples from the Flight Readiness Test and final flight loading were processed and evaluated to determine the flight worthiness of J-14 system. Processed film exhibits from both instrument #140 and #165 showed that the horizon fiducials, time word, 200 pps timing track, S/I slur pulse, and the time word blank pulse were all present.

Series 3 green safelight and series OA yellow safelights were used according to new prescribed test procedures during supply cassette loading and final system integration. No safelight fog was observed on the final system output film samples that were removed and processed at VAFB. Input film samples removed at VAFB and processed at A/P contained no safelight fog.

Light-tight fixtures supplied by Boston and used for the first time over supply cassette film exit parts prevented the payload from being fogged by ambient room white light.

Final payload splices were made in white light using the mechanical film splice fixture supplied by A/P. Final flight splices were inspected and found to be perfectly aligned.

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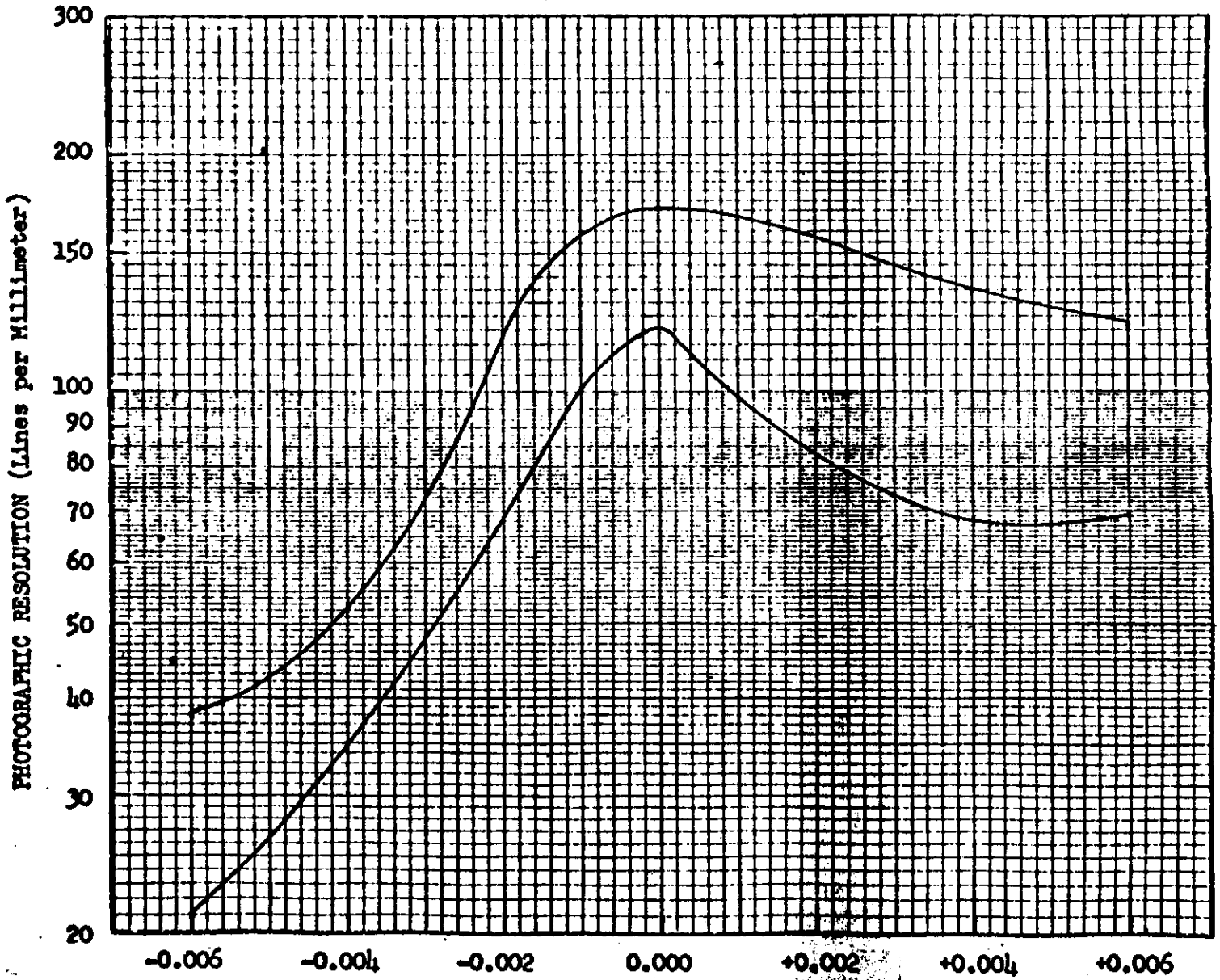
PRE-FLIGHT DYNAMIC RESOLUTION




Camera No: 140

Payload No: J-14

Resolution (l/mm)

High Contrast: 171

Low Contrast: 120

Film Type: 3404

Test Date: 12/12/64

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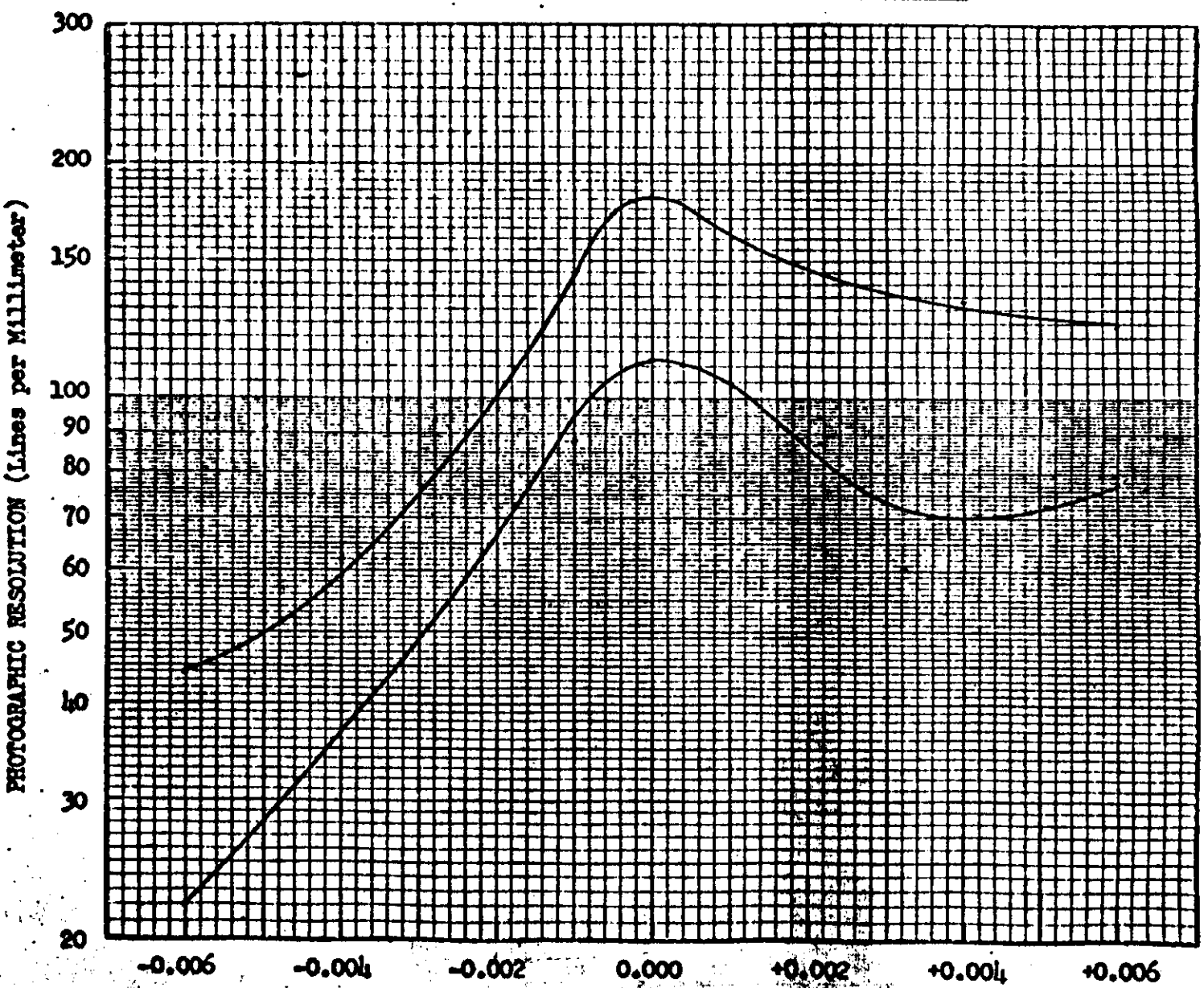
Figure 2-1

PRE-FLIGHT DYNAMIC RESOLUTION




Camera No: 165

Payload No: J-14

Resolution (1/mm)

High Contrast: 182

Low Contrast: 113

Film Type: 3404

Test Date: 12/12/64





Figure 2-2

SECTION 3

FLIGHT OPERATIONS

## A. SYSTEMS PERFORMANCE SUMMARY

The Agena and payload systems achieved the desired orbit with all equipment operational. The Agena performance was satisfactory throughout the flight.

The performance of all cameras were acceptable throughout the first mission. In the second mission the stellar-index camera experienced a metering problem. The slave panoramic camera experienced an apparent capping shutter failure during the last 22% of the second mission.

Average temperature of the panoramic cameras ranged from 77°F to 60°F during the nine day active flight.

The payload system clock performance was satisfactory and good correlation with the tracking station's system time was obtained. A reset of the system time generators was experienced during the first mission but did not result in a problem with time correlation.

The pressure make-up system performed satisfactorily throughout both missions.

The third orbital sine functional generator (Yaw Programmer) was flown on the J-14 system. The programmer was active from orbit 9 until orbit 121. However, the unit appears to have failed on orbit 88.

Both recovery units were successfully air recovered and contained 100% of the panoramic film supplied.

## B. PANORAMIC CAMERA PERFORMANCE

Instrument dynamic operations were observed on the orbits listed in Table 3-1. Both pan cameras performed normally through the first mission and operational cycle rates were less than 1 percent from pre-flight predictions. In the second mission the operational cycle rate of the slave pan camera gradually slowed down to 1 1/2 percent below predicated. The operational cycle rates of the two units were matched within 2 1/2 percent throughout the flight.

During the second mission the master pan cameras, S/N 140, developed an abnormality in its shutdown. At random times during engineering operations, the unit would continue to cycle for one or two cycles beyond the design shut-off. Below is a list of the acquisitions at [redacted] Tracking Station in which an extra cycle was seen and those that were normal.

Engineering Operations

| Extra Cycle (s) | Normal |
|---|---|
| 088 | 0104 |
| 095 | 0120 |
| 0111 | 0152 |
| 0127 (2) | 0168 |
| 0159 | 0174 |
| 0191 | 0175 |
| | 0199 |

Special inflight tests were performed to investigate this problem after the second recovery (0145). Analysis of the information from these tests indicate the most probable cause to be an intermittent failure of a switch to open. This switch, S-107, is used to self-energize the unit until predetermined position in the cycle. This switch is normally open only approximately 1/20 of the cycle and, if it momentarily fails to open, the unit would be self-energized for another cycle.

The customer reported an apparent capping shutter problem on the slave pan camera, S/N 165. The problem was reported to have first been noticed on orbit 117 and then failed in the "open" position on orbit 133. This problem was not detected by any of the telemetry monitors.

FMC Match

During preflight operations, it was reported that the cameras were operating approximately 3% slower than the calibrated rates. It was determined to step from the nominal reference level step 5 to step 4 at [redacted] on Rev. 1. Since actual on-orbit rates appeared similar to the

calibration, readjustment was made on Rev. 9 to step 5, and that level was maintained until Rev. 32 when orbit parameters indicated a shift to step 4 was desirable. The remainder of the flight used step 4.

In general, the aft camera appeared to operate approximately 1 1/2% slower than the forward during the first mission, declining to 3 - 4% slower during the second mission.

Estimated mean FMC errors:

| | |
|---|---|
| Revs. 2 - 8 | +3.1% |
| 9 - 32 | -1.1% |
| 32 - 81 | 1.0% |
| 82 - 104 | 1.5% |
| 105 - 137 | 3.0% (2% on forward camera) |

Panoramic Film Consumption (Frames)

| | Nominal | Actual Master | Actual Slave |
|---|---|---|---|
| Pre-Launch | 115 | 163 | 156 |
| -1 Mission | 3000 | 2942 | 2947 |
| -2 Mission | 2900 | 2914 | 2908 |
| Total | 6015 | 6019 | 6011 |

## C. INSTRUMENTATION AND COMMAND PERFORMANCE

The telemetry instrumentation system was satisfactory throughout both missions. The film footage potentiometer readings agree with the cycle counters within plus or minus 50 cycles (minimum resolution) during the first mission. During the second mission the master cycle counter and footage pot agree within minimum resolution but the slave footage pot averaged about 60 cycles below the counter.

Channel 9 of the first recovery unit telemetry failed to switch from retro events to parachute events. The channel was normal during all retro events but apparently did not have excitation to the divider network monitoring parachute events.

The command system performed satisfactorily throughout the flight. The [redacted] Tracking Station experienced problems with analog command nine (Program Select) during several orbits. This appears to have been caused by local interference and not a vehicle problem.

## D. THERMAL ENVIRONMENT

The temperatures monitored by telemetry during the active flight are listed in Table 3-2. The self-heating corrections for the temp. sensors on this system were determined from inflight data taken on orbit 74 during the [redacted] acquisition.

Predicted and actual flight temperatures are compared in Figures 3-1 to 3-3.

## E. CLOCK PERFORMANCE

The clock performance was satisfactory during both missions. Correlation between the clock and tracking station system time was good. A reset was made to the system time generator at [redacted] Station during orbit 60. This reset amounted to correcting the system time by a minus 100 milliseconds. Corrections of minus 100 milliseconds were made to all system time readings prior to orbit 60. Tables 3-3 and 3-4 contain clock/system time correlation with the -100 milliseconds corrections, slant range corrections and smoothed for human reading accuracy.

## F. SINE FUNCTION GENERATOR PERFORMANCE

Orbital sine function generator, S/N 259, was the third Yaw Programmer to be flown on a Corona J system. The unit was activated by real time command from [redacted] Tracking Station on orbit 9. At turn-on the output signal to the Agena was 8 millivolts and the vehicle appeared to respond correctly to this signal. The telemetry monitor on the unit indicated correct positioning of the generator through orbit 88. Telemetry data at the start of orbit 89 indicated the unit had failed to complete its cycle on orbit 88.

Since it appeared the unit was not cycling it was commanded to an inactive condition on orbit 121. After second recovery on orbit 145, several on-orbit tests were made to see if the turn-on transients could be detected. There appeared to be no response to enabling the unit. Based

on the lack of response to these tests on orbit 152 through 175, it was concluded the unit had lost the 400 cps input supply voltage. It could not be determined whether or not this was the original cause of failure.

## G. PRESSURE MAKE-UP SYSTEM PERFORMANCE

Consumption of the nitrogen supply was nominal and indicated satisfactory performance of the system throughout both missions. The internal system pressure was not monitored on this system. Figure 3-4 shows the supply pressure decrease with the accumulative instrument operating time.

## H. STELLAR-INDEX CAMERA PERFORMANCE

### -1 Mission

Stellar-Index camera, S/N D21, performance was normal throughout the -1 mission. Telemetry monitors indicated normal film transporting on both the stellar and the index and normal performance of the index shutter. An estimate of 420 stellar and index frames were obtained.

### -2 Mission

Stellar-Index Camera, S/N D60, was first observed on orbit 88 at which time the S/I programmer and the platen were operating normally but neither the stellar nor the index cameras indicated metering. The next observation on orbit 95 showed normal programmer, platen and shutter operations but only one metering cycle out of four commanded. All observations for the remainder of the flight indicated normal operation except for film metering.

J-14/1611 FLIGHT CYCLE RATE SUMMARY MISSION 1017

| REV/MODE | | RAMP | | T.U.R. | INST 140 ACT. | INST 140 NOM. | INST 140 DEV. | INST 165 ACT. | INST 165 NOM. | INST 165 DEV. | 140/165 DIFF. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 9 | A | 5 | 6 | 125 | 4.085 | 4.226 | 3.34 | 4.115 | 4.253 | 3.25 | 0.73 |
| 16 | A | 5 | 6 | 1617 | 2.320 | 2.306 | -0.60 | 2.298 | 2.283 | -0.64 | -0.95 |
| 25 | A | 5 | 6 | 174 | 4.064 | 4.199 | 3.21 | 4.108 | 4.224 | 2.75 | 1.08 |
| 32 | A | 5 | 6 | 1658 | 2.278 | 2.282 | 0.19 | 2.281 | 2.260 | -0.93 | 0.13 |
| 48 | A | 4 | 6 | 1645 | 2.240 | 2.224 | -0.71 | 2.235 | 2.228 | -0.30 | -0.22 |
| 63 | A | 4 | 6 | 1765 | 2.215 | 2.215 | -0.02 | 2.217 | 2.221 | 0.19 | 0.09 |
| 88 | B | 4 | 6 | 305 | 3.825 | 3.906 | 2.09 | 3.925 | 3.915 | -0.25 | 2.61 |
| 95 | B | 4 | 6 | 1760 | 2.210 | 2.215 | 0.22 | 2.235 | 2.221 | -0.61 | 1.13 |
| 104 | B | 4 | 6 | 329 | 3.810 | 3.882 | 1.86 | 3.920 | 3.890 | -0.78 | 2.89 |
| 111 | B | 4 | 6 | 1775 | 2.200 | 2.214 | 0.65 | 2.250 | 2.221 | -1.32 | 2.27 |
| 120 | B | 4 | 6 | 389 | 3.763 | 3.816 | 1.40 | 3.877 | 3.820 | -1.48 | 3.03 |
| 127 | B | 4 | 6 | 1814 | 2.220 | 2.213 | -0.30 | 2.250 | 2.219 | -1.38 | 1.35 |

DEV. AND DIFF. ARE IN PERCENT
THE (-) SIGN INDICATES THAT THE INST IS SLOWER THAN PREDICTED OR THAT INST 1 IS SLOWER THAN INST 2

TABLE 3-1

## TABLE 3-2

## J-14 TEMPERATURE SUMMARY

| SENSOR | ORBITS ACQUIRED | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | A | B | | | | | | | |
| Fair ("A") Barrel #1 ("B") | INJ | 9 | 16 | 25 | 32 | 41 | 48 | 56 | 63 | 72 | 79 | 88 | 95 | 104 | 111 | 120 | 127 | 136 | 143 |
| 1 | OBH | 43 | 39 | 39 | 43 | 39 | 39 | 39 | 52 | 39 | 49 | 24 | 27 | 24 | 27 | 24 | 30 | 24 | 34 |
| 2 | OBH | 16 | -4 | 13 | 0 | 13 | 0 | 13 | 3 | 12 | 0 | 53 | 43 | 56 | 46 | 59 | 53 | 62 | 62 |
| 3 | OBH | 3 | 3 | -3 | -3 | -3 | 3 | 0 | 6 | -3 | 3 | 68 | 111 | 68 | 98 | 68 | 98 | 72 | 109 |
| 4 | 217 | 60 | 51 | 54 | 48 | 54 | 45 | 54 | 51 | 51 | 48 | 42 | 74 | 39 | 58 | 39 | 49 | 24 | 46 |
| 5 | 230 | 73 | 73 | 66 | 63 | 63 | 60 | 60 | 54 | 57 | 48 | 45 | 48 | 38 | 44 | 38 | 38 | 24 | 32 |
| 6 | 230 | 69 | 87 | 62 | 81 | 62 | 72 | 59 | 75 | 75 | 66 | -- | -- | -- | -- | -- | -- | -- | -- |
| Barrel #2 | | | | | | | | | | | | | | | | | | | |
| 1 | 140 | 62 | 83 | 59 | 74 | 56 | 71 | 56 | 65 | 49 | 59 | 37 | 43 | 34 | 37 | 30 | 30 | 27 | 27 |
| 2 | 133 | 59 | 98 | 55 | 92 | 52 | 86 | 49 | 86 | 46 | 81 | 43 | 65 | 36 | 52 | 36 | 43 | 27 | 43 |
| 3 | 212 | 62 | 95 | 62 | 92 | 62 | 95 | 65 | 106 | 62 | 109 | 65 | 101 | 62 | 92 | 62 | 87 | 50 | 101 |
| 4 | 230 | 50 | 40 | 50 | 40 | 53 | 43 | 56 | 50 | 56 | 50 | 56 | 47 | 56 | 50 | 59 | 53 | 58 | 65 |
| 5 | 200 | 46 | 53 | 43 | 46 | 46 | 53 | 50 | 56 | 50 | 53 | 40 | 40 | 43 | 40 | 43 | 40 | 41 | 46 |
| Conic Adapter | | | | | | | | | | | | | | | | | | | |
| 1 | 161 | 71 | 74 | 68 | 68 | 61 | 61 | 61 | 58 | 58 | 49 | 39 | 30 | 33 | 23 | 30 | 20 | 26 | 20 |
| Clock | | | | | | | | | | | | | | | | | | | |
| 1 | 95 | 75 | 69 | 73 | 69 | 73 | 69 | 75 | 69 | 71 | 67 | 62 | 54 | 60 | 54 | 60 | 52 | 58 | 52 |
| 2 | 95 | 80 | 71 | 75 | 71 | 75 | 71 | 75 | 71 | 73 | 69 | 65 | 56 | 62 | 56 | 62 | 54 | 60 | 54 |
| Thrust Cone "A" to "B" SRV | | | | | | | | | | | | | | | | | | | |
| 1 | 118 | 52 | 44 | 48 | 41 | 46 | 41 | 46 | 39 | 44 | 38 | 65 | 59 | 62 | 55 | 62 | 57 | 60 | 56 |
| 2 | 82 | 66 | 63 | 67 | 55 | 58 | 59 | 63 | 58 | 60 | 54 | 71 | 65 | 61 | 63 | 61 | 60 | 59 | 59 |
| Stellar/Index "A" to "B" | | | | | | | | | | | | | | | | | | | |
| 1 | 87 | 72 | 63 | 66 | 60 | 63 | 63 | 66 | 63 | 63 | 60 | 65 | 56 | 63 | 56 | 62 | 56 | 59 | 53 |
| 2 | 83 | 74 | 64 | 67 | 64 | 67 | 64 | 67 | 64 | 64 | 61 | 59 | 50 | 67 | 50 | 56 | 47 | 56 | 50 |
| Recovery Battery "B" SRV | | | | | | | | | | | | | | | | | | | |
| 1 | 97 | 71 | 74 | 71 | 70 | 70 | 71 | 74 | 70 | 67 | 67 | 83 | 86 | 77 | 78 | 73 | 87 | 81 | 87 |
| Master Cassette 'A" SRV | | | | | | | | | | | | | | | | | | | |
| 2 | 78 | 63 | 53 | 52 | 48 | 48 | 46 | 51 | 47 | 48 | 47 | -- | -- | -- | -- | -- | -- | -- | -- |

NOTE: Only Thrust Cone Data corrected for self-heating.

## TABLE 3-2

## J-14 TEMPERATURE SUMMARY

| SENSOR | ORBITS ACQUIRED | | | | | | | | | | A \| B | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Master Camera | INJ | 9 | 16 | 25 | 32 | 41 | 48 | 56 | 63 | 72 | 79 | 88 | 95 | 104 | 111 | 120 | 127 | 136 | 143 |
| 3 | 64 | 69 | 65 | 68 | 66 | 67 | 65 | 69 | 65 | 68 | 64 | 61 | 57 | 60 | 57 | 58 | 55 | 58 | 55 |
| 4 | 71 | 76 | 72 | 76 | 73 | 75 | 72 | 78 | 72 | 75 | 69 | 68 | 62 | 67 | 62 | 65 | 61 | 67 | 61 |
| 5 | 67 | 80 | 75 | 78 | 75 | 77 | 74 | 80 | 74 | 77 | 72 | 70 | 65 | 68 | 64 | 67 | 64 | 67 | 62 |
| 6 | 61 | 82 | 79 | 79 | 77 | 77 | 76 | 80 | 75 | 77 | 73 | 69 | 64 | 65 | 62 | 63 | 62 | 62 | 60 |
| 7 | 65 | 80 | 79 | 79 | 77 | 77 | 76 | 82 | 76 | 79 | 75 | 70 | 67 | 67 | 66 | 66 | 64 | 63 | 63 |
| 8 | 73 | 84 | 79 | 83 | 79 | 81 | 79 | 72 | 78 | 81 | 75 | 74 | 68 | 71 | 67 | 60 | 67 | 70 | 65 |
| 9 | 65 | 84 | 80 | 83 | 79 | 80 | 77 | 82 | 76 | 80 | 75 | 72 | 67 | 70 | 66 | 69 | 64 | 67 | 62 |
| 10 | 66 | 77 | 75 | 76 | 75 | 73 | 74 | 76 | 74 | 75 | 71 | 66 | 63 | 65 | 63 | 63 | 61 | 63 | 61 |
| 11* | 95 | 79 | 81 | 80 | 80 | 83 | 78 | 83 | 77 | 81 | 76 | 70 | 67 | 67 | 64 | 66 | 63 | 67 | 64 |
| 12 | 74 | 74 | 69 | 74 | 72 | 73 | 68 | 75 | 69 | 74 | 67 | 68 | 61 | 68 | 60 | 65 | 59 | 65 | 59 |
| 13 | 72 | 69 | 79 | 79 | 75 | 79 | 76 | 80 | 76 | 77 | 74 | 69 | 66 | 66 | 63 | 65 | 63 | 65 | 62 |
| AVG | 68 | 78 | 75 | 78 | 75 | 76 | 74 | 77 | 73 | 76 | 72 | 69 | 64 | 67 | 63 | 64 | 62 | 65 | 61 |
| Slave Camera | | | | | | | | | | | | | | | | | | | |
| 3 | 61 | 79 | 76 | 78 | 75 | 75 | 74 | 76 | 72 | 74 | 69 | 66 | 61 | 63 | 58 | 59 | 56 | 58 | 54 |
| 4 | 61 | 76 | 70 | 75 | 69 | 73 | 68 | 74 | 68 | 72 | 66 | 64 | 58 | 61 | 55 | 59 | 54 | 58 | 53 |
| 5 | 62 | 78 | 74 | 75 | 74 | 75 | 72 | 77 | 72 | 75 | 70 | 68 | 62 | 65 | 62 | 64 | 60 | 64 | 60 |
| 6 | 61 | 71 | 69 | 70 | 69 | 69 | 68 | 72 | 68 | 70 | 66 | 63 | 59 | 61 | 59 | 59 | 58 | 59 | 58 |
| 7 | 65 | 78 | 75 | 77 | 75 | 74 | 74 | 77 | 74 | 76 | 71 | 68 | 64 | 65 | 63 | 64 | 61 | 64 | 62 |
| 8 | 65 | 77 | 72 | 77 | 71 | 75 | 72 | 77 | 71 | 75 | 70 | 68 | 63 | 66 | 62 | 64 | 60 | 64 | 60 |
| 9 | 63 | 71 | 69 | 72 | 70 | 71 | 79 | 74 | 69 | 72 | 68 | 66 | 61 | 64 | 61 | 63 | 60 | 63 | 60 |
| 10 | 63 | 73 | 71 | 72 | 71 | 71 | 70 | 74 | 70 | 72 | 68 | 64 | 61 | 59 | 58 | 60 | 58 | 59 | 58 |
| 11* | 89 | 71 | 68 | 70 | 67 | 69 | 68 | 72 | 67 | 70 | 67 | 63 | 59 | 61 | 58 | 59 | 57 | 59 | 59 |
| 12 | 70 | 84 | 78 | 84 | 77 | 83 | 77 | 83 | 76 | 81 | 74 | 73 | 64 | 70 | 63 | 67 | 61 | 66 | 61 |
| 13 | 66 | 69 | 67 | 67 | 67 | 67 | 65 | 69 | 65 | 68 | 64 | 59 | 56 | 57 | 55 | 55 | 53 | 54 | 54 |
| AVG | 64 | 76 | 72 | 75 | 72 | 73 | 72 | 75 | 70 | 74 | 69 | 66 | 61 | 63 | 60 | 61 | 58 | 61 | 58 |
| Supply Spool | | | | | | | | | | | | | | | | | | | |
| 1 | 60 | 57 | 58 | 58 | 60 | 58 | 60 | 62 | 57 | 62 | 60 | 52 | 52 | 50 | 50 | 49 | 49 | 47 | 48 |
| 2 | 63 | 71 | 67 | 73 | 68 | 72 | 68 | 73 | 67 | 70 | 65 | 65 | 58 | 60 | 56 | 59 | 55 | 59 | 54 |

NOTE: All data corrected for self-heating, except injection.

*Not included in instrument averages

CLOCK/SYSTEM TIME CORRELATION

PAYLOAD J-14 VEH 1611 MISSION 1017-2

ORDER FIT 1

| SYS TIME I/P | CL TIME I/P | COMP SYS TM | DELTA ST | REV | STA |
|---|---|---|---|---|---|
| 33736.955 | 137780.79790 | 33736.95920 | -0.00412 | 88 | 1 |
| 73068.512 | 177112.35590 | 73068.50910 | 0.00292 | 95 | 1 |
| 33636.685 | 224080.54290 | 33636.68640 | -0.00068 | 104 | 1 |
| 72861.037 | 263304.89790 | 72861.03330 | 0.00393 | 111 | 1 |
| 33498.216 | 310342.08990 | 33498.21560 | 0.00066 | 120 | 1 |
| 72705.011 | 349548.89390 | 72705.01160 | -0.00026 | 127 | 1 |
| 33331.626 | 396575.52190 | 33331.62990 | -0.00317 | 136 | 1 |
| 72617.219 | 435861.11890 | 72617.21880 | 0.00071 | 143 | 1 |

A0=-0.10404381030 06 A1= 0.9999997937540 00

SIGMA=0.00242 NO. POINTS= 8

RATIO OF CLOCK TIME TO SYS TIME= 0.1000000206250 01

PAYLOAD J-14 VEH 1611 MISSION 1017-2

ORDER FIT 2

| SYS TIME I/P | CL TIME I/P | COMP SYS TM | DELTA ST | REV | STA |
|---|---|---|---|---|---|
| 33736.955 | 137780.79790 | 33736.95740 | -0.00232 | 88 | 1 |
| 73068.512 | 177112.35590 | 73068.50880 | 0.00326 | 95 | 1 |
| 33636.685 | 224080.54290 | 33636.68730 | -0.00150 | 104 | 1 |
| 72861.037 | 263304.89790 | 72861.03470 | 0.00263 | 111 | 1 |
| 33498.216 | 310342.08990 | 33498.21700 | -0.00065 | 120 | 1 |
| 72705.011 | 349548.89390 | 72705.01240 | -0.00108 | 127 | 1 |
| 33331.626 | 396575.52190 | 33331.62950 | -0.00284 | 136 | 1 |
| 72617.219 | 435861.11890 | 72617.21700 | 0.00250 | 143 | 1 |

A0=-0.10404382070 06 A1= 0.9999998758920 00
A2=-0.14318333186540-12

SIGMA=0.00214 NO. POINTS= 8

TABLE 3-3

CLOCK/SYSTEM TIME CORRELATION

PAYLOAD J-14 VEH 1611 MISSION 1017-1

ORDER FIT 1

| SYS TIME I/P | CL TIME I/P | COMP SYS TM | DELTA ST | REV | STA |
|---|---|---|---|---|---|
| 39254.186 | 248168.90990 | 39254.18790 | -0.00131 | 9 | 1 |
| 78553.383 | 287468.10890 | 78553.38430 | -0.00072 | 16 | 1 |
| 39280.941 | 334595.66990 | 39280.94230 | -0.00037 | 25 | 1 |
| 78566.138 | 373880.86490 | 78566.13470 | 0.00384 | 32 | 1 |
| 39282.744 | 420997.47490 | 39282.74170 | 0.00234 | 41 | 1 |
| 78557.801 | 460272.53990 | 78557.80420 | -0.00245 | 48 | 1 |
| 33860.903 | 501975.64490 | 33860.90650 | -0.00290 | 56 | 1 |
| 39258.754 | 507373.49190 | 39258.75310 | 0.00174 | 57 | 1 |
| 73215.655 | 4459.48490 | 73215.65590 | -0.00023 | 63 | 1 |
| 33811.864 | 51455.69690 | 33811.86490 | -0.00054 | 72 | 1 |
| 73162.737 | 90806.57190 | 73162.73730 | 0.00061 | 79 | 1 |

A0=-0.20891470610 06 A1= 0.9999999354150 00

SIGMA=0.00184 NO. POINTS= 11

RATIO OF CLOCK TIME TO SYS TIME= 0.1000000064580 01

PAYLOAD J-14 VEH 1611 MISSION 1017-1

ORDER FIT 2

| SYS TIME I/P | CL TIME I/P | COMP SYS TM | DELTA ST | REV | STA |
|---|---|---|---|---|---|
| 39254.186 | 248168.90990 | 39254.18730 | -0.00073 | 9 | 1 |
| 78553.383 | 287468.10890 | 78553.38410 | -0.00050 | 16 | 1 |
| 39280.941 | 334595.66990 | 39280.94240 | -0.00047 | 25 | 1 |
| 78566.138 | 373880.86490 | 78566.13500 | 0.00357 | 32 | 1 |
| 39282.744 | 420997.47490 | 39282.74210 | 0.00197 | 41 | 1 |
| 78557.801 | 460272.53990 | 78557.80450 | -0.00282 | 48 | 1 |
| 33860.903 | 501975.64490 | 33860.90670 | -0.00316 | 56 | 1 |
| 39258.754 | 507373.49190 | 39258.75340 | 0.00151 | 57 | 1 |
| 73215.655 | 4459.48490 | 73215.65600 | -0.00030 | 63 | 1 |
| 33811.864 | 51455.69690 | 33811.86460 | -0.00028 | 72 | 1 |
| 73162.737 | 90806.57190 | 73162.73670 | 0.00123 | 79 | 1 |

A0=-0.2089147[illegible]09D 06 A1= 0.9999999591300 00
A2=-0.27218795803590-13

SIGMA=0.00181 NO. POINTS= 11

TABLE 3-4