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18 APR 1969

MEMORANDUM FOR: Director, CIA Reconnaissance Programs

SUBJECT : OSP's NRO Quarterly Report on NRP SATELLITE SYSTEMS

Attached for your consolidation into an overall CIA Reconnaissance Report is OSP's NRO Quarterly Progress Report. Two additional copies are attached for Dr. Flax and [redacted] and one copy each of CORONA and [redacted] is attached for forwarding to [redacted]

[redacted]

Attachments: a/s

CORONA [redacted]
TOP SECRET

HANDLE VIA [redacted]
CONTROL SYSTEM ONLY

Distribution:
Cys [redacted]

8 APR 1969

QUARTERLY PROGRESS REPORT

SATELLITE SYSTEMS

1 January 1969 through 31 March 1969

I. CORONA PROGRAM

A. J-1 System Status

1. Open Items From Last Quarter

a. Agena Battery Failure - During Mission 1049 two batteries in the Agena power supply failed. The most probable cause was internal battery failure. To preclude the recurrence of this failure, more stringent controls are being used during activation and final checkout of the batteries.

b. Main Instrument Out-Of-Focus - The imagery from J-50 was described as being "generally out-of-focus." The Payload Evaluation Team attributed the anomaly to the higher than normal temperature. Action taken was to tighten controls concerning thermal coating surface, stricter launch window limits, and review of ascent temperatures.

2. J-43 Flight Summary

a. On 19 March 1969 J-43 (Mission 1050) was successfully launched. On Rev 22 T/M data indicated that the Agena attitude control system was malfunctioning. The failure mode produced a yaw rotation of approximately one-half degree per second. The failure was attributed to a malfunctioning valve. Abnormally high consumption of control gas required that the Mission be shortened to four days. Successful recovery of both buckets was accomplished by use of the lifeboat system.

[redacted]

b. In the event of a failure of the primary attitude control module the lifeboat system aligns the vehicle with the earth's magnetic field by use of a separate pneumatic control system.

c. Selected portions of the Mission past Rev 22 were usable to some extent. These will be duplicated and distributed to the users. However, only fifteen percent or 990 cycles were obtained before the malfunction occurred. This significantly reduced the requirements satisfactorily covered by Mission 1050.

B. J-3 System Status

1. CR-6 Summary

On 5 February 1969 CR-6 (Mission 1106) was successfully launched. Two important firsts were accomplished on the Mission -- successful operation of the Digital Shift Register Command System (DSR) and satisfactory performance of the first non-gold thermal coating.

Immediately prior to the flight an extensive commanding exercise was conducted. The exercise involved [redacted] tracking station sending RF commands to a receiver/DSR/TM transmitter breadboard installed in a contractor facility at VAFB; the breadboard "looked" to the tracking station like an in-flight system. The exercise included all of the tracking station/Satellite Test Center (STC) communications and T/M verifications interfaces. The exercise confirmed confidence in the DSR Command System.

By the end of the first day of Mission 1106 the only serious problem remaining with the Satellite Control Facility was some inadequately debugged software in the Auggie System (Auggie is a digital printout of selected T/M data points). This deficiency caused bad data printouts at STC for certain system parameters and contributed to our failure to detect two wrong loads. The Auggie problem was fully corrected for all stations by Rev 38.

During the Mission several DSR anomalies occurred. They are described below:

a. Two loads were wrong due to a DSR shifting malfunction. The result was that all operates on Rev 9 were moved south by approximately 26 degrees; for Rev 22 the operates were moved south by approximately 40 degrees. Further testing is being performed to define actual failure mode and recommend corrective action.

b. One load was wrong due to an improper procedure. On Rev 57 at the prime command station the command load was sent, but no verification was obtained. At the back-up station, after verification was made, the execute command was sent. After the pass, T/M showed an erroneous word in the output register, resulting in the shifting of all operates 26 degrees south.

This mode is normal when the load command and execute command are sent at two different stations and a T/M off brush occurs between the stations. A change in procedure has been made to preclude the recurrence of this problem.

c. One load was wrong because of a human error; however, the denied area operation was correct because of a fortunate brush sequencing.

d. Two loads could not be verified, and, therefore, the emergency back-up command system was enabled. The first occurrence was Rev 4 before all stations had had actual experience with the DSR. Immediate action was taken to adjust their command verification voltage levels, and no recurrence of this problem occurred.

The second case occurred on Rev 85; [redacted] STC Computer contact was lost during pass. The action taken was to begin DSR loading as early as

[redacted]

possible in pass. In addition, the tracking stations practiced procedures for fast voice readback during post recovery exercises.

In spite of the problems encountered during Mission 1106, the flight is considered a successful demonstration of the DSR System.

CR-6 was the first system to use the Mystic aluminized tape instead of the gold thermal surface. The new surface produced temperatures that were both uniform and predictable.

Four subsystems failed during the flight -- the automatic V/H control, the automatic exposure control, the aft-looking instrument, and the payload tape recorder. These are described below:

(1) The V/H programmer failed to start after launch. Proper V/H match was maintained during the major portion of the mission by real time commands. The cause was reasoned to be an open circuit supplying current to an oscillator in the programmer. Additional cyclic testing and inspection of programmers will be made in future systems.

(2) The automatic aperture control (switch programmer) failed on Rev 22. The proper aperture setting was maintained by real time commanding with no serious exposure errors.

Failure analysis indicated that a relay failed to operate. This relay has a failure rate of 0.4 per 1000. Normal inspection and testing will continue pending review of failure reports on the switch programmer.

(3) The aft-looking instrument failed on Rev 105, approximately half way through the SO-121 (color film) and approximately 86 percent through the total mission.

It is believed that a mylar splice failed. Flight requirements necessitated a mixed roll of 3404/SO-121. Mylar splices were required because permacel splices would have activated the Material Change Detector (MCD) at each splice. Possible corrective action is being reviewed.

(4) The "B" SRV recoverable tape recorder failed. The vendor's failure report stated that an oscillator failed. These recorders were refurbished and the first such to be utilized during a mission. During refurbishment the oscillator was not replaced. In future refurbishments this will be done.

2. Proposals and Future Changes

a. Glass Filters - CR-14 and up will use glass filters.

b. Splices - A/P has started a series of ultrasonic splice tests. The first series of tests will be completed by May 1969.

c. A constant tension device is being incorporated in future J-3 systems. This mod should reduce tension transients during operation.

d. Itek is conducting special UTB test as outlined by the UTB Task Team.

C. There exist only two J-1 systems; one of these will be launched by the end of fiscal year 1969; the last one will be launched in September 1969. Eight J-3 systems remain in house; one of the above J-3 systems will be used in July 1969. Itek will deliver the last three J-3 systems by end of the fiscal year. The last CORONA flight is presently scheduled for May 1971.

[redacted]

D. Deliveries to A/P

1. SRV Deliveries

743R/744R - February 1969
825/826 - February 1969

2. Main Instrument Delivery

S/N - IR 328/329 - March 1969

E. Missions Completed This Quarter

Mission No.	1106	1050
Booster No.	519	541
Agena No.	1650	1651
Payload No.	CR-6	J-43
Instrument No.	312 /313	210/211
SI No.	--	D113/114
DISIC No.	6	--
DRCG No.	627	611
Film Type	3404	SO-230
Flight Date	5 February 1969	19 March 1969
Feet Payload Flown	29394/3404 2000/SO-121	32606/SO-230
Feet Payload Recovered	29394/3404 911/SO-121	24877/SO-230
Recovery Dates	9/14 February 1969	21/22 March 1969

F. Missions Planned For Next Quarter

Date	14 May 1969
Mission	1051
Payload	J-44

G. Meetings

1. PET Meeting for Mission 1049 on 6 through 8 January 1969.

2. UTB Task Team met at A/P on 4 February 1969.

3. Brigadier General Edward T. Podufaly was given a CORONA Briefing and a tour of the A/P Facility on 24 March 1969. General Podufaly is Commander of the Army Topographic Command which has recently been activated and assumes Topographic Command functions.

NOTICE OF REMOVED PAGES

Pages 8 through 26 are not provided because their full text does not contain CORONA, ARGON, LANYARD programmatic information.