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*Memo for Record:
This paper was the
basis of a status
report given verbally
to the USIB and the
5412 Group by Dr. McKellan
on 14 November 1963.*

WARNING



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This document contains information referring to Projects:

CORONA GAMBIT LANYARD ARGON  POPPY QUILL

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13 November 1963

STATUS OF SATELLITE RECONNAISSANCE PROGRAMS

CORONA

The CORONA Program at present has two payload configurations--the basic single-recovery Mural configuration flown in 1962, spring and summer of 1963, and presently available as backup, and the dual recovery J configuration.

The most recent Mural mission (M-24) was launched on 9 November 1963 but failed to orbit when an in-flight malfunction in the THOR control system caused the vehicle to become unstable and to destroy itself. The malfunction has been isolated to the "engine follow-up" circuit but the specific cause of failure has not yet been determined.

This was the 79th THOR-AGENA launching (includes 10 Improved THORS) - 78 AF and one NASA. Of this number, previous mission failures due to THOR were two in February 1960 and one in July 1961. None of these failures was similar to the 9 November problem. (In addition, the first attempted launch of the Improved THOR failed in February 1963 due to improper connection of a plug to one of the three solid motors.)

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Total THORs launched to date (missiles and satellites)--210.

On four THORs there were problems which may be related to the one experienced on 9 November (although none of these was THOR/AGENAs).

The next launch, scheduled for 27 November, will be Mural 25 on a basic THOR-AGENA. Mural 26 on a TAT AGENA [REDACTED] is available for launch on 14 December if required. Mural 27 as a reserve vehicle (R-7) will be available in January and Mural 28, another reserve, in February.

CORONA J's will be utilized to provide future reserve as necessary after the Mural missions available in January and February are actually launched.

Two CORONA J missions have been launched. On each of these, the first half mission and recovery (equivalent to a full Mural mission) was successful, while the second half was unsuccessful. On the first, an inverter failure prevented main camera operation after reactivation and a battery failure prevented recovery chute deployment. On the second, secure command system problems prevented reactivation of the satellite after its deactivated period.

As subsequent J payloads experienced difficulties in the ground test cycle, decision was made to use the back-up Mural payloads in this time period while completing the R&D on the J configuration. The primary J payload problem is one of adjusting for proper tension in the

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film transport system. Tests now underway at Sunnyvale are providing data on these adjustments. These tests are scheduled for completion on 16 November. After these tests are completed, a J payload will be prepared for flight and, if it successfully passes ground tests, will be available for launch about 20 December. In the meantime, other known problems in the J system (inverter and command system) have been fixed by providing redundant equipment.

GAMBIT

The third GAMBIT mission was launched on 25 October 1963 and was successfully operated in the hitch-up mode (i. e., Orbital Control Vehicle tied to the AGENA, without roll capability) and recovered on 27 October. During ascent, an error occurred in the injection angle, thought to be due to the influence of a cold cloud on the infra-red horizon sensors which provide the reference for orbit injection. This error resulted in an orbit which differed from that planned as follows:

	<u>Planned</u>	<u>Actual</u>
Apogee	180 (n. m.)	182
Perigee	95.48	78.18
Period	88.27 (min.)	88.97
Inclination	98.96 (deg.)	99.11

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Although the difference in orbits had considerable effect on the number of targets that could be covered by this particular mission, limited to vertical photography, it should be noted that it would have little effect on an operational mission since it could be corrected by the orbit adjust system, and full roll capability will also be available. After the recovery, the OCV was separated from the AGENA and exercised "solo" for two days. These exercises, all of which were extremely successful, provided a full test of the roll capability, the orbital adjust capability, and the deboost capability, the latter being used to de-orbit the OCV over the South Pacific.

In the photography from this mission, the ribbing structure of radomes, types of railroad cars and motor vehicles, and players on a football field could be distinguished.

The next GAMBIT mission is scheduled for launch on 13 December. This mission is planned for two days with full solo OCV operation with roll and orbit adjust capability, recovery of the film, and then additional OCV exercising. "Lifeboat" emergency recovery system is available on the OCV if needed.

On the basis of progress made to date in the R&D missions, it is estimated that the GAMBIT project may be fully operational by the fifth or sixth flight, with substantial intelligence take being obtained

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as an important bonus during the R&D period. It is also evident that the performance will exceed the design specifications in regard to photographic quality.

LANYARD

LANYARD was initiated solely as a back-up to GAMBIT, with the expectation of providing coverage of quality better than CORONA but not as good as GAMBIT. It is now evident that LANYARD is not required for this purpose. The LANYARD launch for November was cancelled and the TAT/AGENA converted to other uses. Five payloads are being completed and will be stored.

ARGON

The ARGON launch in October operated for five full days on orbit and was successfully recovered. Four additional ARGON payloads are on procurement for use in CY 1964, if required.

POPPY

The two general search POPPY payloads launched last December continue to operate satisfactorily. They have now operated almost double their design lifetime of six months. [REDACTED]

[REDACTED]

[REDACTED]

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[REDACTED] [REDACTED]
[REDACTED] Additional coverage will be obtained from another [REDACTED]
available for next month. [REDACTED]
launched this month and next. These payloads are designed to meet
portions of the proposed COMOR coverage requirements directed
against [REDACTED].

A three-ball POPPY launch is scheduled for 10 December 1963,
and the first Project 315 [REDACTED] is scheduled for 25 January 1964.
These launches are designed to meet general search and other directed
coverage requirements. The next Project 315 [REDACTED] is
scheduled for March 1964 for electronic-order-of-battle updating.
Development work has started on combining the Project 315 [REDACTED]
[REDACTED] along with the inclusion of more reliable componentry
and response flexibility.

417

The last two 417 missions attempted have failed because of
Scout booster malfunctions. Because of this poor experience (3 failures
out of 5 launches) and the continuing difficulties encountered with the
rocket motors, decision has been made to utilize the THOR-AGENA
booster for 417 launches. Two 417 satellites will be launched at once

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by this booster combination in order to increase the probability of success and maximize the expected useful operating time per launch. The first of these double payloads will be launched in January 1964. Both satellites will be placed on the same orbit. On later missions, the individual 417 satellites will be placed on different orbits by the use of solid rockets so as to optimize weather coverage. Development of an improved 417 payload is underway to increase reliability and operating life and improve performance. The first of these modified vehicles is scheduled for October 1964.

QUILL

The QUILL experiment is being conducted to demonstrate the feasibility of high resolution radar for terrain reconnaissance from a satellite.

The experiment will use an Improved THOR for the booster and the AGENA for the second stage and satellite vehicle. It will utilize the Goodyear RF-4C side-looking radar which is predicted to give about a 100-foot resolution over a swath width of 10 miles.

Data will be transmitted to the ground by direct (real time) electronic readout while the satellite is over the U. S. and by physical recovery of film at the end of a four-day flight. This will increase the

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probability of usable data return and permit a good evaluation of the degradation of data due to electronic readout.

Two flights are scheduled with the first to be in April 1964.

THOR-Based Photo Payload Inventory (as of 13 Nov 63)

<u>Payload</u>	<u>Programmed</u>	<u>Expended</u>	<u>Balance</u>
M	6	2	4
J	20	2	18
L	5 / 3 / 5	3 (/ 5 cancelled)	5
A	2 / 4	2	4