5600-114:RDM:sr
BYE 26911-67
27 JUL 1967

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From: Director, Naval Research Laboratory, Washington, D. C.
To: Director, National Reconnaissance Office

Subj: MISSION 7106, modification, schedule and design plan for

Ref: (a) NRO ltr B-52433-67 of 15 June 67
(b) NRL ltr B-26909-67 of 13 June 67
(c) NRL ltr B-26904-67 of 7 Feb 67

Encl: (1) Revised detailed design plan for MISSION 7106

1. With the highly successful launch of MISSION 7105 on 31 May 1967, it is now possible to place in sharp prospective the detailed design goals for MISSION 7106, and at the same time it is possible to up-date the design to meet the changes in the SIGINT collection requirements. On 17 July 1967 a meeting was held at NRO between the staff of the NRO, NRL and NSA personnel, to reappraise the design details proposed in reference (c), and weigh them against the latest statement of requirements for SIGINT collection. The results of this meeting are given in enclosure (1) as a revised detailed design plan for MISSION 7106.

2. Reference (a) requests information on the following items:

a. Total weight of all four POPPY payloads and mounting hardware for MISSION 7106 will be approximately 1100 pounds.

b. Estimated payload weight for Vehicle 2707 (MISSION 7107) has not been determined but it should be essentially the same as that for MISSION 7106.

c. A review of the fiscal details for FY 68 has shown that the FY 67 carry over is $1,258 K and that the estimates will remain essentially the same as given in reference (b) for FY 68 with any carry over of FY 68 funds being applied to FY 69.

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d. Launch schedule for MISSION 7106 has been reviewed and due to the changes in design goals, the satellites will be ready for launching 8 June 1968, about 12 months after MISSION 7105. The schedule for MISSION 7107 at NRL will result in launch about twelve months after that for MISSION 7106 or June 1969.

e. A meeting has been scheduled 1-2 August 1967 at the Naval Research Laboratory, with the [redacted] representatives to provide the detailed definition of the interface with the MISSION 7106 spacecraft and payloads.

[redacted]

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Subj: Revised detailed design plan for MISSION 7106

Ref: (a) Encl. (1) to NRL ltr BYE 26904-67 of 7 Feb 1967
(b) NRO ltr BYE 52212-67 of 21 Mar 67
(c) NRL ltr BYE 26914 of 30 Dec 66

1. Reference (a) as approved by reference (b) has been the basis of the POPPY Program design at the Naval Research Laboratory. The operational experience derived from MISSION 7105 has resulted in modification of the requirements for MISSION 7106. This revised design plan incorporates and reflects the latest guidance for these improved goals. Paragraphs 2, 4 and 7 of reference (a) remain the same. Paragraph 3 remains the same except for the overall weight of 1100 pounds. The section on SIGINT coverage is modified by Table 1 of this enclosure.

2. The SIGINT coverage shown in Table 1 will provide the following major operational capabilities:

a. Complete coverage of the frequency spectrum from 153 to 10,000 megacycles from at least [redacted] so that the NSA perfected [redacted] emitter-location analysis can be utilized throughout the frequency spectrum. The only band not providing [redacted] coverage is the twenty-first band in the 7106C satellite which covers from 14,800 to 15,100 megacycles.

b. High sensitivity options are available on command in the bands shown by asterisk in Table 1.

c. Experience with 7105 indicates little need for quadrant selectable antenna coverage therefore in the interest of simplification and improved reliability this option will not be provided.

d. The proposal for [redacted] the data from each collection band with its own [redacted] is now being modified to comply with the request of the NSA analysis community. [redacted] differing by [redacted] will be available from each data transmitter in each satellite. NSA will assign these unique

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Encl (1) to
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[redacted] to the collection bands which are tasked together in a group thus allowing for eight bands to be tasked at one time with full capability of unambiguous resolution of the band-of-data-origin. However, the satellite command system will allow any combination of collection bands to be activated, permitting data collection from any spot in the world as described in reference (a).

3. These modifications to the design of MISSION 7106 will optimize the responsiveness to the ABM collection problem. However, it is desirable not to modify too radically, the basic concepts of the POPPY system, such as the wide-open omnidirectional and wide frequency coverage for general search and the [redacted] emitter location capability in the bands of major interest. These features, combined with the ability to read-out in the field for specific geographic locations, as outlined in reference (c), have all been retained in these revised detailed design plans for MISSION 7106 and will assist the NRO in arriving at a solution to the current ABM/AES problems. Location accuracy should be improved because of ground station up-dating to the point where 1 to 2 nautical mile locations will result.

[redacted]

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Band No.	7106 A	7106 B	7106 C	7106D
1	153 - 165	153 - 165	153 - 165	153 - 165
2	165 - 200	165 - 200	165 - 200	165 - 200
3	200 - 240	200 - 2240	200 - 240	200 - 240
4	350 - 450	350 - 450	240 - 350	240 - 350
5	450 - 550	450 - 550	550 - 650	550 - 650
6	550 - 650	550 - 650*	650 - 820	650 - 820
7	650 - 820	650 - 820*	1080 - 1350	1080 - 1350
8	820 - 920	820 - 920*	820 - 920	820 - 920
9	920 - 1080	920 - 1080	1350 - 1800	1350 - 1800
10	1800 - 2100	1800 - 2100	1800 - 2100	1800 - 2100
11	2100 - 2580	2100 - 2580	2100 - 2580	2100 - 2580
12	2580 - 2680	2580 - 2680	2580 - 2680	2580 - 2680*
13	2680 - 2930	2680 - 2930	2680 - 2930	2680 - 2930*
14	2930 - 3120	2930 - 3120	2930 - 3120	2930 - 3120*
15	3120 - 3300	3120 - 3300	3120 - 3300	3120 - 3300*
16	3300 - 3600	3300 - 3600	3600 - 4050	3600 - 4050
17	5250 - 5850	5250 - 5850	4050 - 4800	4050 - 4800
18	5850 - 6700	5850 - 6700	4800 - 5250	4800 - 5250
19	8600 - 9340	8600 - 9340	6700 - 7900	6700 - 7900
20.	9340 - 9500	9340 - 9500	7900 - 8600	7900 - 8600
21	9500 -10000	9500 -10000	14,800 -15,100	

* Denote high sensitivity option providing 12 to 15 db additional sensitivity available on command

TABLE I

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Approved for Release: 2024/06/11 C05025605

C05025605

From John Coulam NSA
early 1968.

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Memo for the record

Specific target accomplishments provided to the SIGINT Community by the Poppy Satellite missions.

1. The following are exclusives considered to be significant contributions to the SIGINT community from satellite collection sources.

a. [redacted] - Formerly [redacted], is derived only from satellite source material. The emitter appears to come from Site I Sary Shagan, possibly from the large screen south of [redacted] (ELT/R2-67). A new intercept of [redacted] as described in a recent report displays a scan rate of 5.2 seconds instead of the 2.62 seconds previously ~~seen~~ observed. Other variations from the usual characteristics are a double [redacted] and a shift in the [redacted] train similar to that seen in [redacted] emissions (ELT/R1-67). This signal has only been intercepted by the Poppy satellites with the first intercept occurring on 25 Dec. 1964.

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B. [redacted] Possible [redacted] signal intercepted on 1 July 1967 (ELT/R6-67) by Poppy satellite 7105. The satellite was in an area near Sary Shagan when the intercept occurred. All previous intercepts of this signal were by other sources in the Far East USA area.

C. Poppy Satellites missions 7101, 7102, 7103, 7104 and 7105 have provided significant data on the [redacted] signals to permit special studies to be made regarding its operating parameters. Several reports were published dealing with RF measurements, scan rates and sector coverages. Poppy mission 7101 on 17 Feb. 1963 made the first intercept of this very important defense system ringing the City of Moscow.

D. The GRAB II (DYNO) satellite mission intercepted [redacted] on 7 Aug 1961, a signal probably emanating from one of the several ballistic missile [redacted] within Sary Shagan

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Parameters of this signal are of a type which would be radiated by an electronically scanned array, such as those used to detect and/or track ballistic missiles and earth satellites. The signals RF was located within the band of 550-620 Mcs. Approximately Two and one-half hours earlier the Soviet manned space vehicle designated Sputnik XII with TITOV aboard landed.

c. [redacted] emitter at Sary Shagan. Missions 7103 and 7104 provided the first indication of the type of modulation-on-pulse used by the [redacted] emitter. A report (ELT/R5-66) published 12 Feb 66 summerizes a number of intercepts by these vehicles and compares (by photos) the [redacted] emitter to the United States AN/FPS-17 radar in [redacted]

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P. [redacted] first generation [redacted] mission 7103 because of its comparatively low sensitivity (-46 DBM) was able to define a scan sector on this emitter (ELT/R5-66). The same was true for intercepts of the [redacted] signal.

g. [redacted] The first indication that the Soviets might deploy a new EW radar similar to [redacted] was seen in mission 7104 data. This vehicle, on 29 July 1966 successfully intercepted a radar emanating from the Soviet R and D facility at Gorkiy. The RF ~~bracket~~ limits of the intercept place the emitter in the 155 to 202 Mcs band. 139 PDS

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H. [redacted] new PRF modes. In early Feb 1964 Mission 7103 A/B made numerous intercepts which except for PRF exhibit operating characteristics similar to those of the Soviet EW radar [redacted] The PRF values obtained from these intercepts equate to one-half and one-quarter of the nominal 200 PRF rate. With these data new rates were established permitting refinements to the ELTEX card formats.

I. ELT/R63-66 Possible Chinese [redacted] associated radar intercept. On 30 Aug 1966 Mission 7104 intercepted an emission believed to be emanating from a ChiCom Dan Song [redacted]

J. [redacted] (ELT/R21-65) (ELT/R20-65) (ELT/R32-65) (~~Mission 7104D~~) Poppy the only Satellite contributing to this X-Band signal. Parameters ~~for this~~ [redacted] well defined Mission 7104D.