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DEFENSE INTELLIGENCE AGENCY
WASHINGTON, D. C. 20301

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MEMORANDUM FOR M&G WORKING GROUP

17 June 1968

SUBJECT: Report of Sub-Committee for Mission Planning

1. The Sub-Committee for Mission Planning was formed to consider the geodetic application of the frame materials from the KH-4B systems on an event-by-event basis. Although the specific purpose was to consider the question in terms of the next event, which is 1104 scheduled for August 1968, we have investigated the overall problem of acquiring data to meet the criteria for a short arc solution. Also, we have explored possible penalties which might be incurred in the intelligence collection program should changes be required in the planned mission parameters.

2. Since it is generally agreed that a short-arc solution (SAR) will not meet the requirement unless additional control is available inside the Sino-Soviet Bloc, the question as to why go the short-arc route at all was discussed. One advantage is that such a solution would provide [redacted] capability to improve the position of targets to an accuracy of 550-600 feet (Air Force feels that you could possibly do better) prior to the operation of a direct targeting system such as Doppler on the KH-4 system. Informal discussions with NRO suggests that such a system could be operational by August 1969. An additional advantage results from the fact that a SAR geometric network could be analytically adjusted to the direct system solution to shift the computed target positions simultaneously. In this manner the accuracy requirements for those targets contained in the SAR could be met without the necessity for additional mensuration. This would enable a considerable amount of the photo mensuration to be accomplished prior to the operational deployment of a direct system. Specifically, it would be possible to position 290 priority one targets now over 750 ft and complete the photo mensuration for 535 now over 450 ft.

3. In considering the photographic coverage to meet SAR requirements several points were brought out. Arcs should be flown so as to cover areas of geodetic control on both entrance to and exit from the Sino-Soviet Bloc and form a pattern of intersecting cross flights internal to the bloc. Arcs from a mission flown at 82° inclination with a 2200Z launch time and an perigee-apogee of 85-135 n.m. do not cover areas of geodetic control on entrance to and exit from the Sino-Soviet Bloc nor do the intersecting cross-flights occur. Preliminary investigations on the part of ACIC indicate that an inclination of 72° with a launch window of 0130Z would provide the optimum control coverage (Europe and Southeast Asia, Japan) with the required intersections. An inclination of 82° with a launch window of 0130Z would provide control coverage (North America and Southeast Asia) although the resultant arcs would be longer. Although this is a less desirable situation, the criteria for control as well as intersecting passes are met. Whether the inclination is changed or not it would be

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necessary to alter the launch time in order to get the intersecting passes.

4. Since the next KH-4B mission is scheduled for a launch time of 2130Z ±15 minutes, the minimum criteria for a short-arc geometric network would not be met. To meet optimum conditions both the inclination and launch time would need to be altered although the minimum criteria could be met with a change in launch time only. From informal discussions with CIA and NRO it appears that a change in the inclination would be of more concern, especially at this time of year. As an example six targets are missed if the inclination is changed from 82° to 75°. NRO has also indicated some concern about the ability to insert updated weather information into the satellite at a lower inclination. On a few occasions the vehicle would be out of range of telemetry stations for up to 5 revolutions. This could result in a 5°-8° percent loss in coverage because of weather. Additionally it is estimated that some time in orbit (one day approximately) would be lost due to the extra fuel expendature requirement to achieve the lower inclination from the Western Test Range. While a change in inclination appears to be of definite concern a change in launch time, to 0130Z does not appear to be serious. Essentially it means that photography will be acquired generally four hours later. As an example the time over Moscow ranges from 1230 - 0930 for a 2130Z launch while the time for a 0130Z launch is from 1530 - 1230. The later launch time means that, on decending passes, the minimum sun angle is reached at higher latitude. However, at no time would this be higher than 10° south. Since the intelligence data has always been collected on the decending passes and no Northern Hemisphere coverage is lost, this does not appear to be a problem. If intelligence data is collected on ascending passes the scale will be somewhat smaller because of the higher altitude. Another area which has to be reviewed is the different thermal (heating) conditions caused by a change in launch time. This does not present a problem, but requires some time for evaluation.

5. The estimates of required launch time and inclination for obtaining SAR data and possible penalties involved are based on our analysis and informal discussions with NRO and CIA. Although it is believed that our analysis is valid NRO has been formally requested to provide more accurate estimate as to the effects of a change in launch time and a specific recommendation concerning the most optimum mission parameters for meeting the SAR requirements with minimum impact on the intelligence mission.

6. Based on our investigations it is recommended that the launch time of the KH-4B mission scheduled for August be changed to meet the SAR requirements as explanied above. It should be pointed out that the August mission will be the last opportunity before next spring to collect the necessary data without a significant change in inclination.

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