

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS UNITED STATES AIR FORCE
WASHINGTON, D.C.



REPORT TO
ATTN: AFNINC

SUBJECT NRO Proposals for Meeting Worldwide Positioning Requirements



TO SAFSS (Brigadier General Berg)

1. Reference NRO MEMORANDUM FOR THE CHAIRMAN, COMIREX, subject: Use of NRP Satellite Systems for Geodesy, 6 August 1968.

2. The fourth paragraph of reference 1, in discussing the possibility of modifying the KH-4B system to incorporate a TRANSIT Beacon, reached two crucial conclusions:

a. that the critical item is the availability of the SGLS, and, therefore, June 1970 represents the earliest time in which the improved geodetic data could be obtained from an NRP system, and

b. that this system could marginally meet the DoD geodetic accuracy requirement.

3. The stated DoD requirement is for the ability to position any object with respect to the World Geodetic System (WGS) to within 450 feet (CE 90%) horizontal, and 300 feet (90% assurance) vertical. The Air Force has an operational requirement for this accuracy for the Mark 12 warhead for Minuteman, and for positioning targets for the Manned Orbiting Laboratory. A requirement can be foreseen for improving this accuracy for the Mark 18 warhead circa 1972.

4. On 5 September, the Navy made a presentation at a DIA meeting which summarized Navy experience with Doppler. Based upon studies made at NWL, assuming no SGLS data, and tracking by TRANET and other mobile vans manned by the Navy, it was estimated that orbit positioning could be achieved with accuracies of 100 feet CEP horizontally and 50 feet (one sigma) vertically.

5. A study recently completed by ACIC, which takes into consideration the results announced by the Navy, reaches these conclusions,

a. Of the three methods considered in reference 1, the Doppler Transponder method is the only one capable of meeting the worldwide positioning requirement.

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b. The Doppler Transponder system installed in either the KH-4B or the KH-9 system could meet Air Force positioning requirements with a safety factor of at least two, and reach the Mark 18 requirement.

c. The KH-4B, if equipped with a Transponder in a timely manner and tracked by existing Doppler ground tracking facilities alone, could satisfy orbit reduction accuracy requirements to enable meeting the positioning requirement at least two years in advance of the KH-9.

6. Should SAFSS elect further to consider the conclusions cited in para 2a and 2b above in the light of the additional information which post-dates reference 1, a copy of the ACIC study can be made available. ACIC technicians are available to assist as required.

Jack E Thomas

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