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Copy 8 of 10

6 November 1968

MEMORANDUM FOR: Comptroller, OSA

SUBJECT : Funding Request for the Concept Formulation Phase of an Advanced Aerodynamics Reconnaissance System under the FY-69 General Research and Development (Aircraft) Budget

REFERENCE : (a) [Redacted] FY-1969 Budget Issue No. 9, Advanced Aircraft

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EVALUATION

1. This memorandum is a request for authorization for the expenditure of [Redacted] to pursue the Concept Formulation Phase of an Advanced Aerodynamic Reconnaissance System. This is a new FY-69 effort and is appropriate to the General Research and Development (Aircraft) program.

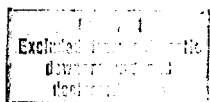
2. The program, as discussed in detail in Attachment I, is to explore various methods of achieving a survivable quick reaction reconnaissance capability (manned or unmanned). The primary objective would be to survive in the lethal envelopes of projected Sovbloc and other defensive environments through the 1975 - 1980 period. In formulation of an approach to this program, attention is directed to reference (a) wherein it is pointed out that the decision to phase-out the OXCART vehicle and the decision to discontinue work on the ISINGLASS concept represented a trend away from continuing maintenance of a high-performance covert manned overflight capability in the NRP. Reference (a) further notes that the cost and effectiveness of alternative vehicle concepts must be examined; for example, should the vehicle be manned or unmanned and in each case what type of launch operation, propulsion, recovery, etc. offers the most promise. These questions are addressed in the elements of the task.

NRO review(s) completed.

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3. It is requested that funds in the amount of [Redacted] be allocated to CIA, for use in FY-69, for the concept formulation phase of an Advanced Aerodynamic Reconnaissance System, under the General Research and Development (Aircraft) program.

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Deputy for
Research and Development
Special Activities

Attachment:
As stated

ASD/R&D/OSA [Redacted]:anw/5 Nov 1968

Distribution:

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Attachment I to

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PROGRAM DESCRIPTION

EXHIBIT 170W

I. TITLE Concept Formulation Phase of an Advanced Aerodynamic Reconnaissance System

REFERENCE [Redacted] dtd 5 Sept 1967, "Funding Request for Certain FY-68 General R&D (Aircraft) Activities"

II. OBJECTIVE To explore various methods of achieving a survivable quick-reaction reconnaissance capability. Primary objective would be to survive in the lethal envelopes of projected Sovbloc and other defensive environments through the 1975 - 1980 period. Elements of the task encompass items 3 and 4 of the referenced memorandum.

III. BACKGROUND In anticipation of approval for this study, the Office of Scientific Intelligence (OSI) was requested to provide their most realistic estimate of the Soviet Bloc and the non-Soviet Bloc defensive environments for the 1975 - 1980 period. A summary of the results of the OSI effort are presented in Exhibit (A). These results in Exhibit (A) together with the quick reaction capability as stipulated by USIB for the indications satellite, Exhibit (B), are used to establish an approach to the problem.

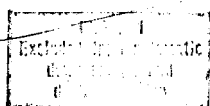
IV. APPROACH TO THE PROBLEM

Survivability would be considered as two distinct environments, i.e., Soviet Bloc and non-Soviet Bloc. Exhibit (B) identifies how each of these two environments would be investigated. Since a "wait and see" approach is recommended for the non-Soviet Bloc environment, the effort for FY-69 reduces to concentrating only on the Soviet Bloc task. This task

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would be performed in sequence by a "Think Group" and then an Airframe contractor. The proposed program organization and elements of the task are shown in Exhibits (A) and (B).

V. ELEMENTS OF THE TASK

The elements of the task would encompass the specifics as outlined in Exhibit (A). Further amplification of this exhibit is noted below:

a. Profiles and Tactics - Using the SA-5 (Tallinn System) as the limiting minimum envelope, investigate maximum capable concepts. Implicit in the development of these concepts will be the realization that future defensive systems expected 10 years hence can only be postulated. Therefore, the sensitivity of survival to variation in defensive system performance parameters must be considered. All conceivable and potentially feasible vehicle profiles and tactics would be considered for survivability. No technological constraints would be imposed on either altitude or speed. Also realistic maneuvers, as they effect the engagement geometry between the SAM and the vehicle, would be evaluated,

b. Candidate Concept Survey - Based on using viable profiles and tactics developed above, this survey should ideally result in one or more concepts. This segment would be the sole responsibility of the airframe contractor under Headquarters direction.

Flight Modes - All modes would be examined to determine if one or more emerges as a superior approach. The launch phase would include investigating

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vehicles which are air launched, ground launched, boosted or self-accelerators. The significant, i.e., intelligence gathering phase, would consider but not be restricted to glide, powered, throttling techniques, high-altitude, low altitude and combinations thereof and speeds to encompass from hypersonic to sub-sonic in consonance with the profiles and tactics.

^{BACKGROUND}
Technology - The contractor would avail himself of the latest materials, manufacturing and engineering technology. All of the technology ^{BACKGROUND} derived from previous programs would be considered so as not to "replow old ground." The most futuristic NASA data would be considered for applicability.

Operational Considerations - The case of manned vs. unmanned would be considered in depth with all compromises both from the vehicle design standpoint and from the cost and reliability standpoint being weighed. The type of launch ^{BACKGROUND} and the basing facilities would be reviewed as they effect the design capability. Considerations necessary to maintain a covert program would be addressed.

c. Analysis - A determination/assessment of how well each concept meets the problem would result from this phase of the task.

Force Fit - It is highly unlikely that any one design would prove superior in all aspects and certain weight would have to be given to the various aspects of the problem during the analysis.

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THE INFLUENCE OF THE PRESENTS OF A MAN
ON THE CONFIGURATION MUST BE CONSIDERED,
I.E., A LARGE VEHICLE TO ACCOMMODATE A
MAN COMPARED TO A SMALLER UNMANNED
VEHICLE. IF A MAN MUST BE INCLUDED
TO ASSURE A COST EFFECTIVE PROGRAM
DURING THE EARLY, LESS RELIABLE TEST
PERIOD,

Reaction - Any intelligence collection system is useful only if the data are available to the users on a "soonest" basis. Therefore, the quick-reaction ability of the concepts would be given prime consideration. Both the reaction time for the actual collection of the data and also the subsequent steps necessary for processing, etc., would be a part of the study.

IMPACT

Man Value - Since politically an unmanned vehicle would be much more palatable, the presence of a man must prove to be of extreme value from the reliability and mission success standpoint if selected. ~~Perhaps~~ the man might be present only during the test phase with the vehicle being droned operationally.

Cost - Naturally any large expenditure of funds committed for intelligence collection can only be justified if (a) ~~a requirement for the intelligence exists,~~ (b) the concept has a high chance of success of obtaining the data and (c) a more reliable, less costly, more politically acceptable approach doesn't exist. Therefore, in the analysis, it is envisioned that both the Airframe Contractor and Headquarters would have an input.

d. Answer - This phase of the task would represent the end result of the effort. Only if the results clearly indicated that both survivability and quick reaction were potentially feasible and practically achievable, would consideration be given to a follow-on effort to include confirmation of system designs and the investigation of basic technology in certain critical areas.

VI. The contractor candidates would be selected in accordance with the criteria of Exhibit (B). A cost and schedule estimate is presented in Exhibit (C).

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Projected Defensive Capabilities Through 1975-1980 Period

Soviet Bloc

- (A) Barrier Defense and Point Defense of High Priority Targets
 - SA-5 (Tallinn System) - ~~130,000~~ feet altitude at Mach ~~7.0~~
- (B) ABM defenses against ICBM and SLBM threats to principal urban-industrial concentrations
- (C) Merging of the two defenses will provide capability of coping with targets at all regimes of aerodynamic operation
- (D) Capability for either nuclear or non-nuclear warhead 25X1



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DEFINITION OF QUICK REACTION

MINIMIZE
~~TWENTY-FIVE HOUR~~ ELAPSED TIME INCREMENT FROM
OFFICIAL REQUEST FOR RECONNAISSANCE COVERAGE TO
RECEIPT OF PROCESSED PRODUCT BY INTERPRETERS.

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PROJECTED RECONNAISSANCE SYSTEMS

SOVIET BLOC

USING SA-5 (TALLINN SYSTEM) AS LIMITING MINIMUM ^{THREAT} ENVELOPE,
INVESTIGATE MAXIMUM CAPABLE CONCEPT WITHIN 1975-80 PROJECTED
STATE-OF-THE-ART.

REQUEST INDEPENDENT CONCURRENT HIGH PRIORITY COLLECTION EFFORT
AGAINST SA-5 AND ABM SYSTEMS TO HARDEN INTELLIGENCE.

NON-SOVIET BLOC

FOLLOW TAGBOARD PROGRESS FOR ONE YEAR

IF SATISFACTORY, INVESTIGATE MODS TO TAGBOARD TO IMPROVE
ALTITUDE.

IF UNSATISFACTORY, INVESTIGATE MODS TO A-12/SR-71 FAMILY
TO IMPROVE ALTITUDE.

*FOLLOW OTHER RECONNAISSANCE AGENCIES AND AIRCRAFT DEVELOPMENT
PROGRAMS TO IDENTIFY AND REPORT ON ANY NEW DEVELOPMENTS*

PROGRAM ORGANIZATION FOR SOVIET-BLOC STUDY

THINK GROUP - Based on reconnaissance targets and ground rules, identify PROFILES AND TACTICS. Options to be rated in order of preference.

HEADQUARTERS - PROFILES AND TACTICS to be selected based on think group data plus in-house assessment.

AIRFRAME MANUFACTURER - Technological survey of all potential CANDIDATE CONCEPTS compatible with PROFILES AND TACTICS.

- ANALYSIS of concepts to provide rating in order of preference with supporting data.

HEADQUARTERS - Review and final judgement.

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ELEMENTS OF THE TASK

1. PROFILES AND TACTICS - THINK GROUP
2. CANDIDATE CONCEPT SURVEY - AIRFRAME MANUFACTURER
3. ANALYSIS - AIRFRAME MANUFACTURER/HEADQUARTERS
4. ANSWER - AIRFRAME MANUFACTURER/HEADQUARTERS

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I. PROFILES AND TACTICS

LOW TO HIGH ALTITUDES

SUBSONIC TO HYPERSONIC SPEEDS

MANEUVERABILITY

COUNTER MEASURES

RADAR CROSS-SECTION TRADE-OFFS

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2. CANDIDATE CONCEPT SURVEY

FLIGHT MODES - AIR LAUNCHED VS. GROUND LAUNCHED
BOOSTED VS. SELF-ACCELERATION
GLIDE, POWERED, THROTTLING TECHNIQUES

TECHNOLOGY - ⁶⁴⁴⁻³⁴¹⁰ OXCART
ISINGLASS



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OPERATIONAL CONSIDERATIONS - MANNED VS. UNMANNED
TYPE OF LAUNCH
BASING FACILITIES
COVERT OPERATION

SENSOR CONSIDERATIONS - BROAD SPECIFICATIONS FOR WEIGHT AND
VOLUME ALLOTMENT

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3. ANALYSIS

FORCE FIT - CANDIDATE CONFIGURATIONS RELATIVE TO WEIGHTING OF VARIOUS ASPECTS OF PROBLEM

REACTION - TIME FOR COLLECTION OF DATA

TIME FOR PROCESSING AND DELIVERY TO INTERPRETER

^{MAN} VALUE - ~~IMPACT ON~~ RELIABILITY AND MISSION SUCCESS

~~POLITICAL CONSIDERATIONS~~

~~CONFIGURATION TEST~~
~~CONSIDER MAN ONLY DURING TEST PHASE~~

COST - JUSTIFIED ONLY IF:

~~A. REQUIREMENT EXISTS~~

A. ACCEPTABLE PROBABILITY OF SUCCESS

B. NO MORE RELIABLE, LESS COSTLY, MORE POLITICALLY ACCEPTABLE APPROACH

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4. ANSWER

- A. SURVIVABILITY POSSIBLE?
- B. QUICK REACTION POSSIBLE?
- C. IF BOTH A AND B POSSIBLE, DEVELOP PLAN

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IV. CONTRACTOR CANDIDATES
CRITERIA FOR SELECTION

THINK GROUP

- * AERODYNAMIC TYPE VEHICLE EXPERIENCE
- * VULNERABILITY ANALYSIS EXPERIENCE
- * TACTICS/ENGAGEMENT ANALYSIS EXPERIENCE

LOCATION OF FACILITY

SECURITY CLEARANCE CONSIDERATIONS

COST

TIME

AIRFRAME/SYSTEMS

DEPENDENT UPON RESULTS OF THINK GROUP EFFORT.

SPECIFIC FLIGHT REGIME EXPERIENCE

HARDWARE VS. DESIGN STUDY

PROGRAM SUCCESSES

PREVIOUS RECONNAISSANCE VEHICLE EXPERIENCE

PREVIOUS AGENCY AFFILIATION.

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Approved For Release 2005/06/09 : CIA-RDP71B00822R000100070031-7

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