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BYE-6396-69

e: Sub-category: Other  
 1) Element: Multi-sensor

PROJECT: AQUILINE

Objectives: To provide a multi-sensor collection and advanced emplacement capability for collection of intelligence.

## Program Plan:

Method of Approach: FY 1970 - During fiscal year 1970, OSA will continue to participate with ORD in the development program. During FY 1970, ORD will be developing and operating the prototype air-ground control station. This will be in conjunction with the development and flight test of the AQUILINE vehicle. The schedule now envisioned indicates that system and sensor tests will start in the first quarter of FY 1970 and the actual flight test of the vehicle carrying its associated systems and payloads will occur during the later part of that fiscal year. OSA will continue to participate through this phase of the development program. Three key personnel for AQUILINE will be required by OSA during fiscal year 1970 to enable adequate participation in the ORD Test Program. These people will be: a Field Program Director; a Manager, Flight Systems; and a Manager, System Support. It is imperative that these positions be filled at the earliest possible date, as these individuals will be the nucleus of the AQUILINE Operational Detachment and will be responsible for effecting an orderly transition of AQUILINE from R&D to operationally ready status. The three positions indicated are in excess of the presently authorized fiscal year 1970 ceiling. OSA will also require \$ [ ] not included in the fiscal year 1970 Budget for support of these operations.

Present plans call for AQUILINE to be conducted as a unilateral U.S. project entirely funded by CIA. There is no need for foreign participation inasmuch as the vehicle is unmanned and it is not expected that foreign-controlled bases will be required. The characteristics of the vehicle are such that it can be launched either by catapult or rocket-assisted take off from U.S. vessels or from any small U.S. base abroad. It is probable that foreign-based launchings can be made without detection or at least without identification. An important element in the security of the vehicle's operation is that its existence, configurations and unique operating characteristics not be known. Thus, every effort is being made to avoid any publicity or knowledge of the vehicle. To this end, flight tests are to be made only at Area 51, and all activities will be conducted as "NOFORN".

FY 1971 - The Flight Test Program conducted by ORD will continue into early FY 1971. The procurement of the second air-ground control system during this period will be the pacing item in attainment of an early operational capability. ORD is proposing to have 7 vehicles for its flight test program. At the conclusion of the flight test program ORD has proposed that the remaining flight test vehicles be rehabilitated and turned over to OSA for use in training, testing and refinement of operational concepts. Anticipating a high attrition rate among flight test vehicles, it is assumed that only 3 vehicles will be available from ORD at

~~TOP SECRET~~

Handle Via  
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~~TOP SECRET~~

BYE-6396-69

the conclusion of their test period.

It is planned to rehabilitate the 3 aircraft left over from the ORD test program, to procure 4 additional aircraft and to use the air-ground control system available from the ORD test program for training, testing and development of operational deployment concepts. During this phase of the OSA operation, it is proposed that an airborne relay system be utilized for confirmation of systems effectiveness, guidance reliability, etc. It must be realized that the maximum range attainable from use of an airborne relay system will be only about [redacted] of which, in an operational environment, only [redacted] could be over denied territory. Necessarily, the relay aircraft must remain outside of denied territory, and the size of components in the operational vehicle is such that only UHF communications are available for its control and navigation. Thus to enable employment of the AQUILINE aircraft to its maximum design capability, it will be necessary to employ satellite relays for communications, control, and data feed-back. If relay systems can be incorporated into satellites being used for other programs, it may be possible to set up a satellite relay system without procurement of a dedicated satellite. If however, a dedicated satellite must be procured, it is estimated this will cost in the neighborhood of [redacted]. In order to acquire an operational capability by late fiscal year 1971, it will therefore be necessary to procure, in addition to the AQUILINE aircraft, a second transportable air-ground control system, a satellite data link, 2 navigation terminals, and terminal control equipment. If a dedicated satellite is necessary, this also should be procured during fiscal year 1971 in order to establish an operational deployment capability in that fiscal year. Twelve additional people will be required to support the training, testing and development of operational concepts and to support possible deployment. Funding requested is sufficient to support this program wherever based, on an austere basis plus minimal coverage for deployment contingencies.

FY 1972 - It is planned to fly a minimum of 12 operational missions. This will necessitate procurement of 6 AQUILINE vehicles, associated systems and payloads, 1 additional ground navigation terminal, and 1 additional satellite data link during this fiscal year. The missions will be controlled from one of two air-ground systems; either the ORD procured prototype or the later, OSA procured, highly mobile system. This will enable one deployment to be conducted, plus training and testing of new or improved aircraft systems and sensors, etc. It will further give marginal dual deployment capability if operations are not conducted at the home base. To maintain a deployment capability plus a home base operating capability will require 8 additional positions.

FY 1973, FY 1974, FY 1975 - No further personnel increases are planned for this period. It is proposed to procure 3 vehicles in each fiscal year to enable accomplishment of up to 12 operational missions per fiscal year, and to continue testing of improved systems and sensors, and refinement of operational concepts and procedures.

Coordination, Joint Planning, Requirements: Coordination is now being effected within DDS&T for joint planning during the

~~TOP SECRET~~

Handle Via  
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~~TOP SECRET~~

BYE-6396-69

remaining development phase. Joint planning will be established as necessary with other components of CIA to insure support for this program. Joint planning will also be established, if deemed necessary, with other members of the intelligence community. There is no requirement for coordination outside the intelligence community or with foreign services.

The AQUILINE vehicle will satisfy specific future requirements of the intelligence community for collection of information in normally denied areas. As opposition defenses increase in capability, the present vehicles may lose some of their utility in obtaining information over these areas. The AQUILINE vehicle will, if developed as projected, enable an almost completely surreptitious penetration. It is planned to attain a capability, combined with satellite relay systems, to satisfy requirements for real time intelligence, precise emplacement capability, etc.

Risks: The obvious risk is loss of an unmanned aircraft over denied territory and the resulting political implications therefrom. The risk in this case is minimized by the fact that the aircraft is much less provocative than any other, being very small and having no armament. This constitutes a low risk capability with an extremely high information gathering potential.

Alternatives: Four alternative levels of effort were considered for FY 1970, and beyond through FY 1975. The first consideration was attainment of an operational capability at the earliest possible date. The development program as outlined by ORD indicated that a relatively sophisticated operational capability could be attained during FY 1970, provided a major expenditure of FY 1969 funds took place. The assets could be acquired to meet such a capability in the most highly desirable form, i.e., a fixed base plus two mobile units capable of simultaneous deployment. This would envision an aircraft with a range of over [redacted], computerized flight, [redacted]. Operation at these ranges with the requirements for precise navigation and precise position control of the aircraft can only be achieved by taking advantage of potentially available satellite relay systems, highly sophisticated ground control equipment and data quality transmission equipment. The cost of establishing such a system would be approximately \$ [redacted]. This was considered to be impractical for numerous reasons among which are:

1. At this point in the development it cannot be said for certain that the equipment in the configuration required for this type of operation would be available within the specified time period.
2. Obtaining the personnel required to man such a capability would have had to start early in FY 1969.
3. The impracticability of obtaining FY 1969 money in the amount indicated.

The second alternative considered was the establishment during FY 1970 of a less ambitious capability consisting of two mobile units with less sophisticated navigation and control

~~TOP SECRET~~

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Control Systems Jointly

~~TOP SECRET~~

BYE-6396-69

equipment but still requiring satellite relay systems for control of the aircraft at the extreme ranges. Equipment for this alternative would cost in the neighborhood of \$13 million for the first year's operation. To establish this capability in FY 1970 would require expenditure of approximately \$ [redacted] of FY 1969 money. This was deemed impractical. Additionally, as indicated above, it was uncertain as to whether the equipment would be developed to the extent necessary to insure reliable production systems.

The third alternative considered establishing one mobile unit during FY 1970. This unit would be considered capable of operating at ranges up to [redacted], which still require satellite relay systems and sophisticated control and navigation equipment, which may or may not be available in the time required.

The fourth alternative is to rehabilitate 3 aircraft left over from the ORD test program, procure 4 additional aircraft, use the ground control available from ORD test program for training, testing and developing operational deployment concepts. This would provide a testing capability for systems and sensors for range extension and for improved aircraft performance. By late fiscal year 1971, the transportable air-ground control system being procured during this year will become available. Since the AQUILINE System must have available a satellite relay to enable employment to design capability, it may be necessary during this fiscal year to procure a dedicated satellite. If this is necessary, such a system, procured in FY 1971, also will be available by late in that fiscal year. This will provide, by late FY 1971, an initial operational deployment capability.

Resources Required:

Unfunded Requirements and Over-ceiling Positions, FY 1970:  
Funding: (Sthousand)

	FY 70
Pers Svc.	[redacted]
Contracts	
Other	
Travel	
Trans	
Supplies	
Equip	
Total	

Positions:

	FY 70
Ceiling	3
Non-Ceiling	-
Field Prog. Dir.	1
Mgr. Flt. Sys.	1
Mgr. Sys. Sup.	1

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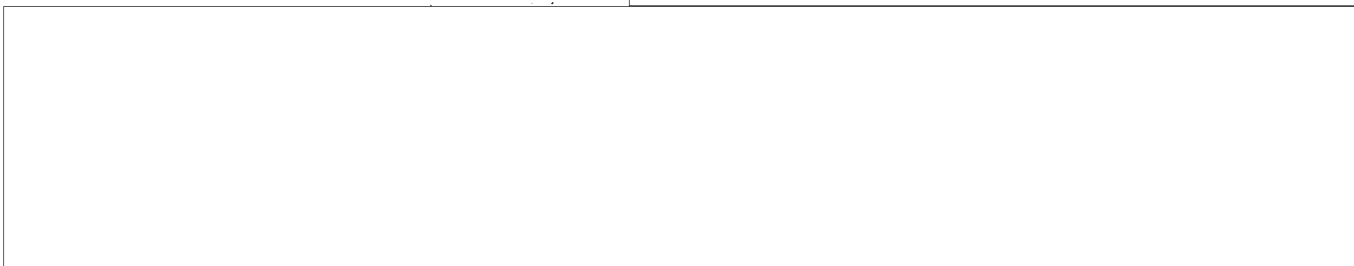
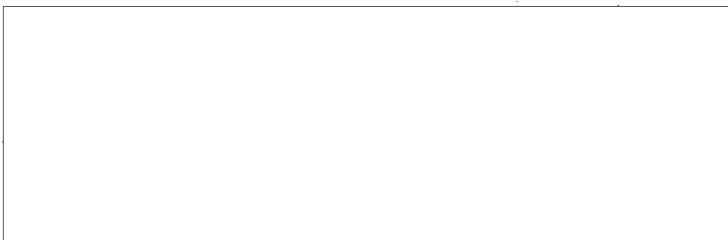
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BYE-6396-69

Requirements FY 1971 - 1975:  
 Funding: (\$thousand)  
 FY68 FY69 FY70 FY71 FY72 FY73 FY74 FY75

Pers Svc. - - -  
 Contracts - - -  
 Other - - -  
 Travel - - -  
 Trans - - -  
 Contract - - -  
 Aircraft - - -



Computers - - -  
 O&M&Tng - - -  
 Supplies - - -  
 Equip. - - -



Total - - -

\* Includes [ ] in FY 1971 for dedicated [ ]

Positions:  
 FY68 FY69 FY70 FY71 FY72 FY73 FY74 FY75

Ceiling - - - 19 27 27 27 27  
 Non-ceiling - - - - - - - -

Total - - - 19 27 27 27 27

Field Prog. Dir. - - - 1 1 1 1 1  
 Manager Flt. Sys. - - - 1 1 1 1 1  
 Manager Sys. Sup. - - - 1 1 1 1 1  
 Security - - - 2 2 2 2 2  
 Clerical - - - 3 3 3 3 3

Operations  
 [ ] - - - 2 4 4 4 4  
 [ ] - - - 2 4 4 4 4  
 [ ] - - - 2 4 4 4 4  
 [ ] - - - 2 4 4 4 4

System Logistics  
 Log. Spec. - - - 1 1 1 1 1  
 Whse. Spec. - - - 1 1 1 1 1  
 Prop. Acc. - - - 1 1 1 1 1

Total - - - 19 27 27 27 27

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