[redacted] NOFORN

~~CONFIDENTIAL~~

30 OCT 1989

#15 110 pages + cover

Director
Aerospace Studies Inst
ATTN: Archives Branch
Maxwell AFB, Alabama

RETURN TO:

K243.8636-44
V.2
12 JUL 1960

Superseded
By 11 August 1960
Development Plan

SPACE SYSTEM

DEVELOPMENT PLAN

EXEMPTED FROM 25 May 1956
DECLASSIFICATION IAW EO 12958
REVIEW DATE_____ REVIEWER 61
REFER TO _____
EXEMPTION (S): 1 2 3 (4) 5 6 7 8 9

PROJECT CORONA HARVEST
DO NOT DESTROY
DOWNGRADED AT 12 YEAR INTERVALS; NOT AUTOMATICALLY DECLASSIFIED. DOD DIR 5200.10

SAMOS R & D PROGRAM

HEADQUARTERS,
AIR FORCE BALLISTIC MISSILE DIVISION
AIR RESEARCH AND DEVELOPMENT COMMAND

3-6806-34
00920402

~~CONFIDENTIAL~~

MICROFILMED BY ADM [redacted]

~~NOFORN~~

T243.8636-44
V.2
12 Jul 1960

30 OCT 1989

[redacted]

~~NOFORN~~

HEADQUARTERS

AIR RESEARCH AND DEVELOPMENT COMMAND

Director
Aerospace
ATTN:
Maxwell AF

RETURN TO:

(UNCLASSIFIED TITLE)

SAMOS R&D PROGRAM

Superseded
By 11 Aug 60

12 JULY 1960

REVIEW ON: 31 Dec 2010

DOWNGRADED AT 12 YEAR INTERVALS; NOT AUTOMATICALLY DECLASSIFIED. DOD DIR 5200.10

B. A. Schriever
Lt. General, USAF
Commander

MICROFILMED BY AFHRA

SPECIAL HANDLING REQUIRED
NOT RELEASABLE TO FOREIGN NATIONALS

~~CONFIDENTIAL~~

WDLPR-387
1

[redacted]

This document contains information affecting the national defense of the United States within the meaning of the Espionage Laws.

1-00920402
54-00110-1

[redacted]

~~CONFIDENTIAL~~ ~~NOFORN~~

AIR FORCE BALLISTIC MISSILE DIVISION

AIR RESEARCH AND DEVELOPMENT COMMAND

12 July 1960

FOREWORD

This volume presents the planning, funding levels, facility requirements and schedules for the continuation of the Advanced Reconnaissance System, SAMOS, under Air Force management and in compliance with Hq USAF guidance for technical emphasis. This volume describes the system concept, program objectives, system characteristics, the various subsystems which comprise the whole, and the testing program being employed to develop the system.

The development emphasis in this plan gives priority to visual reconnaissance over ferret and to the recovery method over the readout method. Every possible effort is being taken to provide the earliest possible flight demonstration of the system. The plan will permit the development of the basic reconnaissance payloads and R&D equipment. This plan does not include any concurrent operationally directed efforts during FY 61 and FY 62.

The plan described herein can be summarized as an essential research and development program capable of satisfying the SAMOS research and development objectives.

It is recommended that the plan be approved as written and funded in accordance with the FY 1961 Financial Plan and FY 1962 Budget Estimate included in the plan.

O. J. RITLAND
Major General, USAF
Commander

This document contains information affecting the national defense of the United States within the meaning of the Espionage Laws,

[redacted]

30 OCT 1989

~~CONFIDENTIAL~~

AIR FORCE BALLISTIC MISSILE DIVISION (ARDC)

SAMOS DEVELOPMENT PLAN

~~NOFORN~~

TABLE OF CONTENTS

This document contains information affecting the national defense of the United States within the meaning of the Espionage Laws

BACKGROUND SUMMARY

The SAMOS Program is a program currently documented under AFBMD Regulation established under Gillette Procedures. Under this documentary procedure, formalized development plans have been the basis for development of the system. The latest previous development plan was submitted 15 January 1960. For a complete background, these development plans offer detailed information.

The SAMOS Program has had several designations and has been a part of the broader WS 117L or Advanced Reconnaissance System. It will be noted that the program had its genesis at the RAND Corporation as early as 1946. It then had a period of limited activity, except for studies, culminating in the publishing of RAND Report 262 (November 1953 and February 1954). This report attested to the feasibility of a satellite as a platform from which intelligence sensors might be operated and recommended that development proceed. In the spring of 1955, design study proposals were solicited by the Air Force from selected contractors.

The number of sources solicited was limited by the Government's desire to maintain a secure program throughout the design and development phase. The WS 117L is a reconnaissance system involving the launching of a vehicle into orbit for the ultimate purpose of collection and dissemination of intelligence information. Therefore, the problem of providing an airframe and engines did not need to be the sole guide to the type of contractors solicited. Those solicited were the Lockheed Aircraft Corporation, the Radio Corporation of America, Glenn L. Martin Company, and Bell Telephone Laboratories. Bell Telephone Laboratories declined to submit a proposal.

The three contractors conducted their design studies between June 1955 and March 1956. These design studies culminated in three separate and distinct development plans. The Lockheed proposal was considered to meet the requirements most satisfactorily. The development and test of WS 117L was awarded the Lockheed Aircraft Corporation on Contract AF 04(647)-97 in October 1956. The Massachusetts Institute of Technology was awarded the contract for research and development of the WS 117L Guidance and Orbital Attitude Control Equipment on Contract AF 04(647)-103 in November 1956. At this time, the executive management of the project was designated to be the responsibility of AFBMD.

By decision of the Secretary of Defense, 1 November 1957, the directive was issued to proceed with the WS 117L at the maximum rate consistent with good management.

This document contains information affecting the national defense of the United States within the meaning of the Espionage Laws, Title 18, U.S.C., Section 793 and 794, the transmission of which in any manner to an unauthorized person is prohibited by law.

On 30 June 1958, the Advanced Research Projects Agency (ARPA) Order No. 9-58 was issued confirming Department of Defense directives for the assumption of responsibilities by ARPA for the Advanced Reconnaissance Satellite Development Program. This directive established the Director ARPA, as the source of policy and technical guidance for future WS 117L development. SAMOS remained an ARPA responsibility until very recently.

In a memorandum to the Chairman, Joint Chief of Staff, subject: Coordination of Satellite and Space Vehicle Operations, dated 18 September 1959, the Secretary of Defense approved specific reassignments to the Air Force of MIDAS and SAMOS. The date of transfer of these systems from the Advanced Research Projects Agency (ARPA) to the Air Force was to be subject to the approval of the Secretary of Defense. The Secretary announced that prior to assuming responsibility for a specific program, the appropriate military departments would submit for approval to the Secretary detailed plans for the system including our relationship with Unified and Specified Commands and other appropriate agencies.

The current development plans (15 January 1960) were prepared in response to these instructions. These plans were submitted in two parts. One part encompassed the basic R&D program, another part outlined the operational aspects of the program. The Air Force submitted the plans, in its two parts, to the Department of Defense. At this level the SAMOS basic R&D program was approved to the extent of releasing those funds required to pursue the FY 60 portion of the basic R&D program. Approval of the basic R&D program for FY 61 has been "tentatively" granted at a slightly lower fund level than requested. The operational FY 60 and FY 61 program has been withheld primarily because of the Air Force's approach to the operational aspects of the program. (It was felt that the Air Force's plan to proceed with a separate operational program at this time would be to the detriment of the national interests.) An attempt to gain a separate operational capability at this time was expected to interfere with the research and development program and would have the effect of delaying the over-all program and raise the program cost. Available funds were to be utilized to emphasize research and development in such a manner as to obtain proven feasibility and reliability of the system at the earliest date.

Early in June 1960, direction to submit a revised SAMOS Development Plan was received from AFDSD (Letter, subject: Exploitation of Initial SAMOS Data, dated 1 June 1960, signed by Lt. Gen. Wilson). The letter stated that a re-evaluation of plans was required because of (1) technical uncertainty as to the character and quality of information that may be obtained by the different SAMOS payloads, and (2) because the character of the initial operational program will be strongly

WDLPR-387
1-1-2

This document contains information affecting the national defense of the United States within the meaning of the Espionage Laws, Title 18, U.S.C., Section 793 and 794, the transmission of which in any manner to an unauthorized person is prohibited by law.

conditioned by the R&D results. The letter directed parallel R&D testing of readout and recovery, earliest achievement of flight dates, and provision for a minimum capability to process intelligence "take".

Other guidance was received in mid-June 1960 in the form of a study on SAMOS prepared in the OSD (DD/R&E). This study proposed reduction in the planned photo readout program, and institution of additional photo recovery payloads.

The plan which follows has been prepared to conform to the guidance and proposals received.

This document contains information affecting the national defense of the United States within the meaning of the Espionage Laws,

DESIGN CONSIDERATIONS

I. INTRODUCTION

A. OBJECTIVES FOR SAMOS

1. The national importance of timely intelligence is fully recognized. In examining how well SAMOS will contribute to satisfying the intelligence needs of the country the following points must be kept in mind.

a. SAMOS will complement and supplement, but not necessarily replace, other intelligence collection systems and techniques. It should be considered as a very productive and timely adjunct to all other sources.

b. SAMOS has two major unique characteristics (common to satellite systems) which set it apart from other collection systems:

(1) It is capable of unlimited geographic access with the least risk of major political ramifications.

(2) It is capable of high repetitive world-wide collections in a very time responsive manner.

2. The SAMOS R&D effort is likely to produce, as a part of its controlled R&D testing, intelligence information of a great value which will be reflected in modification of the requirements. The system must not be limited to the support of only military requirements. It must be basically responsive to intelligence and surveillance requirements as dictated by national policies.

3. Intelligence requirements to be satisfied by Satellite Reconnaissance System such as SAMOS have been passed to the program by the United States Intelligence Board (USIB-D-33.6/8 dated 5 July 1960). Depending upon state-of-the-art considerations, the SAMOS Program will be addressed to developing sensors and related equipments to permit the reconnaissance of:

a. Terrain and culture features of the earth's surface; i.e. visual aspects by photos or other means.

b. Electromagnetic emission; i.e., Ferret, Comint, other.

4. Within these broad reconnaissance areas, the first priority shall be to provide a broad base of coverage over designated large areas of the earth. The resolution or nature of this broad coverage should be compatible with providing this coverage at the earliest possible time. There is the additional requirements to provide surveillance or observsnce of selected areas on a "more sophisticated"

This document contains information affecting the national defense of the United States within the meaning of the Espionage Laws

basis in a repetitive manner. Also, sensors must be developed which can collect information which will be useful in assessing technical accomplishments or capabilities of specified nations. The timeliness of the development of these sensors must be emphasized.

5. The following is an abstract from the above referenced USIB document:

* * * * *

"At the present time, the U.S. Intelligence Board is faced with several outstanding problems which should be considered on a priority basis for system development and employment of the photographic satellite vehicles during the 1961-1962 time period as follows:

a. Our first and most urgent priority requirement is for a photographic reconnaissance system capable of locating suspect ICBM launch sites. It is estimated that many sites for the launching of operational Soviet ICBM's will be completed between now and the end of 1962. It is our strong belief that our best and possibly our only chance to detect these sites will be during the construction phase; once these sites are completed, we will have considerably less opportunity to detect them. It is important, therefore, that a maximum effort be made to find the Soviet operational ICBM launch sites before the end of 1962. Once any ICBM site is located, a satellite reconnaissance system with adequate ground resolution should be able to maintain surveillance and report changes in its status, but if these sites are not located before the end of the construction phase almost any reconnaissance system would be of considerably less value against such a target. We believe that if we are to find the Soviet operational ICBM launch sites, our highest priority effort should be directed to a general search of a substantial portion of [redacted] Photographic resolution to accomplish this search mission would need to approach 20 feet on a side. Repetition of this general search at the rate of approximately once each month initially would give us a relatively high degree of assurance of providing the information required. Read-out of the photography on this frequency would establish trends and priorities for the programming of subsequent search missions. It is expected that the photography will also be used to supplement that obtained by other means for the improvement of mapping and more precise location of targets in the Soviet Union in response to the Emergency War Plans of the Armed Services.

WDLPR-387
1-2-2

This document contains information affecting the national defense of the United States within the meaning of the Espionage Laws,

b. If suspicious locations are identified which might be possible ICBM launch sites, these locations will be added to the highest priority category of the National Priority Reconnaissance Requirements List. Our second priority requirement, therefore, is for photographic coverage of the highest priority target category in the USSR, with a photographic system of sufficient resolution to supply us with descriptive information on those targets. It is believed that resolution approaching 5 feet on a side is necessary for this requirement. There should be a capability to launch and/or control these missions on-call at short notice to meet the needs of the intelligence situation as it develops.

c. Our third priority requirement is for a photographic system of sufficient resolution to supply us with the technical characteristics of the highest priority targets before the end of 1962. This will require a resolution of better than 5 feet on a side.

d. If technological development barriers preclude the design objectives for resolutions described above, the USIB will designate resolutions which are acceptable from an intelligence standpoint."

* * * * *

6. Information collected of intelligence value during any portion of the program, including initial R&D take, will be made available to the intelligence community. It is considered to be a mandatory objective of the SAMOS R&D program to collect information of intelligence value as soon as practicable in the flight test program. This practicability is a function of requirements for sound development and testing (including diagnostic testing).

B. GENERAL DEVELOPMENT CONSIDERATIONS

1. It is of the highest priority for this system to satisfy critical collection requirements at the earliest time. So far as the agency operating the devices is concerned, the means by which this requirement is met or the development status of the system is unimportant in satisfying the requirement. Thus, there is latitude to depart from the classical system development approaches and to depart from classical military planning for the deployment of the system, particularly since:

a. It is evident that the over-riding problem for at least the ensuing few years will continue to be the development problem due to the uniqueness of the unattended satellite platform as a collection system. This has required advances in the state-of-the-art during the

This document contains information affecting the national defense of the United States within the meaning of the Espionage Laws

past years. Many of these advancements, although presently incorporated in the system design, are yet not thoroughly proven and are critical to the satisfactory routine performance of the system.

b. The nature of the intelligence mission requires flexibility of operation with multi and/or adaptable sensors. It is improbable that any model of sensor will be serially produced in large quantities. Job shop production and special handling may be expected to keynote the preparation of sensors for some time to come. It is also contemplated that various aspects of the vehicles and boosters will be subject to modification as a result of sensor variation to meet mission requirements.

c. The types of information collectable, information rates, scales and scope of photographic coverage, high coverage repetition rates for both visual and electronic sensors, and the geo-time correlatable nature of mixed sensor information, are relatively new and unique.

2. Carefully controlled experimentation and study of both the collection and the analysis functions must be conducted during the R&D period with test results to determine the best methods of employment and information processing prior to the establishment of firm operational doctrine and procedures. Dual development approaches are necessary in many areas in order to optimize and/or assure success of the system. The selection of single approaches should be postponed until appropriate feasibility and reliability can be demonstrated. Standardization, design freezes and other "over control" during development can only inhibit the efficient development of this unique system.

3. The pacing nature of the development program, the inability to define fully the requirements for exploitation of the system, and the requirement for flexibility in the sensors, gives the strong indication that the SAMOS System will have an "R&D complexion" for some time to come and if not throughout its life. Therefore, the stringent assignment of particular requirements for an "operating system" can be postponed until more is learned of system capabilities, information processing methods and the realistic requirements for the time period under consideration.

4. A system as important as this must be given every opportunity to succeed. Therefore, we must fully exploit on a continuing basis the maximum levels of American technology.

5. Coincident with the requirement for special and unique equipment and techniques is the requirement for relatively small units of specially skilled personnel to operate the equipment. Much of the advantage of improved techniques and methodologies can be lost because the complexities attending the new compact operations come into conflict with the G.I. concept which is established to satisfy wide-spread large

This document contains information affecting the national defense of the United States within the meaning of the Espionage Laws,

scale operations.

6. This system in particular, involving as it does the use of widely varying equipment systems and techniques in most phases, may not lend itself to the "standard force" concept of operating personnel. Therefore, careful consideration should be given to the utilization of very skilled technical specialists in combination with experienced and sympathetic operational personnel in every phase of the SAMOS System.

7. The requirement for complex non-standard equipment, specially skilled technical personnel and maximum security to perform the mission at a modest level of effort, are not compatible with standard Air Force organizational and logistic concepts. The R&D facilities for launch, tracking, command, readout and processing required for the system testing and to gain the maximum amount of intelligence during the R&D phases can all be utilized for the later "operational" phase of the program, rather than considering the establishment of an entirely new duplicate set of facilities and equipments.

8. It is not possible, for instance, to take immediate advantage of state-of-the-art improvements in equipment and techniques on a mass production basis. The standardization of equipment necessary for force-wide use within the Air Force restrict us, time-wise and money-wise, to major equipment improvements, thoroughly tested and programmed, and for the operation of which large numbers of personnel can be early trained. This is unlikely to ever be the case. The relatively small centrally controlled system of high collection rate capability will most likely be singularly unique and certainly firmly fixed geographically. These features make the system very amenable to special treatment from an organization and logistic viewpoint. Even still, certain portions of the system may be subject to some degree of standardization. These must be individually examined and standardization should take place when it is clearly apparent these will not inhibit flexibility and capability of the system.

9. Security of the operation is yet another complex problem. For all these - the changing nature and detail of the national requirements, the many unknowns surrounding the full utilization of the unique data collected, the complex and experimental nature of the equipments comprising the system and the combination of special technical and operating skills of the personnel required for sensible system operation - the results, methods and techniques obtained and learned during the planned R&D program, will provide a preliminary yardstick to determine the firm future course of action. Therefore, the SAMOS Employment Program should be guided by the following considerations:

a. Remain completely flexible to permit fulfillment of changing requirements (compression of lead time between expression of need and examination of flight results).

This document contains information affecting the national defense of the United States within the meaning of the Espionage Laws, Title 18 U.S.C. Section 793 and 794, the transmission of which in any manner to an unauthorized person is prohibited by law.

b. Retain ability to incorporate extremely complex experimental equipment into its operations means that very close contact with ARDC developers is required.

c. Be staffed by specially trained, technical personnel in combination with personnel experienced in reconnaissance and intelligence operations.

d. Integrate closely all elements of the system to provide for high system response and to provide a means of applying maximum security cover to portions of the "take" of the operation if this is deemed desirable. Likewise, if it is a possibility that the program or elements thereof go "white" at some point in time, this compact integration of all system elements will provide the least risk of security compromise to other systems.

C. REQUIRED PROGRAM ALIGNMENTS

1. NEW DEVELOPMENT EFFORT

a. An appraisal of the development program which existed to the time of this Development Plan will show that primary emphasis and effort has been directed toward providing a relatively high resolution (5') photo sensor system and a medium resolution (20') readout surveillance. Both of these photo systems are limited in swath width and search capability. A review of the USIB priority requirements indicates that highest priority is placed upon "general search of a substantial portion of that part of the USSR [redacted] The search should be at 20' resolution. Repetition of this general search is required.

b. It is evident that the past development apportionment of efforts is not compatible with the latest USIB established priorities.

c. Therefore, this Development Plan includes a major new development effort addressed to providing a "search capability". This search capability will be provided by new recoverable photo (film) technique system. The system will have a 20' resolution (or better) capability. Gross areacoverage per orbital trace will be a feature. Accurate overland recovery of the exposed film will be included. Subsequently, in this plan, this new "Search Capability" has been designated an E-6, medium resolution recovery system, and as a back-up recovery system. An application of the THOR IRBM will be used as the initial stage for the launch of this system

d. In pursuing this new effort, emphasis will be placed on technical soundness; the Aerospace Corporation will participate in a technical role. The contractor base will be broadened, with competition a factor.

This document contains information affecting the national defense of the United States within the meaning of the Espionage Laws, Title 18, U.S.C., Section 793 and 794, the transmission of which in any manner to an unauthorized person is prohibited by law.

2. CHANGES TO PROGRAM IN BEING

The existing program has been a minimum R&D effort in terms of "back-up" and depth. In line with the new guidance and the importance placed upon early accomplishment of objectives, many changes to the "program in being" are included in this plan. It is important to understand that the program which is in being offers the best and only opportunity for early flight testing and resulting intelligence "take". Unfortunately, the initial flight tests cannot be made with a system of optimum characteristic for the highest priority search requirement. This must follow on an accelerated basis. Many changes have been directed which will assure the early flight success of the program. In order that maximum effort be placed upon the "Search" problem, the Surveillance System (E-2) has been reduced in scope of flight testing; the Ferret (F-2 and F-3) testing has also been reduced.

3. INCREASED TECHNICAL (development) SCOPE

This plan will direct emphasis on studies, research, and development which will lead to solution of such problems as (1) obtaining one (1) foot resolution from satellites, (2) the weather (cloud coverage) effect, (3) special sensor applications (new stereo techniques, optics, filters, stablization, etc.), (4) employment techniques, (5) special Ferret applications and (6) recovery techniques.

D. SYSTEM CONCEPT

1. The SAMOS concept utilizes satellite vehicles, modified ICBM and IRBM boosters, launch facilities, tracking facilities, and a communication and data processing network with related facilities. The booster provides the primary propulsive power to the SAMOS satellite vehicle. Separation occurs on attainment of the proper altitude and attitude. As the booster falls away, the satellite vehicle continues in a self-stabilized, predetermined coast to a programmed altitude. Orbital altitudes will be selected according to mission requirement. At the termination of the coast phase, the satellite orbital boost engine activates, supplying the orbital velocity increment required to establish a substantially circular orbit. The internal controls then orient the vehicle to the proper attitude. The most common orbits will pass within a few degrees of the poles. The vehicle will complete a revolution of the earth at approximately 90-minute intervals. Because the orbit is essentially fixed in space, while the earth rotates inside it, successive passes over the earth's surface will be displaced approximately at the equator. This offsetting will permit a single vehicle to observe the entire earth in a total time period which depends, in part, on the width of the swath observed. Sensors aboard the orbiting vehicle will record intelligence information over areas of interest. Two types of ground-space links will be developed for SAMOS data retrieval: physical recovery and electronic readout.

This document contains information affecting the national defense of the United States within the meaning of the Espionage Laws Title 18 U.S.C. Section 793 and 794. [illegible]

2. Re-entry and recovery will be achieved by two methods:

a. High Resolution Flights: The re-entry and recovery sequence of operations may be initiated by the vehicle timer or by ground command. The recovery capsule will be slowed to re-entry velocity by orienting the vehicle and restarting the AGENA engine. The vehicle will provide all control and stabilization functions down to 400,000 feet. Pre-recovery capsule will then be separated from the satellite vehicle and propelled in an appropriate re-entry trajectory for air recovery in the ocean area adjacent to Hawaii. Over-land as well as over-water recovery is planned. At the proper altitude a parachute system will be deployed. Simutaneously, the recovery capsule radio beacon and light begin operating. Aircraft specially equipped with direction finder systems and air recovery gear will detect, locate, and accomplish air recovery of the capsule. If over-water air recovery fails, surface vessels, similarly equipped with direction finder systems, will recover the capsule from the sea with the assistanee of helicopters.

b. Medium Resolution Flights: The re-entry and recovery sequence of operations may be initiated by the vehicle timer, or by ground command. The recovery capsule will be slowed to re-entry velocity by a retro-propulsive technique. The vehicle will provide all control and stabilization function up to capsule separation from the vehicle. Pre-recovery capsule will then be separated from the satellite vehicle and propelled in an appropriate re-entry trajectory for air recovery or land impact over the Continental United States. The recovery capsule will employ lifting re-entry and terminal guidance techniques for direction from de-orbit to the impact location. When capsule acquisition is effected by the ground station, the capsule will be terminally guided to a selected point and a parachute will be deployed; the recovery capsule radio beacon and light beacon begin operating. Air recovery of the capsule may also be considered.

3. The satellite vehicle equipment used in the readout portion of the SAMOS program will be programmed by a ground-space communication link to activate and deactivate visual or electronic sensing equipment over the target. Over a SAMOS ground receiving station, the vehicle shall, upon command, transmit the recorded data. These data will be received, processed, and transmitted to the using agencies. Useful operations will be terminated when air drag changes the orbit sufficiently to prevent operations, or when either the electrical power supply is exhausted or a failure of equipment takes place. Expected mean useful life for early versions of the readout satellite vehicle is about 10 to 30 days. Expected mean useful life for later versions of the readout satellite vehicle is more than a year for ferret reconnaissance equipment and at least 4 months for visual reconnaissance equipment.

4. The data processing portion of SAMOS will develop the apability to process the data collected by the SAMOS vehicle sensors,

This document contains information affecting the national defense of the United States within the meaning of the Espionage Laws, Title 18 U.S.C. Section 793 and 794, the transmission of which in any manner to an unauthorized person is prohibited by law.

correlate the data with time and the orbital information, and extract and report time-significant information, convert the collected data to formats which can be readily utilized by all intelligence agencies, and analyze the collected data to provide feed-back information for proper control and operation of SAMOS vehicles and associated payloads.

This document contains information affecting the national defense of the

E. PROGRAM ELEMENTS

1. Visual Reconnaissance (Subsystem E)

a. Recovery

(1) One recovery portion of the SAMOS Program will provide a payload (E-5) which will be designed to obtain high resolution visual reconnaissance and is to be capable of achieving 5 foot ground resolution with a location accuracy of one nautical mile. The system will have an active orbit life of 15-30 days and will permit coverage of selected targets. The data will be returned to earth in a recovery capsule ejected from the satellite vehicle.

(2) Major emphasis in the program will be placed on providing a visual reconnaissance payload (E-6) designed to attain 20 foot ground resolution with a location accuracy of one nautical mile. It will have an active orbit life of 8-20 days with a potential ground coverage in excess of 9,000,000 nm^2. This will provide a search capability.

b. Readout

(1) The E-1 is a visual reconnaissance component test payload. It is intended to attain a 100' ground resolution with location accuracy of one nautical mile. It contains a slit camera with inflight processing and negative storage. On command from a ground station, the negative images are scanned and converted to electrical signals which are transmitted to the ground station. Here ground reconstruction equipment changes them back to photographic images.

(2) The E-2 is a steerable visual reconnaissance readout payload. It is intended to attain a 20' ground resolution with location accuracy of one nautical mile. Like E-1, it contains a slit camera, but of greater focal length. In flight processing, scanning, transmission and ground reconstruction are the same as in E-1.

(3) The E-3 is a visual reconnaissance steerable payload. It is intended to provide 5 foot ground resolution. No flights are scheduled for this payload on which the effort is limited to study alone.

This document contains information affecting the national defense of the United States within the meaning of the Espionage Laws,