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29 NOV 1961

SAFSP

SANOS Annual Progress Report

Secretary of the Air Force (SAFMS)
Wash 25, D.C.

The attached report is forwarded for information concerning annual progress of the SANOS Program. It provides items of interest and "highlights" of the program for the past year beginning with the establishment of the SANOS Project Office in September 1960.

STAMPED
ROBERT E. GREEN
MajGen, USAF
Director

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Report, SANOS Annual
Progress Rpt w/ 1 Atch
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DEPARTMENT OF THE AIR FORCE
SAFEP
Air Force Unit Post Office
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29 November 1961

SAFOS

ANNUAL PROGRESS REPORT

SAFEP-04-22

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SAMOS ANNUAL PROGRESS REPORT

I. PROGRAM STATUS

A. The SAMOS Project Office was established in September 1960 at El Segundo, California, as a field extension of the Office of the Secretary of the Air Force. Secretarial action further directed the appointment of a Director for the Project Office who would act as Program Director and administer the management functions involved.

B. Of importance was the national priority placed on the SAMOS Program and the precedence procedures placed in effect to permit direct communications between the Secretary's Office and the Program Director. This action provided expediency in resolving major problems affecting the program.

C. In November 1960, the program was directed to an R&D effort for the purpose of exploiting promising satellite reconnaissance techniques. Direction was received from the S&F in November to place priority on photo recovery techniques over resident systems. Subsequently, efforts on the E-1 visual reconnaissance system and the E-2 system were reduced. The principal effort of the program has since been directed toward two recovery type payloads. These are:

1. The E-5, now known as Program 102B, which is proceeding under an accelerated program for a first launch in November 1961.

2. A more sophisticated second generation photo recovery payload, E-6, now Program 801, is being designed to photograph ground targets at a 10' resolution. All subsystems of the 801 Program are progressing toward a first launch in March 1962.

D. 

E. Development of equipment for Data Processing, Subsystem I, was discontinued in November 1960, after an evaluation of the program had been completed by the Air Force and the National Security Council.

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II. TECHNICAL PROGRESS. Progress of the SAMOS Program during the past 12 months was highlighted by the successful launch and polar orbit of Satellite 2202. Technical progress of the program has been broken out into Program I and Program II.

A. PROGRAM I

1. The Missiles and Space Division of Lockheed was selected as the contractor for technical direction, systems engineering and systems integration for Program I. Under established design and development criteria, the Lockheed Missiles and Space Division provided the AGMA/B vehicle modified to accept the ATLAS/D booster. The management ability of LMSD became a concern in late 1960 when it was apparent that program milestones would not be met. In June 1961, with assistance from the Air Force, the LMSD was reorganized toward a management concept that provided adequate staffing and technical direction to accomplish space system requirements. The Division was designated the Lockheed Missiles and Space Company with three divisions operating independently: The Space Systems Division, Missiles Division, and General Services Division. The new management concept defines more clearly the functions and staff responsibilities of the Company. One of the major efforts being placed on the new Space Systems Division at this time is the acceleration of Program I to meet a November 1961 launch date for Satellite 2202 and a December launch date for Satellite 2203. Indications are that these objectives will be met.

2. Significant progress has also been made in system configuration, concept, and development of Aerospace Support Equipment.

a. The Satellite Photographic Processing Laboratory was established in December 1960. Its mission covers the processing of film and the research and development in the film processing field. The organization immediately launched into a three phase program aimed at improving processing quality through optimization of processing equipment, physical working environment and basic research in high acuity processing. To date, new processing equipment has been fabricated and installed, and detailed plans completed for modifying the laboratory into a dust-free facility with rigidly controlled temperature and humidity conditions; facility modification has been approved, and should be completed during the first quarter of FY 1963.

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b. Command and Communication Facilities were improved at Vandenberg, New Boston and ██████████

c. In recovery support, five JC-130B aircraft were modified, qualified and delivered to the Recovery Group in Hawaii. These aircraft are operational with trained crews. An additional JC-130B is stationed at Edwards Air Force Base for test support activities. Testing of recovery techniques for Program 502 progressed through the Pegasus Test System with the third launch attempt at the White Sands Missile Range highly successful. Booster and parachute deployment functioned according to plan.

B. PROGRAM II

1. Direction was received from ARMC in July 1960 to proceed with the development of an orbital, high acuity photo reconnaissance system. The photo subsystem was to be designed to meet a 10' ground resolution. The AGENA/B was selected as the injection and orbiting vehicle with an ATLAS/D as the first stage booster.

2. Selection of the following associate contractors was made for Program 502:

Photo Subsystem
Recovery Subsystem
AGENA/B
ATLAS

Eastern Metal Co
General Electric
Lockheed Aircraft Corp
Convair Astronautics Div

General Systems Engineering and Technical Direction was assigned to the Aerospace Corporation. For Program 502, both the ballistic and maneuverable vehicles were chosen. The Martin Company maneuverable vehicle, Program 502, was divided into two phases. Phase I involves studies, material selection, and preliminary design. Phase II consists of five non-orbital flight tests from the Atlantic Missile Range. Approval of funding for Phase II is scheduled for December 1961.

3. Significant achievements in Program 502 have been accomplished:

a. Johnston Island was selected as the initial recovery site.

b. The AGENA/B vehicle was redesigned to meet critical weight limitations and to simplify interface problems.

c. Optics were unfolded in favor of a lighter, less complex photographic system.

d. A secure command and communications link of large capacity was added.

e. The existing tracking net was expanded by the addition of stations at Annette and Thule.

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f. Weight problems were re-evaluated and design of subsystems was made to allow assignment of weight limitation as follows:

AGHNA/B: 2000 lbs
Payload Vehicle: 1630 lbs
Photographic Subsystem: 1230 lbs

4. Eastman Kodak Company fabrication of the first flight payload began in August 1961. The photographic subsystem is scheduled for installing in the AGHNA in January 1962. The primary optics for the engineering model have been subjected to preliminary tests at Rochester and have exceed the design specifications.

5. General Electric Company has had the most difficult and varied development problems. The RVK-2A re-entry heat shield was completely redesigned to eliminate weight. A modified VEHICONT S-band radar CAC system was chosen. General Electric has also been given major responsibilities in the operational recovery area.

III. PROCUREMENT AND PROGRAMING

A. In August 1960, the SAMOS Program consisted only of Program I. Lockheed Missiles and Space Division was designated the Prime Contractor, with funding for Contract AF 04(647)-563 through 31 March 1961 estimated at [REDACTED]. Cumulation costs through 30 May 1962 are estimated to be [REDACTED].

B. Program II contractors were selected by the Board in July 1960. Estimated costs for the program, by contract, were as follows:

<u>Contract</u>	<u>Contractor</u>	<u>Estimated Cost</u>
AF 04(647)-715	General Electric	[REDACTED]
AF 04(647)-716	Eastman Kodak	[REDACTED]
AF 04(647)-677	Lockheed	[REDACTED]
AF 04(647)-726	Martin Company	[REDACTED]

C. We additionally entered into the following contracts:

<u>Contract</u>	<u>Contractor</u>	<u>Estimated Cost</u>
AF 04(647)-918	General Atomics	[REDACTED]
AF 04(647)-877	Airborne Instr Lab	[REDACTED]
AF 04(647)-892	Goodyear Aert Corp	[REDACTED]
AF 04(647)-841	LMSC	[REDACTED]

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D. Our Fiscal Year 1961 fund program of ██████████ was 100% committed and 98.7% obligated on 30 June 1961. Fiscal Year 1962 fund requirements were approved for ██████████

IV. ORGANIZATION AND MANPOWER

A. The establishment of the SAMOS Project Office in September 1960, brought about a reorganization of the SAMOS Program Directorate to provide for a Director, Special Assistant to the Director, Vice Director, Vice Director for Technical Matters, Executive/Administrative Office, and a Deputy Director for each of the following: Engineering, Operations, Plans and Programming.

B. Procurement support for the SAMOS Program was consolidated by the Commander, Ballistic Missile Center in September 1960 to provide for a single office of five officers and two civilians. The Procurement Office worked in direct support to the SAMOS Program. This action resulted in improved efficiency in terms of responsiveness, direction, and security.

C. In early January 1961, the Project Office was reorganized to provide for two Programs, I and II, an Operations Directorate, and a Plans and Programming Office. A minor reorganization of staff functions required further organization realignment in July 1961. The Project Office staff functions were separated into four Directorates. In August, a Recovery Office was added to the organization and personnel staffing was completed shortly thereafter.

D. Manning authorizations for the SAMOS Program have been broken out by time periods to indicate personnel requirements as the program progressed.

MANPOWER

<u>MONTH</u>	<u>OFFICERS</u>	<u>ARMY</u>	<u>CIV</u>
September 1960	14	0	3
December 1960	49	1	25
January 1961	51	1	25
August 1961	66	1	34

V. SECURITY

A. The mission of the SAMOS Program required a continuous review of security procedures in effect. Action was taken by the Program Director to limit "need-to-know" and, under Secretarial direction, Visitor Control procedures were enforced to the extent permissible to allow mission accomplishment.

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B. Actions to enhance the security of the SAMDS Program were taken to complete the following:

1. Direct communication teletype networks were established between the SAMDS Project Office and LSEC, Eastman Kodak, General Electric, AFSEFL, SAFMS, and the SEC.
2. Direct voice communications established with SAFMS and AFSEFL.
3. A cipher phone link established with SAFMS and a clear voice link with HQ AFSC.
4. Contractors related to the program have been advised to "low key" the word SAMDS and to substitute Program I or II. Also, the payloads were redesignated program numbers for security and funding purposes as follows: E-1/7-1 to Program 101; E-2 was assigned as Program 101A; [REDACTED] E-3 as 101B; and E-6 designated as 211.
5. A personnel badge exchange system was instituted for administrative control at the entrance to building corridors having program offices.
6. Background investigations of all personnel working in the SAMDS Program have been rechecked.
7. All major Air Force Commands and the JEC (Navy) were notified of increased security requirements.
8. Technical security survey sweep of the SAMDS Project Offices was completed by the OBI.
9. The Press is provided only the minimum information required for public release on launches. The "Fast Facts" given out to the Press are first approved at SAF level. Messages containing launch progress are identified by a code name. Briefings to the Press are given by the Vice Director, or specially selected officers.

VI. CHRONOLOGY

Highlight events have been added as Attachment 1 to provide more detailed information.

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SAMDS Program Highlights (S)

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SAMOS PROGRAM HIGHLIGHTS

11 August 1960

SAF Order designated General Robert E. Greer as Director of the SAMOS Project with duty station at El Segundo, California. The Project Office would be a field extension of the Office of the Secretary of the Air Force.

12 September 1960

AREC Message stated SAMOS FY 61 Program for funding was increased by [REDACTED] for a total revised program funding of [REDACTED]

13 September 1960

Memorandum for SAF to Chief of Staff, USAF, established policy stating that there would be no review or approval channels between the Director of the SAMOS Project and the Secretary of the Air Force.

10 October 1960

Secretary of Defense memorandum to SAF stated that action had been taken by the National Security Council and approved by the President to place the Air Force Satellite Reconnaissance Program (SAMOS) on a very high priority.

11 October 1960

The first SAMOS Vehicle, 2101, was launched from Point Arguillo on 11 October 1960. The satellite umbilical did not release and the nitrogen fill line was pulled out of the ACHNA vehicle as the ATLAS lifted from the pad. Separation and ACHNA engine ignition were normal. ACHNA attitude control had been lost. The thrust was not directed into the orbital injection plane. Engineering changes were directed to prevent a similar occurrence in the future.

4 November 1960

Under Secretary of the Air Force (Mr. Charyk) memorandum to the Director of the SAMOS Project Office directed termination of Subsystem I development. This decision was in accordance with the decision that was made at the recent review of the SAMOS Project at the highest National level, and the associated re-direction of the project emphasis from readout type systems to recovery type systems. Distribution of Subsystem I development equipment was under study.

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6 December 1960

Memorandum from Under Secretary of the Air Force established certain basic policies pertinent to SAMOS. The memorandum stated that the program should be regarded as an R&D program aimed at the exploitation of various promising reconnaissance techniques.

15 December 1960

RAF Order 116.2 established the Air Force Satellite Photographic Processing Laboratory (AFSPPL) at Westover AFB Mass. The Laboratory would be under the command of the Director SAMOS Project, El Segundo, California. Development planning was set forth in Appendix I to 11 August 1960 Development Plan.

17 January 1961

M&E Program. A discussion of material selection, material test program, and test facilities, was held with the Martin Company. Martin Company was asked to outline a materials test program and to establish test requirements to be presented to Aerospace Corporation for review on 26 January 1961.

31 January 1961

Communication and Control. A decision was made to use the present VERLANT tracking net with the addition of a new VERLANT tracking station at Annette Island, Alaska, to meet SAMOS Program II requirements (Project 201). Aerospace Corporation was instructed to conduct a study to determine methods of improving the VERLANT net to provide more accurate tracking for future requirements.

31 January 1961

M&E. A study of the existing M&E at VAFB was accomplished for the purpose of determining adequacy for Program II efforts. The decision was made to convert approximately 1/2 of the Convair ALAS booster area to the use of the SAMOS Program. To support the increased requirements of P&C Nos 1 and 2, P&R, a new first-stage booster M&E is being written into the development plan. When this space becomes available, it will enable the SAMOS Program to expand into the remaining 1/2 of the booster area.

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31 January 1961

SAMOS Vehicle 2102 was successfully placed into polar orbit (launched from FMR at 1223 hours).

14 February 1961

In accordance with verbal direction from the Under Secretary of the Air Force to the Director, SAMOS Project, SAMOS/AGHRA 2103 was cancelled. This action was confirmed one day later by message from SAFWP-VT to SAFMS (15-2-13).

16 February 1961

~~RECOVERY~~. A decision to remove air snatch recovery considerations for SAMOS Project 201 from the recovery system design was made at the General Electric Technical Direction meeting 15 and 16 February 1961.

25 February 1961

SAMOS Project 201 initial drop and recovery area was defined as Johnston Island Atoll.

9 March 1961

The Martin Company MRC Program was cut back to ~~per month per month~~ per month per month. The new program will specify a study project only through the engineering and mock-up phases.

20 March 1961

The Commander, White Sands Missile Range (Safety) approved the Pegasus Flight Profile. Launch azimuth degrees true heading was finalized. The Pegasus is a rocket to be used for testing Project 1013 land recovery techniques.

1 April 1961



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1 April 1961

The reorganization of elements of AFMND and HMC into Space Systems Division has resulted in internal reorganizations which should assist the SAMMS Program in expediting future program direction and contractual coverage. The incorporation of the procurement functions into the Space Program control enables more rapid dissemination of the technical and administrative decisions (Maj Air Force Systems Command Special Order No. G-3, dated 1 April 1961).

19 April 1961

Action was taken by SAFSEP to cancel requirements for AGENA B Vehicle 2122 which had been designated for Project 101A. LMSD was advised.

21 April 1961

Project 201 photographic payload mockup was delivered from HMC to General Electric on schedule.

10 May 1961

Planning Research Corporation (PRC) was given a contract 10 May 1961 for Operations Analysis Support of the SAMMS Program. The total value of the contract (AF OH(647)-869) was [REDACTED] which includes a fixed fee of [REDACTED]

31 May 1961

[REDACTED]

6 June 1961

SAFMS message 200 61-60 indicated curtailment of the IA Program by Deputy Secretary of Defense to delete scheduling of flight vehicles until further notice.

30 June 1961

Action was initiated to activate [REDACTED] to support SAMMS Program II. A station performance specification and the initial survey of the site have been completed.

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7 July 1961

The initial release of FY 1962 funds to the SAMDS Project was in the amount of [REDACTED] Budget Authorization was contained in AFAC message SOCMR-3-7-3 dated 7 July 1961. It is anticipated that the full programmed amount of [REDACTED] will be made available by 1 September 1961.

9 July 1961

A space radiation package, including a sample of 101A film and processing web, was recovered with the DISCOVERER XXVI payload after 32 orbits. Analysis test of samples verified that the payload experienced a radiation dose of one half roentgen which was 80 to 90 times less than that of sensitized film used on present SAMDS programs.

20 July 1961

Program 202 Planning Estimate was submitted to the Commander, Atlantic Missile Range. Pad 15 was subsequently assigned for program use.

29 July 1961

Five (5) JC-130B aircraft with Program 101B recovery gear were deployed to Hawaii. Tests are continuing at Edwards Air Force Base with test aircraft JC-130B No. 386. This aircraft accomplished pickup of a 2000-pound dummy XRV capsule in June.

13 August 1961

Agma vehicle 2901 and its associated airframe and AGE are now being programmed to a SED desired first flight date in early February 1962. The second 102 flight is scheduled for mid-June 1962.

18 August 1961

A high altitude balloon drop test of a Project 101B XRV capsule was completed over the White Sands Missile Range. The drop was accomplished at an altitude of 100,200 feet and was satisfactory in all respects. This balloon drop followed another successful B-52 drop on 1 August at Edwards Air Force Base.

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18 August 1961

Effective this date, responsibility for development of payload recovery systems was centralized in a Recovery Office (SAFEP-R) within the SAMS Project Office. The Recovery Office will provide recovery system support to the SAMS and RECOVERER Programs. Manpower spaces were provided from Space Systems Division Offices, [REDACTED]

5 September 1961

Program Authorization No. 62-DCAS-50 dated 5 September increased the program fund allocation for FY 1962 by [REDACTED] to a revised total of [REDACTED]. Budget Authorization in the same amount was issued on SA No. 36 (DCAS). Of the [REDACTED] authorized SAMS for FY 1962, [REDACTED]

11 September 1961

Two recovery test units (RTU) for Project 101B were dropped from a B-52 aircraft over the Hawaiian Islands on this date. Aerial recovery of the first drop was abandoned at approximately 9000 feet, and retrieved by surface ship without difficulty. The second drop was successfully recovered by a JC-130B aircraft at approximately 13,000 feet. These drop recoveries followed five successful air recoveries out of six attempts at Hickam AFB on 8 September 1961.

18 September 1961

The first drop of Program 201 recovery vehicle from a B-52 was completed successfully at Kirtland AFB. Telemetry data up to the point of impact was received.

18 September 1961

Training plans, classes and schedules for indoctrination of personnel engaged in recovery activities for Program 201 were finalized at a 659th Test Wing conference. Requirement for a KC-121 aircraft in support of training and actual recovery operations was deleted. This action was taken after assessing the factors involved in supporting a KC-121 from the recovery site versus the contribution it was predicted to make toward the recovery effort.

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22 September 1961

A final decision was made to implement a
~~between~~
and all tracking stations supporting
Program 201.

29 September 1961

Contract negotiations (1A) were completed
on 29 September at the AFTR Sunnyvale. The
definitive contract will be written and
forwarded to Lockheed for signature on
9 October 1961. Target date for definitization
is 23 October 1961.

30 September 1961

Satellite vehicle 2121 was deleted from
Program I flight schedule and placed in
housed storage at Lockheed. This action
was necessitated by higher priority use of
critical pad time.

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Gen Green:

27 nov 61

[Redacted]

2 SAFMS
1 - OA

This is "stockholders"

report you asked for
some time ago.

[Redacted]

OK -

Looks good -

Go to press on it &
consult with me on
distribution.

~~2 SAFMS~~ 2 SAFMS
1 - OA