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DEPARTMENT OF THE AIR FORCE
DIRECTORATE OF SPECIAL PROJECTS (OSAF)
AF UNIT POST OFFICE, LOS ANGELES, CALIFORNIA 90045

REPLY TO ATTN OF: [redacted]

1 FEB 1966

SUBJECT: Program Management Plan, Project G-3

TO: SP-1 (Gen Martin)

Submitted herewith is a Program Management Plan for the Advanced GAMBIT System, Project G-3. It is intended for local use in implementing the Preliminary Development Plan, dated 4 Feb 1964.

WILLIAM C. KING, JR., Colonel, USAF
Deputy Director

SP-1

2 FEB 1966

SUBJECT: Project Approval

TO: [redacted] (Col King)

1. Pursuant to authority contained in Secretary of the Air Force Order 116.1, dated 19 July 1962, the attached Program Management Plan for Project G-3 is approved.

2. This Plan will be used as a guide for over-all objectives, delivery and launch schedules, contracting and financial planning.

3. You will submit change requests for approval when any of the project elements require revision.

JOHN L. MARTIN, JR., Brig General, USAF
Director

DISTRIBUTION:

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OFFICE OF THE SECRETARY OF THE AIR FORCE

PROJECT G-3
(ADVANCED GAMBIT SYSTEM)

PROGRAM MANAGEMENT PLAN

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TABLE OF CONTENTS

GAMBIT CUBED (G^3)

GENERAL DESCRIPTION OF

MISSION, SYSTEM CHARACTERISTICS AND OPERATIONS

SECTION I

GENERAL

A. MISSION

The mission of the GAMBIT-Cubed system is to conduct high resolution, satellite reconnaissance missions to cover specified high priority targets and to recover the photographic record. Ground resolutions will be [redacted]

B. GENERAL

1. The project is covert and has the covert code name of GAMBIT-Cubed (G^3). This name indicates that the system is an advanced version of the G or GAMBIT system. The overt identifier is Project 206-II, which is conducted as a classified (strict need-to-know) R&D space effort.

2. The project was approved by DNRO in message [redacted] 3 January 1964.

C. SYSTEM CHARACTERISTICS

1. The first stage booster will be the Titan IIIB, with the injection stage to be an adaption of the Agena D, which is identified as a part of the Satellite Control Section.

2. The Satellite Vehicle will have two sections: a Photographic Payload Section (PPS) and a Satellite Control Section (SCS). In covert documentation, the SCS actually includes the Payload Adapter Section (PAS) which is commonly called the "roll joint," which provides the obliquity pointing capability.

3. The payload employs a catadioptric optical system having a focal length of approximately 160 inches. The payload will be an integral part of the Photographic Payload Section (PPS) structure, as opposed to the GAMBIT system method of separate fabrication of the payload and orbital control vehicle and their mating in the field prior to launch.

4. The PPS contains the following elements as described in the Development Plan:

Supply and Looper Assembly

Satellite Re-entry Vehicle (SRV)

Supply Recovery Module (SRM)

Camera Optics Module (COM)

Adapter Section Assembly (ASA)

External Structure (sub-contracted to LMSC)

5. The SCS is an adaption of the Agena D vehicle and contains the following elements:

a. Spaceframe Subsystem. Mounts and supports all vehicle system equipments and provides environmental shelter to the extent necessary to achieve mission objectives. This includes a program peculiar booster adapter section.

b. Propulsion Subsystem. The primary propulsion system is a dual burn liquid rocket engine with its propellant pressurization, loading and feed system and is used for initial orbit injection, as well as for post-mission de-boost. The secondary propulsion system is a fixed thrust, pressure fed, storable hypergolic liquid propellant rocket engine system and is used for orbit correction and change, as well as for de-boost.

c. Back-Up Stabilization System (BUSS). Controls the vehicle during terminal maneuvering in the event the primary attitude control system fails.

d. Electrical Power Subsystem. Provides primary power for the SCS and the PPS and also includes the pyrotechnics and the power and distribution system for the vehicle.

e. Tracking, Telemetry and Command (T, T&C). Provides for these required functions.

f. Command Subsystem. Consists of an Extended Command Subsystem (ECS) and a Minimal Command Subsystem (MCS) for both normal (ECS) operation and emergency (MCS) operation.

g. Guidance and Control Subsystem. Provides necessary attitude, time, velocity references and flight programming to attain orbit; control attitude on-orbit; and control during normal recovery and de-boost operation.

6. Major Specifications:

a. Detail Specification, Model 58205 Vehicle, Program 206-II - LMSC/1417190A, 23 July 1965 (~~C~~).

b. Detail Model Specification for the PAS/SCS - LMSC/1417539B, 1 November 1965 (~~S~~-SH).

c. Program 206-II General Systems Specification - Aerospace 65-0000-05261, Reissue C, 20 December 1965 (~~S~~).

d. Photographic Subsystem Specification No. 1402-215-Eastman Kodak Company Document No. K-006490-DH-001, 2 April 1965 (~~S~~-SH).

D. OPERATIONS

1. Launch. The PPS is shipped by covert means directly to Pad 3 at Vandenberg AFB, where it is mated with the SCS, and integrated pre-launch tests are accomplished. Vandenberg AFB assembly, test and launch operations are under the over-all supervision of the 6595th ATW.

2. On-orbit Operation. Computer programming is prepared in advance by various software contractors [redacted] GE, STL, [redacted] to

provide ephemeris determination, command generation and mission optimization. The data processing and computation procedures provide the capability of generating a new vehicle program in 90 minutes.

On-orbit operations utilize the existing Air Force Satellite Control Facility. Various tracking stations track the vehicle for establishment of the ephemeris and for transmission of command loadings to the satellite. Commands are stored and equated through the on-board command subsystem to conduct the on-orbit function of the SCS and PPS. Telemetry data are recorded and transmitted to the SCF at station contacts for monitoring of vehicle health. Vehicle health evaluation and on-orbit operational decision are the responsibility of the Director, Special Projects, and his technical staff. The 6594th Support Group has over-all responsibility for conducting the operation of the Satellite Control Facility, including the recovery.

a. The orbit has the following general characteristics:

Injection altitude - 65 to 160 n. mi.

Orbit inclination - 60^{o} to 145^{o}

Nominal period - 90 min.

b. The nominal mission life is five days for early flights with eight to 12 days as objectives for follow-on flights.

3. Record Handling. Same as the G Program.

SECTION II

PROGRAM DIRECTION CORRESPONDENCE

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TSCF032/102218Z ZEA 10 FEB 1964
BT
XXXXX ZEA

~~S E C R E T~~ 102218Z

PRIORITY [redacted] CITE [redacted]

FOR GENERAL GREER FROM GENERAL MARTIN.

REFERENCE YOUR BRIEFING ON G-CUBE ON 5 FEBRUARY. DR.MCMILLAN

APPROVES PROCEEDING WITH RFP AND THE SPECIFICATIONS AS PROPOSED

IN THE BRIEFING.

~~S E C R E T~~

CFN GENERAL GREER GENERAL MARTIN G-CUBE 5 FEBRUARY DR. MCMILLAN RFP
BT

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~~S E C R E T~~ 031604Z 3 JAN 1964
PRIORITY [redacted] CITE [redacted]

FOR GENERAL GREER FROM GEN MARTIN AND [redacted]

REFERENCE [redacted]

DNRO APPROVES INITIATION OF THE G3 EFFORT ALONG THE LINES IN REFERENCED MESSAGE. AUTHORITY TO USE PRESENTLY-PROGRAMMED GAMBIT FUNDS FOR THIS PURPOSE IS GRANTED. REQUEST G3 FUND ACCOUNTABILITY BE ESTABLISHED AND MAINTAINED SEPARATELY FROM GAMBIT. IT IS EXPECTED THAT OSD EMERGENCY FUNDS WILL BE MADE AVAILABLE WHEN NEEDED TO CONTINUE THE FY 1964 EFFORT. HOWEVER, MORE DEFINITIVE COST DATA WILL BE REQUIRED BEFORE A REQUEST TO OSD CAN BE MADE. ACCORDINGLY, AT THE POINT WHERE THE FY 1964 COSTS ARE REASONABLY FIRM, SUPPORTING DETAIL SHOULD BE FURNISHED, WITH AN INDICATION AS TO HOW MUCH CAN BE ABSORBED WITHIN THE PRESENT GAMBIT PROGRAM, AND THE ADDITIONAL COSTS. ALSO REQUEST THAT REVISED BLACK AND WHITE FUNDING UNDER GAMBIT AND G3 BE FURNISHED AS EXPEDITIOUSLY AS DETERMINATIONS CAN BE MADE, WITHIN PRESENT GAMBIT TOTALS.

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SP-1 2 Jan 64

MEMO FOR COL KING

SUBJECT: G^3

1. Per verbal KY-9 direction of Dr. McMillan, we may proceed as of this date on the G^3 program as outlined in message [redacted], dated 27 Dec 63.

2. Dr. McMillan desires to keep open the choice of booster at this time, examining further the alternatives of Titan I or Titan III core as substitutes for Atlas/Agena. You should probably study and make recommendations to me on this element prior to finalizing the space vehicle RFP's.

3. Advise me on the latest date we need to fix on the booster decision; move out immediately on the payload contract.

ROBERT E. GREER
Major General, USAF
Director, Special Projects

cy to: [redacted]

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~~S E C R E T~~ 271942Z 27 DEC 1963

[redacted] CITE [redacted]

SUBJECT: FOLLOW ON GAMBIT PROGRAM - G3. REFERENCE IS MADE TO 5 DEC 63 BRIEFING TO DR. MCMILLAN BY EKC.

PART I. GENERAL PLANS HAVE BEEN FORMULATED TO PURSUE THE G3 DEVELOPMENT AS FOLLOWS: (A) MANAGEMENT - DEVELOPMENT WILL BE CARRIED OUT UNDER GAMBIT PROGRAM MANAGEMENT, EXCEPT THAT A SPECIFIC AEROSPACE GSE/TD DIRECTOR AND GROUP WILL STEER THE G3 EFFORT. (B) TIME PHASING - INITIAL FLIGHT TESTS OF G3 WILL BE SCHEDULED FOR THE 2D QUARTER OF CY 66. AT SOME POINT DOWNSTREAM IN CY 66, G3 WILL PHASE IN AND G OUT. CONTROLLED ENTRY INTO THE DEVELOPMENT PROGRAM FOR BOTH THE PAYLOAD CONTRACTOR AND VEHICLE CONTRACTOR WILL COMMENCE IN FY 64. IT IS EMPHASIZED THAT BOTH A PAYLOAD AND VEHICLE CONTRACTOR MUST BE DEFINED AND INTERFACES ESTABLISHED WHICH WILL ALLOW EITHER CONTRACTOR TO WORK EFFECTIVELY IN SUPPORT OF INITIAL LAUNCHES IN CY 66. THE GAP BETWEEN THE CURRENT 22 VEHICLE G PROGRAM AND THE EFFECTIVITY OF G3 WILL BE FILLED WITH ADDITIONAL G PROCUREMENT. REASONABLE G IMPROVEMENTS WILL BE EFFECTED, BUT MAJOR CHANGES SUCH AS FOCAL LENGTH, APERATURE, ETC., WILL NOT BE INCLUDED. (C) PROCUREMENT SCHEDULE - PAYLOAD - EK HAS BEEN REQUESTED TO SUBMIT TECHNICAL PROPOSAL; A DRAFT OF WHICH HAS BEEN RECEIVED. THIS DRAFT PROPOSAL IS BEING USED IN THE PREPARATION OF A WORK STATEMENT. THIS WORK STATEMENT WILL PROVIDE FOR CONTROLLED ENTRY INTO DEVELOPMENT DURING THIS FISCAL YEAR AND WILL PROVIDE FOR MILESTONES AT WHICH FEASIBILITY CAN BE ASSESSED FOR DECISION INTO FULL SCALE DEVELOPMENT. EKC WORK STATEMENT SHOULD BE COMPLETED AND COORDINATED BY EARLY JANUARY 1964. VEHICLES - IN ORDER TO SELECT A MOST OPTIMUM APPROACH FOR A VEHICLE CONFIGURATION, AN RFP WILL BE PREPARED AND SUBMITTED TO LMSC AND GE. IT IS ANTICIPATED THAT THIS COMPETITIVE APPROACH WILL GIVE US A LOOK ON TWO DIFFERENT VEHICLE ARRANGEMENTS, I.E., PROBABLY (1) AN AGENA - ROLL JOINT APPROACH AND (2) AN OCV WITH AN ASCENT CAPABILITY APPROACH. RFP'S WILL BE SUBMITTED MID FEB '64 WITH PROPOSALS BEING RECEIVED MID APRIL; EVALUATION OF PROPOSAL COMPLETED IN EARLY MAY '64; DEFINITIVE CONTRACT IN JUNE '64.

PART II. PRINCIPAL G3 EFFORT WILL BE APPLIED TO A VEHICLE UTILIZING THE ATLAS WITH INJECTION BY THE AGENA OR COMPARABLE VEHICLE. A SEPARATE EFFORT TO ENHANCE INVULVERABILITY WILL BE STUDIED AS PART OF G3 WITH THE PROVISION THAT TITAN III OR FLOX ATLAS MAY BE REQUIRED TO MEET ORBITAL REQUIREMENTS.

PART III. IT IS ESTIMATED THAT THE FY 1964 COSTS WILL BE APPROXIMATELY [redacted] OF WHICH [redacted] WILL BE BLACK. I BELIEVE THAT BY CAREFUL MANAGEMENT I CAN GET [redacted] OF THE REQUIRED [redacted] FROM THE CURRENT GAMBIT BUDGET IN ORDER TO GET THE G3 PROJECT STARTED. THIS WOULD REQUIRE AN ADDITIONAL [redacted] FROM YOU ABOUT MARCH. SOME ADJUSTMENT BETWEEN BLACK AND WHITE IN THE CURRENT BUDGET MAY BE NECESSARY.

SIGNED, R. GREER. GP-1

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SECTION III

CONTRACT STRUCTURE

CONTRACT STRUCTURE

CONTRACT	TYPE	FOR	LIFE	FACE VALUE
AF 04(695)-619 LMSC Admin: [redacted]	WHITE	Satellite Control Section: Development and 6 Vehicles, Non-Payload Related Effort	21 Jul 1964 - 30 Apr 1967	[redacted] SECRET
AF 04(695)-896 LMSC Admin: [redacted]	WHITE	Satellite Control Section: 16 Vehicle Follow-on to Above Contract -619	1 Dec 65 - 31 Aug 68	
[redacted] LMSC Admin: [redacted]	BLACK	Satellite Control Section: Development and 6 Vehicles, Payload Related Effort	21 Jul 1964 - 30 Apr 1967	
[redacted] LMSC Admin: [redacted]	BLACK	Satellite Control Section: 16 Vehicle Follow-on to Above Contract -2709	To be Determined	To be Determined
[redacted] Eastman Kodak Company Admin: [redacted]	BLACK	Photographic Payload Section: Development and 6 Vehicles	22 Jan 1964 - 31 Mar 1967	[redacted] SPECIAL HANDLING
[redacted] Eastman Kodak Company Admin: [redacted]	BLACK	Photographic Payload Section: 16 Vehicle Follow-on to Above Contract -2108	1 Nov 1965 - 3 Jul 1968	
AF 04(695)-594 GE-LMED Admin: [redacted]	WHITE	Command Programmers: Development and 6 Vehicles	25 May 1964 - 15 Jul 1966	
AF 04(695)-897 GE-LMED Admin: [redacted]	WHITE	Command Programmers: 16 Vehicle Follow-on to Above Contract -594	5 Nov 65 - 7 Aug 68	[redacted] st)

CONTRACT	TYPE	FOR	LIFE	FACE VALUE
AF 04(695)-636 GE-Spacecraft Dept. Admin: [redacted]	WHITE	Parallel Study Effort on SCS	27 Jul 1964 - 31 May 1965	[redacted]
AF 04(695)-693 GE-Spacecraft Dept. Admin: [redacted]	WHITE	Command and Control Computer Effort (Software) in Support of SCS	8 Sep 1964 - 15 Feb 1967	
[redacted] GE-RSD Admin: [redacted]	BLACK	Satellite Re-entry Vehicles: 16 Vehicle Follow-on (Original 6 Procured Under Subcontract to -2108)	8 Dec 1965 - 31 Mar 1968	
Various Admin: SSHK	WHITE	Titan IIIB Booster Hardware and Launch Services	—	FY 66 Program (GAMBIT^3 funds only): [redacted]
Various LMSC Admin: SSVAK	WHITE	Standard Agena (SS-01B) Hardware	—	FY 66 Program (GAMBIT^3 funds only): [redacted]
AF 04(695)-669 Aerospace Corp. Admin: SSYK	WHITE	Systems Engineering/Technical Direction Support	1 Jul 1965 - 30 Jun 1966	FY 66 Program (GAMBIT^3 funds only): [redacted]

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SECTION IV

DELIVERY AND LAUNCH SCHEDULES

CONTRACT DELIVERY AND LAUNCH SCHEDULES

	TIIIB	PPS		SCS		Launch Date
	Date	FMT	15 Jan 66		Date	
1	24 May 66	FM-1	13 Jul 66	4751	8 Jul 66	28 Jul 66
2	16 Aug 66	FM-2	10 Sep 66	4752	25 Aug 66	15 Sep 66
3	15 Sep 66	FM-3	26 Oct 66	4753	12 Oct 66	1 Nov 66
4	14 Oct 66	FM-4	25 Nov 66	4754	9 Nov 66	1 Dec 66
5	15 Nov 66	FM-5	29 Dec 66	4755	9 Dec 66	3 Jan 67
6	16 Dec 66	FM-6 (Formerly FMT)	26 Jan 67	4756	12 Jan 67	1 Feb 67
	1/Mo. thereafter thru 24		1/Mo. thereafter thru 22		1/Mo. thereafter thru 22	1/Mo. thereafter

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SECTION V

BUDGET ESTIMATE

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BUDGET ESTIMATE

[redacted]

ITEM	FY 64	FY 65	FY 66	FY 67	FY 68	FY 69	FY 70	FY 71	TOTAL
SCS - Development - Adaptation - Peculiars - AGE - Agena Hdw - Agena Launch	[redacted]								
COMMAND SUBSYSTEM									
PPS - Development - Hardware - RV - Launch									
T III-B - Booster - Launch									
AEROSPACE SE/TD									
VULNERABILITY									
SUPPORT SERVICES: Mission Planning Industrial Facilities Pad Modification Other Support									
TOTAL									

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SECTION VI

FINANCIAL PLAN

FY 1966 FINANCIAL PLAN [redacted]

CATEGORY	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	TOTAL
White Funds: [redacted]					
SPACECRAFT:					
Adapter					
Peculiars					
AGE					
COMMAND SUBSYSTEM					
T-III B LAUNCH					
MISSION PLANNING					
INDUSTRIAL FACILITIES					
SUPPORT SERVICES					
Sub-Total [redacted]					
[redacted]					
AEROSPACE MTS					
T-III B BOOSTER					
AGENA D					
Sub-Total [redacted]					
TOTAL WHITE					
Black Funds: [redacted]					
PAYLOAD					
SCS					
RV					
VULNERABILITY					
TOTAL BLACK					
GRAND TOTAL					

[redacted]