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BY 3/14-84
COPY 1 OF 1

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PHILOSOPHY

- INITIATE POSITIVE RELIABILITY PROGRAM AT AP
- STANDARDIZE TEST CYCLE & EQUIPMENT
- ELIMINATE EXCESSIVE TESTING & TEARDOWN AT AP & VAFB
- ELIMINATE CHANGES EXCEPT THOSE MANDATORY FOR RELIABILITY & STANDARDIZATION
- MAINTAIN CLOSE CONTROL OF ALL MANUFACTURING PHASES BY THE PROGRAM OFFICE
- STANDARDIZE TEST PROCEDURES
- DEVELOP CONSISTENCY OF PERFORMANCE

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SPECIAL HANDLING

SAFSS: S 16/21-64
P. 27 3
13 APR 1964

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 SYSTEMS ENGINEERING
 THE UNIVERSITY OF
 TEXAS AT AUSTIN

ENGINEERING DEALING WITH OVER-ALL SYSTEM

FUNCTIONS

1. GENERAL SYSTEM SPECIFICATION
2. INTERFACE DEFINITION
3. TEST SUPERVISION
4. HARDWARE FLOW
5. PROGRESS & STATUS EVALUATION
6. POST FLIGHT EVALUATION

LEVEL OF EFFORT - 24 MAN-YEARS/YEAR

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SYSTEMS INTEGRATION

ENGINEERING DEALING WITH SPECIFIC ASPECTS OF SYSTEM

FUNCTIONS

- 1. SUBSYSTEM INTEGRATION
- 2. DESIGN CONTROL DOCUMENTATION
- 3. INTERFACE IMPLEMENTATION
- 4. TEST OPERATIONS
- 5. OPERATING PROCEDURES
- 6. PROGRESS AND STATUS REPORTING
- 7. POST FLIGHT ANALYSIS

LEVEL OF EFFORT - 19 MAN-YEARS/YEAR

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CONTRACTS ~~SECRET~~

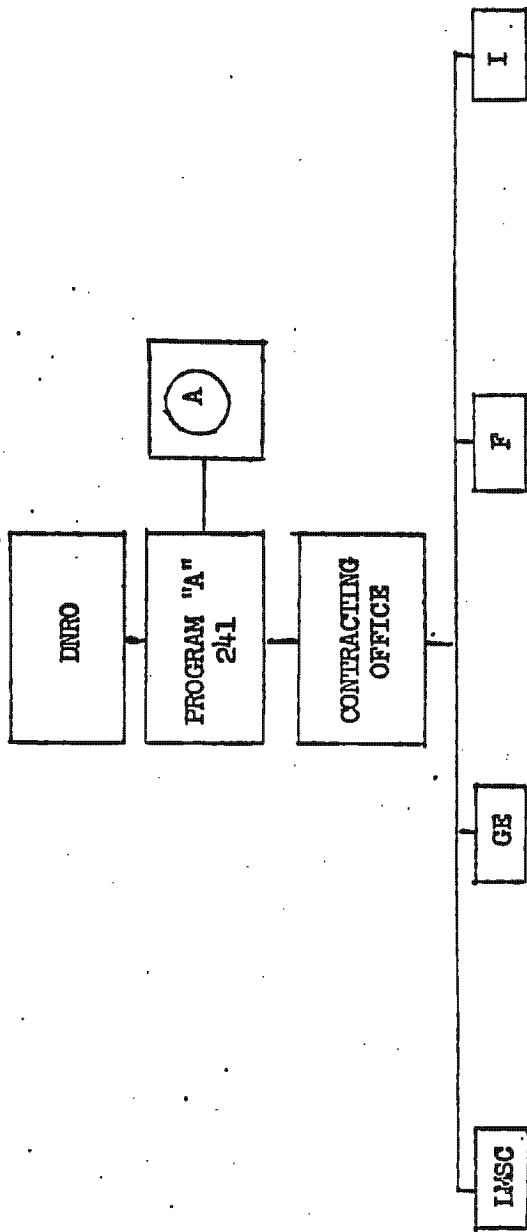
NO	TYPE	FOR	LIFE	ACTION
Aerospace L/C AFO4(695)252	CPIF	System Engineering Vehicles (14) (5 re- maining)	Yearly Oct64 (Jan65)	Being Accomplished Altered to provide <u>A</u> SE/TD and IMSC System Integration <i>Class II</i>
AFO4(695)343	CPIF	Vehicles (23) (18 re- maining)	Feb65 (Jun66)	Altered to provide <u>A</u> SE/TD and IMSC System Integration
New Contract	CPIF	Vehicles (9)	To be deter- mined	Under Negotiation - Includes <u>A</u> SE/TD, IMSC System Integration
B. *SE 1928 IMSC	Level of Effort	FY64 System Engineering	30 Jun 64 (17 Aug 64)	Upon expiration new contract for system integration effective 17 Aug 64
*AD 1316 IMSC	CPIF	Structures	30 Sep 64	Requires Program Definition
*FI 5777 I	FP	Items	30 Sep 64	<i>?</i>
*FI 6555 I	Labor	Field Services	30 Sep 64	<i>To be defined</i>
**DM 2616 IMSC	CPIF	6 + 20	31 Mar 65	Requires amendment for <u>A</u> enabling and designation of SIC
**TWX 2130 9Mar64	Unknown	Add on 4	Last Delivery June 65	Requires definitization, Quote Avail Can be new contract
**BB 550 I	FPI	6 + 20	28 Feb 65	Requires Amendment for <u>A</u> enabling and designation of SIC
**TWX 2190 I 3Mar64	Unknown	Add on 4	Last Delivery 31 Jan 65	Requires Definitization, Quote Avail Can be new contract
**CC 1600 GE	FPI	61	Sept 64	Refurbishment complete in Sep 64. No new procurement authorized Anew con- tract, with appropriate provisions will be accomp.

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**Not Administered Locally

**Local Administration

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SPECIAL HANDLING

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ENABLING CLAUSE

- A. The effort on Program 241 covered by this contract is under general program management of SAFSP. The Air Force has entered into a contract with the Aerospace Corporation for the services of a technical group which will, under the management of the SAFSP be responsible for the general system engineering and corresponding technical direction of the efforts under this contract.
- B. In the performance of this contract, the contractor agrees to cooperate with the Aerospace Corporation by responding to invitations to meetings, request for technical information, and requests for research and development planning data on all matters pertaining to this contract and by discussing with the Aerospace Corporation employees, technical matters relating to this program. The contractor further agrees to accept technical direction as described herein.
- C. Formalization of general systems engineering and technical direction generated by the Aerospace Corporation of effort under this contract will be documented by the issuance of a serially numbered "Technical Directive," issued by the SAFSP SP-7, and signed by the appropriate government contracting officer, stating that compliance with such "Technical Directive" is directed pursuant to the clause of this contract entitled "Changes."

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23 June 1964

STATEMENT OF WORK
FOR
SYSTEMS INTEGRATION

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1.0 Scope

1.1 The Contractor shall accomplish Systems Integration for the activities of Advanced Projects under Program 241. Systems Integration is defined as that engineering dealing with the specific technical aspects of a system. It includes design compromise between sub-systems, detailed design of interfaces, engineering analysis, and testing, all to the extent required to assure that system objectives are being met in an economical and timely manner.

1.2 This effort includes the integration of equipments supplied by associate contractors including ITTEK laboratories; G.E., MSVD; Fairchild Space and Defense Systems; IMSC; and such others as may be contractually assigned.

2.0 Program Management

2.1 The effort on Program 241 is under general program management of SAFSP. The Air Force has entered into a contract with Aerospace Corporation for the services of a technical group which will, under the management of SAFSP, be responsible for the General Systems Engineering and corresponding Technical Direction of the efforts under this contract.

2.1.1 The Contractor shall cooperate with Aerospace Corporation by responding to invitations to meetings, requests for technical information, and requests for research and development planning on all matters pertaining to the activities of Advanced Projects under Program 241, and by discussing with Aerospace Corporation employees, technical matters relating to this program. The contractor shall accept technical direction as described herein.

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3.7 Evaluate and report program status to the Air Force.

3.8 Review and evaluate designs of Associate Contractors to assure interface compatibility of associate subsystems and equipment.

3.9 Witness acceptance tests of the Associate Contractors' deliverable end items, participate in the evaluation of the test data, as required, and make recommendations thereon to the Air Force.

3.10 The Contractor shall conduct a post-flight evaluation of the material and associated data from each mission to determine equipment functioning and mission quality and submit a memorandum report thereon.

3.11 Such other functions as the Air Force may direct.

4.0 Period of Performance

The period of performance will be from 1 July 1964 through 30 June 1965.

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TECHNICAL OPERATING PLANS FOR FY 1965

29 June 1964

1.0 GENERAL

Within the areas of responsibility assigned to SAFSP-7 for the Program, Aerospace Corporation shall perform General Systems Engineering and Technical Direction as defined in Exhibit A of Aerospace/Air Force current contract and further amplified in Paragraph 2 below:

1.1 Scope of Plan

1.1.1 Work to be Performed

This document describes, in Paragraph 2 below, the work to be performed by the Aerospace Corporation from the date of issue of this document through the end of the program. The work to be accomplished during the Fiscal Year is indicated in Paragraph 4 below.

1.1.2 Associated Contractors

Aerospace Corporation will perform General Systems Engineering for the _____ Program, and will perform Technical Direction of the following associate contractors:

<u>Contractor Function</u>	<u>Contractor Name</u>
<u>Orbital Vehicle</u>	_____
<u>Payload</u>	_____

1.2 Definitions

1.2.1 General Systems Engineering

That portion of systems engineering dealing with the overall integration of a system, design compromise among subsystems, definition of interfaces, analysis of subsystems, and supervision of system testing, all to the extent required to assure that the system concept and objectives are being met in an economical and timely manner.

1.2.2 Technical Direction

That process by which a contractor's work is reviewed, information on progress and problems is exchanged, plans for future work are discussed, and, where it will better achieve Air Force objectives, the Contractor's effort is modified, realigned, or redirected. Where contractual change is involved or where the Air Force, the Aerospace Corporation or the contractor may so request, specified technical direction will be formalized as serially-numbered Air Force/Aerospace Technical Directives (TD's).

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Technical Operating Plans for FY 1965

29 June 1964
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2.0 GENERAL SYSTEMS ENGINEERING AND TECHNICAL DIRECTION TASKS

2.1 General Systems Engineering

2.1.1 Systems Studies

2.1.1.1 Perform engineering analyses and design studies necessary to assess system requirements and operating concepts necessary to meet military objectives.

2.1.1.2 Perform design analyses, feasibility studies, studies of trade-offs among subsystems, trajectory studies, definition of system operation, and preparation of mission profiles. Identify subsystems, define subsystem performance characteristics, define major interfaces.

2.1.1.3 Review of over-all contractor system integration, with exchange of information on progress and problems, analysis of work in progress and planned, and make recommendation to the Air Force on modification, realignment or redirection of system contractor effort.

2.1.1.4 Review of system interface definitions, analysis of effect of compromises involved, and make recommendations to the Air Force on the validity of interface choices.

2.1.1.5 Periodically up-date the system definition, as a result of associate contractor inputs and further internal studies and analyses.

2.1.1.6 Perform studies and investigations to resolve critical technical systems problems.

2.1.1.7 Perform selected studies for the system, and recommend to SAFSP-7 approaches for growth capability and/or follow-on systems

2.1.1.8 Evaluate requirements for tracking and ephemeris determination for all phases of flight including launch and orbital operations.

2.1.2 Contractor Negotiation

2.1.2.1 Evaluate technical portions of contractor proposals.

2.1.2.2 Prepare and up-date technical portions of contractors' Statements of Work and advise SAFSP-7 in the negotiation of definitive contracts.

2.1.3 Specifications

2.1.3.1 Prepare an outline of the program specification requirements, including the Specification Tree.

2.1.3.2 Prepare and up-date as required the System Specification (top system specification) and the Program Documentation Requirements Specification.

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2.1.4 Program Management

2.1.4.1 Establish and maintain system reliability goals and confidence levels. Apportion reliability budget among subsystems.

2.1.4.2 Assist SAFSP-7 in its formulation, estimation, and evaluation of technical performance incentives.

2.1.4.3 In support of SAFSP-7, prepare and when necessary, present technical portions of briefings.

2.2 Technical Direction

All Technical Direction of contractors will be performed by Aerospace and the Air Force in accordance with the procedures of SSD Regulation 80-9, Aerospace Corporation General System Engineering/Technical Direction or Technical Surveillance, dated 23 September 1963.

2.2.1 Technical Meetings

2.2.1.1 With SAFSP-7 concurrence, initiate and conduct Technical Direction meetings as necessary.

2.2.1.2 With SAFSP-7 concurrence, initiate and conduct technical interchange meetings as necessary.

2.2.1.3 Establish, with SAFSP-7 and contractor assistance, technical working groups. Provide the Chairman for the selected working groups, such as Interface, Performance, and System Test.

2.2.2 Review of Contractor Activity and Documentation

2.2.2.1 Review, for system implications, all technical portions of contractor plans, such as the Program Plan, Reliability and Quality Assurance Plans, and AGE Development Plan. Prepare Technical Direction as required.

2.2.2.2 Review, for system implications, all contractually-required specifications and prepare Technical Direction as required.

2.2.2.3 Review, for system implications, other contractually-required technical documents necessary for system evaluation, and prepare Technical Direction as required.

2.2.2.4 Review associate contractors' functional analysis data. Review integrated system functional analysis, and prepare Technical Direction as required.

2.2.2.5 Review, for system implications, the progress of the contractor development program, and prepare Technical Direction as required.

2.2.2.6 Perform in-plant review, for system implications, of contractor technical programs such as ground tests, acceptance tests, qualification tests, reliability and quality assurance programs, and recommend acceptance or prepare Technical Direction as required.

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2.2.3 Administration of Technical Direction of Contractors

2.2.3.1 Prepare and coordinate Technical Directives to associate contractors.

2.2.3.2 Recommend to SAFSP-7 necessary changes in Work Statements for associate contractors.

2.2.3.3 Advise SAFSP-7 in preparations for negotiations with associate contractors on CCN's, Work Statements, schedules, and test equipment requirements.

2.2.4 System Design and Analysis

2.2.4.1 Prepare Technical Direction covering studies of systems and equipment to be conducted by associate contractors, and review results of contractor studies.

2.2.4.2 Review, for system implications, associate contractor system integration efforts, and designs of equipment, at any applicable level of detail in those cases considered necessary to ensure adherence to program objectives. Prepare Technical Direction as required.

2.2.4.3 Evaluate associate contractor guidance equations and prepare Technical Direction as required.

2.2.4.4 Evaluate associate contractor trajectory calculations, and prepare Technical Direction as required.

2.2.5 Ground System Support

2.2.5.1 Review, for system implications, contractor-prepared design data for AGE, and design requirements for facilities, and prepare Technical Direction as required.

2.2.6 Configuration and Interface Control

2.2.6.1 Review, for system implications, and make recommendations to SAFSP-7 concerning the technical portion of all Class I Change Proposals, and support Configuration Control Board activities.

2.2.6.2 Review, for system implications, all contractor-prepared systems integration and interface control data, and prepare Technical Direction as required.

2.2.7 Ground Test Planning and Evaluation

2.2.7.1 Review contractors' ground test program plans and procedures, and prepare Technical Direction as required.

2.2.7.2 Observe the performance of critical tests on the system and major subsystems, and evaluate, for system implications, system and subsystem test data. Formulate technical recommendations to SAFSP-7 based on analyses of test results.

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Page 52.2.8 Flight Test Planning, Analysis, and Operation

2.2.8.1 Review contractor-prepared planning for range activities, and prepare Technical Direction as required.

2.2.8.2 Review the contractor-prepared System Test Plan and prepare Technical Direction as required.

2.2.8.3 Review contractor-prepared Program Requirements Document, and Recovery Requirements Document.

2.2.8.4 Review and make recommendations concerning the Program Support Plan, Orbital Support Plan, and Recovery Support Plan.

2.2.8.5 Review and make recommendations concerning the System Test Objectives and Launch Test Objective documents for each flight test.

2.2.8.6 Review the contractor-prepared Range Safety Report.

2.2.8.7 Provide field technical and flight test operations support.

2.2.8.8 Perform analysis and evaluation of selected flight test data, including Launch Reports, Orbit Reports, and Recovery Reports, as required for system evaluation.

2.2.8.9 Perform analysis and evaluation of system or subsystem malfunctions.

2.2.8.10 Establish and maintain requirements for TT&C equipment and computer programming to ensure compatibility between vehicle and ground equipment.

2.2.9 Hardware and Computer Program Acceptance

2.2.9.1 Review contractor-prepared acceptance specifications and documentation, and prepare Technical Direction as required.

2.2.9.2 Participate in selected end-item acceptance activities.

3.0 OPERATING REPORTS

Aerospace Corporation will prepare operating reports by mutual agreement with SAFSP-7.

4.0 WORK TO BE PERFORMED IN CONTRACTUAL PERIOD OF FISCAL YEAR 1965

This work will include activity on all tasks called out in Paragraph 2.

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5.0 LEVEL OF EFFORT -- MTS

The level of MTS effort, will be as follows:

FY 1965	<u>Average MTS Man Months per Months</u>			
	<u>1st Qtr.</u>	<u>2nd Qtr.</u>	<u>3rd Qtr.</u>	<u>4th Qtr.</u>

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