

CANCELLED BY SKYLAB PROGRAM
DIRECTIVE # 7A.

**OFFICE OF
MANNED SPACE
FLIGHT**

APOLLO APPLICATIONS PROGRAM

REFERENCE COPY

PROGRAM DIRECTIVE NO. 7

**ESTABLISHMENT OF AAP INTER-CENTER
INTERFACE PANEL ORGANIZATION**



**NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
WASHINGTON D. C. 20546**

APOLLO APPLICATIONS
PROGRAM DIRECTIVE NO. 7

TO : Distribution

FROM:

Charles W. Melick
DIRECTOR, APOLLO APPLICATIONS

SUBJECT: Establishment of AAP Inter-center Interface Panel Organization

I. PURPOSE:

This directive establishes the Interface Panel organization to be utilized in the Apollo Applications Program to define and control inter-center interfaces and resolve related interface problems.

II. SCOPE:

This directive applies to all NASA personnel engaged in AAP Inter-center Panel activities.

III. BACKGROUND:

Management of the Apollo Applications Program is carried out by the Manned Space Flight Apollo Applications Program Offices at NASA Headquarters, MSC, MSFC and KSC. Program management is the responsibility of the program office at NASA Headquarters. Project management responsibility has been delegated to the appropriate centers. This delegation of project responsibility to more than one center requires the establishment of a formal process to define, coordinate and control inter-center interfaces and to resolve interface related problems. An AAP task team comprised of senior representatives from the AAP Program Offices at MSFC, MSC, KSC and MSF defined an interface panel system similar to the Apollo Interface Panel System to provide the coordination and control activity required. The panel organization and panel scope statements contained in this directive are the result of the efforts of this task team, the panel co-chairmen and the Center Program Managers as modified and amplified by the Program Director.

IV. POLICY:

The panel organization performs a technical coordination and definition function that is an extension of Center Program Office functional responsibilities. All panel activity shall be conducted with due consideration for these existing functional responsibilities.

V. PANEL STRUCTURE:

Panel structure and relationship to the Center Program Managers and the Program Director are shown in Figure 1. Panel co-chairmen and senior members are listed in Figure 2. Co-chairmen and senior member appointments are the responsibility of the centers. Changes to co-chairmen and senior member appointments designated in Figure 2 shall be forwarded to the Program Director. In the performance of panel functions, the designees report to the cognizant Center Program Managers.

VI. SUBPANEL STRUCTURE:

Subpanels are established as required by the panel co-chairmen and senior members with prior approval by the Center Program Managers. Subpanels established as of the date of this directive are listed in Figure 3.

VII. PANEL SCOPE STATEMENTS:

Approved panel scope statements defining the objectives and responsibilities of the individual panels are provided in the attachment. Revisions to these scope statements may be in order as the program develops and the panels have functioned for a period of time. Substantive changes in panel scope statements when agreed to by the panel co-chairmen or by the chairman and senior members, as in the case of the Launch Operations Panel, shall be referred to the cognizant Program Managers for concurrence and to the Program Director for approval before implementation.

VIII. IMPLEMENTATION OF PANEL DECISIONS:

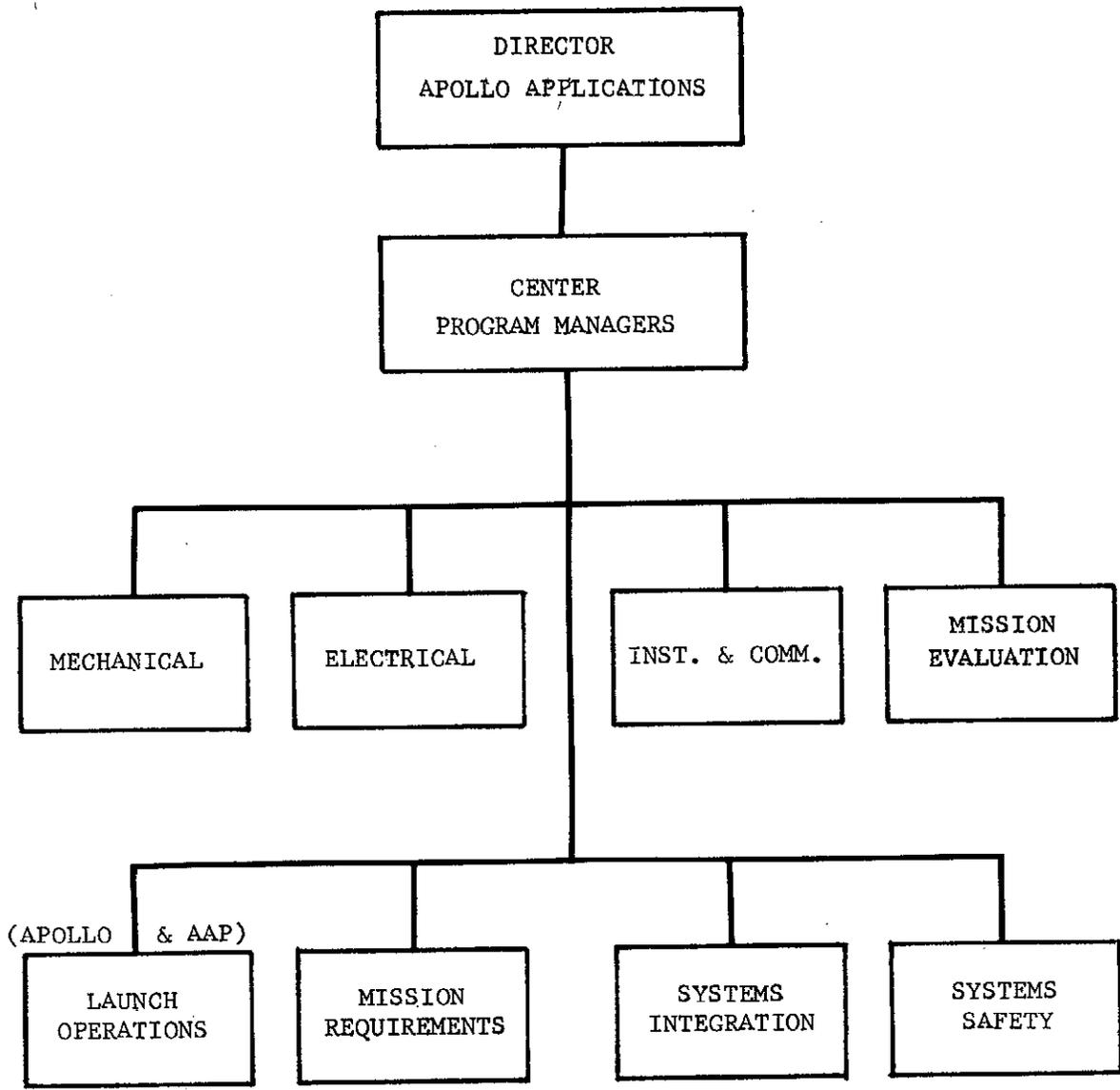
The panel co-chairmen are responsible to the Program Managers for implementation of panel decisions reached in panel meetings and recorded in the minutes of the panel meetings. Panel decisions that commit substantive program effort or require contractor

direction must be approved by the cognizant Center Program Managers prior to implementation. If a Program Manager objects to any panel decision, he may stay implementation of the decision by notifying the co-chairmen.

When a panel cannot agree on an action item, it shall be referred to the cognizant Program Managers for resolution. If unresolved at the Program Manager level, it shall be forwarded to the Program Director for resolution.

IX. IMPLEMENTATION/DEVIATIONS:

- A. This directive is effective immediately.
- B. Requests for revisions to this directive shall be submitted to the Apollo Applications Program Director.



AAP INTER-CENTER INTERFACE PANEL ORGANIZATION

FIGURE 1

<u>PANEL TITLE</u>	<u>CO-CHAIRMEN</u>	<u>ORGANIZATION</u>
MECHANICAL	L. BERNARDI H. PALAORO	KS/MSC R-P&VE/MSFC
ELECTRICAL	P. MIGLICCO H. FICHTNER	KS/MSC R-ASTR-E/MSFC
INSTRUMENTATION & COMMUNICATION	C. WILLIAMS J. POWELL	KS/MSC R-ASTR-I/MSFC
MISSION EVALUATION	(VACANT) J. LINDBERG	/MSC R-AERO-F/MSFC
MISSION REQUIREMENTS	W. EVANS O. JEAN	KM/MSC R-AERO-DIR/MSFC
SYSTEMS INTEGRATION	H. DOTTS F. VRUELS J. WOOTTON	KS/MSC R-TO-DIR/MSFC DB/KSC
SYSTEMS SAFETY	G. MC INTOSH J. ABERG	KT/MSC R-P&VE-V/MSFC
LAUNCH OPERATIONS	J. WOOTTON (Chairman) H. DOUGLAS (Senior Memb.) G. HUNTER (Senior Memb.)	AP-SYS/KSC KT/MSC R-TO/MSFC

AAP INTER-CENTER INTERFACE PANEL CHAIRMEN

FIGURE 2

MECHANICAL PANEL SUBPANELS:

STRUCTURES
ECS-THERMAL
CREW STATION
WEIGHTS

INSTRUMENTATION & COMMUNICATIONS PANEL SUBPANELS:

RADIO FREQUENCY
ELECTRO MAGNETIC INTERFERENCE
DATA SYSTEMS

LAUNCH OPERATIONS PANEL SUBPANELS:

FACILITIES
SPACECRAFT INDUSTRIAL AREA
LC-34/LC-37
LC-39
ELECTRICAL
EMERGENCY EGRESS

MISSION REQUIREMENTS PANEL SUBPANELS:

MISSION REQUIREMENTS
GUIDANCE, PERFORMANCE AND DYNAMICS
FLIGHT LIMITS AND RANGE SAFETY
EXPERIMENTS

AAP INTER-CENTER INTERFACE PANEL SUBPANELS

FIGURE 3

SYSTEMS INTEGRATION PANEL SCOPE STATEMENT

The objectives and responsibilities of this panel will be to assure the definition and control of interfaces associated with the performance requirements and operation of systems and experiments of the AAP flight systems including cluster configurations and to assure resolution of interface problems. The panel will define, resolve and document recommended changes to those documents containing all technical requirements which constrain interfaces. The panel will also review and assure overall systems performance compatibility. Panel responsibilities shall include, but not be limited to the following specific tasks:

- (1) Perform an overview function of the AAP Panel activities for the Center program managers.

- (2) Assure a systems approach to:
 - a. Integrated design requirements
 - b. Integrated test requirements
 - c. Overall GSE requirements
 - d. Weight and performance requirements

- (3) Coordinate, review, and assign action items to other panels as required.

MECHANICAL PANEL SCOPE STATEMENT

The objectives and responsibilities of this Panel are to define, resolve and document all mechanical interfaces resulting from the delegation of project management to more than one Center, with due consideration for the existing functional responsibilities of the individual Centers. Interface coordination by this panel shall include but not be limited to the following specific tasks:

- (1) Define and resolve the interface requirements for mechanical system design compatibility and the functional and procedural interfaces associated with:
 - a. Structural design loads
 - b. Weights
 - c. Mass characteristics and mass distribution
 - d. Mating and demating, including docking and undocking
 - e. Checkout
 - f. Materials and standards
 - g. Propellants
 - h. Fluids
 - i. Gases
 - j. Environmental conditioning
 - k. Alignment
 - l. Servicing
 - m. Access
 - n. Explosives
 - o. Temporary and long-term deactivation in space environment
 - p. Component replacement and/or refurbishment

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and resolve mechanical configuration and procedural interface problems associated with:

- a. Preparation of mission modules for crew habitability
 - b. Crew quarters design
 - c. Mobility aids and crew restraints
 - d. Crew protective devices and padding
 - e. Mechanical hardware which requires crew operation, handling, or contact.
 - f. Equipment mountings and attachments as they are applicable to crew safety and convenience.
 - g. Mechanical tools for the accomplishment of work by the crew in all areas of the space vehicles including extra-vehicular activity.
- (3) Establish overall mechanical systems compatibility.

(2) Define and resolve mechanical configuration and procedural interface problems associated with:

- a. Preparation of mission modules for crew habitability
- b. Crew quarters design
- c. Mobility aids and crew restraints
- d. Crew protective devices and padding
- e. Mechanical hardware which requires crew operation, handling, or contact.
- f. Equipment mountings and attachments as they are applicable to crew safety and convenience.
- g. Mechanical tools for the accomplishment of work by the crew in all areas of the space vehicles including extra-vehicular activity.

(3) Establish overall mechanical systems compatibility.

- (2) Define and resolve mechanical configuration and procedural interface problems associated with:
 - a. Preparation of mission modules for crew habitability
 - b. Crew quarters design
 - c. Mobility aids and crew restraints
 - d. Crew protective devices and padding
 - e. Mechanical hardware which requires crew operation, handling, or contact.
 - f. Equipment mountings and attachments as they are applicable to crew safety and convenience.
 - g. Mechanical tools for the accomplishment of work by the crew in all areas of the space vehicles including extra-vehicular activity.

- (3) Establish overall mechanical systems compatibility.

ELECTRICAL PANEL SCOPE STATEMENT

The objectives and responsibilities of this Panel are to define, resolve and document all electrical interfaces resulting from the delegation of project management to more than one Center, with due consideration for the existing functional responsibilities of the individual Centers. Interface coordination by this panel shall include but not be limited to the following specific tasks:

- (1) Define and resolve the interface requirements for electrical system design compatibility and the functional and procedural interfaces associated with:
 - a. Mating and demating (including docking and undocking)
 - b. Checkout
 - c. Materials and electrical standards
 - d. Servicing
 - e. Utilization of electrically operated equipment
 - f. Range Safety
 - g. Temporary and long-term deactivation in space environment
 - h. Component replacement and/or refurbishment

- (2) Define and resolve electrical configuration, functional and procedural interfaces associated with:
 - a. Preparation of mission modules for crew habitability
 - b. Crew quarters design
 - c. Electrically operated hardware which requires crew operation or handling
 - d. Crew protection during all operational mission phases

- (3) Establish overall electrical systems compatibility

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INSTRUMENTATION AND COMMUNICATIONS PANEL SCOPE STATEMENT

The objectives and responsibilities of this Panel are to define, resolve and document all instrumentation and communications interfaces resulting from the delegation of project management to more than one Center, with due consideration for the existing functional responsibilities of the individual Centers. Interface coordination by this panel shall include but not be limited to the following specific tasks:

- (1) Define and resolve the interface requirements for instrumentation and communications systems design compatibility and the procedural interface problems associated with:
 - a. Mating and demating, including docking and undocking
 - b. Checkout
 - c. Materials and standards
 - d. Servicing
 - e. Temporary and long-term deactivation in space environment
 - f. Component replacement and/or refurbishment
 - g. Command requirements
 - h. Onboard and ground monitoring requirements
 - i. Data requirements
- (2) Define and resolve instrumentation and communications systems configuration and procedural interface problems associated with:
 - a. Crew quarters design
 - b. Crew safety and convenience
- (3) Define and resolve interface problems associated with radio frequencies including frequency allocations.
- (4) Define and resolve interface problems associated with high energy nuclear radiation effects on instrumentation and communications systems operations.

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- (5) Insure a compatible space vehicle electromagnetic program including interfaces with ground support equipment, launch facilities and ground stations.
- (6) Establish overall instrumentation and communications systems compatibility and adequacy to obtain the required data for real time and post flight performance evaluation.

MISSION REQUIREMENTS PANEL SCOPE STATEMENT

The objectives and responsibilities of this Panel are to define, resolve, and document all mission requirements interfaces resulting from the delegation of project management to more than one Center, with due consideration for the existing functional responsibilities of the individual Centers. Panel responsibilities shall include but not be limited to the following specific tasks:

- (1) Assure the development, coordination, and implementation of interface related mission requirements, constraints, and schedules.
- (2) Assure the necessary interface coordination to properly develop and implement requirements for accomplishment of all mission phases through the definition and resolution of interface problems associated with:
 - a. Flight mechanics
 - b. Flight dynamics and control
 - c. Guidance performance including error analyses
 - d. Guidance and navigation
 - e. Reference and Operational trajectories, and other trajectories necessary for training and simulation
 - f. Dispersed, alternate and abort trajectories
 - g. Orbital attitude
 - h. Launch vehicle orbital venting and attitude time lines
 - i. Aerospace environments and aerodynamics
 - j. Performance of range safety analyses
 - k. Determination of emergency detection system limits and abort limits
- (3) Assure identification and resolution of all intercenter interface problems associated with mission planning data and information flow.
- (4) Coordinate inflight interface requirements and associated problems related to the accomplishment of detailed experiment objectives and assure that the objectives of each experiment are adequately expressed in terms of crew training, mission planning, and systems operational capabilities.

LAUNCH OPERATIONS PANEL SCOPE STATEMENT

- (1) Ensure the operational compatibility of the space vehicle and facilities including power supplies, ground support equipment (GSE), and launching accessories.
- (2) Ensure that adequate space and facilities are available at the launch site for checkout and mating of the launch vehicle and spacecraft.
- (3) Define and resolve interface problems between space vehicle, GSE and launch facilities.
- (4) Review all areas of the space vehicle for compatibility and possible interface problems with launch operations.
- (5) Ensure that engineering, equipment and facilities support space vehicle launch and flight safety requirements.
- (6) Determine impact on ground safety plan of new or modified inter-center interfaces.
- (7) Timely implementation of Apollo Applications Program requirements in accordance with above-stated responsibilities.

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MISSION EVALUATION PANEL SCOPE STATEMENT

The objectives and responsibilities of this panel are to assure the definition and resolution of interface problems associated with mission evaluation and reporting, resulting from the delegation of project management responsibilities to more than one Center, with due consideration for the existing functional responsibilities of the individual Centers. Interface coordination by this panel shall include but not be limited to the following specific tasks:

- (1) Assure that the evaluation reports for the Apollo Applications Program missions are defined and that the responsibilities of the Centers with respect to data analyses and report preparation are assigned.
- (2) Assure the definition and resolution of interface problems between Centers in the evaluation of mission module performance.
- (3) Define and resolve flight and ground instrumentation interface problems with respect to the effects on mission performance evaluation; and review all associated requirements documents for adequacy for mission evaluation.
- (4) Assure the resolution of causes of malfunctions occurring during missions and deviations from planned procedures which appear to have been the result of interface problems.
- (5) Develop procedures for adequate and timely exchange of selected raw and processed data and/or results of analyses.
- (6) Establish overall mission evaluation interface compatibility.

SYSTEMS SAFETY PANEL SCOPE STATEMENT

The objectives and responsibilities of this panel are to assure the definition and control of systems-crew interfaces involving crew safety during prelaunch checkout operations and throughout all AAP mission phases from crew ingress to recovery. The panel will assure resolution of interface problems during the entire program and accomplishment of a total mission oversight review of systems safety interface matters for each AAP mission. Specific areas of systems safety responsibility for this panel include:

- (1) Identification and reduction or elimination of environmental hazards
- (2) Definition of emergency conditions
- (3) Emergency detection systems requirements
- (4) Systems safety design criteria
- (5) Development of safety/emergency/contingency procedures including emergency egress plans and demonstrations
- (6) Crew safety systems requirements
- (7) Range safety systems requirements
- (8) Recovery systems requirements
- (9) Crew safety ground monitoring systems requirements
- (10) Post flight systems safety evaluations
- (11) Systems safety training

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