DOCUMENT NUMBER VOY-DC-FR
28 JULY 1967

FINAL REPORT
DATA MANAGEMENT STUDY
APPENDIX O
CONTRACTOR DATA REQUIREMENTS
SCIENCE INTEGRATION (SI)

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VOYAGER SPACECRAFT SYSTEM PROJECT

J.H. BEHM
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VOYAGER SPACECRAFT SYSTEM PROJECT

APPROVED BY:

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DATA MANAGEMENT AND CONTROL TASK
VOYAGER SPACECRAFT SYSTEM PROJECT

PREPARED FOR
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
NASA PASADENA OFFICE
PASADENA, CALIFORNIA

UNDER NASA CONTRACT NO. NAS7-584

GENERAL ELECTRIC
MISSILE AND SPACE DIVISION
Valley Forge Space Technology Center
P.O. Box 8555 • Philadelphia, Penna. 19101

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1.1 DEFINITION - SCIENCE INTEGRATION (SI)

This category includes data used to plan, control, review, and report Voyager activities relative to the selection, preparation, conduct, and interpretation of scientific experiments.

1.2 SCOPE

Data items include the specifications, reports, lists, guidelines, and manuals required to successfully integrate the GFE experiments on the spacecraft.

The contractor - user flow diagrams show the principal design and development control activities associated with the contractor engineering effort. Emphasis is placed upon the actions and documents required in designing the spacecraft to meet the structural and electrical requirements and in handling the processing, storage, and communication of scientific data. The project span covered by the flow diagrams extends from contract award through the Mission Acceptance Review. The diagrams have been prepared with the assumption that the GFE scientific experiments information and hardware will be available at the times shown.

DATA ITEM NUMBER	DATA ITEM SCIENCE INTEGRATION	DESCRIPTIO
SI-001	Specification, Spacecraft Science Integration	Specific performance and design requirement ments on the spacecraft. Defines the interfa science subsystem.
SI-002	Specification, Spacecraft Science OSE	Specifies performance and design requireme
SI-003	Report, Science Analysis and Trade Study	Report on science analysis; alternate approa stallation operation, and calibration.
SI-004	Specification, Scientific Instrument Requirements	Specifies requirements for the combined gro items as (but not limited to): electrical powe events, telemetry channel assignments, mea
SI-005	Report, Science Checkout and Evaluation	Reports of operation status of science equipr experimenters.
SI-006	Specification, Science Standards Requirements	Summary description of characteristics of al
SI-007	List, Science Parts	Tabulation of all component parts required f Includes both GFE and contractor-furnished
SI-008	Report, Science Qualification Tests	Reports of status of experiments after being Includes analysis of problems, causes and p
SI-009	Specification, Configuration Management Requirements (Experiments)	Establishes information expected by spacecr experimenters.
SI-010	Manual, Science Calibration (Preflight and Flight)	An approved set of procedures for calibratin

* KEY INFORMAL DATA

DATA ITEM LIST/USER MATRIX

	APPLICABILITY TO FUNCTIONAL USERS AT CONTRACTOR LEVEL														
	SE	PQ	MG	CM	QA	TE	RA	LS	MA	SC	PC	MF	MP	DM	FA
s for integration of experi- ces between spacecraft and the	R	U	-	-	U	U	R	-	PM	-	U	-	U	-	-
nts for science OSE.	A	-	-	-	U	U	R	-	-	-	U	-	-	-	-
ches of design, test, in-	A	-	-	-	U	U	R	U	-	-	U	-	U	-	-
up of experiments; defines such r requirements, sequences of surements and data handling.	A	-	-	-	U	U	R	U	-	-	U	-	U	-	-
nent when received from	A	-	-	-	U	U	U	U	U	-	U	-	U	-	-
l experiments.	A	-	-	-	U	U	R	-	-	-	U	-	U	-	-
r science integration. parts.	A	-	-	-	U	U	U	R	U	-	U	U	-	-	U
tested in spacecraft. revention.	A	-	U	-	U	U	U	-	U	-	U	-	U	-	-
aft contractor from	A	-	-	U	U	U	R	U	U	-	U	-	-	-	-
g experiments.	A	-	-	-	U	U	-	-	-	-	U	-	U	-	-

					APPLICABILITY AT SUBCONTRACTOR/VENDOR/SUPPLIER LEVELS						APPLICABILITY TO PROJECT BOARDS										
SA	AL	SI	RP	AM	PRINCIPAL SUBCONTRACTORS	MAJOR SUBCONTRACTORS	KEY SUBCON AND VENDORS	OTHER VENDORS	KEY SUPPLIERS	KEY SUBSUPPLIERS	CONFIGURATION CONTROL	CONFIGURATION MANAGEMENT	DATA REVIEW	DESIGN REVIEW	FAILURE REVIEW	INTEGRATED SAFETY	INTEGRATED TEST	MAKE OR BUY	MATERIAL REVIEW	SOURCE EVALUATION	SOURCE SELECTION
U	U	U	-	U	(C)	(C)	(C)	-	-	-	-	-	-	U	-	U	U	-	-	-	-
U	U	U	-	U	(C)	(C)	-	-	-	-	-	-	-	U	-	U	-	U	-	-	-
U	U	U	U	-	(S)	(S)	(S)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U	U	-	U	-	(C/S)	(C/S)	(C/S)	-	(C/S)	(C/S)	-	-	-	U	-	-	U	-	-	-	-
-	U	U	-	U	(S)	(S)	(S)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U	U	U	-	U	(C)	(C)	(C)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U	U	U	-	U	(S)	(S)	(S)	-	(S)	(S)	-	-	-	-	-	-	-	-	-	U	U
-	U	U	-	U	(S)	(S)	(S)	-	(S)	(S)	-	-	-	U	-	-	R	-	-	-	-
-	U	U	-	U	(C)	(C)	(C)	-	(C)	(C)	-	R	-	-	-	-	-	-	-	-	-
-	U	U	-	U	(C/S)	(C/S)	(C/S)	-	(C/S)	(C/S)	-	-	-	-	-	-	-	-	-	-	-

AL C - PREPARED BY CONTRACTOR S - PREPARED BY SUBCONTRACTOR/VENDOR/SUPPLIER ( ) - OPTIONAL APPLICATION NA - NOT APPLICABLE

USER FLOW DIAGRAMS

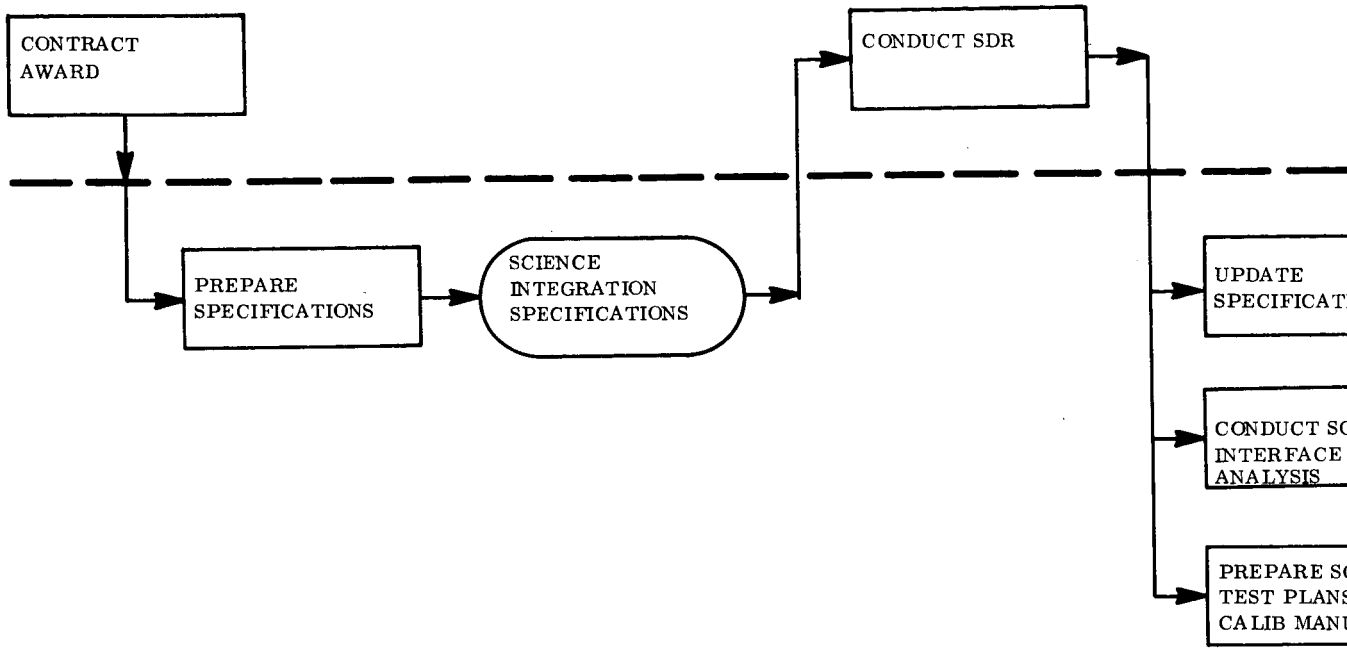
Contractor - user flow diagrams show the relationship between Voyager system documentation and the activities undertaken by the prime spacecraft contractor. The diagrams are intended to be a communication tool which describes the project in terms which emphasize documentation and as a planning tool for the integration of data management activities into the overall project management scheme.

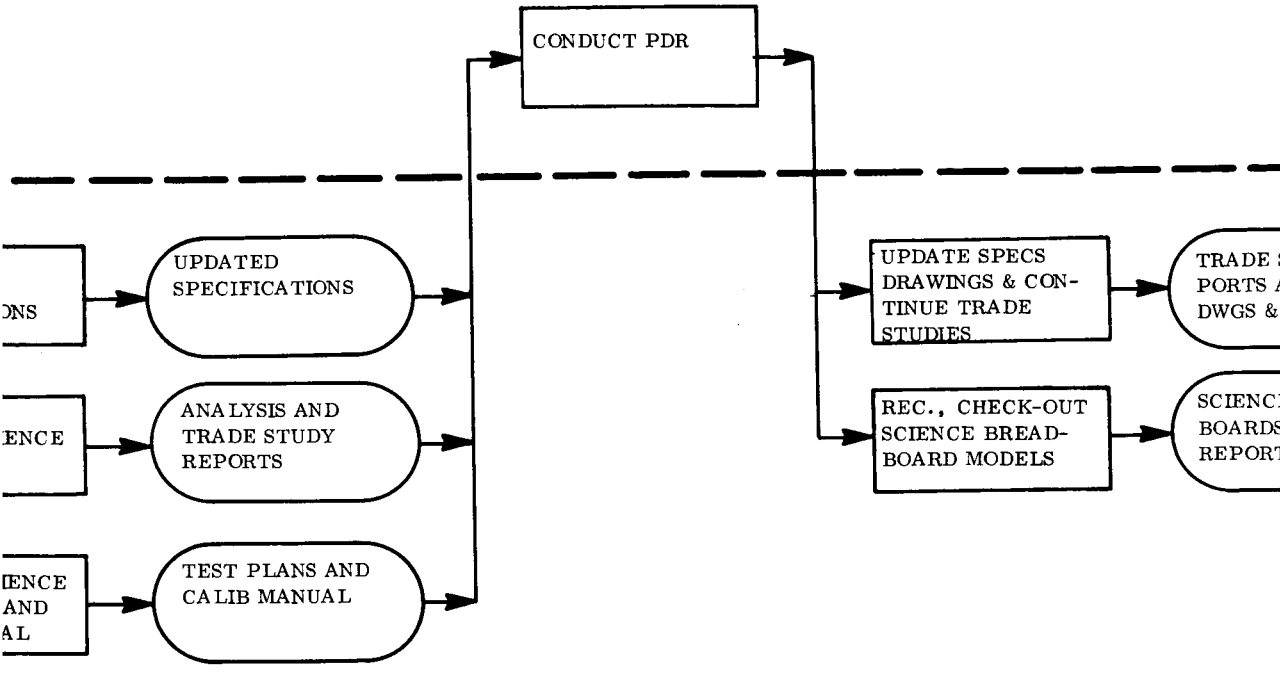
The project is considered in a generalized sense, in that subsystems and components are each treated as collective entities; that is, the documentation flows associated with the several separate subsystems are not distinguished. A single representative flow is presented.

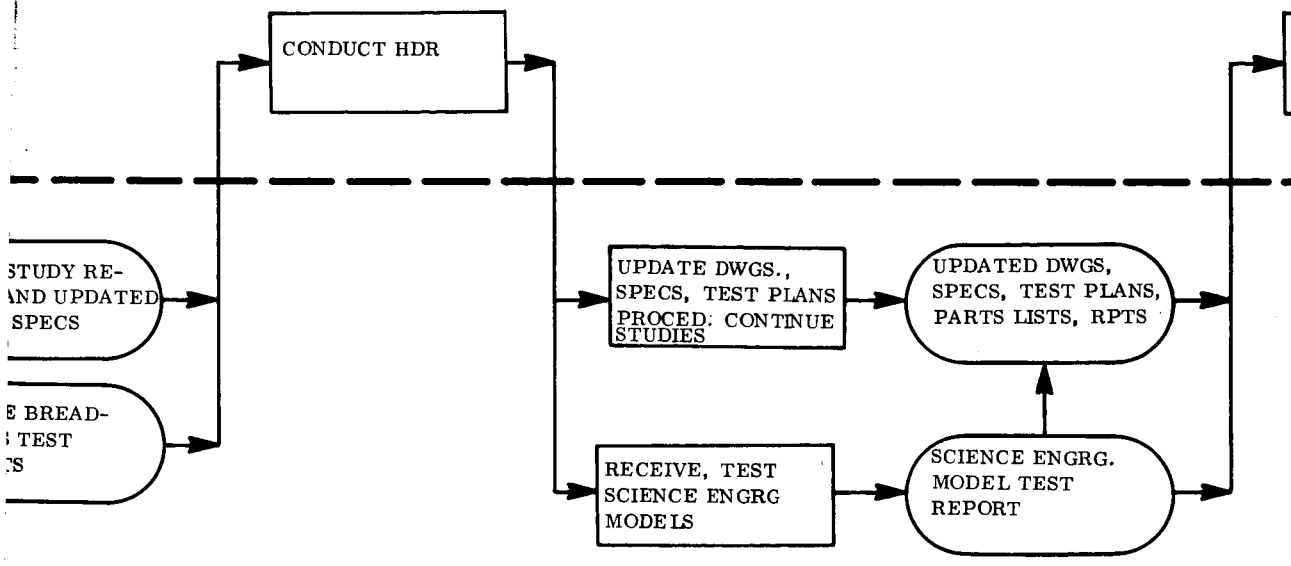
The drawings show the detail activities and are keyed to the formal design and hardware reviews. A generalized summary flow is also included.

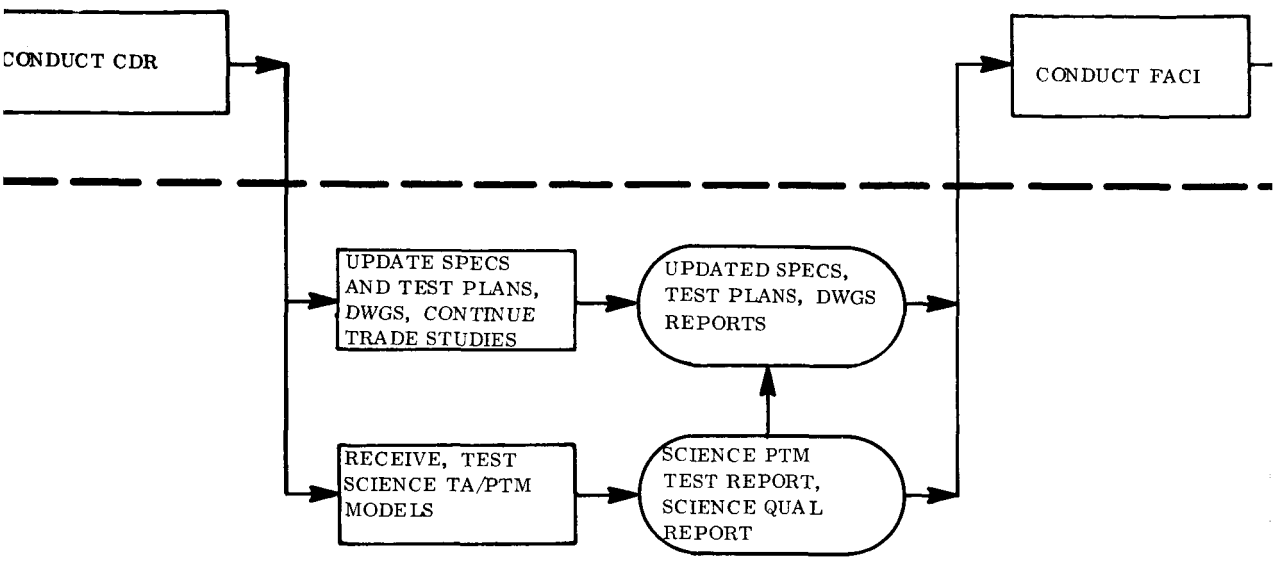
Science Integration User Flow Diagrams

Figure Number	Title
O-1	Science Integration User Flow Diagram - Summary
O-2	Science Integration User Flow Diagram - Contract Award Through Preliminary Design Review
O-3	Science Integration User Flow Diagram - Preliminary Design Review Through Critical Design Review
O-4	Science Integration User Flow Diagram - Critical Design Review Through Mission Acceptance Review

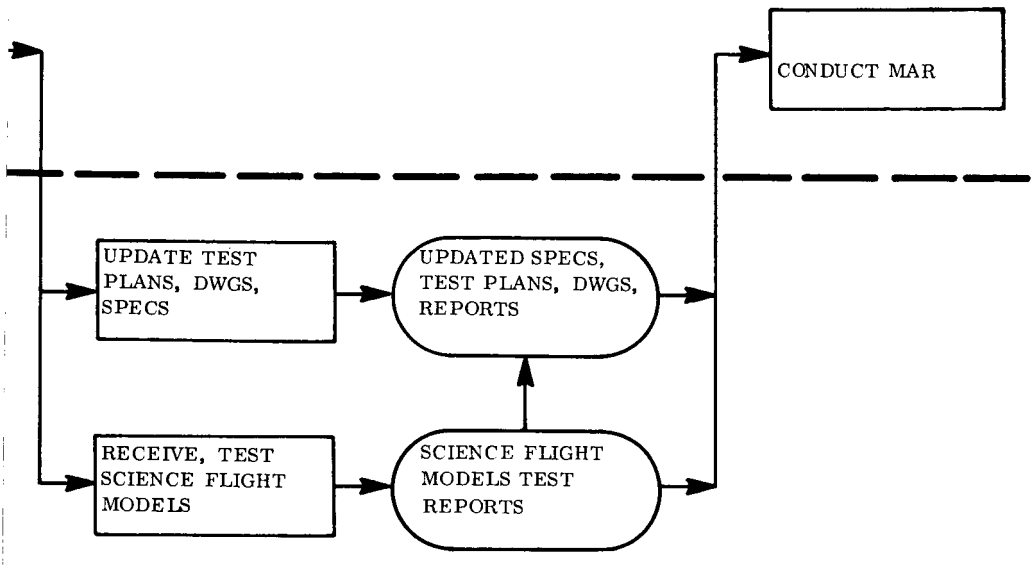

CONTRACT
AWARD
PREPARE
SPECIFICATIONS
SCIENCE
INTEGRATION
SPECIFICATIONS
CONDUCT SDR
UPDATE
SPECIFICAT
CONDUCT SC
INTERFACE
ANALYSIS
PREPARE SC
TEST PLANS
CALIB MANU


CONDUCT PDR
ONS
UPDATED SPECIFICATIONS
ENCE
ANALYSIS AND TRADE STUDY REPORTS
IENCE AND AL
TEST PLANS AND CALIB MANUAL
UPDATE SPECS DRAWINGS & CONTINUE TRADE STUDIES
TRADE PORTS DWGS &
REC., CHECK-OUT SCIENCE BREAD-BOARD MODELS
SCIENC BOARDS REPORT


CONDUCT HDR
STUDY RE-
AND UPDATED
SPECS
E BREAD-
TEST
S
UPDATE DWGS.,
SPECS, TEST PLANS
PROCED: CONTINUE
STUDIES
UPDATED DWGS,
SPECS, TEST PLANS,
PARTS LISTS, RPTS
RECEIVE, TEST
SCIENCE ENGRG
MODELS
SCIENCE ENGRG.
MODEL TEST
REPORT


CONDUCT CDR
CONDUCT FACI
UPDATE SPECS AND TEST PLANS, DWGS, CONTINUE TRADE STUDIES
UPDATED SPECS, TEST PLANS, DWGS REPORTS
RECEIVE, TEST SCIENCE TA/PTM MODELS
SCIENCE PTM TEST REPORT, SCIENCE QUAL REPORT

LEGEND

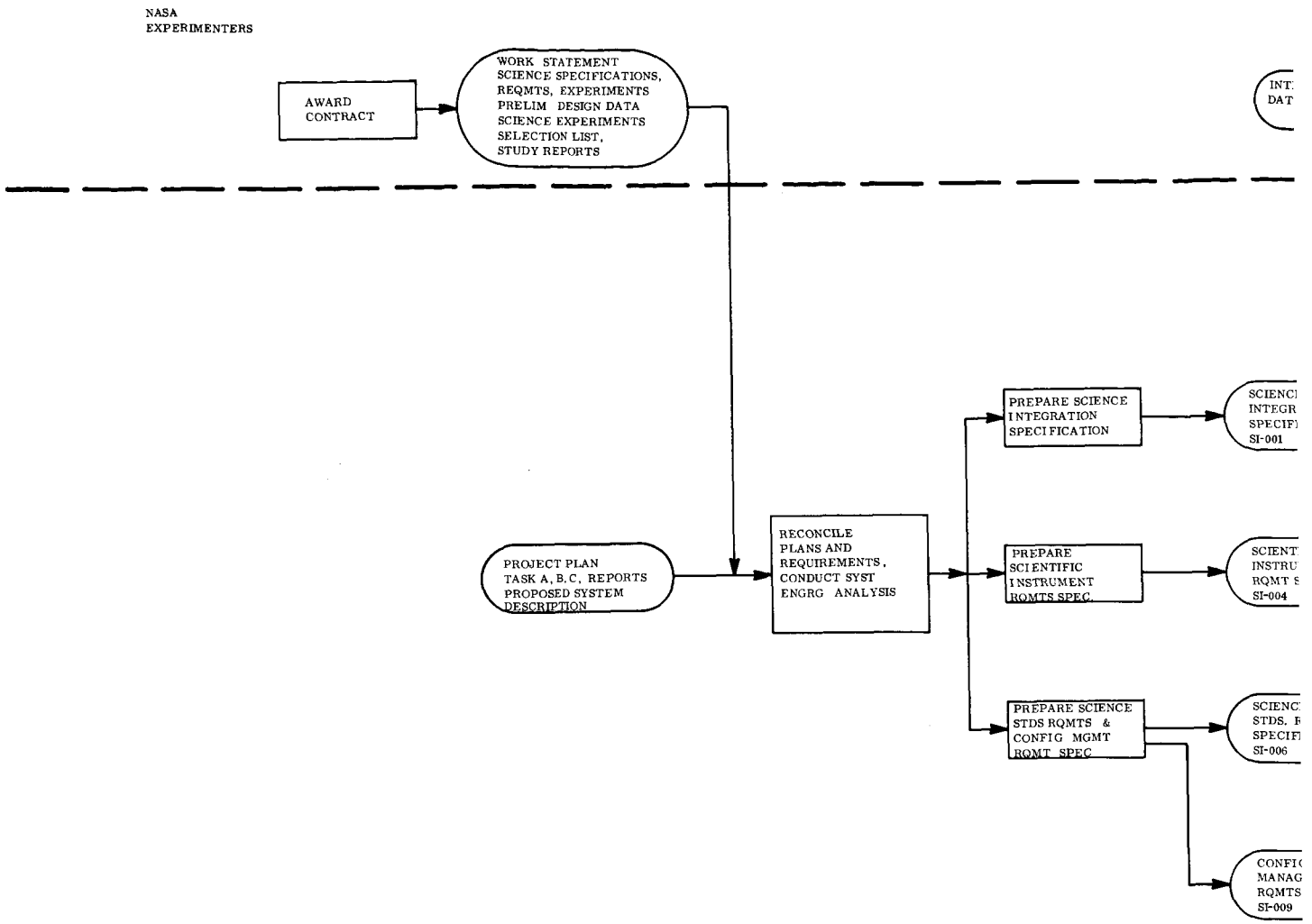


):

ACTIVITY, WITH DESCRIPTION INSIDE

DATA ITEM(S), WITH TITLE(S) INSIDE

Figure O-1. Science Integration User Flow Diagram (Summary)


NASA
EXPERIMENTERS
AWARD
CONTRACT
WORK STATEMENT
SCIENCE SPECIFICATIONS,
REQMTS, EXPERIMENTS
PRELIM DESIGN DATA
SCIENCE EXPERIMENTS
SELECTION LIST,
STUDY REPORTS
PROJECT PLAN
TASK A, B, C, REPORTS
PROPOSED SYSTEM
DESCRIPTION
RECONCILE
PLANS AND
REQUIREMENTS,
CONDUCT SYST
ENGRG ANALYSIS
PREPARE SCIENCE
INTEGRATION
SPECIFICATION
PREPARE
SCIENTIFIC
INSTRUMENT
RQMTS SPEC.
PREPARE SCIENCE
STDS RQMTS &
CONFIG MGMT
RQMT SPEC

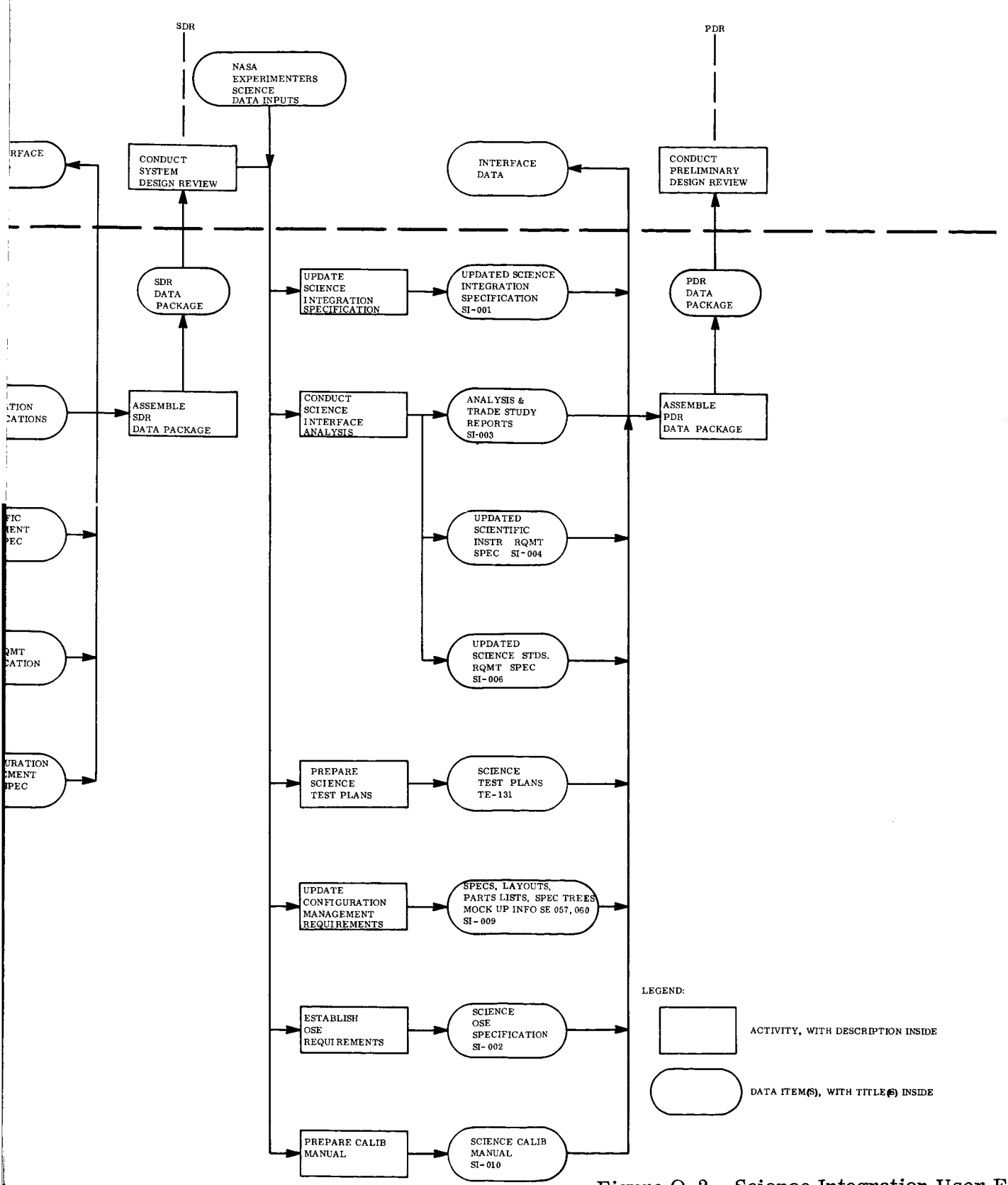
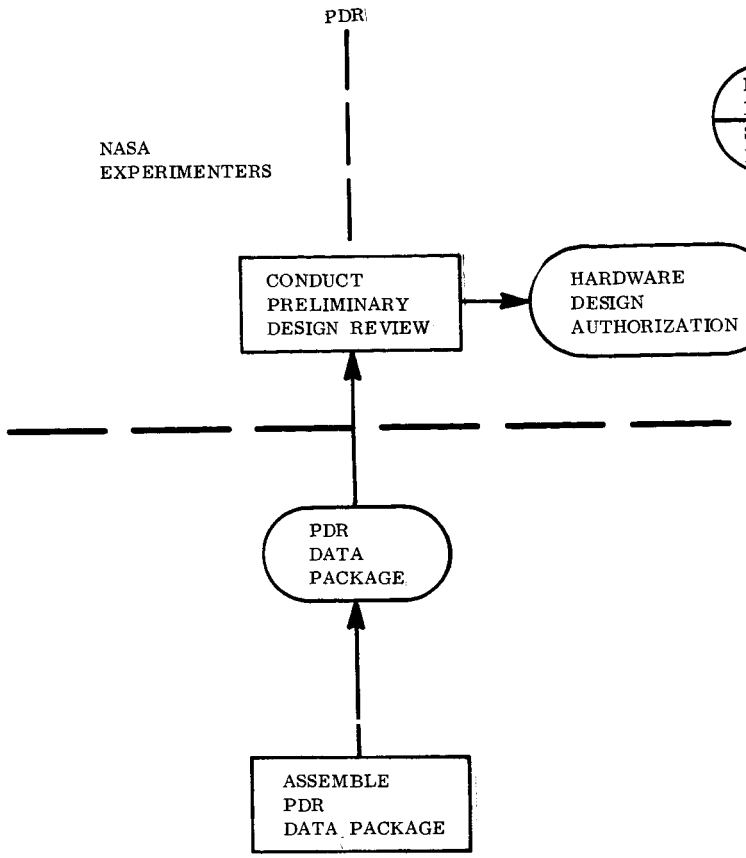
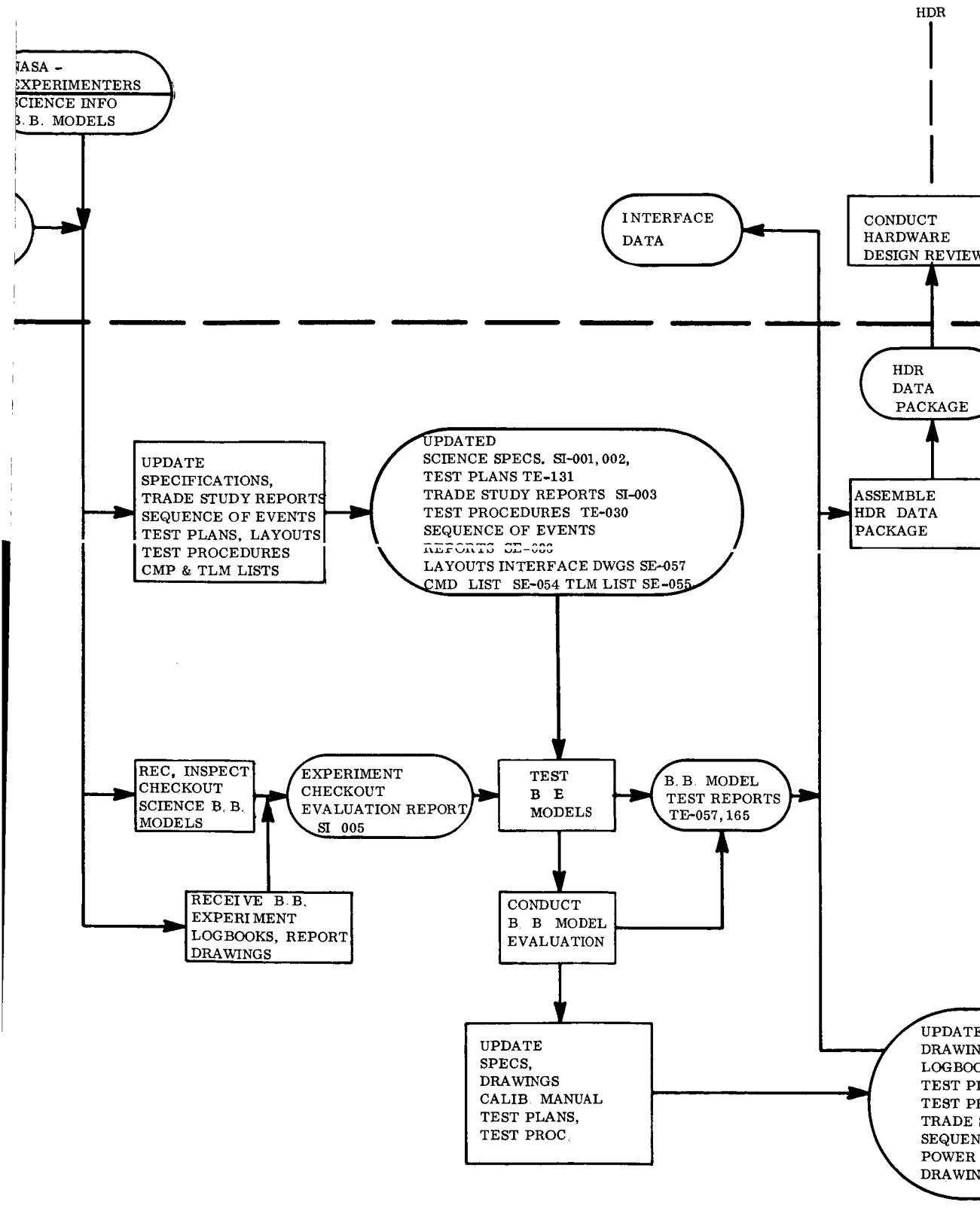


Figure O-2. Science Integration User Flow Diagram - Contract Award Through Preliminary Design Review


PDR
NASA
EXPERIMENTERS
CONDUCT
PRELIMINARY
DESIGN REVIEW
HARDWARE
DESIGN
AUTHORIZATION
PDR
DATA
PACKAGE
ASSEMBLE
PDR
DATA PACKAGE


HDR
NASA -
EXPERIMENTERS
SCIENCE INFO
B. B. MODELS
INTERFACE
DATA
CONDUCT
HARDWARE
DESIGN REVIEW
HDR
DATA
PACKAGE
UPDATE
SPECIFICATIONS,
TRADE STUDY REPORTS
SEQUENCE OF EVENTS
TEST PLANS, LAYOUTS
TEST PROCEDURES
CMP & TLM LISTS
UPDATED
SCIENCE SPECS. SI-001, 002,
TEST PLANS TE-131
TRADE STUDY REPORTS SI-003
TEST PROCEDURES TE-030
SEQUENCE OF EVENTS
REPORTS SE-033
LAYOUTS INTERFACE DWGS SE-057
CMD LIST SE-054 TLM LIST SE-055
ASSEMBLE
HDR DATA
PACKAGE
REC, INSPECT
CHECKOUT
SCIENCE B. B.
MODELS
EXPERIMENT
CHECKOUT
EVALUATION REPORT
SI 005
TEST
B E
MODELS
B. B. MODEL
TEST REPORTS
TE-057, 165
RECEIVE B. B.
EXPERIMENT
LOGBOOKS, REPORT
DRAWINGS
CONDUCT
B. B MODEL
EVALUATION
UPDATE
SPECS,
DRAWINGS
CALIB. MANUAL
TEST PLANS,
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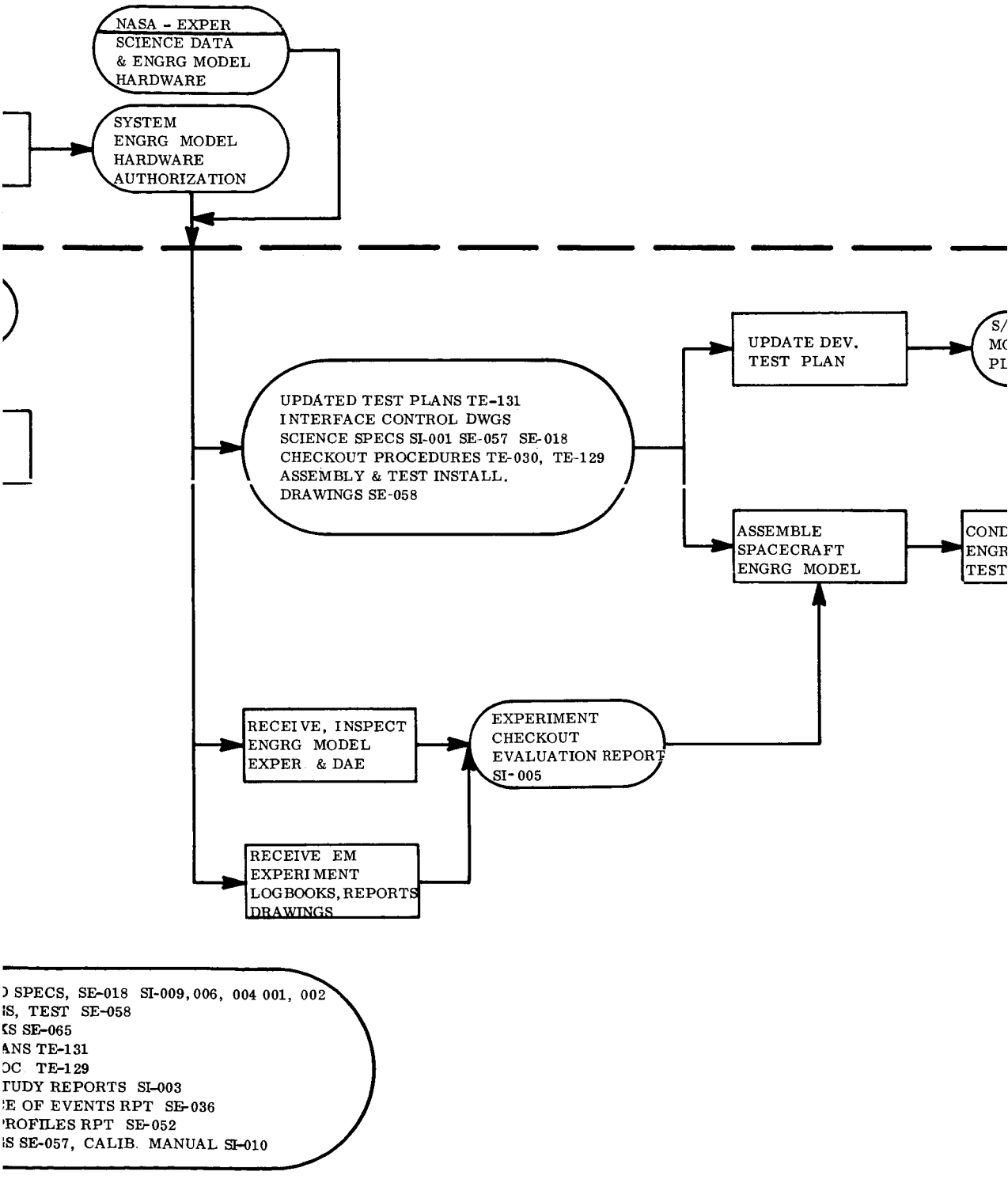
NASA - EXPER
SCIENCE DATA
& ENGRG MODEL
HARDWARE
SYSTEM
ENGRG MODEL
HARDWARE
AUTHORIZATION
UPDATE DEV.
TEST PLAN
UPDATED TEST PLANS TE-131
INTERFACE CONTROL DWGS
SCIENCE SPECS SI-001 SE-057 SE-018
CHECKOUT PROCEDURES TE-030, TE-129
ASSEMBLY & TEST INSTALL.
DRAWINGS SE-058
ASSEMBLE
SPACECRAFT
ENGRG MODEL
RECEIVE, INSPECT
ENGRG MODEL
EXPER & DAE
EXPERIMENT
CHECKOUT
EVALUATION REPORT
SI-005
RECEIVE EM
EXPERIMENT
LOGBOOKS, REPORTS
DRAWINGS
SPECS, SE-018 SI-009, 006, 004 001, 002
S, TEST SE-058
S SE-065
NS TE-131
C TE-129
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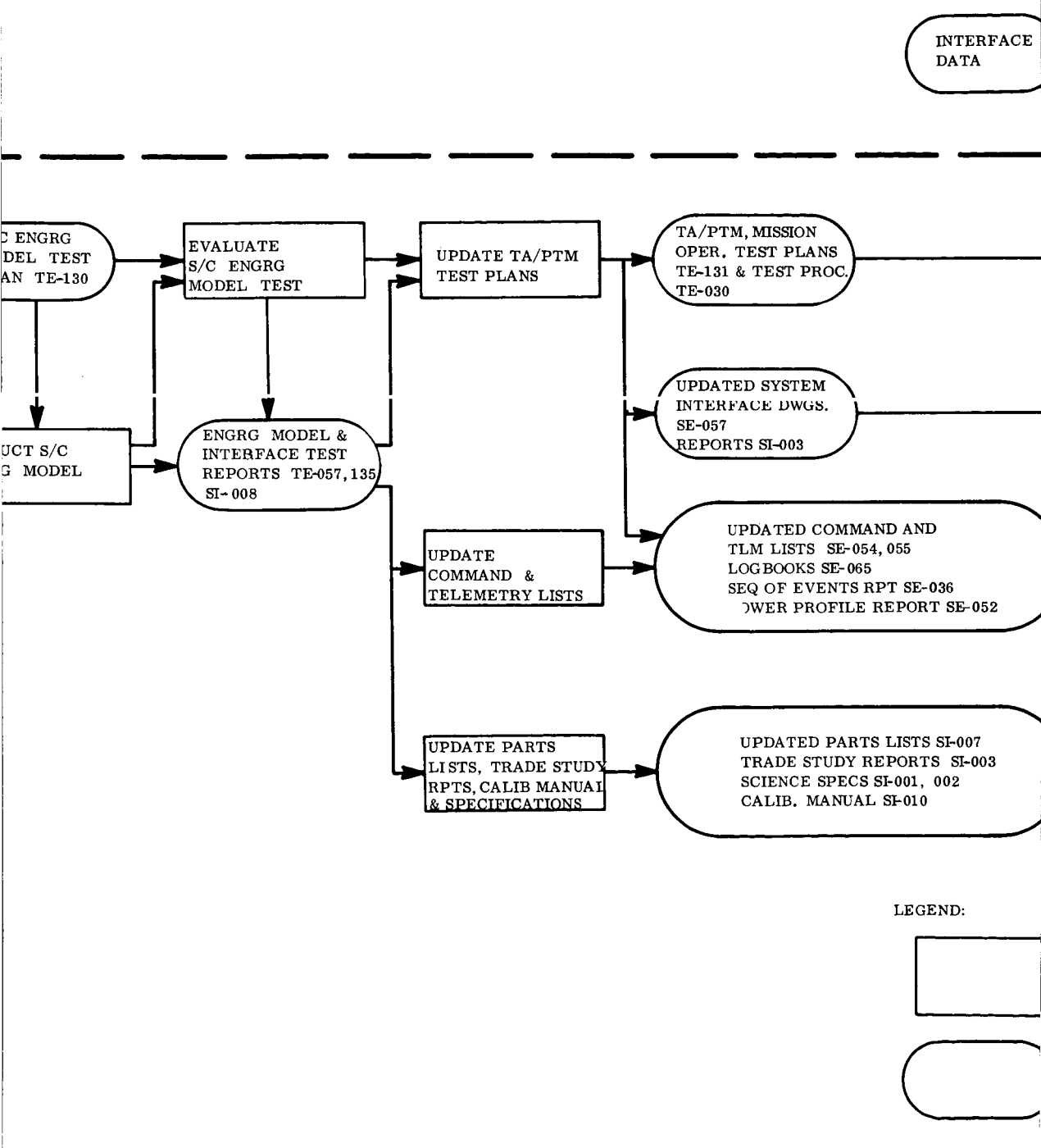
ROFILES RPT SE-052
S SE-057, CALIB. MANUAL SI-010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EVALUATE S/C ENGRG MODEL TEST
UPDATE TA/PTM TEST PLANS
TA/PTM, MISSION OPER. TEST PLANS TE-131 & TEST PROC. TE-030
UCT S/C G MODEL
ENGRG MODEL & INTERFACE TEST REPORTS TE-057, 135 SI-008
UPDATED SYSTEM INTERFACE DWGS. SE-057 REPORTS SI-003
UPDATE COMMAND & TELEMETRY LISTS
UPDATED COMMAND AND TLM LISTS SE-054, 055 LOGBOOKS SE-065 SEQ OF EVENTS RPT SE-036 OWER PROFILE REPORT SE-052
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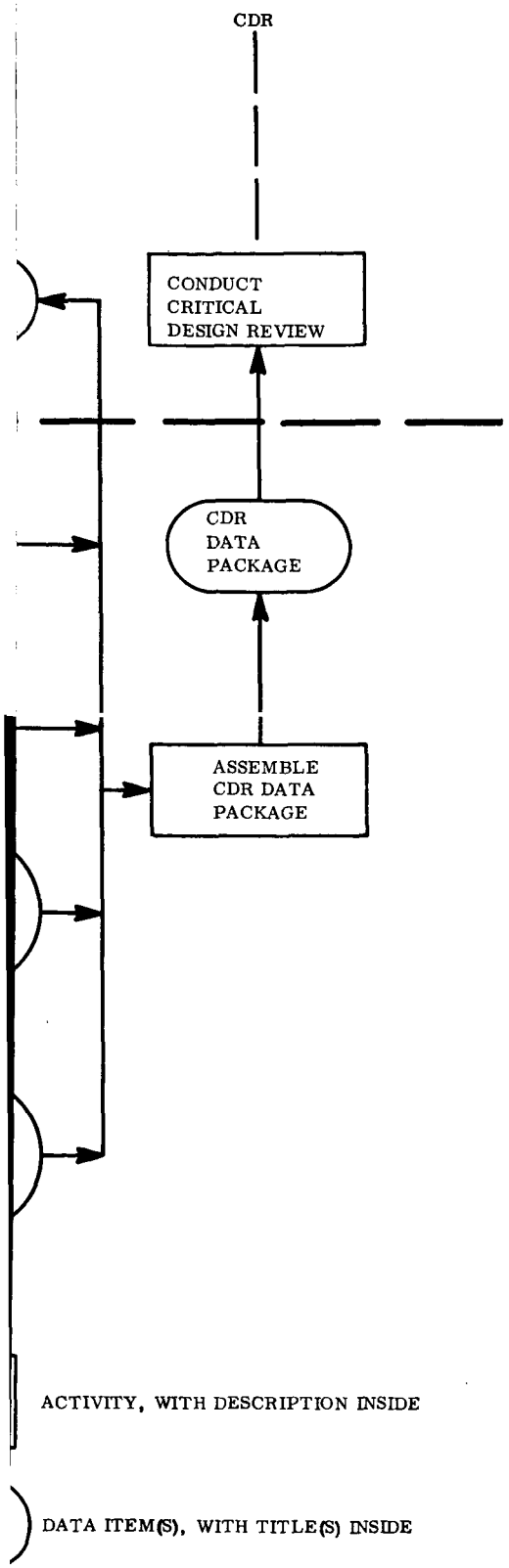
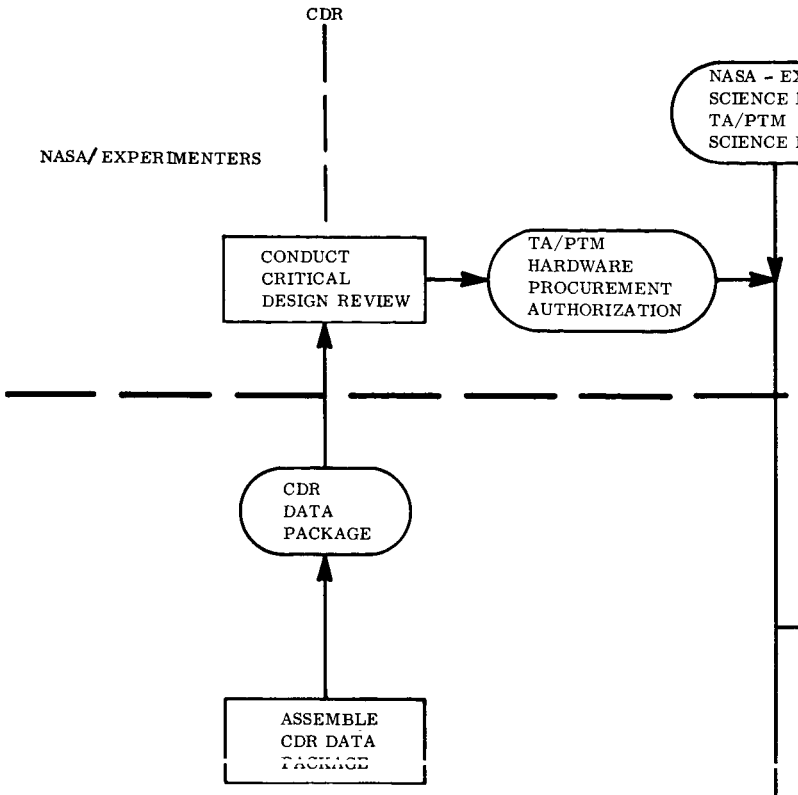


Figure O-3. Science Integration User Flow Diagram - Preliminary Design Review Through Critical Design Review


CDR
NASA/ EXPERIMENTERS
NASA - EX
SCIENCE
TA/PTM
SCIENCE
CONDUCT
CRITICAL
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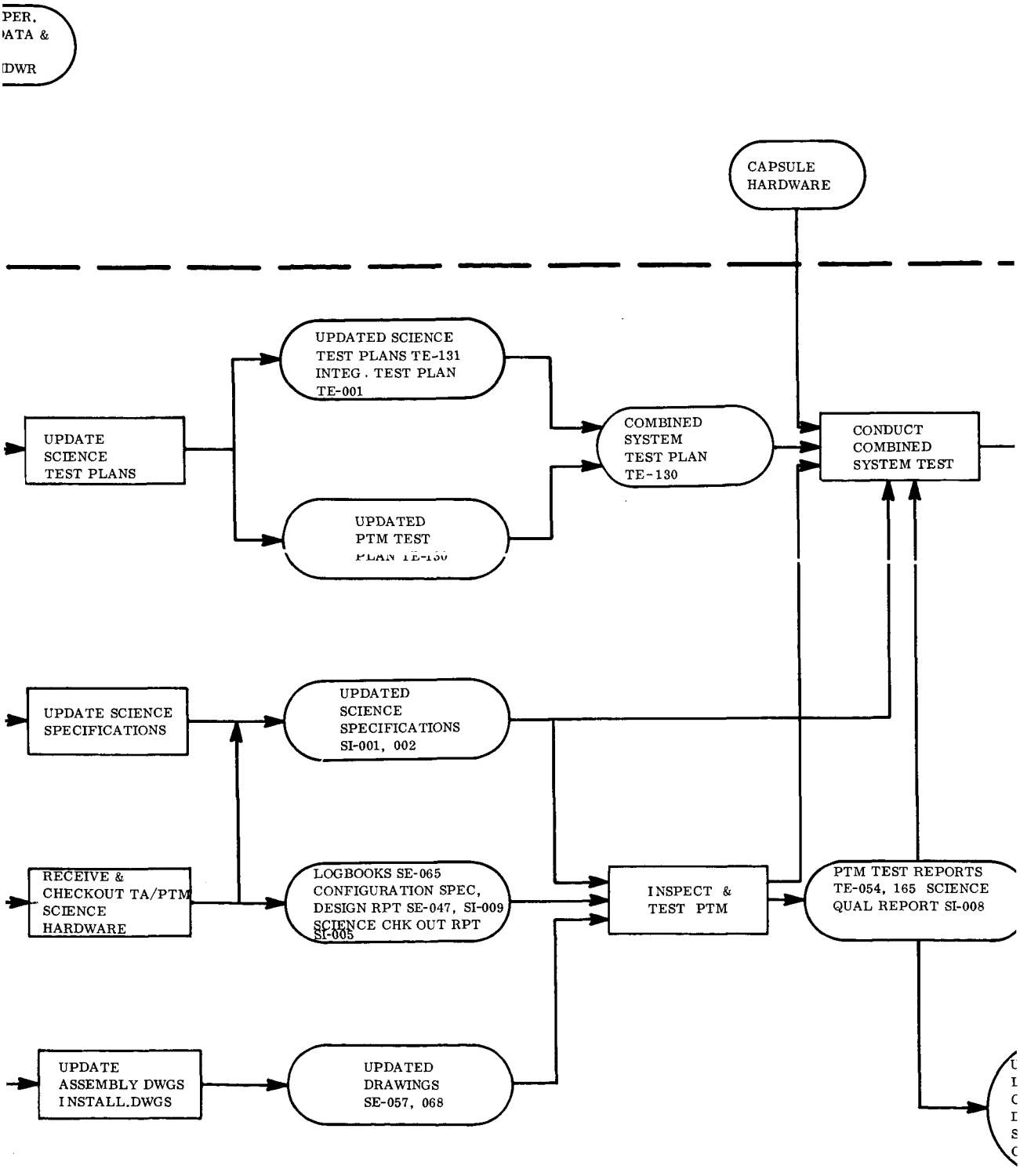
TA/PTM
HARDWARE
PROCUREMENT
AUTHORIZATION
CDR
DATA
PACKAGE
ASSEMBLE
CDR DATA


PER.
ATA &
DWR
CAPSULE HARDWARE
UPDATED SCIENCE TEST PLANS TE-131 INTEG. TEST PLAN TE-001
UPDATE SCIENCE TEST PLANS
COMBINED SYSTEM TEST PLAN TE-130
CONDUCT COMBINED SYSTEM TEST
UPDATED PTM TEST
UPDATE SCIENCE SPECIFICATIONS
UPDATED SCIENCE SPECIFICATIONS SI-001, 002
RECEIVE & CHECKOUT TA/PTM SCIENCE HARDWARE
LOGBOOKS SE-065 CONFIGURATION SPEC, DESIGN RPT SE-047, SI-009 SCIENCE CHK OUT RPT SI-005
INSPECT & TEST PTM
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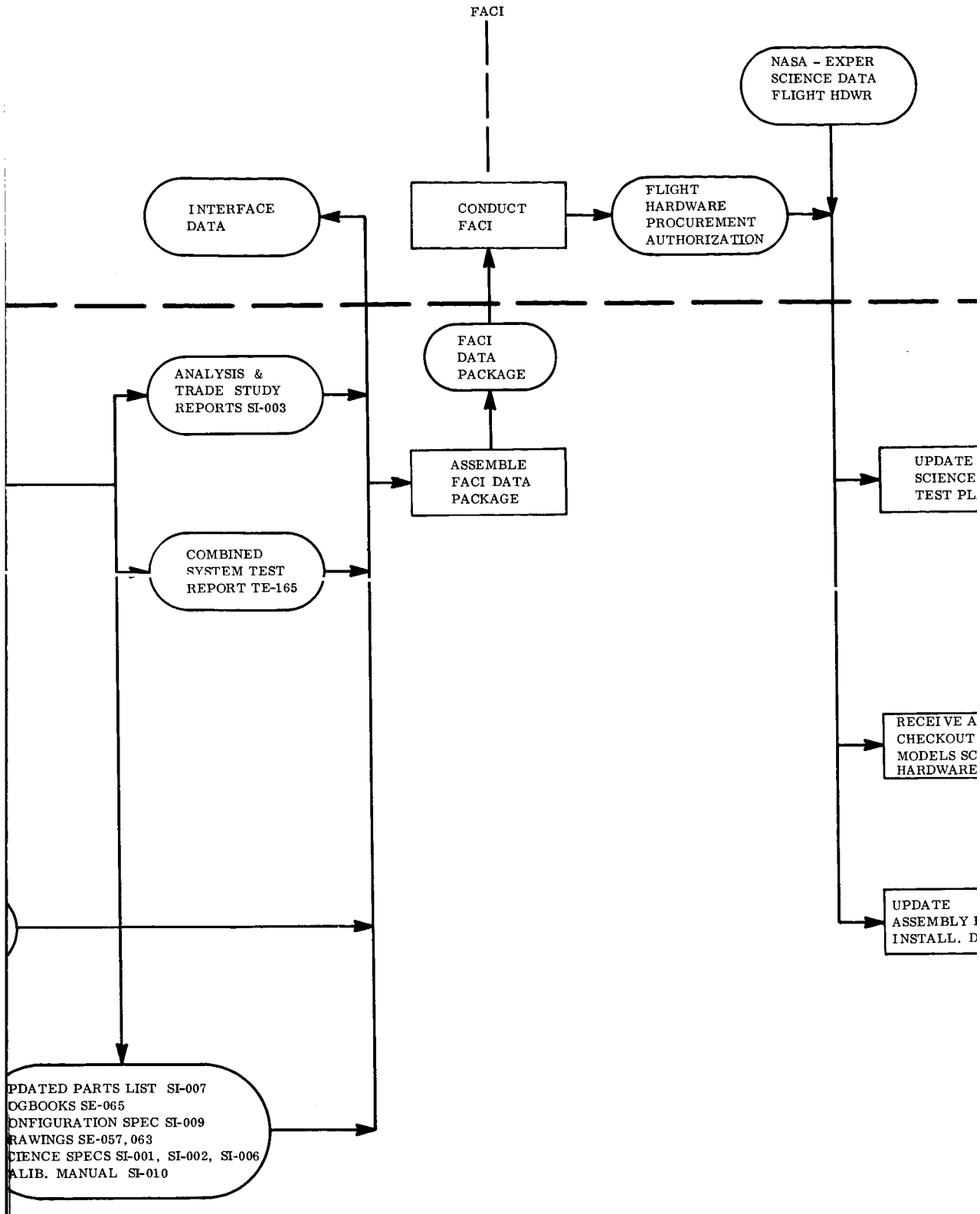
UPDATED DRAWINGS SE-057, 068


FACI
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SCIENCE DATA
FLIGHT HDWR
INTERFACE
DATA
CONDUCT
FACI
FLIGHT
HARDWARE
PROCUREMENT
AUTHORIZATION
FACI
DATA
PACKAGE
ANALYSIS &
TRADE STUDY
REPORTS SI-003
ASSEMBLE
FACI DATA
PACKAGE
UPDATE
SCIENCE
TEST PL
COMBINED
SYSTEM TEST
REPORT TE-165
RECEI VE A
CHECKOUT
MODELS SC
HARDWARE
UPDATE
ASSEMBLY
INSTALL. D
PDATED PARTS LIST SI-007
OGBOOKS SE-065
ONFIGURATION SPEC SI-009
RAWINGS SE-057, 063
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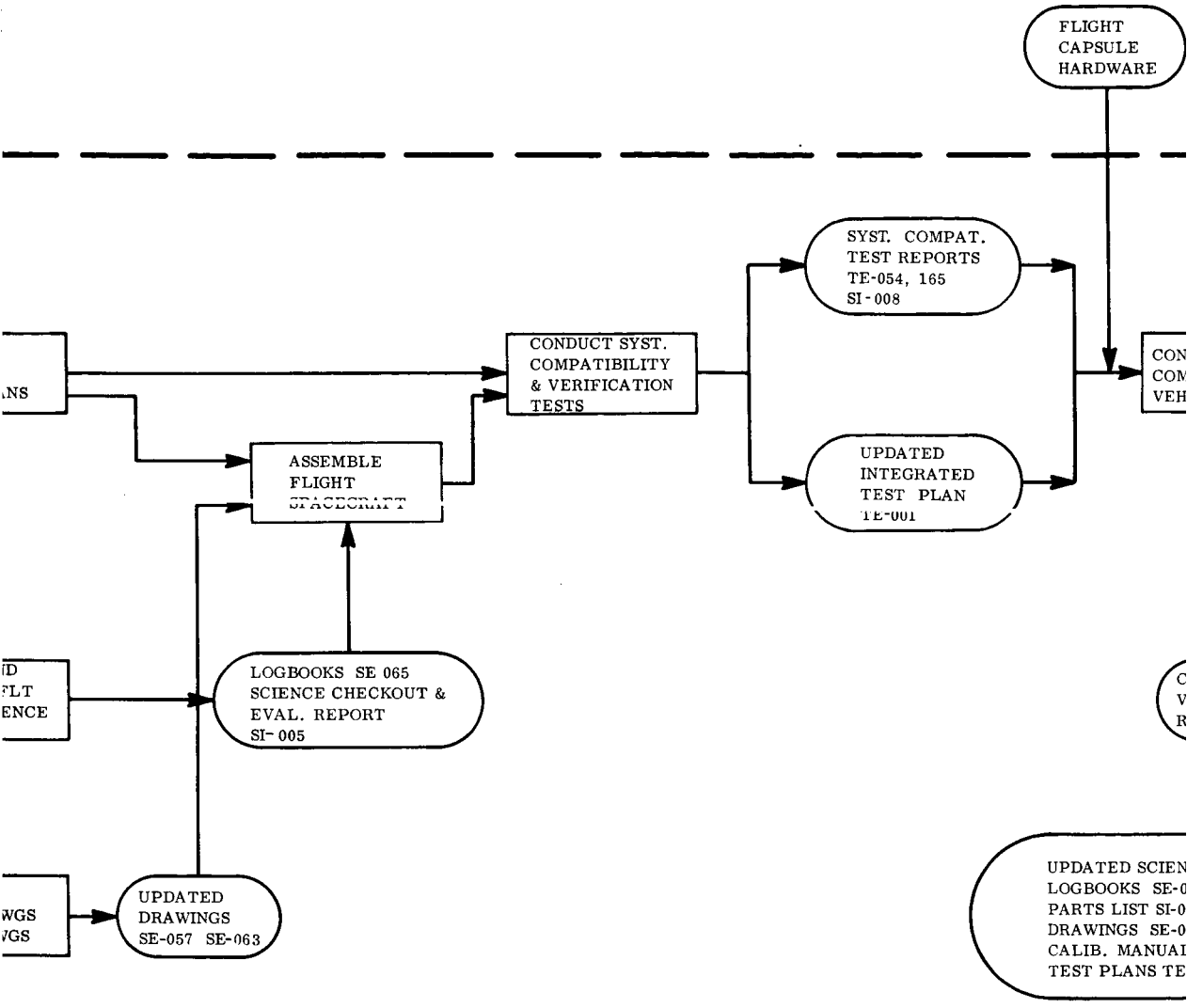
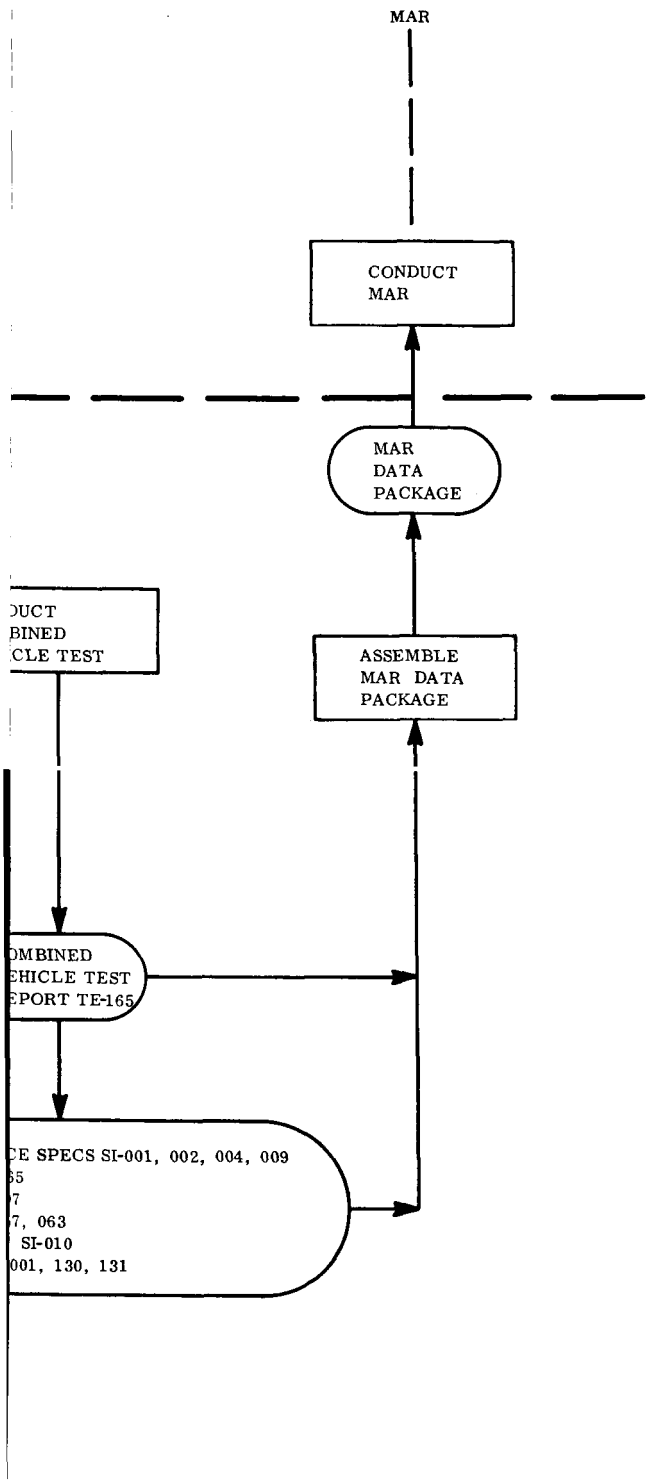
ALIB. MANUAL SI-010


FLIGHT CAPSULE HARDWARE
SYST. COMPAT. TEST REPORTS TE-054, 165 SI-008
CONDUCT SYST. COMPATIBILITY & VERIFICATION TESTS
ASSEMBLE FLIGHT SPACECRAFT
UPDATED INTEGRATED TEST PLAN TE-001
LOGBOOKS SE 065 SCIENCE CHECKOUT & EVAL. REPORT SI-005
UPDATED DRAWINGS SE-057 SE-063
LEGEND:
ACTIVITY,
DATA ITEM



ITH DESCRIPTION INSIDE

), WITH TITLE(S) INSIDE

Figure O-4. Science Integration User Flow Diagram - Critical Design Review Through Mission Acceptance Review

[redacted]

Science Integration Data Requirement Descriptions

DRD Number	Title
SI-001	Specification, Spacecraft Science Integration
SI-002	Specification, Spacecraft Science OSE
SI-003	Report, Science Analysis and Trade Study
SI-004	Specification, Scientific Instrument Requirements
SI-005	Report, Science Checkout and Evaluation
SI-006	Specification, Science Standards Requirements
SI-007	List, Science Parts
SI-008	Report, Science Qualification Tests
SI-009	Specification, Configuration Management Requirements (Experiments)
SI-010	Manual, Science Calibration (Preflight and Flight)

GE EXHIBIT DRD SI-001

VOYAGER DATA REQUIREMENT DESCRIPTION	DRD APPROVED BY:	DATE:	DATA CATEGORY:

ORGANIZATION ORIGINATING REQUIREMENT:	CODE:	OFFICE RESPONSIBLE FOR DRD:	CODE:	DRD PREPARED BY:	DATE:	CONTRACT NO.:	DRD NO.:
	SI			R. H. Woodyard	7/28/67		SI-001

TITLE OF DOCUMENT:

SPECIFICATION, SPACECRAFT SCIENCE INTEGRATION

ORGANIZATION RESPONSIBLE FOR DOCUMENT PREPARATION:	TASK OR SUBTASK:	DRL ITEM NO.:
System Engineering		
ORGANIZATION RESPONSIBLE FOR DOCUMENT REPRODUCTION:	DRL NO.:	LEVEL NO.:
ORGANIZATION RESPONSIBLE FOR DOCUMENT DISTRIBUTION:	DDL NO.:	FILE NO.:

TYPE OF DOCUMENT: ☒ CONTROL ☐ ACTION ☐ REFERENCE ☐ INFORMATION

USE OF DOCUMENT:
To provide specific performance and design requirements for this science subsystem; provides general guide for other science documents.

ORGANIZATION RESPONSIBLE FOR DOCUMENT STOWAGE:	NO. OF COPIES:
	100
ESTIMATED MANHOURS FOR SINGLE PREPARATION:	INFORMATION CUTOFF DATE OR MILESTONE:
ESTIMATED COST ($) FOR SINGLE PREPARATION:	DATE DATA DUE TO USER:

INTERRELATIONSHIP WITH OTHER DATA REQUIREMENTS:

SE-008, Specification, System Performance/Design Requirements
SE-010, Contract End Item (CEI) Detail Specification (Prime Equipment) Part I (Requirements)
SE-011, Contract End Item (CEI) Detail Specification (Prime Equipment) Part II

FREQUENCY OF ISSUE:
- ☐ ANNUALLY
- ☐ SEMI-ANNUALLY
- ☐ QUARTERLY
- ☐ BI-MONTHLY
- ☐ MONTHLY
- ☐ SEMI-MONTHLY
- ☐ BI-WEEKLY
- ☐ WEEKLY
- ☐ DAILY
- ☒ OTHERWISE, AS SPECIFIED: As required

PUBLICATION DATE: SDR

UPDATE (FREQUENCY OR MILESTONE): Thru MAR

ESTIMATED EXPIRATION DATE:

CLASSIFICATION:
- ☐ SECRET
- ☐ CONFIDENTIAL
- ☐ SECRET RESTRICTED DATA
- ☐ CONFIDENTIAL RESTRICTED DATA
- ☒ UNCLASSIFIED
- ☐ GROUP 1
- ☐ GROUP 2
- ☐ GROUP 3
- ☐ GROUP 4
- ☐ PROPRIETARY
- ☐ PUBLIC DOMAIN
- ☐ SPECIAL HANDLING
- ☐ NASA DISCREET
- ☐ JPL DISCREET
- ☐ PROJECT DISCREET
- ☐ NOFORN

FORM OF DATA:
- ☒ PRINTED DOCUMENT
- ☐ CHART
- ☐ DIAGRAM
- ☐ DRAWING
- ☐ FILM (STATIC OR MOTION)
- ☐ ILLUSTRATION
- ☐ MODEL
- ☐ RECORDING (TAPE OR DISC)
- ☐ COMPUTER CARD
- ☐ COMPUTER TAPE
- ☐ MICROFILM (W/OR W/O CARD)
- ☐ OTHER

KIND OF DATA:
- ☐ ABSTRACT
- ☐ BROCHURE
- ☐ BULLETIN
- ☐ CATALOG
- ☐ CONTRACT
- ☐ DIRECTIVE
- ☐ DISCLOSURE
- ☐ ENGINEERING CHANGE ORDER
- ☐ REQUEST FOR ENGINEERING CHANGE PROPOSAL
- ☐ ENGINEERING CHANGE PROPOSAL
- ☐ HANDBOOK
- ☐ INDEX
- ☐ INSTRUCTION
- ☐ LETTER
- ☐ LIST
- ☐ LOG
- ☐ MANUAL
- ☐ MEMORANDUM
- ☐ MINUTES
- ☐ PLAN
- ☐ PROCEDURE
- ☐ REGULATION
- ☐ REPORT
- ☐ SCHEDULE
- ☒ SPECIFICATION
- ☐ STANDARD
- ☐ VOUCHER

REFERENCE DOCUMENTS:
Mission Specification
Experimenters' Technical Data.

APPLICABLE STANDARDS:

REVIEWS AND/OR APPROVALS REQUIRED:
(LIST IN ORDER OF SUBMITTAL)

	DRAFT	DATE	PREPUBLICATION PROOF	DATE
SUBMIT FOR REVIEW TO:		BY		BY
SUBMIT FOR APPROVAL TO:	Project Manager	BY		BY

VOYAGER DATA REQUIREMENT DESCRIPTION - 2ND SHEET

DRD NO.: SI-001

SPECIAL INSTRUCTIONS: Documents to be based upon the contract work statement, customer specifications, requirements, experiments preliminary design data, science experiments selection list, and experimenters' study reports issued at time of contract award. This document shall be completed, updated and reissued as required prior to each design review.

This specification will be prepared jointly by the contractor and the NASA Center with assistance from the experimenters. It is a directive document in that it establishes the design requirements of the spacecraft as affected by each experiment.

SPECIAL DISTRIBUTION: (IF DISTRIBUTION IS NOT COVERED BY AN EXISTING DDL WRITE IN DISTRIBUTION BELOW)

OUTLINE OF CONTENTS:

1. Scope
2. Applicable documents
3. Requirements
   - a. Performance
     - (1) Characteristics
     - (2) Subsystem definition
     - (3) Operability
   - b. Data interface
   - c. Electrical interface
   - d. Mechanical interface
   - e. Thermal interface
   - f. Planetary scan platform and control experiment
   - g. Spacecraft body mounted experiments

(CONTINUE ON THIRD SHEET, IF NECESSARY, AND AFFIX TO THIS DRD.)

GE EXHIBIT DRD SI-002

VOYAGER DATA REQUIREMENT DESCRIPTION

DRD APPROVED BY:

DATE:

DATA CATEGORY:

ORGANIZATION ORIGINATING REQUIREMENT: CODE: SI

OFFICE RESPONSIBLE FOR DRD: CODE:

DRD PREPARED BY: R.H. Woodyard DATE: 7/28/67

CONTRACT NO.:

DRD NO.: SI-002

TITLE OF DOCUMENT:

SPECIFICATION, SPACECRAFT SCIENCE OSE

ORGANIZATION RESPONSIBLE FOR DOCUMENT PREPARATION: System Engineering

TASK OR SUBTASK:

DRL ITEM NO.:

ORGANIZATION RESPONSIBLE FOR DOCUMENT REPRODUCTION:

DRL NO.:

LEVEL NO.:

ORGANIZATION RESPONSIBLE FOR DOCUMENT DISTRIBUTION:

DDL NO.:

FILE NO.:

TYPE OF DOCUMENT: ☒ CONTROL ☐ ACTION ☐ REFERENCE ☐ INFORMATION

USE OF DOCUMENT:

To provide specific performance and design requirements for the OSE used with the experiment when installed on the spacecraft.

ORGANIZATION RESPONSIBLE FOR DOCUMENT STOWAGE:

NO. OF COPIES: 100

ESTIMATED MANHOURS FOR SINGLE PREPARATION:

INFORMATION CUTOFF DATE OR MILESTONE:

ESTIMATED COST ($) FOR SINGLE PREPARATION:

DATE DATA DUE TO USER:

INTERRELATIONSHIP WITH OTHER DATA REQUIREMENTS:

SE-008, Specification, System Performance/Design Requirements

SI-001, Specification, Spacecraft Science Integration

FREQUENCY OF ISSUE:

- ☐ ANNUALLY
- ☐ SEMI-ANNUALLY
- ☐ QUARTERLY
- ☐ BI-MONTHLY
- ☐ MONTHLY
- ☐ SEMI-MONTHLY
- ☐ BI-WEEKLY
- ☐ WEEKLY
- ☐ DAILY
- ☒ OTHERWISE, AS SPECIFIED: As required

PUBLICATION DATE: PDR

UPDATE (FREQUENCY OR MILESTONE): Thru MAR

ESTIMATED EXPIRATION DATE:

CLASSIFICATION:

- ☐ SECRET
- ☐ CONFIDENTIAL
- ☐ SECRET RESTRICTED DATA
- ☐ CONFIDENTIAL RESTRICTED DATA
- ☒ UNCLASSIFIED

- ☐ GROUP 1
- ☐ GROUP 2
- ☐ GROUP 3
- ☐ GROUP 4
- ☐ PROPRIETARY
- ☐ PUBLIC DOMAIN

- ☐ SPECIAL HANDLING
- ☐ NASA DISCREET
- ☐ JPL DISCREET
- ☐ PROJECT DISCREET
- ☐ NOFORN

FORM OF DATA:

- ☒ PRINTED DOCUMENT
- ☐ CHART
- ☐ DIAGRAM
- ☐ DRAWING
- ☐ FILM (STATIC OR MOTION)
- ☐ ILLUSTRATION
- ☐ MODEL
- ☐ RECORDING (TAPE OR DISC)
- ☐ COMPUTER CARD
- ☐ COMPUTER TAPE
- ☐ MICROFILM (W/OR W/O CARD)
- ☐ OTHER

KIND OF DATA:

- ☐ ABSTRACT
- ☐ BROCHURE
- ☐ BULLETIN
- ☐ CATALOG
- ☐ CONTRACT
- ☐ DIRECTIVE
- ☐ DISCLOSURE
- ☐ ENGINEERING CHANGE ORDER
- ☐ REQUEST FOR ENGINEERING CHANGE PROPOSAL
- ☐ ENGINEERING CHANGE PROPOSAL
- ☐ HANDBOOK
- ☐ INDEX
- ☐ INSTRUCTION
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- ☐ MINUTES
- ☐ PLAN
- ☐ PROCEDURE
- ☐ REGULATION
- ☐ REPORT
- ☐ SCHEDULE
- ☒ SPECIFICATION
- ☐ STANDARD
- ☐ VOUCHER

REFERENCE DOCUMENTS:

Experimenters' Technical Data

APPLICABLE STANDARDS:

REVIEWS AND/OR APPROVALS REQUIRED: (LIST IN ORDER OF SUBMITTAL)

	DRAFT	DATE	PREPUBLICATION PROOF	DATE
SUBMIT FOR REVIEW TO:				
		BY		BY
SUBMIT FOR APPROVAL TO:	Manager, System Engineering	BY		BY

JPL 2568 OCT 65

VOYAGER DATA REQUIREMENT DESCRIPTION - 2ND SHEET

DRD NO.: SI-002

SPECIAL INSTRUCTIONS: This document establishes the functional design requirements for the OSE associated with the scientific experiments when installed on the spacecraft. The first issue of this specification shall be made prior to PDR and shall be updated as required when more technical data on the experiments become available.

SPECIAL DISTRIBUTION: (IF DISTRIBUTION IS NOT COVERED BY AN EXISTING DDL WRITE IN DISTRIBUTION BELOW)

OUTLINE OF CONTENTS:

1. Scope
2. Applicable documents
3. Design requirements
   - a. Performance
     - (1) Characteristics
     - (2) Component definition and description
     - (3) Operability
   - b. Design and construction
     - (1) Data interface
     - (2) Electrical interface
     - (3) Mechanical interface

(CONTINUE ON THIRD SHEET, IF NECESSARY, AND AFFIX TO THIS DRD.)

GE EXHIBIT DRD SI-003

VOYAGER DATA REQUIREMENT DESCRIPTION

DRD APPROVED BY:

DATE:

DATA CATEGORY:

ORGANIZATION ORIGINATING REQUIREMENT:

CODE: SI

OFFICE RESPONSIBLE FOR DRD:

CODE:

DRD PREPARED BY: R. H. Woodyard

DATE: 7/28/67

CONTRACT NO.:

DRD NO.: SI-003

TITLE OF DOCUMENT:

REPORT, SCIENCE ANALYSIS AND TRADE STUDY

ORGANIZATION RESPONSIBLE FOR DOCUMENT PREPARATION: System Engineering

TASK OR SUBTASK:

DRL ITEM NO.:

ORGANIZATION RESPONSIBLE FOR DOCUMENT REPRODUCTION:

DRL NO.:

LEVEL NO.:

ORGANIZATION RESPONSIBLE FOR DOCUMENT DISTRIBUTION:

DDL NO.:

FILE NO.:

TYPE OF DOCUMENT: ☐ CONTROL ☐ ACTION ☐ REFERENCE ☒ INFORMATION

USE OF DOCUMENT:

To report on science analysis, alternate approaches of design, test, installation, operation, and calibration.

ORGANIZATION RESPONSIBLE FOR DOCUMENT STOWAGE:

NO. OF COPIES: 50

ESTIMATED MANHOURS FOR SINGLE PREPARATION:

INFORMATION CUTOFF DATE OR MILESTONE:

ESTIMATED COST ($) FOR SINGLE PREPARATION:

DATE DATA DUE TO USER:

INTERRELATIONSHIP WITH OTHER DATA REQUIREMENTS:

SE-008, Specification, System Performance/Design Requirements

SI-001, Specification, Spacecraft Science Integration

FREQUENCY OF ISSUE:

- ☐ ANNUALLY
- ☐ SEMI-ANNUALLY
- ☐ QUARTERLY
- ☐ BI-MONTHLY
- ☐ MONTHLY
- ☐ SEMI-MONTHLY
- ☐ BI-WEEKLY
- ☐ WEEKLY
- ☐ DAILY
- ☒ OTHERWISE, AS SPECIFIED

As required

PUBLICATION DATE: PDR

UPDATE (FREQUENCY OR MILESTONE): At completion of each analysis

ESTIMATED EXPIRATION DATE:

CLASSIFICATION:

- ☐ SECRET
- ☐ CONFIDENTIAL
- ☐ SECRET RESTRICTED DATA
- ☐ CONFIDENTIAL RESTRICTED DATA
- ☒ UNCLASSIFIED

- ☐ GROUP 1
- ☐ GROUP 2
- ☐ GROUP 3
- ☐ GROUP 4
- ☐ PROPRIETARY
- ☐ PUBLIC DOMAIN

- ☐ SPECIAL HANDLING
- ☐ NASA DISCREET
- ☐ JPL DISCREET
- ☐ PROJECT DISCREET
- ☐ NOFORN

FORM OF DATA:

- ☒ PRINTED DOCUMENT
- ☐ CHART
- ☐ DIAGRAM
- ☐ DRAWING
- ☐ FILM (STATIC OR MOTION)
- ☐ ILLUSTRATION
- ☐ MODEL
- ☐ RECORDING (TAPE OR DISC)
- ☐ COMPUTER CARD
- ☐ COMPUTER TAPE
- ☐ MICROFILM (W/OR W/O CARD)
- ☐ OTHER

KIND OF DATA:

- ☐ ABSTRACT
- ☐ BROCHURE
- ☐ BULLETIN
- ☐ CATALOG
- ☐ CONTRACT
- ☐ DIRECTIVE
- ☐ DISCLOSURE
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- ☐ MANUAL
- ☐ MEMORANDUM
- ☐ MINUTES
- ☐ PLAN
- ☐ PROCEDURE
- ☐ REGULATION
- ☒ REPORT
- ☐ SCHEDULE
- ☐ SPECIFICATION
- ☐ STANDARD
- ☐ VOUCHER

REFERENCE DOCUMENTS:

Mission Specifications
Experimenters' Reports

APPLICABLE STANDARDS:

REVIEWS AND/OR APPROVALS REQUIRED: (LIST IN ORDER OF SUBMITTAL)

	DRAFT	DATE	PREPUBLICATION PROOF	DATE
SUBMIT FOR REVIEW TO:				
		BY		BY
SUBMIT FOR APPROVAL TO:		BY		BY
	Manager, System Engineering			

JPL 2568 OCT 65

VOYAGER DATA REQUIREMENT DESCRIPTION - 2ND SHEET

DRD NO.: SI-003

SPECIAL INSTRUCTIONS: Drawings, graphs, tables, and sketches shall be presented in such a form that quantitative information can be obtained directly from them; i.e., graphs shall be of sufficient size with sufficient grids such that points can be read directly from the graphs, and each graph, etc., shall be sufficiently labeled so as to be self-explanatory. Reports covering a single analysis are preferred to longer reports covering a variety of analyses.

The content of the report may consist of extracts from the experimenters' design data report and from the contractor's Science Integration engineers' notebook, contractor's internal memorandums, minutes of meetings, reduction of presentation charts and formal engineering reports, etc., as long as the study report contains as a minimum, the items shown below in the outline of contents. Each report on each experiment shall cover a complete analysis and shall be self-sufficient except for references to other formal documents.

SPECIAL DISTRIBUTION: (IF DISTRIBUTION IS NOT COVERED BY AN EXISTING DDL WRITE IN DISTRIBUTION BELOW)

OUTLINE OF CONTENTS:

1. Scope
2. Functional and technical design requirements
3. Design approaches and significant design characteristics
4. Comparison matrix of design approaches
5. Recommended design approach

(CONTINUE ON THIRD SHEET, IF NECESSARY, AND AFFIX TO THIS DRD.)

GE EXHIBIT DRD SI-004

VOYAGER DATA REQUIREMENT DESCRIPTION

DRD APPROVED BY:

DATE:

DATA CATEGORY:

ORGANIZATION ORIGINATING REQUIREMENT: CODE: SI

OFFICE RESPONSIBLE FOR DRD: CODE:

DRD PREPARED BY: R.H. Woodyard DATE: 7/28/67

CONTRACT NO.:

DRD NO.: SI-004

TITLE OF DOCUMENT:

SPECIFICATION, SCIENTIFIC INSTRUMENT REQUIREMENTS

ORGANIZATION RESPONSIBLE FOR DOCUMENT PREPARATION: System Engineering

TASK OR SUBTASK:

DRL ITEM NO.:

ORGANIZATION RESPONSIBLE FOR DOCUMENT REPRODUCTION:

DRL NO.:

LEVEL NO.:

ORGANIZATION RESPONSIBLE FOR DOCUMENT DISTRIBUTION:

DDL NO.:

FILE NO.:

TYPE OF DOCUMENT: ☒ CONTROL ☐ ACTION ☐ REFERENCE ☐ INFORMATION

USE OF DOCUMENT:

Specifies requirements for the combined group of experiments; defines such items as electrical power requirements, sequence of events, commands, and telemetry channel assignments.

ORGANIZATION RESPONSIBLE FOR DOCUMENT STOWAGE:

NO. OF COPIES: 100

ESTIMATED MANHOURS FOR SINGLE PREPARATION:

INFORMATION CUTOFF DATE OR MILESTONE:

ESTIMATED COST ($) FOR SINGLE PREPARATION:

DATE DATA DUE TO USER:

INTERRELATIONSHIP WITH OTHER DATA REQUIREMENTS:

SE-008, Specification, System Performance/Design Requirements

SE-052, Report, Power Profile

SE-054, List, Command

SI-001, Specification, Spacecraft Science Integration

FREQUENCY OF ISSUE:

- ☐ ANNUALLY
- ☐ SEMI-ANNUALLY
- ☐ QUARTERLY
- ☐ BI-MONTHLY
- ☐ MONTHLY
- ☐ SEMI-MONTHLY
- ☐ BI-WEEKLY
- ☐ WEEKLY
- ☐ DAILY
- ☒ OTHERWISE, AS SPECIFIED

As required

PUBLICATION DATE: SDR

UPDATE (FREQUENCY OR MILESTONE): Thru MAR

ESTIMATED EXPIRATION DATE:

CLASSIFICATION:

- ☐ SECRET
- ☐ CONFIDENTIAL
- ☐ SECRET RESTRICTED DATA
- ☐ CONFIDENTIAL RESTRICTED DATA
- ☒ UNCLASSIFIED

- ☐ GROUP 1
- ☐ GROUP 2
- ☐ GROUP 3
- ☐ GROUP 4
- ☐ PROPRIETARY
- ☐ PUBLIC DOMAIN

- ☐ SPECIAL HANDLING
- ☐ NASA DISCREET
- ☐ JPL DISCREET
- ☐ PROJECT DISCREET
- ☐ NOFORN

FORM OF DATA:

- ☒ PRINTED DOCUMENT
- ☐ CHART
- ☐ DIAGRAM
- ☐ DRAWING
- ☐ FILM (STATIC OR MOTION)
- ☐ ILLUSTRATION
- ☐ MODEL
- ☐ RECORDING (TAPE OR DISC)
- ☐ COMPUTER CARD
- ☐ COMPUTER TAPE
- ☐ MICROFILM (W/OR W/O CARD)
- ☐ OTHER

KIND OF DATA:

- ☐ ABSTRACT
- ☐ BROCHURE
- ☐ BULLETIN
- ☐ CATALOG
- ☐ CONTRACT
- ☐ DIRECTIVE
- ☐ DISCLOSURE
- ☐ ENGINEERING CHANGE ORDER
- ☐ REQUEST FOR ENGINEERING CHANGE PROPOSAL
- ☐ ENGINEERING CHANGE PROPOSAL
- ☐ HANDBOOK
- ☐ INDEX
- ☐ INSTRUCTION
- ☐ LETTER
- ☐ LIST
- ☐ LOG
- ☐ MANUAL
- ☐ MEMORANDUM
- ☐ MINUTES
- ☐ PLAN
- ☐ PROCEDURE
- ☐ REGULATION
- ☐ REPORT
- ☐ SCHEDULE
- ☒ SPECIFICATION
- ☐ STANDARD
- ☐ VOUCHER

REFERENCE DOCUMENTS:

Mission Specification
Experimenters' Reports

APPLICABLE STANDARDS:

REVIEWS AND/OR APPROVALS REQUIRED: (LIST IN ORDER OF SUBMITTAL)

	DRAFT	DATE	PREPUBLICATION PROOF	DATE
SUBMIT FOR REVIEW TO:				
		BY		BY
SUBMIT FOR APPROVAL TO:	Manager, System Engineering	BY		BY

JPL 2568 OCT 65

VOYAGER DATA REQUIREMENT DESCRIPTION - 2ND SHEET

DRD NO.: SI-004

SPECIAL INSTRUCTIONS: These specification appendixes shall be continually updated to include computer printouts, with data describing individual science events recorded on the tabulating cards for ease of revision in order, duration, or time of occurence. Items to be covered are electrical power requirements, commands, telemetry channel assignments, measurements, and data handling information. Each Science data item shall contain:

1. Name of the experiment and its status, such as "off" or "on," etc.
2. The predicted nominal time of the execution of this event.
3. The source for the initiation of the event.
4. The backup source code or command number.
5. Type of output data required for each experiment.

SPECIAL DISTRIBUTION: (IF DISTRIBUTION IS NOT COVERED BY AN EXISTING DDL WRITE IN DISTRIBUTION BELOW)

OUTLINE OF CONTENTS:

1. Scope
2. Applicable documents
3. Description and explanation of notation
4. Notes used on tabulated sequence, commands, etc.

Appendix

1. Tabulated sequence of events and power profile
   a. Nominal predicted mission
   b. Alternate or degraded missions
2. Measurements
   a. Body-mounted instruments
      (1) Data types
      (2) Data rates
   b. Scan platform instruments
      (1) Data types
      (2) Data rates
3. Data modes and switching
4. Command list

(CONTINUE ON THIRD SHEET, IF NECESSARY, AND AFFIX TO THIS DRD.)

GE EXHIBIT DRD SI-005

VOYAGER DATA REQUIREMENT DESCRIPTION	DRD APPROVED BY:	DATE:	DATA CATEGORY:

ORGANIZATION ORIGINATING REQUIREMENT:	CODE:	OFFICE RESPONSIBLE FOR DRD:	CODE:	DRD PREPARED BY:	DATE:	CONTRACT NO.:	DRD NO.:
	SI			R.H. Woodyard	7/28/67		SI-005

TITLE OF DOCUMENT:

REPORT, SCIENCE CHECKOUT AND EVALUATION

ORGANIZATION RESPONSIBLE FOR DOCUMENT PREPARATION:	TASK OR SUBTASK:	DRL ITEM NO.:
System Engineering		

ORGANIZATION RESPONSIBLE FOR DOCUMENT REPRODUCTION:	DRL NO.:	LEVEL NO.:

ORGANIZATION RESPONSIBLE FOR DOCUMENT DISTRIBUTION:	DDL NO.:	FILE NO.:

TYPE OF DOCUMENT: ☐ CONTROL ☐ ACTION ☐ REFERENCE ☒ INFORMATION

USE OF DOCUMENT:

To report the operation status of the science equipment when received by the spacecraft contractor

ORGANIZATION RESPONSIBLE FOR DOCUMENT STOWAGE:	NO. OF COPIES:
	50

ESTIMATED MANHOURS FOR SINGLE PREPARATION:	INFORMATION CUTOFF DATE OR MILESTONE:

ESTIMATED COST ($) FOR SINGLE PREPARATION:	DATE DATA DUE TO USER:

INTERRELATIONSHIP WITH OTHER DATA REQUIREMENTS:

SE-008, Specification, System Performance/Design Requirements
SI-001, Specification, Spacecraft Science Integration

FREQUENCY OF ISSUE:
- ☐ ANNUALLY
- ☐ SEMI-ANNUALLY
- ☐ QUARTERLY
- ☐ BI-MONTHLY
- ☐ MONTHLY
- ☐ SEMI-MONTHLY
- ☐ BI-WEEKLY
- ☐ WEEKLY
- ☐ DAILY
- ☒ OTHERWISE, AS SPECIFIED

As required

PUBLICATION DATE: HDR

UPDATE (FREQUENCY OR MILESTONE): Thru MAR

ESTIMATED EXPIRATION DATE:

CLASSIFICATION:
- ☐ SECRET
- ☐ CONFIDENTIAL
- ☐ SECRET RESTRICTED DATA
- ☐ CONFIDENTIAL RESTRICTED DATA
- ☒ UNCLASSIFIED

- ☐ GROUP 1
- ☐ GROUP 2
- ☐ GROUP 3
- ☐ GROUP 4
- ☐ PROPRIETARY
- ☐ PUBLIC DOMAIN

- ☐ SPECIAL HANDLING
- ☐ NASA DISCREET
- ☐ JPL DISCREET
- ☐ PROJECT DISCREET
- ☐ NOFORN

FORM OF DATA:
- ☒ PRINTED DOCUMENT
- ☐ CHART
- ☐ DIAGRAM
- ☐ DRAWING
- ☐ FILM (STATIC OR MOTION)
- ☐ ILLUSTRATION
- ☐ MODEL
- ☐ RECORDING (TAPE OR DISC)
- ☐ COMPUTER CARD
- ☐ COMPUTER TAPE
- ☐ MICROFILM (W/OR W/O CARD)
- ☐ OTHER

KIND OF DATA:
- ☐ ABSTRACT
- ☐ BROCHURE
- ☐ BULLETIN
- ☐ CATALOG
- ☐ CONTRACT
- ☐ DIRECTIVE
- ☐ DISCLOSURE
- ☐ ENGINEERING CHANGE ORDER
- ☐ REQUEST FOR ENGINEERING CHANGE PROPOSAL
- ☐ ENGINEERING CHANGE PROPOSAL
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- ☐ MANUAL
- ☐ MEMORANDUM
- ☐ MINUTES
- ☐ PLAN
- ☐ PROCEDURE
- ☐ REGULATION
- ☒ REPORT
- ☐ SCHEDULE
- ☐ SPECIFICATION
- ☐ STANDARD
- ☐ VOUCHER

REFERENCE DOCUMENTS:

Mission Specification
Experimenters' Report
Experimenters' Test Plan

APPLICABLE STANDARDS:

REVIEWS AND/OR APPROVALS REQUIRED:
(LIST IN ORDER OF SUBMITTAL)

	DRAFT	DATE	PREPUBLICATION PROOF	DATE
SUBMIT FOR REVIEW TO:				
		BY		BY
SUBMIT FOR APPROVAL TO:	Manager, System Engineering	BY		BY

VOYAGER DATA REQUIREMENT DESCRIPTION - 2ND SHEET

DRD NO.: SI-005

SPECIAL INSTRUCTIONS:

This report will be used to give the contractor's initial evaluation of an operational test to be performed on each model of an experiment when it is received by the spacecraft contractor from the experimenter.

SPECIAL DISTRIBUTION: (IF DISTRIBUTION IS NOT COVERED BY AN EXISTING DDL WRITE IN DISTRIBUTION BELOW)

OUTLINE OF CONTENTS:

1. Introduction and Summary
   a. What was tested
   b. When the tests occurred
   c. Where the tests were conducted
   d. Major events, number of tests, length of test, etc.
2. Objectives and apparent degree of satisfaction
3. Evaluation of the test and data produced
4. Conclusions

(CONTINUE ON THIRD SHEET, IF NECESSARY, AND AFFIX TO THIS DRD.)

GE EXHIBIT DRD SI-006

VOYAGER DATA REQUIREMENT DESCRIPTION

DRD APPROVED BY:

DATE:

DATA CATEGORY:

ORGANIZATION ORIGINATING REQUIREMENT:

CODE: SI

OFFICE RESPONSIBLE FOR DRD:

CODE:

DRD PREPARED BY: R. H. Woodyard

DATE: 7/28/67

CONTRACT NO.:

DRD NO.: SI-006

TITLE OF DOCUMENT:

SPECIFICATION, SCIENCE STANDARDS REQUIREMENTS

ORGANIZATION RESPONSIBLE FOR DOCUMENT PREPARATION: System Engineering

TASK OR SUBTASK:

DRL ITEM NO.:

ORGANIZATION RESPONSIBLE FOR DOCUMENT REPRODUCTION:

DRL NO.:

LEVEL NO.:

ORGANIZATION RESPONSIBLE FOR DOCUMENT DISTRIBUTION:

DDL NO.:

FILE NO.:

TYPE OF DOCUMENT: ☒ CONTROL ☐ ACTION ☐ REFERENCE ☐ INFORMATION

USE OF DOCUMENT:

To define the scientific experiments, their physical characteristics, and interfaces.

ORGANIZATION RESPONSIBLE FOR DOCUMENT STOWAGE:

NO. OF COPIES: 75

ESTIMATED MANHOURS FOR SINGLE PREPARATION:

INFORMATION CUTOFF DATE OR MILESTONE:

ESTIMATED COST ($) FOR SINGLE PREPARATION:

DATE DATA DUE TO USER:

INTERRELATIONSHIP WITH OTHER DATA REQUIREMENTS:

SE-008, Specification, System Performance/Design Requirements

SI-001, Specification, Spacecraft Science Integration

FREQUENCY OF ISSUE:

- ☐ ANNUALLY
- ☐ SEMI-ANNUALLY
- ☐ QUARTERLY
- ☐ BI-MONTHLY
- ☐ MONTHLY
- ☐ SEMI-MONTHLY
- ☐ BI-WEEKLY
- ☐ WEEKLY
- ☐ DAILY
- ☒ OTHERWISE, AS SPECIFIED

As required

PUBLICATION DATE: SDR

UPDATE (FREQUENCY OR MILESTONE): Thru FACI

ESTIMATED EXPIRATION DATE:

CLASSIFICATION:

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- ☐ CONFIDENTIAL
- ☐ SECRET RESTRICTED DATA
- ☐ CONFIDENTIAL RESTRICTED DATA
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- ☐ PROJECT DISCREET
- ☐ NOFORN

FORM OF DATA:

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KIND OF DATA:

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- ☐ REGULATION
- ☐ REPORT
- ☐ SCHEDULE
- ☒ SPECIFICATION
- ☐ STANDARD
- ☐ VOUCHER

REFERENCE DOCUMENTS:

Mission Specification, Experimenters' Technical Data

APPLICABLE STANDARDS:

REVIEWS AND/OR APPROVALS REQUIRED: (LIST IN ORDER OF SUBMITTAL)

	DRAFT	DATE	PREPUBLICATION PROOF	DATE
SUBMIT FOR REVIEW TO:				
		BY		BY
SUBMIT FOR APPROVAL TO:	Manager, System Engineering	BY		BY

VOYAGER DATA REQUIREMENT DESCRIPTION - 2ND SHEET

DRD NO.: SI-006

SPECIAL INSTRUCTIONS:

This document will be used to define the scientific experiments, their physical characteristics and interfaces based upon information supplied by the customer.

In addition to containing a brief description of each experiment and a list of reference documents, it will summarize the characteristics of each experiment in tabular form.

SPECIAL DISTRIBUTION: (IF DISTRIBUTION IS NOT COVERED BY AN EXISTING DDL WRITE IN DISTRIBUTION BELOW)

OUTLINE OF CONTENTS:

1. Introduction
2. Experiment objectives and instrument descriptions
3. References
4. Appendix
   Table I Body-mounted instruments
   Table II Instruments on scan platform
   (Each of these tables shall list the experiments and show for each one such characteristics as: sensor and electronics weight, sensor and electronics volume, power input, data rate, total field of view, alignment tolerance, orientation clock and cone angle, and general remarks)

(CONTINUE ON THIRD SHEET, IF NECESSARY, AND AFFIX TO THIS DRD.)

GE EXHIBIT DRD SI-007

VOYAGER DATA REQUIREMENT DESCRIPTION	DRD APPROVED BY:	DATE:	DATA CATEGORY:

ORGANIZATION ORIGINATING REQUIREMENT:	CODE: SI	OFFICE RESPONSIBLE FOR DRD:	CODE:	DRD PREPARED BY: R. H. Woodyard	DATE: 7/28/67	CONTRACT NO.:	DRD NO.: SI-007

TITLE OF DOCUMENT:

LIST, SCIENCE PARTS

ORGANIZATION RESPONSIBLE FOR DOCUMENT PREPARATION: System Engineering

TASK OR SUBTASK:

DRL ITEM NO.:

ORGANIZATION RESPONSIBLE FOR DOCUMENT REPRODUCTION:

DRL NO.:

LEVEL NO.:

ORGANIZATION RESPONSIBLE FOR DOCUMENT DISTRIBUTION:

DDL NO.:

FILE NO.:

TYPE OF DOCUMENT: ☐ CONTROL ☐ ACTION ☐ REFERENCE ☒ INFORMATION

USE OF DOCUMENT:

To list all component parts associated with the science subsystem including GFE and contractor-furnished components

ORGANIZATION RESPONSIBLE FOR DOCUMENT STOWAGE:

NO. OF COPIES: 75

ESTIMATED MANHOURS FOR SINGLE PREPARATION:

INFORMATION CUTOFF DATE OR MILESTONE:

ESTIMATED COST ($) FOR SINGLE PREPARATION:

DATE DATA DUE TO USER:

INTERRELATIONSHIP WITH OTHER DATA REQUIREMENTS:

CM-011, List, Indented Breakdown of Parts
SE-008, Specification, System Performance/ Design Requirements

FREQUENCY OF ISSUE:

- ☐ ANNUALLY
- ☐ SEMI-ANNUALLY
- ☐ QUARTERLY
- ☐ BI-MONTHLY
- ☐ MONTHLY
- ☐ SEMI-MONTHLY
- ☐ BI-WEEKLY
- ☐ WEEKLY
- ☐ DAILY
- ☒ OTHERWISE, AS SPECIFIED: As required

PUBLICATION DATE: CDR

UPDATE (FREQUENCY OR MILESTONE): Thru MAR

ESTIMATED EXPIRATION DATE:

CLASSIFICATION:

- ☐ SECRET
- ☐ CONFIDENTIAL
- ☐ SECRET RESTRICTED DATA
- ☐ CONFIDENTIAL RESTRICTED DATA
- ☒ UNCLASSIFIED

- ☐ GROUP 1
- ☐ GROUP 2
- ☐ GROUP 3
- ☐ GROUP 4
- ☐ PROPRIETARY
- ☐ PUBLIC DOMAIN

- ☐ SPECIAL HANDLING
- ☐ NASA DISCREET
- ☐ JPL DISCREET
- ☐ PROJECT DISCREET
- ☐ NOFORN

FORM OF DATA:

- ☒ PRINTED DOCUMENT
- ☐ CHART
- ☐ DIAGRAM
- ☐ DRAWING
- ☐ FILM (STATIC OR MOTION)
- ☐ ILLUSTRATION
- ☐ MODEL
- ☐ RECORDING (TAPE OR DISC)
- ☐ COMPUTER CARD
- ☐ COMPUTER TAPE
- ☐ MICROFILM (W/OR W/O CARD)
- ☐ OTHER

KIND OF DATA:

- ☐ ABSTRACT
- ☐ BROCHURE
- ☐ BULLETIN
- ☐ CATALOG
- ☐ CONTRACT
- ☐ DIRECTIVE
- ☐ DISCLOSURE
- ☐ ENGINEERING CHANGE ORDER
- ☐ REQUEST FOR ENGINEERING CHANGE PROPOSAL
- ☐ ENGINEERING CHANGE PROPOSAL
- ☐ HANDBOOK
- ☐ INDEX
- ☐ INSTRUCTION
- ☐ LETTER
- ☒ LIST
- ☐ LOG
- ☐ MANUAL
- ☐ MEMORANDUM
- ☐ MINUTES
- ☐ PLAN
- ☐ PROCEDURE
- ☐ REGULATION
- ☐ REPORT
- ☐ SCHEDULE
- ☐ SPECIFICATION
- ☐ STANDARD
- ☐ VOUCHER

REFERENCE DOCUMENTS:

Experimenters' Technical Data

APPLICABLE STANDARDS:

REVIEWS AND/OR APPROVALS REQUIRED: (LIST IN ORDER OF SUBMITTAL)

	DRAFT	DATE	PREPUBLICATION PROOF	DATE
SUBMIT FOR REVIEW TO:				
		BY		BY
SUBMIT FOR APPROVAL TO:	Manager, System Engineering	BY		BY

VOYAGER DATA REQUIREMENT DESCRIPTION - 2ND SHEET

DRD NO.: SI-007

SPECIAL INSTRUCTIONS:

This document will be a summary list of all science components on the spacecraft including those components furnished by both the customer and the spacecraft contractor.

SPECIAL DISTRIBUTION: (IF DISTRIBUTION IS NOT COVERED BY AN EXISTING DDL WRITE IN DISTRIBUTION BELOW)

OUTLINE OF CONTENTS:

This document will be in the form of a matrix and will contain at least the following information about each Science component:

1. Component name
2. Experiment name
3. Quantity used
4. Name of supplier
5. Supplier identification number
6. Spacecraft contractor identification number
7. Contractor next assembly drawing number
8. Location of spacecraft

(CONTINUE ON THIRD SHEET, IF NECESSARY, AND AFFIX TO THIS DRD.)

GE EXHIBIT DRD SI-008

VOYAGER DATA REQUIREMENT DESCRIPTION

DRD APPROVED BY:

DATE:

DATA CATEGORY:

ORGANIZATION ORIGINATING REQUIREMENT: CODE: SI

OFFICE RESPONSIBLE FOR DRD: CODE:

DRD PREPARED BY: R.H. Woodyard DATE: 7/28/67

CONTRACT NO.:

DRD NO.: SI-008

TITLE OF DOCUMENT:

REPORT, SCIENCE QUALIFICATION TESTS

ORGANIZATION RESPONSIBLE FOR DOCUMENT PREPARATION: System Engineering

TASK OR SUBTASK:

DRL ITEM NO.:

ORGANIZATION RESPONSIBLE FOR DOCUMENT REPRODUCTION:

DRL NO.:

LEVEL NO.:

ORGANIZATION RESPONSIBLE FOR DOCUMENT DISTRIBUTION:

DDL NO.:

FILE NO.:

TYPE OF DOCUMENT: ☐ CONTROL ☐ ACTION ☐ REFERENCE ☒ INFORMATION

USE OF DOCUMENT:

Reports status of experiments after being tested in spacecraft. Includes analysis of problems, causes and prevention.

ORGANIZATION RESPONSIBLE FOR DOCUMENT STOWAGE:

NO. OF COPIES: 50

ESTIMATED MANHOURS FOR SINGLE PREPARATION:

INFORMATION CUTOFF DATE OR MILESTONE:

ESTIMATED COST ($) FOR SINGLE PREPARATION:

DATE DATA DUE TO USER:

INTERRELATIONSHIP WITH OTHER DATA REQUIREMENTS:

SI-001, Specification, Spacecraft Science Integration
SI-004, Specification, Scientific Instrument Requirements
SI-005, Report. Science Checkout and Evaluation

FREQUENCY OF ISSUE:

☐ ANNUALLY
☐ SEMI-ANNUALLY
☐ QUARTERLY
☐ BI-MONTHLY
☐ MONTHLY
☐ SEMI-MONTHLY
☐ BI-WEEKLY
☐ WEEKLY
☐ DAILY
☒ OTHERWISE, AS SPECIFIED
One time

PUBLICATION DATE: CDR

UPDATE (FREQUENCY OR MILESTONE): Thru MAR

ESTIMATED EXPIRATION DATE:

CLASSIFICATION:

☐ SECRET
☐ CONFIDENTIAL
☐ SECRET RESTRICTED DATA
☐ CONFIDENTIAL RESTRICTED DATA
☒ UNCLASSIFIED

☐ GROUP 1
☐ GROUP 2
☐ GROUP 3
☐ GROUP 4
☐ PROPRIETARY
☐ PUBLIC DOMAIN

☐ SPECIAL HANDLING
☐ NASA DISCREET
☐ JPL DISCREET
☐ PROJECT DISCREET
☐ NOFORN

FORM OF DATA:

☒ PRINTED DOCUMENT
☐ CHART
☐ DIAGRAM
☐ DRAWING
☐ FILM (STATIC OR MOTION)
☐ ILLUSTRATION
☐ MODEL
☐ RECORDING (TAPE OR DISC)
☐ COMPUTER CARD
☐ COMPUTER TAPE
☐ MICROFILM (W/OR W/O CARD)
☐ OTHER

KIND OF DATA:

☐ ABSTRACT
☐ BROCHURE
☐ BULLETIN
☐ CATALOG
☐ CONTRACT
☐ DIRECTIVE
☐ DISCLOSURE
☐ ENGINEERING CHANGE ORDER
☐ REQUEST FOR ENGINEERING CHANGE PROPOSAL
☐ ENGINEERING CHANGE PROPOSAL
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☐ MANUAL
☐ MEMORANDUM
☐ MINUTES
☐ PLAN
☐ PROCEDURE
☐ REGULATION
☒ REPORT
☐ SCHEDULE
☐ SPECIFICATION
☐ STANDARD
☐ VOUCHER

REFERENCE DOCUMENTS:

Mission Constraints and Specifications
Experimenters' Technical Data

APPLICABLE STANDARDS:

REVIEWS AND/OR APPROVALS REQUIRED: (LIST IN ORDER OF SUBMITTAL)

	DRAFT	DATE	PREPUBLICATION PROOF	DATE
SUBMIT FOR REVIEW TO:				
		BY		BY
SUBMIT FOR APPROVAL TO:	Manager, System Engineering	BY		BY

VOYAGER DATA REQUIREMENT DESCRIPTION - 2ND SHEET

DRD NO.: SI-008

SPECIAL INSTRUCTIONS:

This report is used to summarize the status of the experiments after being tested in the engineering model, PTM, and flight spacecrafts. The analysis of the problems, causes, and prevention will include a comparison with data received from the experimenters and with test data obtained when experiments are initially checked out individually by the spacecraft contractor.

SPECIAL DISTRIBUTION: (IF DISTRIBUTION IS NOT COVERED BY AN EXISTING DDL WRITE IN DISTRIBUTION BELOW)

OUTLINE OF CONTENTS:

1. Scope
2. Applicable documents
3. Summary of test results of experiments while operating in spacecraft
4. Analysis of problems
5. Notes
6. Appendix

(CONTINUE ON THIRD SHEET, IF NECESSARY, AND AFFIX TO THIS DRD.)

GE EXHIBIT DRD SI-009

VOYAGER DATA REQUIREMENT DESCRIPTION

DRD APPROVED BY:

DATE:

DATA CATEGORY:

ORGANIZATION ORIGINATING REQUIREMENT: CODE: SI

OFFICE RESPONSIBLE FOR DRD: CODE:

DRD PREPARED BY: R. H. Woodyard DATE: 7/28/67

CONTRACT NO.:

DRD NO.: SI-009

TITLE OF DOCUMENT:

SPECIFICATION, CONFIGURATION MANAGEMENT REQUIREMENTS (EXPERIMENTS)

ORGANIZATION RESPONSIBLE FOR DOCUMENT PREPARATION: System Engineering

TASK OR SUBTASK:

DRL ITEM NO.:

ORGANIZATION RESPONSIBLE FOR DOCUMENT REPRODUCTION:

DRL NO.:

LEVEL NO.:

ORGANIZATION RESPONSIBLE FOR DOCUMENT DISTRIBUTION:

DDL NO.:

FILE NO.:

TYPE OF DOCUMENT: ☒ CONTROL ☐ ACTION ☐ REFERENCE ☐ INFORMATION

USE OF DOCUMENT:

To establish the information expected by the spacecraft contractor from the experimenters.

ORGANIZATION RESPONSIBLE FOR DOCUMENT STOWAGE:

NO. OF COPIES: 50

ESTIMATED MANHOURS FOR SINGLE PREPARATION:

INFORMATION CUTOFF DATE OR MILESTONE:

ESTIMATED COST ($) FOR SINGLE PREPARATION:

DATE DATA DUE TO USER:

INTERRELATIONSHIP WITH OTHER DATA REQUIREMENTS:

SE-008, Specification, System Performance/Design Requirements

SI-001, Specification, Spacecraft Science Integration

SI-004, Specification, Scientific Instrument Requirements

FREQUENCY OF ISSUE:

- ☐ ANNUALLY
- ☐ SEMI-ANNUALLY
- ☐ QUARTERLY
- ☐ BI-MONTHLY
- ☐ MONTHLY
- ☐ SEMI-MONTHLY
- ☐ BI-WEEKLY
- ☐ WEEKLY
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- ☒ OTHERWISE, AS SPECIFIED

As required

PUBLICATION DATE: SDR

UPDATE (FREQUENCY OR MILESTONE): Thru MAR

ESTIMATED EXPIRATION DATE:

CLASSIFICATION:

- ☐ SECRET
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- ☐ SECRET RESTRICTED DATA
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- ☐ NASA DISCREET
- ☐ JPL DISCREET
- ☐ PROJECT DISCREET
- ☐ NOFORN

FORM OF DATA:

- ☒ PRINTED DOCUMENT
- ☐ CHART
- ☐ DIAGRAM
- ☐ DRAWING
- ☐ FILM (STATIC OR MOTION)
- ☐ ILLUSTRATION
- ☐ MODEL
- ☐ RECORDING (TAPE OR DISC)
- ☐ COMPUTER CARD
- ☐ COMPUTER TAPE
- ☐ MICROFILM (W/OR W/O CARD)
- ☐ OTHER

KIND OF DATA:

- ☐ ABSTRACT
- ☐ BROCHURE
- ☐ BULLETIN
- ☐ CATALOG
- ☐ CONTRACT
- ☐ DIRECTIVE
- ☐ DISCLOSURE
- ☐ ENGINEERING CHANGE ORDER
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- ☐ MINUTES
- ☐ PLAN
- ☐ PROCEDURE
- ☐ REGULATION
- ☐ REPORT
- ☐ SCHEDULE
- ☒ SPECIFICATION
- ☐ STANDARD
- ☐ VOUCHER

REFERENCE DOCUMENTS:

Mission Constraints and Specifications
Experimenters' Technical Data

APPLICABLE STANDARDS:

REVIEWS AND/OR APPROVALS REQUIRED:
(LIST IN ORDER OF SUBMITTAL)

	DRAFT	DATE	PREPUBLICATION PROOF	DATE
SUBMIT FOR REVIEW TO:				
		BY		BY
SUBMIT FOR APPROVAL TO:	Manager, System Engineering	BY		BY

VOYAGER DATA REQUIREMENT DESCRIPTION - 2ND SHEET

DRD NO.: SI-009

SPECIAL INSTRUCTIONS:

This report will (1) establish the information expected by the spacecraft contractor from the experimenters, and (2) provide background information and instructions to contractor spacecraft system designers as to the selection of operational modes and parameters that will meet the constraints of the experiments in order to acquaint the personnel with the methods and approach for properly integrating the science subsystem.

SPECIAL DISTRIBUTION: (IF DISTRIBUTION IS NOT COVERED BY AN EXISTING DDL WRITE IN DISTRIBUTION BELOW)

OUTLINE OF CONTENTS:

1. Scope
2. Reference documents
3. Science subsystem constraints - overall
4. Science subsystem constraints during operational phases
   a. Prelaunch
   b. Launch
   c. Near-earth corrections
   d. Interplanetary cruise
   e. Near-Mars corrections/orbit insertion
   f. Martian orbit maneuvers
5. Recommended approaches to fulfilling science constraints
6. Recommended modes of operation of experiments
7. Notes

(CONTINUE ON THIRD SHEET, IF NECESSARY, AND AFFIX TO THIS DRD.)

GE EXHIBIT DRD SI-010

VOYAGER DATA REQUIREMENT DESCRIPTION

DRD APPROVED BY:

DATE:

DATA CATEGORY:

ORGANIZATION ORIGINATING REQUIREMENT: CODE: SI

OFFICE RESPONSIBLE FOR DRD: CODE:

DRD PREPARED BY: R. H. Woodyard DATE: 7/28/67

CONTRACT NO.:

DRD NO.: SI-010

TITLE OF DOCUMENT:

MANUAL, SCIENCE CALIBRATION
(PRE-FLIGHT AND FLIGHT)

ORGANIZATION RESPONSIBLE FOR DOCUMENT PREPARATION: System Engineering

TASK OR SUBTASK:

DRL ITEM NO.:

ORGANIZATION RESPONSIBLE FOR DOCUMENT REPRODUCTION:

DRL NO.:

LEVEL NO.:

ORGANIZATION RESPONSIBLE FOR DOCUMENT DISTRIBUTION:

DDL NO.:

FILE NO.:

TYPE OF DOCUMENT: ☐ CONTROL ☐ ACTION ☒ REFERENCE ☐ INFORMATION

USE OF DOCUMENT:

Describes the procedures for calibrating the experiments.

ORGANIZATION RESPONSIBLE FOR DOCUMENT STOWAGE:

NO. OF COPIES: 50

ESTIMATED MANHOURS FOR SINGLE PREPARATION:

INFORMATION CUTOFF DATE OR MILESTONE:

ESTIMATED COST ($) FOR SINGLE PREPARATION:

DATE DATA DUE TO USER:

INTERRELATIONSHIP WITH OTHER DATA REQUIREMENTS:

SI-001, Specification, Spacecraft Science Integration
SI-002, Specification, Spacecraft Science OSE
SI-004, Specification, Scientific Instrument Requirements
SI-008, Report, Science Qualification Test

FREQUENCY OF ISSUE:

☐ ANNUALLY
☐ SEMI-ANNUALLY
☐ QUARTERLY
☐ BI-MONTHLY
☐ MONTHLY
☐ SEMI-MONTHLY
☐ BI-WEEKLY
☐ WEEKLY
☐ DAILY
☒ OTHERWISE, AS SPECIFIED
One time

PUBLICATION DATE: PDR

UPDATE (FREQUENCY OR MILESTONE): Thru MAR

ESTIMATED EXPIRATION DATE:

CLASSIFICATION:

☐ SECRET
☐ CONFIDENTIAL
☐ SECRET RESTRICTED DATA
☐ CONFIDENTIAL RESTRICTED DATA
☒ UNCLASSIFIED

☐ GROUP 1
☐ GROUP 2
☐ GROUP 3
☐ GROUP 4
☐ PROPRIETARY
☐ PUBLIC DOMAIN

☐ SPECIAL HANDLING
☐ NASA DISCREET
☐ JPL DISCREET
☐ PROJECT DISCREET
☐ NOFORN

FORM OF DATA:

☒ PRINTED DOCUMENT
☐ CHART
☐ DIAGRAM
☐ DRAWING
☐ FILM (STATIC OR MOTION)
☐ ILLUSTRATION
☐ MODEL
☐ RECORDING (TAPE OR DISC)
☐ COMPUTER CARD
☐ COMPUTER TAPE
☐ MICROFILM (W/OR W/O CARD)
☐ OTHER

KIND OF DATA:

☐ ABSTRACT
☐ BROCHURE
☐ BULLETIN
☐ CATALOG
☐ CONTRACT
☐ DIRECTIVE
☐ DISCLOSURE
☐ ENGINEERING CHANGE ORDER
☐ REQUEST FOR ENGINEERING CHANGE PROPOSAL
☐ ENGINEERING CHANGE PROPOSAL
☐ HANDBOOK
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☐ PLAN
☐ PROCEDURE
☐ REGULATION
☐ REPORT
☐ SCHEDULE
☐ SPECIFICATION
☐ STANDARD
☐ VOUCHER

REFERENCE DOCUMENTS:

Mission Specification
Experimenters' Technical Data

APPLICABLE STANDARDS:

REVIEWS AND/OR APPROVALS REQUIRED:
(LIST IN ORDER OF SUBMITTAL)

	DRAFT	DATE	PREPUBLICATION PROOF	DATE
SUBMIT FOR REVIEW TO:				
		BY		BY
SUBMIT FOR APPROVAL TO:		BY		BY
	Manager, System Engineering			

JPL 2568 OCT 65

VOYAGER DATA REQUIREMENT DESCRIPTION - 2ND SHEET

DRD NO.: SI-010

SPECIAL INSTRUCTIONS:

This document will contain an approved set of procedures for calibrating each experiment so that reliable data and confidence can be maintained during system test and during various phases of the planetary mission.

SPECIAL DISTRIBUTION: (IF DISTRIBUTION IS NOT COVERED BY AN EXISTING DDL WRITE IN DISTRIBUTION BELOW)

OUTLINE OF CONTENTS:

1. Scope
2. Applicable documents
3. Step-by-step calibration procedure for each experiment
4. Notes
5. Appendix
   Calibration curves and tables as required.

(CONTINUE ON THIRD SHEET, IF NECESSARY, AND AFFIX TO THIS DRD.)

DOCUMENTATION RELATIONSHIP TREES

A documentation relationship tree has been prepared to further develop the data base interrelationships by identifying and presenting pictorially the relationships of all Voyager contractor data items within each functional category and by showing their relationships across categories.

Relationships within the functional category are shown by constructing a tier pattern beginning with the top-level (or governing) data item and relating, in descending order, all data items within the category to this top-level data item. (The location of a data item at a given level on the diagram does not necessarily indicate the importance of that specific item but identifies and defines its relation to all other data items in that category.)

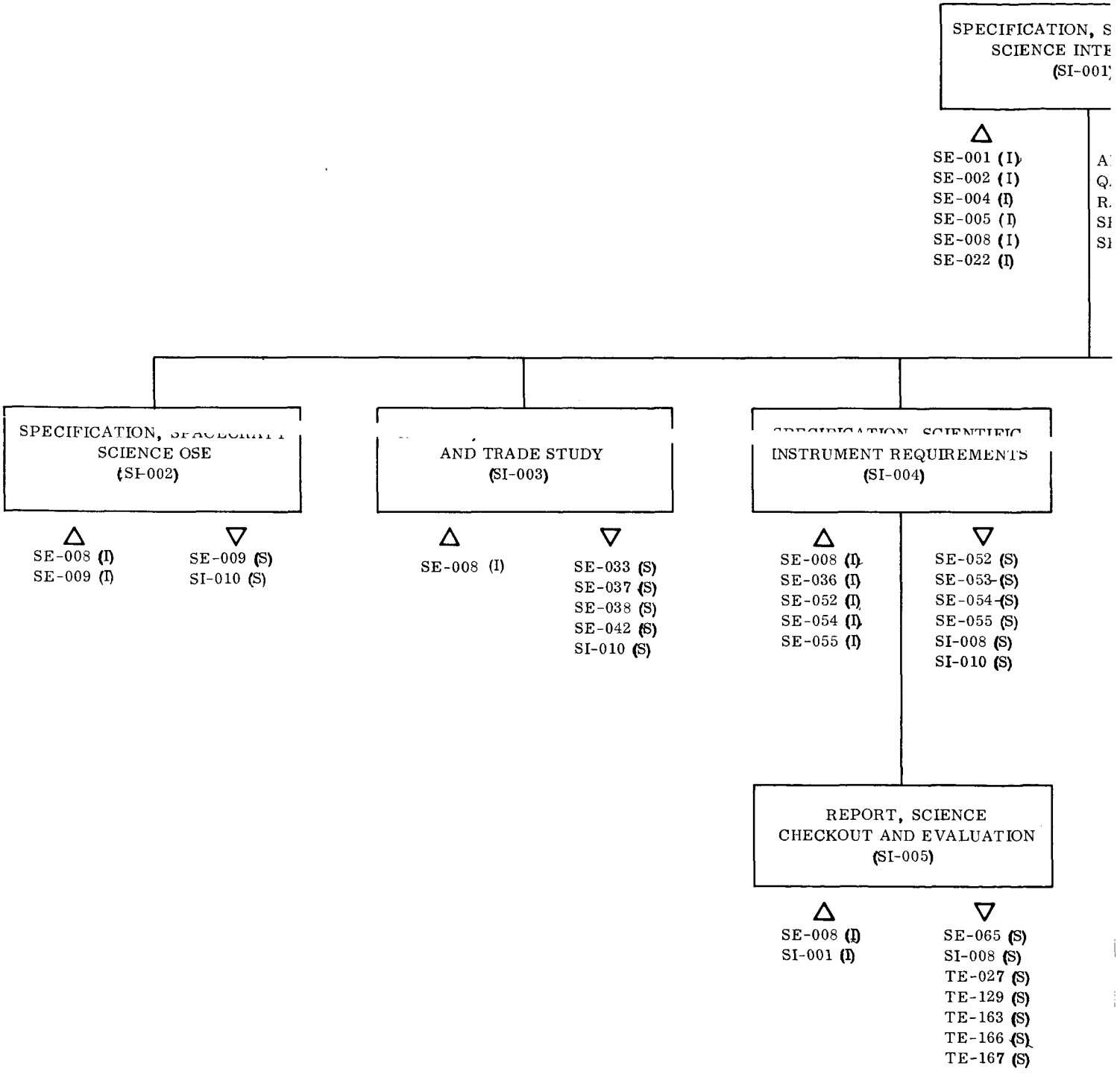
Relationships between data items in one category and data items in other functional categories are shown by (1) arrows to indicate the direction of the relationship, and (2) an alphabetic code to indicate the nature of the interrelationship as follows:

a. Data items needed for preparation and/or support of the referenced item. (I)

b. Data items supported or needed by this data item. (S)

c. Data items that relate "to" and provide information of a general nature but are not required in an input or support role. (G)

Each data item appearing on the Data Item List (DIL) was examined and evaluated with respect to its contribution to, or dependence on, data items appearing in other categories, and is included in the diagrams.


SPECIFICATION, S
SCIENCE INTE
(SI-001)
SE-001 (I)
SE-002 (I)
SE-004 (I)
SE-005 (I)
SE-008 (I)
SE-022 (I)
SPECIFICATION,
SCIENCE OSE
(SI-002)
SE-008 (I)
SE-009 (I)
SE-009 (S)
SI-010 (S)
AND TRADE STUDY
(SI-003)
SE-008 (I)
SE-033 (S)
SE-037 (S)
SE-038 (S)
SE-042 (S)
SI-010 (S)
INSTRUMENT REQUIREMENTS
(SI-004)
SE-008 (I)
SE-036 (I)
SE-052 (I)
SE-054 (I)
SE-055 (I)
SE-052 (S)
SE-053 (S)
SE-054 (S)
SE-055 (S)
SI-008 (S)
SI-010 (S)
REPORT, SCIENCE
CHECKOUT AND EVALUATION
(SI-005)
SE-008 (I)
SI-001 (I)
SE-065 (S)
SI-008 (S)
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TE-129 (S)
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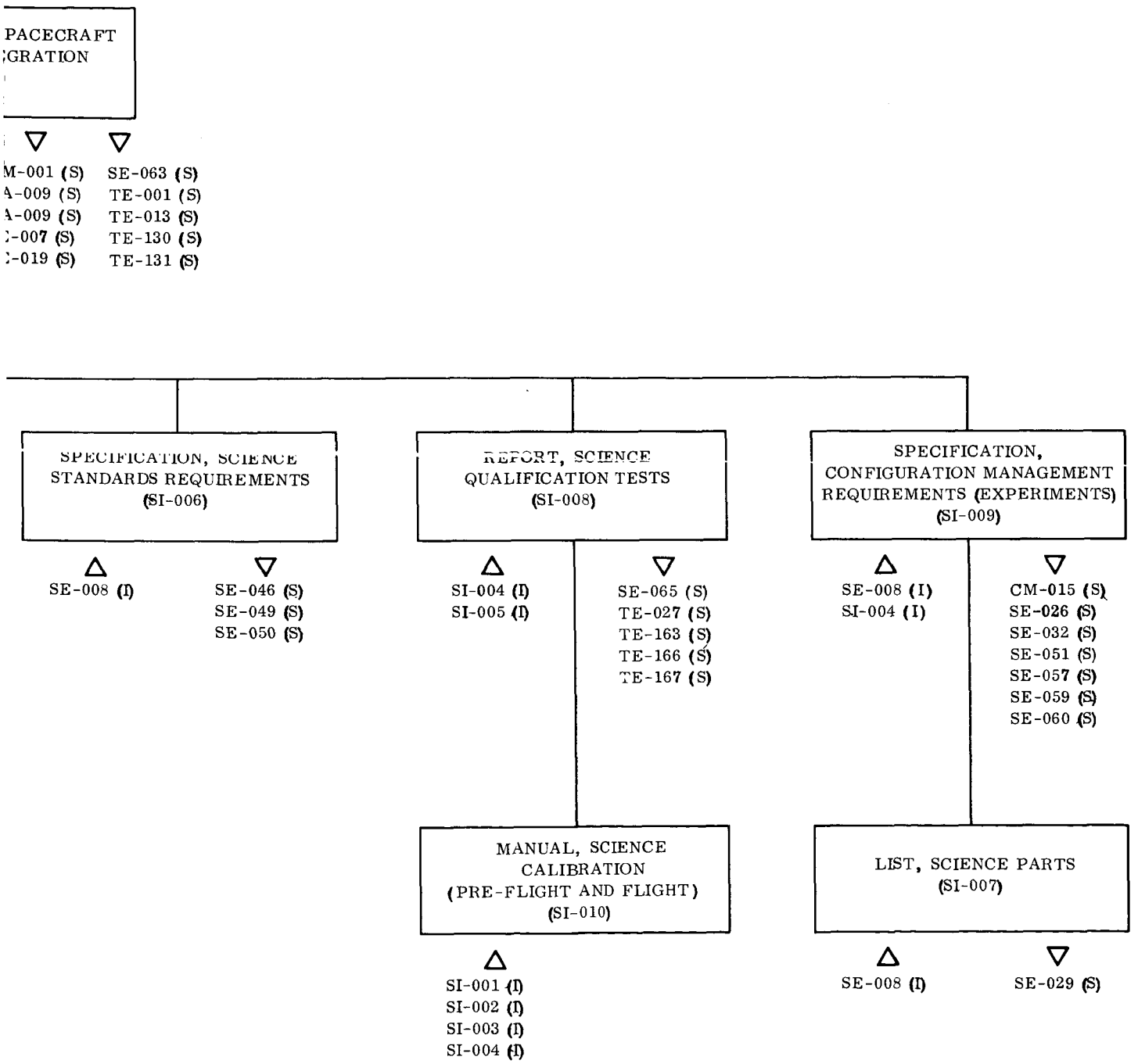


Figure O-5. Science Integration Documentation Relationship Tree (SI)

DATA ITEM PHASING/FREQUENCY

The data item frequency and phasing chart shows the requirements for contractor data item preparation by major project review periods. It is concerned with the phasing and frequency of preparation of each individual data item and not the total number of copies required for reproduction and distribution.

The following legend and/or abbreviations have been used:

A	Annual	Q	Quarterly
S/A	Semiannual	I	Initial
WK	Weekly	F	Final
MO	Monthly	N/R	New and revised
B/W	Biweekly	SDR	System design review
B/M	Bimonthly	PDR	Preliminary design review
O/T	One time	HDR	Hard design review
A/R	As required	CDR	Critical design review
U	Update	FACI	First article configuration inspection
I/U	One update	MAR	Mission acceptance review
DA	Daily	J FACT	Joint flight acceptance composite testing

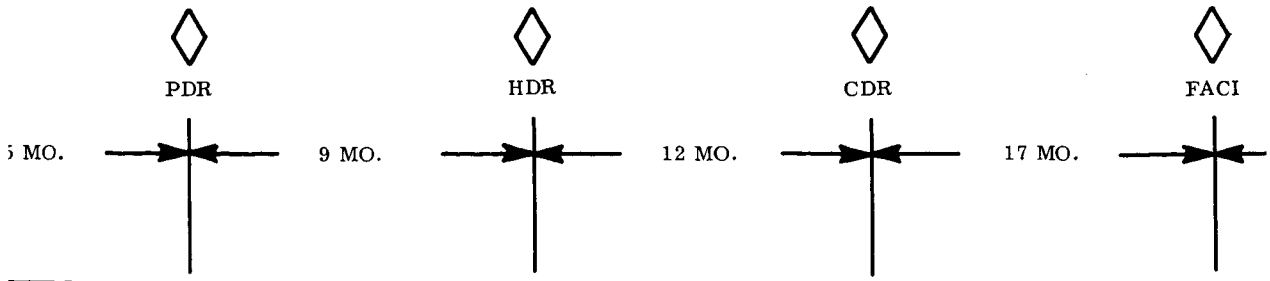
SDR

3.5 MO. | 3.

DATA ITEM TITLE

SCIENCE INTEGRATION

	QUAN	FREQ	TOTAL	QUAN
LISTS				
SI-007 List, Science Parts				
MANUALS				
SI-010 Manual, Science Calibration (Pre-Flight and Flight)				1
REPORTS				
SI-003 Report, Science Analysis and Trade Study				16
SI-005 Report, Science Checkout and Evaluation				
SI-008 Report, Science Qualification Tests				
SPECIFICATIONS				
SI-001 Specification, Spacecraft Science Integration	1	I	1	1
SI-002 Specification, Spacecraft Science OSE				1
SI-004 Specification, Scientific Instrument Requ...	1	I	1	1
SI-006 Specification, Science Standards Requirements	1	I	1	1
SI-009 Specification, Configuration Management Requirements	1	I	1	1
(Experiments)				
TOTAL			4	



REQ	TOTAL	QUAN	FREQ	TOTAL	QUAN	FREQ	TOTAL	QUAN	FREQ	TOTAL	QU
					1	I	1	1	U/1	2	
I	1	1	U/1	2	1	U/1	2	1	U	1	
O/T	16	32	O/T	32	40	O/T	40	32	O/T	32	
		16	O/T	16	16	O/T	16	16	O/T	16	
					1	O/T	1	1	O/T	1	
U	1	1	U/1	2	1	U/1	2	1	U/1	2	
I	1	1	U/1	2	1	U/1	2	1	U/1	2	
U	1	1	U	1	-	-	-	-	-	-	
U	1	1	U	1	-	-	-	1	F	1	
U	1	1	U	1	-	-	-	1	U/1	2	
	22			57			64			59	

	MAR		J FACT		LAUNCH
14 MO.		2.5 MO.		2.5 MO.	

UAN	FREQ	TOTAL	QUAN	FREQ	TOTAL	QUAN	FREQ	TOTAL	TOTALS	
1	F	1							4	
1	F	1							7	
16	O/T	16							136	
16	O/T	16							64	
1	O/T	1							3	
1	F	1							9	
1	F	1							8	
1	F	1							4	
									4	
1	F	1							6	
		39							245	

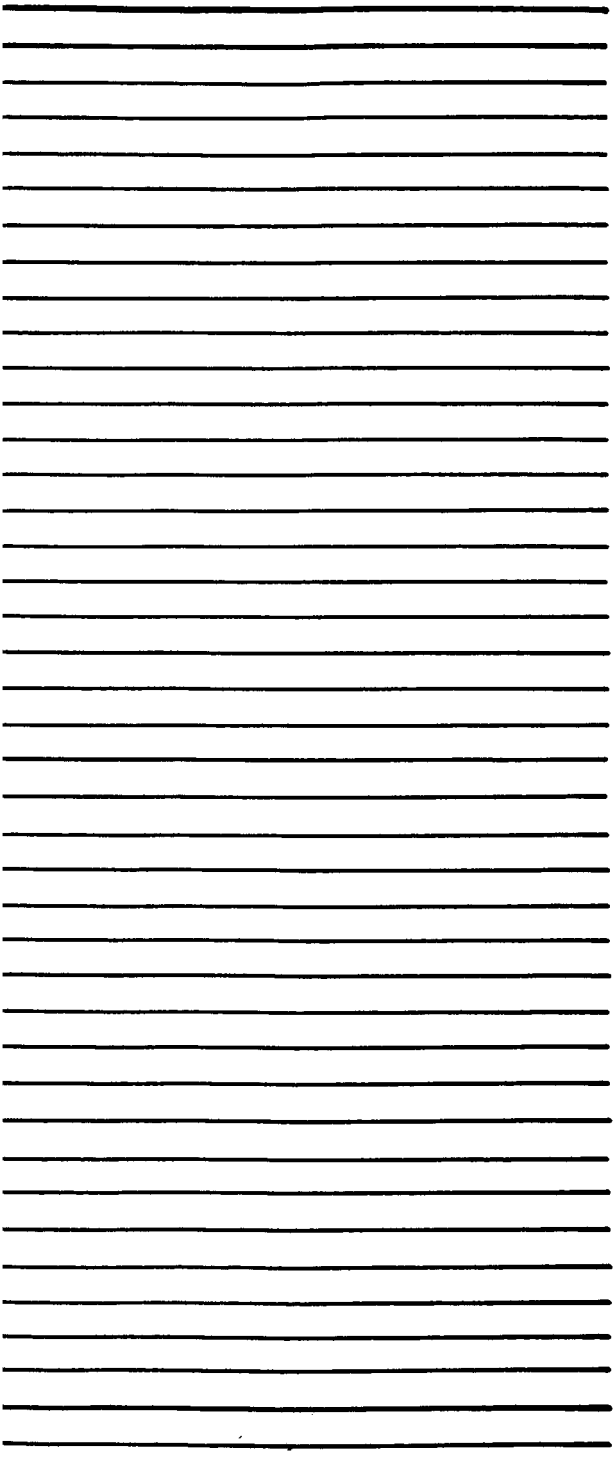


Figure O-6. Science Integration Data Item Phasing and Frequency Matrix