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VOLUME 5  
DATA MANAGEMENT STUDY

APPENDIX C  
CONTRACTOR DATA PACKAGE  
MANUFACTURING (MG)

PREPARED BY

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MANUFACTURING MANAGEMENT  
VOYAGER SPACECRAFT SYSTEM PROJECT

APPROVED BY



A. FRANK, COGNIZANT ENGINEER  
DATA MANAGEMENT AND CONTROL TASK  
VOYAGER SPACECRAFT SYSTEM PROJECT

PREPARED FOR

JET PROPULSION LABORATORY  
CALIFORNIA INSTITUTE OF TECHNOLOGY  
4800 OAK GROVE DRIVE  
PASADENA, CALIFORNIA

UNDER JPL CONTRACT No. 951112

**GENERAL  ELECTRIC**

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

TABLE OF CONTENTS

Section	Page
1 INTRODUCTION. . . . .	1-1
2 DATA ITEM LIST/USER MATRIX. . . . .	2-1
3 USER FLOW DIAGRAMS . . . . .	3-1
4 DATA REQUIREMENT DESCRIPTIONS (DRD'S) . . . . .	4-1
5 DOCUMENTATION RELATIONSHIP TREES . . . . .	5-1
6 DATA ITEM PHASING/FREQUENCY . . . . .	6-1

## INTRODUCTION

This appendix presents the Contractor Data Package (Data Item Matrix, Data Requirement Descriptions, User Flow Diagrams, Document Relationship Tree, and Frequency and Phasing Charts) for Manufacturing (MG).

These data relate to the planning, designing, tooling and processes, scheduling, ordering, manufacturing, testing, fabricating, production control, assembly, and reporting necessary to produce a finished product from a set of drawings and specifications.

The complete list of Contractor Data Package appendixes is as follows:

- Appendix A - Technical Description and System Engineering (SE)
- Appendix B - Planetary Quarantine (PQ)
- Appendix C - Manufacturing (MG)
- Appendix D - Configuration Management (CM)
- Appendix E - Quality Assurance (QA)
- Appendix F - Test (TE) and Mission Operations (MP)
- Appendix G - Reliability Assurance (RA)
- Appendix H - Logistics and Support (LS)
- Appendix I - Overall Management (MA), Scheduling (SC), and Manning and Financial (MF)
- Appendix J - Procurement and Contracting (PC)
- Appendix K - Data Management (DM)
- Appendix L\* - Facilities (FA)
- Appendix M\* - Safety (SA)
- Appendix N\* - Site Activation for Launch (AL)
- Appendix O\* - Science (SI)
- Appendix P\* - Related Project Interfaces (RP)
- Appendix Q\* - Advanced Missions (AM)

\* Appendixes L through Q prepared under Contract NAS 7-584

DATA ITEM NUMBER	1 of 3  DATA ITEM  <u>MANUFACTURING</u>	DESCRIPT
	<u>DRAWINGS</u>	
MG-001	Drawings, Interface Tools, Jigs and Fixtures	Drawings for tools, jigs, and fixtures co interfaces.
MG-002	* Drawings, Tools, Jigs and Fixtures	Drawings for tools, jigs, and fixtures of with system interfaces.
	<u>MANUALS</u>	
MG-005	* Manual, Certification and Training	A manual based on NASA military and cu be used in GE/customer approved training tion of operators/inspectors.
MG-006	* Manual, Hardware Handling	An instruction manual for protecting and during transportation and at work place during test and inspection.
	<u>PLANS</u>	
MG-009	Plan, Manufacturing	Defines the contractual requirements to reliability, and schedules for the assem prime hardware.
MG-010	Plan, Storage	A plan to stock and store completed flig manner assuring prime status.
MG-011	Plan, Manufacturing Detailed Flow and Inspection (Assembly Diagram)	A hardware flow plan for sequential fabr

\* KEY INFORMAL DATA

# DATA ITEM LIST/USER MATRIX

FUNCTION	APPLICABILITY TO FUNCTIONAL USERS AT CONTRACTOR LEVEL															
	SE	PQ	MG	CM	QA	TE	RA	LS	MA	SC	PC	MF	MP	DM	FA	
Concerned with system	U	-	A	U	R	U	-	-	-	-	-	-	-	-	-	
Other than those concerned	U	-	A	U	R	U	-	-	-	-	-	-	-	-	-	
Customer requirements to go to school for certifica-	-	-	A	-	R	-	U	-	-	-	-	-	-	-	-	
handling of hardware fabrication areas	-	U	A	-	R	U	U	U	-	-	-	-	-	-	-	
to be met for quality, assembly and fabrication of	U	U	R	-	U	U	U	-	PM	U	U	-	-	-	U	
to be met for quality, equipment in a	-	U	R	-	R	U	R	U	PM	-	U	-	-	-	U	
to be met for quality, fabrication or assembly.	-	U	A	-	R	U	U	U	U	U	U	-	-	-	-	

U - USE      R - REVIEW AUTHORITY      A - APPROVAL AUTHORITY      PM - PROJECT MANAGER APPROVAL

					APPLICABILITY AT SUBCONTRACTOR/VENDOR/SUPPLIER LEVELS					APPLICABILITY TO PROJECT BOARDS												
SA	AL	SI	RP	AM	PRINCIPAL SUB-CONTRACTORS	MAJOR SUB-CONTRACTORS	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	-	-	-	(S)	(S)	(S)	NA	(S)	NA	-	-	-	-	-	-	-	-	-	-	-	-
U	-	-	-	-	(S)	(S)	(S)	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
U	U	-	-	-	S	S	(S)	NA	(S)	(S)	-	-	-	-	-	-	-	-	-	-	-	-
U	-	-	-	-	S	S	(S)	NA	(S)	NA	-	-	-	-	-	-	-	-	-	-	-	-
U	-	-	-	-	S	S	(S)	NA	(S)	(S)	-	-	-	-	-	-	U	-	-	-	-	-
U	-	-	-	-	S	S	(S)	NA	(S)	NA	-	-	-	-	-	-	U	-	-	-	-	-
U	-	-	-	-	S	S	(S)	NA	(S)	NA	-	-	-	-	-	-	-	-	-	-	-	-

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

2-2-2

DATA ITEM NUMBER	2 of 3  DATA ITEM  <u>MANUFACTURING</u>	DESCRIP
	<u>PROCEDURES</u>	
MG-003	Procedure, Manufacturing Operating	Defines the controls and manufacturing p into detailed shop planning.
MG-004	Manufacturing Standing Instructions (MSIs)	
	<u>RECORDS</u>	
MG-007	Record, Methods and Tool Sheets	
MG-008	Sheet, Planning Fabrication/Assembly	A detailed step-by-step instruction for t sequence, including implementation step
	<u>REPORTS</u>	
MG-016	Report, Line of Balance	Report to determine planned manufactur actual performance in meeting overall s
MG-017	* Report, Producibility	Summarizes the producibility analysis a potential problem areas caused by design good control during fabrication.
MG-018	* Report, Receiving	
MG-019	* Report, Stock Inventory	This report is used to determine the ava hardware needed for meeting fabrication lished reorder cycle.

\* KEY INFORMAL DATA

# DATA ITEM LIST/USER MATRIX

DESCRIPTION	APPLICABILITY TO FUNCTIONAL USERS AT CONTRACTOR LEVEL													
	SE	PQ	MG	CM	QA	TE	RA	LS	MA	SC	PC	MF	MP	DM
processes for incorporation	-	R	A	-	U	U	R	-	-	-	-	-	-	-
	-	R	A	-	R	U	-	-	-	-	-	-	-	-
	-	-	A	-	-	-	-	-	-	-	-	-	-	-
the fabrication or assembly s.	U	U	A	-	U	U	U	U	R	U	U	-	-	-
ing performance versus schedules.	-	-	A	-	-	-	-	-	U	U	U	-	-	-
and delineates specific which will require	U	U	A	-	U	-	U	-	-	-	-	-	-	-
	-	-	A	-	U	U	-	-	-	-	U	U	-	-
liability of parts and schedule and estab-	-	-	A	U	-	-	-	U	-	-	-	U	-	-

U - USE      R - REVIEW AUTHORITY      A - APPROVAL AUTHORITY      PM - PROJECT MANAGER

2-4-1



						APPLICABILITY AT SUBCONTRACTOR/VENDOR/SUPPLIER LEVELS						APPLICABILITY TO PROJECT BOARDS											
FA	SA	AL	SI	RP	AM	PRINCIPAL SUB-CONTRACTORS	MAJOR SUB-CONTRACTORS	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	-	-	-	-	S	S	(S)	NA	(S)	NA	-	-	-	-	-	-	-	-	-	-	-	-
-	U	-	-	-	-	(S)	(S)	(S)	NA	(S)	NA	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	(S)	(S)	(S)	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
U	U	-	-	-	-	S	S	(S)	NA	(S)	(S)	-	-	-	-	-	-	U	-	-	-	-	-
-	-	-	-	-	-	(S)	(S)	(S)	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	S	(S)	(S)	NA	(S)	NA	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-

2-4-2

~~2-4-2~~

DATA ITEM NUMBER	DATA ITEM	DESCRIP
	3 of 3	
	<u>MANUFACTURING</u>	
	<u>REPORTS (Cont'd)</u>	
MG-020	Report, Fabrication/Assembly	
MG-021	Report, Hardware Status	
	<u>REQUESTS</u>	
MG-012	*Request, Manufacturing Planning	A production control request specifying a manufacturing operations to be performed
MG-013	*Request, Special Tool(s)	A request to build special tools for the manufacturing of a controlled drawing so that changes may be made
	<u>SCHEDULES</u>	
MG-014	Schedule, Detail Assembly	
MG-015	Schedule, Shop Loading	

\* KEY INFORMAL DATA

2-5



					APPLICABILITY AT SUBCONTRACTOR/VENDOR/SUPPLIER LEVELS						APPLICABILITY TO PROJECT BOARDS											
SA	AL	SI	RP	AM	PRINCIPAL SUB-CONTRACTORS	MAJOR SUB-CONTRACTORS	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	
-	-	-	-	-	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	S	NA	S	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	S	S	(S)	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-

2-6-2

~~2-6-2~~

## USER FLOW DIAGRAMS

Manufacturing Data User Flow Diagrams have been developed to show the time phasing functions and data uses during the Voyager Program. The principal feature of these diagrams is the identification of functions which interface with systems office, contractor Voyager Project and procurement source activities.

Following contract award, early emphasis is placed on preparation of the major subcontractor's work statements and schedule requirements. After systems design review, and continuing through launch, major manufacturing activities are:

### SDR through PDR

- Finalize manufacturing plan.
- Formulate make or buy plan.
- Review subcontractor make or buy plans.
- Conduct producibility engineering studies on contract technical requirements.

### PDR through HDR

- Develop manufacturing operating procedures.
- Continue producibility engineering evaluations.
- Establish plan to meet storage requirements.
- Develop special tooling drawings.
- Prepare detailed procurement plan.
- Procure component parts and materials.
- Prepare hardware sterilization and handling manuals.
- Fabricate thermal and structural model hardware.

### HDR through CDR

- Update manufacturing technical procedures, plans, and schedules.
- Fabricate or modify tools, jigs and fixtures.
- Review engineering model drawings and material requirements.
- Procure component parts.

- Fabricate engineering model components.
- Receive and checkout purchased materials.

#### CDR through FACI

- Prepare purchase requisitions for substituted parts and materials.
- Evaluate suppliers and quotes.
- Establish resident prime contractor production engineers at selected subcontractors.
- Update Manufacturing Standing Instructions.
- Procure, fabricate and assemble TA, PTM & OSE hardware.

#### FACI through MAR

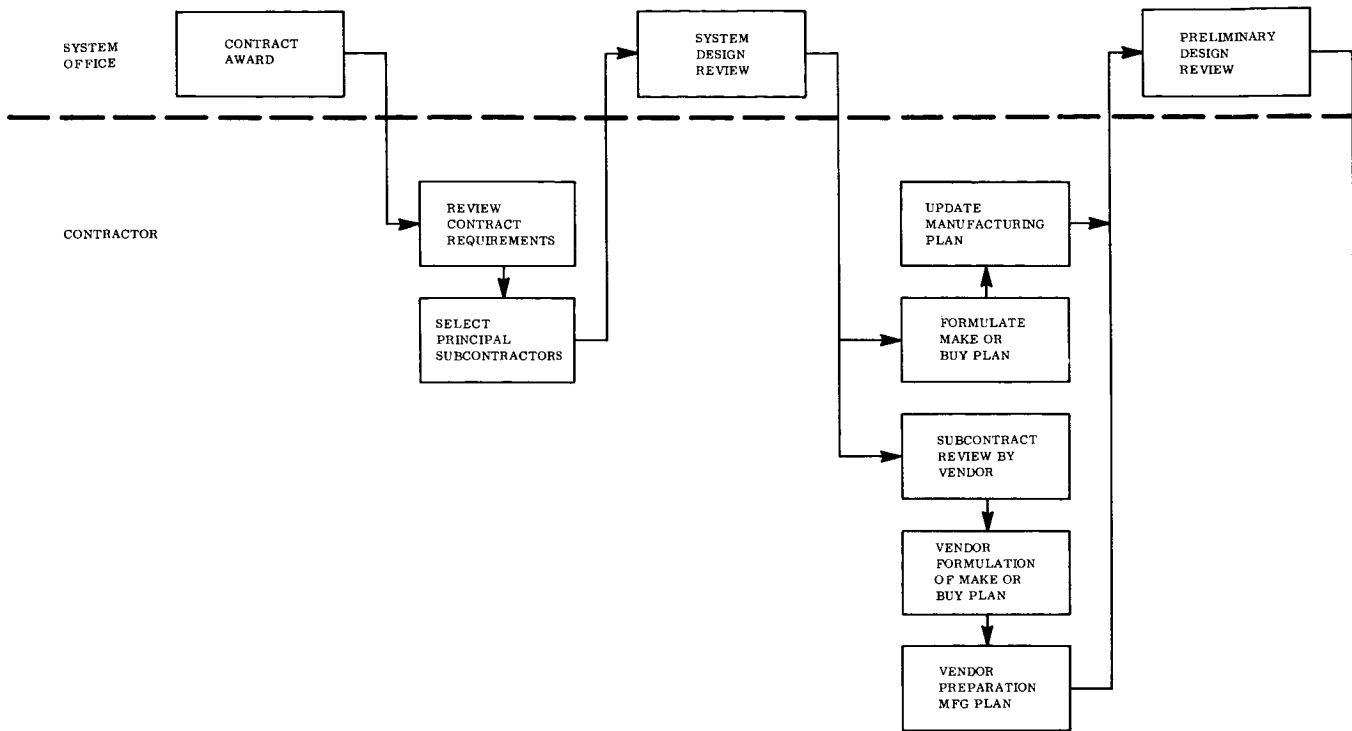
- Modify tools, jigs and fixtures.
- Establish packing and shipping and storage procedures for launch operations.
- Release all flight hardware purchase orders.
- Reevaluate fabrication and assembly techniques.
- Fabricate and assemble FA and OSE.
- Submit hardware for mission acceptance review.

#### MAR through Launch

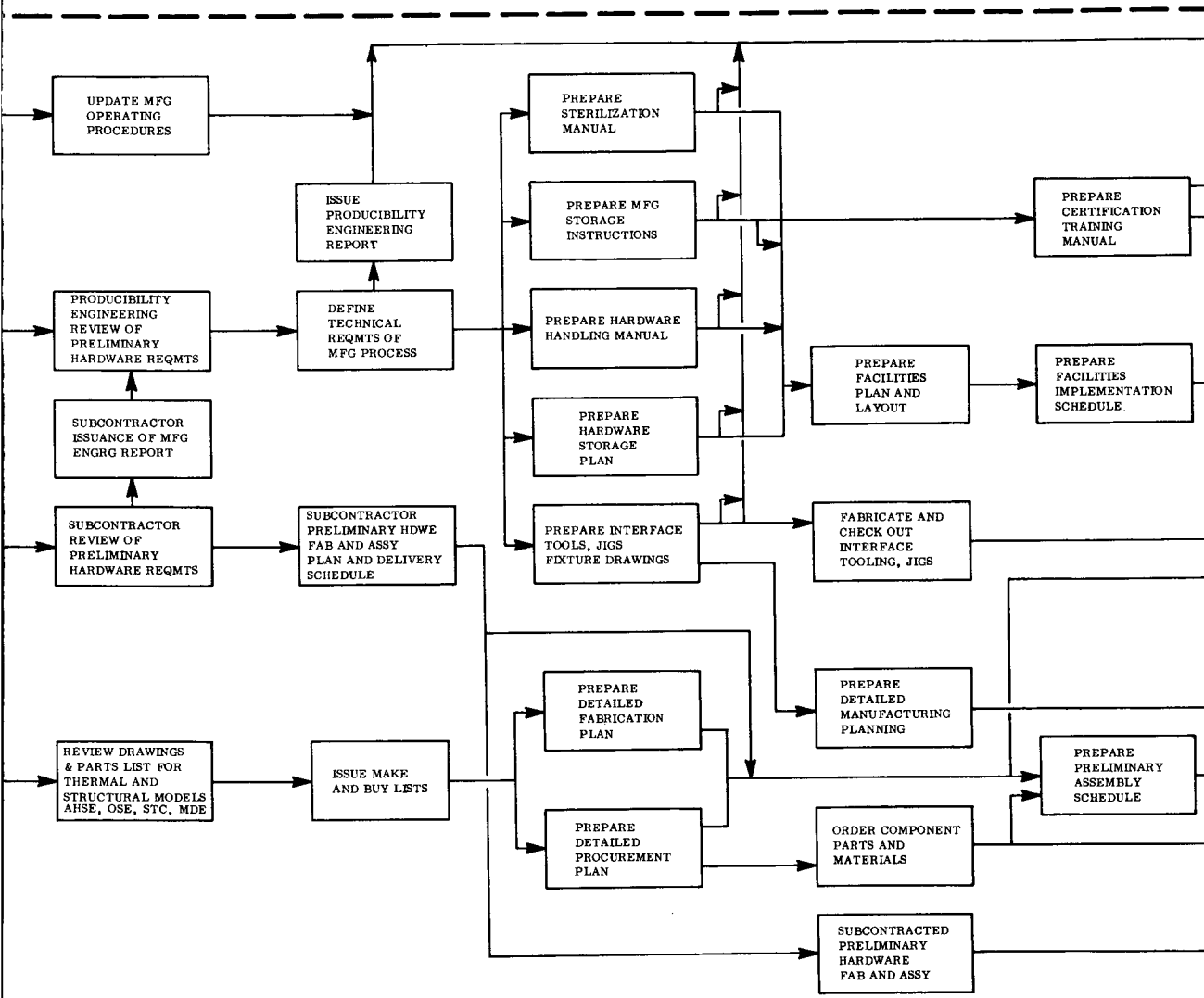
- Pack and ship flight articles and OSE.
- Receive and store hardware at launch site.
- Provide manufacturing support for launch operations.

## Manufacturing User Flow Diagrams

<u>Figure Number</u>	<u>Title</u>
C-1	Manufacturing User Flow Diagram - Summary (2 sheets)
C-2	Manufacturing User Flow Diagram - Contract Award Through Preliminary Design Review
C-3	Manufacturing User Flow Diagram - Preliminary Design Review Through Hard Design Review (2 sheets)
C-4	Manufacturing User Flow Diagram - Hard Design Review Through Critical Design Review (3 sheets)
C-5	Manufacturing User Flow Diagram - Critical Design Review Through First Article Configuration Inspection
C-6	Manufacturing User Flow Diagram - First Article Configuration Inspection Through Launch







3-6-1

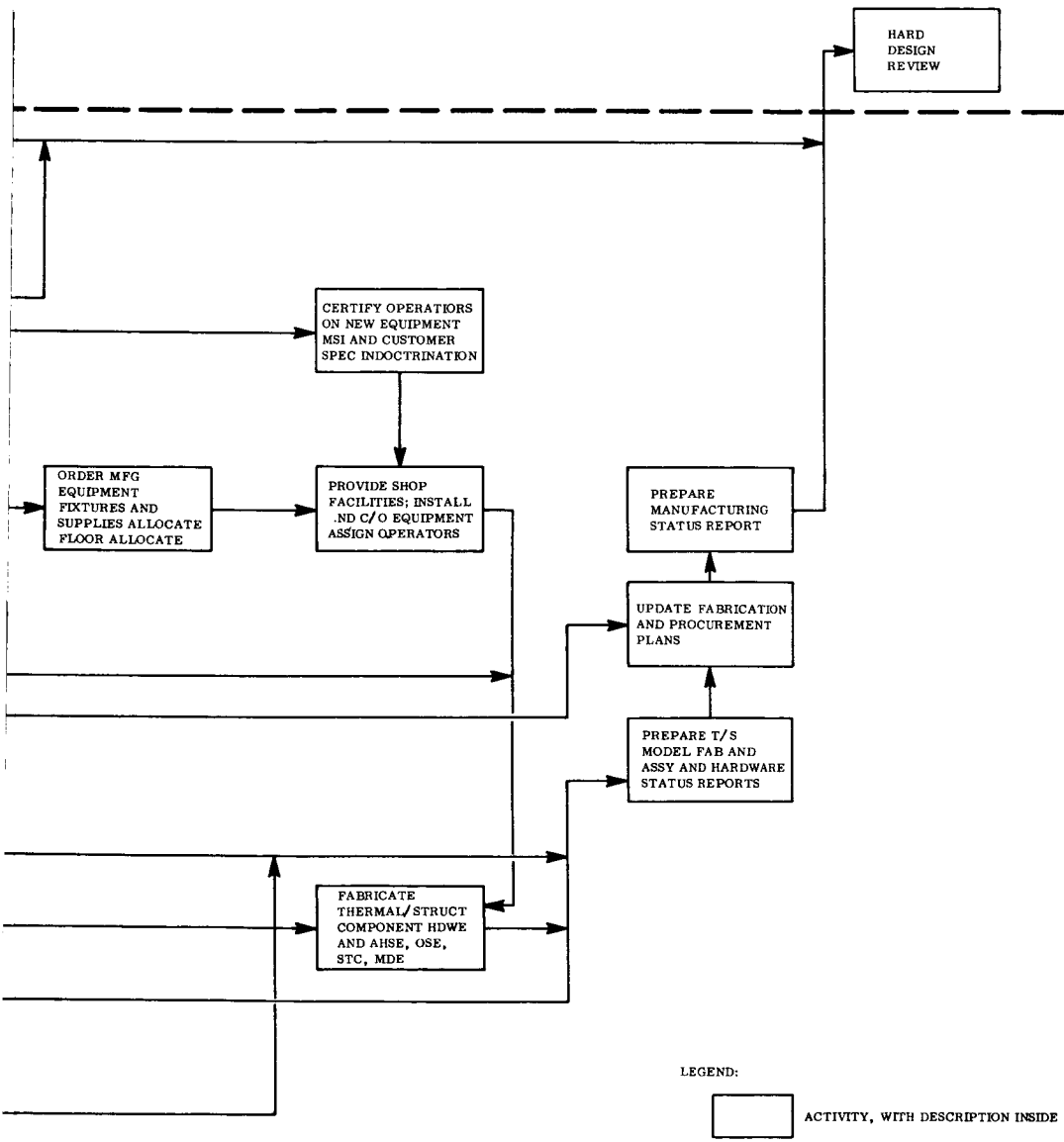
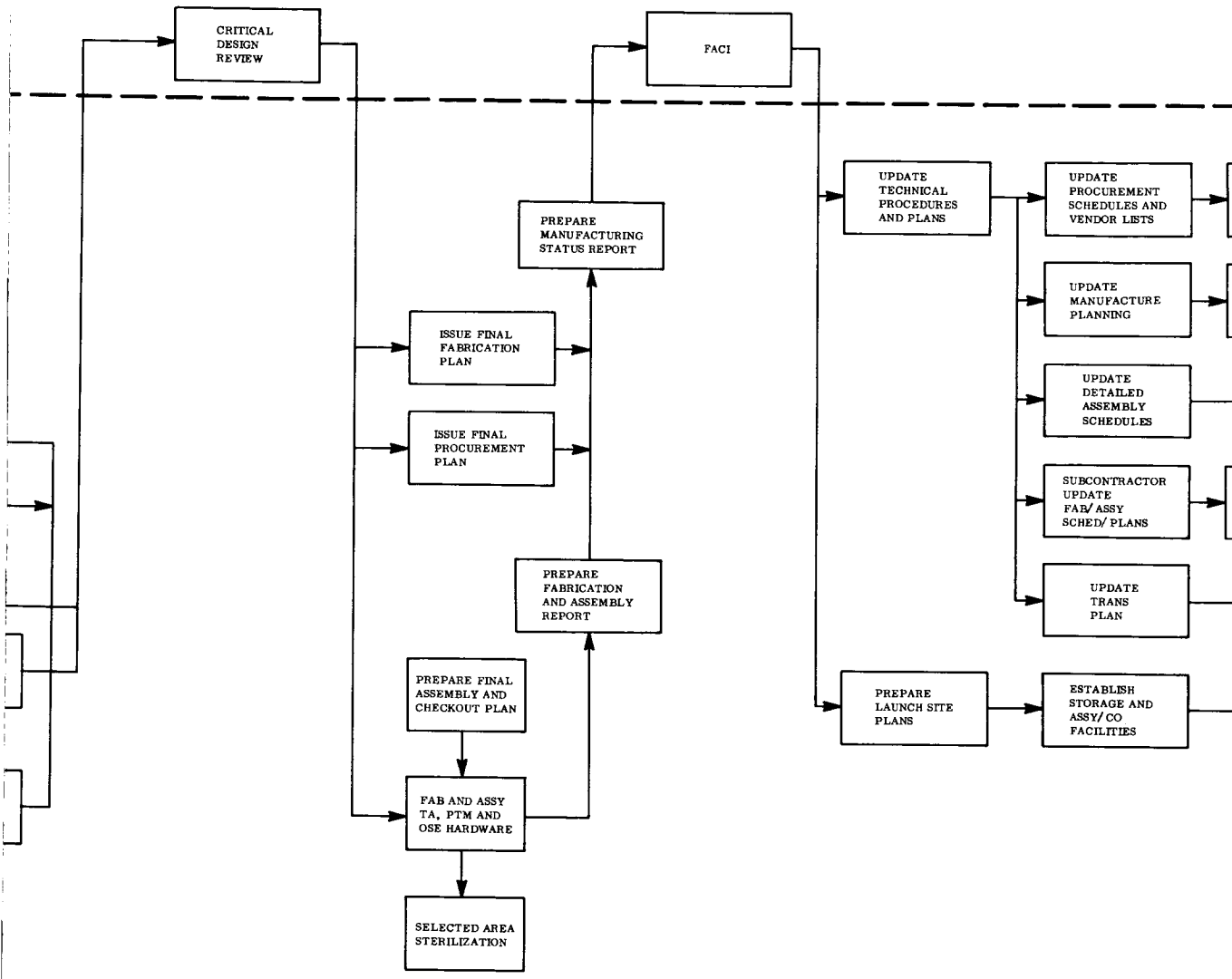


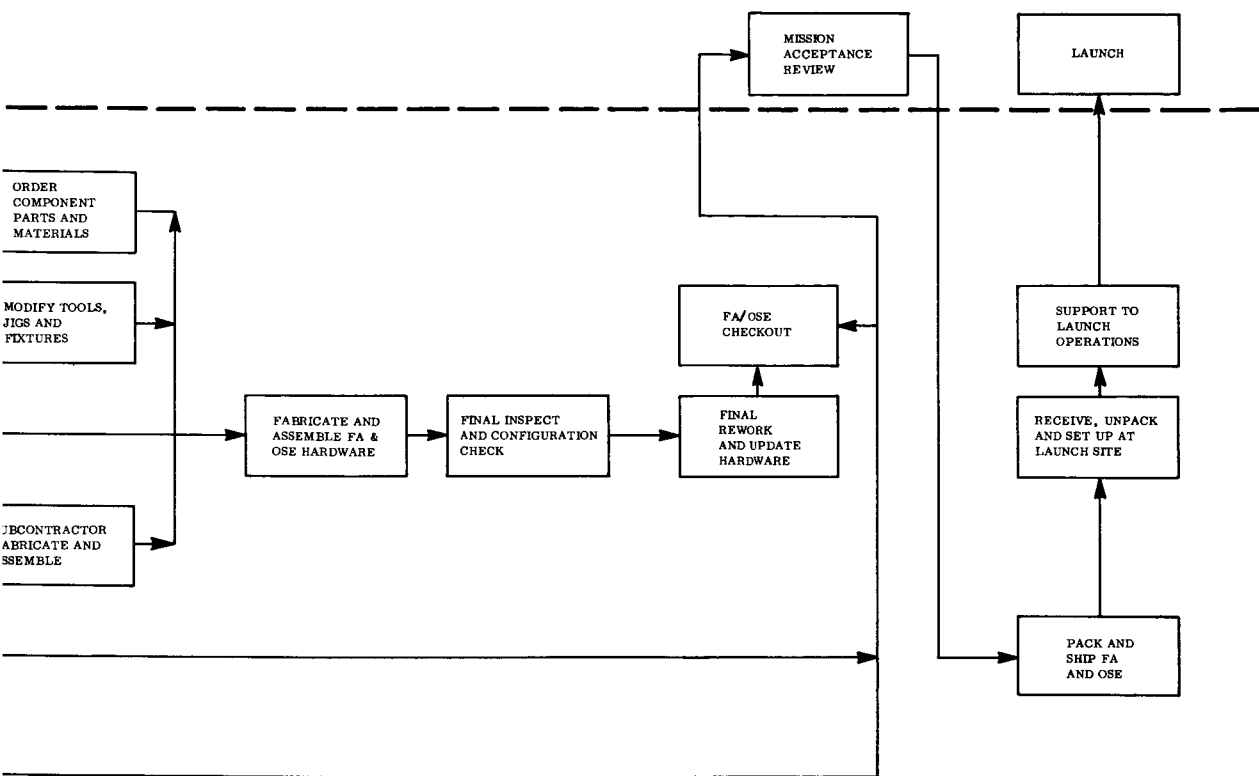
Figure C-1. Manufacturing User  
 Flow Diagram - Summary  
 (Sheet 1 of 2)

3-6-2





3-8-1

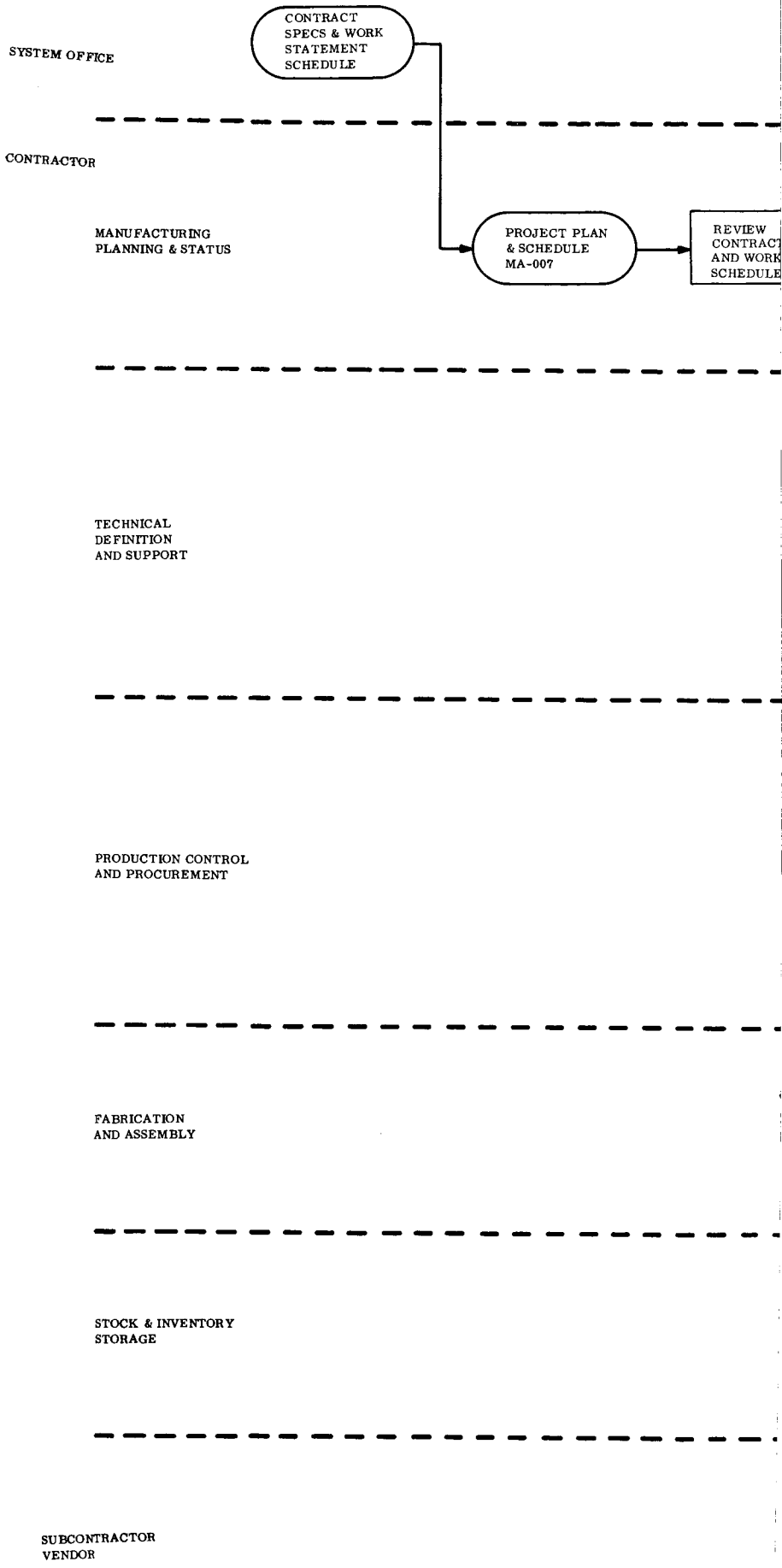


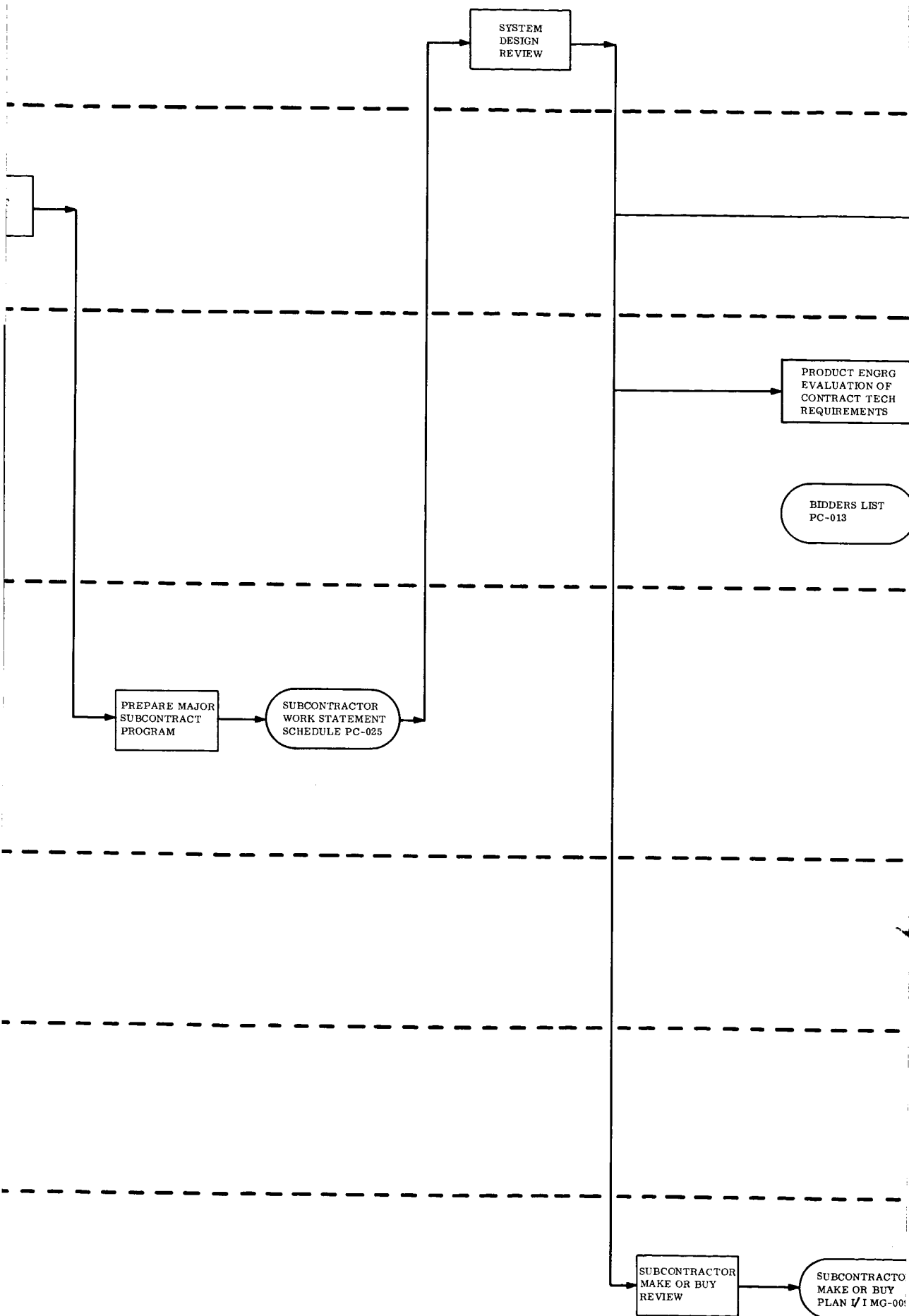
LEGEND

ACTIVITY. WITH DESCRIPTION INSIDE

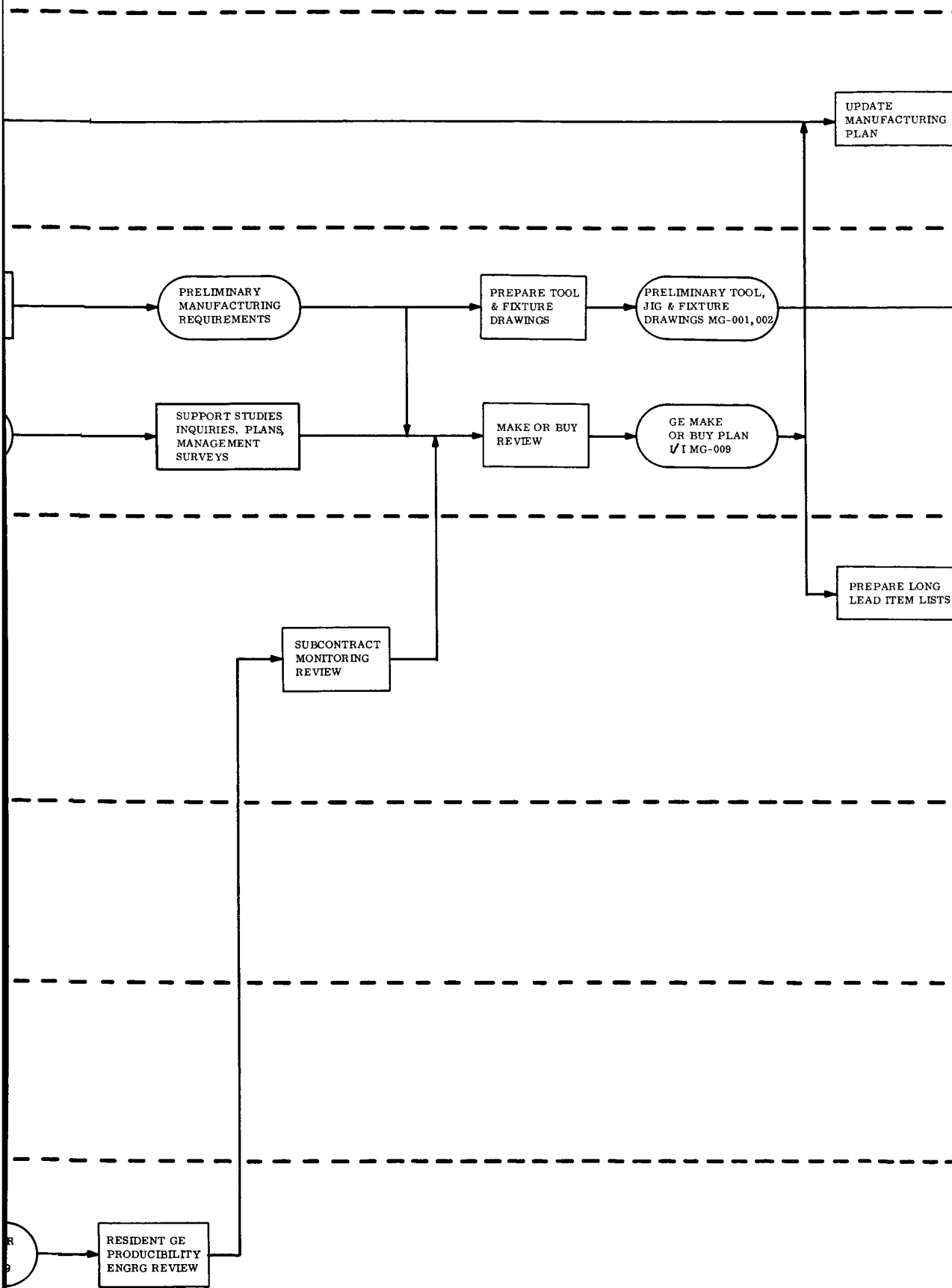
Figure C-1. Manufacturing User Flow Diagram - Summary (Sheet 2 of 2)

3-8-2





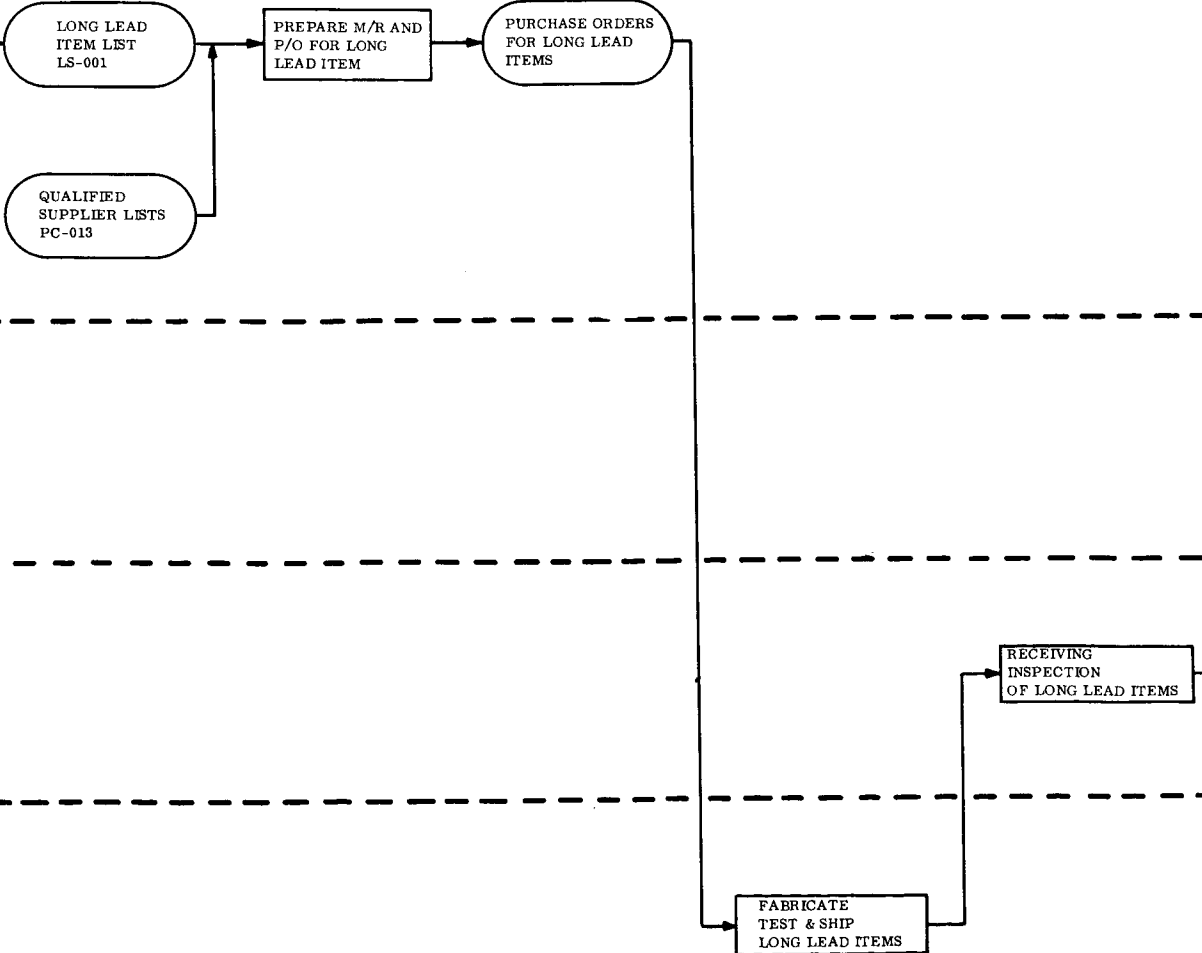
3-10-1



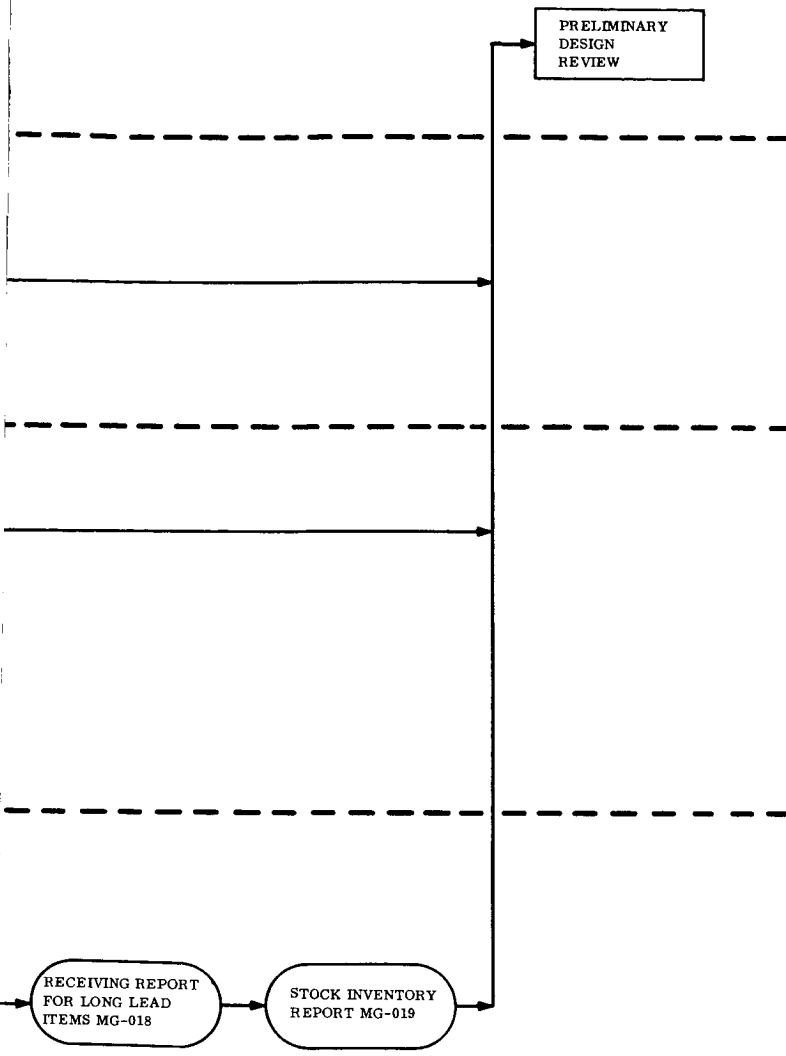
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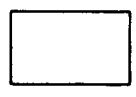
FINAL GE  
MANUFACTURING  
PLAN MG-009



3-10-3



LEGEND:



ACTIVITY, WITH DESCRIPTION INSIDE



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

Figure C-2. Manufacturing User Flow Diagram - Contract Award Through Preliminary Design Review

3-10-4

SYSTEM OFFICE

PRELIMINARY DESIGN REVIEW

CONTRACTOR

MANUFACTURING PLANNING & STATUS

APPROVED MANUFACTURING PLAN MG-009

TECHNICAL DEFINITION & SUPPORT

PRELIMINARY DESIGN DRAWINGS, PARTS LISTS & SPECIFICATIONS SE-028, 027, 029, 056

PRODUCIBILITY ENGRG EVALUATION HWWE REQUIREMENTS

PRODUCTION CONTROL AND PROCUREMENT

APPROVED MAKE OR BUY PLAN I/1 MG-009

MODEL & OSE DRAWINGS & PARTS LISTS SE-029, 058, 060, 062

PREPARE ENCRG MODEL & OSE FABRICATION, ASSY & TEST SCHEDULE

FABRICATION AND ASSEMBLY

STOCK AND INVENTORY STORAGE

SUBCONTRACTOR VENDOR

SUBCONTR HARDWARE REQUIREMENTS PC-027

SUBCONTR MANUFACTURING ENGRG EVALUATION HWWE REQUIREMENTS

SUBCONTR MANUFACTURING ENGRG REPORT MG-021

RESIDENT G PRODUCIBILITY ENGINEERING IN-HOUSE REVIEW



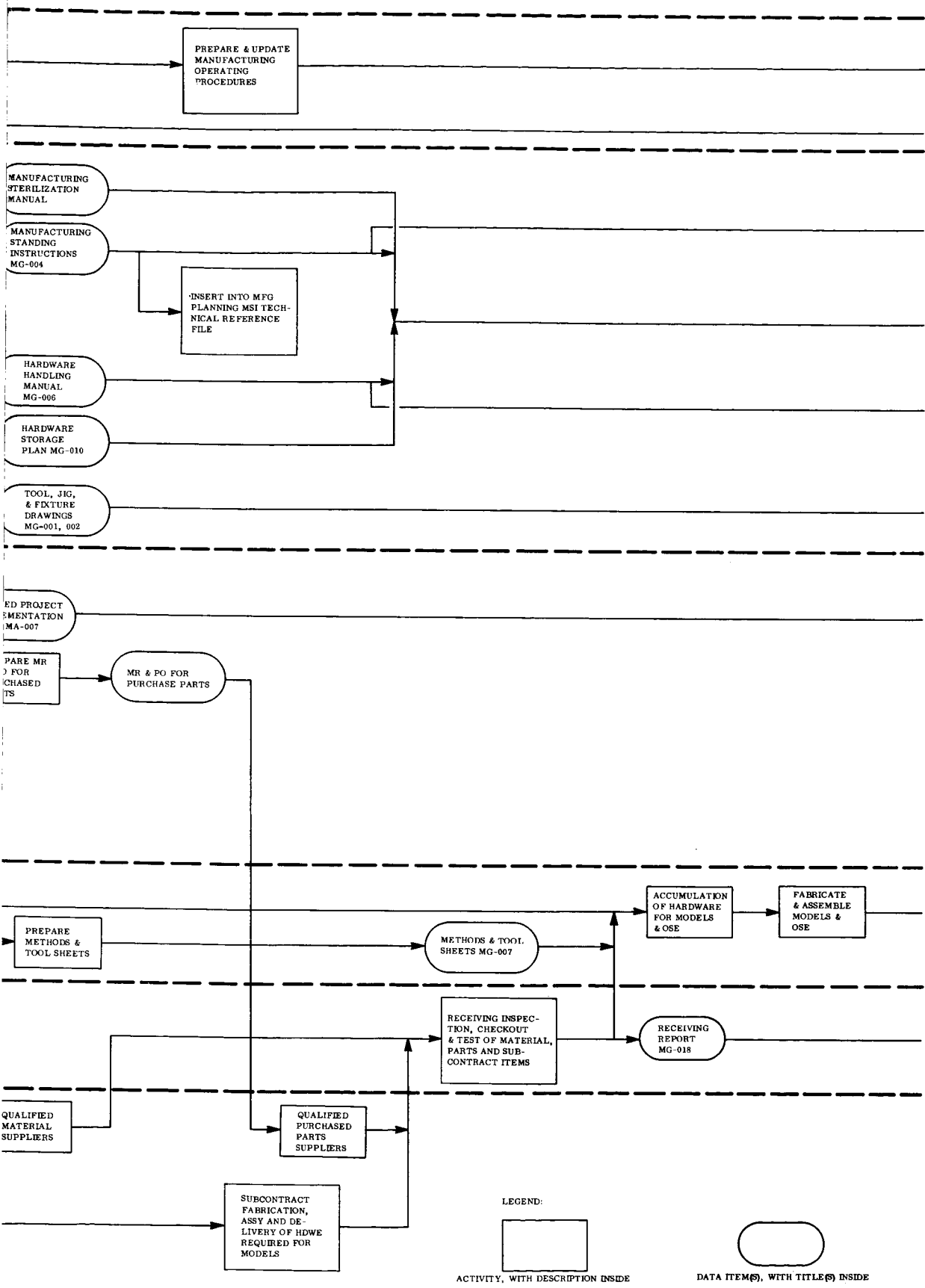


Figure C-3. Manufacturing User Flow Diagram - Preliminary Design Review Through Hard Design Review (Sheet 1 of 2)

3-12-2

SYSTEM OFFICE

CONTRACTOR

MANUFACTURING  
PLANNING & STATUS

PREPARE MFG  
HARDWARE  
STATUS  
REPORT

PREPARE V  
CERTIFICAT  
TRAINING M

TECHNICAL  
DEFINITION  
& SUPPORT

EQUIPMEN  
BROCHURE  
VENDOR Q

PRODUCTION CONTROL  
AND PROCUREMENT

HARDWARE STATUS  
REPORT MG-021

ACCUMULATION  
OF HARDWARE  
FOR MODELS  
& OSE

FABRICATE  
& ASSEMBLE  
MODELS &  
OSE

MODELS & OSE  
FABRICATION &  
ASSEMBLY REPORT  
MG-020

FABRICATION  
AND ASSEMBLY

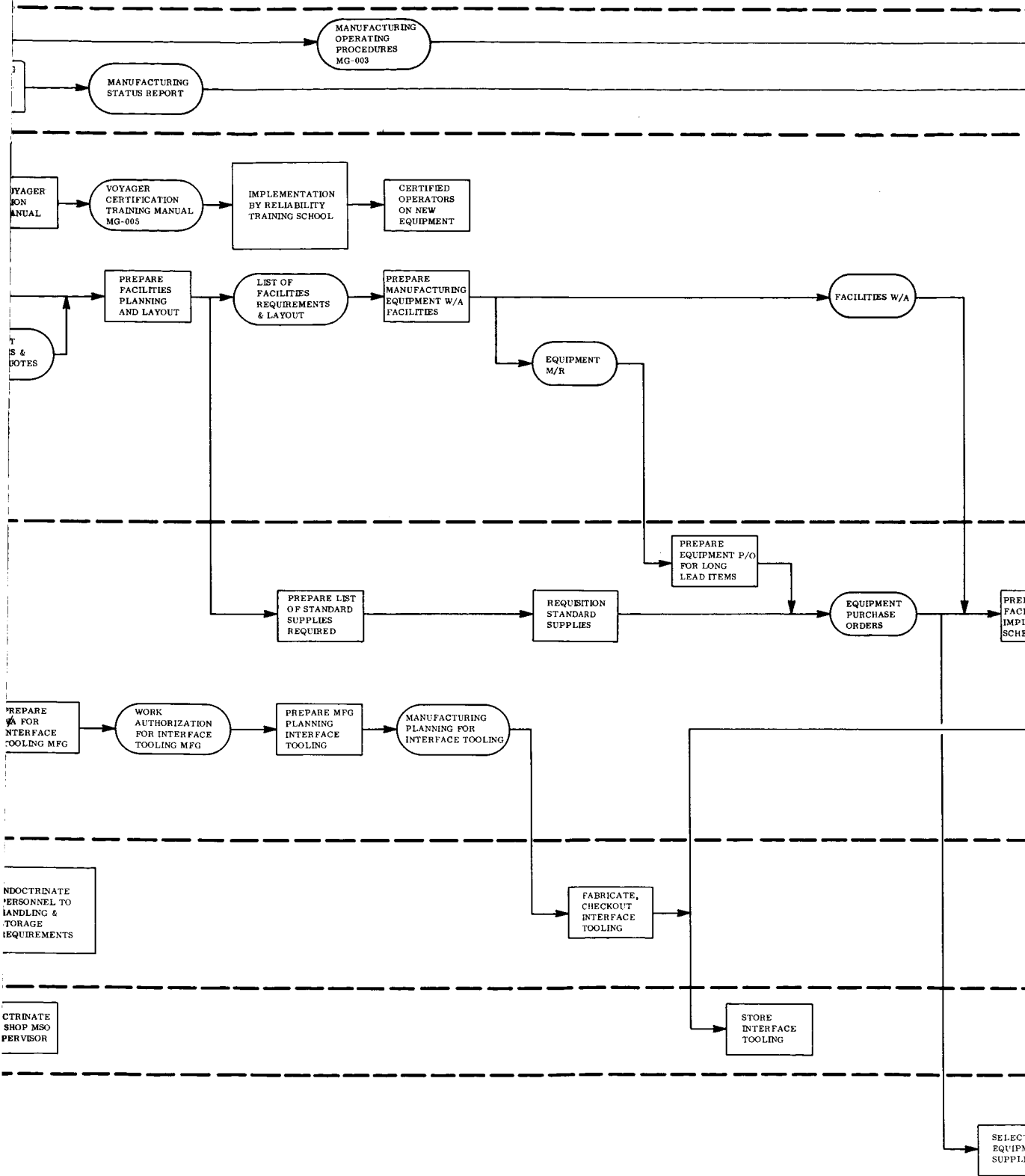
STOCK AND  
INVENTORY  
STORAGE

RECEIVING  
REPORT  
MG-018

STOCK  
INVENTORY  
REPORT MG-019

INDC  
MFG  
& SU

SUBCONTRACTOR  
VENDOR



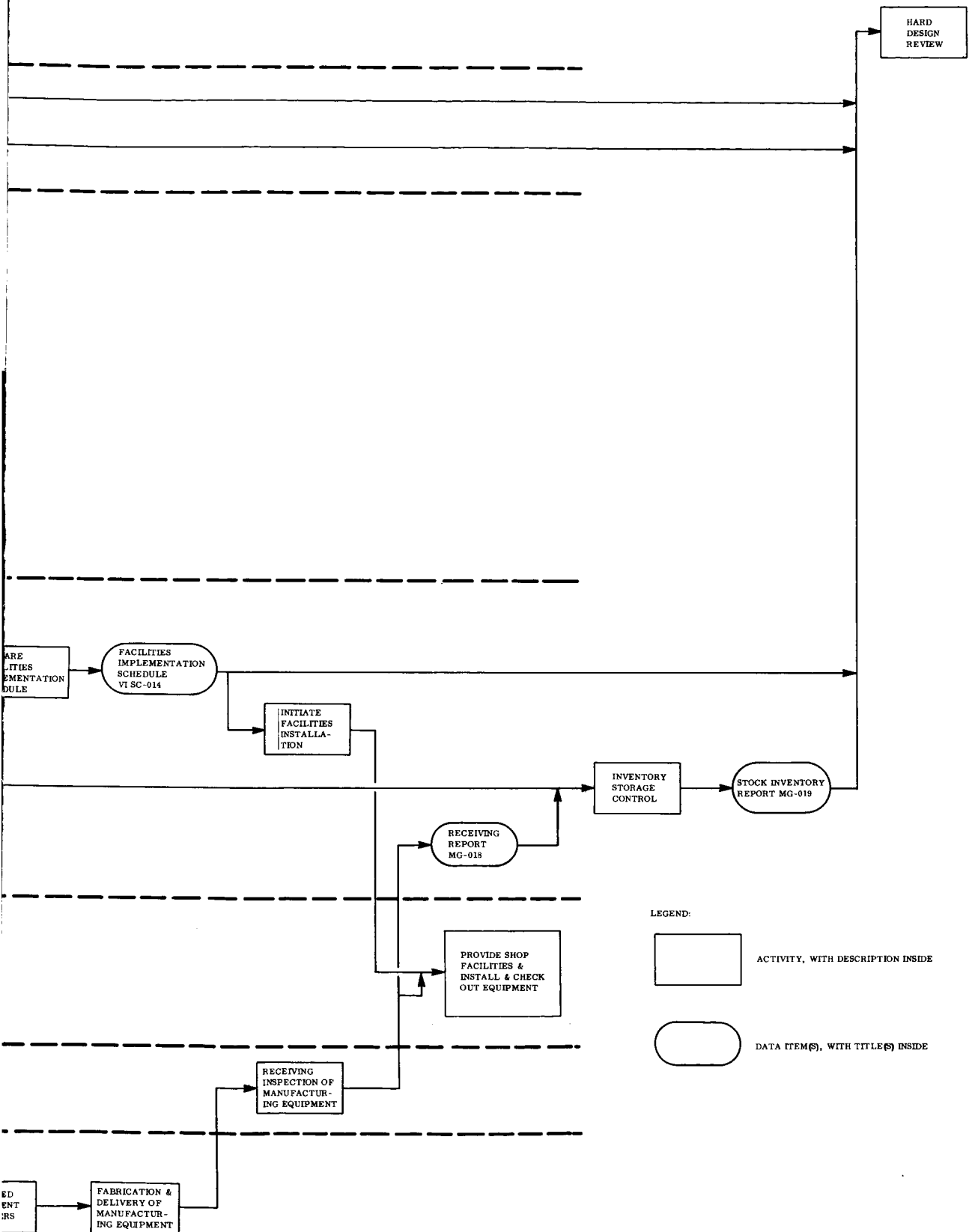
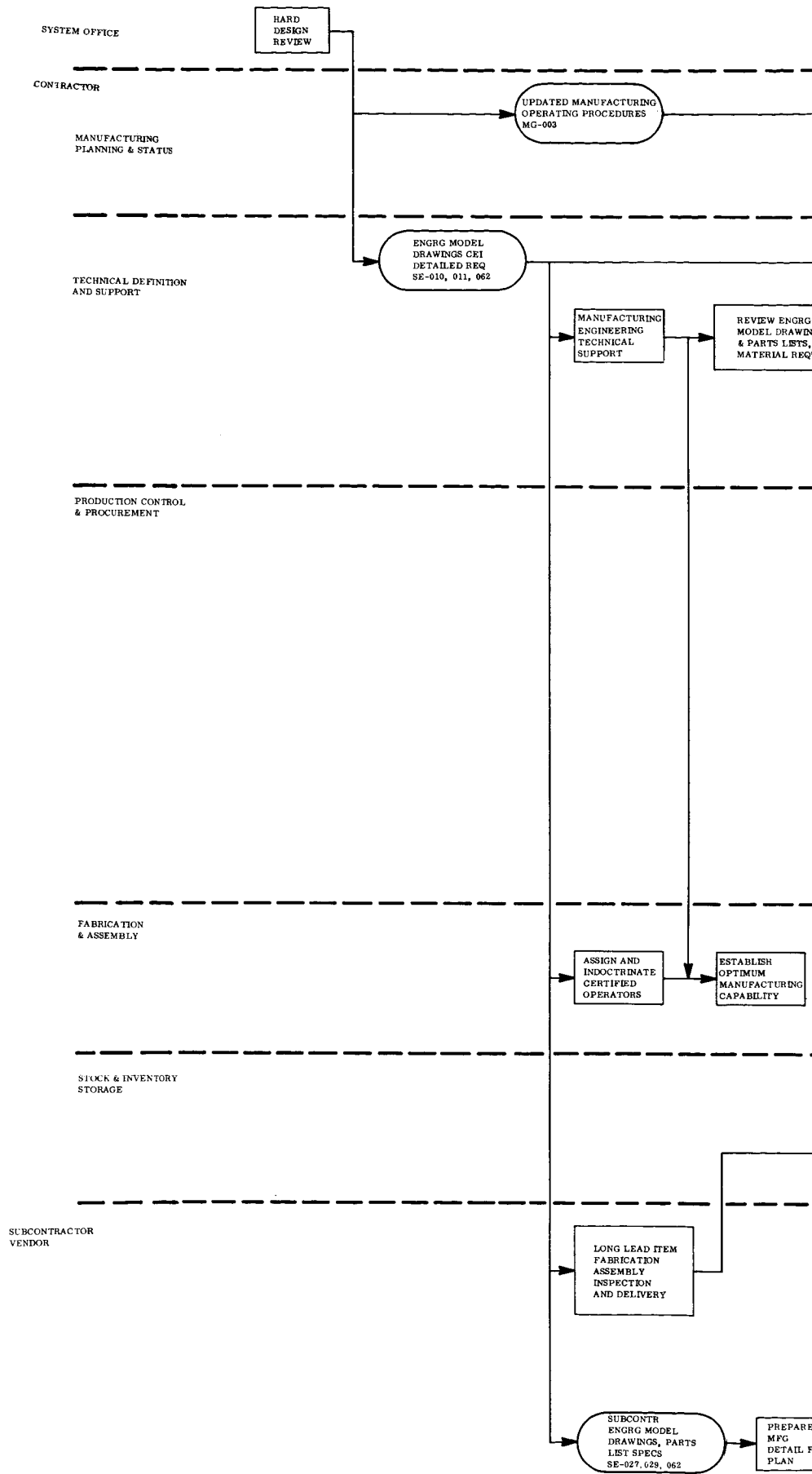


Figure C-3. Manufacturing User Flow Diagram - Preliminary Design Review Through Hard Design Review (Sheet 2 of 2)

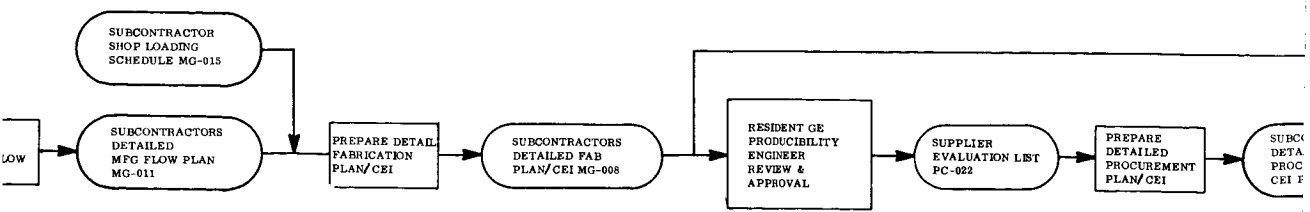
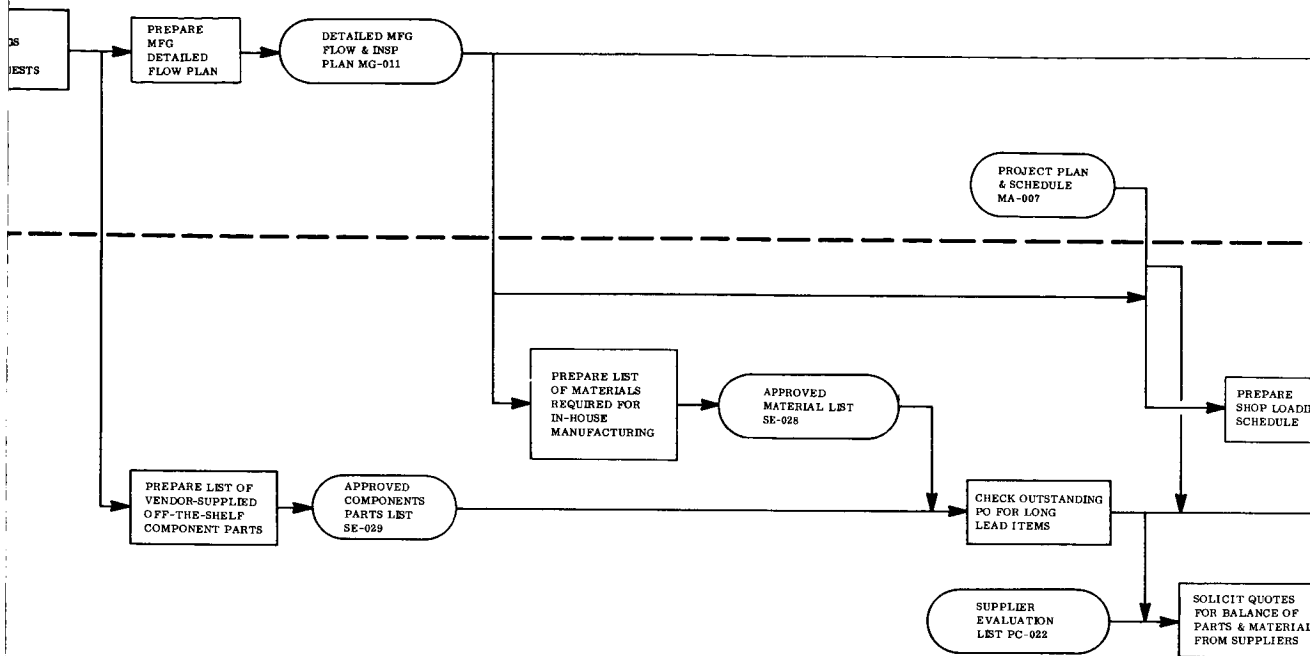
3-14-2

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3-15



3-16-1

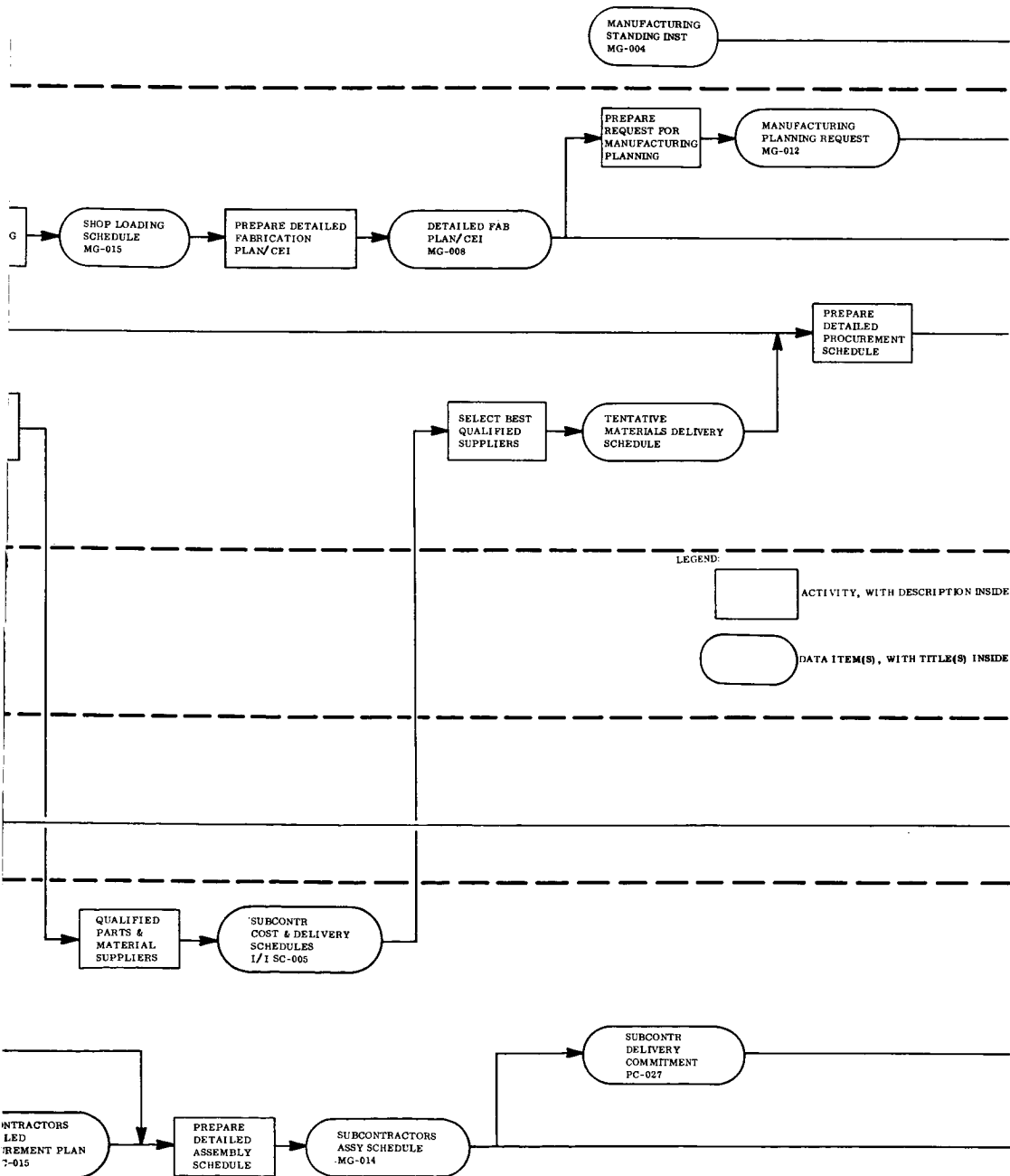


Figure C-4. Manufacturing User Flow Diagram - Hard Design Review Through Critical Design Review (Sheet 1 of 3)

SYSTEM OFFICE

CONTRACTOR

MANUFACTURING  
PLANNING & STATUS

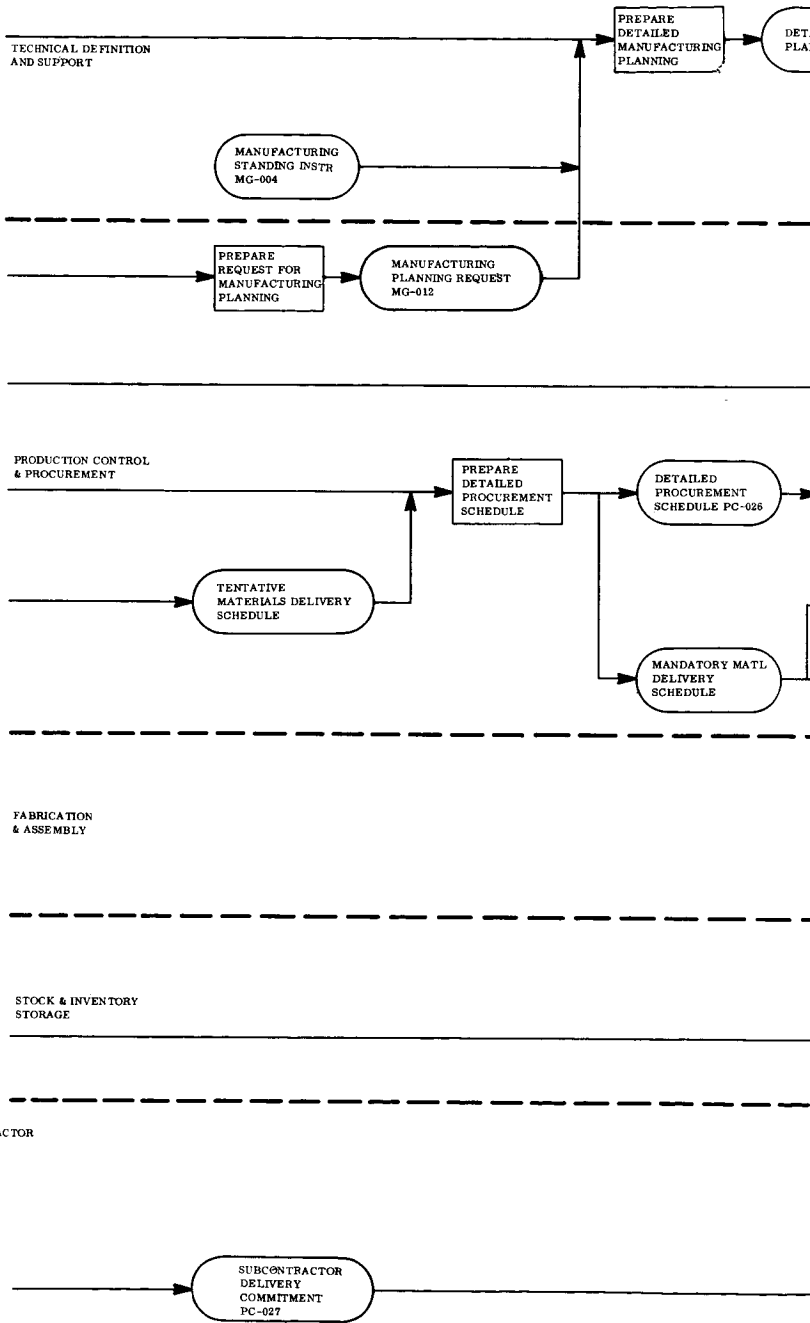
TECHNICAL DEFINITION  
AND SUPPORT

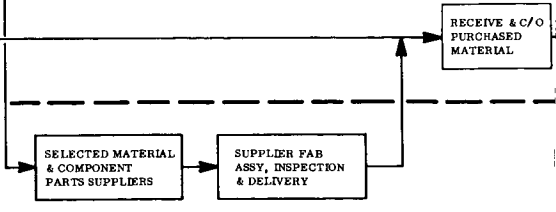
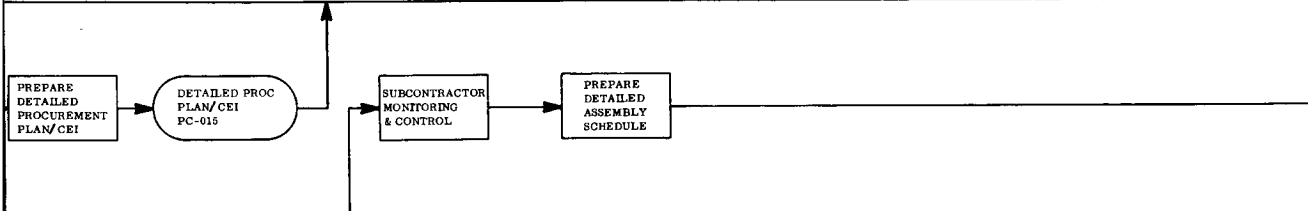
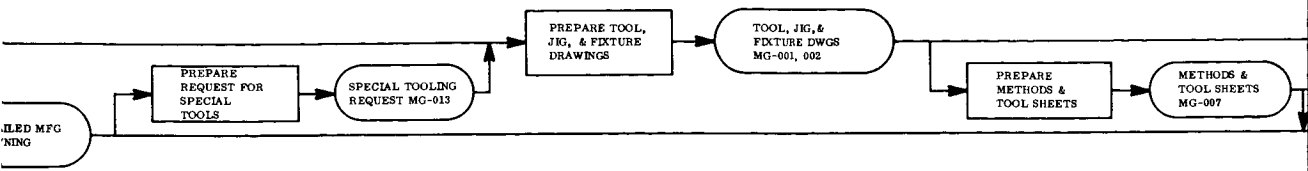
PRODUCTION CONTROL  
& PROCUREMENT

FABRICATION  
& ASSEMBLY

STOCK & INVENTORY  
STORAGE

SUBCONTRACTOR  
VENDOR





3-18-1

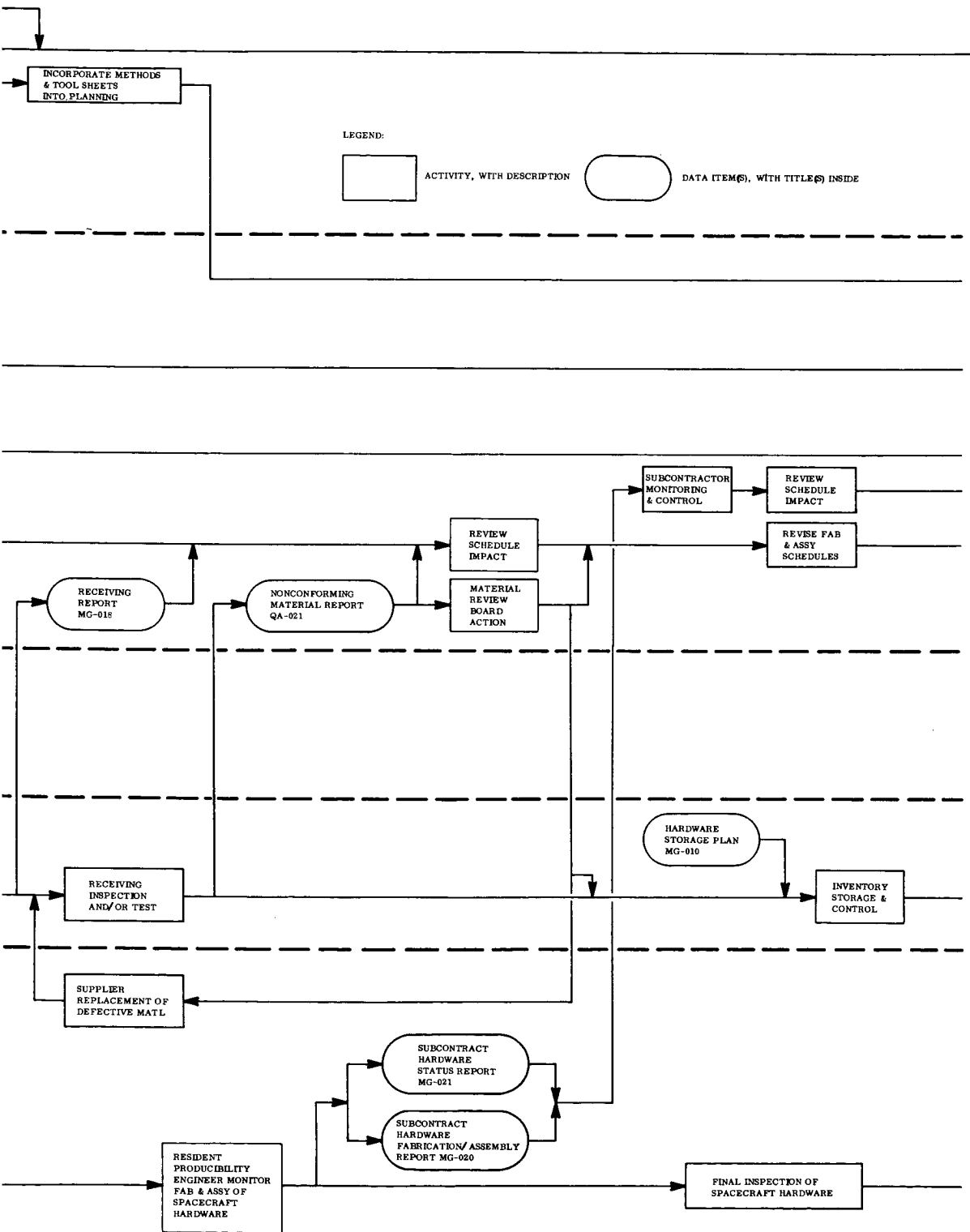


Figure C-4. Manufacturing User Flow Diagram - Hard Design Review Through Critical Design Review (Sheet 2 of 3)

3-18-2



SYSTEM OFFICE

CONTRACTOR

MANUFACTURING  
PLANNING & STATUS

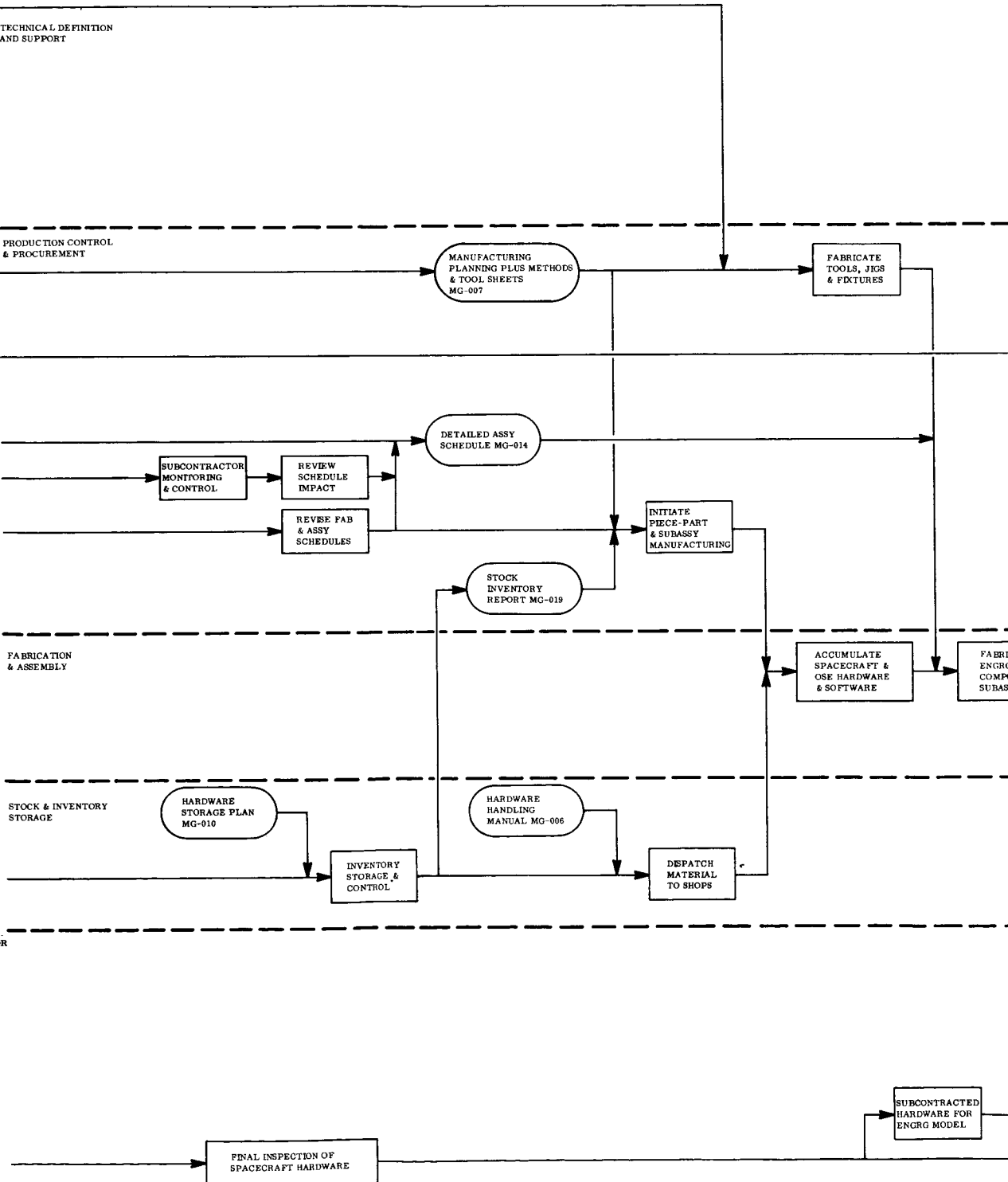
TECHNICAL DEFINITION  
AND SUPPORT

PRODUCTION CONTROL  
& PROCUREMENT

FABRICATION  
& ASSEMBLY

STOCK & INVENTORY  
STORAGE

SUBCONTRACTOR  
VENDOR



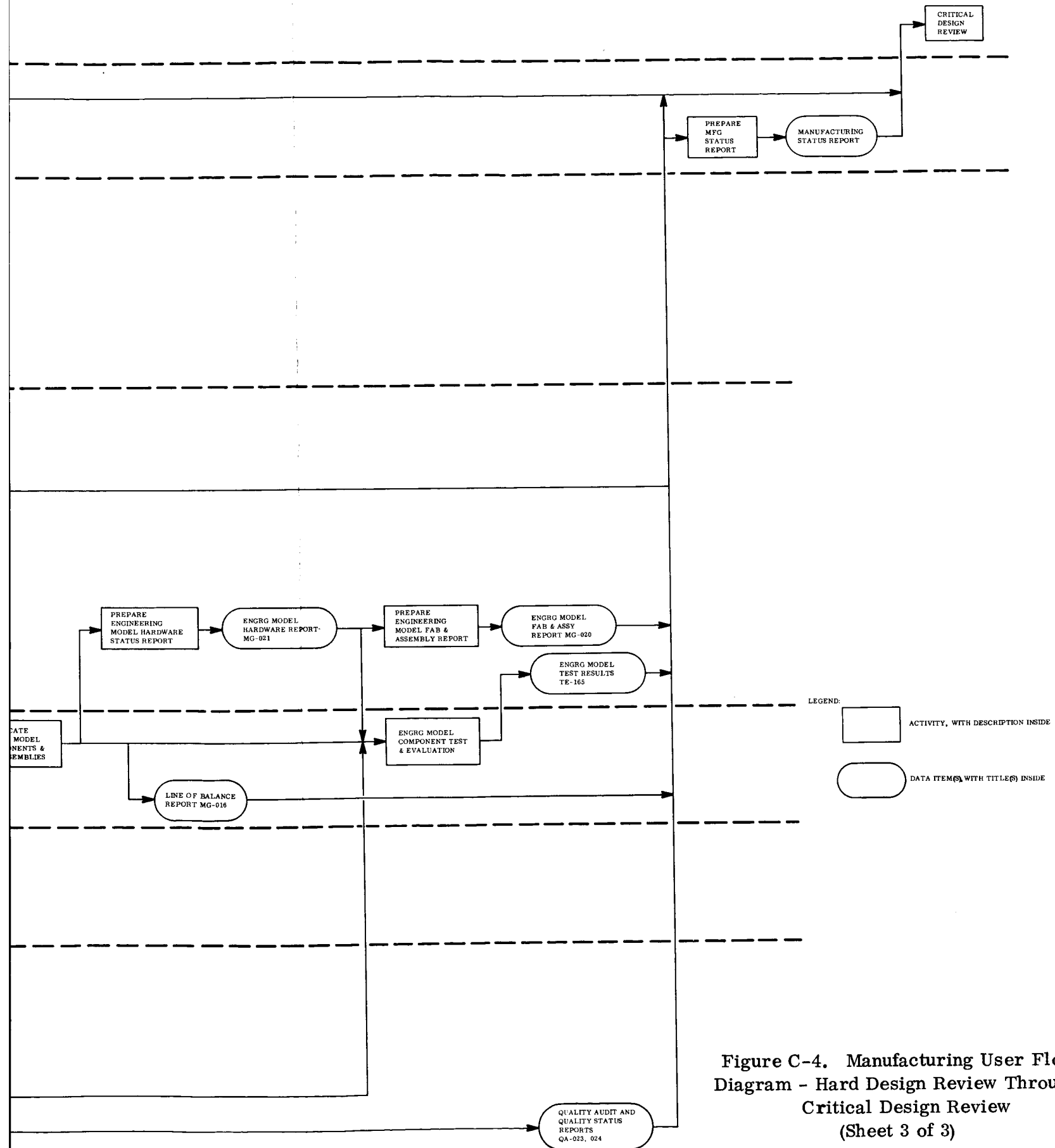
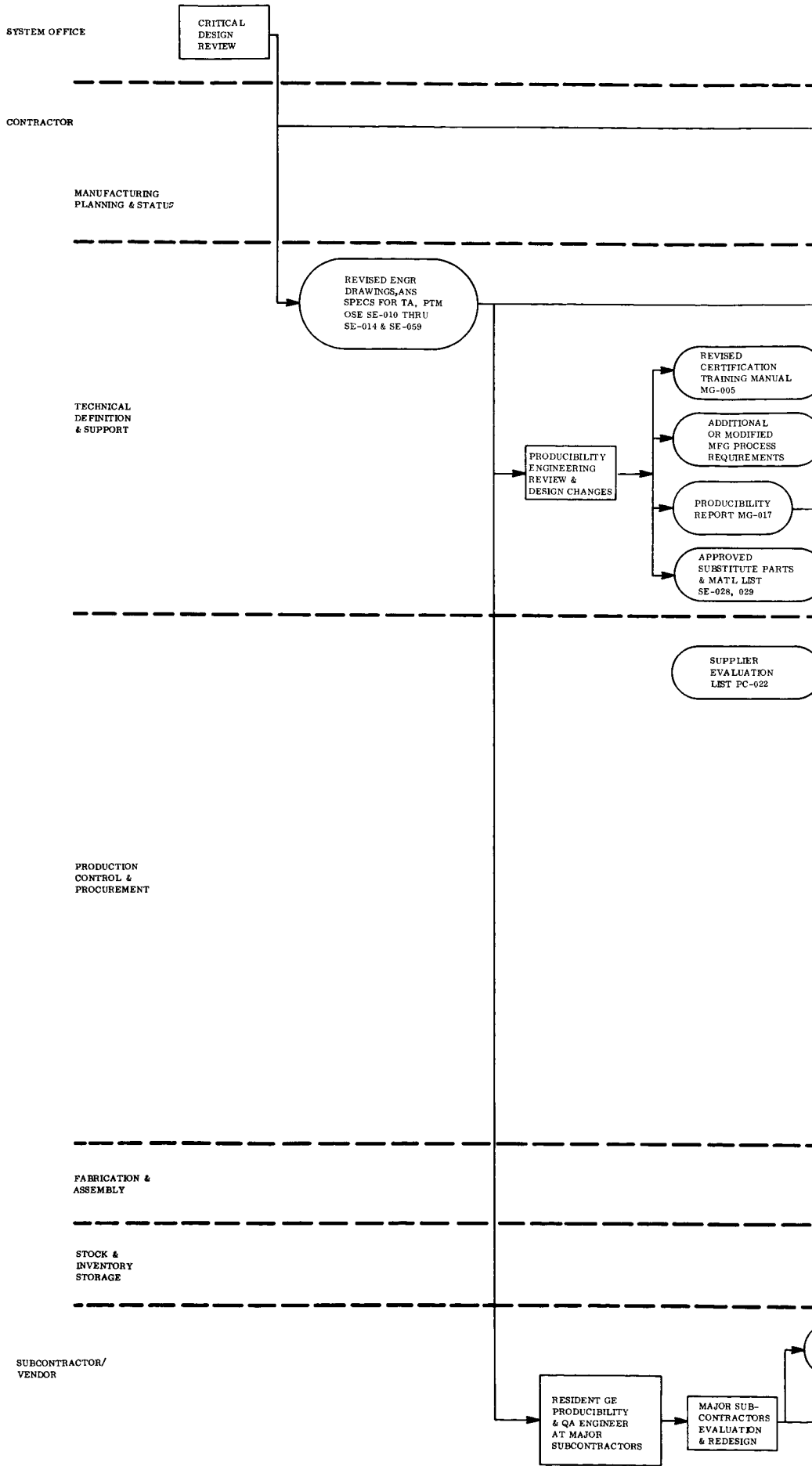
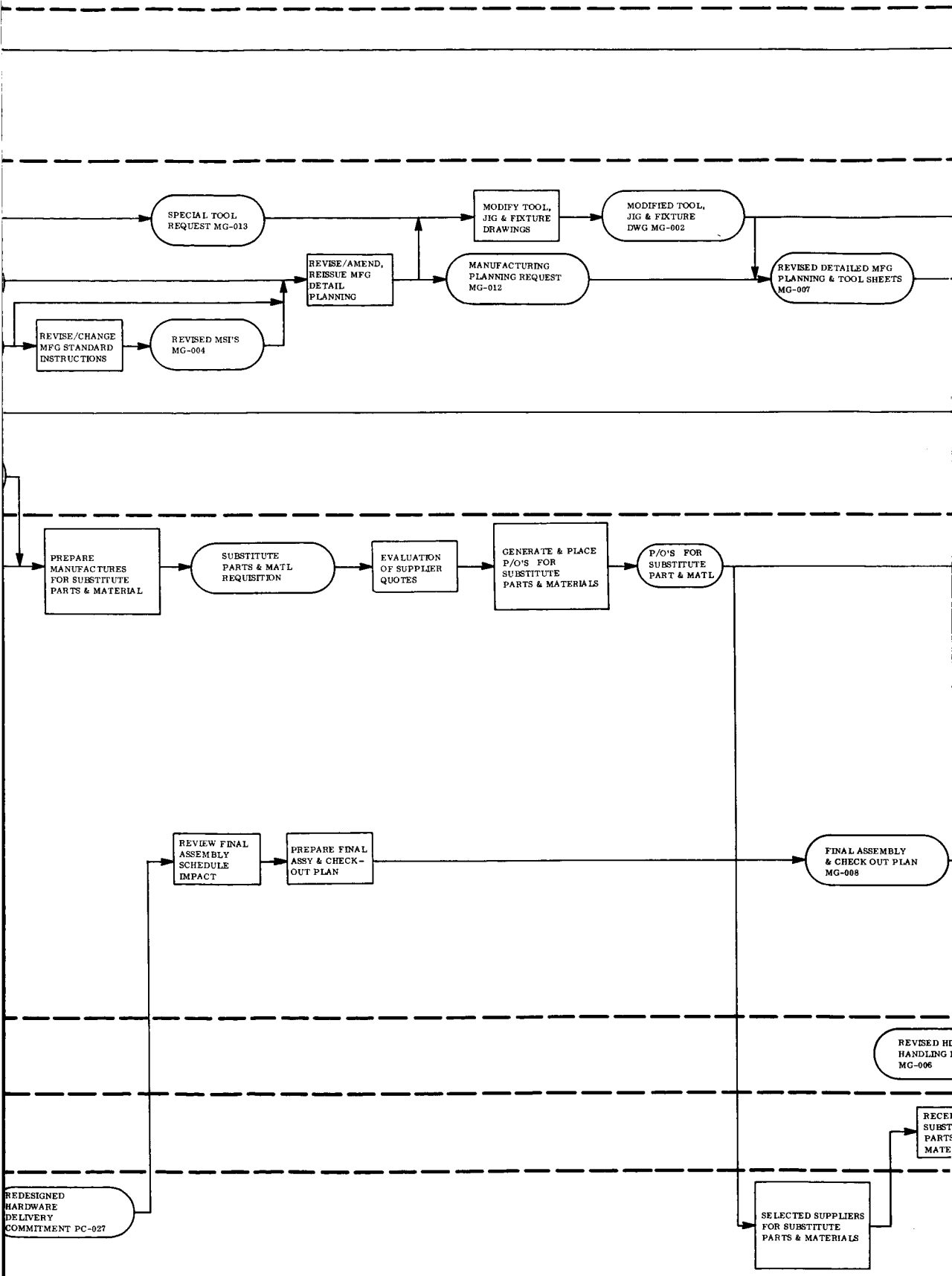


Figure C-4. Manufacturing User Flow Diagram - Hard Design Review Through Critical Design Review (Sheet 3 of 3)

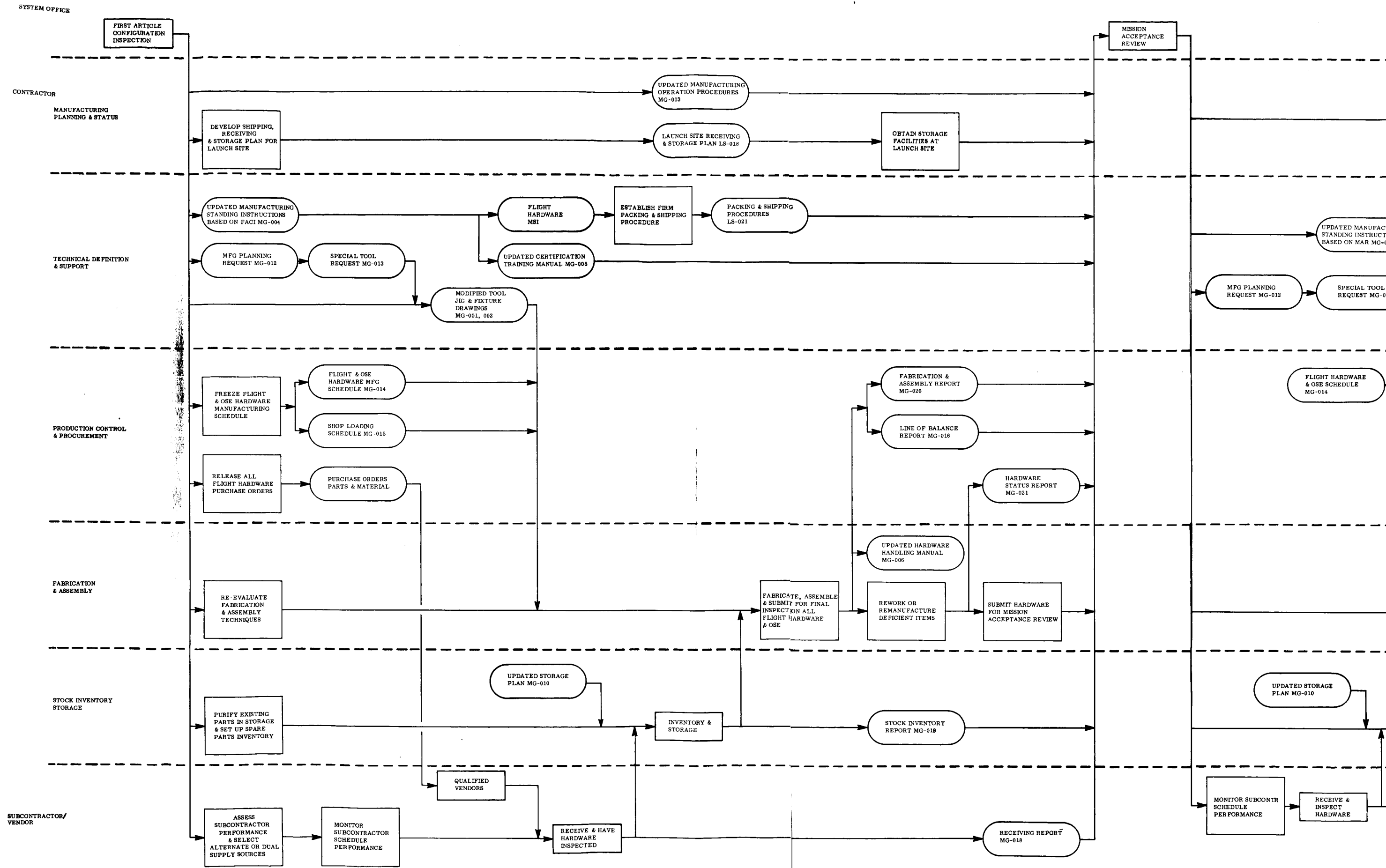


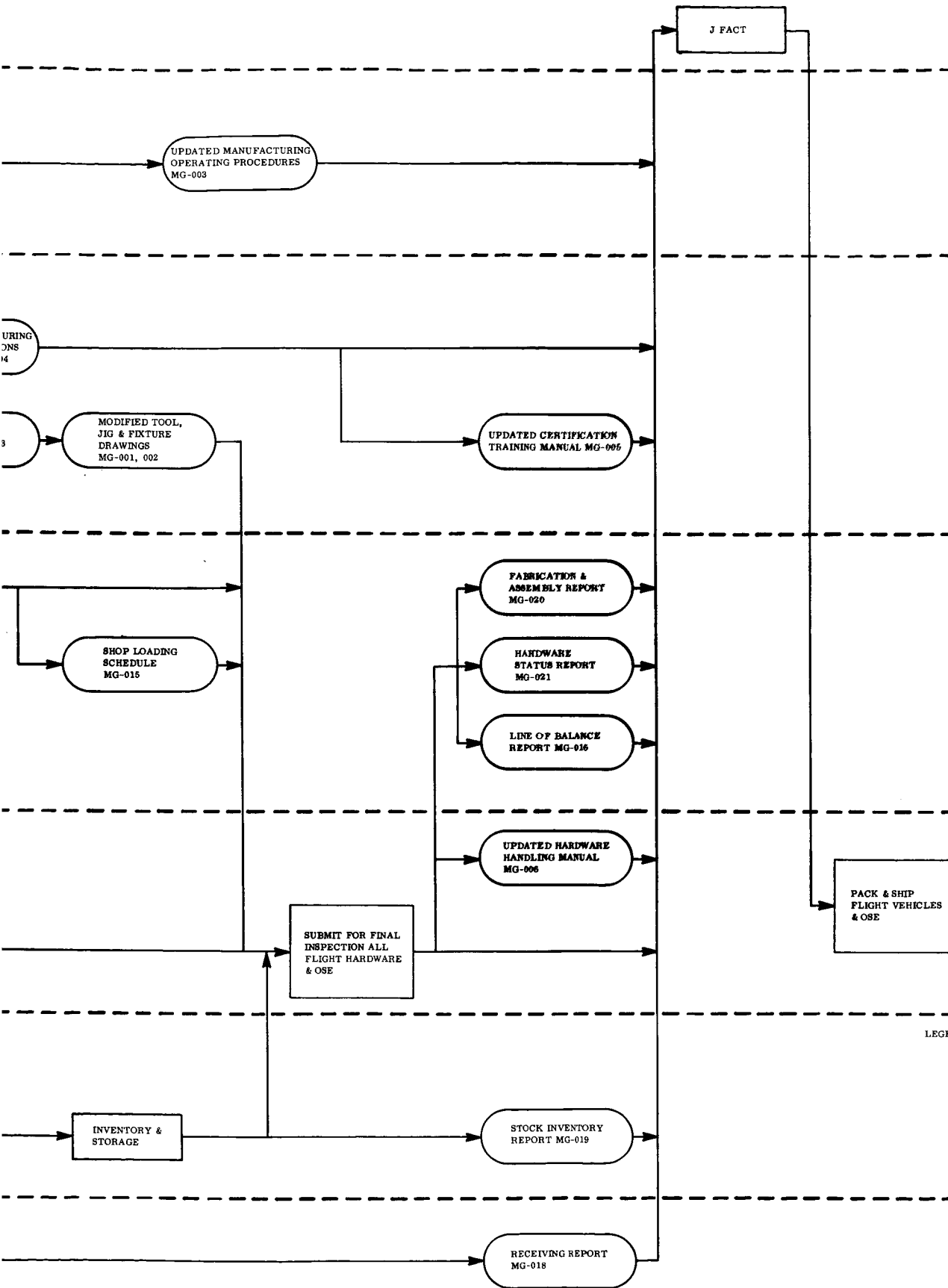


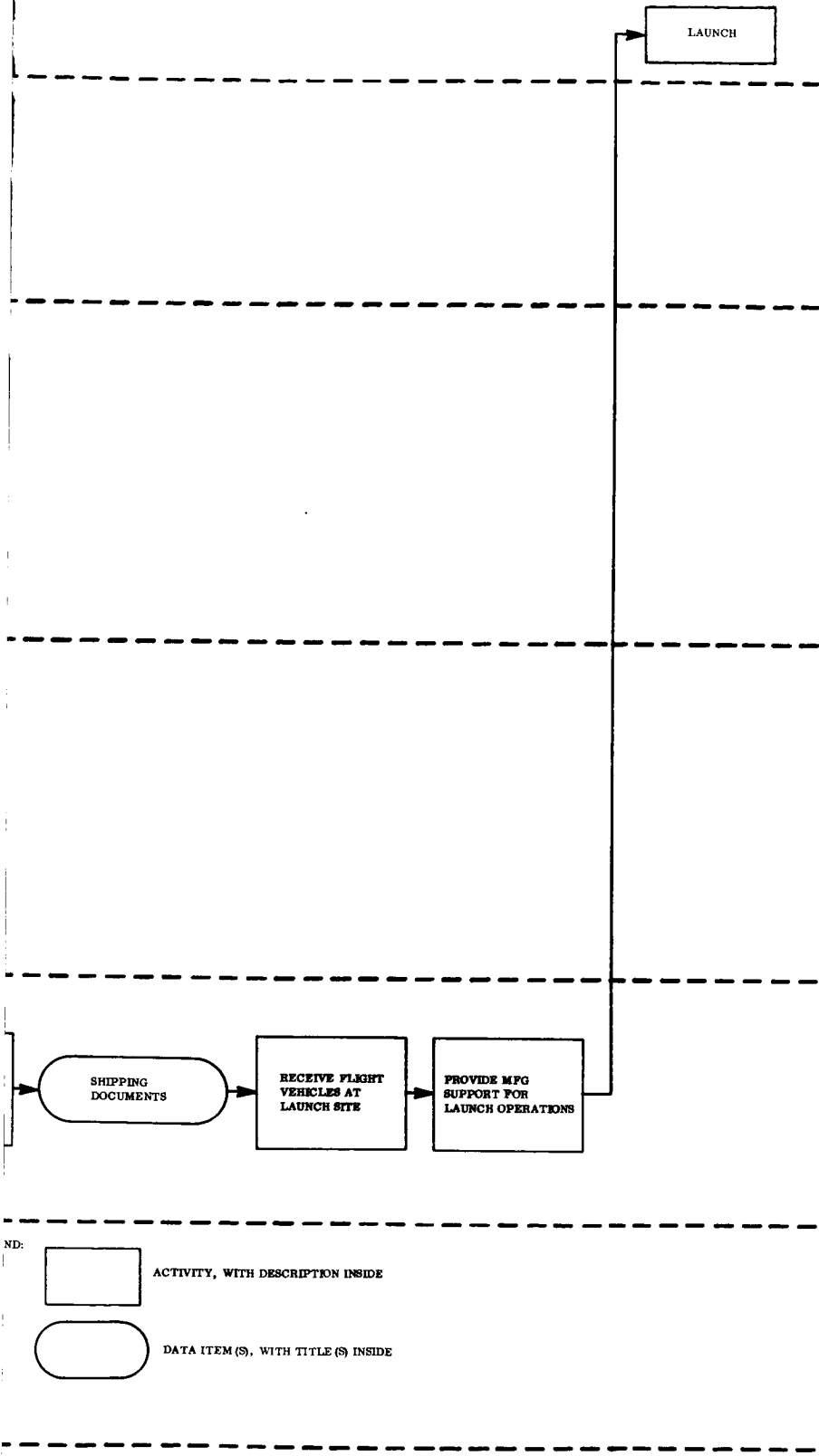













ND:

 ACTIVITY, WITH DESCRIPTION INSIDE


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

Figure C-6. Manufacturing User Flow Diagram - First Article Configuration Inspection Through Launch

~~3-29-24~~

3-29-3

## Manufacturing Data Requirement Descriptions

<u>DRD Number</u>	<u>Title</u>
MG-001	Drawings, Interface Tools, Jigs and Fixtures
MG-002	*Drawings, Tools, Jigs and Fixtures
MG-003	Procedure, Manufacturing Operating
MG-004	Manufacturing Standing Instruction (MI)
MG-005	*Manual, Certification and Training
MG-006	*Manual, Hardware Handling
MG-007	Record, Methods and Tool Sheet
MG-008	Sheet, Planning, Fabrication/Assembly
MG-009	Plan, Manufacturing
MG-010	Plan, Storage
MG-011	Plan, Manufacturing Detailed Flow and Inspection (Assembly Diagram)
MG-012	*Request, Manufacturing Planning
MG-013	*Request, Special Tool(s)
MG-014	Schedule, Detail Assembly
MG-015	Schedule, Shop Loading
MG-016	Report, Line of Balance
MG-017	*Report, Producibility
MG-018	*Report, Receiving
MG-019	*Report, Stock Inventory
MG-020	Report, Fabrication/Assembly
MG-021	Report, Hardware Status

\*Key Informal Data





DRD NO.:

MG-001

SPECIAL INSTRUCTIONS:

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

## OUTLINE OF CONTENTS:

1. These drawings shall include all the information necessary to fabricate the tooling. They will include sufficient information to satisfy the needs for acquiring identical items as defined in MIL-D-1000.
2. These drawings shall conform to the requirements for Form 2 drawings as specified in MIL-D-1000.
3. A set of drawings for tooling shall consist of, as appropriate, those drawings specified in MIL-STD-100 and shall meet the requirements specified therein.
4. Drawings shall be maintained current with the configuration of the tooling.

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

**GE EXHIBIT DRD MG-002**

VOYAGER DATA REQUIREMENT DESCRIPTION					DRD APPROVED BY:		DATE:	DATA CATEGORY:					
ORGANIZATION ORIGINATING REQUIREMENT:	CODE: MG	OFFICE RESPONSIBLE FOR DRD:	CODE:	DRD PREPARED BY: T. F. Smyth	DATE: 7/28/67	CONTRACT NO.:	DRD NO.: MG-002						
TITLE OF DOCUMENT:  <b>*DRAWINGS, TOOLS, JIGS AND FIXTURES</b>					ORGANIZATION RESPONSIBLE FOR DOCUMENT PREPARATION: <b>Manufacturing</b>		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: <input checked="" type="checkbox"/> CONTROL <input type="checkbox"/> ACTION <input type="checkbox"/> REFERENCE <input type="checkbox"/> INFORMATION					ORGANIZATION RESPONSIBLE FOR DOCUMENT STOWAGE:		NO. OF COPIES: <b>To be determined</b>						
USE OF DOCUMENT: Used for the manufacture of tools, jigs and fixtures, other than matched and coordinated tooling, which are used in the fabrication, assembly and installation of prime equipment.					ESTIMATED MANHOURS FOR SINGLE PREPARATION:		INFORMATION CUTOFF DATE OR MILESTONE:						
INTERRELATIONSHIP WITH OTHER DATA REQUIREMENTS: <b>SE-059, Drawings (Category E) for Manufacture and Procurement of Prime Hardware</b>					ESTIMATED COST (\$) FOR SINGLE PREPARATION:		DATE DATA DUE TO USER:						
					FREQUENCY OF ISSUE: <input type="checkbox"/> ANNUALLY <input type="checkbox"/> SEMI-ANNUALLY <input type="checkbox"/> QUARTERLY <input type="checkbox"/> BI-MONTHLY <input type="checkbox"/> MONTHLY <input type="checkbox"/> SEMI-MONTHLY <input type="checkbox"/> BI-WEEKLY <input type="checkbox"/> WEEKLY <input type="checkbox"/> DAILY <input checked="" type="checkbox"/> OTHERWISE, AS SPECIFIED <b>One time</b>		PUBLICATION DATE:  <b>SDR</b>  UPDATE (FREQUENCY OR MILESTONE): <b>As required Thru MAR</b>  ESTIMATED EXPIRATION DATE:						
CLASSIFICATION: <input type="checkbox"/> SECRET <input type="checkbox"/> GROUP 1 <input type="checkbox"/> CONFIDENTIAL <input type="checkbox"/> GROUP 2 <input type="checkbox"/> SECRET RESTRICTED DATA <input type="checkbox"/> GROUP 3 <input type="checkbox"/> CONFIDENTIAL RESTRICTED DATA <input type="checkbox"/> GROUP 4 <input checked="" type="checkbox"/> UNCLASSIFIED <input type="checkbox"/> PROPRIETARY <input type="checkbox"/> PROJECT DISCREET <input type="checkbox"/> PUBLIC DOMAIN <input type="checkbox"/> NOFORN <input type="checkbox"/> SPECIAL HANDLING <input type="checkbox"/> NASA DISCREET <input type="checkbox"/> JPL DISCREET					FORM OF DATA: <input type="checkbox"/> PRINTED DOCUMENT <input type="checkbox"/> CHART <input type="checkbox"/> DIAGRAM <input checked="" type="checkbox"/> DRAWING <input type="checkbox"/> FILM (STATIC OR MOTION) <input type="checkbox"/> ILLUSTRATION <input type="checkbox"/> MODEL <input type="checkbox"/> RECORDING (TAPE OR DISC) <input type="checkbox"/> COMPUTER CARD <input type="checkbox"/> COMPUTER TAPE <input type="checkbox"/> MICROFILM (W/OR W/O CARD) <input type="checkbox"/> OTHER			KIND OF DATA: <input type="checkbox"/> ABSTRACT <input type="checkbox"/> INSTRUCTION <input type="checkbox"/> BROCHURE <input type="checkbox"/> LETTER <input type="checkbox"/> BULLETIN <input type="checkbox"/> LIST <input type="checkbox"/> CATALOG <input type="checkbox"/> LOG <input type="checkbox"/> CONTRACT <input type="checkbox"/> MANUAL <input type="checkbox"/> DIRECTIVE <input type="checkbox"/> MEMORANDUM <input checked="" type="checkbox"/> DISCLOSURE <input type="checkbox"/> MINUTES <input type="checkbox"/> ENGINEERING CHANGE ORDER <input type="checkbox"/> PLAN <input type="checkbox"/> REQUEST FOR ENGINEERING CHANGE PROPOSAL <input type="checkbox"/> REGULATION <input type="checkbox"/> ENGINEERING CHANGE PROPOSAL <input type="checkbox"/> REPORT <input type="checkbox"/> ENGINEERING CHANGE PROPOSAL <input type="checkbox"/> SCHEDULE <input type="checkbox"/> HANDBOOK <input type="checkbox"/> SPECIFICATION <input type="checkbox"/> INDEX <input type="checkbox"/> STANDARD <input type="checkbox"/> <input type="checkbox"/> VOUCHER		REFERENCE DOCUMENTS:  <b>MIL-D-1000</b>			
REVIEWS AND/OR APPROVALS REQUIRED: (LIST IN ORDER OF SUBMITTAL)					APPLICABLE STANDARDS:  <b>MIL-STD-100</b>								
SUBMIT FOR REVIEW TO: _____					DRAFT								
BY _____					DATE _____								
SUBMIT FOR APPROVAL TO: _____					PREPUBLICATION PROOF								
BY <b>Manager, Manufacturing</b>					DATE _____								

SPECIAL INSTRUCTIONS:

DRD NO.:

MG-002

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

## OUTLINE OF CONTENTS:

1. These drawings shall include all the information necessary to fabricate the tooling as well as certification and verification of their proper calibration and suitability.
2. These drawings shall consist of, as appropriate, those drawings specified in MIL-STD-100 and shall meet the requirements specified therein.
3. Drawings may be prepared in conformance to the Form 3 requirements of MIL-D-1000.
4. The following relaxed provisions are applicable:
  - a. Noncritical dimensions may be indicated as nominal, minimum or maximum.
  - b. Noncritical surfaces need not be indicated.
  - c. Common hardware and materials may be specified by their commercial designation.
  - d. Marking of parts may be omitted.
  - e. Scale need not be maintained.
  - f. Free hand drafting may be used if desired.

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



DRD NO.:  
MG-003

SPECIAL INSTRUCTIONS:

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

OUTLINE OF CONTENTS:

The procedures define the internal administrative and functional manufacturing responsibilities to meet the overall program objectives and requirements and consist of the following:

1. Purpose
2. Definitions of terminology
3. Detailed description of procedure
4. Number of procedure
5. Date issued
6. Revision status

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



## SPECIAL INSTRUCTIONS:

DRD NO.:

MG-004

The approved parts list will be the basis for determining materials to be specified in the MSI for use in the fabrication processes.

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

## OUTLINE OF CONTENTS:

1. Subject and scope
2. Related material and process specifications
3. Materials and equipment to be used
4. Safety precautions
5. Detailed description of the process, including the use material and the critical control procedures
6. Criteria for in-process and final inspection of process results

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





DRD NO.:

MG-005

SPECIAL INSTRUCTIONS:

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

OUTLINE OF CONTENTS:

This document will define the following:

1. Outlines all processes requiring training certification.
2. Course content.
3. Identifies certification and recertification periods for the various processes.
4. Instructions for operator training and good workmanship acceptance criteria are based on approved NASA and military training school documents.
5. Pictorial illustration for defining good workmanship.
6. Delineates approved ancillary materials to support the process and the approved process equipment.
7. Defines the approved training time requirements for certification.

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



SPECIAL INSTRUCTIONS:

DRD NO.:  
MG-006

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

OUTLINE OF CONTENTS:

This document will define the following:

- |   |  |
|---|--|
| --Safety for personnel and the hardware | --Electrical and chain hoists            |
| --Lifting and turnover slings           | --Rider fork and pallet trucks           |
| --Transport and assembly dollies        | --Handling and installation fixtures     |
| --Storage and transportation containers | --Sketches and drawings will be included |

The manual specifies the procedure that must be used for handling hardware. It lists in specific detail the "Do" and the "Do Not" methods that will be used. The how to accomplish is identified to the various subassembly and assembly categories or part number if applicable.

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



## VOYAGER DATA REQUIREMENT DESCRIPTION - 2ND SHEET

DRD NO.:  
MG-007

## SPECIAL INSTRUCTIONS:

Sketches are recommended to describe more clearly the operation and/or use of the tool. A second sheet is supplied with the form for this purpose.

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

## OUTLINE OF CONTENTS:

1. Drawing number of parts or assemblies upon which the operation or tool was used.
2. Operation name, i. e., milling, drilling, etc.
3. Work station designation.
4. Operation cycle time.
5. Detailed description of method to be employed including instructions for use of tools.
6. Revision status of the record sheet and current issue date.
7. Planner's name (original).
8. Date planned (original).

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

VOYAGER DATA REQUIREMENT DESCRIPTION				DRD APPROVED BY:		DATE:	DATA CATEGORY:
ORGANIZATION ORIGINATING REQUIREMENT:	CODE: MG	OFFICE RESPONSIBLE FOR DRD:	CODE:	DRD PREPARED BY: T. F. Smyth	DATE: 7/28/67	CONTRACT NO.:	DRD NO.: MG-008
TITLE OF DOCUMENT:  SHEETS, PLANNING, FABRICATION/ASSEMBLY				ORGANIZATION RESPONSIBLE FOR DOCUMENT PREPARATION: Manufacturing		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: <input checked="" type="checkbox"/> CONTROL <input type="checkbox"/> ACTION <input type="checkbox"/> REFERENCE <input type="checkbox"/> INFORMATION				ORGANIZATION RESPONSIBLE FOR DOCUMENT STOWAGE:		NO. OF COPIES: 3	
USE OF DOCUMENT:  A detailed step-by-step instruction for the performance of a fabrication or assembly sequence, including in-process and final inspection steps.				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: MG-004, Manufacturing Standing Instructions (MSIs) MG-009, Plan, Manufacturing MG-012, Request, Manufacturing Planning SE-006, Plan, Cleanliness Control SE-059, Drawings (Category E) for Manufacture and Procurement of Prime Equipment				FREQUENCY OF ISSUE: <input type="checkbox"/> ANNUALLY <input type="checkbox"/> SEMI-ANNUALLY <input type="checkbox"/> QUARTERLY <input type="checkbox"/> BI-MONTHLY <input type="checkbox"/> MONTHLY <input type="checkbox"/> SEMI-MONTHLY <input type="checkbox"/> BI-WEEKLY <input type="checkbox"/> WEEKLY <input type="checkbox"/> DAILY <input checked="" type="checkbox"/> OTHERWISE, AS SPECIFIED As required		PUBLICATION DATE:  PDR	
				UPDATE (FREQUENCY OR MILESTONE): Not applicable		ESTIMATED EXPIRATION DATE:	
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FORM OF DATA: <input checked="" type="checkbox"/> PRINTED DOCUMENT <input type="checkbox"/> CHART <input type="checkbox"/> DIAGRAM <input type="checkbox"/> DRAWING <input type="checkbox"/> FILM (STATIC OR MOTION) <input type="checkbox"/> ILLUSTRATION <input type="checkbox"/> MODEL <input type="checkbox"/> RECORDING (TAPE OR DISC) <input type="checkbox"/> COMPUTER CARD <input type="checkbox"/> COMPUTER TAPE <input type="checkbox"/> MICROFILM (W/OR W/O CARD) <input type="checkbox"/> OTHER		KIND OF DATA: <input type="checkbox"/> ABSTRACT <input type="checkbox"/> BROCHURE <input type="checkbox"/> BULLETIN <input type="checkbox"/> CATALOG <input type="checkbox"/> CONTRACT <input type="checkbox"/> DIRECTIVE <input type="checkbox"/> DISCLOSURE <input type="checkbox"/> ENGINEERING CHANGE ORDER <input type="checkbox"/> REQUEST FOR ENGINEERING CHANGE PROPOSAL <input type="checkbox"/> ENGINEERING CHANGE PROPOSAL <input type="checkbox"/> HANDBOOK <input type="checkbox"/> INDEX		<input type="checkbox"/> INSTRUCTION <input type="checkbox"/> LETTER <input type="checkbox"/> LIST <input type="checkbox"/> LOG <input type="checkbox"/> MANUAL <input type="checkbox"/> MEMORANDUM <input type="checkbox"/> MINUTES <input checked="" type="checkbox"/> PLAN <input type="checkbox"/> PROCEDURE <input type="checkbox"/> REGULATION <input type="checkbox"/> REPORT <input type="checkbox"/> SCHEDULE <input type="checkbox"/> SPECIFICATION <input type="checkbox"/> STANDARD <input type="checkbox"/> VOUCHER		REFERENCE DOCUMENTS:	
REVIEWS AND/OR APPROVALS REQUIRED: (LIST IN ORDER OF SUBMITTAL)				APPLICABLE STANDARDS:			
				DRAFT		DATE	
SUBMIT FOR REVIEW TO: _____		BY _____		_____		BY _____	
SUBMIT FOR APPROVAL TO: _____		BY _____		_____		BY _____	
		Manager, Manufacturing		_____		_____	

DRD NO.:

MG-008

## SPECIAL INSTRUCTIONS:

Changes to Planning, Fabrication/Assembly are made in response to alteration notices (AN's) of hardware drawing changes. Changes are recorded on the change record sheet.

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

## OUTLINE OF CONTENTS:

1. Part or assembly drawing reference
2. Program name
3. Planner's name
4. Planning bill of material (if required)
5. Tool and fixture list
6. Work station designation
7. Operation standard times
8. Detailed step-by-step fabrication or assembly instructions
9. Detailed step-by-step inspection instructions
10. Method sheets (as required)
11. Change record sheet

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



VOYAGER DATA REQUIREMENT DESCRIPTION				DRD APPROVED BY:		DATE:	DATA CATEGORY:	
ORGANIZATION ORIGINATING REQUIREMENT:	CODE: <b>MG</b>	OFFICE RESPONSIBLE FOR DRD:	CODE:	DRD PREPARED BY: <b>T. F. Smyth</b>	DATE: <b>7/28/67</b>	CONTRACT NO.:	DRD NO.: <b>MG-009</b>	
TITLE OF DOCUMENT:  <b>PLAN, MANUFACTURING</b>				ORGANIZATION RESPONSIBLE FOR DOCUMENT PREPARATION: <b>Manufacturing</b>		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: <input checked="" type="checkbox"/> CONTROL <input type="checkbox"/> ACTION <input type="checkbox"/> REFERENCE <input type="checkbox"/> INFORMATION				ORGANIZATION RESPONSIBLE FOR DOCUMENT STORAGE:		NO. OF COPIES: <b>20</b>		
USE OF DOCUMENT: <b>The Manufacturing Plan defines the system contractors modus operandi for the procurement, fabrication and assembly of prime hardware to meet the quality and reliability requirements while fulfilling the schedule requirements. It defines the organizational elements within manufacturing and their functional requirements.</b>				ESTIMATED MANHOURS FOR SINGLE PREPARATION:		INFORMATION CUTOFF DATE OR MILESTONE:		
				ESTIMATED COST (\$) FOR SINGLE PREPARATION:		DATE DATA DUE TO USER:		
				FREQUENCY OF ISSUE: <input type="checkbox"/> ANNUALLY <input type="checkbox"/> SEMI-ANNUALLY <input type="checkbox"/> QUARTERLY <input type="checkbox"/> BI-MONTHLY <input type="checkbox"/> MONTHLY <input type="checkbox"/> SEMI-MONTHLY <input type="checkbox"/> BI-WEEKLY <input type="checkbox"/> WEEKLY <input type="checkbox"/> DAILY <input checked="" type="checkbox"/> OTHERWISE, AS SPECIFIED <b>Maintain current</b>		PUBLICATION DATE:  <b>SDR</b>		
INTERRELATIONSHIP WITH OTHER DATA REQUIREMENTS: <b>PC-015, Plan, Procurement QA-009, Plan, Quality Assurance Program RA-009, Plan, Reliability Program SC-002, Schedule, Project Level (PERT)</b>				UPDATE (FREQUENCY OR MILESTONE): <b>As required thru HDR</b>		ESTIMATED EXPIRATION DATE:		
				CLASSIFICATION: <input type="checkbox"/> SECRET <input type="checkbox"/> CONFIDENTIAL <input type="checkbox"/> SECRET RESTRICTED DATA <input type="checkbox"/> CONFIDENTIAL RESTRICTED DATA <input checked="" type="checkbox"/> UNCLASSIFIED		<input type="checkbox"/> GROUP 1 <input type="checkbox"/> GROUP 2 <input type="checkbox"/> GROUP 3 <input type="checkbox"/> GROUP 4 <input type="checkbox"/> PROPRIETARY <input type="checkbox"/> PUBLIC DOMAIN		<input type="checkbox"/> SPECIAL HANDLING <input type="checkbox"/> NASA DISCREET <input type="checkbox"/> JPL DISCREET <input type="checkbox"/> PROJECT DISCREET <input type="checkbox"/> NOFORN
FORM OF DATA: <input checked="" type="checkbox"/> PRINTED DOCUMENT <input type="checkbox"/> CHART <input type="checkbox"/> DIAGRAM <input type="checkbox"/> DRAWING <input type="checkbox"/> FILM (STATIC OR MOTION) <input type="checkbox"/> ILLUSTRATION <input type="checkbox"/> MODEL <input type="checkbox"/> RECORDING (TAPE OR DISC) <input type="checkbox"/> COMPUTER CARD <input type="checkbox"/> COMPUTER TAPE <input type="checkbox"/> MICROFILM (W/OR W/O CARD) <input type="checkbox"/> OTHER		KIND OF DATA: <input type="checkbox"/> ABSTRACT <input type="checkbox"/> BROCHURE <input type="checkbox"/> BULLETIN <input type="checkbox"/> CATALOG <input type="checkbox"/> CONTRACT <input type="checkbox"/> DIRECTIVE <input type="checkbox"/> DISCLOSURE <input type="checkbox"/> ENGINEERING CHANGE ORDER <input type="checkbox"/> REQUEST FOR ENGINEERING CHANGE PROPOSAL <input type="checkbox"/> ENGINEERING CHANGE PROPOSAL <input type="checkbox"/> HANDBOOK <input type="checkbox"/> INDEX		<input type="checkbox"/> INSTRUCTION <input type="checkbox"/> LETTER <input type="checkbox"/> LIST <input type="checkbox"/> LOG <input type="checkbox"/> MANUAL <input type="checkbox"/> MEMORANDUM <input type="checkbox"/> MINUTES <input checked="" type="checkbox"/> PLAN <input type="checkbox"/> PROCEDURE <input type="checkbox"/> REGULATION <input type="checkbox"/> REPORT <input type="checkbox"/> SCHEDULE <input type="checkbox"/> SPECIFICATION <input type="checkbox"/> STANDARD <input type="checkbox"/> VOUCHER		REFERENCE DOCUMENTS:		
						APPLICABLE STANDARDS:		
REVIEWS AND/OR APPROVALS REQUIRED: (LIST IN ORDER OF SUBMITTAL)								
		DRAFT	DATE	PREPUBLICATION PROOF		DATE		
SUBMIT FOR REVIEW TO:		_____	_____	_____		_____		
		BY	_____	_____		BY _____		
		_____	_____	_____		_____		
		BY	_____	_____		BY _____		
SUBMIT FOR APPROVAL TO:		_____	_____	_____		_____		
		<b>Project Manager</b>	_____	_____		_____		

## VOYAGER DATA REQUIREMENT DESCRIPTION - 2ND SHEET

SPECIAL INSTRUCTIONS:

DRD NO.:  
MG-009

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

OUTLINE OF CONTENTS:

The Manufacturing Plan defines the following:

1. Functional responsibilities and organizational elements
2. Facilities required
3. Manpower levels required
4. Program, detail assembly, shop and procurement schedules that will be used
5. Labor reporting system that will be used
6. Documentation systems (formal and informal)
7. Stock keeping philosophy and method of charging materials and standard stock items
8. Transportation system to be used on the program
9. Logistic support
10. Hardware handling procedures
11. Preliminary make or buy decisions

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

GE EXHIBIT DRD MG-010

VOYAGER DATA REQUIREMENT DESCRIPTION				DRD APPROVED BY:		DATE:	DATA CATEGORY:	
ORGANIZATION ORIGINATING REQUIREMENT:	CODE: MG	OFFICE RESPONSIBLE FOR DRD:	CODE:	DRD PREPARED BY: T. F. Smyth	DATE: 7/28/67	CONTRACT NO.:	DRD NO.: MG-010	
TITLE OF DOCUMENT:  <b>PLAN, STORAGE</b>				ORGANIZATION RESPONSIBLE FOR DOCUMENT PREPARATION: <b>Manufacturing</b>		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: <input checked="" type="checkbox"/> CONTROL <input type="checkbox"/> ACTION <input type="checkbox"/> REFERENCE <input type="checkbox"/> INFORMATION				
USE OF DOCUMENT: The storage plan establishes the basis for the stocking and storage of completed flight equipment and items of OSE prior to intended use or awaiting assembly with other items.				ORGANIZATION RESPONSIBLE FOR DOCUMENT STOWAGE:		NO. OF COPIES: <b>5</b>		
				ESTIMATED MANHOURS FOR SINGLE PREPARATION:		INFORMATION CUTOFF DATE OR MILESTONE:		
INTERRELATIONSHIP WITH OTHER DATA REQUIREMENTS: IS-017, Plan, Transportation and Handling MA-007, Plan, Project Implementation MG-021, Report, Hardware Status PC-015, Plan, Project Procurement TE-001, Plan, Integrated Test				ESTIMATED COST (\$) FOR SINGLE PREPARATION:		DATE DATA DUE TO USER:		
				FREQUENCY OF ISSUE: <input type="checkbox"/> ANNUALLY <input type="checkbox"/> SEMI-ANNUALLY <input type="checkbox"/> QUARTERLY <input type="checkbox"/> BI-MONTHLY <input type="checkbox"/> MONTHLY <input type="checkbox"/> SEMI-MONTHLY <input type="checkbox"/> BI-WEEKLY <input type="checkbox"/> WEEKLY <input type="checkbox"/> DAILY <input checked="" type="checkbox"/> OTHERWISE, AS SPECIFIED <b>Initial issue only</b>		PUBLICATION DATE: <b>PDR</b>		
CLASSIFICATION: <input type="checkbox"/> SECRET <input type="checkbox"/> CONFIDENTIAL <input type="checkbox"/> SECRET RESTRICTED DATA <input type="checkbox"/> CONFIDENTIAL RESTRICTED DATA <input checked="" type="checkbox"/> UNCLASSIFIED				<input type="checkbox"/> GROUP 1 <input type="checkbox"/> GROUP 2 <input type="checkbox"/> GROUP 3 <input type="checkbox"/> GROUP 4 <input type="checkbox"/> PROPRIETARY <input type="checkbox"/> PUBLIC DOMAIN		<input type="checkbox"/> SPECIAL HANDLING <input type="checkbox"/> NASA DISCREET <input type="checkbox"/> JPL DISCREET <input type="checkbox"/> PROJECT DISCREET <input type="checkbox"/> NOFORN		UPDATE (FREQUENCY OR MILESTONE): <b>As required thru CDR</b>
								ESTIMATED EXPIRATION DATE:
FORM OF DATA: <input checked="" type="checkbox"/> PRINTED DOCUMENT <input type="checkbox"/> CHART <input type="checkbox"/> DIAGRAM <input type="checkbox"/> DRAWING <input type="checkbox"/> FILM (STATIC OR MOTION) <input type="checkbox"/> ILLUSTRATION <input type="checkbox"/> MODEL <input type="checkbox"/> RECORDING (TAPE OR DISC) <input type="checkbox"/> COMPUTER CARD <input type="checkbox"/> COMPUTER TAPE <input type="checkbox"/> MICROFILM (W/OR W/O CARD) <input type="checkbox"/> OTHER		KIND OF DATA: <input type="checkbox"/> ABSTRACT <input type="checkbox"/> BROCHURE <input type="checkbox"/> BULLETIN <input type="checkbox"/> CATALOG <input type="checkbox"/> CONTRACT <input type="checkbox"/> DIRECTIVE <input type="checkbox"/> DISCLOSURE <input type="checkbox"/> ENGINEERING CHANGE ORDER <input type="checkbox"/> REQUEST FOR ENGINEERING CHANGE PROPOSAL <input type="checkbox"/> ENGINEERING CHANGE PROPOSAL <input type="checkbox"/> HANDBOOK <input type="checkbox"/> INDEX		<input type="checkbox"/> INSTRUCTION <input type="checkbox"/> LETTER <input type="checkbox"/> LIST <input type="checkbox"/> LOG <input type="checkbox"/> MANUAL <input type="checkbox"/> MEMORANDUM <input type="checkbox"/> MINUTES <input checked="" type="checkbox"/> PLAN <input type="checkbox"/> PROCEDURE <input type="checkbox"/> REGULATION <input type="checkbox"/> REPORT <input type="checkbox"/> SCHEDULE <input type="checkbox"/> SPECIFICATION <input type="checkbox"/> STANDARD <input type="checkbox"/> VOUCHER		REFERENCE DOCUMENTS:		
						APPLICABLE STANDARDS:		
REVIEWS AND/OR APPROVALS REQUIRED: (LIST IN ORDER OF SUBMITTAL)								
		DRAFT	DATE	PREPUBLICATION PROOF	DATE			
SUBMIT FOR REVIEW TO: _____			_____	_____	_____			
		BY	_____	_____	BY _____			
			_____	_____	_____			
		BY	_____	_____	BY _____			
SUBMIT FOR APPROVAL TO: _____			_____	_____	_____			
<b>Project Manager</b>			_____	_____	_____			

## VOYAGER DATA REQUIREMENT DESCRIPTION - 2ND SHEET

DRD NO.:

MG-010

SPECIAL INSTRUCTIONS:

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

OUTLINE OF CONTENTS:

1. Purpose and scope
2. Applicable documents
3. Reference
4. Matrix of items to be stored
5. Storage schedule
6. Environmental requirements
7. Handling and protection
8. Control procedures
9. Interface checking equipment - special requirements and agreements
10. Revision status

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



DRD NO.:

MG-011

## SPECIAL INSTRUCTIONS:

The manufacturing hardware flow plan is especially useful when alternate assembly sequences are requested because of late deliveries, incorporation of alteration notices, etc.

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

## OUTLINE OF CONTENTS:

This plan will be in the form of a diagram and contain the following:

1. The flow of hardware in the normal buildup of the hardware.
2. It will show the test cycles of the various subassemblies, the location of them and also their duration.
3. The terminal location of certain specific subassemblies beyond which the assembly cannot continue until the designated operations are performed.
4. The timing sequence for the availability of the shipping containers and handling dollies.
5. The inspection stations for the assembly buildup.
6. Subassembly drawing numbers.
7. Manufacturing and inspection operation numbers (correlated to the applicable planning).

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



## VOYAGER DATA REQUIREMENT DESCRIPTION - 2ND SHEET

SPECIAL INSTRUCTIONS:

DRD NO.:  
MG-012

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

OUTLINE OF CONTENTS:

1. Drawing number of part or assembly to be planned
2. Description of item (i. e. , name or designation)
3. Quantity required
4. Date planning required
5. Date planning promised
6. Actual completion date
7. Program name
8. Shop order number
9. Requestor's name and phone number
10. Planner's name and phone number
11. Production control code

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



GE EXHIBIT DRD MG-013

VOYAGER DATA REQUIREMENT DESCRIPTION				DRD APPROVED BY:		DATE:	DATA CATEGORY:
ORGANIZATION ORIGINATING REQUIREMENT:	CODE: MG	OFFICE RESPONSIBLE FOR DRD:	CODE:	DRD PREPARED BY: T. F. Smyth	DATE: 7/28/67	CONTRACT NO.:	DRD NO.: MG-013
TITLE OF DOCUMENT:  *REQUEST, SPECIAL TOOL(S)				ORGANIZATION RESPONSIBLE FOR DOCUMENT PREPARATION: Manufacturing	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: <input type="checkbox"/> CONTROL <input checked="" type="checkbox"/> ACTION <input type="checkbox"/> REFERENCE <input type="checkbox"/> INFORMATION				ORGANIZATION RESPONSIBLE FOR DOCUMENT STOWAGE:		NO. OF COPIES: 10	
USE OF DOCUMENT: The Planning Tool Request places an order for a specially designed tool needed to produce a part or assembly in accordance with the Fabrication/Assembly Planning procedure.				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: MG-001, Drawings, Interface Tools, Jigs and Fixtures MG-002, Drawings, Tools, Jigs and Fixtures MG-008, Sheets, Planning, Fabrication/Assembly				FREQUENCY OF ISSUE: <input type="checkbox"/> ANNUALLY <input type="checkbox"/> SEMI-ANNUALLY <input type="checkbox"/> QUARTERLY <input type="checkbox"/> BI-MONTHLY <input type="checkbox"/> MONTHLY <input type="checkbox"/> SEMI-MONTHLY <input type="checkbox"/> BI-WEEKLY <input type="checkbox"/> WEEKLY <input type="checkbox"/> DAILY <input checked="" type="checkbox"/> OTHERWISE AS SPECIFIED <b>One time as required</b>		PUBLICATION DATE:  PDR	
						UPDATE (FREQUENCY OR MILESTONE): Not applicable	
						ESTIMATED EXPIRATION DATE:	
CLASSIFICATION:		<input type="checkbox"/> GROUP 1 <input type="checkbox"/> SPECIAL HANDLING <input type="checkbox"/> GROUP 2 <input type="checkbox"/> NASA DISCREET <input type="checkbox"/> GROUP 3 <input type="checkbox"/> JPL DISCREET <input type="checkbox"/> GROUP 4 <input type="checkbox"/> PROJECT DISCREET <input type="checkbox"/> PROPRIETARY <input type="checkbox"/> NOFORN <input type="checkbox"/> PUBLIC DOMAIN		<input type="checkbox"/> SECRET <input type="checkbox"/> CONFIDENTIAL <input type="checkbox"/> SECRET RESTRICTED DATA <input type="checkbox"/> CONFIDENTIAL RESTRICTED DATA <input checked="" type="checkbox"/> UNCLASSIFIED			
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<input checked="" type="checkbox"/> PRINTED DOCUMENT <input type="checkbox"/> CHART <input type="checkbox"/> DIAGRAM <input type="checkbox"/> DRAWING <input type="checkbox"/> FILM (STATIC OR MOTION) <input type="checkbox"/> ILLUSTRATION <input type="checkbox"/> MODEL <input type="checkbox"/> RECORDING (TAPE OR DISC) <input type="checkbox"/> COMPUTER CARD <input type="checkbox"/> COMPUTER TAPE <input type="checkbox"/> MICROFILM (W/OR W/O CARD) <input type="checkbox"/> OTHER		<input type="checkbox"/> ABSTRACT <input type="checkbox"/> INSTRUCTION <input type="checkbox"/> BROCHURE <input type="checkbox"/> LETTER <input type="checkbox"/> BULLETIN <input type="checkbox"/> LIST <input type="checkbox"/> CATALOG <input type="checkbox"/> LOG <input type="checkbox"/> CONTRACT <input type="checkbox"/> MANUAL <input type="checkbox"/> DIRECTIVE <input type="checkbox"/> MEMORANDUM <input type="checkbox"/> DISCLOSURE <input type="checkbox"/> MINUTES <input type="checkbox"/> ENGINEERING CHANGE ORDER <input type="checkbox"/> PLAN <input type="checkbox"/> REQUEST FOR ENGINEERING CHANGE PROPOSAL <input type="checkbox"/> PROCEDURE <input type="checkbox"/> ENGINEERING CHANGE PROPOSAL <input type="checkbox"/> REGULATION <input type="checkbox"/> HANDBOOK <input type="checkbox"/> REPORT <input type="checkbox"/> INDEX <input type="checkbox"/> SCHEDULE <input type="checkbox"/> <input type="checkbox"/> SPECIFICATION <input type="checkbox"/> <input type="checkbox"/> STANDARD <input type="checkbox"/> <input type="checkbox"/> VOUCHER <input checked="" type="checkbox"/> Request		APPLICABLE STANDARDS:			
REVIEWS AND/OR APPROVALS REQUIRED: (LIST IN ORDER OF SUBMITTAL)							
SUBMIT FOR REVIEW TO:		DRAFT	DATE	PREPUBLICATION PROOF	DATE		
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_____		BY	_____	_____	_____		
Manager, Manufacturing			_____	_____	_____		

VOYAGER DATA REQUIREMENT DESCRIPTION - 2ND SHEET

SPECIAL INSTRUCTIONS:

DRD NO.:  
MG-013

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

OUTLINE OF CONTENTS:

1. Part or assembly drawing number of item requiring the tool
2. Shop order number
3. Requestor's name
4. Program name
5. A detailed description of tool desired and of its specific use. This may include sketches.
6. Proposed vendor (if applicable)
7. Date tool is required
8. Number and date of request

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

VOYAGER DATA REQUIREMENT DESCRIPTION				DRD APPROVED BY:	DATE:	DATA CATEGORY:																																								
ORGANIZATION ORIGINATING REQUIREMENT:	CODE: MG	OFFICE RESPONSIBLE FOR DRD: CODE:	DRD PREPARED BY: T. F. Smyth	DATE: 7/28/67	CONTRACT NO.:	DRD NO.: MG-014																																								
TITLE OF DOCUMENT:  <b>SCHEDULE, DETAIL ASSEMBLY</b>				ORGANIZATION RESPONSIBLE FOR DOCUMENT PREPARATION: <b>Manufacturing</b>	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: <input checked="" type="checkbox"/> CONTROL <input type="checkbox"/> ACTION <input type="checkbox"/> REFERENCE <input type="checkbox"/> INFORMATION																																										
USE OF DOCUMENT:  Is used to schedule the fabrication of all the parts and subassemblies necessary for the program. It is also used to determine the need date for purchased parts.				ORGANIZATION RESPONSIBLE FOR DOCUMENT STORAGE:	NO. OF COPIES: <b>10</b>																																									
				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:  MG-015, Schedule, Shop Loading SC-004, Schedule, Task and Subtask Level (PERT) SC-005, Schedule, Task and Subtask Level (Milestone)				FREQUENCY OF ISSUE: <input type="checkbox"/> ANNUALLY <input type="checkbox"/> SEMI-ANNUALLY <input type="checkbox"/> QUARTERLY <input type="checkbox"/> BI-MONTHLY <input type="checkbox"/> MONTHLY <input type="checkbox"/> SEMI-MONTHLY <input type="checkbox"/> BI-WEEKLY <input type="checkbox"/> WEEKLY <input type="checkbox"/> DAILY <input checked="" type="checkbox"/> OTHERWISE, AS SPECIFIED	PUBLICATION DATE: <b>HDR</b>																																									
				CLASSIFICATION: <input type="checkbox"/> SECRET <input type="checkbox"/> CONFIDENTIAL <input type="checkbox"/> SECRET RESTRICTED DATA <input type="checkbox"/> CONFIDENTIAL RESTRICTED DATA <input checked="" type="checkbox"/> UNCLASSIFIED		<input type="checkbox"/> GROUP 1 <input type="checkbox"/> GROUP 2 <input type="checkbox"/> GROUP 3 <input type="checkbox"/> GROUP 4 <input type="checkbox"/> PROPRIETARY <input type="checkbox"/> PUBLIC DOMAIN	<input type="checkbox"/> SPECIAL HANDLING <input type="checkbox"/> NASA DISCREET <input type="checkbox"/> JPL DISCREET <input type="checkbox"/> PROJECT DISCREET <input type="checkbox"/> NOFORN	UPDATE (FREQUENCY OR MILESTONE): <b>As required</b>																																						
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				APPLICABLE STANDARDS:																																										
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<table border="0"> <thead> <tr> <th></th> <th>DRAFT</th> <th>DATE</th> <th>PREPUBLICATION PROOF</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td>SUBMIT FOR REVIEW TO:</td> <td>_____</td> <td>_____</td> <td>_____</td> <td>_____</td> </tr> <tr> <td></td> <td></td> <td>BY</td> <td></td> <td>BY</td> </tr> <tr> <td></td> <td>_____</td> <td>_____</td> <td>_____</td> <td>_____</td> </tr> <tr> <td></td> <td></td> <td>BY</td> <td></td> <td>BY</td> </tr> <tr> <td>SUBMIT FOR APPROVAL TO:</td> <td>_____</td> <td>_____</td> <td>_____</td> <td>_____</td> </tr> <tr> <td></td> <td></td> <td>BY</td> <td></td> <td>BY</td> </tr> <tr> <td></td> <td><b>Manager, Manufacturing</b></td> <td>_____</td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>								DRAFT	DATE	PREPUBLICATION PROOF	DATE	SUBMIT FOR REVIEW TO:	_____	_____	_____	_____			BY		BY		_____	_____	_____	_____			BY		BY	SUBMIT FOR APPROVAL TO:	_____	_____	_____	_____			BY		BY		<b>Manager, Manufacturing</b>	_____	_____	_____
	DRAFT	DATE	PREPUBLICATION PROOF	DATE																																										
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	<b>Manager, Manufacturing</b>	_____	_____	_____																																										

VOYAGER DATA REQUIREMENT DESCRIPTION - 2ND SHEET

SPECIAL INSTRUCTIONS:

DRD NO.:

MG-014

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

OUTLINE OF CONTENTS:

This document will define the following:

1. A list of all parts and subassemblies
2. The date the items on the list will be delivered to test
3. The date the items on the list will be delivered to stock
4. The date the vendor will deliver the items that are purchased
5. Fabrication and test cycle times

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

GE EXHIBIT DRD MG-015

VOYAGER DATA REQUIREMENT DESCRIPTION				DRD APPROVED BY:		DATE:	DATA CATEGORY:
ORGANIZATION ORIGINATING REQUIREMENT:	CODE: MG	OFFICE RESPONSIBLE FOR DRD:	CODE:	DRD PREPARED BY: T. F. Smyth	DATE: 7/28/67	CONTRACT NO.:	DRD NO.: MG-015
TITLE OF DOCUMENT:  <b>SCHEDULE, SHOP LOADING</b>				ORGANIZATION RESPONSIBLE FOR DOCUMENT PREPARATION: <b>Manufacturing</b>	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: <input checked="" type="checkbox"/> CONTROL <input type="checkbox"/> ACTION <input type="checkbox"/> REFERENCE <input type="checkbox"/> INFORMATION				ORGANIZATION RESPONSIBLE FOR DOCUMENT STORAGE:		NO. OF COPIES: <b>6</b>	
USE OF DOCUMENT:  This document is used to allocate manpower and facility time against hardware delivery requirements.				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:  MG-008, Sheets, Planning, Fabrication/Assembly MG-014, Schedule, Detail Assembly SE-007, Schedule, Work Package and Cost Account Level (Milestone)				FREQUENCY OF ISSUE:		PUBLICATION DATE: <b>HDR</b>	
				<input type="checkbox"/> ANNUALLY <input type="checkbox"/> SEMI-ANNUALLY <input type="checkbox"/> QUARTERLY <input type="checkbox"/> BI-MONTHLY <input checked="" type="checkbox"/> MONTHLY <input type="checkbox"/> SEMI-MONTHLY <input type="checkbox"/> BI-WEEKLY <input type="checkbox"/> WEEKLY <input type="checkbox"/> DAILY <input type="checkbox"/> OTHERWISE, AS SPECIFIED		UPDATE (FREQUENCY OR MILESTONE): <b>As required</b>	
						ESTIMATED EXPIRATION DATE:	
CLASSIFICATION:				<input type="checkbox"/> GROUP 1 <input type="checkbox"/> SPECIAL HANDLING <input type="checkbox"/> GROUP 2 <input type="checkbox"/> NASA DISCREET <input type="checkbox"/> GROUP 3 <input type="checkbox"/> JPL DISCREET <input type="checkbox"/> GROUP 4 <input type="checkbox"/> PROJECT DISCREET <input type="checkbox"/> PROPRIETARY <input type="checkbox"/> NOFORN <input type="checkbox"/> PUBLIC DOMAIN		<input type="checkbox"/> SECRET <input type="checkbox"/> CONFIDENTIAL <input type="checkbox"/> SECRET RESTRICTED DATA <input type="checkbox"/> CONFIDENTIAL RESTRICTED DATA <input checked="" type="checkbox"/> UNCLASSIFIED	
FORM OF DATA:				REFERENCE DOCUMENTS:			
KIND OF DATA: <input type="checkbox"/> ABSTRACT <input type="checkbox"/> INSTRUCTION <input type="checkbox"/> BROCHURE <input type="checkbox"/> LETTER <input type="checkbox"/> BULLETIN <input type="checkbox"/> LIST <input type="checkbox"/> CATALOG <input type="checkbox"/> LOG <input type="checkbox"/> CONTRACT <input type="checkbox"/> MANUAL <input type="checkbox"/> DIRECTIVE <input type="checkbox"/> MEMORANDUM <input type="checkbox"/> DISCLOSURE <input type="checkbox"/> MINUTES <input type="checkbox"/> ENGINEERING CHANGE ORDER <input type="checkbox"/> PLAN <input type="checkbox"/> REQUEST FOR ENGINEERING CHANGE PROPOSAL <input type="checkbox"/> PROCEDURE <input type="checkbox"/> REPORT <input type="checkbox"/> ENGINEERING CHANGE PROPOSAL <input checked="" type="checkbox"/> SCHEDULE <input type="checkbox"/> SPECIFICATION <input type="checkbox"/> STANDARD <input type="checkbox"/> VOUCHER <input type="checkbox"/> HANDBOOK <input type="checkbox"/> INDEX				APPLICABLE STANDARDS:			
REVIEWS AND/OR APPROVALS REQUIRED: (LIST IN ORDER OF SUBMITTAL)							
SUBMIT FOR REVIEW TO:		DRAFT	DATE	PREPUBLICATION PROOF		DATE	
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SUBMIT FOR APPROVAL TO:							
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_____		BY	_____	_____		BY	
<b>Manager, Manufacturing</b>			_____	_____		_____	

## VOYAGER DATA REQUIREMENT DESCRIPTION - 2ND SHEET

SPECIAL INSTRUCTIONS:

DRD NO.:  
MG-015

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

OUTLINE OF CONTENTS:

This document will contain the following:

1. A list of all parts and subassemblies that will be fabricated in house
2. The date the item will be delivered to test or stock whichever is applicable
3. The number of hours allocated to the job
4. The quantity of items required
5. Remarks (problems anticipated, slippage dates, etc)

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

VOYAGER DATA REQUIREMENT DESCRIPTION				DRD APPROVED BY:		DATE:		DATA CATEGORY:							
ORGANIZATION ORIGINATING REQUIREMENT:		CODE: MG	OFFICE RESPONSIBLE FOR DRD:		CODE:	DRD PREPARED BY: T. F. Smyth		DATE: 7/28/67	CONTRACT NO.:	DRD NO.: MG-016					
TITLE OF DOCUMENT:  <b>REPORT, LINE OF BALANCE</b>						ORGANIZATION RESPONSIBLE FOR DOCUMENT PREPARATION: <b>Manufacturing</b>		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: <input type="checkbox"/> CONTROL <input type="checkbox"/> ACTION <input type="checkbox"/> REFERENCE <input checked="" type="checkbox"/> INFORMATION									
USE OF DOCUMENT: <b>Provides a production control graphic display for balancing actual shop events against planned events and providing "red flag" problem indications for management action.</b>						ORGANIZATION RESPONSIBLE FOR DOCUMENT STOWAGE:		NO OF COPIES <b>10</b>							
INTERRELATIONSHIP WITH OTHER DATA REQUIREMENTS: <b>MG-014, Schedule, Detail Assembly SC-004, Schedule, Task and Subtask Level, (PERT) SC-005, Schedule, Task and Subtask Level, (Milestone)</b>						ESTIMATED MANHOURS FOR SINGLE PREPARATION:		INFORMATION CUTOFF DATE OR MILESTONE:							
						ESTIMATED COST (\$) FOR SINGLE PREPARATION:		DATE DATA DUE TO USER:							
						FREQUENCY OF ISSUE: <input type="checkbox"/> ANNUALLY <input type="checkbox"/> SEMI-ANNUALLY <input type="checkbox"/> QUARTERLY <input type="checkbox"/> BI-MONTHLY <input type="checkbox"/> MONTHLY <input type="checkbox"/> SEMI-MONTHLY <input type="checkbox"/> BI-WEEKLY <input type="checkbox"/> WEEKLY <input type="checkbox"/> DAILY <input checked="" type="checkbox"/> OTHERWISE, AS SPECIFIED		PUBLICATION DATE: <b>HDR</b>							
CLASSIFICATION: <input type="checkbox"/> SECRET <input type="checkbox"/> CONFIDENTIAL <input type="checkbox"/> SECRET RESTRICTED DATA <input type="checkbox"/> CONFIDENTIAL RESTRICTED DATA <input checked="" type="checkbox"/> UNCLASSIFIED						<input type="checkbox"/> GROUP 1 <input type="checkbox"/> GROUP 2 <input type="checkbox"/> GROUP 3 <input type="checkbox"/> GROUP 4 <input type="checkbox"/> PROPRIETARY <input type="checkbox"/> PUBLIC DOMAIN		<input type="checkbox"/> SPECIAL HANDLING <input type="checkbox"/> NASA DISCREET <input type="checkbox"/> JPL DISCREET <input type="checkbox"/> PROJECT DISCREET <input type="checkbox"/> NOFORN							
FORM OF DATA: <input type="checkbox"/> PRINTED DOCUMENT <input checked="" type="checkbox"/> CHART <input type="checkbox"/> DIAGRAM <input type="checkbox"/> DRAWING <input type="checkbox"/> FILM (STATIC OR MOTION) <input type="checkbox"/> ILLUSTRATION <input type="checkbox"/> MODEL <input type="checkbox"/> RECORDING (TAPE OR DISC) <input type="checkbox"/> COMPUTER CARD <input type="checkbox"/> COMPUTER TAPE <input type="checkbox"/> MICROFILM (W/OR W/O CARD) <input type="checkbox"/> OTHER						KIND OF DATA: <input type="checkbox"/> ABSTRACT <input type="checkbox"/> BROCHURE <input type="checkbox"/> BULLETIN <input type="checkbox"/> CATALOG <input type="checkbox"/> CONTRACT <input type="checkbox"/> DIRECTIVE <input type="checkbox"/> DISCLOSURE <input type="checkbox"/> ENGINEERING CHANGE ORDER <input type="checkbox"/> REQUEST FOR ENGINEERING CHANGE PROPOSAL <input type="checkbox"/> ENGINEERING CHANGE PROPOSAL <input type="checkbox"/> HANDBOOK <input type="checkbox"/> INDEX <input type="checkbox"/> INSTRUCTION <input type="checkbox"/> LETTER <input type="checkbox"/> LIST <input type="checkbox"/> LOG <input type="checkbox"/> MANUAL <input type="checkbox"/> MEMORANDUM <input type="checkbox"/> MINUTES <input type="checkbox"/> PLAN <input type="checkbox"/> PROCEDURE <input type="checkbox"/> REGULATION <input checked="" type="checkbox"/> REPORT <input type="checkbox"/> SCHEDULE <input type="checkbox"/> SPECIFICATION <input type="checkbox"/> STANDARD <input type="checkbox"/> VOUCHER						REFERENCE DOCUMENTS:		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:						_____		_____		_____		_____			
<b>Manager, Manufacturing</b>						_____		_____		_____		_____			

## VOYAGER DATA REQUIREMENT DESCRIPTION - 2ND SHEET

SPECIAL INSTRUCTIONS:

DRD NO.:  
MG-016

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

OUTLINE OF CONTENTS:

The report shall consist of the following three interrelated charts:

1. Objective Chart - Cummulative graph of quantity of items versus schedule time.
2. Production Plan Chart - Manufacturing cycle chart depicting predicted fabrication time versus time left to complete to meet project schedule.
3. Progress Chart - Depicts planned rate of production to meet project schedule against which actual hardware status is plotted.

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



VOYAGER DATA REQUIREMENT DESCRIPTION				DRD APPROVED BY:		DATE:	DATA CATEGORY:																																														
ORGANIZATION ORIGINATING REQUIREMENT:	CODE: <b>MG</b>	OFFICE RESPONSIBLE FOR DRD:	CODE:	DRD PREPARED BY: <b>T. F. Smyth</b>	DATE: <b>7/28/67</b>	CONTRACT NO.:	DRD NO.: <b>MG-017</b>																																														
TITLE OF DOCUMENT:  <b>*REPORT, PRODUCIBILITY</b>				ORGANIZATION RESPONSIBLE FOR DOCUMENT PREPARATION: <b>Manufacturing</b>	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: <input type="checkbox"/> CONTROL <input type="checkbox"/> ACTION <input type="checkbox"/> REFERENCE <input checked="" type="checkbox"/> INFORMATION																																																	
USE OF DOCUMENT:  <b>The Producibility Report summarizes the findings and recommendations resulting from the producibility analysis of new designs and forms a part of the Preliminary Design Review.</b>				ORGANIZATION RESPONSIBLE FOR DOCUMENT STOWAGE:	NO OF COPIES:  <b>20</b>																																																
				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:  <b>SE-059, Drawings (Category E) for Manufacture and Procurement of Prime Hardware</b>				FREQUENCY OF ISSUE: <input type="checkbox"/> ANNUALLY <input type="checkbox"/> SEMI-ANNUALLY <input type="checkbox"/> QUARTERLY <input type="checkbox"/> BI-MONTHLY <input type="checkbox"/> MONTHLY <input type="checkbox"/> SEMI-MONTHLY <input type="checkbox"/> BI-WEEKLY <input type="checkbox"/> WEEKLY <input type="checkbox"/> DAILY <input checked="" type="checkbox"/> OTHERWISE, AS SPECIFIED  <b>As required.</b>	PUBLICATION DATE:  <b>PDR</b>																																												
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## SPECIAL INSTRUCTIONS:

DRD NO.:

MG-017

The Producibility Report may be used to document requests for producibility changes in the event agreement cannot be reached verbally between the design engineer and the producibility engineer and the producibility engineer does not sign the drawing.

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

## OUTLINE OF CONTENTS:

1. Name of hardware item
2. Drawing number
3. Producibility engineer's name
4. Memorandum number
5. Distribution list
6. A detailed review of those design features and requirements which are deemed to be excessively difficult and/or costly to fabricate.
7. Detailed recommendations for improvements and/or changes which will render the designs more producible.

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

GE EXHIBIT DRD MG-018

VOYAGER DATA REQUIREMENT DESCRIPTION				DRD APPROVED BY:		DATE:	DATA CATEGORY:
ORGANIZATION ORIGINATING REQUIREMENT:	CODE: <b>MG</b>	OFFICE RESPONSIBLE FOR DRD:	CODE:	DRD PREPARED BY: <b>T. F. Smyth</b>	DATE: <b>7/28/67</b>	CONTRACT NO.:	DRD NO.: <b>MG-018</b>
TITLE OF DOCUMENT:  <b>*REPORT, RECEIVING</b>				ORGANIZATION RESPONSIBLE FOR DOCUMENT PREPARATION: <b>Manufacturing</b>		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: <input type="checkbox"/> CONTROL <input type="checkbox"/> ACTION <input type="checkbox"/> REFERENCE <input checked="" type="checkbox"/> INFORMATION				ORGANIZATION RESPONSIBLE FOR DOCUMENT STORAGE:		NO OF COPIES <b>10</b>	
USE OF DOCUMENT: <b>Used to inform procurement and production managers of the delivery of purchased items.</b>				ESTIMATED MANHOURS FOR SINGLE PREPARATION:		INFORMATION CUTOFF DATE OR MILESTONE	
INTERRELATIONSHIP WITH OTHER DATA REQUIREMENTS:  <b>PC-026, *Schedule, Project Procurement</b>				ESTIMATED COST (\$) FOR SINGLE PREPARATION:		DATE DATA DUE TO USER:	
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## VOYAGER DATA REQUIREMENT DESCRIPTION - 2ND SHEET

## SPECIAL INSTRUCTIONS:

DRD NO.:

MG-018

The Receiving Report is prepared on one of the multiple copies of the purchase order so that the order and the record of its receipt are recorded on the same page. Copies for distribution are made of this sheet.

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

## OUTLINE OF CONTENTS:

1. Purchase order number
2. Vendor number
3. Various control code numbers (internal)
4. Delivery instructions
5. Material request (MR) number and date
6. Shop order number
7. Requestor
8. Buyer
9. Order date
10. Price of total order
11. Contract number
12. Vendor certification status
13. Vendor name and address
14. Procurement approval
15. Items procured (name and quantity and price each)
16. Quantity received
17. Date received
18. Signature of receiving clerk.

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



SPECIAL INSTRUCTIONS:

DRD NO.:

MG-019

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

OUTLINE OF CONTENTS:

The stock inventory report itemizes the following:

1. An alpha-numeric listing of all parts, ie., piece parts, electronic parts, completed assemblies and subassemblies by program.
2. Quantity in stock.
3. Stock withdrawals by quantity and date.
4. Usage code.

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

**GE EXHIBIT DRD MG-020**

VOYAGER DATA REQUIREMENT DESCRIPTION				DRD APPROVED BY:		DATE:	DATA CATEGORY:				
ORGANIZATION ORIGINATING REQUIREMENT:		CODE: MG	OFFICE RESPONSIBLE FOR DRD:		CODE:	DRD PREPARED BY: T. F. Smyth	DATE: 7/28/67	CONTRACT NO.:	DRD NO.: MG-020		
TITLE OF DOCUMENT:  REPORT, FABRICATION/ASSEMBLY						ORGANIZATION RESPONSIBLE FOR DOCUMENT PREPARATION:  Manufacturing	TASK OR SUBTASK:	DRL ITEM NO.:			
TYPE OF DOCUMENT: <input type="checkbox"/> CONTROL <input type="checkbox"/> ACTION <input type="checkbox"/> REFERENCE <input checked="" type="checkbox"/> INFORMATION						ORGANIZATION RESPONSIBLE FOR DOCUMENT REPRODUCTION:	DRL NO.:	LEVEL NO.:			
						ORGANIZATION RESPONSIBLE FOR DOCUMENT DISTRIBUTION:	DDL NO.:	FILE NO.:			
USE OF DOCUMENT: This report provides a detailed list of problem situations affecting schedule and delivery of hardware items, with a summary of actions taken and resulting schedule changes.						ORGANIZATION RESPONSIBLE FOR DOCUMENT STOWAGE:		NO. OF COPIES: 10			
INTERRELATIONSHIP WITH OTHER DATA REQUIREMENTS: MG-014, Schedule, Detail Assembly MG-015, Schedule, Shop Loading MG-021, Report, Hardware Status SC-004, Schedule, Task and Subtask Level (PERT) SC-005, Schedule, Task and Subtask Level (Milestone)						ESTIMATED MANHOURS FOR SINGLE PREPARATION:	INFORMATION CUTOFF DATE OR MILESTONE:				
						ESTIMATED COST (\$) FOR SINGLE PREPARATION:	DATE DATA DUE TO USER:				
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## SPECIAL INSTRUCTIONS:

DRD NO.:

MG-020

Reports are updated weekly and constitute a continuous history of schedule problem resolution.

Updated reports are presented for discussion at weekly status meetings with the Manager, Manufacturing.

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

## OUTLINE OF CONTENTS:

## Problem and action summary.

1. Component name and identification number
2. Priority of action
3. Fiscal week the problem was reported
4. Problem statement
5. Required action
6. Date action promised complete
7. Function responsible for action
8. Name of manager preparing report and date

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





## VOYAGER DATA REQUIREMENT DESCRIPTION - 2ND SHEET

## SPECIAL INSTRUCTIONS:

DRD NO.:  
MG-021

A weekly meeting is held where the latest promises are reviewed. A plan is made to improve the promises, if possible, and the hardware status is updated and reissued.

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

## OUTLINE OF CONTENTS:

The Hardware Status Report identifies the following:

1. Lists all the parts and subassemblies by name and identification number that are required in the fabrication of the vehicle
2. Depicts whether it is a make item or a buy item
3. Shows current promise date of each item resulting from activities of subordinate items

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

## DOCUMENTATION RELATIONSHIP TREES

A documentation relationship tree has been prepared to show the relationships of data items within each functional category as well as their relationships across categories.

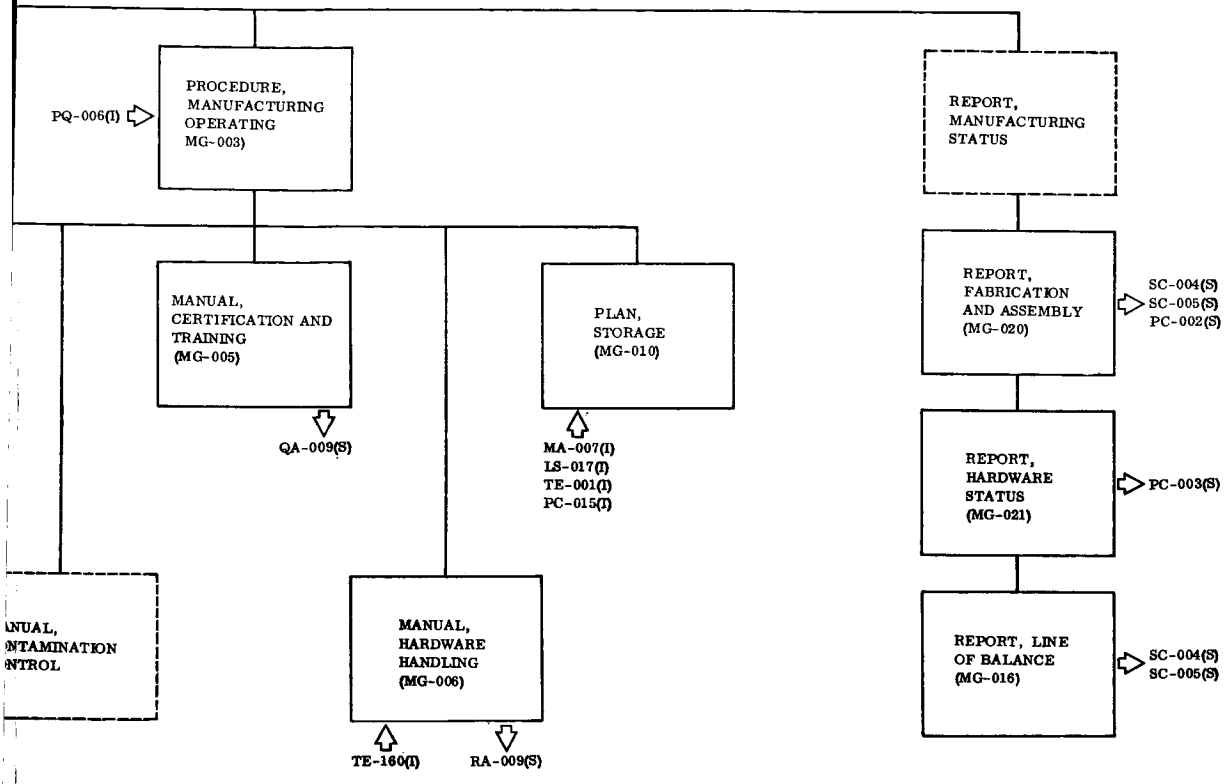
Relationships within each functional category are shown by constructing a tier pattern beginning with the top-level (or governing) data item and relating in descending order all data items within the category to this top-level data item. (The location of a data item at a given level on the diagram does 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) shaded 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 that are 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 upon, data items appearing in other categories and is included in the diagrams. Additionally, certain data elements indicated in the user flow diagrams (but currently not identified as individual data items) have been shown within a dashed rectangle to clarify relationships.





**LEGEND:**

- (I) INDICATES DATA ITEMS NEEDED FOR PREPARATION OR SUPPORT OF THE REFERENCED ITEM (INPUT).
- (S) INDICATES DATA ITEMS THAT ARE SUPPORTED OR NEEDED BY THIS ITEM.
- (G) DATA ITEMS THAT RELATE TO AND PROVIDE INFORMATION OF A GENERAL NATURE BUT ARE NOT REQUIRED IN AN INPUT OR SUPPORT ROLE
- ↑ INDICATES PRINCIPAL RELATIONSHIP (I, S, OR G) BETWEEN DATA ITEMS IN OTHER FUNCTIONAL CATEGORIES.
- - - DATA ELEMENT NOT CURRENTLY IDENTIFIED AS A DATA ITEM.

**Figure C-7. Manufacturing Documentation Relationship Tree (MG)**

## DATA ITEM PHASING/FREQUENCY

Time phasing and preparation of data items associated with the Manufacturing function are shown on the Manufacturing Data Item Phasing and Frequency Matrix, Figure C-8. The following assumptions were used as a basis for determining these estimates:

- a. Data items list of December 15, 1966, was used as the baseline.
- b. Eight equivalent spacecraft will be produced (including breadboards, structural test models, thermal test models, proof test models, system test models and two flight vehicles).
- c. Two sets of OSE will be produced.
- d. Spacecraft and OSE will consist of approximately 352 CEI's.
- e. Each spacecraft will consist of: (estimated)
 

28 Prime equipment (CEI's) broken down into	
36 Identification Items (CEI's) and	
85 Engineering Critical Components (CEI's)	149
Assume 11 Subassemblies for each Identification Item	396
Assume 34 Subassemblies for each Engineering Critical Component (CEI's)	2,040
Total Spacecraft Assemblies	2,585
8 Equivalent Spacecraft	20,680
- f. Each set of OSE, AHSE, MDE will consist of: (estimated)
 

36 Prime equipment (CEI's) broken down into	
135 Identification Items (CEI's) and	
18 Engineering Critical Components (CEI's)	
11 Subassemblies for each Identification Item	1,485
24 Subassemblies for each Engineering Critical Component	432
Total OSE, AHSE, MDE Assemblies	2,106
Two sets of OSE	4,212
- g. Estimated piece parts per spacecraft 100,000
- h. Estimated piece parts per set OSE 70,000

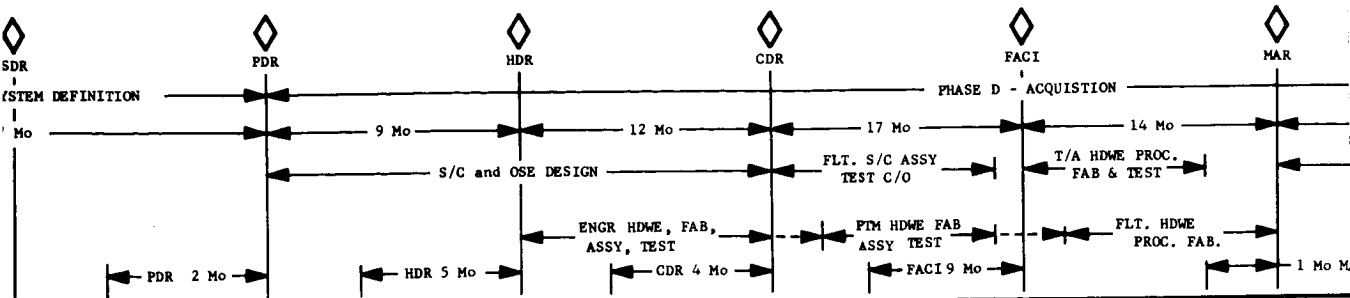
Distribution and density of data item preparation requirements are shown in Manufacturing Data Item Density Profile, Figure C-9. Requirements are shown as averages per month by project review periods and include both formal and key informal data items.

MANUFACTURING  
(MG)

DATA ITEM TITLE	QUANTITY	FREQUENCY	TOTAL
MG-001 Drawings, Interface Tools, Jigs & Fixtures			
MG-002 *Drawings, Tools, Jigs & Fixtures			
<b>MANUALS</b>			
MG-005 *Manual, Certification and Training			
MG-006 *Manual, Hardware Handling			
<b>PLANS</b>			
MG-009 Plan, Manufacturing			
MG-010 Plan, Storage			
MG-011 Plan, Manufacturing Detailed Flow & Inspection (Assembly Diagram)			
<b>PROCEDURES</b>			
MG-003 Procedure, Manufacturing Operating			
MG-004 Manufacturing Standing Instruction (MSI)			
<b>RECORDS</b>			
MG-007 Record, Methods and Tool Sheets			
MG-008, Sheets, Planning Fabrication/Assy			
<b>REPORTS</b>			
MG-016 Report, Line of Balance			
MG-017 *Report, Producibility			
MG-018 *Report, Receiving			
MG-019 *Report, Stock Inventory			
MG-020 Report, Fabrication/Assembly			
MG-021 Report, Hardware Status			
<b>REQUESTS</b>			
MG-012 *Request, Manufacturing Planning			
MG-013 *Request, Special Tool(s)			
<b>SCHEDULES</b>			
MG-014 Schedule, Detail Assembly			
MG-015 Schedule, Shop Loading			
TOTALS			

\*Key Informal Data

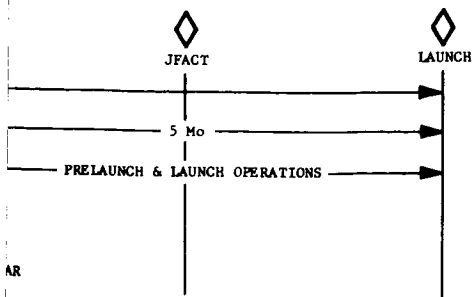
A	Annual	O/T	One Time
S/A	Semi-Annual	A/R	As Required
WK	Weekly	U	Update
MO	Monthly	I/U	One Update
B/W	Bi-Weekly	DA	Daily
B/M	Bi-Monthly	Q	Quarterly



QUANTITY	FREQUENCY	TOTAL	QUANTITY	FREQUENCY	TOTAL	QUANTITY	FREQUENCY	TOTAL	QUANTITY	FREQUENCY	TOTAL	QUANTITY	FREQUENCY	TOTAL	QUANTITY
50	O/T	50	50	O/T	50	50	O/T	50				25	O/T	25	10
500	O/T	500	1000	O/T	1000	1000	O/T	1000	1000	O/T	1000	600	O/T	600	
			1	U/Mo	9	1	U/Mo	12	1	U/Mo	17	1	U/Mo	14	1
			1	U/Mo	9	1	U/Mo	12	1	U/Mo	17	1	U/Mo	14	1
1	I	1	1	U	1										
			1	I	1	1	U	1				1	U	1	
						1	Q	4	1	F	1				
			1	Mo	1	1	2/U	2	1	3/U	30	1	2/U	2	
			70	O/T	70	10	O/T	10	10	O/T	10	10	O/T	10	
			4000	O/T	4000	3000	O/T	3000							
			12,000	O/T	12,000	6,000	O/T	6,000							
						1	Wk	52	1	Wk	74	1	Wk	61	1
			100	O/T	100				100	O/T	100				
2,000	A/R	2,000	5000	A/R	5000	1500	A/R	1500	10000	A/R	10000	5000	A/R	5000	1000
			1	Wk	40	1	Wk	52	1	Wk	74	1	Wk	61	1
			1	Wk	40	1	Wk	52	1	Wk	74	1	Wk	61	1
			1	Wk	40	1	Wk	52	1	Wk	74	1	Wk	61	1
						12000	O/T	12000	6000	O/T	6000	3000	O/T	3000	500
			1000	O/T	1000	1000	O/T	1000	1000	O/T	1000	1000	O/T	1000	500
						500	O/T	500		O/T	250	100	O/T	100	100
						5	Mo	60	5	Mo	85	5	Mo	70	5
		2,551			24004			38877			18546				

I Initial  
 F Final  
 N/R New and Revised  
 SDR System Design Review  
 PDR Preliminary Design Review  
 HDR Hard Design Review  
 CDR Critical Design Review  
 FACI First Article Configuration Inspection  
 MAR Mission Acceptance Review  
 J FACT Joint Flight Acceptance Composite Testing







Y	FREQUENCY	TOTAL	QUANTITY	FREQUENCY	TOTAL	TOTALS	NOTES AND ASSUMPTIONS
	O/T	10				185	Assumption that each S/C will contain approx. 100,000 piece parts. A total of 8 equivalent S/C will be produced, each containing approx. 352 CEI's and 28,000 components
						4100	
	U/Mo	3				55	
	U/Mo	3				55	
						2	
						3	
						5	
						10	
						100	
						7000	
						18,000	
	Wk	10				197	
						200	
	A/R	1000				38,000	
	Wk	10				237	
	Wk	10				237	
	Wk	10				237	
	O/T	500				21500	
	O/T	500				4500	
						850	
	Mc	15				230	Elec. Shop, Harness Shop, Sheet Metal, Pre-Final Assig.
		2171				96,387	

Figure C-8. Manufacturing Data Item Phasing and Frequency Matrix

NOTE: ALL VALUES LESS THAN 100 NOT TO SCALE

LEGEND:  
 FORMAL DATA  
 KEY INFORMAL DATA

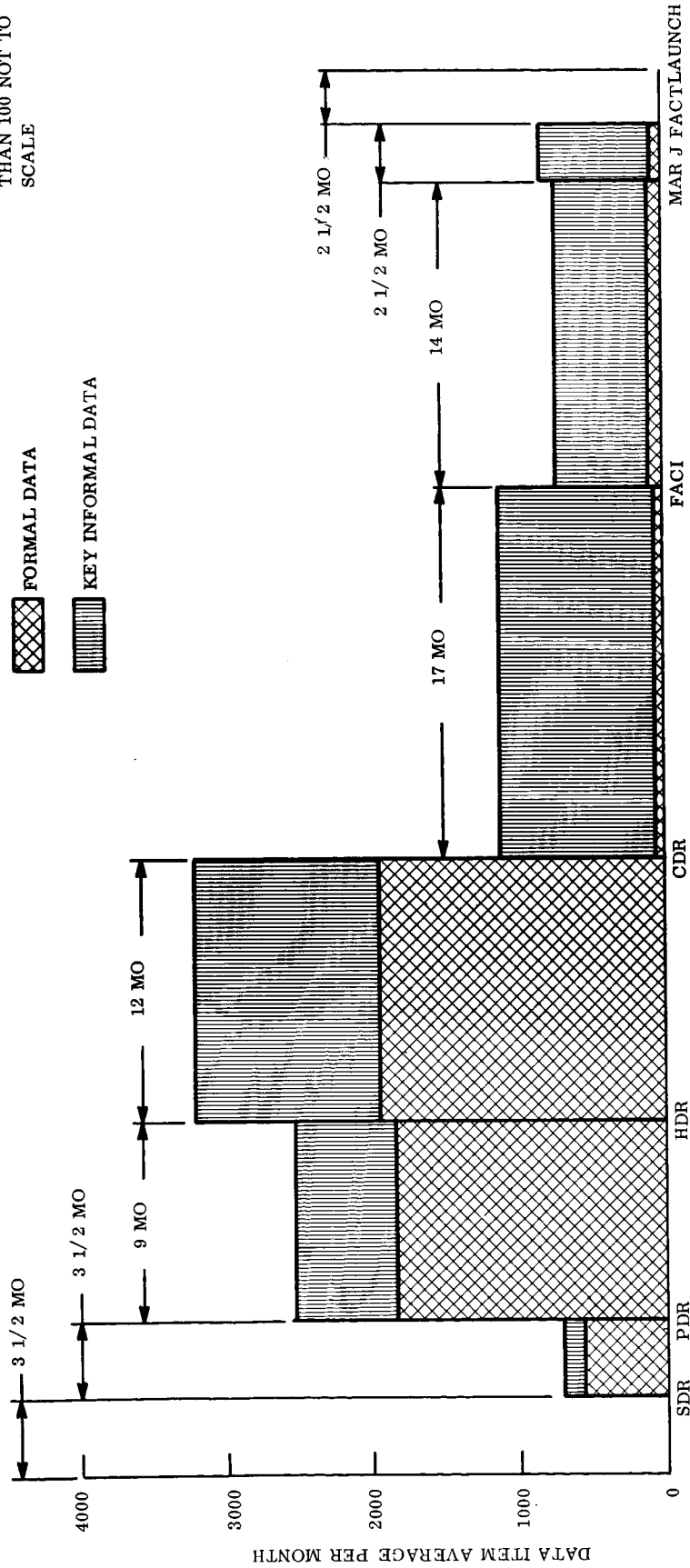


Figure C-9. Manufacturing Data Item Density Profile