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STRUCTURED ANALYSIS/DESIGN

LSA TASK 302

SUPPORT SYSTEM ALTERNATIVES

**SUBTASK 302.2.3 & 302.2.4
ALTERNATIVE SUPPORT PLANS &
UPDATED ALTERNATIVE SUPPORT PLANS**

APJ 966-235

APJ



AMERICAN POWER JET CO. RIDGEFIELD N.J.

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This report consolidates the Structured Analysis and Structured Design for the Logistic Support Analysis (LSA) Tasks. Included are the Data Flows Diagrams (DFDs) for the LSA Subtask 302.2.3, "Alternative Support Plans", and 302.2.4, "Updated Alternative Support Plans", with the corresponding descriptions of the processes, data flows, data stores, and external entities identified on each DFD. The DFDs are further developed into procedures which identifies how to use the data to carry out the processes and accomplish the LSA Subtask. Venture Evaluation Review Technique (VERT) Batch Input files are also provided to assist, as tools, giving both technical and managerial aspects of a task.

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APJ 966-235

STRUCTURED ANALYSIS/DESIGN

**LSA TASK 302
SUPPORT SYSTEM ALTERNATIVES**

**SUBTASK 302.2.3 & 302.2.4
ALTERNATIVE SUPPORT PLANS &
UPDATED ALTERNATIVE SUPPORT PLANS**

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INTEGRATED LOGISTIC SUPPORT OFFICE
AMSMC-LSP
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RIDGEFIELD, NJ

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FOREWORD

APJ, under contract to HQs, AMCCOM, has initiated the automation of the LSA Tasks (MIL-STD-1388-1), and the assessment of the ILS elements (AR 700-127). A major goal is to unify military and contractor approach to the performance of ILS and LSA.

Detailed to meet all requirements of ILS and LSA, the automated process will continue to provide the flexibility in selecting tasks and elements to be addressed at each life cycle stage. A major advantage of this approach is to insure that the application of each task is consistent with prescribed Army policies and procedures.

This report consolidates the Structured Analysis and Structured Design under one cover for the respective LSA Tasks. Structured Analysis provides a logical model of the method to perform an LSA Task. This logical model facilitates the development of a Structured Design that provides the detailed procedures to perform the analysis. Both the logical model and detailed procedures are used to develop the application software programs which will be provided to Government and contractor personnel to assist in the performance of the LSA Task.

Included in this report are the Data Flow Diagrams (DFDs) for LSA Subtask 302.2.3, "Alternative Support Plans" and 302.2.4, "Updated Alternative Support Plans" as well as the corresponding descriptions of the processes, data flows, data stores, and external entities identified on each DFD (Annex B). In addition, the DFDs are further developed into step-by-step procedures (Annex C) which identifies how to use the data to carry out the processes which ultimately lead to accomplishing the LSA Subtask.

To assist managers in planning and controlling this task, Venture Evaluation Review Technique (VERT) Batch Input Files are provided (Annex D). These VERT tools provide government agencies with complete packages to give contractors that cover both technical and managerial aspects of a task. This approach establishes a standardized form of communication and management between contractors performing the task and government personnel reviewing the task.

To view this work in context, Annex E of this report also presents a brief overview of Structured Analysis and its place in the overall systems development process. The overview and certain portions of the introductory text are repeated verbatim in every report in this series so that each report is free standing.

TABLE OF CONTENTS

<u>TITLE</u>	<u>PAGE</u>
Purpose.....	1
Background.....	1
Scope.....	1
Structured Analysis and Design for LSA Subtask 302.2.3 and 302.2.4.....	2
LSA Subtask 302.2.3 Description.....	2
LSA Subtask 302.2.4 Description.....	3
Approach.....	3
VERT Diagrams.....	4
ANNEX A:	
LSA Task 302 Description - Support System Alternatives.....	A-1
ANNEX B:	
LSA Subtask 302.2.3 & 302.2.4 - Alternative Support Plans & Updated Alternative Support Plans, Data Flow Diagrams, and Data Dictionary.....	B-1
ANNEX C:	
LSA Subtask 302.2.3 & 302.2.4 - Alternative Support Plans & Updated Alternative Support Plans Structured Design.....	C-1
ANNEX D:	
VERT Batch Input Files.....	D-1
ANNEX E:	
Structured Systems Analysis - Fundamentals.....	E-1

LIST OF FIGURES

<u>FIGURE NO.</u>	<u>TITLE</u>	<u>PAGE</u>
1	Structured Analysis and Structured Systems Design Organization.....	E-4
2	Standard DFD Symbol Definitions.....	E-5

INTRODUCTION

PURPOSE

The purpose of this report series is to present the results of the APJ efforts under Contract DAAA21-86-D-0025 for coordination with the AMCCOM Program Manager prior to in-depth programming of ILS and LSA functions and processes. LSA Task 302, "Support System Alternatives" (LSA Subtask 302.2.3 and 302.2.4 "Alternative Support Plans" and "Updated Alternative Support Plans") is addressed in this report.

BACKGROUND

The Department of the Army has a requirement for management control over contractor and Government agency response to the requirements of AR 700-127, "Integrated Logistic Support", and MIL-STD-1388-1, "Logistic Support Analysis". HQs AMCCOM has initiated action to structure each of the LSA tasks, the assessment of each ILS element, the form of the results, and the detailed processed to insure consistency with current Army policies, procedures, and techniques.

This approach (undertaken by AMCCOM and APJ) will insure uniformity in efforts and products, reproducibility of analyses, and a well-defined structure which can be coordinated among all participants in the logistic process to arrive at common understanding and procedures.

SCOPE

This report summarizes the results of the Structured Analysis of LSA Subtasks 302.2.3 and 302.2.4, "Alternative Support Plans" and "Updated Alternative Support Plans" and presents the associated Data Flow Diagrams (DFDs) developed from the Structured Analysis. The portions of the Data Dictionary relating to labels, names, descriptions, processes, data flows, data stores, and external entities are included in their present degree of completeness. (The Data Dictionary is a "living document" that evolves through the analysis and design process).

The Data Dictionaries developed for each of the individual LSA Subtasks are integrated together into a Master Data Dictionary. Integration of the individual Data Dictionary involves the combination of similar Data Flows, Data Stores, and External Entities. The resulting Master Data Dictionary may well contain some minor differences from the definitions that appear in this report. All processes, and of course, the content of the structured design will remain identical.

The Structured Design portion of this report develops the processes and data flows developed in the DFDs into procedures which are used to accomplish the LSA Tasks. The DFDs provide the method and the Design implements it, by formulating a guide for programmers to write software applications.

This report presents a brief overview of Structured Analysis and its place in the overall systems design process to assist the reader who may not be fully briefed on the symbols and conventions used. It is supported by Annex E, which defines each element in Structured Analysis, and by a separate Glossary.

LSA SUBTASK 302.2.3 & 302.2.4 - DATA FLOW DIAGRAMS (DFD)

The Data Flow Diagram is a tool that shows the flow of data, (i.e., data flows from sources) and is processed by activities to produce intermediate or final products.

The DFD provides a useful and meaningful partitioning of a system from the viewpoint of identification and separation of all functions, actions, or processes so that each can be introduced, changed, added, or deleted with minimal disruption of the overall program, i.e., it emphasizes the underlying concept of modularity and identifiable transformations of data into actionable products.

A series of two (2) DFDs have been developed to structure both LSA subtasks relative to plan development and update as follows:

1. 302.2.3, "Alternative Support Plan"
2. 302.2.4, "Updated Alternative Support Plan"

Four standard symbols are used in the drawing of a DFD (see Annex E, Figure 2).

A copy of each DFD is presented in Annex B, accompanied by the Data Dictionary process elements. Each entry made in the DFDs has a corresponding entry in the Data Dictionary, immediately following each of the DFDs.

LSA SUBTASK 302.2.3 & 302.2.4 - DESCRIPTION

Both the 302.2.3 and 302.2.4 LSA subtasks address themselves to the development of viable Support Plan Alternatives and the update of each viable Support Plan Alternative. In all cases, a plan is developed for each viable Support Concept Alternative fulfilling the needs of each System/Equipment Alternative.

LSA Subtask 302.2.3 - Provides for:

1. Identification of the System/Equipment hardware below the Subsystem/Subequipment levels (i.e., indenture level 3 and lower).
2. The determination of the logistic support resources necessary to maintain and operate the lower level hardware.
3. The incorporation of the System/Subsystem or Equipment/Subequipment level viable Support Concepts into the Support Plan. This newly developed support resource requirements incorporates with the established concept level resource requirement to arrive at a total support resource package covering all indenture levels (from the Top level down) of the System/Equipment under consideration.

LSA Subtask 302.2.4 - Provides for the update of the viable Support Plan after the plan has undergone Trade-Off Analysis in accordance with LSA Task 303 or the viable Support Concept Alternative has undergone update in accordance with Subtask 302.2.2.

The descriptions and definitions of LSA Task 302 and LSA subtasks 302.2.3 and 302.2.4 indicated in MIL-STD-1388-1A are included herein as Annex A.

APPROACH

The APJ approach to Structured Analysis of the LSA task is:

1. Scope the process defined in MIL-STD-1388-1A in the context of the other LSA tasks.
2. Review the guidance provided in AMC PAM 700-11, "Logistics Support Analysis Review Team Guide".
3. Review the applicable Data Item Descriptions (DIDs) from the Acquisition Management Systems and Data Requirements Control List (AMSDL) published by the Department of Defense.
4. Review all source documents referenced in the AMSDL as applicable to the referenced DIDs of interest.

5. Apply staff experience in logistic support analysis to assure that the topic has been exhaustively addressed.
6. From the completed DFDs prepare the step-by-step procedures that form the structured design.
7. Review Data Item Description and other applicable material to develop output reports.
8. If required revise DFDs and Data Dictionary based on preparation of detailed procedures.
9. Validate results in discussions with Army activities and personnel directly involved in the applicable or related LSA tasks.

NOTE: Structured Analysis and preparation of Data Flow Diagrams (DFDs) was further assisted by the application of Structured Analysis software. Licensed by Index Technology Corporation, Excelerator provides for automated tracking of names, labels, descriptions, multiple levels of detail in the data flow diagrams, and industry standards in symbols and diagramming practices.

VERT DIAGRAMS

The Venture Evaluation Review Technique (VERT) was developed as a network analysis technique to facilitate management decision making. It allows systematic planning and control of programs and enables managers to find solutions to real life managerial problems. The VERT Diagrams and INput Files for this task can be found in Annex D. In order to understand how these Input Files were developed, a brief discussion of the methodology used is provided. The same explanation is repeated verbatim in every report.

ANNEX A

LSA TASK 302
SUPPORT SYSTEM ALTERNATIVES

LSA SUBTASKS 302.2.3 & 302.2.4
ALTERNATIVE SUPPORT PLANS
AND
UPDATED ALTERNATIVE SUPPORT PLANS

ANNEX A

LSA TASK 302 DESCRIPTION

SUPPORT SYSTEM ALTERNATIVES

302.1 PURPOSE. To establish viable support system alternatives for the new system/equipment for evaluation, trade-off analysis, and determination of the best system for development.

302.2 TASK DESCRIPTION

302.2.3 Develop and document viable alternative support plans for the new system/equipment to a level of detail commensurate with the hardware, software, and operational scenario development.

302.2.4 Update and refine the alternative support plans as trade-offs are conducted and the new system/equipment's design and operational scenario become better defined.

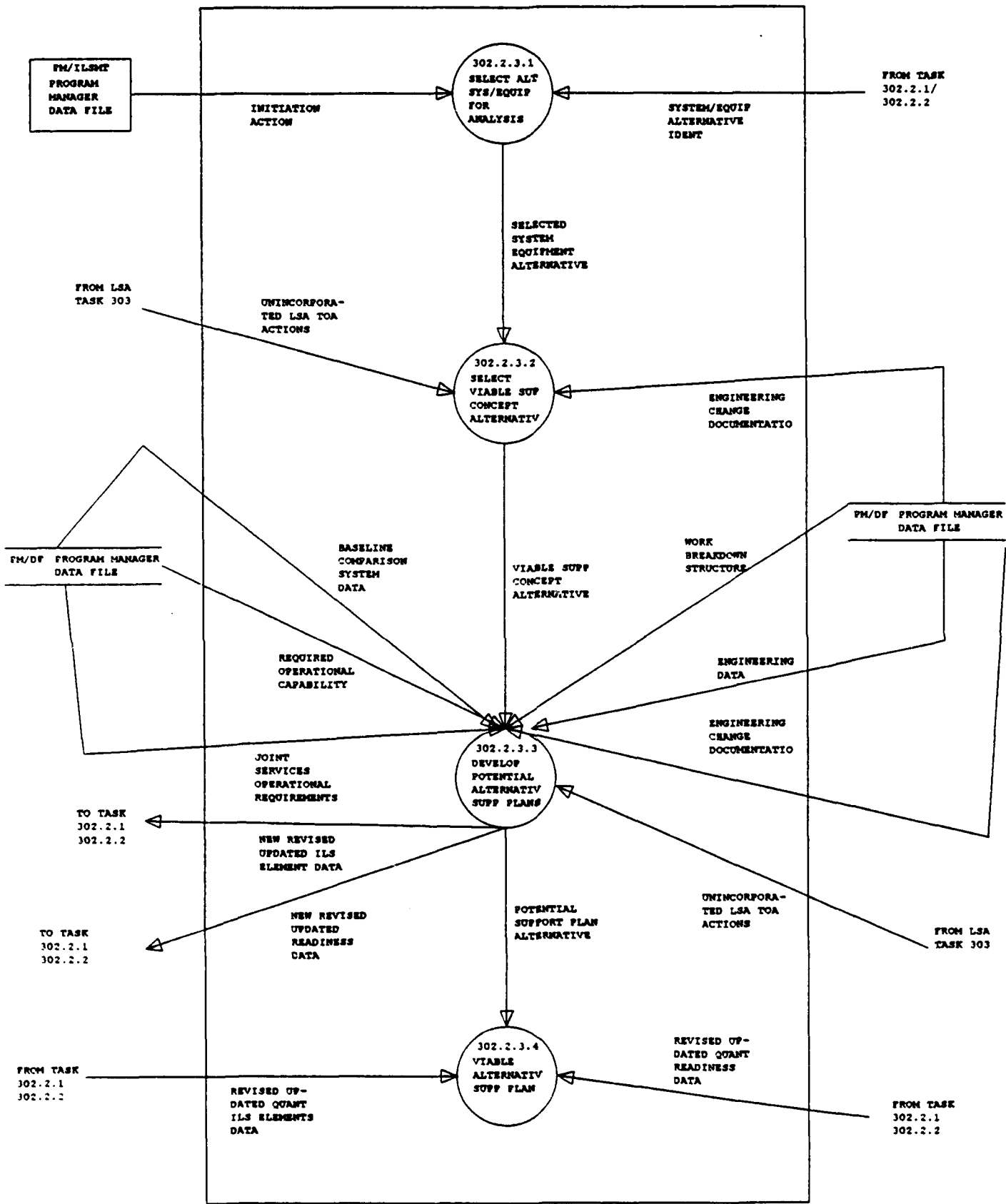
1/ Abstracted verbatim from MIL-STD-1388-1A, April 11, 1983,
Pages 36-37.

ANNEX B

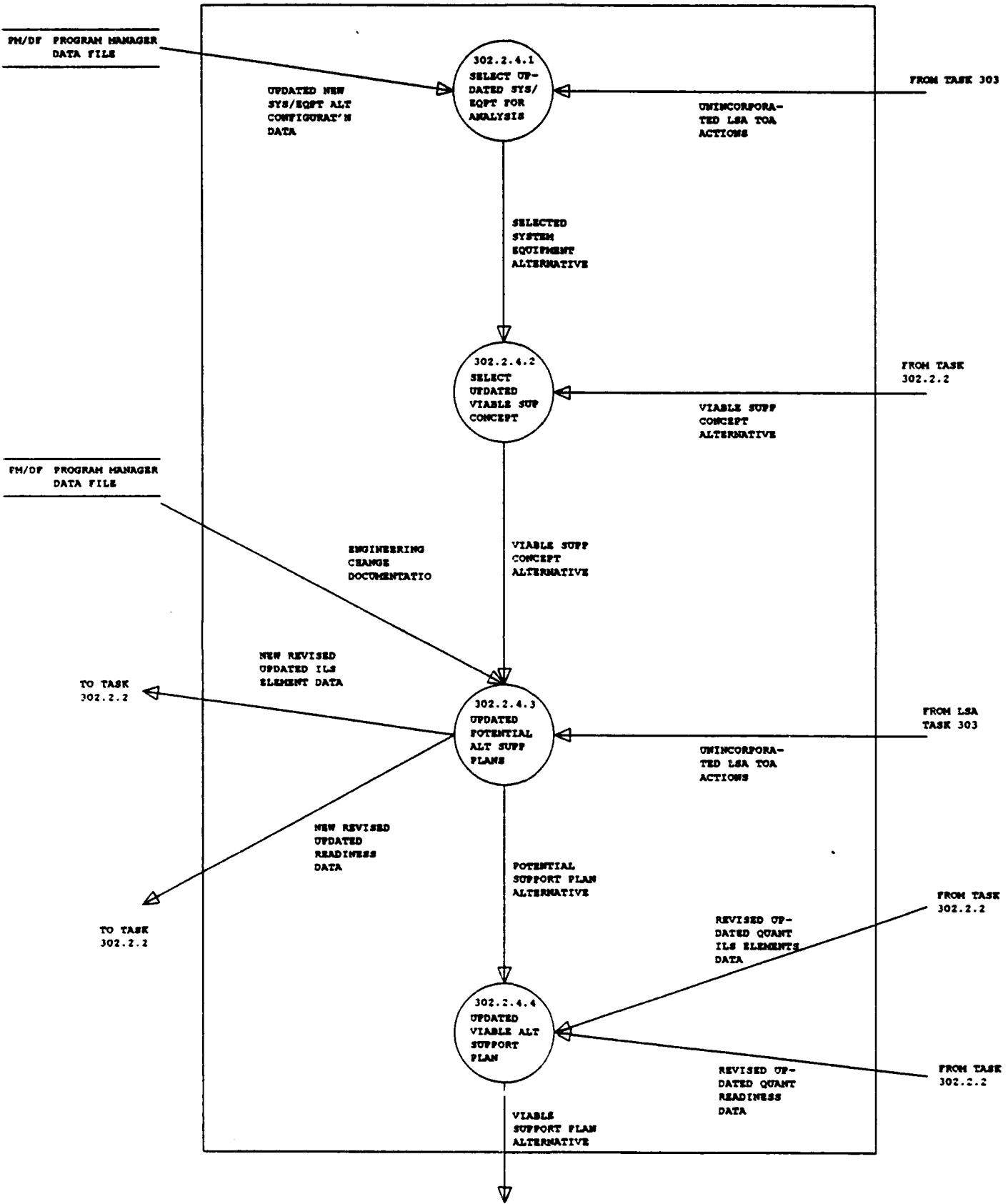
**LSA TASK 302
SUPPORT SYSTEM ALTERNATIVES**

**SUBTASKS 302.2.3 & 302.2.4,
ALTERNATIVE SUPPORT PLANS &
UPDATED ALTERNATIVE SUPPORT PLANS**

DATA FLOW DIAGRAMS AND PROCESS DATA DICTIONARY



302.2.3 ALTERNATE SUPPORT PLANS
 Created by: SID
 Revised by: SID
 Date changed: 21-DEC-99



302.2.4 ALT SUPP PLAN UPDATE
 Created by: SID
 Revised by: SID
 Date changed: 21-DEC-89

Name	Label	Description
302.2.3.1	SELECT ALT SYS/EQUIP FOR ANALYSIS	THE DATA IN ITS ENTIRETY REPRESENTING EACH UPDATED/REVISED/NEW ALTERNATIVE SYSTEM/EQUIPMENT IS PACKAGE AND IDENTIFIED AND READIED FOR USE IN THE DEVELOPMENT OF A SUPPORT PLAN ALTERNATIVE.
302.2.3.2	SELECT VIABLE SUP CONCEPT ALTERNATIV	THE VIABLE SUPPORT CONCEPT ALTERNATIVES, BOTH NEW AND UPDATED, DEVELOPED IN PROCESS 302.2.1.6 AND 302.2.2.5, ARE IDENTIFIED AND THEIR DATA ACCUMULATED FOR EACH SYSTEM/EQUIPMENT UNDER CONSIDERATION. UNINCORPORATED TRADE-OFF ANALYSIS (TOA) ACTIONS AND ENGINEERING CHANGES ARE GATHERED AT THIS TIME AND RESUBMITTED FOR UPDATE OF EACH CONCEPT IN PROCESS 302.2.2.5.
302.2.3.3	DEVELOP POTENTIAL ALTERNATIV SUPP PLANS	SYSTEM/EQUIPMENT HARDWARE INDENTURE LEVELS BELOW LEVEL 2 AS DEFINED IN MIL-STD-881A ARE DEVELOPED AND PREPARED FOR ANY ADDITIONAL ILS ELEMENT AND READINESS CONSIDERATIONS. REQUANTIFICATION OF EITHER THE ILS ELEMENTS OR READINESS REQUIREMENTS ARE ACCOMPLISHED IN PROCESS 302.2.1.5 OR 302.2.2.4.
302.2.3.4	VIABLE ALTERNATIV SUPP PLAN	IN THIS PROCESS THE EXPANDED VIABLE SUPPORT CONCEPT ALTERNATIVE PLUS THE INCLUSION OF ALL EXISTING LOWER INDENTURE LEVEL SUPPORT REQUIREMENTS CONSTITUTING THE POTENTIAL SUPPORT PLAN ARE RECEIVED AND ANALYZED FOR VIABILITY AS A ALTERNATIVE SUPPORT PLAN (i.e., SUPPORT REQUIREMENTS ARE WITHIN SUPPORT CONSTRAINTS). SELECTED SUPPORT PLAN ALTERNATIVES AND THEIR DOCUMENTATION ARE RETAINED FOR TRADEOFF ANALYSIS IN LSA TASK 303.
302.2.4.1	SELECT UP- DATED SYS/ EQPT FOR ANALYSIS	SYSTEM/EQUIPMENT ALTERNATIVES HAVING UNDERGONE TRADE-OFF ANALYSIS OR NEW SYSTEM/EQUIPMENT ALTERNATIVES DEVELOPED AS A RESULT OF TRADE-OFF ANALYSIS ARE IDENTIFIED AND READIED FOR ANALYSIS AND USE IN THE UPGRADE OF THE SUPPORT PLAN ALTERNATIVES.
302.2.4.2	SELECT UPDATED VIABLE SUP CONCEPT	FROM THE UPDATED VIABLE SUPPORT CONCEPT PROCESSED IN SUBTASK 302.2.2.1, THOSE CONCEPTS REPRESENTING THE SYSTEM/EQUIPMENT ALTERNATIVES UNDER CONSIDERATIONS ARE SELECTED AND ACCUMULATED FOR INTEGRATION WITH THE UPDATED DOCUMENTATION AND REPRESENTS THE BALANCE OF UPDATED LOWER LEVEL POTENTIAL ALTERNATIVE SUPPORT REQUIREMENTS.
302.2.4.3	UPDATED POTENTIAL ALT SUPP PLANS	LSA TOA AND ENGINEERING TOA ACTIONS AFFECTING SUPPORT CONSIDERATIONS FOR LEVEL 3 PER MIL-STD-881A AND LOWER INDENTURE LEVEL HARDWARE ARE INCORPORATED INTO EACH POTENTIAL SUPPORT PLAN ALTERNATIVE AND, WHERE APPLICABLE, THE DATA IS ACCUMULATED AND UTILIZED IN SUBTASK 302.2.2 TO UPDATE ILS ELEMENT DOCUMENTATION AND READINESS REQUIREMENT DATA.
302.2.4.4	UPDATED VIABLE ALT SUPPORT PLAN	THE UPDATED QUANTIFIED ILS ELEMENT DOCUMENTATION AND UPDATED QUANTIFIED READINESS DATA ARE ASSESSED FOR COMPATIBILITY WITH THE CONSTRAINTS ESTABLISHED FOR THE SYSTEM/EQUIPMENT. WHERE REQUIREMENTS EXCEED THE CONSTRAINT THRESHOLD LEVEL, THE ALTERNATIVE SUPPORT PLAN IN ITS ENTIRETY, SHALL BE CONSIDERED UNACCEPTABLE. ACCEPTABLE SUPPORT PLAN ALTERNATIVE DOCUMENTATION ARE READIED FOR FURTHER TOA ACTIONS PER LSA TASK 303.

Name	Label	Description
BCS	BASELINE COMPARISON SYSTEM DATA	THE BASELINE COMPARISON SYSTEM DOCUMENTATION PROVIDES INPUT DATA FOR THE ANALYSIS AND PROJECTION OF POTENTIAL SYSTEM READINESS, MANPOWER AND PERSONNEL REQUIREMENTS, AND O & S COSTS FOR EACH POTENTIAL SUPPORT CONCEPT FOR EACH ALTERNATIVE SYSTEM/EQUIPMENT. REFERENCE: LSA TASK 203.
ENG/CHANGE/DOC	ENGINEERING CHANGE DOCUMENTATIO	ACRONYMS: TOA, ECN ENGINEERING CHANGE DOCUMENTATION - ENGINEERING TOA ACTION, DOCUMENTATION, UNINCORPORATED ECN's, NEW OR EXPANDED SYSTEM/EQUIPMENT DEFINITION OR OTHER ENGINEERING EFFORTS AND DOCUMENTATION HAVING A BEARING ON THE DEVELOPMENT OR REQUIRING UPDATED OF THE SUPPORT CONCEPT OR THE SUPPORT PLAN.
ENG/DATA	ENGINEERING DATA	ENGINEERING DRAWINGS, PARTS LISTS AND OTHER ENGINEERING DOCUMENTATION DEFINED IN DOD-STD-1000 AND MIL-STD-100 HAVING A BEARING ON THE DEVELOPMENT OR UPDATE OF THE SUPPORT CONCEPT, SUPPORT PLAN OR OTHER ILS ACTIVITY.
INIT/ACT	INITIATION ACTION	ACRONYMS: ILS - INTEGRATED LOGISTIC SYSTEMS THE REQUIRED ACTIONS OF THOSE (IF MORE THAN ONE) ACTIVITIES NECESSARY TO ACTUATE AN ILS ELEMENT ASSESSMENT FOR A SYSTEM AND/OR EQUIPMENT PROVIDES THE FORMAL AUTHORIZATION FOR THE PERFORMANCE OF AN ILS EFFORT.
JSOR	JOINT SERVICES OPERATIONAL REQUIREMENTS	ACRONYMS: JSOR - JOINT SERVICES OPERATIONAL REQUIREMENTS PORTION OF THE JSOR DATA ARE UTILIZED TO ESTABLISH THE POTENTIAL SUPPORT CONCEPTS, READINESS FACTOR, AND COSTS INORDER TO DETERMINE THE VIABLE SUPPORT CONCEPT ALTERNATIVES.
NEW/REV/UPDTD/ILS/DA	NEW REVISED UPDATED ILS ELEMENT DATA	ACRONYMS: ILS - INTEGRATED LOGISTIC SYSTEM NEW/REVISED/UPDATED ILS ELEMENT DATA - DATA AFFECTING EXISTING QUANTIFIED ILS ELEMENTS AND THEIR DOCUMENTATION ARE ACCUMULATED FOR CONSIDERATION IN THE REVISION AND/OR UPDATE OF THE QUANTIFIED DATA.
NEW/REV/UPDTD/READ/D	NEW REVISED UPDATED READINESS DATA	NEW/REVISED/UPDATED READINESS DATA - DATA AFFECTING EXISTING QUANTIFIED READINESS REQUIREMENTS AND THEIR DOCUMENTATION ARE ACCUMULATED FOR CONSIDERATION IN THE REVISION AND/OR UPDATE OF THE QUANTIFIED DATA.
POT/SUPP/PLAN/ALT	POTENTIAL SUPPORT PLAN ALTERNATIVE	POTENTIAL SUPPORT PLAN ALTERNATIVE - THE INITIAL COMPILATION OF THE ALTERNATIVE SUPPORT CONCEPT, THE IDENTIFIED LOWER INDENTURE LEVEL HARDWARE AND THEIR SUPPORT REQUIREMENTS.
REV/QUANT/ILS/ELE/DA	REVISED UP- DATED QUANT ILS ELEMENTS DATA	ACRONYMS: TOA, ILS REVISED/UPDATED QUANTIFIED ILS ELEMENT DATA - REVISED AND/OR UPDATED ILS ELEMENTS AND THEIR DOCUMENTATION REFLECTING TOA ACTIONS AND OTHER CHANGES OR CONSIDERATIONS HAVING A BEARING ON REQUIRED SYSTEM/EQUIPMENT LOGISTIC SUPPORT.

Name	Label	Description
REV/QUANT/READ/DATA	REVISED UP-DATED QUANT READINESS DATA	ACRONYMS: TOA REVISED/UPDATED QUANTIFIED READINESS DATA - REVISED AND/OR UPDATED READINESS DOUCMENTATION REFLECTING TOA ACTIONS AND OTHER CHANGES OR CONSIDERATIONS AFFECTING SYSTEM/EQUIPMENT READINESS.
ROC	REQUIRED OPERATIONAL CAPABILITY	PORTION OF THE ROC DATA ARE UTILIZED TO ESTABLISH THE POTENTIAL SUPPORT CONCEPTS, READINESS FACTORS, AND COSTS IN ORDER TO DETERMINE THE VIABLE SUPPORT CONCEPT ALTERNATIVES.
SEL/SYS/EQUIP/ALT	SELECTED SYSTEM EQUIPMENT ALTERNATIVE	SELECTED SYSTEM/EQUIPMENT ALTERNATIVE - ALL IDENTIFIED SYSTEM/EQUIPMENT ALTERNATIVES WITH THEIR RELATED DOCUMENTATION ARE CORRELATED AND PREPARED FOR FURTHER SUPPORT ANALYSIS ON A SELECTED (INDIVIDUAL) BASIS.
SYS/EQP/ALT/IDENT	SYSTEM/EQUIP ALTERNATIVE IDENT	THE DATA AND DOCUMENTATION PRODUCED BY THE COMBAT DEVELOPER THAT IDENTIFY SYSTEM/EQUIPMENT ALTERNATIVES FULFILLING MISSION AREA REQUIREMENTS.
UNINCORP/LSA/TOA/ACT	UNINCORPORA-TED LSA TOA ACTIONS	UNINCORPORATED LSA TOA ACTIONS - TOA ACTIONS AND DOCUMENTS GENERATED AS A RESULT OF PERFORMING, LSA TASK 303 THAT HAVE NOT BEEN INCORPORATED, WHEN APPLICABLE, IN EITHER THE VIABLE SUPPORT CONCEPTS OR THE POTENTIAL ALTERNATIVE SUPPORT PLAN.
UPD/NEW/SYS/EQPT/ALT	UPDATED NEW SYS/EQPT ALT CONFIGURAT'N DATA	ADDITIONAL DATA DEFINING THE DETAILS OF EXISTING ALTERNATIVE SYSTEM/EQUIPMENT CONFIGURATION OR THE GENERATION OF NEW SYSTEM/EQUIPMENT EXTRACTED FROM THE PROGRAM MANAGERS FILE FOR USE IN THE ANALYSIS PROCESS TO UPDATE EXISTING CONCEPTS AND/OR DEVELOP NEW SUPPORT CONCEPTS.
VIABLE/SUPP/CONC/ALT	VIABLE SUPP CONCEPT ALTERNATIVE	VIABLE SUPPORT CONCEPT ALTERNATIVE - CORRELATED AND DOCUMENTED RESULTS OF DETERMINING SUPPORT CONCEPTS THAT FULFILL ALL SUPPORT REQUIREMENTS WITHIN ESTABLISHED CONSTRAINTS.
VIABLE/SUPP/PLN/ALT	VIABLE SUPPORT PLAN ALTERNATIVE	VIABLE SUPPORT PLAN ALTERNATIVE - THE SELECTED POTENTIAL SUPPORT PLANS SHOWN TO BE VIABLE ALTERNATIVES FOR EACH SYSTEM/EQUIPMENT ALTERNATIVE.
WBS	WORK BREAKDOWN STRUCTURE	DOCUMENTED RESULTS OF THE WORK BREAKDOWN STRUCTURE - EFFORT PERFORMED IN PROCESS 301.2.1.2A, IN PARTICULAR, THE IDENTIFICATION OF THE LEVELS 2 AND 3 SUBSYSTEMS AND SUBEQUIPMENTS. THE OUTPUT IS REQUIRED IN PROCESS 302.2.2 TO ESTABLISH THE OVERALL ALTERNATIVE SYSTEM PACKAGE, THE ALTERNATIVE SUPPORT CONCEPT UPDATE, OR A NEW ALTERNATIVE SUPPORT CONCEPT. REFERENCE: MIL-STD-881A, WORK BREAKDOWN STRUCTURES FOR DEFENSE MATERIELS ITEMS

Name	Label	Description
PM/DF	PROGRAM MANAGER DATA FILE	CONTAINS THOSE FILES AND DATA WHICH ARE NORMALLY DEVELOPED BY AND/OR RETAINED BY THE PROGRAM MANAGER FOR PROPER MANAGEMENT OF THE DEVELOPMENT PROGRAM. THESE FILES INCLUDE: 1. ENGINEERING DRAWINGS 2. ENGINEERING CHARACTERISTICS 3. DT/OT RESULTS 4. CONCEPT FORMULATION PACKAGE (CFP) 5. DESIGN CONCEPT PAPER (DCP) 6. TYPE TECHNICAL REVIEWS REQUIRED 7. MILESTONE SCHEDULES 8. FUNDING PROFILES 9. REQUIRED OPERATIONAL CAPABILITIES (ROC) 10. ITEM/EQUIPMENT SPECIFICATIONS 11. ITEM/EQUIPMENT MISSIONS & FUNCTIONS 12. EQUIPMENT, MANPOWER, AND TECHNICAL RISK ASSESSMENTS (FROM LSA TASK 301.2.3 13. TRADE OFF DETERMINATION ANALYSIS (TOD) 14. TRADE OFF ANALYSIS (TOA) 15. BEST TECHNICAL APPROACH ANALYSIS (BTA) 16. COST AND OPERATIONAL-EFFECTIVENESS ANALYSIS (COEA)

Name	Label	Description
PM/ILSMT	PROGRAM MANAGER DATA FILE	THE PROGRAM MANAGER OR THOSE ACTIVITIES, AGENCIES, OR AUTHORITIES THAT ARE RESPONSIBLE FOR THE INITIATION OF THE REQUIREMENT FOR AN ILS ELEMENT ASSESSMENT DURING A DEVELOPMENT PROGRAM FOR A SYSTEM AND/OR EQUIPMENT IN ACCORDANCE WITH AR 700-127. THE KEY ACTION (OUTPUT) REQUIRED OF THIS EXTERNAL ENTITY IS THE DIRECTIVE, AUTHORITY, OR OTHER DOCUMENTATION THE INITIATES THE REQUIREMENT FOR THE APPLICATION OF THIS ILS ASSESSMENT TO A SPECIFIC SYSTEM/EQUIPMENT DEVELOPMENT PROGRAM AT A SPECIFIED POINT IN ITS LIFE CYCLE.

ANNEX C

SUBTASK 302.2.3 & 302.2.4
ALTERNATIVE SUPPORT PLANS &
UPDATED ALTERNATIVE SUPPORT PLANS

SUBTASK 302.2.3
ALTERNATIVE SUPPORT PLANS

PROCESS 302.2.3.1 - Select System/Equipment Alternative
for Analysis

PURPOSE:

To identify the System/Equipment Alternative and obtain the related engineering documentation originally developed in Process 302.2.1.1 or by the Combat Developer.

PROCEDURES:

1. From Subtask 302.2.1 and 302.2.2, obtain the previously developed technical information identifying each viable System/Equipment Alternative, as well as the following:
 - a. The Baseline Comparison System documentation applicable to each System/Equipment Alternative.
 - b. All developed and completed quantitative and qualitative forms (if any) applicable to each System/Equipment Alternative.
 - c. All engineering data (including engineering drawings) applicable to and utilized in the development of each System/Equipment Alternative.
2. If not accomplished, package each set of documentation, including the completed forms and their background data, to represent each viable System/Equipment Alternative.
3. Select one (1) System/Equipment Alternative (if more than one), and its related documentation package for analysis in Processes 302.2.3.2 through 302.2.3.4.

NOTE: Repeat the System/Equipment Alternative selection process and analysis until all System/Equipment Alternatives have undergone and completed this Subtask in its entirety.

REFERENCES:

The following references may be useful:

- Program Manager's Data File
- Acquiring Activity File
- LSA Task 203, Comparative Analysis Documentation
- AR 700-127, Integrated Logistic Support
- AMC/TRADOC PAM 70-2, Materiel Acquisition Handbook Chapters 9 & 10.

PROCESS 302.2.3.2 - Select Viable Support Concept Alternatives

PURPOSE:

To identify those Support Concept Alternatives proven viable and applicable to the System/Equipment Alternative under consideration.

PROCEDURE:

1. From Subtasks 302.2.1 and/or 302.2.2, or from documentation prepared using APJ Report 966-234, "Support System Alternatives", paragraph 1.b of Process 302.2.3.1, identify and obtain all viable Support Concept Alternatives applicable to the System/Equipment under consideration.
2. From LSA Trade-Off Analysis (TOA) activities in Task 303, or from the Program Manager's Data File, identify and obtain any outstanding documentation relative to TOA actions and results that have not been incorporated in all or any existing viable Support Concept Alternatives. Review the documentation and determine the following:
 - a. Review each ILS element to identify changes to requirements affecting the System/Subsystem support concept.
 - b. Identify existence of changes in the following areas of the System/Subsystem levels of Alternatives:
 - (1) Functional characteristics
 - (2) Operational characteristics
 - (3) Configuration characteristics
 - (4) Environmental conditions.

LSA TOA generated changes affecting all or any existing viable Support Concept Alternative shall have the LSA TOA documentation accumulated for further analysis and consideration in accordance with the update provisions of LSA Subtask 302.2.2.

3. Perform the same review and data accumulation as outlined in paragraph 2 above, except substitute outstanding engineering TOA documentation, Engineering Change Notices (ECNs), and any other Engineering Change/Update Documents that could have a bearing on the viability of existing Support Concept Alternatives.

NOTE:

- Viable Support Concept Alternatives affected by Engineering changes shall be updated simultaneously with any LSA TOA generated changes in accordance with the provisions of Subtask 302.2.2.
- As Support Concept Alternatives only encompass Levels 1 and 2 equipments, as defined in MIL-STD-881A, any data accumulation pertaining to lower indenture levels of the System/Equipment under consideration shall be retained for use in establishing the overall support plan (Ref.: APJ Report 966-234 "Support System Alternatives", Processes 302.2.3.3 and 302.2.3.4).

REFERENCES:

The following references may be useful:

- Program Manger's Data File
- LSA Task 303, Evaluation of Alternatives and Trade-off Analysis
- MIL-STD-881A, Work Breakdown Structure
- AMC/TRADOC PAM 70-2, Materiel Acquisition Handbook Chapters 9, 10, and 12
- AR 70-37, Configuration Management
- MIL-STD-480, Configuration Management
- MIL-STD-483, Configuration Management Practices in Systems, Equipments, Munitions and Computer Programs
- MIL-T-60530, Technical Data Packages for AMC Materiel

PROCESS 302.2.3.3 - Develop Potential Alternative Support Plans

PURPOSE:

To establish the base that will constitute the initial formulation and identification of all possible support plans that can be applied towards a given System/Equipment Alternative.

NOTE: The analyst shall keep in mind that every viable support concept alternative requires the generation of a support plan.

1. Establish/complete/enlarge, as applicable, Level 3 requirements of the Work Breakdown Structure documentation per MIL-STD-881A by performing the following:

- a. From LSA Subtask 302.2.2 - "Updated Support System Alternatives", obtain the Work Breakdown Structure documentation applicable to the System/Equipment Alternatives under considerations.
- b. From the Program Manager's Data File, obtain the following data identifying the current design parameters:
 - (1) Detail engineering drawings, including the sub-subsystem/sub-subequipment and all lower indenture levels of the system/equipment.
 - (2) Approved ECNs not incorporated in engineering documentation.
 - (3) Engineering TOA actions and results whose documentation have not been incorporated into the engineering drawings or related engineering data.
 - (4) Baseline Comparison System documentation representing the system/equipment under consideration.
 - (5) ROC & JSOR

- c. Using the data accumulated in paragraph 1.b(1) and 1.b(2) above, check the Level 2 data listing of the WBS to assure current level of completeness and accuracy. Update the listing on an "as required" basis in accordance with APJ Report 966-234 "Support System Alternatives" procedures for Process 302.2.2.2.
- d. From the Level 2 WBS listing, determine the hardware items constituting Level 3 of the document. Complete/enlarge/update the existing listing, or if a Level 3 listing does not exist, refer to MIL-STD-881A for preparation instructions. Use the accumulated engineering data and Baseline Comparison System data as the information sources.

NOTE: New/updated Level 3 hardware items shall be listed on the enclosed form entitled "New/Updated Sub-Subsystem/Sub-Subequipment Hardware Items".

2. Research the Work Breakdown Structure (WBS) Level 3 listing for the next lower indenture level hardware items by reviewing the Level 3 hardware item drawing parts list. Repeat this research and review procedure until all indenture levels, including the absolute lowest level, have been identified. Indicate on the enclosed form, entitled "New/Updated Sub-Subsystem/Sub-Subequipment Hardware Items" all hardware items constituting each and every identified indenture level of the System/Equipment Alternative.
3. Obtain the ILS Element Data Developed for Levels 1 and 2 of the WBS, in LSA Subtasks 302.2.1 and 302.2.2. Review the support concept established based on the ILS Element Data. Determine if the Level 3 hardware identified, has an impact on the existing support concept which in turn affects the ILS Element Data and Readiness Requirement Data. If the third level item affects the system support concept, place a Y (yes) in the New/Updated ILS Element Effort required column of the "New/Updated Sub-Subsystem/Sub-Subequipment Hardware Items" worksheet.
4. From the data accumulated in paragraph 1.b above, check the Engineering TOA actions and the ROC or JSOR for changes having a bearing on the Level 3 and lower indenture level hardware items of the system/equipment. All changes shall be documented and acted upon as follows:

- a. Review the engineering data and any engineering TOA actions and data identifying the following characteristics of all WBS Level 3 hardware items and all lower level subsystem/subequipment components and assemblies:
- (1) Functional characteristics
 - (2) Operational characteristics
 - (3) Environmental conditions
 - (4) Configuration characteristics

Identified characteristics and conditions affecting existing ILS element data or readiness requirements shall be listed on the enclosed form entitled "Sub-Subsystem/Sub-Subequipment and Detail Hardware Characteristics".

- b. Revised ROC or JSOR documentation, if any, shall be reviewed for changes, additions, and deletions affecting any of the existing ILS elements data and readiness requirements data for any level of system/equipment hardware. Indicate any changes, additions, or deletions to hardware items on the form entitled: "New/Updated Sub-Subsystem/Sub-Subequipment and Detail Hardware Characteristics". Similarly, changed equipment characteristics and conditions shall be indicated on the form entitled: "Sub-Subsystem/Sub-Subequipment and Detail Hardware Characteristics"/
- c. Upon completion of the forms mentioned in a and b above, check each new Hardware and Characteristics listing therein for existing ILS element data coverage and Readiness Requirement data coverage in the Baseline Comparison System documentation. Coverages that are complete and usable "as is" shall be incorporated as part of the Potential Alternative Support Plan. All other hardware and characteristics listings on the two forms shall undergo assessment and analysis in accordance with LSA Subtask 302.2.1 and 302.2.2 and Processes 302.2.1.5A and 302.2.2.4 described in APJ Report 966-234 "Support System Alternatives". Attach all ILS and Readiness forms to the completed "New/Updated Sub-Subsystem/Sub-Subequipment Hardware Items" form and "Sub-Subsystem/Sub-Subequipment and Detail Hardware Characteristics" form.

REFERENCES:

The following references may be useful:

- MIL-STD-881A, Work Breakdown Structure
- Program Manager's Data File
- LSA Task 203, Comparative Analysis
- AMC/TRADOC PAM 70-2, Materiel Acquisition Handbook, Chapters 3, 9 & 12
- AR 70-37, Technical Data Packages.

PROCESS 302.2.3.4 - Viable Support Plan Alternative

PURPOSE:

To establish Viable Support Plan Alternatives that will satisfy the functional and operational requirements of the System/Equipment Alternative.

PROCEDURES:

1. Review the completed, updated Readiness forms developed in Process 302.2.2.4 (see APJ Report 966-234 for a description of the process) and compare the Readiness constraints with the calculated Sub-Subsystem/Sub-Subequipment and lower indenture level hardware Readiness requirements. Where the calculated requirements exceed the established LSA Subtask 303.2.2 "Support System Alternatives", threshold level of the Sub-Subsystem/Sub-Subequipment and lower indenture level hardware constraints (if any), or requirements cause the System/Subsystem constraints to be exceeded, the package representing the Viable Support Concept for the System/Subsystem/Equipment/Subequipments (Levels 1 and 2 per MIL-STD-881A) under consideration shall be considered unacceptable.
2. For LSA Task 303 purposes, consolidate the Viable Alternative Support Concept Data with the Level 3 and lower indenture level hardware data which represents the support needs of the system/equipment under consideration.

Develop Potential Alternative Plans
(Process 302.2.3)

End Item Name: _____

Nomenclature: _____

Part Number: _____

NEW/UPDATED SUB-SUBSYSTEM/SUB-SUBEQUIPMENT HARDWARE ITEMS

1. Check mark the "Work Breakdown Structure (WBS) Level" Column for Level 3 Hardware items.
2. Complete "Indenture Level" column for hardware items below Level 3 of the WBS.

ITEM NO.	ITEM NAME (NOMENCLATURE)	WBS LEVEL MIL-STD-881A	INDENTURE LEVEL	NEW/UPDATED ILS ELEMENTS EFFORT REQ'D Y=YES, N=NO	REVISED ILS DATA ATTACHED ()	NEW/UPDATED READINESS EFFORT REQ'D Y=YES, N=NO	REVISED READINESS DATA ATTACHED ()

**Develop Potential Alternative Support Plans
(Process 302.2.3.3)**

End Item Name: _____
Nomenclature: _____
Part Number: _____

SUB-SUBSYSTEM/SUB-SUBEQUIPMENT AND DETAIL HARDWARE CHARACTERISTICS

NOTE: Same Item No. & Part/Dwg. No. shall appear on all forms.

ITEM NO.	HARDWARE NAME & PART/DWG. NO.	FUNCTIONAL CHARACTERISTICS	NEW/ADD'L. SUPPORT REQ'D. (Y=YES, N=NO)	REMARKS
ITEM NO.	HARDWARE NAME & PART/DWG. NO.	OPERATIONAL CHARACTERISTICS	NEW/ADD'L. SUPPORT REQ'D. (Y=YES, N=NO)	REMARKS
ITEM NO.	HARDWARE NAME & PART/DWG. NO.	CONFIGURATION CHARACTERISTICS	NEW/ADD'L. SUPPORT REQ'D. (Y=YES, N=NO)	REMARKS
ITEM NO.	HARDWARE NAME & PART/DWG. NO.	ENVIRONMENTAL CHARACTERISTICS	NEW/ADD'L. SUPPORT REQ'D. (Y=YES, N=NO)	REMARKS

SUBTASK 302.2.4
ALTERNATIVE SUPPORT PLAN UPDATE

- NOTE:
1. Each System/Equipment Alternative and related Support System Concept Alternatives, having undergone Trade-Off Analysis shall, on an individual basis, proceed through Subtask 302.2.2 prior to initiation of Support Plan update.
 2. This subtask does not include TOA generated new System/Equipment Alternatives or new Support System Concept Alternatives. Each new Alternative shall be processed in accordance with LSA Subtask 302.2.1.

PROCESS 302.2.4.1 - Select Updated System/Equipment Alternatives

PURPOSE:

Identify all System/Equipment Alternatives generated in LSA Subtasks 302.2.2 or 302.2.3 having undergone revision or update as a result of TOA actions or other authorized LSA/Engineering activities.

PROCEDURES:

1. From Subtask 302.2.3, obtain all related revised System/Equipment Alternatives.
2. Check each identified System/Equipment Alternative with the Alternatives identified in Process 302.2.3.1. Eliminate from consideration in this subtask, the following:
 - a. System/Equipment Alternatives from Subtask 302.2.1 that were analyzed in Subtask 302.2.3, but not subjected to Task 303 analysis.
 - b. Updated System/Equipment Alternatives from Subtask 302.2.2 that were previously analyzed in Subtask 302.2.3, but not subjected to Task 303 analysis.
 - c. System/Equipment Alternatives and Updated System/Equipments having full ILS element data coverage and full Readiness data coverage usable in an "as is" condition in the Baseline Comparison System documentation.

3. Select one System/Equipment Alternative or Updated System/Equipment Alternative (if more than one), its related Engineering data, Support Plan data, and Baseline Comparison System documentation for use and analysis in Process 302.2.4.2 through 302.2.4.4.

NOTE: Repeat the System/Equipment Alternatives selection and analysis process until all System/Equipment Alternatives have undergone and completed this Subtask in its entirety.

REFERENCES:

The following references may be useful:

- LSA Task 203, Baseline Comparison System
- LSA Subtasks 302.2.1 and 302.2.2, Support Concept Alternatives Development and Update.

PROCESS 302.2.4.2 - Select Updated Viable Support Concept

PURPOSE:

Identify and obtain all related documentation applicable to the Support Concept Alternatives generated in Subtask 302.2.2 as a result of TOA actions or other authorized LSA/Engineering activities.

PROCEDURES:

1. From Subtask 302.2.2 "Updated Support System Alternatives", obtain all updated Support System Concept Alternatives representing the System/Equipment Alternative under consideration.
2. Accumulate the updated data representing each Support System Concept Alternative, including all TOA actions and other documentation for incorporation in the update of the Potential Alternative Support Plan package.

PROCESS 302.2.4.3 - Updated Potential Support Plans

NOTE: Any new Support System Concepts accumulated as a result of actions taken in Process 302.2.4.2 shall not be processed in accordance with this update procedure. The development of new Potential Support Plans shall be accomplished in accordance with Process 302.2.3.

PURPOSE:

To update the existing baseline constituted by the Potential Alternative Support Plans.

PROCEDURES:

1. Select one (1) Potential Alternative Support Plan (if more than one) applicable to the Support System Concept updated in Process 302.2.4.2.
2. Review the TOA action documentation or other LSA/ Engineering generated changes, additions, or deletions affecting the Level 3 and lower level items listed in the Support Plan.
3. Indicate all generated changes, additions, or deletions to hardware items, and all functional and operational characteristics on the form provided, entitled: "TOA or Other Authorized Hardware/Characteristics Changes". In addition:
 - a. Determine and indicate on the form if any ILS elements require rework. Refer to APJ Report 966-234 for LSA Subtask 302.2.1 "Support System Alternatives and perform Process 302.2.1.5A, assess and analyze the elements requiring rework, complete the element ILS forms, as applicable, and attach to this form. Check the "Revised/New ILS Data Attached" column.

NOTE: Do not re-assess any ILS elements or subelements not affected by TOA or other actions.

- b. Determine and indicate on the form if any Readiness requirement effort is necessary. Refer to APJ Report 966-234 and perform Process 302.2.2.4, determine and perform requirement rework effort as necessary. Complete the Readiness form and attach to this form. Check "Revised/New Readiness Data Attached" column.

NOTE: Do not requantify any Readiness requirements not affected by TOA or other actions.

REFERENCES:

The following references may be useful:

- LSA 303, Evaluation of Alternatives and Trade-off Analysis
- AR 70-37, Configuration Management

**Updated Potential Support Plans
(Process 302.2.4.3)**

End Item Name: _____
Nomenclature: _____
Part Number: _____

TOA OR OTHER AUTHORIZED HARDWARE/CHARACTERISTICS CHANGES

ITEM NO.	ITEM NAME OR FUNCT/OPNL CHARACTER'CS.	INDENTURE LEVEL	ILS ELEMENT EFFORT REQ'D. Y=YES, N=NO	REVISED/NEW ILS DATA ATTACHED ()	READINESS EFFORT REQUIRED Y=YES, N=NO	REVISED/NEW READINESS DATA ATTACHED ()

PROCESS 302.2.4.4 - Updated Viable Support Plan Alternatives

PURPOSE:

To establish updated Viable Support Plan Alternatives that will satisfy the functional and operational requirements of the System/Equipment Alternatives.

PROCEDURES:

1. Review the Updated Readiness forms that resulted in completing Process 302.2.2.4 and compare the Readiness constraints with the calculated updated Sub-Subsystem/Sub-Subequipment and lower indenture level hardware Readiness requirements. Where calculated requirements exceed the established threshold level of the system/equipment and its sub-level hardware constraints, will make the viable Support Concept Alternative and the related Potential Support Plan, for the system/equipment under consideration, unacceptable.
2. Each viable Support Plan Alternatives fulfilling the support needs of the system/equipment alternative shall have its documentation assembled and packaged for Trade-Off Analysis in accordance with LSA Task 303.

ANNEX D

**VERT BATCH INPUT FILES
FOR
LSA SUBTASKS 302.2.3 AND 302.2.4**

VERT APPLICATION METHODOLOGY

BACKGROUND:

Venture Evaluation and Review Technique (VERT) was developed as a network analysis technique to facilitate management decision making. It allows a systematic planning and control of programs and enables managers to find solutions to real life managerial problems.

The terms of the APJ contract require the provision of batch files for each of the VERT networks associated with the various Data Flow Diagrams in the APJ 966 projects.

APJ has been successful in adopting a method for the creation of these networks using the existing EXCELERATOR software package and establishing a naming convention compatible with that used in the Data Flow Diagrams. To do this APJ has made use of the PC model of VERT. A Structured Analysis project was used for this purpose. The prototype VERT network structure was made for one top level and one lower level data flow diagram.

The PC model of VERT has certain limitations built into it. To overcome some of these limitations, certain conventions were used to create the input files. To maintain full generality a set of "dummy" default values were established. The model allows the user to alter the default values of time, cost, and performance to satisfy their specific requirements.

METHODOLOGY:

The basic symbols used to structure the network are :

- (i) **SQUARES** - to indicate NODES. These are ~~action~~ ~~in~~ in the project, or points beyond which the project cannot proceed unless certain criteria are met. There are two types of nodes, one which supports input operations and, the second type which supports output operations.
- (ii) **LINES** - to indicate ARCS which are ~~action~~ that have time, cost, and performance criteria associated with them.

In practice, however, both the arcs and nodes are similar, in that both have time, cost, and performance criteria associated with them. The arcs have a primary and a cumulative set of time, cost, and performance criteria whereas the nodes have only a single cumulative set.

- (iii) **NAMING CONVENTIONS** - Efforts have been made to keep the naming convention as compatible as possible to the Data Flow Diagrams. The naming convention used is displayed below.

NODES - All nodes are prefixed with the letter N. The individual Nodes are identified by a number and a letter. The number refers to the number of the node within the diagram and the letter refers to the diagram number in the project. In the event that a node has been referenced in an earlier diagram they also carry the number of the node in the earlier diagram as a prefix to the individual node number.

N2.4A

- N** - All nodes are prefixed with the letter N
- 2** - Gives the number of the node it relates to in a higher level diagram or an earlier data flow diagram within the project. In this case it refers to node N2 of the top level diagram.
- 4** - Gives the number of the node in the present data flow diagram.
- A** - The nodes in each subsequent explosion are allotted an alphabetical suffix indicating the number of the explosion diagram in the particular project. In this case it is the first lower level diagram within the project.

ARCS - All arcs are prefixed with either the letter C or E. The individual Arcs are identified by two numbers. The first number refers to the number of the arc within the diagram and the second number refers to the number of the diagram within the project. In the event that an arc has been referenced in an earlier diagram they also carry the number of the arc in the earlier diagram as a prefix to the individual arc number. The arcs which are identified by the letter E have direct reference to a process in the corresponding data flow diagram and as such are named the same as the process itself.

C3.3.8.4

E12.1A2

- C** - All arcs are prefixed with the letter C. In some cases, however, arcs carry a prefix of E. These particular arcs correspond to a process within the data flow diagram and are thus named the same as the process itself.

- 3.3 - Gives the number of the arc it relates to in a higher level diagram or an earlier data flow diagram within the project. In this case it refers to arc number 3 in lower level diagram #3 within the project.
- 8.4 - Indicates that this particular arc is the #8 arc in the #4 lower level diagram of the project.

BATCH FILES

- INPUT FILES** - The input file names are given the extension *.IN.
- OUTPUT FILES** - The simulation output files are given the extension *.OU.
- PRINT FILES** - The print files have been given the extension *.PR.

(This would allow subsequent updates of the input files to be numbered as IN1...,OU1...,PR1... etc.)

DEFAULT SETTINGS:

Control Record:

- (i) The output option selected is "0" which provides a detailed listing, and high level of summary information.
- (ii) The input record listing option selected is "0" which prints all input records.
- (iii) The composite terminal node output option selected is "16" which assumes family mode and intrafamily transfer of histogram data.
- (iv) The number of iterations used are "10" in the demonstration model to facilitate operation in the debug mode if required.
- (v) The composite node name and the network name are left as blanks.
- (vi) In the run identification the name of the corresponding Data Flow Diagram is used as identification for the network description.

Arc Records:

- (i) For each of the arcs the following records are provided:
 - (a) Master Arc Record
 - (b) Time Distribution Satellite
 - (c) Cost Distribution Satellite
 - (d) Performance Distribution Satellite
- (ii) The Distribution Satellite Records are created to provide a uniform statistical distribution.
- (iii) The default values used for the minimum and maximum in each criteria are:

TIME	10.0	20.0
COST	10.0	100.0
PERFORMANCE	10.0	50.0

Node Records:

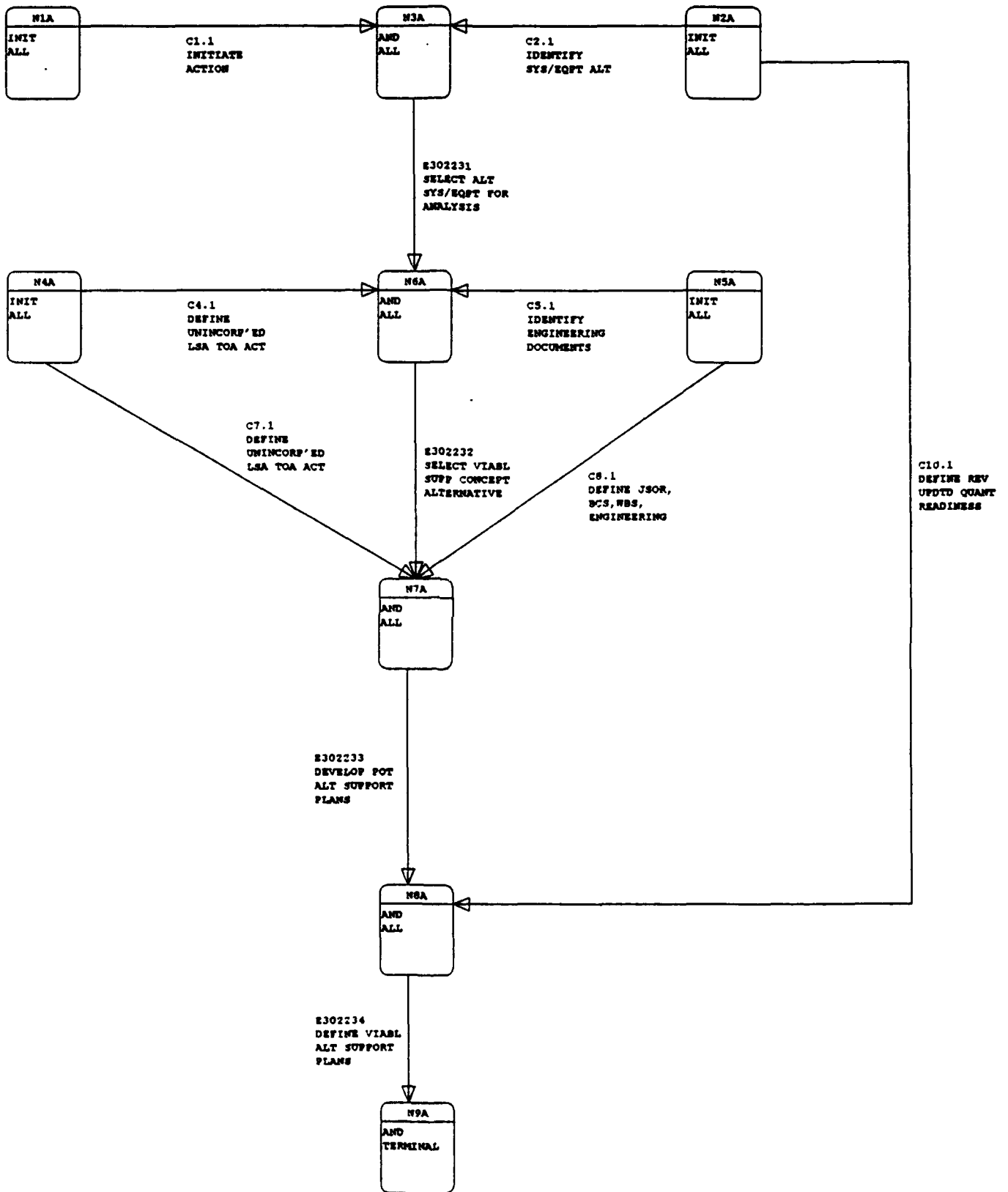
- (i) Input Logic - The input logic for the nodes are either "INITIAL" or "AND".
- (ii) Output Logic - The output logic has been defaulted to "AND" or "TERMINAL".
- (iii) The output option indicator and the storage option indicator are defaulted to read "0".
- (iv) The node description has also been left blank.

(It is again noted that the user can change the default values to desired values as identified by the particular requirement and applications.)

DOCUMENTATION:

With every project report APJ will be providing the following documents relating to the VERT:

- (i) A VERT network diagram corresponding to a particular data flow diagram.
- (ii) A print out of the VERT network inputs for the particular data flow diagrams.
- (iii) A floppy disc containing the sample input, print, and the simulation output files for the default VERT network.



302.2.3 VERT
 Created by: CRAU
 Revised by: CRAU
 Date changed: 10-OCT-99

1

NEW NETWORK

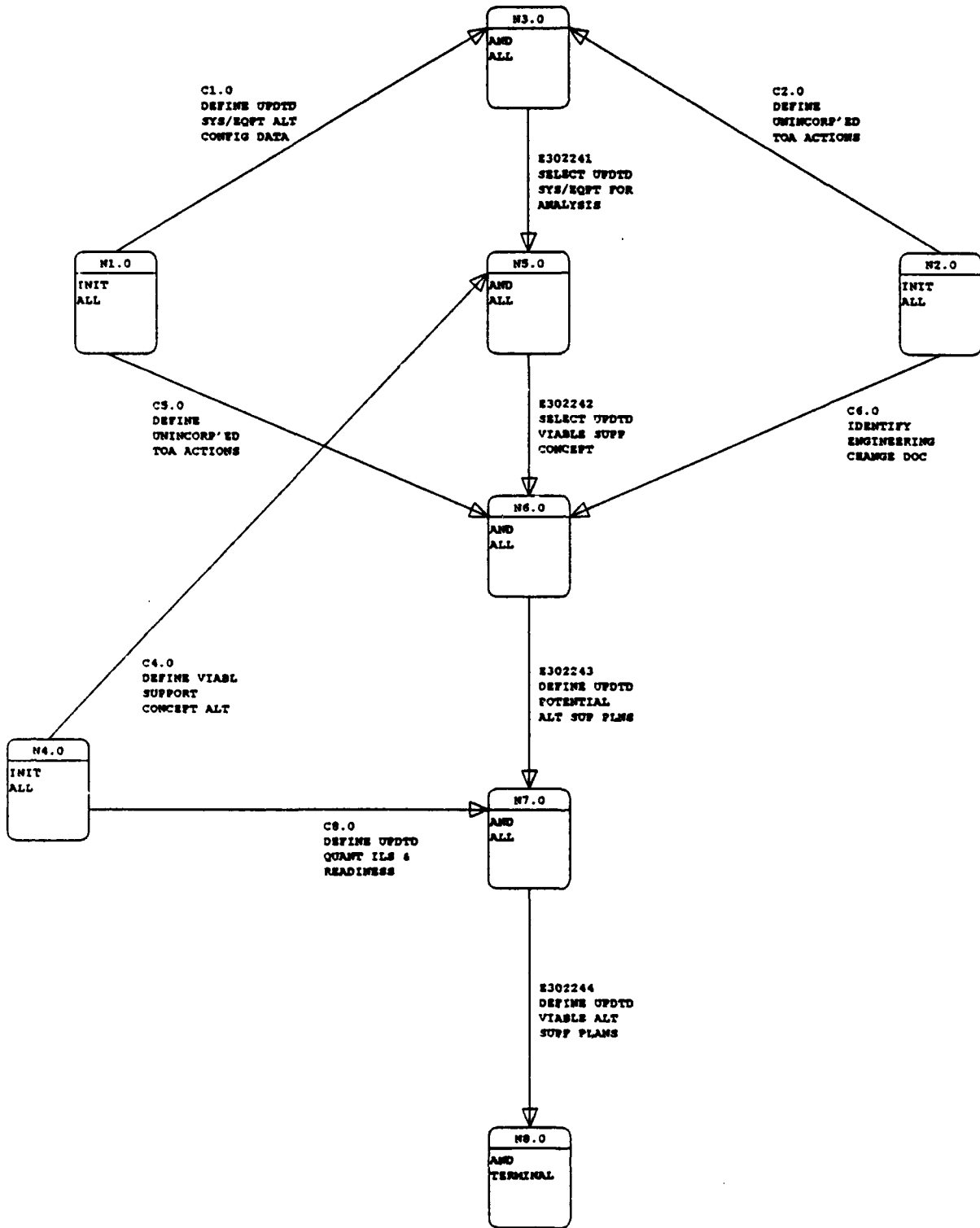
PAGE 1

	1	2	3	4	5	6	7
12345678901234567890123456789012345678901234567890123456789012							
1. 0016 10'				ALTERNATE SUPPORT PLAN UPDATE			
	+	+	+	+	+	+	+
2. C1.0	N1.0	N3.0	1.0	DEFINE	SYSTEM/EQUIPMENT	ALTERNATE	CONFIGURA
3. C1.0	DTIME 1		2	10.0	20.0		
4. C1.0	DCOST 1		2	10.0	100.0		
5. C1.0	DPERF 1		2	10.0	50.0		
	+	+	+	+	+	+	+
6. C2.0	N2.0	N3.0	1.0	DEFINE	UNINCORPORATED	TOA	ACTIONS
7. C2.0	DTIME 1		2	10.0	20.0		
8. C2.0	DCOST 1		2	10.0	100.0		
9. C2.0	DPERF 1		2	10.0	50.0		
	+	+	+	+	+	+	+
10. E302241	N3.0	N5.0	1.0	SELECT	UPDATED	SYSTEM/EQUIPMENT	FOR ANALYSI
11. E302241	DTIME 1		2	10.0	20.0		
12. E302241	DCOST 1		2	10.0	100.0		
13. E302241	DPERF 1		2	10.0	50.0		
	+	+	+	+	+	+	+
14. C4.0	N4.0	N5.0	1.0	DEFINE	VIALE	SUPPORT	CONCEPT ALTERNATIVES
15. C4.0	DTIME 1		2	10.0	20.0		
16. C4.0	DCOST 1		2	10.0	100.0		
17. C4.0	DPERF 1		2	10.0	50.0		
	+	+	+	+	+	+	+
18. C5.0	N1.0	N6.0	1.0	DEFINE	UNINCORPORATED	TOA	ACTIONS
19. C5.0	DTIME 1		2	10.0	20.0		
20. C5.0	DCOST 1		2	10.0	100.0		
21. C5.0	DPERF 1		2	10.0	50.0		
	+	+	+	+	+	+	+
22. C6.0	N2.0	N6.0	1.0	IDENTIFY	ENGINEERING	CHANGE	DOCUMENTS
23. C6.0	DTIME 1		2	10.0	20.0		
24. C6.0	DCOST 1		2	10.0	100.0		
25. C6.0	DPERF 1		2	10.0	50.0		
	+	+	+	+	+	+	+
26. E302242	N5.0	N6.0	1.0	SELECT	UPDATED	VIALE	SUPPORT CONCEPT
27. E302242	DTIME 1		2	10.0	20.0		
28. E302242	DCOST 1		2	10.0	100.0		
29. E302242	DPERF 1		2	10.0	50.0		
	+	+	+	+	+	+	+
30. C8.0	N4.0	N7.0	1.0	DEFINE	UPDATED	QUANTIFIED	ILS AND READINESS
31. C8.0	DTIME 1		2	10.0	20.0		
32. C8.0	DCOST 1		2	10.0	100.0		
33. C8.0	DPERF 1		2	10.0	50.0		
	+	+	+	+	+	+	+
34. E302243	N6.0	N7.0	1.0	DEFINE	UPDATED	POTENTIAL	ALTERNATIVE SUPPOR
35. E302243	DTIME 1		2	10.0	20.0		
36. E302243	DCOST 1		2	10.0	100.0		
37. E302243	DPERF 1		2	10.0	50.0		
	+	+	+	+	+	+	+
38. E302244	N7.0	N8.0	1.0	DEFINE	UPDATED	VIALE	ALTERNATIVE SUPPORT P
39. E302244	DTIME 1		2	10.0	20.0		
40. E302244	DCOST 1		2	10.0	100.0		
41. E302244	DPERF 1		2	10.0	50.0		
	+	+	+	+	+	+	+
42. ENDARC							
	+	+	+	+	+	+	+
43. N1.0	1 2 0 0						
	+	+	+	+	+	+	+
	1	2	3	4	5	6	7

```

1      1234567890123456789012345678901234567890123456789012345678901234567890123456789012
      N E W      N E T W O R K      P A G E      2
      1          2          3          4          5          6          7
1234567890123456789012345678901234567890123456789012345678901234567890123456789012
44. N3.0  2  2  0  0      +          +          +          +          +          +          +
      +          +          +          +          +          +          +
45. N2.0  1  2  0  0      +          +          +          +          +          +          +
      +          +          +          +          +          +          +
46. N5.0  2  2  0  0      +          +          +          +          +          +          +
      +          +          +          +          +          +          +
47. N4.0  1  2  0  0      +          +          +          +          +          +          +
      +          +          +          +          +          +          +
48. N6.0  2  2  0  0      +          +          +          +          +          +          +
      +          +          +          +          +          +          +
49. N7.0  2  2  0  0      +          +          +          +          +          +          +
      +          +          +          +          +          +          +
50. N8.0  2  1  0  0      +          +          +          +          +          +          +
      +          +          +          +          +          +          +
51. ENDNODE      1          2          3          4          5          6          7
123456789012345678901234567890123456789012345678901234567890123456789012

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302.2.4 VERT
 Created by: CRAU
 Revised by: CRAU
 Date changed: 18-OCT-99

	1	2	3	4	5	6	7
12345678901234567890123456789012345678901234567890123456789012							
1. 0016 10							
	+	+	+	+	+	+	+
2. C1.1	N1A	N3A	1.0	INITIATE ACTION			
3. C1.1	DTIME 1		2	10.0	20.0		
4. C1.1	DCOST 1		2	10.0	100.0		
5. C1.1	DPERF 1		2	10.0	50.0		
	+	+	+	+	+	+	+
6. C2.1	N2A	N3A	1.0	IDENTIFY SYSTEM/EQUIPMENT ALTERNATIVES			
7. C2.1	DTIME 1		2	10.0	20.0		
8. C2.1	DCOST 1		2	10.0	100.0		
9. C2.1	DPERF 1		2	10.0	50.0		
	+	+	+	+	+	+	+
10. E302231	N3A	N6A	1.0	SELECT ALTERNATE SYSTEM/EQUIPMENT FOR ANALY			
11. E302231	DTIME 1		2	10.0	20.0		
12. E302231	DCOST 1		2	10.0	100.0		
13. E302231	DPERF 1		2	10.0	50.0		
	+	+	+	+	+	+	+
14. C4.1	N4A	N6A	1.0	DEFINE UNINCORPORATED LSA TOA ACTIONS			
15. C4.1	DTIME 1		2	10.0	20.0		
16. C4.1	DCOST 1		2	10.0	100.0		
17. C4.1	DPERF 1		2	10.0	50.0		
	+	+	+	+	+	+	+
18. C5.1	N5A	N6A	1.0	IDENTIFY ENGINEERING DOCUMENTS			
19. C5.1	DTIME 1		2	10.0	20.0		
20. C5.1	DCOST 1		2	10.0	100.0		
21. C5.1	DPERF 1		2	10.0	50.0		
	+	+	+	+	+	+	+
22. E302232	N6A	N7A	1.0	SELECT VIABLE SUPPORT CONCEPT ALTERNATIVE			
23. E302232	DTIME 1		2	10.0	20.0		
24. E302232	DCOST 1		2	10.0	100.0		
25. E302232	DPERF 1		2	10.0	50.0		
	+	+	+	+	+	+	+
26. C7.1	N4A	N7A	1.0	DEFINE UNINCORPORATED LSA TOA ACTIONS			
27. C7.1	DTIME 1		2	10.0	20.0		
28. C7.1	DCOST 1		2	10.0	100.0		
29. C7.1	DPERF 1		2	10.0	50.0		
	+	+	+	+	+	+	+
30. C8.1	N5A	N7A	1.0	DEFINE JSOR,BCS,WBS, ENGINEERING CHANGE DOC			
31. C8.1	DTIME 1		2	10.0	20.0		
32. C8.1	DCOST 1		2	10.0	100.0		
33. C8.1	DPERF 1		2	10.0	50.0		
	+	+	+	+	+	+	+
34. E302233	N7A	N8A	1.0	DEVELOP POTENTIAL ALTERNATE SUPPORT PLANS			
35. E302233	DTIME 1		2	10.0	20.0		
36. E302233	DCOST 1		2	10.0	100.0		
37. E302233	DPERF 1		2	10.0	50.0		
	+	+	+	+	+	+	+
38. C10.1	N2A	N8A	1.0	DEFINE REVISED UPDATED QUANTIFIED READINESS			
39. C10.1	DTIME 1		2	10.0	20.0		
40. C10.1	DCOST 1		2	10.0	100.0		
41. C10.1	DPERF 1		2	10.0	50.0		
	+	+	+	+	+	+	+
42. E302234	N8A	N9A	1.0	DEFINE VIABLE ALTERNATE SUPPORT PLANS			
43. E302234	DTIME 1		2	10.0	20.0		
44. E302234	DCOST 1		2	10.0	100.0		
45. E302234	DPERF 1		2	10.0	50.0		
	+	+	+	+	+	+	+

1

	1	2	3	4	5	6	7
	123456789012345678901234567890123456789012345678901234567890123456789012						
	NEW	NETWORK		PAGE	2		
	1	2	3	4	5	6	7
	123456789012345678901234567890123456789012345678901234567890123456789012						
46.	ENDARC						
	+	+	+	+	+	+	+
47.	N1A	1 2 0 0					
	+	+	+	+	+	+	+
48.	N3A	2 2 0 0					
	+	+	+	+	+	+	+
49.	N2A	1 2 0 0					
	+	+	+	+	+	+	+
50.	N6A	2 2 0 0					
	+	+	+	+	+	+	+
51.	N4A	1 2 0 0					
	+	+	+	+	+	+	+
52.	N5A	1 2 0 0					
	+	+	+	+	+	+	+
53.	N7A	2 2 0 0					
	+	+	+	+	+	+	+
54.	N8A	2 2 0 0					
	+	+	+	+	+	+	+
55.	N9A	2 1 0 0					
	+	+	+	+	+	+	+
56.	ENDNODE						
	1	2	3	4	5	6	7
	123456789012345678901234567890123456789012345678901234567890123456789012						

ANNEX E

STRUCTURED SYSTEMS ANALYSIS/DESIGN

Fundamentals

ANNEX E
STRUCTURED SYSTEMS ANALYSIS

Fundamentals

Structured Systems Analysis (SSA) has recently become an industry standard for generating Data Flow Diagrams (replacing "logic diagrams" or "flow charts") to aid in coordinating the functions to be performed by a computer program and its associated Inputs/Outputs (I/O). During the SSA, each set of "flow charts" can be checked by the potential user to assure that there is complete agreement on what is to be done by the program, and how it is to be accomplished. It also provides considerable flexibility for updating or changing the program.

Six basic elements are used in SSA:

1. Process (PRC)
2. Data Flow (DAF)
3. Data Store (DAS)
4. External Entity (EXT)
5. Data Flow Diagram (DFD)
6. Data Dictionary (DCT)

PROCESS (Represented by a Circle):

A function or operation to be performed which can be explained by a set of instructions representing a single task, e.g., "calculate interest on a loan", "prepare a draft report". If the Process description is too complex to describe in a few steps, it may be necessary to develop a lower level description (see below).

DATA FLOW (Lines interconnecting Processes or I/Os):

Each function or Process cannot be a stand-alone in a complex network. To have any meaning in a program, each process must be initiated by a previous action and/or provided information on which to act. Furthermore, a Process must result in an output which is the input to the next logical Process. These inputs, outputs, or initiating actions are identified as Data Flows, and are represented by the Data Flow lines indicating its point of origin and the process to which it provides data.

DATA STORE (Represented by two parallel lines):

Although some Processes generate data used as input to a succeeding Process, there is often a need to "gather or collect" information from files in which it is stored. This information may come from an external source (such as a MIL-STD, Army regulation, historical experience files, etc.), or an internal source or file in which data is temporarily stored for use by succeeding processes. These Data Stores can be visualized as a "file cabinet", in which the data are stored for later retrieval).

EXTERNAL ENTITY (Represented by a Rectangle):

Each program or logical process must have an initiating action, a "point" of disposition of the results, and possible input guidance or instructions. Each of these have authorities, functions, or applications which are independent of the program Process (although required by the program Process). Thus, these activities, agencies, or facilities are considered "External Entities" to the program.

DATA FLOW DIAGRAM:

The general arrangement of the above can be readily seen. First, the circle or Process describes what has to be done; the interconnecting lines represent the Data Flows, together with the specific description of all I/Os. The Data Stores identify the source and/or file designation of a data base, and the External Entities represent those activities remote from the Process, which are the source of guidance or the recipients of the program. This combination of Processes, Data Flows, Data Stores, and External Entities constitutes a "Data Flow Diagram". The unique feature of the Data Flow Diagram (DFD) is that each process can be considered independently, permitting a change to be made in one Process without a major change in the overall program.

DATA DICTIONARY:

The Data Dictionary consists of a complete description of each of the basic elements. For the Process, it contains a step-by-step description of what has to be performed. The description of the Data Flow identifies the nomenclature of the data, a detailed description of its content, and its source. The Data Stores and External Entities are described, including possible location.

The Data Dictionary (a living document) begins with a description of the first Process and is continually built-up as the Data Flow Diagrams are expanded, detailed, and eventually completed.

APPROACH TO PERFORMING STRUCTURED SYSTEM ANALYSIS:

The best approach to Structured Systems Analysis is to assume that the program consists of a series of processes, each of which are to be assigned to an inexperienced analyst. Each analyst is to be walked through the assigned process of the Program, explaining step-by-step what functions have to be performed or what actions have to be taken to accomplish the process. The analyst is also informed where the information is coming from (input Data Flow), what is to be generated by each process (output Data Flow), where the data base may to be found (Data Stores), and who to contact for guidance (External Entities).

The best way to initiate a SSA is to set down the point of origin of a program, its final goal(s), and the intermediate functions or actions needed to get from beginning to goal. Each step should be considered as a Process - some may be sequential and others parallel. Then, the steps needed to accomplish the Process should be described. If the description is complex and needs intermediate steps, the Process is then a candidate for an "explosion". That is, the top (or upper) level Process is considered as a "project" and its own Data Flow Diagram is prepared.

When writing the step-by-step procedures in the Process, certain elements of data (or information) must be made available for the procedure. Each element of data is considered as an input Data Flow, which is identified and described. The product (or result) of a Process is an output Data Flow element.

Each Data Flow to the Process must originate from:

1. an earlier Process
2. a Data Store (or file)
3. an External Entity.

These sources are also identified, described and put into the Data Dictionary. As soon as the last portion of the Data Flow Diagram has been described, the SSA is complete.

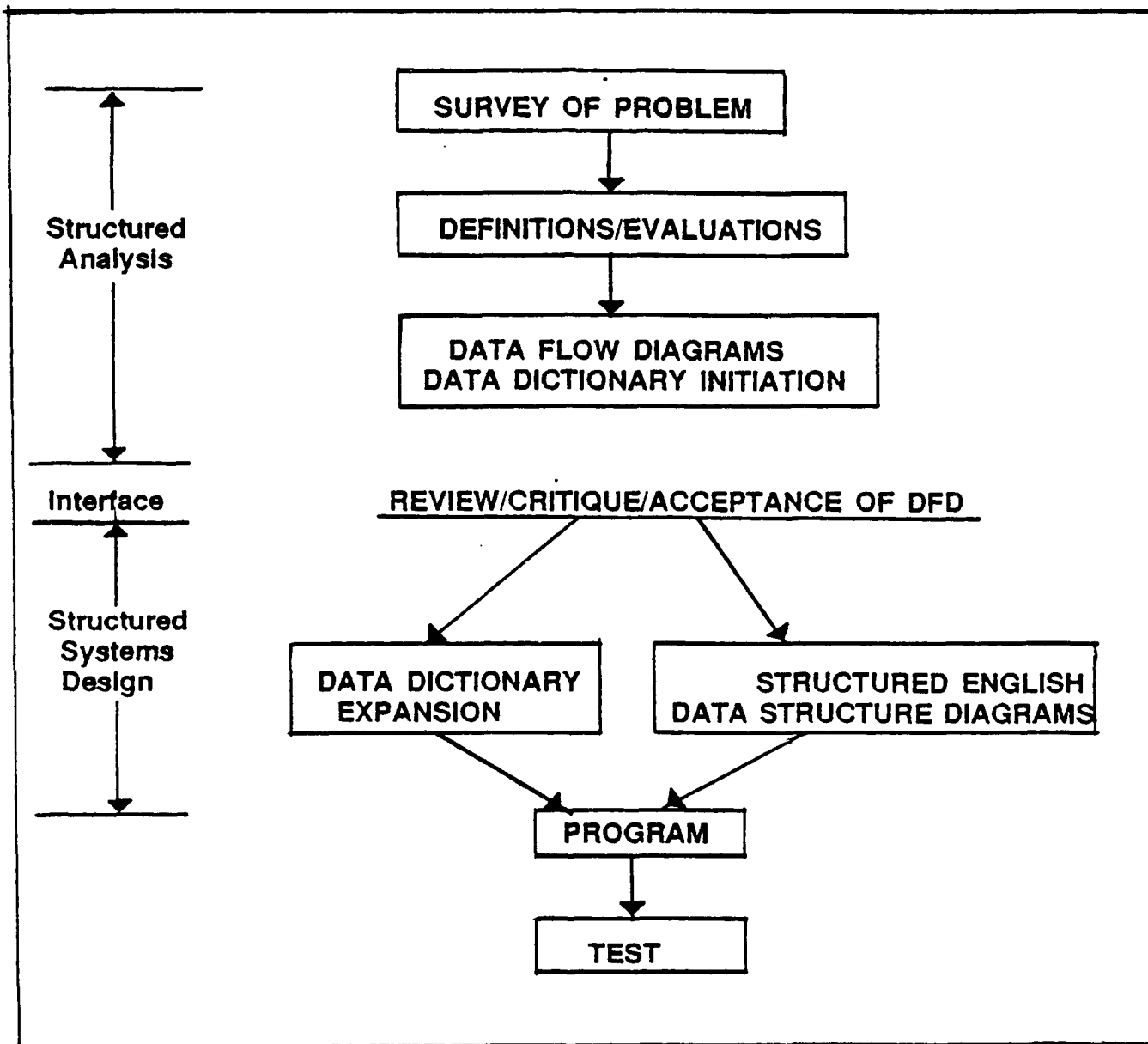


Figure 1. Structured Analysis & Structured Systems Design Organization

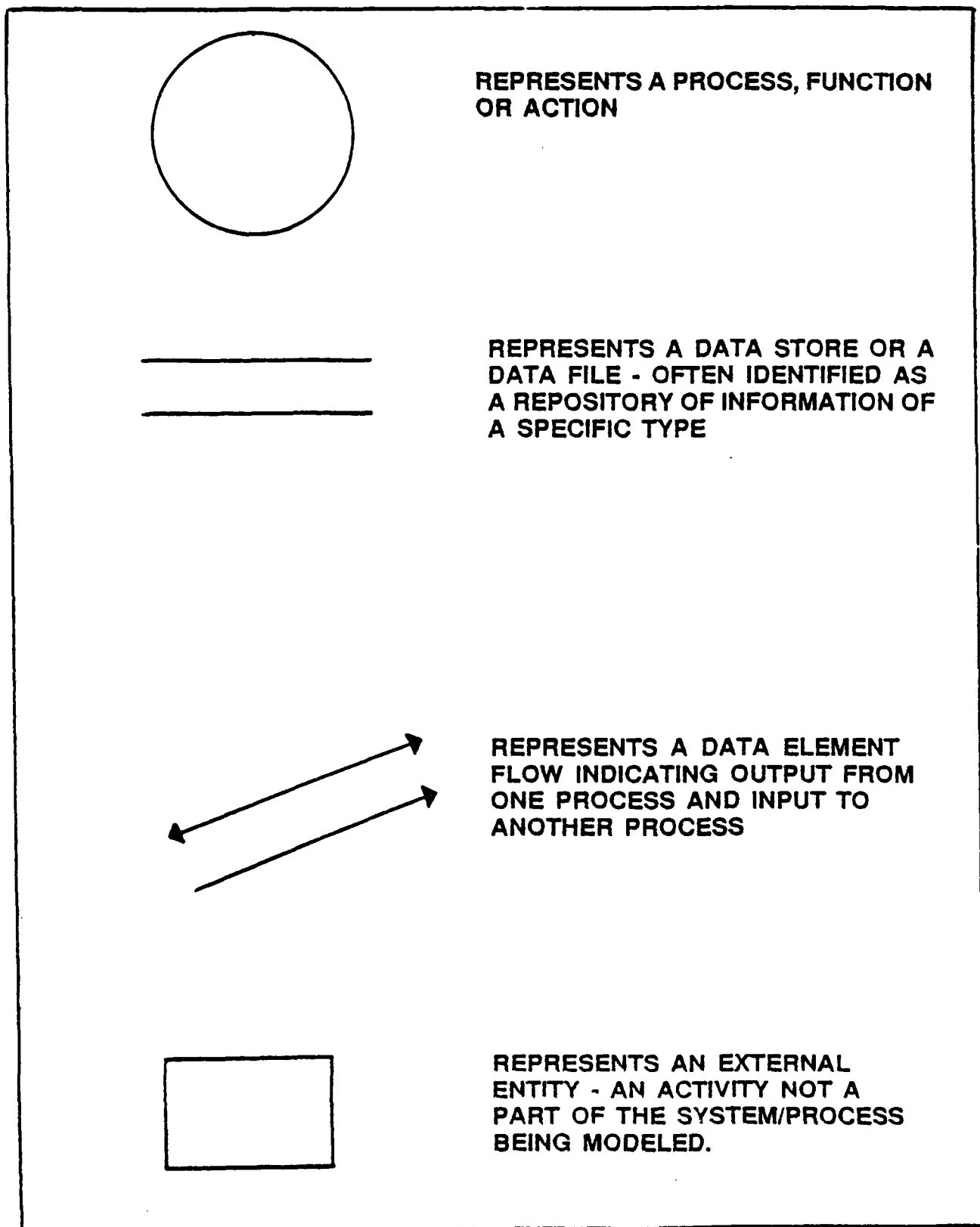


Figure 2. Standard DFD Symbol Definitions