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APR 79 A J CZUCHRY, R H KISTLER, J M GLASIER F33615-75-C-5218
AFHRL-TR-78-2(II) NL

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**DIGITAL AVIONICS INFORMATION SYSTEM (DAIS):
RELIABILITY AND MAINTAINABILITY MODEL
USERS GUIDE**

By

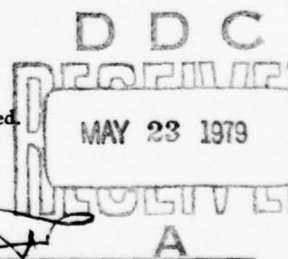
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This report has been reviewed by the Information Office (OI) and is releasable to the National Technical Information Service (NTIS). At NTIS, it will be available to the general public, including foreign nations.

This technical report has been reviewed and is approved for publication.

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Commander

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) → The digital avionics information system (DAIS) life cycle cost (LCC) study provides the Air Force with an enhanced in-house capability to incorporate LCC considerations during all stages of the system acquisition process. This report documents a reliability and maintainability (R&M) model developed in the study and also serves as a users manual. The R&M model, a training model, and a cost model comprise the DAIS LCC impact model (LCCIM) designed for use in LCC analysis of avionics systems. In this context, its primary function is to manipulate input data banks to produce intermediate products, figures of merit, and outputs required by the training and cost models. When used in a stand-alone mode, the R&M model provides a means for analyzing the R&M impact of changes in system design and maintenance concepts on system support requirements.			

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The input data banks contain values for the R&M parameters of avionics hardware configurations, i.e., maintenance action rate, maintenance task event time, task event probability of occurrence, manpower required for each task, skill level requirements, and support equipment (SE) required for each task. The R&M model employs a figure of merit concept to aggregate the values for these R&M parameters to produce manhour and SE requirement estimates. These are point estimates; however, they can be used to (a) make comparisons on a total system, subsystem, or line replaceable unit (LRU) basis, and (b) identify "high drivers" or problem areas in terms of resource requirements. In addition, the R&M model can be used to conduct sensitivity and trade-off analyses in terms of resource requirements after it has identified high driver items. It can perturb combinations of R&M parameters to determine sensitivities. Thus, alternatives for achieving a reduction in resource requirements can be assessed by selectively altering input data and observing the model's outputs indicating the resultant changes in resource requirements.

This document is intended to guide the user of the R&M model. It describes the features of the model, its logical operations, its input data requirements, and its output reports. It also provides a program listing, instructions for preparing input data, and guidance for interpreting and using output reports.

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SUMMARY

This report is Volume II of AFHRL-TR-78-2 which describes a reliability and maintainability (R&M) model developed to facilitate the performance of design vs. cost trade-offs within the systems acquisition process. The model can provide timely visibility to relationships between system design and support requirements and a means of using them to avoid unnecessarily high system operation and maintenance cost. Stand-alone operation permits the user to assess potential impacts of design reliability factors on system support factors and operational availability. However, the R&M model was also designed to function as part of a modeling system which includes a training requirements analysis model and a system cost model. Joint operation provides the capability of translating the design impact assessments into estimates of the consequent cost of system operation and maintenance and, ultimately, that of performing design vs. cost trade-offs.

The R&M model operates in conjunction with a computerized data bank containing historical reliability and maintenance data gathered from operational systems. This data is made relevant to new systems by factoring the historical data on the basis of system/subsystem comparability analyses. Inputs to the R&M model include: the frequency of maintenance actions by subsystem and line replaceable unit (LRU) for both aircraft and support equipment (SE); and data concerning the task events within each maintenance action such as type, probability of occurrence, time to complete, manpower type and skill requirements, and SE requirements. The model uses these inputs to compute the manhour resources, SE, and spares consumed, by task event, to satisfy the maintenance requirements of each subsystem and its LRUs for both flight line and shop actions. Outputs are displayed in matrix format.

Capable of extremely rapid operation, the R&M model affords the user a powerful tool for answering a multitude of "what if" questions concerning the implications of system design on support requirements. Its speed facilitates iterative application and should promote trade-off analyses early in the design process when cost avoidance actions are most effective. This operational speed stems from the fact that, unlike simulation models sometimes used in this type of analysis, the R&M model does not attempt to account for peak loads, saturations, queues, or other nonlinear constraints that exist in the actual maintenance environment. Rather, it is an average value model which uses estimates of maintenance task and equipment R&M factor values to compute the average expected values for

resource requirements. Additionally, a figure of merit concept is employed to aggregate the detailed data outputs and generate structured data products which allow comparisons to be made and high resource consumers to be identified on either an LRU, subsystem, or system basis. An example of such a figure of merit is maintenance manhours per 1000 flight hours.

Apart from its ability to facilitate sensitivity and trade-off analyses, the R&M model can aid the user in determining the most acceptable means of avoiding undesirable potential impacts which it has identified. By comparing alternative cause and result situations, trade-off analyses can be employed in a more investigative manner. This entails an iterative model application to determine the differential effects on projected support resource requirements obtainable by changing combinations of R&M parameters. An example of such a trade-off might be the cost to achieve an increased subsystem reliability versus that to obtain a reduced flight line troubleshooting time. The user can determine the various combinations of reliability improvement and reduced flight line troubleshooting time to achieve a specified reduction in support resource requirements for that subsystem. These values would be inputted to training and cost portions of the modeling system to assist in evaluating alternatives on a total cost of ownership basis.

The initial application of the R&M model is directed at the determination of the potential impacts of the digital avionics information system (DAIS) on system support personnel requirements and life cycle cost. Results will be contained in a later technical report within the series of which this is a member. The model is, however, applicable in the development of almost any new system as well as the evaluation of existing systems.

This volume provides a complete guide to the operation of the R&M model in the stand alone mode. It describes the features and structure of the model, its input data requirements, its logical operations, and its output reports. It provides instructions and the format for preparing input data and for selecting output options. Sample output reports are also provided for each option that can be selected. A listing and description of potential error messages are included in the appendix, as well as a listing of the computer program.

PREFACE

This report is one of a series of technical reports, models, and data banks produced under contract no. F33615-75-C-5218, "DAIS Life Cycle Costing Study." Results of this study, in combination with the present Air Force capabilities provide the means to assess the life cycle cost impact of the operational implementation of the Digital Avionics Information System (DAIS).

The study was directed by the Advanced Systems Division, Air Force Human Resources Laboratory, Wright-Patterson Air Force Base, Ohio, and is documented under Work Unit 20510001, "DAIS Life Cycle Costing Study." It was performed under Air Force Avionics Laboratory Program Element 63243F, "Digital Avionics Information System," as Project 2051. Project 2051, "Impact of the DAIS on Life Cycle Costs," is jointly sponsored by the Air Force Human Resources Laboratory, the Air Force Avionics Laboratory, and Air Force Logistics Command. Contract funds were provided by the Air Force Avionics Laboratory. The DAIS Program Manager is Lt. Col. Robert A. Dessert. The Air Force Human Resources Laboratory Project Scientist is Mr. H. Anthony Baran. The Air Force Logistics Command project officer is Capt. Ronald Hahn. The latter two are DAIS deputy directors. The Contractor Program Manager is Mr. John C. Goclowski.

TABLE OF CONTENTS

Section	Page No.
I. INTRODUCTION	9
Main Features	9
General Description	10
Data Structure	10
II. MODEL LOGIC	11
Model Input	11
Calculations	11
Model Output	13
Program Flow Chart	13
III. EXAMPLE RUN	15
IV. INPUT FORMATS	17
Data File Formats	17
Card Type CR - Cross Reference File	18
Card Type SF - Support Equipment Flight Line File	22
Card Type LF - Air Force Specialty Flight Line File	24
Card Type LS - Air Force Specialty Shop File	26
Card Type TS - Task Time - Shop File	28
Card Type TF - Task Time - Flight Line File	30
Card Type PF - Probability - Flight Line File	32
Card Type PS - Probability - Shop File	34
Card Type SS - Support Equipment - Shop File	36
Card Type MF - Reliability Mean Values - Flight Line File	38
AFSC Cards - AFSC Definition	40
SE Cards - Support Equipment Definition	40
Option Card Formats	43
AFSCs and SEs of Interest	43
Subsystem Data Options	45
V. OUTPUT REPORTS	48
Structure	48
Example Run	49

Table of Contents (continued)

	Page No.
Appendix A - Description of Input Data Elements	68
Appendix B - Error Messages	74
Appendix C - Acronyms	77
Appendix D - Reliability and Maintainability Model (File Name RANDM) Listing of Control Data Corporation CDC-6600, Cyber 74 Version)	79

LIST OF ILLUSTRATIONS

Figure No.		Page No.
1	Summary flow chart of R&M model	14
2	Equipment hierarchy structure for the example run	16
3	Printout of CR cards with "title" card and "number of subsystems" card for the example run	19
4	Printout of SF cards for the example run	22
5	Printout of LF cards for the example run	24
6	Printout of LS cards for the example run	26
7	Printout of TS cards for the example run	28
8	Printout of TF cards for the example run	30
9	Printout of PF cards for the example run	32
10	Printout of PS cards for the example run	34
11	Printout of SS cards for the example run	36
12	Printout of MF cards for the example run	38
13a	Printout of AFSC definition cards for example run	40
13b	Printout of SE definition cards for example run	40
14	Printout of input option cards for example run	47
15	Input data records	50
16	Sample availability report	55
17	Sample SE maintenance requirements report	56
18	Sample manpower report	57
19	Sample option 13 report (part 1)	58
20	Sample option 13 report (part 2)	58
21	Sample option 01 report	59
22	Sample option 02 report	60
23	Sample option 03 report	61
24	Sample option 04 report	62
25	Sample option 05 report	63
26	Sample option 06 report	64
27	Sample option 07 report	65
28	Sample option 08 report	65
29	Sample option 09 report	66
30	Sample option 10 report	66
31	Sample option 11 report	67
32	Sample option 12 report	67

LIST OF TABLES

Table No.		Page No.
Field Formats of Data Elements		
1a	Cross Reference File - Card #1	20=
1b	Cross Reference File - Card #2	21
2	Support Equipment - Flight Line File	23
3	Air Force Specialty - Flight Line File	25
4	Air Force Specialty - Shop File	27
5	Task Time - Shop File	29
6	Task Time - Flight Line File	31
7	P Probability - Flight Line File	33
8	P Probability - Shop File	35
9	Support Equipment - Shop File	37
10	Reliability Mean Values - Flight Line File	39
11	AFSC Definition	41
12	Support Equipment Definition	42
13	AFSC and SE Option Cards	44

DIGITAL AVIONICS INFORMATION SYSTEM (DAIS): RELIABILITY AND MAINTAINABILITY MODEL USERS GUIDE

I. INTRODUCTION

The reliability and maintainability (R&M) model, in conjunction with a cost model and a training model, make up a life cycle cost impact model (LCCIM). The R&M model is an analytical type batch process model that computes unique outputs based on a given set of values for R&M input variables. These inputs pertain to avionics subsystems and their line replaceable units (LRU). The principal data input elements consist of average times to complete maintenance task events, the associated probabilities of occurrence of those events, and the frequency of the equipment maintenance. Other R&M inputs include the type of task event; the number, type, and skill level of each manpower specialty needed to perform the task event; and the support equipment required.

The computed outputs of this model are "expected values" since they are based on average input values rather than on peak demands, or other constraints, such as queuing or the nonlinearities inherent in a "real world" type of simulation model. These outputs are principally measures of the maintenance manhour resource requirements which may be expected to result under a given set of conditions. These conditions are determined by system variables such as equipment configuration, equipment design, and/or the system support maintenance concept. The particulars of these conditions are made available to the model in terms of the R&M input variables previously described.

Main Features

The R&M model is available in Fortran IV language for both the Honeywell H-6000 and Control Data Corporation CDC-6600 Cyber 74 computers. It is characterized by the following:

- Unlimited flexibility in the representation of the avionics equipment structure
- Similarly structured output reports for all output parameters
- Selection for analysis of a single subsystem, all subsystems, or a categorical group of subsystems
- Automatic output of short summary reports, optional output of complete reports.

General Description

The primary purpose of the R&M model is to provide data input to the LCCIM cost model and training model. However, in a stand-alone operation, this model provides a means for analyzing the R&M impact of various avionics design and support concept parameters. It employs a figure of merit (FOM) concept to aggregate the data and then to make comparisons of resources required on a total system, subsystem, or LRU basis and to identify "high drivers" or problem areas of high resource requirements. FOM analyses within the model may address, for example, maintenance manhours per 1000 flight hours (measures maintenance man-hour resource requirements) and service availability (measures the impact of maintenance on operational availability). The basic parameters used to calculate the FOMs for each subsystem, broken out for each shop and flight line maintenance task event, are:

- Probability of occurrence
- Average time to complete the event
- Air Force specialty and skill level
- Support equipment

The maintenance action rate for each subsystem is input as mean flight hours between maintenance actions.

By making reasonable variations in any of the foregoing input parameters, the model can be used to note the effect on the various outputs. In this way, the R&M model can be used to conduct sensitivity and trade-off analyses. Thus, after high driver items are identified in terms of resource requirements, combinations of R&M parameters can be perturbed to determine the system sensitivities. Alternatives for achieving reduction in the resources required can thus be identified.

Data Structure

The data represented in the R&M model are structured in matrix form permitting all outputs to be displayed in similar fashion. The data elements in each row of an output report convey information (such as mean time to repair (MTTR)) for each maintenance task event leading to a particular outcome that results from a maintenance action. The columns convey the same information for a selected maintenance task event.

A maintenance action is defined as any subsystem malfunction that results in a series of maintenance task events. These events are those principal tasks necessary to restore the subsystem to operational readiness and to accomplish any necessary repairs of removed LRUs. The maintenance task events consist of one or more maintenance functions or major tasks (e.g., adjust, align, calibrate, troubleshoot, inspect, operate, remove/install, repair, service, etc.). Each flight line maintenance task event and each shop maintenance task event are defined in Appendix A under FLIGHT LINE TASKS and SHOP TASKS, respectively. If further explanation of the terms maintenance action and maintenance event are desired, they are explained in detail in volume one of this report.

II. MODEL LOGIC

This section describes the computer program used to implement the R&M model. It will provide the analyst with an in-depth view of the workings of the program.

Model Input

Initially, data are read into computer storage from the R&M data base files. Detailed descriptions for each input data element contained on the records that constitute the base files are included in Appendix A. These data files are part of an integrated data bank. Verification of the input data for accuracy or completeness can only be made by a comparison of the input data with its raw data source. However, the program is capable of generating certain error messages. Appendix B provides a list of them. Other data problems will result in an immediate halt of the program, usually following a message from the computer system. The input card which caused this type of problem will normally be the last one displayed on the computer printout.

Calculations

The main body of the R&M model generates two matrices plus an additional matrix for each Air Force specialty code (AFSC) of interest. A support equipment (SE) maintenance requirements matrix is also generated. These matrices represent the following:

- MTTR - mean time to repair for each shop and flight line maintenance event is defined and calculated as follows: the probability of occurrence of the task event, given that

there is a failure, multiplied by the maintenance event task time. It should be noted that the maintenance event task time used as the input for this computation is the actual average time it takes to accomplish the event based on historical data; i.e., the input is the mean time to repair per task event without considering the probability of occurrence.

- MMH - maintenance manhours for each shop and flight line task event. This is calculated as MTTR multiplied by the total number of AFSCs required for the event.
- SE maintenance - for each shop test station a matrix is set up to give values for the MTTR, MMH, MMH/1000 FH, and MTTR/1000 FH consumed in test drawer and test station repair for each LRU tested. The ready time of the test station per 1000 operating hours of test time is also calculated in the model.
- For each AFSC designated for analysis, another matrix is set up that displays the MMH/1000 FH consumed for each LRU and subsystem that is maintained. These values are then multiplied by a constant cost factor to show the manhour cost per 1000 flight hours.

Once the single task event/single outcome elements of each matrix have been computed, the program totals across maintenance events (columns) and outcomes (rows) to complete the matrix. These matrices are intermediate products which are the basis for a series of user selected output options.

The flight line inherent availability (A) of each subsystem is also calculated within the model by dividing the mean flight hours between maintenance actions (MFHBMA) by the total of the MFHBMA and the flight line MTTR. This calculation can also be represented as:

$$A = \frac{1}{1 + (MTTR)(PMA)}$$

where $PMA = \frac{1}{MFHBMA}$,

or the probability of a maintenance action (PMA) per flight hour.

The service flight line availability for the avionics system is then calculated within the model as the product of all of the inherent subsystem availabilities.

Model Output

Subsystem inherent flight line availability is a mandatory output, as is the listing of the input data files which precedes it. All other outputs are user selected as described in Section IV.

Except for the MTTR and MMH matrices (including the MMH/1000 FH required for user selected AFSCs), the remainder of the output is calculated when selected. To display the MTTR as percent of total, each matrix element is divided by one one-hundredth of the total MTTR for that subsystem. MMH as a percent of total is computed in the same manner. MMH per 1000 flight hours (FH) is calculated by dividing each matrix element by one one-thousandth of the MFHBMA. Maintenance index (defined as the MTTR per 1000 FH) is each element of the MTTR matrix divided by one one-thousandth of the MFHBMA, also.

Most outputs can be summed over a group of subsystems for examination at a higher level of aggregation.

Program Flow Chart

The basic flow of execution of the R&M model is shown in Figure 1.

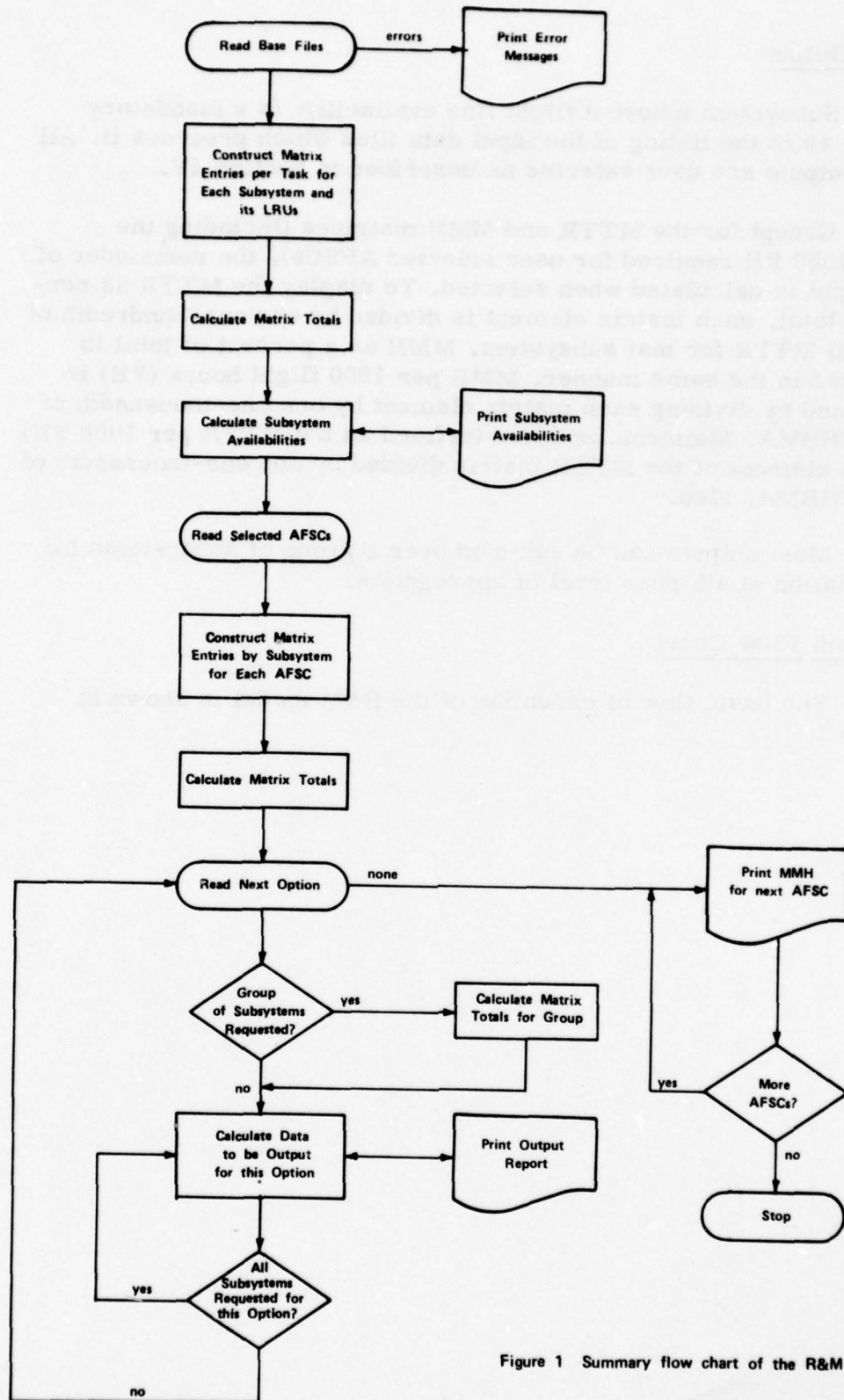


Figure 1 Summary flow chart of the R&M model

III. EXAMPLE RUN

Subsequent sections describe the input forms and output reports of the model. To facilitate this description, an example run has been constructed and is used to illustrate the ways in which the data are input to the model and results displayed on output reports.

The example run consists of an avionics system containing six subsystems and 14 LRUs. The arrangement of these items in the equipment hierarchy structure for the system is shown in Figure 2. Dashed line boxes represent equipment not represented in the example run.

All of the input data for the example run are given in the sample input data in the next section. The sample data are generally similar to the type of data prepared for operational use of the model.

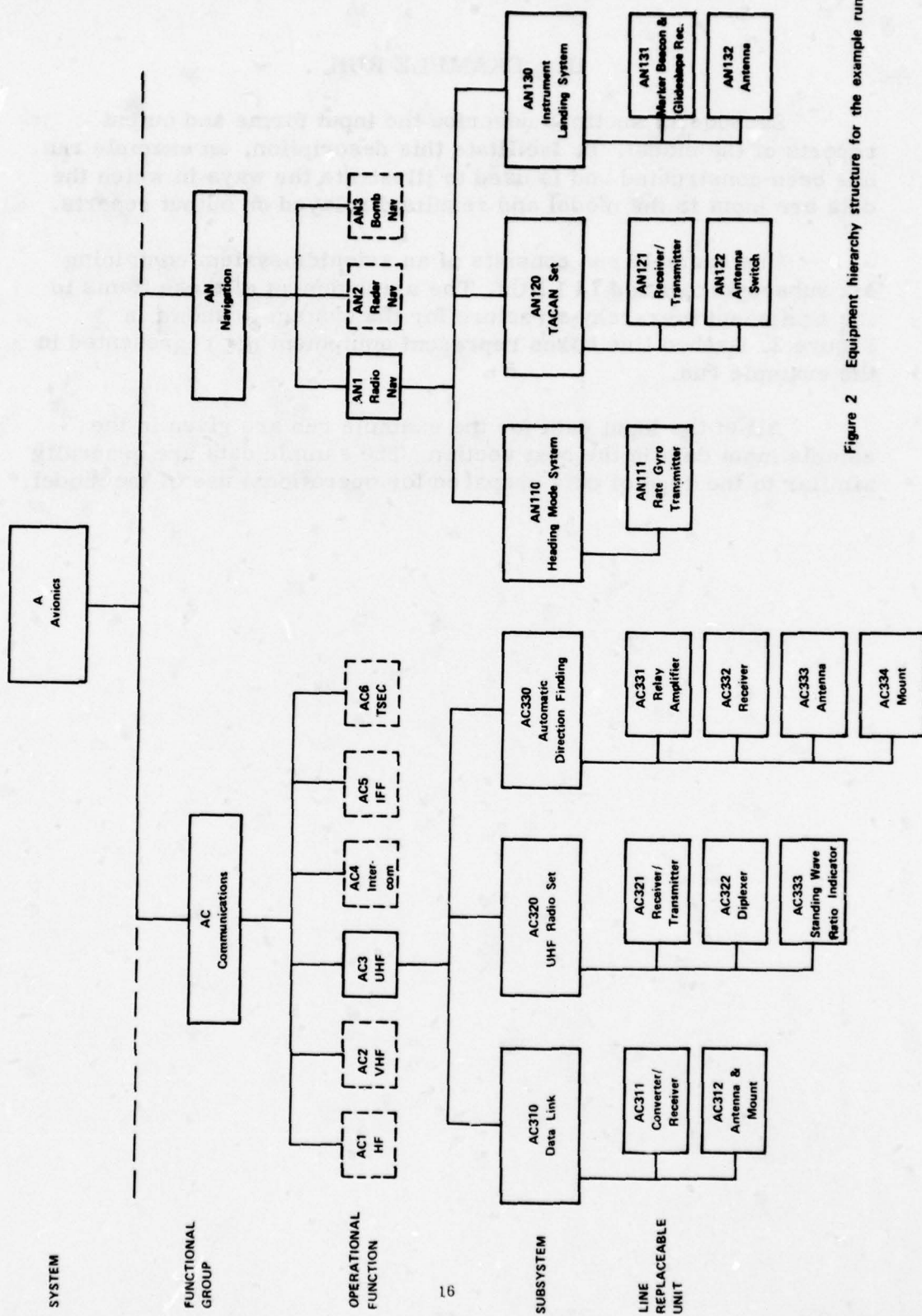


Figure 2 Equipment hierarchy structure for the example run

IV. INPUT FORMATS

Data File Formats

The operation of the R&M model requires that a variety of special input cards be prepared which precisely describe the equipment being analyzed and its logistics support system. There are 13 record card formats. Each contains a particular category of data. A detailed description of the input data elements contained in each field of the individual record cards is included in Appendix A.

The input record card formats, each of which is identified by a two-character code in columns 1 and 2, are described on the following pages. Tables which immediately follow the card type descriptions provide a listing of the data elements contained on each card along with their field format. Each of the tables is preceded by a figure illustrating the input data cards necessary for execution of the example run.

Two cards must precede the input deck. The first card contains the data base title. The second card must contain the number of subsystems to be described punched in columns 1 and 2. (In the example run, which contains six subsystems, a "06" is provided on the second card preceding the input deck.) Each card type must have at least one card for every subsystem/LRU that is input in the cross reference file. The present program allows a number of cards for subsystems and LRUs of 40 and 120, respectively.

Card Type CR - Cross Reference File

The first card type designates the equipment hierarchy structure. This structure is illustrated in Figure 2. The data used in this cross reference file is allocated to two cards noted as a -1 or -2 in column 12, the card sequence column. The second card is a continuation of the first and, when used, contains specific additional information.

CR card number 1 gives the equipment identification (ID) number, LRU weight in pounds, work unit code (WUC), quantity per aircraft (QPA), and the name of the subsystem or LRU. The subsystem CR card also gives the number of LRUs it contains, whereas the LRU CR card gives the number of SRUs that the LRU contains. Card number 2 contains the LRU national stock number (NSN), the AN/nomenclature of the subsystem and LRU, and the manufacturer's part number for the subsystem and LRU. There must be a #1 card for each subsystem and for each LRU, but a #2 card is not mandatory. As pertinent data required by the #2 card are available, they can be used to provide additional identification or reference information. Each card group begins with a subsystem card and is followed by the cards describing the LRUs which belong to it. The formats for CR cards 1 and 2 are shown in Tables 1a and 1b, respectively, and are further described in Appendix A.

A printout of the cards used for the example run are shown in Figure 3. The 06 in columns 1 and 2 of the second card is the "number of subsystems." Note that the same card format is used for both subsystems and LRUs.

DAIS	THEORETICAL	RELIABILITY	AND	MAINTAINABILITY	MODEL
06					
CR	AC310 -1	63510	1 DATA LINK		2
CR	AC310 -2	63150		AN/ASW- 25	8
CR	AC311 -1	11.8 63511	1 CONVERTER/RECEIVER		1
CR	AC311 -2	63511		CV-2230A/ASW-25	3
CR	AC312 -1	2.0 63515	1 MOUNT & ANTENNA		3
CR	AC320 -1	63A00	1 UHF RADIO SET		9
CR	AC320 -2	63A00		AN/ARC- 51BX	2
CR	AC321 -1	27.7 63AA0	1 RECEIVER/TRANSMITTER (UHF)		1
CR	AC321 -2	63AA0	5821-00-134-6239	RT-742B/ARC-51BX	2
CR	AC322 -1	1.0 63AE0	1 DIPLEXER		1
CR	AC323 -1	1.1 63AL0	1 STANDING WAVE RATIO INDICATOR		4
CR	AC323 -2	63AL0	5821-00-978-7867	ID-1003/ARC	2
CR	AC330 -1	63B00	1 AUTOMATIC DIRECTION FINDING SET - UHF		2
CR	AC330 -2	63B00		AN/ARA- 50	1
CR	AC331 -1	5.4 63BA0	1 RELAY AMPLIFIER		7
CR	AC331 -2	63BA0	5826-00-059-2726	AM-3624/ARA-50	1
CR	AC332 -1	10.0 63BB0	1 ANTENNA		1
CR	AC332 -2	63BB0	5826-00-849-0055	AS-909/ARA-48	1
CR	AC333 -1	8.0 63BC0	1 RECEIVER		1
CR	AC333 -2	63BC0	5821-00-999-4590-MA	R-1286/ARR-69	1
CR	AC334 -1	1.1 63BF0	1 MOUNT		1
CR	AN110 -1	71A00	1 HEADING MODE SYSTEM		1
CR	AN111 -1	4.0 71AD0	1 RATE GYRO TRANSMITTER		1
CR	AN120 -1	71B00	1 TACAN SET		2
CR	AN120 -2	71B00		AN/ARN- 52	8
CR	AN121 -1	43.3 71BA0	1 RECEIVER/TRANSMITTER (TACAN)		1
CR	AN121 -2	71BA0	5826-00-884-0914	RT-893/ARN-52	2
CR	AN122 -1	2.3 71BB0	1 ANTENNA SWITCH		1
CR	AN130 -1	71C00	1 INSTRUMENT LANDING SYSTEM		2
CR	AN130 -2	71C00		AN/ARN- 58A	6
CR	AN131 -1	8.6 71CA0	1 RADIO MARKER BEACON & GLIDESLOPE REC		1
CR	AN131 -2	71CA	5826-00-226-6030	R-844A/ARN-58A	
CR	AN132 -1	4.0 71CC0	1 ANTENNA		
CR	AN132 -2				

Figure 3. Printout of CR cards with "title" card and "number of subsystems" card for the example run

Table 1a

Field Format of Data Elements Cross Reference File - Card No. 1

Column	Title	Length	Type*	Justification**	Decimal Placement
1 - 2	Card Type - CR	2	A	F	-
3	Blank	1	-	-	-
4	Aircraft System	1	A	F	-
5	Major System	1	A	F	-
6	Functional Group	1	A	F	-
7	Organizational Function	1	N	F	-
8	Subsystem	1	N	F	-
9	Line Replaceable Unit (LRU)	1	X	F	-
10	Shop Replaceable Unit (SRU)	1	N	F	-
11	Dash	1	X	F	-
12	Card Sequence - 1	1	N	F	-
13	Blank	1	-	-	-
14 - 18	LRU Weight—in lbs (col. 17 is a decimal)	5	N	R	1
19	Blank	1	-	-	-
20 - 24	Work Unit Code	5	X	F	-
25	Blank	1	-	-	-
26 - 27	Quantity per Aircraft (QPA)	2	N	R	-
28	Blank	1	-	-	-
29 - 68	Equipment Name	40	A	L	-
69 - 74	Blank	6	-	-	-
75 - 76	No. of LRUs in the Subsystem or SRUs per LRU	2	N	R	-
77 - 80	Blank	4	-	-	-

*A = alpha, N = numeric, X = alpha/numeric

**F = fixed, R = right, L = left

Table 1b
Cross Reference File — Card No. 2

Column	Title	Length	Type*	Justification**	Decimal Placement
1 - 2	Card Type CR	2	A	F	—
3	Blank	1	—	—	—
4	Aircraft System	1	A	F	—
5	Major System	1	A	F	—
6	Functional Group	1	A	F	—
7	Organizational Function	1	N	F	—
8	Subsystem	1	N	F	—
9	Line Replaceable Unit	1	N	F	—
10	Shop Replaceable Unit	1	N	F	—
11	Dash	1	X	F	—
12	Card Sequence — 2	1	N	F	—
13 - 19	Blank	7	—	—	—
20 - 24	Work Unit Code	5	X	F	—
25	Blank	1	—	—	—
26 - 27	Dual Cognizance Code	2	X	F	—
28	Material Contrnl Code	1	X	F	—
29	Dash	1	X	F	—
30 - 33	Federal Supply Classification (NSN)	4	N	F	—
34	Dash	1	X	F	—
35 - 36	Country Code (NSN)	2	N	F	—
37	Blank	1	—	—	—
38 - 40	Federal Item ID No. (NSN)	3	N	F	—
41	Dash	1	X	F	—
42 - 45	Federal Item ID No. cont. (NSN)	4	N	F	—
46	Dash (only when suffix is added)	1	X	F	—
47 - 48	Special Material ID Code (NSN Suffix)	2	A	F	—
49	Blank	1	—	—	—
50 - 52†	AN/	3	X	F	—
53 - 55	AN/No. Alpha Code	3	A	F	—
56	Dash	1	X	F	—
57 - 59	AN/No. Numeric Code	3	N	R	—
60 - 61	AN/No. Alpha Suffix Code	2	A	L	—
62 - 64	Blank	1	—	—	—
65 - 80	Manufacturers Stock Number	15	N	R	—

*A = alpha, N = numeric, X = alpha/numeric

**F = fixed, R = right, L = left

† for LRU part number left justify from column 50

Card Type SF - Support Equipment - Flight Line File

The flight line support equipment cards (SF) identify for the model what special support equipment is needed on the flight line to perform each maintenance task event. One or more SF cards must be supplied for each subsystem, in the format specified in Table 2 and further described in Appendix A.

These cards may be in any order, but placing them in the same order as the CR cards is recommended for more efficient program operation and for ease of editing. If more than one item of support equipment is required for any flight line task event(s) for a particular subsystem, an additional card is used, identifying the additional support equipment in the same field of the second card. Columns 1-11 of the two cards should be the same, with column 12 set at "2" for the second card and "3" for a third. Only the first card of the group requires an entry in columns 56-57, which conveys the total cards for the equipment. If there is only one card, a zero or a one or a blank may be used. The current version of the program allows a maximum of three pieces of support equipment per maintenance event. The cards used for the example run are listed in Figure 4.

	ID#	A	T	CND	R	M	VR	VM
SF	AC310	-1	D60	D60	D60	D60	D60	D60
SF	AC320	-1	D60	D60	D60	D60	D60	D60
SF	AC330	-1	D60	D60	D60	D60	D60	D60
SF	AN110	-1	D60	D60	D60	D60	D60	D60
SF	AN120	-1	D60	D60	D60	D60	D60	D60
SF	AN130	-1	D60	D60	D60	D60	D60	D60

Figure 4. Printout of SF cards for the example run

Table 2
Support Equipment -- Flight Line File

Column	Title	Length	Type	Justification**	Decimal Placement
1 - 2	Card Type -- SF	2	A	F	--
3	Blank	1	--	--	--
4	Aircraft System	1	A	F	--
5	Major System	1	A	F	--
6	Functional Group	1	A	F	--
7	Operational Function	1	N	F	--
8	Subsystem	1	N	F	--
9	Line Replaceable Unit	1	X	F	--
10	Shop Replaceable Unit	1	N	F	--
11	Dash	1	X	F	--
12	Card Sequence	1	N	F	--
13	Blank	1	--	--	--
14 - 18	(A) Set Up Support Equipment (SE)	5	N	L	--
19	Blank	1	--	--	--
20 - 24	(T) Troubleshooting SE	5	N	L	--
25	Blank	1	--	--	--
26 - 30	(C) Cannot Duplicate Discrepancy SE	5	N	L	--
31	Blank	1	--	--	--
32 - 36	(R) SE to Remove & Replace (R&R)	5	N	L	--
37	Blank	1	--	--	--
38 - 42	(M) On Aircraft (A/C) Maint. SE	5	N	L	--
43	Blank	1	--	--	--
44 - 48	(V _R) R&R Verification SE	5	N	L	--
49	Blank	11	--	--	--
50 - 54	(V _M) On A/C Maint. Verif. SE	5	N	L	--
55	Blank	1	--	--	--
56 - 57	Maximum No. of SE Per Task	2	N	R	--
58 - 80	Blank	23	--	--	--

*A = alpha, N = numeric, X = alpha/numeric

**F = fixed, R = right, L = left

Card Type LF - Air Force Specialty - Flight Line File

The flight line Air Force specialty (LF) cards identify the manpower by specialty type and skill level that is needed to accomplish each maintenance task event. One or more LF cards must be supplied for each subsystem and should be organized in the same order as the CR cards for more efficient program operation and ease of editing. The current version of the program allows assigning up to five Air Force specialty codes (AFSCs) per task event per equipment. Table 3 gives the card format which is further described in Appendix A. The cards for the example run are listed in Figure 5.

	ID#		A	T	CND	R	M	VR	VM	#
LF	AC310	-1	43171	32833	32853	32833	32853	32853	32853	2
LF	AC310	-2	42153					32833	32833	
LF	AC320	-1	43171	32833	32853	32833	32853	32853	32853	2
LF	AC320	-2	42153		32833		32833			
LF	AC330	-1	43171	32833	32853	32833	32853	32853	32853	2
LF	AC330	-2	42153		32833		32833	32833	32833	
LF	AN110	-1	43171	32831	32851	32831	32851	32851	32851	2
LF	AN110	-2	42153		32831		32831			
LF	AN120	-1	43171	32831	32851	32831	32851	32851	32851	2
LF	AN120	-2	42153		32831		32831			
LF	AN130	-1	43171	32831	32851	32831	32851	32851	32851	2
LF	AN130	-2	42153		32831		32831	32831	32831	

Figure 5. Printout of LF cards for the example run

Table 3

Air Force Specialty — Flight Line File

Column	Title	Length	Type*	Justification**	Decimal Placement
1 - 2	Card Type — LF	2	A	F	—
3	Blank	1	—	—	—
4	Aircraft Sytem	1	A	F	—
5	Major System	1	A	F	—
6	Functional Group	1	A	F	—
7	Operational Function	1	N	F	—
8	Subsystem	1	N	F	—
9	Line Replaceable Unit	1	X	F	—
10	Shop Replaceable Unit	1	N	F	—
11	Dash	1	X	F	—
12	Card Sequence	1	N	F	—
13	Blank	1	—	—	—
14 - 18	(A) AFSC to Set Up Support Equipment	5	N	F	—
19	Blank	1	—	—	—
20 - 24	(T) Troubleshooting AFSC	5	N	F	—
25	Blank	1	—	—	—
26 - 30	(C) Cannot Duplicate Discrepancy AFSC	5	N	F	—
31	Blank	1	—	—	—
32 - 36	(R) AFSC to Remove & Replace (R&R)	5	N	F	—
37	Blank	1	—	—	—
38 - 42	(M) On Aircraft (A/C) Maint. AFSC	5	N	F	—
43	Blank	1	—	—	—
44 - 48	(V _R) R&R Verification AFSC	5	N	F	—
49	Blank	1	—	—	—
50 - 54	(V _M) On A/C Maint. Verif. AFSC	5	N	F	—
55	Blank	1	—	—	—
56 - 57	Maximum No. of AFSCs Per Task	2	N	R	—
58 - 80	Blank	23	—	—	—

*A = alpha, N = numeric, X = alpha/numeric

**F = fixed, R = right, L = left

Card Type LS - Air Force Specialty - Shop File

The shop Air Force specialty (LS) cards, like the flight line LF cards, identify the manpower needed to perform the associated shop tasks. One or more LS cards must be supplied for each LRU accounted for by the CR cards. These cards may be in any order, but placing them in the same order as the CR cards is recommended for more efficient program operation and for ease of editing. The format is found in Table 4 and is further described in Appendix A. A printout of the cards used for the example run are listed in Figure 6.

	ID#	W	K	N	TD	TS	#
LS	AC311 -1	32850	32850	32850	3265A	3265A	2
LS	AC311 -2	32830			3263A	3263A	
LS	AC312 -1	32850		32850			2
LS	AC312 -2	32830					
LS	AC321 -1	32850	32850	32850	3265A	3265A	2
LS	AC321 -2	32830			3263A	3263A	
LS	AC322 -1	32850		32850	3265A	3265A	2
LS	AC322 -2				3263A	3263A	
LS	AC323 -1	32850		32850	3265A	3265A	2
LS	AC323 -2				3263A	3263A	
LS	AC331 -1	32850	32850		3265A	3265A	2
LS	AC331 -2	32830			3263A	3263A	
LS	AC332 -1	32850		32850	3265A	3265A	2
LS	AC332 -2	32830			3263A	3263A	
LS	AC333 -1	32850	32850		3265A	3265A	2
LS	AC333 -2	32830			3263A	3263A	
LS	AC334 -1	32850		32850			2
LS	AC334 -2	32830					
LS	AN111 -1			32651	3265B	3265B	2
LS	AN111 -2				3263B	3265B	
LS	AN121 -1	32850	32850	32850	3265A	3265A	2
LS	AN121 -2	32830			3263A	3263A	
LS	AN122 -1			32850	3265A	3265A	2
LS	AN122 -2				3263A	3263A	
LS	AN131 -1	32850	32850	32850	3265A	3265A	2
LS	AN131 -2	32830			3263A	3263A	
LS	AN132 -1			32850			1

Figure 6. Printout of LS cards for the example run

Table 4

Air Force Specialty - Shop File

Column	Title	Length	Type*	Justification**	Decimal Placement
1 - 2	Card Type - LS	2	A	F	-
3	Blank	1	-	-	-
4	Aircraft System	1	A	F	-
5	Major System	1	A	F	-
6	Functional Group	1	A	F	-
7	Organizational Function	1	N	F	-
8	Subsystem	1	N	F	-
9	Line Replaceable Unit	1	X	F	-
10	Shop Replaceable Unit	1	N	F	-
11	Dash	1	X	F	-
12	Card Sequence	1	N	F	-
13 - 19	Blank	7	-	-	-
20 - 24	(W) Bench Check & Repair AFSC	5	N	F	-
25	Blank	1	-	-	-
26 - 30	(K) Bench Check & CND AFSC	5	N	F	-
31	Blank	1	-	-	-
32 - 36	(N) Bench Check & NRTS AFSC	5	N	F	-
37 - 39	Blank	13	-	-	-
50 - 54	(TD) Test Drawer Repair AFSC	5	N	F	-
55	Blank	1	-	-	-
56 - 60	(TS) Test Station Repair AFSC	5	N	F	-
61	Blank	1	-	-	-
62 - 63	Maximum No. of AFSCs Per Task	2	N	R	-
64 - 80	Blank	17	-	-	-

*A - alpha, N = numeric, X = alpha/numeric

**F = fixed, R = right, L = left

Card Type TS - Task Time - Shop File

The shop task time (TS) cards provide the model with the average time per worker that it takes to accomplish the associated task event. For each LRU, one card of type TS is required to input the shop task event times. These cards may be in any order, but placing them in the same order as the CR cards is recommended for more efficient program operation and for ease of editing. The card format is found in Table 5 and is further described in Appendix A. The cards used for the example run are listed in Figure 7. The time is input in tenths of an hour; e.g., 50 equals 5.0 hours.

	ID#	W	K	N	TD	TS
TS	AC311 -1	28	14	14	12	50
TS	AC312 -1	25		10		
TS	AC321 -1	50	14	13	12	50
TS	AC322 -1	08		10	12	50
TS	AC323 -1	59		07	12	50
TS	AC331 -1	31	28		12	50
TS	AC332 -1	45		35	12	50
TS	AC333 -1	25	14		12	50
TS	AC334 -1	15		06		
TS	AN111 -1			08	12	50
TS	AN121 -1	33	11	20	12	50
TS	AN122 -1			05	12	50
TS	AN131 -1	11	07	17	12	50
TS	AN132 -1			02		

Figure 7. Printout of the TS cards for the example run

Table 5

Task Time - Shop File

Column	Title	Length	Type*	Justification**	Decimal Placement
1 - 2	Card Type - TS	2	A	F	-
3	Blank	1	-	-	-
4	Weapon System	1	A	F	-
5	Major System	1	A	F	-
6	Functional Group	1	A	F	-
7	Operational Function	1	N	F	-
8	Subsystem	1	N	F	-
9	Line Replaceable Unit	1	X	F	-
10	Shop Replaceable Unit	1	N	F	-
11	Dash	1	X	F	-
12	Card Sequence	1	N	F	-
13 - 19	Blank	7	-	-	-
20 - 24	(W) Bench Check & Repair Time	5	N	R	1
25	Blank	1	-	-	-
26 - 30	(K) Bench Check & CND Time	5	N	R	1
31	Blank	1	-	-	-
32 - 36	(N) Bench Check & NRTS Time	5	N	R	1
37 - 49	Blank	13	-	-	-
50 - 54	(TD) Test Drawer Repair Time	5	N	R	1
55	Blank	1	-	-	-
56 - 60	(TS) Test Station Repair Time	5	N	R	1
60 - 80	Blank	20	-	-	-

*A = alpha, N = numeric, X = alpha/numeric

**F = fixed, R = right, L = left

Card Type TF - Task Time - Flight Line File

The flight line task time (TF) cards, like the TS cards, provide the average time, by subsystem, to accomplish the flight line maintenance task events. One card must be provided for each subsystem and organized in the same order as the CR cards for efficient program operation and ease of editing. The card format is provided in Table 6 and further described in Appendix A. The cards used for the example run are listed in Figure 8.

	ID#	A	T	CND	R	M	VR	VM
TF	AC310 -1	02	05	20	15	26	01	01
TF	AC320 -1	02	02	08	14	11	05	05
TF	AC330 -1	02	10	10	10	06	05	05
TF	AN110 -1	02	10	16	15	14	09	09
TF	AN120 -1	02	05	18	10	08	05	02
TF	AN130 -1	02	02	27	10	10	04	02

Figure 8. Printout of TF cards for example run

Table 6

Task Time - Flight Line File

Column	Title	Length	Type*	Justification**	Decimal Placement
1 - 2	Card Type - TF	2	A	F	-
3	Blank	1	-	-	-
4	Aircraft System	1	A	F	-
5	Major System	1	A	F	-
6	Functional Group	1	A	F	-
7	Operational Function	1	N	F	-
8	Subsystem	1	N	F	-
9	Line Replaceable Unit	1	X	F	-
10	Shop Replaceable Unit	1	N	F	-
11	Dash	1	X	F	-
12	Card Sequence	1	N	F	-
13	Blank	1	-	-	-
14 - 18	(A) Time to Set Up Support Equipment	5	N	R	1
19	Blank	1	-	-	-
20 - 24	(T) Troubleshooting Time	5	N	R	1
25	Blank	1	-	-	-
26 - 30	(C) Cannot Duplicate Discrepancy Time	5	N	R	1
31	Blank	1	-	-	-
32 - 36	(R) Time to Remove & Replace (R&R)	5	N	R	1
37	Blank	1	-	-	-
38 - 42	(M) On Aircraft (A/C) Maint. Time	5	N	R	1
43	Blank	1	-	-	-
44 - 48	(V _R) R&R Verification Time	5	N	R	1
49	Blank	1	-	-	-
50 - 54	(V _M) On A/C Maintenance Verif. Time	5	N	R	1
55 - 80	Blank	26	-	-	-

*A = alpha, N = numeric, X = alpha/numeric

**F = fixed, R = right, L = left

Card Type PF - Probability - Flight Line File

The flight line probability (PF) cards provide the probability of occurrence of each flight line maintenance task event. One card of type PF is required for each subsystem. They may be in any order, but placing them in the same order as the CR cards is recommended for more efficient program operation and for ease of editing. The card format is provided in Table 7 and further described in Appendix A. A printout of the cards used in the example run are shown in Figure 9.

	ID#		A	T	CND	R	M	VR	VR
PF	AC310	-1	10000	8800	1200	5280	3520	5280	3520
PF	AC320	-1	10000	8700	1300	7569	1131	7569	1131
PF	AC330	-1	10000	9300	0700	2790	6510	2790	6510
PF	AN110	-1	10000	8600	1400	6280	2320	6280	2320
PF	AN120	-1	10000	9600	0400	8256	1344	8256	1344
PF	AN130	-1	10000	9200	0800	6624	2576	6624	2576

Figure 9. Printout of the PF cards for the example run

Table 7

P Probability - Flight Line File

Column	Title	Length	Type*	Justification**	Decimal Placement
1 - 2	Card Type - PF	2	A	F	-
3	Blank	1	-	-	-
4	Aircraft System	1	A	F	-
5	Major System	1	A	F	-
6	Functional Group	1	A	F	-
7	Operational Function	1	N	F	-
8	Subsystem	1	N	F	-
9	Line Replaceable Unit	1	X	F	-
10	Shop Replaceable Unit	1	N	F	-
11	Dash	1	X	F	-
12	Card Sequence	1	N	F	-
13	Blank	1	-	-	-
14 - 18	P _A - Set Up Support Equipment	5	N	R	4
19	Blank	1	-	-	-
20 - 24	P _T - Troubleshoot	5	N	R	4
25	Blank	1	-	-	-
26 - 30	P _C - Cannot Duplicate Discrepancy	5	N	R	4
31	Blank	1	-	-	-
32 - 36	P _R - Remove & Replace (R&R)	5	N	R	4
37	Blank	1	-	-	-
38 - 42	P _M - On Aircraft (A/C) Maintenance	5	N	R	4
43	Blank	1	-	-	-
44 - 48	PV _R - R&R Verification	5	N	R	4
49	Blank	1	-	-	-
50 - 54	PV _M - On A/C Maintenance Verification	5	N	R	4
55 - 80	Blank	26	-	-	-

*A = alpha, N = numeric, X = alpha/numeric

**F = fixed, R = right, L = left

Card Type PS - Probability - Shop File

The shop probability (PS) cards, like the PF cards, provide the probability of occurrence of each maintenance task event performed on each LRU received in the shop. One card must be provided for each LRU, preferably in the same order as the CR cards to simplify editing and make program operation more efficient. The card format is listed in Table 8 and further described in Appendix A. A printout of the cards used in the example run are shown in Figure 10.

ID#	W	K	N	TD	TS
PS AC311 -1	1126	0423	1971	0317	0188
PS AC312 -1	0880		0880		
PS AC321 -1	6790	0295	0295	1993	0168
PS AC322 -1	0076		0009	0020	0003
PS AC323 -1	0052		0052	0016	0002
PS AC331 -1	0272	0189		0125	0105
PS AC332 -1	0216		0438	0124	0017
PS AC333 -1	0623	0166		0213	0018
PS AC334 -1	0443		0443		
PS AN111 -1			6280	1319	0115
PS AN121 -1	7228	0318	0397	2145	0181
PS AN122 -1			0313	0059	0008
PS AN131 -1	5503	0842	0129	1748	0148
PS AN132 -1			0150		

Figure 10. Printout of the PS cards used for the example run

Table 8

P Probability — Shop File

Column	Title	Length	Type*	Justification**	Decimal Placement
1 - 2	Card Type — PS	2	A	F	—
3	Blank	1	—	—	—
4	Aircraft System	1	A	F	—
5	Major System	1	A	F	—
6	Functional Group	1	A	F	—
7	Organizational Function	1	N	F	—
8	Subsystem	1	N	F	—
9	Line Replaceable Unit	1	X	F	—
10	Shop Replaceable Unit	1	N	F	—
11	Dash	1	X	F	—
12	Card Sequence	1	N	F	—
13 - 19	Blank	7	—	—	—
20 - 24	PW — Bench Check & Repair	5	N	R	4
25	Blank	1	—	—	—
26 - 30	PK — Bench Check & RTOK	5	N	R	4
31	Blank	1	—	—	—
32 - 36	PN — Bench Check & NRTS	5	N	R	4
37 - 49	Blank	13	—	—	—
50 - 54	PTD — Test Drawer Repair	5	N	R	4
55	Blank	1	—	—	—
56 - 60	PTS — Test Station Repair	5	N	R	4
61 - 80	Blank	20	—	—	—

*A = alpha, N = numeric, X = alpha/numeric

**F = fixed, R = right, L = left

Card Type SS - Support Equipment - Shop File

The shop support equipment (SS) cards identify for the model which test station(s) and what drawer number within the station will be used to test each LRU received by the shop for maintenance. The SS card can also be used to list test equipment that would be used to maintain the test station. The current maximum number of test stations per LRU that the model will recognize is two. When a second station is necessary, the data are assigned to a second card with a -2 sequence. At least one card must be assigned to each LRU, preferably in the same order as the CR cards for more efficient program operation and to simplify editing. The format is provided in Table 9 and further described in Appendix A. A printout of the cards used for the example run are shown in Figure 11.

ID#	W	K	N	TD#	TD	TS	#
SS AC311 -1	DTS	DTS	DTS	012	DTS		1
SS AC312 -1				013			0
SS AC321 -1	CNITM	CNITM	CNITM	014	CNITM		1
SS AC322 -1	CNITM		CNITM	015	CNITM		1
SS AC323 -1	CNITM		CNITM	016	CNITM		1
SS AC331 -1	CNITM	CNITM		017	CNITM		1
SS AC332 -1	CNITM		CNITM	018	CNITM		1
SS AC333 -1	CNITM	CNITM		019	CNITM		1
SS AC334 -1				020			0
SS AN111 -1			CMPTS	027	CMPTS		1
SS AN121 -1	CNITM	CNITM	CNITM	028	CNITM		1
SS AN122 -1			CNITM	029	CNITM		1
SS AN131 -1	CNITM	CNITM	CNITM	030	CNITM		1
SS AN132 -1				031			0

Figure 11. Printout of SS cards for the example run

Table 9

Support Equipment (SE) - Shop File

Column	Title	Length	Type*	Justification**	Decimal Placement
1 - 2	Card Type - SS	2	A	F	-
3	Blank	1	-	-	-
4	Aircraft System	1	A	F	-
5	Major System	1	A	F	-
6	Functional Group	1	A	F	-
7	Operational Function	1	N	F	-
8	Subsystem	1	N	F	-
9	Line Replaceable Unit	1	X	F	-
10	Shop Replaceable Unit	2	N	F	-
11	Dash	1	X	F	-
12	Card Sequence	1	N	F	-
13 - 19	Blank	7	-	-	-
20 - 24	(W) SE to Bench Check & Repair	5	X	L	-
25	Blank	1	-	-	-
26 - 30	(K) SE to Bench Check & CND	5	X	L	-
31	Blank	1	-	-	-
32 - 36	(N) SE to Bench Check & NRTS	5	X	L	-
37	Blank	1	-	-	-
38 - 40	Test Drawer Number	3	N	R	-
41 - 49	Blank	9	-	-	-
50 - 54	(TD) SE Test Station Under Repair	5	X	L	-
55	Blank	1	-	-	-
56 - 60	(TS) SE to Check Out Test Station	5	X	L	-
61	Blank	1	-	-	-
62 - 63	Maximum No. of SE Per Task	2	N	R	-
64 - 80	Blank	17	-	-	-

*A = alpha, N = numeric, X = alpha/numeric

**F = fixed, R = right, L = left

Card Type MF - Reliability Mean Values - Flight Line File

The flight line reliability mean value (MF) cards contain the mean flight hours between maintenance actions (MFHBMA) for each subsystem. An "H" factor showing the ratio of flight line LRU removals to shop receipts is also provided. The H factor values are input as an additive value greater than unity, and the program adds a one to this value. A further explanation of the H factor is provided in Appendix A for this card type.

There must be one MF card for every subsystem. They may be in any order, but placing them in the same order as the CR cards is recommended for more efficient program operation and for ease of editing. The format is found in Table 10 and further described in Appendix A. A printout of the cards used for the example run are shown in Figure 12. (Note: The example shows zero filled "H" factor" values, but the program does not require this data entry.)

	ID#		MFHBMA	H.FACTOR
MF	AC310	-1	404.6	0.0000
MF	AC320	-1	62.9	0.0000
MF	AC330	-1	328.1	0.0000
MF	AN110	-1	1031.9	0.0000
MF	AN120	-1	62.9	0.0000
MF	AN130	-1	232.9	0.0000

Figure 12. Printout of the MF cards used for the example run

Table 10

Reliability Mean Values - Flight Line File

Column	Title	Length	Type*	Justification**	Decimal Placement
1 - 2	Card Type - MF	2	A	F	-
3	Blank	1	-	-	-
4	Aircraft System	1	A	F	-
5	Major System	1	A	F	-
6	Functional Group	1	A	F	-
7	Operational Function	1	N	F	-
8	Subsystem	1	N	F	-
9	Line Replaceable Unit	1	X	F	-
10	Shop Replaceable Unit	1	N	F	-
11	Dash	1	X	F	-
12	Card Sequence	1	N	F	-
13	Blank	1	-	-	-
14 - 19	Mean Flight Hours Between Maintenance Actions by subsystem (column 18 is a decimal)	6	N	R	1
20	Blank	1	-	-	-
21 - 26	H factor (column 22 is a decimal)	6	N	F	1
27 - 80	Blank	55	-	-	-

*A = alpha, N = numeric, X = alpha/numeric

**F = fixed, R = right, L = left

AFSC Cards - Air Force Specialty Code Definition

All AFSCs which were input in either an "LS" or "LF" input card must be defined here. The first card contains the number of AFSCs punched on the remaining cards. Each succeeding card may contain up to six AFSCs and the respective manhour rates. The AFSCs may be put in any order, and that ordering will be maintained in the AFSC output. If no manhour rate is input, \$1 per hour will be used. The format is provided in Table 11. A printout of the cards used for the example run are shown in Figure 13a.

016				
32251	32231	32651	32631	32652
32632	32850	32830	32851	32831
32853	32833	40451	40431	42153
43171				

Figure 13a. Printout of AFSC definition cards for example run

SE Cards - Support Equipment Definition

All support equipments which were input in either an "SF" or "SS" input card must be defined here. The first card contains the number of SEs punched on the remaining cards. Each succeeding card contains up to 13 SEs. They may be put in any order, and that ordering will be maintained in the SE output. The format is provided in Table 12. A printout of the cards used for the example run are shown in Figure 13b.

06
MWTS ARFTS CNITM DTS ICTM CMPTS

Figure 13b. Printout of SE definition cards for the example run

Table 11

AFSC Definition

Column	Title	Length	Type*	Justification**	Decimal Placement
(first card)					
1 - 3	Number of AFSCs	3	N	R	—
(succeeding cards)					
1 - 5	AFSC	5	N	L	—
6 - 11	AFSC manhour cost	6	N	R	2
13 - 17	AFSC	5	N	L	—
18 - 23	AFSC manhour cost	6	N	R	2
25 - 29	AFSC	5	N	L	—
30 - 35	AFSC manhour cost	6	N	R	2
37 - 41	AFSC	5	N	L	—
42 - 47	AFSC manhour cost	6	N	R	2
49 - 53	AFSC	5	N	L	—
54 - 59	AFSC manhour cost	6	N	R	2
61 - 65	AFSC	5	N	L	—
66 - 71	AFSC manhour cost	6	N	R	2
72 - 80	Blank	9	—	—	—

*A = alpha, N = numeric, x = alpha/numeric

**F = fixed, R = right, L = left

Table 12
Support Equipment Definition

Column	Title	Length	Type*	Justification**	Decimal Placement
(first card)					
1 - 2	Number of SEs	2	N	R	—
(succeeding cards)					
1 - 5	SE	5	X	L	—
7 - 11	SE	5	X	L	—
13 - 17	SE	5	X	L	—
19 - 23	SE	5	X	L	—
25 - 29	SE	5	X	L	—
31 - 35	SE	5	X	L	—
37 - 41	SE	5	X	L	—
43 - 47	SE	5	X	L	—
49 - 53	SE	5	X	L	—
55 - 59	SE	5	X	L	—
61 - 65	SE	5	X	L	—
67 - 71	SE	5	X	L	—
73 - 77	SE	5	X	L	—
78 - 80	Blank	3	—	—	—

*A = alpha, N = numeric, X = alpha/numeric

**F = fixed, R = right, L = left

Option Card Formats

Program option cards immediately follow the data file cards of the R&M input deck. These cards are used to generate optional outputs of the model as described below.

AFSCs and SEs of Interest

This option specifies how many Air Force specialty code (AFSC) and support equipment (SE) reports are to be output and then defines them. The first card contains the count and the succeeding cards the AFSC or SE identifications. The format is provided in Table 13. If no AFSC or SE output is desired, a zero is entered in the first card and successive cards are omitted. To reduce the input requirements, the words ALLAF or ALLSE may be used in place of the AFSC or SE identifications to invoke output for all the AFSCs or all of the SEs.

A separate output report will be generated for each AFSC designated. Each report displays, for every subsystem requiring that AFSC, the MMH/1000 FH required for the total shop task events per LRU, the total flight line task events, and the total for the subsystem. An example output matrix is shown in Figure 18. A column of the matrix records the cost/1000 FH for each of these MMH/1000 FH outputs obtained by multiplying by the cost per MMH for that AFSC.

A separate output report of maintenance requirements will be generated for each SE designated. An example output matrix is shown in Figure 17. Each of these reports will provide values for (1) the Test Drawer Repair (TD REP) representing the in-shop repair of the test station drawer (or combination of test equipment) that is needed to test the LRU being checked, (2) the Test Station Repair (TS REP) representing the in-shop repair of the entire test station that is needed to test the LRU being checked and (3) their total. These TD REP, TS REP, and total values are provided for each of the individual LRUs tested on the particular test station and each is given in terms of MTTR, MMH, MMH/1000 FH, and MTTR/1000 FH.

Table 13
AFSC and SE Option Cards

Column	Title	Length	Type*	Justification**	Decimal Placement
(first card)					
1 - 3	Number of AFSCs and SEs requested	3	N	R	-
(succeeding cards)					
1 - 5		5	X	L	-
7 - 11		5	X	L	-
13 - 17		5	X	L	-
19 - 23		5	X	L	-
25 - 29		5	X	L	-
31 - 35	AFSC identification or	5	X	L	-
37 - 41	SE identification or	5	X	L	-
43 - 47	ALLAF or ALLSE	5	X	L	-
49 - 53		5	X	L	-
55 - 59		5	X	L	-
61 - 65		5	X	L	-
67 - 71		5	X	L	-
73 - 77		5	X	L	-
78 - 80		3	-	-	-

*A = alpha, N = numeric, X = alpha/numeric

**F = fixed, R = right, L = left

Subsystem Data Options

The following 13 option cards may occur in any number (or may be omitted) and in any order, with duplications if desired. They serve to call up optional output reports as described below. If none are included, no optional reports will be output. In every case, the subsystem name, or portion thereof, is punched in columns 1-7 and the option number (right-justified) in columns 9-10.

<u>Option #</u>	<u>Title</u>	<u>- Description</u>
01	MTTR BY TASK PER LRU	- displays mean time to repair for each LRU within the subsystem designated. If the subsystem field is left blank and only the option number is specified, one report will be generated for each subsystem and its LRUs.
02	MTTR AS % OF TOTAL	- same as 01 except the values displayed are percentages of the total subsystem MTTR. Only the percentages are displayed.
03	MMH BY TASK PER LRU	- displays maintenance manhours for each LRU within the subsystem designated. If the subsystem field is left blank and only the option number is specified, one report will be generated for each subsystem and its LRUs.
04	MMH AS % OF TOTAL	- same as 03 except the values displayed are percentages of the total subsystem MMH. Only the percentages are displayed.
05	MMH PER 1000 FH	- displays maintenance manhours per thousand flight hours reports for each LRU within the subsystem designated. If the subsystem field is left blank and only the option number is specified, one report will be generated for each subsystem and its LRUs.
06	MAINT INDEX x 1000	- displays the equipment maintainability index defined as MTTR per 1000 flight hours obtained from the equation $(MTTR \times 1000)/MFHBMA$. If the subsystem field is left blank, one report will be generated for each subsystem and its LRUs.

Options 07 through 12 are similar to options 01 through 06, respectively, with the following two exceptions which apply to each option:

- a) Only the bottom line total is given for each report rather than itemizing by LRU
- b) Rather than each report representing outcomes of maintenance actions for a single subsystem, each can be stipulated to represent a summation over several subsystems as selected by the portion of the subsystem ID number punched in columns 1-7.

These exceptions can be noted in the example run, whereby "AC3" was used as the operational function group ID for options 07 through 12. All subsystems beginning with "AC3" are then used in the summation. Any number of characters may be used as the portion of the subsystem ID. This makes possible the selection of outputs for any hierarchical grouping of subsystems desired. This relationship of ID number to hierarchical order of the equipment is illustrated in Figure 2.

<u>Option #</u>	<u>Title</u>	<u>- Description</u>
13	MTTR for All Subsystems and MMH for All Subsystems -	this option requires no entry in the subsystem field (columns 1-7) and produces two reports summing the MTTR and MMH for all subsystems.

Figure 14 shows the input option cards which immediately follow the input data file cards. This set of option cards was used in the example run to generate the sample output reports used in this report.

```

002
ALLAF ALLSE
      13
      01
AC320 02
      03
AC320 04
      05
      06
AC3   07
AC3   08
AC3   09
AC3   10
AC3   11
AC3   12

```

Figure 14. Printout of input options cards for the example run

V. OUTPUT REPORTS

Structure of the Example Run

The R&M model is capable of providing the user with up to 16 output reports. In addition, a complete listing of the R&M input data is printed out for verification by the user. Figure 15 is a print-out of the data used for the example run; complete instructions for its preparation have been provided in Section IV and Appendix A of this volume. Figure 16 displays the first report printed when the R&M model batch program is run. It is the "Subsystem Inherent Flight Line Availability" report which displays this parameter for all subsystems ranked by order of magnitude. This report is always printed first and is not optionally controlled.

Samples of the support equipment (SE) matrices (Figure 17) and AFSC matrices (Figure 18) were selected from the set requested on the option cards previously shown in Figure 14. One report matrix for each requested SE and AFSC is produced when the R&M model is run. Formats for these reports are described on page 43.

Optional output reports 01 through 13 are printed next (Figures 19 through 32) in the order they were requested (Figure 14). The format of these output reports is similarly structured. Briefly, the first line of the report names the value computed and the terms of the computation. The second line provides the subsystem identification (ID) number, work unit code (WUC) in parentheses, equipment name, and the mean flight hours between maintenance action value for the specified subsystem. The third line provides the user with the column headings that describe the data elements contained in the output matrices for each maintenance event.

The column titles are:

AGE F/L	setup support equipment event on the flight line
TS F/L	troubleshooting event on the flight line
R&R	remove and replace event
VR&R	verification event of removal and replacement
CND A/C	troubleshooting event on the aircraft, cannot duplicate the discrepancy

M A/C	minor maintenance on aircraft event
VM A/C	verification event, that the maintenance performed corrected the discrepancy
SHOP	bench check, test, and repair events of units removed to the shop
TOT/OUT	total per outcome

The fourth line provides the line replaceable unit (LRU), ID number, WUC, and equipment name, which is repeated for each set of LRU data displayed.

Descriptions of lines two and four apply only to report options 01 through 06.

The rows of data that follow these headings contain the computed values broken out by task event for each of the following maintenance action outcomes:

W	bench check and repair outcome
K	bench tested and found serviceable outcome (no maintenance required)
N	not repairable this station (NRTS) outcome which is a return to depot for repair
SUB	subtotal for the shop tasks required for the LRU
CND	cannot duplicate the discrepancy outcome
TOT/TSK	total for the task

For detailed descriptions of the output reports, including equations, definitions, and example calculations the user should reference Section IV of AFHRL-TR-78-2(I), the companion technical report to this user's guide.

DAIS THEORETICAL RELIABILITY AND MAINTAINABILITY MODEL				
06				
CR	AC310 -1	63510	1 DATA LINK	
CR	AC310 -2	63150		AN/ASW- 25
CR	AC311 -1	11.8	1 CONVERTER/RECEIVER	
CR	AC311 -2	63511		CV-2230A/ASW-25
CR	AC312 -1	2.0	1 MOUNT & ANTENNA	
CR	AC320 -1	63A00	1 UHF RADIO SET	
CR	AC320 -2	63A00		AN/ARC- 51BX
CR	AC321 -1	27.7	1 RECEIVER/TRANSMITTER (UHF)	
CR	AC321 -2	63AA0	5821-00-134-6239	RT-742B/ARC-51BX
CR	AC322 -1	1.0	1 DIPLEXER	
CR	AC323 -1	1.1	1 STANDING WAVE RATIO INDICATOR	
CR	AC323 -2	63AL0	5821-00-978-7867	ID-1003/ARC
CR	AC330 -1	63B00	1 AUTOMATIC DIRECTION FINDING SET - UHF	
CR	AC330 -2	63B00		AN/ARA- 50
CR	AC331 -1	5.4	1 RELAY AMPLIFIER	
CR	AC331 -2	63BA0	5826-00-059-2726	AM-3624/ARA-50
CR	AC332 -1	10.0	1 ANTENNA	
CR	AC332 -2	63BB0	5826-00-849-0055	AS-909/ARA-48
CR	AC333 -1	8.0	1 RECEIVER	
CR	AC333 -2	63BC0	5821-00-999-4590-MA	R-1286/ARR-69
CR	AC334 -1	1.1	1 MOUNT	
CR	AN110 -1	4.0	1 HEADING MODE SYSTEM	
CR	AN111 -1	71A00	1 RATE GYRO TRANSMITTER	
CR	AN120 -1	71B00	1 TACAN SET	
CR	AN120 -2	71B00		AN/ARN- 52
CR	AN121 -1	43.3	1 RECEIVER/TRANSMITTER (TACAN)	
CR	AN121 -2	71BA0	5826-00-884-0914	RT-893/ARN-52
CR	AN122 -1	2.3	1 ANTENNA SWITCH	

Figure 15. Input data records

CR	AN130	-1	71C00	1	INSTRUMENT LANDING SYSTEM		2
CR	AN130	-2	71C00				
CR	AN131	-1	8.6	71CA0	1	RADIO MARKER BEACON & GLIDESLOPE REC	6
CR	AN131	-2		71CA		5826-00-226-6030	
CR	AN132	-1	4.0	71CC0	1	ANTENNA	1
CR	AN132	-2					
SF	AC310	-1	D60	D60	D60	D60	D60
SF	AC320	-1	D60	D60	D60	D60	D60
SF	AC330	-1	D60	D60	D60	D60	D60
SF	AN110	-1	D60	D60	D60	D60	D60
SF	AN120	-1	D60	D60	D60	D60	D60
SF	AN130	-1	D60	D60	D60	D60	D60
LF	AC310	-1	43171	32833	32853	32853	32853
LF	AC310	-2	42153			32833	32833
LF	AC320	-1	43171	32833	32853	32853	32853
LF	AC320	-2	42153				
LF	AC330	-1	43171	32833	32853	32853	32853
LF	AC330	-2	42153				
LF	AN110	-1	43171	32831	32851	32851	32851
LF	AN110	-2	42153				
LF	AN120	-1	43171	32831	32851	32851	32851
LF	AN120	-2	42153				
LF	AN130	-1	43171	32831	32851	32851	32851
LF	AN130	-2	42153				
LS	AC311	-1		32850	32850	3265A	3265A
LS	AC311	-2		32830		3263A	3263A
LS	AC312	-1		32850	32850		
LS	AC312	-2		32830			
LS	AC321	-1		32850	32850	3265A	3265A
LS	AC321	-2		32830		3263A	3263A

Figure 15. (continued)

LS	AC322	-1	32850	32850	3265A	3265A	2
LS	AC322	-2			3263A	3263A	
LS	AC323	-1	32850	32850	3265A	3265A	2
LS	AC323	-2			3263A	3263A	
LS	AC331	-1	32850	32850	3265A	3265A	2
LS	AC331	-2	32830		3263A	3263A	
LS	AC332	-1	32850	32850	3265A	3265A	2
LS	AC332	-2	32830		3263A	3263A	
LS	AC333	-1	32850	32850	3265A	3265A	2
LS	AC333	-2	32830		3263A	3263A	
LS	AC334	-1	32850	32850			2
LS	AC334	-2	32830				
LS	AN111	-1		32651	3265B	3265B	2
LS	AN111	-2			3263B	3265B	
LS	AN121	-1	32850	32850	3265A	3265A	2
LS	AN121	-2	32830		3263A	3263A	
LS	AN122	-1		32850	3265A	3265A	2
LS	AN122	-2			3263A	3263A	
LS	AN131	-1	32850	32850	3265A	3265A	2
LS	AN131	-2	32830		3263A	3263A	
LS	AN132	-1		32850			1
TS	AC311	-1	28	14	12	50	
TS	AC312	-1	25	10			
TS	AC321	-1	50	13	12	50	
TS	AC322	-1	08	10	12	50	
TS	AC323	-1	59	07	12	50	
TS	AC331	-1	31	28	12	50	
TS	AC332	-1	45		12	50	
TS	AC333	-1	25	14	12	50	
TS	AC334	-1	15	06			

Figure 15. (continued)

PS	AN132	-1	DTS	DTS	0150	DTS	012	DTS	013	014	015	016	017	018	019	020	027	028	029	030	031	0	
SS	AC311	-1																				1	
SS	AC312	-1																				0	
SS	AC321	-1																				1	
SS	AC322	-1																				1	
SS	AC323	-1																				1	
SS	AC331	-1																				1	
SS	AC332	-1																				1	
SS	AC333	-1																				1	
SS	AC334	-1																				0	
SS	AN111	-1																				1	
SS	AN121	-1																				1	
SS	AN122	-1																				1	
SS	AN131	-1																				1	
SS	AN132	-1																				0	
MF	AC310	-1	404.6	0.0000																			
MF	AC320	-1	62.9	0.0000																			
MF	AC330	-1	328.1	0.0000																			
MF	AN110	-1	1031.9	0.0000																			
MF	AN120	-1	62.9	0.0000																			
MF	AN130	-1	232.9	0.0000																			
016																							
32251			32231			32651				32631													32652
32632			32850			32830				32851													32831
32853			32833			40451				40431													42153
43171																							
06																							
MWTS	ARFTS	CNITM	DTS	ICTM	CMPTS																		

Figure 15. (continued)

SUBSYSTEM INHERENT FLIGHT LINE AVAILABILITY

SUBSYSTEM	AVAILABILITY
AN120	0.9673
AC320	0.9677
AN130	0.9922
AC330	0.9929
AC310	0.9934
AN110	0.9968

SERVICE FLIGHT LINE AVAILABILITY -
0.9132

Figure 16. Sample availability report

SE-CNITH				-MTR-				-MMH-				-MMH/1000 FH-				-MTR/1000 FH-			
TO#	TO#	TS	TOTAL	TO#	TS	TOTAL	TO#	TS	TOTAL	TO#	TS	TOTAL	TO#	TS	TOTAL	TO#	TS	TOTAL	TO#
AC111 6	0.0823	0.0210	0.1033	0.1656	0.0420	0.2076	3.2282	0.8235	4.0518	1.6141	0.4118	2.0259	1.6141	0.4118	2.0259	1.6141	0.4118	2.0259	1.6141
AC112 7	0.0490	0.0270	0.0760	0.0979	0.0560	0.1539	1.9200	1.0588	2.9788	0.9600	0.5294	1.4894	0.9600	0.5294	1.4894	0.9600	0.5294	1.4894	0.9600
AC113 8	0.0154	0.0085	0.0239	0.0307	0.0170	0.0477	0.6024	0.3333	0.9357	0.3012	0.1667	0.4679	0.3012	0.1667	0.4679	0.3012	0.1667	0.4679	0.3012
AC114 9	0.0162	0.0090	0.0252	0.0324	0.0180	0.0504	0.6353	0.3559	0.9912	0.5176	0.1765	0.6941	0.5176	0.1765	0.6941	0.5176	0.1765	0.6941	0.5176
AC110	0.1628	0.0655	0.2283	0.3257	0.1310	0.4567	6.3859	2.5686	8.9545	3.1929	1.2843	4.4773	3.1929	1.2843	4.4773	3.1929	1.2843	4.4773	3.1929
AC211 10	0.1777	0.0625	0.2402	0.3554	0.1250	0.4804	4.7519	1.6711	6.4230	2.3759	0.8356	3.2115	2.3759	0.8356	3.2115	2.3759	0.8356	3.2115	2.3759
AC212 11	0.0028	0.0015	0.0043	0.0055	0.0030	0.0085	0.0738	0.0401	0.1139	0.0369	0.0201	0.0570	0.0369	0.0201	0.0570	0.0369	0.0201	0.0570	0.0369
AC210	0.1805	0.0640	0.2445	0.3610	0.1280	0.4890	4.8257	1.7112	6.5369	2.4128	0.8556	3.2684	2.4128	0.8556	3.2684	2.4128	0.8556	3.2684	2.4128
AC311 12	0.0380	0.0940	0.1320	0.0761	0.1880	0.2641	0.1880	0.4667	0.6527	0.0940	0.2323	0.3263	0.0940	0.2323	0.3263	0.0940	0.2323	0.3263	0.0940
AC310	0.0380	0.0940	0.1320	0.0761	0.1880	0.2641	0.1880	0.4667	0.6527	0.0940	0.2323	0.3263	0.0940	0.2323	0.3263	0.0940	0.2323	0.3263	0.0940
AC321 14	0.2392	0.0840	0.3232	0.4783	0.1680	0.6463	7.6045	2.6709	10.2754	3.8022	1.3555	5.1577	3.8022	1.3555	5.1577	3.8022	1.3555	5.1577	3.8022
AC322 15	0.0024	0.0015	0.0039	0.0048	0.0030	0.0078	0.0763	0.0477	0.1240	0.0382	0.0238	0.0620	0.0382	0.0238	0.0620	0.0382	0.0238	0.0620	0.0382
AC323 16	0.0019	0.0010	0.0029	0.0038	0.0020	0.0058	0.0610	0.0318	0.0928	0.0305	0.0159	0.0464	0.0305	0.0159	0.0464	0.0305	0.0159	0.0464	0.0305
AC320	0.2435	0.0865	0.3300	0.4870	0.1730	0.6600	7.7418	2.7504	10.4922	3.8709	1.3752	5.2461	3.8709	1.3752	5.2461	3.8709	1.3752	5.2461	3.8709
AC331 17	0.0150	0.0525	0.0675	0.0300	0.1050	0.1350	0.0914	0.3200	0.4115	0.0457	0.1600	0.2057	0.0457	0.1600	0.2057	0.0457	0.1600	0.2057	0.0457
AC332 18	0.0149	0.0085	0.0234	0.0298	0.0170	0.0468	0.0907	0.0518	0.1425	0.0454	0.0259	0.0713	0.0454	0.0259	0.0713	0.0454	0.0259	0.0713	0.0454
AC333 19	0.0256	0.0090	0.0346	0.0511	0.0180	0.0691	0.1558	0.0349	0.2107	0.0779	0.0274	0.1053	0.0779	0.0274	0.1053	0.0779	0.0274	0.1053	0.0779
AC330	0.0554	0.0700	0.1254	0.1109	0.1400	0.2509	0.3379	0.4267	0.7646	0.1690	0.2133	0.3823	0.1690	0.2133	0.3823	0.1690	0.2133	0.3823	0.1690
AC411 21	0.0416	0.0640	0.1056	0.0833	0.0080	0.0913	0.5559	0.0534	0.6093	0.2780	0.0267	0.3047	0.2780	0.0267	0.3047	0.2780	0.0267	0.3047	0.2780
AC412 22	0.0316	0.0030	0.0346	0.0631	0.0060	0.0691	0.4214	0.0401	0.4614	0.2107	0.0200	0.2307	0.2107	0.0200	0.2307	0.2107	0.0200	0.2307	0.2107
AC413 23	0.0132	0.0010	0.0142	0.0264	0.0020	0.0284	0.1762	0.0134	0.1896	0.0881	0.0067	0.0948	0.0881	0.0067	0.0948	0.0881	0.0067	0.0948	0.0881
AC410	0.0864	0.0080	0.0944	0.1728	0.0160	0.1888	1.1555	0.1068	1.2623	0.5768	0.0534	0.6302	0.5768	0.0534	0.6302	0.5768	0.0534	0.6302	0.5768
AC511 24	0.2777	0.0700	0.3477	0.5554	0.1400	0.6954	0.8574	0.2161	1.0736	0.4287	0.1081	0.5368	0.4287	0.1081	0.5368	0.4287	0.1081	0.5368	0.4287
AC510	0.2777	0.0700	0.3477	0.5554	0.1400	0.6954	0.8574	0.2161	1.0736	0.4287	0.1081	0.5368	0.4287	0.1081	0.5368	0.4287	0.1081	0.5368	0.4287
AC611 25	0.1643	0.0415	0.2058	0.3286	0.0830	0.4116	2.7221	0.6877	3.4098	1.3611	0.3438	1.7049	1.3611	0.3438	1.7049	1.3611	0.3438	1.7049	1.3611
AC612 26	0.0035	0.0020	0.0055	0.0070	0.0040	0.0110	0.0577	0.0331	0.0908	0.0288	0.0166	0.0454	0.0288	0.0166	0.0454	0.0288	0.0166	0.0454	0.0288
AC610	0.1678	0.0435	0.2113	0.3355	0.0870	0.4225	2.7798	0.7208	3.5006	1.3899	0.3604	1.7503	1.3899	0.3604	1.7503	1.3899	0.3604	1.7503	1.3899
AN121 28	0.2574	0.0905	0.3479	0.5148	0.1810	0.6958	8.1844	2.8776	11.0620	4.0922	1.4388	5.5310	4.0922	1.4388	5.5310	4.0922	1.4388	5.5310	4.0922
AN122 29	0.0071	0.0040	0.0111	0.0142	0.0080	0.0222	0.2751	0.1272	0.4023	0.1126	0.0836	0.1962	0.1126	0.0836	0.1962	0.1126	0.0836	0.1962	0.1126
AN120	0.2645	0.0945	0.3590	0.5290	0.1890	0.7180	8.4095	3.0048	11.4143	4.2048	1.5024	5.7072	4.2048	1.5024	5.7072	4.2048	1.5024	5.7072	4.2048
AN131 30	0.2098	0.0740	0.2838	0.4195	0.1480	0.5675	1.8013	0.6355	2.4368	0.9006	0.3177	1.2184	0.9006	0.3177	1.2184	0.9006	0.3177	1.2184	0.9006
AN130	0.2098	0.0740	0.2838	0.4195	0.1480	0.5675	1.8013	0.6355	2.4368	0.9006	0.3177	1.2184	0.9006	0.3177	1.2184	0.9006	0.3177	1.2184	0.9006
AN211 32	0.2448	0.0860	0.3308	0.4896	0.1720	0.6616	9.0000	3.1678	12.1678	4.5000	1.5809	6.0809	4.5000	1.5809	6.0809	4.5000	1.5809	6.0809	4.5000
AN213 34	0.0128	0.0070	0.0198	0.0257	0.0140	0.0397	0.4721	0.2574	0.7294	0.2360	0.1287	0.3647	0.2360	0.1287	0.3647	0.2360	0.1287	0.3647	0.2360
AN210	0.2576	0.0930	0.3506	0.5153	0.1860	0.7013	9.4721	3.4191	12.8912	4.7360	1.7096	6.4456	4.7360	1.7096	6.4456	4.7360	1.7096	6.4456	4.7360
TOTAL	1.9440	0.7630	2.7070	3.8880	1.5260	5.4140	43.9530	16.0247	59.9777	21.9765	8.0124	29.9889	21.9765	8.0124	29.9889	21.9765	8.0124	29.9889	21.9765

Figure 17. Sample SE maintenance requirements report

AFSC-32830 \$ 1.00

	MMH/KFH	COST/KFH
AC111	13.43961	13.43961
AC112	18.18980	18.18980
AC113	3.96471	3.96471
AC114	6.00549	6.00549
FL	0.	0.
AC110	41.59961	41.59961
AC211	23.18182	23.18182
AC212	0.26310	0.26310
FL	0.	0.
AC210	23.44492	23.44492
AC311	0.77924	0.77924
AC312	0.54375	0.54375
FL	0.	0.
AC310	1.32299	1.32299
AC321	53.97456	53.97456
FL	0.	0.
AC320	53.97456	53.97456
AC331	0.25699	0.25699
AC332	0.29625	0.29625
AC333	0.47470	0.47470
AC334	0.20253	0.20253
FL	0.	0.
AC330	1.23048	1.23048
AC411	1.93565	1.93565
FL	0.	0.
AC410	1.93565	1.93565
AC511	2.03008	2.03008
FL	0.	0.
AC510	2.03008	2.03008
AC612	0.12759	0.12759
FL	0.	0.
AC610	0.12759	0.12759
AN121	37.92114	37.92114
FL	0.	0.
AN120	37.92114	37.92114
AN131	2.59910	2.59910
FL	0.	0.
AN130	2.59910	2.59910
AN211	39.04779	39.04779
FL	0.	0.
AN210	39.04779	39.04779
TOTAL	205.23391	205.23391

Figure 18. Sample manpower report

MTR FCR ALL SUBSYSTEMS										
SUBSYS	AGE F/L	TS F/L	R+R	VR+R	CND A/C	M A/C	VM A/C	SHOP	TOT/OUT	
AC310	0.2000	0.4400	0.7919	0.0528	0.2400	0.9152	0.0352	0.9583	3.6333	
AC320	0.2000	0.1740	1.0599	0.3785	0.1040	0.1244	0.0566	3.5306	5.6181	
AC330	0.2000	0.9200	0.2790	0.1395	0.0700	0.3906	0.3255	0.6598	2.9944	
AN110	0.2000	0.8600	0.9420	0.5652	0.2240	0.3248	0.2088	0.5024	3.8272	
AN120	0.2000	0.4800	0.8256	0.4128	0.0720	0.1075	0.0269	2.5153	4.6401	
AN130	0.2000	0.1840	0.6624	0.2650	0.2160	0.2576	0.0515	0.6892	2.9257	
TOTAL	1.2000	3.0680	4.5608	1.8138	0.9260	2.1201	0.7045	8.0555	23.2487	

Figure 19. Sample option 13 report (part 1)

MMH FCR ALL SUBSYSTEMS										
SUBSYS	AGE F/L	TS F/L	R+R	VR+R	CND A/C	M A/C	VM A/C	SHOP	TOT/OUT	
AC310	0.4000	0.4400	0.7919	0.1056	0.2400	0.9152	0.0704	1.4936	4.4565	
AC320	0.4001	0.1740	1.0599	0.3785	0.2080	0.1244	0.1131	6.9261	9.3842	
AC330	0.4000	0.9300	0.2790	0.2790	0.1400	0.7812	0.6510	1.0635	4.9237	
AN110	0.4000	0.8600	0.9420	0.5652	0.4480	0.6496	0.2088	0.5024	4.9760	
AN120	0.4000	0.4800	0.8256	0.4128	0.1440	0.2150	0.0269	4.9005	7.4048	
AN130	0.4000	0.1840	0.6624	0.5299	0.4320	0.5152	0.1030	1.2945	4.1211	
TOTAL	2.4000	3.0680	4.5608	2.2711	1.6120	3.2007	1.1732	16.1806	34.4663	

Figure 20. Sample option 13 report (part 2)

MTTR BY TASK PER LRU

SUBSYSTEM- AC320 (63A00) UHF RADIO SET MFHBMA= 62.9

AGE F/L	TS F/L	R+R	VR+R	CND A/C	M A/C	VM A/C	SHOP	TOT/OUT
LRU- AC321 (63A00) RECEIVER/TRANSMITTER (UHF)								
W	0.13580	0.13580	0.95060	0.33950			3.39500	4.95670
K	0.00590	0.00590	0.04130	0.01475			0.04130	0.10915
N	0.00590	0.00590	0.04130	0.01475			0.03835	0.10620
SUB	0.14760	0.14760	1.03320	0.36900			3.47465	5.17205
LRU- AC322 (63A00) DIPLEXER								
W	0.00158	0.00158	0.01106	0.00395			0.00632	0.02449
K	0.00018	0.00018	0.00126	0.00045			0.00090	0.00297
SUB	0.00176	0.00176	0.01232	0.00440			0.00722	0.02746
LRU- AC323 (63A00) STANDING WAVE RATIO INDICATOR								
W	0.00104	0.00104	0.00728	0.00260			0.03068	0.04264
K	0.00104	0.00104	0.00728	0.00260			0.00364	0.01560
SUB	0.00208	0.00208	0.01456	0.00520			0.03432	0.05824
CND	0.02600				0.10400			0.13000
M	0.02262				0.12441	0.05655		0.22620
TOT/TSK	0.20006	0.17406	1.06008	0.37860	0.10400	0.05655	3.51619	5.61395

Figure 21. Sample option 01 report

MTTR AS % OF TOTAL

SUBSYSTEM- AC320 (63A00) UHF RADIO SET MFHBMA= 62.9

AGE F/L	TS F/L	R+R	VR+R	CND A/C	M A/C	VM A/C	SHOP	TOT/OUT
LRU- AC321 (63A00) RECEIVER/TRANSMITTER (UHF)								
W	2.419	2.419	16.933	6.047			60.474	88.293
K	0.105	0.105	0.736	0.263			0.736	1.944
N	0.105	0.105	0.736	0.263			0.683	1.892

SUB	2.629	2.629	18.404	6.573			61.893	92.129

LRU- AC322 (63AE0) DIPLEXER								
W	0.028	0.028	0.197	0.070			0.113	0.436
K	0.	0.	0.	0.			0.	0.
N	0.003	0.003	0.022	0.008			0.016	0.053

SUB	0.031	0.031	0.219	0.078			0.129	0.489

LRU- AC323 (63AL0) STANDING WAVE RATIO INDICATOR								
W	0.019	0.019	0.130	0.046			0.546	0.760
K	0.	0.	0.	0.			0.	0.
N	0.019	0.019	0.130	0.046			0.065	0.278

SUB	0.037	0.037	0.259	0.093			0.611	1.037

CND	0.463		1.853					2.316
M	0.403	0.403			2.216	1.007		4.029

TOT/TSK	3.564	3.100	18.883	6.744	1.853	2.216	1.007	62.633 100.000

Figure 22. Sample option 02 report

MMH BY TASK PER LRU										MFHBM= 62.9	
SUBSYSTEM- AC320		(63A00)		UHF RADIO SET							
AGE	F/L	TS	F/L	R+R	VR+R	CND	A/C	M	A/C	VM	A/C
RECEIVER/TRANSMITTER (UHF)										SHOP	
LRU- AC321 (63A00)										TOT/OUT	
W	0.27160	0.13580	0.95060	0.33950						6.79000	8.48750
K	0.01180	0.00590	0.04130	0.01475						0.04130	0.11505
N	0.01180	0.00590	0.04130	0.01475						0.03835	0.11210
SUB	0.29520	0.14760	1.03320	0.36900						6.86965	8.71465
LRU- AC322 (63A00)										DIPLEXER	
W	0.00316	0.00158	0.01106	0.00395						0.00632	0.02607
K	0.	0.	0.	0.						0.	0.
N	0.00036	0.00018	0.00126	0.00045						0.00090	0.00315
SUB	0.00352	0.00176	0.01232	0.00440						0.00722	0.02922
LRU- AC323 (63A00)										STANDING WAVE RATIO INDICATOR	
W	0.00208	0.00104	0.00728	0.00260						0.03068	0.04368
K	0.	0.	0.	0.						0.	0.
N	0.00208	0.00104	0.00728	0.00260						0.00364	0.01664
SUB	0.00416	0.00208	0.01456	0.00520						0.03432	0.06032
CND	0.05200					0.20800					0.26000
M	0.04524	0.02262					0.24882		0.05655		0.37323
TOT/TSK	0.40012	0.17406	1.06008	0.37860	0.20800	0.24882	0.05655			6.91119	9.43742

Figure 23. Sample option 03 report

MMH AS % OF TOTAL										MFHBMA= 62.9							
SUBSYSTEM- AC320				(63A00)		UHF RADIO SET											
AGE F/L		TS F/L		R+R		VR+R		CND A/C		M A/C		VM A/C		SHOP		TOT/OUT	
-----		-----		---		---		-----		---		---		---		-----	
LRU- AC321				(63A00)		RECEIVER/TRANSMITTER (UHF)											
W		2.878		1.439		10.073		3.597						71.948		89.935	
K		0.125		0.063		0.438		0.156						0.438		1.219	
N		0.125		0.063		0.438		0.156						0.406		1.188	
SUB		3.128		1.564		10.948		3.910						72.792		92.341	
LRU- AC322				(63A00)		DIPLEXER											
W		0.033		0.017		0.117		0.042						0.067		0.276	
K		0.		0.		0.		0.						0.		0.	
N		0.004		0.002		0.013		0.005						0.010		0.033	
SUB		0.037		0.019		0.131		0.047						0.077		0.310	
LRU- AC323				(63A00)		STANDING WAVE RATIO INDICATOR											
W		0.022		0.011		0.077		0.028						0.325		0.463	
K		0.		0.		0.		0.						0.		0.	
N		0.022		0.011		0.077		0.028						0.039		0.176	
SUB		0.044		0.022		0.154		0.055						0.364		0.639	
CND				0.551				2.204								2.755	
M				0.479		0.240				2.637		0.599				3.955	
TOT/TSK				4.240		1.844		11.233		4.012		2.204		0.599		73.232 100.000	

Figure 24. Sample option 04 report

MMH PER 1000 FH									
SUBSYSTEM- AC320 (63A00)					UHF RADIO SET				
AGE F/L	TS F/L	R+R	VR+R	CND A/C	M A/C	VM A/C	SHOP	TOT/OUT	
MFHBMA= 62.9									
LRU- AC321 (63A00) RECEIVER/TRANSMITTER (UHF)									
W	4.318	2.159	15.113	5.397			107.949	134.936	
K	0.188	0.094	0.657	0.234			0.657	1.829	
N	0.188	0.094	0.657	0.234			0.610	1.782	
SUB	4.693	2.347	16.426	5.866			109.215	138.548	
LRU- AC322 (63A00) DIPLEXER									
W	0.050	0.025	0.176	0.063			0.100	0.414	
K	0.	0.	0.	0.			0.	0.	
N	0.006	0.003	0.020	0.007			0.014	0.050	
SUB	0.056	0.028	0.196	0.070			0.115	0.465	
LRU- AC323 (63A00) STANDING WAVE RATIO INDICATOR									
W	0.033	0.017	0.116	0.041			0.488	0.694	
K	0.	0.	0.	0.			0.	0.	
N	0.033	0.017	0.116	0.041			0.058	0.265	
SUB	0.066	0.033	0.231	0.083			0.546	0.959	
CND									
M	0.719	0.360	3.307	3.956	0.899		4.134	5.934	
TOT/TSK	6.361	2.767	16.853	6.019	3.307	3.956	109.876	150.038	

Figure 25. Sample option 05 report

MAINT. INDEX X 1000										MFHBMA= 62.9	
SUBSYSTEM- AC320			(63A00)		UHF RADIO SET						
AGE F/L	TS F/L	R+R	VR+R	CND A/C	M A/C	VM A/C	SHOP	TOT/OUT			
LRU- AC321 (63A00) RECEIVER/TRANSMITTER (UHF)											
W	2.1590	2.1590	15.1129	5.3975			53.9746	78.8029			
K	0.0938	0.0938	0.6566	0.2345			0.6566	1.7353			
N	0.0938	0.0938	0.6566	0.2345			0.6097	1.6884			
SUB	2.3466	2.3466	16.4261	5.8665			55.2409	82.2265			
LRU- AC322 (63A00) DIPLEXER											
W	0.0251	0.0251	0.1758	0.0628			0.1005	0.3893			
K	0.	0.	0.	0.			0.	0.			
N	0.0029	0.0029	0.0200	0.0072			0.0143	0.0472			
SUB	0.0280	0.0280	0.1959	0.0700			0.1148	0.4366			
LRU- AC323 (63A00) STANDING WAVE RATIO INDICATOR											
W	0.0165	0.0165	0.1157	0.0413			0.4878	0.6779			
K	0.	0.	0.	0.			0.	0.			
N	0.0165	0.0165	0.1157	0.0413			0.0579	0.2480			
SUB	0.0331	0.0331	0.2315	0.0827			0.5456	0.9259			
CND											
M	0.4134				1.6534				2.0668		
	0.3596	0.3596				1.9779	0.8990		3.5962		
TOT/TSK											
	3.1806	2.7672	16.8534	6.0191	1.6534	1.9779	0.8990	55.9013	89.2520		

Figure 26. Sample option 06 report

MTRR OVER SUBSYSTEMS AC3

AGE F/L	TS F/L	R+R	VR+R	CND A/C	M A/C	VM A/C	SHOP	TOT/OUT
-----	-----	---	---	-----	-----	-----	---	-----
0.6001	1.5441	2.1311	0.5709	0.4140	1.4302	0.4173	5.1344	12.2419
TOT/TSK								

Figure 27. Sample option 07 report

MTRR % OF TOTAL PER AC3

AGE F/L	TS F/L	R+R	VR+R	CND A/C	M A/C	VM A/C	SHOP	TOT/OUT
-----	-----	---	---	-----	-----	-----	---	-----
4.902	12.613	17.408	4.663	3.382	11.683	3.408	41.941	100.000
TOT/TSK								

Figure 28. Sample option 08 report

MMH OVER SUBSYSTEMS AC3														
	AGE	F/L	TS	F/L	R+R	VR+R	CND	A/C	M	A/C	VM	A/C	SHOP	TOT/OUT
	----	----	----	----	----	----	----	----	----	----	----	----	----	----
TOT/TSK	1.2001	1.5441	2.1311	0.7632	0.5880	1.9452	0.7780	9.4684	18.4180					

Figure 29. Sample option 09 report

MMH % OF TOTAL PER AC3														
	AGE	F/L	TS	F/L	R+R	VR+R	CND	A/C	M	A/C	VM	A/C	SHOP	TOT/OUT
	----	----	----	----	----	----	----	----	----	----	----	----	----	----
TOT/TSK	6.516	8.383	11.571	4.144	3.193	10.562	4.224	51.408	100.000					

Figure 30. Sample option 10 report

MMH PER 1000 FH PER AC3														
	AGE	F/L	TS	F/L	R+R	VR+R	CND	A/C	M	A/C	VM	A/C	SHOP	TOT/OUT
	----	----	----	----	----	----	----	----	----	----	----	----	----	----
TOT/TSK	0.07183	0.09242	0.12755	0.04568	0.03519	0.11643	0.04656	0.56671	1.10237					

Figure 31. Sample option 11 report

MAINT IND X 1000 PER AC3														
	AGE	F/L	TS	F/L	R+R	VR+R	CND	A/C	M	A/C	VM	A/C	SHOP	TOT/OUT
	----	----	----	----	----	----	----	----	----	----	----	----	----	----
TOT/TSK	0.03592	0.09242	0.12755	0.03417	0.02478	0.08560	0.02497	0.30731	0.73272					

Figure 32. Sample option 12 report

Appendix A. DESCRIPTION OF INPUT DATA ELEMENTS

Appendix A. DESCRIPTION OF INPUT DATA ELEMENTS

KEY FIELDS - Columns 1-11 are used as the key fields, and therefore, the format is common to all the card types.

Columns Identifier - Definition

- 1-2 Card Type - (1) indicates the type of data to be found on the record, and (2) indicates whether they reflect flight line, shop, or reference data
- CR - cross reference
LF - AFSC with skill level - F/L
LS - AFSC with skill level - shop
MF - reliability mean values - F/L
PF - P probability - F/L
PS - P probability - shop
SF - support equipment - F/L
SS - support equipment - shop
TF - task time - F/L
TS - task time - shop
- 4-10 Equipment Identification (ID) Number - defines the equipment in a series of codes showing as follows: (4) type of weapon system; (5) major system within the weapon system; (6) functional grouping of the major system; and (7-10) a numerical breakdown by operational function (e.g., radar navigation, radio navigation, or bombing navigation), subsystem, line replaceable unit, and shop replaceable unit. These codes are determined by the user since they are configuration dependent. The codes used in the DAIS data banks are listed in Appendix A to volume one of this report. Example of data card encoding format used in DAIS R&M model for equipment specifications:
- Column 4 - weapon system
 none assigned in DAIS data banks
- Column 5 - major system
 A - avionics
- Column 6 - functional group
 A - air-ground-attack
 C - communications
 I - instruments
 M - miscellaneous
 N - navigation
 Z - core

Columns Identifier - Definition

Column 7 - operational function
 Column 8 - subsystem
 Column 9 - line replaceable unit
 Column 10 - shop replaceable unit
 none assigned in DAIS data banks

11-12 Card Sequence - the sequential number of each record for a particular subsystem or line replaceable unit within a particular card type.

FLIGHT LINE TASKS - Common to LF, PF, SF, and TF card types.

<u>Columns</u>	(Task <u>Code</u>)	<u>Task Name</u> - Definition
1-12		See key fields
14-18	(A)	<u>Set up the support equipment and maintenance stands</u> - that will be used by the technician to provide the power and the accessibility necessary to troubleshoot and repair the equipment that has failed.
20-24	(T)	<u>Troubleshoot</u> - the reported discrepancy to isolate the cause and to determine whether the repair action is to be a remove and replace or the repair can be accomplished on the aircraft.
26-30	(C)	<u>Cannot Duplicate</u> - a troubleshooting action that cannot duplicate (CND) the reported discrepancy.
32-36	(R)	<u>Remove & Replace</u> - once the discrepancy has been isolated to a particular LRU and a determination has been made that the repair is to be made in the shop, the faulty unit is removed and replaced by a spare.
38-42	(M)	<u>On A/C Maintenance</u> - if the discrepancy is minor and does not need shop repair, the equipment is maintained on the aircraft (A/C). This includes, as examples, adjustments, replacement of bulbs, knobs, fuses, and aircraft wiring problems.

<u>Columns</u>	(Task <u>Code</u>)	<u>Task Name - Definition</u>
44-48	(V _R)	<u>R&R Verification</u> - after the removal and replacement of the faulty LRU is completed, a functional check is performed to verify the operational condition of the subsystem.
50-54	(V _M)	<u>On A/C Maintenance Verification</u> - upon completion of any on aircraft maintenance, a functional check is performed to verify the repair and operational condition of the subsystem.

SHOP TASKS - Common to LS, SS, PS, and TS card types.

1-12		See key fields
20-24	(W)	<u>Bench Check & Repair</u> - in-shop bench check and complete repair of a bad LRU, including cleaning, inspection, disassembly, adjustment, part replacement, reassembly, and lubrication of the complete LRU and any minor components.
26-30	(K)	<u>Bench Check & CND</u> - in-shop bench check is performed, any discrepancy cannot be duplicated in the testing, the LRU is serviceable, and no repair is required.
32-36	(N)	<u>Bench Check & NRTS</u> - in-shop bench check or inspection shows that the LRU is not repairable this station (NRTS) because the shop is not authorized to accomplish the repair or the shop lacks the proper tools, equipment, facilities, technical skills, spare parts, time, or technical data to perform repair.
50-54	(TD)	<u>Test Drawer Repair</u> - in-shop repair of the test station drawer (or combination of test equipment) that is needed to test the LRU being checked.
56-60	(TS)	<u>Test Station Repair</u> - in-shop repair of the entire test station that is needed to test the LRU being checked.

CROSS REFERENCE FILE - Card #1

<u>Columns</u>	<u>Identifier - Definition</u>
1-9	See key field
11-12	Card sequence always - 1
14-18	<u>Weight</u> - in pounds of the LRU.
20-24	<u>(WUC) work unit code</u> used to identify each subsystem and LRU in the aircraft system (found on cards #1 and 2).
26-27	<u>(QPA) the quantity per aircraft of a particular subsystem or LRU in the aircraft system</u> (found on cards #1 and 2).
29-67	<u>Equipment name or description of the operational function assigned to a subsystem or LRU.</u>
75-76	<u>The number of LRUs in the subsystem for which input data has been provided, and the number of SRUs per LRU on LRU input cards. Input data are provided for those LRUs requiring a significant amount of unscheduled maintenance.</u>

CROSS REFERENCE FILE - Card #2

1-9	See key field
11-12	Card sequence always - 2
20-24	<u>(WUC) - work unit code</u> used to identify each subsystem and LRU in the aircraft system
26-48	<u>(NSN) - national stock number</u> assigned to the LRU
50-59	<u>AN/nomenclature of the particular subsystem or LRU</u> described on card #1
65-80	<u>Manufacturer's Stock Number</u> - when available

RELIABILITY MEAN VALUES - Flight Line

1-12	See key field
14-19	<u>Mean flight hours between maintenance actions - (MFHBMA_j)</u> shows the frequency of unscheduled maintenance activities required by a subsystem (j).

<u>Columns</u>	<u>Identifier - Definition</u>
21-26	<u>H factor</u> - is the ratio of the number of LRUs tested in the shop to the number of flight line removal actions; only the value greater than unity of the ratio is input whereby the model automatically adds the integer "1" to the given value. The resultant portion that is greater than one accounts for any multiple LRU removals resulting from single flight line repair actions (i. e., two or more LRUs removed for one reported aircraft maintenance action). This factor is used as a multiplier of the shop probability of occurrences to obtain the actual number of shop maintenance actions emanating from flight line removal(s).

Appendix B. ERROR MESSAGES

Appendix B. ERROR MESSAGES

The following is a list of input error messages which are printed by the R&M model. The messages are described and the attributable cause or causes are listed.

_____ Invalid Option

The user has selected an option outside the range of 1 to 13. The option number might not be punched properly in column 9 and 10.

Current Max Subsystems at 40

User has exceeded the program's present capacity for subsystem data input. The first card in front of the base data files contains the number of subsystems to be described. The maximum allowed is 40. The number punched in columns 1 and 2 does not fall within this range.

Preceding Subsystem Card Sequence Error

The subsystem listed just prior to this message has an error in the card sequence number, or the card type identification is invalid. The sequence number should be one in column 12 and the card type should be CR in columns 1 and 2.

_____ Card where _____ Card Belongs

This message appears whenever the program reads a card other than the type it expected to read. It specifies in the blanks the two card types involved. Either a card(s) is misplaced in the base data files, or one or more errors were made in punching the identification type(s), or when a card is missing.

Card Sequence Error

Some card types may allow for more than one card per equipment. In these cases, the second card must have a '2' punched in the "card sequence" field in column 12. In all cases, the first or only card for an equipment must have a '1' in this field. This error indicates a card sequencing problem that could be caused by an omission of a card 1, a mispunch in columns 1-11, or a card out of sequence.

Subsystem Equip ID Invalid

The CR cards designate the subsystem identification which consists of seven characters (columns 4-10) describing the equipment. All other card types refer to the identification as first listed in the CR card. This message declares that the subsystem identification on the card last printed did not match any which were previously entered on CR cards.

Current Max SEs Set at _____

Though the model is designed to accept several support equipments for each task, currently the maximum is set at three for the SF cards and at two for the SS cards. The user must discard the remaining support equipments for this task or the computer program must be modified to accept a higher limit.

Current Max AFSCs Set at _____

Though the model is designed to accept several AFSCs for each task, currently the maximum is set at five. The user must discard the remaining AFSCs for this task or modify the computer program to accept a higher limit.

Invalid Equipment ID

For the subsystems (equipment) with more than one card for any card type, the equipment ID on successive cards within that set must match that of the first. This message points out a violation on the preceding card.

LRU Equipment ID Invalid

Each LRU is identified by a unique seven-character designation which must be initially inputted to the program on a CR card. Any other input card type pertaining to that LRU must contain this same identification. This message indicates that either: (1) the last printed LRU card contained an identification for which the program has no previous CR card record; or (2) a mismatch exists.

Appendix C. ACRONYMS

Appendix C - ACRONYMS

A	inherent availability
AC	avionics communication subsystems
A/C	aircraft
AFSC	Air Force specialty code
AN	avionics navigation subsystems
CDC	Control Data Corporation
CND	cannot duplicate the discrepancy
CR	cross reference file
DAIS	digital avionics information system
FH	flight hours
F/L	flight line
FOM	figure of merit
ID	identification number of a subsystem on an LRU
KFH	1000 flight hours
LCC	life cycle cost
LCCIM	life cycle cost impact model
LF	manpower specialty - flight line file
LRU	line replaceable unit
LS	manpower specialty - shop file
MF	reliability mean values - flight line file
MFHBMA	mean flight hours between maintenance actions
MMH	maintenance man hours
MTTR	mean time to repair
NRTS	not repairable this station
NSN	national stock number
PF	P probability - flight line file
PMA	probability of a maintenance action
PS	P probability - shop file
QPA	quantity per aircraft
R&M	reliability and maintainability
R&R	remove and replace maintenance action
RTOK	retest okay
SE	support equipment
SF	support equipment - flight line file
SRU	shop replaceable unit
SS	support equipment - shop file
TF	task time - flight line file
TS	task time - shop file
WUC	work unit code

Appendix D

DAIS RELIABILITY AND MAINTAINABILITY MODEL

(File Name RANDM)

Listing of Control Data Corporation CDC-6600, Cyber 74 Version

```

1      PROGRAM RM2(INPUT,TAPE5=INPUT,OUTPUT,TAPE6=OUTPUT,
      * TAPE4,TAPE8)
      C
      C MAIN ROUTINE OF THE R&M MODEL.
      C
      C
      C DIMENSION TITLE(5,13),WANT(100),ROW(13),T(4),NUM(4)
      C DIMENSION ARRAY(6),RATE(50),ARATE(6),AF(50),JSFLAG(7)
      C DIMENSION SC(9),TOT(21)
      C FOLLOWING IS DATA ASSOCIATED WITH SUBSYSTEMS. TO ALLOW FOR MORE, CHANGE
      C EACH 40 IN THE RIGHT SUBSCRIPT OF THE FOLLOWING SUBSYSTEM ATTRIBUTES
      C TO THE DESIRED MAXIMUM. TO ALLOW FOR MORE AFSC'S PER SUBSYSTEM
      C TASK, CHANGE EACH 3 IN THE LEFTMOST SUBSCRIPT TO THE DESIRED NUMBER.
      C ALSO CHANGE THESE COMMENTS TO REFLECT THE NEW VALUES.
      C
      C DIMENSION NUML(40),KLRLU(40),TSFL(7,40),PSM(7,40),HFAC(-3),
      * NSAFSC(7,40),FHBMA(40),JNAC(40),NSFSE(7,40),AVAIL(40)
      C DIMENSION SWUC(40),SFSE(2,7,40),SFAFSC(5,7,40)
      C DIMENSION SNAME(5,40)
      C DIMENSION SEQID(40)
      C COMMON/SUBS/SNAME,TSFL,PSM,SWUC,SFSE,
      * SFAFSC,NSAFSC,NSFSE,FHBMA,JNAC,HFAC
      C
      C FOLLOWING IS DATA ASSOCIATED WITH LRU'S. IN A MANNER SIMILAR
      C TO THE ABOVE FOR SUBSYSTEMS, TO ALLOW FOR MORE, CHANGE EACH 120 TO THE
      C DESIRED NUMBER. TO ALLOW FOR MORE AFSC'S PER TASK, CHANGE EACH 3
      C IN THE LEFTMOST SUBSCRIPT TO THE DESIRED NUMBER. CHANGE BOTH THE 20
      C AND THE 3 IN THESE COMMENTS.
      C
      C DIMENSION LDRW(120),LNAC(120),TLSHOP(5,120),NLAFSC(5,120)
      C DIMENSION PLRR(5,120),NLSE(5,120)
      C REAL LSAFSC,LSE
      C DIMENSION LWUC(120),LSAFSC(5,5,120),LSE(2,5,120)
      C DIMENSION LNAME(5,120)
      C REAL LEQID
      C DIMENSION LEQID(120)

```



```

COMMON/LRUS/LNAME,TLSHOP,PLRR,LWUC,LSAFSC,
* LSE,NLAFSC,NLSE,LDRAW,LNAC
C
COMMON/SIZES/NSUB,NLRU,KLRU,NUML
COMMON/EQIDS/SEQID,LEQID
C
DIMENSION LABEL(8)
COMMON/LABL/LABEL
C
C IN THE FOLLOWING STATEMENTS, CHANGE THE 40 TO THE MAXIMUM S.BSYSTEMS,
C THE 120 TO MAXIMUM LRUS IN THE 1ST AND 2ND CARD RESPECTIVELY (AND IN
C THESE COMMENTS). CHANGE THE 7440 TO THE SUM OF THE PRODUCTS OF THE NEW
C DIMENSIONS.
C
DIMENSION TTR(21,40),EMMH(21,40)
DIMENSION TTRL(6,4,120),EMMHL(6,4,120)
DATA TTR,EMMH,TTRL,EMMHL/7440*0.0/
DATA BLANK,ALLMP/5H,5HALLMP/
DATA NBASIC/2/
C
C
C
DATA TITLE/4HMTTR,4H BY,4HTASK,4H PER,4H LRU,
* 4HMTTR,4H AS,4H% OF,4H TOT,4HAL,
* 4HMMH,4HBY T,4HASK,4HPER,4HLRU,
* 4HMMH,4HAS %,4H OF,4HTOTA,4HL,
* 4HMMH,4HPER,4H1000,4H FH,4H,
* 4HMAIN,4HT, I,4HNDEX,4H X 1,4H000,
* 4HMTTR,4H OVE,4HR SU,4HBSYS,4HTEMS,
* 4HMTTR,4H % O,4HF TO,4HTAL,4HPER,
* 4HMMH,4HOWER,4H SUB,4HSYST,4HEMS,
* 4HMMH,4H% OF,4H TOT,4HAL P,4HER,
* 4HMMH,4HPER,4H1000,4H FH,4HPER,
* 4HMAIN,4HT IN,4HD X,4H1000,4H PER,

```

```

70      * 4HMMH ,4HREQU,4HIRIN,4HG MP,4HSC- /
      C READ IN AFSC AND SE OUTPUTS DESIRED.
      READ(5,1) NWANT
75      1 FORMAT(I3)
      IF (NWANT.EQ.0) GO TO 9
      I=0
      2 READ(5,3) ROW
      3 FORMAT(13(A5,1X))
      J=0
80      4 J=J+1
      IF (J.GT.13) GO TO 2
      IF (ROW(J).EQ.BLANK) GO TO 4
      I=I+1
      WANT(I)=ROW(J)
      IF (I.LT.NWANT) GO TO 4
85      C FIRST READ IN THE BASE FILE DATA.
      9 CALL READ
      C
90      C NEXT CALCULATE THE MTRR FOR THE SHOP ACTIVITIES (BACK THRU FLIGHTLINE)
      C FOR EACH LRU.
      C FIRST SET SUBSYSTEM FLIGHTLINE TASK TIMES AND # OF AFSCS.
      DO 50 JSUB=1,NSUB
      T(1)=TSFL(1,JSUB)
95      T(2)=TSFL(2,JSUB)
      T(3)=TSFL(4,JSUB)
      T(4)=TSFL(6,JSUB)
      NUM(1) = NSAFSC(1,JSUB)
      NUM(2) = NSAFSC(2,JSUB)
      NUM(3) = NSAFSC(4,JSUB)
      NUM(4) = NSAFSC(6,JSUB)
100     C NOW FILL IN THE SPECIAL FLIGHTLINE ARRAY.

```

```

105      TTR(7,JSUB)=PSM(3,JSUB) * TSFL(1,JSUB)
      TTR(10,JSUB)=PSM(3,JSUB) * TSFL(3,JSUB)
      P=PSM(5,JSUB)
      TTR(8,JSUB)=P*TSFL(1,JSUB)
      TTR(9,JSUB)=P*TSFL(2,JSUB)
      TTR(11,JSUB)=P*TSFL(5,JSUB)
      TTR(12,JSUB)=P*TSFL(7,JSUB)
110
      C
      C FILL IN MMH TABLE BASED ON # AFSCS REQUIRED.
      EMMH(7,JSUB) = TTR(7,JSUB) * NSAFSC(1,JSUB)
      EMMH(10,JSUB) = TTR(10,JSUB) * NSAFSC(3,JSUB)
      EMMH(8,JSUB) = TTR(8,JSUB) * NSAFSC(1,JSUB)
      EMMH(9,JSUB) = TTR(9,JSUB) * NSAFSC(2,JSUB)
      EMMH(11,JSUB) = TTR(11,JSUB) * NSAFSC(5,JSUB)
      EMMH(12,JSUB) = TTR(12,JSUB) * NSAFSC(7,JSUB)
115
      C
      C NOW FIND THE STARTING LRU FOR THIS SUBSYSTEM AND THE NUMBER OF LRUS.
      JLRU=KLRLU(JSUB)
      NR=NUML(JSUB)
120
      C
      C NOW FOR EACH LRU IN THIS SUBSYSTEM, LOOP THROUGH
      DO 40 K=1,NR
125
      C
      C NOW LOOP THROUGH EACH SHOP TASK, PICKING OUT THE LRU PROBABILITY.
      DO 30 M=1,3
      P=PLRR(M,JLRU)
130
      C
      C NOW FOR EACH FLIGHTLINE TASK, COMPUTE THE MTTR AND MMH.
      DO 20 N=1,4
      TTRL(N,M,JLRU) = T(N) * P
      EMMH(N,M,JLRU) = TTRL(N,M,JLRU) * NUM(N)
135
      20 CONTINUE
      C COMPUTE MTTR FOR SHOP TASK.
      TTRL(5,M,JLRU) = TLRSHOP(M,JLRU) * P * HFAC(JSUB)

```

```

140      EMMHL(5,M,JLRU) = TTRL(5,M,JLRU) * NLAFC(M,JLRU)
      30  CONTINUE
      C  NOW PREPARE FOR NEXT LRU IN THIS SUBSYSTEM.
      40  JLRU=JLRU+1
      C
      50  CONTINUE
      C
      C
      C
      C
      C
      C  NOW TOTAL UP THE VARIOUS COLUMNS
      CALL ADDUP (TTR(1,1),TTRL(1,1,1))
      CALL ADDUP (EMMH(1,1),EMMHL(1,1,1))
      C
      C  NOW READ IN THE AFSC'S OF INTEREST.  MAX=50
      C
      60  READ(4,60) NAF
      60  FORMAT(I3)
      I=0
      IF (NAF.EQ.0) GO TO 154
      IF (NAF.LT.51) GO TO 62
      WRITE(6,61) NAF
      61  FORMAT (1X14,37H AFSC"S IS MORE THAN CURRENT LIMIT OF,13)
      STOP
      62  READ(4,63) (ARRAY(K),ARATE(K),K=1,6)
      WRITE(6,64) (ARRAY(K),ARATE(K),K=1,6)
      63  FORMAT(6(A5,F6.2,1X))
      64  FORMAT(1X6(A5,F6.2,1X))
      C
      J=0
      65  J=J+1
      IF(J.GT.6) GO TO 62

```



```

175 IF (ARRAY(J).EQ.BLANK) GO TO 65
    I=I+1
    AF(I)=ARRAY(J)
    RATE(I)=ARATE(J)
    IF (RATE(I).EQ.0.0) RATE(I)=1.0
    IF (I.LT.NAF) GO TO 65

180 C NOW READ AND PRINT SUPPORT EQUIPMENT RESULTS
    CALL SEDUMP(TTRL,TTR,NWANT,WANT)

185 C LOOP THROUGH EACH AFSC OF INTEREST COPYING MTTR ARRAY FOR TASKS FOR
    C WHICH THIS AFSC IS REQUIRED.
    DO 152 N=1,NAF
        AFSC=AF(N)
        RAT=RATE(N)
        TOTM=0.0
        TOTC=0.0
        LPR=0
        DO 66 LL=1,NWANT
            IF (WANT(LL).EQ.AFSC.OR.WANT(LL).EQ.ALLMP) GO TO 67
            GO TO 691
        LPR=1
        67 WRITE(6,68) AFSC,RAT,LABEL
        68 * FORMAT(6HIMPSC-,A5,2XIH$,F5.2,10X8A10/6X5H-----//,
            14X20HMMH/KFH COST/KFH/14X7H-----,5X8H-----//
        69 FORMAT(1XA5)

200 C LOOP THROUGH SUBSYSTEMS.
    DO 150 JSUB=1,NSUB
        TOTSM=0.0
        TOTSC=0.0
        JLRU=KLRL(JSUB)
        NR=NUML(JSUB)
205

```

```

FAC=1000./FHBMA(JSUB)
C SET UP 7 FLAGS DETERMINING WHICH OF THE 7 FLIGHTLINE TASKS
C FOR THIS SUBSYSTEM REQUIRE THIS AFSC.
DO 80 JJ=1,7
JSFLAG(JJ)=0
C
C CHECK FOR MATCH ACROSS ALL AFSCS REQUIRED FOR THIS TASK.
NJJS=NSAFSC(JJ,JSUB)
DO 70 KK=1,NJJS
IF (AFSC.NE.SFAFSC(KK,JJ,JSUB)) GO TO 70
JSFLAG(JJ)=JSFLAG(JJ)+1
70 CONTINUE
80 CONTINUE
C
C SUBSYSTEM FLAGS ARE NOW SET UP. COPY MTTR WHERE APPLICABLE.
SC(1)=TTR(7,JSUB)*JSFLAG(1)
SC(1)=SC(1)+TTR(8,JSUB)*JSFLAG(1)
SC(2)=TTR(9,JSUB)*JSFLAG(2)
SC(5)=TTR(10,JSUB)*JSFLAG(3)
SC(6)=TTR(11,JSUB)*JSFLAG(5)
SC(7)=TTR(12,JSUB)*JSFLAG(7)
SC(3)=0.0
SC(4)=0.0
SC(8)=0.0
SC(9)=0.0
C
C LOOP THROUGH LRUS
DO 130 K=1,NR
SCL=0.0
DO 110 M=1,3
C SEE IF EITHER THE W,K, OR N TASKS NEED THIS AFSC. IF SO, COF:

```

```

240      C THE MTR ENTRY.
      NLMJ=NLAFC(M,JLRU)
      DO 100 KK=1,NLMJ
      IF (AFSC.NE.LSAFSC(KK,M,JLRU)) GO TO 100
      SCL=SCL+ITRL(5,M,JLRU)
      SC(8) = ITRL(5,M,JLRU) + SC(8)
      100 CONTINUE
      C
      C NOW FOR THE FOUR FLIGHTLINE PORTIONS.
      SC(1)=SC(1)+ITRL(1,M,JLRU) * JSFLAG(1)
      SC(2)=SC(2)+ITRL(2,M,JLRU) * JSFLAG(2)
      SC(3)=SC(3)+ITRL(3,M,JLRU) * JSFLAG(4)
      SC(4)=SC(4)+ITRL(4,M,JLRU) * JSFLAG(6)
      110 SCL=SCL*FAC
      SCC=SCL*RAT
      TOTSM=TOTSM+SCL
      TOTSC=TOTSC+SCC
      IF (SCL.GT.0.0.AND.LPR.EQ.1) WRITE(6,120) LEQID(JLRU),SCL,SCC
      120 FORMAT(1XA7,2F13.5)
      130 JLRU=JLRU+1
      DO 145 J=1,8
      SC(J)=SC(J)*FAC
      145 SC(9)=SC(9)+SC(J)
      C
      IF (SC(9).EQ.0.0) GO TO 150
      SCC=SC(9)*RAT
      TOTSM=SC(9)-TOTSM
      TOTSC=SCC-TOTSC
      IF(LPR.EQ.1)WRITE(6,149) TOTSM,TOTSC,SEQID(JSUB),SC(9),SCC
      149 FORMAT(4X2HFL,2X2F13.5/8X2(6X7H-----)/1XA7,2F13.5//)
      TOTM=TOTM+SC(9)
      TOTC=TOTC+SCC
      150 CONTINUE
      151 FORMAT(1XF10.4)

```

```

275 C NOW PRINT AFSC TOTALS
152 IF (LPR.EQ.1) WRITE(6,153) TOTM,TOTC
153 FORMAT(8X2(6X7H-----)/1X5HTOTAL,2X2F13.5)

280 C CALCULATE AND PRINT AVAILABILITIES
154 DO 155 JSUB=1, NSUB
155 AVAIL(JSUB)=1.0/(1.0+TTR(21,JSUB)/FHBMA(JSUB))
CALL AOUT(AVAIL,SEQID,NSUB)

C READ OUTPUT REQUESTS
285 160 READ(5,170) EQ,JOPT
IF (EOF(5).NE.0) GO TO 999
170 FORMAT(A7,1X12)
IF (JOPT.GT.0) GO TO 185
175 WRITE(6,180) EQ,JOPT
180 FORMAT(1H1,A7,I3,2X15HINVALID OPTION.)
GO TO 160

C LOOP THROUGH SUBSYSTEMS FOR FIRST 5 OPTIONS.
295 185 DO 187 J=1,21
187 TOT(J)=0.0
TOTFL=0.0
IF (JOPT.GT.12) GO TO 470
DO 400 J=1,NSUB
JSUB=J
IF (JOPT.GT.6) GO TO 250
IF (EQ.NE.BLANK.AND.EQ.NE.SEQID(JSUB)) GO TO 400
GO TO (190,200,210,220,230,240),JOPT

300 C
C 190 CALL DUMP(TITLE,BLANK,JSUB,1.0,
* TTR(1,JSUB),TTRL(1,1,1))
GO TO 400

305

```



```

310 C C 200 CALL DUMP(TITLE(1,2),BLANK,JSUB,
      * 100./TTR(15,JSUB),TTR(1,JSUB),TTRL(1,1,1))
      GO TO 400
315 C C 210 CALL DUMP(TITLE(1,3),BLANK,JSUB,1.0,
      * EMMH(1,JSUB),EMMHL(1,1,1))
      GO TO 400

320 C C 220 CALL DUMP(TITLE(1,4),BLANK,JSUB,
      * 100./EMMH(15,JSUB),EMMH(1,JSUB),EMMHL(1,1,1))
      GO TO 400

325 C C 230 CALL DUMP(TITLE(1,5),BLANK,JSUB,
      * 1000./FHBMA(JSUB),EMMH(1,JSUB),EMMHL(1,1,1))
      GO TO 400

330 C C 240 CALL DUMP(TITLE(1,6),BLANK,JSUB,1000./FHBMA(JSUB),
      * TTR(1,JSUB),TTRL(1,1,1))
      GO TO 400

335 C C TOTAL UP APPROPRIATE SUBSYSTEMS
250 CALL EQUALS(EQ,SEQID(JSUB),IN)
      IF (IN.EQ.0) GO TO 400
      IF (JOPT.GE.9.AND.JOPT.LE.11) IN=2
      DO 260 K=1,21
      IF (IN.EQ.1) TOT(K)=TOT(K)+TTR(K,JSUB)
      IF (IN.EQ.2) TOT(K)=TOT(K)+EMMH(K,JSUB)
260 TOTFL=TOTFL+FHBMA(JSUB)
400 CONTINUE
340 C

```

```

345      C DUMP OUT TOTALS ACROSS SUBSYSTEMS
          IF (JOPT.LE.6.OR.JOPT.GE.13) GO TO 160
          IN=JOPT-6
          GO TO (410,420,430,440,450,460),IN
          CALL DUMP(TITLE(1,7),EQ,0,1.0,TOT,DUMMY)
          GO TO 160
          410 CALL DUMP(TITLE(1,8),EQ,0,100./TOT(15),TOT,DUMMY)
          GO TO 160
          420 CALL DUMP(TITLE(1,9),EQ,0,1.0,TOT,DUMMY)
          GO TO 160
          430 CALL DUMP(TITLE(1,10),EQ,0,100./TOT(15),TOT,DUMMY)
          GO TO 160
          440 CALL DUMP(TITLE(1,11),EQ,0,1000./TOTFL,TOT,DUMMY)
          GO TO 160
          450 CALL DUMP(TITLE(1,12),EQ,0,1000./TOTFL,TOT,DUMMY)
          GO TO 160
          460
355      C
          C PRINT MTTR, MMH ARRAY TOTALS
          470 IF (JOPT.GT.13) GO TO 175
          CALL DUMP2(1,TTR(1,1))
          CALL DUMP2(2,EMMH(1,1))
          GO TO 160
          C
          C
          999 WRITE(6,1000)
          1000 FORMAT(20HINORMAL TERMINATION.)
          C
          STOP
          END
370

```

SYMBOLIC REFERENCE MAP (R=1)

ENTRY POINTS
10270 RM2

91

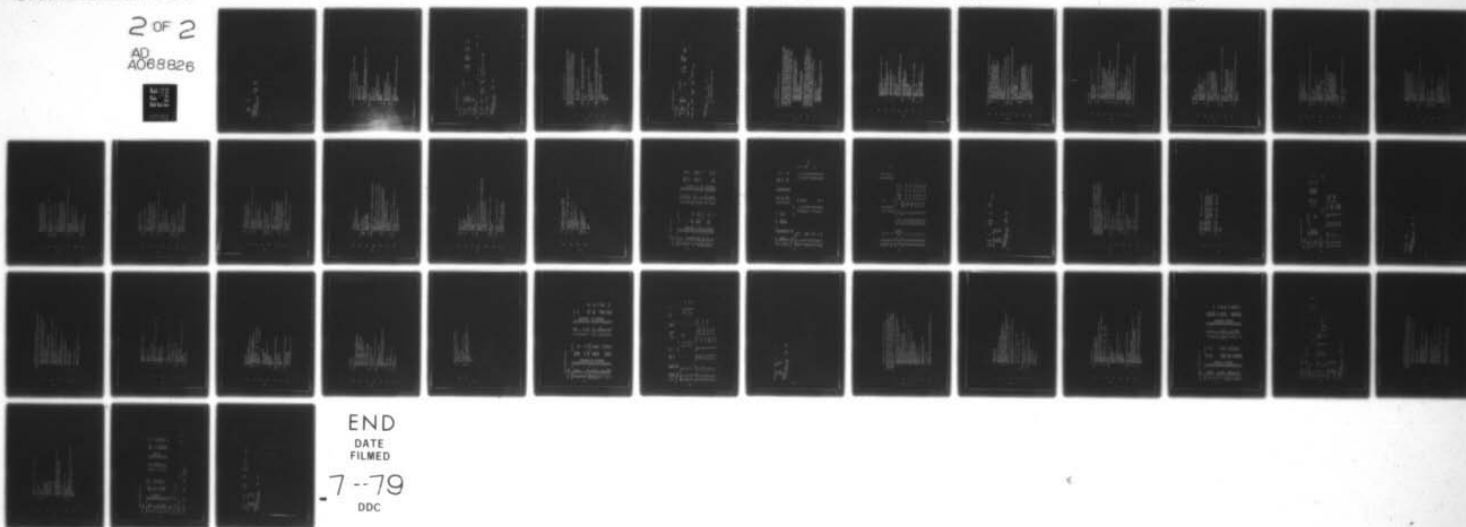
AD-A068 826

DYNAMICS RESEARCH CORP WILMINGTON MASS
DIGITAL AVIONICS INFORMATION SYSTEM (DAIS): RELIABILITY AND MAI--ETC(U)
APR 79 A J CZUCHRY, R H KISTLER, J M GLASIER F33615-75-C-5218
AFHRL-TR-78-2(II) NL

UNCLASSIFIED

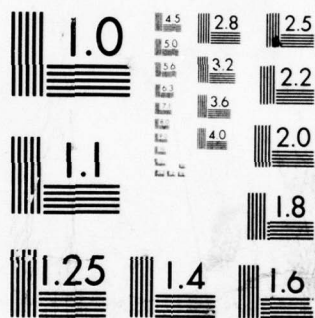
2 OF 2

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7-79
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

SIZES 82
EQIDS 160
LABL 8

STATISTICS

PROGRAM LENGTH 20611B 8585
BUFFER LENGTH 10260B 4272
CM LABELED COMMON LENGTH 25762B 11250
52000B CM USED


```

1      SUBROUTINE AOUT(AVAIL,SEQID,NSUB)
C
C THIS ROUTINE PRINTS OUT THE AVAIL ARRAY SORTED INCREASING.
C
5      DIMENSION AVAIL(NSUB),SEQID(NSUB)
C
C DIMENSION LABEL(8)
C COMMON/LABL/LABEL
C
10     WRITE(6,10) LABEL
10     FORMAT(1H1.8A10//1X42HSUBSYSTEM INHERENT FLIGHTLINE AVAILABILITY/
C      * 10HOSUBSYSTEM,5X12HAVAILABILITY/1X9H-----,
C      * 5X12H-----//)
C
C SORT AND PRINT
C
15     ATOT=1.0
C      DO 50 J=1,NSUB
C        WORST=2.0
C        DO 30 K=1,NSUB
C          IF (AVAIL(K).LT.0.0) GO TO 30
C          IF (AVAIL(K).GT.WORST) GO TO 30
C          WORST=AVAIL(K)
C          JSUB=K
C        30 CONTINUE
C      C JSUB NOW CONTAINS NEXT IN LIST
C        ATOT=ATOT+AVAIL(JSUB)
C        WRITE(6,40) SEQID(JSUB),AVAIL(JSUB)
C        40 FORMAT(2XA7,5XF10.4)
C        50 AVAIL(JSUB)=-WORST
C
C PRINT OVERALL
C
35     WRITE(6,60) ATOT
C        FORMAT(33HOSERVICE FLIGHTLINE AVAILABILITY-/14XF10.4)
C      RETURN
C      END

```

SYMBOLIC REFERENCE MAP (R=1)

ENTRY POINTS
3 AOUT

VARIABLES	SN	TYPE	RELOCATION	0	AVAIL	REAL	ARRAY	F.P.
121 ATOT		REAL		0		REAL		
122 J		INTEGER		125	JSUB	INTEGER		
124 K		INTEGER		0	LABEL	INTEGER	ARRAY	LABL
0 NSUB		INTEGER	F.P.	0	SEQID	REAL	ARRAY	F.P.
123 WORST		REAL						

FILE NAMES
MODE

TAPE6

STATEMENT LABELS

57 10 FMT
0 50

102 40 FMT

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES	EXT REFS	NOT	INNER
22	50	J	17 30	27B				
27	30	K	19 24	5B	INSTACK			

COMMON BLOCKS
LABL

LENGTH

STATISTICS

PROGRAM LENGTH

CM LABELED COMMON LENGTH

52000B CM USED

140B 96
10B 8

```

1      SUBROUTINE EQUALS (KEY, TEST, IN)
      C
      C THIS ROUTINE TESTS AN INPUT STRING (TEST) AGAINST A KEY STRING (KEY)
      C TO FIND IF THE TEST WORD CONTAINS THE SAME CHARACTERS AS THE KEY
      C WORD UP TO BUT NOT INCLUDING THE FIRST BLANK OF THE KEY
      C STRING FOLLOWING THE FIRST NON-BLANK. FOR EXAMPLE, IF THE KEY
      C STRING WAS "AC1" AND THE TEST STRING WAS "AC130", THIS ROUTINE
      C WOULD RETURN A POSITIVE RESPONSE OF "1" IN "IN" INSTEAD OF "0".
      C
10     REAL KEY, KEY1
      DIMENSION KEY1(7), TEST1(7)
      DATA BLANK/1H /

15     C INITIALIZE "IN". JSTART IS SET WHEN THE FIRST NON-BLANK OF THE
      C KEY IS FOUND. A LATER BLANK DENOTES THE END OF THE KEY.
      IN=0
      JSTART=0

20     C PUT THE STRINGS INTO SINGLE CHARACTER ARRAYS.
      DECODE(7,1,KEY) KEY1
      DECODE(7,1,TEST) TEST1
      1  FORMAT(7A1)

25     C LOOP THROUGH EACH OF THE SEVEN CHARACTERS. A MISMATCH IS A FAILURE.
      C WHEN A BLANK IS FOUND IN THE KEY (AFTER A NON-BLANK), THE TEST PASSES.
      DO 10 K=1,7
      IF (KEY1(K).EQ.BLANK) IF(JSTART) 10,10,15
      IF (KEY1(K).NE.TEST1(K)) RETURN
      JSTART=1
10    CONTINUE
15    IN=1
      RETURN
      END

```


ENTRY POINTS
3 EQUALS

VARIABLES	SN	TYPE	RELOCATION			
32 BLANK		REAL				
50 JSTART		INTEGER				
0 KEY		REAL	F.P.	51 K	INTEGER	
0 TEST		REAL	F.P.	52 KEY1	REAL	ARRAY
				61 TEST1	REAL	ARRAY
				0 IN	INTEGER	
						F.P.

STATEMENT LABELS

SUBMITTER LABELS					
45	1	FMT			
25	10				30
98	LOOPS	LABEL	INDEX	FROM-TO	PROPERTIES
	14	10	# K	26 30	EXITS
				14B	

STATISTICS

PROGRAM	LENGTH	CM USED	709	56
1	520003	SUBROUTINE READ		
		C		
		C		
		C		
		C		
5		C		


```

1          SUBROUTINE READ
C
C THIS ROUTINE READS IN THE BASE FILES.
C
C
C FOLLOWING IS DATA ASSOCIATED WITH SUBSYSTEMS. TO ALLOW FOR MORE, CHANGE
C EACH 40 IN THE RIGHTMOST SUBSCRIPT OF THE FOLLOWING SUBSYSTEM ARRAYS
C TO THE DESIRED MAXIMUM. TO ALLOW FOR MORE AFSC'S PER SUBSYSTEM
C TASK, CHANGE THE FIRST 3 IN THE SFAFSC ARRAY TO THE DESIRED NUMBER.
C TO ALLOW FOR MORE SUPPORT EQUIPMENT PER SUBSYSTEM TASK, CHANGE THE
C 1 IN THE LEFTMOST SUBSCRIPT OF SFSE TO THE DESIRED VALUE. ALSO
C CHANGE THE 40, 5, AND 1 IN THE FIRST CARD BELOW AND THESE COMMENTS.
C
C          DIMENSION NUML(40), KLRU(40), TSFL(7, 40), PSM(7, 40),
C          *   NSAFSC(7, 40), JNAC(40), FHBMA(40), NSFSE(7, 40), HFAC(40)
C          DIMENSION SWUC(40), SFSE(2, 7, 40), SFAFSC(5, 7, 40)
C          DIMENSION SNAME(5, 40)
C          DIMENSION SEQID(40)
C          COMMON/SUBS/SNAME, TSFL, PSM, SWUC, SFSE,
C          *   SFAFSC, NSAFSC, NSFSE, FHBMA, JNAC, HFAC
C
C FOLLOWING IS DATA ASSOCIATED WITH LRU'S. IN A MANNER SIMILAR
C TO THE ABOVE FOR SUBSYSTEMS, TO ALLOW FOR MORE, CHANGE EACH 120 TO THE
C DESIRED NUMBER. TO ALLOW FOR MORE AFSC'S PER TASK, CHANGE EACH 3
C IN THE LEFTMOST SUBSCRIPT OF LSAFSC TO THE DESIRED NUMBER. TO CHANGE
C MAX NUMBER OF SUPPORT EQUIPMENT PER TASK, CHANGE THE 1 IN LSE
C TO THE DESIRED NUMBER. CHANGE THE 120, THE 1 AND
C THE 3 IN THE FIRST CARD FOLLOWING AND IN THESE COMMENTS.
C
C          DIMENSION ARRAY(8), LABEL(8)
C          REAL LF, LS, MF
C          COMMON/LABL/LABEL
C          DIMENSION TLSHOP(5, 120), NLAFC(5, 120), PLRR(5, 120),
C          *   LDRAW(120), NLSE(5, 120), LNAC(120)

```

```

35      REAL LSAFSC, LSE
      DIMENSION LWUC(120), LSAFSC(5, 5, 120), LSE(2, 5, 120)
      DIMENSION LNAME(5, 120)
      REAL LEQID
      DIMENSION LEQID(120)
      COMMON/LRUS/LNAME, TLSHOP, PLRR, LWUC, LSAFSC,
      * LSE, NLAFCSC, NLSE, LDRAW, LNAC
      C
      COMMON/SIZES/NSUB, NLRU, KLRLU, NUML
      COMMON/EQIDS/SEQID, LEQID
      C
      DIMENSION TIMES(7), PEAS(7)
      DIMENSION DATA(7)
      DATA BLANK/5H /
      DATA CR, SF, LF, LS, TS, TF, PF, PS, MF, SS
      * /2HCR, 2HSF, 2HLF, 2HLS, 2HTS, 2HTF, 2HPF, 2HPS, 2HMF, 2HSS/
      C
      C READ TITLE CARD AND PRINT.
      DATA MAXLRU, MAXLA, MAXLE/120, 5, 2/
      DATA MAXSUB, MAXSA, MAXSE/40, 5, 2/
      READ(4, 5) LABEL
      WRITE(6, 6) LABEL
      5 FORMAT(8A10)
      6 FORMAT(1X8A10)
      C
      C READ NUMBER OF SUBSYSTEMS. HALT IF TOO MANY.
      NLRU=0
      READ(4, 10) NSUB
      10 FORMAT(I2)
      IF (NSUB.LE.MAXSUB) GO TO 30
      WRITE(6, 20) MAXSUB
      20 FORMAT(27HOCURRENT MAX SUBSYSTEMS AT , I2)
      STOP

```

```

70      C READ EACH SUBSYSTEM IN LOOP 100.  READ AND WRITE THE CR CARD.
      C DO 100 JSUB=1, NSUB
      30 READ(4,40) TYPE, SEQID(JSUB), DASH1, JSEQ1,
      35 * SWUC(JSUB), JNAC(JSUB), (SNAME(K, JSUB), K=1, 5), NR
      40 FORMAT(A2, 1XA7, A1, I1, 7XA5, 1XI2, 1X5A8, 6XI2)
      WRITE(6,41) TYPE, SEQID(JSUB), DASH1, JSEQ1,
      * SWUC(JSUB), JNAC(JSUB), (SNAME(K, JSUB), K=1, 5), NR
      41 FORMAT(1XA2, 1XA7, A1, I1, 7XA5, 1XI2, 1X5A8, 6XI2)
      IF (JSEQ1.EQ.2) GO TO 35
      NUML(JSUB)=NR
      IF(JSEQ1.EQ.1.AND.TYPE.EQ.CR) GO TO 60
      WRITE(6,50)
      50 FORMAT(40HPRECEDING SUBSYSTEM CARD SEQUENCE ERROR.)
      C SET POINTER FOR THIS SUBSYSTEM TO FIRST LRU IN LRU TABLES.
      60 KLRU(JSUB)=NLRU+1
      C READ CROSS REFERENCE CARDS FOR EACH LRU IN THIS SUBSYSTEM (LOOP 90).
      DO 90 LDUMMY=1, NR
      IF (NLRU.LT.MAXLRU) GO TO 80
      WRITE(6,70) MAXLRU
      70 FORMAT(21HOCURRENT MAX LRUS AT , I3)
      STOP
      80 NLRU=NLRU+1
      85 READ(4,40) TYPE, LEQID(NLRU), DASH1, JSEQ1,
      * LWUC(NLRU), LNAC(NLRU), (LNAME(K, NLRU), K=1, 5)
      WRITE(6,41) TYPE, LEQID(NLRU), DASH1, JSEQ1,
      * LWUC(NLRU), LNAC(NLRU), (LNAME(K, NLRU), K=1, 5)
      IF (JSEQ1.EQ.2) GO TO 35
      IF (JSEQ1.EQ.1.AND.TYPE.EQ.CR) GO TO 90
      WRITE(6,86)
      86 FORMAT(34HPRECEDING LRU CARD SEQUENCE ERROR.)
      90 CONTINUE
100

```



```

100 CONTINUE
C
C READ MANDATORY SECOND CR CARD FOR LAST LRU
105 READ(4,5) ARRAY
    WRITE(6,105) ARRAY
105 FORMAT(1XSA10)
C
C READ SF CARDS. THERE MAY BE FROM 1 TO MAXSE CARDS PER SUBSYSTEM.
110 JSUB=0
    DO 150 K=1, NSUB
        READ(4,110) TYPE, EQ, DASH, JSEQ, DATA, NUM
        WRITE(6,111) TYPE, EQ, DASH, JSEQ, DATA, NUM
111 FORMAT(1XA2,1XA7,A1,I1,7(1XA5),I3)
110 FORMAT(A2,1XA7,A1,I1,7(1XA5),I3)
        IF (TYPE.NE.SF) WRITE(6,115) TYPE, SF
115 FORMAT(1XA2,12H CARD WHERE ,A2,14H CARD BELONGS.)
        IF (JSEQ.GT.1) WRITE(6,116)
116 FORMAT(21H CARD SEQUENCE ERROR.)
        IF (NUM.GT.MAXSE) WRITE(6,117) MAXSE
117 FORMAT(24H CURRENT MAX SE'S SET AT,I2)
C
C IF CARDS ARE NOT IN SEQUENCE, WE ADVANCE JSUB UP TO THE CORRECT SUBSYSTEM
    JSUB=JSUB+1
    JFIRST=JSUB
120 IF(EQ.EQ.SEQID(JSUB)) GO TO 130
    JSUB=JSUB+1
    IF (JSUB.GT.NSUB) JSUB=1
    IF (JSUB.NE.JFIRST) GO TO 120
C IF UNABLE TO IDENTIFY SUBSYSTEM, GO TO THE NEXT.
125 WRITE(6,126)
126 FORMAT(28H SUBSYSTEM EQUIP ID INVALID.)
    GO TO 150
C
C ASSIGN TO THE PROPER SUBSYSTEM. FIRST 1 SE, THEN THE 2ND, ETC.
135

```



```

130 NSEQ=1
DO 135 L=1,7
135 NSFSE(L,JSUB)=0
137 DO 140 L=1,7
IF (DATA(L).EQ.BLANK) GO TO 140
NPOS=NSFSE(L,JSUB)+1
NSFSE(L,JSUB)=NPOS
SFSE(NPOS,L,JSUB)=DATA(L)
140 CONTINUE
IF (NSEQ.GE.NUM) GO TO 150
C
C READ ADDITIONAL SE'S. THEN STORE ABOVE.
NSEQ=NSEQ+1
READ(4,110) TYPE,EQ,DASH,JSEQ,DATA
WRITE(6,111) TYPE,EQ,DASH,JSEQ,DATA
IF (EQ.NE.NSEQID(JSUB)) WRITE(6,190)
IF (TYPE.NE.SF) WRITE(6,115) TYPE,SF
IF (JSEQ.NE.NSEQ) WRITE(6,116)
GO TO 137
150 CONTINUE
C
C READ LF CARDS. THERE MAY BE FROM ONE TO MAXSA CARDS FOR EACH SUBSYSTEM.
JSUB=0
DO 200 K=1,NSUB
READ(4,110) TYPE,EQ,DASH,JSEQ,DATA,NUM
WRITE(6,111)TYPE,EQ,DASH,JSEQ,DATA,NUM
IF (TYPE.NE.LF) WRITE(6,115) TYPE,LF
IF (JSEQ.GT.1) WRITE(6,116)
IF (NUM.GT.MAXSA) WRITE(6,155) MAXSA
155 FORMAT(26H CURRENT MAX MPSC'S SET AT, I2)
C
C IF CARDS ARE NOT IN SEQUENCE BY SUBSYSTEM, WE INCREMENT JSUB TO IT.
JSUB=JSUB+1
JFIRST=JSUB

```

```

170      160 IF (EQ.EQ.SEQID(JSUB)) GO TO 170
          JSUB=JSUB+1
          IF (JSUB.GT.NSUB) JSUB=1
          IF (JSUB.NE.JFIRST) GO TO 160
          WRITE(6,126)
          GO TO 200
175
C
C ASSIGN TO PROPER SUBSYSTEM, INITIALLY THE FIRST AFSC, THEN SECOND, ETC.
170 NSEQ=1
    DO 173 L=1,7
173 NSAFSC(L,JSUB)=0
175 DO 180 L=1,7
    IF (DATA(L).EQ.BLANK) GO TO 180
    NPOS=NSAFSC(L,JSUB)+1
    NSAFSC(L,JSUB)=NPOS
    SFAFSC(NPOS,L,JSUB)=DATA(L)
180 CONTINUE
    IF (NSEQ.GE.NUM) GO TO 200
C
C READ ADDITIONAL AFSC'S, THEN STORE SIMILARLY ABOVE.
190 NSEQ=NSEQ+1
    READ(4,110) TYPE,EQ,DASH,JSEQ,DATA
    WRITE(6,111)TYPE,EQ,DASH,JSEQ,DATA
    IF (EQ.NE.SEQID(JSUB)) WRITE(6,190)
190 FORMAT(22H INVALID EQUIPMENT ID.)
    IF (TYPE.NE.LF) WRITE(6,115) TYPE,LF
    IF (JSEQ.NE.NSEQ) WRITE(6,116)
    GO TO 175
200 CONTINUE
C
C READ LS CARDS. THERE MAY BE FROM ONE TO MAXLA CARDS PER LRU.
200 JLRU=0
    DO 260 K=1,NLRU

```

```

205      READ(4,210) TYPE,EQ,DASH,JSEQ,DATA,NUM
        WRITE(6,211)TYPE,EQ,DASH,JSEQ,DATA,NUM
211      FORMAT(1XA2,1XA7,A1,I1,6X7(1XA5),I3)
210      FORMAT(A2,1XA7,A1,I1,6X7(1XA5),I3)
        IF (TYPE.NE.LS) WRITE(6,115) TYPE,LS
        IF (JSEQ.GT.1) WRITE(6,116)
        IF (NUM.GT.MAXLA) WRITE(6,155) MAXLA
        JLRU=JLRU+1
        JFIRST=JLRU
220      IF (EQ.EQ.LEQID(JLRU)) GO TO 230
C
C IF CARDS ARE NOT IN SEQUENCE BY LRU, WE INCREMENT JLRU UP TO IT.
        JLRU=JLRU+1
        IF (JLRU.GT.MLRU) JLRU=1
        IF (JLRU.EQ.JFIRST) GO TO 255
        GO TO 220
220      C
        C ASSIGN TO PROPER LRU
230      NSEQ=1
        DO 235 L=1,5
266      FORMAT(1XA2,1XA7,A1,I1,6X7(1XF5.1))
235      NLAESC(L,JLRU)=0
240      DO 250 L=1,5
        LX=L
        IF (L.GT.3) LX=L+2
        IF (DATA(LX).EQ.BLANK) GO TO 250
        NPOS=NLAESC(L,JLRU)+1
        NLAESC(L,JLRU)=NPOS
        LSAFSC(NPOS,L,JLRU)=DATA(LX)
250      CONTINUE
        IF (NSEQ.GE.NUM) GO TO 260
C
C READ ADDITIONAL AFSC'S, THEN STORE SIMILARLY ABOVE.
        NSEQ=NSEQ+1

```

```

240      READ(4,210) TYPE,EQ,DASH,JSEQ,DATA
        WRITE(6,211)TYPE,EQ,DASH,JSEQ,DATA
        IF (EQ.NE.LEQID(JLRU)) WRITE(6,190)
        IF (TYPE.NE.LS) WRITE(6,115) TYPE,LS
        IF (JSEQ.NE.NSEQ) WRITE(6,116)
        GO TO 240

C
245      C IF UNABLE TO IDENTIFY EQUIPMENT ID, GO TO THE NEXT.
        255 WRITE(6,256)
        256 FORMAT(22H LRU EQUIP ID INVALID.)
        260 CONTINUE

C
250      C READ TS CARDS, ONE PER LRU IN ANY ORDER
        JLRU=0
        DO 300 K=1,NLRU
            READ(4,265) TYPE,EQ,DASH,JSEQ,TIMES
            WRITE(6,266)TYPE,EQ,DASH,JSEQ,TIMES
            265   FORMAT(A2,1XA7,A1,I1,6X7(1XF5.1))
            IF (TYPE.NE.TS) WRITE(6,115) TYPE,TS
            IF (JSEQ.GT.1) WRITE(6,116)

C
260      C IF CARDS ARE NOT IN SEQUENCE BY LRU, WE INCREMENT JLRU UP TO IT.
        JLRU=JLRU+1
        JFIRST=JLRU
        270   IF (EQ.EQ.LEQID(JLRU)) GO TO 280
        JLRU=JLRU+1
        IF (JLRU.GT.NLRU)JLRU=1
        IF (JLRU.NE.JFIRST) GO TO 270
        WRITE(6,256)
        GO TO 300

C
265      C ASSIGN TO PROPER LRU
        280 DO 290 L=1,3
        290   TLSHOP(L,JLRU)=TIMES(L)

```



```

275      TLLSHOP(4,JLRU)=TIMES(6)
      TLLSHOP(5,JLRU)=TIMES(7)
300      CONTINUE
C
C READ IF CARDS, ONE PER SUBSYSTEM
      JSUB=0
      DO 340 K=1,NSUB
        READ(4,305) TYPE,EQ,DASH,JSEQ,TIMES
        WRITE(6,306) TYPE,EQ,DASH,JSEQ,TIMES
306      FORMAT(1XA2,1XA7,A1,11,7(1XF5.1))
305      FORMAT(A2,1XA7,A1,11,7(1XF5.1))
        IF (TYPE.NE.TF) WRITE(6,115) TYPE,TF
        IF (JSEQ.GT.1) WRITE(6,116)
C
C IF CARDS ARE NOT IN SEQUENCE, WE INCREMENT JSUB UP TO IT.
      JSUB=JSUB+1
      JFIRST=JSUB
310      IF (EQ.EQ.SEQID(JSUB)) GO TO 320
      JSUB=JSUB+1
      IF (JSUB.GT.NSUB) JSUB=1
      IF (JSUB.NE.JFIRST) GO TO 310
      WRITE(6,126)
      GO TO 340
C
C ASSIGN TO PROPER SUBSYSTEM
320      DO 330 L=1,7
330      TSFL(L,JSUB)=TIMES(L)
340      CONTINUE
C
C READ PF CARDS, ONE PER SUBSYSTEM.
      JSUB=0
      DO 390 K=1,NSUB
        READ(4,350) TYPE,EQ,DASH,JSEQ,PEAS
        WRITE(6,351) TYPE,EQ,DASH,JSEQ,PEAS
300
305

```

```

310      351  FORMAT(1XA2,1XA7,A1,I1,7(F6.4))
          350  FORMAT(A2,1XA7,A1,I1,7(F6.4))
          IF (TYPE.NE.PF) WRITE(6,115) TYPE,PF
          IF (JSEQ.GT.1) WRITE(6,116)

C
C IF CARDS ARE NOT IN SEQUENCE, WE INCREMENT JSUB UP TO IT.
          JSUB=JSUB+1
          JFIRST=JSUB
          360  IF (EQ.EQ.SEQID(JSUB)) GO TO 370
          JSUB=JSUB+1
          315  IF (JSUB.GT.NSUB) JSUB=1
          IF (JSUB.NE.JFIRST) GO TO 360
          WRITE(6,126)
          GO TO 390

C
C ASSIGN TO PROPER SUBSYSTEM
          370  DO 380  L=1,6
          380  PSM(L,JSUB)=PEAS(L)
          390  CONTINUE

C
C READ PS CARDS, ONE PER LRU IN ANY ORDER
          JLRU=0
          DO 440  K=1,NLRU
            READ(4,400) TYPE,EQ,DASH,JSEQ,PEAS
            WRITE(6,401)TYPE,EQ,DASH,JSEQ,PEAS
            401  FORMAT(1XA2,1XA7,A1,I1,6X7(F6.4))
            400  FORMAT(A2,1XA7,A1,I1,6X7(F6.4))
            IF (TYPE.NE.PS) WRITE(6,115) TYPE,PS
            IF (JSEQ.GT.1) WRITE(6,116)

C
C IF CARDS ARE NOT IN SEQUENCE, WE INCREMENT JLRU TO IT.
          JLRU=JLRU+1
          JFIRST=JLRU
          410  IF (EQ.EQ.LEQID(JLRU)) GO TO 420

```

```

340 JLRU=JLRU+1
    IF (JLRU.GT.NLRU) JLRU=1
    IF (JLRU.NE.JFIRST) GO TO 410
    WRITE(6,255)
    GO TO 440

345 C ASSIGN TO PROPER LRU
    420 DO 430 L=1,3
    430 PLRR(L,JLRU)=PEAS(L)
    PLRR(4,JLRU)=PEAS(6)
    PLRR(5,JLRU)=PEAS(7)
    440 CONTINUE

350 C
355 C READ SS CARDS, ONE PER LRU. ADDITIONAL SE'S ON FOLLOWING CARDS.
    JLRU=0
    DO 449 K=1,NLRU
    READ(4,441) TYPE,EQ,DASH,JSEQ,(DATA(J),J=1,3),ND,DATA(4),
      * DATA(5),NUM
    WRITE(6,4411)TYPE,EQ,DASH,JSEQ,(DATA(J),J=1,3),ND,DATA(4),
      * DATA(5),NUM
    4411 FORMAT(1XA2,1XA7,A1,I1,6X3(1XA5),1XI3,8X2(1XA5),1XI2)
    441 FORMAT(A2,1XA7,A1,I1,6X3(1XA5),1XI3,8X2(1XA5),1XI2)
    IF (TYPE.NE.SS) WRITE(6,115) TYPE,SS
    IF (JSEQ.GT.1) WRITE(6,116)
    IF (NUM.GT.MAXLE) WRITE(6,117) MAXLE
    JLRU=JLRU+1
    JFIRST=JLRU
    442 IF (EQ.EQ.LEQID(JLRU)) GO TO 443

365 C IF CARDS ARE NOT IN SEQUENCE, WE INCREMENT JLRU UP TO IT.
    JLRU=JLRU+1
    IF (JLRU.GT.NLRU) JLRU=1
    IF (JLRU.EQ.JFIRST) GO TO 447
    GO TO 442
370

```

```

375 C ASSIGN TO PROPER LRU
443 NSEQ=1
    DO 444 L=1,5
444 NLSE(L,JLRU)=0
    LDRAW(JLRU)=ND
445 DO 446 L=1,5
    IF (DATA(L).EQ.BLANK) GO TO 446
    NPOS=NLSE(L,JLRU)+1
    NLSE(L,JLRU)=NPOS
    LSE(NPOS,L,JLRU)=DATA(L)
445 CONTINUE
    IF (NSEQ.GE.NUM) GO TO 449

C READ ADDITIONAL SE'S, THEN STORE ABOVE.
    NSEQ=NSEQ+1
    READ(4,441) TYPE,EQ,DASH,JSEQ,(DATA(J),J=1,3),ND,DATA(4),DATA(5)
    WRITE(6,4411)TYPE,EQ,DASH,JSEQ,(DATA(J),J=1,3),ND,DATA(4),DATA(5)
    IF (EQ.NE.LEQID(JLRU)) WRITE(6,190)
    IF (TYPE.NE.SS) WRITE(6,115) TYPE,SS
    IF (JSEQ.NE.NSEQ) WRITE(6,116)
    GO TO 445

395 C IF UNABLE TO IDENTIFY EQUIPMENT, GO TO THE NEXT.
447 WRITE(6,256)
449 CONTINUE
C
C READ MF CARDS, 1 PER SUBSYSTEM IN ANY ORDER
JSUB=0
DO 480 K=1,NSUB
450 READ(4,450) TYPE,EQ,DASH,JSEQ,VAL,H
    FORMAT(A2,1XA7,A1,I1,1XF6.1,1XF6.4)
    WRITE(6,451) TYPE,EQ,DASH,JSEQ,VAL,H

```



```

410
415
420
425
451  FORMAT(1XA2,1XA7,A1,I1,1XF6.1,1XF6.4)
      IF (TYPE.NE.MF) WRITE(5,115) TYPE,MF
      IF (JSEQ.GT.1) WRITE(5,116)
C
C IF CARDS ARE NOT IN SEQUENCE, INCREMENT JSUB UP TO IT.
      JSUB=JSUB+1
      JFIRST=JSUB
460  IF (EQ.EQ.SEQID(JSUB)) GO TO 470
      JSUB=JSUB+1
      IF (JSUB.GT.NSUB) JSUB=1
      IF (JSUB.NE.JFIRST) GO TO 460
      WRITE(6,126)
      GO TO 480
C
C ASSIGN TO PROPER SUBSYSTEM
470  FHMMA(JSUB)=VAL
      HFAC(JSUB)=H+1.0
480  CONTINUE
C
      RETURN
      END

```

ENTRY POINTS
1 READ

VARIABLES	SN	TYPE	RELOCATION	ARRAY	1131	BLANK	REAL	ARRAY	SUBS
2360	ARRAY	REAL			2343	DASH	REAL		SUBS
1132	CR	REAL			2406	DATA	REAL	ARRAY	SUBS
2335	DASH1	REAL			6370	FH8MA	REAL	ARRAY	
2342	FQ	REAL			6510	HFAC	REAL	ARRAY	
2357	H	REAL			2345	JFIRST	INTEGER	ARRAY	SUBS
2354	J	INTEGER			6440	JNAC	INTEGER		
2352	JLRU	INTEGER			2336	JSEQ1	INTEGER		
2344	JSEQ	INTEGER			2337	K	INTEGER		
2333	JSUB	INTEGER			2350	L	INTEGER		
2	KLRU	INTEGER	SIZES	ARRAY	16230	LDRW	INTEGER	ARRAY	LRUS
0	LABEL	INTEGER	LABL	ARRAY	50	LEQID	REAL	ARRAY	EQIDS
2341	LDUMMY	INTEGER			16420	LNAC	INTEGER	ARRAY	LRUS
1134	LF	REAL			1135	LS	REAL		
0	LNAME	INTEGER	LRUS	ARRAY	11470	LSE	REAL	ARRAY	LRUS
3600	LSAFSC	REAL	LRUS	ARRAY	2353	LX	INTEGER		
3410	LWUC	INTEGER	LRUS	ARRAY	1146	MAXLE	INTEGER		
1145	MAXLA	INTEGER							
VARIABLES	SN	TYPE	RELOCATION						
1144	MAXLRU	INTEGER			1150	MAXSA	INTEGER		SIZES
1151	MAXSE	INTEGER			1147	MAXSUB	INTEGER		
1142	MF	REAL			2355	ND	INTEGER		
13750	NLAFSC	INTEGER	LRUS	ARRAY	1	NLRU	INTEGER		
15100	NLSE	INTEGER	LRUS	ARRAY	2351	NPOS	INTEGER		SUBS
2340	NR	INTEGER			5310	NSAFSC	INTEGER	ARRAY	SUBS
2347	NSEQ	INTEGER			5740	NSPSE	INTEGER	ARRAY	
0	NSUB	INTEGER	SIZES		2345	NUM	INTEGER		

52	NUML	INTEGER	ARRAY	SIZES	2377	PEAS	REAL	ARRAY	LRU
1140	PF	REAL			2260	PLRR	REAL	ARRAY	SUB
1141	PS	REAL			740	PSM	REAL	ARRAY	SUB
0	SEQID	REAL	ARRAY	EQIDS	1133	SF	REAL	ARRAY	SUB
2520	SFAFSC	REAL	ARRAY	SUBS	1440	SFSE	REAL		
0	SNAME	REAL	ARRAY	SUBS	1143	SS	REAL		
1370	SWUC	REAL	ARRAY	SUBS	1137	TF	REAL		
2370	TIMES	REAL	ARRAY		1130	TLSHOP	REAL	ARRAY	LRU
1136	TS	REAL			310	TSFL	REAL	ARRAY	SUB
2334	TYPE	REAL			2356	VAL	REAL		

FILE NAMES MODE
TAPE4 FMT

TAPE6 FMT

113

STATEMENT LABELS

STATEMENT LABELS	1163	5	FMT	1165	6	FMT	1174	10	FMT
1202	20	FMT	16	30			17	35	
1223	40	FMT	1243	41			1253	50	FMT
57	60		1265	70			67	80	
71	85		1321	86			127	90	
0	100		1337	105			1370	110	FMT
1364	111	FMT	1401	115			1412	116	FMT
1422	117	FMT	164	120			0	125	INACTIVE
1432	126	FMT	176	130			0	135	
207	137		224	140			252	150	
1532	155	FMT	301	160			313	170	
1566	173	FMT	324	175			342	180	
1625	211	FMT	370	200			1631	210	FMT
0	235		417	220			427	230	
510	255		440	240			461	250	
1741	265	FMT	1714	256			512	260	
547	280		1651	266			535	270	
2005	305	FMT	0	290			563	300	
			2001	306			606	310	

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES	EXT REFS	NOT INNER
620	320	FMT	70 102	115B	EXT REFS	NOT INNER	
2051	350	FMT	87 101	50B	EXT REFS	NOT INNER	
665	370	FMT	111 155	113B	EXT REFS	NOT INNER	
2115	400	FMT	137 138	2B	INSTACK		
732	420	FMT	139 144	7B	INSTACK		
2173	441	FMT	159 198	114B	INSTACK		
0	444	FMT	179 180	2B	OPT		
1062	447	FMT	181 186	10B	INSTACK		
2311	451	FMT	203 248	120B	INSTACK		
1125	480	FMT	223 225	2B	OPT		
			226 233	14B	INSTACK		
			252 274	47B	INSTACK		
			270 271	2B	INSTACK		
			278 299	43B	INSTACK		
			297 298	2B	INSTACK		
			303 324	43B	INSTACK		
			322 323	2B	INSTACK		
			328 351	47B	INSTACK		
			347 348	2B	INSTACK		
			355 399	114B	INSTACK		

1013	444	L	377	378	2B	INSTACK	
1026	446	L	380	385	7B	INSTACK	
1071	480	* K	404	425	37B		EXT REFS

COMMON BLOCKS	LENGTH
SUBS	3440
LABL	8
LRUS	7560
SIZES	82
EQIDS	160

STATISTICS

PROGRAM LENGTH	2415B	1293
CM LABELED COMMON LENGTH	25762B	11250
52000B CM USED		

```

1      SUBROUTINE ADDUP(ASUB,ALRU)
C
C THIS ROUTINE ADDS UP THE VARIOUS COLUMNS AND ROWS OF THE DATA
C ROW PASSED TO ARRAYS ASUB AND ALRU, WHICH ARE EITHER ARRAYS
C TTR AND TTRL OR EMMH AND EMMHL. WHEN ADDING
C SUBSYSTEMS OR LRUS, CHANGE THE 40'S IN THE FIRST CARD BELOW TO
C THE NEW NUMBER OF SUBSYSTEMS. CHANGE THE 120 IN THE 2ND CARD
C BELOW TO THE NEW MAXIMUM NUMBER OF LRU'S. ALSO CHANGE THE
C NUMBERS IN THESE COMMENTS.
10     C
C      DIMENSION ASUB(21,40),KLRU(40),NUML(40)
C      DIMENSION ALRU(6,4,120)
C
C      COMMON/SIZES/NSUB,NLRU,KLRU,NUML
15     C
C      ADD UP LRU TOTALS
C      DO 100 JLRU=1,NLRU
C      DO 90 M=1,3
C      DO 80 N=1,5
C      VAL = ALRU(N,M,JLRU)
C      ALRU(6,M,JLRU) = ALRU(6,M,JLRU) + VAL
C      ALRU(N,4,JLRU) = ALRU(N,4,JLRU) + VAL
C      CONTINUE
C      DO 100 N=1,5
C      ALRU(6,4,JLRU) = ALRU(6,4,JLRU) + ALRU(N,4,JLRU)
25     C
C      ADD UP SUBSYSTEM TOTALS
C      DO 140 JSUB=1,NSUB
C      JLRU=KLRU(JSUB)
C      NR=NUML(JSUB)
30     C
C      DO 120 K=1,NR
C      DO 110 M=1,5
110     ASUB(N,JSUB) = ASUB(N,JSUB) + ALRU(N,4,JLRU)
C      ASUB(15,JSUB)=ASUB(15,JSUB)+ALRU(6,4,JLRU)
35

```

```

DO 115 M=1,3
115 ASUB(M+15,JSUB) = ASUB(M+15,JSUB) + ALRU(5,M,JLRU)
120 JLRU=JLRU+1
DO 130 N=1,4
130 ASUB(6,JSUB) = ASUB(6,JSUB) + ASUB(N,JSUB)
ASUB(13,JSUB)=ASUB(7,JSUB)+ASUB(8,JSUB)+ASUB(1,JSUB)
ASUB(14,JSUB) = ASUB(9,JSUB) + ASUB(2,JSUB)
ASUB(19,JSUB) = ASUB(7,JSUB) + ASUB(10,JSUB)
ASUB(20,JSUB) = ASUB(8,JSUB) + ASUB(9,JSUB) +
* ASUB(11,JSUB) + ASUB(12,JSUB)
C
DO 135 K=1,6
135 ASUB(15,JSUB) = ASUB(15,JSUB) + ASUB(K+6,JSUB)
140 ASUB(21,JSUB) = ASUB(15,JSUB) - ASUB(5,JSUB)
C
RETURN
END

```

40

45

50

SYMBOLIC REFERENCE MAP (R=11)

ENTRY POINTS
3 ADDUP

VARIABLES	SN	TYPE	RELOCATION	ARRAY	F.P.
0 ALRU		REAL			
170 JLRU		INTEGER			
176 K		INTEGER			
171 M		INTEGER			
1	NLRU	INTEGER	SIZES		
0 NSUB		INTEGER	SIZES		
173 VAL		REAL			

STATEMENT LABELS

0 80	0 90	0 100
0 110	0 115	0 120
0 130	0 135	0 140

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES
16	100	* JLRU	17 25	35B	NOT INNER
17	90	* M	18 23	21B	NOT INNER
30	80	N	19 22	4B	INSTACK
45	100	N	24 25	3B	INSTACK
54	140	* JSUB	28 49	112B	NOT INNER
60	120	* K	32 38	42B	NOT INNER
71	110	N	33 34	3B	INSTACK
112	115	M	36 37	3B	INSTACK
130	130	N	39 40	3B	INSTACK
155	135	K	47 48	3B	INSTACK

COMMON BLOCKS LENGTH
SIZES 82

STATISTICS

PROGRAM LENGTH
CM LABELED COMMON LENGTH
52000B CM USED

224B 148
122B 82

```

1      SUBROUTINE SEDUMP(TTR,TTR,NWANT,WANT)
C      THIS ROUTINE DUMPS TO THE PRINTER ALL THE SUPPORT EQUIPMENT REPORTS
C      AFTER READING IN THE SUPPORT EQUIPMENTS OF INTEREST.
C
5      DIMENSION NUML(40),KLUR(40),TSFL(7,40),PSM(7,40),HFAC(40),
*      NSAFSC(7,40),FHBMA(40),JNAC(40),NSFSE(7,40),AVAIL(40)
      DIMENSION SWUC(40),SFSE(2,7,40),SFAFSC(5,7,40)
      DIMENSION SNAME(5,40)
      DIMENSION SEQID(40)
10     COMMON/SUBS/SNAME,TSFL,PSM,SWUC,SFSE,
*      SFAFSC,NSAFSC,NSFSE,FHBMA,JNAC,HFAC
C
      DIMENSION LDRW(120),LNAC(120),TLSHOP(5,120),NLAFSC(5,120)
      DIMENSION PLRR(5,120),NLSE(5,120)
      REAL LSAFSC,LSE
15     DIMENSION LWUC(120),LSAFSC(5,5,120),LSE(2,5,120)
      DIMENSION LNAME(5,120)
      REAL LEQID
      DIMENSION LEQID(120)
20     COMMON/LRUS/LNAME,TLSHOP,PLRR,LWUC,LSAFSC,
*      LSE,NLAFSC,NLSE,LDRW,LNAC
C
      COMMON/SIZES/NSUB,NLUR,KLUR,NUML
      COMMON/EQIDS/SEQID,LEQID
C
25     DIMENSION LABEL(8)
      COMMON/LABL/LABEL
C
C
30     DIMENSION WANT(100)
C
      DIMENSION ESSE(3,4),GT(3,4),TOTSE(3,4)
      DIMENSION SES(50),ARRAY(13)

```

```

35      DIMENSION TTRL(6,4,120),TTR(21,40)
      DATA BLANK,ALLSE/5H
      ,5HALLSE/
      IANY=0
      C
      10  READ(4,10) NSES
      40  FORMAT(I2)
      I=0
      IF (NSES.EQ.0) RETURN
      IF (NSES.LT.51) GO TO 20
      45  WRITE(6,15) NSES
      15  FORMAT(1X13,35H SE"S IS MORE THAN CURRENT LIMIT OF,I3)
      STOP
      20  READ(4,30) ARRAY
      30  FORMAT(13(A5,1X))
      31  WRITE(6,31) ARRAY
      50  FORMAT(1X13(A5,1X))
      C
      J=0
      40  J=J+1
      IF (J.GT.13) GO TO 20
      IF (ARRAY(J).EQ.BLANK) GO TO 40
      I=I+1
      SES(I)=ARRAY(J)
      IF (I.LT.NSES) GO TO 40
      C
      C LOOP THROUGH SE"S OF INTEREST
      60  DO 160 N=1,NSES
      SE=SES(N)
      DO 41 LL=1,NWANT
      65  IF (WANT(LL).EQ.SE.OR.WANT(LL).EQ.ALLSE) GO TO 411
      41  CONTINUE
      GO TO 160
      411  DO 42 II=1,4
      DO 42 JJ=1,3

```

```

70      42  GT(JJ,II)=0.0
          UPGT=0.0
          WRITE(6,43) SE,LABEL
          FORMAT(4H1SE-,A5,10X,8A10/4X5H-----)
          WRITE(6,44)
          FORMAT(21X6H-MTTR-,21X5H-MMH-,19X
75      * 13H-MMH/1000 FH-,14X14H-MTTR/1000 FH-/
          * /8X3HTD#,1X,
          * 4(1X22HTD REP TS REP TOTAL,4X),6X6HUP/KFH,
          * /8X3H---,1X
          * 4(1X22H-----,4X),6X6H-----/)
          LINE=7
80      C
          DO 150 JSUB=1,NSUB
          JLRU=KLRL(JSUB)
          NR=NUML(JSUB)
          IF (LINE+NR.LE.58) GO TO 444
          WRITE(6,443)
          FORMAT(1H1)
          WRITE(6,44)
          LINE=7
85      443
          C
          C ZERO OUT TOTAL ARRAY FOR EACH SUBSYSTEM.
          444  DO 45 II=1,3
          DO 45 JJ=1,4
          45  TOTSE(II,JJ)=0.0
          TTRX=0.0
          IP=0
95      C
          C LOOP THROUGH EACH LRU IN THIS SUBSYSTEM.
          DO 140 K=1,NR
          NL4J=NLSE(4,JLRU)
          DO 47 KK=1,NL4J
          IF (SE.EQ.LSE(KK,4,JLRU)) GO TO 60
100

```



```

105      47 CONTINUE
          GO TO 140
C
C  COMPUTE FOMS
60      ESSE(1,1)=PLRR(4,JLRU)*TLSHOP(4,JLRU)
          ESSE(2,1)=PLRR(5,JLRU)*TLSHOP(5,JLRU)
          ESSE(3,1)=ESSE(1,1)+ESSE(2,1)
          ESSE(1,2)=ESSE(1,1)*NLAFSC(4,JLRU)
          ESSE(2,2)=ESSE(2,1)*NLAFSC(5,JLRU)
          ESSE(3,2)=ESSE(1,2)+ESSE(2,2)
          FACT=1000./FHBMA(JSUB)
          DO 65 II=1,3
65      ESSE(II,3)=ESSE(II,2)*FACT
          ESSE(II,4)=ESSE(II,1)*FACT
C
C  SET UP SUBSYSTEM TOTAL ARRAY
          DO 68 II=1,3
          DO 68 JJ=1,4
68      TOTSE(II,JJ)=TOTSE(II,JJ)+ESSE(II,JJ)
C
C  PRINT LRU LINE
          TTRLX=TTRL(5,4,JLRU)*FACT
          TTRX=TTRX+TTRLX
          WRITE(6,70) LEQID(JLRU),LDRAW(JLRU),ESSE,TTRLX
70      FORMAT(1XA7,I3,4(3F8.4,3X),F13.5)
          IP=1
          IANY=1
          LINE=LINE+1
C
130      140 JLRU=JLRU+1
          IF (IP.EQ.0) GO TO 150
C
C  PRINT TOTALS
          UPGT=UPGT+TTRX
135

```

```

145 WRITE(6,145) SEQID(JSUB),TOTSE,TTRX
   FORMAT(11X,4(3(2X6H-----),3X),6X7H-----)/
   * 1XA7,3X4(3F8.4,3X),F13.5//
   LINE=LINE+3
   DO 147 II=1,3
   DO 147 JJ=1,4
   GT(II,JJ)=GT(II,JJ)+TOTSE(II,JJ)
147 CONTINUE
150 IF (IANY.EQ.1) WRITE(6,170) GT,UPGT
160 IF (IANY.EQ.1) WRITE(6,170) GT,UPGT
170 * /1X5HTOTAL,5X4(3F8.4,3X),F13.5)
   RETURN
   END

```

140

145

ENTRY POINTS
3 SEDUMP

VARIABLES	SN	TYPE	RELOCATION	673	ARRAY	REAL	ARRAY
272 ALLSE		REAL		673	ARRAY	REAL	ARRAY
475 AVAIL		REAL		271	BLANK	REAL	
545 ESSE		REAL		473	FACT	REAL	
6370 FHBMA		REAL	SUBS	561	GT	REAL	ARRAY
6510 HFAC		REAL	SUBS	452	I	INTEGER	
450 IANY		INTEGER		457	II	INTEGER	
467 IP		INTEGER		453	J	INTEGER	
460 JJ		INTEGER		464	JLRU	INTEGER	
6440 JNAC		INTEGER	SUBS	463	JSUB	INTEGER	
470 K		INTEGER		472	KK	INTEGER	
2 KLRU		INTEGER	SIZES	0	LABEL	INTEGER	ARRAY
16230 LDRAW		INTEGER	LRUS	50	LEQID	REAL	ARRAY
VARIABLES	SN	TYPE	RELOCATION	456	LL	INTEGER	
462 LINE		INTEGER		0	LNAME	INTEGER	LRUS
16420 LNAC		INTEGER	LRUS	11470	LSE	REAL	LRUS
3600 LSAFSC		REAL	LRUS	454	N	INTEGER	
3410 LWUC		INTEGER	LRUS	1	NLRU	INTEGER	
13750 NLAFSC		INTEGER	LRUS	471	NLJ	INTEGER	
15100 NLSE		INTEGER	LRUS	5310	NSAFSC	INTEGER	SUBS
465 NR		INTEGER		5740	NSFSE	INTEGER	SUBS
451 NSES		INTEGER	SIZES	52	NUML	INTEGER	SIZES
0 NSUB		INTEGER	F.P.	2260	PLRR	REAL	LRUS
0 NWANT		INTEGER	SUBS	455	SE	REAL	
740 PSM		REAL	EQIDS	611	SES	REAL	ARRAY
0 SEQID		REAL	SUBS	1440	SFSE	REAL	ARRAY
2520 SFAFSC		REAL	SUBS	1370	SWUC	REAL	ARRAY
0 SNAME		REAL	LRUS	575	TOTSE	REAL	ARRAY
1130 TLRSHOP		REAL					

310	TSFL	REAL	ARRAY	SUBS	0	TTR	REAL	ARRAY	F.P.
0	TTRL	REAL	ARRAY	F.P.	474	TTRLX	REAL		
466	TTRX	REAL	ARRAY	F.P.	461	UPGT	REAL		
0	WANT	REAL	ARRAY						

FILE NAMES		MODE
TAPE4	TAPE6	FMT

STATEMENT LABELS		
300	10	FMT
321	30	FMT
0	41	
347	44	FMT
145	60	
410	70	FMT
0	147	
436	170	FMT
114	444	

306	15	FMT
330	31	FMT
0	42	
0	45	
0	65	
224	140	
256	150	
61	411	

26	20	
33	40	
340	43	FMT
0	47	
0	68	
422	145	FMT
261	160	
374	443	FMT

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES	EXT REFS	NOT INNER
45	160	* N	60 144	223B		EXITS	
50	41	* LL	62 64	10B	OPT	NOT INNER	
62	42	* II	66 68	12B			
67	42	* JJ	67 68	2B	INSTACK		
102	150	* JSUB	81 143	157B		EXT REFS	NOT INNER
115	45	* II	91 93	13B		NOT INNER	
122	45	* JJ	92 93	2B	INSTACK		
132	140	* K	98 131	76B		EXT REFS	NOT INNER
136	47	* KK	100 102	7B	INSTACK	EXITS	
165	65	* II	113 115	4B	INSTACK		
173	68	* II	118 120	14B		NOT INNER	
200	68	* JJ	119 120	3B	INSTACK		
242	147	* II	140 142	14B		NOT INNER	
247	147	* JJ	141 142	3B	INSTACK		

COMMON BLOCKS LENGTH
 SUBS 3440
 LRUS 7560
 SIZES 82
 EQIDS 160
 LABL 8

STATISTICS
 PROGRAM LENGTH 720B 464
 CM LABELED COMMON LENGTH 25762B 11250
 52000B CM USED

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1      SUBROUTINE DUMP(TITLE,HEADER,JSUB,FACTOR,ASUB,ALRU)
C
C THIS ROUTINE DUMPS THE VARIOUS COLUMNS AND ROWS OF THE DATA
C ELEMENTS ASUB AND ALRU PASSED AS ARGUMENTS, WHICH ARE EITHER ARRAYS
C TTR AND TTRL OR EMMH AND EMMHL. WHEN ADDING SUBSYSTEMS OR
C LRU'S, CHANGE THE 40'S IN THE 1ST CARD BELOW TO THE NEW NUMBER OF
C SUBSYSTEMS. CHANGE THE 120'S IN THE SECOND CARD BELOW TO THE NEW
C MAXIMUM NUMBER OF LRU'S. ALSO CHANGE THE NUMBERS IN THESE COMMENTS.
C
10     DIMENSION NUML(40),KLUR(40),TSFL(7,40),PSM(7,40),HFAC(40),
      * NSAFSC(7,40),FHBMA(40),JNAC(40),NSFSE(7,40),AVAIL(40)
      DIMENSION SWUC(40),SFSE(2,7,40),SFAFSC(5,7,40)
      DIMENSION SNAME(5,40)
      COMMON/SUBS/SNAME,TSFL,PSM,SWUC,SFSE,
      * SFAFSC,NSAFSC,NSFSE,FHBMA,JNAC,HFAC
      DIMENSION LDRAW(120),LNAC(120),TLSHOP(5,120),NLAFSC(5,120)
      DIMENSION PLRR(5,120),NLSE(5,120)
      REAL LSAFSC,LSE
      DIMENSION LWUC(120),LSAFSC(5,5,120),LSE(2,5,120)
      DIMENSION LNAME(5,120)
      COMMON/LRUS/LNAME,TLSHOP,PLRR,LWUC,LSAFSC,
      * LSE,NLAFSC,NLSE,LDRAW,LNAC
      DIMENSION ASUB(21),SEQID(40)
      DIMENSION ALRU(6,4,120)
      DIMENSION LEQID(120)
      REAL LEQID
      DIMENSION X(6,4),Y(21)
C
C COMMON/SIZES/NSUB,NLRU,KLUR,NUML
C COMMON/EQIDS/SEQID,LEQID
C
C DIMENSION WKN(4)
C
C DIMENSION FLRU(14),FFL(14),FTOT(5),ALL(33),FIELD(6)
C EQUIVALENCE (ALL(1),FLRU(1)),(ALL(29),FTOT(1)),(ALL(15),FFL(1))

```

```

C
C
40      COMMON/LABEL/LABEL
        DIMENSION LABEL(8)

C
        DIMENSION TITLE(5), IND(10)
        DATA WKN/3H W,3H K,3H N,3H SUB/
        DATA FLRU/5H( 3(/,8H4XA3,1X4,4HF8.4,5H,24X2,
          * 4HF8.4,8H)/8X4(1X,8H7(1H-)),8H24X2(1X7,7H(1H-))/,
          * 8H4XA3,1X4,4HF8.4,5H,24X2,4HF8.4,1H)/
        DATA FFL/5H(/,4X,8H3HCND,1X,4HF8.4,6H,2(24X,4HF8.4,8H)/6X1HM,,
          * 3H1X2,4HF8.4,5H,24X2,4HF8.4,3H,8X,4HF8.4,8H/8X9(1X7,
          * 8H(1H-))) /
        DATA FTOT/4H(1X7,8HHTOT/TSK,4H,1X9,4HF8.4,1H)/

C
        DATA FIELD/8H(1XF7.5),8H(1XF7.4),8H(1XF7.3),8H(1XF7.2),
          * 8H(1XF7.1),8H(1XF7.0)/

C
        DATA IND/3,5,11,13,17,19,22,24,26,32/

C
        IF (ASUB(15).EQ.0.0) RETURN

C
C COPY ARRAYS, MULTIPLYING BY REQUIRED FACTOR.
DO 5 K=1,21
5 Y(K)=ASUB(K)*FACTOR

C
C SET UP FORMAT FIELDS FOR CORRECT WIDTHS
JF=ALOG10(Y(15))+1
IF (JF.LT.1) JF=1
IF (JF.GT.6) JF=6
DO 8 K=1,10
I=IND(K)
8 ALL(I)=FIELD(JF)

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```

70      8 ALL(I)=FIELD(JF)
      C WRITE TITLE,HEADER AND HEADER LINES.
      WRITE(6,10) TITLE,HEADER,LABEL
      10 FORMAT(1H1,5A4,A5,10X8A10)
      IF (JSUB.GT.0) WRITE(6,12) SEQID(JSUB),SWUC(JSUB),
      * (SNAME(J,JSUB),J=1,5),FHEMA(JSUB)
      12 FORMAT(11H0SUBSYSTEM-,A7,5X1H(A5,1H),5X5A8,5X7HMFHEMA=,F6.1)
      WRITE(6,14)
      14 FORMAT(/9X31HAGE F/L TS F/L R+R VR+R
      * 40H CND A/C M A/C VM A/C SHOP TOT/OUT/
      * 9X31H-----,
      * 40H -----)
      C BYPASS LRUS
      IF (JSUB.EQ.0) GO TO 40
      JLRU=KLRU(JSUB)
      NR=NUML(JSUB)
      KICK=0
      DO 30 K=1,NR
      IF (ALRU(6,K,JLRU).EQ.0.0) GO TO 30
      KICK=KICK+1
      IF (KICK.LE.6) GO TO 18
      WRITE(6,16)
      16 FORMAT(1H1)
      KICK=0

95      C COPY ARRAYS, MULTIPLYING BY REQUIRED FACTOR.
      DO 20 N=1,6
      DO 20 M=1,4
      X(N,M)=ALRU(N,M,JLRU)*FACTOR
      20 WRITE(6,25) LEQID(JLRU),LWUC(JLRU),(LNAME(J,JLRU),J=1,5)
      25 FORMAT(/1X4HLRU-,A7,5X1H(A5,1H),5X5A8)
      WRITE(6,FLRU) (WKN(M),(X(N,M),N=1,6),M=1,4)
      30 JLRU=JLRU+1
      WRITE(6,FFL) Y(7),Y(10),Y(19),Y(8),Y(9),Y(11),Y(12),Y(20)
      40 WRITE(6,FTOT) Y(13),Y(14),Y(3),Y(4),Y(10),Y(11),Y(12),Y(5),Y(15)
      RETURN
      END

```


SYMBOLIC REFERENCE MAP (R=1)

ENTRY POINTS
3 DUMP

VARIABLES	SN	TYPE	RELOCATION	0	ALRU	REAL	ARRAY	F.P.	ARRAY	F.P.
327 ALL	0	REAL	ARRAY	370	AVAIL	REAL	ARRAY		*UNDEF	
0 ASUB	0	REAL	ARRAY	345	FFL	REAL	ARRAY		ARRAY	
0 FACTOR	0	REAL	ARRAY	521	FIELD	REAL	ARRAY		ARRAY	
6370 FHBMA	327	REAL	ARRAY	363	FTOT	REAL	ARRAY		ARRAY	
327 FLRU	0	REAL	ARRAY	6510	HFAC	REAL	ARRAY		ARRAY	
0 HEADER	320	REAL	ARRAY	527	IND	INTEGER	ARRAY		ARRAY	
320 I	321	INTEGER	ARRAY	317	JF	INTEGER	ARRAY		ARRAY	
321 J	322	INTEGER	ARRAY	6440	JNAC	INTEGER	ARRAY		ARRAY	
322 JLRU	0	INTEGER	ARRAY	316	K	INTEGER	ARRAY		ARRAY	
324 KICK	0	INTEGER	ARRAY	2	KLRU	INTEGER	ARRAY		ARRAY	
0 LABEL	0	INTEGER	ARRAY	16230	LDRW	INTEGER	ARRAY		ARRAY	
50 LEQID	50	REAL	ARRAY	16420	LNAC	INTEGER	ARRAY		ARRAY	
0 LNAME	0	INTEGER	ARRAY	3600	LSAFSC	REAL	ARRAY		ARRAY	
11470 LSE	0	REAL	ARRAY	3410	LUWC	INTEGER	ARRAY		ARRAY	
326 M	11470	INTEGER	ARRAY	325	N	INTEGER	ARRAY		ARRAY	
13750 NLAFC	326	INTEGER	ARRAY	1	NLRU	INTEGER	ARRAY		ARRAY	
15100 NLSE	0	INTEGER	ARRAY	323	NR	INTEGER	ARRAY		ARRAY	
5310 NSAFSC	0	INTEGER	ARRAY	5740	NSFSE	INTEGER	ARRAY		ARRAY	
0 NSUB	0	INTEGER	ARRAY	52	NUML	INTEGER	ARRAY		ARRAY	
2260 PLRR	0	REAL	ARRAY	740	PSM	REAL	ARRAY		ARRAY	
0 SEQID	0	REAL	ARRAY	2520	SFAFSC	REAL	ARRAY		ARRAY	
1440 SFSE	0	REAL	ARRAY	0	SNAME	REAL	ARRAY		ARRAY	
1370 SWUC	0	REAL	ARRAY	0	TITLE	REAL	ARRAY		ARRAY	
1130 TLSHOP	0	REAL	ARRAY	310	TSFL	REAL	ARRAY		ARRAY	
515 WKN	0	REAL	ARRAY	440	X	REAL	ARRAY		ARRAY	
470 Y	0	REAL	ARRAY				ARRAY		ARRAY	

FILE NAMES	MODE	EXTERNALS	TYPE	REAL	ARGS	1	LIBRARY
TAPE6	FMT						
ALOG10							
STATEMENT LABELS							
0 5					0 8		
204 12	FMT				216 14		
102 18					0 20		
151 30					157 40		
LOOPS							
22 5	INDEX						
41 8	K						
72 30	* K						
103 20	* N						
114 20	* M						
136	* M						
COMMON BLOCKS							
SUBS	LENGTH						
LRUS	3440						
SIZES	7560						
EQIDS	82						
COMMON BLOCKS	160						
LABEL	LENGTH						
	8						
STATISTICS							
PROGRAM LENGTH							
CM LABELED COMMON LENGTH	557B						
52000B CM USED	25762B						
	367						
	11250						

172 10 FMT
243 16 FMT
253 25 FMT

FMT

FROM-TO LENGTH PROPERTIES
59 60 3B INSTACK
66 68 4B INSTACK
86 101 63B
95 97 17B
96 97 3B
100 100 12B

EXT REFS NOT INNER
NOT INNER
EXT REFS

```

1  SUBROUTINE DUMP2(M,ASUB)
C THIS ROUTINE DUMPS OF ALL THE MTTR AND MMH TOTALS ACROSS ALL
C SUBSYSTEMS. WHEN INCREASING THE NUMBER OF SUBSYSTEMS,
C CHANGE THE 40'S IN THE RIGHT SUBSCRIPTS BELOW TO THE NEW NUMBER.
C ALSO CHANGE THE DIMENSION OF "DUM" TO THE NEW NUMBER OF LRU'S.
C
C DIMENSION NUML(40),KLRU(40),TSFL(7,40),PSM(7,40),
C * NSAFSC(7,40),JNAC(40),FHBMA(40),NSFSE(7,40),HFAC(40)
C
C DIMENSION LABEL(8)
C COMMON/LABL/LABEL
C
C DIMENSION ASUB(21,40)
C DIMENSION SWUC(40),SFSE(2,7,40),SFAFSC(5,7,40)
C DIMENSION SNAME(5,40)
C DIMENSION SEQID(40)
C COMMON/SUBS/SNAME,TSFL,PSM,SWUC,SFSE,
C * SFAFSC,NSAFSC,NSFSE,FHBMA,JNAC,HFAC
C
C COMMON/SIZES/NSUB,NLRU,KLRU,NUML
C COMMON/EQIDS/SEQID,DUM
C DIMENSION DUM(120)
C DIMENSION TOT(21),TITLE(2),FORMAT(4),FIELD(6)
C DATA TITLE/4HMTTR,3HMMH/
C DATA TOTAL/5HTOTAL/
C DATA FIELD/4HF8.5,4HF8.4,4HF8.3,4HF8.2,4HF8.1,4HF8.0/
C DATA FORMAT/6H(1XA7,,3H1X9,4HF8.4,1H)/
C
C WRITE(6,10) TITLE(M),LABEL
10 FORMAT(1H1,A4,1X18HFOR ALL SUBSYSTEMS,5X8A10/
C * 40HOSUBSYS AGE F/L TS F/L R+R VR+R,
C * 40H CND A/C M A/C VM A/C SHOP TOT/OUT/

```

```

35      * 1X39H-----
      * 40H -----
      C
      DO 20 J=1,21
      20 TOT(J)=0.0
      C
      C FIND FORMAT
      T15=0.0
      DO 25 J=1,NSUB
      25 T15=T15+ASUB(15,J)
      JF=ALOG10(T15)+1
      IF (JF.LT.1) JF=1
      IF (JF.GT.6) JF=6
      FORMAT(3)=FIELD(JF)
      C
      C
      DO 40 JSUB=1,NSUB
      WRITE(6,FORMAT) SEQID(JSUB),ASUB(13,JSUB),ASUB(14,JSUB),
      * ASUB(3,JSUB),ASUB(4,JSUB),ASUB(10,JSUB),
      * ASUB(11,JSUB),ASUB(12,JSUB),ASUB(5,JSUB),
      * ASUB(15,JSUB)
      C
      DO 35 J=1,21
      35 TOT(J)=TOT(J)+ASUB(J,JSUB)
      40 CONTINUE
      WRITE(6,49)
      49 FORMAT(8X9(1X7(1H-)))
      WRITE(6,FORMAT) TOTAL,TOT(13),TOT(14),TOT(3),TOT(4),TOT(10),
      * TOT(11),TOT(12),TOT(5),TOT(15)
      RETURN
      END
65

```


ENTRY POINTS
3 DUMP2

135

35	25	J				
53	40	* JSUB			3B	
104	35	J			37B	EXT REFS NOT INNER
					3B	

COMMON BLOCKS	LENGTH	
LABL	8	
SUBS	3440	
SIZES	82	
EQIDS	160	

0 STATISTICS		
PROGRAM LENGTH	302B	194
CM LABELED COMMON LENGTH	7152B	3690
52000B CM USED		