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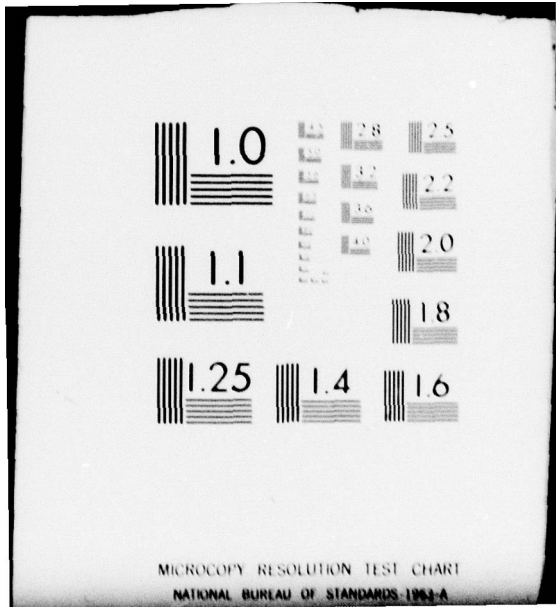
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USERS GUIDE

6 US ROLAND II LOGISTICS MODEL (ROLOG)
Users Guide.

Prepared for

U. S. Army Missile Research and Development Command
Attention: DRCPM-ROL-M
Redstone Arsenal, Alabama

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Thomas E. Wilkerson
Thomas E. Wilkerson
Logistics Engineer

Edwin Schwemmer
Edwin Schwemmer
ESH Cost Analysis

J. Neale S. Dunkin
J. Neale, S. Dunkin
Programmer

Bradley B. Dunn
Bradley B. Dunn
TACRAC Program Manager

403 238

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TABLE OF CONTENTS

		<u>PAGE</u>
1.0	GENERAL	1
1.1	Introduction	1
1.2	Purpose	1
1.3	Model Versatility	1
1.4	Application to Other Systems	1
2.0	DATA BASE BUILD	4
2.1	Read LSAR Tapes (BUFTP)	4
2.2	Extract LSAR Data (EXTAPE)	6
2.3	Parts File Sort (SORTMRG)	6
2.4	File Merge (MRGFLS)	7
2.5	Data Base Build Input Formats	7
2.5.1	BUFTP Input Format	12
2.5.2	EXTAPE Input Format	13
2.5.3	SORTMRG Input Format	17
2.5.4	MRGFLS Input Format	17
2.6	Data Base Build Job Control Language	18
3.0	ROLOG DATA BASE UPDATE	19
3.1	Main Update (MAINUD)	19
3.2	Sort of DIM File (SORTMRG)	19
3.3	Update Data Base (UPDB)	19
3.4	Data Base Update Input Formats	22
3.4.1	MAINUD Input Format	22
3.4.2	SORTMRG Input Format	27
3.4.3	UPDB Input Format	27
3.5	Data Base Update Job Control Language	28
4.0	ROLAND LOGISTICS PROGRAM (ROLOG)	29
4.1	ROLOG Reports	29
4.2	ROLOG Produced Files	34
4.3	ROLOG Input Format	41
4.4	SORTMRG Input Format	46
4.5	ROLOG Job Control Language	46
5.0	SUPPORT EQUIPMENT UTILIZATION (SEU)	51

		<u>PAGE</u>
5.1	SEU Data Format	51
5.2	SEU Job Control Language	51
6.0	GRAPHICS DISPLAY (GRAPH)	54
6.1	GRAPH Job Control Language	54

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LIST OF TABLES

<u>TABLE</u>	<u>TITLE</u>	<u>PAGE</u>
I	EXTAPE Data Cards for ROLAND	14
II	Master Data Base Layout	25
III	ROLOG Data Base Layout	48

LIST OF ILLUSTRATIONS

<u>FIGURE</u>	<u>TITLE</u>	<u>PAGE</u>
1	Data Base Build Flow Diagram	5
2	Control File Report	8
3	Parts Number Report, Part 1	9
4	Parts Number Report, Part 2	10
5	Supplementary Report	11
6	Data Base Update Flow Diagram	21
7	ROLOG Flow Diagram	30
8	Operational Availability Report	35
9	Maintenance Manhours by Equipment Report	36
10	Maintenance Manhours by Skill Specialty Report	37
11	Spares Provisioning List	38
12	Summary Spares Provisioning Report	39
13	Logistics Life Cycle Cost Report	40
14	SEU Flow Diagram	52
15	Support Equipment Utilization Report	53
16	Graphics Report	55

1.0 GENERAL

1.1 Introduction

The US ROLAND Logistics Model (ROLOG) is a series of computer programs for processing LSAR data, updating the data base, performing logistic support effectiveness calculations, and reporting data in both graphic and tabular formats. This document is intended to assist the user in executing the programs to achieve realism in the outputs specific to the operational and support scenarios being evaluated.

1.2 Purpose

The ROLOG system is designed to evaluate the cost and availability impacts of various logistics alternatives and to provide management with a tool for assessing impact of these alternatives before decisions are made.

1.3 Model Versatility

The ROLOG system utilizes up to four maintenance levels (I) and (J) geographic locations. The model is designed to bypass any maintenance level or level of supply if that level does not exist in a location (J) as indicated by input data. This permits utilizing different support structures for different geographic areas (a one Battalion deployment would probably not have a GSU while a multiple Battalion deployment may). The model also permits two user imposed constraints in essential item provisioning, probability of stockout (not having stock when required) and maximum acceptable wait for stock at the remove/replace location. By setting the wait to a very long period it can effectively be removed as a constraint, when desired, and only stockout probability is a factor in the computations.

1.4 Application to Other Systems

An effort was made to make the ROLOG as general as possible and still meet all specific requirements of the US ROLAND system. Use of the programs with any other system will require some reprogramming and possibly the changing of some values now in the equations. Some examples are as follows:

- o The skill specialty codes (SSC) entered in the namelist constants are those currently authorized by the Manning Tables and Equipment Lists (MTEL) for the Organization, Direct Support Unit, and General Support

- Unit for ROLAND. (The number and value of the skill specialty codes should be input by a user to reflect the specific system under evaluation). A maximum of 30 codes are available to the user. Should more be required some reprogramming of dimension statements will be required.
- o The programs are coded to evaluate a two area deployment (J) in any one run. If more areas are to be evaluated it can be accomplished by running the programs once for each two geographic areas. Some reprogramming of input values, dimension statements, etc. will be required to evaluate more than two areas in a single run.
 - o The ROLAND LSAR contains conditional maintenance task distribution (MTD - percentage of those received which are required - not percentage of total failures). An algorithm is included to convert these conditional MTD to unconditional. When used with a system utilizing a newer version of LSAR these cards must be removed.
 - o No LSAR base is available for the carrier vehicles for the ROLAND Fire Unit. In the computation of system operational availability, a value for the vehicle availability (TVOA) is input rather than computed. For any system whose subsystems analysis is wholly contained in the LSAR data base some reprogramming will be necessary.
 - o The order and ship times (OST) entered are the most current available for missile material. When used with another system, the most current listing of OST should be checked for the area and commodity command involved and changes made as necessary.
 - o The probability of stockout (PSO) is a user imposed constraint utilized in provisioning. The PSO is entered for each level of stockpoint in each geographic area. The user may test with various values to arrive at the optimum level of provisioning which meets the systems cost and availability requirements.
 - o Support equipment is not available for utilization all of the time. A utilization factor has been applied to compensate for time spent in maintenance, self test, warmup times, movement to the point of use, etc. This factor may vary from system to system and from one level of maintenance to another. The SEUK should be evaluated for the specific system and operational scenario being analyzed.

- o For manpower costing, a variable productivity factor (PRF) is applied to compensate for leave, sick, military training time, housekeeping functions, etc. The value of this factor may vary for different systems and operational or deployment concepts.

2.0 DATA BASE BUILD

A new data base for ROLOG must be built each time there is a major update to the system LSAR tapes. Since LSAR is the output of an iterative logistics support analysis, which continues well into the life cycle of the system, these update programs are meaningful even after initial deployment of the system. The ROLOG Data Base build is a function of four distinct computer routines run as one program. A flow diagram of the Data Base Build program is shown in Figure 1 and is described in the following paragraphs.

2.1 Read LSAR Tapes (BUFTP)

The Logistics support analysis record (LSAR) is stored on two tapes. For the US ROLAND system these tapes are 9 track, 1600 BPI prepared on an IBM 360 system and are not compatible with the CDC 6600 system used for ROLQG. The BUFTP routine reads the variable length tapes and outputs 7 track 800 BPI tapes for use on the CDC 6600. The first tape, LSAFU03M is the functional group code master, also referred to as the A Tape. The second tape, LSAPU08M, is the parts master file, referred to as the H Tape or provisioning tape. Cards must be input to describe the tapes and the record size. BUFTP is run twice, once for the A Tape and once for the H Tape. The record layout and length for the ROLAND LSAR Tapes is as follows:

<u>A Tape</u>	<u>Length</u>
One A1 record for each item	203 characters
Zero to N A4 records per A1	308 characters
Zero to N C4 records per A4	94 characters
One to N D4 records per C4	61 characters
Zero to N D7 records per C4	61 characters
<u>H Tape</u>	<u>Length</u>
One H1 record for each item	482 characters
One to N H9 records per H1	77 characters

The output of BUFTP consist of two 7 track, 800 BPI tapes previously referred to and two disk files. The disk files, one containing A Tape information, the other containing H Tape data are inputs to EXTAPE for the data base build. The two 7 track tapes are stored in the tape library as backup. BUFTP also prints an unformatted copy of the data base upon request.

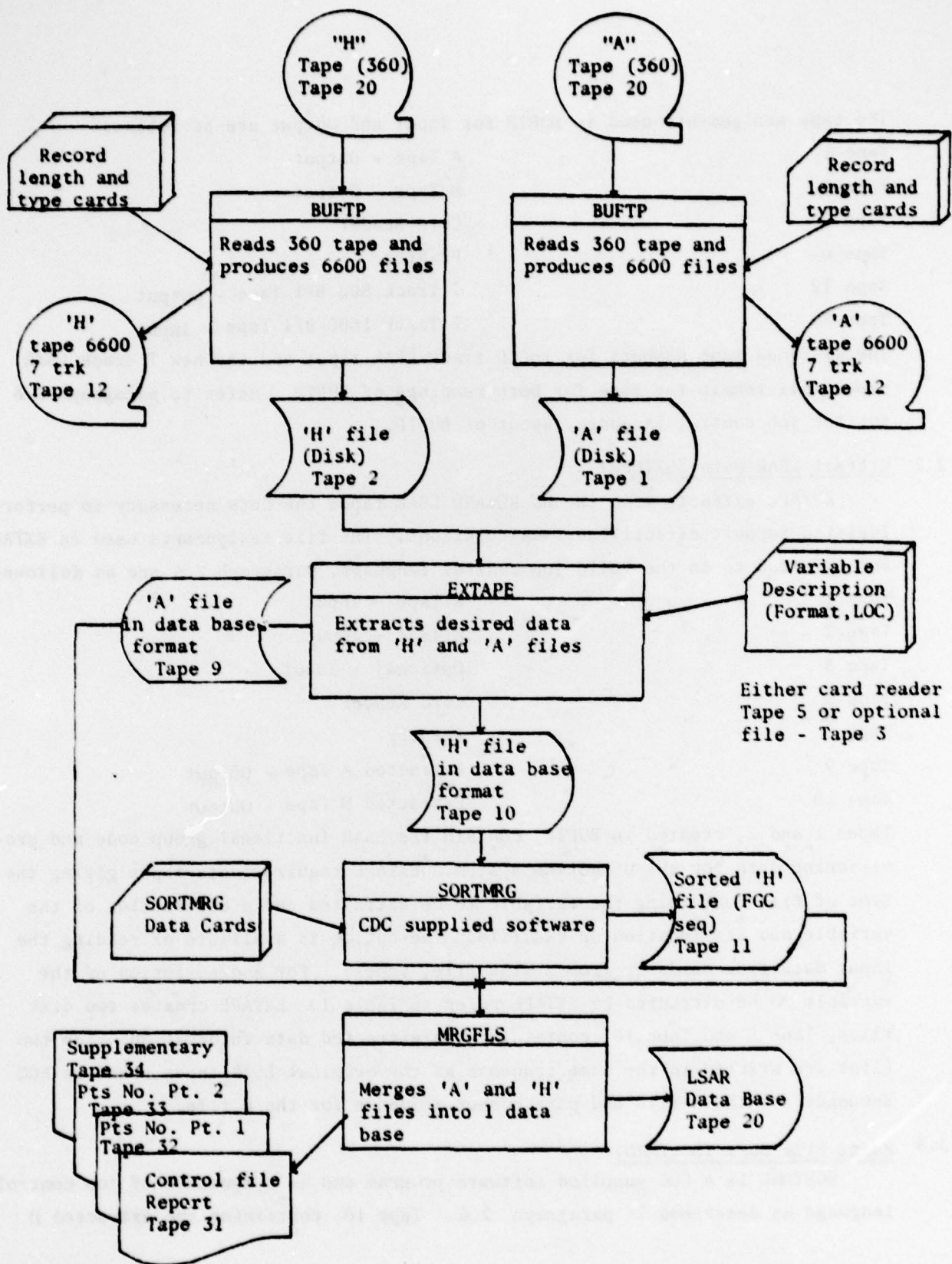


Figure 1. Data Base Build Flow Diagram

The tape assignments used in BUFTP for input and output are as follows:

Tape 1	A Tape - Output
Tape 2	H Tape - Output
Tape 5	Card Reader
Tape 6	Printer
Tape 12	7 Track 800 BPI Tape - Output
Tape 20	9 Track 1600 BPI Tape - Input

The assigned tape numbers for the 9 track LSAR tapes and the new 7 track LSAR tapes will remain the same for both runnings of BUFTP. Refer to paragraph 2.6 for the job control language layout of BUFTP.

2.2 Extract LSAR Data (EXTAPE)

EXTAPE extracts from the US ROLAND LSAR tapes the data necessary to perform logistic support effectiveness calculations. The file assignments used in EXTAPE and referred to in the Build job control language, paragraph 2.6 are as follows:

Tape 1	A Tape - Input
Tape 2	H Tape - Input
Tape 3	Optional - Input
Tape 5	Card Reader
Tape 6	Printer
Tape 9	Extracted A Tape - Output
Tape 10	Extracted H Tape - Output

Tapes 1 and 2, created in BUFTP, contain the LSAR functional group code and provisioning data for the US ROLAND system. EXTAPE requires data input giving the type of file containing the variable to be extracted and a description of the variable and its location on the file. The option is available of reading the input data from cards or from a disk file, Tape 3. For a description of the variable to be extracted by EXTAPE refer to Table I. EXTAPE creates two disk files, Tape 9 and Tape 10, containing the extracted data information. The two files are written in the same sequence as the original LSAR tapes, that is FGC sequence for the A file and part number sequence for the H file.

2.3 Parts File Sort (SORTMRG)

SORTMRG is a CDC supplied software program and is a function of job control language as described in paragraph 2.6. Tape 10, containing the extracted H

tape data is sorted into FGC sequence to conform to the order of the A file. Data cards are required to describe the sort order. Tape 11, is the sorted H tape file produced by SORTMRG.

2.4 File Merge (MRGFLS)

The routine MRGFLS treats the A file as the master file and the sorted H file as the transaction file, merging the two and creating a ROLOG Master Data Base File (work file). The file assignments utilized in MRGFLS are as follows:

Tape 6	Printer
Tape 9	A Tape - Input
Tape 11	Sorted H Tape - Input
Tape 20	ROLOG Master Data Base - Output

MRGFLS produces four tabular report files described as follows:

Tape 31	Control File Report lists task and support equipment for each FGC.
Tape 32	Part No. Report, Part 1 contains dimension and weight data, quantity installed, unit price, washout rate, essentially and source maintenance and recoverability code.
Tape 33	Part No. Report, Part 2 contains the maintenance task distribution, repair turnaround time, and the maintenance factor.
Tape 34	Supplementary Report lists part number name, generic code and miscellaneous data.

One data card input is required to determine which reports are required. Examples of each report are illustrated in Figures 2 thru 5.

2.5 Data Base Build Input Formats

As the data base build is comprised of four independent routines, one of which (BUFTP) is run twice, and a CDC software program (SORTMRG), separators must occur between data decks pertaining to different routines. The separator, a multi-punch 7/8/9, is herein, referred to as a terminator.

DATA BASE REPORT
CONTROL FILE REPORT

K
I
C
C SMME

ISO

FGC	PART NUMBER	NAME	TASK SEQ TASK	TFR	XMET	SSC	MHR	EQ SEQ SMPN	ISO
02A03ACAD	11517810	VIDAMP GEN TMG	1 HGFXXYA	.07	.36	827710	.36	1 14364100 2 15076	1 1
02A03ACADA	11517813	CKT CD ASSY AMP	1 HGFXXYA	.04	.36	827710	.36	1 14364100 2 15076	1 1
02A03ACAE	11515904	GATING CNT SWF	1 HGFXXYA	.07	.36	827710	.36	1 14364100 2 15076	1 1
02A03ACAEA	11515900	CKT CD ASSY GAT	1 HGFXXYA	.05	.36	827710	.36	1 14364100 2 15076	1 1
02A03ACAF	11515912	MISSILE CSPLY GE	1 HGFXXYA	.05	.36	827710	.36	1 14364100 2 15076	1 1
02A03ACAFAA	11515914	CKT CD ASSY MSL	1 HGFXXYA	.09	.36	827710	.36	1 14364100 2 15076	1 1
02A03ACAG	11515920	INTRG IFF	1 HGFXXYA	.06	.36	827710	.36	1 14364100 2 15076	1 1
02A03ACAGAA	11515922	CKT CD ASSY IFF	1 HGFXXYA	.01	.36	827710	.36	1 14364100 2 15076	1 1
02A03ACAH	11515926	SNP GEN CLAMP	1 HGFXXYA	.01	.36	827710	.36	1 14364100 2 15076	1 1
02A03ACAHAA	11515930	CKT CD ASSY SWF	1 HGFXXYA	.03	.36	827710	.36	1 14364100 2 15076	1 1
02A03ACAI	11515935	GEN REF 1 SIG	1 HGFXXYA	.01	.36	827710	.36	1 14364100 2 15076	1 1
02A03ACAI1A	11515941	CKT CD ASSY GEN	1 HGFXXYA	.01	.36	827710	.36	1 14364100 2 15076	1 1
02A03ACAJ	11517815	DRIVEP 50C MZ	1 HGFXXYA	.01	.36	827710	.36	1 14364100 2 15076	1 1
02A03ACAJA	11517822	CKT CD ASSY ADA	1 HGFXXYA	.01	.36	827710	.36	1 14364100 2 15076	1 1
02A03ACAK	11515947	PAR SPLY HV	1 HGFXXYA	.01	.36	827710	.36	1 14364100 2 15076	1 1
02A03ACAKAA	11516673	CKT CD ASSY AMF	1 HGFXXYA	.01	.36	827710	.36	1 14364100 2 15076	1 1
02A03ACAKAA	11516669	AMPL CAS HV PWR	1 HGFXXYA	.01	.36	827710	.36	1 14364100 2 15076	1 1
02A03ACAKAB	11515951	CKT CD ASSY PWR	1 HGFXXYA	.01	.36	827710	.36	1 14364100 2 15076	1 1
02A03ACAL	11516624	CHASSIS FPI ASS	1 HGFXXYA	.01	.36	827710	.36	1 14364100 2 15076	1 1
02A03AD	11517794	MCUSING. SUPPORT	1 HGFXXYA	.01	.36	827710	.36	1 14364100 2 15076	1 1
02A03AE	11517806	PLATE ICENT	1 HGFXXYA	.01	.36	827710	.36	1 14364100 2 15076	1 1
02A04	11518241	TRANSFORMER.50	1 HGFXXYA	.01	.36	827710	.36	1 14364100 2 15076	1 1
02A04AP	11518251	COVER ASSY	1 HGFXXYA	.01	.36	827710	.36	1 14364100 2 15076	1 1
02A04AC	11518242	SEAL.COVER ASSY	1 HGFXXYA	.01	.36	827710	.36	1 14364100 2 15076	1 1
02A04AD	11518243	SCREW CAPTIVE	1 HGFXXYA	.01	.36	827710	.36	1 14364100 2 15076	1 1
02A04AE	335-220	C-RING	1 HGFXXYA	.01	.36	827710	.36	1 14364100 2 15076	1 1
02A04AF	11518244	RSHG. I SLP XFMR	1 HGFXXYA	.01	.36	827710	.36	1 14364100 2 15076	1 1
02A04AG	4261100-122	SCREW. SLTD PAN	1 HGFXXYA	.01	.36	827710	.36	1 14364100 2 15076	1 1
02A04AH	41-100-17	WASHER. F IAIN	1 HGFXXYA	.01	.36	827710	.36	1 14364100 2 15076	1 1
02A04AI	330-999	CAP. PROTECTIVE	1 HGFXXYA	.01	.36	827710	.36	1 14364100 2 15076	1 1
02A04AJ	4100100-332	CLIP CIRCLE	1 HGFXXYA	.01	.36	827710	.36	1 14364100 2 15076	1 1

2 ADAPTER
1 MULTIS.DIG.
1 MR.ROX AND OE.18MM
1 KEY.SKT HD SCR
1 DOLLY.LOW PROFILE
1 SCOR.FLT TIP 1/4
2 CONTROL UNIT(2RC)
2 TESTER UNIT(2RA)
2 POWER SUPPLY(2RB)
2 CABLE SET
1 MULTIMETER.DIGITAL

Figure 2

FGC	PART NUMBER	LENGTH	WDM	WGHT	VOLP	WTUP	WTP	IOE1	SMRC	L	I	UPR	UPRC	UPM	WRR
B2FUAAAFJE	SC06125-75	0.3	0.6	0.3	0.38	0.00	0.00	0	PAFZZA	7	1	6	22.00		0.00
B2FUAAAFJN	11543964	0.3	0.6	0.3	0.38	0.00	0.00	0	PAFZZA	7	1	6	339.00		0.00
B2FUAAAFJN	PA12-8/1211	0.0	0.0	0.0	0.00	0.00	0.00	54	PAFZZA	1	7	6	1.50		0.00
B2PUBAFJQ	35522-2380	0.0	0.0	0.0	0.00	0.00	0.00	48	PAFZZA	3	1	4	1.75		0.00
B2FUAAAFJP	R32-14/2011.5	0.3	0.6	0.3	0.38	0.00	0.00	4	PAFZZA	7	1	6	28.20		0.00
B2PUBAFJQ	99029-2398	0.0	0.0	0.0	0.00	0.00	0.00	4	PAFZZA	3	1	4	1.75		0.00
B2FUAAAFJS	M8X2-NFE27161ATU	0.3	0.6	0.3	0.38	0.00	0.00	14	PAFZZA	3	1	4	1.20		0.00
B2FUAAAFJT	J8-N01M679883C	0.3	0.6	0.3	0.38	0.00	0.00	0	PAOZZA	3	1	4	1.18		0.00
B2FUAAAFJU	11533981	0.3	0.6	0.3	0.38	0.00	0.00	0	PAFFD	1	12	14691.00			0.05
B2PUBAFJVI	M8X201Y92-6080	0.3	0.6	0.3	0.38	0.00	0.00	0	PAFZZA	3	1	4	0.00		0.00
B2FUAAAFJW	S3C80PLT00P41612	0.3	0.6	0.3	0.38	0.00	0.00	0	PAOZZA	3	1	4	0.03		0.00
B2PUBAFJXI	11533942	0.0	0.0	0.0	0.00	0.00	0.00	0	TOPZZA	3	1	5	71.00		0.00
B2FUAAAFJY	M8X450IN31.2-8.88	0.3	0.6	0.3	0.38	0.00	0.00	0	PAOZZA	7	1	4	0.02		0.00
B2FUAAAFJZ	S5C80PLT00P41612	0.3	0.6	0.3	0.38	0.00	0.00	0	PAOZZA	3	1	4	0.15		0.00
B2FUAAAFKA	11533943	0.3	0.6	0.3	0.38	0.00	0.00	0	PAOFFA	1	12	4714.00			0.05
B2PUBAFK2	11533943	0.0	0.0	0.0	0.00	0.00	0.00	0	TOPZZA	3	1	5	71.00		0.00
B2FUAAAFK2	11533946	0.3	0.6	0.3	0.38	0.00	0.00	0	PAFZZA	3	1	5	9.50		0.00
B2PUBAFK2	7131-62865-8-1.2	0.3	0.6	0.3	0.38	0.00	0.00	0	PAFZZA	7	1	5	0.18		0.00
B2FUAAAFK2	11533947	0.3	0.6	0.3	0.38	0.00	0.00	0	PAFZZA	7	1	5	19.00		0.00
B2PUBAFK2	M828775-792	0.0	0.0	0.0	0.00	0.00	0.00	0	PAFZZA	7	1	5	1.20		0.00
B2FUAAAFK2	11533938	0.3	0.6	0.3	0.38	0.00	0.00	0	LOOZZA	3	1	4	233.00		0.00
B2PUBAFK2	M828775-792	0.0	0.0	0.0	0.00	0.00	0.00	0	PAFZZA	7	1	5	1.20		0.00
B2FUAAAFK2	11533937	0.3	0.6	0.3	0.38	0.00	0.00	0	PAOZZA	3	1	6	292.00		0.00
B2PUBAFK2	M828775-792	0.0	0.0	0.0	0.00	0.00	0.00	0	PAFZZA	7	1	4	1.20		0.00
B2FUAAAFK2	11545881	0.3	0.6	0.3	0.38	0.00	0.00	0	PAFZZA	3	1	5	9.50		0.00
B2PUBAFK2	281-2014472	0.0	0.0	0.0	0.00	0.00	0.00	0	PAOZZA	7	1	5	0.22		0.00
B2FUAAAFK2	11533939	0.3	0.6	0.3	0.38	0.00	0.00	0	PAFZZA	7	1	5	32.00		0.00
B2PUBAFK2	11533987	0.0	0.0	0.0	0.00	0.00	0.00	0	PAFZZA	7	1	5	38.00		0.00
B2FUAAAFK2	11533941	0.3	0.6	0.3	0.38	0.00	0.00	0	PAFZZA	7	1	5	118.00		0.00
B2PUBAFK2	11533946	0.0	0.0	0.0	0.00	0.00	0.00	0	PAFZZA	7	1	5	13.00		0.00
B2FUAAAFK2	11533935	0.3	0.6	0.3	0.38	0.00	0.00	0	PAFZZA	7	1	5	442.00		0.00
B2PUBAFK2	11533948	0.0	0.0	0.0	0.00	0.00	0.00	0	TOPZZA	3	1	5	39.00		0.00
B2FUAAAFK2	S3C80PLT00P41612	0.3	0.6	0.3	0.38	0.00	0.00	0	PAOZZA	3	1	4	0.03		0.00
B2PUBAFK2	11534049	0.0	0.0	0.0	0.00	0.00	0.00	0	LOGZZA	7	1	5	40.00		0.00
B2FUAAAFK2	95817-66-2888	0.3	0.6	0.3	0.38	0.00	0.00	0	PAOZZA	7	1	5	1.60		0.00
B2PUBAFK2	11534927	0.0	0.0	0.0	0.00	0.00	0.00	0	PAOZZA	7	1	6	356.00		0.00
B2FUAAAFK2	M828775-233	0.3	0.6	0.3	0.38	0.00	0.00	0	PAFZZA	7	1	4	0.02		0.00
B2PUBAFK2	11533927	0.0	0.0	0.0	0.00	0.00	0.00	0	PAFZZA	7	1	5	76.00		0.00
B2FUAAAFK2	M8X103IN31.2-8.88	0.3	0.6	0.3	0.38	0.00	0.00	0	PAOZZA	3	1	4	0.00		0.00
B2PUBAFK2	S5C80PLT00P41612	0.0	0.0	0.0	0.00	0.00	0.00	0	PAOZZA	3	1	4	0.00		0.00
B2FUAAAFK2	11533508	0.3	0.6	0.3	0.38	0.00	0.00	0	LOOZZA	3	1	5	186.00		0.00
B2PUBAFK2	11534829	0.0	0.0	0.0	0.00	0.00	0.00	0	PAOZZA	7	1	5	19.00		0.00
B2FUAAAFK2	11533936	0.3	0.6	0.3	0.38	0.00	0.00	0	PAOZZA	3	1	5	163.00		0.00
B2PUBAFK2	M8X103IN31.2-8.88	0.3	0.6	0.3	0.38	0.00	0.00	0	PAFZZA	7	1	4	0.03		0.00
B2FUAAAFK2	S5C80PLT00P41612	0.0	0.0	0.0	0.00	0.00	0.00	0	PAFZZA	7	1	4	0.35		0.00
B2PUBAFK2	11534925	0.0	0.0	0.0	0.00	0.00	0.00	0	PAFZZA	7	1	5	233.00		0.00
B2FUAAAFK2	M828775-151	0.3	0.6	0.3	0.38	0.00	0.00	0	PAFZZA	7	1	6	0.00		0.00
B2PUBAFK2	S5C80PLT00P41612	0.0	0.0	0.0	0.00	0.00	0.00	0	PAFZZA	7	1	5	0.00		0.00
B2FUAAAFK2	11534556	0.3	0.6	0.3	0.38	0.00	0.00	0	TOPZZA	7	1	5	64.00		0.00
B2PUBAFK2	M828775-349	0.0	0.0	0.0	0.00	0.00	0.00	0	PAFZZA	7	1	5	1.05		0.00

Figure 3

THIS PAGE IS PART QUALITY PROGRAM
FOR PART NUMBER 11533935

REC	PART NUMBER	NAME	ILNGTH	DATE	SEQ	GRNG	CLASS
02A01A9AA	11516230	CKT CD ASSY TUM	50	06/01/70	0	0	M
02A01A9B	11517002	CONV PCVP XMT	62	06/01/70	0	0	M
02A01ACAA	11517005	CONV PCVP SUBASSY	50	06/01/70	0	0	M
02A01ACAB	11517119	MIXED XMT	50	06/01/70	0	0	M
02A01AD	11517119	MOD XMT/REC	62	06/01/70	0	0	M
02A01ADAA	11517116	KEYING SUBASSY XMT	50	06/01/70	0	0	M
02A01ADAT	11517122	MON FEED PWR XMT	62	06/01/70	0	0	M
02A01ADAA	11517125	MONITOR PWR XMT	50	06/01/70	0	0	M
02A01ADAJ	11517170	CONTROL V4TF	62	06/01/70	0	0	M
02A01ADAJA	11517173	CONT SUBASSY XMT	50	06/01/70	0	0	M
02A01AK	11517150	ENCL FLEC FOST	50	06/01/70	0	0	M
02A01AL	11517178	POWER, PWR	50	06/01/70	0	0	M
02A01AM	4100116-1F7	SPRM, SLTD PAN MM	50	06/01/70	0	0	M
02A01AN	4100116-27	WASHER, SPRING	50	06/01/70	0	0	M
02A01AO	4101114-160	SPRM, SLTD PAN MD	50	06/01/70	0	0	M
02A01AP	4100116-20	WASHER, SPRING	50	06/01/70	0	0	M
02A01AQ	4100117-1F2	SPRM, SLTD PAN MM	50	06/01/70	0	0	M
02A01AR	11540723	SPARE, SPRM	50	06/01/70	0	0	M
02A01AS	11569220	PLATE, CHPT MT	50	06/01/70	0	0	M
02A01AT	4100116-30	WASHER, PLAIN	50	06/01/70	0	0	M
02A01AU	11560200	SPRM, CAPTIVE	50	06/01/70	0	0	M
02A01AV	4100116-54	SPRM, SLTD PAN MD	50	06/01/70	0	0	M
02A01AW	4100116-54	WASHER, SPRING	50	06/01/70	0	0	M
02A01AX	3700-74	CABLE ASSEMBLY	74	06/01/70	0	0	M
02A01AY	3301-50E	CABLE ASSEMBLY	74	06/01/70	0	0	M
02A01AZ	3701-777	CABLE ASSEMBLY	74	06/01/70	0	0	M
02A01A	3701-504	CABLE ASSEMBLY	74	06/01/70	0	0	M
02A01B	3700-74	CABLE ASSEMBLY	74	06/01/70	0	0	M
02A01C	3700-74	CABLE ASSEMBLY	74	06/01/70	0	0	M
02A01D	3700-74	CABLE ASSEMBLY	74	06/01/70	0	0	M
02A01E	3701-504	CABLE ASSEMBLY	74	06/01/70	0	0	M
02A01F	3700-74	CABLE ASSEMBLY	74	06/01/70	0	0	M
02A01G	3700-74	CABLE ASSEMBLY	74	06/01/70	0	0	M
02A01H	1574504-5	MEAL, RANGER	50	06/01/70	0	0	M
02A01I	1574507-1	MEAL, RANGER	50	06/01/70	0	0	M
02A01J	11560700	CAP PROTECTIVE	50	06/01/70	0	0	M
02B02	1151700F	RECEIVER, SURV RDP	300	06/01/70	0	0	M
02A02A	1151700	FRAME, PROTECTIVE	74	06/01/70	0	0	M
02A02AB	1151701	FLTR A MINUS V	50	06/01/70	0	0	M
02A02ABAB	1151723	PLATE MOUNTING	50	06/01/70	0	0	M
02A02ABAC	1151674-2	SPRM, PANHEAF	50	06/01/70	0	0	M
02A02ABAD	3700-80E	CAP, PROTECTIVE	50	06/01/70	0	0	M
02A02ABAE	3701-1	CAP, PROTECTIVE	50	06/01/70	0	0	M
02A02ABAF	1151657	WASHER, SHLD	50	06/01/70	0	0	M
02A02ABC	1151700	OSCILLATOR, CONT XMT	62	06/01/70	0	0	M
02A02ABCA	1151742	HOUSING, CCR	50	06/01/70	0	0	M
02A02ABCAA	1151706	MSG SUBASSY NCR	50	06/01/70	0	0	M
02A02ABCAAB	1151700	AMPLIFIED OSC	50	06/01/70	0	0	M
02A02ABCAAC	1151702	CKT CD ASSY AMPL	50	06/01/70	0	0	M
02A02ABCAAD	1151044	CC CHANNEL 12	62	06/01/70	0	0	M

Figure 5

2.5.1 BUFTP Input Format

The data input for BUFTP describes the record type and the length in characters of a record contained on the LSAR tape. Each run must have a Tape Identifier indicating 1 for the A Tape and 2 for the H Tape run. The Print Switch determines if an unformatted dump of the data base is required. An entry of 0 indicates the dump is to be printed, 1 indicates suspend printing. A terminator (7/8/9) must occur between A Tape and H Tape data decks as BUFTP is run separately for each LSAR tape.

BUFTP A TAPE (LSAFU03M)

Card	Column	Variable	Format	Justification
1	1-2	Tape Identifier	I2	Right
	3-4	Print Switch	I2	Right
2-6	1-10	Record Type	A10	Left
	11-20	Record Length	I10	Right
7	1	Terminator (7/8/9)	Multi-punch	Left

Card	Column	Variable	Format	Justification
1	1-2	Tape Identifier	I2	Right
	3-4	Print Switch	I2	Right
2-6	1-10	Record Type	A10	Left
	11-20	Record Length	I10	Right
7	1	Terminator (7/8/9)	Multi-punch	Left

BUFTP H TAPE (LSAPU08M)

Card	Column	Variable	Format	Justification
1	1-2	Tape Identifier	I2	Right
	3-4	Print Switch	I2	Right
2-6	1-10	Record Type	A10	Left
	11-20	Record Length	I10	Right
4	1	Terminator (7/8/9)	Multi-punch	Left

Card	Column	Variable	Format	Justification
1	1-2	Tape Identifier	I2	Right
	3-4	Print Switch	I2	Right
2-6	1-10	Record Type	A10	Left
	11-20	Record Length	I10	Right
4	1	Terminator (7/8/9)	Multi-punch	Left

TABLE I. EXTAPE Data Cards for ROLAND

Subsystem to be processed = ALL

HI

1	2	A2	Type
3	18	A10,A6	XMPN
58	76	A10,A9	XNME
256	259	F4.1	XLNTH
260	263	F4.1	WDTH
264	267	F4.1	HGHT
268	269	A2	LWHCD
270	275	F6.1	WTUP
276	277	A2	WTCB
295	299	F5.0	IQEI
304	309	A6	SMRC
310	310	A1	LSSE
311	312	F2.0	PLT
319	328	F10.2	UPRC
329	329	A1	UPM
412	416	F5.2	XMMR
435	437	F3.1	XMTDOC
438	440	F3.1	XMTDFC
441	443	F3.1	XMTDHC
444	446	F3.1	XMTDDC
447	449	F3.1	XMTDOO
450	452	F3.1	XMTDFO
453	455	F3.1	XMTDHO
456	458	F3.1	XMTDDO
459	461	F3.0	TATOC
462	464	F3.0	TATFC
465	467	F3.0	TATHC
468	470	F3.0	TATDC
471	473	F3.0	TATOO
474	476	F3.0	TATFO
477	479	F3.0	TATHO
480	482	F3.0	TATDO

ENDH1

EXTAPE Data Cards (continued)

H9

1	2	A2	TYPE
3	18	A10,A6	XMPN
19	29	A10,A1	FGC
69	73	F5.0	QPNHA
74	77	F4.0	XMFC

ENDH9

A1

1	2	A2	TYPE
3	13	A10,A1	FGC
81	99	A10,A9	XNME
130	145	A10,A6	XMPN

ENDA1

C4

1	2	A2	TYPE
3	13	A10,A1	FGC
14	20	A7	TASK
37	41	F5.2	TFR
43	47	F5.2	XMET(1)
48	52	F5.2	XMET(1)
53	57	F5.2	XMET(1)
59	66	A8	SSC
70	74	F5.2	XMMR(1)
75	79	F5.2	XMHR(2)
80	84	F5.2	XMHR(3)

ENDC4

D7

1	2	A2	TYPE
3	13	A10,A1	FGC

EXTAPE Data Cards (continued)

D7

21	36	A10,A6	SMPN
37	37	A1	XICC
38	56	A10,A9	SNME
57	60	F4.0	ISQPT

ENDD7

2.6 Data Base Build Job Control Language

The job control language in the Data Base build is as follows:

	COMMENTS
LIMIT(4000)	
ATTACH,OLD,PRBATEMP, ID=PRWALT, CY=200.	
REQUEST(TAPE12, HY) SCRATCH	New 7 Track A Tape
COPYBF(OLD, BUF)	
COPYBF(OLD, EX)	
COPYBF(OLD, MRG)	
REQUEST(TAPE20, PE, S, EB, E) LIB. NO.	9 Track LSAR A Tape
BUF(PL=77777)	Execute BUFTP for A Tape
UNLOAD(TAPE20)	
UNLOAD(TAPE12)	
REQUEST(TAPE12, HY) SCRATCH	New 7 Track H Tape
REQUEST(TAPE20, PE, S, EB, E) LIB. NO.	9 track LSAR H Tape
BUF(PL=77777)	Execute BUFTP for H Tape
RETURN(TAPE20)	
RETURN(TAPE6)	
RETURN(BUF)	
*ATTACH,TAPE3, PERMANENT FILE NAME, ID=NAME, CY=CYCLE.	Optional Input File
REQUEST(TAPE9, *PF)	A Tape file output
REQUEST(TAPE10, *PF)	Unsorted H Tape file output
FILE(TAPE10, BT=I, RT=W, MRL=500)	
FILE(TAPE11, BT=I, RT=W, MRL=500)	
LDSET(FILES=TAPE10)	
EX(PL=77777)	Execute EXTAPE
RETURN(TAPE1)	Input of A Tape created by BUF
RETURN(TAPE2)	Input of H Tape created by BUF
RETURN(TAPE3)	Optional Input File
RETURN(EX)	
LDSET(FILES=TAPE10, TAPE11)	Tape 10 is sorted onto Tape 11
SORTMRG	Execute SORTMRG
RETURN(TAPE10)	
REQUEST(TAPE20, *PF)	
LDSET(FILES=TAPE11)	Sorted H Tape
MRG(PL=77777)	Execute MRGFLS
ATTACH, A, PRLSAR, ID=PRTACRAC, CY=3.	A = Old ROLOG Data Base File
PURGE(A)	
RETURN(A)	
CATALOG, TAPE20, PRLSAR, ID=PRTACRAC, CY=003.	New ROLOG Data Base File
EXIT(U)	
RETURN(TAPE11)	Sorted H Tape file
RETURN(TAPE9)	A Tape file
RETURN(MRG)	
REWIND, TAPE31, TAPE32, TAPE33, TAPE34.	Tabular Report Tapes
COPYCF(TAPE31, OUTPUT)	Control File
COPYCF(TAPE32, OUTPUT)	Part No. Report, Part 1
COPYCF(TAPE33, OUTPUT)	Part No. Report, Part 2
COPYCF(TAPE34, OUTPUT)	Supplementary Report
EXIT.	

Data Build Job Control Language (continued)

DMP(1000000)

COPYCF(TAPE31,OUTPUT)

COPYCF(TAPE32,OUTPUT)

COPYCF(TAPE33,OUTPUT)

COPYCF(TAPE34,OUTPUT)

7/8/9

BUFTP DATA

A Tape

7/8/9

BUFTP DATA

H Tape

7/8/9

EXTAPE DATA

7/8/9

SORTMRG DATA

7/8/9

MRGFLS DATA

7/8/9

6/7/8/9

- * Eliminate the ATTACH of Tape 3, the optional input file, from the job control stream if data for EXTAPE is being put in through cards

3.0 ROLOG DATA BASE UPDATE

To permit correction of data errors detected in the LSAR data, and to allow for testing alternatives, a means of updating the ROLOG data base is required. Two distinct computer routines and the CDC supplied software routine, SORTMRG, run as one program comprise the ROLOG data base update. A flow diagram of the Update Program is shown in Figure 6 and is described in the following paragraphs.

3.1 Main Update (MAINUD)

The MAINUD routine utilizes input data cards to build two transaction files with which to update the data base. The file assignments referenced in Update job control language, paragraph 3.5, are as follows:

Tape 5	Card reader
Tape 6	Printer
Tape 14	DIM transaction file - Output
Tape 15	RVRM transaction file - Output

Tape 14 contains Delete, Insert or Modify transaction codes as they will only be performed against a single FGC record in the data base. Tape 15 contains Replace-Value and Replace-Multiply transaction codes, as this data is used to update all records in the data base. MAINUD prints a transaction file and a transaction listing with any associated error messages.

3.2 Sort of DIM file (SORTMRG)

The CDC supplied program SORTMRG, sorts the DIM transaction file created by MAINUD into FGC order. Data cards are input to describe the sort which uses the FGC as the primary key and the transaction code as the secondary key. The sorted transaction file produced by SORTMRG is Tape 16.

3.3 Update Data Base (UPDB)

UPDB utilizes the ROLOG Date Base File as the master file and the two transaction files created by MAINUD as secondary files to produce the updated data base. The transaction files are bumped against the master file to delete, insert, or modify individual records and to replace data in all data base records. The UPDB file assignments referenced in Update job control language, paragraph 3.5 are as follows:

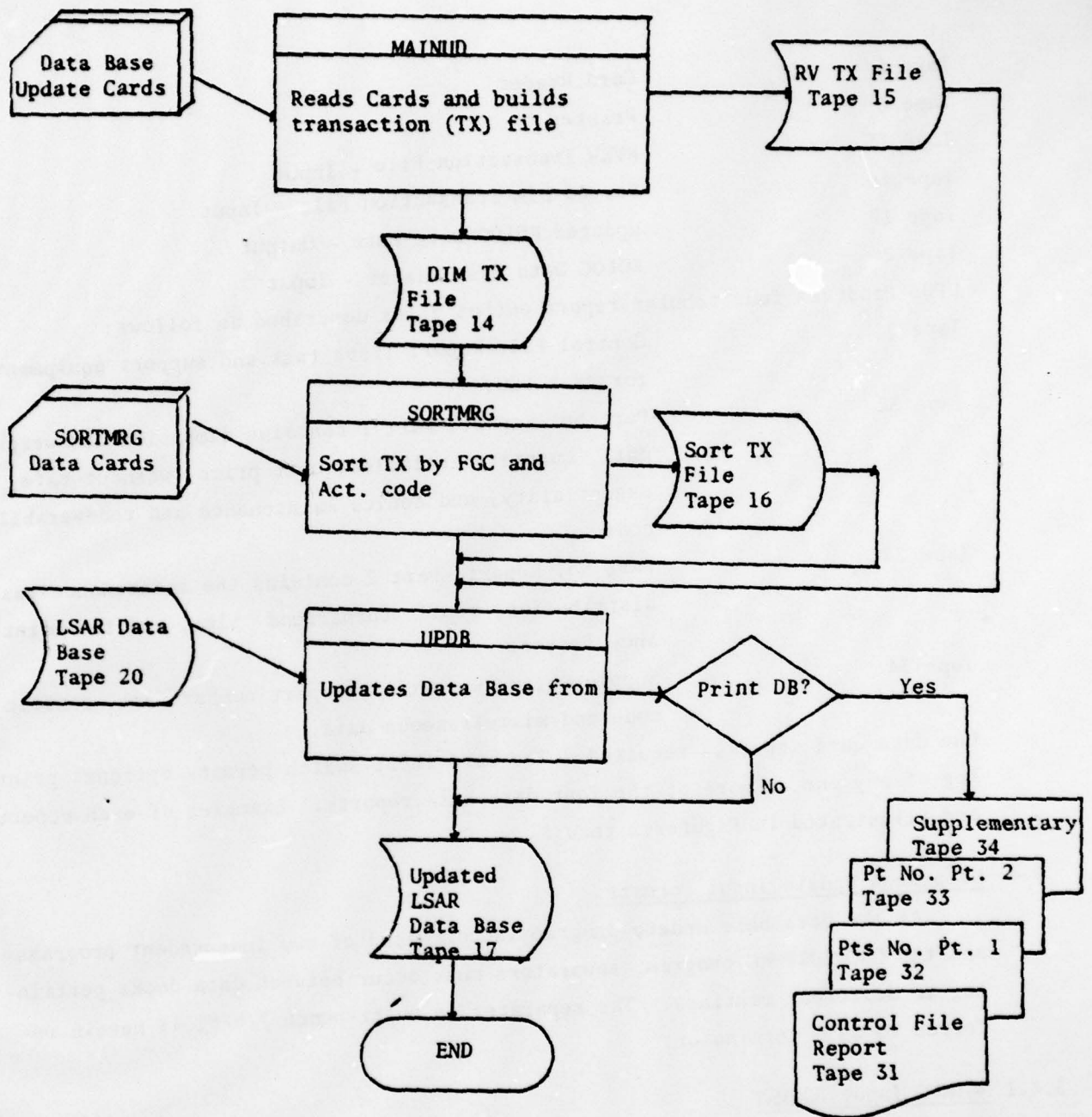


Figure 6. Data Base Update Flow Diagram

Tape 5	Card Reader
Tape 6	Printer
Tape 15	RVRM Transaction File - Input
Tape 16	Sorted DIM Transaction File - Input
Tape 17	Updated ROLOG Data Base - Output
Tape 20	ROLOG Data Base Master - Input

UPDB Produces four tabular report output files described as follows:

Tape 31	Control File Report lists task and support equipment for each FGC.
Tape 32	Part No. Report, Part 1 contains dimension and weight data, quantity installed, unit price, washout rate, essentiality, and source maintenance and recoverability code.
Tape 33	Part No. Report, Part 2 contains the maintenance task distribution, repair turnaround time, and the maintenance factor.
Tape 34	Supplementary Report lists part number name, generic code and miscellaneous data.

One data card input is required. The card input switch permits optional printing of any one or more of the four data base reports. Examples of each report are illustrated in Figures 2 thru 5.

3.4 Data Base Update Input Formats

As the data base update program is comprised of two independent programs and the CDC SORTMRG program, separators must occur between data decks pertaining to different routines. The separator, a multi-punch 7/8/9, is herein referred to as a terminator.

3.4.1 MAINUD Input FORMAT

Data cards are used in MAINUD to build the DIM and RV-RM transaction files. The data cards contain the transaction code, the FGC where needed, field numbers of the values to be changed, the new value and a field code as applicable.

Transaction keys used in MAINUD are as follows:

D	DELETE	To delete an entire record (FGC)
I	INSERT	To insert a new record into the file
M	MODIFY	To change value of a field on an existing record. Currently, this key can only be used on fields 2 through 46.
RM	REPLACE VALUE BY MULTIPLICA- TION	To change the value in a field by applying a fixed multiplier to all records in the file.
RV	REPLACE WITH A FIXED VALUE	To replace the current value of the field, on all records, with a fixed value.

If the transaction code is I and tasks and equipment are to be inserted, a card with a field code in column one must immediately precede each task and/or equipment. The field code for a task is T and for equipment is E. The RM or RV keys allow the user the option of replacing all values in the field with a fixed value or of replacing the value only if it is a specific value (ie: replacing only blank filled fields with a default value). Field location of each data base variable is shown in Table II. Data cards for MAINUD are prepared as follows:

<u>Card</u>	<u>Column</u>	<u>Variable</u>	<u>Format</u>	<u>Remarks</u>
1	1-2	Transaction Key	A2	
	11-30	FGC	A10,A1	Blank if transaction key = RM or RV
2	1-10	Field Numbers		Separate multiple fields with commas
	11-80	Value		Separate values with commas. If transaction key = RM or RV, the first value is the new value or multiplier and the second, if present, is the only value to be replaced (limit one field per card for RM or RV)
N	1-10	Field Code	A1	T if preceding task input and E if preceding equipment input. New card for each task and equipment being inserted.
N+1	1	Terminator (7/8/9)		

TABLE II Master Data Base Layout

Field	Variable Name	Word Number	Number of Words	Format	Source
1	FGC	1,2	2	A10,A1	A1 or H9
2	XMPN	3,4	2	A10,A6	A1 or H9
3	XNME	5,6	2	A10,A9	A1 or H9
4	ILNGTH	7	1	I10	Calc.
5	DATE	8	1	A10	Calc.
6	FILLER	9	1		
7	GNRC	10	1	A5	Card
8	XISQ	11	1	A1	Card
9	H-B IDENT.	12	1	A3	Calc.
10	FILLER	13	1		
11	FILLER	14	1		
12	FILLER	15	1		
13	FILLER	16	1		
14	XLNTH	17	1	F4.1	H1
15	WDTH	18	1	F4.1	H1
16	HGHT	19	1	F4.1	H1
17	VOLP	20	1	F5.2	Calc.
18	WTUP	21	1	F6.2	H1
19	WTP	22	1	F6.2	Calc.
20	QEI	23	1	F5.0	H1
21	SMRC	24	1	A6	H1
22	ESSE	25	1	F2.0	H1
23	RPS	26	1	A1	H1
24	PLT	27	1	F3.0	H1
25	UPRC	28	1	F10.2	H1
26	UPM	29	1	A1	H1
27	XMMR	30	1	F5.2	H1
28	XMTD(1,1)	31	1	F3.2	H1
29	XMTD(2,1)	32	1	F3.2	H1
30	XMTD(3,1)	33	1	F3.2	H1
31	XMTD(4,1)	34	1	F3.2	H1

TABLE II Master Data Base Layout (Continued)

Field	Variable Name	Word Number	Number of Words	Format	Source
32	XMTD(1,2)	35	1	F3.2	H1
33	XMTD(2,2)	36	1	F3.2	H1
34	XMTD(3,2)	37	1	F3.2	H1
35	XMTD(4,2)	38	1	F3.2	H1
36	TAT(1,1)	39	1	F4.0	H1
37	TAT(2,1)	40	1	F4.0	H1
38	TAT(3,1)	41	1	F4.0	H1
39	TAT(4,1)	42	1	F4.0	H1
40	TAT(1,2)	43	1	F4.0	H1
41	TAT(2,2)	44	1	F4.0	H1
42	TAT(3,2)	45	1	F4.0	H1
43	TAT(4,2)	46	1	F4.0	H1
44	QPNHA	47	1	F5.0	H9
45	XMFC	48	1	F4.0	H9
46	XMFC	49	1	F4.0	Calc.
47	ITASK	50	1	I10	Calc.
48	TASK	51	1	A7	C4
49	TFR	52	1	F5.2	C4
50	XMET	53	1	F5.2	C4
51	SSC	54	1	A8	C4
52	XMHR	55	1	F6.2	C4
53	IEQUIP	56	1	I10	Calc.
54	SMPN	57,58	2	A10,A6	D7
55	XICC	59	1	A1	D7
56	SNMH	60,61	2	A10,A9	D7
57	SQPT	62	1	F5.0	D7

3.4.2 SORTMRG INPUT FORMAT

The primary sort key is the twenty character FGC. The secondary sort key is the one character transaction code. SORTMRG data input cards are as follows starting in column 1.

Card

- 1 SORT
- 2 FILE, INPUT=TAPE14 (R) ,OUTPUT=TAPE16 (CR)
- 3 FIELD,FGC (1,20,DISPLAY)
- 4 FIELD,ACT (31,1,DISPLAY)
- 5 KEY,FGC (A,COBOL6)
- 6 KEY,ACT (A,COBOL6)
- 7 END
- 8 TERMINATOR (7/8/9)

1	SORT
2	FILE, INPUT=TAPE14 (R) ,OUTPUT=TAPE16 (CR)
3	FIELD,FGC (1,20,DISPLAY)
4	FIELD,ACT (31,1,DISPLAY)
5	KEY,FGC (A,COBOL6)
6	KEY,ACT (A,COBOL6)
7	END
8	TERMINATOR (7/8/9)

3.4.3 UPDB INPUT FORMAT

The single data card required for UPDB uses four I2 words, right justified, to exercise the option of printing any one or more of the four data base reports. 01 indicates print and 00 indicates suspend printing. The positions are as follows.

Card	Column	Report
1	1-2	Control File Report
	3-4	Parts Number Report, Part 1
	5-6	Parts number Report, Part 2
	7-8	Supplementary Report
2	1	Terminator (7/8/9)

01010000

3.5 Data Base Update Job Control Language

LIMIT(4000)
ATTACH(OBIN,PRBATEMP,ID=PRWALT,CY=200)
COPYBF(OBIN,BUFTP)
COPYBF(OBIN,EX)
COPYBF(OBIN,MRGFLS)
COPYBF(OBIN,MAINUD)
COPYBF(OBIN,UPDB)
FILE(TAPE14,BT=1,RT=W,MRL=1000)
FILE(TAPE16,BT=1,RT=W,MRL=1000)
LDSET(FILES=TAPE14)
MAINUD(PL=77777)
REWIND(TAPE14)
LDSET(FILES=TAPE14/TAPE16)
SORTMRG
REWIND,TAPE16.
REQUEST(TAPE17,*PF)
ATTACH(TAPE20,PRLSAR,ID=PRTACRAC,CY=003.
LDSET(FILES=TAPE16)
UPDB(PL=77777)
PURGE,TAPE20.
RETURN,TAPE20.
CATALOG,TAPE17,PRLSAR,ID=PRTACRAC,CY=003.
REWIND(TAPE31,TAPE32,TAPE33,TAPE34)
COPYCY(TAPE31,OUTPUT)
COPYCY(TAPE32,OUTPUT)
COPYCF(TAPE33,OUTPUT)
COPYCF(TAPE34,OUTPUT)
EXIT.
DMP(100000)
COPYCF(TAPE31,OUTPUT)
COPYCF(TAPE32,OUTPUT)
COPYCF(TAPE33,OUTPUT)
COPYCF(TAPE34,OUTPUT)
7/8/9
MAINUD DATA
7/8/9
SORT
FILE,INPUT=TAPE14(R),OUTPUT=TAPE16(CR)
FIELD,FGC(1,20,DISPLAY)
FIELD,ACT(31,1,DISPLAY)
KEY,FGC(A,COBOL6)
KEY,ACT(A,COBOL6)
END
7/8/9
UPDB DATA
7/8/9
6/7/8/9

Comments

Unsorted DIM transaction file

Execute MAINUD

Execute SORTMRG
SORTED DIM transaction file

Old Data Base File

Execute UPDB
PURGE Old Master Data Base

Updated Data Base
Four Data Base Reports
Control File Files
Part No. File, Part 1
Part No. File, Part 2
Supplementary Report

4.0 ROLAND LOGISTICS PROGRAM

The ROLOG program utilizes the ROLOG data base and data input to perform logistic support effectiveness calculations on the ROLAND weapon system to evaluate cost and effectiveness of that system. It simulates a given logistic scenario and analyzes the problems of sparing, stocking, availability and maintenance. The results of these calculations are printed in tabular reports or written to work files for further manipulation by the SEU program and the GRAPH routine. Refer to Figure 7 for a view of the ROLOG flow diagram. The tape assignments used in ROLOG are as follows:

Tape 1	OAV - Output
Tape 2	Maintenance Manhours by FGC - Output
Tape 3	Maintenance Manhours by Skill Code - Output
Tape 4	Plots File - Output
Tape 5	Card Reader
Tape 6	Printer
Tape 7	Support Equipment File (unsorted) - Output
Tape 8	Provisioning - Output
Tape 9	New Data Base Spinoff - Output - Input
Tape 10	Support Equipment File (sorted) - Output
Tape 15	Logistic Life Cycle Cost File - Output
Tape 16	Provisioning Item File (unsorted) - Output
Tape 17	Provisioning Item File (sorted) - Output
Tape 20	ROLOG Data Base - Input

4.1 ROLOG Reports

ROLOG produces five tabular reports described as follows:

Operational Availability A Output No. 1

Output number 1 reflects the fraction of total time that the system is operating or is ready for immediate operation on demand. One line is used for each subsystem to permit the user to determine those subsystems having the major impact on the overall system availability. For the fire unit (FU) the last two lines reflect the fire unit availability and the ROLAND availability. For other systems (missile, FMFS, OPTE, etc.) the last line gives the availability of the system being analyzed. The columns of the output give the following data:

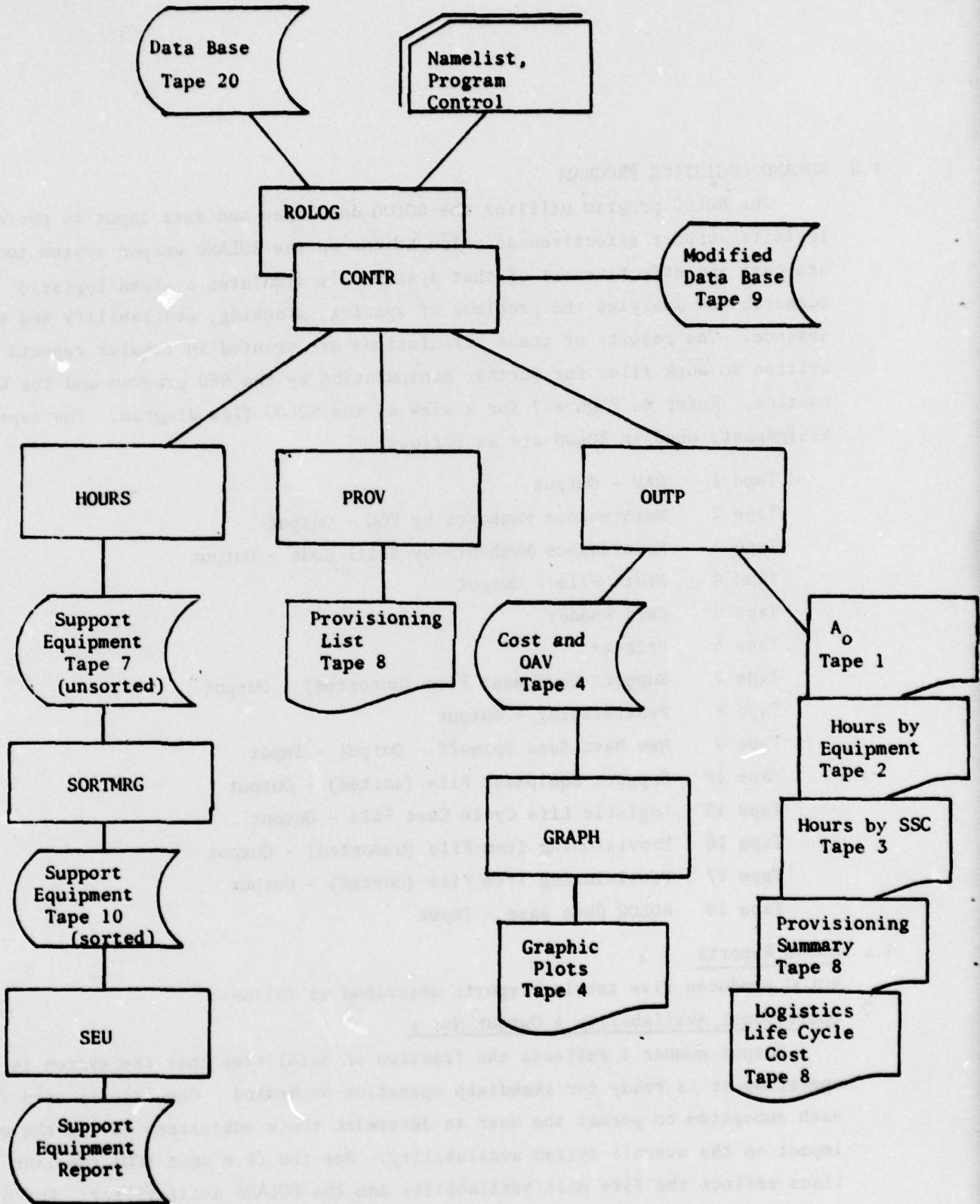


Figure 7. ROLOG Flow Diagram

- Column 1 Functional Group code of system/subsystem
- 2 Nomenclature of system/subsystem
- 3 Availability of CONUS systems
- 4 Availability of Overseas deployed systems
- 5 Weighted worldwide availability - which is the total downtime, maintenance and logistic, divided by total time.
- 6 Inherent worldwide availability which is the downtime designed into the system and is a function of mean time between failure and the mean time to repair.
- 7 Achieved worldwide availability adds to the inherent availability the downtime associated with preventive maintenance action.

A sample of output number 1 is shown in Figure 8.

Annual Maintenance Manhours by Equipment Output No. 2

Output number 2 is a summation of the active maintenance manhours for one year for one maintenance point of each level. One line is devoted to each subsystem with the last line containing the summation at the system level. The column assignments are as follows:

- Column 1 Functional group code of system/subsystem
- 2 Nomenclature of system/subsystem
- 3 Annual manhours for one Orgn in CONUS
- 4 Annual manhours for one DSU in CONUS
- 5 Annual manhours for one GSU in CONUS
- 6 Annual manhours for one Depot in CONUS
- 7 Annual manhours for one Orgn Overseas
- 8 Annual manhours for one DSU Overseas
- 9 Annual manhours for one GSU Overseas
- 10 Annual manhours for one Depot Overseas

A sample of output number 2 is shown in Figure 9.

Annual Maintenance Manhours by SSC, Output No. 3

A separate output number 3 is printed for each system or subsystem being analyzed and reflects the annual active maintenance manhours required by skill specialty code, at one of each level maintenance point. As currently coded, each skill specialty code authorized by the MTEL is input and the hours of

active maintenance time required of each is summed. The column assignments for output number 3 are as follows:

- Column 1 Skill specialty code (SSC)
- 2 Manhours for one Orgn in CONUS
- 3 Manhours for one DSU in CONUS
- 4 Manhours for one GSU in CONUS
- 5 Manhours for one Depot in CONUS
- 6 Manhours for one Orgn Overseas
- 7 Manhours for one DSU Overseas
- 8 Manhours for one GSU Overseas
- 9 Manhours for one Depot Overseas

A sample of output number 3 is shown in Figure 10.

Spares Provisioning List, Output No. 4

The Spares Provisioning List uses two lines for each part computed for stockage by ROLOG. The parts are sorted in generation breakdown sequence (FGC) to permit costs to be allocated against the specific subsystems. The total quantity of parts required for all applications is shown each time the part appears in a next higher assembly but the cost shown reflects only that portion of the cost allocated against the specific application. The column assignments are as follows:

- Column 1 Functional group code
- 2 line 1 nomenclature
line 2 part number
- 3 Generic code
- 4 International Interchangeability flag
- 5 Repairable status (repair or throwaway)
- 6 Essentiality code
- 7 Quantity per next higher assembly
- 8 line 1 Quantity per Orgn in CONUS
line 2 Quantity per Orgn Overseas
- 9 line 1 Cost per Orgn in CONUS
line 2 Cost per Orgn Overseas
- 10 line 1 Quantity per DSU in CONUS
line 2 Quantity per DSU Overseas

Column 11 line 1 Cost per DSU in CONUS
 line 2 Cost per DSU Overseas
 12 line 1 Quantity per GSU in CONUS
 line 2 Quantity per GSU Overseas
 13 line 1 Cost per GSU in CONUS
 line 2 Cost per GSU Overseas
 14 line 1 Quantity per Depot in CONUS
 line 2 Quantity per Depot Overseas
 15 line 1 Cost per Depot in CONUS
 line 2 Cost per Depot Overseas
 16 Annual replenishment quantity
 17 Annual replenishment cost

A sample spares provisioning list is shown in Figure 11.

Spares Provisioning Summary, Output No. 5

The Summary Spares Provisioning Report sums the cost, weight, volume and number of line items reflected on the provisioning list. The first four elements of the summary are:

- Cost
- Weight
- Volume
- Number of line items

Each of these elements require two lines of output; the top line contains CONUS values and the second reflects the values for overseas deployment. Column assignments are:

- Column 1 FGC
- 2 Element (cost, weight, etc.)
- 3 Values for one organization
- 4 Values for one DSU
- 5 Values for one GSU
- 6 Values for one Depot

The last two lines of output data reflect the replacement of washouts required during the demand development period (a part of initial provisioning) and the recurring annual replenishments required throughout the remainder of the life

cycle. Column assignments for these two lines are:

- Column 1 FGC
- 2 Element (initial washouts, annual replenishments)
- 3 Cost
- 4 Weight
- 5 Volume
- 6 Number of line items

A sample of the provisioning summary is shown in Figure 12.

Logistic Life Cycle Cost Report No. 5

This report segregates cost by investment, and by operation and support. Investment costs are broken down into initial spares and repair parts, 1st destination transportation costs, 2nd destination transportation costs, the cost of initially entering an item in the Federal supply system and the cost of maintaining an item in the supply system. Operating and support costs are ten year projected costs broken down into replenishment spares costs, transportation of replenishment spares, hands on maintenance labor costs, costs of maintaining an item in the supply system, and depot labor costs. The last two lines of the report contain the Budgetary Funding Profile which depicts lead times and appropriations for replenishments. A sample of the Life Cycle Cost report is shown in Figure 13.

In addition, ROLOG reports erroneous data in a record by printing out the FGC and any associated error messages, ie. an incorrect skill specialty code.

4.2 ROLOG Produced Files

ROLOG produces two work files for use with the Support Equipment Program (SEU) and the Graphics Program (GRAPH). Also, a new data base may be produced by ROLOG at user discretion.

SUPPORT EQUIPMENT UTILIZATION File

The SEU file, Tape 7, contains data evolved from ROLOG which gives the annual support equipment usage based upon mean elapsed time for the maintenance task in question. Tape 7 is sorted by the CDC supplied routine, SORTMRG, into FGC and part number order. The sorted SEU file, Tape 10, is catalogued for later use by the SEU program, a stand alone program responsible for the support equipment report. Refer to paragraph 5.0 for further information on the SEU program. A sample SEU report is shown in Figure 15.

OUTPUT NO. 1 OPERATIONAL AVAILABILITY WORLDWIDE 09/09/78

FUNCTIONAL GROUP CODE	NAME	CONUS	OVERSEAS	OPERATIONAL	IMMERENT	ACHIEVED	MEAN LOS T.
02	FTE UNIT MODULE	1.000	.997	.997	.993	.997	0.6.1
02A	SURVEILLANCE-0A90	1.000	.984	.984	.997	.997	13.033
02B	IFF TROPOCATOR SFT	1.000	.999	.999	1.000	1.000	1.550
02C	TRACK-0A90	1.000	.973	.973	.990	.990	10.015
02D	ELFRON-OPTICAL GR	1.000	.998	.998	.999	.999	7.812
02E	COMMAN-0A90	1.000	.990	.990	1.000	1.000	25.077
02F	MULL ASSEMBLY	1.000	.980	.980	.985	.985	9.771
02G	supers-AS44	1.000	.999	.999	.999	.999	23.393
02H	DATA PROCESSING SYS	1.000	.995	.995	1.000	1.000	20.530
02I	COMBOLS-4-DISPLAY	1.000	.999	.999	1.000	1.000	9.599
02J	COMMUNICATIONS SYST	1.000	.946	.946	.990	.990	19.511
02K	POWER-SYS-FU-ELECT	1.000	.974	.974	.990	.990	9.030
02	FTE UNIT MODULE	1.000	.862	.862	.957	.936	14.122
	POL-4NF	.945	.945	.945			

Figure 8

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ANNUAL MAINTENANCE MANHOURS BY SUBSYSTEM

OUTPUT NO. 2

NONFACTURE	ORGN	OSU	CONUS	GSU	DEPOT	OAGN	OSU	OVERSEAS	FEPOT
02A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
02B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
02C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
02D	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
02E	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
02F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
02G	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
02H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
02I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
02J	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
02K	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
02L	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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Figure 9

09/23/78

ANNUAL MAINTENANCE MANHOURS BY SKILL SPECIALTY CODE

OUTPUT NO.3
SYSTEM 02
SKILL CODE

1	OPGN	1	DSU	1	COMUS	1	GSU	DEPOT	1	OPGN	1	DSU	1	GSU	DEPOT
1	OPGN	1	DSU	1	COMUS	1	GSU	DEPOT	1	OPGN	1	DSU	1	GSU	DEPOT
916720	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I16720	6712.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6712.1	0.0	0.0	0.0	0.0	0.0	0.0
A16720	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B24720	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I24720	1415.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1415.6	0.0	0.0	0.0	0.0	0.0	0.0
A24720	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I24740	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
A26740	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I26720	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
A26740	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I27720	0.0	26.2	0.0	0.0	0.0	0.0	0.0	0.0	26.2	0.0	0.0	0.0	0.0	0.0	0.0
A27720	0.0	2059.5	0.0	0.0	0.0	0.0	0.0	0.0	2059.5	0.0	0.0	0.0	0.0	0.0	0.0
I27740	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
A27740	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I27740	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B52810	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B52820	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B52C10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I52C20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I52D10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B52B20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B63810	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B27210	0.0	1163.1	0.0	0.0	0.0	0.0	0.0	0.0	1163.1	0.0	0.0	0.0	0.0	0.0	0.0
A2724Y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I2722Y	0.0	3336.0	0.0	0.0	0.0	0.0	0.0	0.0	3336.0	0.0	0.0	0.0	0.0	0.0	0.0
B2722Y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
A2724X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I2722X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B2722X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ERPCOE	1388.4	1758.2	0.0	0.0	0.0	0.0	0.0	0.0	1388.4	1758.2	0.0	0.0	0.0	0.0	0.0

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Figure 10

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SPARES PROVISIONING LIST

OUTPUT NO. 4

GMSC ISO PPS ESC IOP NMA ORGN CSU DEPOT REPLENISHMENT

CODE	WOMENICLATURE	GMSC	ISO	PPS	ESC	IOP	NMA	ORGN	CSU	DEPOT	REPLENISHMENT					
PART NO.																
QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST					
02FDAYAKAH	WUT	NCI	N	T	7	2	1.0	.02	3.0	.06	0.0	0.00	272.0	5.03	473.00	203.00
02FDAYAKAJ	WANDL	SYS	N	T	3	2	1.0	.02	3.0	.06	0.0	0.00	0.0	0.00	0.00	0.00
02FDAYAKAL	SCREN	NCI	N	T	3	2	0.0	0.00	0.0	0.00	0.0	0.00	5.0	100.00	7.00	206.00
02FDAYAKAN	WASHEP	NCI	N	T	3	2	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.00	0.00
02FDAYAKAP	PIP	NCI	N	T	7	2	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.00	0.00
02FDAYAKAV	RUSHING	NCI	N	T	1	2	0.0	0.00	0.0	0.00	0.0	0.00	5.0	1105.00	5.00	1105.00
02FDAYAKAW	COLLAC	PCI	N	T	3	4	0.0	0.00	0.0	0.00	0.0	0.00	13.0	45.50	17.00	59.50
02FDAYAKAY	RUSHING	NCI	N	T	3	2	0.0	0.00	0.0	0.00	0.0	0.00	20.0	750.00	30.00	195.00
02FDAYAKAZ	FITTING	PCI	N	T	3	2	0.0	0.00	0.0	0.00	0.0	0.00	13.0	509.17	20.00	943.00
02FDAYAKBC	SWITCH	SYS	N	T	1	2	0.0	0.00	0.0	0.00	0.0	0.00	51.0	1531.91	54.00	853.00
02FDAYAKBM	SCREN	NCI	N	T	7	4	0.0	0.00	0.0	0.00	0.0	0.00	4.0	10.62	05.00	151.50
02FDAYAKBL	SCREN	NCI	N	T	7	2	0.0	0.00	0.0	0.00	0.0	0.00	10.0	6.48	17.00	10.00
02FDAYAKBP	BOLT LOCK	NCI	N	T	3	2	0.0	0.00	0.0	0.00	0.0	0.00	14.0	700.00	22.00	1430.00
02FDAYAKBR	PLATE-STRIKER	NCI	N	T	3	2	0.0	0.00	0.0	0.00	0.0	0.00	13.0	724.00	17.00	949.00
02FDAYAKBU	SWIM	NCI	N	T	3	2	0.0	0.00	0.0	0.00	0.0	0.00	20.0	2303.33	30.00	4290.00
02FDABA	CLIP	NCI	N	T	3	1	0.0	0.00	0.0	0.00	0.0	0.00	2.0	1.50	3.00	2.37
02FDBD	CLIP	NCI	N	T	3	1	0.0	0.00	0.0	0.00	0.0	0.00	2.0	1.50	3.00	2.37
02FDBE	SEAL	SYS	N	T	7	1	0.0	0.00	0.0	0.00	0.0	0.00	125.0	4596.25	169.00	6214.13
02FDBF	PLATE AY	NCI	N	T	7	1	0.0	0.00	0.0	0.00	0.0	0.00	1.0	12.70	2.00	25.40
02FFBA	SCREN-TMHP	NCI	N	T	3	4	0.0	0.00	0.0	0.00	0.0	0.00	6.0	51.00	0.00	69.00
02FFBB	PIN	NCI	N	T	3	4	0.0	0.00	0.0	0.00	0.0	0.00	6.0	1.32	0.00	1.76
02FFBC	WASHEP	NCI	N	T	3	4	0.0	0.00	0.0	0.00	0.0	0.00	4.0	15	76.00	2.20

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Figure 11

OUTPUT NO 5
 FUNCTIONAL GROUP CODE

SUBSYSTEM SPARES PROVISIONING REPORT
 ORGN DSU

69/20/78
 DEPOT

02A INITIAL SPARES COST 143290. 884006. 0. 5003272.
 173290. 804000. 0. 5063272.

02A INITIAL SPARES WT (L9S) 461. 3042. 0. 12716.
 491. 2971. 0. 0.

02A INITIAL SPARES VOL (CU FT) 23. 153. 0. 651.
 23. 150. 0. 0.

02A TOTAL-LINE ITEMS 19 11 0 147
 10 11 0 0

02A INITIAL-WASHOUTS-1ST-2-YEARS 081343. 2020. 141. 112
 COST WT VOL LI

02A ANNUAL PFPLFNISHMENT 440672. 1416. 71. 112.

Figure 12

OUTPUT NO. 6

LOGISTIC LIFE CYCLE COST IMPACT REPORT
FOR FCC 02A

SPOLP
COST ACCOUNTS

COSTS IN THOUSANDS OF DOLLARS

INVESTMENTS PLUS OPERATIONS AND SUPPORT

	YEAR 1	YEAR 2	YEAR 3	TOTAL	0/0
INVESTMENT	10975.2			10975.2	
INITIAL SPARES AND REPAIR PARTS	891.3			891.3	
WASHOUT SPARES					
1ST DESTINATION TRANSPORTATION	13.3			13.3	
2ND DESTINATION TRANSPORTATION	7.4			7.4	
INITIAL SUPPLY ENTRY	51.7			51.7	
MAINTAIN SUPPLY SYSTEM	64.7			64.7	
OPERATING AND SUPPORT					
PEPLENISHMENT SPARES	4405.7			4405.7	
TRANSPORTATION P/S	4.5			4.5	
HANDS ON MAINTENANCE LABOR	3487.9			3487.9	
MAINTAIN SUPPLY SYSTEM	323.6			323.6	
DEPT LABOR	0.0			0.0	
				11993.7	
				20100.5	

BUDGETARY FUNDING PROFILE

	YEAR 1	YEAR 2	YEAR 3	TOTAL	0/0
PROC	10.1	0.0	0.0	10.1	4.1
OMA (ASF)	0.0	422.6	0.0	422.6	95.9

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Figure 13

Graphic Program File

ROLOG performs sensitivity per user request. The user is able to sensitize on any value by supplying the word location of the value to be sensitized and the four multipliers to be applied. This sets up a condition whereby ROLOG is run five times, once for a baseline calculation, and once for each of the four sensitivity multipliers. The variations of the sensitive variable and its corresponding life cycle cost and availability are stored on Tape 4, the PLOTS file. Tape 4 is used by the graphics program (GRAPH) to plot sensitivity in graphic format. A sample GRAPH report is shown in Figure 16. Refer to 6.0 for further information on the GRAPH program.

Modified Data Base File

If the ROLOG Data Base needs modifications, they may be made during a ROLOG run and a new Data Base catalogued. Tape 9 contains the modified data base. For further information on the use of and means of implementing this modification refer to paragraph 4.4.

4.3 ROLOG Input Format

Designed to provide the user with a flexible and accurate assessment of the impact of varying logistic parameters, ROLOG utilizes the ROLOG Data Base file and data cards. The data cards provide ROLOG's versatility, enabling the user to make corrections to and save the Data Base, alter the values of variables, consider the options of printing various reports and sensitizing on a particular value. The Title card in the data deck sets up the conditions of a particular run. It gives the run description and sets a series of switches which determine whether all or part of the ROLOG Data Base is to be used, whether modifications to the Data Base will be made, and whether skill specialty codes need to be updated. At user discretion, a single value may be temporarily modified for a specific scenario by using the LOC, VAL, GNRC codes or the Data Base may be modified permanently and saved by setting ISWTCH and supplying the changes to be made.

The Namelist Constants are a list of variables whose values may be changed through data cards to reflect a particular scenario. ROLOG is designed specifically for the US ROLAND weapon system which utilizes a four maintenance level support structure and two geographic area deployments. To simplify the input array

description for Level of Maintenance and Geographic Area Deployment, the subscripts I and J are used throughout the program. I and J are defined as follows:

Level of Maintenance (I)

- I = 1 Organization (Battery)
- I = 2 Direct Support Unit (DSU)
- I = 3 General Support Unit (GSU)
- I = 4 Depot

Geographic Area Deployment (J)

- J = 1 CONUS
- J = 2 Overseas (U. S. Army Europe)

All cost variables in the Namelist are values in dollars unless otherwise specified. Percentage factors used in Namelist must be converted to a fraction by dividing by one hundred ($10\% = \frac{10}{100} = .1$). The following Namelist Constants are input through data cards:

CMLI Cost per year of maintaining a line item in the supply system. Current code - 1295.

CPNLI Cost of entering a line item into the Federal supply system. Current code - 2070.

IPR Print switch to inhibit printing of undesired subsystem reports. All subsystem reports will be printed unless the value one (1) is input to shut off the print on a particular report. The Provisioning Item List may be sorted and printed in part number sequence. Inserting the value two (2) in the fourth element of the IPR array sets the switch to print a sorted Provisioning Item Report. The positions of the reports in the IPR array are as follows.

- 1. Operational Availability Ø
- 2. Maintenance Manhours by Equipment Ø
- 3. Maintenance Manhours by Skill Specialty Code Ø
- 4. Provisioning List Ø
- 5. Provisioning Summary Ø

ISE The word location in the data base of the value on which sensitivity is to be performed. Sensitivity may be performed on any word location less than 50 or greater than 5000. Refer to Table III for the list of ROLOG variables and their word locations.

OST Order-Ship-Time is time in days required to obtain resupply from the next higher level of supply point. OST will vary from commodity to commodity and from year to year.
 Current value: .25,2,7,21,.25,2,7,42
 Array Size - I,J

PAY Hourly labor rate for maintenance manhours.
 Current code: 9.313,19.
 Array Size - J

PAYD Hourly labor rate for maintenance manhours at the Depot level in dollars.
 Current code - 19.

PLCB The unit learning curve factor (90% = 9) for BAC subsystems.

PLCH The cumulative average learning curve factor for HAC subsystems.

PNLI Factor representing that percentage of all line items that are new.
 Current code - .17

PRF Productivity Factor is input to compensate for leave, sick, military duties, etc., for maintenance personnel and will vary by operational scenario and geographic location.
 Current value: .5, .5
 Array size: J

PSO Probability of Stockout is acceptable probability of a repair part being out of stock when needed.
 Current value: .20, .20, .20, .15, .15, .15, .15, .15
 Array size: I,J

QM Quantity of Maintenance Points (ORG, DSU, GSU, DEPOT) per deployment area.
 Current value: Classified.
 Array Size: I,J

QS The quantity of system requiring maintenance support.
 Current Value: Classified.
 Array Size: J

QTY The quantity of systems procured during investment.

SEN Sensitivity multiplier to be applied in sensitivity analysis. Must be input on sensitivity run. Since the baseline is hard coded as 1, the first two values must be less than 1 and the last two greater than 1

to generate the desired curve of sensitivity.

Current code: 1., 1., 1., 1.

Array size: 4

SEUK Support Equipment Utilization is a factor to compensate for nonproductive support equipment time. It compensates for support equipment maintenance, and self test, warm up times, movement to point of need, etc.

Current code: .8, .8, .9, .9, .8, .8, .9, .9

Array size: I,J

SMP No. of systems supported by each supply and maintenance point.

Array size: I,J

TVOA Track Vehicle Operational Availability is an input value rather than computed.

Current value: .980, .980

Array size: J

T1 Cost per pound for transportation from manufacturer to depot.

T2 Cost per pound of second destination transportation costs.

Array size: J

WAIT Wait is the maximum acceptable wait in days for repair parts at the remove-replace location. To eliminate this constraint on provisioning a very high value can be put.

Current code: 1., 3., 30., 90.

Array size: I

XMLDT Mean Logistic Downtime is the mean wait in hours for maintenance personnel and equipment when a failure occurs.

Current code: .5, .5

Array size: J

YOP Years of Operational Support

Current Code: 10

YP Mean full production period in years

Current code: 2

The formats used on the data cards are as follows:

<u>Card</u>	<u>Columns</u>	<u>Variable</u>	<u>Format</u>	<u>Remarks</u>
1	1-10	SYS	A10	FGC of first system to be processed. Use the word All if entire data base is to be run

<u>Card</u>	<u>Columns</u>	<u>Variable</u>	<u>Format</u>	<u>Remarks</u>
	11-20	SYSE	A10	FGC of first item following last item to be processed. Use the word All for entire data base.
	21-25	ISWTCH	I5	Index to indicate if entire data base is to be run. Ø = Total data base 1 = Portion of data base 2 = Modification of data base
	26-30	ISC	I5	Index to indicate skill specialty codes are to be updated. Ø = not to be updated 1 = update skill codes
	31-35	LOC	I5	Word address of variable to be replaced. Blank if none.
	36-45	Val	A10	Alphanumeric replacement values. Blank if none.
	46-50	GNR	A5	Generic code of data to be modified. Blank indicates total data base is to be modified.
	51-80	TITLE	3(A10)	Title of run
2-N	1-80	SCC	A7	Skill specialty codes input to update run. Ten skill codes per card may be input, leaving a blank space between each code.
N+1	2-9	\$DEPLOY		Namelist card. Must be input in every run.
N+2-x	2-NN	Constant		Name of namelist constant followed by = sign.
	NN-	Value	Alpha-Numeric	Update value of namelist constant. Comma between each value in array and as last character.
X+1	2-5	\$END		End of Namelist. Must be input in every run.
X+2-XX	1-10	FGCI	A10	FGC of record to be modified.
	11-20	FOR	A10	Format of value to be modified.
	21-30	VALU	A10	Input value.
	31-55	LOCA	I5 (right justified)	Word address of value to be replaced.
XX+1	1-10	END	A3	The word END signifies end to the modification data.

Card

1 SORT
2 FILE, INPUT=TAPE7 (R) ,OUTPUT=TAPE10 (CR)
3 FIELD, MAJ (1, 3, DISPLAY)
4 FIELD, MIN (21, 16, DISPLAY)
5 KEY, MAJ (A, COBOL6)
6 KEY, MIN (A, COBOL6)
7 END
8 TERMINATOR (7/8/9)

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72

SORT
FILE, INPUT=TAPE7 (R) ,OUTPUT=TAPE10 (CR)
FIELD, MAJ (1, 3, DISPLAY)
FIELD, MIN (21, 16, DISPLAY)
KEY, MAJ (A, COBOL6)
KEY, MIN (A, COBOL6)
END
TERMINATOR (7/8/9)

TABLE III ROLOG Data Base Layout

This table reflects only those variables used in ROLOG Programs

WORD LOCATION	VARIABLE NAME	NUMBER OF WORDS	FORMAT
1,2	FGC - functional group code	2	A10,A1
3,4	XMPN - part number	2	A10,A6
5,6	XNME - part name	2	A10,A9
10	GNRC - generic code	1	A5
11	XISQ - international interchangeability	1	A1
20	VOLP - volume packaged	1	F5.2
21	WTP - weight packaged	1	F6.2
24	SMRC - source maintenance & recoverability code	1	A6
25	ESSE - essentiality code	1	F2.0
26	RPS - repairability status	1	A1
27	PLT - production lead time	1	F3.0
28	UPRC - unit price	1	F10.2
30	XMMR - maintenance replacement rate	1	F5.2
31	XMTD ORG CONUS-maintenance task distribution	1	F3.2
32	XMTD DSU CONUS	1	F3.2
33	XMTD GSU CONUS	1	F3.2
34	XMTD DEPOT CONUS	1	F3.2
35	XMTD ORG OVERSEAS	1	F3.2
36	XMTD DSU OVERSEAS	1	F3.2
37	XMTD GSU OVERSEAS	1	F3.2
38	XMTD DEPOT OVERSEAS	1	F3.2
39	TAT ORG, CONUS repair turnaround time	1	F4.0
40	TAT DSU CONUS	1	F4.0
41	TAT GSU CONUS	1	F4.0
42	TAT DEPOT CONUS	1	F4.0
43	TAT ORG OVERSEAS	1	F4.0
44	TAT DSU OVERSEAS	1	F4.0
45	TAT GSU OVERSEAS	1	F4.0
46	TAT DEPOT OVERSEAS	1	F4.0
47	QPNHA - quantity per next higher assembly	1	F5.0
48	XMFC - maintenance factor, this application	1	F4.0
49	XMFAC - summed maintenance factor	1	F4.0
50	TASK I - number of tasks	1	I10
5001	PSO ORG CONUS - probability of stockout	1	F4.3
5002	PSO DSU CONUS - probability of stockout	1	F4.3
5003	PSO GSU CONUS - probability of stockout	1	F4.3
5004	PSO DEPOT CONUS - probability of stockout	1	F4.3
5005	PSO ORG OVERSEAS - probability of stockout	1	F4.3
5006	PSO DSU OVERSEAS - probability of stockout	1	F4.3
5007	PSO GSU OVERSEAS - probability of stockout	1	F4.3
5008	PSO DEPOT OVERSEAS - probability of stockout	1	F4.3
5009	WAIT ORG	1	F4.0
5010	WAIT DSU	1	F4.0
5011	WAIT GSU	1	F4.0
5012	WAIT DEPOT	1	F4.0

4.5 ROLOG Job Control Language

The job control language used in ROLOG is as follows:

	<u>Comments</u>
LIMIT(4000)	
ATTACH,OLDPL,PRBAT, ID=PRWALT,CY=001.	
ATTACH,OLDBIN,PRBAT, ID=PRWALT,CY=002.	
UPDATE,N.	
FTN,I=COMPILE.	
REWIND,LGO.	
COPYL,OLDBIN,LGO,NEWBIN.	
RETURN,OLDPL.	
RETURN,OLDBIN.	
RETURN,LGO.	
REQUEST,TAPE4,*PF.	
REQUEST,TAPE9,*PF	
ATTACH,TAPE20,PRLSAR, ID=PRTACRAC,CY=003.	ROLOG Data Base File
FILE(TAPE7,BT=I,RT=W,MRL=120)	
FILE(TAPE16,BT=I,RT=W,MRL=300)	
LDSET(FILE=TAPE7)	Unsorted SEU File
LDSET(FILE=TAPE16)	Unsorted Provisioning File
LDSET(FILE=TAPE17)	Sorted Provisioning File
NEWBIN(PL=77777)	
*CATALOG,TAPE4,Permanent File Name, ID=Name,CY=Cycle.	PLOTS File
*CATALOG,TAPE9,Permanent File Name, ID=Name,CY=Cycle.	Data Base File
RETURN,NEWPL.	
RETURN,TAPE20.	
RETURN,TAPE16,TAPE17.	
REWIND,TAPE1,TAPE2,TAPE3,TAPE7,TAPE8,TAPE15.	Tabular Report Files
COPYCF(TAPE1,OUTPUT)	Operational Availability
COPYCF(TAPE2,OUTPUT)	Maintenance Manhours by Equip.
COPYCF(TAPE3,OUTPUT)	Maintenance Manhours by SSC
COPYCF(TAPE8,OUTPUT)	Provisioning Summary
COPYCF(TAPE15,OUTPUT)	Error Listing
REQUEST,TAPE10,*PF.	
FILE(TAPE10,BT=1,RT=W,MRL=120)	
LDSET(FILE=TAPE7/TAPE10)	
SORTMRG.	Execute SORTMRG
*CATALOG,TAPE10,Permanent File Name, ID=Name, CY=Cycle.	Sorted SEU File
EXIT.	
DUMP(100000)	
REWIND,TAPE1,TAPE2,TAPE3,TAPE8,TAPE15	
COPYCF(TAPE1,OUTPUT)	
COPYCF(TAPE2,OUTPUT)	
COPYCF(TAPE3,OUTPUT)	
COPYCF(TAPE8,OUTPUT)	
COPYCF(TAPE15,OUTPUT)	
7/8/9	
ROLOG Data Deck	
7/8/9	

```
SORT
FILE, INPUT=TAPE7 (R) ,OUTPUT=TAPE10 (CR)
FIELD, MAJ (1,3,DISPLAY)
FIELD, MIN (21,16,DISPLAY)
KEY, MAJ (A, COBOL6)
KEY, MIN (A, COBOL6)
END
7/8/9
6/7/8/9
```

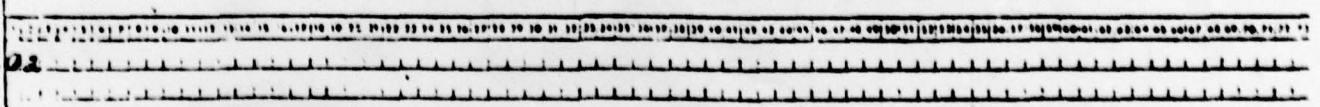
*These CATALOG commands may be eliminated from the job control stream depending on the user's requirements.
Tape 4 is only catalogued during a sensitivity run.
Tape 9 is only catalogued if ROLOG is modifying and creating a new Data Base.
Tape 10 is catalogued if the SEU program is to be run.

5.0 SUPPORT EQUIPMENT UTILIZATION (SEU)

Support equipment usage calculations based upon mean elapsed time are computed in the ROLOG program where they are sorted by FGC and by part number. SEU attaches this file, Tape 10, to sum, print, and resort the support equipment utilization data by subsystem and by system. An internal sort is utilized to sort the equipment utilization at the system level. Refer to Figure 14 for a flow diagram of SEU. The subsystem and system reports generated in SEU list the support equipment items by their classification grouping in part number order and give the support equipment usage at each of the four maintenance levels in the two deployment locations, CONUS and Overseas (Europe). Refer to Figure 15 for a sample Support Equipment report.

5.1 SEU Input Format

The option is available of printing both subsystem and system reports or just the system report. A single data card input governs the print option. The data card format of the print switch option is a single 12 word starting in column 1. 02 indicates the subsystem report is to be printed. 01 indicates only the system report is required.



5.2 SEU Job Control Language

```
LIMIT(4000)
FILE(TAPE10,BT=I,RT=W,MRL=180)           Sorted subsystem SEU File
ATTACH,TAPE10,PERMANENT FILE NAME,ID=NAME,CY=CYCLE.
FILE(TAPE12,BT=I,RT=W,MRL=180)           Sorted subsystem SEU File
LDSET(FILES=TAPE10/TAPE11,TAPE12)       Execute SEU
LGO
EXIT
DMP(1000000)
7/8/9
Data Input
7/8/9
6/7/8/9
```

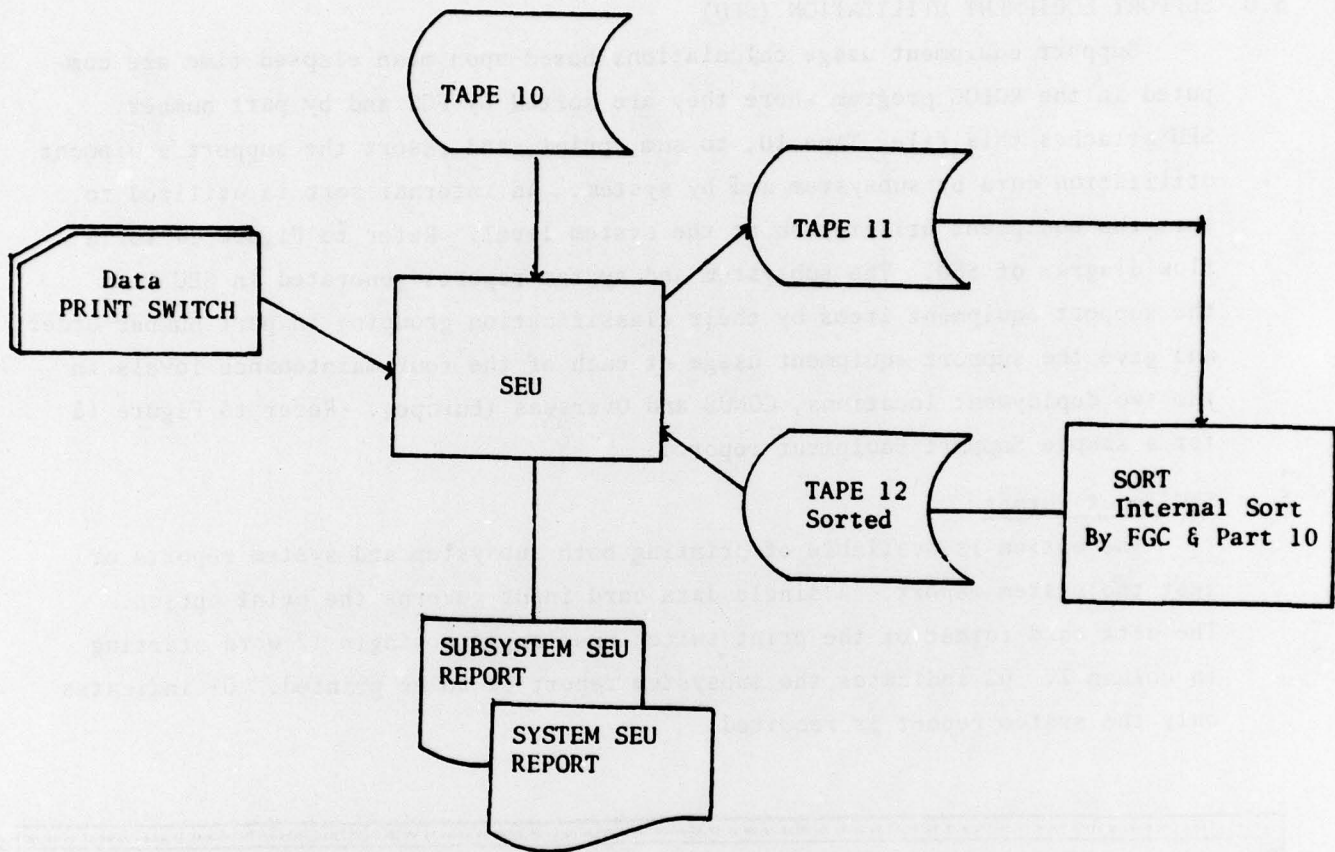


Figure 14. SEU Flow Diagram.

SYSTEM PART NUMBER	DESCRIPTION	ICC	1 OFGN	1 USU	CURUS	LEPOT	1 ORGN	1 DSU	OVERSEAS	DEPOT
12MR-2R01	CABLE	2	15.06	0.00	0.00	0.00	10.06	0.00	0.00	0.00
11570	ADAPTER, RF CABLE	J	2.15	0.00	0.00	0.00	2.15	0.00	0.00	0.00
115761.2	CONTROL BOX	2	1.98	1.98	0.00	0.00	0.00	1.98	0.00	0.00
115760.0	KEY-FAST W/ SK	1	52.00	0.00	0.00	0.00	52.00	0.00	0.00	0.00
115762.0	PCRN MAST, 2M	2	0.28	0.00	0.00	0.00	0.28	0.00	0.00	0.00
115765.0	CONTROL UNIT 2PC	2	134.04	0.00	0.00	0.00	134.04	0.00	0.00	0.00
11579.0	2M TRANSOMER	2	133.53	0.00	0.00	0.00	133.53	0.00	0.00	0.00
115794.2	PCRN TRANSPONDER	2	2.03	0.00	0.00	0.00	2.03	0.00	0.00	0.00
115795.2	TESTER UNIT (2P-)	2	134.04	0.00	0.00	0.00	134.04	0.00	0.00	0.00
115795.9	CABLE (M1)	2	3.07	0.00	0.00	0.00	3.07	0.00	0.00	0.00
115795.1	CABLE (M3)	2	3.07	0.00	0.00	0.00	3.07	0.00	0.00	0.00
115795.3	CABLE (M5)	2	3.07	0.00	0.00	0.00	3.07	0.00	0.00	0.00
115795.6	CABLE (M4)	2	3.07	0.00	0.00	0.00	3.07	0.00	0.00	0.00
115797.6	CABLE ASSY (M1)	2	2.03	0.00	0.00	0.00	2.03	0.00	0.00	0.00
115802.2	PCRN SHIPPLY 2MR	2	134.04	0.00	0.00	0.00	134.04	0.00	0.00	0.00
115815.5	PROGRAM ADAPTER CPA	2	10.06	0.00	0.00	0.00	10.06	0.00	0.00	0.00
115815.2	CONTROL BOX	2	31.66	31.66	0.00	0.00	0.00	31.66	0.00	0.00
115865.3	KIR MOUNT	2	33.65	33.65	0.00	0.00	0.00	33.65	0.00	0.00
115861.8	PCRN MOUNT	2	0.02	0.02	0.00	0.00	0.02	0.00	0.00	0.00
115873.3	PCRN MOUNT	2	21.29	0.00	0.00	0.00	21.29	0.00	0.00	0.00
115873.3	204 CMD ANT ALIG FL	2	10.06	0.00	0.00	0.00	10.06	0.00	0.00	0.00
115873.3	CABLE 2PA-PF CE-F1L	2	10.06	0.00	0.00	0.00	10.06	0.00	0.00	0.00
115871.0	CABLE 2PE-P3 SW-P19	2	10.06	0.00	0.00	0.00	10.06	0.00	0.00	0.00
115872.2	2GA MTRC SUP UNIT	2	10.06	0.00	0.00	0.00	10.06	0.00	0.00	0.00
115872.7	PROGRAM PROCESS 2P3	2	10.06	0.00	0.00	0.00	10.06	0.00	0.00	0.00
115872.0	PROGRAM CONTROL 2P2	2	10.06	0.00	0.00	0.00	10.06	0.00	0.00	0.00
115872.9	LAUNCH 2E UNIT 2SE	2	20.12	0.00	0.00	0.00	20.12	0.00	0.00	0.00
115872.6	2E OPTICAL SIG SLS	2	10.06	0.00	0.00	0.00	10.06	0.00	0.00	0.00
115872.7	PCRN MAST, 2M	2	1.75	0.00	0.00	0.00	1.75	0.00	0.00	0.00
115872.4	CABLE 2PA-P1 2P3-P1	2	10.06	0.00	0.00	0.00	10.06	0.00	0.00	0.00
115872.6	CABLE 2PA-P3 GP-F1	2	10.06	0.00	0.00	0.00	10.06	0.00	0.00	0.00
115872.7	CABLE 2PA-P4 EG-F3	2	10.06	0.00	0.00	0.00	10.06	0.00	0.00	0.00
115872.8	CABLE 2PA-P6 LW-F3	2	10.06	0.00	0.00	0.00	10.06	0.00	0.00	0.00
115873.2	CABLE 2PA-P7 LW-F1	2	10.06	0.00	0.00	0.00	10.06	0.00	0.00	0.00
115873.0	CABLE 2PA-P8 VM-F21	2	10.06	0.00	0.00	0.00	10.06	0.00	0.00	0.00
115873.1	CABLE 2PA-P9 VM-F22	2	10.06	0.00	0.00	0.00	10.06	0.00	0.00	0.00
115873.2	CABLE 2PE-P2 2PC-P1	2	10.06	0.00	0.00	0.00	10.06	0.00	0.00	0.00
115873.3	CABLE TG-F1 EJ-P3	2	10.06	0.00	0.00	0.00	10.06	0.00	0.00	0.00
115873.4	CABLE TP-31 2SE	2	10.06	0.00	0.00	0.00	10.06	0.00	0.00	0.00
115873.0	CABLE 2PR-P. 2MT-P1	2	10.06	0.00	0.00	0.00	10.06	0.00	0.00	0.00
115873.1	2TF SIMULATOR KOUND	2	20.12	0.00	0.00	0.00	20.12	0.00	0.00	0.00
115873.3	2V ADAPTER SUPPORT	2	10.06	0.00	0.00	0.00	10.06	0.00	0.00	0.00
115872.5	CABLE 2PA-P2 LL-F9	2	10.06	0.00	0.00	0.00	10.06	0.00	0.00	0.00
115872.5	CABLE SET	2	131.77	0.00	0.00	0.00	131.77	0.00	0.00	0.00
115872.5	TEST SET, RF-FMIS	2	555.94	555.94	0.00	0.00	0.00	555.94	0.00	0.00
115872.5	COLLY	3	36.56	36.56	0.00	0.00	0.00	36.56	0.00	0.00
115872.5	SCORFL TIP FMH	4	151.87	151.87	0.00	0.00	0.00	151.87	0.00	0.00
115872.5	SCORFL TIP	K	1.78	1.78	0.00	0.00	1.78	0.00	0.00	0.00

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6.0 GRAPHICS DISPLAY (GRAPH)

Graph is a stand alone program whose function is to plot a cost effectiveness analysis. Tape 4, a ROLOG produced file, is the only data input required. GRAPH plots availability and life cycle cost on the same graph, each as a factor of the sensitized variable. This program is designed for use with the TEKTRONICS 4014 terminal and the TEKTRONICS PLOT 10 software.

6.1 GRAPH Job Control Language

The following interface directions are to be implimented on the TEKTRONICS 4014 terminal for executing the GRAPH program.

	<u>Comments</u>
ATTACH,OLDPL,PRBAT,ID=PRWALT,CY=003.	GRAPH
ATTACH,Tape4,Permanent File Name,ID=Name,CY=Cycle.PLOTS	File produced by ROLOG
REWIND,DUMMY.	
UPDATE,F,I=DUMMY.	
FTN,I=COMPILE.	
ATTACH,AG11,TEKTRONIX4014,ID=WTPL0T,CY=002.	TEKTRONICS PLOT 10 software
LIBRARY,AG11.	
LGO	

The system software is not available to obtain hard copies automatically, therefore to the system message

DO YOU WISH AUTOMATIC HARD COPIES
PLEASE ANSWER YES OR NO

. .

enter the word NO

To the system message

BUILD A TABLE OF DESIRED FGC... ENTER FGC STRING SEPARATED BY A COMMA
ENTER THE WORD ALL IF ALL FGC's ARE DESIRED

. .

the user may determine whether to obtain plots of all FGC's by entering the word ALL, or plots of any one or more FGC's by entering the FGC's desired.

A manually operated copier is available to obtain copies of the plots. When the tone sounds denoting a plot is finished, and a copy has been made, enter the letter N to go on to the next plot. Refer to Figure 16 for an example of a GRAPH plot.

To the system message

LAST PLOT COMPLETED
ENTER 1 TO CONTINUE ENTER 2 TO STOP

. .

09/18/78

SURVEILLANCE RADAR

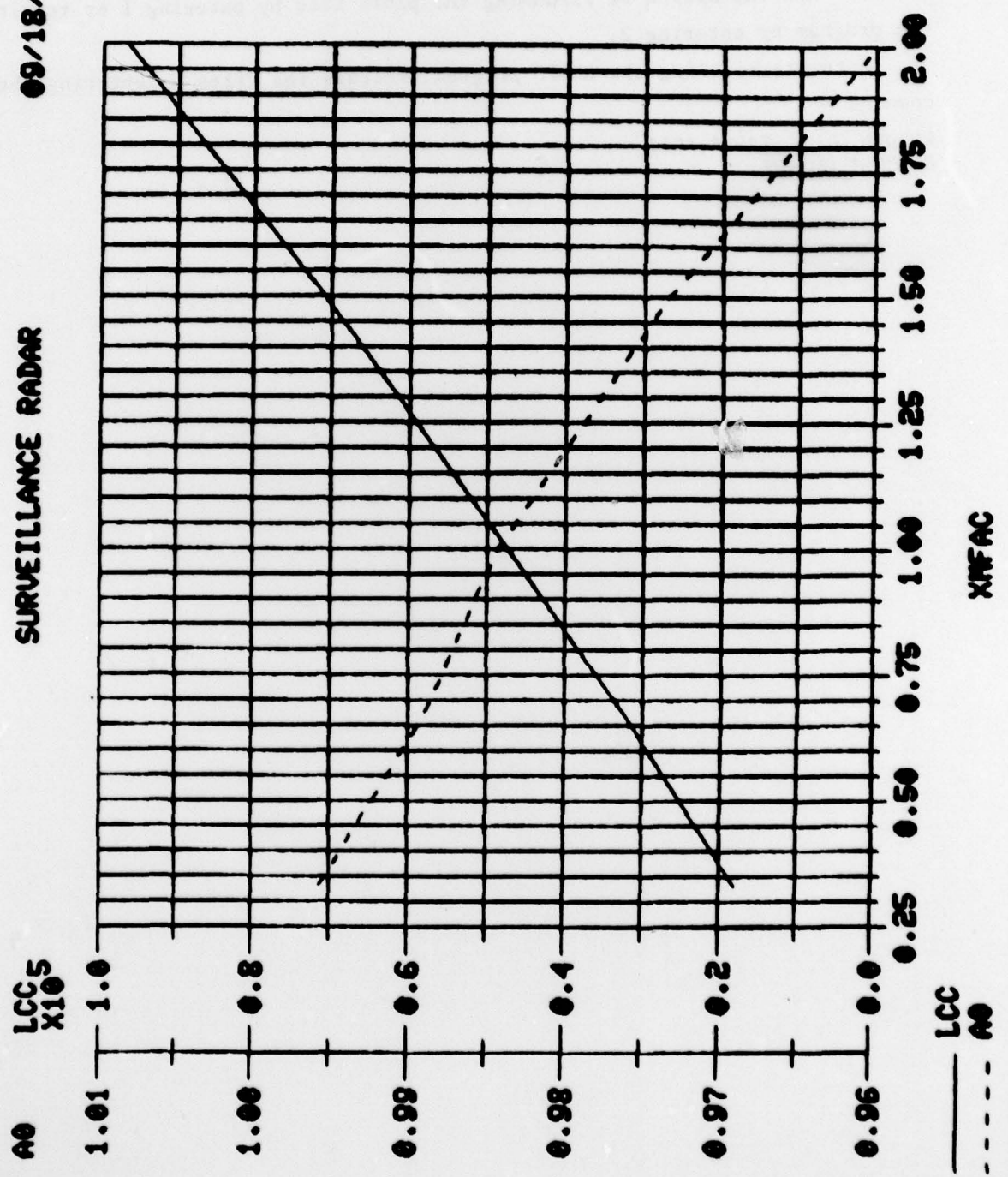


Figure 16

the user has the option of rerunning the plots file by entering 1 or terminating the program by entering 2.

After terminating the GRAPH program, release the files by entering the command

```
RETURN,OLDPL,TAPE4,AGII  
DISCONT,OUTPUT
```

