AD-A051 776 ARINC RESEARCH CORP ANNAPOLIS MD F/G 16/4.1

APPLICATION OF ILS MODEL TO PHOENIX MISSILE SYSTEM,(U)

SEP 75 K J BRAMAN F09603-75-A-3001

UNCLASSIFIED 1295-01-1-1444 NL

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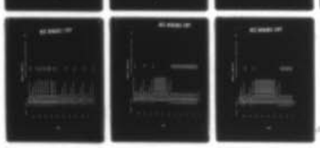

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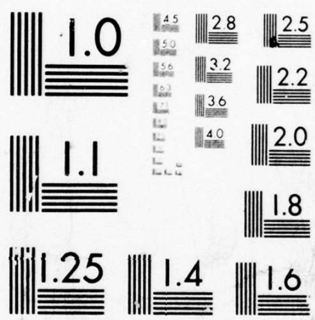

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APPLICATION OF ILS MODEL TO PHOENIX MISSILE SYSTEM

September 1975

Prepared for

U.S. NAVY PACIFIC MISSILE TEST CENTER
Pt. Mugu, California

Under Contract F09603-75-A-3001-0004

Publication 1295-01-1-1444

ARINC RESEARCH CORPORATION

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

(14)

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER
1295-01-1-1444

2. GOVT ACCESSION NO.

3. RECIPIENT'S CATALOG NUMBER

4. TITLE (and Subtitle) (6)
APPLICATION OF ILS MODEL TO PHOENIX MISSILE SYSTEM,

5. TYPE OF REPORT & PERIOD COVERED

6. PERFORMING ORG. REPORT NUMBER
1295-01-1-1444

7. AUTHOR(s) (10)
K. J. Braman

8. CONTRACT OR GRANT NUMBER(s) (15)
F09603-75-A-3001-0004

9. PERFORMING ORGANIZATION NAME AND ADDRESS
ARINC Research Corp.
2551 Riva Road
Annapolis, Maryland 21401

10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS

11. CONTROLLING OFFICE NAME AND ADDRESS
U.S. NAVY PACIFIC MISSILE TEST CENTER
Pt. Mugu, California

12. REPORT DATE (11)
Sep[redacted]75

13. NUMBER OF PAGES (12)
38
70p

14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)
U.S. NAVY PACIFIC MISSILE TEST CENTER
Pt. Mugu, California

15. SECURITY CLASS. (of this report)
UNCLASSIFIED

15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

UNCLASSIFIED/UNLIMITED

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The application of a computerized Integrated Logistics Support model to the Phoenix Missile System is discussed. Results of the study are presented in two parts:

a. An unclassified discussion of study background, approach, results, conclusions, and recommendations.
b. A classified attachment containing CONFIDENTIAL logistics data for the Phoenix Missile System (SNA/C/75-59).

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

400247

(12)

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Prepared for

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Prepared by

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Publication 1295-01-1-1444

Prepared under Contract F09603-75-A-3001-0004, which grants to the U.S. Government a license to use any material in this publication for government purposes.

ABSTRACT

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a. An unclassified discussion of study background, approach, results, conclusions, and recommendations.

b. A classified attachment containing CONFIDENTIAL logistics data for the Phoenix Missile System (SNA/C/75-59).

SUMMARY

A computer program developed by the Pacific Missile Test Center to project the Navywide distribution and status of all-up rounds in an air-launched missile system was exercised by ARINC Research Corporation for the Phoenix Missile System (PMS).

In preparation for the exercising of the computer program, it was necessary to:

a. Develop PMS user information for the computer program.

b. Identify sources of the required input data.

c. Adapt the program to the computer facility utilized.

d. Prepare the required program and input data card decks.

In addition to exercising the computer program, ARINC Research analyzed the ILS model represented by the computer program and compared it with the description of the logistics flow of Phoenix Missile AURs as described in the PMS Integrated Logistics Support Plan. Results of the computer exercise yielded an inventory projection over an eight-month period that was in acceptable agreement with actual inventory information.

The user information for the computer program was documented and is contained in an appendix to this report.

CONTENTS

ILLUSTRATIONS

1
INTRODUCTION

This report describes a study by ARINC Research Corporation to apply a computerized Integrated Logistics Support model to the Phoenix Missile System (PMS). This program was conducted under contract F09603-75-A-3001-0004 with the U.S. Navy Pacific Missile Test Center (PMTC), Point Mugu, California.

The computerized model utilized, developed by PMTC, is a dynamic, deterministic representation of a procurement/logistics system for Navy in-service air-launched missiles. This model, which will be hereafter referred to as the "ILS model", utilizes weapon operational requirements, usage rates, flow patterns, etc., and projects logistics status parameters suitable for system management decision-making.

Specific tasks under this study included:

a. Analyzing a computer listing of the ILS model program to determine the necessary input information.

b. Defining and acquiring PMS input data required by the model.

c. Operating the model with the PMS data.

d. Comparing the logistics system depicted in the model with the logistics system documented in the PMS Integrated Logistics Support Plan and Operational Logistics Support Plan.

e. Recommending changes to the model to make it more realistic.

This report describes the ILS model and its required input parameters (Section 2); its four types of output (Section 3); its adaptation to the Phoenix Missile System and computer facility (Section 4); the logistics flow plan resulting from the model (Section 5); sources of data to be input to the model (Section 6); general results of exercising the model (Section 7, with specific details presented in the CONFIDENTIAL attachment to this report); and conclusions and recommendations arising from this study (Section 8).

Appendixes to this report present user information and details of card deck assembly for exercising the ILS model for the Phoenix Missile System (Appendix A), and computer program listings for the PMS (Appendix B).

2
PMS LOGISTICS MODEL

The statement of work for this study specified the Air-Launched Weapon Status Summary (ALWSS2) as the applicable logistics model. ARINC Research had gained familiarity with the ALWSS2 during approximately a one-year period preceding the start of this effort. Upon initiation of work, however, a different logistics model was substituted by PMTC which is similar to ALWSS2 but considered more suitable for application to Phoenix. This model was relatively new, having just been developed by PMTC; and no user information had been documented for it. ARINC Research therefore had to develop the necessary user information to apply the ILS model in the contracted effort. The additional tasks necessitated included:

a. Analysis of a program listing and the development of a flow diagram to facilitate further analysis of operational aspects of the computerized program.

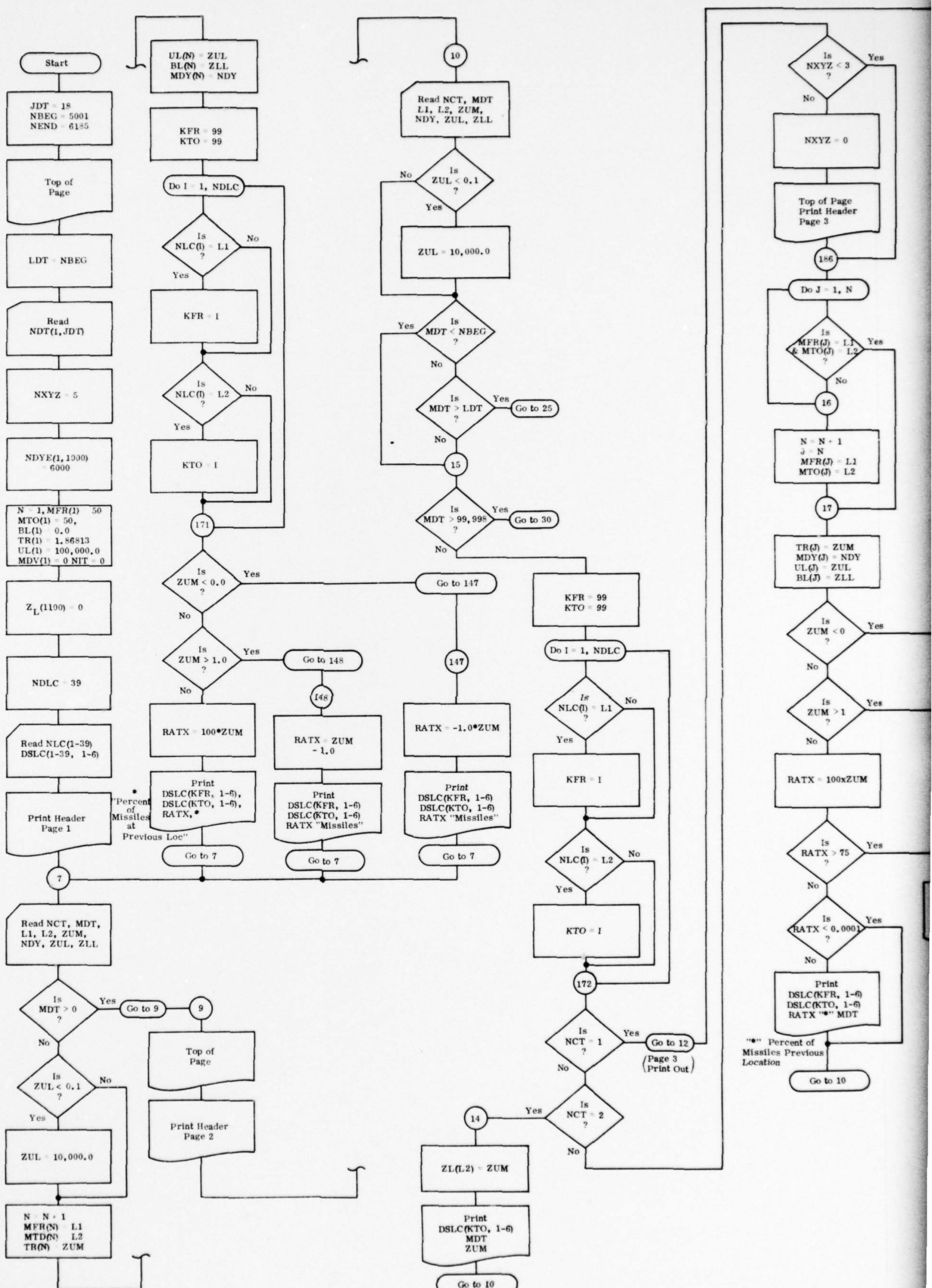
b. Identification and definition of input data parameters.

c. Determination of the input data formats.

d. Determination of rules and sequences for the assembly of an input data card deck.

Documentation available at the commencement of this project was a program listing, reproduced in Table A-1 of Appendix A; and sample output listings, reproduced as Figures 3-1 through 3-4. Further information was obtained from discussions with the author of the program, Dr. Don Isaac of PMTC. From the foregoing information, a flow diagram of the computer program was developed and appears as Figure 2-1. That diagram served as the basis for an analysis to gain familiarization with the structure of the program and to determine the input data required.

Once the input parameters were identified, the method of input was determined, i.e., the sequence of input information and data versus card column information. Results of this analysis are presented in Appendix A.



Start
JDT = 18
NBEG = 5001
NEND = 6185
Top of Page
LDT = NBEG
Read NDT(1, JDT)
NXYZ = 5
NDYE(1, 1000) = 6000
N = 1, MFR(1) = 50
MTO(1) = 50,
BL(1) = 0.0
TR(1) = 1.86813
UL(1) = 100,000.0
MDV(1) = 0 NIT = 0
Z_L(1100) = 0
NDLC = 39
Read NLC(1-39)
DSLC(1-39, 1-6)
Print Header Page 1
7
Read NCT, MDT, L1, L2, ZUM, NDY, ZUL, ZLL
Is MDT > 0 ?
Yes
No
Go to 9
Is ZUL < 0.1 ?
Yes
No
ZUL = 10,000.0
N = N + 1
MFR(N) = L1
MTD(N) = L2
TR(N) = ZUM
UL(N) = ZUL
BL(N) = ZLL
MDY(N) = NDY
KFR = 99
KTO = 99
Do I = 1, NDLC
Is NLC(I) = L1 ?
Yes
No
KFR = I
Is NLC(I) = L2 ?
Yes
No
KTO = I
171
Is ZUM < 0.0 ?
Yes
No
Go to 147
Is ZUM > 1.0 ?
Yes
No
Go to 148
148
RATX = 100*ZUM
RATX = ZUM - 1.0
Print DSLC(KFR, 1-6), DSLC(KTO, 1-6), RATX, *
* "Percent of Missiles at Previous Loc"
Print DSLC(KFR, 1-6) DSLC(KTO, 1-6) RATX "Missiles"
Go to 7
Go to 7
9
Top of Page
Print Header Page 2
10
Read NCT, MDT L1, L2, ZUM, NDY, ZUL, ZLL
Is ZUL < 0.1 ?
No
Yes
ZUL = 10,000.0
Is MDT < NBEG ?
Yes
No
Is MDT > LDT ?
Yes
No
Go to 25
15
Is MDT > 99,998 ?
Yes
No
Go to 30
147
RATX = -1.0*ZUM
Print DSLC(KFR, 1-6) DSLC(KTO, 1-6) RATX "Missiles"
Go to 7
KFR = 99
KTO = 99
Do I = 1, NDLC
Is NLC(I) = L1 ?
Yes
No
KFR = I
Is NLC(I) = L2 ?
Yes
No
KTO = I
172
Is NCT = 1 ?
Yes
No
Go to 12
(Page 3 Print Out)
Is NCT = 2 ?
Yes
No
14
ZL(L2) = ZUM
Print DSLC(KTO, 1-6) MDT ZUM
Go to 10
Is NXYZ < 3 ?
Yes
No
NXYZ = 0
Top of Page Print Header Page 3
186
Do J = 1, N
Is MFR(J) = L1 & MTO(J) = L2 ?
Yes
No
16
N = N + 1
J = N
MFR(J) = L1
MTO(J) = L2
17
TR(J) = ZUM
MDY(J) = NDY
UL(J) = ZUL
BL(J) = ZLL
Is ZUM < 0
Yes
No
Is ZUM > 1
Yes
No
RATX = 100xZUM
Is RATX > 75
Yes
No
Is RATX < 0.0001
Yes
No
Print DSLC(KFR, 1-6) DSLC(KTO, 1-6) RATX "*" MDT
"*" Percent of Missiles Previous Location
Go to 10

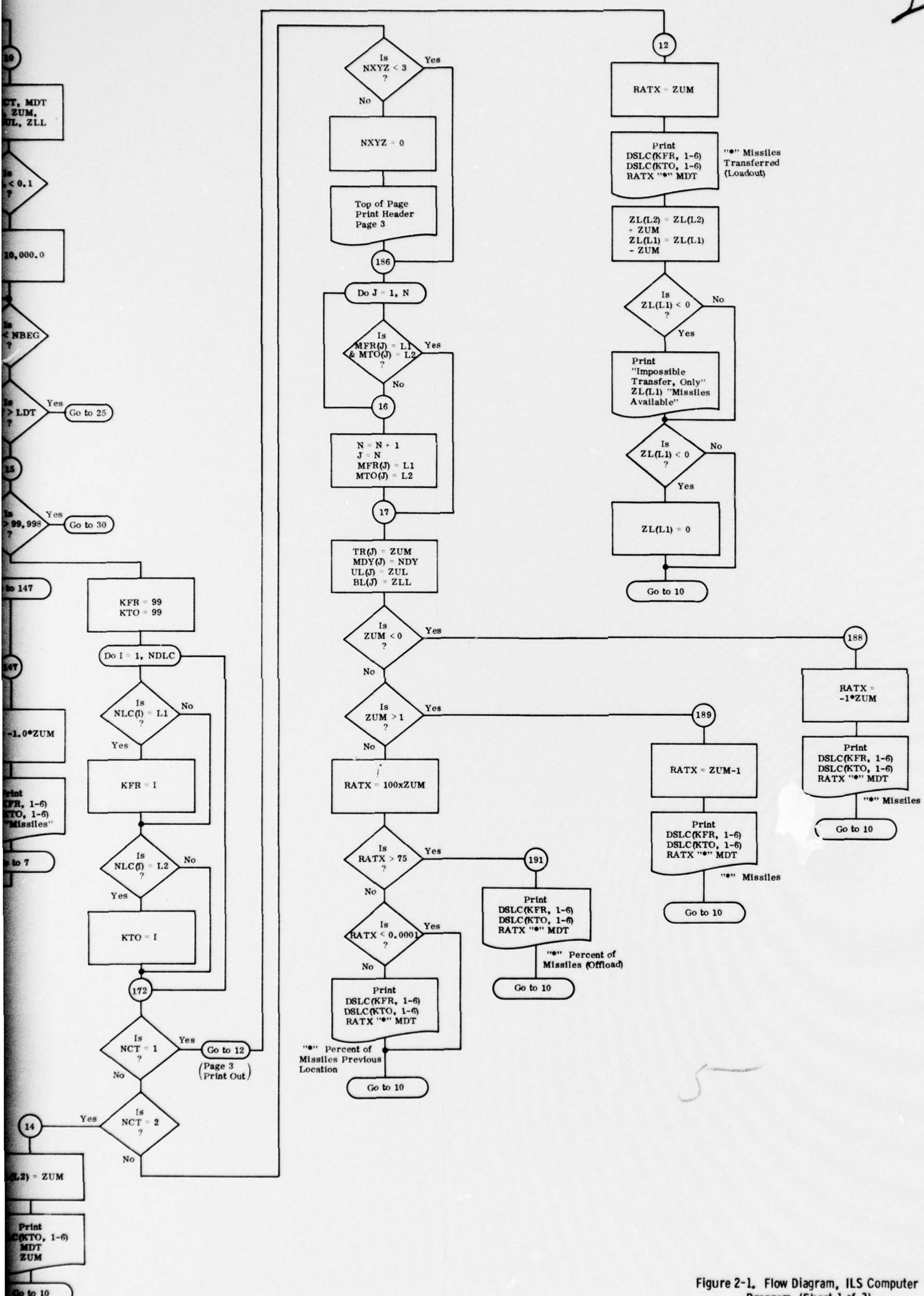
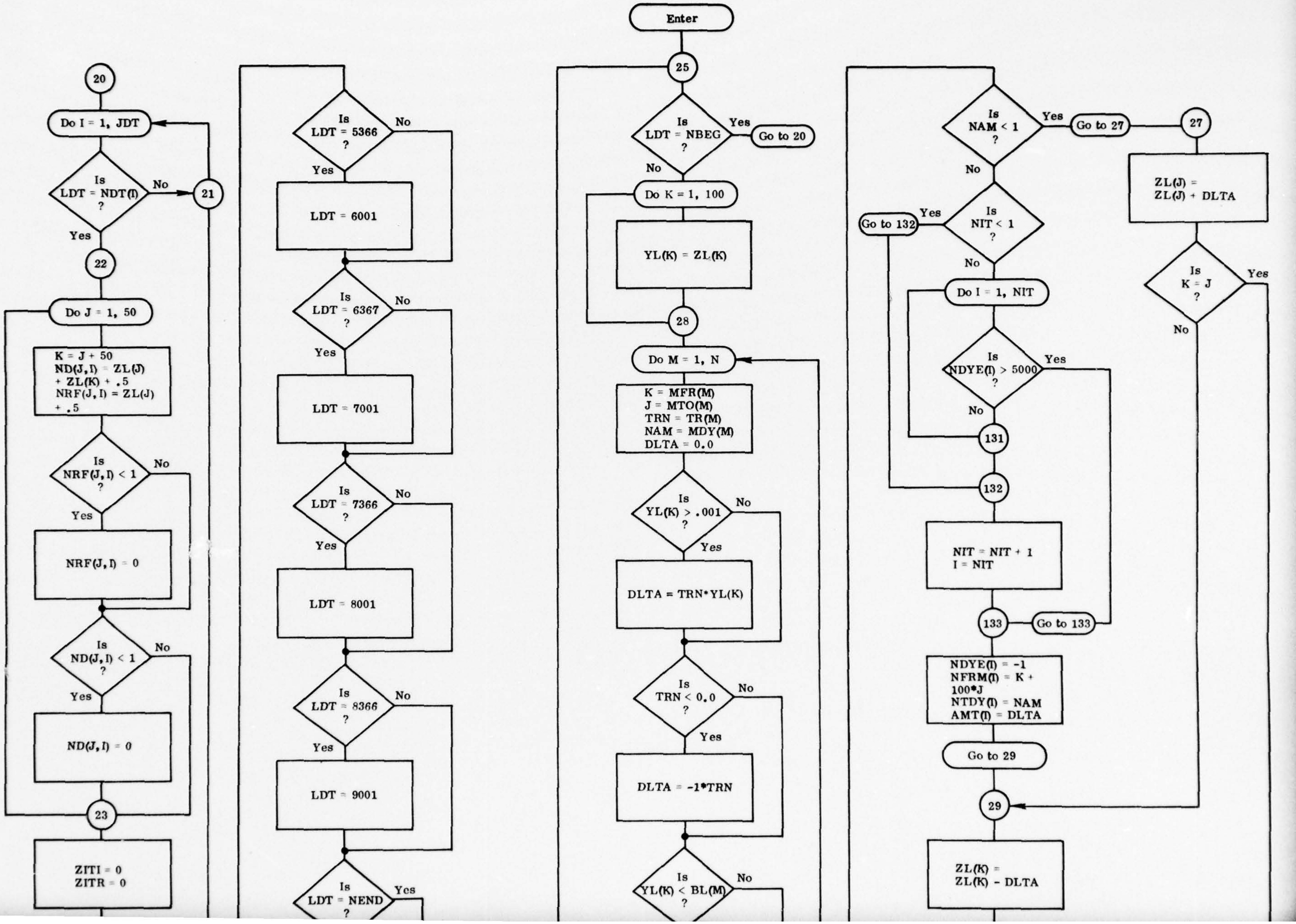


Figure 2-1. Flow Diagram, ILS Computer Program (Sheet 1 of 3)


Enter
25
Is LDT = NBEG ?
Yes
Go to 20
No
Do K = 1, 100
YL(K) = ZL(K)
28
Do M = 1, N
K = MFR(M)
J = MTO(M)
TRN = TR(M)
NAM = MDY(M)
DLTA = 0.0
Is YL(K) > .001 ?
Yes
No
DLTA = TRN*YL(K)
Is TRN < 0.0 ?
Yes
No
DLTA = -1*TRN
Is YL(K) < BL(M) ?
No
20
Do I = 1, JDT
Is LDT = NDT(I) ?
No
21
Yes
22
Do J = 1, 50
K = J + 50
ND(J,I) = ZL(J)
+ ZL(K) + .5
NRF(J,I) = ZL(J)
+ .5
Is NRF(J,I) < 1 ?
Yes
No
NRF(J,I) = 0
Is ND(J,I) < 1 ?
Yes
No
ND(J,I) = 0
23
ZITI = 0
ZITR = 0
Is LDT = 5366 ?
Yes
No
LDT = 6001
Is LDT = 6367 ?
Yes
No
LDT = 7001
Is LDT = 7366 ?
Yes
No
LDT = 8001
Is LDT = 8366 ?
Yes
No
LDT = 9001
Is LDT = NEND ?
Yes
Is NAM < 1 ?
Yes
Go to 27
No
Is NIT < 1 ?
Yes
Go to 132
No
Do I = 1, NIT
Is NDYE(I) > 5000 ?
Yes
No
131
132
NIT = NIT + 1
I = NIT
133
Go to 133
NDYE(I) = -1
NFRM(I) = K +
100*J
NTDY(I) = NAM
AMT(I) = DLTA
Go to 29
29
ZL(K) =
ZL(K) - DLTA
27
ZL(J) =
ZL(J) + DLTA
Is K = J ?
Yes
No

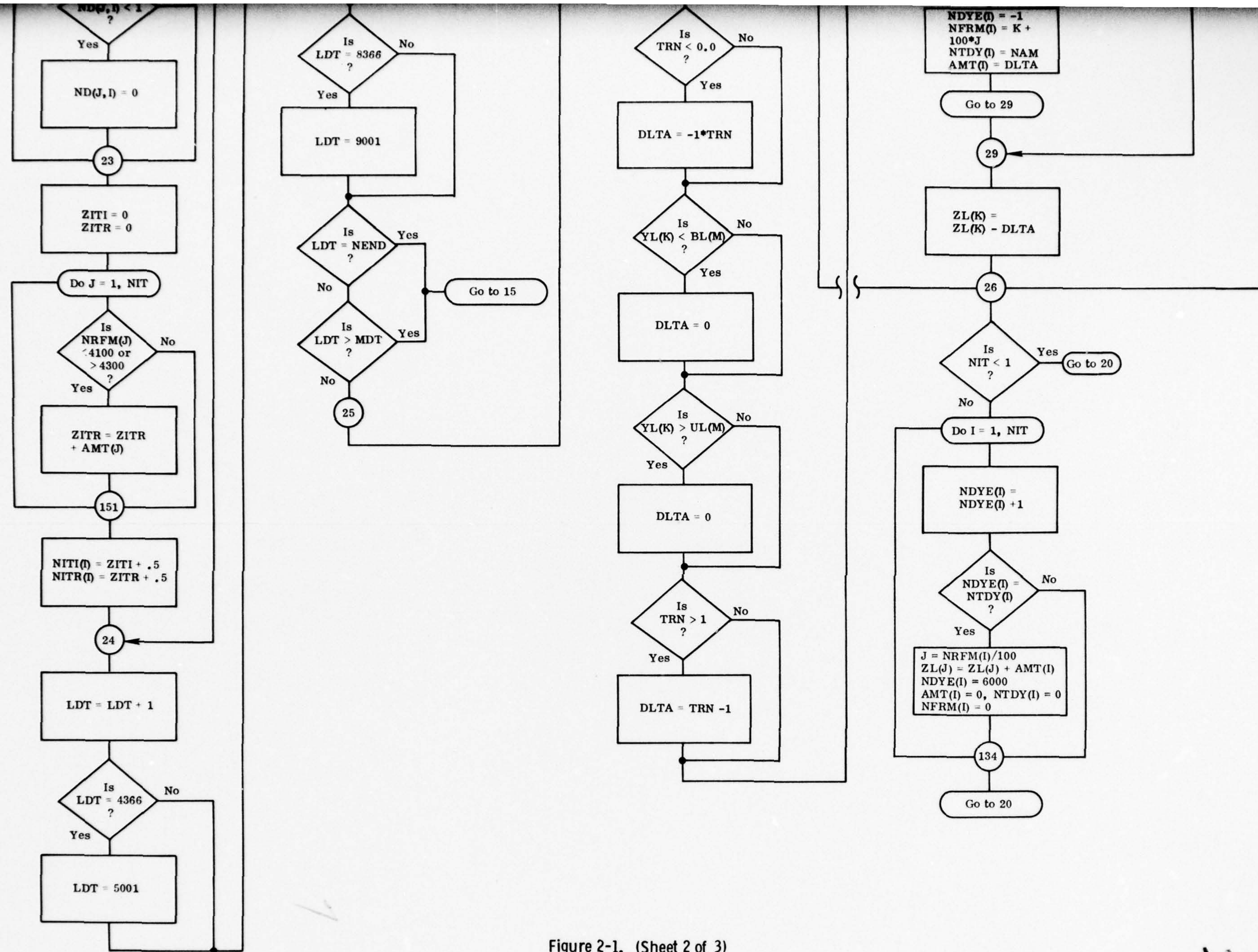
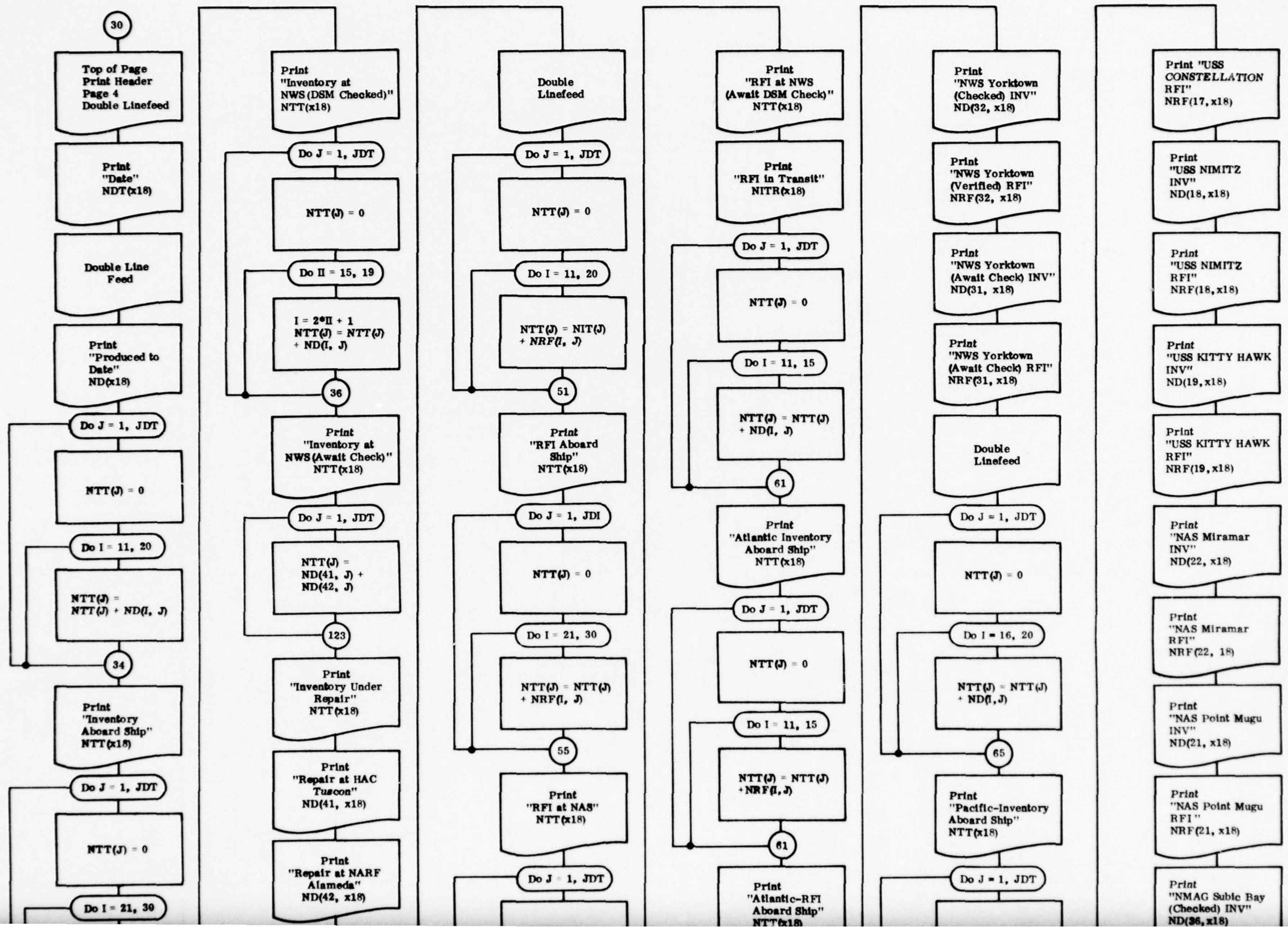


Figure 2-1. (Sheet 2 of 3)

2


30
Top of Page Print Header Page 4 Double Linefeed
Print "Date" NDT(x18)
Double Line Feed
Print "Produced to Date" ND(x18)
Do J = 1, JDT
NTT(J) = 0
Do I = 11, 20
NTT(J) = NTT(J) + ND(I, J)
34
Print "Inventory Aboard Ship" NTT(x18)
Do J = 1, JDT
NTT(J) = 0
Do I = 21, 30
Print "Inventory at NWS (DSM Checked)" NTT(x18)
Do J = 1, JDT
NTT(J) = 0
Do II = 15, 19
I = 2*II + 1 NTT(J) = NTT(J) + ND(I, J)
36
Print "Inventory at NWS (Await Check)" NTT(x18)
Do J = 1, JDT
NTT(J) = ND(41, J) + ND(42, J)
123
Print "Inventory Under Repair" NTT(x18)
Print "Repair at HAC Tuscon" ND(41, x18)
Print "Repair at NARF Alameda" ND(42, x18)
Double Linefeed
Do J = 1, JDT
NTT(J) = 0
Do I = 11, 20
NTT(J) = NIT(J) + NRF(I, J)
51
Print "RFI Aboard Ship" NTT(x18)
Do J = 1, JDI
NTT(J) = 0
Do I = 21, 30
NTT(J) = NTT(J) + NRF(I, J)
55
Print "RFI at NAS" NTT(x18)
Do J = 1, JDT
Print "RFI at NWS (Await DSM Check)" NTT(x18)
Print "RFI in Transit" NITR(x18)
Do J = 1, JDT
NTT(J) = 0
Do I = 11, 15
NTT(J) = NTT(J) + ND(I, J)
61
Print "Atlantic Inventory Aboard Ship" NTT(x18)
Do J = 1, JDT
NTT(J) = 0
Do I = 11, 15
NTT(J) = NTT(J) + NRF(I, J)
61
Print "Atlantic-RFI Aboard Ship" NTT(x18)
Print "NWS Yorktown (Checked) INV" ND(32, x18)
Print "NWS Yorktown (Verified) RFI" NRF(32, x18)
Print "NWS Yorktown (Await Check) INV" ND(31, x18)
Print "NWS Yorktown (Await Check) RFI" NRF(31, x18)
Double Linefeed
Do J = 1, JDT
NTT(J) = 0
Do I = 16, 20
NTT(J) = NTT(J) + ND(I, J)
65
Print "Pacific-Inventory Aboard Ship" NTT(x18)
Do J = 1, JDT
Print "USS CONSTELLATION RFI" NRF(17, x18)
Print "USS NIMITZ INV" ND(18, x18)
Print "USS NIMITZ RFI" NRF(18, x18)
Print "USS KITTY HAWK INV" ND(19, x18)
Print "USS KITTY HAWK RFI" NRF(19, x18)
Print "NAS Miramar INV" ND(22, x18)
Print "NAS Miramar RFI" NRF(22, 18)
Print "NAS Point Mugu INV" ND(21, x18)
Print "NAS Point Mugu RFI" NRF(21, x18)
Print "NMAG Subic Bay (Checked) INV" ND(36, x18)

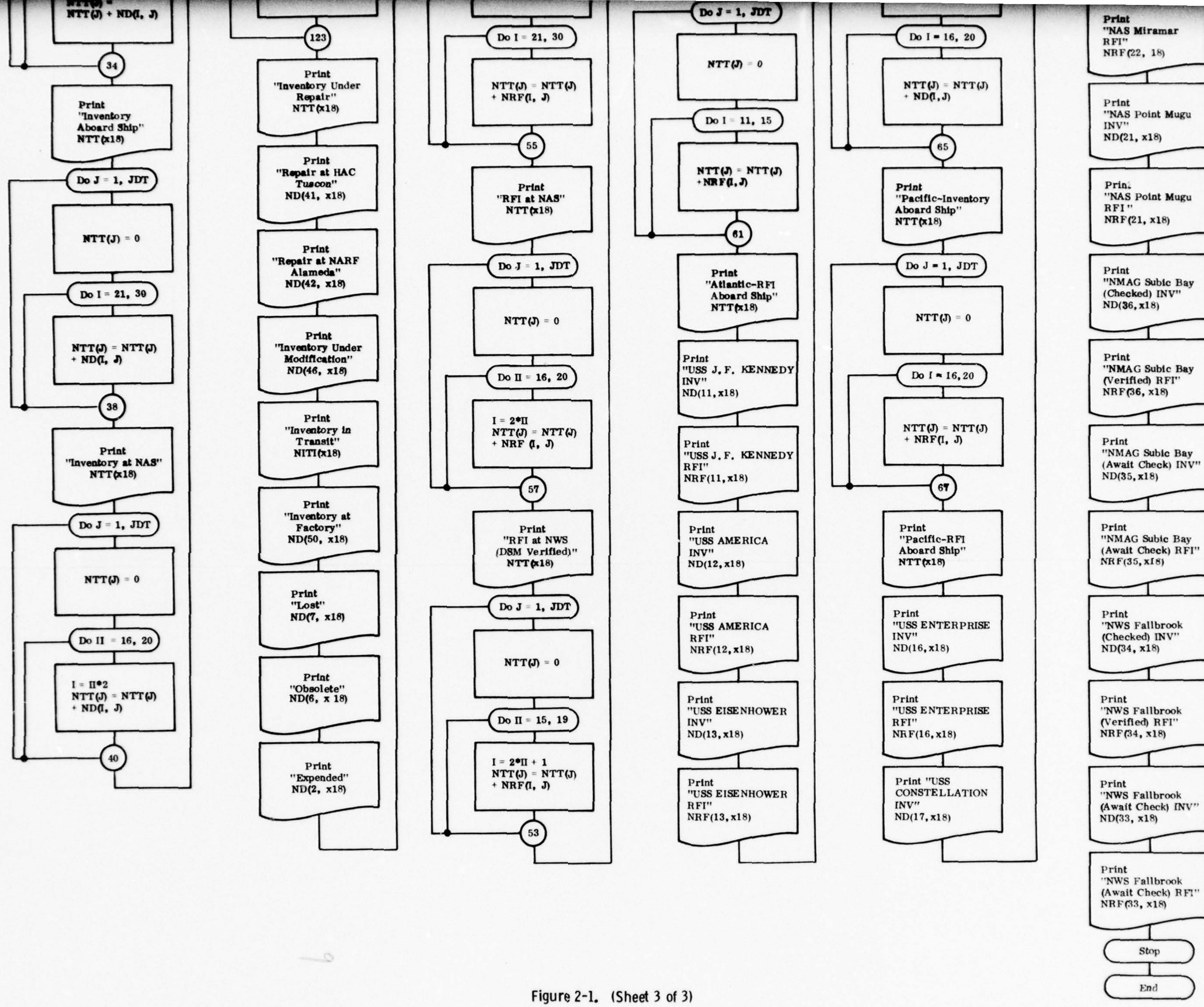


Figure 2-1. (Sheet 3 of 3)

3
PROGRAM OUTPUT LISTINGS

Outputs of the ILS model pertinent to the Phoenix Missile System are described in this section.

The "Current and Projected Phoenix Missile Inventory Status" (see example, Figure 3-1) summarizes the Navywide status and location of Phoenix missiles. The information is presented for the current date and projected for the succeeding 18 months. The column headings for this and other program printouts are four-digit time codes, with the first digit representing the year of a decade and the next three digits the consecutively numbered day of the year. For example, "5131" would represent the 131st day (May 11) of 1975. The quantities of missiles are in terms of all-up rounds (AUR).

The printout, "Initial Transfer Rates" (Figure 3-2), lists the transfer rates in effect on the first day of the period covered by the input data. Presented are departure and destination locations and the associated daily transfer rates.

The printout, "Initial Inventory" (Figure 3-3), lists all locations at which missiles are deployed on the first day of the covered period, together with the number of missiles at these locations. The location descriptors indicate not only physical location but also status information, i.e., RFI or NRFI.

The printout, "Transfers and Changes in Transfer Rates" (Figure 3-4), lists all transfers during the covered period in terms of date of transfer, previous and new locations, and quantity transferred. Also listed on this sheet are any changes in transfer rate in terms of the effective date, destination and departure locations, and new transfer rate.

CURRENT AND PROJECTED PHOENIX MISSILE INVENTORY STATUS

DATE		5001	5031	5061	5091	5121	5151	5181	5211	5241	5271	5301	5331	6001	6031	6061	6091	6121	6151
PRODUCED TO DATE		415	441	467	493	519	545	571	597	623	649	675	701	732	758	784	810	836	862
INVENTORY ABOARD SHIP		72	78	76	74	0	0	72	70	68	66	65	63	72	70	68	66	135	131
INVENTORY AT NAS		57	56	54	53	52	51	50	49	48	48	47	47	46	45	45	45	44	44
INVENTORY AT NWS (DSM CHECKED)		158	158	223	257	299	355	330	366	394	421	449	475	444	504	542	571	527	554
INVENTORY AT NWS (AWAIT CHECK)		0	32	5	3	63	34	11	4	4	5	3	5	58	19	4	3	4	4
INVENTORY UNDER REPAIR		55	33	24	18	14	14	14	12	10	9	7	7	6	9	12	11	9	8
REPAIR AT HAC TUCSON		55	33	24	18	14	14	14	12	10	9	7	7	6	9	12	11	9	8
REPAIR AT NARF ALAMEDA		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INVENTORY UNDER MODIFICATION		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INVENTORY IN TRANSIT		0	7	7	6	5	6	5	5	5	5	5	4	5	6	6	5	5	5
INVENTORY AT FACTORY		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LOST		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OBSOLETE		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EXPENDED		53	61	64	67	70	71	72	75	77	80	82	84	86	88	91	93	97	100
RFI ABOARD SHIP		72	75	69	63	0	0	72	65	60	55	50	46	72	66	60	55	116	106
RFI AT NAS		52	48	44	40	37	34	31	29	26	24	22	21	19	17	16	15	14	13
RFI AT NWS (DSM VERIFIED)		152	146	210	247	286	339	319	357	387	415	443	470	435	487	531	563	520	547
RFI AT NWS (AWAIT DSM CHECK)		0	31	4	2	55	34	11	4	4	5	3	5	41	17	4	3	3	4
RFI IN TRANSIT		0	6	5	5	5	5	5	4	4	4	4	4	4	4	4	4	4	4
ATLANTIC - INVENTORY ABOARD SHIP		0	0	0	0	0	0	72	70	68	66	65	63	72	70	68	66	65	63
ATLANTIC - RFI ABOARD SHIP		0	0	0	0	0	0	72	65	60	55	50	46	72	66	60	55	50	46
USS J. F. KENNEDY	INV	0	0	0	0	0	0	72	70	68	66	65	63	0	0	0	0	0	0
USS J. F. KENNEDY	RFI	0	0	0	0	0	0	72	65	60	55	50	46	0	0	0	0	0	0
USS AMERICA	INV	0	0	0	0	0	0	0	0	0	0	0	0	72	70	68	66	65	63
USS AMERICA	RFI	0	0	0	0	0	0	0	0	0	0	0	0	72	66	60	55	50	46
USS EISENHOWER	INV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
USS EISENHOWER	RFI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NWS YORKTOWN (CHECKED)	INV	33	53	73	91	106	122	65	79	95	108	122	135	88	135	158	172	185	199
NWS YORKTOWN (VERIFIED)	RFI	33	50	69	87	103	118	62	76	92	105	119	133	82	121	150	167	181	195
NWS YORKTOWN (AWAIT CHECK)	INV	0	2	2	1	1	1	1	2	1	2	1	2	55	16	1	1	2	1
NWS YORKTOWN (AWAIT CHECK)	RFI	0	2	2	1	1	1	1	2	1	2	1	2	38	14	1	1	1	1
PACIFIC - INVENTORY ABOARD SHIP		72	78	76	74	0	0	0	0	0	0	0	0	0	0	0	0	70	68
PACIFIC - RFI ABOARD SHIP		72	75	69	63	0	0	0	0	0	0	0	0	0	0	0	0	66	60
USS ENTERPRISE	INV	72	78	76	74	0	0	0	0	0	0	0	0	0	0	0	0	70	68
USS ENTERPRISE	RFI	72	75	69	63	0	0	0	0	0	0	0	0	0	0	0	0	66	60
USS CONSTELLATION	INV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
USS CONSTELLATION	RFI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
USS NIMITZ	INV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
USS NIMITZ	RFI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
USS KITTY HAWK	INV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
USS KITTY HAWK	RFI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NAS MIRAMAR	INV	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NAS MIRAMAR	RFI	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NAS POINT MUGU	INV	55	54	52	51	50	49	48	47	46	46	45	45	44	43	43	43	42	42
NAS POINT MUGU	RFI	50	46	42	38	35	32	29	27	24	22	20	19	17	15	14	13	12	11
NMAG SUBIC BAY (CHECKED)	INV	71	32	58	56	55	55	54	54	54	54	54	54	54	54	54	54	54	54
NMAG SUBIC BAY (VERIFIED)	RFI	71	28	53	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54
NMAG SUBIC BAY (AWAIT CHECK)	INV	0	29	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NMAG SUBIC BAY (AWAIT CHECK)	RFI	0	28	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NWS FALLBROOK (CHECKED)	INV	54	73	92	110	138	178	211	233	245	259	273	286	302	315	330	345	288	301
NWS FALLBROOK (VERIFIED)	RFI	48	68	88	106	129	167	203	227	241	256	270	283	299	312	327	342	285	298
NWS FALLBROOK (AWAIT CHECK)	INV	0	1	2	1	51	32	9	1	2	2	1	2	2	2	2	1	1	2
NWS FALLBROOK (AWAIT CHECK)	RFI	0	1	2	1	53	32	9	1	2	2	1	2	2	2	2	1	1	2

Figure 3-1. Example, Current and Projected Phoenix Missile Inventory Status

INITIAL TRANSFER RATES

PREVIOUS LOCATION	NEW LOCATION	TRANSFER RATE PER DAY
PRODUCED	PRODUCED	.8681 MISSILES
RFI USS J. F. KENNEDY	EXPENDED	.1000 PERCENT OF MISSILES AT PREVIOUS LOC
RFI USS J. F. KENNEDY	NRFI USS J. F. KENNEDY	.2000 PERCENT OF MISSILES AT PREVIOUS LOC
RFI USS AMERICA	EXPENDED	.1000 PERCENT OF MISSILES AT PREVIOUS LOC
RFI USS AMERICA	NRFI USS AMERICA	.2000 PERCENT OF MISSILES AT PREVIOUS LOC
RFI USS EISENHOWER	EXPENDED	.1000 PERCENT OF MISSILES AT PREVIOUS LOC
RFI USS EISENHOWER	NRFI USS EISENHOWER	.2000 PERCENT OF MISSILES AT PREVIOUS LOC
RFI USS ENTERPRISE	EXPENDED	.1000 PERCENT OF MISSILES AT PREVIOUS LOC
RFI USS ENTERPRISE	NRFI USS ENTERPRISE	.2000 PERCENT OF MISSILES AT PREVIOUS LOC
RFI USS CONSTELLATION	EXPENDED	.1000 PERCENT OF MISSILES AT PREVIOUS LOC
RFI USS CONSTELLATION	NRFI USS CONSTELLATION	.2000 PERCENT OF MISSILES AT PREVIOUS LOC
RFI USS NIMITZ	EXPENDED	.1000 PERCENT OF MISSILES AT PREVIOUS LOC
RFI USS NIMITZ	NRFI USS NIMITZ	.2000 PERCENT OF MISSILES AT PREVIOUS LOC
RFI USS KITTY HAWK	EXPENDED	.1000 PERCENT OF MISSILES AT PREVIOUS LOC
RFI USS KITTY HAWK	NRFI USS KITTY HAWK	.2000 PERCENT OF MISSILES AT PREVIOUS LOC
RFI NAS POINT MUGU	EXPENDED	.1000 PERCENT OF MISSILES AT PREVIOUS LOC
RFI NAS POINT MUGU	NRFI NAS POINT MUGU	.2000 PERCENT OF MISSILES AT PREVIOUS LOC
FACTORY	RFI NWS YORKTOWN (DSM CHECK)	.4341 MISSILES
RDPAIR - HAC TUCSON	RFI NWS YORKTOWN (DSM CHECK)	1.0000 PERCENT OF MISSILES AT PREVIOUS LOC
RFI NWS YORKTOWN (DSM CHECK)	RFI NWS YORKTOWN (STORAGE)	1.2000 MISSILES
RFI NWS YORKTOWN (DSM CHECK)	NRFI NWS YORKTOWN (STORAGE)	.3000 MISSILES
NRFI NWS YORKTOWN (DSM CHECK)	RFI NWS YORKTOWN (STORAGE)	.1000 MISSILES
NRFI NWS YORKTOWN (DSM CHECK)	NRFI NWS YORKTOWN (STORAGE)	.4000 MISSILES
NRFI NWS YORKTOWN (STORAGE)	RFI NWS YORKTOWN (DSM CHECK)	2.0000 PERCENT OF MISSILES AT PREVIOUS LOC
NRFI NWS YORKTOWN (STORAGE)	RDPAIR - HAC TUCSON	2.0000 PERCENT OF MISSILES AT PREVIOUS LOC
FACTORY	RFI NWS FALLBROOK (DSM CHECK)	.4341 MISSILES
RDPAIR - HAC TUCSON	RFI NWS FALLBROOK (DSM CHECK)	1.0000 PERCENT OF MISSILES AT PREVIOUS LOC
RFI NWS FALLBROOK (DSM CHECK)	RFI NWS FALLBROOK (STORAGE)	1.2000 MISSILES
RFI NWS FALLBROOK (DSM CHECK)	NRFI NWS FALLBROOK (STORAGE)	.3000 MISSILES
NRFI NWS FALLBROOK (DSM CHECK)	RFI NWS FALLBROOK (STORAGE)	.1000 MISSILES
NRFI NWS FALLBROOK (DSM CHECK)	NRFI NWS FALLBROOK (STORAGE)	.4000 MISSILES
NRFI NWS FALLBROOK (STORAGE)	RFI NWS FALLBROOK (DSM CHECK)	2.0000 PERCENT OF MISSILES AT PREVIOUS LOC
NRFI NWS FALLBROOK (STORAGE)	RDPAIR - HAC TUCSON	2.0000 PERCENT OF MISSILES AT PREVIOUS LOC
RFI SUBIC BAY (DSM CHECK)	RFI SUBIC BAY (STORAGE)	1.2000 MISSILES
RFI SUBIC BAY (DSM CHECK)	NRFI SUBIC BAY (STORAGE)	.3000 MISSILES
NRFI SUBIC BAY (DSM CHECK)	RFI SUBIC BAY (STORAGE)	.1000 MISSILES
NRFI SUBIC BAY (DSM CHECK)	NRFI SUBIC BAY (STORAGE)	.4000 MISSILES
NRFI SUBIC BAY (STORAGE)	RFI SUBIC BAY (DSM CHECK)	2.0000 PERCENT OF MISSILES AT PREVIOUS LOC
NRFI SUBIC BAY (STORAGE)	RDPAIR - HAC TUCSON	2.0000 PERCENT OF MISSILES AT PREVIOUS LOC

Figure 3-2. Example, Initial Transfer Rates

INITIAL INVENTORY

LOCATION	DATE	NUMBER
PRODUCED	5001	415.
EXPENDED	5001	57.
RFI NAS POINT MUGU	5001	50.
NRFI NAS POINT MUGU	5001	5.
RFI NAS MIRAMAR	5001	2.
RFI NWS FALLBROOK (STORAGE)	5001	48.
NRFI NWS FALLBROOK (STORAGE)	5001	6.
RFI NWS YORKTOWN (STORAGE)	5001	33.
RFI USS ENTERPRISE	5001	72.
RDRATR - HAC TUCSON	5001	55.
RFI SUBIC BAY (STORAGE)	5001	71.

Figure 3-3. Example, Initial Inventory

TRANSFERS AND CHANGES IN TRANSFER RATES

PREVIOUS LOCATION	NEW LOCATION	TRANSFER RATE PER DAY	DATE
RFI USS ENTERPRISE	RFI SUBIC BAY (DSM CHECK)	80.0000 PERCENT OF MISSILES (OFFLOAD)	5012
NRFI USS ENTERPRISE	NRFI SUBIC BAY (DSM CHECK)	100.0000 PERCENT OF MISSILES (OFFLOAD)	5012
RFI SUBIC BAY (STORAGE)	RFI USS ENTERPRISE	66.0000 MISSILES TRANSFERRED (LOADOUT)	5013
RFI USS ENTERPRISE	RFI NWS FALLBROOK (DSM CHECK)	100.0000 PERCENT OF MISSILES (OFFLOAD)	5110
NRFI USS ENTERPRISE	NRFI NWS FALLBROOK (DSM CHECK)	100.0000 PERCENT OF MISSILES (OFFLOAD)	5110
RFI NWS YORKTOWN (STORAGE)	RFI USS J. F. KENNEDY	72.0000 MISSILES TRANSFERRED (LOADOUT)	5180
RFI USS J. F. KENNEDY	RFI NWS YORKTOWN (DSM CHECK)	100.0000 PERCENT OF MISSILES (OFFLOAD)	5360
NRFI USS J. F. KENNEDY	NRFI NWS YORKTOWN (DSM CHECK)	100.0000 PERCENT OF MISSILES (OFFLOAD)	5360
RFI NWS YORKTOWN (STORAGE)	RFI USS AMERICA	72.0000 MISSILES TRANSFERRED (LOADOUT)	6001
RFI NWS FALLBROOK (STORAGE)	RFI USS ENTERPRISE	72.0000 MISSILES TRANSFERRED (LOADOUT)	6092
RFI NWS YORKTOWN (STORAGE)	RFI USS J. F. KENNEDY	72.0000 MISSILES TRANSFERRED (LOADOUT)	6180
RFI NWS FALLBROOK (STORAGE)	RFI USS CONSTELLATION	72.0000 MISSILES TRANSFERRED (LOADOUT)	6180
RFI USS AMERICA	RFI NWS YORKTOWN (DSM CHECK)	100.0000 PERCENT OF MISSILES (OFFLOAD)	6181
NRFI USS AMERICA	NRFI NWS YORKTOWN (DSM CHECK)	100.0000 PERCENT OF MISSILES (OFFLOAD)	6181
RFI USS ENTERPRISE	RFI NWS FALLBROOK (DSM CHECK)	100.0000 PERCENT OF MISSILES (OFFLOAD)	6272
NRFI USS ENTERPRISE	NRFI NWS FALLBROOK (DSM CHECK)	100.0000 PERCENT OF MISSILES (OFFLOAD)	6272
RFI USS J. F. KENNEDY	RFI NWS YORKTOWN (DSM CHECK)	100.0000 PERCENT OF MISSILES (OFFLOAD)	6360
NRFI USS J. F. KENNEDY	NRFI NWS YORKTOWN (DSM CHECK)	100.0000 PERCENT OF MISSILES (OFFLOAD)	6360
RFI USS CONSTELLATION	RFI NWS FALLBROOK (DSM CHECK)	100.0000 PERCENT OF MISSILES (OFFLOAD)	6360
NRFI USS CONSTELLATION	NRFI NWS FALLBROOK (DSM CHECK)	100.0000 PERCENT OF MISSILES (OFFLOAD)	6360
RFI NWS FALLBROOK (STORAGE)	RFI USS CONSTELLATION	72.0000 MISSILES TRANSFERRED (LOADOUT)	7180
RFI USS CONSTELLATION	RFI NWS FALLBROOK (DSM CHECK)	100.0000 PERCENT OF MISSILES (OFFLOAD)	7360
NRFI USS CONSTELLATION	NRFI NWS FALLBROOK (DSM CHECK)	100.0000 PERCENT OF MISSILES (OFFLOAD)	7360

Figure 3-4. Example, Transfers and Changes in Transfer Rates

4
COMPUTER PROGRAM ADAPTATION

The ILS model was exercised at the Orange County Computer Center, Irvine, California. Control Data Corporation's "Cybernet" service, which operates with a CDC 6600 computer, was used with batch-card input and high-speed printer output.

The program deck was prepared from the listing obtained from PMTC. No significant changes were necessary to make the program compatible with the computer facility utilized.

A listing of the dummy data deck used in producing the outputs described in Section 3 was obtained from PMTC. A data deck was then prepared from this listing, and computer runs and subsequent adjustments to the program deck were made until the resulting output listing corresponded with that of PMTC.

Since the output listing will be classified CONFIDENTIAL when the ILS model is exercised with a real data input, the program had to be modified such that the output produced would not compromise the security of the data content. This modification involved the generation of two versions of the program, each of which would produce a partial output listing. Each listing by itself would not be complete enough to divulge the classified information. Two output listings resulting from runs with the two versions of the program with the same input data can be fit together to provide a complete listing which would be classified CONFIDENTIAL at that time. Listings of these two versions of the program appear in Appendix B.

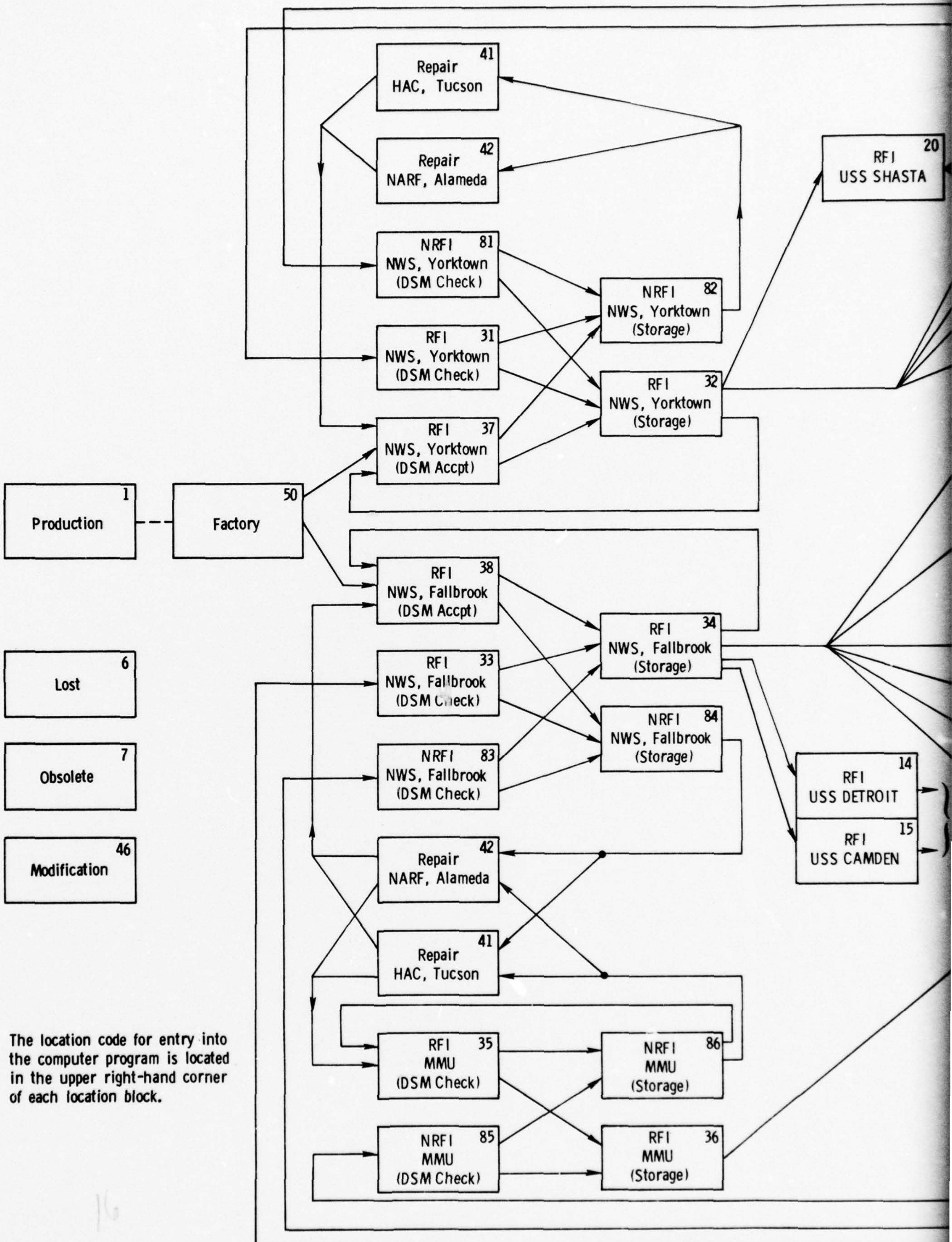
5
LOGISTICS FLOW PLAN

Characteristics of the logistics flow model represented by the ILS program for the Phoenix missile are determined by the makeup of the input data deck. The logistics flow diagram, Figure 5-1, represents a model containing all locations pertinent to the Navywide deployment of the Phoenix Missile System. These locations are defined by the Group B cards within the data deck (see Appendix A). The numbers in the upper right-hand corners of the location blocks in the diagram are location codes for input into the computer program. The locations and corresponding computer codes are summarized in Table A-3.

The distribution of production Phoenix missiles is shown in Figure 5-1 as beginning at the factory and proceeding to two Naval Weapon Stations (Yorktown and Fallbrook). The models for the weapon stations at Yorktown and Fallbrook are identical, consisting of three checkout and two storage locations. Three checkout locations are necessary since missiles entering the Naval Weapon Station in different status can be expected to have different rejection ratios and therefore different transfer rates. Status of missiles incoming to the Weapon Station can be categorized as either 1) fleet-returned missiles, non-RFI; 2) fleet-returned missiles, RFI; and 3) RFI missiles that have seen no service since last test or initial delivery.

It is recognized that the division of fleet return missiles into RFI and NRFI is somewhat ficticious as it relates to missile availability for issue from the NWS. However, this distinction is necessary for the purposes of this model, in that it is felt that missiles returning from the fleet, after having been determined non-RFI during fleet operations, will have a different rejection ratio than those missiles that remained in an RFI status during their fleet operations. The two storage locations within the Naval Weapon Station model are non-RFI and RFI storage. Since there is a requirement in the ILS plan for Phoenix that a missile undergo testing 60 days prior to issue, a path is necessary from RFI storage back into RFI acceptance test.

All issues to the fleet are made from RFI storage at the Naval Weapon Stations and the Mobile Maintenance Unit (MMU). The MMU portion of the ILS model is similar to that of the Naval Weapon Station, but does not contain an acceptance test



NOTE: The location code for entry into the computer program is located in the upper right-hand corner of each location block.

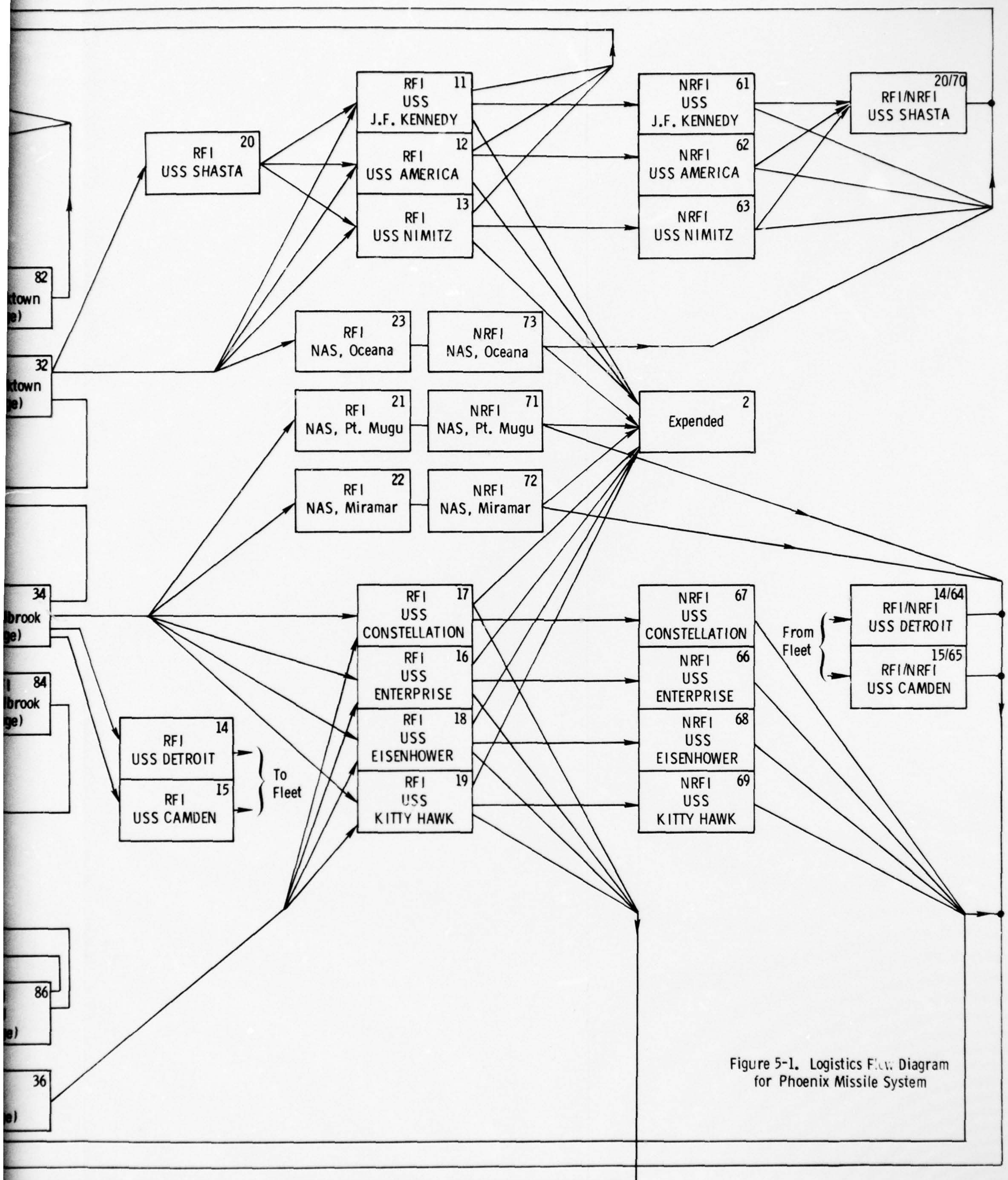


Figure 5-1. Logistics Flow Diagram for Phoenix Missile System

location since no new deliveries are made to the MMU. In the diagram shown in Figure 5-1, the MMU is depicted as attached to the Pacific Fleet. However, it is possible that this unit could be attached to the Atlantic Fleet in an identical manner.

Factory and NARF facilities accept missiles from non-RFI storage locations of Naval Weapons Stations. The output from these repair facilities is returned to a Weapon Station acceptance test location.

The fleet portions of the model consist of RFI and non-RFI locations for each ship and station. The operational ships and Naval Air Stations have transfer paths between RFI and non-RFI locations. The support ships have no paths between RFI and non-RFI since these ships are utilized only to transport missiles, and therefore the missiles would not undergo operational degradation while aboard these ships. Missiles may exit the two locations at each fleet site, either directly to the Naval Weapon Station or indirectly via a service ship location. Additional exit of missiles from RFI locations from the operational sites of the fleet are to the location labeled "Expended".

The three location blocks located on the left-hand side of the diagram, labeled "Lost", "Obsolete", and "Modification", can receive missiles from any location on the diagram, with the possible exception of production and factory. To avoid cluttering of the diagram, the possible paths into these three blocks are not shown.

The logistics flow model described in this section was compared with the description of the PMS logistics flow contained in the Phoenix Missile Integrated Logistics Support Plan, MS-027, Revision 9, December 1974. Flow paths and locations were found to be in general agreement. However the ILS computer program expands on the descriptions of those paths and locations. Necessary detail was added to differentiate between varying locations having similar functions but dissimilar transfer rates for missiles from different sources.

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6
DATA SOURCE IDENTIFICATION

To obtain input data for the program, a primary task was to identify the sources of suitable data. As required by the statement of work, the data had to be obtained from existing sources, and no new data requirements could be generated.

Pursuant to this task, a meeting was held between representatives of the Fleet Missile System Analysis and Evaluation Group (FMSAEG) and ARINC Research. At this meeting, a number of potential data sources were identified and subsequently investigated as to their suitability as sources of PMS input data. Sources found useful are discussed below.

6.1 CAIMS

The Conventional Ammunition Integrated Management System (CAIMS) includes an extensive data bank which contains, among other information elements, Navywide inventory data for Phoenix. The inventory data are useful to the program as baseline information for initializing the ILS model, and for periodic checks and updates of model projections. Since it is not reasonable to anticipate that the model's transfer rates and flow patterns will yield totally accurate projections, it must be assumed that periodic updates of the PMS inventory status will be necessary. The frequency of these corrections will have to be determined as the ILS model is applied on a regular basis, and when the deviations between inventory projections and actual inventory status can be observed and evaluated.

CAIMS reports are furnished to various users in a format tailored to their specific requirements. The PMTC Maintenance Management Division, Code 2260, receives three reports biweekly from CAIMS containing the necessary inventory information for input to this program. These reports, classified CONFIDENTIAL, are:

a. Ammunition Consolidated Stock Status Report (ACSSR)

b. Air Launched Missile Report, Fleet and Overseas

c. Air Launched Missile Report, CONUS

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CAIMS reports are originated by NAVAIR-4124. It is recommended, however, that the reports be obtained through the PMTC Maintenance Management Division for purposes of maintaining the PMS inventory computer program.

6.2 POFAR

The Projected Operational Force Air-Launched Missile Requirements (POFAR) report is published quarterly by the Naval Ship Weapon Systems Engineering Station, Port Hueneme, California. This report, classified CONFIDENTIAL, is a source of the projected movement of missiles into and out of the fleet. In addition to providing shipfill and ship offload data, POFAR can be used in conjunction with data from the Workload Execution Plan (WEP) to determine the breakdown between RFI and NRFI returns to the NWS from the fleet.

6.3 WEP

The Workload Execution Plan (WEP) is a document produced quarterly by the Maintenance Management Division of PMTC. Data from CAIMS, POFAR, and other sources are processed to produce WEP outputs. Of particular interest to this program is the Quarterly Fleet Support Workload Projection for PMS portion of the WEP. An example of this report is shown in Figure 6-1.

Production rate information can be derived from data entered on lines 5 and 11 of the Quarterly Fleet Support Workload Projection. The data on these lines will also be useful in evaluating production rejection data obtained from the "Phoenix NWS Processing Rates" report published by FMSAEG (see Section 6.4). The transfer rates for missiles to repair facilities at Hughes Aircraft/Tucson and at NARF/Alameda can be derived from data on lines 37 and 40. Transfer rates for missiles from these repair facilities can be derived from data on lines 12 and 15.

6.4 PHOENIX NWS PROCESSING RATES

The unclassified report, "Phoenix NWS Processing Rates", is published quarterly by FMSAEG. It contains information on number of missiles processed and rejected at NWS/Yorktown, NWS/Fallbrook, and the MMU; and the computed rejection ratios. This type of data is presented for new production, fleet returns, and units out of storage. An example of the report is shown in Figure 6-2.

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(when filled in)

NWS	FISCAL YEAR	QUARTERLY FLEET SUPPORT WORKLOAD PROJECTION	QUARTER	MONTH

MISSILE SYSTEM			NO	AUR	GUIDANCE & CONTROL	RKT MTR	WAR HEAD	WINGS	FINS	TDD	S&A
	INVENTORY BEGINNING OF PERIOD	UNSERVICEABLE	1								
		SERVICEABLE	2								
		TOTAL	3								
UNSERVICEABLE	PROJECTED GAINS DURING PERIOD	SHIP OFFLOADS	4								
		PRODUCTION REJECTS	5								
		OTHER RETURNS	6								
		NWS	7								
		NWS	8								
			9								
		TOTAL	10								
SERVICEABLE	PROJECTED GAINS DURING PERIOD	PRODUCTION ACCEPTANCES	11								
		NARF ALAMEDA	12								
		NARF NORFOLK	13								
		NOS INDIAN HEAD	14								
		DOP	15								
		NWS	16								
		NWS	17								
		TOTAL	18								
	ISSUES AND TRANSFERS DURING PERIOD	SHIPFILLS	19								
		TRAINING	20								
		PWRS	21								
		MCAS	22								
		NWS	23								
		NWS	24								
		FMS	25								
		THROUGHPUT	26								
		TOTAL	27								
WORKLOAD REQUIREMENT			28								
PROJECTED MAINTENANCE REQUIREMENT		THROUGHPUT (OTHER)	29								
	REJECT RATIO (%)	QUANTITY	30								
		TOTAL	31								
		THROUGHPUT (O&MN)	32								
	REJECT RATIO (%)	QUANTITY	33								
		TOTAL	34								
PROJECTED COSTS		UNIT COST	35	$							
		TOTAL COST ($ K)	36	$							
UNSERVICEABLE		TRANSFERS TO NARF ALAMEDA	37								
		TRANSFERS TO NARF NORFOLK	38								
		TRANSFERS TO NOS INDIAN HEAD	39								
		TRANSFERS TO DOP	40								
		TRANSFERS TO NWS	41								
		TRANSFERS TO NWS	42								
	INVENTORY END OF PERIOD	UNSERVICEABLE	43								
		SERVICEABLE	44								
		TOTAL	45								

REMARKS

CONFIDENTIAL
Enclosure 1, Appendix C

Figure 6-1. Quarterly Fleet Support Workload Projection

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MISSILE	SOURCE		RESULTS	YORK	CONC	FALL	MMMU	TOTAL
PHX/54/A	NEW PRODUCTION							
		4TH-QTR-74	NO.PROC.			164		164
			NO.REJ.			44		44
			RATIO			0.27		0.27
		1ST-QTR-75	NO.PROC.			44		44
			NO.REJ.			16		16
			RATIO			0.36		0.36
		FOUR-QTR-AVG	NO.PROC.			98		98
			NO.REJ.			20		20
			RATIO			0.20		0.20
	STORAGE							
		FOUR-QTR-AVG	NO.PROC.			8		8
			NO.REJ.			0		0
			RATIO			0.00		0.00
	FLEET RETURN							
		FOUR-QTR-AVG	NO.PROC.			6		6
			NO.REJ.			4		4
			RATIO			0.67		0.67
	ALL SOURCES							
		4TH-QTR-74	NO.PROC.			164		164
			NO.REJ.			44		44
			RATIO			0.27		0.27
		1ST-QTR-75	NO.PROC.			44		44
			NO.REJ.			16		16
			RATIO			0.36		0.36
		FOUR-QTR-AVG	NO.PROC.			113		113
			NO.REJ.			25		25
			RATIO			0.22		0.22

000001

Figure 6-2. Phoenix NWS Processing Rates

6.5 WEAPON SYSTEM PLANNING DOCUMENT

The classified report, "Weapon System Planning Document, Phoenix AIM-54 Missile System", is published annually as NAVAIRNOTE C13010. That report is of interest to this program in that it contains PMS production and delivery information. In addition, it presents long-range deployment and operational requirements that would be useful should it be desired to use the program for long-range projections (beyond 18 months).

6.6 DATA SOURCE SUMMARY

Figure A-2 summarizes required input data for the ILS model versus data source.

7
MODEL EXERCISE

7.1 PROGRAM INPUT

The ILS model was exercised with historic and projected PMS data covering the period from 1 January 1975 to 31 May 1976.

Since the Phoenix Missile System has only recently been deployed operationally in the fleet, some of the data sources previously discussed contain little or no data on that missile. Therefore, alternate sources of data had to be used for an initial exercise of the program. The major portion of these data centered around missiles deployed operationally aboard the USS ENTERPRISE on two cruises, in 1974 and 1975. Data on these missiles, gathered by PMTC/Pt. Mugu, includes transfer rates from RFI to non-RFI aboard ship; the quantity of missiles involved in ship fills and offloads; the quantity of missiles received at the Naval Weapon Stations, together with the status as received; and a quantity breakdown of these missiles as they flowed through the Naval Weapon Stations. Transfer rates associated with the lost and expended missiles were based on experience during the ENTERPRISE cruises.

Data on the initial inventory as of 1 January 1975 were obtained from the Reliability Engineering Division of PMTC. The data are incomplete in that there is a difference between the missiles produced to that date and the cumulative quantity of missiles at various locations. The reason for the discrepancy could not be determined during this model exercise.

7.2 PROGRAM RESULTS AND OUTPUT LISTING

The program output listing is presented in the classified attachment to this report, and is the result of a run using data from the interim sources described in Section 7.1.

Table 1 of the classified attachment contains a comparison of CAIMS-reported inventory as of 3 August 1975 with the computer projected inventory as of 31 July 1975, based on a data initialization date of 1 Jaunary 1975. The data show general

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correlation, but some discrepancies. The major reason for the discrepancies is that the program was not initialized with data from CAIMS, since CAIMS reports of 1 January 1975 were not available.

The realism of the projected data cannot be determined because a realistic source of baseline data cannot be identified. This source should have been the CAIMS reports, since they are the only officially sanctioned source of inventory information on the Navy's air-launched missiles. Since it was impossible to initialize the projection with CAIMS-generated data, no determination could be made relative to the program projections correlating with CAIMS data over a period of months.

The analysis of the computer model with the logistics flow described in the ILS Plan, however, indicates that the computer model is realistic. The degree of correlation obtained between projections and CAIMS data tends to support this conclusion.

8
CONCLUSIONS AND RECOMMENDATIONS

The Phoenix Missile System logistics flow modeled by the ILS computer program is in agreement with the actual logistics flow described in the PMS Integrated Logistics Support Plan. The accuracy of projections made by the computer program will be dependent on the accuracy of the input data.

The input data sources identified in this study are in most cases the sole officially sanctioned origins of the required data, and therefore the accuracy of the data must be accepted. Although in some cases there are other sources that claim to be, and in fact could be, more accurate at this time, their lack of official Navy sanction makes them undesirable choices since their continued existence is questionable. It is therefore recommended that the data sources discussed in this report be utilized, and that efforts be made to aid the organizations providing these data in improving the accuracy of the information.

The various transfer rates required by the ILS model will in many cases require continuous refinement, since they are influenced by operational factors that are constantly changing. During the use of the computer program, these transfer rates should be examined relative to their contributions to the output projection accuracy; and those requiring updating should be identified.

To facilitate the ongoing use of the ILS computer program, an organization should be designated to collect the necessary data and operate the program. This organization should then ensure itself continual receipt of the required data by requesting that it be included in the distribution of the various data reports required.

The users of the program outputs should be solicited for suggestions for improvement of the output format and content.

Although the ILS model is usable in its current configuration, it is felt that certain changes would make the model easier to use with regard to changing reporting dates, the number of reporting dates, missile location points, etc. The present

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program requires modifications to both the program deck and the input data deck to make changes that might be desired during operation. Modification of the program to require only data deck changes should be considered.

APPENDIX A

DATA INPUT PROCEDURES

This appendix describes the makeup of the card deck for entering data into and exercising the ILS computer program for the Phoenix Missile System. The content of the deck will vary slightly according to the processing facility being utilized, but would consist typically of, from front to back:

a. Control cards peculiar to the system being utilized (see Section A.1)

b. Program deck (see Section A.2)

c. Control cards

d. Data deck (see Section A.3)

e. Control cards

The total deck is illustrated in Figure A-1.

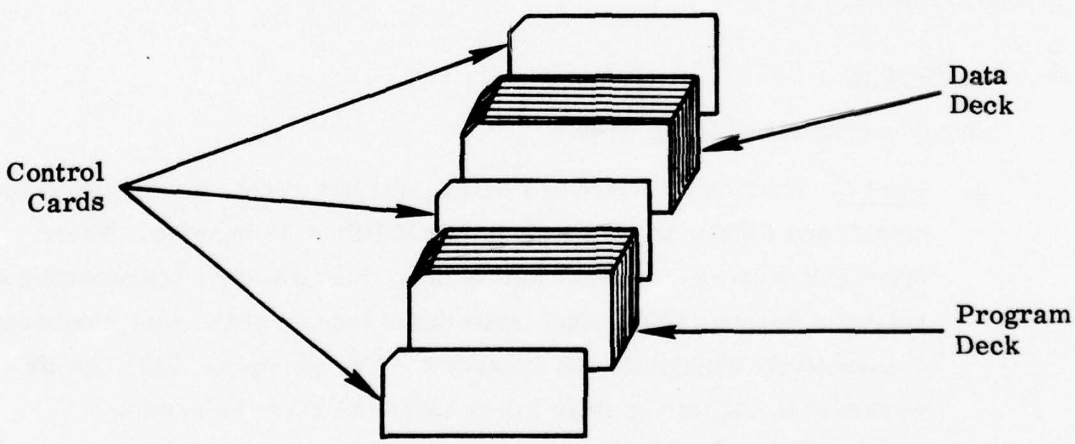

Figure A-1. Composite Card Deck

A.1 CONTROL CARDS

To run a program on a given computer facility, certain instructions peculiar to the operation of that facility must be included on control cards within the composite deck. Specific information on these cards is obtained from operations information for the facility being utilized.

A.2 PROGRAM DECK

The program deck contains the instructions and routines used by the computer facility to process the input data. These instructions do not change as long as it is not desired to modify the manner in which the input data are processed. The average user of the program would therefore not be directly concerned with the content of the program deck. A listing of the program deck for the Phoenix Missile System appears in Table A-1.

A.3 DATA DECK

The data deck consists of cards containing the input information to the run, and is the object of the processes directed by the program deck. It is that information contained in the data deck which is of the greatest interest to the user.

The input data in the data deck are obtained from several sources, as summarized in Table A-2.

The following paragraphs provide details concerning how a data deck is organized. To facilitate the discussion, the deck is arbitrarily divided into various groups, A through F.

A.3.1 Group A

Group A consists of three cards:

a. Card 1. Input on this card are NBEG, the initial date for the projected output; and NEND, the last output date (NBEG + 18 months). These dates are expressed in four-digit format, the first digit representing the year of a decade and the final three digits the day of the year numbered consecutively beginning with January 1. For example, "5131" would designate the 131st day (May 11) of 1975. NBEG is entered in columns 2-5 and NEND in columns 7-10.

b. Card 2. This card is used to input the first 16 output reporting dates (NDT) in the format described above for NBEG and NEND. These dates are entered in columns 2-5, 7-10, 11-15, 17-20, 21-25, 27-30, 21-35, 37-40, 41-45, 47-50, 51-55, 57-60, 61-65, 67-70, 71-75, and 77-80.

c. Card 3. The remainder of the desired reporting dates are entered in columns 2-5 and 7-10 in the described format.

TABLE A-1. PROGRAM DECK LISTING (Sheet 1 of 8)

```
      PROGRAM BRAMAN(INPUT,OUTPUT,TAPE5=INPUT,TAPE6=OUTPUT)
      DIMENSION ZL(100),ND(50,18),NDT(18),NTT(18)
      DIMENSION MFR(1000),MTO(1000),TR(1000),UL(1000),BL(1000),MDY(1000)
      DIMENSION NFRM(1000),AMT(1000),NDYE(1000),NTDY(1000)
      DIMENSION NRF(50,18)
      DIMENSION NLC(100),DSLC(100,6)
      DIMENSION NIT2(18)
      DIMENSION NITT(18)
      DIMENSION YL(100)
      JDT=18
      NBEG=5001
      NEND=6185
      WRITE (6,1)
    1 FORMAT (1H1)
      LDT=NBEG
      READ (5,3) (NDT(I),I=1,JDT)
    3 FORMAT (16I5)
      NXYZ=5
      DO 4 I=1,1000
      NDYE(I)=6000
    4 CONTINUE
      N=1
      MFR(1)=50
      MTO(1)=50
      TR(1)=1.86813
      UL(1)=100000.0
      BL(1)=0.0
      MDY(1)=0
      NIT=0
      DO 5 I=1,100
      ZL(I)=0.0
    5 CONTINUE
      NDLC=39
      DO 181 I=1,NDLC
      READ (5,6) NLC(I),(DSLC(I,J),J=1,6)
    6 FORMAT (I2,6A6)
  181 CONTINUE
      WRITE (6,141)
  141 FORMAT (50X,30HINITIAL TRANSFER RATES ASSUMED//)
      WRITE (6,142)
  142 FORMAT (10X,17HPREVIOUS LOCATION,23X,12HNEW LOCATION,18X,21HTRANSF
     1ER RATE PER DAY //)
    7 CONTINUE
      READ (5,11) NCT,MDT,L1,L2,ZUM,NDY,ZUL,ZLL
      IF (MDT.GT.0) GO TO 8
      IF (ZUL.LT.0.1) ZUL=10000.0
      N=N+1
      MFR(N)=L1
      MTO(N)=L2
      TR(N)=ZUM
      UL(N)=ZUL
      BL(N)=ZLL
      MDY(N)=NDY
      KF2=99
      KF0=99
```

TABLE A-1. (Sheet 2 of 8)


```
      DO 171 I=1,NOLC
      IF (NLC(I).EQ.L1) KFR=I
      IF (NLC(I).EQ.L2) KTO=I
  171 CONTINUE
      IF (ZUM.LT.0.0) GO TO 147
      IF (ZUM.GT.1.0) GO TO 148
      RATX=100.0*ZUM
      WRITE (6,143) (DSLC(KFR,LL),LL=1,6),(DSLC(KTO,LM),LM=1,6),RATX
  143 FORMAT (1X,6A6,3X,6A6,3X,F8.4,1X,35HPERCENT OF MISSILES AT PREVIOU
     1S LOC )
      GO TO 7
  147 CONTINUE
      RATX=-1.0*ZUM
      WRITE (6,144) (DSLC(KFR,LL),LL=1,6),(DSLC(KTO,LM),LM=1,6),RATX
  144 FORMAT (1X,6A6,3X,6A6,3X,F8.4,1X,8HMISSILES )
      GO TO 7
  148 CONTINUE
      RATX=ZUM-1.0
      WRITE (6,149) (DSLC(KFR,LL),LL=1,6),(DSLC(KTO,LM),LM=1,6),RATX
  149 FORMAT (1X,6A6,3X,6A6,3X,F8.4,1X,8HMISSILES )
      GO TO 7
    9 CONTINUE
      WRITE (6,1)
      WRITE (6,145)
  145 FORMAT (12X,25HINITIAL INVENTORY ASSUMED //)
      WRITE (6,146)
  146 FORMAT (10X,8HLOCATION,22X,4HDATE,3X,6HNUMBER//)
   10 CONTINUE
      READ (5,11) NCT,MPT,L1,L2,ZUM,NDY,ZUL,ZLL
   11 FORMAT (I1,I5,2I2,F7.0,I2,2F7.0)
      IF (ZUL.LT.0.1) ZUL=10000.0
      IF (MPT.LT.NPEG) GO TO 15
      IF (MPT.GT.LDT) GO TO 25
   15 CONTINUE
      IF (MPT.GT.99999) GO TO 30
      KFR=99
      KTO=99
      DO 172 I=1,NOLC
      IF (NLC(I).EQ.L1) KFR=I
      IF (NLC(I).EQ.L2) KTO=I
  172 CONTINUE
      IF (NCT.EQ.1) GO TO 12
      IF (NCT.EQ.2) GO TO 14
      IF (NYYZ.LT.7) GO TO 186
      NYYZ=0
      WRITE (6,1)
      WRITE (6,187)
  187 FORMAT (30X,48HTRANSFERS AND CHANGES IN TRANSFER RATES ASSUMED //)
      WRITE (6,183)
  183 FORMAT (10X,17HPREVIOUS LOCATION,27X,12HNEW LOCATION,18X,21HTRANSF
     1ER RATE PER DAY,25X,4HDATE//)
  186 CONTINUE
      DO 16 J=1,N
      IF (MFR(J).EQ.L1.AND.MTO(J).EQ.L2) GO TO 17
   16 CONTINUE
```

TABLE A-1. (Sheet 3 of 8)

```
      N=N+1
      J=N
      MFR(J)=L1
      MTO(J)=L2
   17 CONTINUE
      TR(J)=ZUM
      MDY(J)=NDY
      UL(J)=ZUL
      RL(J)=ZLL
      IF (ZUM.LT.0.0) GO TO 188
      IF (ZUM.GT.1.0) GO TO 189
      RATX=100.0*ZUM
      IF (RATX.GT.75.0) GO TO 191
      IF (RATX.LT.0.0001) GO TO 10
      WRITE (6,182) (DSLC(KFR,LL),LL=1,6),(DSLC(KTO,LM),LM=1,6),RATX,MDT
  182 FORMAT (1X,6A6,3X,6A6,3X,F8.4,1X,35HPERCENT OF MISSILES AT PREVIOU
     1S LOC ,I7)
      GO TO 10
  191 CONTINUE
      WRITE (6,192) (DSLC(KFR,LL),LL=1,6),(DSLC(KTO,LM),LM=1,6),RATX,MDT
  192 FORMAT (1X,6A6,3X,6A6,3X,F8.4,1X,35HPERCENT OF MISSILES (OFFLOAD)
     1        ,I7)
      GO TO 10
  188 CONTINUE
      RATX=-1.0*ZUM
      WRITE (6,184) (DSLC(KFR,LL),LL=1,6),(DSLC(KTO,LM),LM=1,6),RATX,MDT
  184 FORMAT (1X,6A6,3X,6A6,3X,F8.4,1X,8HMISSILES,29X,I5)
      GO TO 10
  189 CONTINUE
      RATX=ZUM-1.0
      WRITE (6,195) (DSLC(KFR,LL),LL=1,6),(DSLC(KTO,LM),LM=1,6),RATX,MDT
  195 FORMAT (1X,6A6,3X,6A6,3X,F8.4,1X,8HMISSILES,29X,I5)
      GO TO 10
   12 CONTINUE
      RATX=ZUM
      WRITE (6,190) (DSLC(KFR,LL),LL=1,6),(DSLC(KTO,LM),LM=1,6),RATX,MDT
  190 FORMAT (1X,6A6,3X,6A6,3X,F8.4,1X,30HMISSILES TRANSFERRED (LOADOUT)
     1 ,7X,I5)
      ZL(L2)=ZL(L2)+ZUM
      ZL(L1)=ZL(L1)-ZUM
      IF (ZL(L1).LT.0.0) WRITE (6,13) ZL(L1)
   13 FORMAT (26H IMPOSSIBLE TRANSFER, ONLY,F8.2,19H MISSILES AVAILABLE
     1,75(1H*))
      IF (ZL(L1).LT.0.0) ZL(L1)=0.0
      GO TO 10
   14 CONTINUE
      ZL(L2)=ZUM
      WRITE (6,160) (DSLC(KTO,LL),LL=1,6),MDT,ZUM
  160 FORMAT (1X,6A6,3X,I4,7X,F6.0)
      GO TO 10
   20 CONTINUE
      DO 21 I=1,JDT
      IF (LDT.EQ.NDT(I)) GO TO 22
   21 CONTINUE
      GO TO 24
```

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TABLE A-1. (Sheet 4 of 8)

```
 22 CONTINUE
    DO 23 J=1,50
    K=J+50
    ND(J,I)=ZL(J)+ZL(K)+0.5
    NPE(J,I)=ZL(J)+0.5
    IF (NPE(J,I).LT.1) NPE(J,I)=0
    IF (ND(J,I).LT.1) ND(J,I)=0
 23 CONTINUE
    ZITI=0.0
    ZITP=0.0
    DO 151 J=1,NIT
    IF (NFRM(J).LT.4100.OR.NFRM(J).GT.4200) ZITP=ZITP+AMT(J)
    ZITI=ZITI+AMT(J)
151 CONTINUE
    NITI(I)=ZITI+0.5
    NITP(I)=ZITP+0.5
 24 CONTINUE
    LDT=LDT+1
    IF (LDT.EQ.4366) LDT=5001
    IF (LDT.EQ.5366) LDT=6001
    IF (LDT.EQ.6367) LDT=7001
    IF (LDT.EQ.7366) LDT=8001
    IF (LDT.EQ.8366) LDT=9001
    IF (LDT.GT.NEND) GO TO 15
    IF (LDT.GE.MDT) GO TO 15
 25 CONTINUE
    IF (LDT.EQ.NREG) GO TO 20
    DO 28 K=1,100
    YL(K)=ZL(K)
 28 CONTINUE
    DO 26 M=1,N
    K=MFR(M)
    J=MTO(M)
    TRN=TR(M)
    NAM=MDY(M)
    DLTA=0.0
    IF (YL(K).GT.0.001) DLTA=TRN*YL(K)
    IF (TRN.LT.0.0) DLTA=-1.0*TRN
    IF (YL(K).LT.BL(M)) DLTA=0.0
    IF (YL(K).GT.UL(M)) DLTA=0.0
    IF (TRN.GT.1.0) DLTA=TRN-1.0
    IF (NAM.LT.1) GO TO 27
    IF (NIT.LT.1) GO TO 132
    DO 131 I=1,NIT
    IF (NRXR(I).GT.5000) GO TO 133
131 CONTINUE
132 CONTINUE
    NIT=NIT+1
    I=NIT
133 CONTINUE
    NRXR(I)=-1
    NFRM(I)=K+1000*J
    MTQY(I)=NAM
    AMT(I)=DLTA
    GO TO 22
```

TABLE A-1. (Sheet 5 of 8)

```
27 CONTINUE
   ZL(J)=ZL(J)+DLTA
   IF (K.EQ.J) GO TO 26
20 CONTINUE
   ZL(K)=ZL(K)-DLTA
26 CONTINUE
   IF (NIT.LT.1) GO TO 20
   DO 134 I=1,NIT
   NDYE(I)=NDYE(I)+1
   IF (NDYE(I).NE.NTDY(I)) GO TO 134
   J=NFRM(I)/100
   ZL(J)=ZL(J)+AMT(I)
   NDYE(I)=6000
   AMT(I)=0.0
   NTDY(I)=0
   NFRM(I)=0
134 CONTINUE
   GO TO 20
70 CONTINUE
   WRITE (6,1)
   WRITE (6,31)
31 FORMAT (77X,54HCURRENT AND PROJECTED PHOENIX MISSILE INVENTORY STA
  1TUS//)
   WRITE (6,72) (NDT(I),I=1,JDT)
32 FORMAT (28X,5HDATE ,18I5)
   WRITE (6,2)
 2 FORMAT (2H  )
   WRITE (6,33) (ND(1,J),J=1,JDT)
33 FORMAT (33H PRODUCED TO DATE                ,18I5)
   WRITE (6,2)
   DO 34 J=1,JDT
   NTT(J)=0
   DO 34 I=11,20
   NTT(J)=NTT(J)+ND(I,J)
34 CONTINUE
   WRITE (6,35) (NTT(J),J=1,JDT)
35 FORMAT (33H INVENTORY ABOARD SHIP           ,18I5)
   DO 38 J=1,JDT
   NTT(J)=0
   DO 38 I=21,30
   NTT(J)=NTT(J)+ND(I,J)
38 CONTINUE
   WRITE (6,39) (NTT(J),J=1,JDT)
39 FORMAT (33H INVENTORY AT NAS                ,18I5)
   DO 40 J=1,JDT
   NTT(J)=0
   DO 40 II=16,23
   I=2*II
   NTT(J)=NTT(J)+ND(I,J)
40 CONTINUE
   WRITE (6,37) (NTT(J),J=1,JDT)
37 FORMAT (33H INVENTORY AT NWS (DSM CHECKED)  ,18I5)
   DO 36 J=1,JDT
   NTT(J)=0
   DO 36 II=15,19
```

TABLE A-1. (Sheet 6 of 8)

```
      I=2*II+1
      NTT(J)=NTT(J)+ND(I,J)
   35 CONTINUE
      WRITE (6,41) (NTT(J),J=1,JDT)
   41 FORMAT (33H INVENTORY AT NWS (AWAIT CHECK)   ,18I5)
      DO 123 J=1,JDT
      NTT(J)=ND(41,J)+ND(42,J)
  123 CONTINUE
      WRITE (6,91) (NTT(J),J=1,JDT)
   91 FORMAT (33H INVENTORY UNDER REPAIR           ,18I5)
      WRITE (6,121) (ND(41,J),J=1,JDT)
  121 FORMAT (33H       REPAIR AT HAC TUCSON       ,18I5)
      WRITE (6,122) (ND(42,J),J=1,JDT)
  122 FORMAT (33H       REPAIR AT NARF ALAMEDA     ,18I5)
      WRITE (6,92) (ND(46,J),J=1,JDT)
   92 FORMAT (33H INVENTORY UNDER MODIFICATION     ,18I5)
      WRITE (6,152) (NTTI(J),J=1,JDT)
  152 FORMAT (33H INVENTORY IN TRANSIT             ,18I5)
      WRITE (6,124) (ND(50,J),J=1,JDT)
  124 FORMAT (33H INVENTORY AT FACTORY             ,18I5)
      WRITE (6,125) (ND(7,J),J=1,JDT)
  125 FORMAT (33H LOST                             ,18I5)
      WRITE (6,97) (ND(6,J),J=1,JDT)
   97 FORMAT (33H OBSOLETE                         ,18I5)
      WRITE (6,96) (ND(2,J),J=1,JDT)
   96 FORMAT (33H EXPENDED                         ,18I5)
      WRITE (6,2)
      DO 51 J=1,JDT
      NTT(J)=0
      DO 51 I=11,20
      NTT(J)=NTT(J)+NPE(I,J)
   51 CONTINUE
      WRITE (6,52) (NTT(J),J=1,JDT)
   52 FORMAT (33H RET ABOARD SHIP                  ,18I5)
      DO 55 J=1,JDT
      NTT(J)=0
      DO 55 I=21,30
      NTT(J)=NTT(J)+NPE(I,J)
   55 CONTINUE
      WRITE (6,56) (NTT(J),J=1,JDT)
   56 FORMAT (33H RET AT NAS                       ,18I5)
      DO 57 J=1,JDT
      NTT(J)=0
      DO 57 II=16,20
      I=2*II
      NTT(J)=NTT(J)+NPE(I,J)
   57 CONTINUE
      WRITE (6,58) (NTT(J),J=1,JDT)
   58 FORMAT (33H RET AT NWS (RSM VERIFIED)        ,18I5)
      DO 53 J=1,JDT
      NTT(J)=0
      DO 53 II=15,19
      I=2*II+1
      NTT(J)=NTT(J)+NPE(I,J)
   53 CONTINUE
```

TABLE A-1. (Sheet 7 of 8)

```
      WRITE (6,54) (NTT(J),J=1,JDT)
   54 FORMAT (33H RFI AT NWS (AWAIT QSM CHECK)     ,18I5)
      WRITE (6,153) (NITR(J),J=1,JDT)
  153 FORMAT (33H RFI IN TRANSIT                   ,18I5)
      WRITE (6,2)
      DO 61 J=1,JDT
      NTT(J)=0
      DO 61 I=11,15
      NTT(J)=NTT(J)+ND(I,J)
   61 CONTINUE
      WRITE (6,62) (NTT(J),J=1,JDT)
   62 FORMAT (33H ATLANTIC - INVENTORY ABOARD SHIP,18I5)
      DO 63 J=1,JDT
      NTT(J)=0
      DO 63 I=11,15
      NTT(J)=NTT(J)+NPF(I,J)
   63 CONTINUE
      WRITE (6,64) (NTT(J),J=1,JDT)
   64 FORMAT (33H ATLANTIC - RFI ABOARD SHIP       ,18I5)
      WRITE (6,71) (ND(11,J),J=1,JDT)
      WRITE (6,102) (NPF(11,J),J=1,JDT)
      WRITE (6,72) (ND(12,J),J=1,JDT)
      WRITE (6,103) (NPF(12,J),J=1,JDT)
      WRITE (6,74) (ND(13,J),J=1,JDT)
      WRITE (6,104) (NPF(13,J),J=1,JDT)
      WRITE (6,81) (ND(32,J),J=1,JDT)
      WRITE (6,111) (NPF(32,J),J=1,JDT)
      WRITE (6,80) (ND(31,J),J=1,JDT)
      WRITE (6,110) (NPF(31,J),J=1,JDT)
   71 FORMAT (33H      USS J. F. KENNEDY        INV,18I5)
  102 FORMAT (33H      USS J. F. KENNEDY        RFI,18I5)
   72 FORMAT (33H      USS AMERICA              INV,18I5)
  103 FORMAT (33H      USS AMERICA              RFI,18I5)
   74 FORMAT (33H      USS EISENHOWER           INV,18I5)
  104 FORMAT (33H      USS EISENHOWER           RFI,18I5)
   81 FORMAT (33H NWS YORKTOWN (CHECKED)        INV,18I5)
  111 FORMAT (33H NWS YORKTOWN (VERIFIED)       RFI,18I5)
   80 FORMAT (33H NWS YORKTOWN (AWAIT CHECK)    INV,18I5)
  110 FORMAT (33H NWS YORKTOWN (AWAIT CHECK)    RFI,18I5)
   76 FORMAT (33H      USS ENTERPRISE           INV,18I5)
  106 FORMAT (33H      USS ENTERPRISE           RFI,18I5)
   77 FORMAT (33H      USS CONSTELLATION        INV,18I5)
  107 FORMAT (33H      USS CONSTELLATION        RFI,18I5)
   78 FORMAT (33H      USS NIMITZ               INV,18I5)
  108 FORMAT (33H      USS NIMITZ               RFI,18I5)
   73 FORMAT (33H      USS KITTY HAWK           INV,18I5)
  109 FORMAT (33H      USS KITTY HAWK           RFI,18I5)
   87 FORMAT (33H NAS MIRAMAR                   INV,18I5)
  117 FORMAT (33H NAS MIRAMAR                   RFI,18I5)
   86 FORMAT (33H NAS POINT MUGU                INV,18I5)
  116 FORMAT (33H NAS POINT MUGU                RFI,18I5)
      WRITE (6,2)
      DO 65 J=1,JDT
      NTT(J)=0
      DO 65 I=16,2?
```

TABLE A-1. (Sheet 8 of 8)

```
      NTT(J)=NTT(J)+ND(I,J)
   65 CONTINUE
      WRITE (6,66) (NTT(J),J=1,JDT)
   66 FORMAT (33H PACIFIC   - INVENTORY ABOARD SHIP,18I5)
      DO 67 J=1,JDT
      NTT(J)=0
      DO 67 I=16,20
      NTT(J)=NTT(J)+NPF(I,J)
   67 CONTINUE
      WRITE (6,68) (NTT(J),J=1,JDT)
   68 FORMAT (33H PACIFIC   - RFI ABOARD SHIP        ,18I5)
      WRITE (6,76) (ND(16,J),J=1,JDT)
      WRITE (6,106) (NPF(16,J),J=1,JDT)
      WRITE (6,77) (ND(17,J),J=1,JDT)
      WRITE (6,107) (NPF(17,J),J=1,JDT)
      WRITE (6,78) (ND(18,J),J=1,JDT)
      WRITE (6,108) (NPF(18,J),J=1,JDT)
      WRITE (6,79) (ND(19,J),J=1,JDT)
      WRITE (6,109) (NPF(19,J),J=1,JDT)
      WRITE (6,87) (ND(22,J),J=1,JDT)
      WRITE (6,117) (NPF(22,J),J=1,JDT)
      WRITE (6,86) (ND(21,J),J=1,JDT)
      WRITE (6,116) (NPF(21,J),J=1,JDT)
      WRITE (6,83) (ND(36,J),J=1,JDT)
      WRITE (6,113) (NPF(36,J),J=1,JDT)
      WRITE (6,85) (ND(35,J),J=1,JDT)
      WRITE (6,115) (NPF(35,J),J=1,JDT)
      WRITE (6,82) (ND(34,J),J=1,JDT)
      WRITE (6,112) (NPF(34,J),J=1,JDT)
      WRITE (6,84) (ND(33,J),J=1,JDT)
      WRITE (6,114) (NPF(33,J),J=1,JDT)
   83 FORMAT (33H NMAG SUBIC BAY (CHECKED)      INV,18I5)
  113 FORMAT (33H NMAG SUBIC BAY (VERIFIED)     RFI,18I5)
   85 FORMAT (33H NMAG SUBIC BAY (AWAIT CHECK) INV,18I5)
  115 FORMAT (33H NMAG SUBIC BAY (AWAIT CHECK) RFI,18I5)
   82 FORMAT (33H NWS FALLBROOK (CHECKED)       INV,18I5)
  112 FORMAT (33H NWS FALLBROOK (VERIFIED)      RFI,18I5)
   84 FORMAT (33H NWS FALLBROOK (AWAIT CHECK)  INV,18I5)
  114 FORMAT (33H NWS FALLBROOK (AWAIT CHECK)  RFI,18I5)
```

TABLE A-2. INPUT DATA AND SOURCES (Sheet 1 of 2)

Mnemonic	Description	Data Source
NCT	NCT is a control input and is set equal to 1 for loadout, equal to 3 for transfers other than loadout, and equal to 2 for initial inventory data.	N/A
MDT (≠0)	The date of transaction of inventory status, expressed in a 4-digit code. The left hand digit is the year of a decade and the remaining three digits are the day of the year when numbered consecutively.	Same source as associated data.
MDT (=0)	Set to zero when associated data is initial transfer rate.	N/A
L1	"From" location code of a transfer.	Location code assignments; see Table A-3.
L2	"To" location code of a transfer or initial inventory.	Location code assignments; see Table A-3.
ZUM (MDT=0)	Initial transfer rates:	
	a) Production rates	WEP/Weapon Sys. Planning Doc.
	b) Expenditures	Expenditure reports (FMSAEG)
	c) NWS fleet return RFI check to RFI storage	Phoenix NWS processing rates (FMSEAG/WEP/POFAR)
	d) NWS fleet return RFI check to NRFI storage	↓
	e) NWS new production check to RFI storage	↓
	f) NWS new production check to NRFI storage	↓
	g) NWS RFI storage to RFI check	↓
	h) NWS RFI storage check to RFI storage	↓
	i) NWS RFI storage check to NRFI storage	↓
	j) NWS NRFI fleet return check to RFI storage	Phoenix NWS processing rates (FMSEAG/WEP/ POFAR)

TABLE A-2. (Sheet 2 of 2)

Mnemonic	Description	Data Source
	k) NWS NRFI fleet return check to NRFI storage	Phoenix NWS processing rates (FMSEAG/WEP/POFAR)
	l) NWS NRFI storage to factory	WEP
	m) Factory to NWS Fallbrook	Weapon system planning document/WEP
	n) Factory to NWS Yorktown	Weapon system planning document/WEP
	p) Fleet RFI to NRFI	USS ENTERPRISE data
	q) Factory repair to NWS	WEP
ZUM	a) Any of above (a-q) can be changed on date designated by MDT.	N/A
	b) NWS RFI storage to fleet (loadout)	POFAR
	c) RFI fleet to NWS (offload)	POFAR/WEP
	d) NRFI fleet to NWS (offload)	POFAR/WEP
	e) Any location to lost	
	f) Any location to obsolete	CAIMS
	g) Any location to modification	CAIMS
NDY	Number of days in transit between locations	Estimate
NLC	Location codes	See Table A-3
DSLC	Location descriptors	See Table A-3

A.3.2 Group B

This group of cards is used to input location codes (NLC) and location descriptions (DSLC). NLC is a number from 1 to 98, entered in columns 1 and 2, right-hand justified. NLC assignments are subject to the following ground rules:

a. 11-40 are RFI locations

b. 61-90 are NRFI locations

c. Even numbers between 28 and 40, and 78 and 90, are assigned to NWS and MMU storage locations

d. 11-20 and 61-70 are shipboard locations

e. 21-25 and 71-75 are NAS locations

f. 26-40 and 76-90 are NWS and MMU locations

g. 1-10 and 41-50 miscellaneous locations

h. 91-98 are not presently used

i. RFI and corresponding NRFI locations are related as follows:

$$NLC(NRFI) = NLC(RFI) + 50$$

The location descriptors (DSLC) are alphanumeric groups of up to 36 characters entered in columns 4 through 39.

The code assignments and location presently being used are shown in Table A-3.

A.3.3 Group BA

This group contains one card with 99 entered in columns 1 and 2.

A.3.4 Group C

This group of cards is used to input initial transfer rates and transit times. The data are entered as follows:

a. Column 1. 3 on all cards

b. Column 6. 0 on all cards

c. Columns 7 and 8. The code (NLC, see Table A-3) designating the "from" location, right-hand justification.

TABLE A-3. LOCATIONS AND CODE ASSIGNMENTS (Sheet 1 of 2)

NLC	DSLC	NLC	DSLC
1	Produced	25	
2	Expended	26	
3		27	
4		28	
5		29	
6	Obsolete	30	
7	Lost	31	RFI NWS/Yorktown (DSM Check)
8		32	RFI NWS/Yorktown (Storage)
9		33	RFI NWS/Fallbrook (DSM Check)
10		34	RFI NWS/Fallbrook (Storage)
11	RFI USS KENNEDY	35	RFI MMU (DSM Check)
12	RFI USS AMERICA	36	RFI MMU (Storage)
13	RFI USS EISENHOWER	37	RFI NWS/Yorktown (Acceptance)
14	RFI USS DETROIT	38	
15	RFI USS CAMDEN	39	RFI NWS/Fallbrook (Acceptance)
16	RFI USS ENTERPRISE	40	
17	RFI USS CONSTELLATION	41	Repair - HAC/Tucson
18	RFI USS NIMITZ	42	Repair - NARF/Alameda
19	RFI USS KITTY HAWK	43	
20	RFI USS SHASTA	44	
21	RFI NAS/Point Mugu	45	
22	RFI NAS/Miramar	46	Modification
23	RFI NAS/Oceana	47	
24		48	

Note: Blank entries are reserved for future use.

TABLE A-3. (Sheet 2 of 2)

NLC	DSLC	NLC	DSLC
49		75	
50	Factory	76	
51		77	
52		78	
53		79	
54		80	
55		81	NRFI NWS/Yorktown (DSM Check)
56		82	NRFI NWS/Yorktown (Storage)
57		83	NRFI NWS/Fallbrook (DSM Check)
58		84	NRFI NWS/Fallbrook (Storage)
59		85	NRFI MMU (DSM Check)
60		86	NRFI MMU (Storage)
61	NRFI USS KENNEDY	87	Not to be assigned
62	NRFI USS AMERICA	88	
63	NRFI USS EISENHOWER	89	Not to be assigned
64	NRFI USS DETROIT	90	
65	RFI USS CAMDEN	91	
66	NRFI USS ENTERPRISE	92	
67	NRFI USS CONSTELLATION	93	
68	NRFI USS NIMITZ	94	
69	NRFI USS KITTY HAWK	95	
70	NRFI USS SHASTA	96	
71	NRFI NAS/Point Mugu	97	
72	NRFI NAS/Miramar	98	
73	NRFI NAS/Oceana	99	Not to be assigned
74			

d. Columns 9 and 10. The code (NLC, see Table A-3) designating the "to" location, right-hand justified.

e. Columns 11 through 17. The transfer rate (ZUM). ZUM can be in one of three formats, 1) a number between 0 and 1, 2) a number equal to or greater than 1, or 3) a negative number. The format used is determined as follows:

1) 0 to 1 is used to enter a daily transfer rate in terms of the decimal fraction of missiles at the "from" location. This form is used for all transfer rates except those from production and delivery locations, NWS and MMU checkout locations, and from NWS and MMU RFI storage locations.

2) A number greater than 1 is used to express a daily transfer rate in terms of missiles transferred plus one. For example, a daily transfer rate of 0.46 missiles per day would be entered as 1.46.

3) A negative number is used to express the daily transfer rate in terms of missiles per day from NWS and MMU checkout locations.

f. Columns 18 and 19. The transit time in days, right-hand justified.

A.3.5 Group CA

A single card with a 1 entered in column 6.

A.3.6 Group D

This group of cards is used to input the initial inventory at the various locations. The data are entered as follows:

a. Column 1. All cards in Group D have a 2 entered in column 1.

b. Columns 3-6. The initial date in the format described under Group A.

c. Columns 9 and 10. The location code per the code assignments in Table A-3, right-hand justified.

d. Columns 11-17. The number of missiles at the location, entered as a number greater than 1, right-hand justified.

A.3.7 Group E

This group of cards is used to enter changes in transfer, production, and delivery rates. It is also used for "loadout" and "offload" data for ship-related missile transfers.

Changes in transfer, production, and delivery rates are entered as described for the Group C cards, with the exception that the date on which the change is effective is entered in columns 4-6 in the date format described under Group A. Additionally, transfer rates cannot exceed 0.75.

The transfer of missiles from a shore location to a shipboard location ("loadout") is entered in the following format:

a. Column 1. All cards with "loadout" data will have a 1 in this column.

b. Columns 4-6. The date of the transfer in the date format described under Group A.

c. Columns 7-8. The location code representing the "from" location per the assignments in Table A-3.

d. Columns 9-10. The location code representing the "to" location per the assignments in Table A-3.

e. Columns 11-17. The number of missiles loaded, expressed as a number greater than 1, right-hand justified.

Missiles transferred from a shipboard location to a shore location ("offload") will have their related data entered in the same format as Group C cards, except that 1) the date of the transfer will be entered in columns 4-6 in the date format described in Group A, and 2) the transfer rate will be greater than 0.75 per day entered as a number between and including 0.75 and 1.0. This allows for 75 to 100 percent of the missiles onboard to be offloaded on a given day. To prevent this transfer rate from being effective on succeeding days, an additional card must be included in sequence for the day immediately following the offload day, with 0.0 entered in columns 15-17. All cards in Group E must be arranged in the deck from front to back by increasing date codes in columns 4-6.

A.3.8 Group F

This is a single card with 19999 entered in columns 1-5.

A complete input data deck is assembled by organizing the card groups described above in an alphabetic sequence, with Group A at the front and Group F at the back.

APPENDIX B

PMS LOGISTIC COMPUTER PROGRAM LISTINGS

TABLE B-1. PROGRAM LISTING, VERSION 1 (Sheet 1 of 8)


```
      PROGRAM BRAMAN(INPUT,OUTPUT,TAPE5=INPUT,TAPE6=OUTPUT)
      DIMENSION ZL(100),ND(50,18),NDT(18),NTT(18)
      DIMENSION MFR(1000),MTO(1000),TR(1000),UL(1000),BL(1000),MDY(1000)
      DIMENSION NFRM(1000),AMT(1000),NDYF(1000),NTDY(1000)
      DIMENSION NRF(50,18)
      DIMENSION NLC(100),DSLC(100,6)
      DIMENSION NITR(18)
      DIMENSION NITI(18)
      DIMENSION YL(100)
      JDT=18
      READ (5,200) NBEG,NEND
  200 FORMAT (2I5)
      WRITE (6,1)
    1 FORMAT (1H1)
      LDT=NBEG
      READ (5,3) (NDT(I),I=1,JDT)
    3 FORMAT (16I5)
      NXYZ=5
      DO 4 I=1,1000
      NDYF(I)=6000
    4 CONTINUE
      N=1
      MFR(1)=50
      MTO(1)=50
      TR(1)=1.86913
      UL(1)=100000.0
      BL(1)=0.0
      MDY(1)=0
      NIT=0
      DO 5 I=1,100
      ZL(I)=0.0
    5 CONTINUE
      NDLC=49
      DO 181 I=1,NDLC
      READ (5,6) NLC(I),(DSLC(I,J),J=1,6)
    6 FORMAT (I2,6A6)
  181 CONTINUE
      WRITE (6,141)
  141 FORMAT (50X,30HINITIAL TRANSFER RATES ASSUMED//)
      WRITE (6,142)
  142 FORMAT (10X,17HPREVIOUS LOCATION,23X,12HNEW LOCATION,18X,21HTRANSF
     1ER RATE PER DAY //)
    7 CONTINUE
      READ (5,11) NCT,MDT,L1,L2,ZUM,NDY,ZUL,ZLL
      IF (MDT.GT.0) GO TO 9
      IF (ZUL.LT.0.1) ZUL=10000.0
      N=N+1
      MFR(N)=L1
      MTO(N)=L2
      TR(N)=ZUM
      UL(N)=ZUL
      BL(N)=ZLL
      MDY(N)=NDY
      KFR=99
      KTO=99
```

TABLE B-1. (Sheet 2 of 8)


```
          DO 171 I=1,NDLC
          IF (NLC(I).EQ.L1) KFR=I
          IF (NLC(I).EQ.L2) KTO=I
      171 CONTINUE
          IF (ZUM.LT.0.0) GO TO 147
          IF (ZUM.GT.1.0) GO TO 148
          RATX=100.0*ZUM
          WRITE (6,143) (DSLC(KFR,LL),LL=1,6),(DSLC(KTO,LM),LM=1,6)
      143 FORMAT (1X,6A6,3X,6A6)
          GO TO 7
      147 CONTINUE
          RATX=-1.0*ZUM
          WRITE (6,143) (DSLC(KFR,LL),LL=1,6),(DSLC(KTO,LM),LM=1,6)
          GO TO 7
      148 CONTINUE
          RATX=ZUM-1.0
          WRITE (6,143) (DSLC(KFR,LL),LL=1,6),(DSLC(KTO,LM),LM=1,6)
          GO TO 7
        9 CONTINUE
          WRITE (6,1)
          WRITE (6,145)
      145 FORMAT (12X,25HINITIAL INVENTORY ASSUMED //)
          WRITE (6,146)
      146 FORMAT (10X,8HLOCATION,22X,4HDATE,3X,6HNUMBER//)
       10 CONTINUE
          READ (5,11) NCT,MDT,L1,L2,ZUM,NDY,ZUL,ZLL
       11 FORMAT (I1,I5,2I2,F7.0,I2,2F7.0)
          IF (ZUL.LT.0.1) ZUL=10000.0
          IF (MDT.LT.NBEG) GO TO 15
          IF (MDT.GT.LDT) GO TO 25
       15 CONTINUE
          IF (MDT.GT.99998) GO TO 30
          KFR=99
          KTO=99
          DO 172 I=1,NDLC
          IF (NLC(I).EQ.L1) KFR=I
          IF (NLC(I).EQ.L2) KTO=I
      172 CONTINUE
          IF (NCT.EQ.1) GO TO 12
          IF (NCT.EQ.2) GO TO 14
          IF (NXYZ.LT.3) GO TO 186
          NXYZ=0
          WRITE (6,1)
          WRITE (6,187)
      187 FORMAT (30X,49HTRANSFERS AND CHANGES IN TRANSFER RATES ASSUMED //)
          WRITE (6,183)
      183 FORMAT (10X,17HPREVIOUS LOCATION,23X,12HNEW LOCATION,18X,21HTRANSF
         1ER RATE PER DAY,25X,4HDATE//)
      186 CONTINUE
          DO 16 J=1,N
          IF (MFR(J).EQ.L1.AND.MTO(J).EQ.L2) GO TO 17
       16 CONTINUE
          N=N+1
          J=N
          MFR(J)=L1
```

TABLE B-1. (Sheet 3 of 8)


```
      MTO(J)=L2
   17 CONTINUE
      TR(J)=ZUM
      MDY(J)=NDY
      UL(J)=ZUL
      BL(J)=ZLL
      IF (ZUM.LT.0.0) GO TO 188
      IF (ZUM.GT.1.0) GO TO 189
      RATX=100.0*ZUM
      IF (RATX.GT.75.0) GO TO 191
      IF (RATX.LT.0.0001) GO TO 10
      WRITE (6,143) (DSLC(KFR,LL),LL=1,6),(DSLC(KTO,LM),LM=1,6)
      GO TO 10
  191 CONTINUE
      WRITE (6,143) (DSLC(KFR,LL),LL=1,6),(DSLC(KTO,LM),LM=1,6)
  192 FORMAT (1X,6A6,3X,6A6,3X,F8.4,1X,35HPERCENT OF MISSILES (OFFLOAD)
     1       ,I7)
      GO TO 10
  188 CONTINUE
      RATX=-1.0*ZUM
      WRITE (6,143) (DSLC(KFR,LL),LL=1,6),(DSLC(KTO,LM),LM=1,6)
      GO TO 10
  189 CONTINUE
      RATX=ZUM-1.0
      WRITE (6,143) (DSLC(KFR,LL),LL=1,6),(DSLC(KTO,LM),LM=1,6)
      GO TO 10
   12 CONTINUE
      RATX=ZUM
      WRITE (6,143) (DSLC(KFR,LL),LL=1,6),(DSLC(KTO,LM),LM=1,6)
      ZL(L2)=ZL(L2)+ZUM
      ZL(L1)=ZL(L1)-ZUM
      ZF=ZL(L1)+ZUM
      IF (ZL(L1).LT.0.0) WRITE (6,13) ZF
   13 FORMAT (26H IMPOSSIBLE TRANSFER, ONLY,F8.2,19H MISSILES AVAILABLE
     1,75(1H*))
      IF (ZL(L1).LT.0.0) ZL(L1)=0.0
      GO TO 10
   14 CONTINUE
      ZL(L2)=ZUM
      WRITE (6,160) (DSLC(KTO,LL),LL=1,6)
  160 FORMAT (1X,6A6,3X)
      GO TO 10
   20 CONTINUE
      DO 21 I=1,JDT
      IF (LDT.EQ.NDT(I)) GO TO 22
   21 CONTINUE
      GO TO 24
   22 CONTINUE
      DO 23 J=1,50
      K=J+50
      ND(J,I)=ZL(J)+ZL(K)+0.5
      NPF(J,I)=ZL(J)+0.5
      IF (NPF(J,I).LT.1) NPF(J,I)=0
      IF (ND(J,I).LT.1) ND(J,I)=0
   23 CONTINUE
```


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TABLE B-1. (Sheet 4 of 8)


```
      ZITI=0.0
      ZITR=0.0
      DO 151 J=1,NIT
      IF (NFRM(J).LT.4100.OR.NFRM(J).GT.4300) ZITR=ZITR+AMT(J)
      ZITI=ZITI+AMT(J)
  151 CONTINUE
      NITI(I)=ZITI+0.5
      NITR(I)=ZITR+0.5
   24 CONTINUE
      LDT=LDT+1
      IF (LDT.EQ.4366) LDT=5001
      IF (LDT.EQ.5366) LDT=6001
      IF (LDT.EQ.6367) LDT=7001
      IF (LDT.EQ.7366) LDT=8001
      IF (LDT.EQ.8366) LDT=9001
      IF (LDT.GT.NEND) GO TO 15
      IF (LDT.GE.MDT) GO TO 15
   25 CONTINUE
      IF (LDT.EQ.NBEG) GO TO 20
      DO 28 K=1,100
      YL(K)=ZL(K)
   28 CONTINUE
      DO 26 M=1,N
      K=MFR(M)
      J=MTO(M)
      TRN=TR(M)
      NAM=MDY(M)
      DLTA=0.0
      IF (YL(K).GT.0.001) DLTA=TRN*YL(K)
      IF (TRN.LT.0.0) DLTA=-1.0*TRN
      IF (YL(K).LT.BL(M)) DLTA=0.0
      IF (YL(K).GT.UL(M)) DLTA=0.0
      IF (TRN.GT.1.0) DLTA=TRN-1.0
      IF (NAM.LT.1) GO TO 27
      IF (NIT.LT.1) GO TO 132
      DO 131 I=1,NIT
      IF (NDYE(I).GT.5000) GO TO 133
  131 CONTINUE
  132 CONTINUE
      NIT=NIT+1
      I=NIT
  133 CONTINUE
      NDYE(I)=-1
      NFRM(I)=K+100*J
      NTDY(I)=NAM
      AMT(I)=DLTA
      GO TO 29
   27 CONTINUE
      ZL(J)=ZL(J)+DLTA
      IF (K.EQ.J) GO TO 26
   29 CONTINUE
      ZL(K)=ZL(K)-DLTA
   26 CONTINUE
      IF (NIT.LT.1) GO TO 29
      DO 134 I=1,NIT
```

TABLE B-1. (Sheet 5 of 8)


```
      NDYE(I)=NDYE(I)+1
      IF (NDYE(I).NE.NTDY(I)) GO TO 134
      J=NFRM(I)/100
      ZL(J)=ZL(J)+AMT(I)
      NDYE(I)=6000
      AMT(I)=0.0
      NTDY(I)=0
      NFRM(I)=0
  134 CONTINUE
      GO TO 20
   30 CONTINUE
      WRITE (6,1)
      WRITE (6,31)
   31 FORMAT (33X,54HCURRENT AND PROJECTED PHOENIX MISSILE INVENTORY STA
     1TUS//)
      WRITE (6,32) (NDT(I),I=1,JDT)
   32 FORMAT (28X,5HDATE ,18I5)
      WRITE (6,2)
    2 FORMAT (2H  )
      WRITE (6,33)
   33 FORMAT (33H PRODUCED TO DATE                )
      WRITE (6,2)
      DO 34 J=1,JDT
      NTT(J)=0
      DO 34 I=11,20
      NTT(J)=NTT(J)+ND(I,J)
   34 CONTINUE
      WRITE (6,35)
   35 FORMAT (33H INVENTORY ABOARD SHIP           )
      DO 38 J=1,JDT
      NTT(J)=0
      DO 38 I=21,30
      NTT(J)=NTT(J)+ND(I,J)
   38 CONTINUE
      WRITE (6,39)
   39 FORMAT (33H INVENTORY AT NAS                )
      DO 40 J=1,JDT
      NTT(J)=0
      DO 40 II=16,20
      I=2*II
      NTT(J)=NTT(J)+ND(I,J)
   40 CONTINUE
      WRITE (6,37)
   37 FORMAT (33H INVENTORY AT NWS (OSM CHECKED)  )
      DO 36 J=1,JDT
      NTT(J)=0
      DO 36 II=15,19
      I=2*II+1
      NTT(J)=NTT(J)+ND(I,J)
   36 CONTINUE
      WRITE (6,41)
   41 FORMAT (33H INVENTORY AT NWS (AWAIT CHECK)  )
      DO 123 J=1,JDT
      NTT(J)=ND(41,J)+ND(42,J)
  123 CONTINUE
```

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TABLE B-1. (Sheet 6 of 8)


```
      WRITE (6,91)
   91 FORMAT (33H INVENTORY UNDER REPAIR           )
      WRITE (6,121)
  121 FORMAT (33H     REPAIR AT HAC TUCSON         )
      WRITE (6,122)
  122 FORMAT (33H     REPAIR AT NARF ALAMEDA       )
      WRITE (6,92)
   92 FORMAT (33H INVENTORY UNDER MODIFICATION     )
      WRITE (6,152)
  152 FORMAT (33H INVENTORY IN TRANSIT             )
      WRITE (6,124)
  124 FORMAT (33H INVENTORY AT FACTORY             )
      WRITE (6,125)
  125 FORMAT (33H LOST                             )
      WRITE (6,97)
   97 FORMAT (33H OBSOLETE                         )
      WRITE (6,96)
   96 FORMAT (33H EXPENDED                         )
      WRITE (6,2)
      DO 51 J=1,JDT
      NTT(J)=0
      DO 51 I=11,20
      NTT(J)=NTT(J)+NRF(I,J)
   51 CONTINUE
      WRITE (6,52)
   52 FORMAT (33H RFI ABOARD SHIP                  )
      DO 55 J=1,JDT
      NTT(J)=0
      DO 55 I=21,30
      NTT(J)=NTT(J)+NRF(I,J)
   55 CONTINUE
      WRITE (6,56)
   56 FORMAT (33H RFI AT NAS                       )
      DO 57 J=1,JDT
      NTT(J)=0
      DO 57 II=16,20
      I=2*II
      NTT(J)=NTT(J)+NRF(I,J)
   57 CONTINUE
      WRITE (6,58)
   58 FORMAT (33H RFI AT NWS (DSM VERIFIED)        )
      DO 53 J=1,JDT
      NTT(J)=0
      DO 53 II=15,19
      I=2*II+1
      NTT(J)=NTT(J)+NRF(I,J)
   53 CONTINUE
      WRITE (6,54)
   54 FORMAT (33H RFI AT NWS (AWAIT DSM CHECK)     )
      WRITE (6,153)
  153 FORMAT (33H RFI IN TRANSIT                   )
      WRITE (6,2)
      DO 61 J=1,JDT
      NTT(J)=0
      DO 61 I=11,14
```

TABLE B-1. (Sheet 7 of 8)


```
      NTT(J)=NTT(J)+ND(I,J)
   61 CONTINUE
      WRITE (6,62)
   62 FORMAT (33H ATLANTIC - INVENTORY ABOARD SHIP)
      DO 63 J=1,JDT
      NTT(J)=0
      DO 63 I=11,14
      NTT(J)=NTT(J)+NPF(I,J)
   63 CONTINUE
      WRITE (6,64)
   64 FORMAT (33H ATLANTIC - RFI ABOARD SHIP       )
      WRITE (6,71)
      WRITE (6,102)
      WRITE (6,72)
      WRITE (6,103)
      WRITE (6,74)
      WRITE (6,104)
      WRITE (6,206)
      WRITE (6,207)
      WRITE (6,81)
      WRITE (6,111)
      WRITE (6,80)
   71 FORMAT (33H     USS J. F. KENNEDY       INV)
  102 FORMAT (33H     USS J. F. KENNEDY       RFI)
   72 FORMAT (33H     USS AMERICA             INV)
  103 FORMAT (33H     USS AMERICA             RFI)
   74 FORMAT (33H     USS NIMITZ              INV)
  104 FORMAT (33H     USS NIMITZ              RFI)
   81 FORMAT (33H NWS YORKTOWN (CHECKED)      INV)
  111 FORMAT (33H NWS YORKTOWN (VERIFIED)     RFI)
   80 FORMAT (33H NWS YORKTOWN (AWAIT CHECK)  INV)
  110 FORMAT (33H NWS YORKTOWN (AWAIT CHECK)  RFI)
   76 FORMAT (33H     USS ENTERPRISE          INV)
  106 FORMAT (33H     USS ENTERPRISE          RFI)
   77 FORMAT (33H     USS CONSTELLATION       INV)
  107 FORMAT (33H     USS CONSTELLATION       RFI)
   78 FORMAT (33H     USS EISENHOWER          INV)
  108 FORMAT (33H     USS EISENHOWER          RFI)
   79 FORMAT (33H     USS KITTY HAWK          INV)
  109 FORMAT (33H     USS KITTY HAWK          RFI)
   87 FORMAT (33H NAS MIRAMAR                 INV)
  117 FORMAT (33H NAS MIRAMAR                 RFI)
   86 FORMAT (33H NAS POINT MUGU              INV)
  116 FORMAT (33H NAS POINT MUGU              RFI)
      WRITE (6,2)
      DO 65 J=1,JDT
      NTT(J)=0
      DO 65 I=16,20
      NTT(J)=NTT(J)+ND(I,J)
   65 CONTINUE
      WRITE (6,66)
   66 FORMAT (33H PACIFIC  - INVENTORY ABOARD SHIP)
      DO 67 J=1,JDT
      NTT(J)=0
      DO 67 I=16,20
```

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TABLE B-1. (Sheet 8 of 8)


```
      NTT(J)=NTT(J)+NRF(I,J)
   67 CONTINUE
      WRITE (6,68)
   68 FORMAT (33H PACIFIC  - RFI ABOARD SHIP       )
      WRITE (6,76)
      WRITE (6,106)
      WRITE (6,77)
      WRITE (6,107)
      WRITE (6,78)
      WRITE (6,108)
      WRITE (6,79)
      WRITE (6,109)
      WRITE (6,87)
      WRITE (6,117)
      WRITE (6,86)
      WRITE (6,116)
      WRITE (6,83)
      WRITE (6,113)
      WRITE (6,85)
      WRITE (6,82)
      WRITE (6,112)
      WRITE (6,84)
  206 FORMAT (33H NAS OCEANA                  INV)
  207 FORMAT (33H NAS OCEANA                  RFI)
   83 FORMAT (33H MMU (CHECKED)               INV)
  113 FORMAT (33H MMU (VERIFIED)              RFI)
   85 FORMAT (33H MMU (AWAIT CHECK)           INV)
  115 FORMAT (33H MMU (AWAIT CHECK)           RFI)
   82 FORMAT (33H NWS FALLBROOK (CHECKED)     INV)
  112 FORMAT (33H NWS FALLBROOK (VERIFIED)    RFI)
   84 FORMAT (33H NWS FALLBROOK (AWAIT CHECK) INV)
  114 FORMAT (33H NWS FALLBROOK (AWAIT CHECK) RFI)
      STOP
      END
```

TABLE B-2. PROGRAM LISTING, VERSION 2 (Sheet 1 of 8)

```
PROGRAM     BRAMAN                               CDC 6600 FTN V3.0-P355 OPT=1  09/10/75  09.31.46.      PAGE      1

            PROGRAM BRAMAN(INPUT,OUTPUT,TAPE5=INPUT,TAPE6=OUTPUT)
            DIMENSION ZL(100),ND(50,18),NDT(18),NTT(18)
            DIMENSION MFR(1000),MTO(1000),TR(1000),UL(1000),BL(1000),MDY(1000)
            DIMENSION NFRM(1000),AMT(1000),NDYE(1000),NTDY(1000)
            DIMENSION NRF(50,18)
            DIMENSION NLC(100),DSLC(100,6)
            DIMENSION NITR(18)
            DIMENSION NITI(18)
            DIMENSION YL(100)
            JDT=18
            READ (5,200) NBEG,NEND
        200 FORMAT (2I5)
            WRITE (6,1)
          1 FORMAT (1H1)
            LDT=NBEG
            READ (5,3) (NDT(I),I=1,JDT)
          3 FORMAT (16I5)
            NXYZ=5
            DO 4 I=1,1000
            NDYE(I)=6000
          4 CONTINUE
            N=1
            MFR(1)=50
            MTO(1)=50
            TR(1)=1.86813
            UL(1)=100000.0
            BL(1)=0.0
            MDY(1)=0
            NIT=0
            DO 5 I=1,100
            ZL(I)=0.0
          5 CONTINUE
            NDLC=49
            DO 181 I=1,NDLC
            READ (5,6) NLC(I),(DSLC(I,J),J=1,6)
          6 FORMAT (I2,6A6)
        181 CONTINUE
            WRITE (6,141)
        141 FORMAT (2H  //)
            WRITE (6,142)
        142 FORMAT (2H  //)
          7 CONTINUE
            READ (5,11) NCT,MDT,L1,L2,ZUM,NDY,ZUL,ZLL
            IF (MDT.GT.0) GO TO 9
            IF (ZUL.LT.0.1) ZUL=10000.0
            N=N+1
            MFR(N)=L1
            MTO(N)=L2
            TR(N)=ZUM
            UL(N)=ZUL
            BL(N)=ZLL
            MDY(N)=NDY
            KFR=99
            KTO=99
            DO 171 I=1,NDLC
```


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```
      IF (NLC(I).EQ.L1) KFR=I
      IF (NLC(I).EQ.L2) KTO=I
  171 CONTINUE
      IF (ZUM.LT.0.0) GO TO 147
      IF (ZUM.GT.1.0) GO TO 148
      RATX=100.0*ZUM
      WRITE (6,143)                                          RATX
  143 FORMAT (79X                  ,F8.4,1X,35HPERCENT OF MISSILES AT PREVIOU
     1S LOC )
      GO TO 7
  147 CONTINUE
      RATX=-1.0*ZUM
      WRITE (6,144)                                          RATX
  144 FORMAT (79X                  ,F8.4,1X,8HMISSILES )
      GO TO 7
  148 CONTINUE
      RATX=ZUM-1.0
      WRITE (6,149)                                          RATX
  149 FORMAT (79X                  ,F8.4,1X,8HMISSILES )
      GO TO 7
    9 CONTINUE
      WRITE (6,1)
      WRITE (6,145)
  145 FORMAT (2H  //)
      WRITE (6,146)
  146 FORMAT (2H  //)
   10 CONTINUE
      READ (5,11) NCT,MDT,L1,L2,ZUM,NDY,ZUL,ZLL
   11 FORMAT (I1,I5,2I2,F7.0,I2,2F7.0)
      IF (ZUL.LT.0.1) ZUL=10000.0
      IF (MDT.LT.NBEG) GO TO 15
      IF (MDT.GT.LDT) GO TO 25
   15 CONTINUE
      IF (MDT.GT.99998) GO TO 30
      KFR=99
      KTO=99
      DO 172 I=1,NDLC
      IF (NLC(I).EQ.L1) KFR=I
      IF (NLC(I).EQ.L2) KTO=I
  172 CONTINUE
      IF (NCT.EQ.1) GO TO 12
      IF (NCT.EQ.2) GO TO 14
      IF (NXYZ.LT.3) GO TO 186
      NXYZ=0
      WRITE (6,1)
      WRITE (6,187)
  187 FORMAT (2H  //)
      WRITE (6,183)
  183 FORMAT (2H  //)
  186 CONTINUE
      DO 16 J=1,N
      IF (MFR(J).EQ.L1.AND.MTO(J).EQ.L2) GO TO 17
   16 CONTINUE
      N=N+1
      J=N
```

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TABLE B-2. (Sheet 3 of 8)


```
      MFR(J)=L1
      MTO(J)=L2
   17 CONTINUE
      TR(J)=ZUM
      MDY(J)=NDY
      UL(J)=ZUL
      BL(J)=ZLL
      IF (ZUM.LT.0.0) GO TO 188
      IF (ZUM.GT.1.0) GO TO 189
      RATX=100.0*ZUM
      IF (RATX.GT.75.0) GO TO 191
      IF (RATX.LT.0.0001) GO TO 10
      WRITE (6,182)                                         RATX,MDT
  182 FORMAT (79X                 ,F8.4,1X,35HPERCENT OF MISSILES AT PREVIOU
     1S LOC ,I7)
      GO TO 10
  191 CONTINUE
      WRITE (6,192) RATX,MDT
  192 FORMAT (79X                 ,F8.4,1X,35HPERCENT OF MISSILES (OFFLOAD)
     1       ,I7)
      GO TO 10
  188 CONTINUE
      RATX=-1.0*ZUM
      WRITE (6,184) RATX,MDT
  184 FORMAT (79X                 ,F8.4,1X,8HMISSILES,29X,I5)
      GO TO 10
  189 CONTINUE
      RATX=ZUM-1.0
      WRITE (6,185) RATX,MDT
  185 FORMAT (79X                 ,F8.4,1X,8HMISSILES,29X,I5)
      GO TO 10
   12 CONTINUE
      RATX=ZUM
      WRITE (6,190) RATX,MDT
  190 FORMAT (79X                 ,F8.4,1X,30HMISSILES TRANSFERRED (LOADOUT)
     1 ,7X,I5)
      ZL(L2)=ZL(L2)+ZUM
      ZL(L1)=ZL(L1)-ZUM
      ZF=ZL(L1)+ZUM
      IF (ZL(L1).LT.0.0) WRITE (6,13) ZF
   13 FORMAT (26H IMPOSSIBLE TRANSFER, ONLY,F8.2,19H MISSILES AVAILABLE
     1,75(1H*))
      IF (ZL(L1).LT.0.0) ZL(L1)=0.0
      GO TO 10
   14 CONTINUE
      ZL(L2)=ZUM
      WRITE (6,160) MDT,ZUM
  160 FORMAT (40X        ,I4,3X,F6.0)
      GO TO 10
   20 CONTINUE
      DO 21 I=1,JDT
      IF (LOT.EQ.NDT(I)) GO TO 22
   21 CONTINUE
      GO TO 24
   22 CONTINUE
```


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TABLE B-2. (Sheet 4 of 8)


```
      DO 23 J=1,50
      K=J+50
      ND(J,I)=ZL(J)+ZL(K)+0.5
      NRF(J,I)=ZL(J)+0.5
      IF (NRF(J,I).LT.1) NRF(J,I)=0
      IF (NC(J,I).LT.1) ND(J,I)=0
   23 CONTINUE
      ZITT=0.0
      ZITR=0.0
      DO 151 J=1,NIT
      IF (NFRM(J).LT.4100.OR.NFRM(J).GT.4300) ZITR=ZITR+AMT(J)
      ZITI=ZITT+AMT(J)
  151 CONTINUE
      NITI(I)=ZITI+0.5
      NITR(I)=ZITR+0.5
   24 CONTINUE
      LDT=LDT+1
      IF (LDT.EQ.4366) LDT=5001
      IF (LDT.EQ.5366) LDT=6001
      IF (LDT.EQ.6367) LDT=7001
      IF (LDT.EQ.7366) LDT=8001
      IF (LDT.EQ.8366) LDT=9001
      IF (LDT.GT.NEND) GO TO 15
      IF (LDT.GE.MDT) GO TO 15
   25 CONTINUE
      IF (LDT.EQ.NBEG) GO TO 20
      DO 28 K=1,100
      YL(K)=ZL(K)
   28 CONTINUE
      DO 26 M=1,N
      K=MFR(M)
      J=MTO(M)
      TRN=TR(M)
      NAM=MDY(M)
      DLTA=0.0
      IF (YL(K).GT.0.001) DLTA=TRN*YL(K)
      IF (TRN.LT.0.0) DLTA=-1.0*TRN
      IF (YL(K).LT.BL(M)) DLTA=0.0
      IF (YL(K).GT.UL(M)) DLTA=0.0
      IF (TRN.GT.1.0) DLTA=TRN-1.0
      IF (NAM.LT.1) GO TO 27
      IF (NIT.LT.1) GO TO 132
      DO 131 I=1,NIT
      IF (NDYE(I).GT.5000) GO TO 133
  131 CONTINUE
  132 CONTINUE
      NIT=NIT+1
      I=NIT
  133 CONTINUE
      NDYE(I)=-1
      NFRM(I)=K+100*J
      NIDY(I)=NAM
      AMT(I)=DLTA
      GO TO 20
   27 CONTINUE
```

TABLE B-2. (Sheet 5 of 8)


```
      ZL(J)=ZL(J)+DLTA
      IF (K.EQ.J) GO TO 26
   29 CONTINUE
      ZL(K)=ZL(K)-DLTA
   26 CONTINUE
      IF (NIT.LT.1) GO TO 20
      DO 134 I=1,NIT
      NDYE(I)=NDYE(I)+1
      IF (NDYE(I).NE.NTDY(I)) GO TO 134
      J=NERM(I)/100
      ZL(J)=ZL(J)+AMT(I)
      NDYE(I)=6000
      AMT(I)=0.0
      NTDY(I)=0
      NERM(I)=0
  134 CONTINUE
      GO TO 20
   30 CONTINUE
      WRITE (6,1)
      WRITE (6,31)
   31 FORMAT (2H  //)
      WRITE (6,32)
   32 FORMAT (2H  )
      WRITE (6,2)
    2 FORMAT (2H  )
      WRITE (6,33) (ND(1,J),J=1,JDT)
   33 FORMAT (33H                                 ,18I5)
      WRITE (6,2)
      DO 34 J=1,JDT
      NTT(J)=0
      DO 34 I=11,20
      NTT(J)=NTT(J)+ND(I,J)
   34 CONTINUE
      WRITE (6,35) (NTT(J),J=1,JDT)
   35 FORMAT (33H                                 ,18I5)
      DO 38 J=1,JDT
      NTT(J)=0
      DO 38 I=21,30
      NTT(J)=NTT(J)+ND(I,J)
   38 CONTINUE
      WRITE (6,39) (NTT(J),J=1,JDT)
   39 FORMAT (33H                                 ,18I5)
      DO 40 J=1,JDT
      NTT(J)=0
      DO 40 II=16,21
      I=2*II
      NTT(J)=NTT(J)+ND(I,J)
   40 CONTINUE
      WRITE (6,37) (NTT(J),J=1,JDT)
   37 FORMAT (33H                                 ,18I5)
      DO 36 J=1,JDT
      NTT(J)=0
      DO 36 II=15,19
      I=2*II+1
      NTT(J)=NTT(J)+ND(I,J)
```

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TABLE B-2. (Sheet 6 of 8)


```
   36 CONTINUE
      WRITE (6,41) (NTT(J),J=1,JDT)
   41 FORMAT (33H                                  ,18I5)
      DO 123 J=1,JDT
      NTT(J)=ND(41,J)+ND(42,J)
  123 CONTINUE
      WRITE (6,91) (NTT(J),J=1,JDT)
   91 FORMAT (33H                                  ,18I5)
      WRITE (6,121) (ND(41,J),J=1,JDT)
  121 FORMAT (33H                                  ,18I5)
      WRITE (6,122) (ND(42,J),J=1,JDT)
  122 FORMAT (33H                                  ,18I5)
      WRITE (6,92) (ND(46,J),J=1,JDT)
   92 FORMAT (33H                                  ,18I5)
      WRITE (6,152) (NITT(J),J=1,JDT)
  152 FORMAT (33H                                  ,18I5)
      WRITE (6,124) (ND(50,J),J=1,JDT)
  124 FORMAT (33H                                  ,18I5)
  125 FORMAT (33H                                  ,18I5)
      WRITE (6,125) (ND(7,J),J=1,JDT)
      WRITE (6,97) (ND(6,J),J=1,JDT)
   97 FORMAT (33H                                  ,18I5)
      WRITE (6,96) (ND(2,J),J=1,JDT)
   96 FORMAT (33H                                  ,18I5)
      WRITE (6,2)
      DO 51 J=1,JDT
      NTT(J)=0
      DO 51 I=11,20
      NTT(J)=NTT(J)+NPF(I,J)
   51 CONTINUE
      WRITE (6,52) (NTT(J),J=1,JDT)
   52 FORMAT (33H                                  ,18I5)
      DO 55 J=1,JDT
      NTT(J)=0
      DO 55 I=21,30
      NTT(J)=NTT(J)+NRF(I,J)
   55 CONTINUE
      WRITE (6,56) (NTT(J),J=1,JDT)
   56 FORMAT (33H                                  ,18I5)
      DO 57 J=1,JDT
      NTT(J)=0
      DO 57 II=16,27
      I=2*II
      NTT(J)=NTT(J)+NPF(I,J)
   57 CONTINUE
      WRITE (6,58) (NTT(J),J=1,JDT)
   58 FORMAT (33H                                  ,18I5)
      DO 53 J=1,JDT
      NTT(J)=0
      DO 53 II=15,19
      I=2*II+1
      NTT(J)=NTT(J)+NPF(I,J)
   53 CONTINUE
      WRITE (6,54) (NTT(J),J=1,JDT)
   54 FORMAT (33H                                  ,18I5)
```

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TABLE B-2. (Sheet 7 of 8)


```
      WRITE (6,153) (NITR(J),J=1,JDT)
  153 FORMAT (33H                                          ,18I5)
      WRITE (6,2)
      DO 61 J=1,JDT
      NTT(J)=0
      DO 61 I=11,14
      NTT(J)=NTT(J)+ND(I,J)
   61 CONTINUE
      WRITE (6,62) (NTT(J),J=1,JDT)
   62 FORMAT (33H                                          ,18I5)
      DO 63 J=1,JDT
      NTT(J)=0
      DO 63 I=11,14
      NTT(J)=NTT(J)+NPF(I,J)
   63 CONTINUE
      WRITE (6,64) (NTT(J),J=1,JDT)
   64 FORMAT (33H                                          ,18I5)
      WRITE (6,71) (ND(11,J),J=1,JDT)
      WRITE (6,102) (NPF(11,J),J=1,JDT)
      WRITE (6,72) (ND(12,J),J=1,JDT)
      WRITE (6,103) (NPF(12,J),J=1,JDT)
      WRITE (6,74) (ND(13,J),J=1,JDT)
      WRITE (6,104) (NPF(13,J),J=1,JDT)
      WRITE (6,206) (ND(20,J),J=1,JDT)
      WRITE (6,207) (NPF(20,J),J=1,JDT)
      WRITE (6,81) (ND(32,J),J=1,JDT)
      WRITE (6,111) (NPF(32,J),J=1,JDT)
      DO 205 J=1,JDT
      NTT(J)=ND(37,J)+ND(31,J)
  205 CONTINUE
      WRITE (6,80) (NTT(J),J=1,JDT)
   71 FORMAT (33H                                          ,18I5)
  102 FORMAT (33H                                          ,18I5)
   72 FORMAT (33H                                          ,18I5)
  103 FORMAT (33H                                          ,18I5)
   74 FORMAT (33H                                          ,18I5)
  104 FORMAT (33H                                          ,18I5)
   81 FORMAT (33H                                          ,18I5)
  111 FORMAT (33H                                          ,18I5)
   80 FORMAT (33H                                          ,18I5)
  110 FORMAT (33H                                          ,18I5)
   76 FORMAT (33H                                          ,18I5)
  106 FORMAT (33H                                          ,18I5)
   77 FORMAT (33H                                          ,18I5)
  107 FORMAT (33H                                          ,18I5)
   78 FORMAT (33H                                          ,18I5)
  108 FORMAT (33H                                          ,18I5)
   79 FORMAT (33H                                          ,18I5)
  109 FORMAT (33H                                          ,18I5)
   87 FORMAT (33H                                          ,18I5)
  117 FORMAT (33H                                          ,18I5)
   86 FORMAT (33H                                          ,18I5)
  116 FORMAT (33H                                          ,18I5)
      WRITE (6,2)
      DO 65 J=1,JDT
```


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TABLE B-2. (Sheet 8 of 8)


```
      NTT(J)=0
      DO 65 I=16,20
      NTT(J)=NTT(J)+ND(I,J)
   65 CONTINUF
      WPITE (6,66) (NTT(J),J=1,JDT)
   66 FORMAT (33H                              ,18I5)
      DO 67 J=1,JDT
      NTT(J)=0
      DO 67 I=16,20
      NTT(J)=NTT(J)+NRF(I,J)
   67 CONTINUF
      WPITE (6,68) (NTT(J),J=1,JDT)
   68 FORMAT (33H                              ,18I5)
      WRITE (6,75) (ND(16,J),J=1,JDT)
      WPITE (6,106) (NRF(16,J),J=1,JDT)
      WPITE (6,77) (ND(17,J),J=1,JDT)
      WPITE (6,107) (NRF(17,J),J=1,JDT)
      WPITE (6,78) (ND(18,J),J=1,JDT)
      WPITE (6,108) (NRF(18,J),J=1,JDT)
      WPITE (6,79) (ND(19,J),J=1,JDT)
      WRITE (6,109) (NRF(19,J),J=1,JDT)
      WPITE (6,87) (ND(22,J),J=1,JDT)
      WPITE (6,117) (NRF(22,J),J=1,JDT)
      WPITE (6,86) (ND(21,J),J=1,JDT)
      WRITE (6,116) (NRF(21,J),J=1,JDT)
      WRITE (6,83) (ND(36,J),J=1,JDT)
      WRITE (6,113) (NRF(36,J),J=1,JDT)
      WPITE (6,85) (ND(35,J),J=1,JDT)
      WPITE (6,82) (ND(34,J),J=1,JDT)
      WPITE (6,112) (NRF(34,J),J=1,JDT)
      DO 210 J=1,JDT
      NTT(J)=ND(39,J)+ND(33,J)
  210 CONTINUF
      WPITE (6,84) (NTT(J),J=1,JDT)
  206 FORMAT (33H                              ,18I5)
  207 FORMAT (33H                              ,18I5)
   85 FORMAT (33H                              ,18I5)
   83 FORMAT (33H                              ,18I5)
  113 FORMAT (33H                              ,18I5)
  115 FORMAT (33H                              ,18I5)
   82 FORMAT (33H                              ,18I5)
  112 FORMAT (33H                              ,18I5)
   84 FORMAT (33H                              ,18I5)
  114 FORMAT (33H                              ,18I5)
      STOP
      END
```