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model, calculates facility requirements for each phase of training.

The purpose of the Phase II study was to develop a preliminary total systems IFRS management planning tool (including the two submodels developed in Phase I, as well as Base Loading, Facilities Excess/Deficiency, and Total Cost submodels), and automate the model so that it provides quick, accurate, and relevant information for use in the decision-making process. The present IFRS model is working to provide useful information to the decision-maker. Refinement and expansion of the present Phase II model will be completed in Phase III.

This report is composed of four volumes. Volume I contains a summary of the IFRS management planning tool. A detailed discussion of each of the five submodels and associated data files is contained in Volume II. A manual discussing the use of the automated model is provided in Volume III and the programmer's manual is contained in Volume IV.

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OPERATIONS RESEARCH, Inc.

SILVER SPRING, MARYLAND

**DEVELOPMENT OF A PRELIMINARY AUTOMATED
TOTAL SYSTEMS MODEL FOR THE INTEGRATED
FACILITIES REQUIREMENTS STUDY (IFRS)
PHASE II**

VOLUME III—USER'S MANUAL

9 February 1970

Prepared under Contract N00025-67-C-0031
(NBy-78672) for the Naval Facilities Engineering Command
Department of the Navy
Washington, D.C.

FOREWORD

This report documents the second phase of the multi-phase Integrated Facilities Requirements Study (IFRS). It has been prepared for the Systems Analysis Division of the Office of the Assistant Commander for Facilities Planning (Code 20), Naval Facilities Engineering Command (NAVFAC), Department of the Navy, as part of Contract N00025-67-C-0031 (NBy-78672) awarded to Operations Research, Inc., in June 1969.

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The IFRS model was developed and programmed by staff members of the Economic Analysis Division of Operations Research, Inc., under the direction of Dr. William J. Leininger, Vice President and Division Director, and Thomas N. Kyle, Project Manager. The project team members were Richard D. Heilbron, John H. Avila, Frederick L. McCoy, Thomas L. Shaffer, and Dr. Joan L. Turek.

Mr. Dennis Whang of the Systems Analysis Division of Facilities Planning was contract monitor for NAVFAC. In addition, valuable assistance was provided by many other Navy personnel including, in particular, those in the Office of the Staff Civil Engineer and the Training/Plans Division of the Naval Air Training Command and in the Systems Analysis Division of NAVFAC. The authors gratefully acknowledge the contributions made by all of these people to the development of the IFRS model.

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I. INTRODUCTION

PURPOSE OF THE USER'S MANUAL

1.1 The purpose of this manual is to provide the decision maker with detailed instructions for the use of the Integrated Facilities Requirements Study (IFRS) model. The overall flow of control within the IFRS model appears in Figure 1. This figure illustrates the various data files, inputs required, outputs received, and the following major system submodels.

- Logistics Support Requirements (LSR) Generator
- Base Loading Submodel
- Facilities Requirements Submodel
- Excess/Deficiency Submodel
- Total Systems Cost (TSC) Submodel.

As discussed in Volumes I and II of this report, these submodels are sequentially related, and the output of each is printed by the time-sharing terminal as well as automatically entered as input data to one or more successive models. The Pilot Training Rate (PTR) and the assignment of training phases to particular Naval Air Stations (NASs) are entered through the terminal by the decision maker.

1.2 The user should familiarize himself with the following sections of this manual to realize the greatest effectiveness and flexibility in the use of the IFRS model. It is also recommended that he become familiar with the standard operating procedures for the computer on which the IFRS model is programmed, the General Electric GE 635 time-sharing computer.

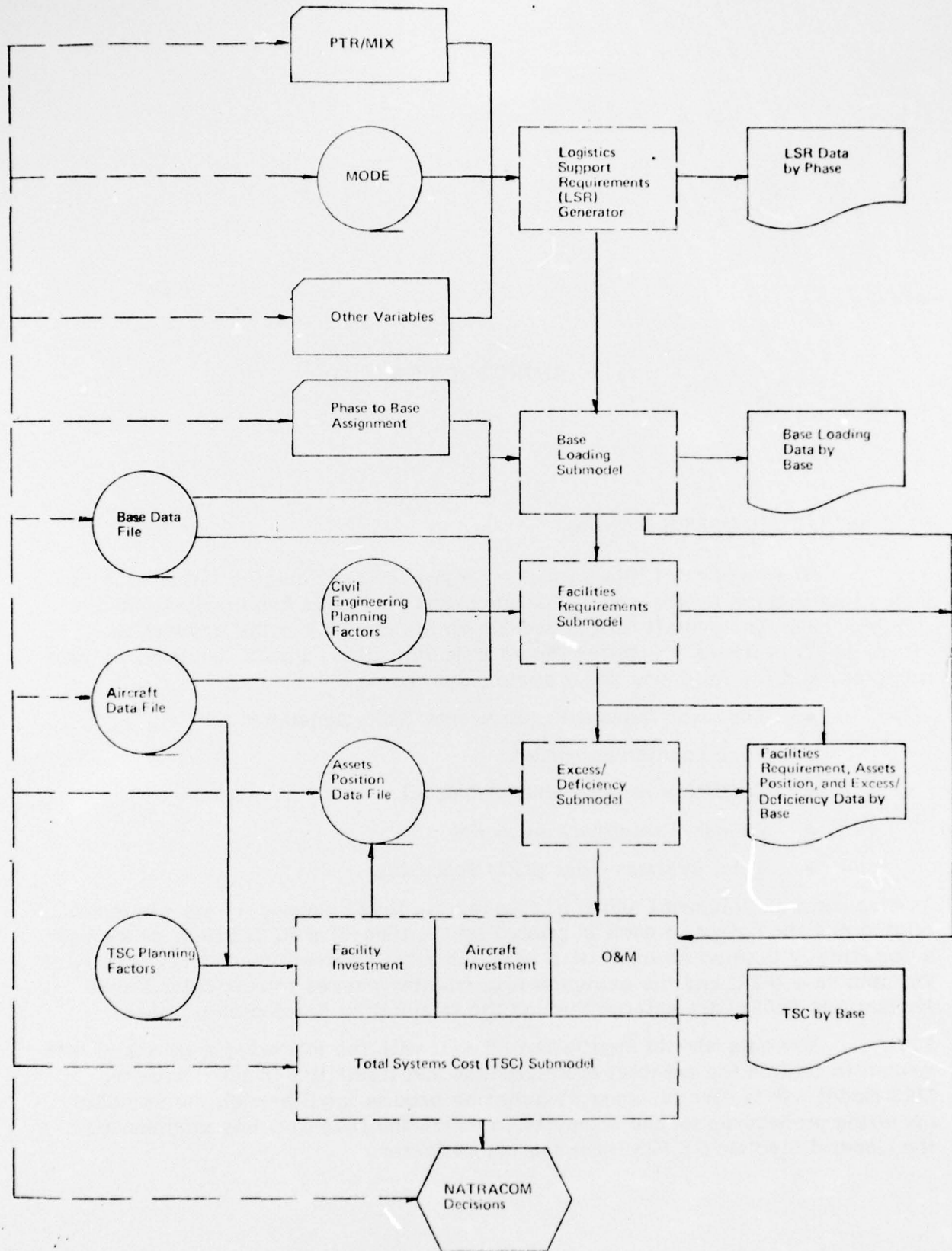


FIGURE 1. IFRS SIMULATION CONCEPT

ORGANIZATION OF THE MANUAL

1.3 The IFRS system can be entered at three points. The LSR Generator is entered by running program XLSRM*. From this program the entire IFRS system can be run. The Base Loading Submodel and subsequent submodels can be entered directly, if desired, by running program PART2*. The IFRS system can also be entered at the Excess/Deficiency Submodel by running program PART6*. If the IFRS system is entered at PART2* or PART6*, the data generated in the previous LSR Generator run are used as input to the following submodels. The availability of entry after the LSR Generator can save the user valuable time. If he wants to analyze one PTR in various phase to base assignments, he runs the LSR Generator once and re-enters at PART2* for new phase assignments. If he wants to change the facility substandard option in the Excess/Deficiency program, he re-enters PART6*.

1.4 Section II of this manual discusses the general operating procedures and extended operations of the IFRS model. Section III contains a description of the diagnostic messages provided for the assistance of the user. Section IV describes data file updating procedures, and Section V contains instructions for operation of the IFRS utility programs.

II. GENERAL OPERATING PROCEDURES AND EXTENDED OPERATIONS

INTRODUCTION

2.1 This section on general operating procedures for using the IFRS system is divided into three subsections. The first describes the normal operation of the LSR Generator Submodel. The second describes the use of the remaining system submodels. The third describes the extended capabilities of the LSR Generator submodel.

2.2 An important distinction exists between the LSR Generator and the combined Base Loading, Excess/Deficiency, Facilities Requirements, and Total Systems Cost Submodels. Both of these parts can be run separately, but the LSR Generator offers the added capability of operation in an extended mode. For example, the user can generate several LSRs without ever allocating phases to bases. Similarly, for one given set of LSR data output, the user can run several phase allocation schemes, alter options on acceptance of substandard facilities, or select other options described below without re-entering the LSR Generator. In the most straightforward case, of course, the user enters the LSR Generator and continues directly through the Base Loading and Total Systems Cost Submodels without leaving the IFRS system.

2.3 The LSR Generator may be used in both normal and the extended modes. A description of the former permits the user to gain an initial understanding of the operation of the LSR Generator with unmodified data and unconstrained resources. The user can then master the extended operations described subsequently in this section. The data modifications allowed in the extended operation of the LSR Generator can be completed on-line, i.e., during the actual running of the program.

2.4 It is assumed in the following descriptions of the use of the IFRS system that the user supplies the correct responses to instructions or questions. Affirmative and negative responses are indicated by typing Y for Yes, or N for No. For these and other forms of response, formats are always given with the indicated computer instruction, or question. Wherever possible, formats are free, meaning that the user can type his response, when it consists of a sequence of items, by merely typing a comma between each item. When alphabetic character information is required, the format is generally strict. The notation used in the question from the computer to indicate the format for the appropriate response is as follows: II, or XX, or XX.XX, etc. indicate that a numeric response is expected, the decimal often indicating that the input need not be in whole numbers; AA indicates that an alphabetic character response is expected, the number of letters appearing in the question indicating the number expected in the response. Responses are generally checked for validity. The diagnostic messages returned to the user are discussed in Section III of this volume.

GENERAL OPERATING PROCEDURES

LSR Generator

2.5 The automated IFRS model is entered by running program XLSRM*, the compiled version of LSRM. After the computer system begins running, question 1 is printed.

```
ENTER LEVEL OF COMPLEXITY
1 NO ADJUSTMENTS OR MODIFICATIONS
2 CONSTRAIN LSR OUTPUT
3 MODIFY PHASE DATA
4 COMBINE OPTIONS 2 AND 3? 1
```

(1)

This and the following samples of the conversational mode will show, underlined, a sample user's response to a question posed by the computer. If the user does not wish to modify the LSR data base or constrain the output from the LSR Generator, a response of 1 is given. (For levels of complexity 2, 3, and 4, refer to the subsection below on Extended Operations.)

2.6 After the level of complexity has been entered, question 2 is asked.

```
ENTER TRAINING WEEKS PER YEAR
AND ANNUAL FLY-DAYS (XX.,XXX.)? 50,245
```

(2)

The user must enter the number of weeks and training days to be scheduled annually for pilot training. Note that an input format, (XX., XXX.), is provided as an aid to the user.

2.7 Next, question 3 is asked.

PRINT LIST OF TRAINING PHASES (Y,N)?Y (3)

The user must respond Yes or No. A Yes response produces a list of the training phase names and numbers contained in the LSR data base (see Table 1).

2.8 With a No response or after the training phase list has been printed, the user is asked question 4.

PRINT ALL PIPELINES (Y,N)?Y (4)

Following a Yes response, the computer produces a complete list of all training phases in each training pipeline along with their sequence and attrition rates (see Table 2).

2.9 When a No response is given or upon completion of the printing of pipeline data, the automated system in question 5 requests the user to enter the PTR for the training pipeline.

**F0R PIPELINE NAVY 0FFICER
ENTER PHASE NUMBER AND STUDENT 0UTPUT (XX,XXXX.)
PHASE 0,0 IMPLIES N0 FURTHER ASSIGNMENTS?7,172
NEXT?8,173
NEXT?11,410
NEXT?14,100
NEXT?0,0** (5)

In his response the user may enter as many PTRs as he desires, so long as there is sufficient information for the automated system to compute the PTR for the remaining phases. (See LSR diagnostic message 2067 for a further explanation of invalid PTR entries.) Note that after the user has entered the desired phase PTRs, he must type 0,0 to tell the system he has finished. When all phase - PTR data have been entered, the training pipeline student statistics are printed (see Table 3).

2.10 Generally the user selects the terminal training phases in the training pipeline for PTR assignments (response to question 5). However, the user may wish to constrain the terminal training phases or other phases by assigning a PTR to a training phase early in the pilot training program. For example, he may desire to respond to question 5 in the following way:

TABLE 1
LSR PHASE CODES

TRAINING PHASES

NØ.	PHASE NAME
1	PRIMARY
2	AØC SCHØØL
3	FLIGHT SYS.
4	BASIC JET-A
5	BASIC JET-B
6	B-JET G/CØ
7	ADV JET-TF
8	ADV JET-TA
9	BASIC PRØP
10	B-PRØP CØ
11	ADV PRØP
12	PRE HELØ
13	HELØ PRIM
14	HELØ ADV

TABLE 2

TRAINING PHASES IN A TRAINING PIPELINE

TRAINING PIPELINE FOR NAVY OFFICER

PHASE NO.	PHASE NAME	ATTRITION RATE	FOLLOWING PHASES
1	PRIMARY	0.0900	3
3	FLIGHT SYS.	0.0270	4, 9
4	BASIC JET-A	0.0500	5
5	BASIC JET-B	0.0200	6
6	B-JET G/CQ	0.0200	7, 8
7	ADV JET-TF	0.0400	
8	ADV JET-TA	0.0400	
9	BASIC PRØP	0.1400	10
10	B-PRØP CQ	0.0040	11, 12
11	ADV PRØP	0.0080	
12	PRE HELØ	0.0050	13
13	HELØ PRIM	0.0020	14
14	HELØ ADV	0.0020	

TABLE 3

TRAINING PIPELINE STUDENT STATISTICS

STUDENT TYPE NAVY OFFICER

TRAINING PHASE	.STUDENT STATISTICS.		
	INPUT	OUTPUT	ATTRITES
PRIMARY	1123.	1022.	101.
FLIGHT SYS.	1022.	994.	28.
BASIC JET-A	394.	374.	20.
BASIC JET-B	374.	367.	7.
B-JET G/CQ	367.	359.	7.
ADV JET-TF	179.	172.	7.
ADV JET-TA	180.	173.	7.
BASIC PRØP	600.	516.	84.
B-PRØP CQ	516.	514.	2.
ADV PRØP	413.	410.	3.
PRE HELØ	101.	100.	1.
HELØ PRIM	100.	100.	0.
HELØ ADV	100.	100.	0.

FOR PIPELINE NAVY OFFICER
ENTER PHASE NUMBER AND STUDENT OUTPUT (XX,XXXX.)
PHASE 0,0 IMPLIES NO FURTHER ASSIGNMENTS?1,1022
NEXT?0,0 (5)

The automated system could compute the PTR of Flight Systems, since this training phase is the only phase following primary training. However, the determination of the PTR mix of Basic Jet A and Basic Prop would require a user decision. Responding to question 5a permits the user to make such a decision.

**RESIDUAL OUTPUT FROM PHASE 3 IS 994. STUDENTS
DIVIDE AMONG THE FOLLOWING PHASES 4, 9
ENTER APPROPRIATE MIX (XXXXX.,XXXXX.,XXXXX.)
?394,600** (5a)

The automated system continues to ask the user to allocate the PTR among other sequential phases (see Table 4) until the student statistics can be computed (see Table 5). Note that the student statistics presented in Tables 3 and 5 are almost identical since the PTRs selected for the example were similar. Differences in final digits in the two tables arise from variability in computer rounding.

2.11 After the student statistics have been printed for the first training pipeline in the LSR data base, the following situation occurs for the remaining training pipelines (see Tables 6, 7, and 8).

- A list of each training phase, its sequence, and its attrition rate is printed. Note that this only occurs when question 4 receives a Yes response.
- The user must enter the training phase PTRs, i.e., respond to question 5 and also to 5a, when appropriate.
- Student statistics for each training phase are printed.

When all training phase PTRs have been computed for all training pipelines, an aggregate of the student statistics is printed (see Table 9). Next the LSR summary output is printed (see Table 10).

2.12 When the LSR summary statement has been printed, the user is asked in question 6 whether he desires a detailed LSR output.

DETAILED LSR OUTPUT DESIRED (Y,N)?N (6)

TABLE 4

RESPONSES TO QUESTION 5a

RESIDUAL OUTPUT FROM PHASE 6 IS 360. STUDENTS
 DIVIDE AMONG THE FOLLOWING PHASES 7, 8
 ENTER APROPIATE MIX (XXXXX.,XXXXX.,XXXXX.)
?180,180

RESIDUAL OUTPUT FROM PHASE 10 IS 514. STUDENTS
 DIVIDE AMONG THE FOLLOWING PHASES 11,12
 ENTER APROPIATE MIX (XXXXX.,XXXXX.,XXXXX.)
?413,101

TABLE 5

TRAINING PIPELINE STUDENT STATISTICS

STUDENT TYPE NAVY OFFICER

TRAINING PHASE	.STUDENT STATISTICS.		
	INPUT	OUTPUT	ATTRITES
PRIMARY	1123.	1022.	101.
FLIGHT SYS.	1022.	994.	28.
BASIC JET-A	394.	374.	20.
BASIC JET-B	374.	367.	7.
B-JET G/CQ	367.	360.	7.
ADV JET-TF	180.	173.	7.
ADV JET-TA	180.	173.	7.
BASIC PROP	600.	516.	84.
B-PROP CQ	516.	514.	2.
ADV PROP	413.	410.	3.
PRE HELO	101.	101.	1.
HELO PRIM	101.	100.	0.
HELO ADV	100.	100.	0.

TABLE 6

TOTAL PIPELINE INFORMATION FOR NAVAL AOCs

TRAINING PIPELINE FOR NAVY - AOC

PHASE NO.	PHASE NAME	ATTRITION RATE	FOLLOWING PHASES
1	PRIMARY	0.1400	2
2	AOC SCHØØL	0.0730	3
3	FLIGHT SYS.	0.0320	4, 9
4	BASIC JET-A	0.0800	5
5	BASIC JET-B	0.0310	6
6	B-JET G/CØ	0.0160	7, 8
7	ADV JET-TF	0.0520	
8	ADV JET-TA	0.0520	
9	BASIC PRØP	0.2400	10
10	B-PRØP CØ	0.0060	11, 12
11	ADV PRØP	0.0120	
12	PRE HELØ	0.0060	13
13	HELØ PRIM	0.0050	14
14	HELØ ADV	0.0050	

FOR PIPELINE NAVY - AOC
 ENTER PHASE NUMBER AND STUDENT ØUTPUT (XX,XXXX.)
 PHASE 0,0 IMPLIES NØ FURTHER ASSIGNMENTS? 7, 173
 NEXT? 8, 172
 NEXT? 11, 500
 NEXT? 14, 150
 NEXT? 0, 0

STUDENT TYPE NAVY - AOC

TRAINING PHASE	.STUDENT STATISTICS.		
	INPUT	ØUTPUT	ATTRITES
PRIMARY	1667.	1434.	233.
AOC SCHØØL	1434.	1329.	105.
FLIGHT SYS.	1329.	1287.	43.
BASIC JET-A	415.	382.	33.
BASIC JET-B	382.	370.	12.
B-JET G/CØ	370.	364.	6.
ADV JET-TF	182.	173.	9.
ADV JET-TA	181.	172.	9.
BASIC PRØP	872.	662.	209.
B-PRØP CØ	662.	658.	4.
ADV PRØP	506.	500.	6.
PRE HELØ	152.	152.	1.
HELØ PRIM	152.	151.	1.
HELØ ADV	151.	150.	1.

TABLE 7

TOTAL PIPELINE INFORMATION FOR MARINES

TRAINING PIPELINE FOR MARINE

PHASE NØ.	PHASE NAME	ATTRITION RATE	FØLLØVING PHASES
1	PRIMARY	0.0500	3
3	FLIGHT SYS.	0.0150	4, 9
4	BASIC JET-A	0.0400	5
5	BASIC JET-B	0.0100	6
6	B-JET G/CØ	0.0100	7, 8
7	ADV JET-TF	0.0300	
8	ADV JET-TA	0.0300	
9	BASIC PRØP	0.0900	10
10	B-PRØP CØ	0.0050	12
12	PRE HELØ	0.0040	13
13	HELØ PRIM	0.0020	14
14	HELØ ADV	0.0020	

FOR PIPELINE MARINE
 ENTER PHASE NUMBER AND STUDENT ØUTPUT (XX,XXXX.)
 PHASE 0,0 IMPLIES NØ FURTHER ASSIGNMENTS?7,137
 NEXT?8,138
 NEXT?14,285
 NEXT?0,0

STUDENT TYPE MARINE

TRAINING PHASE	.STUDENT STATISTICS.		
	INPUT	ØUTPUT	ATTRITES
PRIMARY	661.	628.	33.
FLIGHT SYS.	628.	619.	9.
BASIC JET-A	301.	289.	12.
BASIC JET-B	289.	286.	3.
B-JET G/CØ	286.	284.	3.
ADV JET-TF	141.	137.	4.
ADV JET-TA	142.	138.	4.
BASIC PRØP	317.	289.	29.
B-PRØP CØ	289.	287.	1.
PRE HELØ	287.	286.	1.
HELØ PRIM	286.	286.	1.
HELØ ADV	286.	285.	1.

TABLE 8
TOTAL PIPELINE INFORMATION FOR COAST GUARD AND FOREIGN

TRAINING PIPELINE FOR C-GRD & FOR.

PHASE NO.	PHASE NAME	ATTRITION RATE	FOLLOWING PHASES
1	PRIMARY	0.0500	3
3	FLIGHT SYS.	0.0200	9
9	BASIC PRØP	0.0500	11, 12
11	ADV PRØP	0.	
12	PRE HELØ	0.	13
13	HELØ PRIM	0.	14
14	HELØ ADV	0.0100	

FOR PIPELINE C-GRD & FOR.
 ENTER PHASE NUMBER AND STUDENT OUTPUT (XX,XXXX.)
 PHASE 0,0 IMPLIES NO FURTHER ASSIGNMENTS? 11, 40
 NEXT? 14, 60
 NEXT? 0,0

STUDENT TYPE C-GRD & FOR.

TRAINING PHASE	.STUDENT STATISTICS.		
	INPUT	OUTPUT	ATTRITES
PRIMARY	114.	108.	6.
FLIGHT SYS.	108.	106.	2.
BASIC PRØP	106.	101.	5.
ADV PRØP	40.	40.	0.
PRE HELØ	61.	61.	0.
HELØ PRIM	61.	61.	0.
HELØ ADV	61.	60.	1.

TABLE 9
AGGREGATE STUDENT STATISTICS

TOTAL FOR ALL STUDENT TYPES

TRAINING PHASE	STUDENT STATISTICS.		
	INPUT	OUTPUT	ATTRITES
PRIMARY	3565.	3192.	373.
AOC SCHOOL	1434.	1329.	105.
FLIGHT SYS.	3087.	3005.	82.
BASIC JET-A	1110.	1045.	65.
BASIC JET-B	1045.	1023.	22.
B-JET G/CQ	1023.	1007.	16.
ADV JET-TF	503.	482.	21.
ADV JET-TA	504.	483.	21.
BASIC PRØP	1895.	1568.	327.
B-PRØP CQ	1467.	1460.	7.
ADV PRØP	959.	950.	9.
PRE HELØ	601.	599.	3.
HELØ PRIM	599.	597.	2.
HELØ ADV	597.	595.	2.

TABLE 10

LSR SUMMARY STATEMENT

TRAINING PHASE	STUDENT LOAD	AIRCRAFT		FUEL CONSUMED		TOTAL ØFF	TOTAL ENL
		TYPE	NØ.	TYPE	GALLØNS		
PRIMARY	405.	T34B	129.	AGAS	0.131E+07	199.	379.
AOC SCHOOL	276.		0.		0.	8.	0.
FLIGHT SYS.	305.		0.		0.	9.	0.
BASIC JET-A	237.	T-2A	97.	JP-4	0.212E+08	159.	585.
BASIC JET-B	186.	T28C	101.	JP-4	0.240E+08	133.	795.
B-JET G/CQ	142.	T28C	58.	JP-4	0.113E+08	76.	493.
ADV JET-TF	197.	TF9J	170.	JP-4	0.589E+08	214.	1378.
ADV JET-TA	197.	TA4J	153.	JP-4	0.468E+08	210.	1264.
BASIC PRØP	658.	T28C	283.	AGAS	0.101E+08	323.	1347.
B-PRØP CQ	117.	T28C	36.	AGAS	0.111E+07	45.	238.
ADV PRØP	325.	TS2A	164.	A115	0.125E+08	257.	1599.
PRE HELØ	60.	T28C	18.	AGAS	0.710E+06	29.	102.
HELØ PRIM	48.	TH57	21.	AGAS	0.182E+06	31.	77.
HELØ ADV	95.	THIL	54.	JP-4	0.339E+07	82.	372.

Following a Yes response, all LSR data are printed for each training phase. Tables 11 and 12 provide, respectively, a sample detailed LSR output for Primary and Basic Prop CQ phases of training.

2.13 Next the user is asked in question 7 whether he wishes to generate another LSR output.

GENERATE ANOTHER LSR (Y,N)?N (7)

If he answers Yes, question 3 is again asked and the questioning sequence continues from that point.

2.14 When no further LSR outputs are desired, the automated system prints the runway requirements based on the last LSR (see Table 13). The last LSR generated then enters the Base Loading Submodel.

TABLE 11
DETAILED LSR OUTPUT FOR PRIMARY TRAINING

NAME OF PHASE PRIMARY	
STUDENT INPUT	3565.
STUDENT OUTPUT	3192.
AVERAGE STUDENT LOAD	405.
ADMINISTRATIVE OFFICERS	24.
TOTAL OFFICERS	199.
TOTAL ENLISTED	379.
AIRCRAFT TYPES	T34B
NUMBER REQUIRED	129.
FUEL TYPES	AGAS
GALLONS CONSUMED	0.131E+07
FLIGHT INSTRUCTORS	162.
UNDER TRAINING	13.
LSR REQUIREMENTS	0.
ENLISTED SUPPORT	379.

TABLE 12
DETAILED LSR OUTPUT FOR BASIC PROP CQ

NAME OF PHASE B-PROP CQ	
STUDENT INPUT	1467.
STUDENT OUTPUT	1460.
AVERAGE STUDENT LOAD	117.
ADMINISTRATIVE OFFICERS	12.
TOTAL OFFICERS	45.
TOTAL ENLISTED	238.
AIRCRAFT TYPES	T28C
NUMBER REQUIRED	36.
FUEL TYPES	AGAS
GALLONS CONSUMED	0.111E+07
FLIGHT INSTRUCTORS	20.
UNDER TRAINING	2.
LSR REQUIREMENTS	12.
ENLISTED SUPPORT	16 238.

TABLE 13
 RUNWAY REQUIREMENTS

TRAINING PHASE	A/C TYPE	EFFECTIVE RUNWAYS	AIRSPACE SATURATION	ØLF	TARGET AREAS
PRIMARY	T34B	1.077	0.649	0.497	0.
BASIC JET-A	T-2A	0.823	0.823	0.369	0.
BASIC JET-B	T2BC	0.644	0.644	0.289	0.
B-JET G/CØ	T2BC	0.514	0.514	0.198	0.
ADV JET-TF	TF9J	1.520	0.168	0.524	0.
ADV JET-TA	TA4J	1.524	0.169	0.525	0.
BASIC PRØP	T28C	1.313	0.437	0.685	0.
B-PRØP CØ	T28C	0.389	0.013	0.280	0.
ADV PRØP	TS2A	1.357	0.335	0.431	0.
PRE HELØ	T28C	0.144	0.009	0.064	0.
HELØ PRIM	TH57	0.452	0.452	0.114	0.
HELØ ADV	THIL	0.508	0.508	0.113	0.

Base Loading Through Total Systems Cost Submodels

2.15 Having entered the Base Loading Submodel either from the LSR Generator or directly (by running program PART2*) the program asks for the first phase to base allocation (i.e., assignment) in question 8.

PHASE ALLØCATION: ASSIGN EACH PHASE AS--
 II,AAAA,.XX
 WHERE: II = PHASE (2 DIGITS); AAAA = BASE CØDE;
 .XX = PERCENT AT BASE (1.0 = 100%)
 BASE CØDES: CHAS CØRP ELLY
 KING MERI PENS
 SAUF WHIT PHAN
 II = 0 TØ TERMINATE: ?Ø1, SAUF, 1. (8)

The user supplies the first assignment, and dialogue 9 follows.

NEXT?Ø2, PENS, 1.
 NEXT?Ø3, PENS, 1.
 NEXT?Ø4, MERI, 1.
 NEXT?Ø5, MERI, 1.
 NEXT?Ø6, PENS, 1.
 NEXT?Ø7, KING, 1.
 NEXT?Ø8, CHAS, 1.
 NEXT?Ø9, WHIT, 1.
 NEXT?10, SAUF, 1.
 NEXT?11, CØRP, 1.
 NEXT?12, PENS, 1.
 NEXT?13, ELLY, 1.
 NEXT?14, ELLY, 1.
 NEXT?Q (9)

The system then responds with question 10.

DO YOU WANT DETAILED BASE LOADING DATA (Y,N)?N (10)

A No response produces the information appearing in Table 14. A Yes response produces a detailed base loading analysis for each base. An example of one such detailed breakdown for NAS Pensacola appears in Table 15.

TABLE 14
BASE LOADING SUMMARY

BASE LOADING SUMMARY								*AIRCRAFT *FUEL			
*PERSONNEL								MILLION GAL.			
STD.	-----BASE TOTALS -----										
NAS	LOAD	PHASE	NAS	OFF	ENL	CIV	TOTAL	TYPE	NO.	TYPE	AMOUNT
CHAS	197.	1672.	951.	267.	1829.	330.	2623.	TA4J	153.	JP-4	46.79
CORP	325.	2180.	2565.	602.	3639.	5900.	10466.	TS2A	164.	A115	12.45
ELLY	143.	705.	701.	152.	923.	138.	1406.	TH57	21.	AGAS	0.18
								THIL	54.	JP-4	3.39
KING	197.	1789.	982.	271.	1954.	349.	2771.	TF9J	170.	JP-4	58.89
MERI	423.	2096.	1065.	370.	1996.	337.	3176.	T-2A	97.	JP-4	45.20
								T2BC	101.		
PENS	783.	1501.	2902.	736.	2822.	7716.	12106.	T2BC	58.	JP-4	11.28
								T28C	18.	AGAS	0.71
SAUF	522.	1383.	377.	307.	1155.	277.	2260.	T34B	129.	AGAS	2.42
								T28C	36.		
WHIT	658.	2328.	1133.	401.	2004.	442.	3504.	T28C	283.	AGAS	10.10

TABLE 15

DETAILED BASE LOADING PRINTOUT

NAS--PENS	STD.LOAD	OFFICERS	ENLISTED	CIVILIAN	TOTAL
PERSONNEL					
AOC SCHOOL	276.	8.	0.		285.
FLIGHT SYS.	305.	9.	0.		314.
B-JET G/CQ	142.	76.	493.		712.
PRE HELO	60.	29.	102.		191.
ALL PHASES	783.	122.	595.		1501.
TENANTS		529.	954.	6220.	7703.
NAS PERS.		134.	1272.	1496.	2902.
TOTAL BASE		786.	2822.	7716.	12106.

AIRCRAFT DATA

TYPE	NO.
T2BC	58.
T28C	18.
VF	2.
VT	19.
VR	8.
V0	1.
VW	1.
H	5.

FUEL DATA

TYPE	GALLONS
JET	0.114E+08
AGAS	0.610E+07
HEL0	0.

Note that personnel are broken down by phase of training and that, in addition to the data in the summary display, tenant aircraft and fuel are included in the detailed display. For the Yes option, no summary is given.

2.16 The computer next asks question 11.

DO YOU WISH TO RE-ALLOCATE PHASES (Y,N)?N (11)

This option allows the user to reallocate if he wishes to change the loading data displayed in Tables 14 or 15. A Yes response produces question 12.

TYPE FIRST BASE ASSIGNMENT? 01, KING, 1. (12)

Following the response the dialogue proceeds as in dialogue 9.

2.17 Following a No response to question 11, the system proceeds to the airspace factors and OLF requirements, now aggregated by base, and asks question 13.

AIRSPACE FACTORS & OLF REQUIREMENTS:
SKIP PRINTOUT (Y,N)?Y (13)

Since these data were displayed by phase in the LSR Generator printout, the user may not wish to see them here. For the Yes response, no further printout occurs until the program reaches the runway computations and the program asks question 16 described below. A No response produces the printout by base shown in Table 16. Following the printout shown in Table 16, the program asks question 14.

DO YOU WISH TO RE-ALLOCATE PHASES TO BASES (Y,N)?N (14)

A Yes response sends the user back to question 12 and then to dialogue 9. A No response sends the user to question 16.

2.18 If for any base the airspace, as indicated in Table 16, is oversaturated, the following message, question 15, is printed immediately following the printout for that base.

NOTE: AIRSPACE IS OVER-SATURATED
DO YOU WISH TO CONSTRAIN LSR OUTPUT (Y,N)?N (15)

A Yes response would result in a transfer to the LSR Generator and the user would then return to question 3.

2.19 Assuming the user chooses not to return to the LSR Generator, after the OLF and airspace printouts, if any, the system asks question 16.

DO YOU WANT TO SKIP RUNWAY REQUIREMENTS OUTPUT (Y,N)?N (16)

If the answer, as shown, is No, then the system responds in the following manner with the total runway investment cost for all bases for both upgrading existing runways and building new ones.

TOTAL RUNWAY INVESTMENT FOR CURRENT YEAR (THOUS.):
424.

TABLE 16

AIRSPACE FACTORS AND OLF REQUIREMENTS

AIRSPACE FACTORS & OLF REQUIREMENTS:

SKIP PRINTOUT (Y,N)?N

NAS--CHAS

TYPE A/C	AIRSPACE FACTOR	OLF'S REQUIRED
TA4J	0.17	0.53

NAS--CORP

TYPE A/C	AIRSPACE FACTOR	OLF'S REQUIRED
TS2A	0.33	0.43

NAS--ELLY

TYPE A/C	AIRSPACE FACTOR	OLF'S REQUIRED
TH57	0.45	0.11
THIL	0.51	0.11

NAS--KING

TYPE A/C	AIRSPACE FACTOR	OLF'S REQUIRED
TF9J	0.17	0.52

NAS--MERI

TYPE A/C	AIRSPACE FACTOR	OLF'S REQUIRED
T-2A	0.82	0.37
T2BC	0.64	0.29

NAS--PENS

TYPE A/C	AIRSPACE FACTOR	OLF'S REQUIRED
T2BC	0.51	0.20
T28C	0.01	0.06

NAS--SAUF

TYPE A/C	AIRSPACE FACTOR	OLF'S REQUIRED
T34B	0.65	0.50
T28C	0.01	0.22

NAS--WHIT

TYPE A/C	AIRSPACE FACTOR	OLF'S REQUIRED
T28C	0.44	0.68

DO YOU WISH TO RE-ALLOCATE PHASES TO BASES (Y,N)?N

2.20 If the choice made in response to question 16 is to obtain printout, then the data shown in Table 17 (shown only for the first four bases) is produced. Note that for Corpus Christi, an additional printout and choice (question 17) is given as a result of the runway deficit. The response shown indicates that the deficit is to be corrected. The alternate response, not to make up the deficit, is shown in the following dialogue.

```
WILL THESE DEFICITS BE MADE UP (Y,N)?N
WHICH RUNWAYS WON'T BE BUILT OR UPGRADED
ENTER A NUMBER FROM PRECEDING TABLE--
TYPE 0 (ZERO) WHEN FINISHED?1
NEXT--0
```

Following this dialogue, the printout for the remaining bases would continue as shown in Table 17.

2.21 Next, by answering question 18, the user specifies the level of print detail he wishes to maintain for the remainder of the run for the particular year being analyzed.

```
WHICH LEVEL OF PRINT DETAIL
TYPE 1 FOR TOTAL SYSTEMS COST (TSC) ONLY
2 FOR TSC & DETAILED FACILITIES EXCESS-DEFICIENCY
3 FOR TSC & NAS COST SUMMARIES ONLY
4 FOR TSC & FACILITIES DEFICITS & NAS COST SUMM.
5 FOR CHOICE OF DETAILS (IF DESIRED)?5 (18)
```

By typing 5, the user has the option to select only the printouts he desires. On the other hand, a lower level of print detail will speed up the run somewhat when limited printouts are desired. Although the subsequent descriptions deal with the options available under print level 5, a comprehensive picture of what printouts and options are available under the other print levels is given in Figure 2.

2.22 The next questions, 19 and 20, occur at the Excess/Deficiency portion of the program. This section of the IFRS is entered from the previous submodel or directly by running program PART6*. The user must decide whether or not to accept substandard facilities. A No response means no acceptance of substandard facilities for any base. A Yes response allows the user to further modify his choice from base to base and causes question 20 to be printed.

```
EXCESS DEFICIENCY PROGRAM (19)
ACCEPT SUBSTANDARD FACILITIES (Y,N)?Y
SAME OPTION FOR ALL BASES (Y,N)?Y (20)
```

TABLE 17

RUNWAY REQUIREMENT BY BASE

NAS--CHAS

AVAILABLE:

AMOUNT LENGTH THICKNESS

0.84	8000.	9
0.84	8000.	9
0.09	6000.	9

REQUIRED:

AMOUNT LENGTH THICKNESS

1.52	8000.	2
NO RUNWAY DEFICITS		

NAS--CORP

AVAILABLE:

AMOUNT LENGTH THICKNESS

0.84	8000.	9
0.84	5000.	2
0.82	5000.	2
0.62	5000.	2
0.64	5000.	2

REQUIRED:

AMOUNT LENGTH THICKNESS

1.36	8000.	2
------	-------	---

UPGRADE: LENGTH: 5000. TO 8000.

THICKNESS: 2 TO 2

COST: 424. (THOUS.)

SUMMARY OF RUNWAY UPGRADE/CONSTRUCTION

NO. LENGTH THICKNESS COST (THOUS.)

1	8000.	2	424.
---	-------	---	------

WILL THESE DEFICITS BE MADE UP (Y,N)? Y

NAS--ELLY

AVAILABLE:

AMOUNT LENGTH THICKNESS

0.90	3350.	1
0.10	3185.	1
0.90	3125.	1
0.90	3025.	1

REQUIRED:

AMOUNT LENGTH THICKNESS

0.45	200.	1
0.51	200.	1

NO RUNWAY DEFICITS

NAS--KING

AVAILABLE:

AMOUNT LENGTH THICKNESS

0.92	8000.	9
0.92	8000.	9
0.08	8000.	9
0.08	8000.	9

REQUIRED:

AMOUNT LENGTH THICKNESS

1.52	8000.	3
NO RUNWAY DEFICITS		

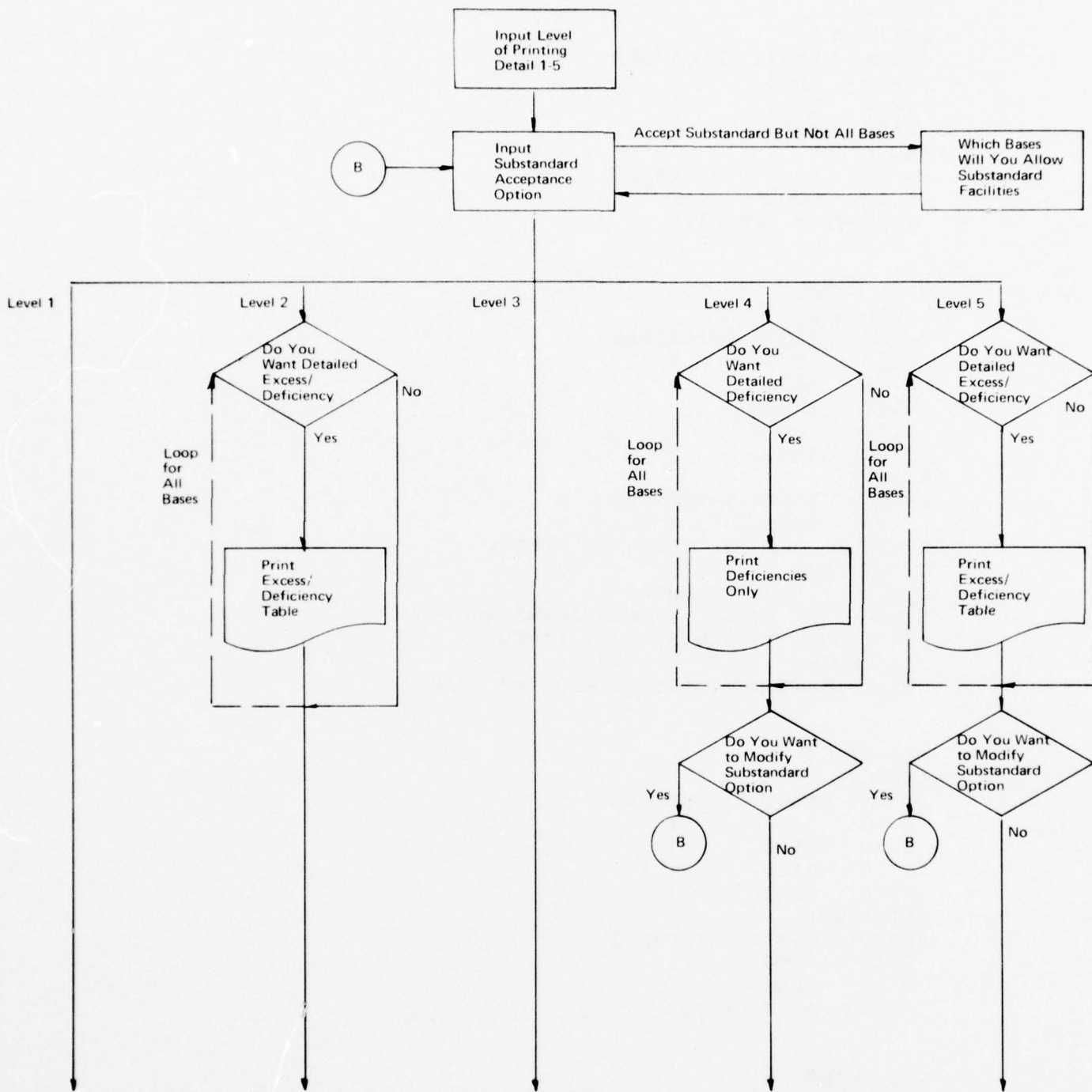


FIGURE 2. PRINT LEVEL QUESTIONS AND ANSWERS

Level 1

Level 2

Level 3

Level 4

Level 5

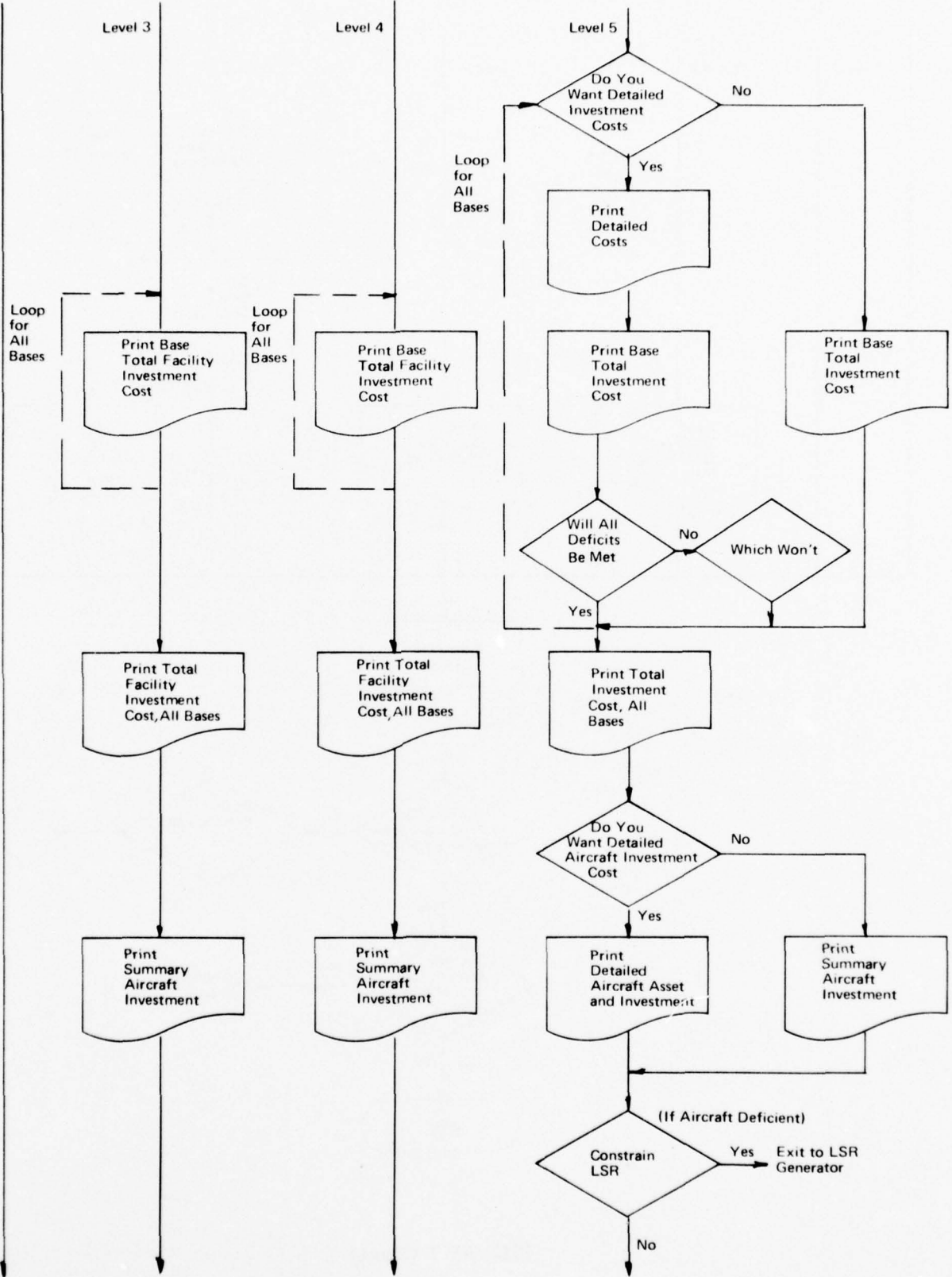


FIGURE 2 (Cont)

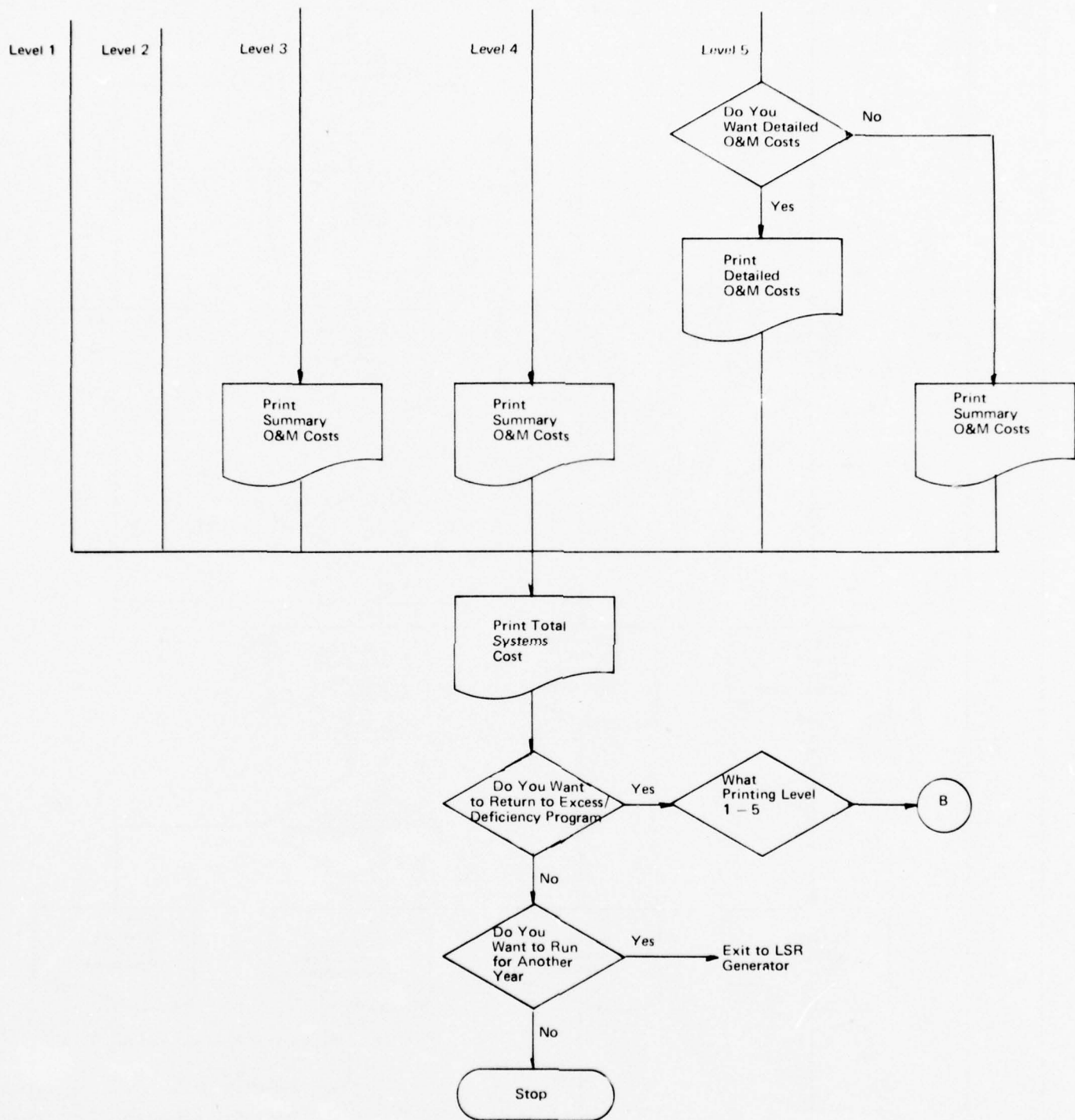


FIGURE 2 (Cont)

A decision to accept substandard facilities, but not for all bases, means that question 21, which asks for acceptance of substandard facilities, is repeated for each base, as shown for NAS Chase.

EXCESS DEFICIENCY PROGRAM
ACCEPT SUBSTANDARD FACILITIES (Y,N)?Y
SAME OPTION FOR ALL BASES (Y,N)?N
ACCEPT SUBSTANDARD FOR CHAS (Y,N)?Y (21)

2.23 The user then chooses in question 22, base by base, whether or not he wishes to see a detailed analysis of facility requirements, asset position, and excess/deficiency data. Both the Yes response and its results are shown in Table 18 for NAS Corpus Christi.

NAS--MERI
DETAILED EXCESS-DEFICIENCY (Y,N)?N (22)

2.24 At the end of the excess/deficiency computations, the user can decide in question 23 that he would like to change the substandard option. A negative choice is indicated in the following example.

DO YOU WISH TO MODIFY THE SUBSTANDARD OPTION (Y,N) ?N (23)

A Yes response sends the user back to question 19.

2.25 Next investment costs are displayed as desired. The user has the option in question 24 to obtain for each base a printout of a detailed cost breakdown or simply the total, as shown in Table 19 for four bases. Questions 24 and 25 are included in the example. Note that when a detailed breakdown is requested the user has the option in question 25 of not meeting all deficits. In the example shown in Table 20, it was decided to make up only 80 percent of the maintenance hangar deficit and 75 percent of the family housing deficit. The new base total reflects these changes.

2.26 After all bases have been considered, the total facilities investment cost (excluding runway investment printed earlier) is displayed as follows:

	NAS TOTAL	
YEAR 1970		59922.7

TABLE 18

DETAILED ANALYSIS OF FACILITY REQUIREMENTS,
ASSET POSITION, AND EXCESS/DEFICIENCY DATA

NAS--CORP

DETAILED EXCESS-DEFICIENCY (Y,N)?Y		REQUIRED		AVAILABLE		POSITION	
CODE	DESCRIPTION	AMOUNT	UNIT	STAND.	SUB-STAND.	EXCESS	DEFICIENT
1320	A/C PKNG APN	115000.	SY	0.	0.	0.	0.
1320	PER TAXIWAY	87500.	SY	0.	0.	0.	0.
11320	TOT PKNG APN	202500.	SY	427700.	0.	225200.	0.
12540	DIST PIPELIN	11.	MI	9.	0.	0.	2.
14140	A/C OP BLDG	16956.	SF	61573.	7692.	52309.	0.
17110	ACADEMC BLDG	5145.	SF	0.	37661.	32516.	0.
21110	MAINT HANGAR	317174.	SF	0.	72210.	0.	244964.
21910	PW MAINT SHP	20455.	SF	53273.	20053.	52871.	0.
4210	GEN WAREHØUS	175282.	SF	0.	0.	0.	0.
4210	SHED SPACE	13711.	SF	0.	0.	0.	0.
44210	TOT WAREHSE	188993.	SF	414794.	518226.	744027.	0.
55010	DISPENSARY	27013.	SF	0.	21100.	0.	5913.
61010	ADMIN OFFICE	203463.	SF	77693.	196794.	71024.	0.
71110	FAM HØUSING	2154.	UN	1383.	428.	0.	343.
0	INELIG HØUSE	399.	UN	294.	127.	22.	0.
72210	EM BARRACKS	1752.	MN	1251.	195.	0.	306.
72310	EM MESS HALL	16385.	SF	0.	33290.	16905.	0.
72415	BØØ	261.	MN	76.	100.	0.	85.
74014	EXCHANGE	16694.	SF	0.	27329.	10635.	0.
74063	SERVICE CLUB	18518.	SF	0.	23334.	4816.	0.
81230	ELEC DIST LN	433785.	LF	340069.	0.	0.	93716.
84210	WATER DIS LN	277652.	LF	251642.	0.	0.	26010.
85110	RØADS	44.	MI	44.	0.	0.	0.
85210	PARKING AREA	242499.	SY	369800.	0.	127301.	0.
TAXIWAYS & RUNWAY LIGHTING							
TAXIWAY DEFICIT		12083.	SY				
RUNWAY LIGHTING DEFICIT:				3000.	LF;	1. APPROACH SYSTEMS	
READY FUEL STORAGE							
REQUIRED: (THOUSANDS OF GALS)							
JET		16.8					
AVGAS		457.1					
AVAILABLE:							
JET		0.					
AVGAS		1300.0					
HELØ		0.					
DEFICIENT							
NØ.	SIZE	TYPE					
1.	1.	JET					
1.	4.	JET					
1.	12.	JET					

TABLE 19

DETAILED AND TOTAL FACILITIES COST PRINTOUT

NAS--MERI
 FACILITIES (24)
 DETAILED BREAKDOWN (Y,N)?N
 BASE TOTAL 14131.3

NAS--PENS
 FACILITIES
 DETAILED BREAKDOWN (Y,N)?Y
 17110 ACADEMC BLDG 971.0
 55010 DISPENSARY 255.4
 61010 ADMIN OFFICE 502.6
 74063 SERVICE CLUB 10.9
 BASE TOTAL 1739.9
 WILL ALL DEFICITS BE MET (Y,N)?Y (25)

NAS--SAUF
 FACILITIES
 DETAILED BREAKDOWN (Y,N)?N
 BASE TOTAL 4480.1

NAS--WHIT
 FACILITIES
 DETAILED BREAKDOWN (Y,N)?N
 BASE TOTAL 9180.1

TABLE 20

TOTAL FACILITIES COST WITH DEFICITS PARTIALLY MADE UP

NAS--WHIT

FACILITIES

DETAILED BREAKDOWN (Y,N)?Y	
11320 TØT PKNG APN	274.7
14140 A/C ØP BLDG	550.9
21110 MAINT HANGAR	2935.0
44210 TØT WAREHSE	679.7
55010 DISPENSARY	341.0
61010 ADMIN ØFFICE	831.7
71110 FAM HØUSING	1245.3
72415 BØØ	1838.3
74063 SERVICE CLUB	105.3
81230 ELEC DIST LN	378.1

BASE TØTAL 9180.1

WILL ALL DEFICITS BE MET (Y,N)?N

WRITE CATEGORY CODE AND PERCENT OF DEFICIT TO BE MADE UP AS--
NNNNN,.XX

(NEED ØNLY ENTER CASES WHERE PERCENT IS LESS THAN 1.0)

USE CATEGORY CODES GIVEN ABOVE,

ZERØ CATEGORY CODE INDICATES END ØF INPUT?21110,.8

NEXT--?71110,.75

NEXT--?Ø

NEW BASE TØTAL 8281.7

2.27 Aircraft investment is computed next, and the user can obtain either a detailed asset position and investment cost or a summary, but not both, by answering question 26.

DETAILED A/C ASSET POSITION & INVESTMENT (Y,N)?N (26)

The summary option is printed out in the following manner:

```
A/C INVESTMENT (CNATRA)---SUMMARY
TOTAL A/C    TOTAL
DEFICIENT    COST (THOUS.)
    152.         148792.
```

The result of requesting a detailed printout is shown in Table 21, part a.

2.28 The final computations produced are O&M costs and total systems cost. Question 27 gives the user the choice of detailed cost breakdowns or a summary statement. The summary option is shown in Table 21, part b.

DO YOU WANT DETAILED O & M COSTS (Y,N)?N (27)

A request in response to question 27 for detailed O&M costs produces a list for each base like the one shown in Table 22 for NAS Whiting.

2.29 Finally, the total systems cost is displayed in the following manner.

```
TOTAL SYSTEMS COST =
  FACILITY INVESTMENT COSTS
  + A/C INVESTMENT
  + O & M COSTS (LESS NON ADD ITEMS)
  + CNATRA, CNABATRA, CNAVANTRA --- FIXED COSTS
-----
                                464461.7
```

Following this output, the user can indicate whether he wishes to return to the excess/deficiency portion of the program in question 28 (possibly with a different print option according to his answer to question 30). If No is the response, then he decides whether or not to run for another year (question 29).

DO YOU WISH TO RETURN TO EXCESS-DEFICIENCY PROGRAM (Y,N)?N (28)

DO YOU WISH TO RUN FOR ANOTHER YEAR (Y,N)?N (29)

BEST AVAILABLE COPY

TABLE 21
 DETAILED AIRCRAFT INVESTMENT AND ASSET POSITION AND
 SUMMARY O&M COST PRINTOUTS

Part a.

A/C INVESTMENT & ASSET POSITION---CNA164						
ASSET POSITION			----- COSTS (THOUS.) ----			
A/C	AVAILABLE	REQ'D	DEFICIT	FLYAWAY	SUPPORT	TOTAL
T34B	150.	149.	0.	0.	0.	0.
T28C	469.	388.	0.	0.	0.	0.
T-2A	114.	112.	0.	0.	0.	0.
T28C	178.	183.	5.	2740.	411.	3151.
TF9J	399.	196.	0.	0.	0.	0.
T44J	100.	176.	76.	83809.	12571.	96381.
TS2A	179.	188.	9.	18103.	2715.	20818.
TH1L	0.	62.	62.	24732.	3710.	28441.
TH57	34.	25.	0.	0.	0.	0.

Part b.

SUMMARY O & M COSTS

NAS	MILITARY	A/C FUEL	A/C O&M	BASE	TOTAL
	P&A	TOTAL	TOTAL	SUPPORT	
CHAS	16459.5	6009.5	3750.9	3630.3	29850.1
CORP	28110.4	2625.3	1919.5	12514.4	45169.7
ELLY	8921.8	522.9	372.6	2251.1	12068.4
KING	17258.3	7547.1	2651.8	3797.5	31254.8
MERI	20878.3	5808.5	1972.8	4256.2	32915.8
PENS	29650.4	2482.7	591.6	14372.0	47096.7
SAUF	15866.8	472.1	394.0	3219.1	19952.0
WHIT	23284.6	1747.0	1155.6	4628.3	30815.5
TOTAL O & M COST					
ALL BASES					249122.9

TABLE 22
 DETAILED O&M COST PRINTOUT

```

-----
NAS--WHIT
11320 TOT PKNG APN      10.6
12540 DIST PIPELIN     2.4
14140 A/C OP BLDG      4.5
17110 ACADEMC BLDG     9.5
21110 MAINT HANGAR     67.1
21910 PW MAINT SHP     6.2
44210 TOT WAREHSE      9.5
55010 DISPENSARY       7.0
61010 ADMIN OFFICE     17.6
72210 EM BARRACKS      44.7
72310 EM MESS HALL     4.1
72415 B00              60.8
74014 EXCHANGE         3.6
74063 SERVICE CLUB     2.9
81230 ELEC DIST LN     14.7
84210 WATER DIS LN     10.0
85110 ROADS            38.8
85210 PARKING AREA     5.9
11110 RUNWAYS          10.7
* SUBTOTAL             330.3

* CIVILIAN WAGES      2978.7

PAY & ALLOWANCES
  PHASE OFFICERS      5118.8
  PHASE ENLISTED      7878.4
  STUDENTS            5534.6
  NAS OFFICERS        1064.4
  NAS ENLISTED        3688.3
  SUBTOTAL            23284.6

A/C FUEL              1747.0
A/C O & M              1155.6
BASE SUPPORT          4628.3
TOTAL                 30815.5

TOTAL O & M COST
  ALL BASES          249122.9
* NON-ADD ITEMS
  
```

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If the user decides to return to the excess/deficiency program, the computer then returns to question 19, described above. Question 30 is then asked.

DO YOU WISH TO RETURN TO EXCESS-DEFICIENCY PROGRAM (Y,N)? Y
TYPE LEVEL OF PRINTING DETAIL (1-5)? 5 (30)

A return to the LSR Generator to run for another year brings the user to question 3 and the questions and printouts following it.

EXTENDED OPERATIONS

2.30 Extended capabilities were programmed into the LSR Generator to permit the user to perform on-line modifications to the LSR data base and to measure the impact of limited training resources on the pilot training program. The extended LSR Generator is entered when the user selects an LSR level of complexity other than level 1. Level 2 complexity enables the user to determine the effect of limited aircraft, flight instructors, enlisted maintenance personnel and/or academic instructors on each training phase in the pilot training system; level 3 complexity allows him to modify the LSR data base.

2.31 The following discussion outlines the computerized logic with respect to the automated LSR Generator in the extended form. It is assumed in the following examples that the user has first selected level 3 complexity and then reruns the model at level 2 complexity. The primary reason for rerunning the model and not continuing through the LSR Generator at level 4 complexity is that, throughout the other volumes of this report, a 2510 total PTR is used in illustrative examples utilizing current NATRACOM planning factors. Consequently, the examples provided in this discussion are designed to be consistent with foregoing examples.

Level 3 Complexity — Modify Phase Data

2.32 With level 3 complexity (response to question 1 above), the user is permitted to modify the LSR data base. The automated LSR Generator follows the responses to questions 2 and 3 and then deviates from the normal operation procedure by presenting question 3a.

ANY DELETIONS OR ADDITIONS (Y,N)? Y (3a)

This question asks the user whether he wants to add or delete training phases to or from the current pilot training program (LSR data base). Following a No response, question 3 is immediately presented. Following a Yes response, question 3b is printed.

ANY DELETIONS (Y,N)?Y

(3b)

If one or more of the current training phases are to be removed from the data base, a Yes response is given. If a No response is given, question 3d is printed.

2.33 The user is then asked question 3c.

ENTER PHASE NUMBERS (XX,XX, . .)

TWO DIGITS ARE REQUIRED FOR EACH PHASE?07,08

(3c)

Assuming that the two advanced jet phases, Adv Jet-TA and Adv Jet-TF, are to be dropped in the future, possibly to be replaced later by another phase, the above response would be given to question 3c. Table 23 shows the deletion of the two training phases. Note that in Table 23 all training phase numbers have been revised to preserve sequential training phase numbers.^{1/}

TABLE 23

DELETED TRAINING PHASES AND RENUMBERED PHASES

DELETE PHASE 8 ADV JET-TA
DELETE PHASE 7 ADV JET-TF

TRAINING PHASES

NO.	PHASE NAME
1	PRIMARY
2	AOC SCHOOL
3	FLIGHT SYS.
4	BASIC JET-A
5	BASIC JET-B
6	B-JET G/CO
7	BASIC PROP
8	B-PROP CO
9	ADV PROP
10	PRE HELO
11	HELO PRIM
12	HELO ADV

2.34 Question 3d immediately follows.

ADD A NEW PHASE (Y,N)?Y

(3d)

If the user does not wish to add one or more new training phases to the LSR data base, question 3f follows. A Yes response to question 3d requires the user to enter all data associated with the training phase in question. This is accomplished through a series of responses given in dialogue 3e. See Table 24 for a complete description of dialogue 3e.

^{1/} Renumbering is done to minimize computer storage requirements, thus enabling the user to exercise more program options within a limited amount of computer memory.

TABLE 24

DATA FIELDS REQUIRED TO DEFINE A TRAINING PHASE^{1/}

Data Field-(Element)	Description
1	Name of training phase - 12 alphameric characters
2	Attrition point - the average percentage of the training phase a student attrite is expected to complete
3	Phase duration in weeks
4	Flight and academic instruction tour of duty length in months
5	Number of aircraft instruction types
6	Number of academic instruction types
7-J ^{2/}	Aircraft name - 4 alphameric characters
8-J	Fuel type - 4 alphameric characters
9-J	Percent annual flyable weather
10-J	Aircraft hourly fuel consumption in gallons
11-J	Hours per day an aircraft may be utilized for flight instruction
12-J	Hours per day a flight instructor may be utilized for flight instruction
13-J	Average aircraft flight hours for a successfully completed student
14-J	Average flight instructor hours for a successfully completed student
15-J	Flight instruction training period in months
16-J	Ratio of landing support officers to average student load
17-J	Ratio of direct maintenance personnel to aircraft

^{1/} Data fields 7-17 are not entered if no flight instruction exists, i.e., if data field 5 = 0.

^{2/} The particular element, J, is sequentially incremented from 1 to the number of aircraft types that exist for the training phase (the value of data field 5).

TABLE 24 (Cont)

Data Field-(Element)	Description
18-I ^{3/} , ^{4/}	Name of academic instruction - 4 alphameric characters
19-I	Number of academic instruction hours per student
20-I	Number of student hours an academic instruction can be utilized annually
21-I	Academic instruction training period
<p>^{3/} Data fields 18-21 are not entered if no academic instruction exists, i.e., if data field 6 = 0.</p> <p>^{4/} I is sequentially incremented from 1 to the number of academic instruction types that exist for the training phase (the value of data field 6).</p>	

```

ENTER NAME OF PHASE 13 (AAAAAAAAAAAAA)?NEW PHASE
ENTER DATA FIELD 2 (XXXX.XX)?.5
ENTER DATA FIELD 3 (XXXX.XX)?10
ENTER DATA FIELD 4 (XXXX.XX)?24
ENTER DATA FIELD 5 (X)?1
ENTER DATA FIELD 6 (X)?0
ENTER DATA FIELD 7-1 (AAAA)?T34B
ENTER DATA FIELD 8-1 (AAAA)?AGAS
ENTER DATA FIELD 9-1 (XXX.XXXX)?.8
ENTER DATA FIELD 10-1 (XXX.XXXX)?50.5
ENTER DATA FIELD 11-1 (XXX.XXXX)?2.81
ENTER DATA FIELD 12-1 (XXX.XXXX)?2.25
ENTER DATA FIELD 13-1 (XXX.XXXX)?55
ENTER DATA FIELD 14-1 (XXX.XXXX)?25
ENTER DATA FIELD 15-1 (XXX.XXXX)?2
ENTER DATA FIELD 16-1 (XXX.XXXX)?15
ENTER DATA FIELD 17-1 (XXX.XXXX)?5.47

```

(3e)

In the user responses shown, only 17 data values are entered, as opposed to the 21 presented in Table 24, because academic instruction, data field 6, is not included in a training phase. When a training phase has been completely defined, the data in Table 25 are printed for user reference.

2.35 Question 3d and dialogue 3e are repeated until the user no longer wishes to add new phases, i.e., until he answers No to question 3d. Following a No response, the data in Table 26 is printed to provide a permanent list of the training phases contained in the modified LSR data base. Question 3f is then printed.

```

ANY LISTS OR MODIFICATIONS (Y,N)?Y

```

(3f)

If the user wishes to have a complete list of the current data in any training phase or desires to modify the data in any training phase, he gives a Yes response. Question 3f follows a No response.

2.36 The user must next respond to question 3g.

```

ANY DATA LISTS (Y,N)?Y

```

(3g)

This question enables the user to obtain a data list of one or more training phases. A No response causes question 3i to be printed. When a data list is asked for, question 3h follows.

```

ENTER PHASE NUMBERS (XX,XX, . . .)
TWO DIGITS ARE REQUIRED FOR EACH PHASE?01,13

```

(3h)

TABLE 25

DATA LIST FOR NEW TRAINING PHASE

DATA LIST FOR TRAINING PHASE 13
 01 PHASE NAME NEW PHASE
 02 ATTRITION POINT 0.5000
 03 PHASE DURATION 10.00 WEEKS
 04 TOUR OF DUTY 24.00 MONTHS
 05 AIRCRAFT TYPES 1
 06 INSTRUCTION TYPES 0
 07 AIRCRAFT TYPES T34B
 08 FUEL TYPE AGAS
 09 FLYABLE WEATHER 0.800
 10 FUEL CONSUMPTION 50.50
 11 A/C UTILIZATION 2.81
 12 INSTRUCTOR UTIL. 2.25
 13 FLIGHT HOURS 55.00
 14 FLIGHT INST. HOURS 25.00
 15 INST. TR. PERIOD 2.00
 16 LSO RATIO 15.00
 17 MAINTAINENCE MEN 5.47
 ADD A NEW PHASE (Y,N)?N

TABLE 26

LIST OF TRAINING PHASES IN LSR DATA BASE
 AFTER NEW PHASES HAVE BEEN ADDED

TRAINING PHASES
 NO. PHASE NAME
 1 PRIMARY
 2 AOC SCHOOL
 3 FLIGHT SYS.
 4 BASIC JET-A
 5 BASIC JET-B
 6 B-JET G/CO
 7 BASIC PROP
 8 B-PROP CO
 9 ADV PROP
 10 PRE HELO
 11 HELO PRIM
 12 HELO ADV
 13 NEW PHASE

The user must now enter the phase numbers of the training phases for which he desires data lists. The above response produces the data appearing in Table 27. Note that the data list for the training phase, New Phase, in Table 27 is identical to that shown in Table 25, the data entered by the user while developing a new training phase.

2.37 The user is next asked to respond to question 3i.

ANY MODIFICATIONS (Y,N)?Y (3i)

A No response recycles the automated LSR Generator to question 3f. A Yes response indicates that the user desires to modify particular data elements within the LSR data base. Question 3j is printed next.

ENTER PHASE, FIELD AND ELEMENT (XX,XX,X)
PHASE = 00 IMPLIES NO FURTHER MODIFICATIONS
NOTE TWO DIGIT FIELDS MUST CONTAIN TWO DIGITS?13,01 (3j)

The user responds to question 3j by entering the number of the training phase, 13, and the data field and element to be modified, 01 (see Table 24 for a description of data fields and elements). In this example, the name of training phase 13 is to be changed.

2.38 Question 3k permits data modification.

ENTER NAME OF PHASE 13 (AAAAAAAAAAAA)?CHANGE NAME
01 PHASE NAME CHANGE NAME (3k)

After the particular datum point has been modified, a list of the revised element is displayed. The user must again respond to questions 3j and 3k.

NEXT?13,07,1 (3j)

ENTER DATA FIELD 7-1 (AAAA)?T28C
07 AIRCRAFT TYPES T28C (3k)

The sample response above changes the name of phase 13 aircraft and the following response modifies the number of enlisted maintenance personnel required to support an aircraft.

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TABLE 27

DATA LISTS OF TRAINING PHASES

DATA LIST FOR TRAINING PHASE 1

01 PHASE NAME PRIMARY
 02 ATTRITION POINT 0.5000
 03 PHASE DURATION 6.00 WEEKS
 04 TOUR OF DUTY 24.00 MONTHS
 05 AIRCRAFT TYPES 1
 06 INSTRUCTION TYPES 0
 07 AIRCRAFT TYPES T34B
 08 FUEL TYPE AGAS
 09 FLYABLE WEATHER 0.782
 10 FUEL CONSUMPTION 12.60
 11 A/C UTILIZATION 4.20
 12 INSTRUCTOR UTIL. 3.01
 13 FLIGHT HOURS 32.60
 14 FLIGHT INST. HOURS 29.20
 15 INST. TR. PERIOD 2.00
 16 LSO RATIO 0.
 17 MAINTAINENCE MEN 2.55

DATA LIST FOR TRAINING PHASE 13

01 PHASE NAME NEW PHASE
 02 ATTRITION POINT 0.5000
 03 PHASE DURATION 10.00 WEEKS
 04 TOUR OF DUTY 24.00 MONTHS
 05 AIRCRAFT TYPES 1
 06 INSTRUCTION TYPES 0
 07 AIRCRAFT TYPES T34B
 08 FUEL TYPE AGAS
 09 FLYABLE WEATHER 0.800
 10 FUEL CONSUMPTION 50.50
 11 A/C UTILIZATION 2.81
 12 INSTRUCTOR UTIL. 2.25
 13 FLIGHT HOURS 55.00
 14 FLIGHT INST. HOURS 25.00
 15 INST. TR. PERIOD 2.00
 16 LSO RATIO 15.00
 17 MAINTAINENCE MEN 5.47

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NEXT?13,17,1 (3j)

ENTER DATA FIELD 17-1 (XXX.XXXX)?6.42 (3k)
17 MAINTAINENCE MEN 6.42

Note that in both examples a data element is required to define the aircraft being considered. The process continues until the response, 00, is given to the question "NEXT?" When 00 is entered as a phase number, the automated system returns to question 3f, and the process continues.

2.39 For purposes of clarity,, the following responses were given to questions 3f, 3g, and 3h to produce the printout contained in Table 28. Note that this table incorporates the modifications to training phase 13 presented above in the data list in Table 25.

ANY LISTS OR MODIFICATIONS (Y,N)?Y (3f)

ANY DATA LISTS (Y,N)?Y (3g)

ENTER PHASE NUMBERS (XX,XX, . . .)
TWO DIGITS ARE REQUIRED FOR EACH PHASE?13 (3h)

2.40 When a No response is given to question 3f, question 3l is printed.

SAVE MODIFIED DATA BASE (Y,N)?Y (3l)

This question, when answered Yes, generates the modified LSR data base on data file SAVBCS for future user reference. With a No response or when the data file has been generated, the automated LSR Generator returns to question 4 of its normal operation (see Normal Operating Procedures above).

2.41 After question 4 has been answered,question 4a is printed.

PRINT ALL PIPELINES (Y,N)?Y (4)

SAVE MODIFIED PIPELINES (Y,N)?Y (4a)

This question asks the user whether the subsequent modifications to the training pipeline data should be preserved on a data file. With a Yes response, data file PIPES is generated containing the updated pipeline data. The data in Table 29 are developed after the response to question 4.

TABLE 28

MODIFICATIONS TO A TRAINING PHASE

DATA LIST FOR TRAINING PHASE 13
 01 PHASE NAME CHANGE NAME
 02 ATTRITION POINT 0.5000
 03 PHASE DURATION 10.00 WEEKS
 04 TOUR OF DUTY 24.00 MONTHS
 05 AIRCRAFT TYPES 1
 06 INSTRUCTION TYPES 0
 07 AIRCRAFT TYPES T28C
 08 FUEL TYPE AGAS
 09 FLYABLE WEATHER 0.800
 10 FUEL CONSUMPTION 50.50
 11 A/C UTILIZATION 2.81
 12 INSTRUCTOR UTIL. 2.25
 13 FLIGHT HOURS 55.00
 14 FLIGHT INST. HOURS 25.00
 15 INST. TR. PERIOD 2.00
 16 LSO RATIO 15.00
 17 MAINTAINENCE MEN 6.42

TABLE 29

TRAINING PIPELINE INFORMATION FOR NAVY OFFICERS

TRAINING PIPELINE FOR NAVY OFFICER

PHASE NO.	PHASE NAME	ATTRITION RATE	FOLLOWING PHASES
1	PRIMARY	0.0900	3
3	FLIGHT SYS.	0.0270	4, 7
4	BASIC JET-A	0.0500	5
5	BASIC JET-B	0.0200	6
6	B-JET G/C0	0.0200	
7	BASIC PR0P	0.1400	8
8	B-PR0P C0	0.0040	9, 10
9	ADV PR0P	0.0080	
10	PRE HEL0	0.0050	11
11	HEL0 PRIM	0.0020	12
12	HEL0 ADV	0.0020	

2.42 Note that Table 29 differs from Table 3 above. The training phases, Advanced Jet-TA and Advanced Jet-TF, are deleted in Table 29 and the remaining phases are renumbered to make the data consistent with Table 26.

2.43 When a list of the training phases in a particular training pipeline is printed, according to the user's affirmative response to question 4, question 4b is printed.

PIPELINE NAVY OFFICER
ANY DELETIONS, ADDITIONS, LISTS OR MODIFICATIONS (Y,N)?Y (4b)

This question asks the user whether any modification should occur in the training pipeline currently stored in the computer memory. With a No response, dialogue 5 is conducted, and the user enters the appropriate training phase PTRs (see question 5 above). The next training pipeline is entered and question 4b is repeated.

2.44 Question 4c follows a Yes response to question 4b.

DELETE ANY PHASES (Y,N)?Y (4c)

When the user wishes to delete a training phase from the training pipeline, he gives a Yes response; otherwise, question 4e follows. To delete a phase from the pipeline, the user need only enter the phase number, as shown in question 4d.

ENTER PHASE NUMBERS (XX)
ENTER 0 FOR NO FURTHER DELETIONS?6 (4d)

This response will cause Basic Jet G/CQ to be deleted from the training pipeline. The process of deletion continues until the user terminates it by giving the following response to question 4d.

NEXT?0 (4d)

When this response is given, question 4e is printed.

ADD A NEW PHASE (Y,N)?Y (4e)

If the user does not wish to add a training phase to the pipeline, he types a No, and question 4h follows. Otherwise, question 4f is printed, followed by 4g after 4f receives a response.

ENTER NUMBER OF NEW PHASE (XX)?13 (4f)

ENTER FOLLOWING PHASES AND ATTRITION RATE (4g)
(XX,XX,XX,.XXX) ALL DATA FIELDS MUST BE ENTERED?0,0,0,.01

The above response to 4f indicates that training phase 13 is to be included in the pipeline. In addition, the response to question 4g instructs the computer that phase 13 is to be a terminal pipeline phase (the "0,0,0" response means that no phases follow) with an attrition rate of 1 percent (.01).

2.45 All the desired new training phases are added to the pipeline, and then a No response is given to question 4c. Question 4h follows.

LIST PIPELINE DATA (Y,N)?Y (4h)

A No response will cause question 4i to be printed immediately. Otherwise, a list of pipeline data will be printed first (see Table 30). Note that the table includes the training phase, Change Name, which was added following question 4f.

2.46 Training phase data can be modified in the response to question 4i.

MODIFY A PHASE (Y,N)?Y (4i)

Following a No response to question 4i, the automated LSR Generator returns to question 4b and continues. After a Yes response, question 4j is printed.

ENTER PHASE NUMBER AND SWITCH (XX,X)
SWITCH = 0 - MODIFY FOLLOWING PHASES
 = 1 - MODIFY ATTRITION RATE
PHASE = 0,0 IMPLIES NO FURTHER MODIFICATIONS?13,1 (4j)

This response directs the automated system to revise the attrition rate of phase 13. Question 4k follows.

ENTER ATTRITION RATE (.XXX)?.08 (4k)

TABLE 30

TRAINING PIPELINE WHEN NEW PHASE IS ADDED

TRAINING PIPELINE FOR NAVY OFFICER

PHASE NO.	PHASE NAME	ATTRITION RATE	FOLLOWING PHASES
1	PRIMARY	0.0900	3
3	FLIGHT SYS.	0.0270	4, 7
4	BASIC JET-A	0.0500	5
5	BASIC JET-B	0.0200	
7	BASIC PROP	0.1400	8
8	B-PROP CO	0.0040	9, 10
9	ADV PROP	0.0080	
10	PRE HELO	0.0050	11
11	HELO PRIM	0.0020	12
12	HELO ADV	0.0020	
13	CHANGE NAME	0.0100	

The attrition rate of 8 percent is entered. Question 4j is again partially entered, with the user making the appropriate responses.

NEXT?05,0 (4j)

ENTER FOLLOWING PHASES (XX,XX,XX)?13,0,0 (4k)

NEXT?0,0 (4j)

When the "0,0" response is given to question 4j, the program returns to question 4b and recycles.

2.47 As an example of how the foregoing modifications affects the Navy Officer training pipeline, the following responses were given to questions 4b, 4c, 4e, and 4h.

PIPELINE NAVY OFFICER (4b)

ANY DELETIONS, ADDITIONS, LISTS OR MODIFICATIONS (Y,N)?Y (4c)

DELETE ANY PHASES (Y,N)?N (4e)

ADD A NEW PHASE (Y,N)?N (4h)

LIST PIPELINE DATA (Y,N)?Y

These responses produced the information shown in Table 31. Note that the phases following training phase 5 and the attrition rate of phase 13 have been modified according to user specifications.

2.48 When all training pipelines have been modified and their respective phase PTRs computed, question 4l is printed.

ADD A NEW PIPELINE (Y,N)?Y (4l)

Following a No response, the LSR summary data are printed (see Table 10 above). If he responds Yes, the user must enter the name of the new training pipeline in response to question 4m.

ENTER NAME OF PIPELINE (AAAAAAAAAAAA)?NEW PIPELINE (4m)

TABLE 31
 MODIFIED TRAINING PIPELINE

TRAINING PIPELINE FOR NAVY OFFICER

PHASE NO.	PHASE NAME	ATTRITION RATE	FOLLOWING PHASES
1	PRIMARY	0.0900	3
3	FLIGHT SYS.	0.0270	4, 7
4	BASIC JET-A	0.0500	5
5	BASIC JET-B	0.0200	13
7	BASIC PROF	0.1400	8
8	B-PROP CQ	0.0040	9, 10
9	ADV PROF	0.0080	
10	PRE HEL0	0.0050	11
11	HEL0 PRIM	0.0020	12
12	HEL0 ADV	0.0020	
13	CHANGE NAME	0.0800	

The system recycles to question 4f and continues with the training pipeline modification process.

Level of Complexity of 2 — Constrain LSR Output

2.49 With level 2 complexity, the user may measure the impact of limited training resources on each phase in the pilot training program. When this level of complexity is selected, the automated LSR Generator processes all normal dialogues through question 6 (see Normal Operating Procedures above). Instruction 6a is then printed.

ANY LSR OUTPUT CONSTRAINTS (Y,N)?Y (6a)

Receiving a No response to question 6a, the LSR Generator proceeds with question 7 above. A Yes response means the user wishes to determine the impact of scarce training resources on a training phase. Question 6b is then printed.

WHICH PHASE (XX)?10 (6b)

In response to question 6b, the user selects the training phase to be constrained. He enters the phase number and a detailed LSR output for the training phase is then printed (see Table 32).

2.50 Question 6c is then printed.

SELECT APPROPRIATE FIELD AND ELEMENT (X,X)
1 AIRCRAFT
2 FLIGHT INSTRUCTORS
3 ENLISTED SUPPORT
4 ACADEMIC INSTRUCTORS?1,1 (6c)

The appropriate field is selected by specifying one of the four items listed in question 6c. The element number is the item in the data field to be constrained. In the above response, the number of aircraft in phase 10 are to be constrained. Element number 1 refers to the first aircraft type printed in the detailed LSR printout.^{2/} After the field and element number have been entered, question 6d is printed.

ENTER CONSTRAINING VALUE (XXXX.XXX)?28 (6d)

^{2/} Note that Basic Prop CQ contains only one aircraft type, the T-28C. If another aircraft type had existed in the phase, i.e., the T-34B, the user could constrain either aircraft type by selecting an element of 1 or 2.

TABLE 32

DETAILED LSR OUTPUT BASIC PROP CQ
(UNCONSTRAINED OUTPUT)

NAME OF PHASE B-PROP CQ	
STUDENT INPUT	1467.
STUDENT OUTPUT	1460.
AVERAGE STUDENT LOAD	117.
ADMINISTRATIVE OFFICERS	12.
TOTAL OFFICERS	45.
TOTAL ENLISTED	238.
AIRCRAFT TYPES	T28C
NUMBER REQUIRED	36.
FUEL TYPES	AGAS
GALLONS CONSUMED	0.111E+07
FLIGHT INSTRUCTORS	20.
UNDER TRAINING	2.
LSO REQUIREMENTS	12.
ENLISTED SUPPORT	238.

The user is now required to enter the available amount of that particular training resource. The automated LSR Generator then computes the maximum phase PTR which could be obtained if the resource constraint specified by the user were the only constraint in effect. This PTR, as well as the computer PTR, are printed in question 6e.

ØLD STUDENT ØUTPUT 1460. (6e)
CØNSTRAINED ØUTPUT 1130.
ADDITIONAL CØNSTRAINTS (Y,N)?Y

Following a No response, the automated program prints instruction 6f. The following responses to questions 6c, 6d, and 6e show how the user may constrain flight instructors and enlisted support.

SELECT APPRØPIATE FIELD AND ELEMENT (X,X)?2,1 (6c)

ENTER CØNSTRAINING VALUE (XXXX.XXX)?19 (6d)

ØLD STUDENT ØUTPUT 1460. (6e)
CØNSTRAINED ØUTPUT 1270.
ADDITIONAL CØNSTRAINTS (Y,N)?Y

SELECT APPRØPIATE FIELD AND ELEMENT (X,X)?3,1 (6d)

ENTER CØNSTRAINING VALUE (XXXX.XXX)?200 (6e)

ØLD STUDENT ØUTPUT 1460.
CØNSTRAINED ØUTPUT 1229.
ADDITIONAL CØNSTRAINTS (Y,N)?N

2.51 Question 6f is printed when the user indicates that no further constraints will be observed.

NEW LSR SUMMARY FØR B-PRØP CØ (Y,N)?Y (6f)

A Yes response instructs the automated system to print a detailed LSR output which does not violate the most rigid constraint on a training resource (see

Table 33). Note that three constraints are imposed on Basic Prop CQ, i.e., limitations on aircraft, flight instructors, and enlisted personnel. The detailed constrained output in Table 33 does not violate any of these resource limitations.

2.52 When the detailed LSR output has been printed or when a No response has been given to question 6f, question 6g is printed.

ANOTHER PHASE CONSTRAINED (Y,N)?N
_____ (6g)

A Yes response instructs the automated system to return to question 6b and continue. Following a No response, question 6h is printed.

REVISE LSR TO INCLUDE CONSTRAINTS (Y,N)?N
_____ (6h)

A No response to question 6h returns the automated LSR Generator to normal operations, and the computer prints normal operations question 7. A Yes response indicates that all training phase PTRs must be revised so that limited training resources are not exceeded. The automated LSR Generator returns to question 4 to permit the user to revise the pilot training rates for all training pipelines.

TABLE 33

DETAILED LSR OUTPUT BASIC PROP CQ
(WITH TRAINING RESOURCE LIMITATIONS)

NAME OF PHASE B-PROP CQ	
STUDENT INPUT	1135.
STUDENT OUTPUT	1130.
AVERAGE STUDENT LOAD	91.
ADMINISTRATIVE OFFICERS	9.
TOTAL OFFICERS	35.
TOTAL ENLISTED	184.
AIRCRAFT TYPES	T28C
NUMBER REQUIRED	28.
FUEL TYPES	AGAS
GALLONS CONSUMED	0.856E+06
FLIGHT INSTRUCTORS	16.
UNDER TRAINING	1.
LSO REQUIREMENTS	9.
ENLISTED SUPPORT	184.

III. DIAGNOSTIC MESSAGES

3.1 The automated IFRS system is designed and programmed to provide the user with substantial on-line flexibility through numerous questions and operating instructions presented at critical points during system operation. For example, when the training phase resource requirements have been displayed (LSR summary), the user may wish to measure their impact on a particular training phase's PTR by limiting or constraining certain resources. In another case, after finding the required facility investments for an NAS, accepting only standard facilities, the user may wish to compare this investment with one for which substandard facilities are also acceptable.

3.2 When a system relies repeatedly on the man-machine interface (conversational mode), the likelihood of typographical, transmission, and other types of errors increases greatly. To partially alleviate the erroneous model outputs which result from interface errors, the automated IFRS system checks every response supplied by the user. Two types of checks are conducted: response data are absolutely tested for validity, i.e., should a Yes or No response be required and any other character be recognized, an absolute error exists; and response data are relatively checked for validity, i.e., should the user enter a tour of duty length of 60 months, the system detects that this tour length is longer than normal.

3.3 Table 34 presents all diagnostic messages (error conditions) which can arise during the operation of the automated IFRS system. Along with each diagnostic message is a brief description defining the error condition and the required user action. It should be noted that most diagnostic messages are self-explanatory.

TABLE 34
IFRS DIAGNOSTIC MESSAGES

Diagnostic Message	Description	Required User Action
INVALID REPLY—REPEAT INVALID DATA—REPEAT INVALID DATA—TRY AGAIN BAD REPLY—RETYPE INVALID REPLY—RETYPE BAD FORMAT—TRY AGAIN	The data value entered in response to the previous question is not correct or in bad format	Reply again to previous question
NO PHASES IN PIPELINE	Either the LSR data base or the current training pipeline contain no training phases	New training phases must be added to LSR data base
25 PHASES IN PIPELINE	The LSR data base contains the maximum number of training phases. Phase deletions must occur before a new phase is added	Information only; program continues
PREVIOUS OPTION NOT PROCESSED	User did not enter any phase numbers to exercise the previously specified option	Information only; program continues
COMMA MISSING REPEAT	Data entered in bad format	Respond again to previous question
MAX. FOR FIELD IS 3— FIELD SET TO 0	A maximum of three aircraft or academic instruction types may exist for each training phase. A value greater than 3 was detected. The automated system assumes the correct value to be 0	Information only; program continues
DATA POINT XXXX.XXXX EXCEEDS RANGE OF 0.0 - XXXX. ACCEPT (Y,N)	The data value for the previously printed data field exceeds the expected range for this data point	Accept data value or enter new value

TABLE 34 (Cont)

Diagnostic Message	Description	Required User Action
MAXIMUM PHASES IN PIPELINE	The current training pipeline contains all training phases. No new phases may be added	Information only; program continues
PHASE IN PIPELINE	The training phase the user is attempting to enter currently exists in the training pipeline	Information only; program continues
PIPELINE LOGIC ERROR— ALL PHASES DELETED ALL PHASES DELETED	A logic error exists in the current training pipeline	New training phases must be added to training pipeline
XX IS AN INVALID PHASE	The training phase number exceeds the number of phases in the data base	Phase deleted; program continues
PHASE NOT IN PIPELINE	The previous phase number entered does not exist in the training pipeline or in the LSR data base	Reply again to the previous question
INSUFFICIENT DATA TO COMPUTE STUDENT STATISTICS RE-ENTER STUDENT ASSIGNMENTS OR RERUN	The PTRs entered are not sufficient to compute the PTR for all training phases	Re-enter all PTR data
PHASE CONTAINS NO ACTIVITY	The training phase selected for LSR output constraints is not used for pilot training	Program recycles
RUNWAY PHASE NAME AAA DOES NOT MATCH PHASE NAME AAA. REVISE AND RERUN	Inconsistency exists between runway data base and LSR data base	Program terminated
RUNWAY AIRCRAFT TYPES OF XX DOES NOT MATCH PHASE TYPES OF XX FOR PHASE AAA. REVISE AND RERUN		
FOR PHASE AAA AIRCRAFT NAMES DO NOT MATCH PHASE AIRCRAFT NAME AAA,AAA. REVISE AND RERUN		

TABLE 34 (Cont)

Diagnostic Message	Description	Required User Action
RUNWAY DATA FILE IS INCOMPLETE—UPDATE AND RERUN	No aircraft types exist for a training phase in the Runway Data File	Program terminated
MAX NO. OF RUNWAY TYPES EXCEEDED PROGRAM ABORT RUNWAY REQUIREMENTS EXCEED AVAILABLE TABLE SPACE PROGRAM ABORT	More than the maximum of 10 runway types are required at a training base	Program terminated
PERCENT MUST BE LESS THAN 1.0—TRY AGAIN THE VALUE XX GIVEN FOR PERCENT CANNOT EXCEED 1	Value entered must be less than 1.0	Reply again with correct value
FUEL IN PHASE XX IS OF UNKNOWN TYPE	The fuel name in the printed training phase does not begin with J, H, or A. Fuel requirements are assumed to be 0	Program continues
INCORRECT BASE CODE—TRY AGAIN	The name of the base previously entered is invalid	Program recycles
PHASE XX HAS BEEN OVER-ASSIGNED REALLOCATE THIS PHASE	More than 100 percent of the training phase printed has been allocated to the training base(s)	Allocation assumed to be zero. User must reallocate phase
PHASE XX HAS NOT BEEN ASSIGNED OR IS ONLY PARTLY ASSIGNED	Only partial assignment of the printed training phase has been made	Assign remainder of training phase
UNRECOGNIZED A/C TYPE IN RUNWAY COMPUTATIONS AAA	Aircraft does not appear in aircraft data base	Program terminated

IV. FILE UPDATE PROCEDURES

4.1 The automated IFRS system requires the use of eight data files during a normal computer run. The files have been assigned the following names and incorporate the following information.

- BASCAS—Training phase data used by LSR Generator
- PIPE—Pipeline data for each training pipeline
- RUNDAT—Runway data for each training phase
- RPIFI*—Inventory of facilities for all bases
- ACDAT*—Aircraft data
- BASED*—Base dependent parameters
- INVCO*—Cost data for facilities
- TABLE*—Various tables for computing facility requirements.

These data files were created in a manner which provides the user with maximum ease and flexibility in updating. To update most data files, the user selects the line number of the appropriate data element(s) to be updated, enters the line number and data element(s), and replaces the data file.

4.2 The following paragraphs describe each data file and the procedures required to update it. When the user may update a data file in more than one way, i.e., on-line as well as off-line, both procedures are presented. In off-line data file updates, it should be noted that "free format" is to be assumed unless otherwise specified. Thus, data entries need only be separated by a comma or a space, rather than follow strict FORTRAN format.^{1/}

^{1/} See General Electric Company, FORTRAN Language, Preliminary Reference Manual, Mark II Time-Sharing Service, July 1969, for a detailed discussion of free format.

DATA FILE BASCAS

4.3 Data File BASCAS contains all data associated with each phase of pilot training. This data file may be updated in the course of a computer run by selecting an LSR of level 3 complexity (see Extended Operations above). After all modifications have been made, the user responds Yes to question 31 above. When the computer run has been completed, Data File SAVBCS is renamed BASCAS and the new file replaced. When a new phase is added, Data File RUNDAT must include the new phase.

Off-Line Update of BASCAS

4.4 Four types of data must be present in Data File BASCAS: alphabetic constants, expected maximum values for training phase data points, the number of training phases in the data base, and training phase description data.

4.5 Alphabetic Constants. Alphabetic constants are particular characters used for comparative purposes with user responses and for blanking print fields. Table 35 describes these characters and their associated formats.

TABLE 35

DATA FILE BASCAS ALPHABETIC CONSTANTS

Character	Format	Description
1-4	I4	Line number (must be lowest four-digit number in data file)
6	A1	N - character "N"
7	A1	Y - character "Y"
8	A1	, - character ", "
9-12	A4	████ - four blank spaces

4.6 Expected Maximum Values for Training Phase Data. These data values are the respective maximum values a user expects for the training phase data. If any training phase data point exceeds its respective maximum, a diagnostic message will be produced. Note that these maximum values are independent of training phases. A description of the data characters and their formats appears in Table 36.

TABLE 36

DATA FILE BASCAS MAXIMUM VALUES FOR TRAINING PHASE DATA

Character	Format	Description
1-4	I4	Line number (larger than previous line number)*
6- Next	FREE**	BMAX(1), Maximum attrition point
Next	FREE	BMAX(2), Maximum phase duration
Next	FREE	BMAX(3), Maximum tour of duty for academic and flight instructor in months
Next	FREE	BMAX(4), Maximum percentage flyable weather
1-4	I4	Next line number
6- Next	FREE	BMAX(5), Maximum hourly fuel consumption rate
Next	FREE	BMAX(6), Maximum hours per day an aircraft may be utilized
Next	FREE	BMAX(7), Maximum hours per day a flight instructor may be utilized
Next	FREE	BMAX(8), Maximum number of flight hours to train a student
1-4	I4	Next line number
6- Next	FREE	BMAX(9), Maximum number of flight instructor hours to train a student
Next	FREE	BMAX(10), Maximum number of months a flight instructor will be trained before he is assigned students

* Note that line number are restricted only in that they must be in ascending order.

** FREE format requires only that data fields must be separated by a comma or a space. Zero values must be typed as 0. In the above example, the line number is separated from the first data field by a space. A comma would have given identical results.

TABLE 36 (Cont)

Character	Format	Description
Next	FREE	BMAX(11), Maximum ratio of students to landing support officers
Next	FREE	BMAX(12), Maximum direct enlisted maintenance personnel per aircraft
1-4	I4	Next line number
6-	FREE	BMAX(13), Maximum number of academic instruction hours required to train a student
Next	FREE	BMAX(14), Maximum annual student hours an academic instructor can instruct
Next	FREE	BMAX(15), Maximum number of months an academic instructor will be trained before he is assigned students

4.7 Number of Training Phase. The training phase numbers kept in Data File BASCAS are described in Table 37.

TABLE 37
DATA FILE BASCAS TRAINING PHASE NUMBER

Character	Format	Description
1-4	I4	Next line number
6-	FREE	Number of training phases to follow in this data file

4.8 Training Phase Description Data. Training phase description data are entered on a phase by phase basis, i.e., a complete description for the first phase is entered before data associated with the second phase are begun. Note in the description of these data in Table 38 that 15 lines of data are required to define a single training phase. All training phase description data must be entered for each training phase. Table 39 provides a list of the data currently contained in BASCAS.

DATA FILE PIPE

4.9 Data file PIPE contains the sequence of training phases and the attrition rates associated with each training pipeline. This data file may be updated in the course of a computer run by selecting an LSR level 3 complexity (see Extended Operations above). The user must also request that the modified pipeline data be saved (see instruction 4a above). When the computer run is complete, data file PIPES is renamed PIPE and replaced.

Off-Line Update of PIPE

4.10 Three types of data exist in this data file: the name of the training pipeline, phase sequences and attrition rates, and end of file data.

TABLE 38

DATA FILE BASCAS TRAINING PHASE DESCRIPTIONS

Character	Format	Description
1-4	I4	Next line number
6-17	3A4	Name of training phase
18-21	A4	Name of first aircraft type
22-25	A4	Name of second aircraft type
26-29	A4	Name of third aircraft type
30-33	A4	Fuel consumed by first aircraft type
34-37	A4	Fuel consumed by second aircraft type
38-41	A4	Fuel consumed by third aircraft type
42-45	A4	Name of first type of academic instruction
46-49	A4	Name of second type of academic instruction
50-53	A4	Name of third type of academic instruction
1-4	I4	Next line number
6-	FREE	Number of aircraft types in training phase
Next	FREE	Number of academic instruction types in phase
1-4	I4	Next line number
6-	FREE	Average attrition point for a student attrite
Next	FREE	Phase duration in weeks
Next	FREE	Tour of duty for academic and flight instructors
1-4*	I4	Next line number

* Note that for the remaining data fields, three values must be entered. Should less than the three values be required for phase definitions, enter zeros for the nonapplicable items.

TABLE 38 (Cont)

Character	Format	Description
6-	FREE	Percent flyable weather for each aircraft type (three values must be entered)
1-4	I4	Next line number
6-	FREE	Fuel consumption rate for each aircraft type in gallons per hour
1-4	I4	Next line number
6-	FREE	Hours per day each aircraft may be utilized
1-4	I4	Next line number
6-	FREE	Hours per day a flight instructor can be utilized for flight training for each aircraft type
1-4	I4	Next line number
6-	FREE	Average number of flight hours for a successfully trained student for each aircraft type
1-4	I4	Next line number
6-	FREE	Average number of flight instructor hours for a successfully trained student for each aircraft type
1-4	I4	Next line number
6-	FREE	Time in months required to train a flight instructor before he can instruct students
1-4	I4	Next line number
6-	FREE	Ratio of students on board to landing support officers for each aircraft type
1-4	I4	Next line number
6-	FREE	Number of direct enlisted maintenance personnel required to support one aircraft
1-4	I4	Next line number

TABLE 38 (Cont)

Character	Format	Description
6-	FREE	Number of academic hours per student for each academic instruction type
1-4	I4	Next line number
6-	FREE	Annual student hours an academic instructor can instruct for each academic instruction type
1-4	I4	Next line number
6-	FREE	Time in months an academic instructor must be trained before he can instruct students

TABLE 39
DATA FILE BASCAS

1000	NY,				
1005	0.100000E+01	0.156000E+03	0.480000E+02	0.100000E+01	
1010	0.100000E+04	0.100000E+04	0.100000E+04	0.100000E+04	
1015	0.100000E+04	0.480000E+02	0.500000E+02	0.500000E+02	
1020	0.100000E+04	0.100000E+04	0.480000E+02		
1025	14				
1030	PRIMARY	T34B	AGAS	ACAD	
1035	1	0			
1040	0.500000E+00	0.600000E+01	0.240000E+02		
1045	0.782000E+00	0.782000E+00	0.		
1050	0.126000E+02	0.	0.		
1055	0.420000E+01	0.	0.		
1060	0.301000E+01	0.	0.		
1065	0.326000E+02	0.	0.		
1070	0.292000E+02	0.	0.		
1075	0.200000E+01	0.	0.		
1080	0.	0.	0.		
1085	0.255000E+01	0.	0.		
1090	0.500000E+02	0.	0.		
1095	0.700000E+03	0.	0.		
1100	0.300000E+01	0.300000E+01	0.		
1105	AOC SCHOOL	T-2A	JP-4	ACAD	
1110	0	0			
1115	0.500000E+00	0.100000E+02	0.240000E+02		
1120	0.796000E+00	0.796000E+00	0.		
1125	0.311000E+03	0.	0.		
1130	0.690000E+03	0.	0.		
1135	0.556000E+03	0.	0.		
1140	0.552000E+02	0.	0.		
1145	0.466000E+02	0.	0.		
1150	0.300000E+01	0.	0.		
1155	0.	0.	0.		
1160	0.546000E+01	0.	0.		
1165	0.489000E+03	0.	0.		
1170	0.700000E+03	0.	0.		
1175	0.300000E+01	0.300000E+01	0.		
1180	FLIGHT SYS.	T2BC	JP-4	ACAD	
1185	0	0			
1190	0.500000E+00	0.500000E+01	0.240000E+02		
1195	0.816000E+00	0.816000E+00	0.		
1200	0.365000E+03	0.	0.		
1205	0.676000E+03	0.	0.		
1210	0.570000E+03	0.	0.		
1215	0.496000E+02	0.	0.		
1220	0.276000E+02	0.	0.		
1225	0.300000E+01	0.	0.		
1230	0.	0.	0.		
1235	0.716000E+01	0.	0.		
1240	0.200000E+03	0.	0.		
1245	0.700000E+03	0.	0.		
1250	0.300000E+01	0.300000E+01	0.		

TABLE 39 (Cont)

1255	BASIC JET-A T-2A		JP-4
1260	1 0		
1265	0.500000E+00	0.110000E+02	0.240000E+02
1270	0.805000E+00	0.805000E+00	0.
1275	0.311000E+03	0.	0.
1280	0.354000E+01	0.	0.
1285	0.285000E+01	0.	0.
1290	0.651000E+02	0.	0.
1295	0.670000E+02	0.	0.
1300	0.200000E+01	0.	0.
1305	0.	0.	0.
1310	0.546000E+01	0.	0.
1315	0.712500E+02	0.	0.
1320	0.	0.	0.
1325	0.	0.	0.
1330	BASIC JET-B T2BC		JP-4
1335	1 0		
1340	0.500000E+00	0.900000E+01	0.240000E+02
1345	0.795000E+00	0.795000E+00	0.
1350	0.365000E+03	0.	0.
1355	0.335000E+01	0.	0.
1360	0.285000E+01	0.	0.
1365	0.644000E+02	0.	0.
1370	0.537000E+02	0.	0.
1375	0.200000E+01	0.	0.
1380	0.	0.	0.
1385	0.716000E+01	0.	0.
1390	0.712500E+02	0.	0.
1395	0.	0.	0.
1400	0.	0.	0.
1405	B-JET G/CQ T2BC		JP-4
1410	1 0		
1415	0.500000E+00	0.700000E+01	0.240000E+02
1420	0.830000E+00	0.830000E+00	0.
1425	0.365000E+03	0.	0.
1430	0.263000E+01	0.	0.
1435	0.236000E+01	0.	0.
1440	0.307000E+02	0.	0.
1445	0.209000E+02	0.	0.
1450	0.200000E+01	0.	0.
1455	0.150000E+02	0.	0.
1460	0.776000E+01	0.	0.
1465	0.	0.	0.
1470	0.	0.	0.
1475	0.	0.	0.

TABLE 39 (Cont)

1480	ADV JET-TF	TF9J	JP-4
1485	1	0	
1490	0.500000E+00	0.200000E+02	0.240000E+02
1495	0.846000E+00	0.846000E+00	0.
1500	0.575000E+03	0.	0.
1505	0.290000E+01	0.	0.
1510	0.210000E+01	0.	0.
1515	0.212500E+03	0.	0.
1520	0.145300E+03	0.	0.
1525	0.300000E+01	0.	0.
1530	0.	0.	0.
1535	0.735000E+01	0.	0.
1540	0.930000E+02	0.	0.
1545	0.	0.	0.
1550	0.	0.	0.
1555	ADV JET-TA	TA4J	JP-4
1560	1	0	
1565	0.500000E+00	0.200000E+02	0.240000E+02
1570	0.850000E+00	0.850000E+00	0.
1575	0.470000E+03	0.	0.
1580	0.312000E+01	0.	0.
1585	0.210000E+01	0.	0.
1590	0.206100E+03	0.	0.
1595	0.143300E+03	0.	0.
1600	0.300000E+01	0.	0.
1605	0.	0.	0.
1610	0.750000E+01	0.	0.
1615	0.930000E+02	0.	0.
1620	0.	0.	0.
1625	0.	0.	0.
1630	BASIC PROP	28C	AGAS
1635	1	0	
1640	0.500000E+00	0.190000E+02	0.240000E+02
1645	0.776000E+00	0.776000E+00	0.
1650	0.505000E+02	0.	0.
1655	0.371000E+01	0.	0.
1660	0.310000E+01	0.	0.
1665	0.127500E+03	0.	0.
1670	0.987000E+02	0.	0.
1675	0.200000E+01	0.	0.
1680	0.	0.	0.
1685	0.432000E+01	0.	0.
1690	0.164250E+03	0.	0.
1695	0.	0.	0.
1700	0.	0.	0.

TABLE 39 (Cont)

1705	B-PROP CQ	T28C	AGAS
1710	1	0	
1715	0.500000E+00	0.400000E+01	0.240000E+02
1720	0.879000E+00	0.879000E+00	0.
1725	0.505000E+02	0.	0.
1730	0.281000E+01	0.	0.
1735	0.222000E+01	0.	0.
1740	0.150000E+02	0.	0.
1745	0.660000E+01	0.	0.
1750	0.200000E+01	0.	0.
1755	0.100000E+02	0.	0.
1760	0.547000E+01	0.	0.
1765	0.	0.	0.
1770	0.	0.	0.
1775	0.	0.	0.
1780	ADV PROP	TS2A	A115
1785	1	0	
1790	0.500000E+00	0.170000E+02	0.240000E+02
1795	0.865000E+00	0.865000E+00	0.
1800	0.966000E+02	0.	0.
1805	0.372000E+01	0.	0.
1810	0.275000E+01	0.	0.
1815	0.135700E+03	0.	0.
1820	0.119900E+03	0.	0.
1825	0.300000E+01	0.	0.
1830	0.	0.	0.
1835	0.889000E+01	0.	0.
1840	0.143000E+03	0.	0.
1845	0.	0.	0.
1850	0.	0.	0.
1855	PRE HELO	T28C	AGAS
1860	1	0	
1865	0.500000E+00	0.500000E+01	0.240000E+02
1870	0.850000E+00	0.850000E+00	0.
1875	0.505000E+02	0.	0.
1880	0.381000E+01	0.	0.
1885	0.320000E+01	0.	0.
1890	0.235000E+02	0.	0.
1895	0.236000E+02	0.	0.
1900	0.200000E+01	0.	0.
1905	0.	0.	0.
1910	0.480000E+01	0.	0.
1915	0.370000E+02	0.	0.
1920	0.	0.	0.
1925	0.	0.	0.

TABLE 39 (Cont)

1930	HELO PRIM	TH57	AGAS
1935	1 0		
1940	0.500000E+00	0.400000E+01	0.240000E+02
1945	0.836000E+00	0.836000E+00	0.
1950	0.126000E+02	0.	0.
1955	0.331000E+01	0.	0.
1960	0.296000E+01	0.	0.
1965	0.242000E+02	0.	0.
1970	0.244000E+02	0.	0.
1975	0.200000E+01	0.	0.
1980	0.	0.	0.
1985	0.300000E+01	0.	0.
1990	0.350000E+02	0.	0.
1995	0.	0.	0.
2000	0.	0.	0.
2005	HELO ADV	THIL	JP-4
2010	1 0		
2015	0.500000E+00	0.800000E+01	0.240000E+02
2020	0.864000E+00	0.864000E+00	0.
2025	0.100000E+03	0.	0.
2030	0.298000E+01	0.	0.
2035	0.277000E+01	0.	0.
2040	0.570000E+02	0.	0.
2045	0.598000E+02	0.	0.
2050	0.200000E+01	0.	0.
2055	0.	0.	0.
2060	0.602000E+01	0.	0.
2065	0.350000E+02	0.	0.
2070	0.	0.	0.
2075	0.	0.	0.

4.11 Name of Training Pipeline. These data are described in Table 40.

TABLE 40

DATA FILE PIPE PIPELINE NAME DATA

Character	Format	Description
1-4	I4	First line number (any four-digit number, but must be the smallest line number)
6-8	I3	Number of phases in the pipeline
9-20	3A4	Name of training pipeline

4.12 Phase Sequence and Attrition Rates. These data are described in Table 41. One line is typed for each phase in the training pipeline. Note that the number of phases are specified on the previous line.

TABLE 41

DATA FILE PIPE PHASE SEQUENCE AND ATTRITION RATES

Character	Format	Description
1-4	I4	Next line number
6-	FREE	Number of the first following phase
Next	FREE	Number of the second following phase
Next	FREE	Number of the third following phase
Next	FREE	Number of the training phase in question. (The foregoing three entries are the numbers of the phases following the phase entered here.) The entered phase number must correspond to a phase in Data File BASCAS
Next	FREE	Attrition rate of this phase

4.13 End of File. When the user has completed entering all data for a particular training pipeline (i.e., has entered a line of pipeline name data and one or more lines of phase sequence and attrition data), other pipelines may be entered by the same procedure. There is no upper limit to the number of pipelines that may be entered. When all pipelines have been entered, an end of file line must be entered to indicate to the automated IFRS system that no additional pipelines exist. These data are described in Table 42.

TABLE 42
DATA FILE PIPE END OF FILE DATA

Character	Format	Description
1-4	I4	Largest line number
6-20	A3, 3A4	"-99END OF FILE Ø" End of file designator

4.14 Table 43 contains a list of the data currently stored in Data File PIPE.

DATA FILE RUNDAT

4.15 Data File RUNDAT contains all the data used in developing runway requirements. Since this data file may be lengthy for the amount of data contained in it, only off-line file update procedures are possible. Several program checks are made by the automated IFRS system to ensure compatibility between the Runway Data File and the LSR data base, and the user must be aware of the following conditions imposed on the Runway Data File :

- a. Only training phases that provide flight instruction are included in Data File RUNDAT, e.g., AOC School and Flight Systems are not represented in this data file because flight instruction does not take place in either phase.
- b. The sequence and names of training phases in the LSR data base (either Data File BASCAS or the internal on-line modifications) must be identical to those in the runway data base. This condition does not hold when the foregoing restriction applies, viz., for AOC School. In addition, when the user desires to add, delete, or change the names of training phases while running the automated IFRS system, an identical change must be made to the

TABLE 43
DATA FILE PIPE

1000	13NAVY OFFICER				
1005	3	0	0	1	0.0900
1010	4	9	0	3	0.0270
1015	5	0	0	4	0.0500
1020	6	0	0	5	0.0200
1025	7	8	0	6	0.0200
1030	0	0	0	7	0.0400
1035	0	0	0	8	0.0400
1040	10	0	0	9	0.1400
1045	11	12	0	10	0.0040
1050	0	0	0	11	0.0080
1055	13	0	0	12	0.0050
1060	14	0	0	13	0.0020
1065	0	0	0	14	0.0020
1070	14NAVY - AOC				
1075	2	0	0	1	0.1400
1080	3	0	0	2	0.0730
1085	4	9	0	3	0.0320
1090	5	0	0	4	0.0800
1095	6	0	0	5	0.0310
1100	7	8	0	6	0.0160
1105	0	0	0	7	0.0520
1110	0	0	0	8	0.0520
1115	10	0	0	9	0.2400
1120	11	12	0	10	0.0060
1125	0	0	0	11	0.0120
1130	13	0	0	12	0.0060
1135	14	0	0	13	0.0050
1140	0	0	0	14	0.0050
1145	12MARINE				
1150	3	0	0	1	0.0500
1155	4	9	0	3	0.0150
1160	5	0	0	4	0.0400
1165	6	0	0	5	0.0100
1170	7	8	0	6	0.0100
1175	0	0	0	7	0.0300
1180	0	0	0	8	0.0300
1185	10	0	0	9	0.0900
1190	12	0	0	10	0.0050
1195	13	0	0	12	0.0040
1200	14	0	0	13	0.0020
1205	0	0	0	14	0.0020
1210	7C-GRD & FOR.				
1215	3	0	0	1	0.0500
1220	9	0	0	3	0.0200
1225	11	12	0	9	0.0500
1230	0	0	0	11	0.
1235	13	0	0	12	0.
1240	14	0	0	13	0.
1245	0	0	0	14	0.0100
1250	-99END OF FILE				

Runway Data File before continuing operation. For example, if the user wishes to delete Advanced Jet-TA from the training syllabus, a prior, identical change must be made to the runway data base.

- c. For each phase of training, the number of types of flight instruction and the associated aircraft names in the LSR data base must exactly correspond to those in the runway data base. For example, if an advanced jet phase utilizing two aircraft types, TA-4J and TF-9J, existed in the LSR data base, Data File RUNDAT must also contain two aircraft types, TA-4J and TF-9J.

If these conditions are not completely met, the automated IFRS system prints an appropriate error message and terminates.

4.16 To define totally the runway data for each training phase, 13 types of data are required. These data values are entered phase by phase following the sequence of the phases. The data described in Table 44 constitute Data File RUNDAT.

4.17 Data in the formats shown in Table 44 are entered for all training phases within the foregoing restrictions. Table 45 contains a list of the data currently stored in Data File RUNDAT.

TABLE 44
DATA FILE RUNDAT ELEMENTS

Character	Format	Description
Phase Designator		
1-4	I4	Line number (any four-digit line number)
6-8	I3	Number of aircraft types in a certain phase of training (see condition c above)
9-20	3A4	Name of the training phase (see conditions a and b above)
21-24	A4	Name of first aircraft type
25-28	A4	Name of second aircraft type
29-32	A4	Name of third aircraft type
Daylight Flight Hours		
1-4	I4	Next line number
6-	FREE	Monthly daylight hours for the first 6 months of the year (six values)
1-4	I4	Next line number
6-	FREE	Monthly daylight hours for the second 6 months of the year (six values)
Runway Down Time		
1-4	I4	Next line number
6-	FREE	Percent of flyable time the main runway is down due to repairs, missed approaches, nontraining flights, etc. Also included is the percent of time the main runway is being utilized for non-OLF touch-and-go sorties.
Next	FREE	Percent of time an OLF is down.
Weather Factors by Aircraft Type*		
1-4	I4	Next line number
6-	FREE	Percent monthly flyable weather for the first 6 months (six values)
1-4	I4	Next line number
6-	FREE	Percent monthly flyable weather for the second 6 months (six values)
* Monthly weather factors are entered by aircraft type. This data entry is repeated for all aircraft types specified in data for Phase Designator.		

TABLE 44 (Cont)

Character	Format	Description
Sorties per Student		
1-4	I4	Next line
6-	FREE	Average number of sorties flown by each successful student**
Sortie Length		
1-4	I4	Next line number
6-	FREE	Length of time in hours of the average sortie**
Launch time		
1-4	I4	Next line number
6-	FREE	Average time in hours to launch an aircraft**
Recovery time		
1-4	I4	Next line number
6-	FREE	Average time in hours to recover an aircraft**
Airspace		
1-4	I4	Next line number
6-	FREE	Maximum number of aircraft which can simultaneously be aloft without saturating the airspace**
<p>** Three data values must be entered. The first, second, and third values correspond to the first, second, and third aircraft types, respectively. When fewer than three aircraft types exist, the remaining data fields should contain single zeros. Incomplete entries will produce an error condition.</p>		

TABLE 44 (Cont)

Character	Format	Description
Touch-and-Go Requirements		
1-4	I4	Next line number
6-	FREE	Average number of touch-and-go landings accomplished by each successful student**
Touch-and-Go Time		
1-4	I4	Next line number
6-	FREE	Average time in hours to perform a touch-and-go landing**
Main Runway Utilization for Touch-and-Go		
1-4	I4	Next line number
6-	FREE	Percent of all touch-and-go landings performed at the NAS**
Target Approaches		
1-4	I4	Next line number
6-	FREE	Average number of air-to-ground target approaches accomplished by a successfully trained student**
Time Over Target		
1-4	I4	Next line number
6-	FREE	Average time in hours a student spends over a target area**

TABLE 45
DATA FILE RUNDAT

1000	1PRIMARY	T34B				
1005	9.380	10.080	10.970	11.850	12.680	13.120
1010	12.920	12.250	11.380	10.500	9.620	9.230
1015	0.1500	0.5000				
1020	0.6300	0.6500	0.6900	0.7500	0.8400	0.8300
1025	0.8700	0.8300	0.8600	0.8800	0.7500	0.6800
1030	0.270000E+02	0.		0.		
1035	0.130000E+01	0.		0.		
1040	0.763889E-02	0.		0.		
1045	0.121528E-01	0.		0.		
1050	0.109000E+03	0.		0.		
1055	0.900000E+01	0.		0.		
1060	0.145833E-01	0.		0.		
1065	0.500000E-01	0.		0.		
1070	0.	0.		0.		
1075	0.833333E-01	0.		0.		
1080	1BASIC	JET-A	T-2A			
1085	9.250	10.020	10.930	11.920	12.820	13.280
1090	13.050	12.350	11.450	10.430	9.480	9.100
1095	0.1500	0.5000				
1100	0.5900	0.6300	0.7800	0.8200	0.8800	0.8500
1105	0.9000	0.9100	0.8100	0.8600	0.7500	0.7700
1110	0.480000E+02	0.		0.		
1115	0.143000E+01	0.		0.		
1120	0.829861E-02	0.		0.		
1125	0.158334E-01	0.		0.		
1130	0.560000E+02	0.		0.		
1135	0.160000E+02	0.		0.		
1140	0.190000E-01	0.		0.		
1145	0.500000E-01	0.		0.		
1150	0.	0.		0.		
1155	0.833333E-01	0.		0.		
1160	1BASIC	JET-B	T2BC			
1165	9.250	10.020	10.930	11.920	12.280	13.280
1170	13.050	12.350	11.350	10.430	9.480	9.100
1175	0.1500	0.5000				
1180	0.6000	0.6500	0.8000	0.8400	0.9000	0.8700
1185	0.9200	0.9400	0.8300	0.8900	0.7600	0.7900
1190	0.380000E+02	0.		0.		
1195	0.147000E+01	0.		0.		
1200	0.829861E-02	0.		0.		
1205	0.158334E-01	0.		0.		
1210	0.560000E+02	0.		0.		
1215	0.130000E+02	0.		0.		
1220	0.190000E-01	0.		0.		
1225	0.500000E-01	0.		0.		
1230	0.	0.		0.		
1235	0.833333E-01	0.		0.		

TABLE 45 (Cont)

1240	1B-JET G/CQ T2BC					
1245	9.380	10.080	10.970	11.850	12.680	13.120
1250	12.920	12.250	11.380	10.500	9.620	9.230
1255	0.1500	0.5000				
1260	0.6800	0.6700	0.6900	0.7400	0.8900	0.8300
1265	0.8900	0.8500	0.8300	0.8900	0.7100	0.8100
1270	0.290000E+02	0.		0.		
1275	0.111000E+01	0.		0.		
1280	0.756945E-02	0.		0.		
1285	0.143750E-01	0.		0.		
1290	0.380000E+02	0.		0.		
1295	0.100000E+02	0.		0.		
1300	0.172500E-01	0.		0.		
1305	0.500000E-01	0.		0.		
1310	0.	0.		0.		
1315	0.833333E-01	0.		0.		
1320	1ADV JET-TF TF9J					
1325	9.500	10.200	10.980	11.850	12.530	12.650
1330	12.770	12.150	11.380	10.600	9.780	9.420
1335	0.1500	0.5000				
1340	0.6800	0.7900	0.8100	0.8100	0.8600	0.8900
1345	0.9500	0.9500	0.9100	0.9000	0.8700	0.6600
1350	0.105000E+03	0.		0.		
1355	0.136000E+01	0.		0.		
1360	0.297570E-01	0.		0.		
1365	0.250000E-01	0.		0.		
1370	0.413000E+03	0.		0.		
1375	0.330000E+02	0.		0.		
1380	0.300000E-01	0.		0.		
1385	0.500000E-01	0.		0.		
1390	0.	0.		0.		
1395	0.833333E-01	0.		0.		
1400	1ADV JET-TA TA4J					
1405	9.500	10.200	10.980	11.850	12.530	12.650
1410	12.770	12.150	11.380	10.600	9.780	9.420
1415	0.1500	0.5000				
1420	0.6800	0.7900	0.8100	0.8100	0.8600	0.8900
1425	0.9500	0.9500	0.9100	0.9000	0.8700	0.6600
1430	0.105000E+03	0.		0.		
1435	0.136000E+01	0.		0.		
1440	0.297570E-01	0.		0.		
1445	0.250000E-01	0.		0.		
1450	0.413000E+03	0.		0.		
1455	0.330000E+02	0.		0.		
1460	0.300000E-01	0.		0.		
1465	0.500000E-01	0.		0.		
1470	0.	0.		0.		
1475	0.833333E-01	0.		0.		

TABLE 45 (Cont)

1480	1BASIC PROP	T28C					
1485	9.380	10.080	10.970	11.850	12.680	13.120	
1490	12.920	12.250	11.380	10.500	9.620	9.230	
1495	0.1500	0.5000					
1500	0.6300	0.6500	0.7100	0.7600	0.8200	0.7700	
1505	0.8100	0.8000	0.7600	0.8600	0.7300	0.6600	
1510	0.750000E+02	0.			0.		
1515	0.154000E+01	0.			0.		
1520	0.458334E-02	0.			0.		
1525	0.120486E-01	0.			0.		
1530	0.278000E+03	0.			0.		
1535	0.240000E+02	0.			0.		
1540	0.144583E-01	0.			0.		
1545	0.500000E-01	0.			0.		
1550	0.	0.			0.		
1555	0.833333E-01	0.			0.		
1560	1B-PROP CQ	T28C					
1565	9.380	10.080	10.970	11.850	12.680	13.120	
1570	12.920	12.250	11.380	10.500	9.620	9.230	
1575	0.1500	0.5000					
1580	0.7600	0.7800	0.8200	0.8800	0.8800	0.8900	
1585	0.8900	0.9000	0.8800	0.9500	0.8800	0.8100	
1590	0.160000E+02	0.			0.		
1595	0.103000E+01	0.			0.		
1600	0.420139E-02	0.			0.		
1605	0.255555E-01	0.			0.		
1610	0.100000E+04	0.			0.		
1615	0.600000E+01	0.			0.		
1620	0.306667E-01	0.			0.		
1625	0.500000E-01	0.			0.		
1630	0.	0.			0.		
1635	0.833333E-01	0.			0.		
1640	1ADV PROP	TS2A					
1645	9.500	10.200	10.980	11.850	12.530	12.850	
1650	12.770	12.150	11.380	10.600	9.780	9.420	
1655	0.1500	0.5000					
1660	0.6700	0.7600	0.8500	0.8300	0.8900	0.9400	
1665	0.9700	0.9700	0.9500	0.9400	0.8700	0.6700	
1670	0.390000E+02	0.			0.		
1675	0.278000E+01	0.			0.		
1680	0.319445E-01	0.			0.		
1685	0.232639E-01	0.			0.		
1690	0.204000E+03	0.			0.		
1695	0.130000E+02	0.			0.		
1700	0.279167E-01	0.			0.		
1705	0.500000E-01	0.			0.		
1710	0.	0.			0.		
1715	0.833333E-01	0.			0.		

TABLE 45 (Cont)

1720	1PRE HEL0	T28C					
1725	9.380	10.080	10.970	11.850	12.680	13.120	
1730	12.920	12.250	11.380	10.500	9.620	9.230	
1735	0.1500	0.5000					
1740	0.7100	0.7700	0.8000	0.8700	0.9100	0.8600	
1745	0.9200	0.8900	0.8900	0.9100	0.8500	0.8000	
1750	0.140000E+02	0.		0.			
1755	0.178000E+01	0.		0.			
1760	0.127777E-01	0.		0.			
1765	0.155555E-01	0.		0.			
1770	0.100000E+04	0.		0.			
1775	0.500000E+01	0.		0.			
1780	0.186667E-01	0.		0.			
1785	0.500000E-01	0.		0.			
1790	0.	0.		0.			
1795	0.833333E-01	0.		0.			
1800	1HELO PRIM	TH57					
1805	9.380	10.080	10.970	11.850	12.680	13.120	
1810	12.920	12.250	11.380	10.500	9.620	9.230	
1815	0.1500	0.5000					
1820	0.7000	0.7100	0.7300	0.7900	0.8700	0.8700	
1825	0.8900	0.9000	0.9000	0.9100	0.8100	0.7200	
1830	0.220000E+02	0.		0.			
1835	0.119000E+01	0.		0.			
1840	0.270139E-01	0.		0.			
1845	0.179861E-01	0.		0.			
1850	0.200000E+02	0.		0.			
1855	0.800000E+01	0.		0.			
1860	0.215833E-01	0.		0.			
1865	0.500000E-01	0.		0.			
1870	0.	0.		0.			
1875	0.833333E-01	0.		0.			
1880	1HELO ADV	THIL					
1885	9.380	10.080	10.970	11.850	12.680	13.120	
1890	12.920	12.250	11.380	10.500	9.620	9.230	
1895	0.1500	0.5000					
1900	0.7500	0.7500	0.7700	0.8300	0.9100	0.9100	
1905	0.9300	0.9400	0.9200	0.9500	0.8600	0.7600	
1910	0.300000E+02	0.		0.			
1915	0.179000E+01	0.		0.			
1920	0.210070E-01	0.		0.			
1925	0.139930E-01	0.		0.			
1930	0.400000E+02	0.		0.			
1935	0.100000E+02	0.		0.			
1940	0.167917E-01	0.		0.			
1945	0.500000E-01	0.		0.			
1950	0.	0.		0.			
1955	0.833333E-01	0.		0.			

ASSET POSITION DATA FILE

4.18 The Asset Position Data File, called "RPIFI*", contains four types of information: (a) the category code, description, and unit of measurement code for each of the 30 facilities as presented in Table 46; (b) the amount of each facility, classified as standard or substandard, available at each of the nine bases considered; (c) the effective amount, length, thickness, and composition of each runway at each of the nine bases; and (d) the amount of ready fuel storage for each of three fuel types available at each base.

4.19 Each of the foregoing items can only be updated off-line. Even when no amount of a certain facility is available, a zero must be present and the line cannot be omitted. In the case of runways, 10 lines must be provided for each base. If there are fewer than 10 runways, the remaining lines must contain the proper number of zeros.

4.20 Line numbers are not sequential. Each line number serves as a code for referencing the exact item desired. This coding is described in Table 47 for each type of item. The NAS code numbers stored in this data file are listed in Table 48, and the runway thickness factors used appear in Table 49.

4.21 Table 50 contains a list of the data currently stored in data file RPIFI*.

AIRCRAFT DATA FILE

4.22 The Aircraft Data File, called "ACDAT*", contains 18 items of information for each of the 21 aircraft types considered in the IFRS model. These items are broken down into the following lines of information for each aircraft type.

- a. Aircraft name (1 item)
- b. Parking apron data (4 items)
- c. Hangar data (4 items)
- d. Warehouse data (3 items)
- e. Required runway data (3 items)
- f. Cost data (2 items)
- g. Inventory (1 item).

This list is modified slightly for aircraft types 16 through 21, which are generic types used for tenant aircraft at the various bases. The same number of items is required for these aircraft, but the items differ from those required for the

TABLE 46
INTERNAL FACILITY NUMBERS, CODES, AND DESCRIPTIONS

Internal Facility Number	Category Code	Description
01	01320	Aircraft Parking Apron
02	12540	Distribution Pipeline
03	14140	Aircraft Operations Building
04	17110	Academic Building
05	21110	Mainenance Hangar
06	21910	Public Works Maintenance Shop
07	04210	General Warehouse
08	55010	Dispensary
09	61010	Administrative Offices
10	71110	Family Housing
11	72210	Enlisted Men's Barracks
12	72310	Enlisted Mess
13	72415	BOQ
14	72416	BOQ Mess
15	74014	Exchange
16	74063	Service Club
17	81160	Stand-by Generator
18	81230	Electric Distribution Line
19	83210	Sanitary Sewer
20	84210	Water Distribution Line
21	85110	Road
22	85210	Parking Area
23	87110	Storm Sewer
24	84120	Drainage Ditch

TABLE 46 (Cont)

Internal Facility Number	Category Code	Description
25	87210	Security Fence
26	00000	Ineligible Housing
27	01320	Peripheral Taxiway
28	11320	Total Parking Apron
29	04210	Shed Space
30	44210	Total Warehouse

TABLE 47
ASSETS POSITION DATA FILE DESCRIPTION

Character	Format	Description
Category Codes , Descriptions , and Unit Codes		
1	I1	The integer, 1, is always the first character for lines of this type
2-3	I2	Two-digit number between 01 and 30 representing the internal facility number (see Table 46)
5-9	I5	Five-digit Navy category code designator for the facility. Leading zero necessary or right adjust
11-22	A12	Twelve-character description of facility
24-25	A2	Two-character units code for facility
Amount of Available Facility		
1	I1	Base number between 1 and 9 (see Table 48)
2-3	I2	Internal facility number (see Table 46). Leading zero necessary for 01-09
4	I1	Digit 0 added to make the line a four-digit number
6-	FREE	Amount of facility available in standard condition
Next	FREE	Amount of substandard facility available

AD-A043 863

OPERATIONS RESEARCH INC SILVER SPRING MD
DEVELOPMENT OF A PRELIMINARY AUTOMATED TOTAL SYSTEMS MODEL FOR --ETC(U)
FEB 70 T N KYLE, R D HEILBRON, J D AVILA
ORI-TR-583-VOL-3

F/G 5/1

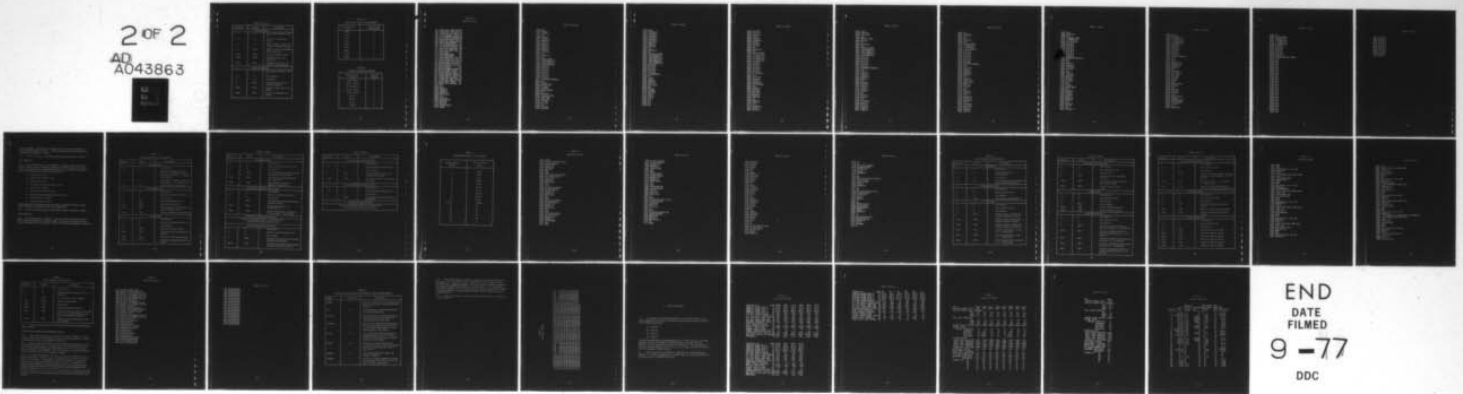
N00025-67-C-0031

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2 OF 2

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TABLE 47 (Cont)

Character	Format	Description
Runway Assets		
1	I1	Base number between 1 and 9
2-3	I1	51-60, one number per runway
4	I1	Digit 0 added to make line number a four-digit number
6-	FREE	Effective runway availability (wind rose data)
Next	FREE	Length of runway in feet
Next	FREE	Thickness factor (see Table 49)
Next	FREE	Composition factor (1 for concrete, 2 for asphalt)
Ready Fuel Storage		
1	I1	Base number between 1 and 9
2-3	I2	The number 61
4	I1	The digit 0
6-	FREE	Amount of ready jet fuel storage in gallons
Next	FREE	Amount of ready avgas fuel storage
Next	FREE	Amount of ready helo fuel storage

TABLE 48
NAVAL AIR STATION CODE NUMBERS

Naval Air Station Code	Corresponding Base Number
CHAS	1
CORP	2
ELLY	3
KING	4
MERI	5
PENS	6
SAUF	7
WHIT	8
PHAN	9

TABLE 49
RUNWAY THICKNESS FACTORS

Aircraft Weight Class	Thickness Factors
AA-5, AA-10	1
AA-15, AB-15	2
AA-20, AB-20	3
AA-25, AB-25	4
AA-30, AB-30	5
AA-35	6
AA-45	7
AD-70	8
AD-90	9

TABLE 50
DATA FILE RPIFI*

101 01320,A/C PKNG APN,SY
102 12540,DIST PIPELIN,MI
103 14140,A/C ØP BLDG ,SF
104 17110,ACADEMC BLDG,SF
105 21110,MAINT HANGAR,SF
106 21910,PW MAINT SHP,SF
107 04210,GEN WAREHØUS,SF
108 55010,DISPENSARY ,SF
109 61010,ADMIN ØFFICE,SF
110 71110,FAM HØUSING ,UN
111 72210,EM BARRACKS ,MN
112 72310,EM MESS HALL,SF
113 72415,BØØ ,MN
114 72416,BØØ MESS ,SF
115 74014,EXCHANGE ,SF
116 74063,SERVICE CLUB,SF
117 81160,STAND BY GEN,UN
118 81230,ELEC DIST LN,LF
119 83210,SANITR SEWER,LF
120 84210,WATER DIS LN,LF
121 85110,RØADS ,MI
122 85210,PARKING AREA,SY
123 87110,STØRM SEWER ,LF
124 87120,DRAIN DITCH ,LF
125 87210,SECURT FENCE,LF
126 00000,INELIG HØUSE,UN
127 01320,PER TAXIWAY ,SY
128 11320,TØT PKNG APN,SY
129 04210,SHED SPACE ,SF
130 44210,TØT WAREHSE ,SF
1010 0,0
1020 0,0
1030 21858,0
1040 21832,0
1050 209473,0
1060 27370,512
1070 0,0
1080 0,15136
1090 60563,1951
1100 668,205
1110 954,451
1120 18500,16151
1130 40,80

TABLE 50 (Cont)

1140 0,0
 1150 9355,0
 1160 12730,0
 1170 0,0
 1180 94925,0
 1190 71683,0
 1200 67885,0
 1210 14.72,0
 1220 90381,0
 1230 57875,0
 1240 36269,0
 1250 79806,0
 1260 110,108
 1270 0,0
 1280 130361,0
 1290 0,0
 1300 78312,19215
 1510 .839,8000,9,1
 1520 .839,8000,9,1
 1530 .086,6000,9,1
 1540 0,0,0,0
 1550 0,0,0,0
 1560 0,0,0,0
 1570 0,0,0,0
 1580 0,0,0,0
 1590 0,0,0,0
 1600 0,0,0,0
 1610 1701000,100000,0
 2010 0,0
 2020 8.55,0
 2030 61573,7692
 2040 0,37661
 2050 0,72210
 2060 53273,20053
 2070 0,0
 2080 0,21100
 2090 77693,196794
 2100 1383,428
 2110 1251,195
 2120 0,33290
 2130 76,100
 2140 0,0
 2150 0,27329
 2160 0,23334

TABLE 50 (Cont)

2170	0,0
2180	340069,0
2190	174834,0
2200	251642,0
2210	44,44,0
2220	369800,0
2230	233152,0
2240	26812,0
2250	28652,0
2260	294,127
2270	0,0
2280	427700,0
2290	0,0
2300	414794,518226
2510	.839,8000,9,1
2520	.839,5000,2,2
2530	.82,5000,2,2
2540	.622,5000,2,2
2550	.641,5000,2,2
2560	0,0,0,0
2570	0,0,0,0
2580	0,0,0,0
2590	0,0,0,0
2600	0,0,0,0
2610	0,1300000,0
3010	0,0
3020	2.3,0
3030	1409,0
3040	29023,0
3050	87654,0
3060	4551,1071
3070	0,0
3080	8345,0
3090	10740,0
3100	460,576
3110	544,0
3120	9251,0
3130	134,0
3140	0,0
3150	0,0
3160	0,0
3170	0,0

TABLE 50 (Cont)

3180	50170,0
3190	10015,0
3200	31645,0
3210	5.8,0
3220	25709,0
3230	174520,0
3240	8328,0
3250	20662,0
3260	49,143
3270	0,0
3280	358146,0
3290	0,0
3300	22576,51968
3510	.9,3125,1,2
3520	.9,3025,1,2
3530	.9,3350,1,2
3540	.1,3185,1,2
3550	0,0,0,0
3560	0,0,0,0
3570	0,0,0,0
3580	0,0,0,0
3590	0,0,0,0
3600	0,0,0,0
3610	0,114960,0
4010	0,0
4020	1.97,1.5
4030	16636,0
4040	15165,0
4050	381285,0
4060	2994,24492
4070	0,0
4080	21838,0
4090	27092,0
4100	898,209
4110	820,796
4120	28068,0
4130	120,100
4140	0,0
4150	22661,0
4160	7590,0
4170	0,0
4180	103086,0
4190	63192,0
4200	82185,0

TABLE 50 (Cont)

4210	34,0
4220	148978,0
4230	151177,0
4240	0,0
4250	58976,19000
4260	226,35
4270	0,0
4280	241954,0
4290	0,0
4300	130333,14348
4510	.925,8000,9,1
4520	.925,8000,9,1
4530	.075,8000,9,1
4540	.075,8000,9,1
4550	0,0,0,0
4560	0,0,0,0
4570	0,0,0,0
4580	0,0,0,0
4590	0,0,0,0
4600	0,0,0,0
4610	3768000,600000,0
5010	0,0
5020	1.87,0
5030	12217,0
5040	30023,0
5050	125764,0
5060	9080,0
5070	0,0
5080	19562,0
5090	33938,0
5100	760,131
5110	1148,0
5120	19241,0
5130	275,0
5140	0,0
5150	18610,0
5160	7507,0
5170	0,0
5180	111340,0
5190	69119,0
5200	72089,0
5210	14.16,0
5220	76290,0
5230	12209,0

TABLE 50 (Cont)

5240 0,0
 5250 155289,0
 5260 121,15
 5270 0,0
 5280 288263,0
 5290 0,0
 5300 95893,14880
 5510 .9,8000,9,1
 5520 .9,8000,9,1
 5530 .745,6400,9,1
 5540 0,0,0,0
 5550 0,0,0,0
 5560 0,0,0,0
 5570 0,0,0,0
 5580 0,0,0,0
 5590 0,0,0,0
 5600 0,0,0,0
 5610 2334990,49980,0
 6010 0,0
 6020 17.03,0
 6030 20274,0
 6040 13406,0
 6050 228381,0
 6060 71028,0
 6070 0,0
 6080 16605,0
 6090 276314,0
 6100 1099,1379
 6110 2910,0
 6120 37314,0
 6130 577,0
 6140 0,0
 6150 78203,0
 6160 15383,0
 6170 0,0
 6180 669038,0
 6190 138190,0
 6200 693604,0
 6210 59,0
 6220 310050,0
 6230 151792,0
 6240 29417,0
 6250 75682,0
 6260 105,311

TABLE 50 (Cont)

6270	0,0
6280	465876,0
6290	0,0
6300	1168499,1906
6510	.9,8000,9,1
6520	.1,6137,9,1
6530	0,0,0,0
6540	0,0,0,0
6550	0,0,0,0
6560	0,0,0,0
6570	0,0,0,0
6580	0,0,0,0
6590	0,0,0,0
6600	0,0,0,0
6610	2268000,923916,0
7010	0,0
7020	0,0
7030	12421,0
7040	34601,0
7050	111685,0
7060	11713,0
7070	0,0
7080	7471,0
7090	15791,0
7100	380,576
7110	22,603
7120	0,12055
7130	374,0
7140	0,0
7150	5705,0
7160	2435,4870
7170	0,0
7180	33986,0
7190	9635,0
7200	21632,0
7210	6.29,0
7220	22134,0
7230	50020,0
7240	0,0
7250	32150,0
7260	36,105
7270	0,0
7280	135932,0

TABLE 50 (Cont)

7290 0,0
 7300 31634,0
 7510 .1,5200,1,2
 7520 .9,6035,1,2
 7530 .1,5296,1,2
 7540 .9,5356,1,2
 7550 0,0,0,0
 7560 0,0,0,0
 7570 0,0,0,0
 7580 0,0,0,0
 7590 0,0,0,0
 7600 0,0,0,0
 7610 15000,150000,0
 8010 0,0
 8020 4,0
 8030 5231,0
 8040 6028,29459
 8050 157501,0
 8060 23315,0
 8070 0,0
 8080 0,11204
 8090 21119,5062
 8100 921,394
 8110 566,644
 8120 0,13721
 8130 0,246
 8140 0,0
 8150 3093,13033
 8160 0,9788
 8170 0,0
 8180 64747,0
 8190 51805,0
 8200 65217,0
 8210 17,11
 8220 98662,5648
 8230 18186,0
 8240 183694,1000
 8250 56938,8000
 8260 114,154
 8270 0,0
 8280 350555,0

TABLE 50 (Cont)

8290	0,0
8300	27894,19220
8510	.9,6000,1,2
8520	.9,6000,1,2
8530	.1,6000,1,2
8540	.1,6000,1,2
8550	0,0,0,0
8560	0,0,0,0
8570	0,0,0,0
8580	0,0,0,0
8590	0,0,0,0
8600	0,0,0,0
8610	733840,452331,15000
9010	0,0
9020	0,0
9030	0,0
9040	0,0
9050	0,0
9060	0,0
9070	0,0
9080	0,0
9090	0,0
9100	0,0
9110	0,0
9120	0,0
9130	0,0
9140	0,0
9150	0,0
9160	0,0
9170	0,0
9180	0,0
9190	0,0
9200	0,0
9210	0,0
9220	0,0
9230	0,0
9240	0,0
9250	0,0
9260	0,0
9270	0,0
9280	0,0
9290	0,0
9300	0,0

TABLE 50 (Cont)

9510	0,0,0,0
9520	0,0,0,0
9530	0,0,0,0
9540	0,0,0,0
9550	0,0,0,0
9560	0,0,0,0
9570	0,0,0,0
9580	0,0,0,0
9590	0,0,0,0
9600	0,0,0,0
9610	0,0,0

training aircraft. Descriptions and formats of the data for both phase and training aircraft appear in Table 51. The internal aircraft code numbers used in this file are presented in Table 52.

4.23 Table 53 provides a list of the data currently contained in ACDAT*.

BASE DATA FILE

4.24 The Base Data File, called "BASED*", contains 31 pieces of information for each of the nine bases considered in the IFRS system. This information is distributed among the following nine lines in the data file for each base. The formats used are described in Table 54.

- a. NAS name (1 item)
- b. Parking apron depth (1 item)
- c. Fuel data (6 items)
- d. Classroom and student data (3 items)
- e. Tenant data (3 items)
- f. Family housing data (5 items)
- g. Base dependent planning factors (3 items)
- h. Runway factors (3 items)
- i. Tenant aircraft (6 items).

In the analysis of the phantom base, the factors contained in BASED* should reflect the planned estimates for the items represented.

4.25 Table 55 provides a listing of the data currently contained in BASED*.

COST DATA FILE

4.26 The Cost Data File, "INVCO*", contains costing information for each of the facilities presently in the IFRS system. One line is specified for each of the 30 facilities now in the model. The format for each line appears in Table 56.

TABLE 51

AIRCRAFT DATA FILE DESCRIPTION

Character	Format	Description
Aircraft Name		
1	I1	The integer 1
2-3	I2	Internal aircraft number (see Table 52). Numbers must be between 01 and 21. Leading 0 is required
4	I1	The integer 1 (indicates type of information, i.e., aircraft name)
6-9	A4	Four-character aircraft name
Parking Apron Data		
1	I1	The integer 1
2-3	I2	Internal aircraft number (01-21)
4	I1	The integer 2
6-	FREE	Aircraft length in feet (A)
Next	FREE	Wing span in feet (B)
Next	FREE	Wing span plus aircraft spacing within column in feet (C)
Next	FREE	Taxiway width required in feet (D)
Hangar Data		
1	I1	The integer 1
2-3	I2	Internal aircraft number (01-21)
4	I1	The integer 3
6-	FREE	Aircraft per hangar module
Next	FREE	Aircraft per crew and equipment module
Next	FREE	Aircraft per basic shop module
Next	FREE	Aircraft per supplementary shop module

TABLE 51 (Cont)

Character	Format	Description
Warehouse Data		
1	I1	The integer 1
2-3	I2	Internal aircraft number (01-21)
4	I1	The integer 4
6-	FREE	Covered warehouse space required per aircraft in square feet
Next	FREE	Shed space required per aircraft in square feet
Next	FREE	Open storage required per aircraft in square feet
Runway Data (Training Aircraft Only)		
1	I1	The integer 1
2-3	I2	Internal aircraft number (01-21)
4	I1	The integer 5
6-	FREE	Runway length required for landing or takeoff in feet
Next	FREE	Weight class factor (1-9) (see Table 49)
Next	FREE	Runway composition requirement (1 for concrete, 2 for asphalt)
Runway Data (Tenant Aircraft Only)		
Same as for training aircraft, except that zero is entered for runway length required		
Cost Data (Training Aircraft Only)		
1	I1	The integer 1
2-3	I2	Internal aircraft number (01-15)
4	I1	The integer 6
6-	FREE	Flyaway investment cost of aircraft in thousands of dollars
Next	FREE	Operation and maintenance (support) cost per flight hour in dollars

TABLE 51 (Cont)

Character	Format	Description
Cost Data (Tenant Aircraft Only)		
1	I1	The integer 1
2-3	I2	Internal aircraft number (16-21)
4	I1	The integer 6
6-	FREE	Average gallons of fuel used annually per aircraft
Next	FREE	Fuel type (1 for jet, 2 for avgas, 3 for helo)
Inventory (Training Aircraft Only)		
1	I1	The integer 1
2-3	I2	Internal aircraft number (01-15)
4	I1	The integer 7
6-	FREE	Total number of aircraft available to CNATRA
Inventory (Tenant Aircraft)		
Same as for training aircraft, except that zero is entered for total number of aircraft		

TABLE 52
INTERNAL AIRCRAFT CODE NUMBERS

Internal Aircraft Number	Present Aircraft Name
1	T-34B
2	T-28C
3	T-2A
4	T-2BC
5	TF-9J
6	TA-4J
7	TS-2A
8	TH-1L
9	TH-57
10	H-34
11-15	Unused
16	VF
17	VT
18	VR
19	VO
20	VW
21	H

TABLE 53
DATA FILE AC DAT*

1011 T34B
1012 25.8, 32.8, 47.8, 72.8
1013 24, 48, 144, 96
1014 175, 5, 50
1015 3000, 1, 2
1016 40, 2.57
1017 150
1021 T28C
1022 34.5, 40.6, 55.6, 80.6
1023 24.0, 48, 144, 96
1024 175, 5, 50
1025 5000, 1, 2
1026 500, 5.78
1027 469
1031 T-2A
1032 35.5, 35.5, 68, 90
1033 24, 48, 144, 96
1034 375, 8, 110
1035 5000, 1, 1
1036 600, 13.01
1037 114
1041 T2BC
1042 35.5, 35.5, 68, 90
1043 24, 48, 144, 96
1044 375, 8, 110
1045 5000, 1, 1
1046 600, 16.51
1047 178
1051 TF9J
1052 34.5, 34.5, 68, 90
1053 15, 24, 144, 60
1054 400, 8, 115
1055 8000, 3, 1
1056 1100, 25.89
1057 399
1061 TA4J

TABLE 53 (Cont)

1062 31, 31, 53.2, 90
 1063 15, 24, 144, 60
 1064 400, 8, 115
 1065 8000, 2, 1
 1066 1100, 37.68
 1067 100
 1071 TS2A
 1072 34, 35, 46, 50
 1073 15, 24, 144, 60
 1074 400, 8, 115
 1075 8000, 2, 1
 1076 2000, 14.89
 1077 179
 1081 THIL
 1082 53, 44, 88, 132
 1083 16, 24, 144, 48
 1084 175, 5, 0
 1085 200, 1, 2
 1086 400, 10.30
 1087 0
 1091 TH57
 1092 43.3, 37.3, 74.5, 111.8
 1093 16, 24, 144, 48
 1094 175, 5, 50
 1095 200, 1, 2
 1096 115, 1.61
 1097 34
 1101 H-34
 1102 65.8, 56.2, 84.2, 112
 1103 12, 20, 144, 24
 1104 250, 8, 75
 1105 200, 1, 2
 1106 400, 12.44
 1107 86
 1111 ZERO

TABLE 53 (Cont)

1112 0,0,0,0
1113 0,0,0,0
1114 0,0,0
1115 0,0,0
1116 0,0
1117 0
1121 ZERO
1122 0,0,0,0
1123 0,0,0,0
1124 0,0,0
1125 0,0,0
1126 0,0
1127 0
1131 ZERO
1132 0,0,0,0
1133 0,0,0,0
1134 0,0,0
1135 0,0,0
1136 0,0
1137 0
1141 ZERO
1142 0,0,0,0
1143 0,0,0,0
1144 0,0,0
1145 0,0,0
1146 0,0
1147 0
1151 ZERO
1152 0,0,0,0
1153 0,0,0,0
1154 0,0,0
1155 0,0,0
1156 0,0
1157 0
1161 VF
1162 34.5, 34.5, 67.9, 90
1163 15, 24, 144, 60
1164 375, 8, 110
1165 0, 2, 1
1166 50300, 1

TABLE 53 (Cont)

1167 0
1171 VT
1172 35.5, 35.5, 68, 90
1173 24, 48, 144, 96
1174 375, 8, 110
1175 0, 1, 2
1176 180000, 2
1177 0
1181 VR
1182 93.9, 117.5, 137.5, 157.5
1183 6, 12, 144, 24
1184 350, 15, 125
1185 0, 2, 2
1186 189000, 2
1187 0
1191 VØ
1192 27.7, 37.2, 57.2, 77.2
1193 24, 48, 144, 96
1194 175, 5, 50
1195 0, 1, 2
1196 5000, 2
1197 0
1201 VW
1202 40, 50, 65, 90
1203 6, 12, 144, 12
1204 900, 50, 275
1205 0, 2, 2
1206 360000, 2
1207 0
1211 H
1212 52.2, 44, 66, 110
1213 12, 20, 144, 24
1214 250, 8, 75
1215 0, 1, 2
1216 18700, 2
1217 0

TABLE 54
BASE DATA FILE DESCRIPTIONS

Character	Format	Description
NAS Name		
1	I1	The integer 1
2-3	I2	Base number (01-09) (see Table 48)
4	I1	The integer 1
6-9	A4	Four character NAS name (present names shown in Table 48)
Parking Apron Depth		
1	I1	The integer 1
2-3	I2	Base number (01-09)
4	I1	The integer 2
6-	FREE	Parking apron depth in feet
Fuel Data		
1	I1	The integer 1
2-3	I2	Base number (01-09)
4	I1	The integer 3
6-	FREE	Number of days of ready fuel storage required for jet fuel
Next	FREE	Number of days of ready fuel storage required for avgas
Next	FREE	Number of days of ready fuel storage required for helo fuel
Next	FREE	Fuel loss percentage, jet fuel (1.0 = 100 percent)
Next	FREE	Fuel loss percentage, avgas (1.0 = 100 percent)
Next	FREE	Fuel loss percentage, helo fuel (1.0 = 100 percent)

TABLE 54 (Cont)

Character	Format	Description
Classroom and Student Data		
1	I1	The integer 1
2-3	I2	Base number (01-09)
4	I1	The integer 4
6-	FREE	Annual classroom utilization in hours
Next	FREE	Class hours required annually per tenant student
Next	FREE	Average tenant student load
Tenant Data		
1	I1	The integer 1
2-3	I2	Base number (01-09)
4	I1	The integer 5
6-	FREE	Tenant officers
Next	FREE	Tenant enlisted personnel
Next	FREE	Tenant civilian personnel
Family Housing Data		
1	I1	The integer 1
2-3	I2	Base number (01-09)
4	I1	The integer 6
6-	FREE	Percent of enlisted eligible for family housing (1.0 = 100 percent)
Next	FREE	Percent of eligible enlisted requiring family housing (1.0 = 100 percent)
Next	FREE	Percent of officers requiring family housing (1.0 = 100 percent)
Next	FREE	Percent of students requiring family housing (1.0 = 100 percent)
Next	FREE	Percent of ineligible enlisted requiring family housing (1.0 = 100 percent)

TABLE 54 (Cont)

Character	Format	Descriptions
Base Dependent Planning Factors		
1	I1	The integer 1
2-3	I2	Base number (01-09)
4	I1	The integer 7
6-	FREE	Percentage of total barrack capacity utilizing mess facilities (1.0 = 100 percent)
Next	FREE	Dispensary code (1 = with beds, 0 = without beds)
Next	FREE	Percent of total base population requiring administrative office space
Runway Factors		
1	I1	The integer 1
2-3	I2	Base number (01-09)
4	I1	The integer 8
6-	FREE	Altitude-temperature correction factor
Next	FREE	Wind rose factor for main runway
Next	FREE	Wind rose factor for crosswind runway
Tenant Aircraft Data		
1	I1	The integer 1
2-3	I2	Base number (01-09)
4	I1	The integer 9
6-	FREE	Number of type VF aircraft
Next	FREE	Number of type VT aircraft
Next	FREE	Number of type VR aircraft
Next	FREE	Number of type VO aircraft
Next	FREE	Number of type VW aircraft
Next	FREE	Number of type H aircraft

TABLE 55
DATA FILE BASED*

1011 CHAS
1012 250
1013 10,10,10,.11,.11,.09
1014 2000,0,0
1015 0,0,0
1016 .419,.825,.835,.254,.204
1017 .85,1,.1
1018 .263,.839,.086
1019 0,2,0,0,0,2
1021 CORP
1022 600
1023 10,10,10,.11,.11,.09
1024 2000,0,0
1025 239,890,4592
1026 .513,.797,.816,.538,.225
1027 .85,1,.12
1028 .187,.839,.161
1029 11,14,0,0,0,3
1031 ELLY
1032 1200
1033 10,10,10,.11,.11,.09
1034 2000,0,0
1035 0,0,0
1036 .422,.724,.847,.569,.179
1037 .85,1,.1
1038 .188,.9,.1
1039 0,2,0,0,0,0
1041 KING
1042 300
1043 10,10,10,.11,.11,.09
1044 2000,0,0
1045 0,0,0
1046 .461,.754,.85,.469,.237
1047 .85,1,.1
1048 .231,.925,.075
1049 0,2,0,0,0,2
1051 MERI
1052 700
1053 10,10,10,.11,.11,.09
1054 2000,0,6

TABLE 55 (Cont)

1055 6,9,0
 1056 .482,.885,.873,.342,.201
 1057 .85,1,.1
 1058 .2553,.9,.1
 1059 0,2,0,0,0,2
 1061 PENS
 1062 420
 1063 10,10,10,.11,.11,.09
 1064 2000,0,0
 1065 529,954,6220
 1066 .422,.724,.847,.569,.179
 1067 .966,0,.15
 1068 .186,.9,.1
 1069 2,19,8,1,1,5
 1071 SAUF
 1072 470
 1073 10,10,10,.11,.11,.09
 1074 2000,0,0
 1075 0,0,0
 1076 .422,.724,.847,.569,.179
 1077 .827,0,.1
 1078 .1893,.9,.1
 1079 0,2,0,0,0,0
 1081 WHIT
 1082 450
 1083 10,10,10,.11,.11,.09
 1084 2000,0,0
 1085 0.20000E+01 0.26000E+02 0.16000E+02
 1086 .477,.762,.834,.476,.247
 1087 .85,1,.1
 1088 .231,.9,.1
 1089 0,1,0,0,0,0
 1091 PHAN
 1092 450
 1093 10,10,10,.11,.11,.09
 1094 2000,0,0
 1095 0,0,0
 1096 .45,.78,.84,.47,.21
 1097 .85,1,.1
 1098 0,.9,.1
 1099 0,2,0,0,0,2

TABLE 56
COST DATA FILE DESCRIPTIONS

Character	Format	Description
1	I1	The integer 1
2-3	I2	Internal facility number (01-30) (see Table 46)
5-	FREE	Unit investment cost in dollars
Next	FREE	Facility support factor
Next	FREE	Typical size
Next	FREE	Cost-time adjustment factor
Next	FREE	Cost-time code (this factor is not presently used in the IFRS model; hence a zero is entered for the value)
Next	FREE	Operation and maintenance cost per unit in dollars

4.27 Table 57 provides a list of the data which are currently contained in data file INVCO*.

FACILITY REQUIREMENTS COMPUTATION TABLES

4.28 The Facility Requirements Computations Table, "TABLE*", contains several tables used in the computation of base facility requirements. A list and description of the tables appears in Table 58.

4.29 Each of these data tables contains planning factors required in computing facility requirements. Should the user wish to generate new values for all these planning factors or simply modify one table, he may do so by running a program named TABGEN. This utility program is a part of the IFRS system and must be run as an independent program.

4.30 In running this program, the user is first asked to type either 1, to generate all tables in new form, or 2, to update one or more of the existing tables. If he enters 1, the program asks for all the tables, one at a time. The user then types the entire table, column by column. For example, in typing the table FAMESS, (a table with dimensions 7 and 2) the user would type 14 numbers corresponding to the elements in the array FAMESS in the following manner: (1, 1), (2, 1), (3, 1), (4, 1), (5, 1), (6, 1), (7, 1), (1, 2), (2, 2), (3, 2), (4, 2), (5, 2), (6, 2), (7, 2). Each item is separated from the next by a comma for as many lines as necessary, providing no line ends with a comma.

TABLE 57
DATA FILE INVCO*

101 11.83,0,0,0,0,.02
102 63360.,1,0,1,0,422.40
103 39.60,1.17,13000,1,0,.19
104 24.10,1.12,25000,1,0,.19
105 23.10,1.15,50000,1,0,.19
106 22.00,1.23,5260,1,0,.19
107 9,1.15,0,0,0,.06
108 38.00,1.14,8000,1,0,.26
109 25.40,1.12,15000,1,0,.22
110 21500,1,0,0,0,0
111 2900,1.10,0,0,0,26.25
112 37.00,1.18,16000,1,0,.21
113 10000,1.17,0,0,0,105.
114 0,0,0,0,0,0
115 25.80,1.15,21000,1,0,.16
116 26.70,1.13,16000,1,0,.16
117 330,1,0,1,0,0
118 5.75,1,0,1,0,.08
119 0,0,0,0,0,0
120 0,0,0,0,0,.08
121 71595.,0,0,1,0,986.
122 4.30,0,0,1,0,.04
123 0,0,0,0,0,0
124 0,0,0,0,0,0
125 5.15,1,0,1,0,0
126 0,0,0,0,0,0
127 11.83,0,0,0,0,.02
128 11.83,0,0,0,0,.02
129 9,1.15,0,0,0,.06
130 9,1.15,0,0,0,.06

TABLE 57 (Cont)

131 0,0,0,0,0,0
132 0,0,0,0,0,0
133 0,0,0,0,0,0
134 0,0,0,0,0,0
135 0,0,0,0,0,0
136 0,0,0,0,0,0
137 0,0,0,0,0,0
138 0,0,0,0,0,0
139 0,0,0,0,0,0
140 0,0,0,0,0,0
141 0,0,0,0,0,0
142 0,0,0,0,0,0
143 0,0,0,0,0,0
144 0,0,0,0,0,0
145 0,0,0,0,0,0
146 0,0,0,0,0,0
147 0,0,0,0,0,0
148 0,0,0,0,0,0
149 0,0,0,0,0,0
150 0,0,0,0,0,0

TABLE 58
FACILITY REQUIREMENTS COMPUTATIONS TABLE DESCRIPTIONS

Table	Dimension	Description
FAPW	6	Maximum total floor area of public works shop for six levels of total maintenance personnel
AP	4, 3	Gross warehouse storage space factors in support of personnel
GWTAB	3	Personnel levels for determining which row of Table AP to use to determine storage requirements per man
FAMESS	7, 2	Enlisted mess hall gross dining facility floor area requirement (second column) for a total mess hall capacity not exceeding value in first column
EXCH	10, 2	Gross square foot area of exchange required (second column) for a total installation military strength not exceeding value in first column
FAEM	8, 2	Gross area in square feet required (second column) for a total base enlisted strength not exceeding the value in first column
TANKS	15	Tank sizes available for ready fuel storage in gallons
TAXITO	3	Number of turnoffs required for runways not exceeding 5500, 7500, and 10,000 feet in length, respectively

4.31 If the user wishes to update, he specifies which table indicated in the printout is to be updated. Having specified the table, the user types that table again, column by column. Having received the update instructions, the program responds with a request for another update. Once all updates have been completed, the user types a zero when asked which table to update to order the program to save the updated tables and halt. TABLE* cannot be updated off line.

4.32 Table 59 provides a list of the data which are currently contained in data file TABLE*.

TABLE 59

DATA FILE TABLE*

0.580000E+040.109000E+050.155000E+050.195000E+050.229000E+050.257000E+05
 0.150000E+020.100000E+020.500000E+010.300000E+010.200000E+010.150000E+01
 0.500000E+000. 0.500000E+010.300000E+010.200000E+010.
 0.400000E+040.600000E+040.800000E+040.500000E+020.150000E+030.500000E+03
 0.750000E+030.125000E+040.225000E+040.225000E+040.295000E+020.230000E+02
 0.170000E+020.150000E+020.150000E+020.110000E+020.100000E+020.500000E+03
 0.100000E+040.300000E+040.500000E+040.700000E+040.100000E+050.150000E+05
 0.200000E+050.250000E+050.300000E+050.490000E+040.772000E+040.136800E+05
 0.175300E+050.225300E+050.248800E+050.305300E+050.394400E+050.434400E+05
 0.458900E+050.250000E+030.500000E+030.750000E+030.120000E+040.200000E+04
 0.400000E+040.500000E+040.100000E+050.250000E+040.300000E+040.700000E+04
 0.100000E+050.127000E+050.198000E+050.278000E+050.556000E+050.100000E+04
 0.200000E+040.400000E+040.600000E+040.100000E+050.120000E+050.200000E+05
 0.300000E+050.500000E+050.210000E+060.315000E+060.420000E+060.630000E+06
 0.840000E+060.105000E+070.550000E+040.750000E+040.100000E+05

V. UTILITY PROGRAMS

5.1 In addition to the programs required to run the IFRS system, four utility programs were written to provide the user with easy access to listings of the following data files.

- ACFILIST
- BAFILIST
- INFILIST
- TABGEN.

The first three programs are used, respectively, to obtain listings of the data currently stored in the Aircraft Data File (ACDAT*), the Base Data File (BASED*), and the Investment Cost Data File (INVCO*). The user obtains a listing of the data stored in these files and a description of each item when he runs the appropriate utility program.

5.2 The results of running ACFILIST, BAFILIST, and INFILIST appear in Tables 60, 61, and 62, respectively. Program TABGEN is described in the foregoing discussion of updating procedures.

TABLE 60
ACFILIST PROGRAM

TRAINING A/C	UNIT	T34B	T28C	T-2A	T28C	TF9J	TA4J
PARKING APRON DATA A	FT	25.8	34.5	35.5	35.5	34.5	31.0
PARKING APRON DATA B	FT	32.8	40.6	35.5	35.5	34.5	31.0
PARKING APRON DATA C	FT	47.8	55.6	68.0	68.0	68.0	53.2
PARKING APRON DATA D	FT	72.8	80.6	90.0	90.0	90.0	90.0
A/C PER HANGAR MODULE	AC	24.	24.	24.	24.	15.	15.
A/C PER CREW & EQUIP MDLAC	AC	48.	48.	48.	48.	24.	24.
A/C PER BASIC SHOP MDL	AC	144.	144.	144.	144.	144.	144.
A/C PER SUPPL SHOP MDL	AC	96.	96.	96.	96.	60.	60.
COVERED WAREHOUSE SPACE	SF	175.	175.	375.	375.	400.	400.
SHED SPACE REQUIRED	SF	5.	5.	8.	8.	8.	8.
OPEN STORAGE REQUIRED	SF	50.	50.	110.	110.	115.	115.
RUNWAY LENGTH REQ.	LF	3000.	5000.	5000.	5000.	8000.	8000.
RUNWAY LOAD FACTOR	**	1.	1.	1.	1.	3.	2.
RUNWAY COMPOSITION FACT.**	**	2.	2.	1.	1.	1.	1.
INVESTMENT COST (THOU.) \$\$		40.	500.	600.	600.	1100.	1100.
O&M COST PER FLIGHT HOUR\$\$		2.57	5.78	13.01	16.51	25.89	37.68
INVENTORY	UN	150.	469.	114.	178.	399.	100.

TRAINING A/C	UNIT	TS2A	TH1L	TH57	H-34
PARKING APRON DATA A	FT	34.0	53.0	43.3	65.8
PARKING APRON DATA B	FT	35.0	44.0	37.3	56.2
PARKING APRON DATA C	FT	46.0	88.0	74.5	84.2
PARKING APRON DATA D	FT	50.0	132.0	111.8	112.0
A/C PER HANGAR MODULE	AC	15.	16.	16.	12.
A/C PER CREW & EQUIP MDLAC	AC	24.	24.	24.	20.
A/C PER BASIC SHOP MDL	AC	144.	144.	144.	144.
A/C PER SUPPL SHOP MDL	AC	60.	48.	48.	24.
COVERED WAREHOUSE SPACE	SF	400.	175.	175.	250.
SHED SPACE REQUIRED	SF	8.	5.	5.	8.
OPEN STORAGE REQUIRED	SF	115.	0.	50.	75.
RUNWAY LENGTH REQ.	LF	8000.	200.	200.	200.
RUNWAY LOAD FACTOR	**	2.	1.	1.	1.
RUNWAY COMPOSITION FACT.**	**	1.	2.	2.	2.
INVESTMENT COST (THOU.) \$\$		2000.	400.	115.	400.
O&M COST PER FLIGHT HOUR\$\$		14.89	10.30	1.61	12.44
INVENTORY	UN	179.	0.	34.	86.

TABLE 60 (Cont)

TENANT A/C	UNIT	VF	VT	VR	VØ	VW	H
PARKING APRON DATA A	FT	34.5	35.5	93.9	27.7	40.0	52.2
PARKING APRON DATA B	FT	34.5	35.5	117.5	37.2	50.0	44.0
PARKING APRON DATA C	FT	67.9	68.0	137.5	57.2	65.0	66.0
PARKING APRON DATA D	FT	90.0	90.0	157.5	77.2	90.0	110.0
A/C PER HANGAR MODULE	AC	15.	24.	6.	24.	6.	12.
A/C PER CREW & EQUIP MDL	AC	24.	48.	12.	48.	12.	20.
A/C PER BASIC SHOP MDL	AC	144.	144.	144.	144.	144.	144.
A/C PER SUPPL SHOP MDL	AC	60.	96.	24.	96.	12.	24.
COVERED WAREHOUSE SPACE	SF	375.	375.	350.	175.	900.	250.
SHED SPACE REQUIRED	SF	8.	8.	15.	5.	50.	8.
OPEN STORAGE REQUIRED	SF	110.	110.	125.	50.	275.	75.
RUNWAY LOAD FACTOR	**	2.	1.	2.	1.	2.	1.
RUNWAY COMPOSITION FACT.	**	1.	2.	2.	2.	2.	2.
ANNUAL FUEL (THOUS.)	GA	50.	180.	189.	5.	360.	19.
FUEL TYPE 1-JET 2-AGAS	**	1.	2.	2.	2.	2.	2.

TABLE 61
BAFILIST PROGRAM

NAS	CHAS	CORP	ELLY	KING	MERI	PENS	SAUF	WHIT
PARKING APRON DEPTH	250.	600.	1200.	300.	700.	420.	470.	450.
DAYS OF READY FUEL STORAGE:								
JET	10.	10.	10.	10.	10.	10.	10.	10.
AGAS	10.	10.	10.	10.	10.	10.	10.	10.
HELØ	10.	10.	10.	10.	10.	10.	10.	10.
FUEL LOSS FACTORS:								
JET	.11	.11	.11	.11	.11	.11	.11	.11
AGAS	.11	.11	.11	.11	.11	.11	.11	.11
HELØ	.09	.09	.09	.09	.09	.09	.09	.09
ANNUAL CLASS UTILIZ.	2000.	2000.	2000.	2000.	2000.	2000.	2000.	2000.
TENANT DATA:								
ANNUAL CLASS HRS	0.	0.	0.	0.	0.	0.	0.	0.
STUDENTS	0.	0.	0.	0.	6.	0.	0.	0.
OFFICERS	0.	239.	0.	0.	6.	529.	0.	2.
ENLISTED	0.	890.	0.	0.	9.	954.	0.	26.
CIVILIAN	0.	4592.	0.	0.	0.	6220.	0.	16.
HOUSING DATA:								
%ELIGIBLE ENLISTED	.419	.513	.422	.461	.482	.422	.422	.477
%ENL. REQ. HOUSING	.825	.797	.724	.754	.885	.724	.724	.762
%OFF. REQ. HOUSING	.835	.816	.847	.850	.873	.847	.847	.834
%STU. REQ. HOUSING	.254	.538	.569	.469	.342	.569	.569	.476
%INELLIG. ENLISTED	.204	.225	.179	.237	.201	.179	.179	.247
MESS HALL FACTØR	.85	.85	.85	.85	.85	.97	.83	.85
DISPENSARY 1=W/BEDS	1	1	1	1	1	0	0	1
%BASE REQ. ADMIN OFF	.10	.12	.10	.10	.10	.15	.10	.10
ALT-TEMP CORRECTION	.26	.19	.19	.23	.26	.19	.19	.23
WINDRØSE DATA MAIN	.84	.84	.90	.92	.90	.90	.90	.90
CROSSWIND	.09	.16	.10	.08	.10	.10	.10	.10
TENANT A/C								
VF	0.	11.	0.	0.	0.	2.	0.	0.
VT	2.	14.	2.	2.	2.	19.	2.	1.
VR	0.	0.	0.	0.	0.	8.	0.	0.
VØ	0.	0.	0.	0.	0.	1.	0.	0.
VW	0.	0.	0.	0.	0.	1.	0.	0.
H	2.	3.	0.	2.	2.	5.	0.	0.

TABLE 61 (Cont)

NAS	PHAN	
PARKING APRON DEPTH	450.	
DAYS OF READY FUEL STORAGE:		
	JET	10.
	AGAS	10.
	HELØ	10.
FUEL LOSS FACTORS:		
	JET	.11
	AGAS	.11
	HELØ	.09
ANNUAL CLASS UTILIZ.	2000.	
TENANT DATA:		
ANNUAL CLASS HRS	0.	
STUDENTS	0.	
OFFICERS	0.	
ENLISTED	0.	
CIVILIAN	0.	
HOUSING DATA:		
%ELIGIBLE ENLISTED	.450	
%ENL. REQ. HOUSING	.780	
%OFF. REQ. HOUSING	.840	
%STU. REQ. HOUSING	.470	
%INELLIG. ENLISTED	.210	
MESS HALL FACTOR	.85	
DISPENSARY I=W/BEDS	1	
%BASE REQ. ADMIN OFF	.10	
ALT-TEMP CORRECTION	.	
WINDROSE DATA MAIN	.90	
CROSSWIND	.10	
TENANT A/C	VF	0.
	VT	2.
	VR	0.
	VØ	0.
	VW	0.
	H	2.

TABLE 62
INFILIST PROGRAM

FACILITY	UNIT COST	FACILITY SUPPORT FACTOR	TYPICAL SIZE	COST-TIME ADJUSTMENT FACTOR	COST TIME CODE	O&M COST/UNIT
1	11.83	0.	0.	0.	0.	0.02
2	63360.00	1.00	0.	1.00	0.	422.40
3	39.60	1.17	13000.	1.00	0.	0.19
4	24.10	1.12	25000.	1.00	0.	0.19
5	23.10	1.15	50000.	1.00	0.	0.19
6	22.00	1.23	5260.	1.00	0.	0.19
7	9.00	1.15	0.	0.	0.	0.06
8	38.00	1.14	8000.	1.00	0.	0.26
9	25.40	1.12	15000.	1.00	0.	0.22
10	21500.00	1.00	0.	0.	0.	0.
11	2900.00	1.10	0.	0.	0.	26.25
12	37.00	1.18	16000.	1.00	0.	0.21
13	10000.00	1.17	0.	0.	0.	105.00
14	0.	0.	0.	0.	0.	0.
15	25.80	1.15	21000.	1.00	0.	0.16
16	26.70	1.13	16000.	1.00	0.	0.16
17	330.00	1.00	0.	1.00	0.	0.
18	5.75	1.00	0.	1.00	0.	0.08
19	0.	0.	0.	0.	0.	0.
20	0.	0.	0.	0.	0.	0.08
21	71595.00	0.	0.	1.00	0.	986.00
22	4.30	0.	0.	1.00	0.	0.04
23	0.	0.	0.	0.	0.	0.
24	0.	0.	0.	0.	0.	0.
25	5.15	1.00	0.	1.00	0.	0.
26	0.	0.	0.	0.	0.	0.
27	11.83	0.	0.	0.	0.	0.02
28	11.83	0.	0.	0.	0.	0.02
29	9.00	1.15	0.	0.	0.	0.06
30	9.00	1.15	0.	0.	0.	0.06