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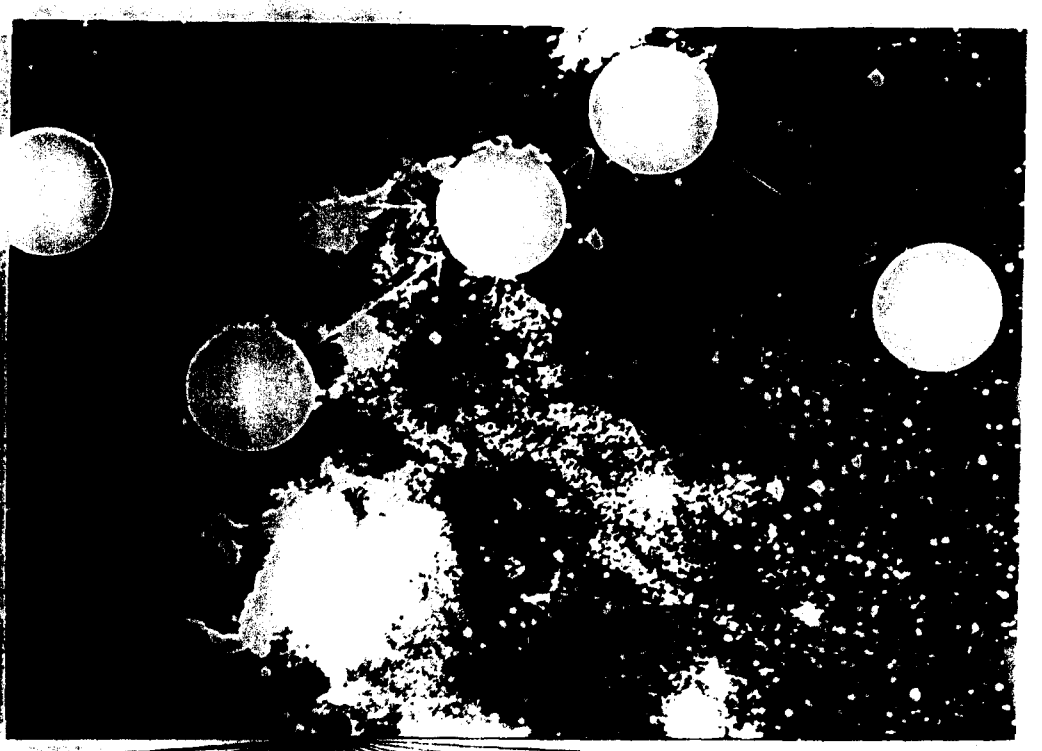
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V

PERT COST SYSTEM COMPUTER PROGRAM HANDBOOK

(PART II)

Programmer's Guide

ADVANCE COPY FOR AFSC IMPLEMENTATION

NO OTS

DECEMBER 1963

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FOREWORD

This manual is Volume IV, Part II of the USAF PERT series. It serves as a companion publication to Volume II, USAF PERT Time System Computer Handbook, dated September 1963.

This document provides a programmer-oriented, complete with flow diagrams, of the IBM 7090 computer program developed to process data for the USAF PERT Cost System. The schedule information input to the program is externally generated from the USAF PERT Time program or any comparable computer program. The cost information input is obtained through the use of input forms or externally generated tapes.

This program produces all of the output reports described in the USAF PERT Cost System Description Manual, dated December 1963, and Supplement #1 of the DOD and NASA Guide to PERT Cost, dated March 1963.

Comments concerning any part of this publication are solicited from both government and industry sources, and should be forwarded to Hq AFSC (SCCSS), Andrews Air Force Base, Washington 25, D. C. 20331.

DUWARD L. CROW
Brigadier General, USAF
DCS/Comptroller

USAF PERT

VOLUME IV

PERT COST SYSTEM COMPUTER PROGRAM HANDBOOK

(PART II)

Programmer's Guide

DECEMBER 1963

USAF has produced a series of PERT documents to provide understanding of the USAF PERT TIME and PERT COST Systems presently in use. This manual is the fifth volume in the USAF PERT series.

VOLUME I	USAF PERT TIME SYSTEM DESCRIPTION MANUAL
VOLUME II	USAF PERT TIME SYSTEM COMPUTER HANDBOOK
VOLUME III	USAF PERT COST SYSTEM DESCRIPTION MANUL
VOLUME IV	USAF PERT COST SYSTEM COMPUTER PROGRAM HANDBOOK, PART I USAF PERT COST SYSTEM COMPUTER PROGRAM HANDBOOK, PART II
VOLUME V	USAF PERT IMPLEMENTATION MANUAL

CONTENTS

CHAPTER I PROGRAM LOGIC AND FLOW

Capabilities I-A-1
Program Logic I-B-1
Computer Run Options I-C-1

CHAPTER II OPERATING PROCEDURES

IBSYS Monitor II-A-1
Tape Assignments II-B-1
Tape Reassignment II-C-1
IBSYS Compiling Procedures II-D-1
IBSYS Operating Procedures II-E-1
IBSYS Conversion Macros II-F-1

CHAPTER III PROGRAM PHASE DESCRIPTION

Outline of Program Phase Description III-A-1
Input/Output III-B-1
PERT Cost Executive III-C-1
PERT Cost Edit Phase III-D-1
PERT Cost Edit Sort Phase III-E-1
PERT Cost Time Merge Phase III-F-1
PERT Cost Update Phase III-G-1
Pre-Reporting Phase III-H-1
Intermediate Reporting Phase III-I-1
Final Reporting Phase III-J-1

CHAPTER IV SUBROUTINES

Introduction IV-A-1
Report Generator IV-B-1
Four-Tape Sort Routine IV-C-1

Two-Tape Sort Routine..... IV-D-1
Calendar Routine..... IV-E-1
Conversion Routines..... IV-F-1
The Writer IV-G-1
The Reader..... IV-H-1
Logical Record Read Routine..... IV-I-1
Other Subroutines IV-J-1

LIST OF FIGURES

I-B-1	PERT Cost Module Logic Flow	I-B-1
II-B-1	Tape Assignments	II-B-1
II-C-1	Change Cards for Tape Reassignment	II-C-1
II-C-2	Change Cards for Conversion to the ASD Version of IBSYS	II-C-3
II-D-1	Tape Assignments for Compilation	II-D-2
II-D-2	Tape Assignments for Compilation Using the ASD Version of IBSYS	II-D-3
III-C-1	Control Card	III-C-14
III-D-1	Card Layouts of Input Data	III-D-55
III-E-1	Input Data Sort Key Matrix	III-E-6
III-F-1	Tape Record and File Description Block	III-F-19
III-F-2	Breakdown of Input Parameter File Description Blocks	III-F-20
III-F-3	Data Description Block	III-F-21
III-F-4	Breakdown of Input Parameter Field Description Blocks	III-F-22
III-F-5	Input Parameter Block	III-F-23
III-F-6	Physical Layout of Secondary Master Tape	III-F-140
III-F-7	Secondary Master Network Code Logical Record	III-F-142
III-F-8	Secondary Master Data Logical Record	III-F-143
III-F-9	PERT Time Record Developed from User's Time Input and Secondary Master	III-F-144
III-G-1	Flow Diagram of Update Phase	III-G-2
III-G-2	Start of Next-Available-Slot Method	III-G-9
III-G-3	Sequence of Steps in Adding Information to Rate Table by Next-Available-Slot Method	III-G-9
III-G-4	Adding A-1 and B-1 to Rate Table	III-G-10
III-G-5	Adding A-2, A-5, and A-4, in Stated Order, to Rate Table	III-G-11
III-G-6	Deleting A-5 and B-1 from Rate Table	III-G-12

III-G-7	Rate Table Record.....	III-G-18
III-G-8	Skill Table Record.....	III-G-43
III-G-9	Physical Layout of PERT COST MASTER.....	III-G-141
III-G-10	Tape Format of Charge or Summary Number Fixed-Portion Record (UCHG).....	III-G-144
III-G-11	Tape Format of QRES2 and QRES1 Logical Records on PERT COST MASTER.....	III-G-145
III-G-12	Physical Layout of QRES2 Table.....	III-G-147
III-G-13	Physical Layout of QRES1 Table.....	III-G-148
III-H-1	Tape Format of Report 1 Record.....	III-H-7
III-H-2	Tape Format of Report 2 Record.....	III-H-11
III-H-3	Tape Format of Type 3 Record.....	III-H-15
III-H-4	Tape Format of Type 4 Record.....	III-H-16
III-H-5	Tape Format of Type 5 Record.....	III-H-17
III-H-6	Tape Format of Type 6 Record.....	III-H-18
III-H-7	Tape Format of Pseudo Time Record.....	III-H-21
III-I-1	Sample Work Breakdown Structure.....	III-I-3
III-I-2	Format of SUM 1 Tape Record.....	III-I-27
III-I-3	Tape Format of Working Table.....	III-I-31
III-I-4	Tape Format of Output Table (SUM 2 Tape).....	III-I-32
III-I-5	Tape Format of Report Information Record.....	III-I-35
III-I-6	Tape Format of Report 10, Summary.....	III-I-59
III-I-7	Tape Format of Report 10, Data.....	III-I-60
III-I-8	Tape Format of Report 11, Data.....	III-I-64

III-I-9	Tape Format of Report 12, Data.....	III-I-67
III-I-10	Tape Format of Report 13, Data.....	III-I-70
III-I-11	Tape Format of Report 20, Data.....	III-I-73
III-I-12	Tape Format of Report 21, Data.....	III-I-76
III-I-13	Tape Format of Report 22, Data.....	III-I-79
III-I-14	Tape Format of Report 23, Data.....	III-I-82
III-I-15	Tape Format of Report 30.....	III-I-85
III-I-16	Tape Format of Report 35, Summary.....	III-I-88
III-I-17	Tape Format of Report 35, Data.....	III-I-89
III-I-18	Tape Format of Reports 40 and 41, Summary.....	III-I-93
III-I-19	Tape Format of Reports 40 and 41, Data.....	III-I-94
III-I-20	Tape Format of Reports 50 and 51, Data.....	III-I-97
III-I-21	Tape Format of Report 52, Data.....	III-I-100
III-I-22	Tape Format of Report 55, Data.....	III-I-103
III-I-23	Tape Format of Report 60, Data.....	III-I-106
III-I-24	Tape Format of Report 70.....	III-I-109
III-I-25	Tape Format of Report 75.....	III-I-110
III-I-26	Tape Format of Reports 71 and 76, Summary.....	III-I-114
III-I-27	Tape Format of Report 71, Data.....	III-I-115
III-I-28	Tape Format of Report 76, Data.....	III-I-116
III-I-29	Tape Format of Reports 80 and 85, Summary.....	III-I-119
III-I-30	Tape Format of Reports 80 and 85, Data.....	III-I-121
III-J-1	Flow Diagram of Final Report Phase.....	III-J-4

LIST OF TABLES

II-C-1	Variable Field Entries for Assigning Tapes	II-C-2
III-B-1	INPUT/OUTPUT Tape Usage by Option Selection.....	III-B-19
III-D-1	Input Coding Assignments.....	III-D-56
III-I-1	Data Sorted by Charge Number (Son).....	III-I-2
III-I-2	Father Sort.....	III-I-4
III-I-3	Father-Son Count.....	III-I-4
III-I-4	Data Sorted by Level and by Father.....	III-I-5

CHAPTER I

GENERAL SYSTEM DESCRIPTION

CHAPTER I

GENERAL SYSTEM DESCRIPTION

I-A CAPABILITIES

PERT Time Data

The system derives its schedule information from tapes generated by various PERT Time systems. This is accomplished through the use of the PERT Time Tape Description Input Forms.

Output Reports

The module produces all of the reports currently described in the USAF PERT Cost System Description Manual. The user may select the type and level of report to be generated with each computer run.

Error Editing

The module has an extensive error editing capability in each of its 4 phases.

Calendar Routine

The system uses a calendar routine which excludes all weekends and holidays from its computations.

Master File

Time and cost data are maintained in a master file which may be automatically updated.

Computer Run Options

There are 7 types of options which permit the user to start and stop the program at various points in the processing cycle. These options are discussed in Subsec. I-C.

Cost Data Only

The program processes cost data without using PERT Time information. This means that the PERT Cost reports will not contain the customary schedule information.

Capacity

The capacity of the program is generally stated as follows:

(a) Work Breakdown Structure

The program will process a work breakdown structure composed of 16 levels. The maximum amount of change or summary numbers that may be associated with a particular parent number is 63.

(b) PERT Network

The system is capable of processing data derived from multiple PERT networks. There is no limit as to the number of activities contained in these networks. However, all of the PERT time data must be contained on a single tape.

(c) Performing Organization / Resource Code Combinations

There is no limit as to the number of Performing Organization / Resource Code combinations that may be associated with a particular charge or summary number.

(d) Activities

There is no limit as to the number of activities that may be associated with a particular charge or summary number.

(e) Cost Data

The system will retain budgeted, estimated, and actual costs in the master file in monthly increments. The maximum number of monthly increments for a particular performing organization / resource code combination is 60.

(f) Rate Table

The maximum number of resource codes or combinations that may be entered in the rate table is 266. The maximum number of rates that may be distributed among these combinations is 1600.

(g) Rainbow Categories

The maximum number of rainbow categories that may be entered in the system is 20. The maximum number of resource codes that may be distributed among these 20 categories is 200. A resource code may not be associated with more than one rainbow category.

(h) Cost Categories

The maximum number of cost categories that may be entered in the system is 200. The maximum number of resource codes that may be distributed among these categories is 200. A resource code may not be associated with more than one cost category.

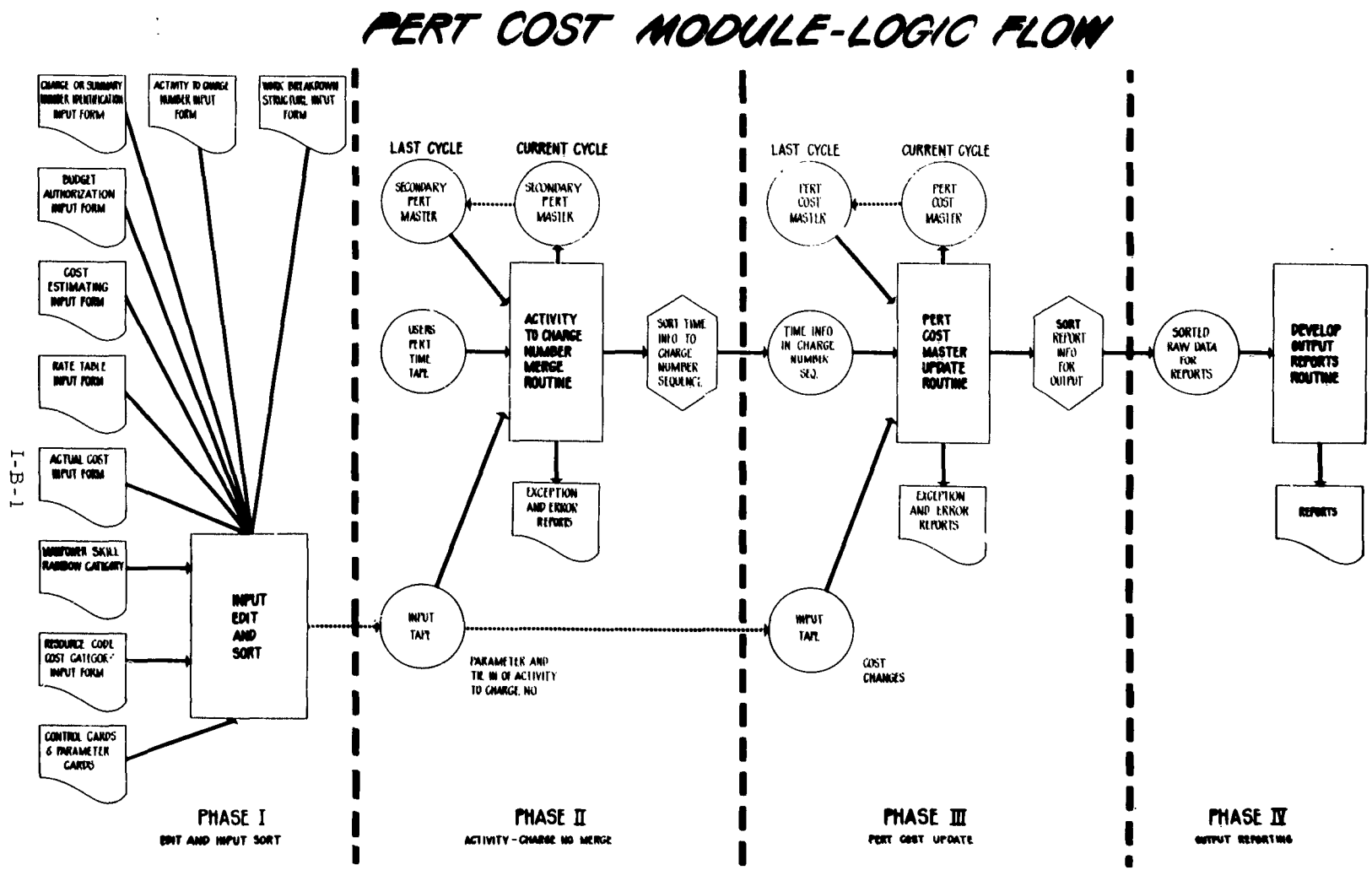


Figure I-B-1 PERT Cost Module - Logic Flow

I-B PROGRAM LOGIC

The program is divided into four phases as shown in Fig. I-B-1 These phases are generalized as follows:

Phase I: Edit and Input Sort

In Phase I, the program reads in all of the input data. Each card is edited for errors. These errors are written on the output tape. An edited data tape is produced and subsequently sorted into card number sequence. The final product of Phase I is a sorted data tape.

Phase II: Activity to Charge Number Merge

In Phase II, the link between the PERT Time system and the PERT Cost module is formed. The PERT Cost Secondary Master File contains the network activities and their associated charge numbers. There is no time information such as T_E, T_L, slack, etc., in this file. This time information is provided by the users PERT Time tape.

In Phase II a sorted time tape and a new Secondary Master File are generated. This is accomplished in the following manner:

(a) The program will read in the new PERT Time parameter cards from the sorted data tape. If there are no parameter cards, then this information is read in from the PERT Cost Secondary Master File.

(b) The user's PERT Time tape is read into the system through the use of this parameter data. If the PERT Time tape is not in the proper sequence, then each record is written in a prescribed format on another tape. This tape is then sorted into the proper sequence.

(c) The program then proceeds to merge these three tapes; that is, the sorted data tape, the user's PERT time tape, and the secondary master tape are matched one activity at a time.

(d) The Type 2 cards (Activity/Charge Number card), if present on the sorted data tape, are used to update the Old PERT Cost Secondary Master File. As this master is being generated.

(e) Wherever an activity on the secondary master matches an activity on the user's PERT Time tape, that activity with its associated charge number and time information are placed on an activity - time tape.

(f) This process continues until all of the activities on the new secondary master have been matched with the user's PERT Time tape. This process results in the generation of an activity - time tape and a new secondary master tape.

(g) The activity - time tape is then sorted into charge number sequence to be used in Phase III.

Errors encountered during the time merge phase are written on the System Error Tape or on the on-line printer. Messages on the System Error Tape will not stop the processing. However, at the conclusion of this phase, the errors will be totaled and printed on-line. The computer will halt, indicating an option to continue. Some errors will cause the computer to halt during the processing cycle. These errors are written on-line and must be rectified prior to rerun.

Phase III: PERT Cost Update

In Phase III the PERT Cost Master File is either established or updated from the data contained in the sorted activity - time tape and the sorted data tape. This phase also generates a sorted report tape which contains all of the data necessary for the final reporting phase. This is accomplished in the following manner:

(a) A record is read into the system from each of the three tapes. More clearly, the information relating to one charge number is read in from each of the tapes, i.e., the PERT Cost Master, the sorted data tape, and the sorted activity - time tape.

(b) The Old PERT Cost master is updated and a new PERT Cost master is generated. The sorted activity - time tape is interrogated to obtain all of the time information associated with each activity assigned to the current charge number.

(c) This time and cost data are written on the report tape.

(d) The report tape is then sorted, to be used in Phase IV.

The errors that are encountered during this phase are written on the System Error Tape or on the on-line printer. Messages on the System Error Tape will not stop the processing. However, at the conclusion of this phase the errors will be totaled and printed on-line. The computer will halt, indicating an option to continue. Some errors will cause the computer to halt during the processing cycle. These errors are written on-line and must be rectified prior to rerun.

Phase IV: Output Reporting

In Phase IV the output reports are generated and written on the output tape. Some errors will cause the computer to halt during the processing cycle. These errors are written on-line and must be rectified prior to rerun.

I-C Computer Run Options

The user is provided with seven options that permit the program to be started and stopped at various points in the processing cycle. The letter indicating the desired option is placed in column 2 of the main control card. These options are briefly described below.

Option A

The input data will be read into the computer and edited for errors. An edited tape will be produced. The errors found during this edit will be placed on the output tape.

Option B

The program will perform those functions described in Option A. In addition, it will sort the edited data into card and type code sequence, thus producing a sorted input tape.

If errors have been uncovered during the edit phase the computer will halt after the edited tape has been generated. The number of errors will be printed on-line. If the user does not deem the number to be excessive, the start key on the console is depressed and processing continues until the sorted input tape is produced. If no errors have been encountered, the program will automatically continue into the next phase.

Option C

The program will perform those functions described in Option B. In addition, it will update the activity-charge number data contained in the Secondary Master Tape; i.e., the first file of the PERT Cost Master Tape. This file is then merged with the user's PERT Time tape to produce a merged time tape. This tape contains each activity, its time

data, and its associated charge number. The merged time tape is then sorted into charge number sequence, producing the sorted time tape.

Errors encountered during the merge phase will be printed on the output tape. If errors have been encountered, the merged time tape will be written and the computer will halt. The number of errors will be printed on-line. If the user does not deem this number to be excessive, the start key on the console is depressed and processing continues until the Work Package/Activity Report is generated. If errors have not been encountered the system will continue processing until the Work Package/Activity Report is generated.

Option D

Option D is used to run from the start to the end of the entire program. The program will perform those functions described in Option C except that the Work Package/Activity Report is not automatically produced. It must be requested by the user through the use of the Report Selection Card.

In addition, the program will use the data contained on the sorted time tape to update the PERT Cost master tape. During this updating phase, the data necessary for the output reports are written on a tape. This tape is sorted to form the sorted output tape. Finally, the program generates all of the output reports requested by the user.

If errors in the data are encountered during this updating phase, they will be printed on the output tape. The computer will halt and the number of errors will be printed on-line. If the user does not deem this number to be excessive, the start key on the console is depressed and processing continues until all of the output reports are generated.

Option E

Option E is selected if the user has previously used Option B and now wishes to continue through Option C; that is, Option E is used if a

sorted input tape has been generated as a result of Option B and the user now wishes to continue processing to obtain the information that would have resulted from Option C (e. g., error messages or the Work Package/Activity Report).

Option F

Option F is selected if the user has previously used Option B and now wishes to go through the entire system to obtain the output reports.

Option G

If the user has generated a sorted time tape as a result of using Options C or E and now wishes to continue through the system, Option G is used. This option is also used if the user wishes to produce the PERT Cost reports without using PERT Time data. Therefore, the reports generated will not contain the customary PERT Time information.

CHAPTER II

OPERATING PROCEDURES

CHAPTER II

OPERATING PROCEDURES

II-A IBSYS MONITOR

The USAF PERT Cost system uses the IBSYS Basic Monitor system. The official designation of this monitor is the IBM 7090/7040 IBSYS Processor 7090-PR-130, Version 8.

System Unit Function Table, SYSUNI

Systems operating under the IBSYS monitor must use certain tape units to carry out specific functions such as library, job input, and output. Tape units, therefore, are assigned certain symbolic names which are indicative of their functions. These symbolic names and their corresponding tape units are maintained by the monitor in a table designated as the System Unit Function Table, or SYSUNI. Since the assignment of tapes may vary with each computer installation, the monitor provides for the modification of this table through the use of the Unit Assignment Control Cards.

The IBSYS Master used by Aerospace Corporation uses the following SYSUNI table.

SYSLB1	A1	SYSPP1	A5
SYSOU1	A2	SYSUT2	B1
SYSIN1	A3	SYSUT3	B2
SYSUT1	A4	SYSUT4	B3

All other tape units are unassigned.

II-B TAPE ASSIGNMENT

The USAF PERT Cost program distributed by Aerospace Corporation uses the tape assignments shown in Fig. II-B-1.

Channel A

1	2	3	4	5	6	7	8
IBSYS Master SYSLB1	Output List SYSOU1	PERT Cost PGM. input deck SYSIN1	Utility SYSUT1		Change tape and NEW P/C MASTER FILE	Utility	

Channel B

1	2	3	4	5	6	7	8
Utility SYSUT2	Utility SYSUT3		PERT Time Data	Utility (edited input)	OLD P/C MASTER FILE (only for updating)		

Fig. II-B-1 Tape Assignments

II-C TAPE REASSIGNMENT

The tapes shown in Fig. II-B-1 may be reassigned to other units and channels through the use of either of the following two procedures:

(a) The Tape Reassignment Card (Control Card D) described in Chapter III of the USAF PERT Cost System - Cost Module, Volume IV Part I) may be used.

(b) A permanent change may be effected by recompiling the program, using the change cards shown in Fig. II-C-1. The asterisks shown in the variable field portion of these cards refer to the entries in Table II-C-1.

LOCATION	OPERATION	ADDRESS TAG DECREMENT COUNT	COMMENTS	LABEL
TA1	PZE	* *	INPUT - NEW MASTER	00245000
TA3	PZE	* *	INPUT - SORT	00245100
TA4	PZE	* *	SORT	00245200
TA5	PZE	* *	OUTPUT (SYSOU1)	00245300
TB1	PZE	* *	CHANGE	00245400
TB2	PZE	* *	OLD MASTER	00245500
TB4	PZE	* *	USER'S PERT TIME TAPE	00245600
TB5	PZE	* *	SORT	00245700
TB6	PZE	* *	SORT	00245800

Fig. II-C-1 Change Cards for Tape Reassignment

Important Points

It is important to observe that:

(a) TA5 must correspond to the SYSOU1 tape

(b) TA3 and TA4 should be on opposite channels from TB5 and TB6 for efficiency in sorting.

Table II-C-1

Variable Field Entries for Assigning Tapes

PHYSICAL UNIT	VARIABLE FIELD (COLS 16-21)
A1	641, 1
A2	642, 1
A3	643, 1
A4	644, 1
A5	645, 1
A6	646, 1
A7	647, 1
A8	648, 1
B1	1153, 1
B2	1154, 1
B3	1155, 1
B4	1156, 1
B5	1157, 1
B6	1158, 1
B7	1159, 1
B8	1160, 1

Tape Assignments With ASD Basic Monitor

In the event that the USAF PERT Cost program is run in conjunction with the version of the IBSYS Basic Monitor used at the Aeronautical Systems Division (ASD), the user may consider it advantageous to permanently change the tape assignments in the PERT Cost program. In this case the following modifications are suggested.

(a) Recompile the PERT Cost program using the change cards shown in Figure II-C-2.

LOCATION		OPERATION	ADDRESS TAG DECREMENT COUNT	COMMENTS		LABEL
TA1		PZE	647, 1	A7	INPUT - NEW MASTER	00245000
TA3		PZE	646, 1	A6	SORT	00245100
TA4		PZE	645, 1	A5	SORT	00245200
TA5		PZE	1155, 1	B3	OUTPUT	00245300
TB1		PZE	1154, 1	B2	CHANGE	00245400
TB2		PZE	1156, 1	B4	OLD MASTER	00245500
TB4		PZE	1159, 1	B7	USER'S TAPE	00245600
TB5		PZE	1158, 1	B6	SORT	00245700
TB6		PZE	1157, 1	B5	SORT	00245800

Fig. II-C-2. Change Cards for Conversion to the ASD Version of IBSYS

(b) Modify the SYSUNI table through the use of the following cards:

```
Col 1        8              16      21
    $ RELEASE               SYSCK 1
    $ RELEASE               SYSCK 2
    $ RELEASE               SYSOU 2
    $ RELEASE               SYSPP 2
```

II-D IBSYS COMPILING PROCEDURES

Input Deck Set-up

The input deck consists of the following cards in the following sequence.

Card Columns	1	7	8	16	73	80
(a)	$IBSYS					
(b)	$ATTACH			A7		
(c)	$AS			SYSCKI		
(d)	$REWIND			SYSCKI		
(e)	$ATTACH			B7		
(f)	$AS			SYSCK 2		
(g)	$REWIND			SYSCK 2		
(h)	$EXECUTE			FORTRAN		
(i)	$ID					
(j)	*	PACK				
(k)	*		FAP			
(l)			UPDATE 9, 10			
(m)			DELETE		00000010	
(n)			COUNT 30000		00000250	
(o)	(Correction cards)					

Correction cards are used to update the symbolic program cards. Serialization must be entered in columns 73-80. See the FAP manual for the precise format of these cards.

End Card

An end card must be inserted with the following format:

Card Column	8	73	80
(p)	END	99999999	

IBSYS Control Cards

Card Columns	1	16
(q)	$ IBSYS	
(r)	$ REMOVE	SYSCK 1
(s)	$ REMOVE	SYSCK 2
(t)	$ STOP	

Tape Assignments

The tape assignments for compilation are shown in Fig. II-D-1

Channel A

1	2	3	4	5	6	7	8
IBSYS Master SYSLB 1	Output list SYSOU 1	Input deck SYSIN 1	Utility SYSUT 1	Punch SYSPP 1		Old blocked update tape (symbolics) SYSCK 1	

Channel B

1	2	3	4	5	6	7	8
Utility SYSUT 2	Utility SYSUT 3	Utility SYSUT 4				New blocked update tape (symbolics) SYSCK 2	

Fig. II-D-1. Tape Assignments for Compilation

Peripheral Input

Place the card deck described on Page II-D-1 on tape, using an IBM 1401 card-to-tape program. Place this tape on unit A3 as indicated in Fig. II-D-1.

Console Operation

(a) Reset.

(b) Clear and load tape.

(c) On-line printer message will indicate the number of errors.

(d) Save B7 (new, updated symbolic tape).

Peripheral Output

(a) Program listing is on A2 (SYSOU 1).

(b) Absolute FAP deck is on punch tape A5 (SYSPP 1).

Compilation Using ASD IBSYS Monitor

The tape assignments for compiling the PERT Cost module using the ASD version of IBSYS are shown in Fig. II-D-2.

Channel A

1	2	3	4	5	6	7	8
IBSYS Master SYSLB 1		Input deck SYSIN 1		SYSUT 1	SYSUT 3	Old blocked update tape (symbolics) SYSCK 1	

Channel B

1	2	3	4	5	6	7	8
Punch Tape SYSPP 1		Output List SYSOU 1		SYSUT 2	SYSUT 4	New blocked update tape SYSCK 2	

Fig. II-D-2. Tape Assignments for Compilation Using the ASD Version of IBSYS

Peripheral Output

(a) Program listing is on B3 (SYSOU 1).

(b) Absolute FAP deck is on punch tape B1 (SYSPP 1).

(c) Due to the size of the program the symbolic reference table will not be generated.

II-E IBSYS OPERATING PROCEDURES

Input Deck Set-up--Program

The PERT Cost program deck consists of the following cards in the following sequence.

IBSYS Control Cards

	Card Columns 1	7	8	16
(a)	$IBSYS			
(b)	$EXECUTE			FORTRAN
(c)	End-of-file card			
(d)	*ID			
(e)	*		XEQ	

Program Cards

(a) First program section

(b) Card Columns 1 7

* DATA

(c) Remaining program sections

IBSYS Control Cards

Card Columns 1

(a) $IBSYS

(b) $STOP

Input Deck Set-up--PERT Cost Data

The PERT Cost data cards must be assembled in the following sequence.

(a) UNSORTED RAW DATA TAPE (Columns 1-22)

(b) Control Card A *

(c) Control Card B *

(d) All other control cards if required *

(e) Cost Data (sort not required) *

(f) EOF Card

*See USAF PERT Cost Volume IV Part I for precise format.

Tape Assignments

The tape assignments required for operation of this program are shown in Fig. II-B-1.

Peripheral Input

(a) Place deck described as "Program Deck" on tape. Place tape on A3.

(b) Place deck described as "Cost Data " on tape. Place tape on A6.

Console Operation

(a) Reset.

(b) Clear and load tape.

(c) Follow on-line printer instructions.

Program Halt

Should the program be aborted (due to machine malfunction, etc.) after operating the PERT Cost edit sort phase, logical tape unit B-5 must be switched with A6 in order to restart without having to rewrite the tape containing the PERT Cost data. An on-line message will indicate when this portion of the program has been operated.

II-F IBSYS CONVERSION MACROS

This PERT Cost program was initially programmed, compiled, and checked out using the Aerospace System B monitor. In order to distribute the program for use with the IBSYS monitor, a compatibility package was written. This package channels all of the I/O through IOEX (the trap supervisor employed by IBSYS) through the use of macro instructions. It is used to start and stop all I/O operations as well as to check for redundancies and initiate recovery procedures. This package was used to compile the PERT Cost program using IBSFAP by placing the card deck containing the macros in front of the PERT Cost program.

The following macros were used:

(a) LODMIT - Brings successive program sections from SYSIN1 into core.

(b) OUTPUT - Writes on-line and off-line messages

(c) BACKR - Backspace a record (s)

(d) BACKF - Backspace a file (s)

(e) READ - Read a record

(f) WRITE - Write a record

(g) WEOF - Write an end-of-file mark

(h) REWND - Rewind a tape

(i) UNLOAD - Rewind and unload a tape

(j) CARDS - Read a card image from SYSIN1

(k) STEPR - Skip a record (s)

(l) STEPF - Skip a file (s)

(m) TAPESN - Returns the address of the unit control block for the tape unit indicated in the address of the accumulator

CHAPTER III

PROGRAM PHASE DESCRIPTION

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PROGRAM PHASE DESCRIPTION

III-A OUTLINE OF PROGRAM PHASE DESCRIPTION

Section III of this Programmer's Manual will discuss the operations of the phases used in the PERT Cost Program and will indicate all messages forthcoming from these phases, as well as the tape configurations and actions. The topical subheadings are listed below with the corresponding page references.

III-B INPUT/OUTPUT III-B-1
- READ Subroutines III-B-1
- WRITE Subroutines III-B-4
- READ and WRITE Error Messages On-Line III-B-6
- Tape Labels III-B-8
- Label On-Line Messages III-B-10
- READ and WRITE of Tables III-B-11
- Table On-Line Messages III-B-14
- WRITE Finish-up Routines III-B-15
- INPUT/OUTPUT by Options III-B-17
- INPUT/OUTPUT Region Descriptions III-B-23

III-C PERT Cost Executive III-C-1
- Program Segmentation III-C-1
- Control Card Setup III-C-4
- Executive On-Line Messages III-C-5
- Executive Control Card Error Messages III-C-8
- Executive Program Operations III-C-11
- Executive Region Descriptions III-C-14

III-D PERT Cost Edit Phase III-D-1
Input Editing Data Tape Labels III-D-1
Input Editing Tape Operations III-D-2
Input Editing Tape Messages On-Line III-D-4
Input Editing Off-Line Error Messages III-D-7
Input Editing Program Operations III-D-11
Input Editing Region Descriptions III-D-13
Input Editing Tape and Card Layouts III-D-52

III-E PERT Cost Edit Sort Phase III-E-1
Edit Sort Tape Operations III-E-1
Edit Sort Tape Messages On-Line III-E-3
Edit Sort Error Message III-E-5
Edit Sort Sequencing Parameters III-E-5
Edit Sort Region Description III-E-7
Edit Sort Tape Layouts III-E-12

III-F PERT Cost Time Merge Phase..... III-F-1
Time Merge General Description III-F-1
Time Merge Input Parameters III-F-2
Time Merge Input Parameter Table Operations III-F-11
Time Merge Input Parameter Error Messages III-F-12
Time Merge Input Parameter Restrictions III-F-16
Time Merge Input Parameter Table Layouts III-F-17
Time Merge Input Parameter Region Descriptions..... III-F-25
Time Merge Phase Tape Operations III-F-38
Time Merge Phase On-Line Messages III-F-41
Time Merge Phase Error Messages III-F-42
Time Merge Phase Region Descriptions III-F-46
Time Merge Phase Tape and Record Layouts III-F-138

III-G PERT Cost Update Phase III-G-1
Cost Update General Description..... III-G-1
Cost Update Rate Table..... III-G-7
Rate Table Next-Available-Slot Approach..... III-G-8
Rate Table Error Messages..... III-G-13
Rate Table Tape Operations..... III-G-14
Rate Table Restrictions and Operations..... III-G-15
Rate Table Layouts..... III-G-17
Rate Table Region Descriptions..... III-G-19
Cost Update Skill Table..... III-G-39
Skill Table Error Messages..... III-G-40
Skill Table Tape Operations..... III-G-41
Skill Table Layouts..... III-G-42
Skill Table Region Descriptions..... III-G-44
Cost Update Phase Tape Operations..... III-G-54
Cost Update Phase On-Line Messages.. ..... III-G-58
Cost Update Phase Error Messages..... III-G-61
Cost Update Phase Region Descriptions..... III-G-65
Cost Update Tape and Table Layouts..... III-G-140

III-H Pre-Reporting Phase..... III-H-1
Input of PERT Time Record..... III-H-1
Input of Complete PERT Cost Item..... III-H-1
Input of Partial PERT Cost Item..... III-H-2
End of Data C ondition..... III-H-2
Option C or E Condition..... III-H-2
Pre-Reporting Phase Region Descriptions..... III-H-2

III-I Intermediate Reporting Phase..... III-I-1
No Reports or Time Reports Only..... III-I-1
Option C or E..... III-I-1
Insertion of Next Higher Relation Descriptor..... III-I-1

Christmas Tree Generation Routine..... III-I-2
Intermediate Reporting Phase Region Descriptions..... III-I-9

III-J Final Reporting Phase..... III-J-1
Input..... III-J-1
Procedure..... III-J-1
List of Reports Produced..... III-J-1
Final Reporting Phase Region Descriptions..... III-J-3

III-B INPUT/OUTPUT

The input/output routines will handle the complete I/O operations that are used during the edit, edit sort, PERT Time merge, and updating phases of the system. The writing of the SYSTEM ERROR TAPE, OUTPUT REPORT TAPE, and the on-line messages will be done outside of this phase. All reading and writing done in these subroutines, outside of the tables, will be double-buffered.

READ Subroutines

The READ subroutines will accomplish the reading function for the following set of tapes:

(a) SORTED DATA TAPE (RCHG)

The edited data information, which is the first file on this tape, is bypassed to get to the point where the sorted data begins. Up to nine of these tapes can be read but they must be in proper sequence—i.e., the order of their creation. If more than one EDITED DATA TAPE is created, only the last one of this edited data series, which also contains the first portion of the SORTED DATA TAPE, need be set onto the tape unit. Each time this tape is read, the location of the record in the buffer is set into CHHLD. CHHLD is originally set to all ones, and at end-of-file (E. O. F.) it is set to all zeros.

(b) OLD PERT COST MASTER (ROPM)

Up to nine of these tapes can be read but they must be set up in their order of creation. The information read by this subroutine will be of a variable nature.

(c) OLD SECONDARY MASTER (ROSM)

Up to nine of these tapes can be read but they must be set up in their order of creation. The data on this tape is blocked but of a fixed length per block.

(d) INPUT DATA TAPE (RRWD)

Up to nine of these tapes can be read and they can be in any order desired, except that the tape containing the control cards must be set on first. After reading is completed the last two tapes are either rewound and unloaded or just rewound, dependent on the option selected.

(e) EDITED DATA TAPE (REDD)

Up to nine of these tapes can be read but they must be set up in their order of creation. After the reading of these tapes the last one is not rewound, since the SORTED DATA TAPE is set onto this tape as a second file.

(f) SORTED TIME TAPE (RSTT)

Up to nine of these tapes can be read in Option G, but they must be set up in order of creation. If Option C, D, E, or F is in effect, this read will be a pickup of the sort information from the activity to charge number sort. For Options C and E only, the pickup of information from the sort and the creation of this SORTED TIME TAPE are accomplished.

(g) USER'S TIME TAPE (PMRD)

This tape is read for Options C, D, E, and F during the Time Merge phase, and its control area will be located in PD70 of the PMRD routine.

All of the above subroutines will use the common read area (RCOM) where all the error messages and I/O macros are centered. Each of the above subroutines modifies certain locations in the RCOM area (as indicated on Page III-B-38). Operating all the reads through a standard routine gives a uniformity to all I/O messages set out in this system. Each of the above subroutines will have a block of data that sets up information for reading and label checking. This block of information is 31 words long and takes the following form:

(1) XXDTE - 1 Word

The date set on this tape is from the previous cycle. It is picked up from the "A" control card.

(2) XXTPE - 1 Word

This is the tape unit number. It indicates the tape unit on which this tape is to be found. This information is set in this location in RCOM after the tape selection routine.

(3) R(X)60 - 3 Words

This location will be the link to the XXTPE information which is used in reading. If the operation code is PZE the tape is read in the binary mode. If the code is MZE the tape is read in the BCD mode. Following the R(X)60 location will be the read commands for picking up the label.

(4) R(X)70 - 1 Word

This word is the exit that is used when E. O. F. is found.

(5) R(X)62 - 2 Words

These words will contain the read communication information.

(6) R(X)90 - 10 Words

The label read from the tape is set into this location.

(7) R(X)93 - 6 Words

The XXDTE is placed into this line. This record is then compared to the label that was set into R(X)90. At each comparison the tape number is increased by one.

(8) R(X)95 - 4 Words

This portion of a message is used for some of the messages set out during the I/O operation. The tape number is set into the last word of this message.

(9) R(X)97 - 1 Word

This location will hold the actual tape number in the form of X0000N, where X is the channel and N is the unit number.

(10) R(X)98 - 1 Word

In case of read error the reason for error is saved in this location.

(11) R(X)99 - 1 Word

This location will indicate whether this is the first time through this particular read subroutine. A non-zero value indicates this is not the first time through.

In the above, the X's indicate that this block is repeated for each read subroutine and each block will have a different letter in place of the (X).

WRITE Subroutines

The WRITE subroutines will accomplish the writing function for the following set of tapes. All of these tapes are produced in the binary mode except where indicated.

(a) NEW PERT COST MASTER (WNPM)

Up to nine of these tapes can be written during a cyclic or file establishment run. The records on this tape will be of variable length.

(b) NEW SECONDARY MASTER (WNSM)

Up to nine of these tapes can be written during a cyclic or file establishment run. The record size is fixed but is set into blocks of 600 words.

(c) EDITED DATA TAPE (WRWD)

Up to nine of these tapes can be written during a cyclic or file establishment run. The records are written one at a time and are unblocked. This tape is developed in the BCD mode.

(d) SORTED TIME TAPE (WSTT)

This operation is accomplished for use in Option G, with up to nine of these tapes being created during Options C or E. The records on this tape are of fixed length, but are grouped in blocks of 576 words.

(e) SORTED DATA TAPE (WCHG)

This tape write will be the second file following the EDITED DATA TAPE. Up to nine of these tapes can be created during a cyclic or file establishment run. The records on this tape are grouped in blocks of 200 words and are written in the binary mode. The two files on this physical tape are written in different write modes, that is the EDITED DATA TAPE is in BCD, and the SORTED DATA TAPE is in binary.

All of the above subroutines will use the common write area (WCOM) where all the error messages and I/O macros are centered. Each of the above subroutines modifies certain locations in the WCOM area (as indicated on Page III-B-63). Operating all the writes through a standard routine gives a uniformity to all I/O messages set out in this system. The above subroutines

also have a block of data that sets up information for writing data and labels. This block of information is 22 words long and takes the following form:

(1) XXTPE - 1 Word

This identifies the tape unit on which this tape is to be found. This information is set in this location in WCOM after the tape selection routine.

(2) W(X)60 - 3 Words

This location will be the link to the XXTPE information which is used in writing. If the operation code is PZE the tape is written in the binary mode. If the code is MZE the tape is written in the BCD mode. Following the W(X)60 location will be the write commands for writing the label.

(3) W(X)62 - 2 Words

These words will contain the write communication information.

(4) W(X)80 - 2 Words

These words are parameters to be used with the write routine (see Subsec. 4. 6). They will contain the location of the two buffers plus the blocking involved and individual record size if not variable.

(5) W(X)82 - 2 Words

This location will be the link to the XXTPE information which is used in writing the "NOTEOF" message at the physical end of a tape that is to be continued. The location following W(X)82 is the write command.

(6) W(X)93 - 6 Words

The new master file as-of date is set into this line and these six words will become the first label record on the tape.

(7) W(X)95 - 4 Words

This portion of a message is used for some of the messages set out during the I/O operation. The tape number is set into the last word of this message.

(8) W(X)97 - 1 Word

This location will hold the actual tape number in the form of X0000N, where X is the channel and N is the unit number.

(9) W(X)99 - 1 Word

This location will indicate whether this is the first time through this particular write subroutine. A non-zero value indicates this is not the first time through.

In the above, the X's indicate that this block is repeated for each write subroutine and each block will have a different letter in place of the (X).

READ and WRITE Error Messages On-Line

During the read and write operations certain error conditions are checked upon. If any of these conditions are found the message is printed out on-line, and the system will come to an unrecoverable stop. The same messages will be used for all reads except that the tape unit number will indicate the unit in trouble. The same will apply to writes. The following error messages are used with the input/output routines.

(a) ERROR IN READING FIRST RECORD OF

SORTED INPUT TAPE XX
PRTCO MASTER TAPE XX
SECONDARY PC TAPE XX
SORTED TIME TAPE XX
UNSORTED DATA TAPE XX
EDITED DATA TAPE XX
USERS PERT TIME TP XX

If any combination of the first line and one of the next seven lines is set out on the on-line printer the system is stopped. This message will indicate that in trying to read the label record an error condition was found. The reason for this error condition is set into RM98 and the code breakdown is:

1 - Redundancy in reading

2 - End-of-file condition on first record

(b) ERROR IN WRITING FIRST RECORD OF

PRTCO MASTER TAPE XX
SECONDARY PC TAPE XX
EDITED DATA TAPE XX

PRTCO CHANGE TAPE XX

SORTED TIME TAPE XX

If any combination of the first line and one of the next five lines is set out on the on-line printer the system is stopped. This message will indicate that in trying to write the label record an error condition was found.

(c) THE SYSTEM WAS NOT ABLE TO READ TAPE XX CORRECTLY

When a redundancy is found in reading the data on the indicated tape this message is set out and the system is stopped.

(d) THE SYSTEM WAS NOT ABLE TO WRITE TAPE XX CORRECTLY

When a write error is determined this message is set out on the on-line printer and the system is stopped.

(e) PROGRAM ERROR IN READER ROUTINE

If there is an illogical combination of conditions existing for the reader routine, this message is set out on the on-line printer and the system is stopped. The reason for this stop is set into R(X)98 (Page III-B-3(10)).

(f) PROGRAM ERROR IN WRITER ROUTINE

If there is an illogical combination of conditions existing for the writer routine, this message is set out on the on-line printer and the system is stopped. The reason for this stop is set into WP98. The codes will be explained in the writer routine

(g) THE SYSTEM WAS NOT ABLE TO WRITE THE

NOTEOF MESSAGE ON PERT COST TAPE XX

NOTEOF MESSAGE ON SECONDARY TAPE XX

NOTEOF MESSAGE ON NEW EDIT TAPE XX

NOTEOF MESSAGE ON SRTD DATA TAPE XX

NOTEOF MESSAGE ON SRTD TIME TAPE XX

When this situation occurs the program will come to a complete halt. This message will indicate write problems for the tape shown.

(h) THE SYSTEM WAS NOT ABLE TO READ TAPE XX AFTER THE EOF

In looking for the continue message or a second E. O. F. the system encountered a redundancy error. This error is recoverable and, prior to halting, a second line to the above message is printed:

IF LABEL IS TO BE IGNORED HIT START BUTTON TO CONTINUE

The program assumes this is a legitimate EOF condition and if the START button is hit it will handle this tape as though it had two EOF's in a row.

(i) ATTEMPTING TO READ SORTED CHANGE TAPE AND CANNOT LOCATE END OF FILE ON EDITED TAPE XX

This message indicates that there is not any EOF to separate the edited information from the sorted. It will be followed by two additional messages with a recovery mode. These messages are:

VERIFY THAT THE PROPER REEL IS ON THIS UNIT

IF PROPER REEL IS PLACED ON UNIT HIT START

After printing out this last message the system will stop. If the right reel for this information is located, and set on its proper unit, the START button can be hit. The program will then continue searching through this new reel for the split between the information.

Tape Labels

Each of the tapes created during any processing run will have a label set on as its first two records. This label will indicate the type of tape, the date it was created, the tape series number, and the program this tape is associated with. A label will also be set at the end of a physical tape that is to be continued. The only variance from the label described above will be the INPUT DATA TAPE, which will use a 4-word label indicating the type of data (see Subsec. III-D), and the USERS TIME TAPE, whose label is variable and depends upon the time system used. The following will describe the common makeup of the tape label.

(a) LABEL FIRST RECORD - WRITE

The first record of every created tape after the tables (see Page III-B-11), other than the SYSTEM OUTPUT TAPE, will be six words long. This record will contain the Master File as-of date in the date slot and will begin numbering the tapes with 1 up to 9. This label will take one of the following forms:

PERT COST MASTER FILE DDMMYY TPE X

SECONDARY MASTER FILE DDMMYY TPE X

EDITED RAW DATA TAPE DDMMYY TPE X

PERT COST CHANGE FILE DDMMYY TPE X

PERT COST TIME INPUT DDMMYY TPE X

During some options the Secondary or PERT Cost tapes are duplicated without updating. If this is the case the first record of the label written out will be the same as the record read in; that is, the master file date for that tape will remain the same.

(b) LABEL SECOND RECORD - WRITE

The second record of every created tape after the tables, aside from the SYSTEM OUTPUT TAPE, will be four words long and will contain the program name found on control card "A". In any case, even for the duplication effort as explained above, the new or current program name will be set into this record.

(c) LABEL FIRST RECORD - READ AND COMPARE

For the input data tapes, only the first four words of the label are checked. For all others except the USERS TIME TAPE, the entire first record is read into R(X)90 and is verified against R(X)93. The date set into R(X)93 is set in from the "A" control card. The following will indicate the dates from the "A" card used for checking the label.

For SORTED INPUT TAPE: The new Master File as-of date since this tape was created for this run.

For PERT COST MASTER TAPE: The PERT Cost master date on the "A" control card. If Option C or E, the label is not verified.

For SECONDARY MASTER TAPE: The secondary master date on the "A" control card. If Option G, the label is not verified.

For PERT COST TIME INPUT: In Option G, the PERT TIME TAPE date on the "A" control card. On other options where the USER TIME TAPE is used, the PERT TIME date on the "A" control tape is verified with the report date on the Users tape.

For INPUT DATA TAPE: No date verification is made on this set of tapes.

For EDITED DATA TAPE: The new master file as-of date since this tape was created for this run.

(d) LABEL SECOND RECORD - READ AND COMPARE

The last four words in R(X)90 are compared to the old program name in PNHD2. If there has been no program name change, the current name in PNHLD will be set into PNHD2. If there has been a name change PNHLD will contain the new name for the labels written out and PNHD2 will contain the old name for comparing.

(e) END LABEL - WRITE

If a tape is to be continued onto another reel after hitting the end-of-tape indication, a 1-word record is set up after the end-of-file. This record will appear as:

NOTEOF

Following this record will be another end-of-file.

(f) END LABEL - READ AND COMPARE

If a tape is being read and an end-of-file is encountered, the next record is checked for "NOTEOF." If it contains this record, the program will continue to read the next tape of the series set on the unit. If, instead of NOTEOF, the program finds another end-of-file it will assume the tape is actually at end-of-file.

Label On-Line Messages

All messages referring to labels will be set out on-line. Most of the label errors can be circumvented and the processing continued by action at the

console. The messages that are involved with label problems are listed and described below:

(a) THE LABEL DID NOT CHECK IN READING TAPE XX

The line following the above message will indicate the label record being compared. All 10 words of this record will be printed out on a single line. For example:

PERT COST MASTER FILE 010563 TPE 1 (Program Name)

After this message the following information is printed out:

VERIFY THAT PROPER REEL IS ON THIS UNIT.

IF LABEL IS TO BE IGNORED HIT START BUTTON TO CONTINUE.

At this point the system will stop. If this label is to be ignored, pressing the START button on the console will continue the program.

(b) THE CONTINUE LABEL DID NOT CHECK IN THE READING OF

SORTED INPUT TAPE XX

PRTCO MASTER TAPE XX

SECONDARY PC TAPE XX

SORTED TIME TAPE XX

EDITED DATA TAPE XX

Any combination of the first line and one of the following lines of the message will indicate on which tape the end label was not legitimate. This message will be followed by another message as follows:

IF LABEL IS TO BE IGNORED HIT START BUTTON TO CONTINUE.

If the start button is hit, the program assumes that another tape of this series is being set on this unit.

READ and WRITE of Tables

The double-buffered read or write routine is not used for the reading and writing of the tables. Since most of these tables are one record long, a nonbuffered read or write is used. Each table will carry its own label, which

will be located just prior to the main record. The following will be the format on these labels:

PERT TIME INPUT PARAMETERS DDMMYY
RATE TABLE PARAMETERS DDMMYY
SKILL CODE TO RAINBOW GROUP DDMMYY

These labels will each be one record of six words, and the date carried in the label is picked up from the "A" control card. When the label is being written out for the tables on the new masters, the date used is the new master file date on control card "A". When the labels are being read and compared, the secondary master file date is set into the input parameter record from control card "A" located in the record at R(X)40 of the information tables of RCOM2. The rate table and skill table will use the PERT COST master date. The same conditions that apply to the read and writing of the PERT Cost and Secondary Master labels (see Page III-B-9 (c)) will apply to the tables located on their respective tapes.

The read and write subroutines will accomplish the reading and writing function for the following tables:

(a) INPUT PARAMETERS READ (RINP)

A record of 350 words will make up the input parameters. This is the first record on the secondary master. This routine will bring this record off of tape into core.

(b) INPUT PARAMETERS WRITE (WINP)

This routine will pick up these data in one record block, except for the label which is a separate record, and set it out on tape.

(c) RATE TABLE READ (RRTB)

A record of 4003 words will make up the rate table. This is the first record on the PERT Cost master. This routine will bring the record off of tape into core.

(d) RATE TABLE WRITE (WRTB)

This routine will pick up these data in one record block, except for the label, which is a separate record, and set it out on tape.

(e) SKILL TABLE READ (RSTR)

A record of 1080 words will make up the skill table. This is the third record following the rate table label and rate table on the PERT Cost master. This routine will bring the record off of tape into core.

(f) SKILL TABLE WRITE (WSTR)

This routine will pick up these data in one record block, except for the label, which is a separate record, and set it out on tape.

All of the above subroutines will use the common read area (RCOM2) or the common write area (WCOM2), where all the error messages and I/O macros are centered. Each of the above subroutines modifies certain locations in either the RCOM2 area (See Page III-B-51) or WCOM2 area (see Page III-B-72). Operating all the I/O from a standard routine will give a uniformity to all messages set out in the system. Each of the above subroutines will have a block of data for reading or writing and label checking and setup. This block of information for RCOM2 is 21 words long, according to the following form:

(1) R(X)25 - 3 Words

The first word of this set will indicate the location that will contain the tape unit number for reading, plus the communication cells. The next location will be the label read followed by the table read.

(2) R(X)28 - 2 Words

These words will contain the read communication information.

(3) R(X)30 - 1 Word

This word contains the tape unit number indicating the unit this tape is to be found on. This information is set in this location in RCOM2 after the tape selection routine.

(4) R(X)40 - 6 Words

The label read from tape is set into this location.

(5) R(X)41 - 6 Words

The secondary master date or PERT Cost master date from control card "A" is set into its respective location in this record and it is verified with R(X)40.

(6) R(X)70 - 3 Words

This portion of a message is used with some of the messages set out during this read operation.

The block of information for WCOM2 is 6 words long, and takes the following form:

(i) W(X)25 - 3 Words

The first word of this set will indicate the location that will contain the tape unit number for writing, plus the communication cells. The last location of this set will be the core area plus the number of words that are to be written preceded by the label write.

(ii) W(X)28 - 2 Words

These words will contain the write communication information.

(iii) W(X)30 - 1 Word

This word contains the tape unit number that indicates which unit this tape is to be found on. This information is set in this location in WCOM2 after the tape selection routine.

The X's indicate that this block is repeated for each read or write (R(X) for reads, W(X) for writes), but each block will have a different letter in place of the (X).

Table On-Line Messages

The table on-line messages will be set out during the reading or writing of the table records and their labels. If the error is an I/O problem the message will be printed out and the system will completely stop. If the error is a label problem a message will be printed out and the system will halt with an option to continue if the label is to be ignored. The following are the messages that will be forthcoming.

(a) THE LABEL DOES NOT AGREE IN READING

INPUT PARAMETERS

RATE TABLE

SKILL TABLE

The first line of the above message plus any one of the next three lines will be followed by the message:

IF LABEL IS TO BE IGNORED HIT START BUTTON TO CONTINUE

At this point the system will stop. If this label is to be ignored, pressing the start button on the console will continue the program.

(b) READIN ERROR ENCOUNTERED ON

INPUT PARAMETERS

RATE TABLE

SKILL TABLE

If any combination of the first line and one of the next three lines is set out on the on-line printer, the system is stopped. This message will indicate that in trying to read the label or table an I/O error condition was found.

(c) WRITE ERROR ENCOUNTERED ON

INPUT PARAMETERS

RATE TABLE

SKILL TABLE

If any combination of the first line and one of the next three lines is set out on the on-line printer, the system is stopped. This message will indicate that in trying to write the label or table an I/O error condition was found.

WRITE Finish-up Routines

After completing the writing of all newly created tapes, a finish-up process is initiated. This sets up the E. O. F. 's and unloads the tapes by means of the following subroutines:

(a) FINISH UP NEW PERT COST MASTER (WDNP)

The double E. O. F. and the rewinding and unloading of the last NEW PERT COST MASTER are accomplished in this subroutine.

(b) FINISH UP NEW SECONDARY MASTER (WDNS)

The double E. O. F. for the last NEW SECONDARY MASTER is accomplished in this subroutine. This tape is never rewound or unloaded, since the NEW PERT COST MASTER will begin where it finishes off.

(c) FINISH UP EDITED DATA TAPE (WDNE)

The double E. O. F. for the last EDITED DATA TAPE is accomplished in this subroutine. This tape is never rewound or unloaded, except in Option A, since the SORTED DATA TAPE will begin where it finishes off.

(d) FINISH UP SORTED DATA TAPE (WDST)

The double E. O. F. and the rewinding and unloading of the last SORTED DATA TAPE are accomplished in this subroutine.

(e) FINISH UP SORTED TIME TAPE (WDTT)

The double E. O. F. and the rewinding and unloading of the last SORTED TIME TAPE are accomplished in this subroutine.

The only I/O problem that can occur in the above subroutines is in writing the two E. O. F. 's. The error messages that will be forthcoming for this error will be:

THE SYSTEM WAS NOT ABLE TO WRITE THE
E. O. F. ON THE PRTCO TAPE XX
E. O. F. ON SECONDARY TAPE XX
E. O. F. ON THE EDITED TAPE XX
E. O. F. ON SORTED DATA TAPE XX
E. O. F. ON SORTED TIME TAPE XX

The first line of the above message plus any one of the next five lines will be followed by the message:

MANUALLY WRITE E. O. F. TWICE ON THE ABOVE TAPE UNIT THEN HIT START.

At this point the system will stop. After complying with the last message, the START button on the console is hit to continue the program.

INPUT/OUTPUT by Options

Table III-B-1 will show the input/output subroutines used for any particular option. It will also show the labels that are to be verified, as well as the labels that are to be set out on the output tapes. The following is an explanation of the fields used:

OPTION (Column 1)

The program option selected is found in this field.

TAPES (Column 2)

This field contains the name of the tape that is involved in an input/output operation. Where more than one tape is involved, it will refer to the grouping of tapes and only the Remarks field will have any bearing.

BCD OR BINARY (Column 3)

This field indicates the mode of reading or writing: BCD = BCD mode; BIN = binary mode.

TYPE OF I/O (Column 4)

This field indicates whether the action for that particular tape is read (R) or write (W).

READER OR WRITER USAGE (Column 5)

An "X" in this field indicates that for this particular tape the reader or writer subroutine is used.

I/O LINKAGE WITH XR 4 (Column 6)

This field gives the name of the subroutine where the input/output action for this tape takes place. All TSX's into the input/output subroutines use Index Register 4.

REWIND (Column 7)

An "X" indicates that this particular tape will be rewound at the end of its processing.

UNLOAD (Column 8)

An "X" indicates that this particular tape will be rewound at the end of its processing.

LABELS (Column 9)

This field shows the label that is to be checked in read-in or the label that is set out on the output tapes.

LABEL RECORDS (Column 10)

A number in this field indicates the number of physical records that make up the label for a particular tape.

LABEL WORDS (Column 11)

This column shows the number of words that will make up the physical record indicated in the preceding column.

BLOCKING USE (Column 12)

This field will indicate by a "Yes" or a "No" whether the data for a particular tape contains blocked or unblocked records, respectively.

NUMBER OF LOGICAL RECORDS PER BLOCK (Column 13)

If blocking is indicated, the maximum number of records in any one block is shown in this column. If it is variable a "V" will indicate this condition.

BLOCK SIZE (Column 14)

If blocking is indicated, the maximum size of the blocked record is shown here.

REMARKS (Column 15)

Any remark that is pertinent to that particular tape during a particular option is noted here. For the case where the information on a tape is the same as in a lower option, the tape is referenced to that option.

Table III-B-1 INPUT/OUTPUT Tape Usage by Option Selection

Option (1)	Tapes (2)	BCD or Binary (3)	Type of I/O (4)	Read or Write Usage (5)	I/O to XR 4 Linkage (6)	Rewind (7)	Unload (8)	Labels (9)	Label		Blocking			Remarks (15)
									No. Records (10)	No. Words (11)	Use (12)	No. Logical Records (11)	Block Size (14)	
A	Input data tape	BCD	R	X	RRWD	X	X	Actual raw data tape	1	4	No			Alternating tapes
								Unsorted raw data tape	1	4				
								Edited raw data tape DDMMYY TPE *	2	6				Only check 1st 4 words
								Program name		4				
	Edited data tape	BCD	W	X	WRWD	X	X	Edited raw data tape DDMMYY TPE *	2	6	No			
								Program name		4				
B	Input data tape	BCD	R	X	RRWD	X	X				No			Same as Option A. If the second of the alternating tapes is used it is not unloaded since it will be used for the sort phase
	Edited data tape	BCD	W	X	WRWD	X					No			Same as Option A (except unload) If more than one tape has been created this tape is unloaded and the first of the series is set on
	Edited data tape	BCD	R	X	REDD			Edited raw data tape DDMMYY TPE *	2	6	No			Into sort routine
								Program name		4				
	Sorted data tape	BIN	W	X	WCHG	X	X	PERT Cost change file DDMMYY TPE*	2	6	Yes	10	200	Same physical tape as edited tape (second file) after sort completion
								Program name		4				
C	Input data tape	BCD	R	X	RRWD	X					No			Same as Option A (except unload). The last two input tapes are not unloaded since they will be used for the new master and sort tapes.
	Edited data tape	BCD	W	X	WRWD	X					No			Same as Option B
	Edited data tape	BCD	R	X	REDD						No			Same as Option B
	Sorted data tape	BIN	W	X	WCHG	X					Yes	10	200	Same as Option B (except unload).
	Sorted data tape	BIN	R	X	RCHG	X	X	PERT Cost change file DDMMYY TPE*	2	6	Yes	10	200	Read past first file to begin picking up sorted input data
								Program name		4				
	Old input parameters	BIN	R		RINP			PERT Time input parameters DDMMYY	1	6	No			One record will make up the input parameters
	Old secondary master	BIN	R	X	ROSM			Secondary master file DDMMYY TPE *	2	6	Yes	75	600	Not rewound since old PERT Cost master is 2nd file on this tape
								Program name		4				
	New input parameters	BIN	W		WINP			PERT Time input parameters DDMMYY	1	6	No			One record will make up the input parameters

(Continued)

Option (1)	Tapes (2)	BCD or Binary (3)	Type of I/O (4)	Read or Write Usage (5)	I/O to XR 4 Linkage (6)	Re-wind (7)	Un-load (8)	Labels (9)	Label			Blocking			Remarks (15)
									No. Records (10)	No. Words (11)	User (12)	No. Logical Records (13)	Block Size (14)		
G cont.	New secondary master	BIN	W	X	WNSM			Secondary master file DDMMYY TYPE *	2	6	Yes	75	600		Not rewound since new PERT Cost master is 2nd file on this tape
								Program name		4					
	Old PERT Cost master	BIN	R	X	RONM	X	X	PERT Cost master file DDMMYY TYPE*	2	6	Yes	V	600		Skip over rate table and skill table to cost data info - Interested only in responsible organ. and charge no. description in cost data record for work package/activity worksheet.
								Program name		4					
	Users time tape		R	X	PARD	X	X								Information regarding this tape is dependent upon input parameters - it has its I/O operations in PERT merge phase.
	Sorted time tape	BIN	W	X	WSTT	X	X	PERT Cost time input DDMMYY TYPE*	2	6	Yes	16	576		This tape is developed after the completion of the sort. It can be on one of two tapes depending on the merge passes of the sort.
								Program name		4					
	IV PT Cost master info.	BIN	R/W		WNPM WRTH WSTR RRTH RSTR										Duplicate the PERT Cost data as the second file of PERT Cost master label dates will remain the same
D	Input data tape	BCD	R	X	RRWD	X									Same as Option A (except) Do not unload last 2 input tapes - to be used for new PERT Cost master and one of the sort tapes
	Edited data tape	BCD	W	X	WRWD	X									Same as Option B
	Edited data tape	BCD	R	X	RDBD										Same as Option B
	Sorted data tape	BIN	W	X	WCBG	X									Same as Option B
	Sorted data tape	BIN	R	X	RCBG	X	X								Same as Option C
	Old input parameters	BIN	R		RINP										Same as Option C
	Old secondary master	BIN	R	X	ROSM										Same as Option C
	New input parameters	BIN	W		WINP										Same as Option C
	New secondary master	BIN	W	X	WNSM										Same as Option C
	User time tape	BIN	R	X	PARD	X	X								Same as Option C
	Old rate table	BIN	R		RRTH			Rate table parameters DDMMYY	1	6	No				One record will make up the rate table On old PERT Cost master
	Old skill table	BIN	R		RSTR			Skill code to Rainbow Group DDMMYY	1	6	No				One record will make up the skill table On old PERT Cost master

(Continued)

Table III-B-1 INPUT/OUTPUT Tape Usage by Option Selection (Continued)

Option (1)	Tapes (2)	BCD or Binary (3)	Type of I/O (4)	Read or Write Usage (5)	I/O to XR 4 Linkage (6)	Re-wind (7)	Un-load (8)	Labels (9)	Label		Blocking			Remarks (15)
									No. Records (10)	No Words (11)	Use (12)	No Logical Records (13)	Block Size (14)	
D cont	Old PERT Cost master	BIN	R	X	ROPM	X	X				Yes	V	600	Same as Option C (except for remarks).
	New rate table	BIN	W		WRTB			Rate table parameters DDMMYY	1	6	No			One record will make up the rate table On new PERT Cost master
	New skill table	BIN	W		WSTR			Skill code to Rainbow Group DDMMYY	1	6	No			One record will make up the skill table On new PERT Cost master
	New PERT Cost master	BIN	W	X	WNPM	X	X	PERT Cost master file DDMMYY TPE*	2	6	Yes	V	600	
								Program name		4				
E	Sorted data tape	BIN	R	X	RCHG	X	X				Yes	10	200	Same as Option C
	Old input parameters	BIN	R		RINP						No			Same as Option C
	Old secondary master	BIN	R	X	ROSM	X	X				Yes	75	600	Same as Option C
	New input parameters	BIN	W		WINP						No			Same as Option C
	New secondary master	BIN	W	X	WNSM	X	X				Yes	75	600	Same as Option C
	Old PERT Cost master	BIN	R	X	ROPM	X	X				Yes	V	600	Same as Option D
	Users time tape		R	X	PMRD	X	X							Same as Option C
	Sorted time tape	BIN	W	X	WSTT	X	X				Yes	16	576	Same as Option C
	PERT Cost master info.	BIN	R/W		WNPM WRTB WSTR RRTB RSTR									Same as Option C
F	Sorted data tape	BIN	R	X	RCHG	X	X				Yes	10	200	Same as Option C
	Old input parameters	BIN	R		RINP						No			Same as Option C
	Old secondary master	BIN	R	X	ROSM						Yes	75	600	Same as Option C
	New input parameters	BIN	W		WINP						No			Same as Option C
	New secondary master	BIN	W	X	WNSM						Yes	75	600	Same as Option C
	Users time tape		R	X	PMRD	X	X							Same as Option C
	Old rate table	BIN	R		RRTB						No			Same as Option D
	Old skill table	BIN	R		RSTR						No			Same as Option D
	Old PERT Cost master	BIN	R	X	ROPM	X	X				Yes	V	600	Same as Option D
	New rate table	BIN	W		WRTB						No			Same as Option D
	New skill table	BIN	W		WSTR						No			Same as Option D
	New PERT Cost master	BIN	W	X	WNPM	X	X				Yes	V	600	Same as Option D
G	Input data tape	BCD	R	X	RRWD	X					No			Same as Option A (except unload). The last two input tapes are not unloaded since they will be used for the new master and sort tapes
	Edited data tape	BCD	W	X	WRWD	X					No			Same as Option B

(Continued)

Table III-B-1 INPUT/OUTPUT Tape Usage by Option Selection (Continued)

Option (1)	Tapes (2)	BCD or Binary (3)	Type of I/O (4)	Read or Write Usage (5)	I/O to XR-4 Linkage (6)	Rewind (7)	Unload (8)	Labels (9)	Label		Blocking			Remarks (15)
									No. Records (10)	No. Words (11)	Use (12)	No. Logical Records (13)	Block Size (14)	
G cont	Edited data tape	BCD	R	X	REDD						No			Same as Option B
	Sorted data tape	BIN	W	X	WGHG	X					Yes	10	200	Same as Option B
	Sorted data tape	BIN	R	X	RGHG	X	X				Yes	10	200	Same as Option C
	Sorted time tape	BIN	R	X	RSTT	X	X	PERT Cost time input DDMMYY TPE8	2	6	Yes	10	576	If indicator is set this tape can be bypassed during this option
								Program name		4				
	Old rate table		R		RRTB						No			Same as Option D
	Old skill table		R		RSTR						No			Same as Option D
	Old PERT Cost master		R		ROPM	X	X				Yes	V	600	Same as Option D
	New rate table		W		WRTB						No			Same as Option D
	New skill table		W		WSTR						No			Same as Option D
	New PERT Cost master		W		WNPM	X	X				Yes	V	600	Same as Option D
	Secondary master info.	BIN	R/W		RINP WINP ROSM WNSM									Duplicate this data as first file of new PERT Cost master. Label dates will remain the same
N/A	Edited data tape	BCD	W		WDNE	See Options		Finish up the writing of these tapes						
	Sorted data tape	BIN	W		WDST									
	New secondary master	BIN	W		WDNS									
	Sorted time tape	BIN	W		WDTT									
	New PERT Cost master	BIN	W		WDNP									

Table III-B-1 INPUT/OUTPUT Tape Usage by Option Selection (Continued)

INPUT/OUTPUT Region Descriptions

The following region specifications will describe the major subroutines used in the input/output region.

Region RCHG

EXPLANATION OF REGION:

This routine will read the SORTED DATA TAPE, which is the second file following the edited data information.

CALLING SEQUENCE:

```
L       TSX  RCHG, 4
L + 1   Normal return
```

INPUT:

SORTED DATA TAPE

OUTPUT:

The location of the next logical record is in the address of the accumulator. The number of words contained in this record is in the decrement.

STORAGE USED:

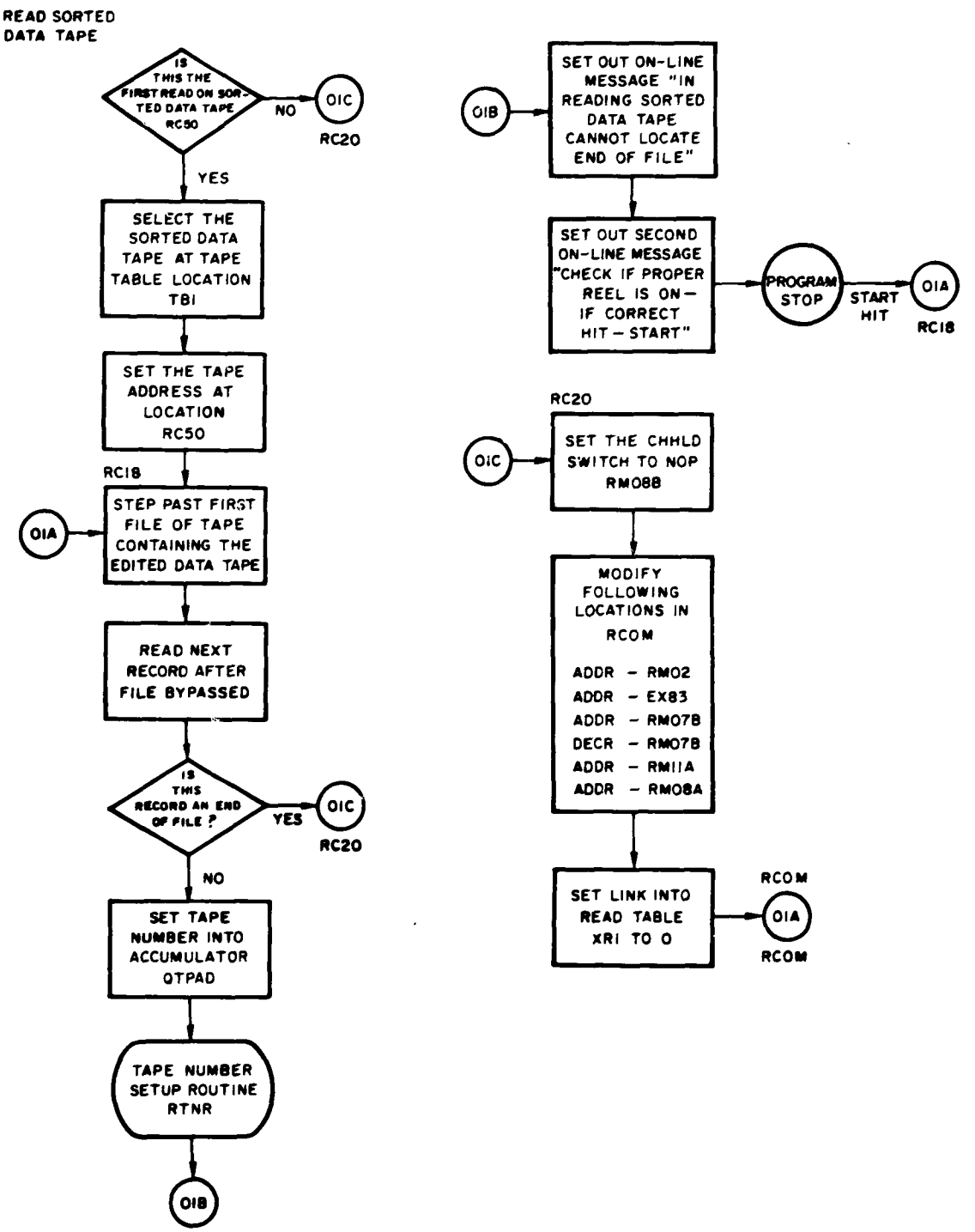
CFDTE - RC99 - 31 words

SUBREGIONS AND SUBROUTINES USED:

TAPSN RCOM

EXPLANATION OF CALLING SEQUENCE:

If an error is determined in reading, a message is set out on the on-line printer and the program is stopped. If an E. O. F. is encountered, the program will automatically go into its E. O. F. exit.


READ SORTED DATA TAPE
IS THIS THE FIRST READ ON SORTED DATA TAPE RC50
NO
O1C
RC20
YES
SELECT THE SORTED DATA TAPE AT TAPE TABLE LOCATION TBI
SET THE TAPE ADDRESS AT LOCATION RC50
RC18
O1A
STEP PAST FIRST FILE OF TAPE CONTAINING THE EDITED DATA TAPE
READ NEXT RECORD AFTER FILE BYPASSED
IS THIS RECORD AN END OF FILE ?
YES
O1C
RC20
NO
SET TAPE NUMBER INTO ACCUMULATOR OTPAD
TAPE NUMBER SETUP ROUTINE RTNR
O1B
O1B
SET OUT ON-LINE MESSAGE "IN READING SORTED DATA TAPE CANNOT LOCATE END OF FILE"
SET OUT SECOND ON-LINE MESSAGE "CHECK IF PROPER REEL IS ON— IF CORRECT HIT — START"
PROGRAM STOP
START HIT
O1A
RC18
RC20
O1C
SET THE CHHLD SWITCH TO NOP RM088
MODIFY FOLLOWING LOCATIONS IN RCOM
ADDR — RM02
ADDR — EX83
ADDR — RM07B
DECR — RM07B
ADDR — RM11A
ADDR — RM08A
SET LINK INTO READ TABLE XR1 TO 0
RCOM
O1A
RCOM

Region ROPM

EXPLANATION OF REGION:

This routine will read the OLD PERT COST MASTER, which is the second file preceding the secondary information.

CALLING SEQUENCE:

```
L       TSX  ROPM, 4
L + 1   Normal return
```

INPUT:

OLD PERT COST MASTER

OUTPUT:

The location of the next logical record is in the address of the accumulator. The number of words contained in this record is in the decrement.

STORAGE USED:

PCDAT - RP99 - 31 words

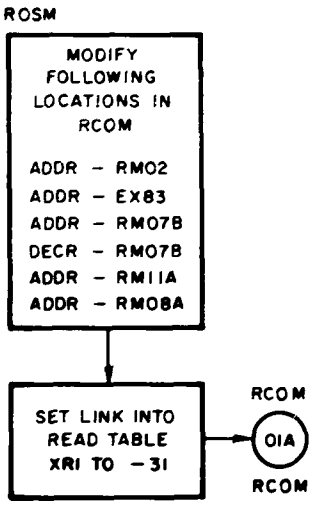
SUBREGIONS AND SUBROUTINES USED:

RCOM

EXPLANATION OF CALLING SEQUENCE:

If an error is determined in reading, a message is set out on the on-line printer and the program is stopped. If an E. O. F. is encountered the program will automatically go into its E. O. F. exit.

READ OLD
PERT COST
MASTER TAPE



Region ROSM

EXPLANATION OF REGION:

This routine will read the OLD SECONDARY MASTER which is the first file of the OLD PERT COST MASTER

CALLING SEQUENCE:

```
L       TSX  ROSM, 4
L + 1   Normal return
```

INPUT:

OLD PERT COST MASTER

OUTPUT:

The location of the next logical record is in the address of the accumulator. The number of words contained in this record is in the decrement.

STORAGE USED:

SMDAT - RS99 - 31 words

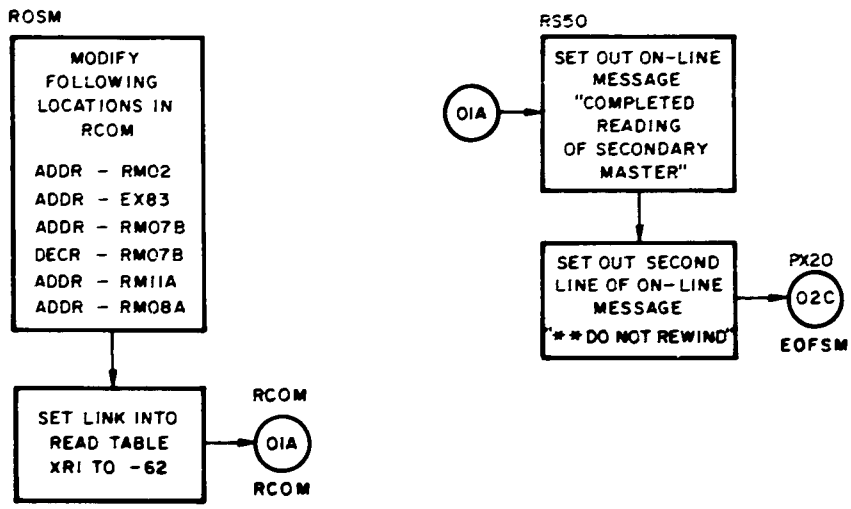
SUBREGIONS AND SUBROUTINES USED:

RCOM

EXPLANATION OF CALLING SEQUENCE:

If an error is determined in reading, a message is set out on the on-line printer and the program is stopped. If an E. O. F. is encountered the program will automatically go into its E. O. F. exit.

READ OLD
SECONDARY
MASTER TAPE



Region RRWD

EXPLANATION OF REGION:

This routine will read the INPUT DATA TAPE one record at a time.

CALLING SEQUENCE:

```
L      TSX  RRWD, 4
L + 1  Normal return
```

INPUT:

INPUT DATA TAPES

OUTPUT:

The location of the next logical record is in the address of the accumulator, the number of words contained in this record is in the decrement.

STORAGE USED:

RDDAT - RW99 - 31 words

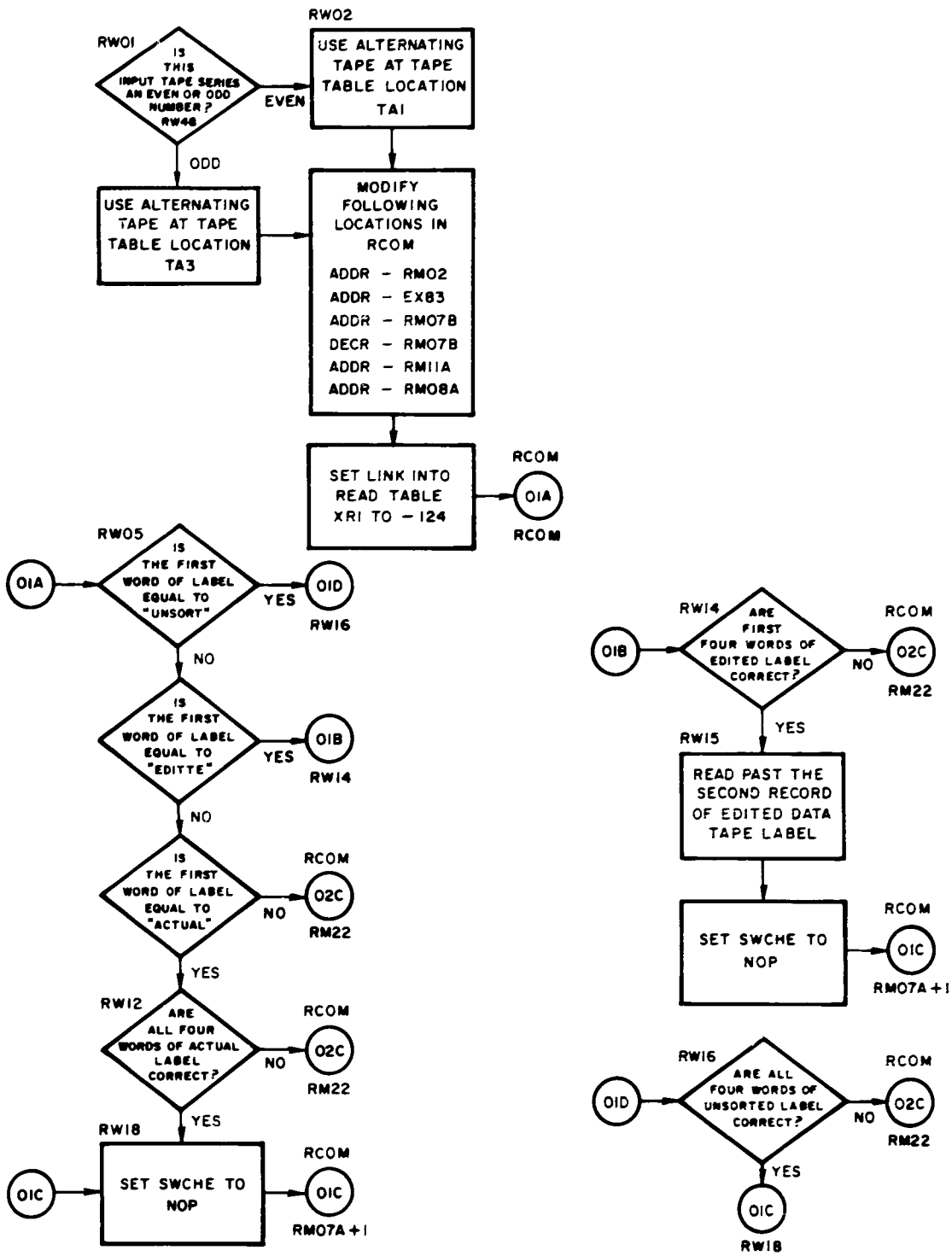
SUBREGIONS AND SUBROUTINES USED:

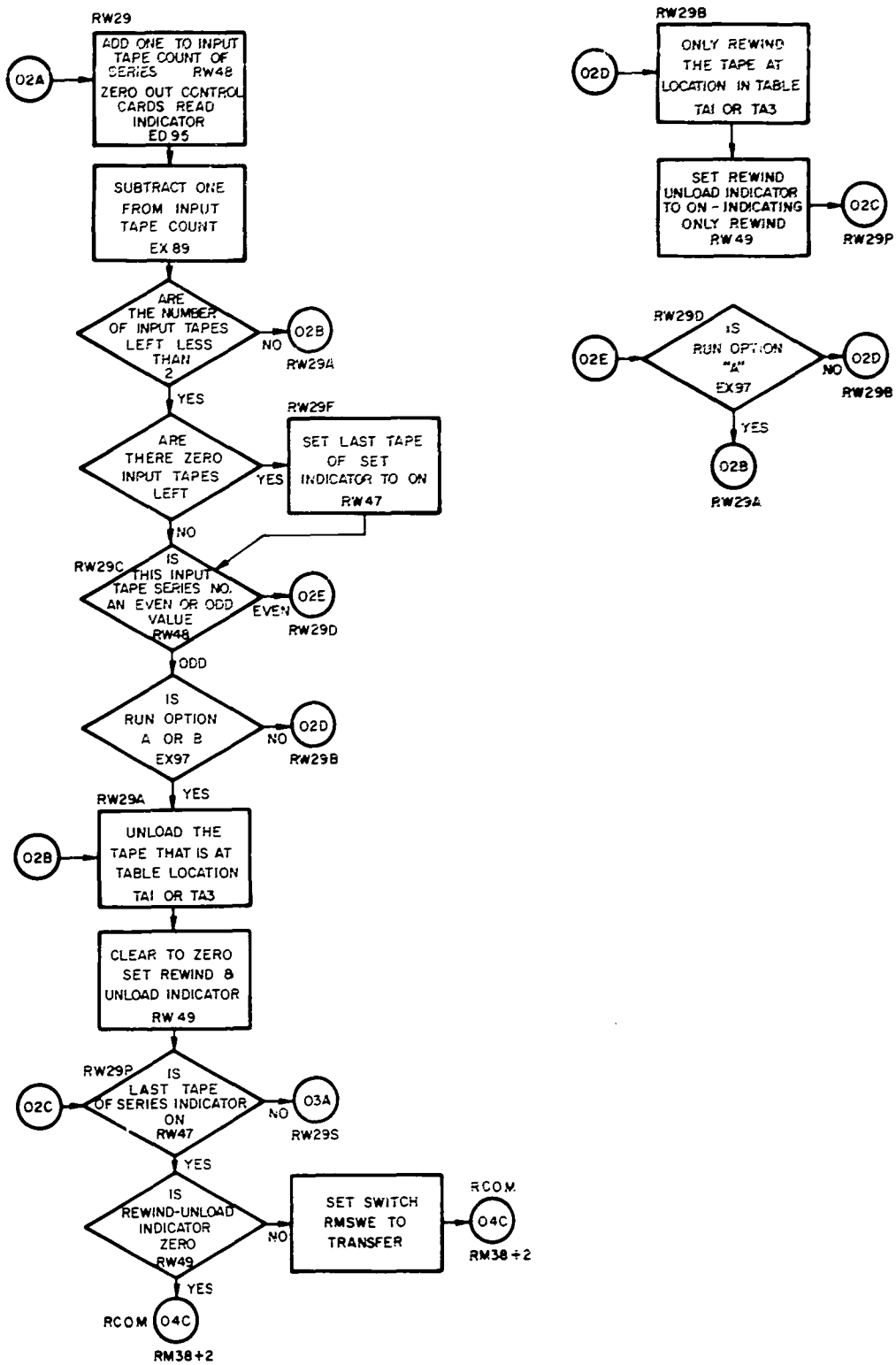
RECOM

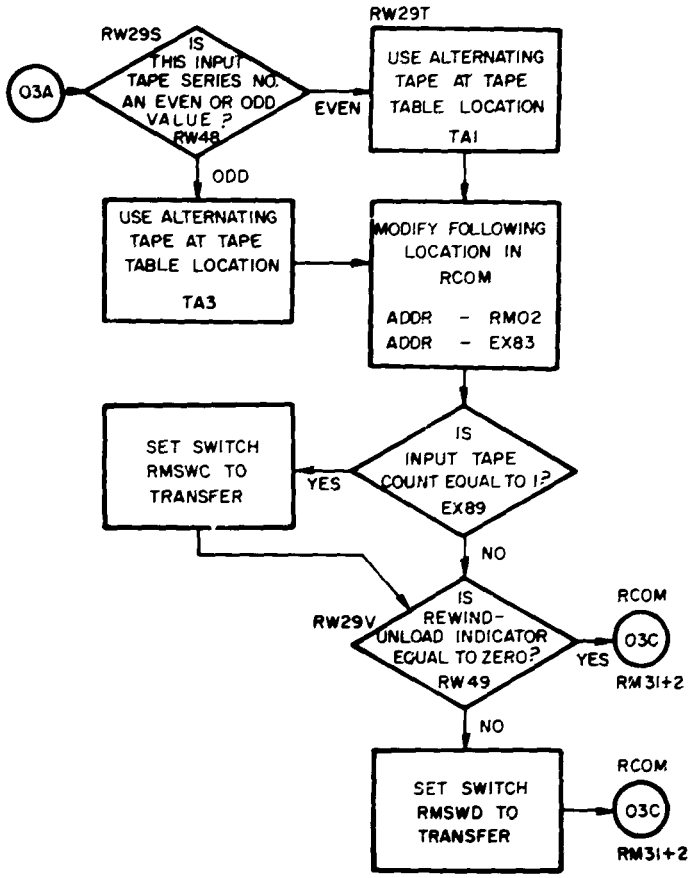
EXPLANATION OF CALLING SEQUENCE:

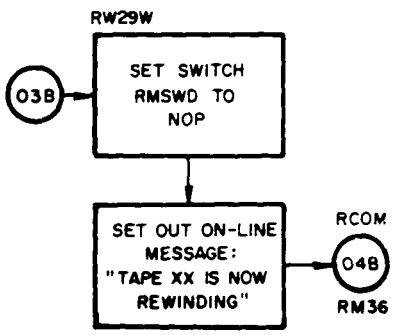
If an error is determined in reading, a message is set out on the on-line printer and the program is stopped. If an E. O. F. is encountered the program will automatically go into its E. O. F. exit.

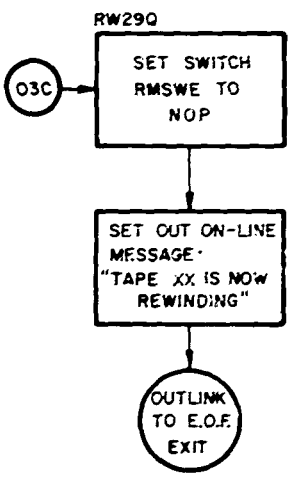
READ THE RAW DATA TAPE




RW29
02A
ADD ONE TO INPUT TAPE COUNT OF SERIES RW48
ZERO OUT CONTROL CARDS READ INDICATOR ED 95
SUBTRACT ONE FROM INPUT TAPE COUNT EX 89
ARE THE NUMBER OF INPUT TAPES LEFT LESS THAN 2
NO
02B
RW29A
YES
RW29F
ARE THERE ZERO INPUT TAPES LEFT
YES
SET LAST TAPE OF SET INDICATOR TO ON RW47
NO
RW29C
IS THIS INPUT TAPE SERIES NO. AN EVEN OR ODD VALUE RW48
EVEN
02E
RW29D
ODD
IS RUN OPTION A OR B EX97
NO
02D
RW29B
YES
RW29A
02B
UNLOAD THE TAPE THAT IS AT TABLE LOCATION TA1 OR TA3
CLEAR TO ZERO SET REWIND & UNLOAD INDICATOR RW 49
RW29P
02C
IS LAST TAPE OF SERIES INDICATOR ON RW47
NO
03A
RW29S
YES
IS REWIND-UNLOAD INDICATOR ZERO RW49
NO
SET SWITCH RMSWE TO TRANSFER
RCOM
04C
RM38+2
YES
RCOM
04C
RM38+2
RW29B
02D
ONLY REWIND THE TAPE AT LOCATION IN TABLE TA1 OR TA3
SET REWIND UNLOAD INDICATOR TO ON - INDICATING ONLY REWIND RW49
02C
RW29P
RW29D
02E
IS RUN OPTION "A" EX97
NO
02D
RW29B
YES
02B
RW29A


RW29S
IS THIS INPUT TAPE SERIES NO. AN EVEN OR ODD VALUE ? RW48
03A
EVEN
ODD
RW29T
USE ALTERNATING TAPE AT TAPE TABLE LOCATION TA1
USE ALTERNATING TAPE AT TAPE TABLE LOCATION TA3
MODIFY FOLLOWING LOCATION IN RCOM
ADDR - RM02
ADDR - EX83
IS INPUT TAPE COUNT EQUAL TO 1? EX89
YES
SET SWITCH RMSWC TO TRANSFER
NO
RW29V
IS REWIND-UNLOAD INDICATOR EQUAL TO ZERO? RW49
YES
RCOM
03C
RM31+2
NO
SET SWITCH RMSWD TO TRANSFER
RCOM
03C
RM31+2


RW29W
03B
SET SWITCH RMSWD TO NOP
SET OUT ON-LINE MESSAGE: "TAPE XX IS NOW REWINDING"
RCOM
04B
RM36


RW29Q
03C
SET SWITCH RMSWE TO NOP
SET OUT ON-LINE MESSAGE "TAPE XX IS NOW REWINDING"
OUTLINK TO E.O.F. EXIT

Region REDD

EXPLANATION OF REGION:

This routine will read the EDITED DATA TAPE for input into the sort routine.

CALLING SEQUENCE:

```
L       TSX  REDD, 4
L + 1   Normal return
```

INPUT:

EDITED DATA TAPE

OUTPUT:

The location of the next logical record is in the address of the accumulator. The number of words contained in this record is in the decrement.

STORAGE USED:

EDDAT - RE99 - 31 words

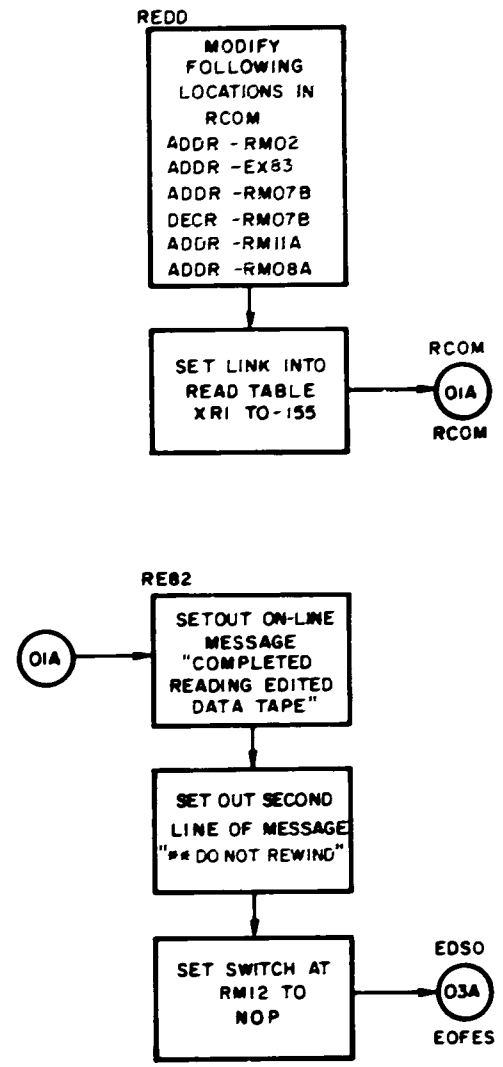
SUBREGIONS AND SUBROUTINES USED:

RCOM

EXPLANATION OF CALLING SEQUENCE:

If an error is determined in reading, a message is set out on the on-line printer and the program is stopped. If an E. O. F. is encountered the program will automatically go into its E. O. F. exit.

READ EDITED
DATA TAPE



Region RSTT

EXPLANATION OF REGION:

This routine will read the SORTED TIME TAPE. If the option is C or E it will create at this time a physical SORTED TIME TAPE to be read during option G.

CALLING SEQUENCE:

```
L      TSX  RSTT,4
L + 1  Normal return
```

INPUT:

SORTED TIME TAPE

OUTPUT:

The location of the next logical record is in the address of the accumulator. The number of words contained in this record is in the decrement.

STORAGE USED:

SPDAT - RA99 - 31 words

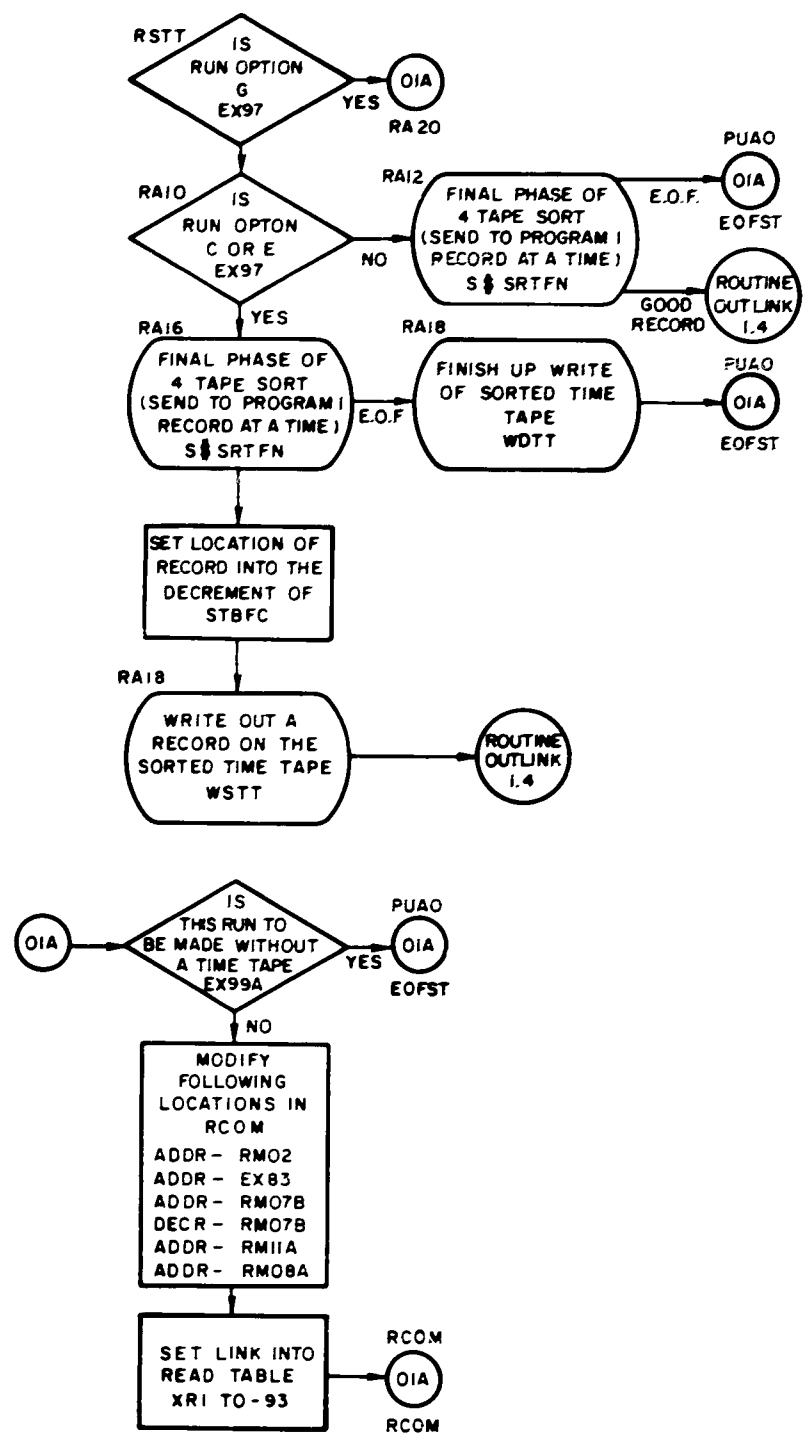
SUBREGIONS AND SUBROUTINES USED:

RCOM
WSTT
WDTT

EXPLANATION OF CALLING SEQUENCE:

If an error is determined in reading, a message is set out on the on-line printer and the program is stopped. If an E. O. F. is encountered the program will automatically go into its E. O. F. exit.

READ SORTED TIME TAPE



Region RCOM

EXPLANATION OF REGION:

This routine will set up all the error messages and operate the read routine for the PERT Cost program.

CALLING SEQUENCE:

```
L     TRA RCOM
```

INPUT:

The following locations are to be modified in the subroutine that uses this routine:

RM09 - Save XR1
RM 10 - Save XR4
RM02 - Location of tape no.
RM07B - Decr - Location of buffers

RM07B, RM11A, RM08A } Indirect location of tape no.

OUTPUT:

The first time this routine is entered for a tape, an on-line message is printed out indicating that the program is reading this tape. All unloads or rewinds are also set out on the printer.

STORAGE USED:

Not applicable

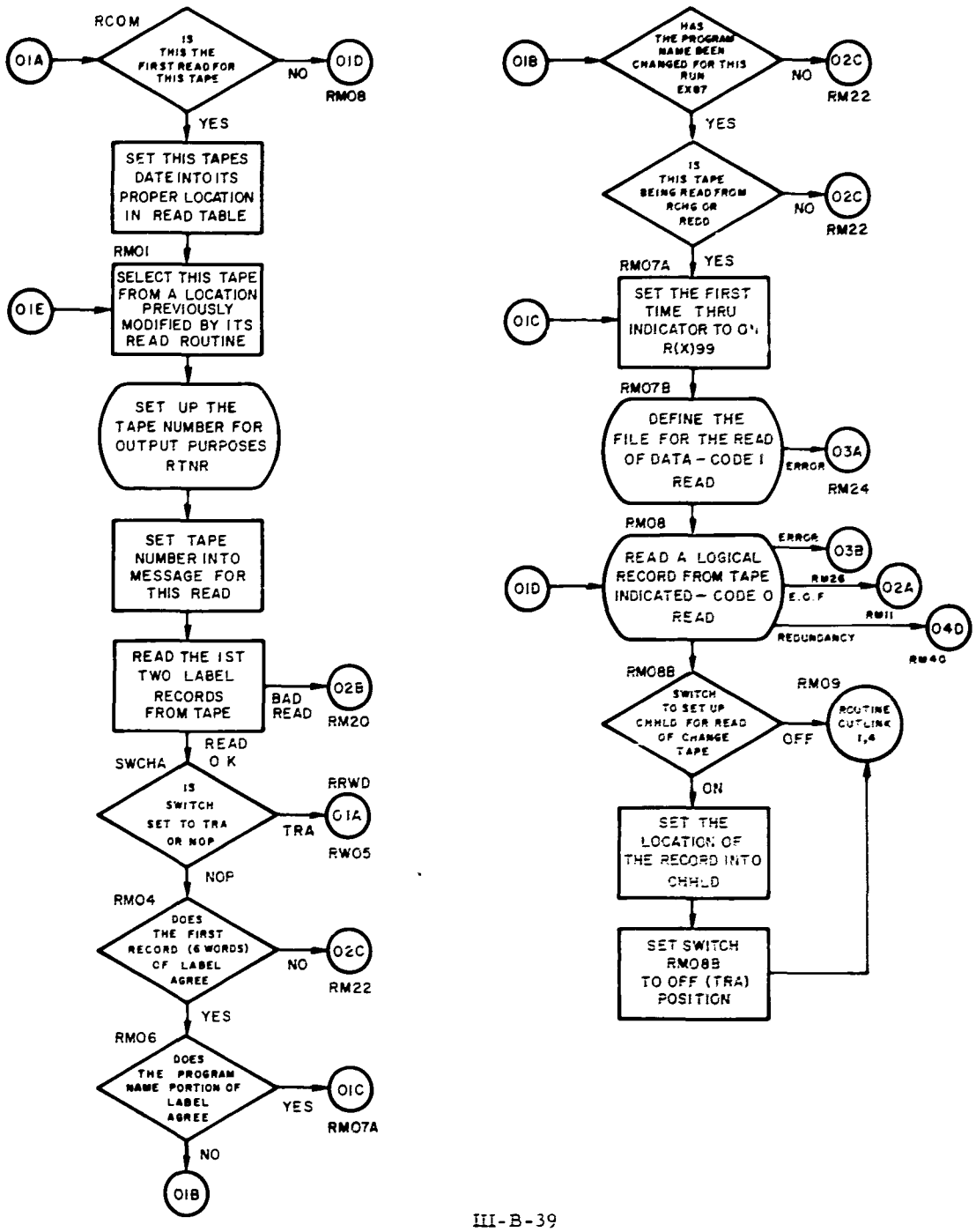
SUBREGIONS AND SUBROUTINES USED:

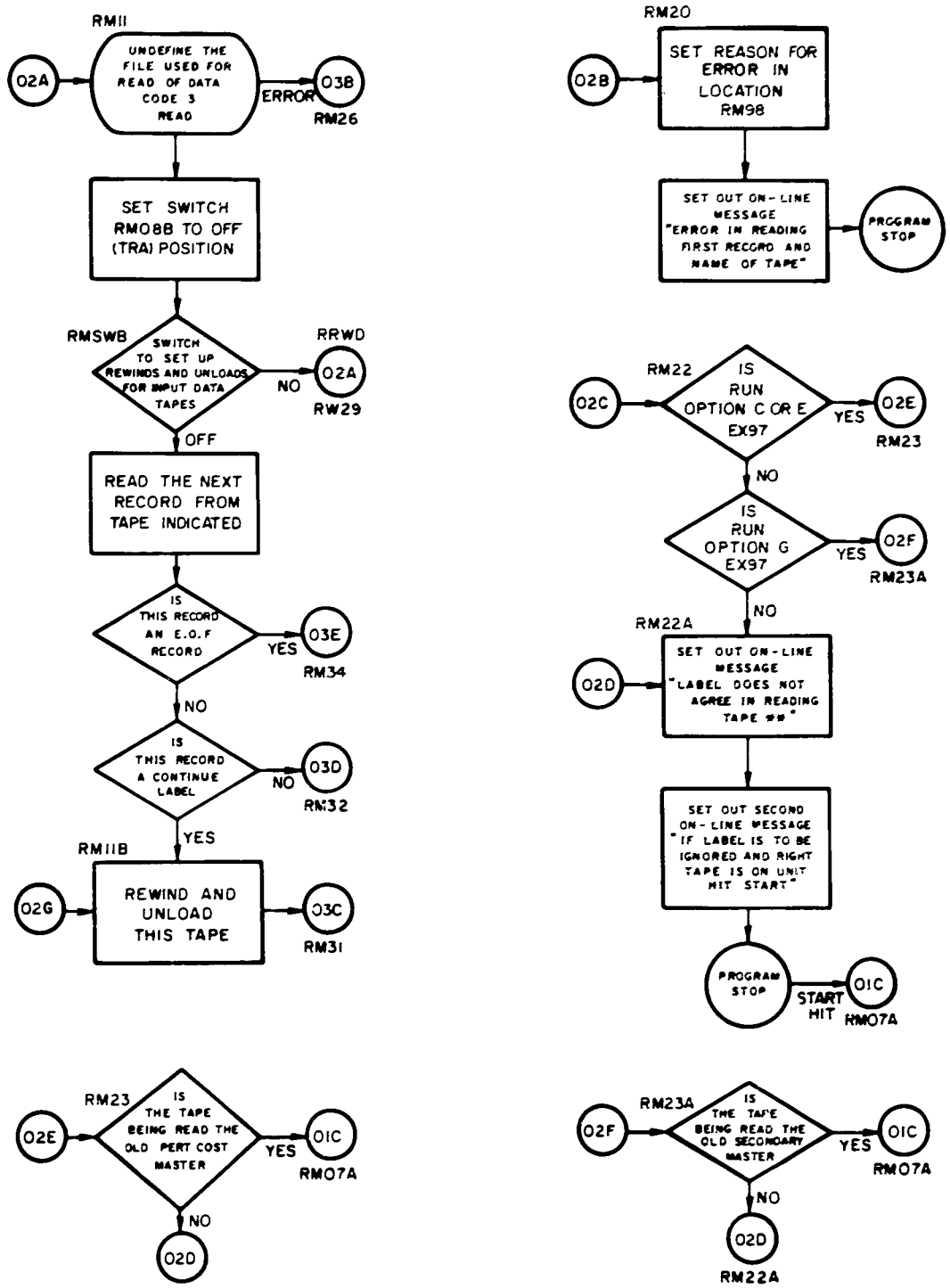
RTNR
TAPSN
READ

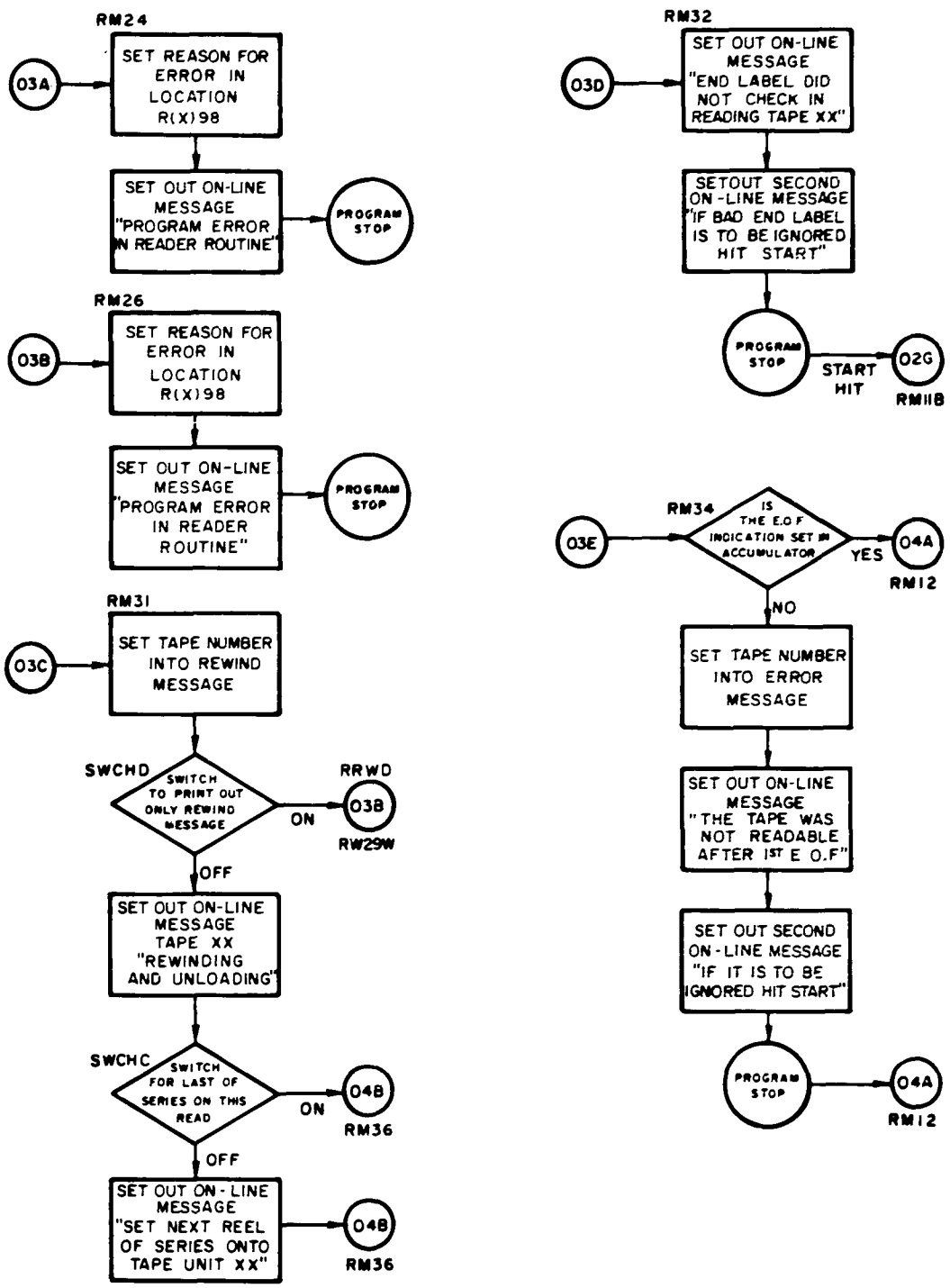
EXPLANATION OF CALLING SEQUENCE:

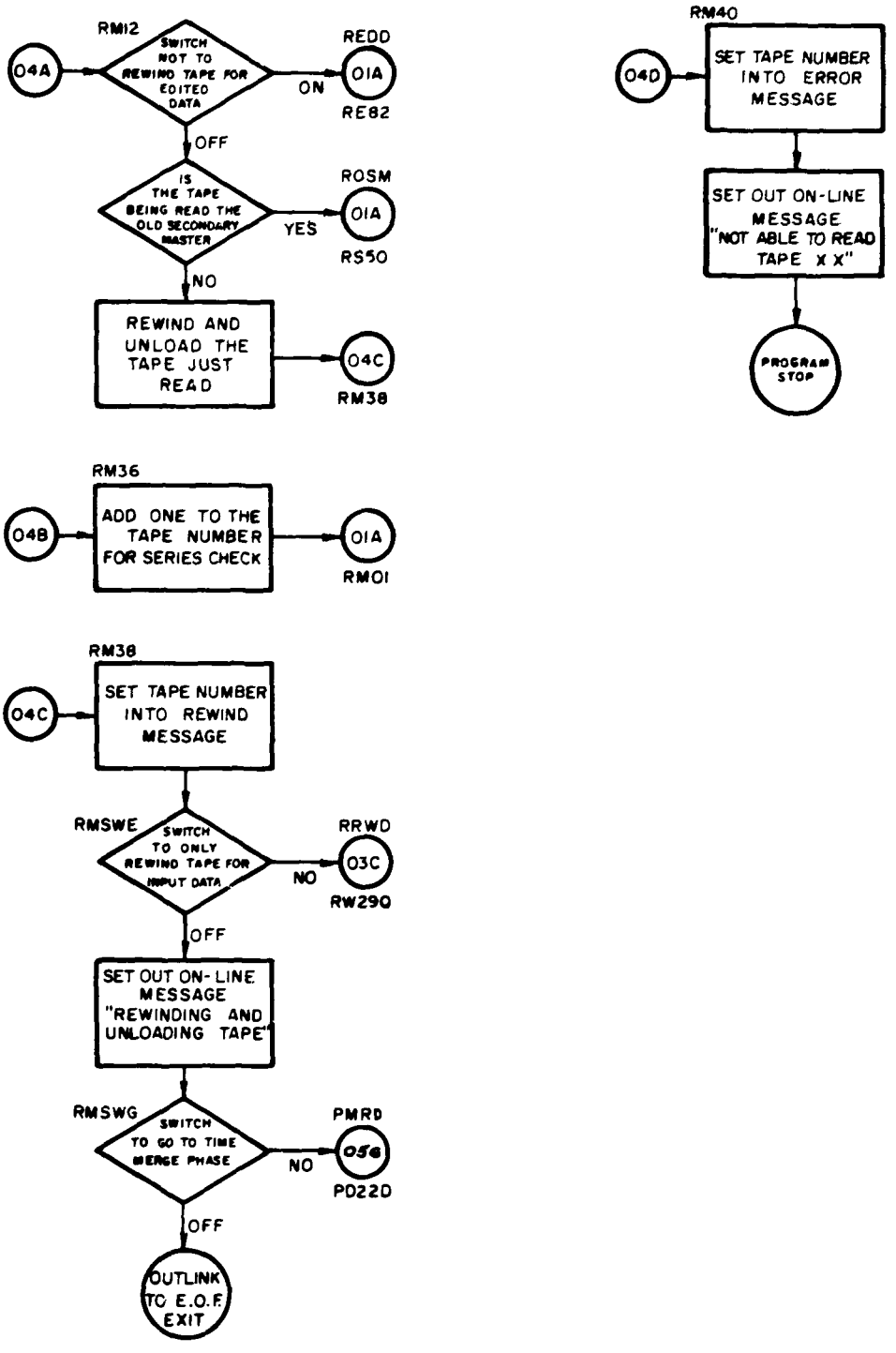
If an error is determined in reading, a message is set out on the on-line printer and the program is stopped. The outlink to this routine is the location set up by the subroutines that use this routine.

COMMON READ AREA




RM11
UNDEFINE THE FILE USED FOR READ OF DATA CODE 3 READ
02A
ERROR
03B
RM26
SET SWITCH RM088 TO OFF (TRA) POSITION
RMSWB
SWITCH TO SET UP REWINDS AND UNLOADS FOR INPUT DATA TAPES
NO
RRWD
02A
RW29
OFF
READ THE NEXT RECORD FROM TAPE INDICATED
IS THIS RECORD AN E.O.F RECORD
YES
03E
RM34
NO
IS THIS RECORD A CONTINUE LABEL
NO
03D
RM32
YES
RM11B
02G
REWIND AND UNLOAD THIS TAPE
03C
RM31
RM20
02B
SET REASON FOR ERROR IN LOCATION RM98
SET OUT ON-LINE MESSAGE "ERROR IN READING FIRST RECORD AND NAME OF TAPE"
PROGRAM STOP
RM22
02C
IS RUN OPTION C OR E EX97
YES
02E
RM23
NO
IS RUN OPTION G EX97
YES
02F
RM23A
NO
RM22A
02D
SET OUT ON-LINE MESSAGE "LABEL DOES NOT AGREE IN READING TAPE **"
SET OUT SECOND ON-LINE MESSAGE "IF LABEL IS TO BE IGNORED AND RIGHT TAPE IS ON UNIT HIT START"
PROGRAM STOP
START HIT
01C
RM07A
RM23
02E
IS THE TAPE BEING READ THE OLD PERT COST MASTER
YES
01C
RM07A
NO
02D
RM22A
RM23A
02F
IS THE TAPE BEING READ THE OLD SECONDARY MASTER
YES
01C
RM07A
NO
02D
RM22A


RM24
03A
SET REASON FOR ERROR IN LOCATION R(X)98
SET OUT ON-LINE MESSAGE "PROGRAM ERROR IN READER ROUTINE"
PROGRAM STOP
RM26
03B
SET REASON FOR ERROR IN LOCATION R(X)98
SET OUT ON-LINE MESSAGE "PROGRAM ERROR IN READER ROUTINE"
PROGRAM STOP
RM31
03C
SET TAPE NUMBER INTO REWIND MESSAGE
SWCHD
SWITCH TO PRINT OUT ONLY REWIND MESSAGE
ON
RRWD
038
RW29W
OFF
SET OUT ON-LINE MESSAGE TAPE XX "REWINDING AND UNLOADING"
SWCHC
SWITCH FOR LAST OF SERIES ON THIS READ
ON
048
RM36
OFF
SET OUT ON-LINE MESSAGE "SET NEXT REEL OF SERIES ONTO TAPE UNIT XX"
048
RM36
RM32
03D
SET OUT ON-LINE MESSAGE "END LABEL DID NOT CHECK IN READING TAPE XX"
SETOUT SECOND ON-LINE MESSAGE "IF BAD END LABEL IS TO BE IGNORED HIT START"
PROGRAM STOP
START HIT
02G
RM11B
RM34
03E
IS THE E.O.F INDICATION SET IN ACCUMULATOR
YES
04A
RM12
NO
SET TAPE NUMBER INTO ERROR MESSAGE
SET OUT ON-LINE MESSAGE "THE TAPE WAS NOT READABLE AFTER 1ST E O.F"
SET OUT SECOND ON-LINE MESSAGE "IF IT IS TO BE IGNORED HIT START"
PROGRAM STOP
04A
RM12


RM12
SWITCH NOT TO REWIND TAPE FOR EDITED DATA
04A
ON
REDD
01A
RE82
OFF
IS THE TAPE BEING READ THE OLD SECONDARY MASTER
YES
ROSM
01A
RS50
NO
REWIND AND UNLOAD THE TAPE JUST READ
04C
RM38
RM40
04D
SET TAPE NUMBER INTO ERROR MESSAGE
SET OUT ON-LINE MESSAGE "NOT ABLE TO READ TAPE X X"
PROGRAM STOP
RM36
04B
ADD ONE TO THE TAPE NUMBER FOR SERIES CHECK
01A
RM01
RM38
04C
SET TAPE NUMBER INTO REWIND MESSAGE
RMSWE
SWITCH TO ONLY REWIND TAPE FOR INPUT DATA
NO
RRWD
03C
RW290
OFF
SET OUT ON-LINE MESSAGE "REWINDING AND UNLOADING TAPE"
RMSWG
SWITCH TO GO TO TIME MERGE PHASE
NO
PMRD
056
PD22D
OFF
OUTLINK TO E.O.F. EXIT

Region RTNR

EXPLANATION OF REGION:

This routine will set up the tape number and beginning read messages.

CALLING SEQUENCE:

```
L       TSX  RTNR, 4
L + 1   Normal return
```

INPUT:

Input is the tape number right-justified in the accumulator

OUTPUT:

Output is the beginning read message on the on-line printer and the set up of tape number into other messages.

STORAGE USED:

Not applicable

SUBREGIONS AND SUBROUTINES USED:

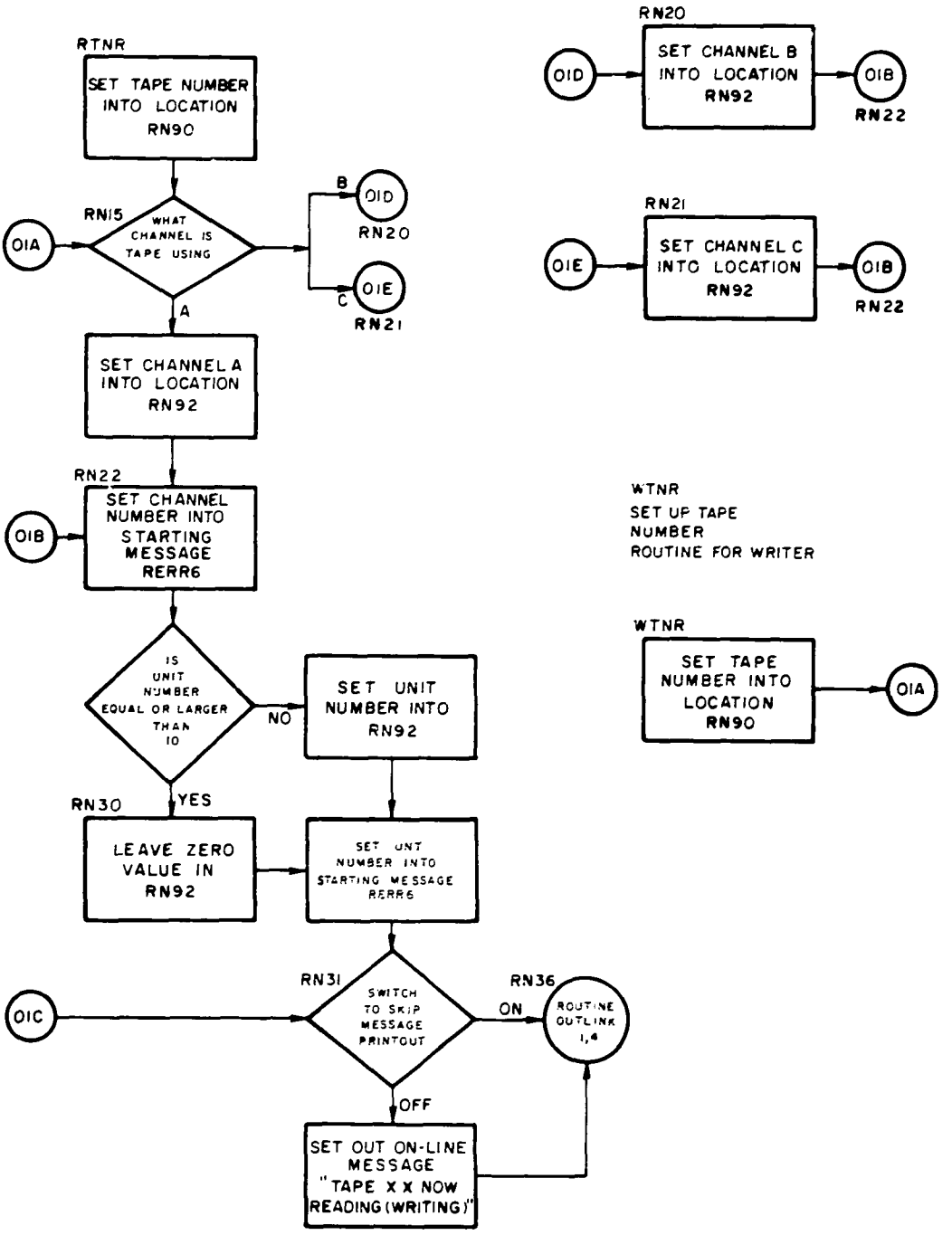
Not applicable

EXPLANATION OF CALLING SEQUENCE:

Not applicable

REGION RTNR

SETUP TAPE NUMBER ROUTINE



Region RINP

EXPLANATION OF REGION:

This routine will read the USERS TIME TAPE input parameters into the system.

CALLING SEQUENCE:

```
L       TSX   RINP, 4
L + 1   Normal return
```

INPUT:

OLD PERT COST MASTER

OUTPUT:

The input parameters will be set into its location in core.

STORAGE USED:

RI25 - RI70 - 21 words

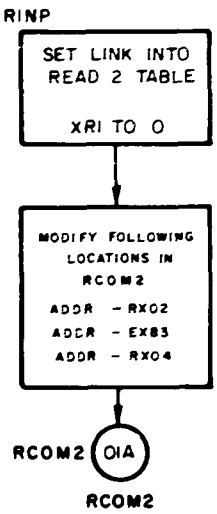
SUBREGIONS AND SUBROUTINES USED:

RCOM2

EXPLANATION OF CALLING SEQUENCE:

If an error is determined in reading, a message is set out on the on-line printer and the program is stopped.

READ INPUT PARAMETERS



Region RRTB

EXPLANATION OF REGION:

This routine will read the rate table into the system from the OLD PERT COST MASTER.

CALLING SEQUENCE:

```
L      TSX  RRTB, 4
L + 1  Normal return
```

INPUT:

OLD PERT COST MASTER

OUTPUT:

The rate table will be set into its location in core.

STORAGE USED:

RR25 - RR70 - 21 words

SUBREGIONS AND SUBROUTINES USED:

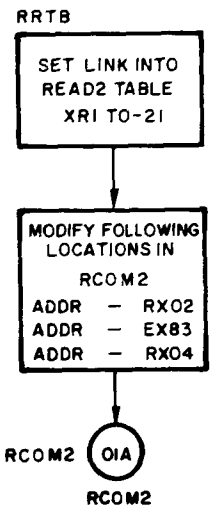
RCOM2

EXPLANATION OF CALLING SEQUENCE:

If an error is determined in reading, a message is set out on the on-line printer and the program is stopped.

REGION RRTB

READ RATE TABLE



Region RSTR

EXPLANATION OF REGION:

From the old PERT COST MASTER, this routine will read into the system the skill table tied to rainbow category and cost category.

CALLING SEQUENCE:

```
L       TSX  RSTR, 4
L + 1   Normal return
```

INPUT:

OLD PERT COST MASTER

OUTPUT:

The skill table will be set into its location in core.

STORAGE USED:

RT25 - RT70 - 21 words

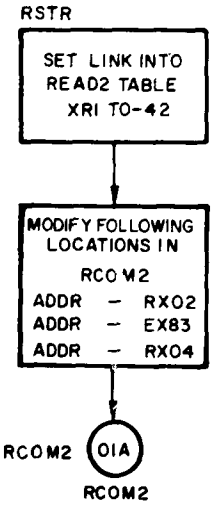
SUBREGIONS AND SUBROUTINES USED:

RCOM2

EXPLANATION OF CALLING SEQUENCE:

If an error is determined in reading, a message is set out on the on-line printer and the program is stopped.

READ SKILL
TABLE



Region RCOM2

EXPLANATION OF REGION:

This routine will handle the control for the PERT COST TABLES. It will also produce the error messages and operate the read macros.

CALLING SEQUENCE:

```
L     TRA  RCOM2
```

INPUT:

The following locations are to be modified in the subroutine that uses this routine:

RX09 - Save XR4
RX02 - Location of tape no.
RX04 - Location of secondary master Date

OUTPUT:

Not applicable

STORAGE USED:

Not applicable

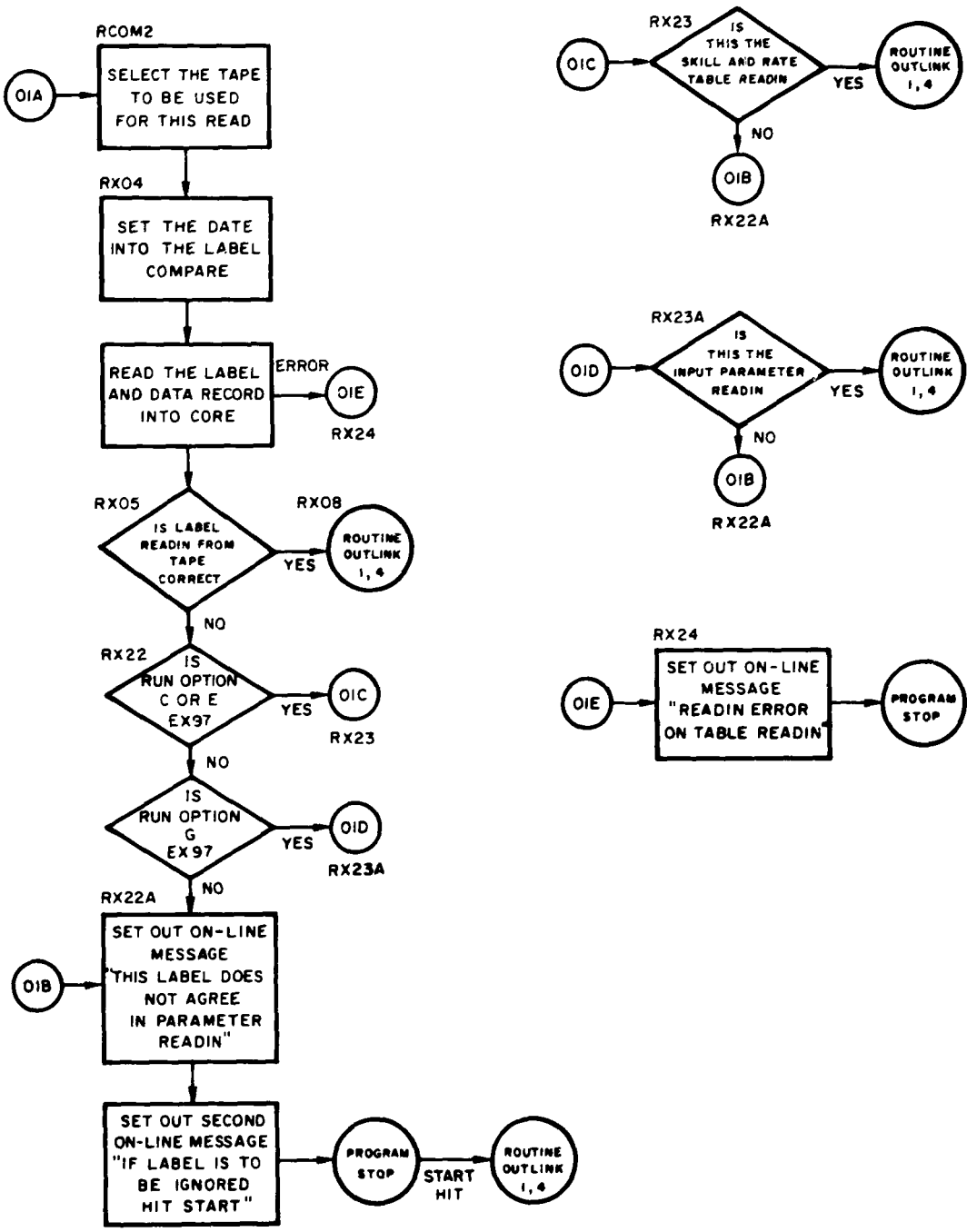
SUBREGIONS AND SUBROUTINES USED:

TAPSN (AC)

EXPLANATION OF CALLING SEQUENCE:

If an error is determined in reading, a message is set out on the on-line printer and the program is stopped. The outlink to this routine is the location set up by the subroutines that use this routine.

COMMON READ
FOR TABLES



Region WNPM

EXPLANATION OF REGION:

This routine will write the NEW PERT COST MASTER, which is a variable record from a location in core into a blocked record.

CALLING SEQUENCE:

```
L       TSX  WNPM, 4
L + 1   Normal return
```

INPUT:

Location WP91 will contain the location of where the record begins plus the word count.

OUTPUT:

NEW PERT COST MASTER

STORAGE USED:

OPTPE - WP99 - 22 words

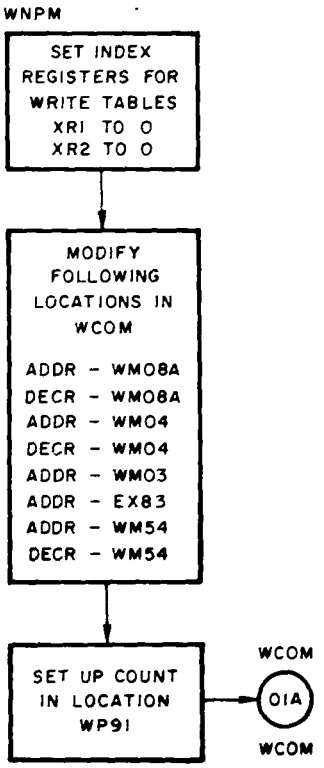
SUBREGIONS AND SUBROUTINES USED:

WCOM

EXPLANATION OF CALLING SEQUENCE:

If an error is determined in writing, a message is set out on the on-line printer and the program is stopped. If end of tape is reached the program will automatically rewind/unload and continue on after setting on a new tape.

WRITE NEW
PERT COST
MASTER TAPE



Region WNSM

EXPLANATION OF REGION:

From a location in core, this routine will write the NEW SECONDARY MASTER, which is a fixed size record, into a blocked record.

CALLING SEQUENCE:

```
L       TSX  WNSM, 4
L + 1   Normal return
```

INPUT:

Not applicable

OUTPUT:

NEW PERT COST MASTER (first file)

STORAGE USED:

OSTPE - WS99 - 22 words

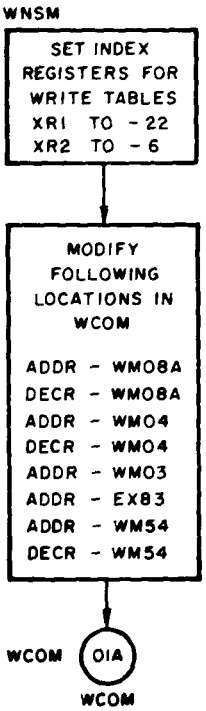
SUBREGIONS AND SUBROUTINES USED:

WCOM

EXPLANATION OF CALLING SEQUENCE:

If an error is determined in writing, a message is set out on the on-line printer and the program is stopped. If end of tape is reached, the program will automatically rewind/unload and continue on after setting on a new tape.

WRITE NEW
SECONDARY
MASTER TAPE



Region WRWD

EXPLANATION OF REGION:

This routine will write the edited data one record at a time onto the EDITED DATA TAPE.

CALLING SEQUENCE:

```
L       TSX   WRWD, 4
L + 1   Normal return
```

INPUT:

Not applicable

OUTPUT:

EDITED DATA TAPE (first file)

STORAGE USED:

EDTPE - WW99 - 22 words

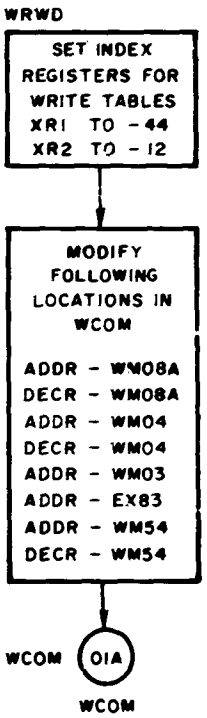
SUBREGIONS AND SUBROUTINES USED:

WCOM

EXPLANATION OF CALLING SEQUENCE:

If an error is determined in writing, a message is set out on the on-line printer and the program is stopped. If end of tape is reached, the program will automatically rewind/unload and continue on after setting on a new tape.

WRITE EDITED
DATA TAPE



Region WSTT

EXPLANATION OF REGION:

This routine will write the SORTED TIME TAPE in blocks of 600 words during Option C or E.

CALLING SEQUENCE:

```
L       TSX  WSTT, 4
L + 1   Normal return
```

INPUT:

Not applicable

OUTPUT:

SORTED TIME TAPE (for use in Option G)

STORAGE USED:

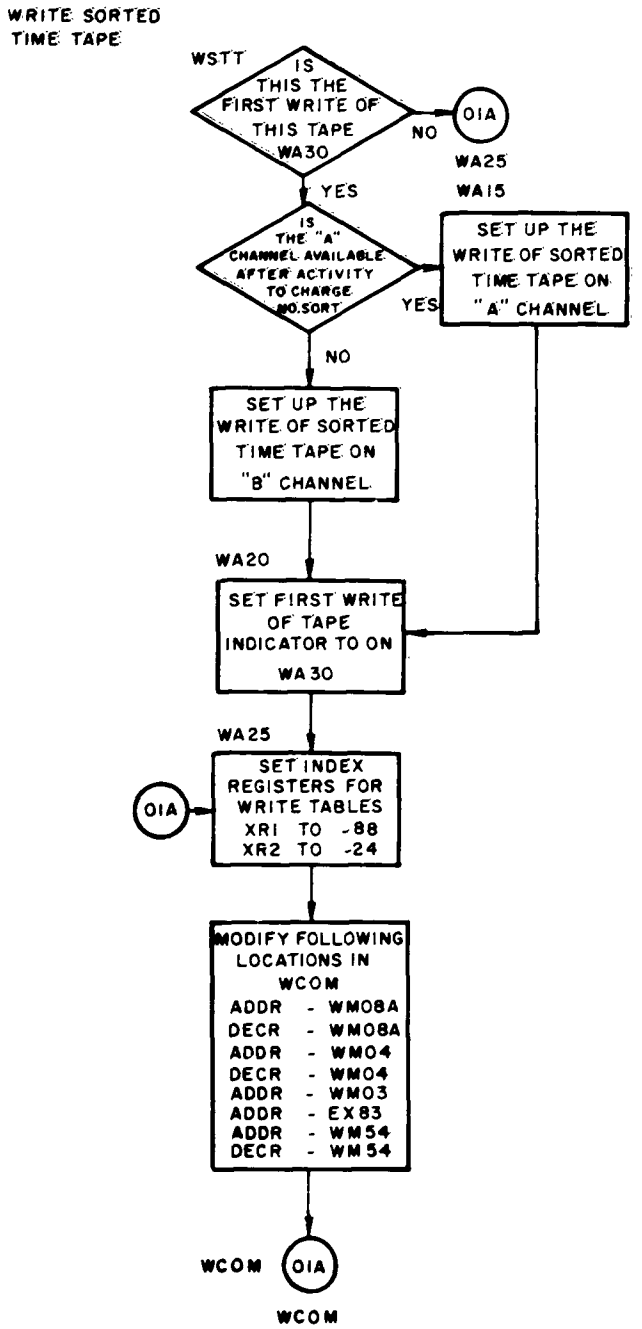
SOTPE - WA99 - 22 words

SUBREGIONS AND SUBROUTINES USED:

WCOM

EXPLANATION OF CALLING SEQUENCE:

If an error is determined in writing, a message is set out on the on-line printer and the program is stopped. If end of tape is reached, the program will automatically rewind/unload and continue on after setting on a new tape.


WRITE SORTED TIME TAPE
WSTT
IS THIS THE FIRST WRITE OF THIS TAPE WA30
NO
01A
WA25
WA15
YES
IS THE "A" CHANNEL AVAILABLE AFTER ACTIVITY TO CHARGE NO.SORT
YES
SET UP THE WRITE OF SORTED TIME TAPE ON "A" CHANNEL
NO
SET UP THE WRITE OF SORTED TIME TAPE ON "B" CHANNEL
WA20
SET FIRST WRITE OF TAPE INDICATOR TO ON WA30
WA25
01A
SET INDEX REGISTERS FOR WRITE TABLES
XR1 TO -88
XR2 TO -24
MODIFY FOLLOWING LOCATIONS IN WCOM
ADDR - WM08A
DECR - WM08A
ADDR - WM04
DECR - WM04
ADDR - WM03
ADDR - EX83
ADDR - WM54
DECR - WM54
WCOM
01A
WCOM

Region WCHG

EXPLANATION OF REGION:

This routine will write the SORTED DATA TAPE in blocks of 200 words.

CALLING SEQUENCE:

```
L       TSX  WCHG, 4
L + 1   Normal return
```

INPUT:

Not applicable

OUTPUT:

SORTED DATA TAPE (second file - after EDITED DATA TAPE)

STORAGE USED:

OCTPE - WC99 - 22 words

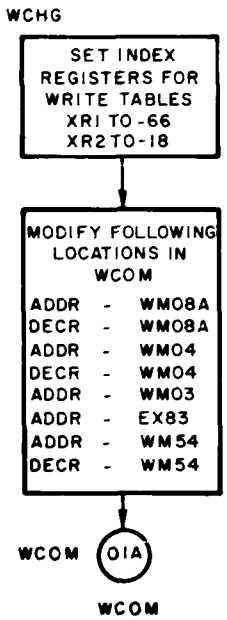
SUBREGIONS AND SUBROUTINES USED:

WCOM

EXPLANATION OF CALLING SEQUENCE:

If an error is determined in writing, a message is set out on the on-line printer and the program is stopped. If end of tape is reached, the program will automatically rewind/unload and continue on after setting on a new tape.

WRITE SORTED
DATA TAPE



Region WCOM

EXPLANATION OF REGION:

This routine will set up all the error messages and operate the write routine for the PERT COST PROGRAM.

CALLING SEQUENCE:

L TRA WCOM

INPUT:

The following locations are to be modified in the subroutine that uses this routine:

WM09 - Save XR1
WM09A - Save XR2
WM10 - Save XR4
WM04 - Decr - Address of location of output buffers
WM03 - Location of tape no.
WM04
WM08A
WM54 - Addr
WM54 - Decr
} Indirect location of tape no.

OUTPUT:

The first time this routine is entered for a tape, an on-line message is printed out indicating that the program is writing this tape. All unloads or rewinds are also set out on the printer.

STORAGE USED:

Not applicable

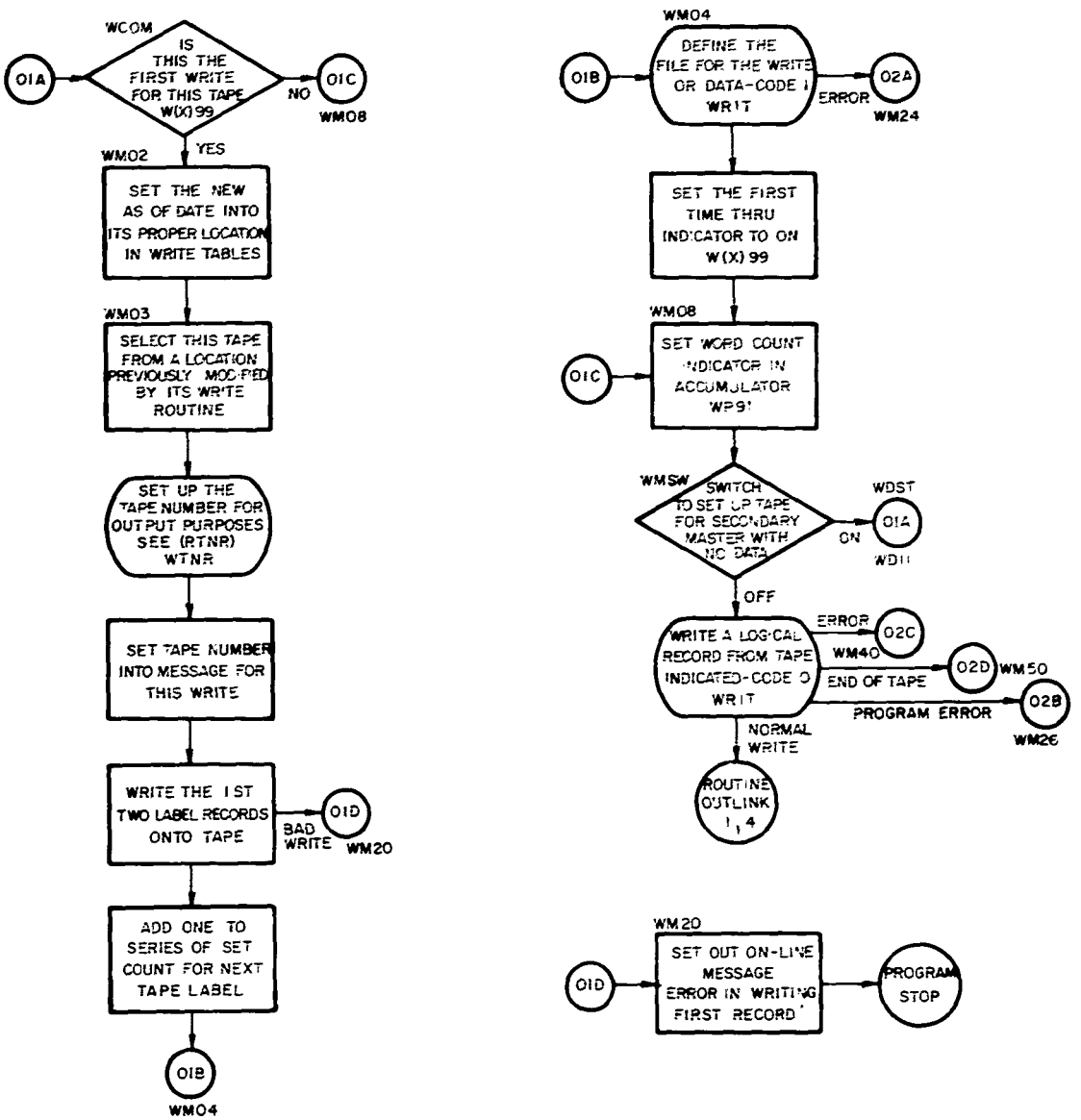
SUBREGIONS AND SUBROUTINES USED:

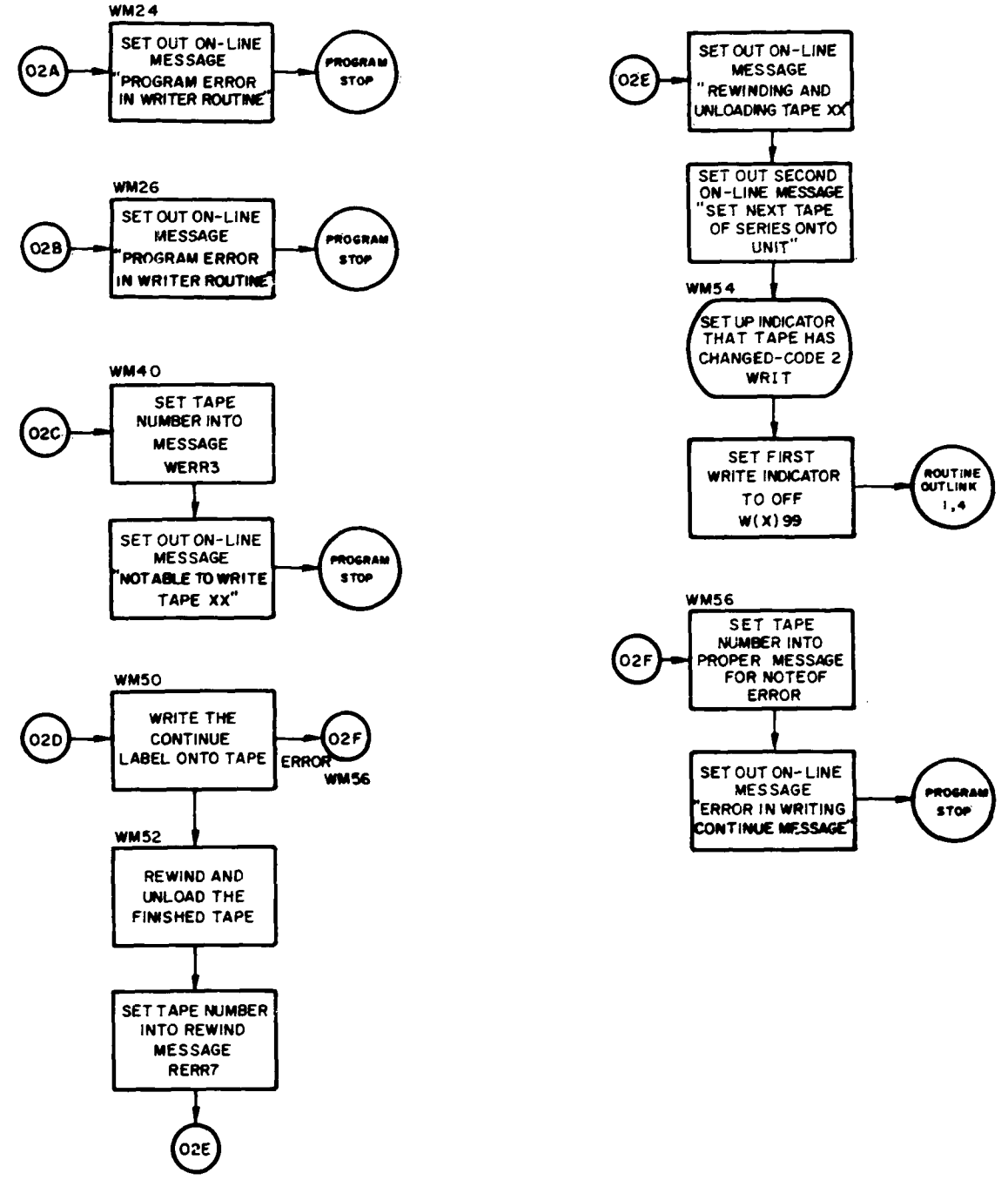
TAPSN
WRIT

EXPLANATION OF CALLING SEQUENCE:

If an error is determined in writing, a message is set out on the on-line printer and the program is stopped. The outlink to this routine is the location set up by the subroutines that use this routine.

COMMON WRITE ROUTINE




WM24
02A
SET OUT ON-LINE MESSAGE "PROGRAM ERROR IN WRITER ROUTINE"
PROGRAM STOP
WM26
02B
SET OUT ON-LINE MESSAGE "PROGRAM ERROR IN WRITER ROUTINE"
PROGRAM STOP
WM40
02C
SET TAPE NUMBER INTO MESSAGE WERR3
SET OUT ON-LINE MESSAGE "NOT ABLE TO WRITE TAPE XX"
PROGRAM STOP
WM50
02D
WRITE THE CONTINUE LABEL ONTO TAPE
02F
ERROR
WM56
WM52
REWIND AND UNLOAD THE FINISHED TAPE
SET TAPE NUMBER INTO REWIND MESSAGE RERR7
02E
02E
SET OUT ON-LINE MESSAGE "REWINDING AND UNLOADING TAPE XX"
SET OUT SECOND ON-LINE MESSAGE "SET NEXT TAPE OF SERIES ONTO UNIT"
WM54
SET UP INDICATOR THAT TAPE HAS CHANGED-CODE 2 WRIT
SET FIRST WRITE INDICATOR TO OFF W(X) 99
ROUTINE OUTLINK 1,4
WM56
02F
SET TAPE NUMBER INTO PROPER MESSAGE FOR NOTEOF ERROR
SET OUT ON-LINE MESSAGE "ERROR IN WRITING CONTINUE MESSAGE"
PROGRAM STOP

Region WINP

EXPLANATION OF REGION:

This routine will write the USERS TIME TAPE input parameters from core onto tape.

CALLING SEQUENCE:

```
L       TSX  WINP, 4
L + 1   Normal return
```

INPUT:

The input parameters in core

OUTPUT:

NEW PERT COST MASTER (first file)

STORAGE USED:

WI25 - WI30 - 6 words

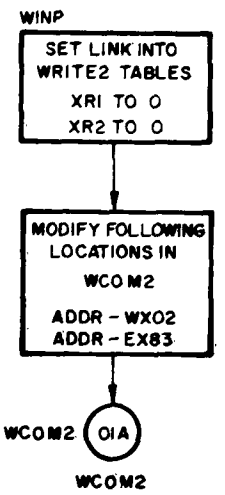
SUBREGIONS AND SUBROUTINES USED:

WCOM2

EXPLANATION OF CALLING SEQUENCE:

If an error is determined in writing, a message is set out on the on-line printer and the program is stopped.

WRITE INPUT PARAMETERS



Region WRTB

EXPLANATION OF REGION:

This routine will write the rate table from core onto the NEW PERT COST MASTER.

CALLING SEQUENCE:

```
L       TSX  WRTB, 4
L + 1   Normal return
```

INPUT:

The rate table in core

OUTPUT:

NEW PERT COST MASTER (second file)

STORAGE USED:

WR25 - WR30 - 6 words

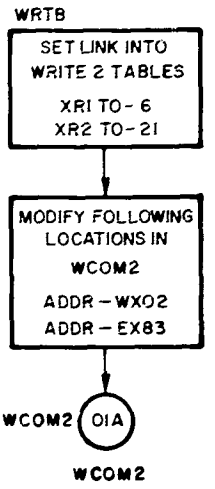
SUBREGIONS AND SUBROUTINES USED:

WCOM2

EXPLANATION OF CALLING SEQUENCE:

If an error is determined in writing, a message is set out on the on-line printer and the program is stopped.

WRITE RATE TABLE



Region WSTR

EXPLANATION OF REGION:

This routine will write the skill table, tied to rainbow category and cost category, from core onto the NEW PERT COST MASTER.

CALLING SEQUENCE:

```
L       TSX   WSTR, 4
L + 1   Normal return
```

INPUT:

The skill table in core

OUTPUT:

NEW PERT COST MASTER (second file)

STORAGE USED:

WT25 - WT30 - 6 words

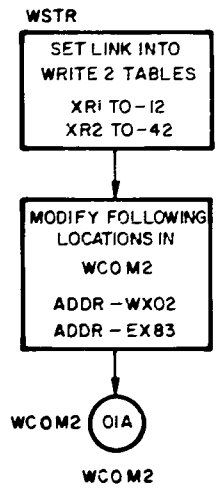
SUBREGIONS AND SUBROUTINES USED:

WCOM2

EXPLANATION OF CALLING SEQUENCE:

If an error is determined in writing, a message is set out on the on-line printer and the program is stopped.

WRITE SKILL TABLE



Region WCOM2

EXPLANATION OF REGION:

This routine will write out the tables for the PERT Cost program, according to the modifications set up by the subroutines that use this routine.

CALLING SEQUENCE:

```
L     TRA  WCOM2
```

INPUT:

The following locations are to be modified in the subroutine that uses this routine:

WX04 - Save XR1
WX05 - Save XR2
WX06 - Save XR4

WX02 - Location of tape no.

OUTPUT:

Not applicable

STORAGE USED:

Not applicable

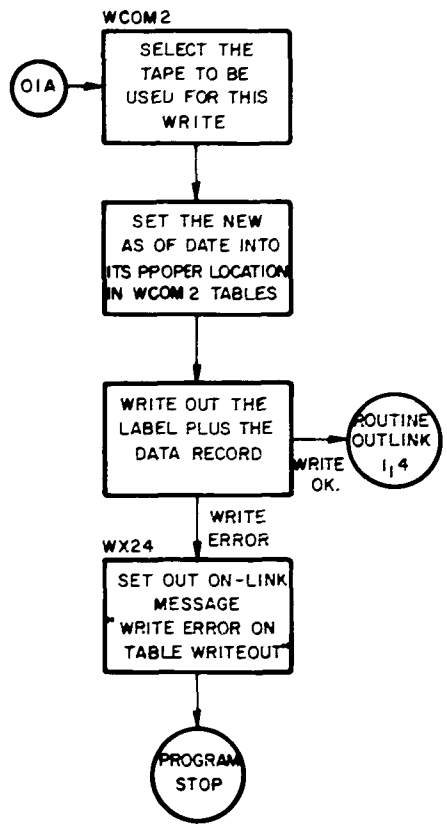
SUBREGIONS AND SUBROUTINES USED:

TAPSN

EXPLANATION OF CALLING SEQUENCE:

If an error is determined in writing, a message is set out on the on-line printer and the program is stopped. The outlink to this routine is the location set up by the subroutines that use this routine.

COMMON WRITE
FOR TABLES



Region WDNP

EXPLANATION OF REGION:

This routine will write the E. O. F. and accomplish the rewind/unloads, for the NEW PERT COST MASTER.

CALLING SEQUENCE:

```
L       TSX   WDNP, 4
L + 1   Normal return
```

INPUT:

Not applicable

OUTPUT:

A completed NEW PERT COST MASTER TAPE rewind and unloaded (second file)

STORAGE USED:

Not applicable

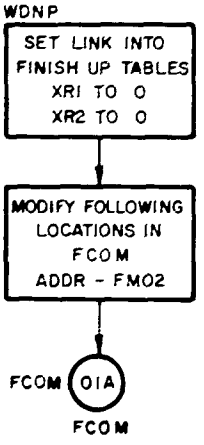
SUBREGIONS AND SUBROUTINES USED:

FCOM

EXPLANATION OF CALLING SEQUENCE:

If an error is determined in finishing up this tape, a message is set out on the on-line printer and the program is stopped.

FINISH UP
PERT COST TAPE



Region WDNS

EXPLANATION OF REGION:

This routine will write the E. O. F. for the NEW SECONDARY MASTER TAPE.

CALLING SEQUENCE:

```
L       TSX   WDNS, 4
L + 1   Normal return
```

INPUT:

Not applicable

OUTPUT:

A completed NEW SECONDARY MASTER TAPE (first file of the NEW PERT COST MASTER TAPE)

STORAGE USED:

Not applicable

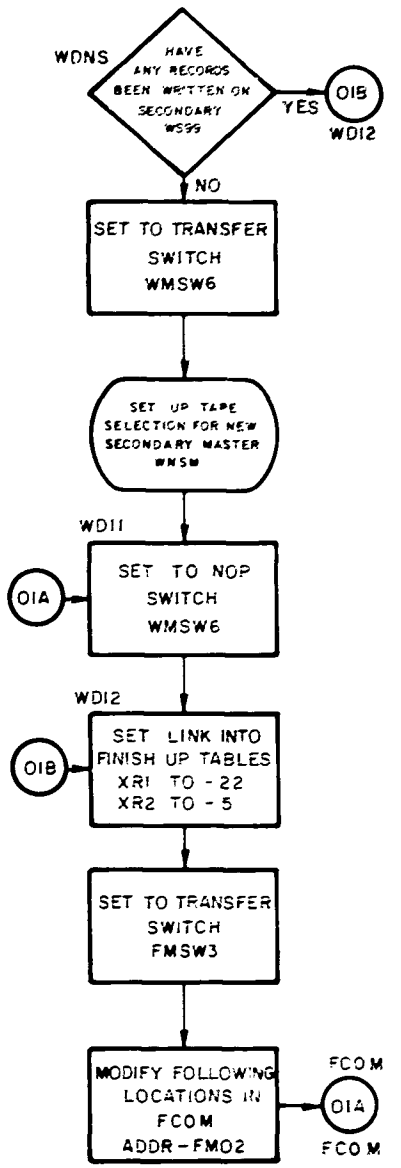
SUBREGIONS AND SUBROUTINES USED:

FCOM (AB)

EXPLANATION OF CALLING SEQUENCE:

If an error is determined in finishing up this tape, a message is set out on the on-line printer and the program is stopped

FINISH UP
SECONDARY TAPE



Region WDNE

EXPLANATION OF REGION:

This routine will accomplish the finishing activities for the EDITED DATA TAPE.

CALLING SEQUENCE:

```
L       TSX  WDNE, 4
L + 1   Normal return
```

INPUT:

Not applicable

OUTPUT:

A completed EDITED DATA TAPE (first file, prior to SORTED DATA TAPE)

STORAGE USED:

Not applicable

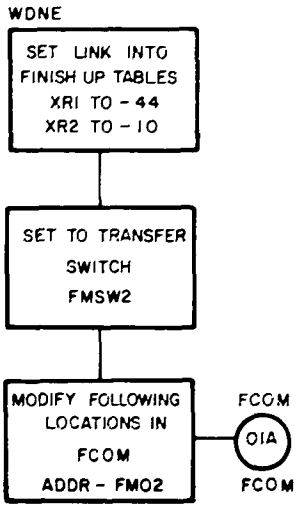
SUBREGIONS AND SUBROUTINES USED:

FCOM

EXPLANATION OF CALLING SEQUENCE:

If an error is determined in finishing up this tape, a message is set out on the on-line printer and the program is stopped

FINISH UP
EDITED TAPE



Region WDST

EXPLANATION OF REGION:

This routine will accomplish the finishing activities for the SORTED DATA TAPE.

CALLING SEQUENCE:

```
L       TSX  WDST, 4
L + 1   Normal return
```

INPUT:

Not applicable

OUTPUT:

A completed SORTED DATA TAPE (second file, following EDITED DATA TAPE)

STORAGE USED:

Not applicable

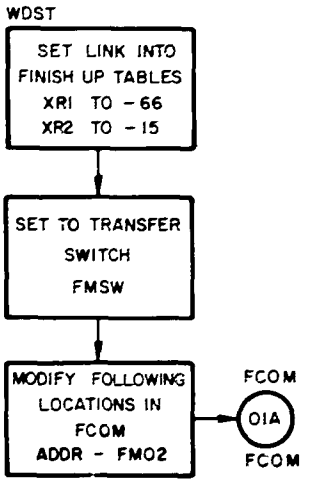
SUBREGIONS AND SUBROUTINES USED:

FCOM

EXPLANATION OF CALLING SEQUENCE:

If an error is determined in finishing up this tape, a message is set out on the on-line printer and the program is stopped.

FINISH UP SORTED
DATA TAPE



Region WDTT

EXPLANATION OF REGION:

This routine will accomplish the finishing activities for the SORTED TIME TAPE in Options C or E.

CALLING SEQUENCE:

```
L       TSX  WDTT, 4
L + 1   Normal return
```

INPUT:

Not applicable

OUTPUT:

A completed SORTED TIME TAPE to be used for Option G

STORAGE USED:

Not applicable

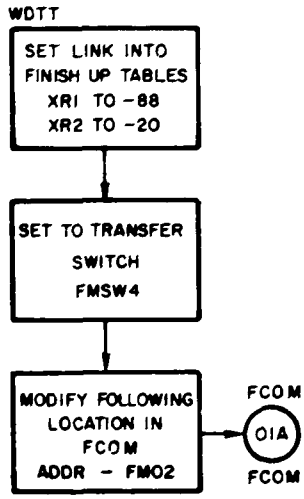
SUBREGIONS AND SUBROUTINES USED:

FCOM

EXPLANATION OF CALLING SEQUENCE:

If an error is determined in finishing up this tape, a message is set out on the on-line printer and the program is stopped.

FINISH UP SORTED
TIME TAPE



Region FCOM

EXPLANATION OF REGION:

This routine is the common routine for all finish-up subroutines. This routine will write the ending E. O. F. and rewind and unload according to the option requested.

CALLING SEQUENCE:

```
L     TRA   FCOM
```

INPUT:

The following locations are modified by the subroutines that use this routine:

FM07 - Save XR1
FM08 - Save XR2
FM09 - Save XR4

FM02 - Indirect location of tape no.

OUTPUT:

Not applicable

STORAGE USED:

Not applicable

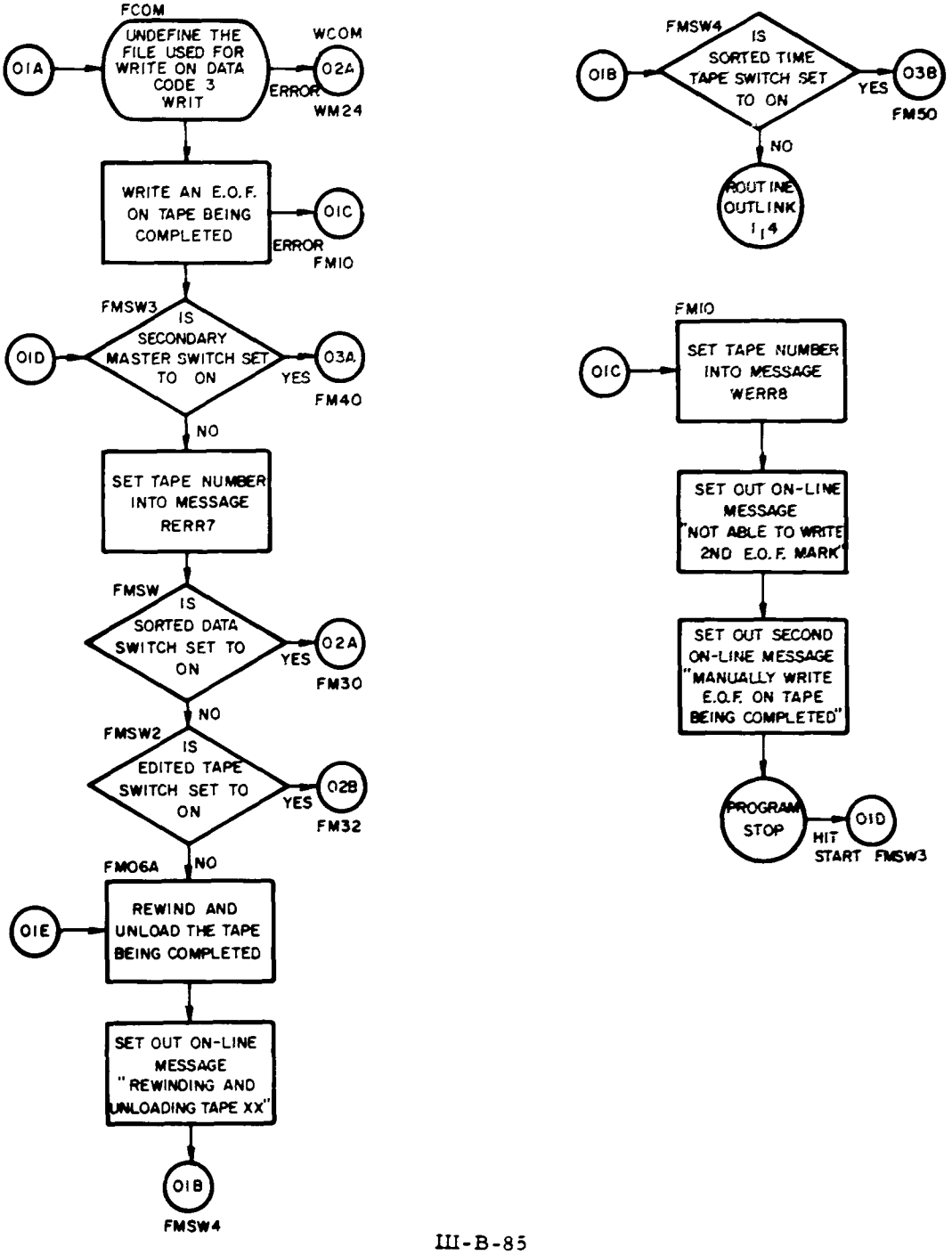
SUBREGIONS AND SUBROUTINES USED:

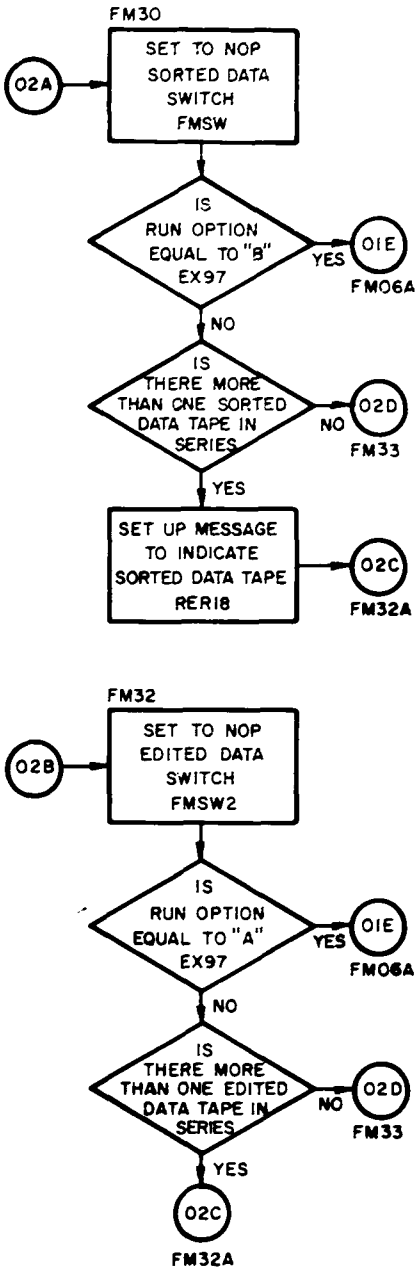
WRIT

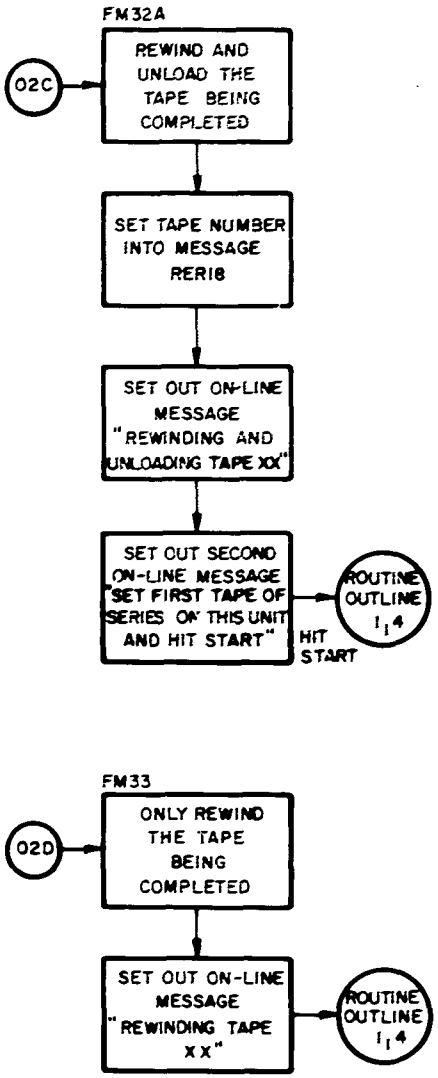
EXPLANATION OF CALLING SEQUENCE:

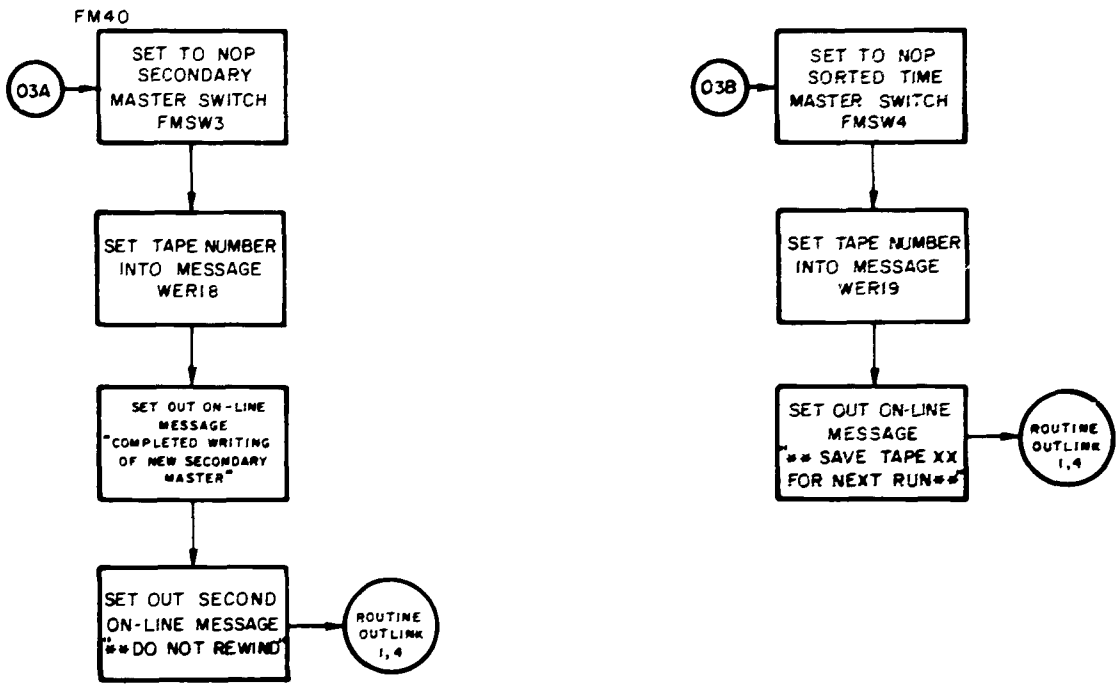
If an error is determined in writing, a message is set out on the on-line printer and the program is stopped. The outlink to this routine is the location set up by the subroutines that use this routine.

COMMON WRITE
FINISHUP ROUTINE




FM30
02A
SET TO NOP SORTED DATA SWITCH FMSW
IS RUN OPTION EQUAL TO "B" EX97
YES
01E
FM06A
NO
IS THERE MORE THAN ONE SORTED DATA TAPE IN SERIES
NO
02D
FM33
YES
SET UP MESSAGE TO INDICATE SORTED DATA TAPE RER18
02C
FM32A
FM32
02B
SET TO NOP EDITED DATA SWITCH FMSW2
IS RUN OPTION EQUAL TO "A" EX97
YES
01E
FM06A
NO
IS THERE MORE THAN ONE EDITED DATA TAPE IN SERIES
NO
02D
FM33
YES
02C
FM32A


FM32A
02C
REWIND AND UNLOAD THE TAPE BEING COMPLETED
SET TAPE NUMBER INTO MESSAGE RER18
SET OUT ON-LINE MESSAGE "REWINDING AND UNLOADING TAPE XX"
SET OUT SECOND ON-LINE MESSAGE "SET FIRST TAPE OF SERIES ON THIS UNIT AND HIT START"
HIT START
ROUTINE OUTLINE 1.4
FM33
02D
ONLY REWIND THE TAPE BEING COMPLETED
SET OUT ON-LINE MESSAGE "REWINDING TAPE XX"
ROUTINE OUTLINE 1.4


FM40
03A
SET TO NOP SECONDARY MASTER SWITCH FMSW3
SET TAPE NUMBER INTO MESSAGE WERI8
SET OUT ON-LINE MESSAGE "COMPLETED WRITING OF NEW SECONDARY MASTER"
SET OUT SECOND ON-LINE MESSAGE "**DO NOT REWIND"
ROUTINE OUTLINK 1,4
03B
SET TO NOP SORTED TIME MASTER SWITCH FMSW4
SET TAPE NUMBER INTO MESSAGE WERI9
SET OUT ON-LINE MESSAGE "** SAVE TAPE XX FOR NEXT RUN**"
ROUTINE OUTLINK 1,4

Region TAPSN

EXPLANATION OF REGION:

This routine will select the tapes and set the indicated density.

CALLING SEQUENCE:

```
L          TSX   TAPSN, 4
L + 1      PZE   A
L + 2      Normal return
```

INPUT:

Not applicable.

OUTPUT:

The tape number in the address of the accumulator in the form of XN.

STORAGE USED:

Not applicable

SUBREGIONS AND SUBROUTINES USED:

Not applicable

EXPLANATION OF CALLING SEQUENCE:

A is the location of a word of the following format:

PZE T,I

where T is the physical tape address and I is the indicated density.

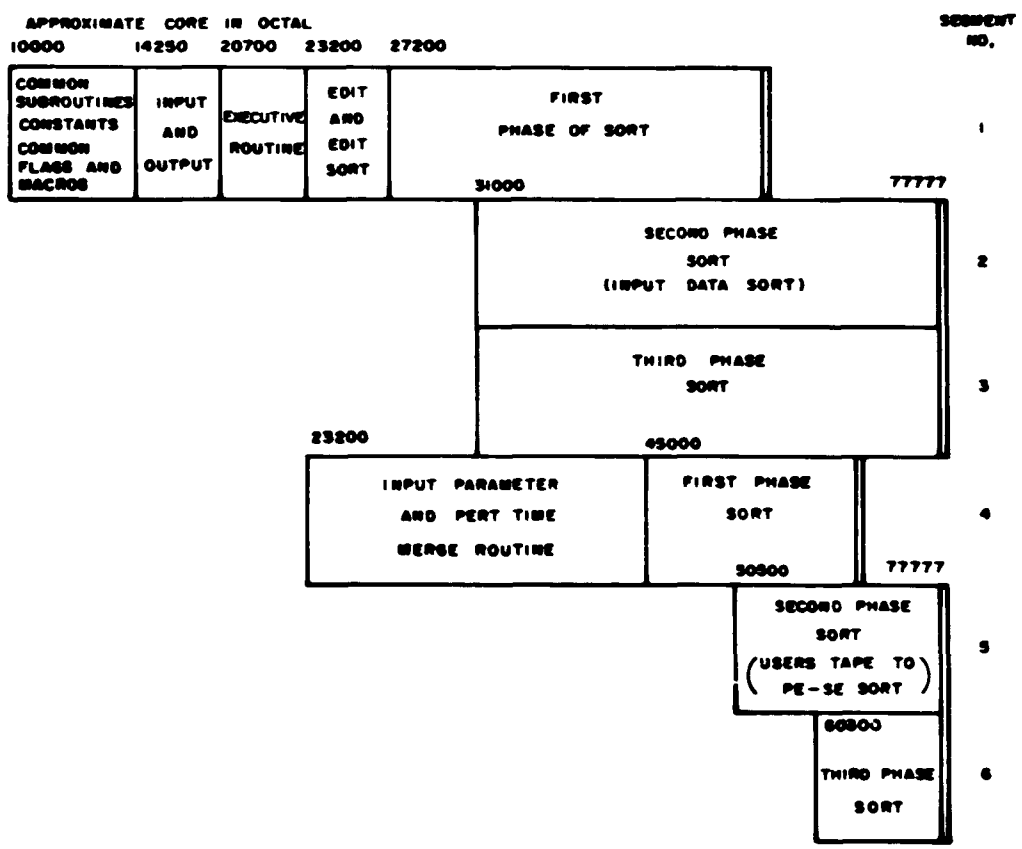
III-C PERT COST EXECUTIVE

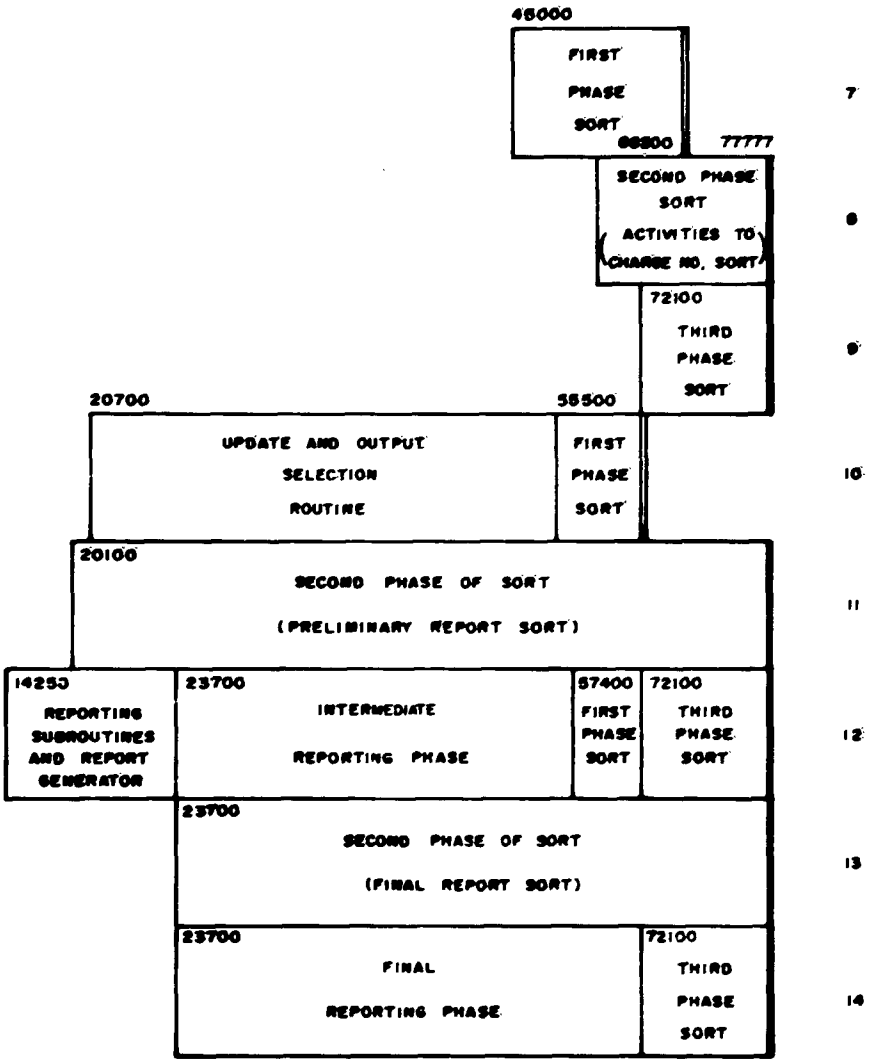
The executive routine will control the loading of the program segments into core, plus the editing of the program control cards. All option control and checks are developed in this routine as well as the initial tape rewinds at program start.

Program Segmentation

The program can be broken down into five basic segments, excluding the sorts, of which each segment itemized below will overlay core area used by the previous segment. The option used will dictate which segments will go into core or be bypassed. Discussed below are each option and the segments used, including the output phase which is not controlled by the executive routine.

a. The Complete Program Segmentation





b. Option A Program Segment Usage

Only segment number 1 is brought into core.

c. Option B Program Segment Usage

Segment 1 is first brought into core. After completion of the edit phase, segment 2 is brought in to sort the input data in the required sequence. At the last pass of the sort, segment 3 is moved into its core location to pull in the sorted information and create the SORTED DATA TAPE.

d. Option C Program Segment Usage

The Option B program segment usage will also hold true for this option. After the creation of the SORTED DATA TAPE, segment 4 is brought in. If it is requested that the USERS TIME TAPE be sorted, segments 5 and 6 are moved in, after which a PSEUDO USERS TIME TAPE is created and segment 7 is moved in. If the USERS TIME TAPE does not have to be sorted, segments 5 and 6 are bypassed and segment 7 is brought in. After completion of the merge phase, segment 8 is brought in to sort the activities into charge number sequence. At the last pass of the sort, segment 9 is moved into its core location to pull in the sorted information and create the SORTED TIME TAPE. (For Option C, segment 10 is brought in to pick up certain information from the OLD PERT COST MASTER TAPE and to duplicate it onto the NEW PERT COST MASTER TAPE. In this option, segment 10 does no updating.) After completing this phase, segment 11 is brought in to sort the WORK PACKAGE/ACTIVITY REPORT (which is the only output from this option) into its proper order. At the last pass of the sort, segment 12 is moved into its core location to create the report and set it out on the OUTPUT REPORT TAPE.

e. Option D Program Segment Usage

The Option B program segment usage will also hold true for this option. After the creation of the SORTED DATA TAPE, segment 4 is brought in. If it is requested that the USERS TIME TAPE be sorted, segments 5 and 6 are moved in, after which a PSEUDO USERS TIME TAPE is created and segment 7 is moved in. If the USERS TIME TAPE does not have to be sorted, segments 5 and 6 are bypassed and segment 7 is moved in. After completion of the merge phase, segment 8 is brought in to sort the activities into charge number sequence. At the last pass of the sort, segment 9 is moved into its core location. It will pull in the sorted information but will not create a physical SORTED TIME TAPE. At the same time that segment 9 is brought in, segment 10 is moved into core. After completion of the update and report selection routine, segment 11 is brought in to sort the output data. For the WORK PACKAGE/ACTIVITY REPORTS it will be the final sort; for all other reports it will be an intermediate sort. At the last pass of the sort, segment 12 is brought in to manipulate the data and to set

them out for the final sort. After completion of this manipulation, segment 13 is brought in to sort the output data in the required sequence. At the last pass of the sort, segment 14 is moved into its core location to pull in the sorted information and create the reports to be placed on the OUTPUT REPORT TAPE.

f. Option E Program Segment Usage

The Option E program segment usage will read in segment 1, bypass 2 and 3, and move segment 4 into its core location. It will use a SORTED DATA TAPE created in an earlier run. Option E will then follow the exact program segment usage as indicated in Option C.

g. Option F Program Segment Usage

The Option F program segment usage will read in segment 1, bypass 2 and 3, and move segment 4 into its core location. It will use a SORTED DATA TAPE created in an earlier run. Option F will then follow the exact program segment usage as indicated in Option D.

h. Option G Program Segment Usage

The Option B program segment usage will also hold true for this option. After creation of the SORTED DATA TAPE, segment 4 is brought in. The only reason that this segment is used is to duplicate the OLD SECONDARY MASTER TAPE onto the NEW SECONDARY MASTER TAPE. After the duplication effort, segments 5, 6, 7, 8, and 9 are bypassed, and segment 10 is brought into core. This option will use SORTED TIME TAPE created in an earlier run. After segment 10 is brought in, Option G will operate exactly as does Option D.

Control Card Setup

The control cards used with any one run will be set on the INPUT DATA TAPE as the first records following the unsorted data label. Following the control cards will be the raw or edited input data. During the edit phase the control cards will be set onto the EDITED DATA TAPE. If more than one input tape is used the first tape read in will be the one that contains the control cards.

Executive On-Line Messages

At the start of the program, certain information-type messages are set out on the on-line printer. These messages indicate the option selected as well as the reports requested. These messages will take the following forms:

a. Beginning Message

THE PERT - COST PROCESSING RUN OF DDMMMYY
FOR - (Program Name)

The date in the beginning message is the NEW MASTER FILE DATE from the control card, and the program name is determined from the name in the "A" control card.

b. Option Selected Message

This message will vary, depending on the option selected by the user.

Option A

THE FOLLOWING PHASE WILL BE OPERATED UPON:

INPUT EDIT

Option B

THE FOLLOWING PHASES WILL BE OPERATED UPON:

INPUT EDIT
INPUT EDIT SORT

Option C

THE FOLLOWING PHASES WILL BE OPERATED UPON:

INPUT EDIT
INPUT EDIT SORT
TIME MERGE AND SORT

Option D

THE FOLLOWING PHASES WILL BE OPERATED UPON:

INPUT EDIT
INPUT EDIT SORT
TIME MERGE AND SORT
COST UPDATE AND REPORTING

Option E

THE FOLLOWING PHASE WILL BE OPERATED UPON:

TIME MERGE AND SORT

Option F

THE FOLLOWING PHASES WILL BE OPERATED UPON:

TIME MERGE AND SORT
COST UPDATE AND REPORTING

Option G

THE FOLLOWING PHASES WILL BE OPERATED UPON:

INPUT EDIT
INPUT EDIT SORT
COST UPDATE AND REPORTING

c. Reports Requested Message

The reports selected as indicated on control card B will be listed on the on-line printer. This listing will contain the report name and number, its sort, and level requested, if any. The following is the format of the on-line messages:

THE FOLLOWING REPORTS WILL BE PRODUCED

ERROR LISTINGS
01 - WORK PACKAGE/ACTIVITY REPORT - RESP, CHGE, PRED, SUCC
02 - WORK PACKAGE/ACTIVITY REPORT - CHGE, PRED, SUCC
10 - ORGANIZATIONAL STATUS REPORT - PERF, CHGE, RESP, RESC
LEVEL NO. XX
11 - ORGANIZATIONAL STATUS REPORT - RESC, CHGE, RESP, PERF
LEVEL NO. XX
12 - ORGANIZATIONAL STATUS REPORT - CHGE, RESP, PERF, RESC
LEVEL NO. XX

13 - ORGANIZATIONAL STATUS REPORT - RESP, CHGE, PERF, RESC
LEVEL NO. XX
20 - ORGANIZATIONAL STATUS REPORT - NETW, PERF, CHGE, RESP, RESC
LEVEL NO. XX
21 - ORGANIZATIONAL STATUS REPORT - NETW, RESC, CHGE, RESP, PERF
LEVEL NO. XX
22 - ORGANIZATIONAL STATUS REPORT - NETW, CHGE, RESP, PERF, RESC
LEVEL NO. XX
23 - ORGANIZATIONAL STATUS REPORT - NETW, RESP, CHGE, PERF, RESC
LEVEL NO. XX
30 - MANAGEMENT SUMMARY REPORT LEVEL NO. XX
35 - PROGRAM/PROJECT STATUS REPORT LEVEL NO. XX
40 - FINANCIAL PLAN/STATUS REPORT - MNTH, CHGE LEVEL NO. XX
41 - FINANCIAL PLAN/STATUS REPORT - MNTH LEVEL NO. XX
50 - MANPOWER LOADING REPORT - RESC, MNTH, PERF, CHGE
LEVEL NO. XX
51 - MANPOWER LOADING REPORT - RESC, MNTH LEVEL NO. XX
52 - MANPOWER LOADING REPORT - PERF, MNTH, RESC LEVEL NO. XX
55 - RAINBOW CATEGORY REPORT LEVEL NO. XX
60 - COST CATEGORY STATUS REPORT LEVEL NO. XX
70 - SUMMARY FINANCIAL FORECAST - SUMMARY ITEM - YEAR
LEVEL NO. XX
71 - SUMMARY FINANCIAL FORECAST - COST CATEGORY - YEAR
LEVEL NO. XX
75 - SUMMARY FINANCIAL FORECAST - SUMMARY ITEM - MNTH
LEVEL NO. XX
76 - SUMMARY FINANCIAL FORECAST - COST CATEGORY - MNTH
LEVEL NO. XX
80 - BUDGET AUTHORIZATION AND UPDATING FORM LEVEL NO. XX
85 - ESTIMATING AND UPDATING FORM LEVEL NO. XX

For the above messages, the first two lines will come out on all on-line listings. For Options C and E, the program will automatically set out report type 01 and its accompanying message. On Options D, F, and G, one or more of the messages will be set out, dependent on what reports have been selected.

The XX following the LEVEL NO. will indicate the level that has been requested for a particular report. Each level will be another line with the level number indicated in the message. If the level number is above 16, the following message will be put out on the on-line printer:

LEVEL OVER 16 INDICATED WILL BE SET TO 16

If the report number requested is not a legal number, the following message will be put out on the on-line printer, with the XX indicating the illegal number:

UNAUTHORIZED REPORT NO. XX

d. End-of-Phase Messages

At the end of each major phase, a message will be forthcoming indicating the completion of one phase and the entrance into the next phase. These messages will take the following forms, depending on the phase being completed:

1. END OF PERT EDIT PHASE
2. END OF PERT COST EDIT SORT PHASE
3. END OF PERT COST TIME MERGE PHASE
4. END OF PERT COST UPDATE PHASE
5. END OF PERT COST PROCESSING RUN

If at the completion of a particular phase, the program is to finish without entering another phase, the message, END OF PERT COST PROCESSING RUN, will supersede the normal end-of-phase message.

Executive Control Card Error Messages

The executive routine will accomplish the editing of the program control cards. Any error that is determined during this edit operation will have an accompanying message indicating the problem set out on the on-line printer. If any errors are determined, the system will stop at completion of the control card edit. These error messages will take the following form:

a. THE-A-CARD IS NOT THE FIRST CONTROL CARD IN THE SYSTEM

The first control card read by the executive program is not an "A" card.

b. A DATE ON THE CONTROL CARD HAS NON-NUMERIC CHARACTERS IN THE DD OR YY

One of the "A" control card dates has a non-numeric day or year in the field.

c. CANNOT LOCATE A MONTH INDICATED ON CONTROL CARD DATE

One of the "A" control card dates has an illegitimate month in its field.

d. THE DAYS DO NOT FALL IN THE RANGE SPECIFIED BY THE MONTH

The number of days associated with a particular month does not fall in the range specified for that month.

e. THERE IS NO OPTION CODE IN CONTROL CARD A

The column to indicate option code is blank or zero in control card "A"

f. THE OPTION CODE IS INCORRECT

The option code in control card "A" is not in the range of A to G

g. THERE IS NO AS OF DATE IN CONTROL CARD A

The new master file date in control card "A" columns 12 through 18 is blank or zero.

h. ONE OF THE DATES REQUIRED FOR OPERATION IS NOT INCLUDED IN CONTROL CARD A

Dependent upon the option requested, certain dates have to be present in the "A" control card. These options and dates are:

1. Option A - New Master File Date

2. Option B - New Master File Date

3. Option C - New Master File Date
   Report Issue Date
   PERT Time Tape Date
   Secondary Master Date

4. Option D - New Master File Date
   Report Issue Date
   PERT Time Tape Date
   Secondary Master Date
   PERT Cost Master Date

5. Option E - Same as Option C

6. Option F - Same as Option D

7. Option G - New Master File Date
   Report Issue Date
   PERT Time Tape Date
   PERT Cost Master Date

i. DUPLICATE A CARDS FOR THIS RUN

More than one "A" card is present in the control card deck.

j. INPUT TAPE COUNT INCORRECT

The column indicating input tape count in control card "A" is not in the range of 1 to 9.

k. NO INPUT TAPES INDICATED ON OPTIONS REQUIRED

For options A, B, C, D, and G the input tape count in control card "A" is zero or blank.

l. ALPHABETIC CHARACTERS IN MAN-MONTH CONVERSION FIELD

The value in the man-month conversion field is non-numeric.

m. THE CONTROL CARD CODE IS INCORRECT

The control card code in column 1 is not in the range of A to F.

n. THERE IS NO CONTROL CARD CODE

The control card code in column 1 is a blank or zero.

o. MORE THAN 5 OUTPUT REPORT CONTROL CARDS INSERTED

The limit of 5 cards with a code of B has been surpassed.

p. NO REPORTS INDICATED ON OPTIONS REQUIRING REPORTS

There is no "B" control card on options D, F, or G which are required to produce at least one output report other than the error listing.

q. MORE THAN 50 PROJECT CONTROL CARDS INSERTED

The limit of 50 network or project cards with a code of "C" has been surpassed.

r. DUPLICATE D CARDS FOR THIS RUN

More than one "D" card is present in the control card deck.

s. TAPE CHANNEL NOT A-B-C

On the "D" control card, one of the tape reassignments is using a channel other than A-B-C.

t. DUPLICATE E CARDS FOR THIS RUN

More than one "E" card is present in the control card deck.

u. DUPLICATE F CARDS FOR THIS RUN

More than one "F" card is present in the control card deck.

v. SECURITY NO. INCREMENTER NOT IN RANGE

The field that indicates the character of the security number to increment is not in the range of 0-24.

Executive Program Operations

The following are some of the conventions used in the executive phase:

a. Executive Flag Indications

During the executive phase, many flags are set which are used during future phase processing. These flags are:

EX81 - If option C or E is in effect, this flag is set on

EX84 - If file establishment on PERT COST MASTER TAPE is indicated, this flag is set on

EX85 - If file establishment on SECONDARY MASTER TAPE is indicated, this flag is set on

EX86 - If the time tape is in SE-PE sequence, this flag is set on

EX87 - If an "F" control card is present, this flag is set on

EX88 - If an "E" control card is present, this flag is set on

EX89 - This flag will carry the count of the input tapes involved in this run

EX90 - If a "D" control card is present, this flag is set on

EX91 - If a "B" control card is present, this flag is set on

EX92 - This flag will carry the count of the "B" control cards present in this run

EX93 - This flag will carry the count of the "C" control cards present in this run

EX94 - If there is no secondary master date, this flag is set on

EX95 - If there is no PERT Cost master date, this flag is set on

EX96 - If there is no user's time tape date, this flag is set on

EX97 - The option being requested is carried in this flag as a value of 1 through 7, representing A thru G, respectively

EX98 - If there is no report issue date, this flag is set on

EX99 - If an "A" control card is present, this flag is set on

EX99A - If this run is to be made without any time input, this flag is set on

When a flag is considered "on," it means a nonzero value is placed in that flag.

b. Tape Table

A special tape table has been constructed for this program to give it a greater flexibility with a minimum control card manipulation. This table will be preset to the following conditions:

1. USER'S TIME TAPE	B4
2. SORTED DATA TAPE	B5
3. OLD PERT COST MASTER	B6
4. SORT - MERGE TAPE	B2
5. SORT - MERGE TAPE	B1
6. SYSTEM ERROR AND OUTPUT TAPE	A2
7. INPUT AND NEW PERT COST MASTER	A6
8. INPUT AND SORT-MERGE TAPE	A7
9. SORT - MERGE TAPE	A4

If this arrangement differs from the tape setup at a particular installation, it can be changed with the use of the "D" control card. Both the tape setup and density can be set with this card. All the above tapes are set to high density in the tape table.

Channel A, B, or C with any unit number from 0 to 9 can be used in this table.

Executive Region Descriptions

The region descriptions on the following pages will describe the major subroutines used in the executive region as well as the executive routine itself. Behind each region description will be one or more flow charts describing that region. Figure III-C-1 is the control card layout.

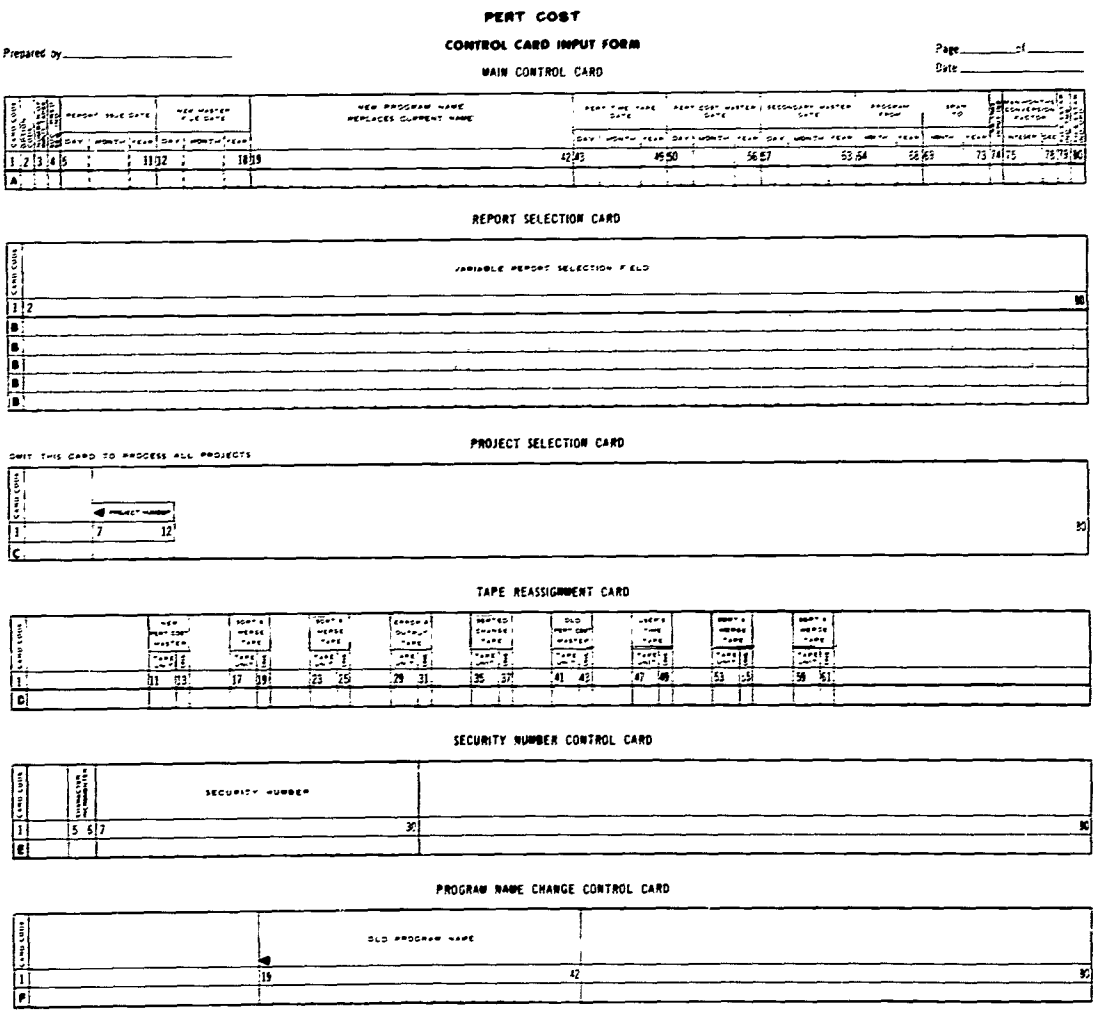


Fig. III-C-1 Control Card

Region EXEC

EXPLANATION OF REGION:

This routine will edit and decipher the control cards. It will control the phasing of the program segments, as well as set up all of the option conditions. All tapes to be used will be initially rewound in this region.

CALLING SEQUENCE:

Program will initially transfer to the EXEC portion of the system. All links to the other phases will be made in this section.

INPUT:

Control cards

OUTPUT:

Not applicable

STORAGE USED:

SCHLD - 4 words - Security number hold

PNHLD - 4 words - Program name hold (new or current)

PNHD2 - 4 words - Program, name hold (old)

TRMSP - 3 words - Term (span)

ORHLD - 70 words - Output report selections hold

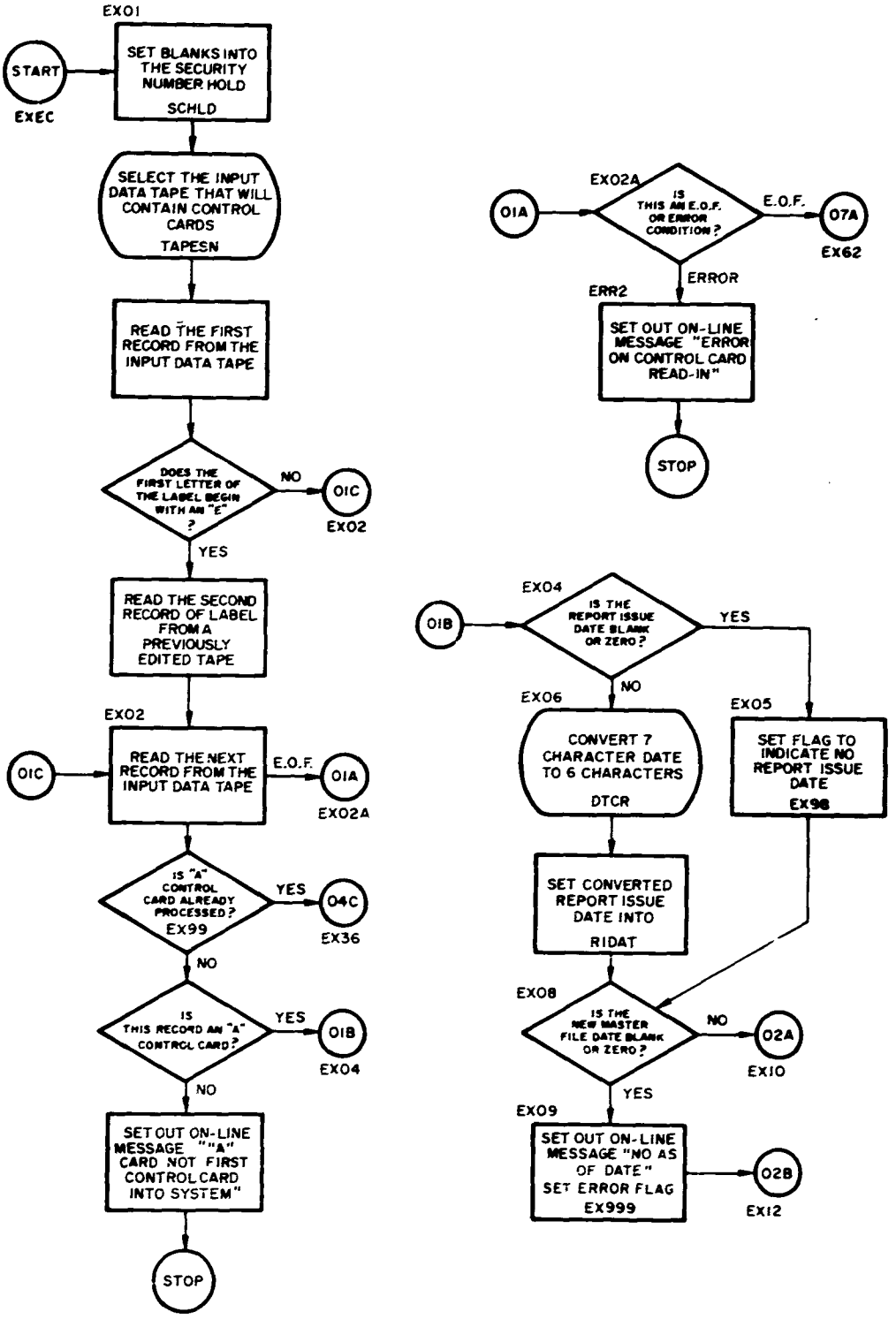
PJHLD - 50 words - Project number hold

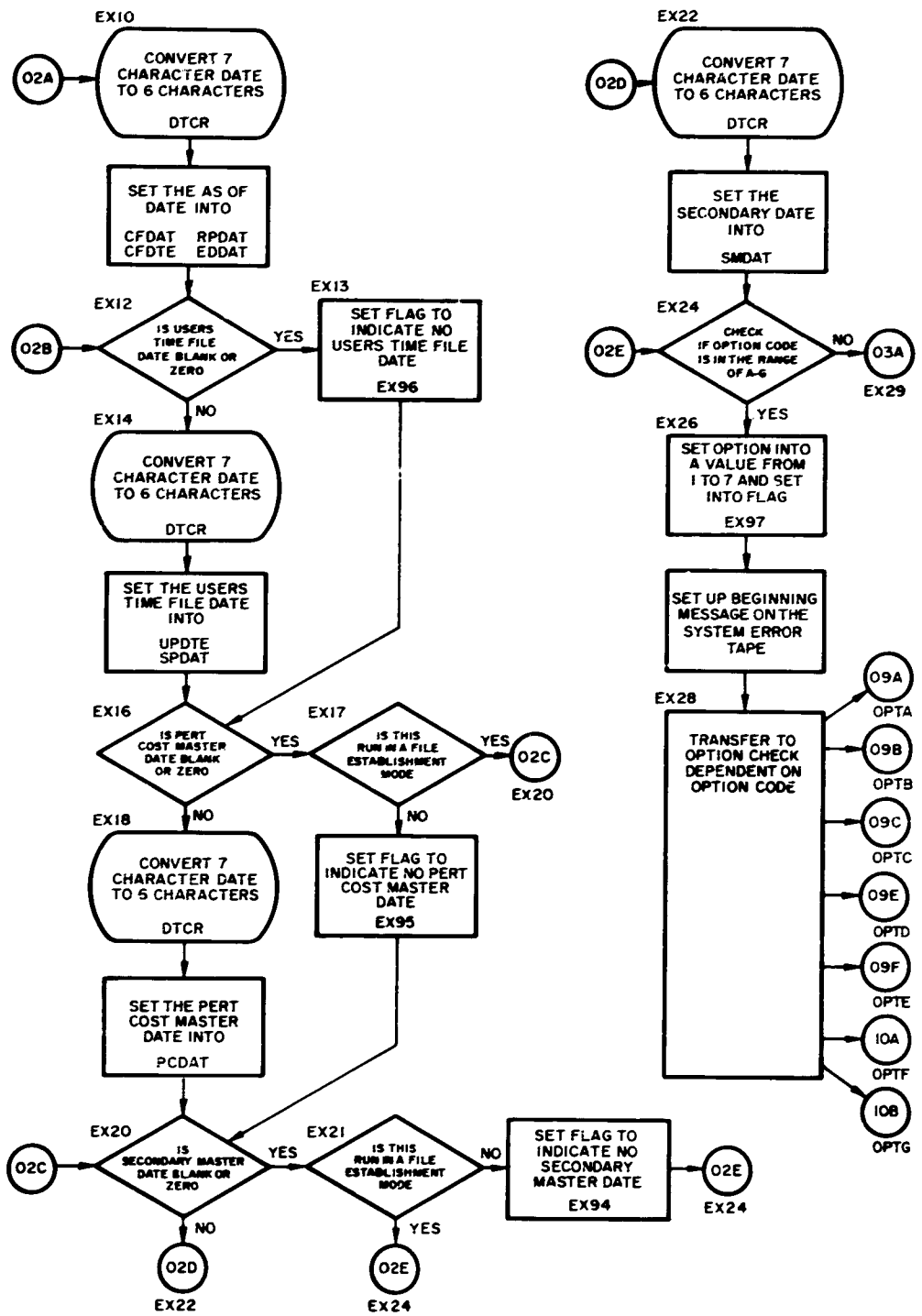
SUBREGIONS AND SUBROUTINES USED:

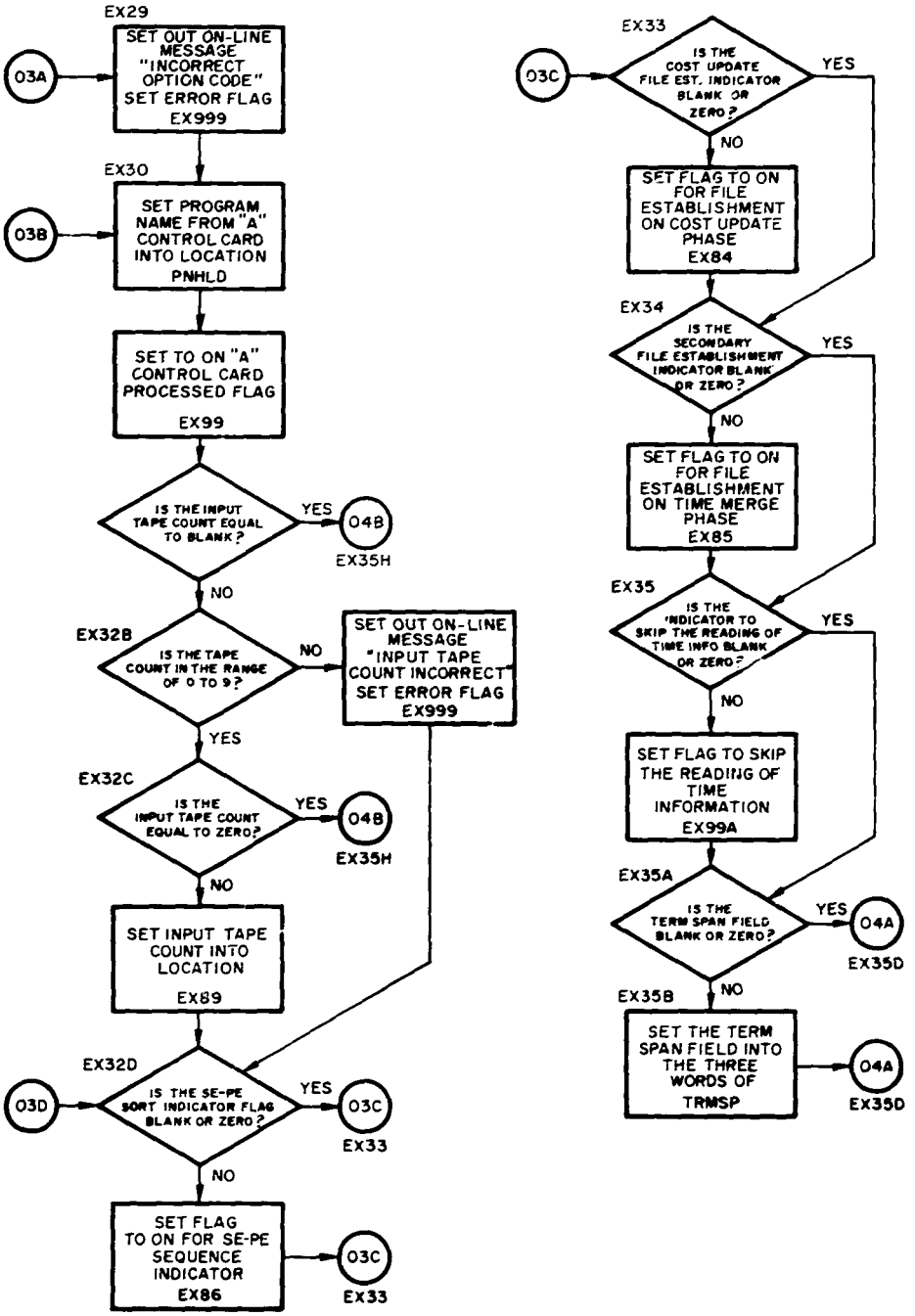
DTCR	PMAS
FIXPT	PUAOT
TUASN	MSRT
EDIT	JAOO
EDSO	

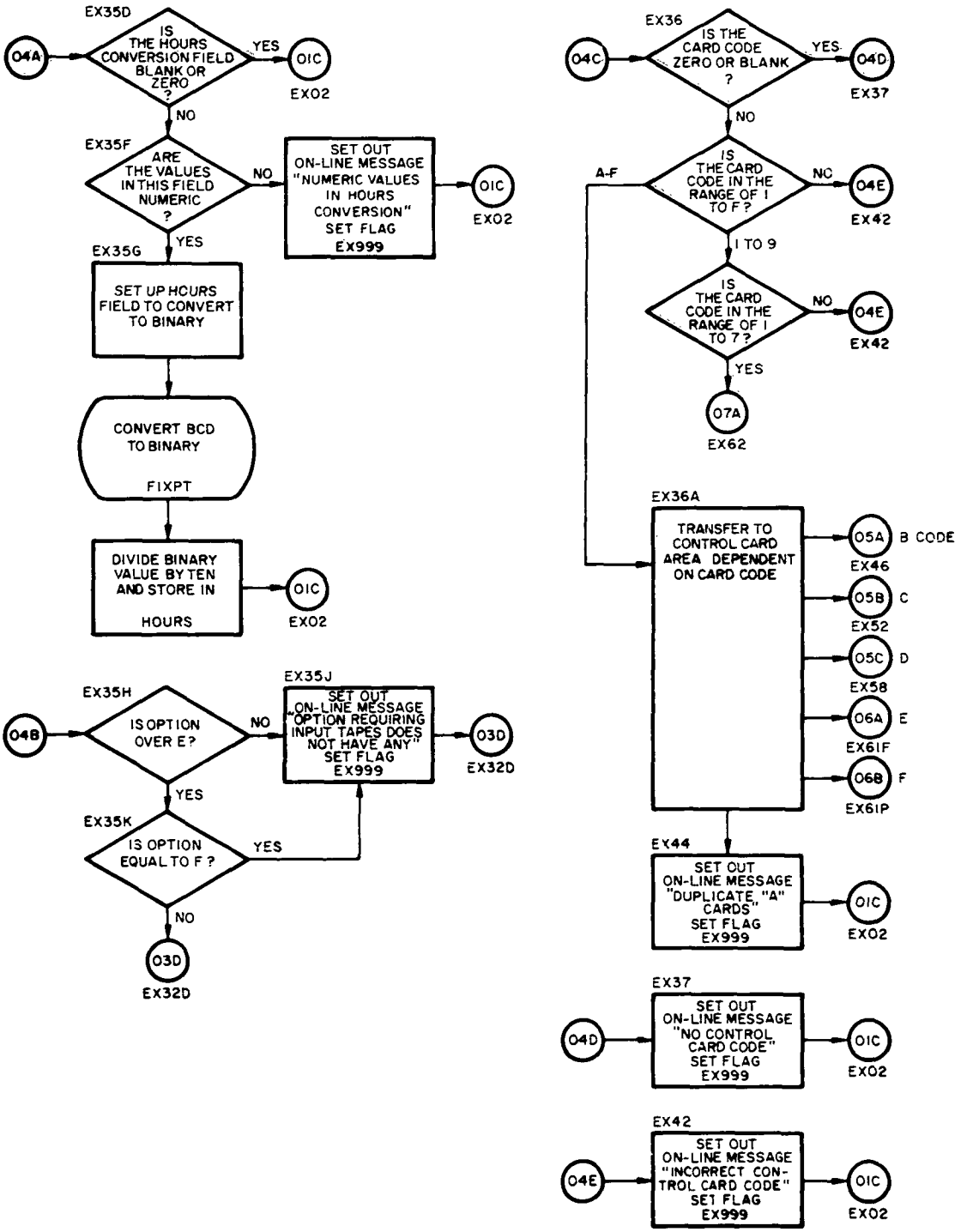
EXPLANATION OF CALLING SEQUENCE:

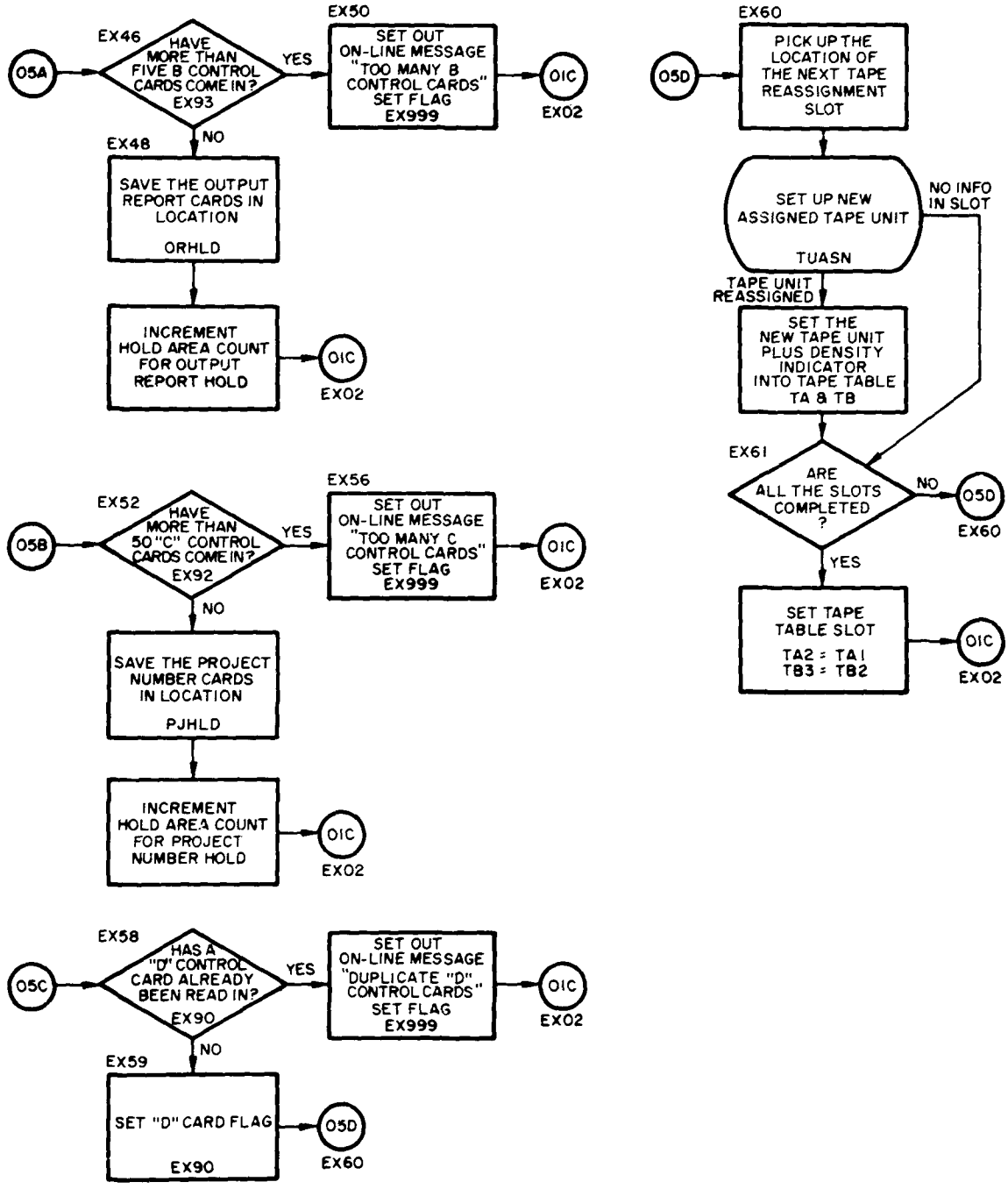
Not applicable

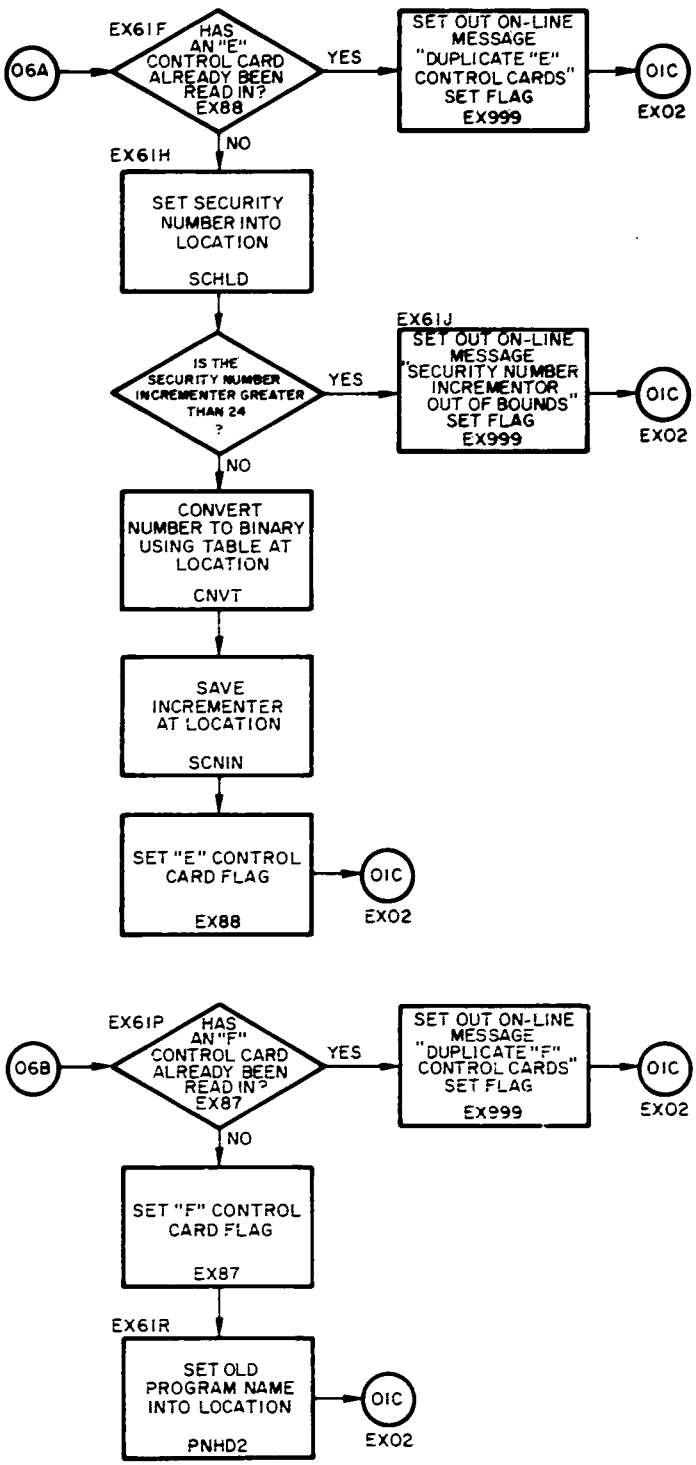

EX01
START
EXEC
SET BLANKS INTO THE SECURITY NUMBER HOLD
SCHLD
SELECT THE INPUT DATA TAPE THAT WILL CONTAIN CONTROL CARDS
TAPESN
READ THE FIRST RECORD FROM THE INPUT DATA TAPE
DOES THE FIRST LETTER OF THE LABEL BEGIN WITH AN "E" ?
NO
01C
EX02
YES
READ THE SECOND RECORD OF LABEL FROM A PREVIOUSLY EDITED TAPE
EX02
01C
READ THE NEXT RECORD FROM THE INPUT DATA TAPE
E.O.F.
01A
EX02A
IS "A" CONTROL CARD ALREADY PROCESSED?
EX99
YES
04C
EX36
NO
IS THIS RECORD AN "A" CONTROL CARD?
YES
01B
EX04
NO
SET OUT ON-LINE MESSAGE "'A" CARD NOT FIRST CONTROL CARD INTO SYSTEM"
STOP
01A
EX02A
IS THIS AN E.O.F. OR ERROR CONDITION?
E.O.F.
07A
EX62
ERROR
ERR2
SET OUT ON-LINE MESSAGE "ERROR ON CONTROL CARD READ-IN"
STOP
01B
EX04
IS THE REPORT ISSUE DATE BLANK OR ZERO?
YES
NO
EX06
CONVERT 7 CHARACTER DATE TO 6 CHARACTERS
DTCR
EX05
SET FLAG TO INDICATE NO REPORT ISSUE DATE
EX98
SET CONVERTED REPORT ISSUE DATE INTO
RIDAT
EX08
IS THE NEW MASTER FILE DATE BLANK OR ZERO?
NO
02A
EX10
YES
EX09
SET OUT ON-LINE MESSAGE "NO AS OF DATE" SET ERROR FLAG
EX999
02B
EX12

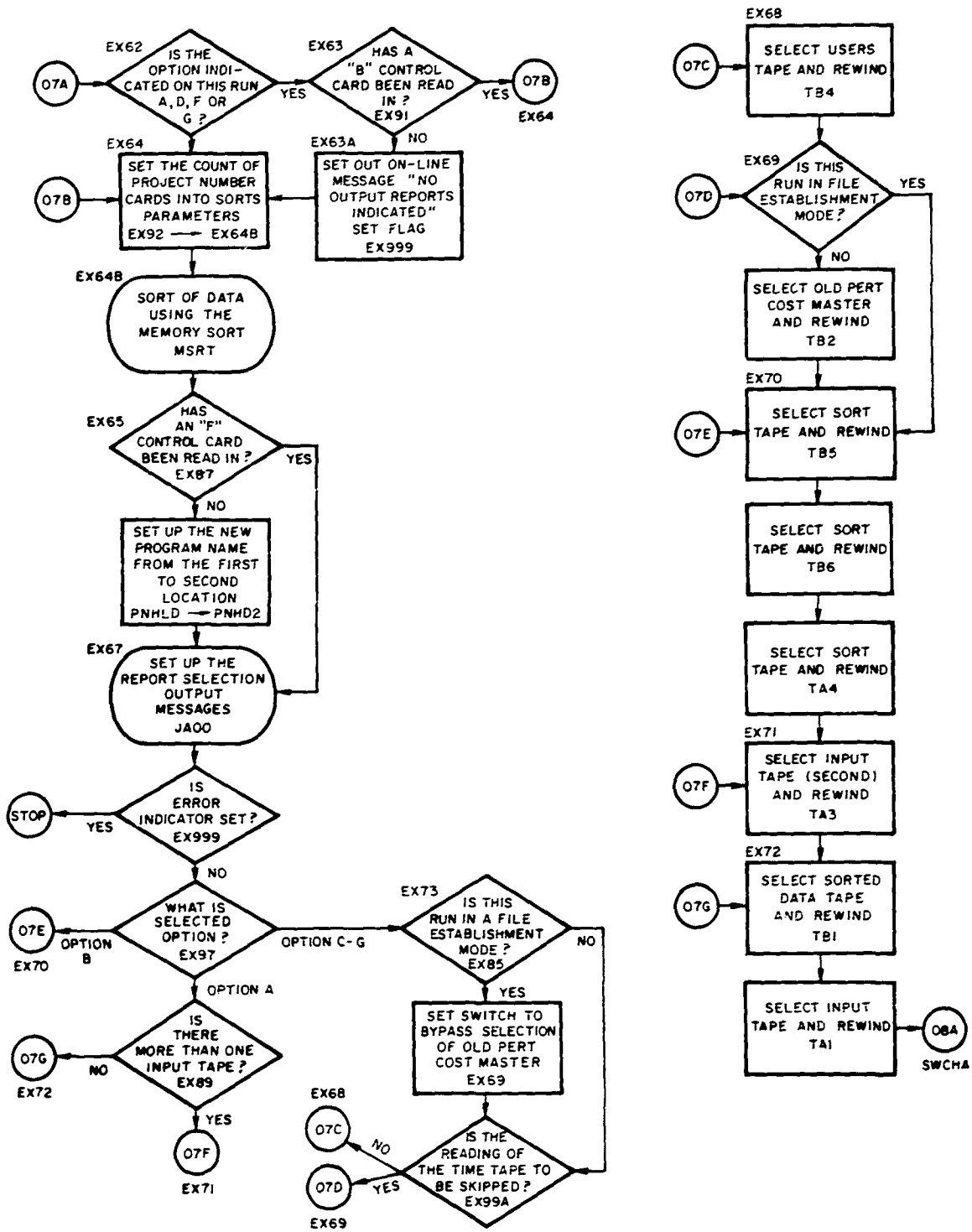

EX10
02A
CONVERT 7 CHARACTER DATE TO 6 CHARACTERS
DTCR
SET THE AS OF DATE INTO
CFDAT RPDAT
CFDTE EDDAT
EX12
02B
IS USERS TIME FILE DATE BLANK OR ZERO
YES
EX13
SET FLAG TO INDICATE NO USERS TIME FILE DATE
EX96
NO
EX14
CONVERT 7 CHARACTER DATE TO 6 CHARACTERS
DTCR
SET THE USERS TIME FILE DATE INTO
UPDTE
SPDAT
EX16
IS PERT COST MASTER DATE BLANK OR ZERO
YES
EX17
IS THIS RUN IN A FILE ESTABLISHMENT MODE
YES
02C
EX20
NO
EX18
CONVERT 7 CHARACTER DATE TO 6 CHARACTERS
DTCR
NO
SET FLAG TO INDICATE NO PERT COST MASTER DATE
EX95
SET THE PERT COST MASTER DATE INTO
PCDAT
EX20
02C
IS SECONDARY MASTER DATE BLANK OR ZERO
YES
EX21
IS THIS RUN IN A FILE ESTABLISHMENT MODE
NO
SET FLAG TO INDICATE NO SECONDARY MASTER DATE
EX94
02E
EX24
NO
02D
EX22
YES
02E
EX24
EX22
02D
CONVERT 7 CHARACTER DATE TO 6 CHARACTERS
DTCR
SET THE SECONDARY DATE INTO
SMDAT
EX24
02E
CHECK IF OPTION CODE IS IN THE RANGE OF A-G
NO
03A
EX29
YES
EX26
SET OPTION INTO A VALUE FROM 1 TO 7 AND SET INTO FLAG
EX97
SET UP BEGINNING MESSAGE ON THE SYSTEM ERROR TAPE
EX28
TRANSFER TO OPTION CHECK DEPENDENT ON OPTION CODE
09A
OPTA
09B
OPTB
09C
OPTC
09E
OPTD
09F
OPTE
10A
OPTF
10B
OPTG

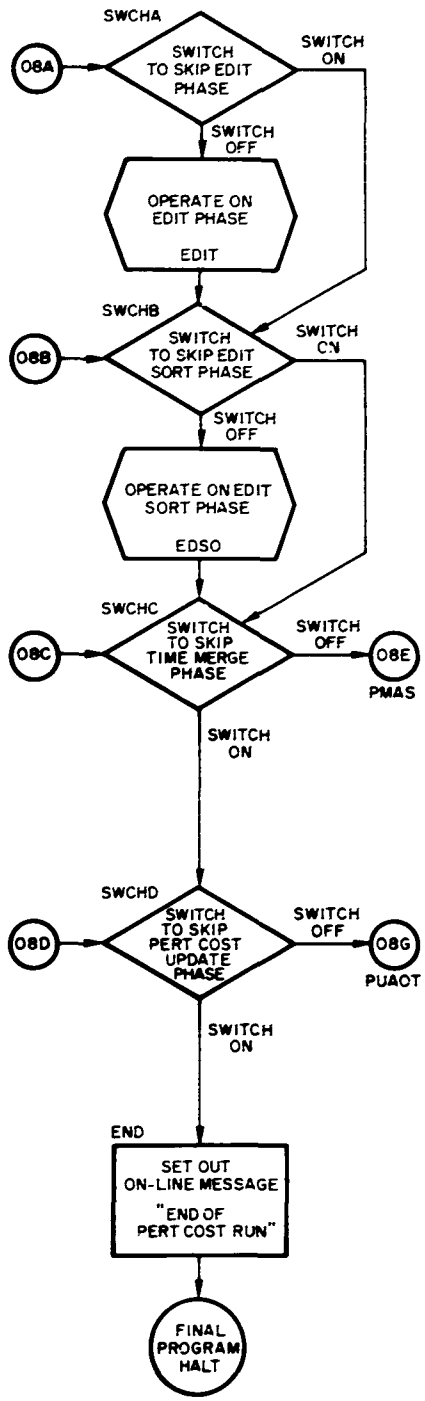

EX29
SET OUT ON-LINE MESSAGE "INCORRECT OPTION CODE" SET ERROR FLAG EX999
03A
EX30
SET PROGRAM NAME FROM "A" CONTROL CARD INTO LOCATION PNHLD
03B
SET TO ON "A" CONTROL CARD PROCESSED FLAG EX99
IS THE INPUT TAPE COUNT EQUAL TO BLANK?
YES
04B
EX35H
NO
EX32B
IS THE TAPE COUNT IN THE RANGE OF 0 TO 9?
NO
SET OUT ON-LINE MESSAGE "INPUT TAPE COUNT INCORRECT" SET ERROR FLAG EX999
YES
EX32C
IS THE INPUT TAPE COUNT EQUAL TO ZERO?
YES
04B
EX35H
NO
SET INPUT TAPE COUNT INTO LOCATION EX89
EX32D
03D
IS THE SE-PE SORT INDICATOR FLAG BLANK OR ZERO?
YES
03C
EX33
NO
SET FLAG TO ON FOR SE-PE SEQUENCE INDICATOR EX86
03C
EX33
EX33
03C
IS THE COST UPDATE FILE EST. INDICATOR BLANK OR ZERO?
YES
NO
SET FLAG TO ON FOR FILE ESTABLISHMENT ON COST UPDATE PHASE EX84
EX34
IS THE SECONDARY FILE ESTABLISHMENT INDICATOR BLANK OR ZERO?
YES
NO
SET FLAG TO ON FOR FILE ESTABLISHMENT ON TIME MERGE PHASE EX85
EX35
IS THE INDICATOR TO SKIP THE READING OF TIME INFO BLANK OR ZERO?
YES
NO
SET FLAG TO SKIP THE READING OF TIME INFORMATION EX99A
EX35A
IS THE TERM SPAN FIELD BLANK OR ZERO?
YES
04A
EX35D
NO
EX35B
SET THE TERM SPAN FIELD INTO THE THREE WORDS OF TRMSP
04A
EX35D

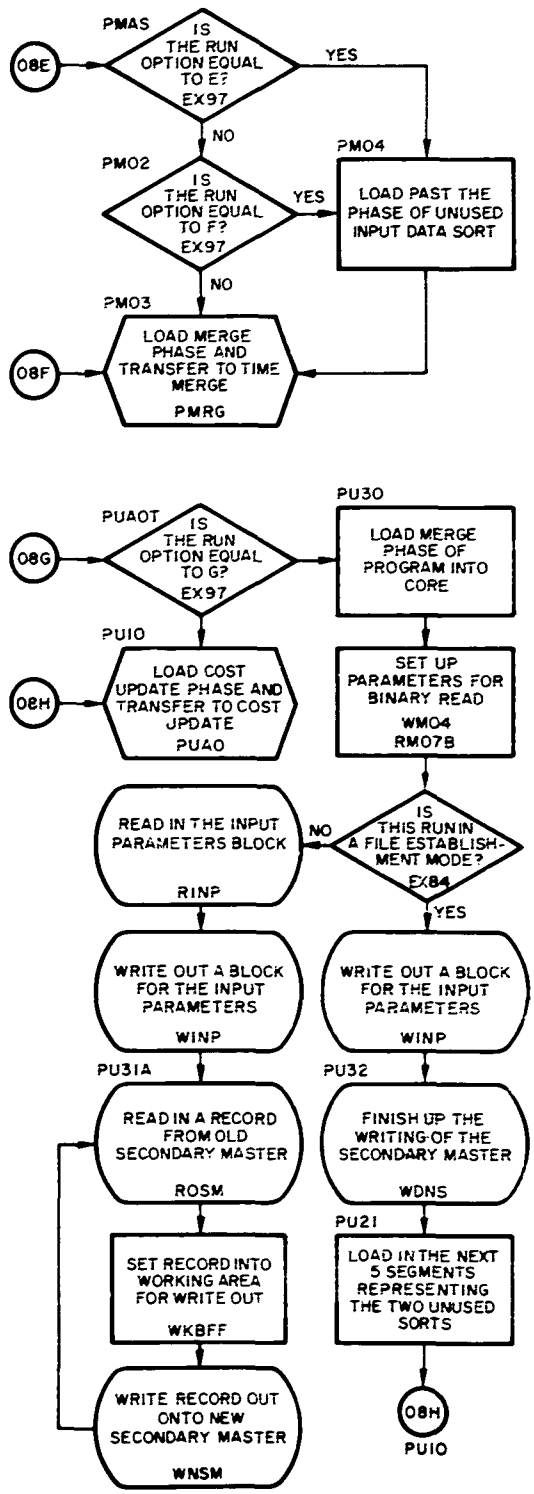

EX35D
IS THE HOURS CONVERSION FIELD BLANK OR ZERO ?
04A
YES
01C
EX02
NO
EX35F
ARE THE VALUES IN THIS FIELD NUMERIC ?
NO
SET OUT ON-LINE MESSAGE "NUMERIC VALUES IN HOURS CONVERSION" SET FLAG EX999
01C
EX02
YES
EX35G
SET UP HOURS FIELD TO CONVERT TO BINARY
CONVERT BCD TO BINARY
FIXPT
DIVIDE BINARY VALUE BY TEN AND STORE IN
HOURS
01C
EX02
EX35H
IS OPTION OVER E?
04B
NO
EX35J
SET OUT ON-LINE MESSAGE "OPTION REQUIRING INPUT TAPES DOES NOT HAVE ANY" SET FLAG EX999
03D
EX32D
YES
EX35K
IS OPTION EQUAL TO F ?
YES
NO
03D
EX32D
EX36
IS THE CARD CODE ZERO OR BLANK ?
04C
YES
04D
EX37
NO
A-F
IS THE CARD CODE IN THE RANGE OF 1 TO F ?
NO
04E
EX42
1 TO 9
IS THE CARD CODE IN THE RANGE OF 1 TO 7 ?
NO
04E
EX42
YES
07A
EX62
EX36A
TRANSFER TO CONTROL CARD AREA DEPENDENT ON CARD CODE
05A
B CODE
EX46
05B
C
EX52
05C
D
EX58
06A
E
EX61F
06B
F
EX61P
EX44
SET OUT ON-LINE MESSAGE "DUPLICATE "A" CARDS" SET FLAG EX999
01C
EX02
EX37
04D
SET OUT ON-LINE MESSAGE "NO CONTROL CARD CODE" SET FLAG EX999
01C
EX02
EX42
04E
SET OUT ON-LINE MESSAGE "INCORRECT CONTROL CARD CODE" SET FLAG EX999
01C
EX02

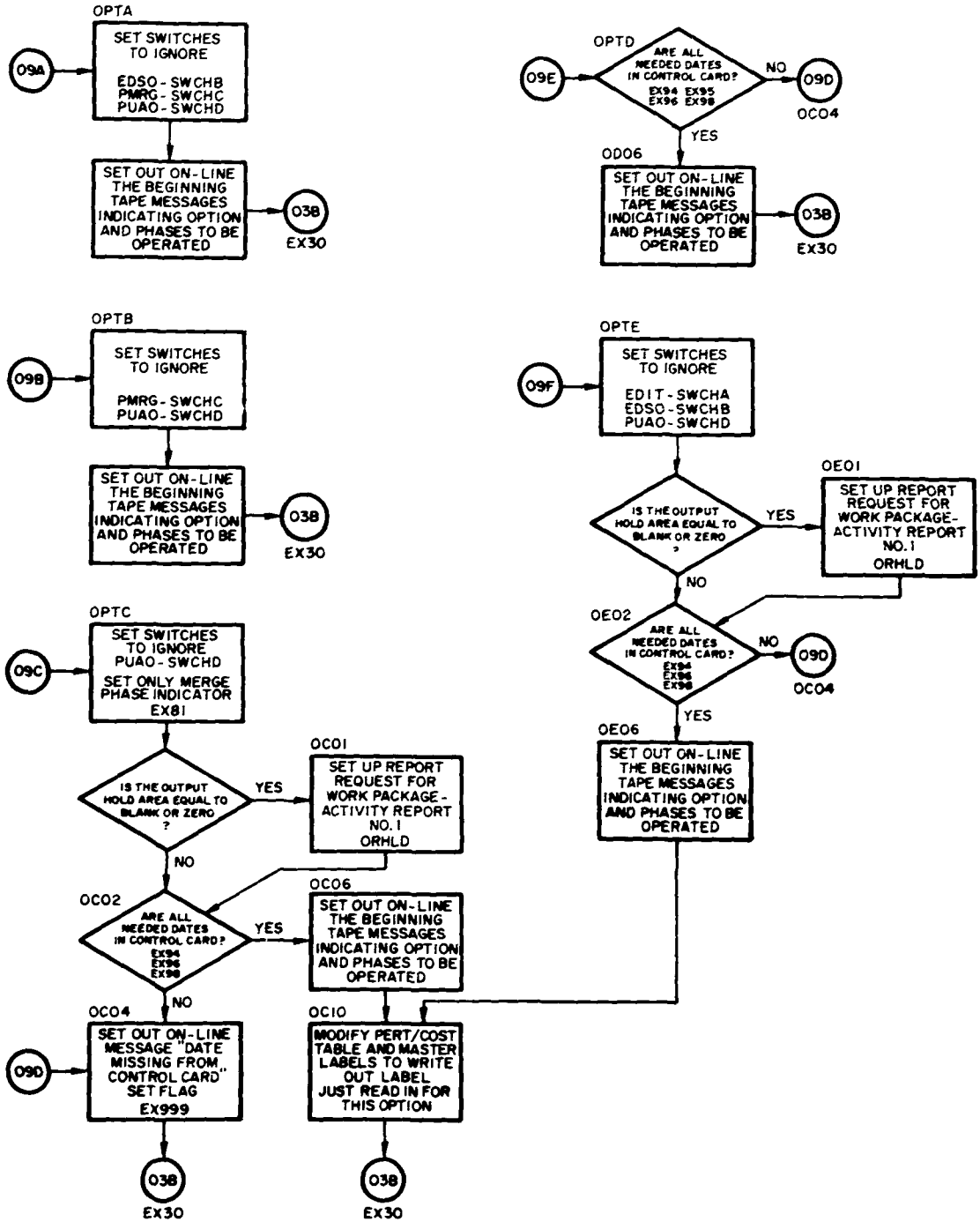

05A
EX46
HAVE MORE THAN FIVE B CONTROL CARDS COME IN? EX93
YES
EX50
SET OUT ON-LINE MESSAGE "TOO MANY B CONTROL CARDS" SET FLAG EX999
01C
EX02
NO
EX48
SAVE THE OUTPUT REPORT CARDS IN LOCATION ORHLD
INCREMENT HOLD AREA COUNT FOR OUTPUT REPORT HOLD
01C
EX02
05B
EX52
HAVE MORE THAN 50 "C" CONTROL CARDS COME IN? EX92
YES
EX56
SET OUT ON-LINE MESSAGE "TOO MANY C CONTROL CARDS" SET FLAG EX999
01C
EX02
NO
SAVE THE PROJECT NUMBER CARDS IN LOCATION PJHLD
INCREMENT HOLD AREA COUNT FOR PROJECT NUMBER HOLD
01C
EX02
05C
EX58
HAS A "D" CONTROL CARD ALREADY BEEN READ IN? EX90
YES
SET OUT ON-LINE MESSAGE "DUPLICATE "D" CONTROL CARDS" SET FLAG EX999
01C
EX02
NO
EX59
SET "D" CARD FLAG EX90
05D
EX60
05D
EX60
PICK UP THE LOCATION OF THE NEXT TAPE REASSIGNMENT SLOT
SET UP NEW ASSIGNED TAPE UNIT TUASN
NO INFO IN SLOT
TAPE UNIT REASSIGNED
SET THE NEW TAPE UNIT PLUS DENSITY INDICATOR INTO TAPE TABLE TA & TB
EX61
ARE ALL THE SLOTS COMPLETED ?
NO
05D
EX60
YES
SET TAPE TABLE SLOT TA2 = TA1 TB3 = TB2
01C
EX02

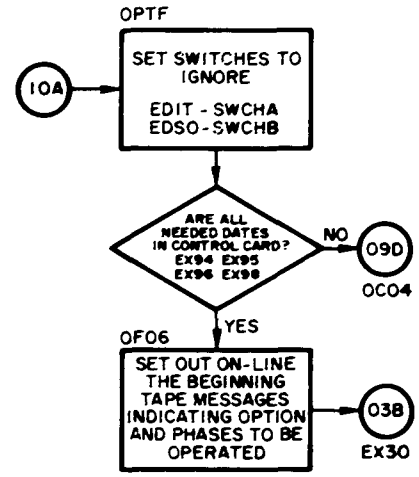

06A
EX61F
HAS AN "E" CONTROL CARD ALREADY BEEN READ IN? EX88
YES
SET OUT ON-LINE MESSAGE "DUPLICATE "E" CONTROL CARDS" SET FLAG EX999
01C
EX02
NO
EX61H
SET SECURITY NUMBER INTO LOCATION
SCHLD
EX61J
IS THE SECURITY NUMBER INCREMENTER GREATER THAN 24 ?
YES
SET OUT ON-LINE MESSAGE "SECURITY NUMBER INCREMENTOR OUT OF BOUNDS" SET FLAG EX999
01C
EX02
NO
CONVERT NUMBER TO BINARY USING TABLE AT LOCATION
CNVT
SAVE INCREMENTER AT LOCATION
SCNIN
SET "E" CONTROL CARD FLAG
EX88
01C
EX02
06B
EX61P
HAS AN "F" CONTROL CARD ALREADY BEEN READ IN? EX87
YES
SET OUT ON-LINE MESSAGE "DUPLICATE "F" CONTROL CARDS" SET FLAG EX999
01C
EX02
NO
SET "F" CONTROL CARD FLAG
EX87
EX61R
SET OLD PROGRAM NAME INTO LOCATION
PNHD2
01C
EX02

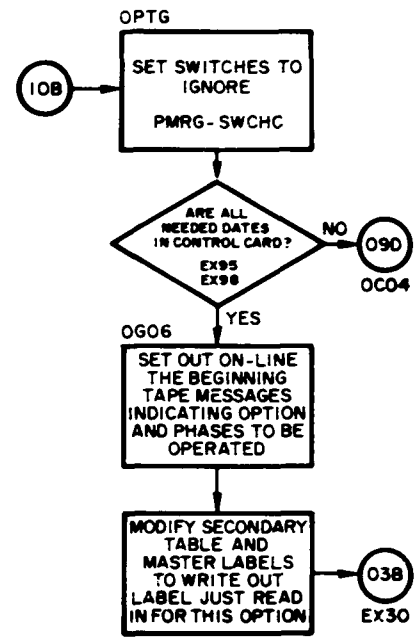

EX62
IS THE OPTION INDICATED ON THIS RUN A, D, F OR G ?
07A
YES
EX63
HAS A "B" CONTROL CARD BEEN READ IN ? EX91
YES
07B
EX64
NO
EX64
SET THE COUNT OF PROJECT NUMBER CARDS INTO SORTS PARAMETERS EX92 → EX648
07B
EX63A
SET OUT ON-LINE MESSAGE "NO OUTPUT REPORTS INDICATED" SET FLAG EX999
EX648
SORT OF DATA USING THE MEMORY SORT MSRT
EX65
HAS AN "F" CONTROL CARD BEEN READ IN ? EX87
YES
NO
SET UP THE NEW PROGRAM NAME FROM THE FIRST TO SECOND LOCATION PNHLD → PNHD2
EX67
SET UP THE REPORT SELECTION OUTPUT MESSAGES JA00
IS ERROR INDICATOR SET? EX999
STOP
YES
NO
WHAT IS SELECTED OPTION ? EX97
07E
EX70
OPTION B
OPTION C-G
EX73
IS THIS RUN IN A FILE ESTABLISHMENT MODE ? EX85
NO
YES
OPTION A
SET SWITCH TO BYPASS SELECTION OF OLD PERT COST MASTER EX69
IS THERE MORE THAN ONE INPUT TAPE ? EX89
07G
EX72
NO
YES
07F
EX71
EX68
07C
NO
IS THE READING OF THE TIME TAPE TO BE SKIPPED ? EX99A
07D
YES
EX69
EX68
SELECT USERS TAPE AND REWIND TB4
07C
EX69
IS THIS RUN IN FILE ESTABLISHMENT MODE ?
07D
YES
NO
SELECT OLD PERT COST MASTER AND REWIND TB2
EX70
SELECT SORT TAPE AND REWIND TB5
07E
SELECT SORT TAPE AND REWIND TB6
SELECT SORT TAPE AND REWIND TA4
EX71
SELECT INPUT TAPE (SECOND) AND REWIND TA3
07F
EX72
SELECT SORTED DATA TAPE AND REWIND TB1
07G
SELECT INPUT TAPE AND REWIND TA1
08A
SWCHA


SWCHA
08A
SWITCH TO SKIP EDIT PHASE
SWITCH ON
SWITCH OFF
OPERATE ON EDIT PHASE
EDIT
SWCHB
08B
SWITCH TO SKIP EDIT SORT PHASE
SWITCH ON
SWITCH OFF
OPERATE ON EDIT SORT PHASE
EDSO
SWCHC
08C
SWITCH TO SKIP TIME MERGE PHASE
SWITCH OFF
08E
PMAS
SWITCH ON
SWCHD
08D
SWITCH TO SKIP PERT COST UPDATE PHASE
SWITCH OFF
08G
PUAOT
SWITCH ON
END
SET OUT ON-LINE MESSAGE "END OF PERT COST RUN"
FINAL PROGRAM HALT


PMAS
08E
IS THE RUN OPTION EQUAL TO E? EX97
YES
NO
PM02
IS THE RUN OPTION EQUAL TO F? EX97
YES
PM04
LOAD PAST THE PHASE OF UNUSED INPUT DATA SORT
NO
PM03
08F
LOAD MERGE PHASE AND TRANSFER TO TIME MERGE PMRG
PUAOT
08G
IS THE RUN OPTION EQUAL TO G? EX97
PU30
LOAD MERGE PHASE OF PROGRAM INTO CORE
PU10
08H
LOAD COST UPDATE PHASE AND TRANSFER TO COST UPDATE PUAO
SET UP PARAMETERS FOR BINARY READ WM04 RM07B
READ IN THE INPUT PARAMETERS BLOCK RINP
NO
IS THIS RUN IN A FILE ESTABLISHMENT MODE? EX84
YES
WRITE OUT A BLOCK FOR THE INPUT PARAMETERS WINP
WRITE OUT A BLOCK FOR THE INPUT PARAMETERS WINP
PU31A
PU32
READ IN A RECORD FROM OLD SECONDARY MASTER ROSM
FINISH UP THE WRITING OF THE SECONDARY MASTER WDNS
PU21
SET RECORD INTO WORKING AREA FOR WRITE OUT WKBFF
LOAD IN THE NEXT 5 SEGMENTS REPRESENTING THE TWO UNUSED SORTS
WRITE RECORD OUT ONTO NEW SECONDARY MASTER WNSM
08H
PUIO


OPTA
09A
SET SWITCHES TO IGNORE
EDSO - SWCHB
PMRG - SWCHC
PUAO - SWCHD
SET OUT ON-LINE THE BEGINNING TAPE MESSAGES INDICATING OPTION AND PHASES TO BE OPERATED
038
EX30
OPTB
09B
SET SWITCHES TO IGNORE
PMRG - SWCHC
PUAO - SWCHD
SET OUT ON-LINE THE BEGINNING TAPE MESSAGES INDICATING OPTION AND PHASES TO BE OPERATED
038
EX30
OPTC
09C
SET SWITCHES TO IGNORE
PUAO - SWCHD
SET ONLY MERGE PHASE INDICATOR
EX81
IS THE OUTPUT HOLD AREA EQUAL TO BLANK OR ZERO ?
YES
OC01
SET UP REPORT REQUEST FOR WORK PACKAGE - ACTIVITY REPORT NO. 1
ORHLD
NO
OC02
ARE ALL NEEDED DATES IN CONTROL CARD?
EX94
EX95
EX96
YES
OC06
SET OUT ON-LINE THE BEGINNING TAPE MESSAGES INDICATING OPTION AND PHASES TO BE OPERATED
NO
OC04
SET OUT ON-LINE MESSAGE "DATE MISSING FROM CONTROL CARD" SET FLAG
EX999
09D
038
EX30
OC10
MODIFY PERT/COST TABLE AND MASTER LABELS TO WRITE OUT LABEL JUST READ IN FOR THIS OPTION
038
EX30
OPTD
09E
ARE ALL NEEDED DATES IN CONTROL CARD?
EX94 EX95
EX96 EX98
NO
09D
OC04
YES
OD06
SET OUT ON-LINE THE BEGINNING TAPE MESSAGES INDICATING OPTION AND PHASES TO BE OPERATED
038
EX30
OPTE
09F
SET SWITCHES TO IGNORE
EDIT - SWCHA
EDSO - SWCHB
PUAO - SWCHD
IS THE OUTPUT HOLD AREA EQUAL TO BLANK OR ZERO ?
YES
OE01
SET UP REPORT REQUEST FOR WORK PACKAGE - ACTIVITY REPORT NO. 1
ORHLD
NO
OE02
ARE ALL NEEDED DATES IN CONTROL CARD?
EX94
EX96
EX98
NO
09D
OC04
YES
OE06
SET OUT ON-LINE THE BEGINNING TAPE MESSAGES INDICATING OPTION AND PHASES TO BE OPERATED


OPTF
10A
SET SWITCHES TO IGNORE
EDIT - SWCHA
EDSO-SWCHB
ARE ALL NEEDED DATES IN CONTROL CARD? EX94 EX95 EX96 EX98
NO
09D
0C04
YES
0F06
SET OUT ON-LINE THE BEGINNING TAPE MESSAGES INDICATING OPTION AND PHASES TO BE OPERATED
038
EX30


OPTG
10B
SET SWITCHES TO IGNORE
PMRG - SWCHC
ARE ALL NEEDED DATES IN CONTROL CARD? EX95 EX98
NO
09D
0C04
YES
0G06
SET OUT ON-LINE THE BEGINNING TAPE MESSAGES INDICATING OPTION AND PHASES TO BE OPERATED
MODIFY SECONDARY TABLE AND MASTER LABELS TO WRITE OUT LABEL JUST READ IN FOR THIS OPTION
038
EX30

Region DTCR

EXPLANATION OF REGION:

This routine will take a seven-character date and convert it into DD-MM-YY and verify the figures.

CALLING SEQUENCE:

L	TSX	DTCR, 4
L + 1	Normal return	

INPUT:

The date will come in as XXXXDD in the accumulator and MMMYYX in the MQ.

OUTPUT:

The date in the form of DD-MM-YY will come out in the accumulator.

STORAGE USED:

DTTB - 12 words - Hold range of days tied to month

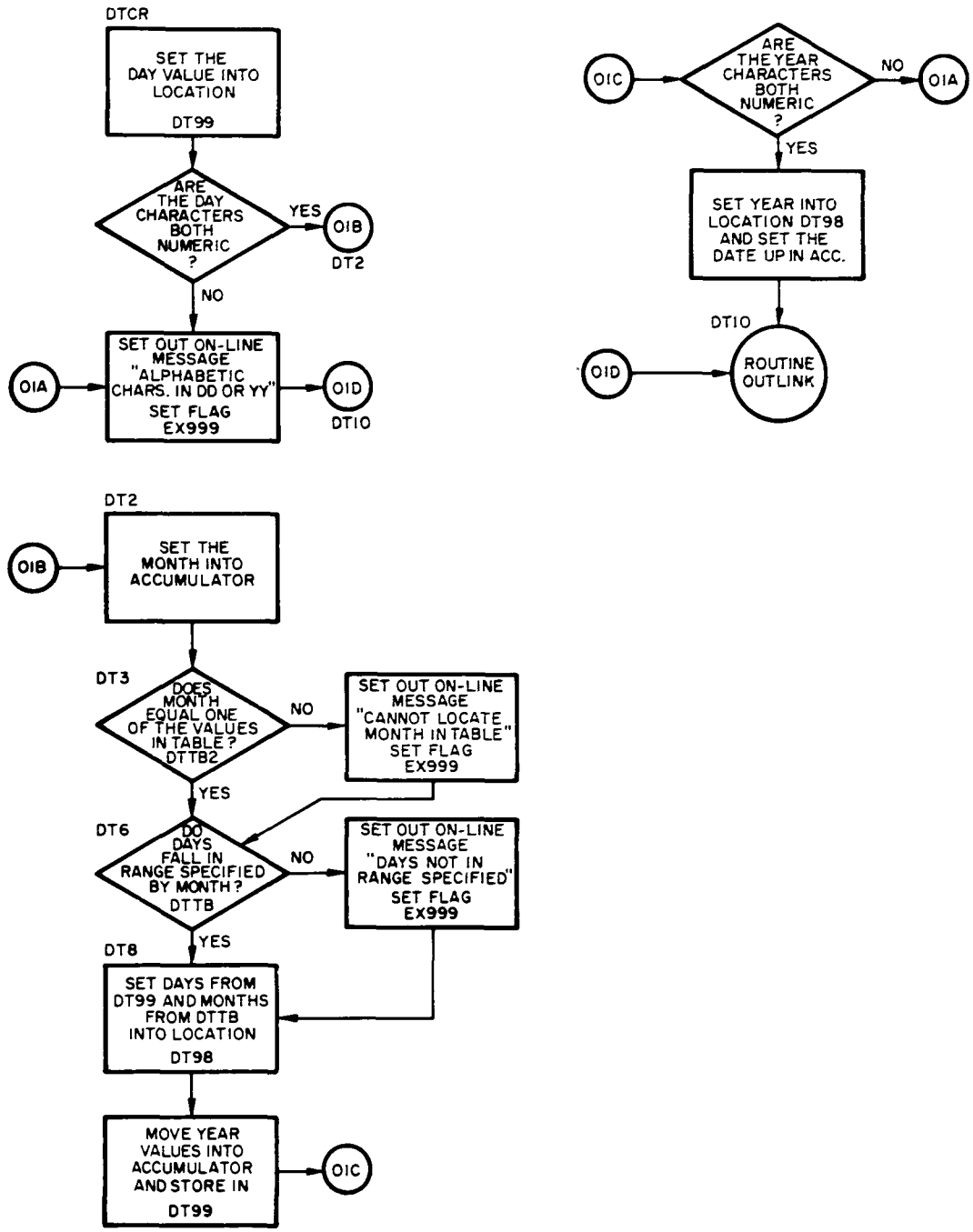
DTTB2 - 12 words - Hold legitimate months

SUBREGIONS AND SUBROUTINES USED:

Not applicable

EXPLANATION OF CALLING SEQUENCE:

If an error is found, a message is put out on the on-line printer, and the program is stopped.


DTCR
SET THE DAY VALUE INTO LOCATION DT99
ARE THE DAY CHARACTERS BOTH NUMERIC ?
YES
01B
DT2
NO
01A
SET OUT ON-LINE MESSAGE "ALPHABETIC CHARS. IN DD OR YY" SET FLAG EX999
01D
DT10
01C
ARE THE YEAR CHARACTERS BOTH NUMERIC ?
NO
01A
YES
SET YEAR INTO LOCATION DT98 AND SET THE DATE UP IN ACC.
DT10
01D
ROUTINE OUTLINK
DT2
01B
SET THE MONTH INTO ACCUMULATOR
DT3
DOES MONTH EQUAL ONE OF THE VALUES IN TABLE ? DTTB2
NO
SET OUT ON-LINE MESSAGE "CANNOT LOCATE MONTH IN TABLE" SET FLAG EX999
YES
DT6
DO DAYS FALL IN RANGE SPECIFIED BY MONTH ? DTTB
NO
SET OUT ON-LINE MESSAGE "DAYS NOT IN RANGE SPECIFIED" SET FLAG EX999
YES
DT8
SET DAYS FROM DT99 AND MONTHS FROM DTTB INTO LOCATION DT98
MOVE YEAR VALUES INTO ACCUMULATOR AND STORE IN DT99
01C

Region TUASN

EXPLANATION OF REGION:

This routine will set up the new tape unit to be reassigned from the "D" control card.

CALLING SEQUENCE:

L	TSX	TUASN, 4
L + 1	Zero or blank return	
L + 2	Normal return	

INPUT:

The "D" control card

OUTPUT:

The tape channel and number in the address of the accumulator.

STORAGE USED:

Not applicable

SUBREGIONS AND SUBROUTINES USED:

Not applicable

EXPLANATION OF CALLING SEQUENCE:

If an error is found, a message is put out on the on-line printer, and the program is stopped.

Region PMAS

EXPLANATION OF REGION:

This routine will set up the segments of the program to operate upon for the PERT merge phase.

CALLING SEQUENCE:

L	TSX	PMAS, 4
L + 1	Normal return	

INPUT:

Not applicable

OUTPUT:

Not applicable

STORAGE USED:

Not applicable

SUBREGIONS AND SUBROUTINES USED:

Not applicable

EXPLANATION OF CALLING SEQUENCE:

The outlink from this routine will take the system into PMRG

Region PUAOT

EXPLANATION OF REGION:

This region will set up the segments of the program to operate upon for the PERT cost update phase.

CALLING SEQUENCE:

```
L       TRA     PUAOT
```

INPUT:

Not applicable

OUTPUT:

Not applicable

STORAGE USED:

Not applicable

SUBREGIONS AND SUBROUTINES USED:

Not applicable

EXPLANATION OF CALLING SEQUENCE:

The outlink from this region will take the system into PUAO from which it will go into the output routine leaving the executive control section.

Region JA00

EXPLANATION OF REGION:

This routine will unpack the output report selections so that they can be deciphered by the output section.

CALLING SEQUENCE:

L	TSX	JA00, 4
L + 1	Normal return	

INPUT:

ORHLD table set up with the "B" control cards.

OUTPUT:

On-line printing indicating the reports selected.

The ORPT table containing the deciphered output report selections.

STORAGE USED:

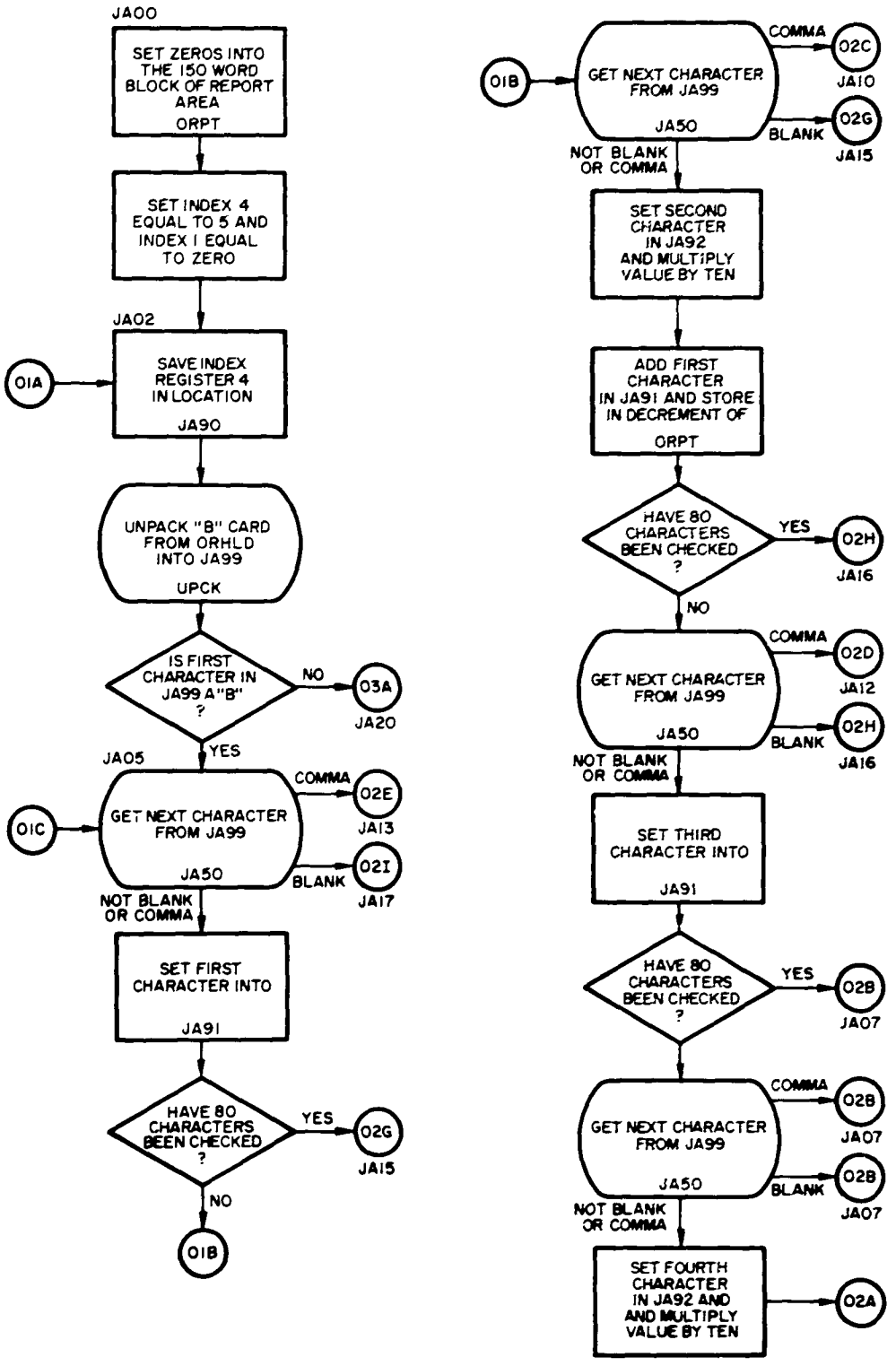
ORPT - 150 words - Hold deciphered output report selections

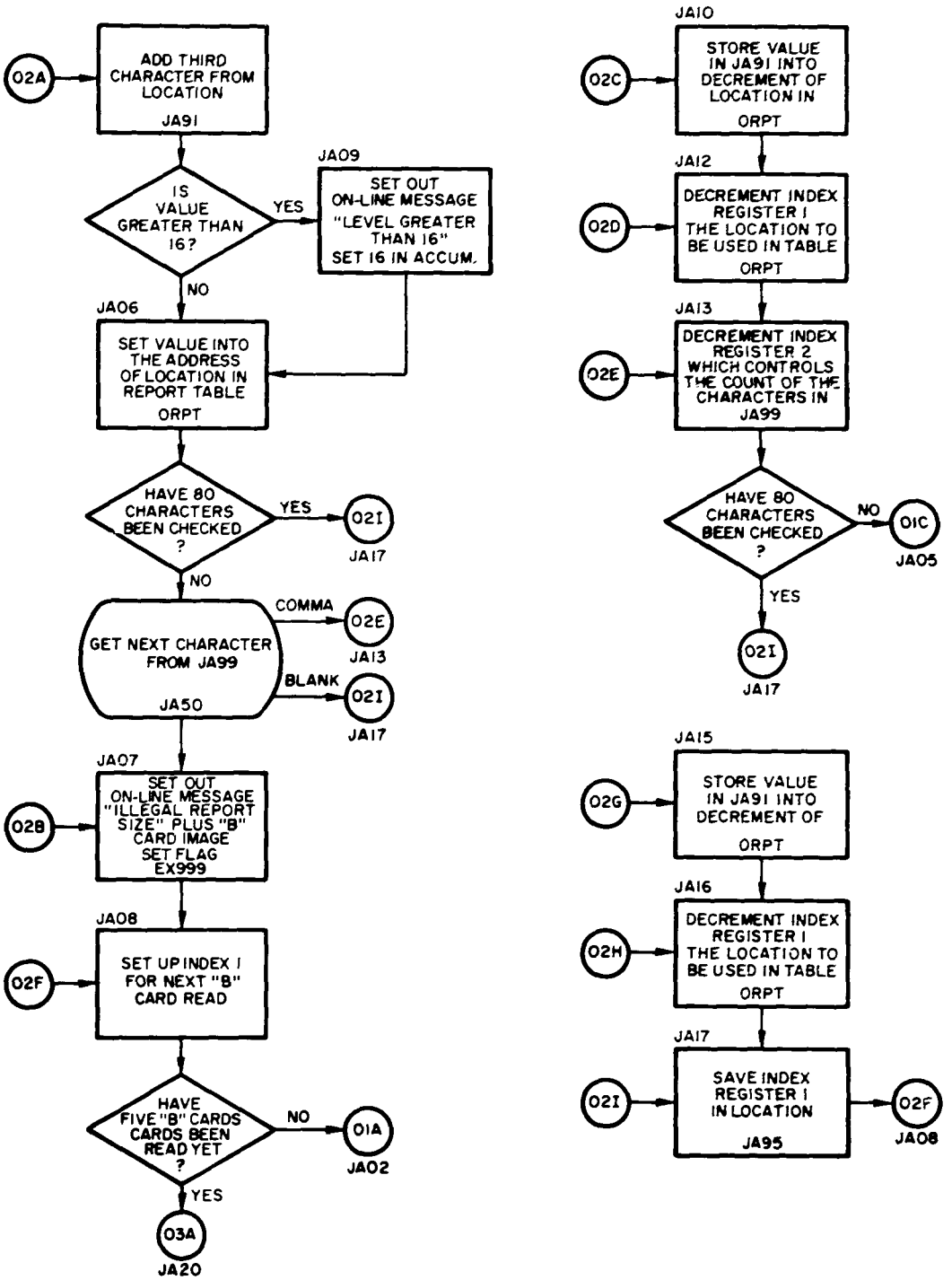
SUBREGIONS AND SUBROUTINES USED:

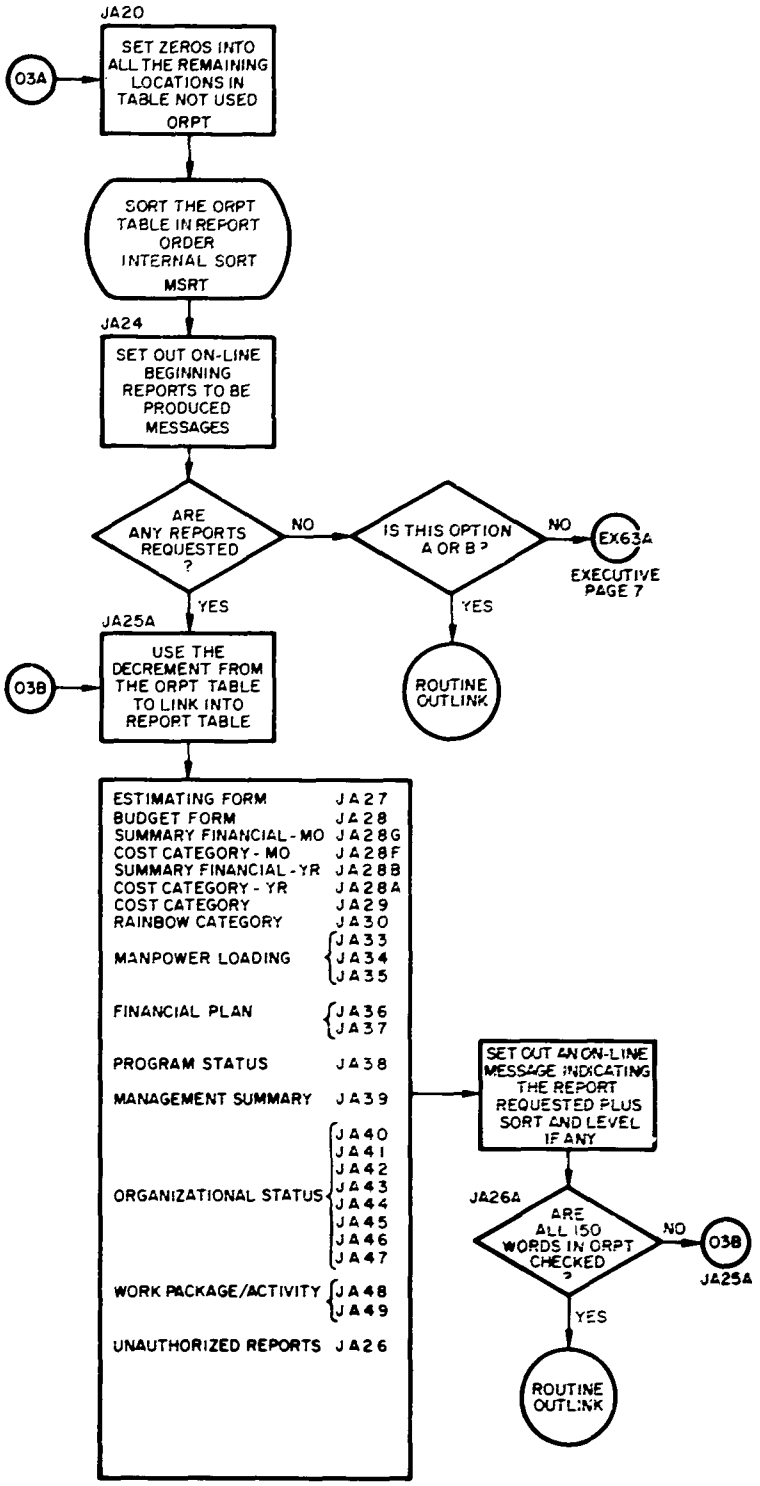
Not applicable

EXPLANATION OF CALLING SEQUENCE:

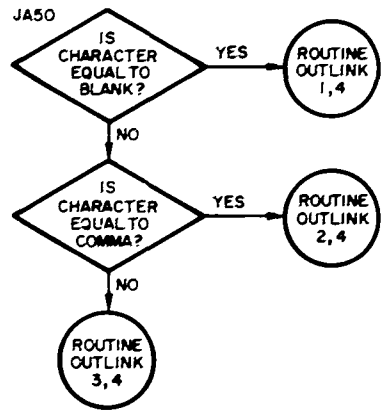
Not applicable


JA00
SET ZEROS INTO THE 150 WORD BLOCK OF REPORT AREA
ORPT
SET INDEX 4 EQUAL TO 5 AND INDEX 1 EQUAL TO ZERO
JA02
01A
SAVE INDEX REGISTER 4 IN LOCATION
JA90
UNPACK "B" CARD FROM ORHLD INTO JA99
UPCK
IS FIRST CHARACTER IN JA99 A "B" ?
NO
03A
JA20
YES
JA05
01C
GET NEXT CHARACTER FROM JA99
JA50
COMMA
02E
JA13
BLANK
02I
JA17
NOT BLANK OR COMMA
SET FIRST CHARACTER INTO
JA91
HAVE 80 CHARACTERS BEEN CHECKED ?
YES
02G
JA15
NO
01B
01B
GET NEXT CHARACTER FROM JA99
JA50
COMMA
02C
JA10
BLANK
02G
JA15
NOT BLANK OR COMMA
SET SECOND CHARACTER IN JA92 AND MULTIPLY VALUE BY TEN
ADD FIRST CHARACTER IN JA91 AND STORE IN DECREMENT OF
ORPT
HAVE 80 CHARACTERS BEEN CHECKED ?
YES
02H
JA16
NO
GET NEXT CHARACTER FROM JA99
JA50
COMMA
02D
JA12
BLANK
02H
JA16
NOT BLANK OR COMMA
SET THIRD CHARACTER INTO
JA91
HAVE 80 CHARACTERS BEEN CHECKED ?
YES
02B
JA07
GET NEXT CHARACTER FROM JA99
JA50
COMMA
02B
JA07
BLANK
02B
JA07
NOT BLANK OR COMMA
SET FOURTH CHARACTER IN JA92 AND AND MULTIPLY VALUE BY TEN
02A

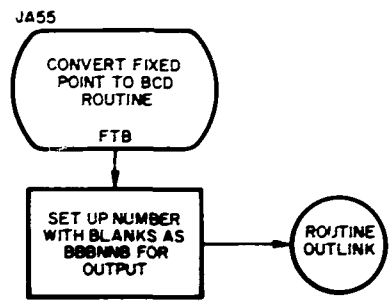

02A
ADD THIRD CHARACTER FROM LOCATION
JA91
IS VALUE GREATER THAN 16?
YES
JA09
SET OUT ON-LINE MESSAGE "LEVEL GREATER THAN 16" SET 16 IN ACCUM.
NO
JA06
SET VALUE INTO THE ADDRESS OF LOCATION IN REPORT TABLE
ORPT
HAVE 80 CHARACTERS BEEN CHECKED ?
YES
02I
JA17
NO
GET NEXT CHARACTER FROM JA99
JA50
COMMA
02E
JA13
BLANK
02I
JA17
JA07
02B
SET OUT ON-LINE MESSAGE "ILLEGAL REPORT SIZE" PLUS "B" CARD IMAGE SET FLAG EX999
JA08
02F
SET UP INDEX 1 FOR NEXT "B" CARD READ
HAVE FIVE "B" CARDS CARDS BEEN READ YET ?
NO
01A
JA02
YES
03A
JA20
JA10
02C
STORE VALUE IN JA91 INTO DECREMENT OF LOCATION IN
ORPT
JA12
02D
DECREMENT INDEX REGISTER 1 THE LOCATION TO BE USED IN TABLE
ORPT
JA13
02E
DECREMENT INDEX REGISTER 2 WHICH CONTROLS THE COUNT OF THE CHARACTERS IN JA99
HAVE 80 CHARACTERS BEEN CHECKED ?
NO
01C
JA05
YES
02I
JA17
JA15
02G
STORE VALUE IN JA91 INTO DECREMENT OF
ORPT
JA16
02H
DECREMENT INDEX REGISTER 1 THE LOCATION TO BE USED IN TABLE
ORPT
JA17
02I
SAVE INDEX REGISTER 1 IN LOCATION
JA95
02F
JA08


JA20
03A
SET ZEROS INTO ALL THE REMAINING LOCATIONS IN TABLE NOT USED
ORPT
SORT THE ORPT TABLE IN REPORT ORDER
INTERNAL SORT
MSRT
JA24
SET OUT ON-LINE BEGINNING REPORTS TO BE PRODUCED MESSAGES
ARE ANY REPORTS REQUESTED ?
NO
IS THIS OPTION A OR B ?
NO
EX63A
EXECUTIVE PAGE 7
YES
YES
JA25A
03B
USE THE DECREMENT FROM THE ORPT TABLE TO LINK INTO REPORT TABLE
ROUTINE OUTLINK
ESTIMATING FORM JA27
BUDGET FORM JA28
SUMMARY FINANCIAL - MO JA28G
COST CATEGORY - MO JA28F
SUMMARY FINANCIAL - YR JA28B
COST CATEGORY - YR JA28A
COST CATEGORY JA29
RAINBOW CATEGORY JA30
MANPOWER LOADING JA33 JA34 JA35
FINANCIAL PLAN JA36 JA37
PROGRAM STATUS JA38
MANAGEMENT SUMMARY JA39
ORGANIZATIONAL STATUS JA40 JA41 JA42 JA43 JA44 JA45 JA46 JA47
WORK PACKAGE/ACTIVITY JA48 JA49
UNAUTHORIZED REPORTS JA26
SET OUT AN ON-LINE MESSAGE INDICATING THE REPORT REQUESTED PLUS SORT AND LEVEL IF ANY
JA26A
ARE ALL 150 WORDS IN ORPT CHECKED ?
NO
03B
JA25A
YES
ROUTINE OUTLINK

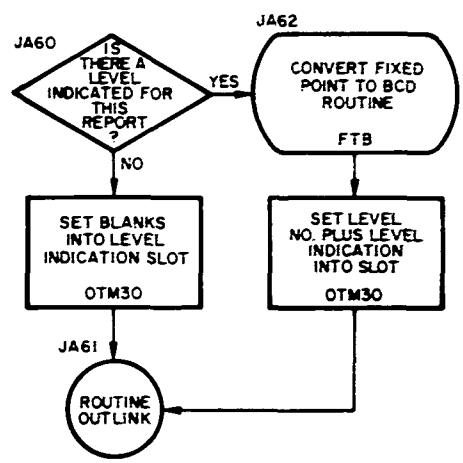
JA50 - CHARACTER TYPE DETERMINATION



JA55 - CONVERT BINARY NUMBER TO BCD



JA60 - SET UP LEVEL INDICATION



III-D PERT COST EDIT PHASE

This phase will accomplish the input data editing. It will select the acceptable data, write the data out on the EDITED DATA TAPE, and write the errors on the SYSTEM ERROR TAPE. At the end of the edit phase, a message will indicate the number of errors encountered during the processing which will be displayed on the on-line printer. This message will take one of the following forms:

1. XXXX ERRORS DETERMINED
   IF RUN IS TO BE CONTINUED EVEN THOUGH ERRORS INDICATED HIT START

2. NO ERRORS DETERMINED

If the option indicated is only the edit phase, the program will come to its normal conclusion with or without input errors, and only the first line of message (1) or message (2) will be printed out. When the option indicated exceeds the edit phase, a halt will occur, and message (1) will indicate the number of input errors encountered. If these errors are to be ignored, the start button at the console is hit, and these input errors are bypassed. The program will then go into the edit sort phase. For the case where there are no errors indicated and the option code exceeds the edit phase, the program will go into the edit sort automatically after message (2) is printed.

Input Editing Data Tape Labels

The input data information can be entered into the system with any one of the three following labels as the first record on tape:

Column ⟶

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
U	N	S	O	R	T	E	D		R	A	W		D	A	T	A		T	A	P	E
A	C	T	U	A	L		R	A	W		D	A	T	A		T	A	P	E		
E	D	I	T	E	D		R	A	W		D	A	T	A		T	A	P	E		

The "UNSORTED RAW DATA TAPE" label is set in front of all input that is in the form of cards and will have to go through a card-to-tape procedure.

The "ACTUAL RAW DATA TAPE" label will be placed onto any input tape that is generated from another computer program and will eventually be fed into the PERT Cost system.

The "EDITED RAW DATA TAPE" label will be set onto the front of all correct data that has previously passed through the edit phase. The label on this tape will indicate that no editing is necessary for this information because it has already been done. For INPUT DATA TAPE label checking, only the first four words are verified for acceptability. When this tape is used as the EDITED DATA TAPE in the edit sort phase, the entire label is checked as is discussed on Page III-E-12. This entire label takes the form on tape of two records, the first record of six words and the second of four.

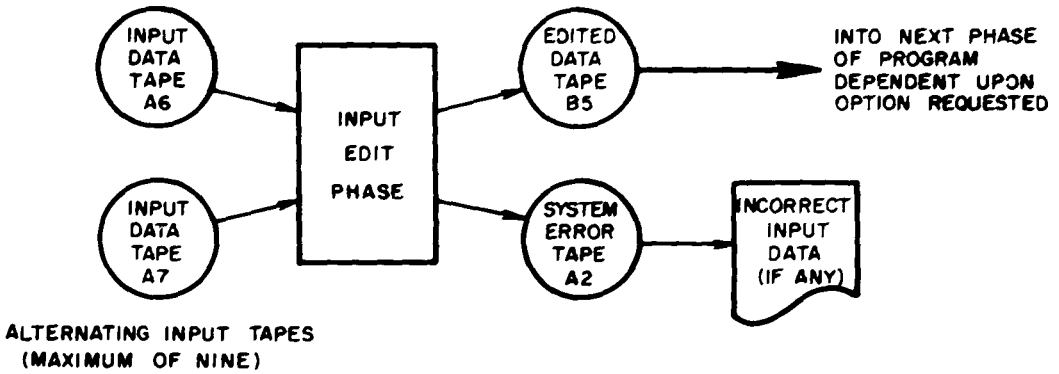
Each tape (if more than one is required) will contain one of the above three labels as the first record on that tape. All records on the INPUT DATA TAPE will be unblocked, and no prior sort will be required, because the edit sort phase will accomplish this. Any combination of input tapes (to a maximum of nine) containing the above three labels can be read in during any cyclic or file establishment run.

Input Editing Tape Operations

The edit phase allows for alternating input tapes A6 and A7. If only one input tape is required for this run, it will be placed on tape unit A6, with a blank tape set on A7 if the option requires it. A maximum of nine alternating input tapes can be used. The output from these alternating input tapes, which has been acceptable to the edit program, is set out on tape unit B5. A maximum of nine reels of B5 can be created during any run.

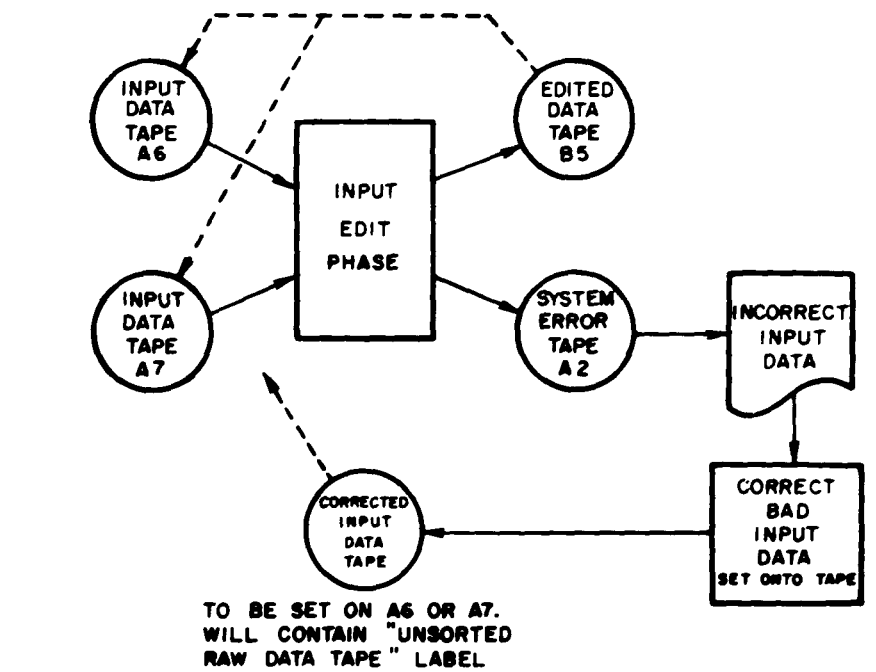
The tape flow during the input editing phase will take the following form:

a. If all input data are correct or if the bad data are to be ignored:



The printout of the SYSTEM ERROR TAPE will take place after the completion of this run.

b. If a portion or all of the input data is incorrect and it is to be corrected:



The printout of the SYSTEM ERROR TAPE will take place after the completion of the edit phase. The errors indicated on this tape will be corrected and new input cards punched reflecting these corrections. These cards, along with the new control cards, will then go card-to-tape with a label of "UNSORTED RAW DATA TAPE" preceding the input. This tape and the tape containing the acceptable data (EDITED DATA TAPE) will be mounted on units A6 and A7. The tape containing the current control cards must be mounted on A6. The program will then be restarted from the beginning.

Input Editing Tape Messages On-Line

The messages forthcoming on the on-line printer regarding the alternating input and edited tapes will be as follows, depending on the number of tapes used and the governing option:

a) Only one input tape and Option A

TAPE A6 HAS BEEN SELECTED FOR READING
TAPE B5 HAS BEEN SELECTED FOR WRITING
TAPE A6 IS NOW REWINDING AND SHOULD UNLOAD
TAPE B5 IS NOW REWINDING AND SHOULD UNLOAD
END OF PERT EDIT PHASE

The above set of messages will be followed by the error-indication messages described on Page III-D-1. Error messages will likewise follow all of the tape messages described in the examples below.

b) Two input tapes and Option A

TAPE A6 HAS BEEN SELECTED FOR READING
TAPE B5 HAS BEEN SELECTED FOR WRITING
TAPE A6 IS NOW REWINDING AND SHOULD UNLOAD
TAPE A7 HAS BEEN SELECTED FOR READING
TAPE A7 IS NOW REWINDING AND SHOULD UNLOAD
TAPE B5 IS NOW REWINDING AND SHOULD UNLOAD
END OF PERT EDIT PHASE

While A6 is rewinding, Tape A7 is being read to speed up computer processing. This is true for all the alternating reads.

c) Three or more input tapes, Option A, and multiple edited tapes

TAPE A6 HAS BEEN SELECTED FOR READING
TAPE B5 HAS BEEN SELECTED FOR WRITING
TAPE A6 IS NOW REWINDING AND SHOULD UNLOAD
SET NEXT REEL OF THIS SERIES ON TAPE A6
TAPE A7 HAS BEEN SELECTED FOR READING
TAPE B5 IS NOW REWINDING AND SHOULD UNLOAD
SET NEXT REEL OF THIS SERIES ON TAPE B5
TAPE A7 IS NOW REWINDING AND SHOULD UNLOAD
TAPE A6 HAS BEEN SELECTED FOR READING
TAPE A6 IS NOW REWINDING AND SHOULD UNLOAD
TAPE B5 IS NOW REWINDING AND SHOULD UNLOAD
END OF PERT EDIT PHASE

The above process can continue until nine input tapes have been read from A6 and A7. A maximum of nine B5 tapes can be created during any one run. The EDITED DATA TAPE is not alternating, and therefore the program must wait until the tape is rewound, unloaded, and a new tape loaded prior to proceeding.

d) Only one input tape and Option B

The on-line messages will take the same form as shown in (a) except for message line 4, which will appear as follows:

TAPE B5 IS NOW REWINDING

Tape B5 is not unloaded in this option because it is to be used in the edit sort phase of the program.

e) Two input tapes and Option B

The on-line messages will take the same form as shown in (b) except for message lines 5 and 6, which will appear as follows:

TAPE A7 IS NOW REWINDING
TAPE B5 IS NOW REWINDING

Tape A7 is not unloaded for this option because it will become one of the sort and merge tapes.

f) Three or more input tapes, Option B, and multiple-edited tapes

The on-line messages will take the same form as shown in c) except for message line 8, which will appear as follows:

TAPE A7 IS NOW REWINDING

The above message applies to the final reference made to tape A7. All previous messages referring to A7 will involve a rewind and unload of the tape. Tape B5 is rewound and unloaded if multiple EDITED DATA TAPES are created. The reason for this operation is to reload the first B5 created onto the unit so that in the edit sort the data are reread in the order they were created.

g) Only one input tape and Options C to G

The on-line messages will take the same form as shown in a) except for message lines 3 and 4, which will appear as follows:

TAPE A6 IS NOW REWINDING
TAPE B5 IS NOW REWINDING

Tape A6 is not unloaded in these options because it will be used for the new PERT COST MASTER TAPE. Tape B5 is not unloaded because it will be input to the edit sort phase.

h) Two input tapes and Options C to G

The on-line messages will take the same form as shown in b) except for message lines 3, 5 and 6, which will appear as follows:

TAPE A6 IS NOW REWINDING
TAPE A7 IS NOW REWINDING
TAPE B5 IS NOW REWINDING

Tape A7 is not unloaded for these options because it will become one of the sort and merge tapes.

i) Three or more input tapes, Options C to G, and multiple-edited tapes

The on-line messages will take the same form as described in f) except that line 10 of c) will be changed as follows:

TAPE A6 IS NOW REWINDING

The above message applies to the final reference made to tape A6. All previous messages referring to A6 will involve a rewind and unload of the tape.

Input Editing Off-Line Error Messages

The errors determined during the edit phase are set out on the SYSTEM ERROR TAPE. There are no on-line indications regarding this tape. The SYSTEM ERROR TAPE is never rewound or unloaded unless it has reached end-of-tape. The removal of this tape at program end is a manual operation.

During the edit phase operation, the program will edit input cards until the first error is located. This error will be set out on the SYSTEM ERROR TAPE, whereupon the program will proceed to edit the next input card. During the edit phase, the following errors and accompanying messages can be forthcoming:

a. ERROR IN CARD CODE

XX — 80 characters of input card — XX

If the input card code is not in the range of 1 to 7, or is a 3, this message will be set out. (Note: the second line of this and all other messages in this section will be a reproduction of the input card to which this message applies.)

b. NOT A LEGITIMATE CHANGE CODE

The change code does not correspond to R, T, and D for 7-3 card inputs or A, C, and D for the others.

c. JUSTIFICATION ON A FIELD OF THIS INPUT IN ERROR

If a field contains data that is not properly justified, this message is set out. The one exception to this rule is where an asterisk is used to clear out a field and this asterisk is always left-justified.

d. ERROR ON INPUT PARAMETER CARD CODE

The 1-type input card is not in the range of A to C. If the A to C range is verified, the following card number ranges are checked:

1. A - Range 1 to 9
2. B - Range 1 to 75
3. C - Range 1 to 19

e. NO PREDECESSOR NUMBER FOR ACTIVITY

If the predecessor is blank or zero on a 2-type input, this message is put out.

f. NO SUCCESSOR NUMBER FOR ACTIVITY

The successor is blank or zero on a 2-type input.

g. NO CHARGE NO. TIED TO AN ACTIVITY

The charge number is blank or zero on a 2-type input and it is not a delete code.

h. NO RESOURCE CODE TIED TO RATE INPUT

The resource code is blank or zero on a 4-type input.

i. RATE INPUT YEAR OUT OF RANGE

The year is alphabetic or not in the range of 6X or 7X.

j. RATE INFORMATION MISSING ON RATE INPUT

If both the unit rate and overhead rate are absent from a field that has a year related to it and the change code is not a delete.

k. ALPHABETIC CHARACTERS IN RATE INPUT

The rate fields contain a character other than blank, decimal point, or 1 to 9 on a 4-type card input.

l. YEAR QUARTER ON RATE CHANGE NOT IN RANGE

The quarter if indicated is not in the range of 1 to 4 on one of the fields on a 4 card input.

m. NO RAINBOW CATEGORY TIED TO INPUT CARD

The rainbow category field on a 5 card is zero or blank.

n. SKILL CODE INFO MISSING ON SKILL INPUT

The first resource or skill code field on a 5 or 6 card input is blank or zero and card code is not a delete.

o. NO COST ELEMENT CODE TIED TO INPUT CARD 6

The cost element code field on a 6 card is zero or blank.

p. ERROR IN SECONDARY CODE

The secondary code (column 78) on 7 card input is not in the range of 0 to 5.

q. NO CHARGE NO. TIED TO COST INPUT

The charge number is blank or zero on 7 card input.

r. CHARGE NO. START DATE IN ERROR

The start date uses a bad month, alphabetic days or years, or the days do not fall in the range specified by its month.

s. CHARGE NO. COMPLETE DATE IN ERROR

The complete date uses a bad month, alphabetic days or years, or the days do not fall in the range specified by its month.

t. LEVEL CODE OUT OF BOUNDS

The work breakdown level code is not in the bounds of 1 to 16.

u. NO PERFORMING UNIT TIED TO COST INPUT

The performing unit is blank or zero on 7-3, 7-4, or 7-5 card inputs.

v. NO RESOURCE CODE TIED TO COST INPUT

The resource code is blank or zero on 7-3, 7-4, or 7-5 card input.

w. NOT A LEGITIMATE INPUT CATEGORY TYPE

The UDC code is not a legitimate code of H, D, M, T, and U for 7-3, 7-4, and 7-5 inputs.

x. NON-NUMERIC CHARACTERS IN COST FIELDS

The values in the numeric fields of the 7-3, 7-4, and 7-5 input cards contain a character other than blank or 0-9. The 7-3 actual input may contain an alphabetic character in the first position of the field due to the possibility of having a minus sign overpunch.

y. NO MONTH OR YEAR IN ACTUAL INPUTS

On a 7-3 input which is not a delete, there is no month or year shown for a field with a UDC code.

z. MONTH AND YEAR OF ACTUAL INPUTS AFTER TIME NOW

The date on a field of the 7-3 actual input card is after the time-now date.

aa. NON-NUMERIC CHARACTERS IN DATE FIELD

The 7-3 input card date uses a non-numeric month and year, other than blank.

bb. THIRD CODE INCORRECT

The code (column 79) on a 7-4 or 7-5 input card is not in the range of 0-9.

cc. A FIELD ON THIS INPUT SHOULD CONTAIN A VALUE

All value fields on the 7-4 or 7-5 input cards are blank, and the change code is not delete

dd. NO DATA ON INPUT CARD

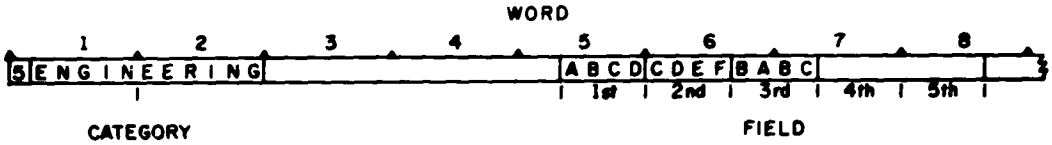
The input card should contain some information in the body data, but these data are all blank or zero.

Input Editing Program Operations

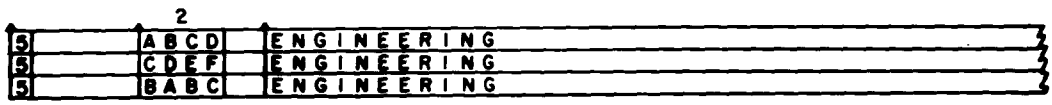
The following are some of the programming approaches that have been followed in the edit phase:

a. 5 and 6 Card Reformatting

Both the 5 and 6 input cards can have one or many resource codes tied to a category. Since the program logic uses the resource code as the indicative information on the card, except for category deletes, the fields are switched during the edit phase. For every resource code, a card is developed as shown:



ORIGINAL INPUT CARD



REFORMATTED INPUT CARD

The above holds true for both 5 and 6 cards. The change code remains in the same location, column 80, even after reformatting.

b. ZERO EDITING

To set up the fields that are involved in sorts, a zero editing approach is used. All leading blanks are transformed to zero. If a blank falls between two valid characters, it is left as a blank. The fields that are zero-edited include:

1. predecessor number
2. successor number
3. charge number
4. network code
5. performing unit
6. resource code
7. responsible organization
8. charge number next higher relation (father).

c. DELETE CHANGE CODE CONVERSION

In developing the sort for the input cards that contain a change code, the following order was used for all but the 7-3 cards:

1. adds or change code A
2. delete or change code D
3. changes or change code C

To make the processing easier, and to get the right order in the change code automatically, all codes having a D were change to B on the EDITED DATA TAPE.

d. CLEAR-OUT OF A FIELD

To set a field other than a value field to a blank, an asterisk is placed in the leftmost column of the field. Justification is disregarded for this case.

Input Editing Region Descriptions

The following region descriptions will describe the major subroutines used in the edit phase as well as the edit phase itself. Behind each region description will be one or more flow charts describing that region.

Region EDIT

EXPLANATION OF REGION:

This routine will accomplish the input data editing. It will select the acceptable data, write it out on the EDITED DATA TAPE, as well as writing the errors on the SYSTEM ERROR TAPE.

CALLING SEQUENCE:

L	TSX	EDIT, 4
L + 1	Normal return	

INPUT:

Up to nine INPUT DATA TAPES

OUTPUT:

Up to nine EDITED DATA TAPES for the acceptable data

The SYSTEM ERROR TAPE for all unacceptable data

STORAGE USED:

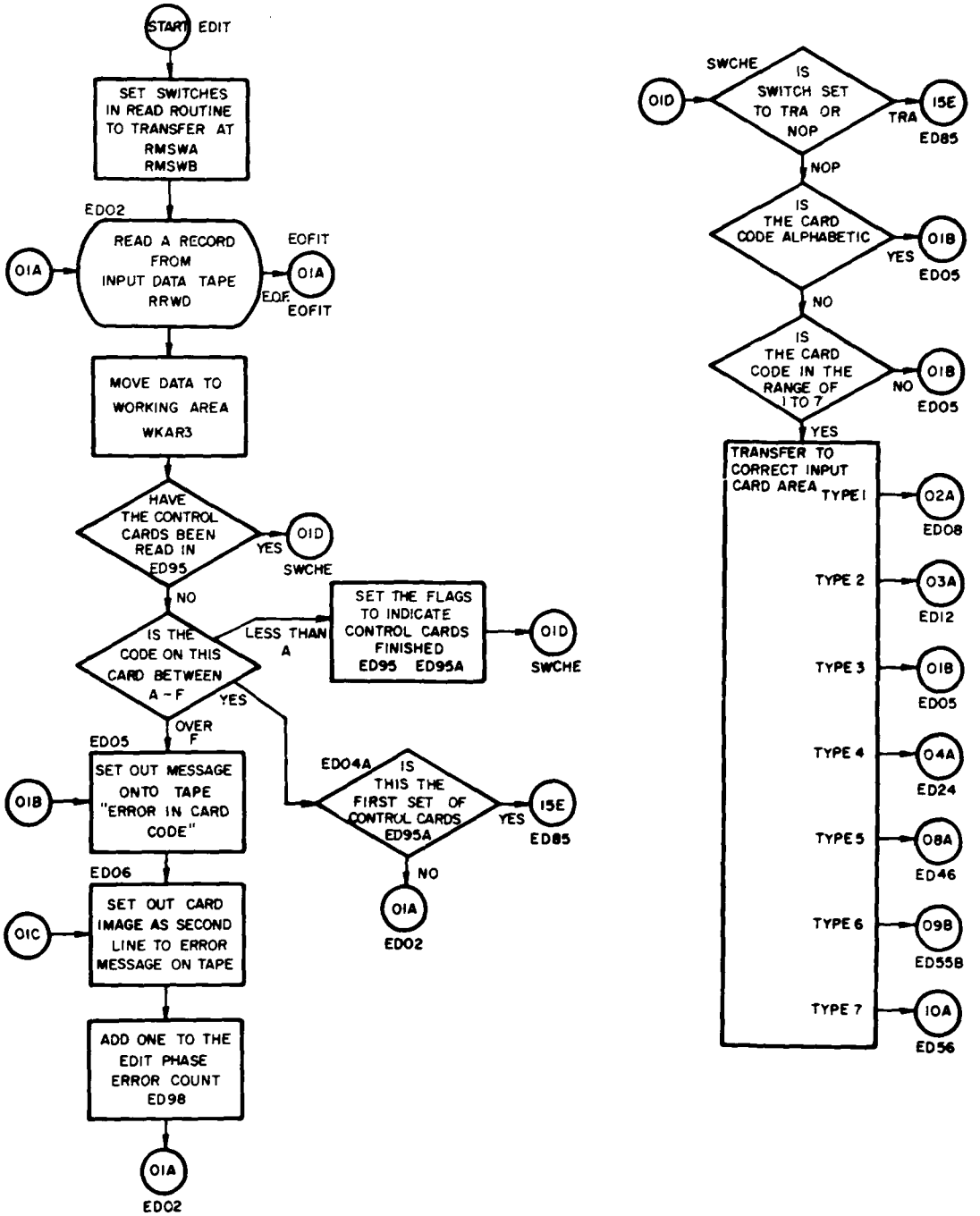
ED 96 - Flag to indicate if there is any information on input card. 0 will indicate no information.

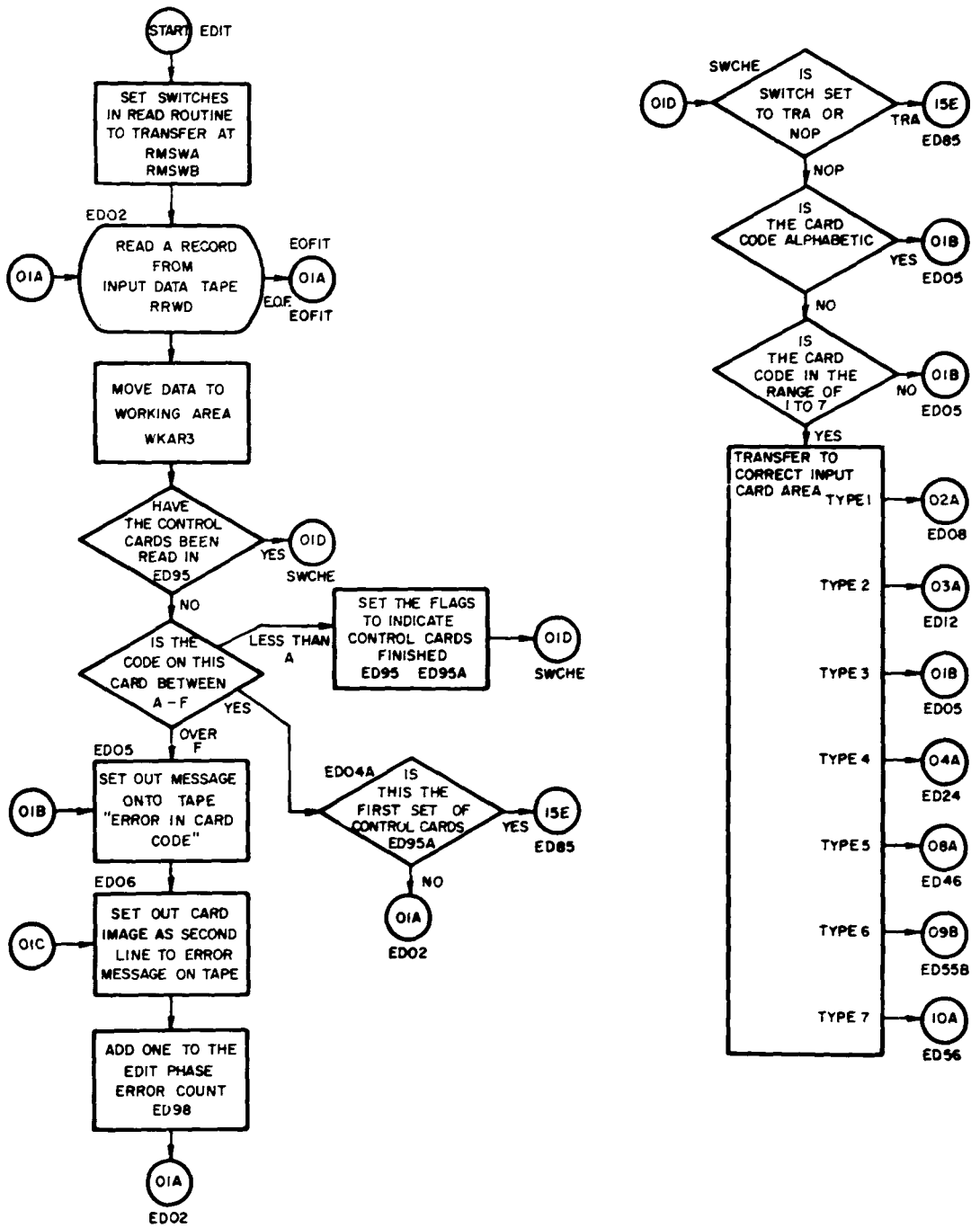
ED98 - Count of errors found in edit phase.

ED99 - Flag to indicate if there is any rate input data. 0 will indicate no data on rate input.

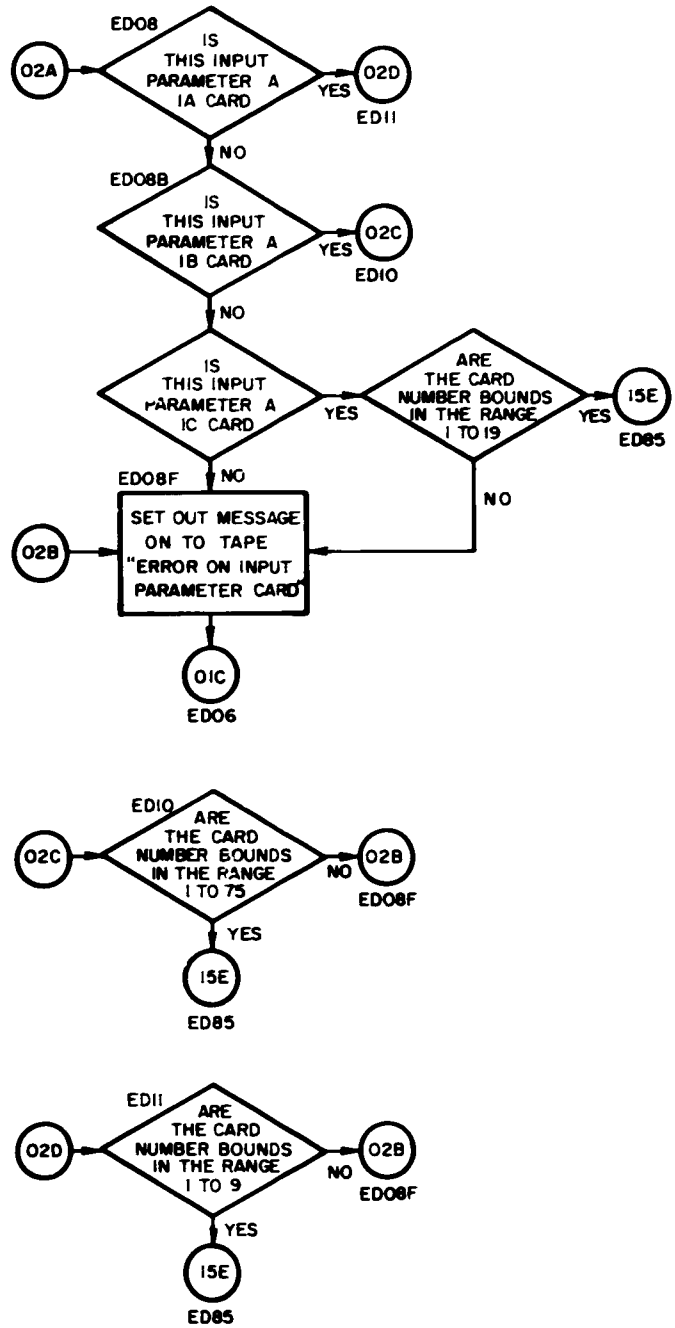
SUBREGIONS AND SUBROUTINES USED:

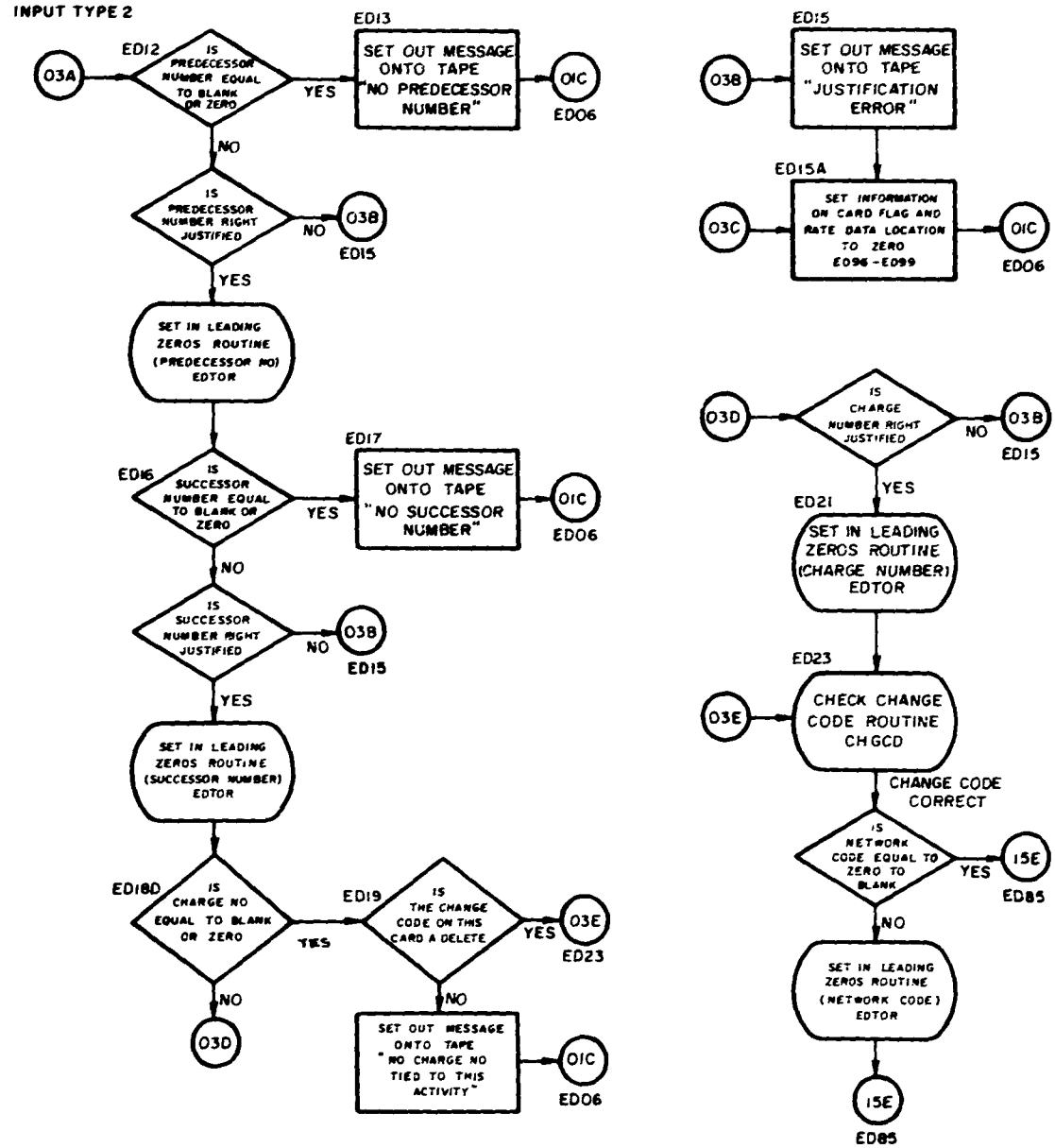
CNCK	CHCD2
DTED	EOFIT
PURC	CHGCD
INFT	EDTOR
MYCK	RRWD
FDCK	WRWD
FDCK2	


START EDIT
SET SWITCHES IN READ ROUTINE TO TRANSFER AT RMSWA RMSWB
ED02
READ A RECORD FROM INPUT DATA TAPE RRWD
01A
EOFIT
E.O.F.
EOFIT
MOVE DATA TO WORKING AREA WKAR3
HAVE THE CONTROL CARDS BEEN READ IN ED95
YES
01D
SWCHE
NO
IS THE CODE ON THIS CARD BETWEEN A-F
LESS THAN A
SET THE FLAGS TO INDICATE CONTROL CARDS FINISHED ED95 ED95A
01D
SWCHE
YES
OVER F
ED05
SET OUT MESSAGE ONTO TAPE "ERROR IN CARD CODE"
01B
ED04A
IS THIS THE FIRST SET OF CONTROL CARDS ED95A
YES
15E
ED85
NO
01A
ED02
ED06
SET OUT CARD IMAGE AS SECOND LINE TO ERROR MESSAGE ON TAPE
01C
ADD ONE TO THE EDIT PHASE ERROR COUNT ED98
01A
ED02
SWCHE
01D
IS SWITCH SET TO TRA OR NOP
TRA
15E
ED85
NOP
IS THE CARD CODE ALPHABETIC
YES
01B
ED05
NO
IS THE CARD CODE IN THE RANGE OF 1 TO 7
NO
01B
ED05
YES
TRANSFER TO CORRECT INPUT CARD AREA
TYPE 1
02A
ED08
TYPE 2
03A
ED12
TYPE 3
01B
ED05
TYPE 4
04A
ED24
TYPE 5
08A
ED46
TYPE 6
09B
ED55B
TYPE 7
10A
ED56

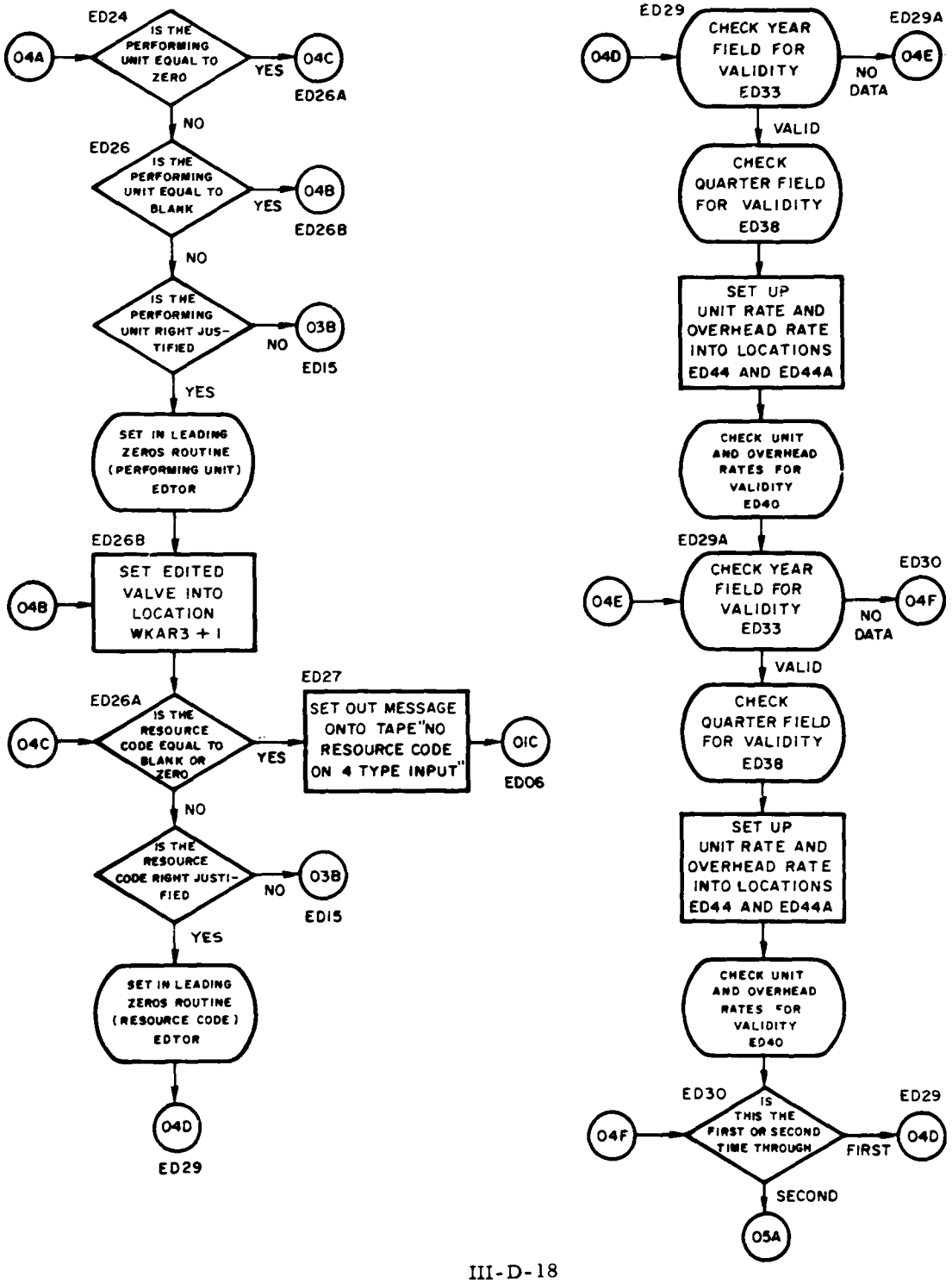

START EDIT
SET SWITCHES IN READ ROUTINE TO TRANSFER AT RMSWA RMSWB
ED02
READ A RECORD FROM INPUT DATA TAPE RRWD
01A
EOFIT
01A
E.O.F.
EOFIT
MOVE DATA TO WORKING AREA WKAR3
HAVE THE CONTROL CARDS BEEN READ IN ED95
YES
01D
SWCHE
NO
IS THE CODE ON THIS CARD BETWEEN A - F
LESS THAN A
SET THE FLAGS TO INDICATE CONTROL CARDS FINISHED ED95 ED95A
01D
SWCHE
YES
OVER F
ED05
SET OUT MESSAGE ONTO TAPE "ERROR IN CARD CODE"
01B
ED04A
IS THIS THE FIRST SET OF CONTROL CARDS ED95A
YES
15E
ED85
NO
01A
ED02
ED06
SET OUT CARD IMAGE AS SECOND LINE TO ERROR MESSAGE ON TAPE
01C
ADD ONE TO THE EDIT PHASE ERROR COUNT ED98
01A
ED02
SWCHE
01D
IS SWITCH SET TO TRA OR NOP
TRA
15E
ED85
NOP
IS THE CARD CODE ALPHABETIC
YES
01B
ED05
NO
IS THE CARD CODE IN THE RANGE OF 1 TO 7
NO
01B
ED05
YES
TRANSFER TO CORRECT INPUT CARD AREA
TYPE 1
02A
ED08
TYPE 2
03A
ED12
TYPE 3
01B
ED05
TYPE 4
04A
ED24
TYPE 5
08A
ED46
TYPE 6
09B
ED55B
TYPE 7
10A
ED56

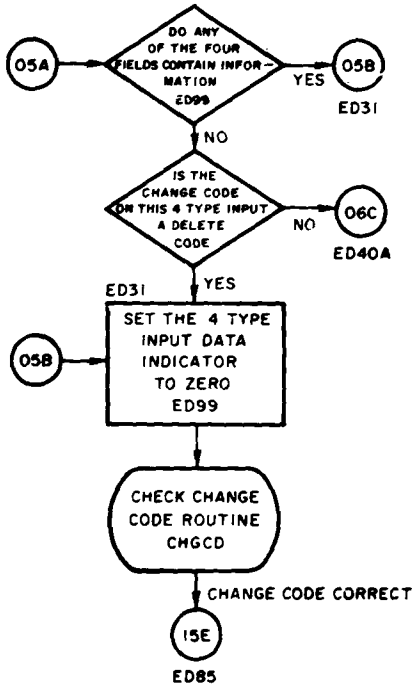
INPUT TYPE I


ED08
IS THIS INPUT PARAMETER A IA CARD
02A
YES
02D
ED11
NO
ED08B
IS THIS INPUT PARAMETER A IB CARD
YES
02C
ED10
NO
IS THIS INPUT PARAMETER A IC CARD
YES
ARE THE CARD NUMBER BOUNDS IN THE RANGE 1 TO 19
YES
15E
ED85
NO
ED08F
NO
SET OUT MESSAGE ON TO TAPE "ERROR ON INPUT PARAMETER CARD"
02B
01C
ED06
ED10
ARE THE CARD NUMBER BOUNDS IN THE RANGE 1 TO 75
02C
NO
02B
ED08F
YES
15E
ED85
ED11
ARE THE CARD NUMBER BOUNDS IN THE RANGE 1 TO 9
02D
NO
02B
ED08F
YES
15E
ED85

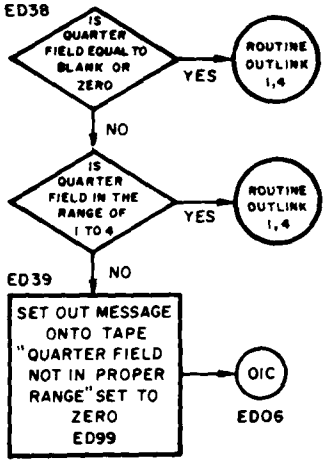

INPUT TYPE 2
03A
ED12
IS PREDECESSOR NUMBER EQUAL TO BLANK OR ZERO
YES
ED13
SET OUT MESSAGE ONTO TAPE "NO PREDECESSOR NUMBER"
01C
ED06
NO
IS PREDECESSOR NUMBER RIGHT JUSTIFIED
NO
03B
ED15
YES
SET IN LEADING ZEROS ROUTINE (PREDECESSOR NO) EDTOR
ED16
IS SUCCESSOR NUMBER EQUAL TO BLANK OR ZERO
YES
ED17
SET OUT MESSAGE ONTO TAPE "NO SUCCESSOR NUMBER"
01C
ED06
NO
IS SUCCESSOR NUMBER RIGHT JUSTIFIED
NO
03B
ED15
YES
SET IN LEADING ZEROS ROUTINE (SUCCESSOR NUMBER) EDTOR
ED18D
IS CHARGE NO EQUAL TO BLANK OR ZERO
YES
ED19
IS THE CHANGE CODE ON THIS CARD A DELETE
YES
03E
ED23
NO
03D
NO
SET OUT MESSAGE ONTO TAPE "NO CHARGE NO TIED TO THIS ACTIVITY"
01C
ED06
03B
ED15
SET OUT MESSAGE ONTO TAPE "JUSTIFICATION ERROR"
ED15A
03C
SET INFORMATION ON CARD FLAG AND RATE DATA LOCATION TO ZERO ED96-ED99
01C
ED06
03D
IS CHARGE NUMBER RIGHT JUSTIFIED
NO
03B
ED15
YES
ED21
SET IN LEADING ZEROS ROUTINE (CHARGE NUMBER) EDTOR
ED23
03E
CHECK CHANGE CODE ROUTINE CHGCD
CHANGE CODE CORRECT
IS NETWORK CODE EQUAL TO ZERO TO BLANK
YES
15E
ED85
NO
SET IN LEADING ZEROS ROUTINE (NETWORK CODE) EDTOR
15E
ED85

INPUT TYPE 4

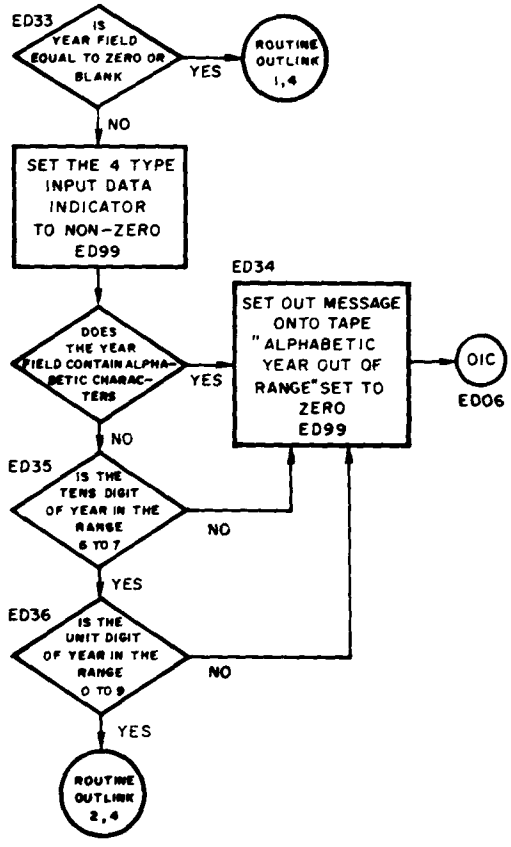

ED24
IS THE PERFORMING UNIT EQUAL TO ZERO
04A
YES
04C
ED26A
NO
ED26
IS THE PERFORMING UNIT EQUAL TO BLANK
YES
04B
ED26B
NO
IS THE PERFORMING UNIT RIGHT JUS-TIFIED
NO
03B
ED15
YES
SET IN LEADING ZEROS ROUTINE (PERFORMING UNIT) EDTOR
ED26B
SET EDITED VALVE INTO LOCATION WKAR3 + 1
04B
ED27
ED26A
IS THE RESOURCE CODE EQUAL TO BLANK OR ZERO
04C
YES
SET OUT MESSAGE ONTO TAPE "NO RESOURCE CODE ON 4 TYPE INPUT"
01C
ED06
NO
IS THE RESOURCE CODE RIGHT JUSTI-FIED
NO
03B
ED15
YES
SET IN LEADING ZEROS ROUTINE (RESOURCE CODE) EDTOR
04D
ED29
ED29
04D
CHECK YEAR FIELD FOR VALIDITY ED33
ED29A
04E
NO DATA
VALID
CHECK QUARTER FIELD FOR VALIDITY ED38
SET UP UNIT RATE AND OVERHEAD RATE INTO LOCATIONS ED44 AND ED44A
CHECK UNIT AND OVERHEAD RATES FOR VALIDITY ED40
ED29A
04E
CHECK YEAR FIELD FOR VALIDITY ED33
ED30
04F
NO DATA
VALID
CHECK QUARTER FIELD FOR VALIDITY ED38
SET UP UNIT RATE AND OVERHEAD RATE INTO LOCATIONS ED44 AND ED44A
CHECK UNIT AND OVERHEAD RATES FOR VALIDITY ED40
ED30
04F
IS THIS THE FIRST OR SECOND TIME THROUGH
FIRST
ED29
04D
SECOND
05A



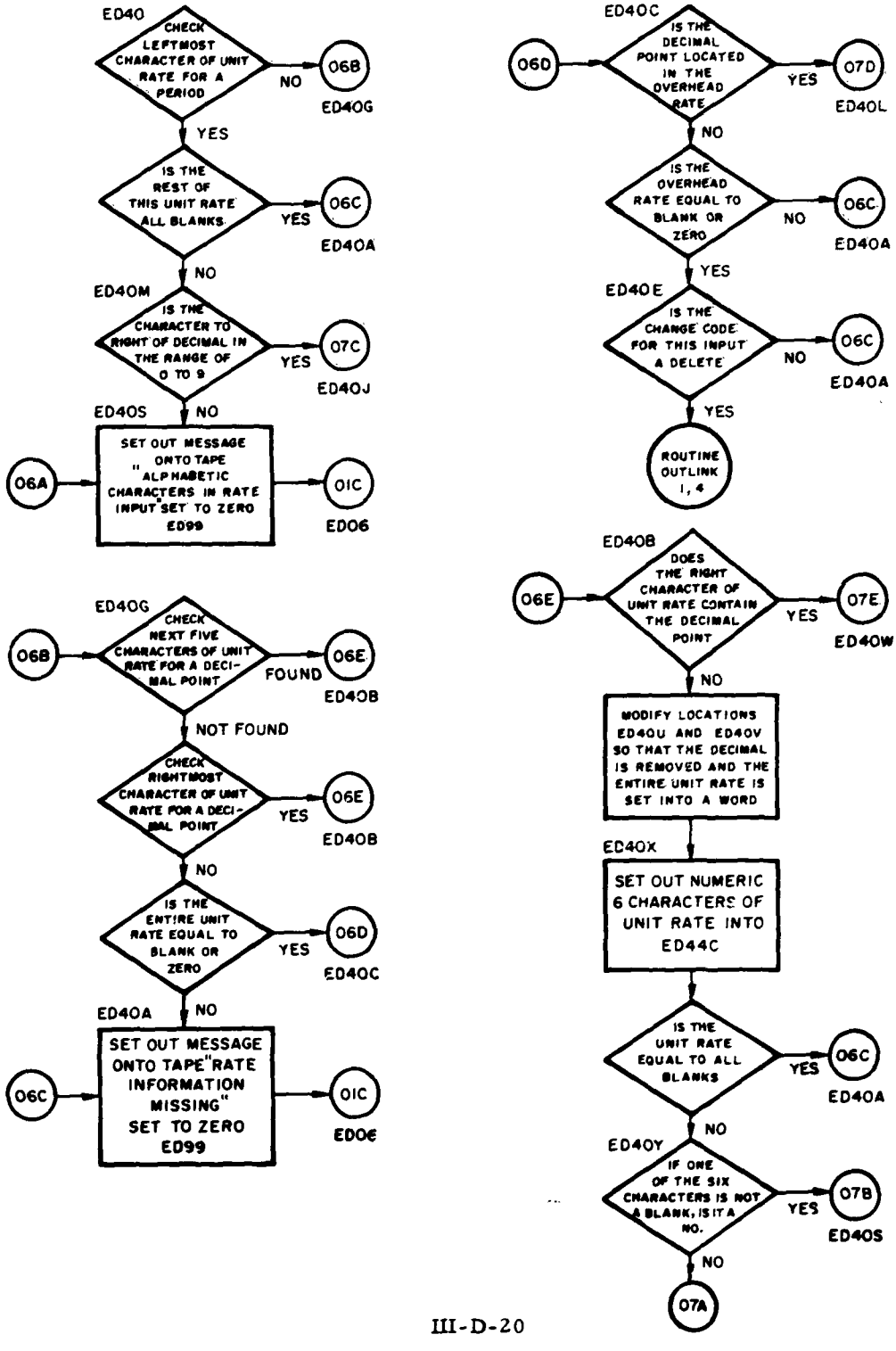
ED38 CHECK QUARTER FIELD FOR VALIDITY



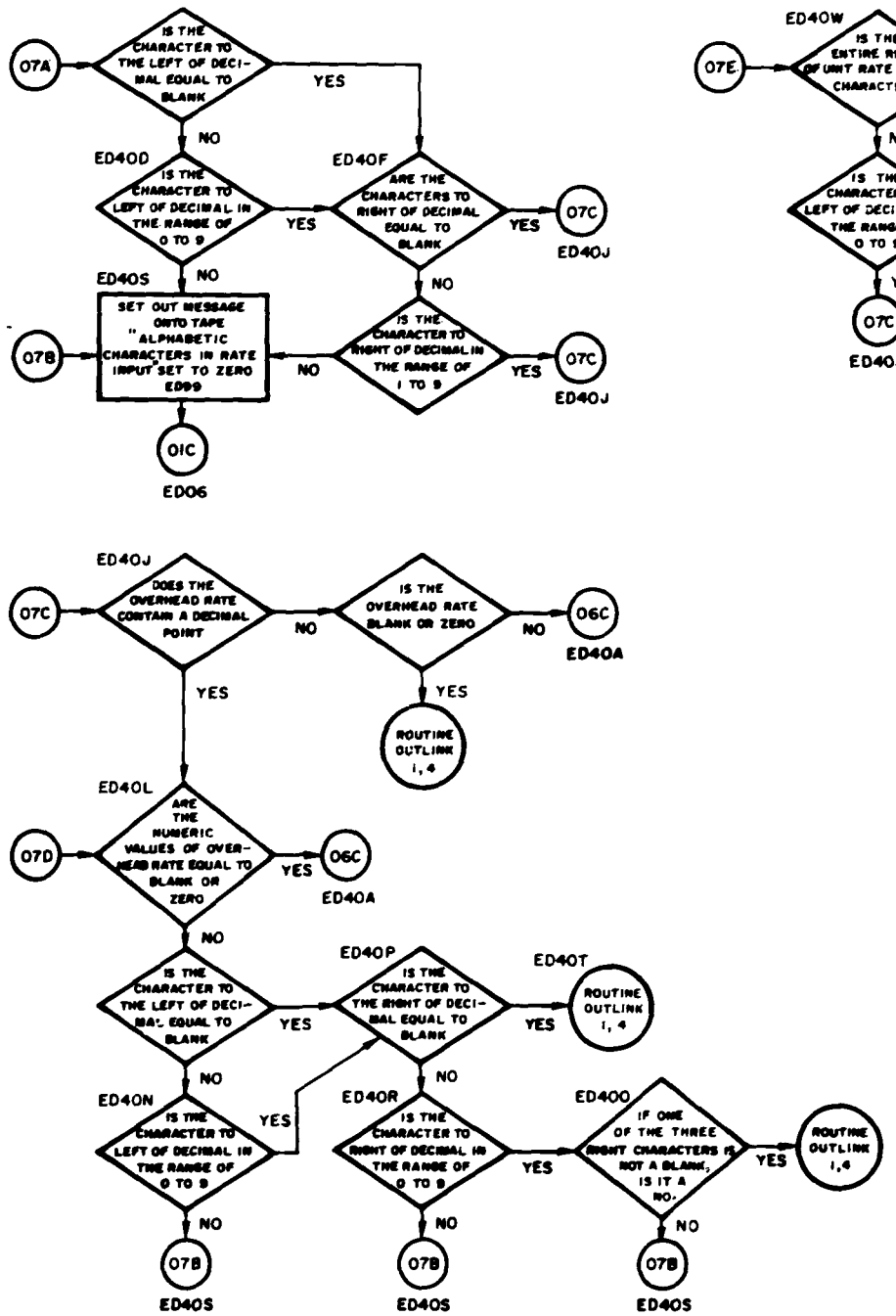
ED33 CHECK YEAR FIELD FOR VALIDITY



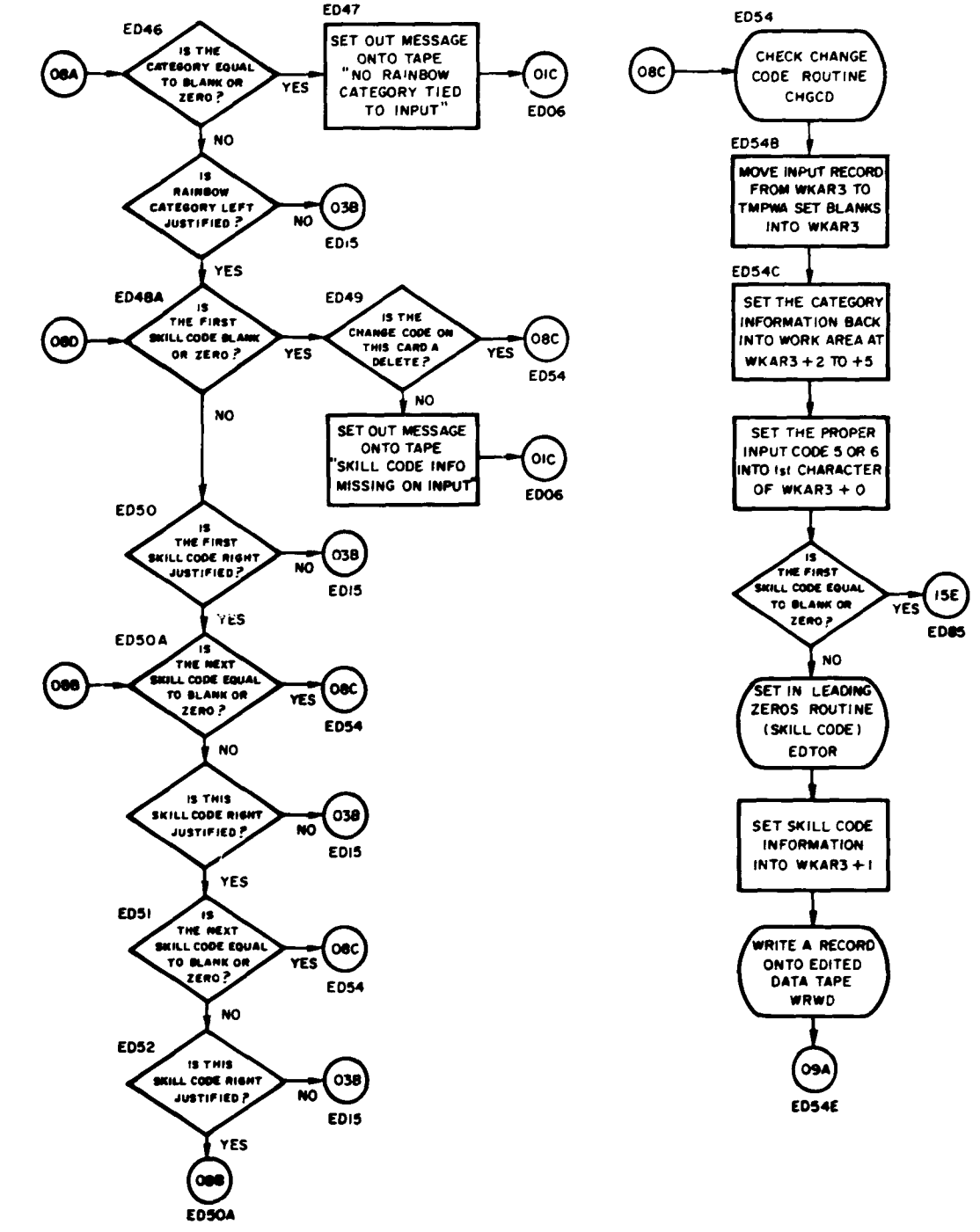
ED40 CHECK UNIT AND OVERHEAD RATES FOR VALIDITY

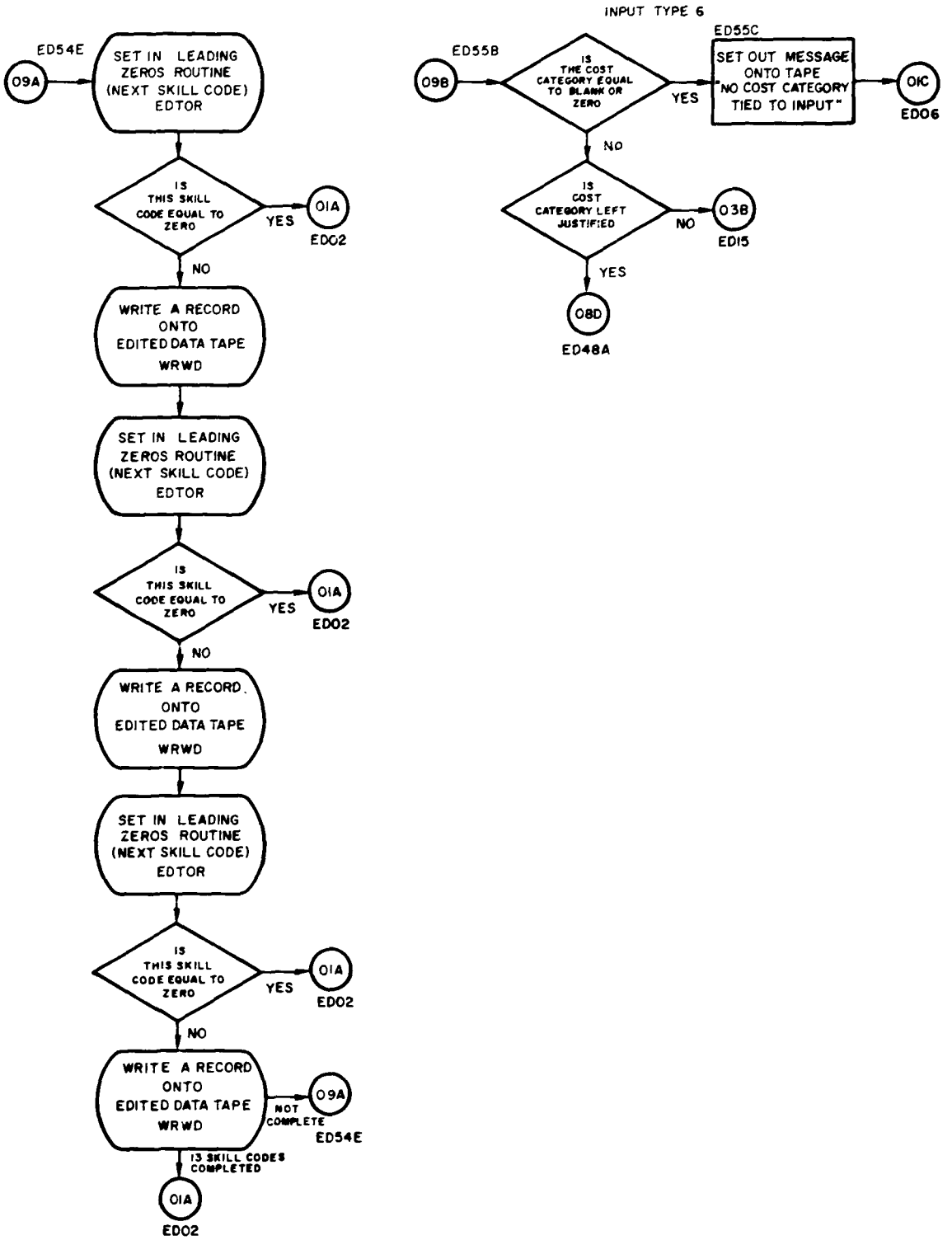


ED 40 (CONT)

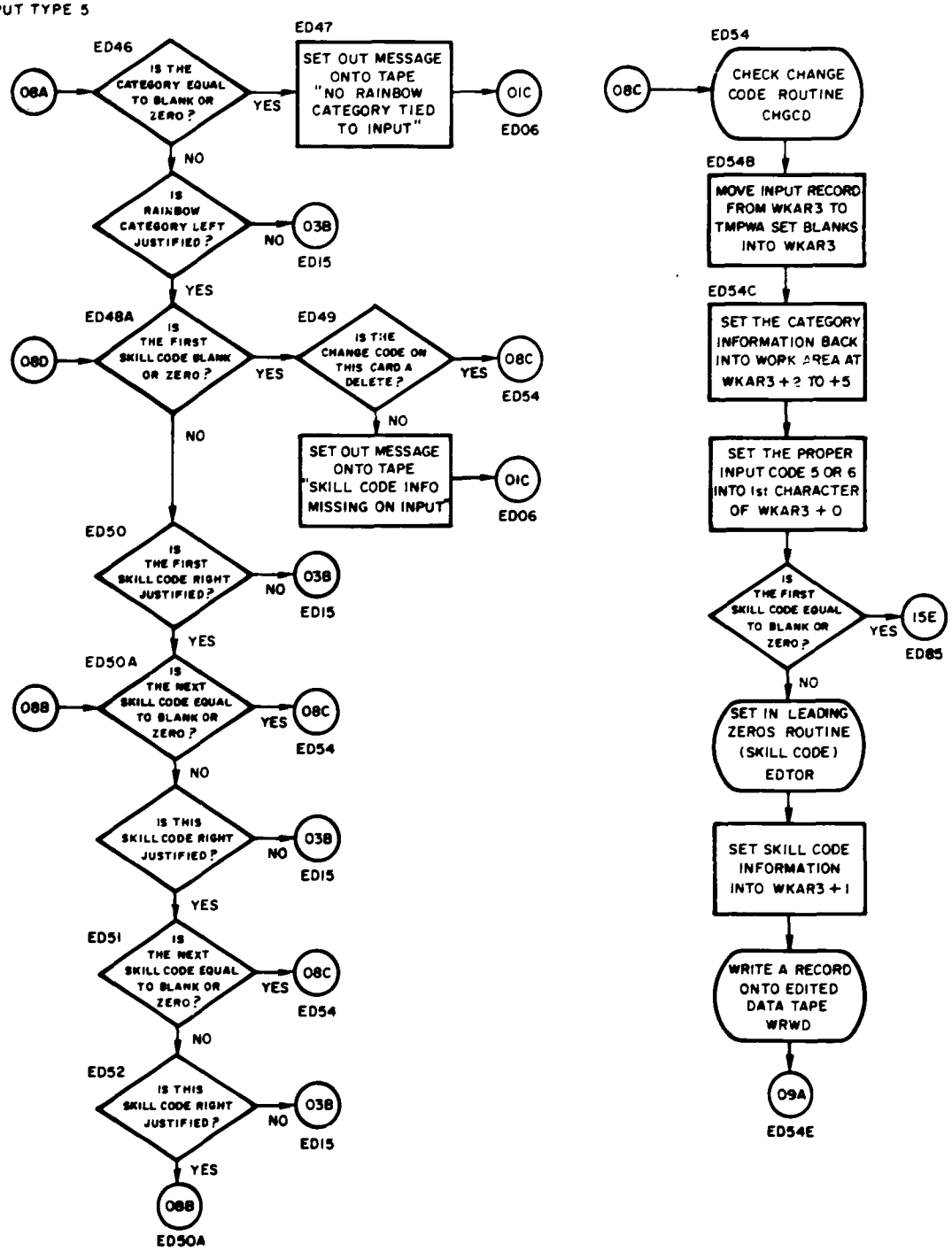

07A
IS THE CHARACTER TO THE LEFT OF DECIMAL EQUAL TO BLANK
YES
NO
ED40D
IS THE CHARACTER TO LEFT OF DECIMAL IN THE RANGE OF 0 TO 9
YES
ED40F
ARE THE CHARACTERS TO RIGHT OF DECIMAL EQUAL TO BLANK
YES
07C
ED40J
NO
ED40S
NO
SET OUT MESSAGE ONTO TAPE "ALPHABETIC CHARACTERS IN RATE INPUT" SET TO ZERO ED99
07B
NO
IS THE CHARACTER TO RIGHT OF DECIMAL IN THE RANGE OF 1 TO 9
YES
07C
ED40J
01C
ED06
ED40W
07E
IS THE ENTIRE RIGHT OF UNIT RATE BLANK CHARACTERS
YES
06C
ED40A
NO
IS THE CHARACTER TO LEFT OF DECIMAL IN THE RANGE OF 0 TO 9
NO
07B
ED40S
YES
07C
ED40J
ED40J
07C
DOES THE OVERHEAD RATE CONTAIN A DECIMAL POINT
NO
IS THE OVERHEAD RATE BLANK OR ZERO
NO
06C
ED40A
YES
YES
ROUTINE OUTLINK 1, 4
ED40L
07D
ARE THE NUMERIC VALUES OF OVERHEAD RATE EQUAL TO BLANK OR ZERO
YES
06C
ED40A
NO
ED40P
IS THE CHARACTER TO THE LEFT OF DECIMAL EQUAL TO BLANK
YES
IS THE CHARACTER TO THE RIGHT OF DECIMAL EQUAL TO BLANK
YES
ED40T
ROUTINE OUTLINK 1, 4
NO
NO
ED40N
IS THE CHARACTER TO LEFT OF DECIMAL IN THE RANGE OF 0 TO 9
YES
ED40R
IS THE CHARACTER TO RIGHT OF DECIMAL IN THE RANGE OF 0 TO 9
YES
ED40O
IF ONE OF THE THREE RIGHT CHARACTERS IS NOT A BLANK, IS IT A NO.
YES
ROUTINE OUTLINK 1, 4
NO
NO
NO
07B
ED40S
07B
ED40S
07B
ED40S

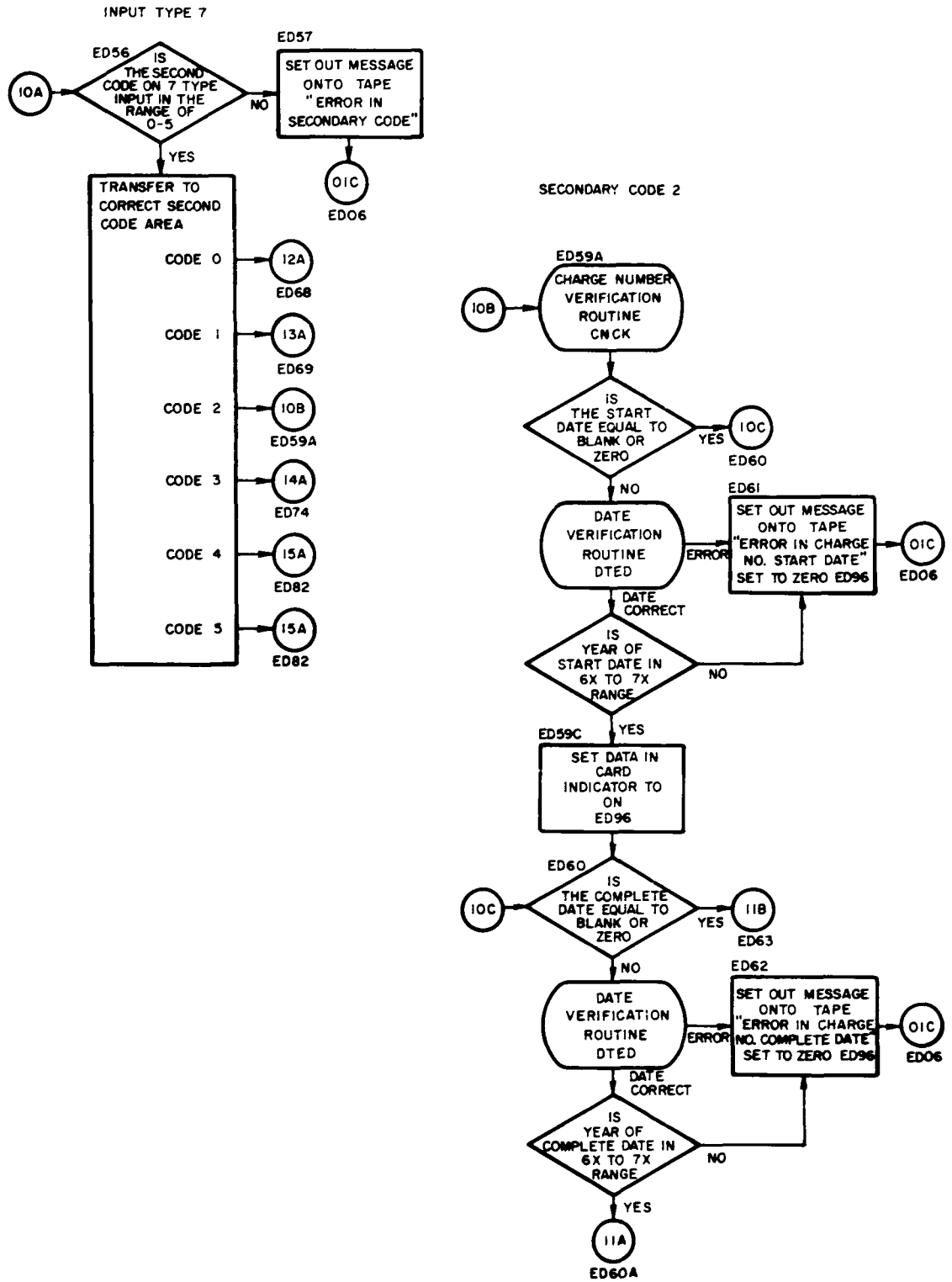
INPUT TYPE 5

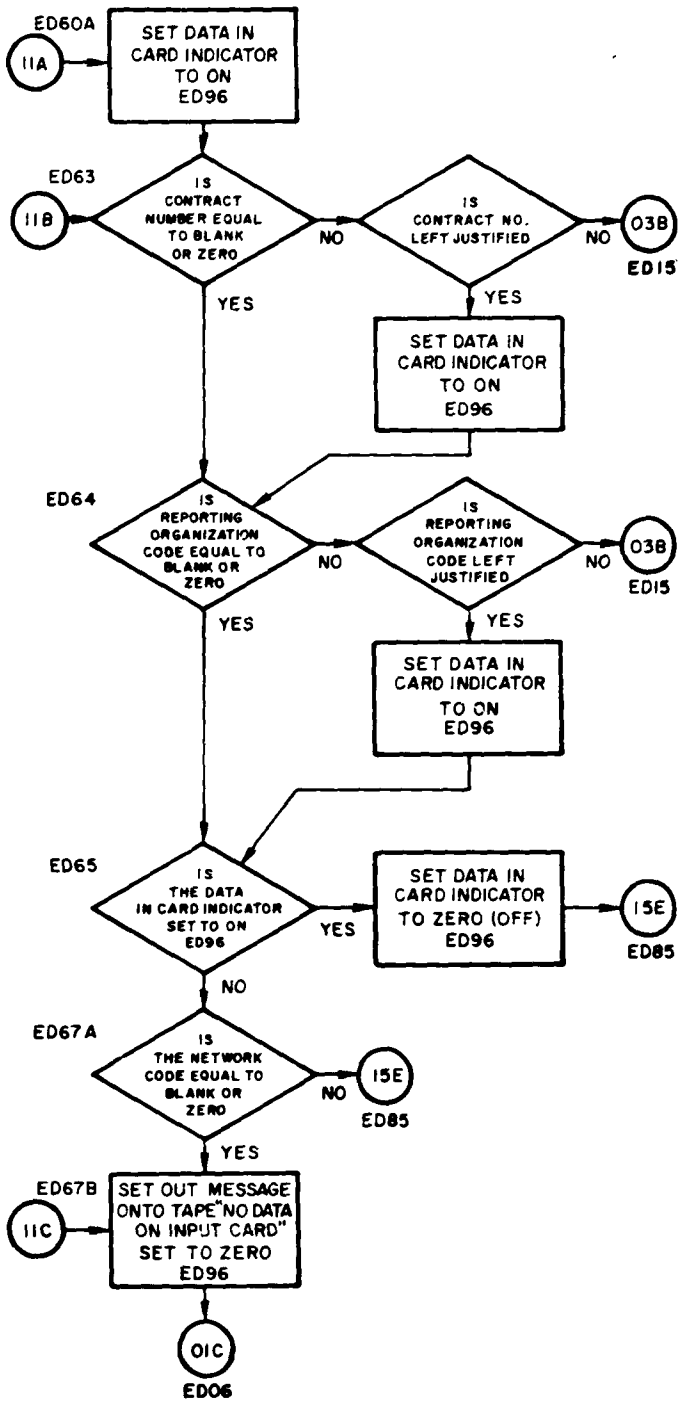

ED46
IS THE CATEGORY EQUAL TO BLANK OR ZERO?
08A
YES
ED47
SET OUT MESSAGE ONTO TAPE "NO RAINBOW CATEGORY TIED TO INPUT"
01C
ED06
NO
IS RAINBOW CATEGORY LEFT JUSTIFIED?
NO
038
ED15
YES
ED48A
IS THE FIRST SKILL CODE BLANK OR ZERO?
080
YES
ED49
IS THE CHANGE CODE ON THIS CARD A DELETE?
YES
08C
ED54
NO
SET OUT MESSAGE ONTO TAPE "SKILL CODE INFO MISSING ON INPUT"
01C
ED06
NO
ED50
IS THE FIRST SKILL CODE RIGHT JUSTIFIED?
NO
038
ED15
YES
ED50A
IS THE NEXT SKILL CODE EQUAL TO BLANK OR ZERO?
088
YES
08C
ED54
NO
IS THIS SKILL CODE RIGHT JUSTIFIED?
NO
038
ED15
YES
ED51
IS THE NEXT SKILL CODE EQUAL TO BLANK OR ZERO?
YES
08C
ED54
NO
ED52
IS THIS SKILL CODE RIGHT JUSTIFIED?
NO
038
ED15
YES
088
ED50A
ED54
08C
CHECK CHANGE CODE ROUTINE CHGCD
ED548
MOVE INPUT RECORD FROM WKAR3 TO TMPWA SET BLANKS INTO WKAR3
ED54C
SET THE CATEGORY INFORMATION BACK INTO WORK AREA AT WKAR3 + 2 TO +5
SET THE PROPER INPUT CODE 5 OR 6 INTO 1st CHARACTER OF WKAR3 + 0
IS THE FIRST SKILL CODE EQUAL TO BLANK OR ZERO?
YES
15E
ED85
NO
SET IN LEADING ZEROS ROUTINE (SKILL CODE) EDTOR
SET SKILL CODE INFORMATION INTO WKAR3 + 1
WRITE A RECORD ONTO EDITED DATA TAPE WRWD
09A
ED54E


ED54E
09A
SET IN LEADING ZEROS ROUTINE (NEXT SKILL CODE) EDTOR
IS THIS SKILL CODE EQUAL TO ZERO
YES
01A
ED02
NO
WRITE A RECORD ONTO EDITED DATA TAPE WRWD
SET IN LEADING ZEROS ROUTINE (NEXT SKILL CODE) EDTOR
IS THIS SKILL CODE EQUAL TO ZERO
YES
01A
ED02
NO
WRITE A RECORD ONTO EDITED DATA TAPE WRWD
SET IN LEADING ZEROS ROUTINE (NEXT SKILL CODE) EDTOR
IS THIS SKILL CODE EQUAL TO ZERO
YES
01A
ED02
NO
WRITE A RECORD ONTO EDITED DATA TAPE WRWD
NOT COMPLETE
09A
ED54E
13 SKILL CODES COMPLETED
01A
ED02
INPUT TYPE 6
ED55B
09B
IS THE COST CATEGORY EQUAL TO BLANK OR ZERO
YES
ED55C
SET OUT MESSAGE ONTO TAPE "NO COST CATEGORY TIED TO INPUT"
01C
ED06
NO
IS COST CATEGORY LEFT JUSTIFIED
NO
03B
ED15
YES
08D
ED48A

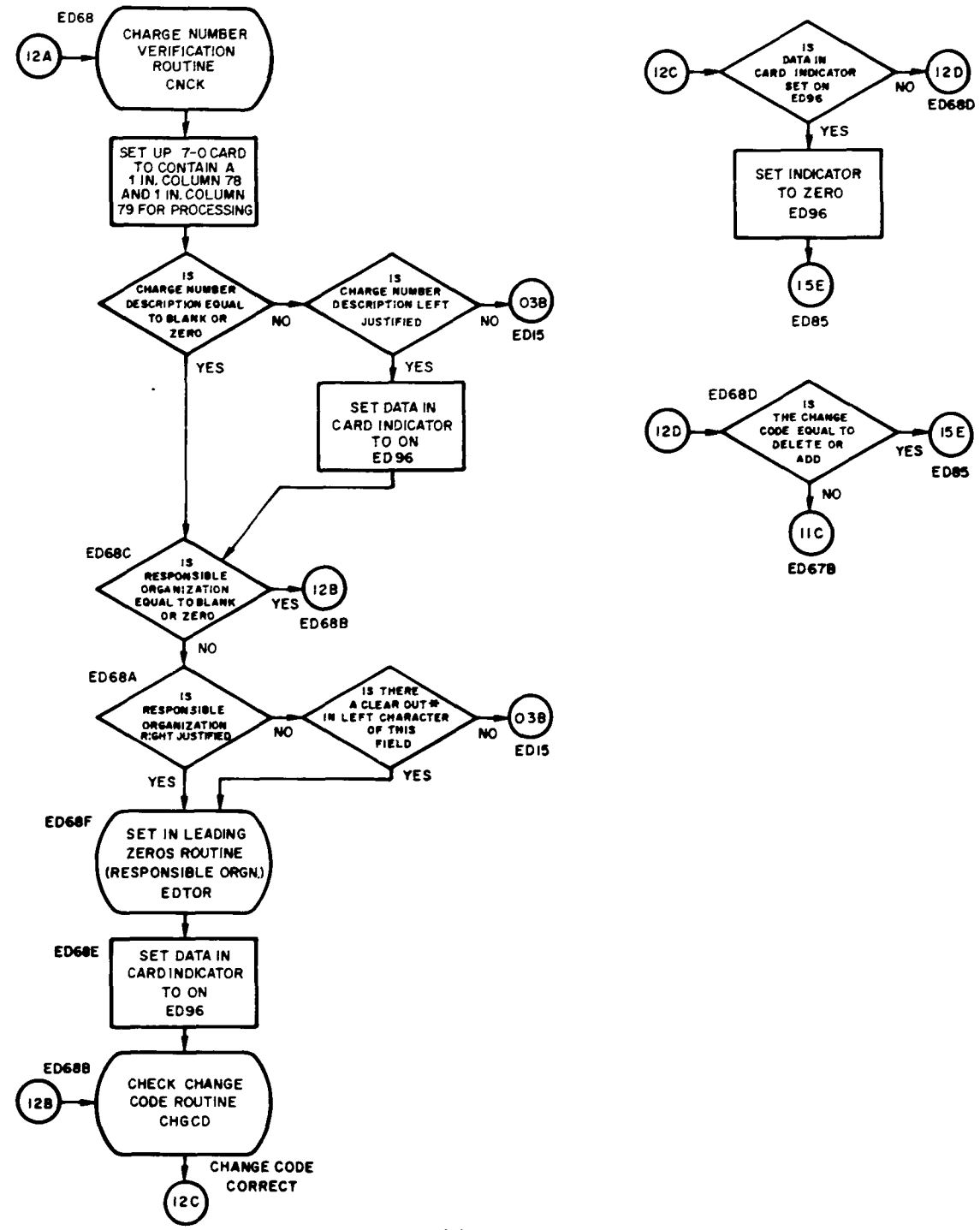
INPUT TYPE 5


ED46
IS THE CATEGORY EQUAL TO BLANK OR ZERO?
08A
YES
ED47
SET OUT MESSAGE ONTO TAPE "NO RAINBOW CATEGORY TIED TO INPUT"
OIC
ED06
NO
IS RAINBOW CATEGORY LEFT JUSTIFIED?
NO
038
ED15
YES
ED48A
IS THE FIRST SKILL CODE BLANK OR ZERO?
08D
YES
ED49
IS THE CHANGE CODE ON THIS CARD A DELETE?
YES
08C
ED54
NO
SET OUT MESSAGE ONTO TAPE "SKILL CODE INFO MISSING ON INPUT"
OIC
ED06
NO
ED50
IS THE FIRST SKILL CODE RIGHT JUSTIFIED?
NO
038
ED15
YES
ED50A
IS THE NEXT SKILL CODE EQUAL TO BLANK OR ZERO?
088
YES
08C
ED54
NO
IS THIS SKILL CODE RIGHT JUSTIFIED?
NO
038
ED15
YES
ED51
IS THE NEXT SKILL CODE EQUAL TO BLANK OR ZERO?
YES
08C
ED54
NO
ED52
IS THIS SKILL CODE RIGHT JUSTIFIED?
NO
038
ED15
YES
088
ED50A
ED54
08C
CHECK CHANGE CODE ROUTINE CHGCD
ED54B
MOVE INPUT RECORD FROM WKAR3 TO TMPWA SET BLANKS INTO WKAR3
ED54C
SET THE CATEGORY INFORMATION BACK INTO WORK AREA AT WKAR3 + 2 TO +5
SET THE PROPER INPUT CODE 5 OR 6 INTO 1st CHARACTER OF WKAR3 + 0
IS THE FIRST SKILL CODE EQUAL TO BLANK OR ZERO?
YES
15E
ED85
NO
SET IN LEADING ZEROS ROUTINE (SKILL CODE) EDTOR
SET SKILL CODE INFORMATION INTO WKAR3 + 1
WRITE A RECORD ONTO EDITED DATA TAPE WRWD
09A
ED54E

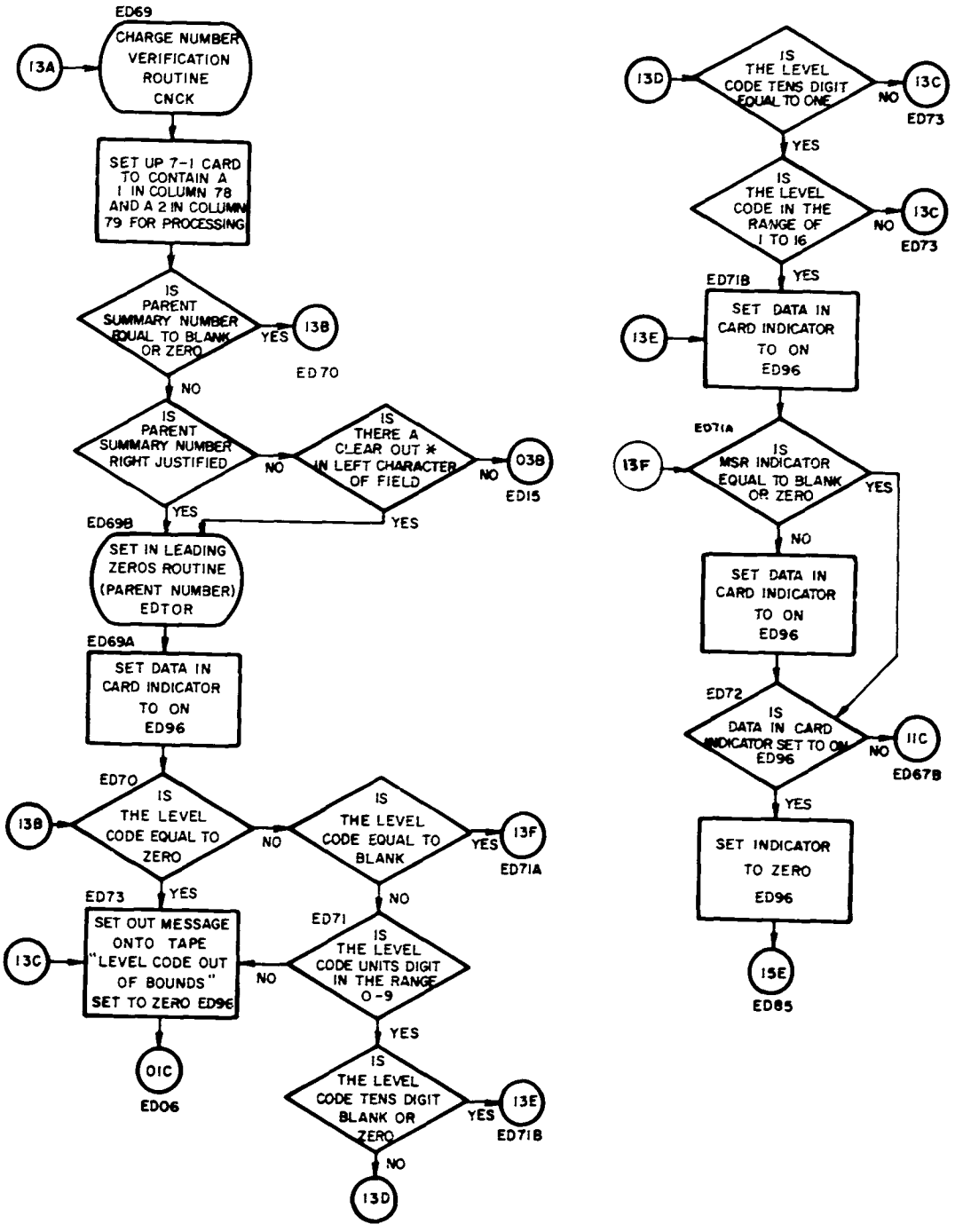

INPUT TYPE 7
ED56
IS THE SECOND CODE ON 7 TYPE INPUT IN THE RANGE OF 0-5
10A
NO
ED57
SET OUT MESSAGE ONTO TAPE "ERROR IN SECONDARY CODE"
01C
ED06
YES
TRANSFER TO CORRECT SECOND CODE AREA
CODE 0
12A
ED68
CODE 1
13A
ED69
CODE 2
10B
ED59A
CODE 3
14A
ED74
CODE 4
15A
ED82
CODE 5
15A
ED82
SECONDARY CODE 2
ED59A
CHARGE NUMBER VERIFICATION ROUTINE CNCK
10B
IS THE START DATE EQUAL TO BLANK OR ZERO
YES
10C
ED60
NO
ED61
DATE VERIFICATION ROUTINE DTED
ERROR
SET OUT MESSAGE ONTO TAPE "ERROR IN CHARGE NO. START DATE" SET TO ZERO ED96
01C
ED06
DATE CORRECT
IS YEAR OF START DATE IN 6X TO 7X RANGE
NO
YES
ED59C
SET DATA IN CARD INDICATOR TO ON ED96
ED60
IS THE COMPLETE DATE EQUAL TO BLANK OR ZERO
10C
YES
11B
ED63
NO
ED62
DATE VERIFICATION ROUTINE DTED
ERROR
SET OUT MESSAGE ONTO TAPE "ERROR IN CHARGE NO. COMPLETE DATE" SET TO ZERO ED96
01C
ED06
DATE CORRECT
IS YEAR OF COMPLETE DATE IN 6X TO 7X RANGE
NO
YES
11A
ED60A


ED60A
11A
SET DATA IN CARD INDICATOR TO ON ED96
ED63
11B
IS CONTRACT NUMBER EQUAL TO BLANK OR ZERO
NO
IS CONTRACT NO. LEFT JUSTIFIED
NO
03B
ED15
YES
YES
SET DATA IN CARD INDICATOR TO ON ED96
ED64
IS REPORTING ORGANIZATION CODE EQUAL TO BLANK OR ZERO
NO
IS REPORTING ORGANIZATION CODE LEFT JUSTIFIED
NO
03B
ED15
YES
YES
SET DATA IN CARD INDICATOR TO ON ED96
ED65
IS THE DATA IN CARD INDICATOR SET TO ON ED96
YES
SET DATA IN CARD INDICATOR TO ZERO (OFF) ED96
15E
ED85
NO
ED67A
IS THE NETWORK CODE EQUAL TO BLANK OR ZERO
NO
15E
ED85
YES
ED67B
11C
SET OUT MESSAGE ONTO TAPE "NO DATA ON INPUT CARD" SET TO ZERO ED96
01C
ED06

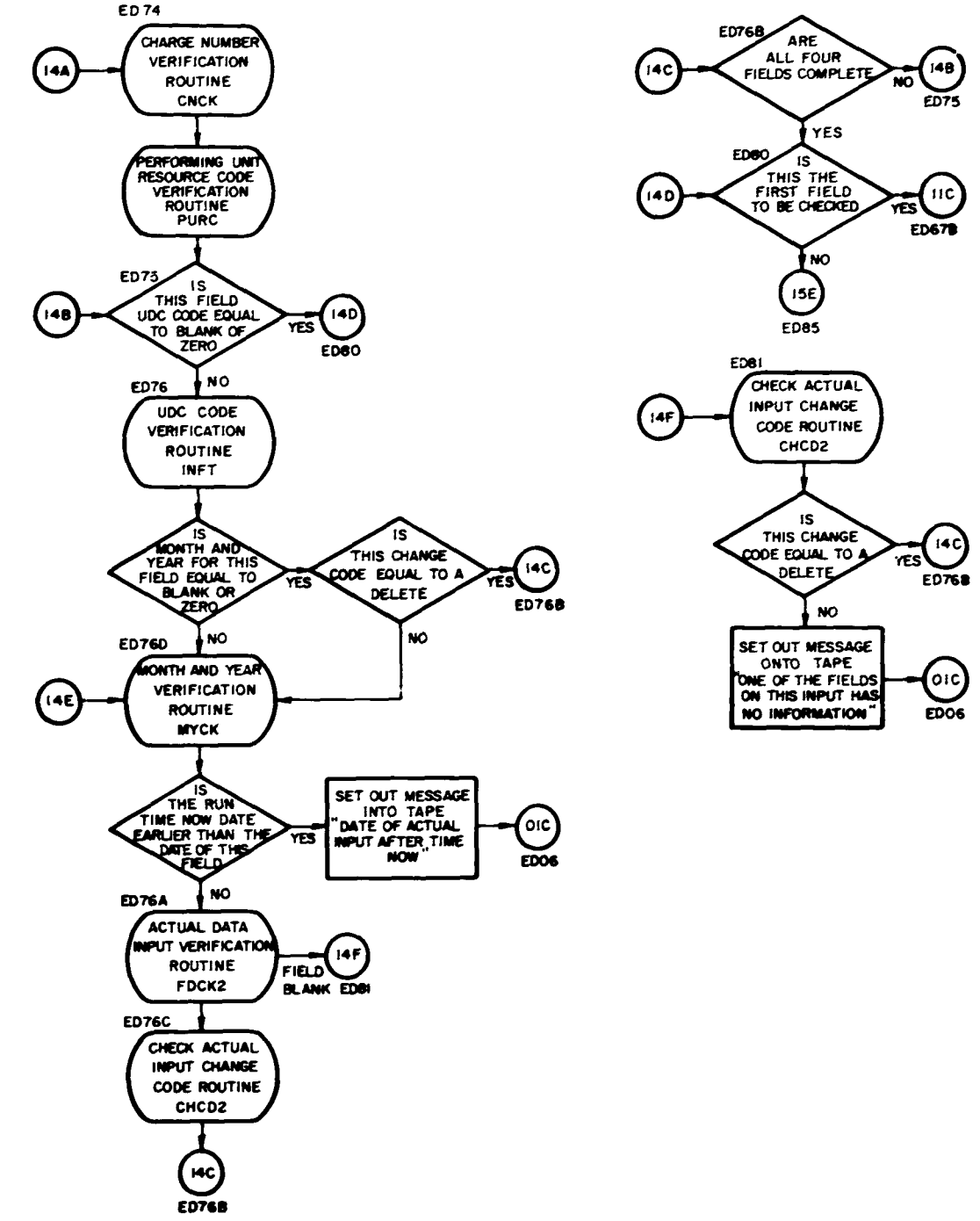
SECONDARY CODE 0



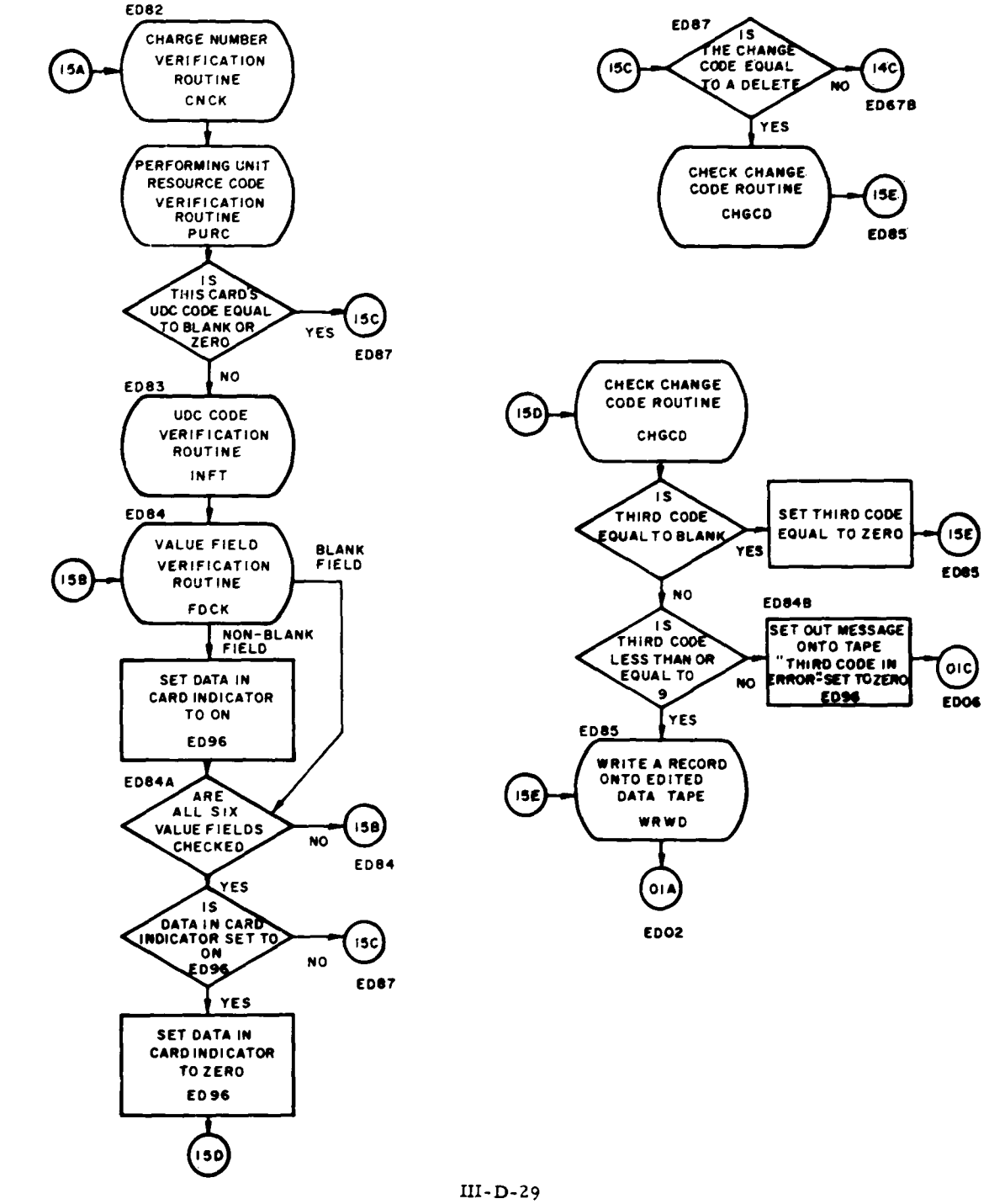
SECONDARY CODE I



SECONDARY CODE 3



SECONDARY CODE 4 AND 5



Region CNCK

EXPLANATION OF REGION:

This routine will edit and verify the charge number on the input data cards.

CALLING SEQUENCE:

L	TSX	CNCK, 4
L + 1	Normal return	

INPUT:

Charge number starting in the 2nd character of WKAR3 and running for 18 characters

OUTPUT:

An edited charge number in WKAR3

STORAGE USED:

Not applicable

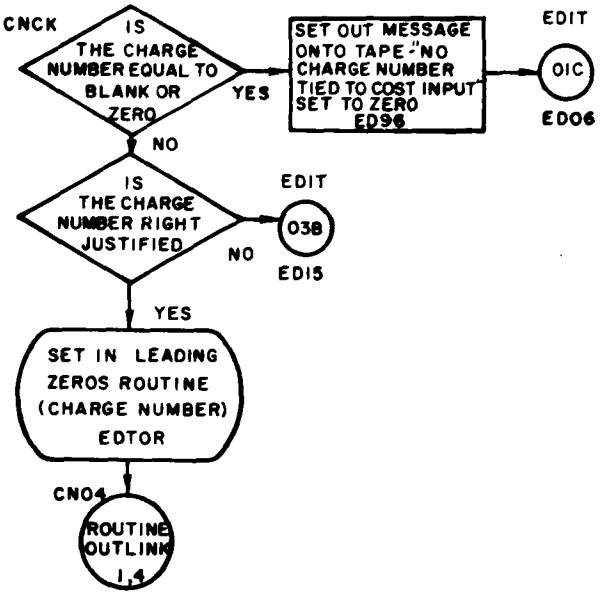
SUBREGIONS AND SUBROUTINES USED:

EDTOR

EXPLANATION OF CALLING SEQUENCE:

If an error is found the input is set out on the SYSTEM ERROR TAPE with an accompanying message

CHARGE NUMBER CHECK
ROUTINE



Region DTED

EXPLANATION OF REGION:

This routine will check the dates (DDMMMYY) in the input cards verifying months, days in range specified by months, and alphabetic characters in year or days.

CALLING SEQUENCE:

L	TSX	DTED, 4
L + 1	Error return	
L + 2	Normal return	

INPUT:

The date will come into this routine as XXXXDD in the accumulator and MMMYYX in the MQ.

OUTPUT:

Not applicable

STORAGE USED:

The DTTB and DTTB2 tables which are part of the DTCR subroutine explained in section III-C.

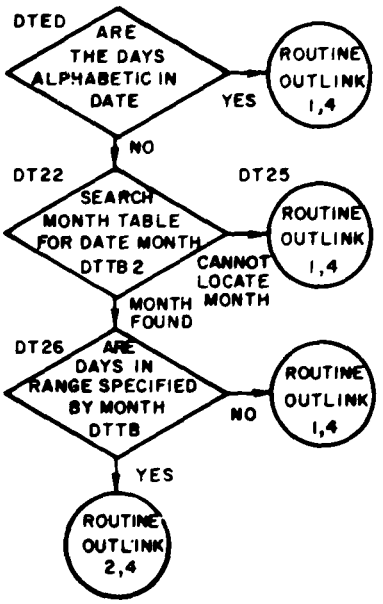
SUBREGIONS AND SUBROUTINES USED:

Not applicable

EXPLANATION OF CALLING SEQUENCE:

Not applicable

DATE EDIT
ROUTINE



Region PURC

EXPLANATION OF REGION:

This routine will edit the performing unit and resource code for the 7 card inputs where required.

CALLING SEQUENCE:

L	TSX	PURC, 4
L + 1	Normal return	

INPUT:

Performing unit starting in the 20th character of WKAR3 and running for 6 characters. Resource code starting in the 26th character of WKAR3 and running for 4 characters.

OUTPUT:

An edited performing unit and resource code in WKAR3.

STORAGE USED:

Not applicable

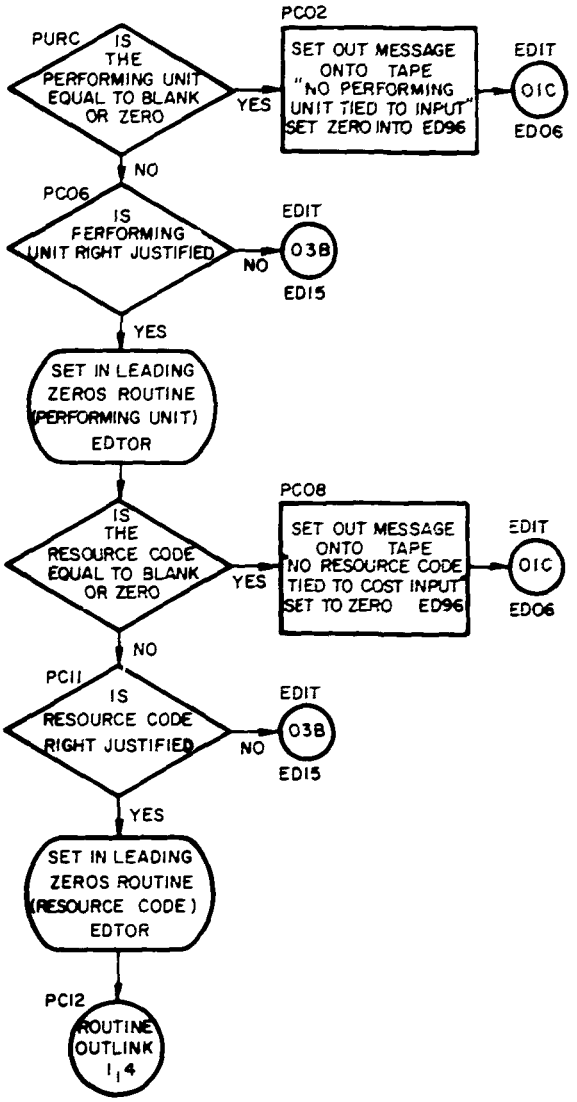
SUBREGIONS AND SUBROUTINES USED:

EDTOR

EXPLANATION OF CALLING SEQUENCE:

If an error is found the input is set out on the SYSTEM ERROR TAPE with an accompanying message.

PERFORMING UNIT
RESOURCE CODE
CHECK ROUTINE



Region INFT

EXPLANATION OF REGION:

This routine will verify the UDC code for the following codes: H, D, M, T, and U.

CALLING SEQUENCE:

L	TSX	INFT, 4
L + 1	Normal return	

INPUT:

The UDC code right-justified in the accumulator.

OUTPUT:

Not applicable

STORAGE USED:

Not applicable

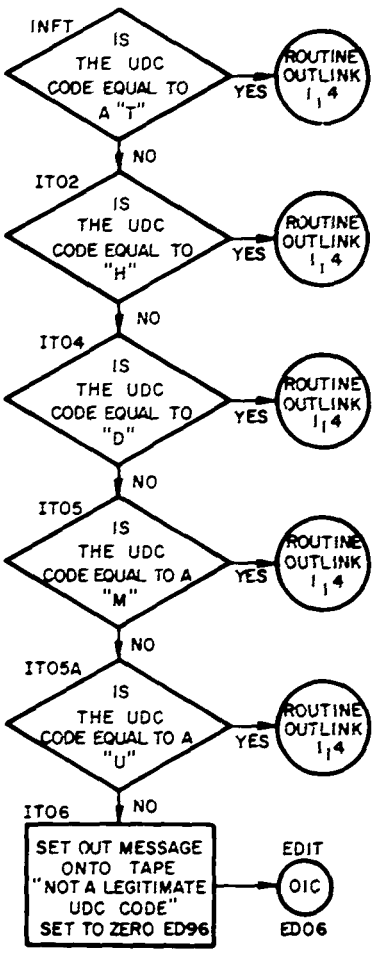
SUBREGIONS AND SUBROUTINES USED:

Not applicable

EXPLANATION OF CALLING SEQUENCE:

If an error is found, the input is set out on the SYSTEM ERROR TAPE with an accompanying message.

UDC CODE
VERIFICATION
ROUTINE



Region MYCK

EXPLANATION OF REGION:

This routine will check the month and year for cost inputs (7-3 cards).

CALLING SEQUENCE:

L	TSX	MYCK, 4
L + 1	Normal return	

INPUT:

The month and year will come into this routine, right-justified, in the accumulator as XXMMYY.

OUTPUT:

Not applicable

STORAGE USED:

Not applicable

SUBREGIONS AND SUBROUTINES USED:

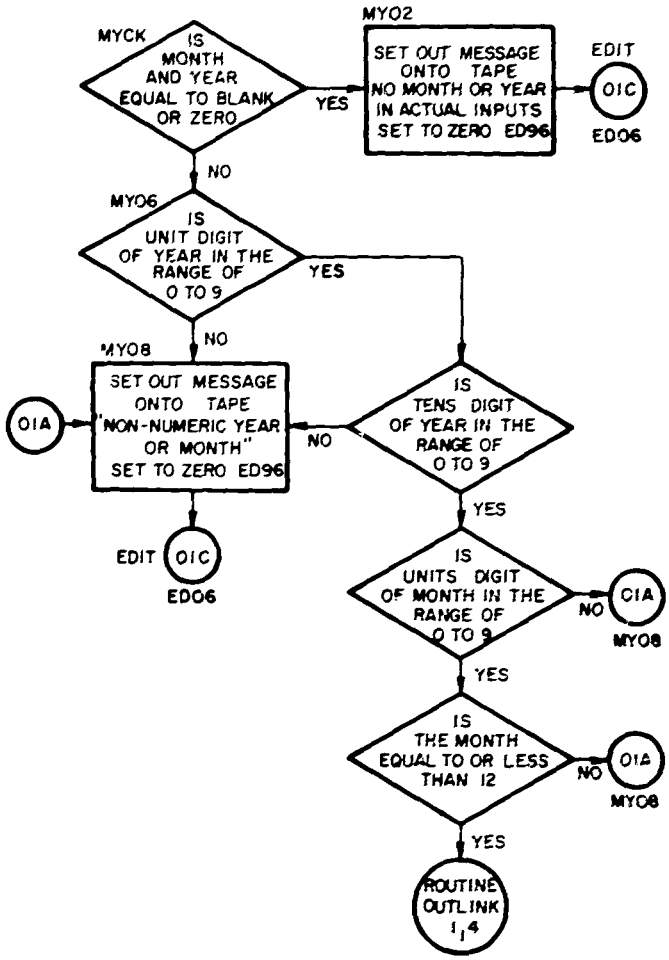
Not applicable

EXPLANATION OF CALLING SEQUENCE:

If an error is found the input is set out on the SYSTEM ERROR TAPE with an accompanying message.

REGION MYCK

MONTH AND YEAR
CHECK ROUTINE



Region FDCK

EXPLANATION OF REGION:

This routine will check the value fields for the 7-4 and 7-5 card inputs.

CALLING SEQUENCE:

L	TSX	FDCK, 4
L + 1	Return if field is blank	
L + 2	Normal return	

INPUT:

The value field will be 6 characters, and is set up in the accumulator.

OUTPUT:

Not applicable

STORAGE USED:

Not applicable

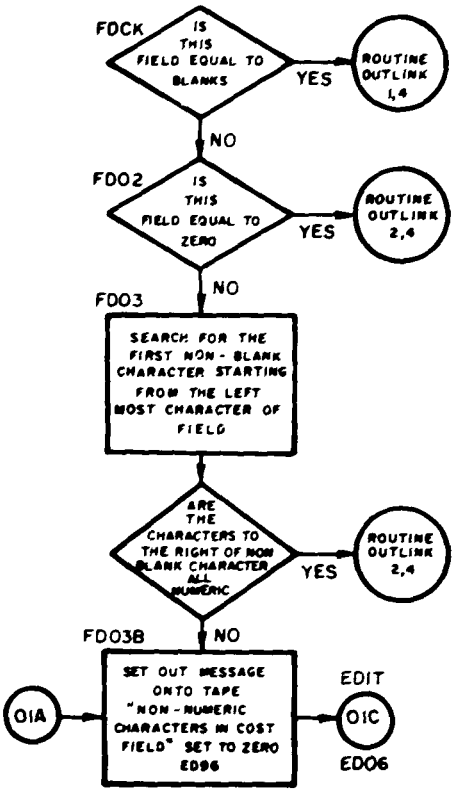
SUBREGIONS AND SUBROUTINES USED:

Not applicable

EXPLANATION OF CALLING SEQUENCE:

If an error is found, the input is set out on the SYSTEM ERROR TAPE with an accompanying message.

VALUE FIELD CHECK
ROUTINE FOR 7-4
AND 7-5 INPUTS



Region FDCK2

EXPLANATION OF REGION:

This routine will check the value fields for the 7-3 card inputs allowing for (-) signs in the leftmost character of field.

CALLING SEQUENCE:

L	TSX	FDCK2, 4
L + 1	Return if field is blank	
L + 2	Normal return	

INPUT:

The value field will be 6 characters, and is set up in the accumulator.

OUTPUT:

Not applicable

STORAGE USED:

Not applicable

SUBREGIONS AND SUBROUTINES USED:

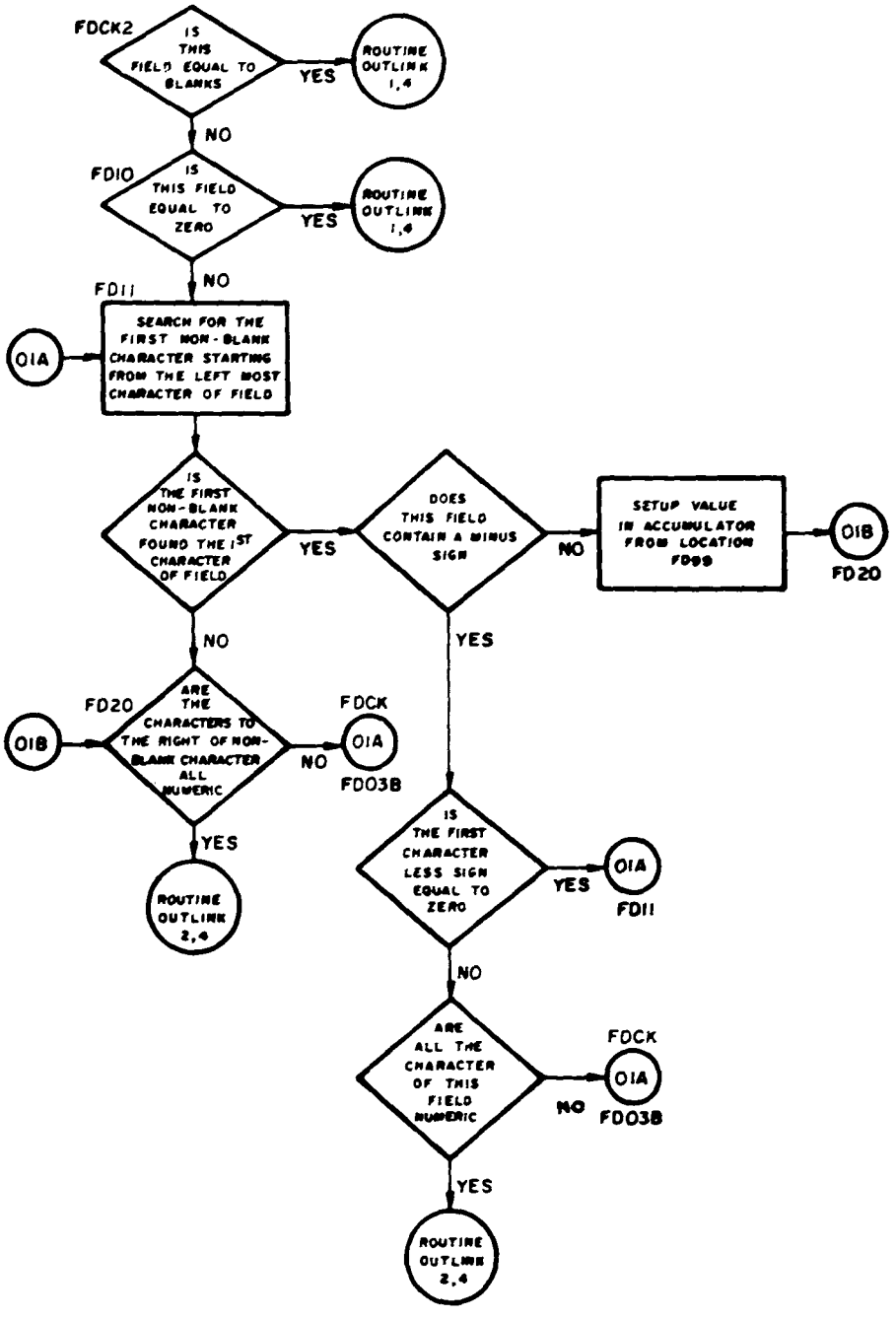
Not applicable

EXPLANATION OF CALLING SEQUENCE:

If an error is found, the input is set out on the SYSTEM ERROR TAPE with an accompanying message.

REGION FDCK2

VALUE FIELD CHECK
ROUTINE FOR 7-3
INPUTS



Region CHCD2

EXPLANATION OF REGION:

This routine will check the second class of change code associated with 7-3 type input. These codes are R, T, and D.

CALLING SEQUENCE:

L	TSX	CHCD2, 4
L + 1	Normal return	

INPUT:

Not applicable--tied to 7-3 input card.

OUTPUT:

Not applicable

STORAGE USED:

Not applicable

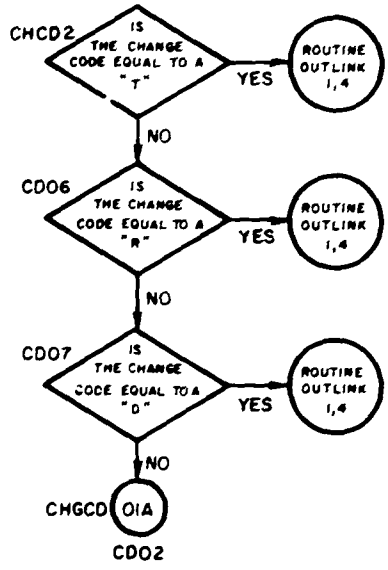
SUBREGIONS AND SUBROUTINES USED:

Not applicable

EXPLANATION OF CALLING SEQUENCE:

If an error is found, the input is set out on the SYSTEM ERROR TAPE with an accompanying message.

ACTUAL INPUT
CHANGE CODE
VERIFICATION
ROUTINE



Region EOFIT

EXPLANATION OF REGION:

END-OF-FILE EXIT for wrapping up the PERT COST EDIT portion of program. The writing of the E.O.F.'s, the rewinding and unloading of tapes, as indicated by the option, as well as setting up the messages for the end of the edit phase are accomplished in this routine.

CALLING SEQUENCE:

L TRA EOFIT

Outlink TRA to EDIT ROUTINE EXIT

INPUT:

Not applicable

OUTPUT:

Number of errors message set out on on-line printer plus accompanying information as described on Page III-D-1.

STORAGE USED:

Not applicable

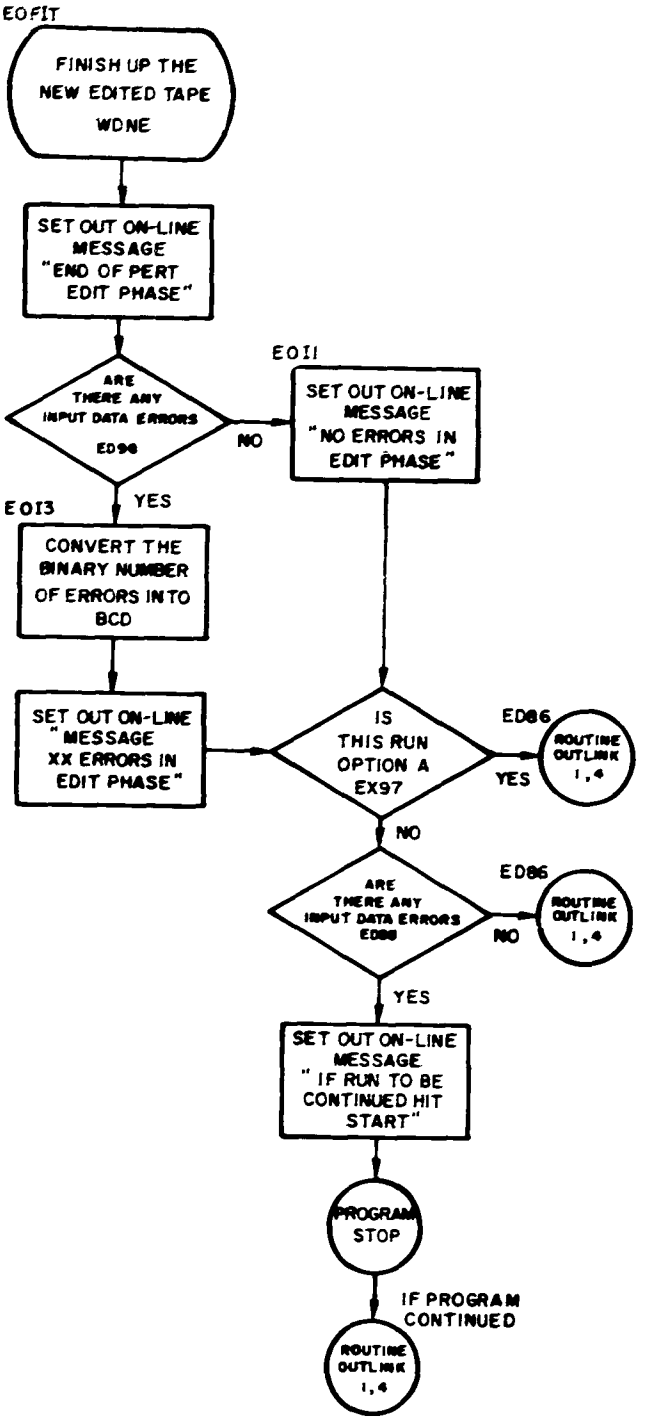
SUBREGIONS AND SUBROUTINES USED:

WDNE (See Section III-B) to finish up EDITED DATA TAPE

EXPLANATION OF CALLING SEQUENCE:

Not applicable

END OF FILE ON
INPUT TAPE



Region CHGCD

EXPLANATION OF REGION:

This routine will check the major type of change code associated with the input cards. These codes are A, C, and D.

CALLING SEQUENCE:

L	TSX	CHGCD, 4
L + 1	Normal return	

INPUT:

Code will always be set in column 80 of card and for this routine will be the 80th character in WKAR3.

OUTPUT:

Any D code located will be set to a B in the 80th character of WKAR3 for sorting convenience.

STORAGE USED:

Not applicable

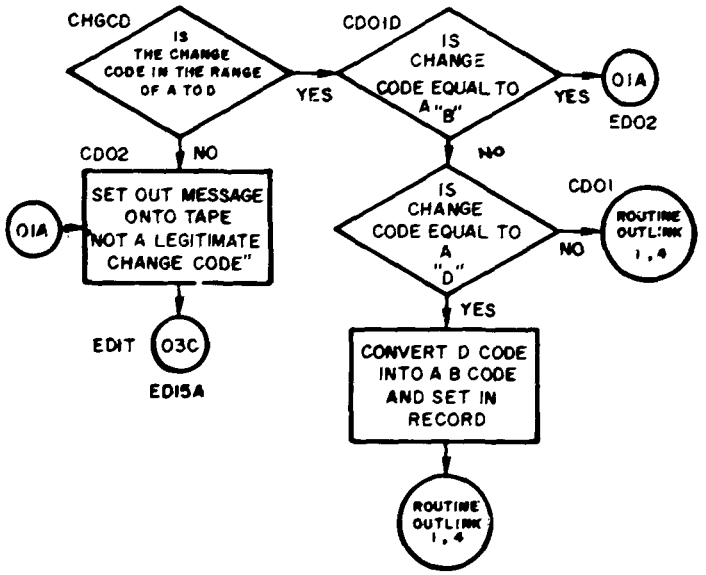
SUBREGIONS AND SUBROUTINES USED:

Not applicable

EXPLANATION OF CALLING SEQUENCE:

If an error is found, the input is set out on the SYSTEM ERROR TAPE with an accompanying message.

CHANGE CODE
VERIFICATION
ROUTINE



Region EDTOR

EXPLANATION OF REGION:

This routine will set up leading zeros for all fields described on Page III-D-12.

CALLING SEQUENCE:

L	TSX	EDTOR, 4
L + 1	This word of field is all blank	
L + 2	Normal return--field does not contain all blank	

INPUT:

The leftmost word of the field to be edited, followed by the word at its right, until a non-blank is found. For each word the routine will have to be entered again. If the first word is less than 6 characters, blanks should be set into the leftmost characters, which are not contained in the field to be checked.

OUTPUT:

For each word of the field entered, the leftmost blanks will be converted to zeros.

STORAGE USED:

Not applicable

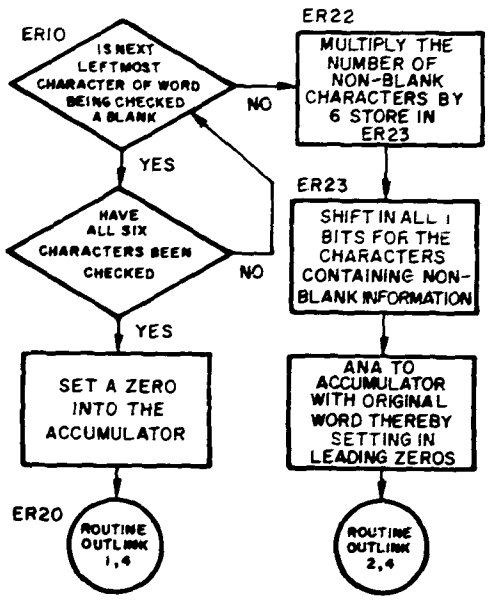
SUBREGIONS AND SUBROUTINES USED:

Not applicable

EXPLANATION OF CALLING SEQUENCE:

Not applicable

TO SET IN LEADING
ZEROS ROUTINE



Input Edit Tape and Card Layouts

The following section will show pictorially the various tape layouts involved in the edit phase as well as the layout for the input data cards (except for the input parameter cards which will be explained in Section III-F.

All input cards can be set onto the INPUT DATA TAPE in a random order except for the label, which must be first. The edit sort phase will set the cards in the proper order. The layout on the INPUT DATA TAPE will take the following form:

Label

UNSORTED RAW DATA TAPE
End-of-record gap
"A" Control Card
End-of-record gap
Last Control Card (if any)
End-of-record gap
First data input
End-of-record gap
Next data input
End-of-record gap
Last data input
End-of-record gap
End-of-file gap

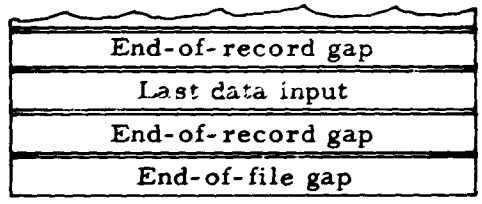
The control card or cards are only set on one of the UNSORTED RAW DATA TAPES, and there can be one or many control cards set onto this tape

The "first" and "last" indications to data input refer only to this physical tape.

Each of the records on this tape, other than the end-of-record gaps, will be 14 words long.

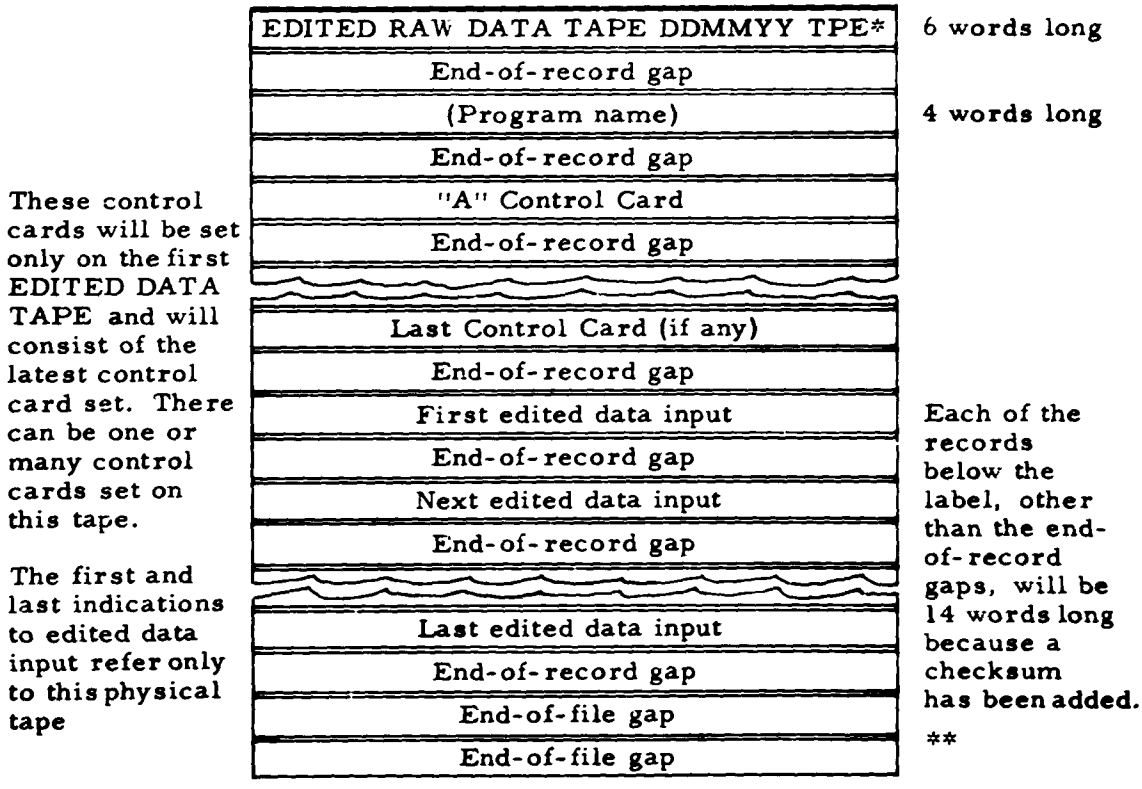
Label

ACTUAL RAW DATA TAPE
End-of-record gap
First data input
End-of-record gap
Next data input
End-of-record gap



These tapes will be created as a result of a card-to-tape or tape-to-tape operation.

The EDITED DATA TAPE will be developed by passing the INPUT DATA TAPES through the edit phase. This EDITED DATA TAPE may be longer than its corresponding INPUT DATA TAPE due to the breakdown of the 5 and 6 card inputs as explained on Page III-D-11. The EDITED DATA TAPE can be used as an INPUT DATA TAPE in the case where a previous edit pass has been corrected and the program is started again. The layout on the EDITED DATA TAPE will take the following form:



*The EDITED DATA TAPE will have a 1 indicating it was the first tape

created of this series. All the following tapes created, if any, will be numbered consecutively from 2 to 9.

**The configuration shown represents the last tape of a series. If it is not the last tape of a series, an additional record of one word is inserted between the two end-of-file gaps as explained on Page III-B-10.

Figure III-D-1 is the input data card layouts. Table III-D-1 shows the input coding assignments.

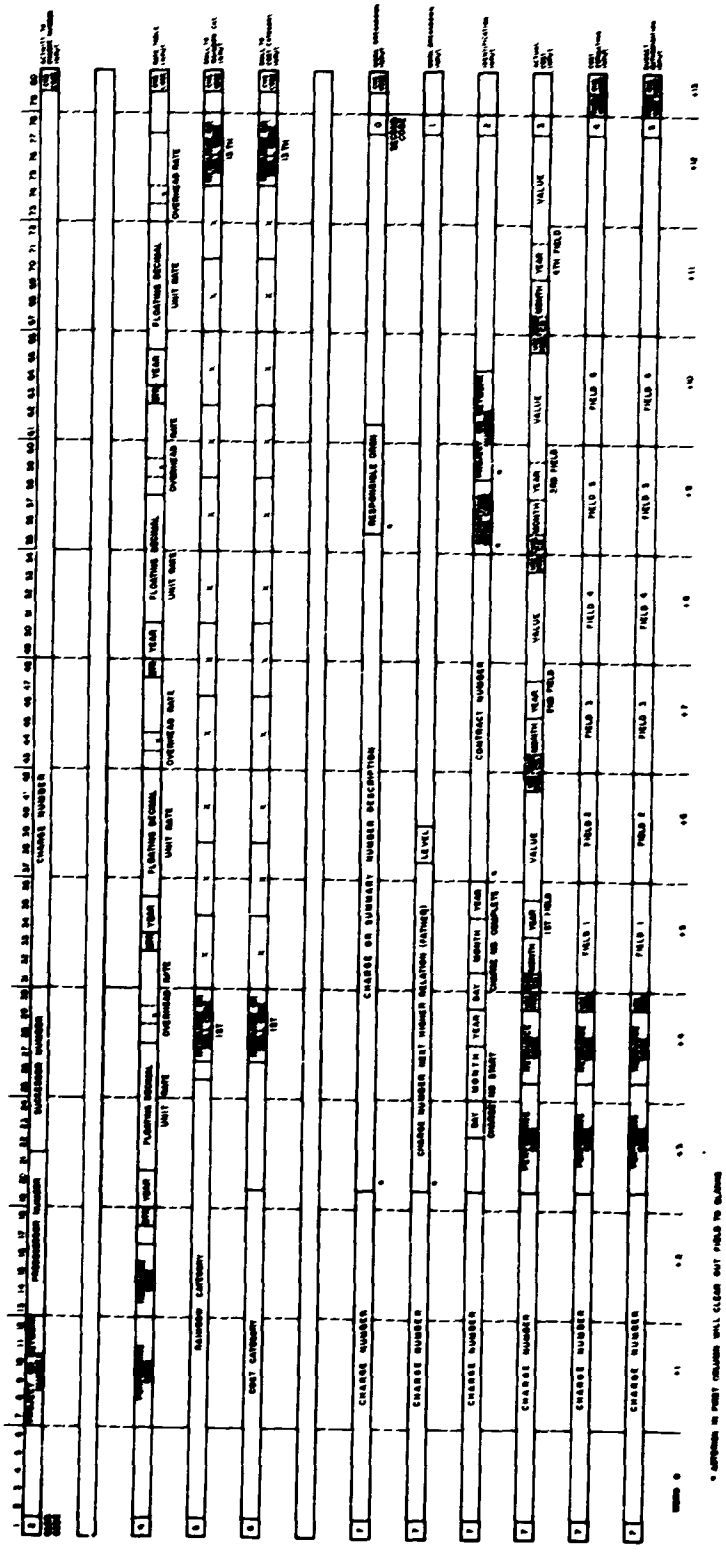


Fig. III-D-1. Card Layouts of Input Data

Input Type	Column 1 Card code Main	Column 2 code Sub	Column 78 Second code	Column 79 Third code	Column 80 Change code	Remarks
1. Control cards						
Main control card	A					Read in off of input tape
Output report selection	B					
Project selection	C					
Tape reassignment	D					
Security number	E					
Program name change	F					
2. Parameter cards Read USERS TIME TAPE	1	A B C				Read in off of input tape Carried on Secondary Master
3. Charge no. associated with activities	2				A-add D-delete C-change	Carried on Secondary Master
4. Rate conversion changes	4				A-add D-delete C-change	Carried on PERT/ Cost Master
5. Rainbow Category associated with resource code	5				A-add D-delete C-change	Carried on PERT/ Cost
6. Cost Category with resource code	6				A-add D-delete C-change	Carried on PERT/ Cost Master
7. Description and responsible unit input	7		0		A-add D-delete C-change	PERT/Cost Master
8. Program breakdown input	7		1			
9. Charge no. changes	7		2			
10. Actual inputs	7		3		R-replace T-add to D-delete	
11. Estimated inputs	7		4	0 to 9	A-add D-delete C-change	
12. Budgeted inputs	7		5	0 to 9	A-add D-delete C-change	

Table III-D-1 Input Coding Assignments

III-E PERT COST EDIT SORT PHASE

This phase will read the EDITED DATA TAPE, format the input cards for sorting, and set the information out on the sort tape. After sorting is completed, this data is set out on the SORTED DATA TAPE and the phase is completed. The sort used for this phase is the 4-tape sort described in section IV-C. If the "B" option is indicated, the program will finish up at this point and print out the program ending messages. If the option is C, D, or G the program will print out the edit sort ending message and will automatically go into the next phase. On options E or F the edit sort phase is bypassed.

Edit Sort Tape Operations

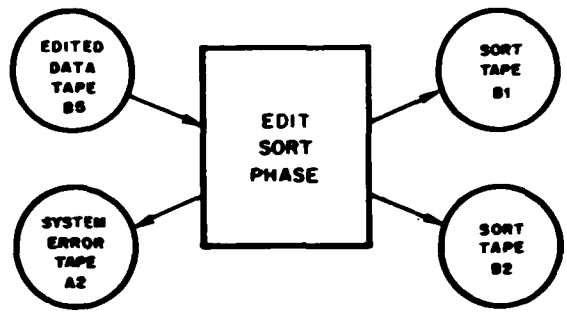
The edit sort phase allows for up to nine SORTED DATA TAPES. The edit sort phase will first read the EDITED DATA TAPES, ignoring the control cards. These tapes contain single unblocked records in BCD. This phase will then take each record, re-format it with the proper sort key, and set it out on the 4-tape sort. The above operation will continue until all the EDITED DATA TAPES have been completed. At this point the program will go into the merge phase of the sort. At the completion of this phase, the program will begin setting up records from the sort into binary blocks of 200 words to be placed on the SORTED DATA TAPE. The SORTED DATA TAPE will be a second file following the EDITED DATA TAPE and may consist of a maximum of nine tapes.

The purpose in setting the SORTED DATA TAPE as a second file is to avoid changing tape during the program operation. As discussed earlier, the last two INPUT DATA TAPES are used for other purposes and the information on these tapes is destroyed. To avoid going back to a card-to-tape operation, the acceptable data for all the INPUT DATA TAPES plus control cards are kept on the EDITED DATA TAPE. Thus, in case of a redundancy on the SORTED DATA TAPE, the input and control cards can be recovered without putting a different tape on the computer, since they are contained in

the file preceding the sorted data on the same physical tape. The program can simply be restarted, and the EDITED DATA TAPES then become the INPUT DATA TAPES.

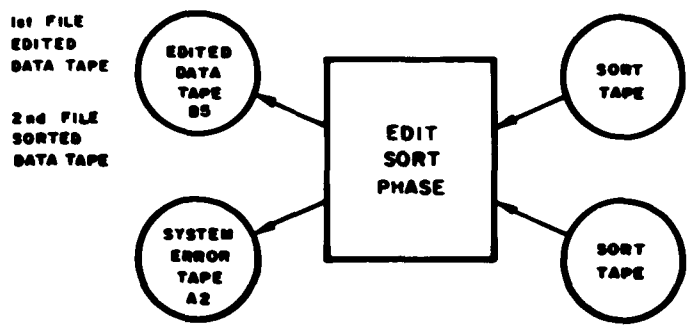
The tape flow for the edit sort phase will take the following form:

During data read-in, formatting and sorting the configuration is



When all of the EDITED DATA TAPES have been completed the last tape is not rewound. At this point the sort will take over and arrange the edited data in proper sequence using tapes B1, B2, A7 and A4 as the merge tapes.

During the last merge pass the sort will pass control to the edit sort phase and the SORTED DATA TAPE will be developed as a second file on B5. The configuration is



The final merge tapes to be used are dependent upon the number of merge passes made by the sort. At the completion of this phase the sorted data tape is rewound and unloaded according to the option that is selected. For option B the tape is both rewound and unloaded; for all other options it is only rewound.

Edit Sort Tape Messages On-Line

The messages forthcoming on the on-line printer regarding the edit sort tapes will be as follows, depending on the number of tapes used and the governing option:

a) One edited tape with the sorted information to be set onto the same tape.

TAPE B5 HAS BEEN SELECTED FOR READING
COMPLETED READING OF EDITED TAPE B5
* * * DO NOT REWIND * * *
TAPE B5 HAS BEEN SELECTED FOR WRITING
TAPE B5 IS NOW REWINDING AND SHOULD UNLOAD
END OF PERT COST EDIT SORT PHASE

For Option B, the above messages will be followed by the program ending message and the system will stop. For Options C, D, and G, line 5 will be changed to read

TAPE B5 IS NOW REWINDING

and the system will automatically go into the time-merge or cost-update phase after the above messages. Options E and F do not pass through the edit sort phase.

b) More than one edited tape with the sorted information to be set onto more than one tape.

To get to the start of the EDITED DATA TAPES the following messages will be set out:

SET FIRST EDITED TPE OF SERIES ON B5
IF PROPER REEL IS PLACED ON UNIT HIT - START

At this point the regular I/O messages will be set out as follows:

TAPE B5 HAS BEEN SELECTED FOR READING
TAPE B5 IS NOW REWINDING AND SHOULD UNLOAD
SET NEXT REEL OF THIS SERIES ON TAPE B5
TAPE B5 HAS BEEN SELECTED FOR READING

. (the above set of messages can
. continue for up to 9 tapes)
.

COMPLETED READING OF EDITED TAPE B5
* * * DO NOT REWIND * * *
TAPE B5 HAS BEEN SELECTED FOR WRITING
TAPE B5 IS NOW REWINDING AND SHOULD UNLOAD
SET NEXT REEL OF THIS SERIES ON TAPE B5
TAPE B5 HAS BEEN SELECTED FOR WRITING

. (the above 3 messages can
. continue for up to 9 tapes)
.

TAPE B5 IS NOW REWINDING AND SHOULD UNLOAD
END OF PERT COST EDIT SORT PHASE

For Option B, the above messages will be followed by the program ending message and the system will stop. The SORTED DATA TAPE inputs into Option E or F will be the first tape that contains sorted information. Those tapes that contain only edited data should not be set back on the computer, but should be saved in case an error occurs on the sorted data. Prior to printing the phase ending message of the above series, the following information will be set out on the printer for Options C, D, or G

SET FIRST SORTED TAPE OF SERIES ON B5
IF PROPER REEL IS PLACED ON UNIT HIT - START

and under these options the system will automatically go into the next phase.

All of the above messages refer to non-alternating tapes. Anytime a new tape is set onto the computer, the system will stop until the tape is in a ready position.

When the message "SET NEXT REEL OF THIS SERIES ON TAPE B5" is set out for the reading of the EDITED DATA TAPES it means that these tapes should be read in the order that they were created. When it is set out for the writing of the SORTED DATA TAPES it means that a blank or utility tape should be set on that unit to write the next tape of the series.

Edit Sort Error Message

There is only one error message that can be produced during the edit sort phase. This message will stop the system and be set out on the on-line printer.

ERROR IN CARD CODE AFTER EDIT PASS
XX - 80 Characters of Input Code - XX

If the card code is not in the range of 1 to 7 the above message will be printed. (The second line of this message is a reproduction of the input card to which the message applies.) This problem is probably due to a computer error, since the card code had been checked and found correct in the edit phase.

Edit Sort Sequencing Parameters

The following parameters are used to develop the sorting sequence for the input cards. Each individual card type will have its own sort key but all cards will be sorted together. The sort key used for this card type will be 5 words and this information will precede the regular 14-word record. The data in the sort key will, in most cases, duplicate information in the original record. The matrix given in Fig. III-E-1 will show the sort key for each of the individual input cards. EX86 is a location in core that is set up from the successor-predecessor indicator in Column 4 of the "A" control card. If Column 4 is blank or zero, EX86 = 0; otherwise, EX86 $\neq$ 0.

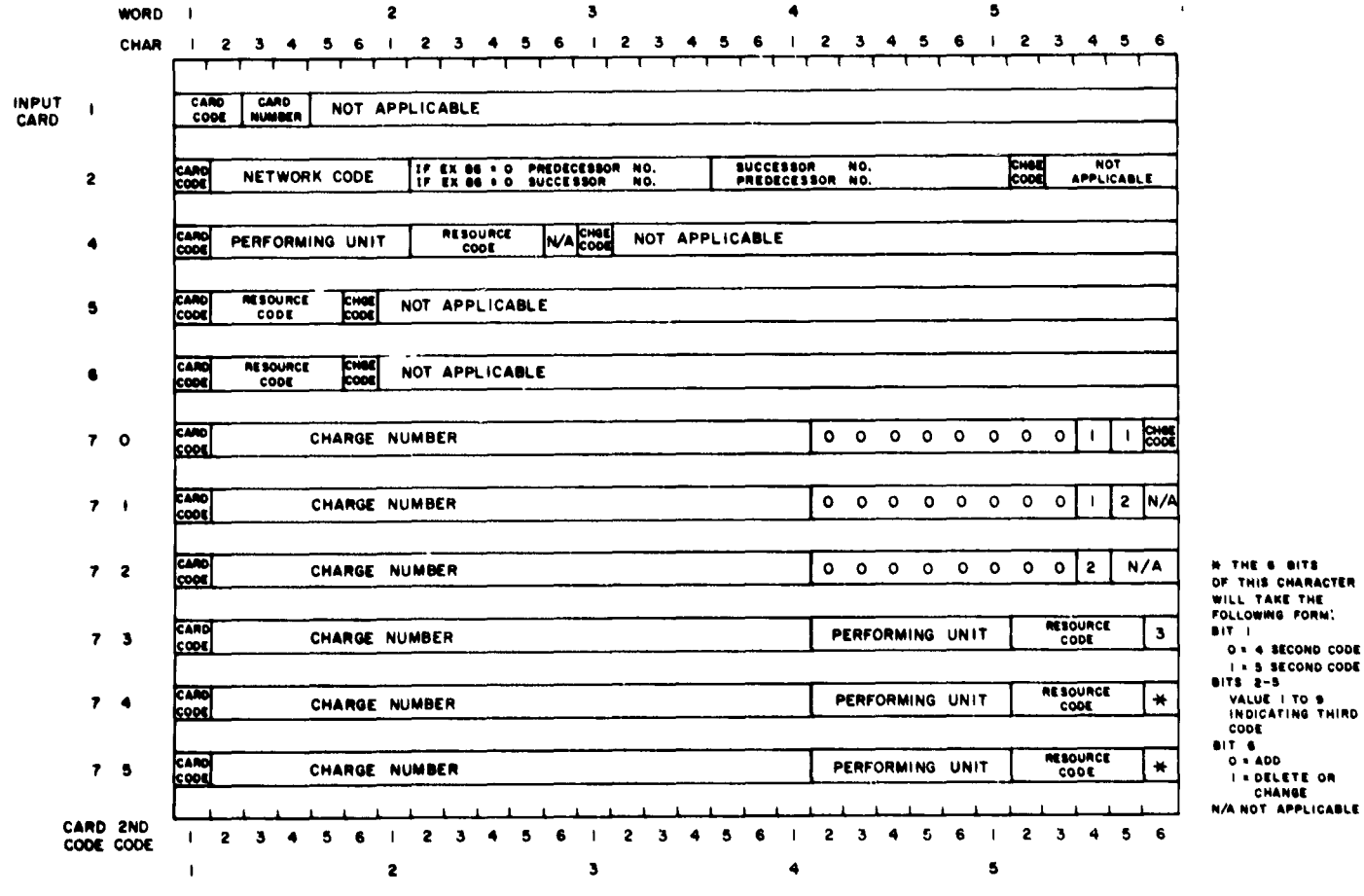


Fig. III-E-1 Input Data Sort Key Matrix

Edit Sort Region Description

The following region description will describe the major subroutine used in the edit sort phase.

Region EDSO

EXPLANATION OF REGION:

This routine will perform the formatting and sorting for the edited input data.

CALLING SEQUENCE:

L TSX EDSO, 4

L+1 Normal return

INPUT:

Up to nine EDITED DATA TAPES.

OUTPUT:

Up to nine SORTED DATA TAPES.

STORAGE USED:

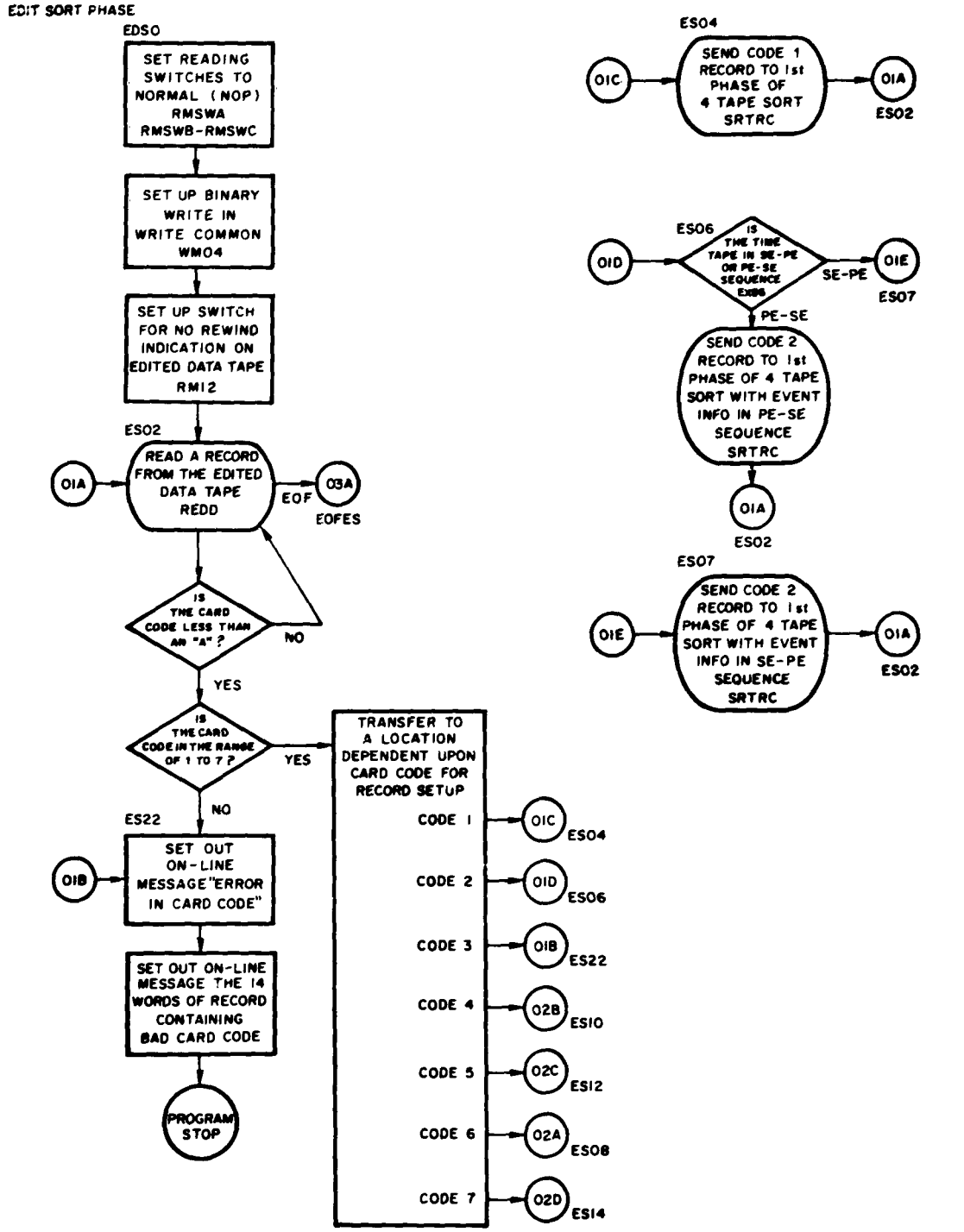
Not applicable.

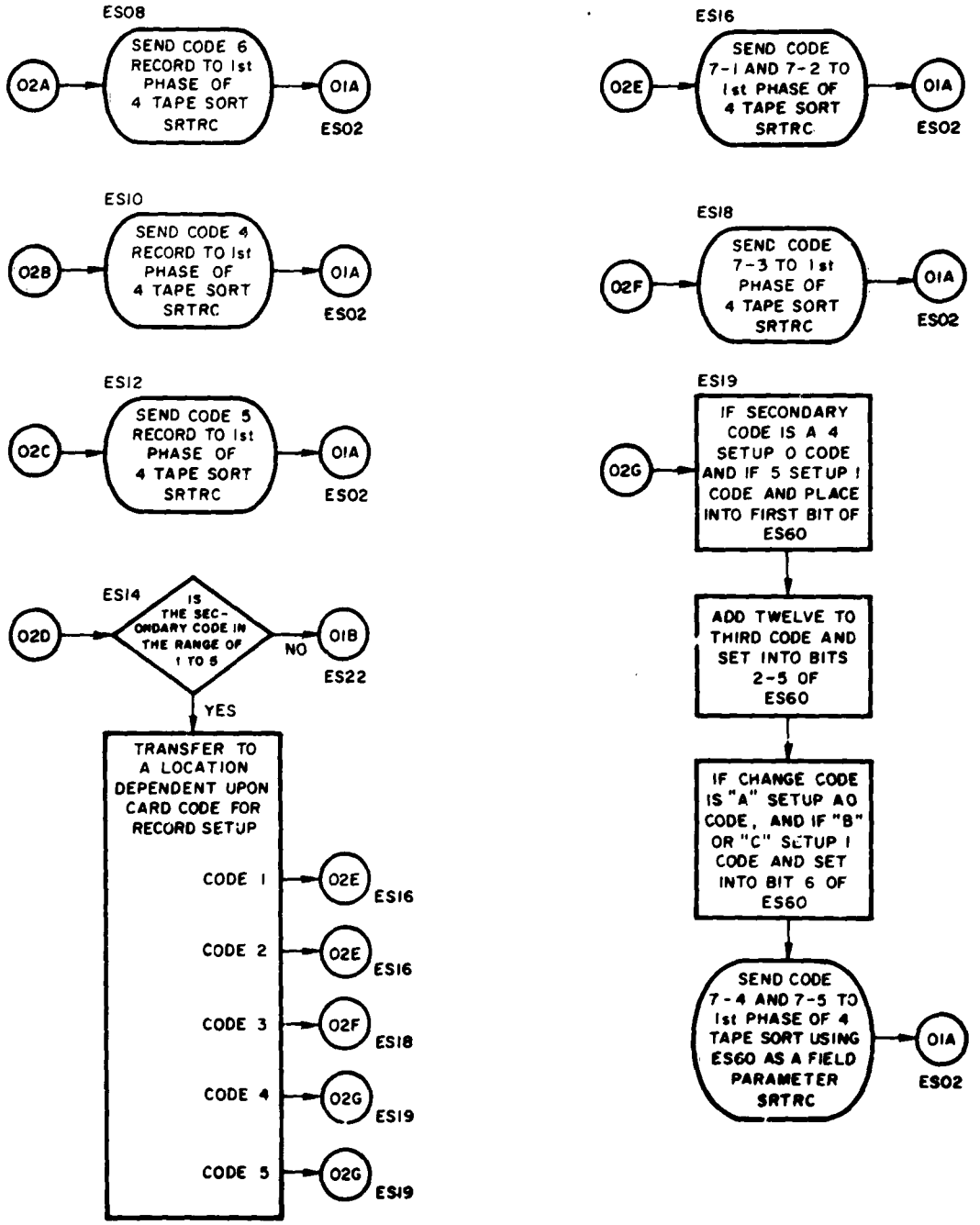
SUBREGIONS AND SUBROUTINES USED:

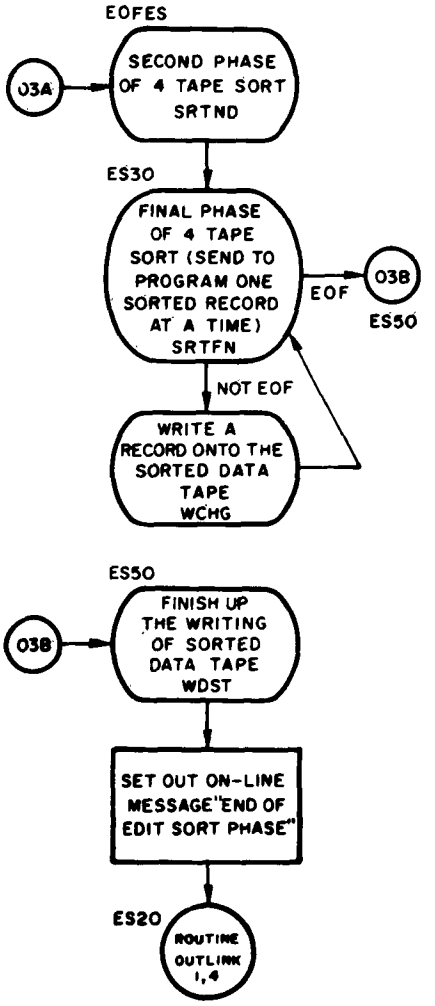
Not applicable.

EXPLANATION OF CALLING SEQUENCE:

If an error is found, the input and error message will be set out on the on-line printer and the program will halt.

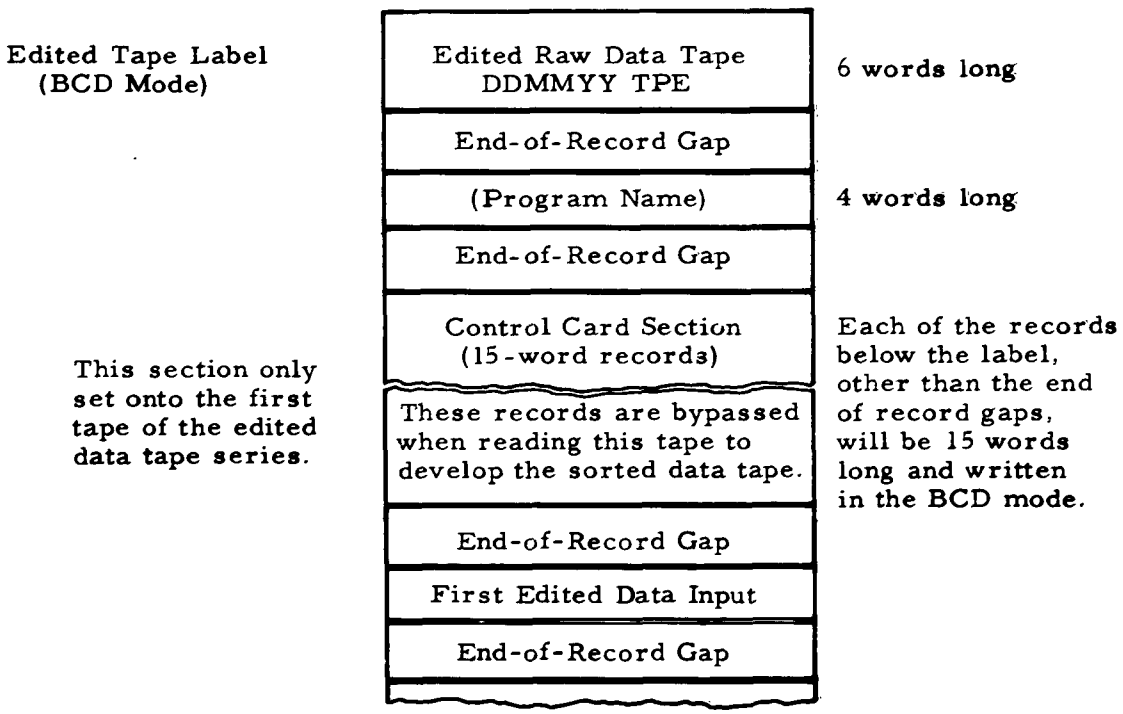

EDIT SORT PHASE
EDSO
SET READING SWITCHES TO NORMAL (NOP) RMSWA RMSWB-RMSWC
SET UP BINARY WRITE IN WRITE COMMON WM04
SET UP SWITCH FOR NO REWIND INDICATION ON EDITED DATA TAPE RM12
ES02
READ A RECORD FROM THE EDITED DATA TAPE REDD
01A
EOF
03A
EOFES
IS THE CARD CODE LESS THAN AN "A" ?
NO
YES
IS THE CARD CODE IN THE RANGE OF 1 TO 7 ?
YES
NO
ES22
SET OUT ON-LINE MESSAGE "ERROR IN CARD CODE"
01B
SET OUT ON-LINE MESSAGE THE 14 WORDS OF RECORD CONTAINING BAD CARD CODE
PROGRAM STOP
TRANSFER TO A LOCATION DEPENDENT UPON CARD CODE FOR RECORD SETUP
CODE 1
01C
ES04
CODE 2
01D
ES06
CODE 3
01B
ES22
CODE 4
02B
ES10
CODE 5
02C
ES12
CODE 6
02A
ES08
CODE 7
02D
ES14
ES04
01C
SEND CODE 1 RECORD TO 1st PHASE OF 4 TAPE SORT SRTRC
01A
ES02
ES06
01D
IS THE TIME TAPE IN SE-PE OR PE-SE SEQUENCE EXIT
SE-PE
01E
ES07
PE-SE
SEND CODE 2 RECORD TO 1st PHASE OF 4 TAPE SORT WITH EVENT INFO IN PE-SE SEQUENCE SRTRC
01A
ES02
ES07
01E
SEND CODE 2 RECORD TO 1st PHASE OF 4 TAPE SORT WITH EVENT INFO IN SE-PE SEQUENCE SRTRC
01A
ES02

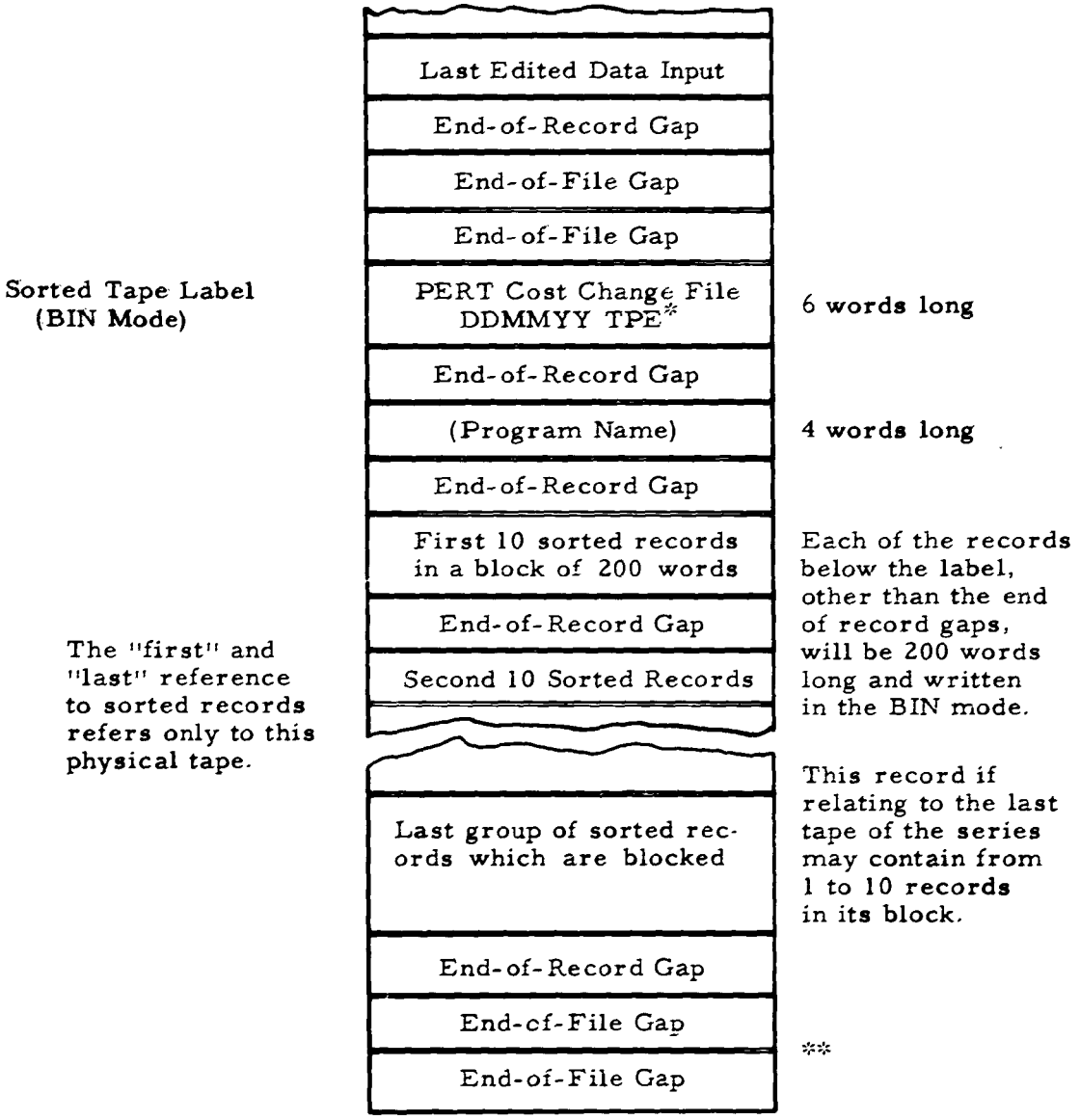

ES08
SEND CODE 6 RECORD TO 1st PHASE OF 4 TAPE SORT SRTRC
02A
01A
ES02
ES10
SEND CODE 4 RECORD TO 1st PHASE OF 4 TAPE SORT SRTRC
02B
01A
ES02
ES12
SEND CODE 5 RECORD TO 1st PHASE OF 4 TAPE SORT SRTRC
02C
01A
ES02
ES14
IS THE SECONDARY CODE IN THE RANGE OF 1 TO 5
02D
NO
01B
ES22
YES
TRANSFER TO A LOCATION DEPENDENT UPON CARD CODE FOR RECORD SETUP
CODE 1
02E
ES16
CODE 2
02E
ES16
CODE 3
02F
ES18
CODE 4
02G
ES19
CODE 5
02G
ES19
ES16
SEND CODE 7-1 AND 7-2 TO 1st PHASE OF 4 TAPE SORT SRTRC
02E
01A
ES02
ES18
SEND CODE 7-3 TO 1st PHASE OF 4 TAPE SORT SRTRC
02F
01A
ES02
ES19
IF SECONDARY CODE IS A 4 SETUP 0 CODE AND IF 5 SETUP 1 CODE AND PLACE INTO FIRST BIT OF ES60
02G
ADD TWELVE TO THIRD CODE AND SET INTO BITS 2-5 OF ES60
IF CHANGE CODE IS "A" SETUP A0 CODE, AND IF "B" OR "C" SETUP 1 CODE AND SET INTO BIT 6 OF ES60
SEND CODE 7-4 AND 7-5 TO 1st PHASE OF 4 TAPE SORT USING ES60 AS A FIELD PARAMETER SRTRC
01A
ES02


EOFES
03A
SECOND PHASE OF 4 TAPE SORT SRTND
ES30
FINAL PHASE OF 4 TAPE SORT (SEND TO PROGRAM ONE SORTED RECORD AT A TIME) SRTFN
EOF
03B
ES50
NOT EOF
WRITE A RECORD ONTO THE SORTED DATA TAPE WCHG
ES50
03B
FINISH UP THE WRITING OF SORTED DATA TAPE WDST
SET OUT ON-LINE MESSAGE "END OF EDIT SORT PHASE"
ES20
ROUTINE OUTLINK 1,4

Edit Sort Tape Layouts

This subsection shows pictorially the tape layouts involved in the Edit Sort phase. The layout of the EDITED DATA TAPE was described on Page III-D-53.

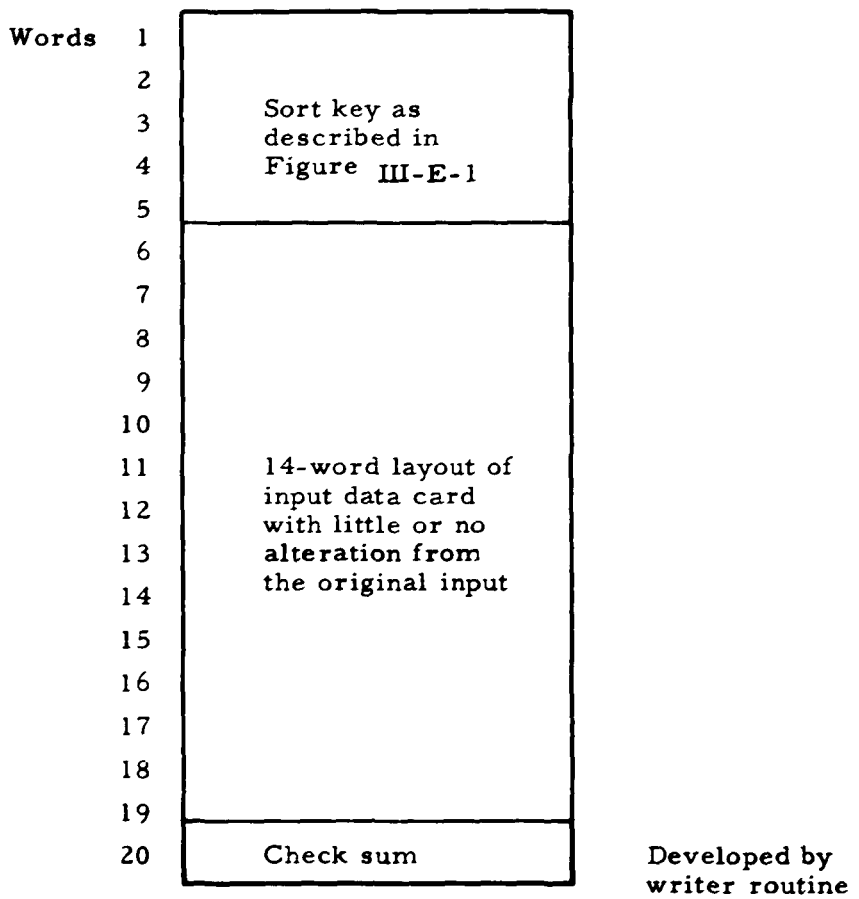




*The first sorted data tape will have a "1," indicating it was the first tape created of this series. If any additional sorted data tapes are created they will be numbered consecutively from 2 to 9.

**The configuration shown represents the last tape of a series. If it is not the last tape of a series an additional record of one word is inserted between the two end-of-file gaps as explained on Page III-B-10.

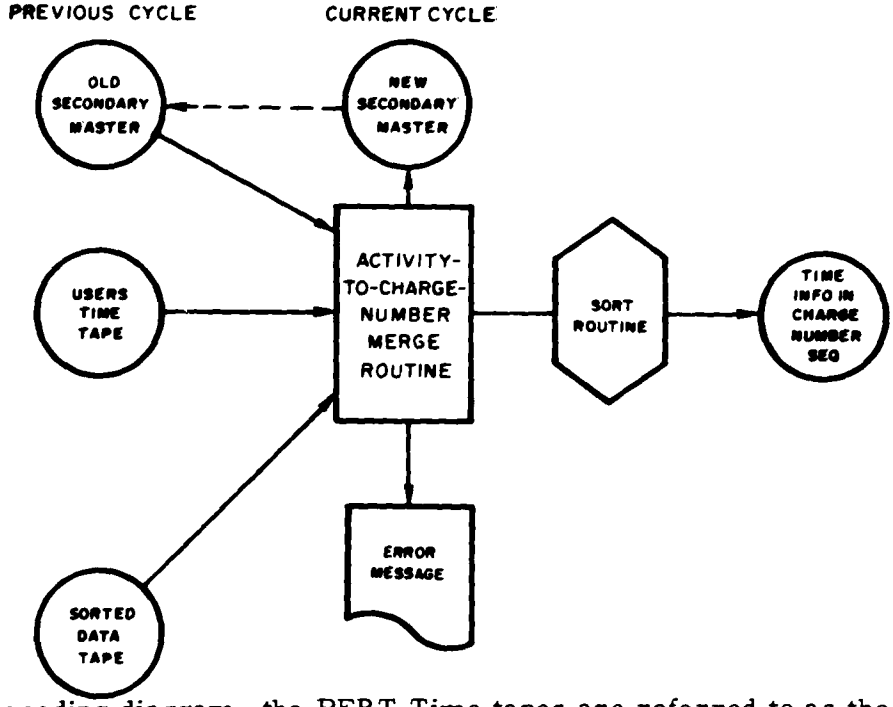
Each individual block of sorted data will be made up of 10 records, except for the last block, and each logical record will take the following form:



III-F PERT COST TIME MERGE PHASE

Time Merge General Description

In the time merge phase, the charge or summary numbers are merged with activity information from a PERT Time tape or cards to generate a time information tape for use during the PERT Cost Update phase. This selected time information for the Cost Update will be sequenced into charge number order by means of a 4-tape sort. Only activities related to a charge or summary number will be included on this output tape. The time merge phase is accomplished by two routines--the activity-to-charge-number merge routine and the activity-to-charge-number sort, as illustrated below.



In the preceding diagram, the PERT Time tapes are referred to as the USERS TIME TAPE, which will contain the activity information to be merged. The inputs that tie the activities to charge or summary numbers were verified in the preceding Edit and Edit Sort phase and come into the system from the SORTED DATA TAPE. The system will read and interpret the USERS TIME

TAPE by means of a set of parameter cards which were read in during the file establishment and which likewise come into the system from the SORTED DATA TAPE. The activity/charge number information is retained on the SECONDARY MASTER TAPE in blocks of 600 words and can be modified by adds, deletes, or changes in the existing file. The input parameters are developed by the system into an INPAR table of 350 words, as described in the following subsections, and is set out onto the NEW SECONDARY MASTER TAPE for use in the next cyclic run.

The output tape from the activity-to-charge-number merge will be in PE-SE or SE-PE sequence and its data will be sorted by charge number in the follow-up routine. The sorted information will be then used during the PERT Cost Update phase.

At the end of the time merge phase, a message indicating the number of errors encountered during the processing will be displayed on the on-line printer. This message will take one of the following forms:

(a) XXXX ERRORS DETERMINED
IF RUN IS TO BE CONTINUED EVEN THOUGH ERRORS INDICATED HIT START

(b) NO ERRORS DETERMINED

If message (a) is printed out the program will stop. If these errors are to be ignored, the start button at the console is hit and they are bypassed. The program will then go into the activity-to-charge-number sort and continue on into its next phase. Where there are no errors indicated (Message (b)), the program will automatically go on to the activity-to-charge-number sort.

Time Merge Input Parameters

The input parameter system for the PERT time merge phase was developed in order to maintain a capability to read most PERT Time system tapes without having to modify the existing PERT Cost program. In the development of this parameter system the following three distinct types of cards

were produced: general description cards, file description cards, and field description cards.

General Description Cards (Type 1A)

These cards contain the code of "1A" in columns 1 and 2. They contain information that relates to the general characteristics of the PERT Time tape that is to be used. Some of the characteristics that are defined in these cards are: (1) the PERT Time network base date, (2) whether the PERT Time calculations are based on the start or the base date, and (3) whether T_S and T_A use the same location in the PERT Time file.

The complete set of characteristics contained in type 1A cards is coded as follows: (See Subsec. 3.5.6 for table layouts):

1. Sort Required Indicator - Column 12

   If the USERS TIME TAPE is in some sequence other than PE-SE or SE-PE sequence, Column 12 is set to a character other than blank or zero. This indicator is located at INPAR + 0: 1 = sort required, 0 or blank = sort not required.

2. Network Base Date - Columns 5 to 11

   If a network start date is in elapsed time relevant to a network base date, or if the activity data are related to a network base date, this date must be present. It will be set up in a DDMMMYY format with the month being represented in an alphabetic configuration containing the first three characters of the month.

3. Base or Start Date Indicator - Column 13

   If the dates in the USERS TIME TAPE are carried as a number, this indicator is set to relate the time dates to the start or the base date of the network. Whichever of the two dates is used it will become the value to which the elapsed time values are added in order to arrive at a calendar date. The indicator is located at Inpar + 3: 1 = calculations made using base date, 2 = calculations made using start date. These same indicator values will appear in the "1A" control card in Column 13.

4. Actual Code Indicator - Column 14

If T_S/T_A are located in the same physical word of the USERS TIME TAPE a scheduled or actual flag (Inpar + 340) is used. This flag will indicate whether the actual or scheduled dates are located in the T_S/T_A field. Once this flag has been isolated the value is compared with the actual code indicator (INPAR + 4). If it agrees, the T_S/T_A field is an actual date, but if it does not, it is a scheduled date.

5. T_S/T_A Set-up Code - Column 15

If T_S/T_A are located in the same physical word of the USERS TIME TAPE this column can be blank or zero. If they are in separate words this indicator is set to a character other than zero or blank. When the T_S/T_A dates are in two separate fields, the actual code indicator and the scheduled or actual flag do not have to be set. The scheduled date field will then be found in the T_S/T_A field (INPAR + 330) and the actual date location will then be found in the T_A field (INPAR + 344).

File Description Cards (Type 1B)

These cards contain the code "1B" in Columns 1 and 2. The information carried in these cards relates to the file characteristics of the PERT Time tape that is to be used. These cards indicate the type of records in the file, as well as the number of files. They give the PERT Cost program the capability to read the tape and to be aware of the kind of record it has read. The elements used, their codes, and the purpose of each field are described below:

1. Card Order Number - Columns 3-4

This code allows a maximum of 75 cards, which must be in the same order as the USERS TIME TAPE.
This code is part of the sort sequence for the card. As these cards come in to the system from the SORTED DATA TAPE they are translated into 4-word configuration groups starting at INPAR + 10 and ending at INPAR + 309. If the maximum number of "1B" cards is not used, the remaining blocks will be filled with zeros.

2. File Order Number - Columns 5-6

This code designates a file and represents a family of record types. Each different, sequential file represented on the USERS TIME TAPE gets an order number larger by 1 than the previous file. This number is carried as a binary value in bits 3-17 of the first word of the file description set.

3. Record Type Number - Column 7

This code links the individual fields, by record type, to a particular record in the file. A maximum of seven record types can be used. These types may be present in more than one file. The record type number used for a particular field will have a corresponding code number for that field in the "1C" cards, no matter which file of the USERS TIME TAPE relates to it. This value is carried in bits 18-20 of the first word of the file description set. If the record type number is zero it will indicate to the program that this is the only card for this file and that this file is to be skipped in processing the USERS TIME TAPE.

4. One-or-Many Indicator - Column 8

This indicator will show whether only one of this type of record or many records of this type are in a particular file of the USERS TIME TAPE. This code is carried in bit S of the fourth word of the file description set. The code used for this indicator is: 0 or Blank = many of this record type in file; 1 = only one of this record type in file.

5. Length of Logical Record - Columns 9-11

If the record being described by this particular "1B" card is a blocked record of a fixed length, the number of words in the logical record are indicated. If this record is not blocked or is made up of variable sized logical records, this field is left blank. If it contains a value, it is converted to binary and is carried in bits 21-35 of the first word of the file description set.

6. Read Mode - Columns 12-14

This field will contain either "BCD" or "BIN" according to the mode used in developing this particular record on the USERS TIME TAPE. The above mnemonics are converted to 1 and 0, respectively, and are set into the S-bit of the second word of the file description set.

7. End-of-Block Code - Columns 15-17

This code will be either "EOL" to indicate that this record is part of a block, or "EOR" to indicate that this record is terminated by an end-of-record mark. The "EOR" condition will convert to a 1 and the "EOL" to a 2 and these codes will be set into bits 1 and 2 of the first word of the file description set.

8. Record ID Code - Columns 18-23

This code will be used in identifying individual records of the USERS TIME TAPE. It will be set into the third word of the file description set, and compared to the file ID code of the USERS TIME TAPE as determined by the information in Columns 24-30. This code will always be right-justified, since the ID code from the USERS TIME TAPE will be forced to the right by the program. If the code is less than 6 characters or a full word, leading zeros should be set into the record ID code field. If the code is greater than 6 characters, the six most meaningful should be selected and set into this field, as well as into the retrieval fields in Columns 24-30. If there is no record ID code, this field is left blank, as is Columns 24-30, and the record being checked from the USERS TIME TAPE is assumed to be the record wanted.

9. Word Position in Record for ID - Columns 24-25

This field will indicate the location in the record that the ID field can be found. This location is converted to binary and set into bits 21-35 in the second word of the file description set. The first word of the record is considered as 1 instead of zero for all references to this record.

10. Retrieval Mode for ID - Column 26

This field will indicate the mode in which this record ID is carried in the USERS TIME TAPE. There are three possible modes that can be used:

C = characters and is converted to a 1

W = words and is converted to a 2

B = binary and is converted to a 3

This converted value is set into bits 18-20 of the second word of the file description set.

11. Field Start Position for ID - Column 27-28

This start position will indicate the location in the word that this field begins. It will vary with the retrieval mode used. If words are used, this field is left blank. If characters are used, this field will contain a value in the range of 1 to 6 indicating the character start position. If it is a binary mode, this field will contain a value in the range of 1 to 36 indicating the bit start position. This number is converted to binary and set into bits 3-11 in the second word of the file description set.

12. Number of Units for ID - Columns 29-30

This field will contain the number of units that are tied to the retrieval code for the record ID. If the retrieval code indicates the ID is carried as words, this field has to be 1, since the program cannot handle an ID of more than one word. If the code denotes characters, this field will have to be in the range of 1 to 6; if the ID is binary, the field must be in the range of 1 to 36. This number is converted to binary and set into bits 12-17 in the second word of the file description set.

13. Variable Record Indicator - Column 31

This code will indicate that the logical record involved is of variable word length and that the information in columns 32-38 will state where the count of the words is located in this record. The letter V in this column will indicate a variable record, and it will cause a 1 to be set into the sign bit of the first word of the file description set.

14. Retrieval Information for Variable Record Count - Columns 32-38

The information regarding these fields are the same as discussed in items 9-12 above, except that this data is set into the fourth word of the file description set instead of the second. The count developed from this data is used as the length of logical record to determine the size of the record in the block.

In the processing of the input parameter file-description cards, a "found" indicator is located in bit 1 of the fourth word of the file description set. This indicator is set when a particular record is located. If this file has been completed and one of the records has not been located, the system will stop and an error message will be forthcoming. (Page III-F-14).

Field Description Cards (1-C)

These cards are coded "1C" in Columns 1 and 2. They contain the data that relate to the individual fields of the PERT Time tape that is to be used. These cards indicate where in the record the requested data can be found as well as how large a field is involved. The card indicates on fields that use dates or binary representations of time the type of information used. The information recorded and the codes used are described below.

1. Field Code Number - Columns 3-4

   This code is preset and will relate the field description code to a particular field. This code will be in the range of 01 to 18 and is part of the sort sequence for this card. As these cards come into the system from the SORTED DATA TAPE they are translated into a 2-word configuration starting at INPAR + 310 and ending at INPAR + 344. If there is no card for a particular field, the 2-word configuration will remain at zero.

2. Record Type - Column 5

   This code ties a particular field to a record in the file. A number from 1 to 7 should appear for every field that is to be used. This code should correspond to the record type in the file description card if this field is a part of that record. In assigning the record type code, the lower number of a set should be given to the first records read in, and then the higher numbers to the following, in their respective order. The reason is that in developing the pseudo-time record from the USERS TIME TAPE, all the fields with a record type number equal to or larger than the one being currently worked upon will be cleared out. This capability allows the program to use multi-record types to develop a pseudo-time record, and to keep certain fields while clearing out others. This code is set into bits S-2 in the first word of the field description set.

3. Word Position in Record - Columns 6-8

   This field indicates the location in the record where this item can be found. This location is converted to binary and set into bits 21-35 in the first word of the field description set. The first word of the record is set up as a 1 instead of 0 for all references to this record.

4. Retrieval Mode - Column 9

   This field indicates the mode used for this item in the USERS TIME TAPE:

   C = characters, and is converted to a 1

   W = words, and is converted to a 2

   B = binary, and is converted to a 3

   This converted value is set into bits 18-20 of the first word of the field description set.

5. Sign Position - Columns 10-11

This field indicates the location of the sign position connected to one of the parameter input fields. It will apply only to those fields that can be either plus or minus, such as slack, T_L, or S_L. This field is expected to be located in one of the binary bits of the word containing the numeric value. If this bit is a zero the sign is made plus, if it is a one the sign is set to minus. The location of the sign position is set into bits 3-17 of the second word of the field description set.

6. Field Start Position - Column 12-13

This start position indicates the location in the word where this field begins. It will vary according to the retrieval mode used. If words are used this field is left blank. If characters are used this field will contain a value in the range of 1 to 6 indicating the character start position. If it is a binary mode, this field will contain a value in the range of 1 to 36 indicating the bit start position. This number is converted to binary and set into bits 3-11 in the first word of the field description set.

7. Number of Units - Columns 14-15

This field contains the number of units that are tied to the retrieval code for this input. If the retrieval code indicates words, this field will state the number of full words that make up this item. If it is characters, this field will indicate the number of characters, which may extend over many words, that will make up this item. If the retrieval mode is in binary the value will be in the range of 1 to 36. The number of units value is converted to a binary number and is set into bits 12-17 in the first word of the field description set.

8. Format Mode - Column 16

The format mode relates to all data that will take the form of a date or elapsed time value. It indicates the manner in which these values are carried in the USERS TIME TAPE. The codes and converted values that are used, and the way the information is carried by the USERS TIME TAPE, are as follows:

B = binary; converted to a 1. The number of work days from a base date is carried in binary.

D = calendar date; converted to a 2. The actual calendar date that relates to this item is carried in BCD.

W = weeks $\times$ 10; converted to a 3. The number of weeks times ten from a base date is carried in binary.

T = weeks and decimal tenths; converted to a 4. The number of weeks and tenths as a decimal value from a base date is carried in binary.

F = floating point; converted to a 5. The weeks and decimal tenths value is carried in a floating-point configuration to be added to a base date.

C = BCD days; converted to a 6. The number of work days from a base date is carried in BCD.

K = BCD weeks and decimal tenths; converted to a 7. The number of weeks and tenths is carried as a BCD value from a base date. A decimal point or any other character may be used to separate the fraction from the whole number.

This format mode value, from 1 to 7, is set into bits 18-20 of the second word of the field description set.

9. Sub-format Mode - Column 17

This code will relate to the format mode that is discussed in 8 above. Three of these format mode categories will be split into a more detailed breakdown of the information in the USERS TIME TAPE. The following are these breakdowns:

If the D code is used in the format mode category, the following codes will indicate the date configuration used.

Code 1 = DDMMYY

Code 2 = MMDDYY

Code 3 = DDMMMYY } Alphabetic Month

Code 4 = MMMDDYY }

Code 5 = DD-MM-YY

Code 6 = MM-DD-YY

If the T code is used in the format mode category, the number of bits from 0-7 that comprise the decimal value is set into this column.

If the K code is used in the format mode category, the following codes will indicate the presence of a decimal indicator or the lack of it, and the number of decimal characters.

Code 0 = no decimal portion to item

Code 1 = no decimal point and 1 decimal character

Code 2 = no decimal point and 2 decimal characters

Code 3 = no decimal point and 3 decimal characters

Code 4 = decimal point and no decimal characters

Code 5 = decimal point and 1 decimal character

Code 6 = decimal point and 2 decimal characters

Code 7 = decimal point and 3 decimal characters

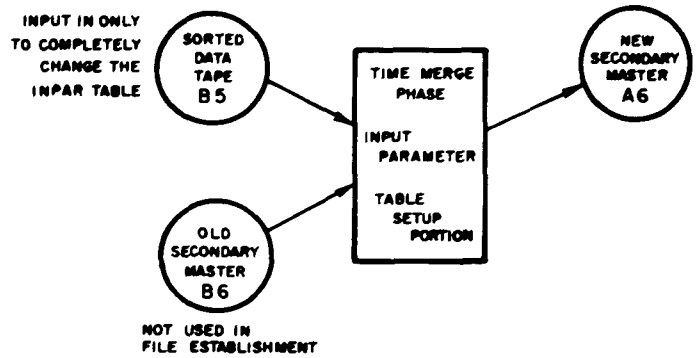
These values, in the range of 0 to 7, are set into bits S-2 of the second word of the field description set.

Time Merge Input Parameter Table Operations

The input parameter cards are initially read in during file establishment and a table of 350 words at location "INPAR" is developed. These cards, if present, will be the first cards read from the SORTED DATA TAPE; therefore, this table development is the first operation completed in the PERT Cost time merge phase. After this table has been developed it is set out on the NEW SECONDARY MASTER TAPE for usage on the next cyclic run. If during the next cyclic run there are no input parameter cards, the table from the OLD SECONDARY MASTER TAPE is used and this table will again be set out on the NEW SECONDARY MASTER. There is no provision for updating this table. Any time a "1" card is found on the SORTED DATA TAPE it will indicate to the program that a new INPAR table will be developed. Therefore, if a change is to be made to the INPAR table the entire set of "1" type parameter cards will have to be reentered into the system.

After the completion of the edit and edit sort phase, the tape on A6 containing the raw data is rewound but not unloaded. This tape will become the NEW SECONDARY MASTER TAPE, and the first item set onto this tape will be the input parameters. If the system is in a file establishment mode the input parameters are developed into the INPAR table and set out onto the NEW SECONDARY MASTER TAPE. If this system is to be run without time data, a pseudo INPAR table is set out containing 350 words of zero. The following

diagram shows the tapes that can be used during this portion on the time merge phase.

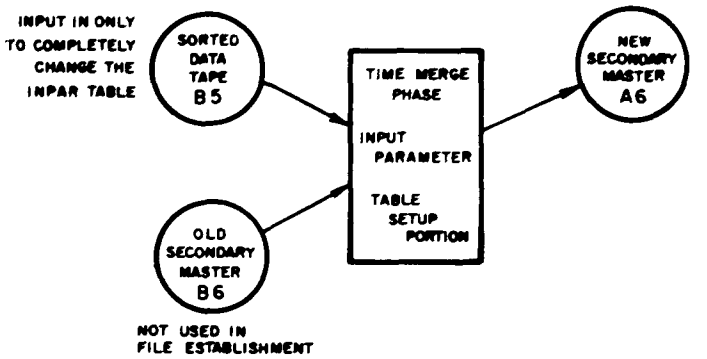


After this table has been developed it will be used during the merging of time data with charge numbers to read the USERS TIME TAPE. Each activity of the USERS TIME TAPE is developed with certain selected time information, as determined by the input parameter cards. This activity is then compared with the activity to charge number information and if they match this record is set out on the sort tapes. If they do not match the time information is ignored and the next time record is developed. It is possible, in the parameter card system, to pick up the charge number from the USERS TIME TAPE. In this case, no merge takes place and those activities that contain a charge number are sent out onto the sort tape. If the USERS TIME TAPE contains a sequence other than PE-SE or SE-PE the program will develop a PSEUDO USERS TIME TAPE. This tape will then be sorted into PE-SE sequence, after which it will be merged with the activity-to-charge-number information.

Time-Merge Input Parameter Error Messages

In developing the INPAR table from the input parameters, the following error or exception messages can be produced, depending on the type of error. The program will first pass through the entire set of parameter cards, indicating the error as it occurs but continuing on to the next card. When the input parameter cards are completed and there have been no

diagram shows the tapes that can be used during this portion on the time merge phase.



After this table has been developed it will be used during the merging of time data with charge numbers to read the USERS TIME TAPE. Each activity of the USERS TIME TAPE is developed with certain selected time information, as determined by the input parameter cards. This activity is then compared with the activity to charge number information and if they match this record is set out on the sort tapes. If they do not match the time information is ignored and the next time record is developed. It is possible, in the parameter card system, to pick up the charge number from the USERS TIME TAPE. In this case, no merge takes place and those activities that contain a charge number are sent out onto the sort tape. If the USERS TIME TAPE contains a sequence other than PE-SE or SE-PE the program will develop a PSEUDO USERS TIME TAPE. This tape will then be sorted into PE-SE sequence, after which it will be merged with the activity-to-charge-number information.

Time-Merge Input Parameter Error Messages

In developing the INPAR table from the input parameters, the following error or exception messages can be produced, depending on the type of error. The program will first pass through the entire set of parameter cards, indicating the error as it occurs but continuing on to the next card. When the input parameter cards are completed and there have been no

errors indicated, the program will go into the next section of the program automatically. If there have been errors the following message will be set out on the on-line printer and the system will stop.

HALT FINISHED PROCESSING TYPE 1 CARDS

The following messages, set out on the on-line printer, will indicate the reasons for the above halt.

a. ERROR 1B ORDER NO. COLS. 3-4

The card order number in Columns 3 and 4 of type 1B card is out of sequence, is a zero, or is greater than 75.

b. ERROR 1B FILE ORDER NO. COLS. 5-6

The file order number of a 1B card is out of sequence, is blank, or is not numeric.

c. ERROR 1B RECORD TYPE COL. 7

The record type code of a 1B card is not in the range of 0 to 7 or there is more than 1 zero for the same file order number.

d. ERROR 1B ONE/MANY INDIC COL. 8

This indicator is not 0, blank, or 1.

e. ERROR 1B READ MODE COLS. 12-14

The mode is not indicated as BIN or BCD.

f. ERROR 1B END OF BLOCK CODE COLS. 15-17

The code is not indicated as EOR, EOL, or blank.

g. ERROR 1B REC. ID MISSING COLS. 18-23

The record ID is blank and Columns 24-25 are not blank.

h. ERROR 1B CODE WORD NUMBER COLS. 24-25

There is information in the record ID, Columns 18-23, but Columns 24 and 25 are zero or blank.

i. ERROR 1B CODE MODE INDIC. COL. 26

The retrieval mode is not indicated as B, C, W, or blank.

j. ERROR 1B CODE FLD. ST. POS. COLS. 27-28

There is information in the record ID and the retrieval code is B or C but Columns 27 and 28 are zero or blank.

k. ERROR 1B CODE NO. OF UNITS COLS. 29-30

There is information in the record ID and the retrieval code is a B or C but Columns 29 and 30 are zero or blank.

l. ERROR 1B TOO MANY DATA UNITS COLS. 27-30

For the field start position, Columns 27-28, if the retrieval code is C this value should be in the range of 1 to 6. If the code is B, it should be in the range of 1 to 36. For the number of units, Columns 29-30, if the retrieval code is C this value should be in the range of 1 to 6. If the code is B this value added to the field start position should be a number equal to or less than 37.

m. ERROR 1B VAR. REC. INDIC. COL. 31

This column does not contain a V indication or a blank.

n. ERROR 1B VAR. REC. WORD NO. COLS. 32-33

There is a "V" in Column 31 and these columns are blank or zero.

o. ERROR 1B VAR. REC. MODE COL. 34

The retrieval mode is not indicated as a B, C, W or blank.

p. ERROR 1B VAR. FLD. START POS. COLS. 35-36

When there is a "V" in Column 31 and the retrieval code is B or C but these columns are zero or blank.

q. ERROR 1B VAR. NO. OF UNITS COLS. 37-38

There is a "V" in Column 31 and the retrieval code is B or C but these columns are zero or blank.

r. ERROR 1B TOO MANY DATA UNITS COLS. 35-38

For the field start position, Columns 35-36, if the retrieval code is C this value should be in the range of 1 to 6. If the code is B it should be in the range of 1 to 36. For the number of units, Columns 37-38, if the retrieval code is C this value should be in the range of 1 to 6. If the code is B this value added to the field start position should be a number equal to or less than 37.

s. ERROR 1C FIELD CODE COLS. 3-4

An error exists on the field code of the 1C type of card if these columns are blank, zero, duplicated, or out of sequence.

t. ERROR 1C RECORD TYPE COL. 5

The record type is not in the range of 1 to 7.

u. ERROR 1C WORD POS. IN REC. COLS. 6-8

The word position value is either blank or zero.

v. ERROR 1C RETRIEVAL MODE COL. 9

The retrieval mode is not indicated as B, C, or W.

w. ERROR 1C FIELD START POS. COLS. 12-13

The retrieval code is B or C and these columns contain either a blank or a zero.

x. ERROR 1C NO. OF UNITS COLS. 14-15

The retrieval code is B, C, or W and these columns contain either a blank or a zero.

y. ERROR 1C TOO MANY DATA UNITS COLS. 12-15

For the field start position, Columns 12-13, if the retrieval code is C this value should be in the range of 1 to 6. If the code is B it should be in the range of 1 to 36. For the number of units, Columns 14-15, if the retrieval code is B this value added to the field start position should be a number equal to or less than 37.

z. ERROR 1C FORMAT MODE COL. 16

This mode is not indicated by a B, D, W, T, F, C, K, or a blank.

aa. ERROR 1C DATE SUB-MODE COL. 17

If the format mode, Column 16, is a D this field should be in the range of 1 to 6. If it contains a T or K this field should be in the range of 0 to 7.

ab. FILE BEING ESTABLISHED WITH NO. 1 CARD INPUT

There is No. 1 card input for a file establishment that uses time data.

The above messages will all be followed with an 80-character reproduction of the input card creating the error.

Time Merge Input Parameter Restrictions

Although this system is flexible with respect to the format of the USERS TIME TAPE, there are certain minimum requirements that must be met. These requirements are:

1. The tape must be compatible with IBM 7090 data processing equipment.

2. The tape must contain, as a minimum, those elements of PERT Time data which are considered to be both necessary and sufficient for a successful computer run. These elements are:

   a) Start or base date

   b) Predecessor and successor number

   c) S_E or T_E

   d) S_L or T_L

   e) T_S

   f) T_A

   g) t_s or t_e

3. The tape must contain activity-oriented PERT Time data. Explicitly, the computed values (T_E, T_L, S_E, S_L, and slack) must be related to an activity or to the succeeding event of an activity.

4. All of the PERT Time data must be contained on a single tape. The system does not have the capability of reading multiple PERT time tapes.

5. If any of the fields contain information carried in the binary mode, this information must be carried within (or up to) a full computer word. It is not acceptable to have binary information split between two computer words.

Time Merge Input Parameter Table Layouts

The following table layouts will illustrate the manner in which the INPAR table has been constructed in core and is carried on tape. (Fig. III-F-1) indicates the fields that were described on Page III-F-4. This figure is the actual input form used, and will allow for up to 15 "1B" cards on this form. The information from this form is translated card by card into the INPAR table area. This table area is located from INPAR + 10 to INPAR + 309 and each card is set into a 4-word block (Fig. III-F-2). Each of these 4-word blocks will follow the previous block until all of the "1B" cards have been completed. The balance of the file description portion of the INPAR table will be zeros. Up to 75 "1B" cards can be set into the INPAR table.

Figure III-F-3 also will indicate fields that were described on Page III-F-7. This figure is the actual input form used, and allows for the input of "1A" and "1C" cards from this form. For the "1A" cards the input is translated field by field and set into its proper location in INPAR + 0 to INPAR + 9. All unused locations in INPAR, or blank fields on the input card, will result in zeros being set into the table. (Figure III-F-5) will show the placement of the "1A" data into the INPAR table.) The information from the "1C" card is translated field by field and card by card into the INPAR table. This table area is located at INPAR + 310 to INPAR + 349 and each card is set into a 2-word block (Figure III-F-4). Each of these 2-word blocks will be set into its respective location according to the card number related to the input. Only those fields that are described by "1C" cards will have information in the INPAR table. All other fields that have not been described will have zeros in their respective locations in this table. INPAR + 346 to +349 will always contain zeros.

Figure 3.5.6-5 shows the entire INPAR table layout and the information contained within. The first of a set of file description blocks is shown in detail at INPAR + 10 to INPAR + 13. All following 4-word blocks will duplicate the first, in form, up to a maximum of 75. The same is true for the field description blocks, in that it is detailed at INPAR + 310 to INPAR + 311 and this form is duplicated by all field descriptions that follow it. Each of the fields is shown opposite the first word of its respective 2-word block.

CARD CODE	CARD NUMBER	FILE ORDER	RECORD TYPE	MULTIPLE RECORD INDICATOR	LENGTH OF LOGICAL RECORD	READ MODE	END OF BLOCK CODE	RECORD ID	BCHO POSITION IN RECORD FOR ID	RETRIEVAL MODE FOR ID	FIELD START POSITION FOR ID	NUMBER OF UNITS FOR ID	VARIABLE RECORD IND	BCHO POSITION IN RECORD FOR VAR. IND.	RETRIEVAL MODE FOR VAR. IND.	FIELD START POS. FOR VAR. IND.	—	NUMBER OF UNITS FOR VAR. IND.
1 2	3 4	5 6	7	8	9 11	12 14	15 17	18 23	24 25	26	27 28	29 30	31	32 33	34	35 36		37 38
1 B																		
1 B																		
1 B																		
1 B																		
1 B																		
1 B																		
1 B																		
1 B																		
1 B																		
1 B																		
1 B																		
1 B																		
1 B																		
1 B																		
1 B																		

Fig. III-F-1 Tape Record and File Description Block

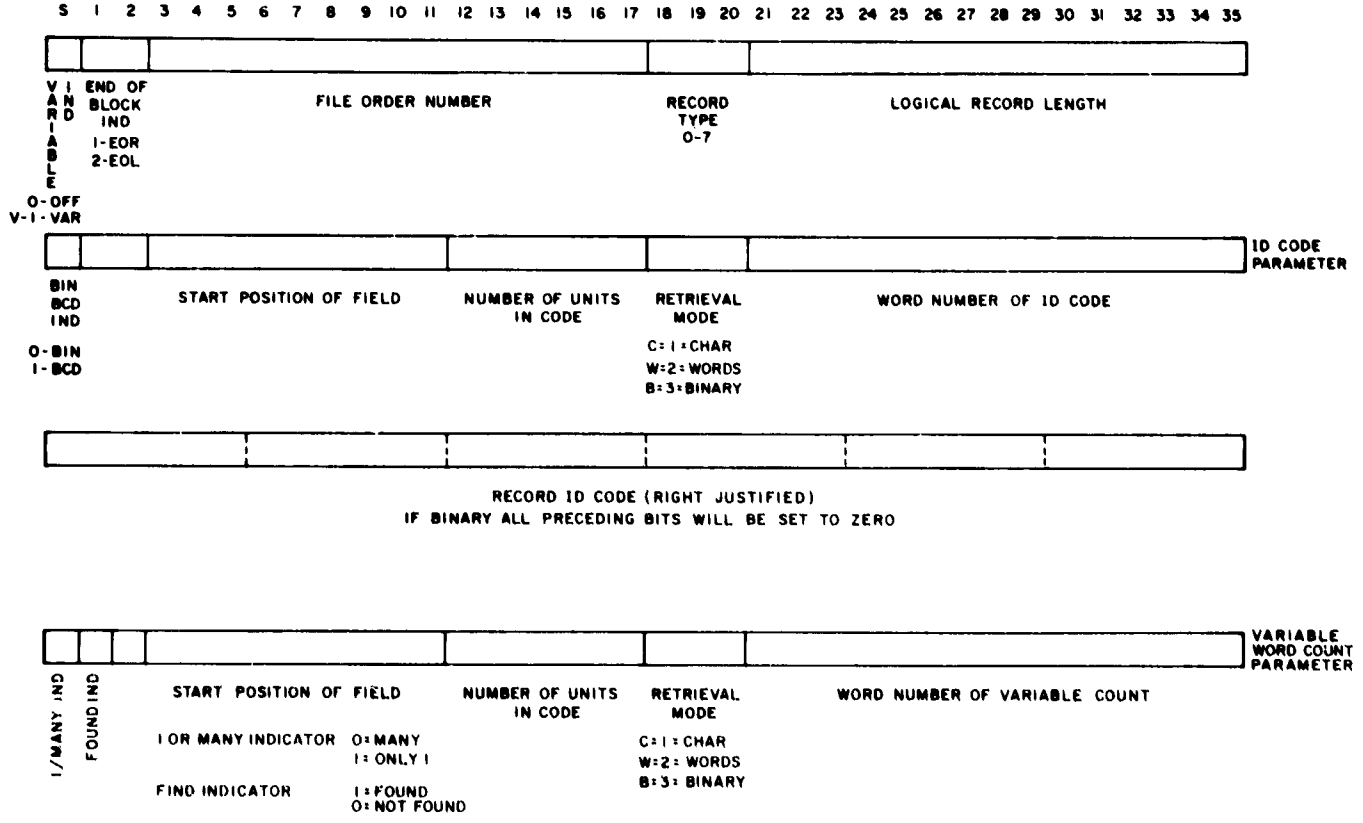


Fig. III-F-2 Breakdown of Input Parameter File Description Blocks

CARD CODE	CARD NUMBER	BASE DATE			SORT REQ. INDICATOR	BASE/START DATE IND.	ACTUAL CODE-T_S/T_A	T_S/T_A SET UP CODE	
		DAY	MONTH	YEAR					
1 2	3 4	5		11	12	13	14	15	
1 A	0 1								

CARD CODE	CARD NUMBER	RECORD TYPE	WORD POSITION IN RECORD	RETRIEVAL MODE	SIGN POSITION	FIELD START POSITION	NUMBER OF UNITS	FORMAT MODE	SUB FORMAT MODE	
1 2	3 4	5	6 8	9	10 11	12 13	14 15	16	17	
1 C	0 1									NETWORK CODE
1 C	0 2									NETWORK DESCRIPTION
1 C	0 3									START DATE
1 C	0 4									REPORT DATE
1 C	0 5									PREDECESSOR NUMBER
1 C	0 6									SUCCESSOR NUMBER
1 C	0 7									S_E
1 C	0 8									T_E
1 C	0 9									S_L
1 C	1 0									T_L
1 C	1 1									T_S OR T_S/ T_A
1 C	1 2									t_s
1 C	1 3									t_e
1 C	1 4									SLACK
1 C	1 5									ACTIVITY DESCRIPTION
1 C	1 6									SCHEDULED/ACTUAL FLAG
1 C	1 7									CHARGE NUMBER
1 C	1 8									T_A

Fig. III-F-3 Data Description Block

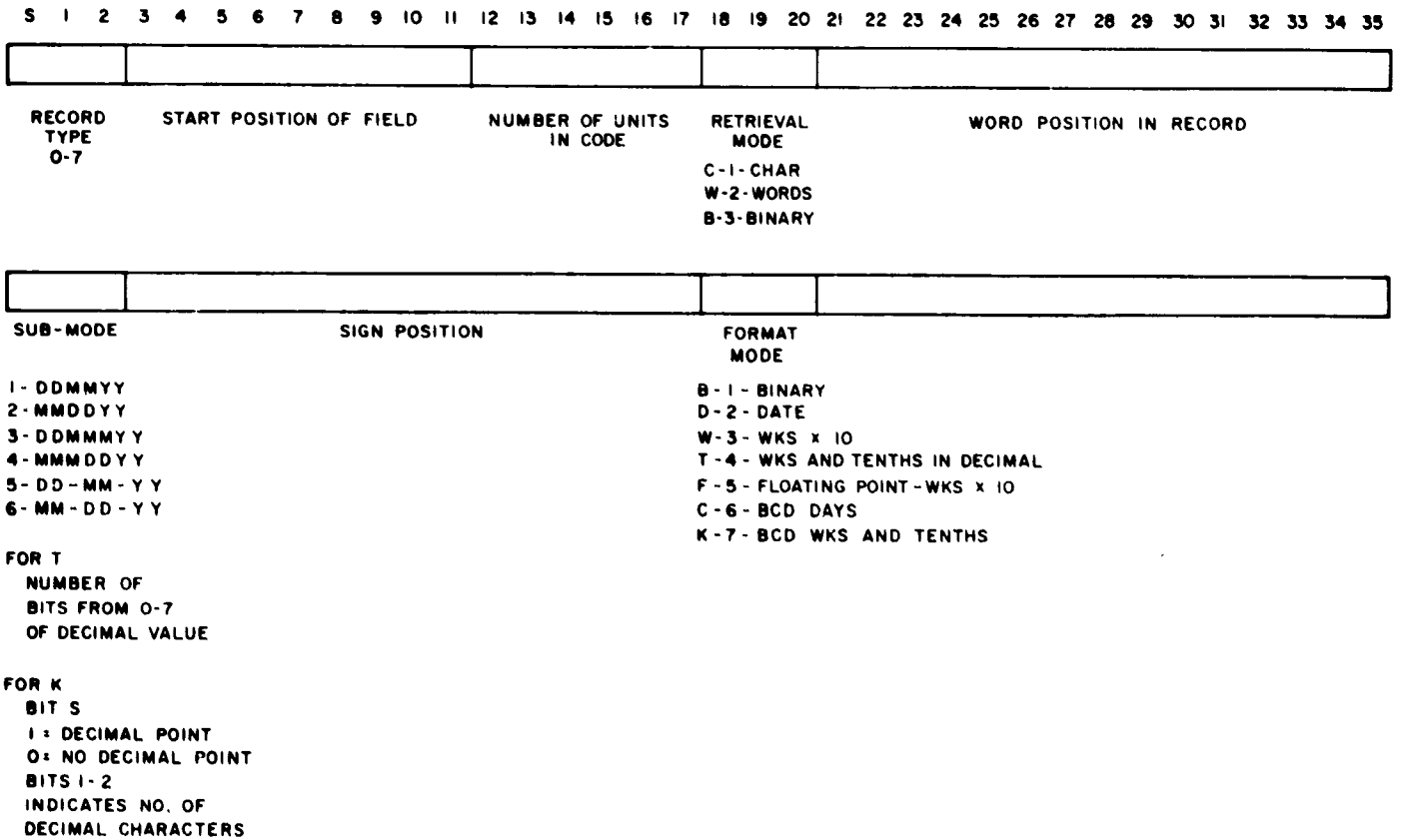


Fig. III-F-4 Breakdown of Input Parameter Field Description Blocks

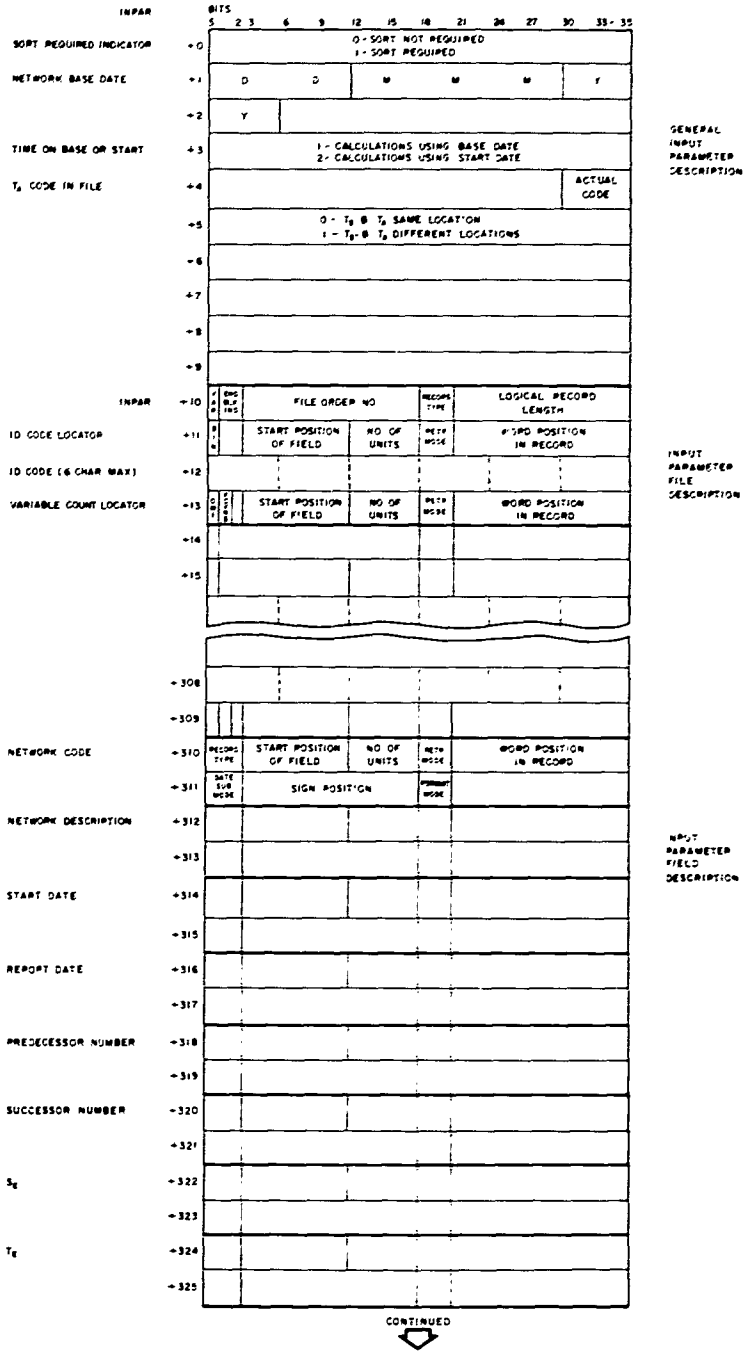


Fig III-F-5 Input Parameter Block

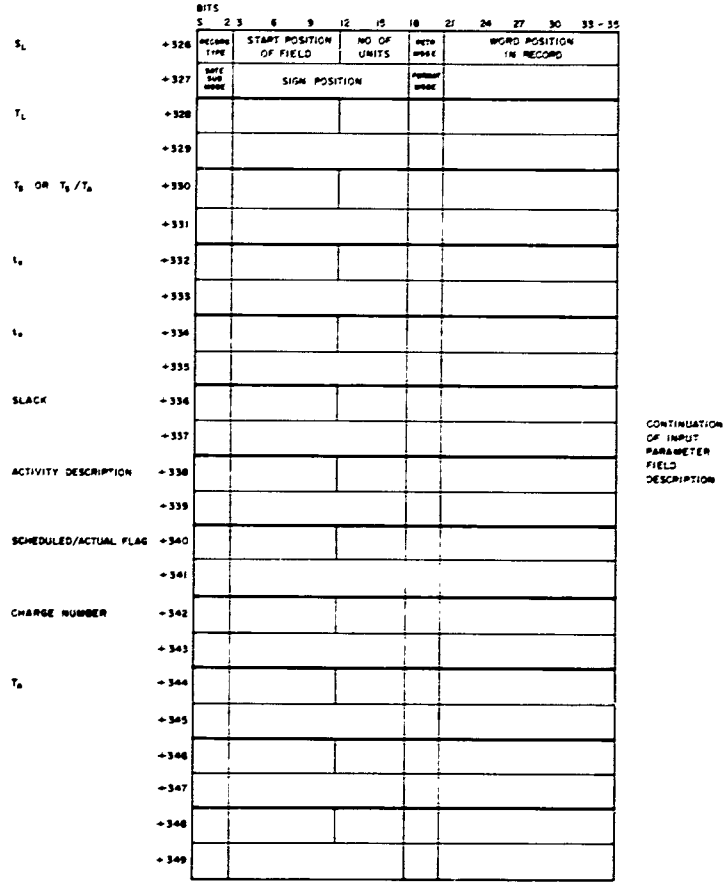


Fig III-F-5 Input Parameter Block (Continued)

Time Merge Input Parameter Region Descriptions

The following region description describes the input parameter subroutine used in the time merge phase of the program.

Region PMSU

EXPLANATION OF REGION:

This region will translate the input parameters into a table called INPAR and write it out on the NEW SECONDARY MASTER TAPE.

CALLING SEQUENCE:

```
L       TSX   PMSU, 4
L + 1   Normal return
```

INPUT:

SORTED DATA TAPE (Input Type Number 1)

OLD SECONDARY MASTER TAPE

OUTPUT:

The INPAR table developed in core and set out on the NEW SECONDARY MASTER TAPE

STORAGE USED:

INPAR - 350 words - table location

HUNPK - 81 words - input card storage locations

HMKUP - 4 words - block makeup area (for both file and field blocks)

SUBREGIONS AND SUBROUTINES USED:

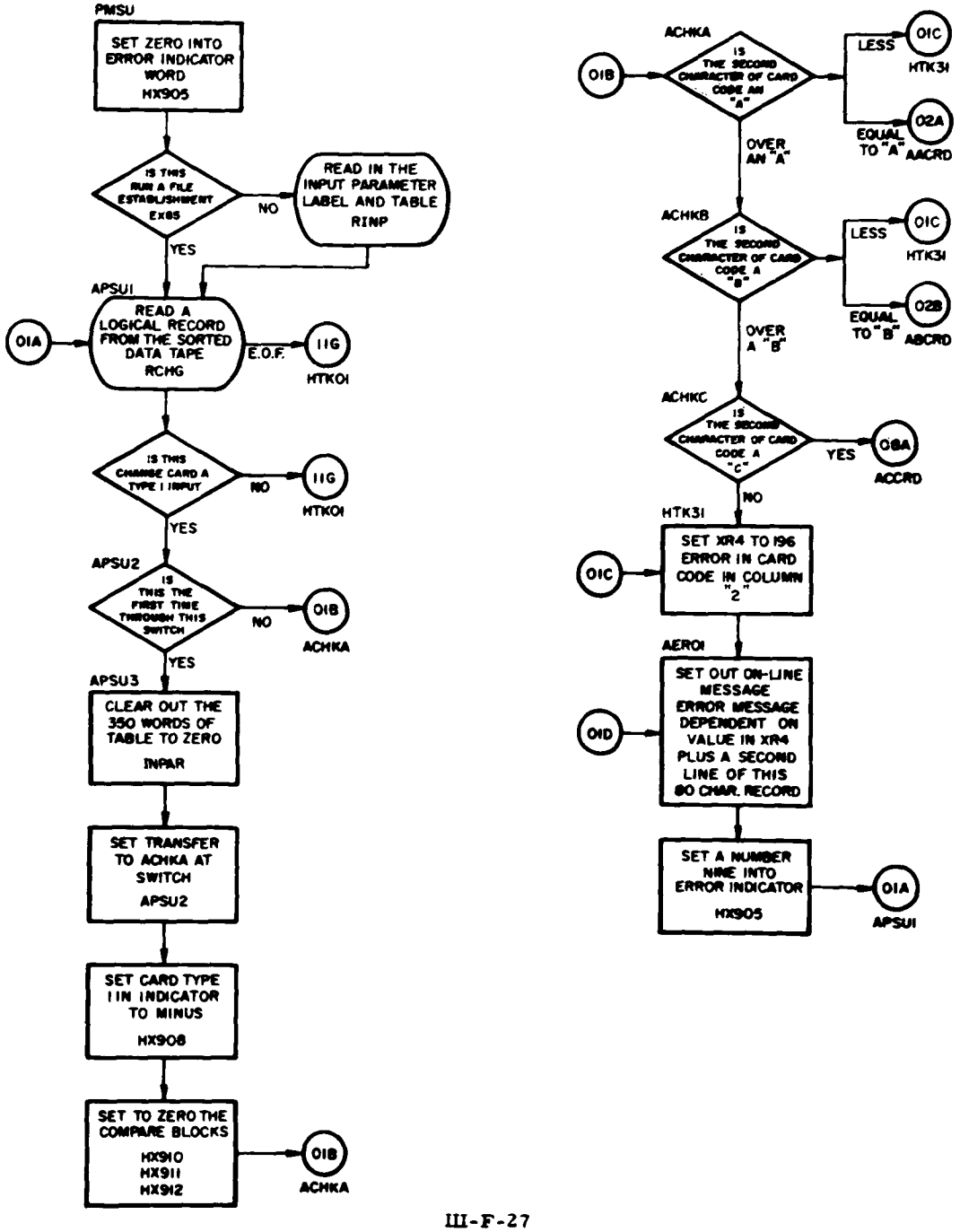
PACK RCHG

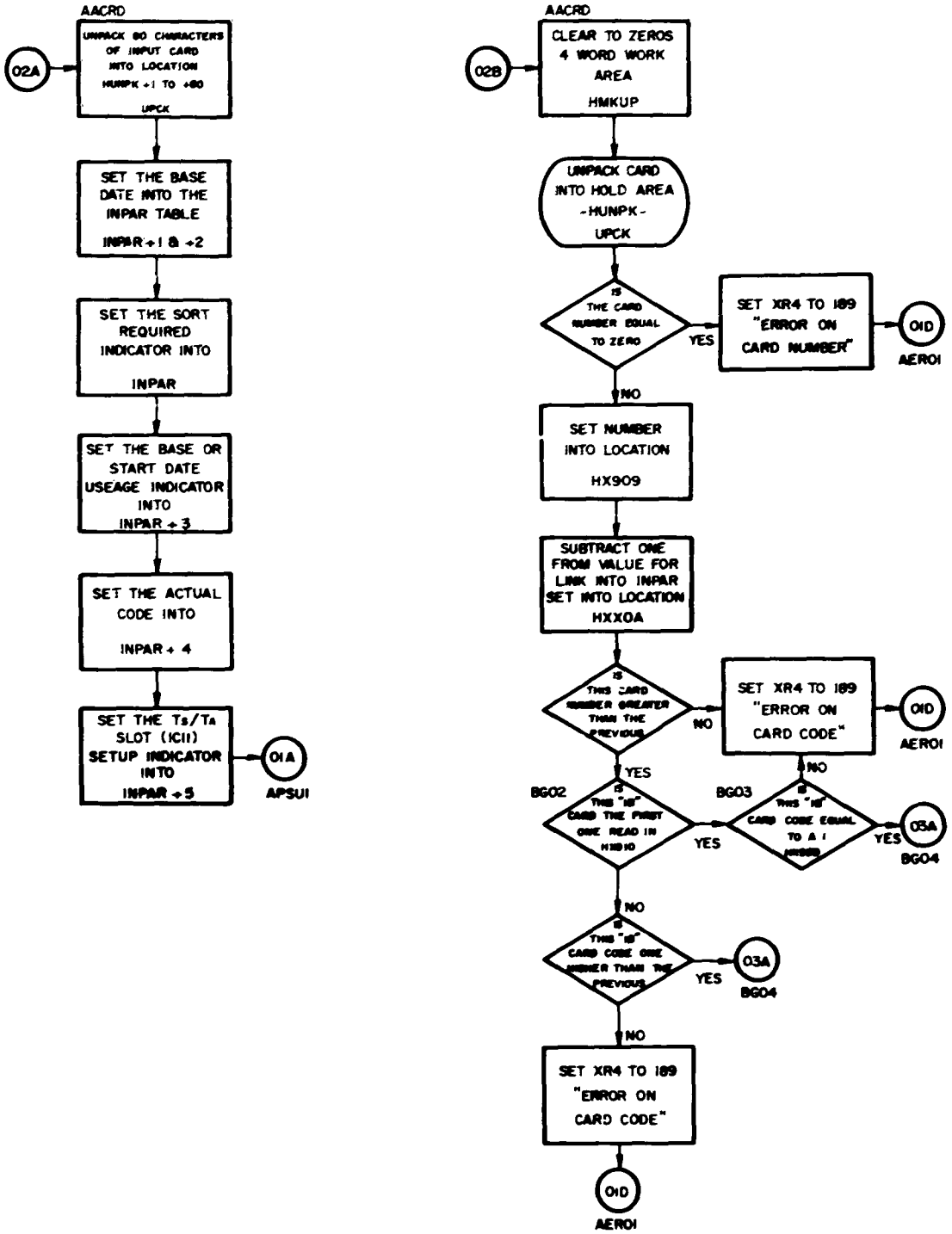
UPCK

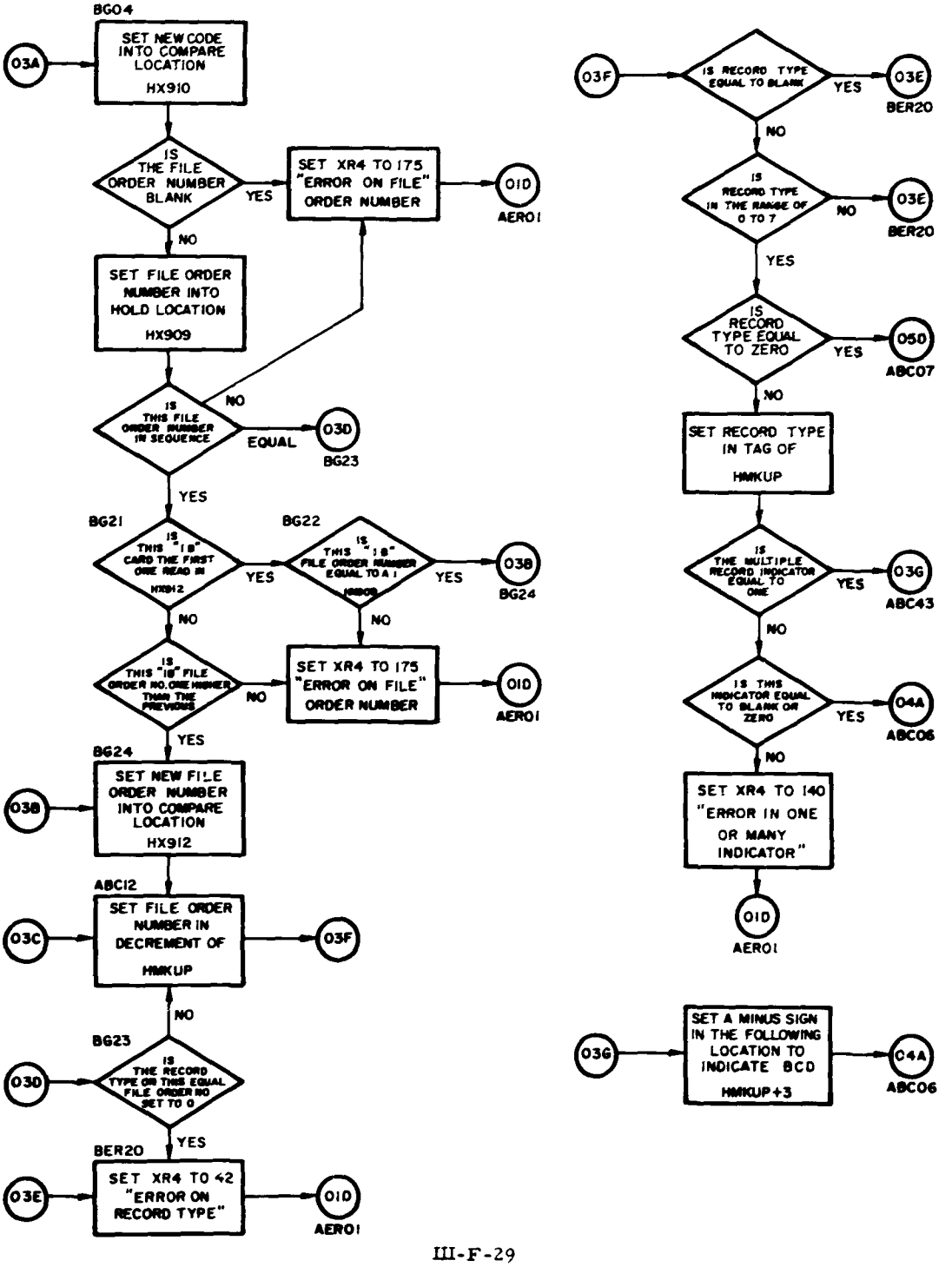
EXPLANATION OF CALLING SEQUENCE:

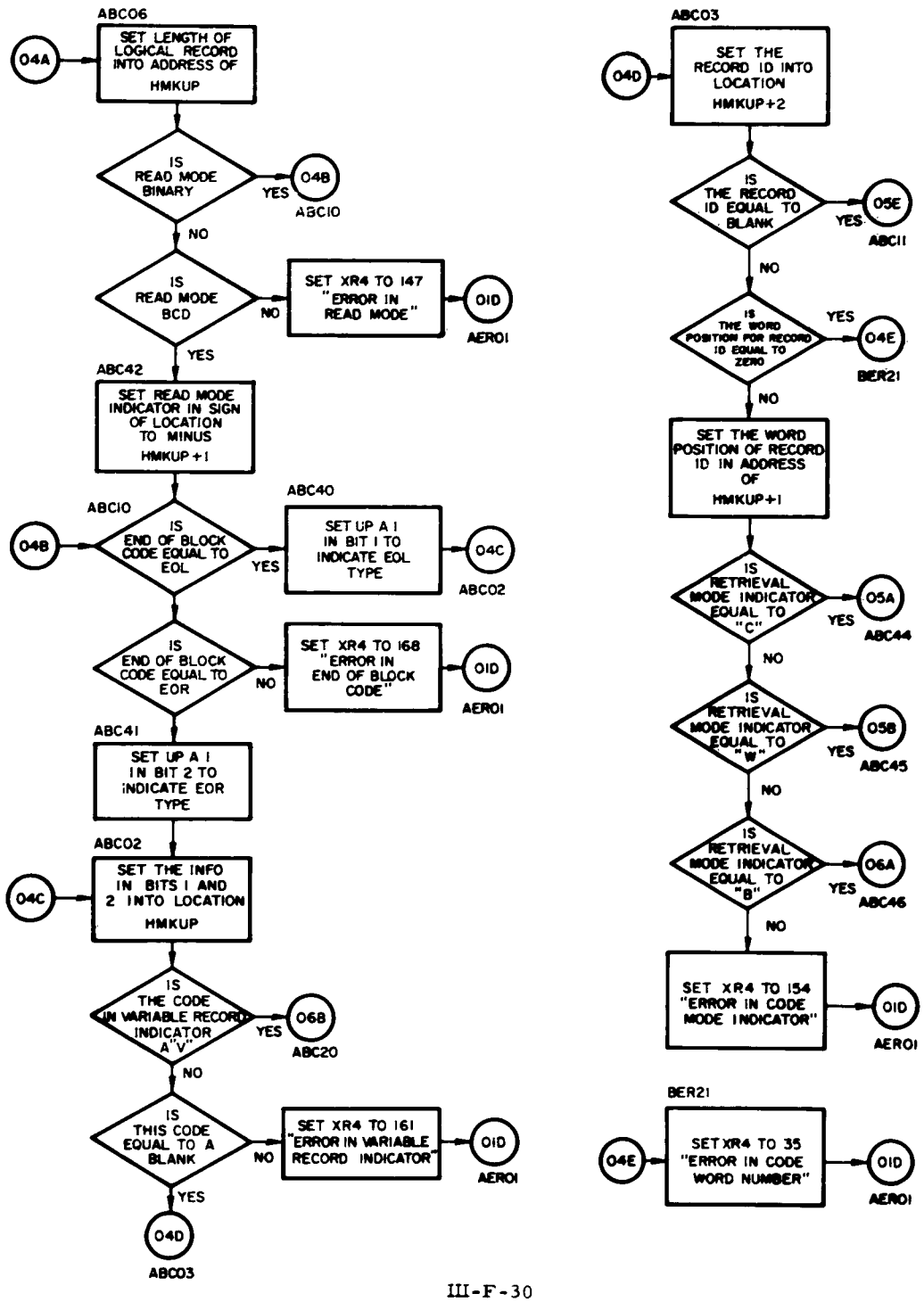
If an error is determined in developing this table, a message is set out on the on-line printer and the program will bring in the next card to translate. When all type 1 cards are completed and one or more errors have been found, the program will stop. If no errors are determined, the program will go to its normal return.

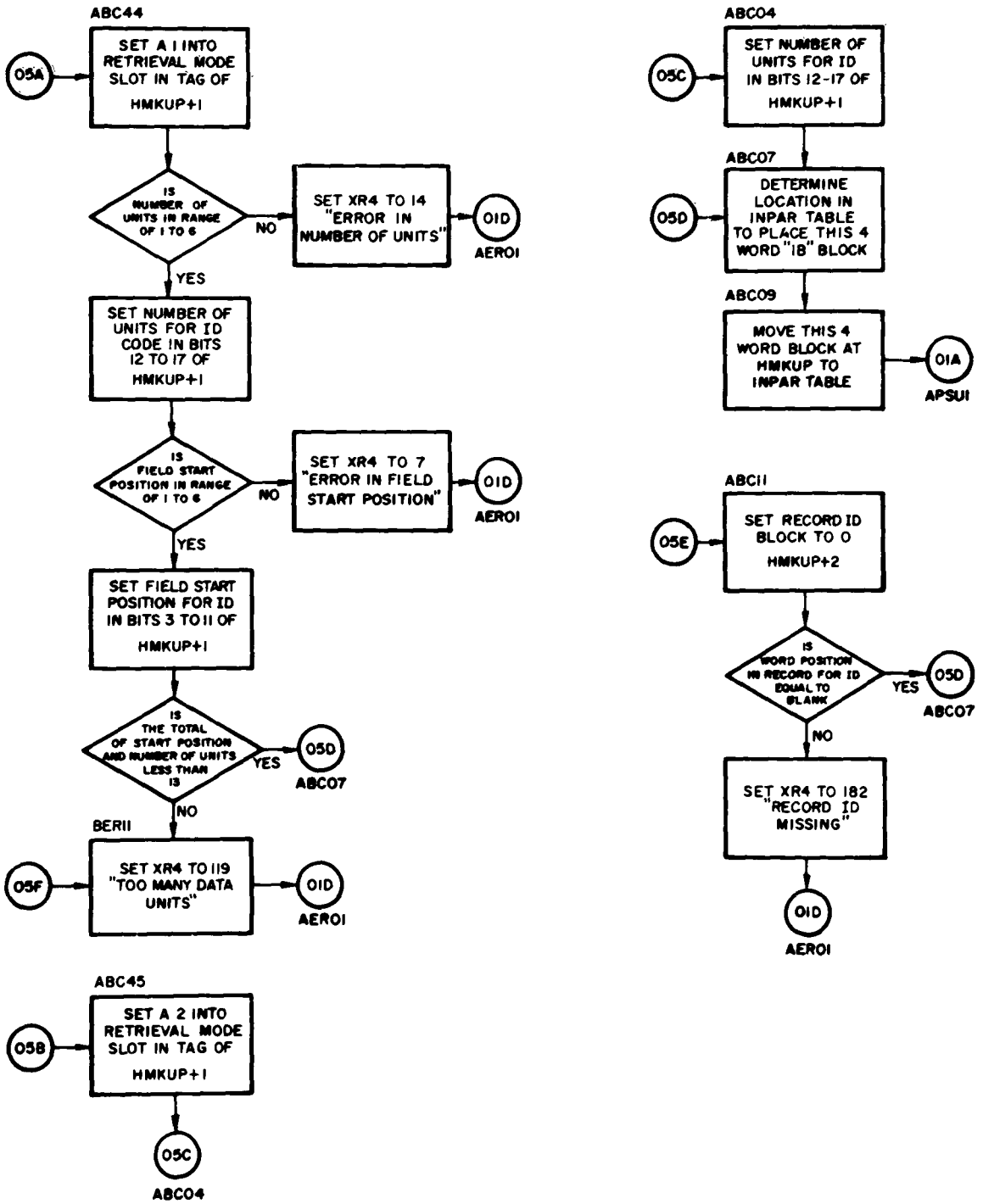
INPUT PARAMETER
TABLE SETUP ROUTINE

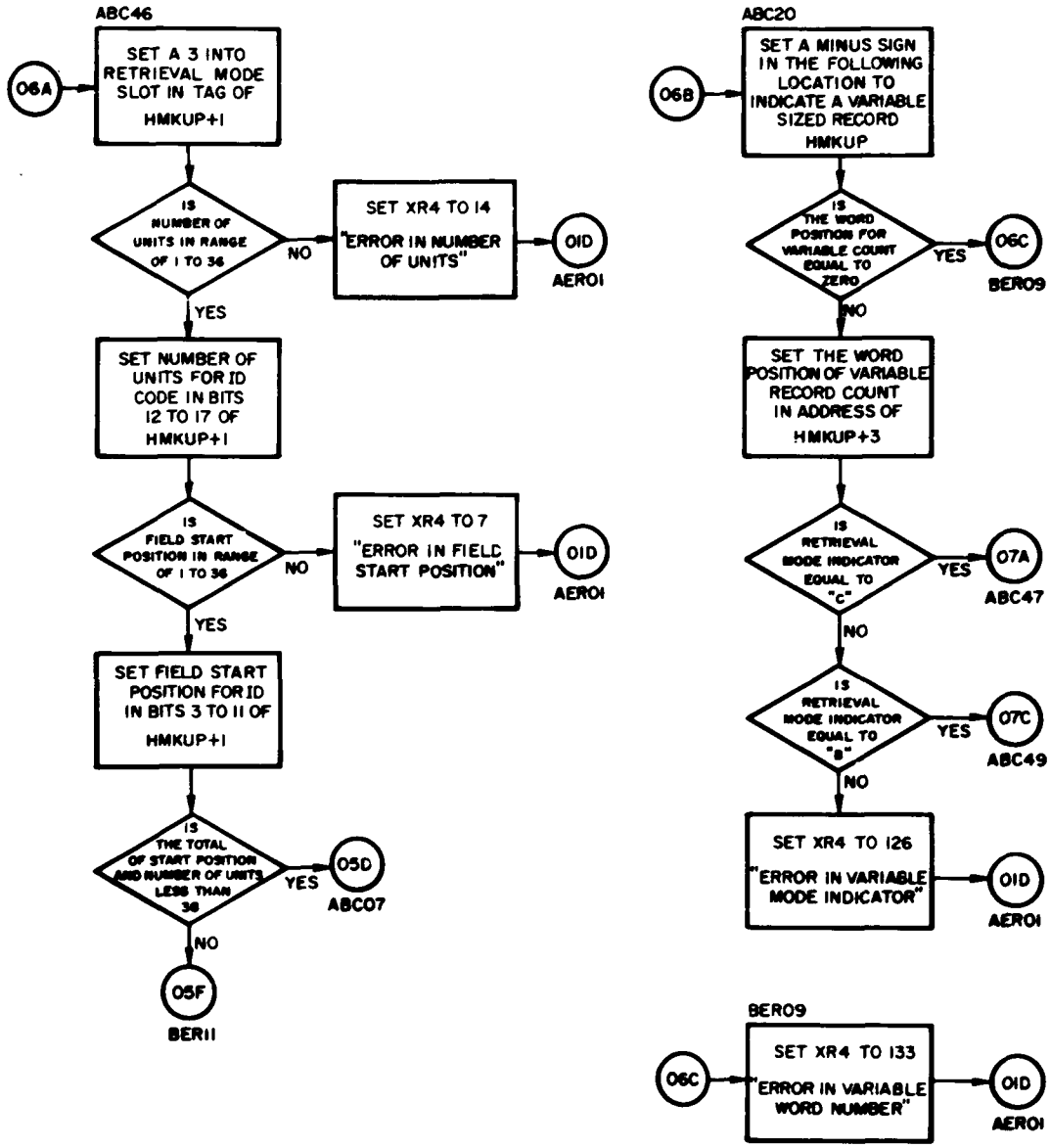


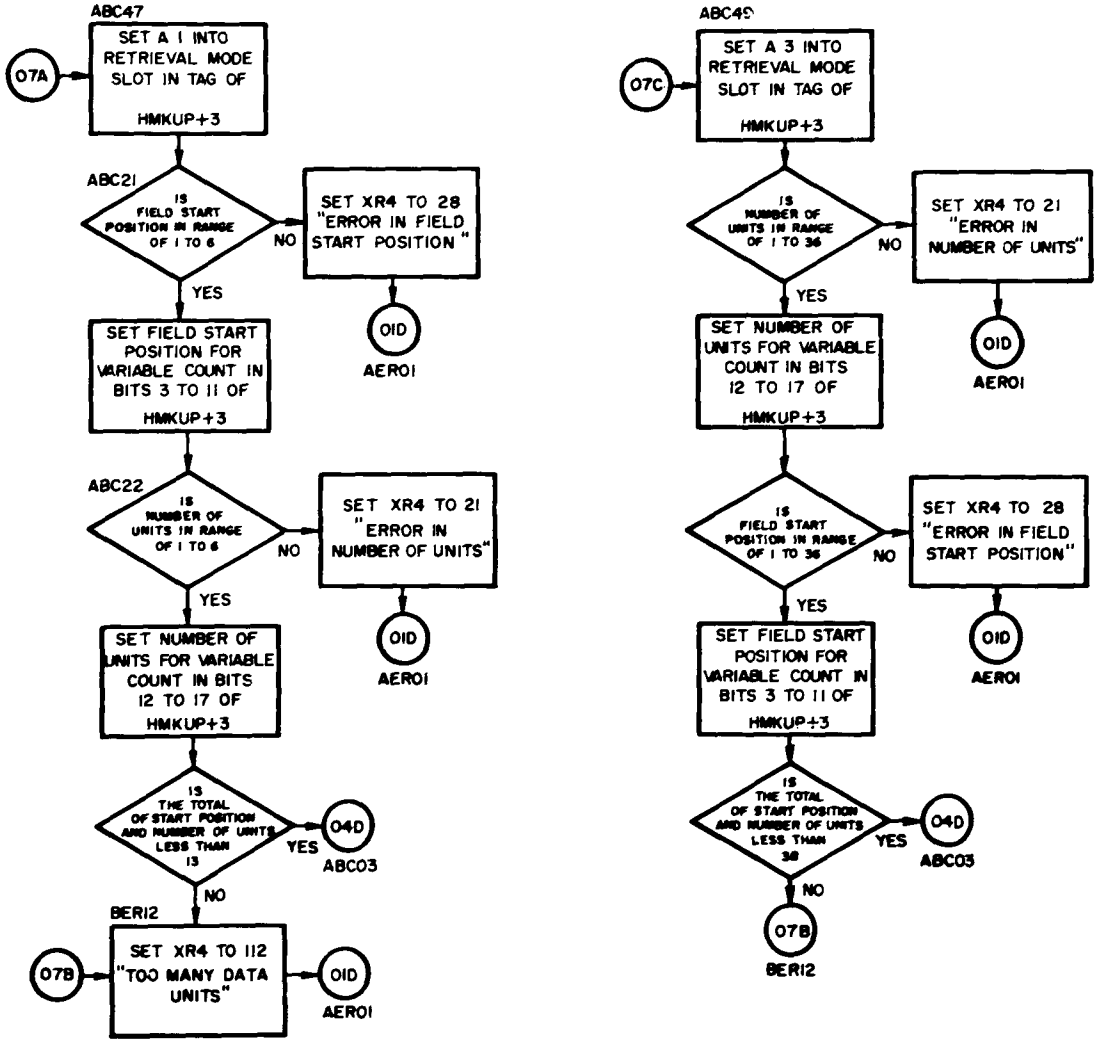

AACRD
02A
UNPACK 80 CHARACTERS OF INPUT CARD INTO LOCATION HUNPK +1 TO +80
UPCK
SET THE BASE DATE INTO THE INPAR TABLE
INPAR+1 & +2
SET THE SORT REQUIRED INDICATOR INTO
INPAR
SET THE BASE OR START DATE USEAGE INDICATOR INTO
INPAR+3
SET THE ACTUAL CODE INTO
INPAR+4
SET THE Ts/Ta SLOT (ICII) SETUP INDICATOR INTO
INPAR+5
01A
APSUI
AACRD
02B
CLEAR TO ZEROS 4 WORD WORK AREA
HMKUP
UNPACK CARD INTO HOLD AREA
-HUNPK-
UPCK
IS THE CARD NUMBER EQUAL TO ZERO
YES
SET XR4 TO 189 "ERROR ON CARD NUMBER"
01D
AERO1
NO
SET NUMBER INTO LOCATION
HX909
SUBTRACT ONE FROM VALUE FOR LINK INTO INPAR SET INTO LOCATION
HXXOA
IS THIS CARD NUMBER GREATER THAN THE PREVIOUS
NO
SET XR4 TO 189 "ERROR ON CARD CODE"
01D
AERO1
YES
NO
BG02
IS THIS "10" CARD THE FIRST ONE READ IN HX910
YES
BG03
IS THIS "10" CARD CODE EQUAL TO A 1
YES
03A
BG04
NO
IS THIS "10" CARD CODE ONE NUMBER THAN THE PREVIOUS
YES
03A
BG04
NO
SET XR4 TO 189 "ERROR ON CARD CODE"
01D
AERO1

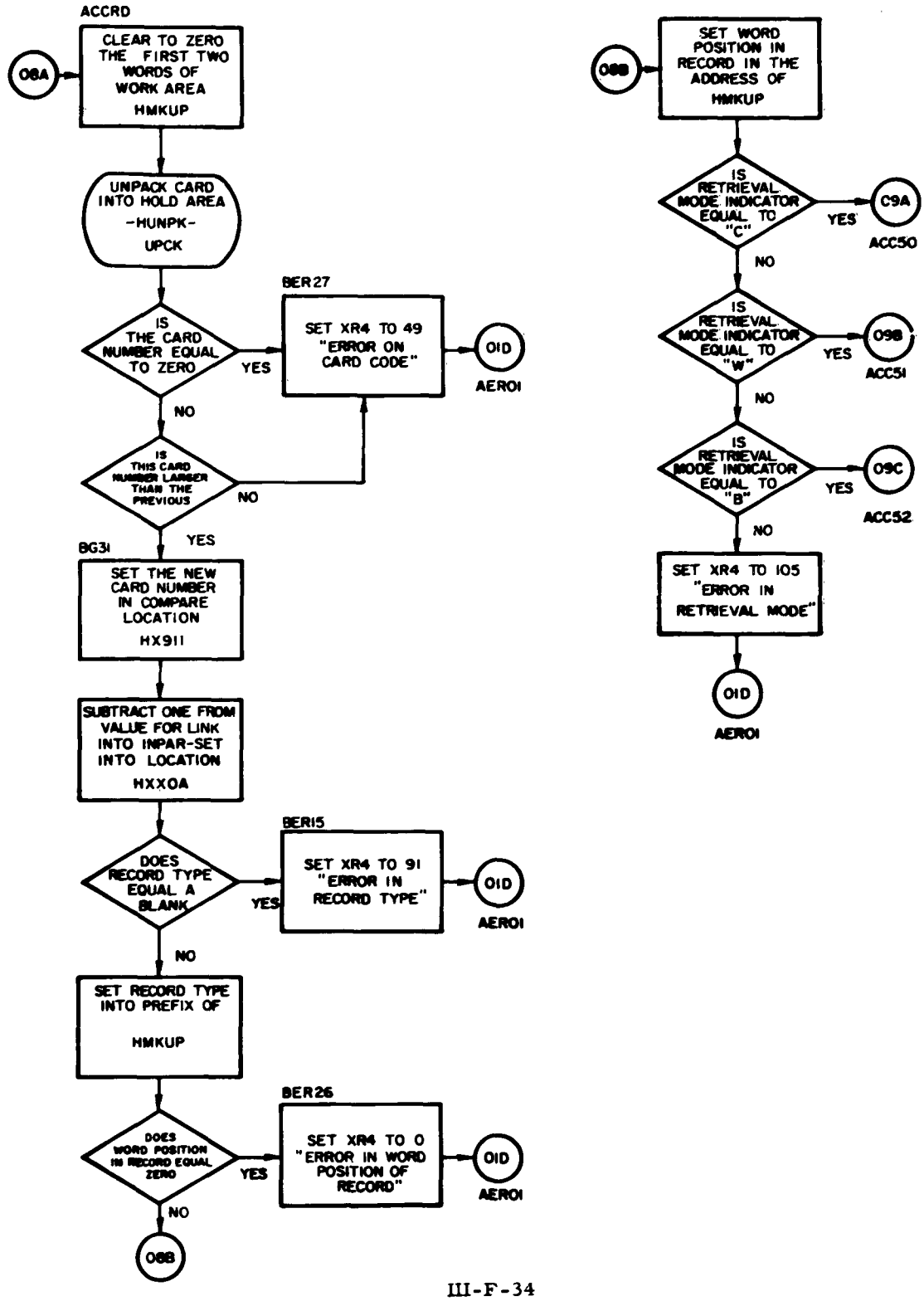

BG04
SET NEW CODE INTO COMPARE LOCATION HX910
03A
IS THE FILE ORDER NUMBER BLANK
YES
SET XR4 TO 175 "ERROR ON FILE" ORDER NUMBER
01D
AER01
NO
SET FILE ORDER NUMBER INTO HOLD LOCATION HX909
IS THIS FILE ORDER NUMBER IN SEQUENCE
NO
EQUAL
03D
BG23
YES
BG21
IS THIS "1B" CARD THE FIRST ONE READ IN HX912
YES
BG22
IS THIS "1B" FILE ORDER NUMBER EQUAL TO A 1 HX908
YES
03B
BG24
NO
NO
IS THIS "1B" FILE ORDER NO. ONE HIGHER THAN THE PREVIOUS
NO
SET XR4 TO 175 "ERROR ON FILE" ORDER NUMBER
01D
AER01
YES
BG24
SET NEW FILE ORDER NUMBER INTO COMPARE LOCATION HX912
03B
ABC12
SET FILE ORDER NUMBER IN DECREMENT OF HMKUP
03C
03F
NO
BG23
IS THE RECORD TYPE OR THIS EQUAL FILE ORDER NO SET TO 0
03D
YES
BER20
SET XR4 TO 42 "ERROR ON RECORD TYPE"
03E
01D
AER01
03F
IS RECORD TYPE EQUAL TO BLANK
YES
03E
BER20
NO
IS RECORD TYPE IN THE RANGE OF 0 TO 7
NO
03E
BER20
YES
IS RECORD TYPE EQUAL TO ZERO
YES
050
ABC07
NO
SET RECORD TYPE IN TAG OF HMKUP
IS THE MULTIPLE RECORD INDICATOR EQUAL TO ONE
YES
03G
ABC43
NO
IS THIS INDICATOR EQUAL TO BLANK OR ZERO
YES
04A
ABC06
NO
SET XR4 TO 140 "ERROR IN ONE OR MANY INDICATOR"
01D
AER01
03G
SET A MINUS SIGN IN THE FOLLOWING LOCATION TO INDICATE BCD HMKUP+3
04A
ABC06

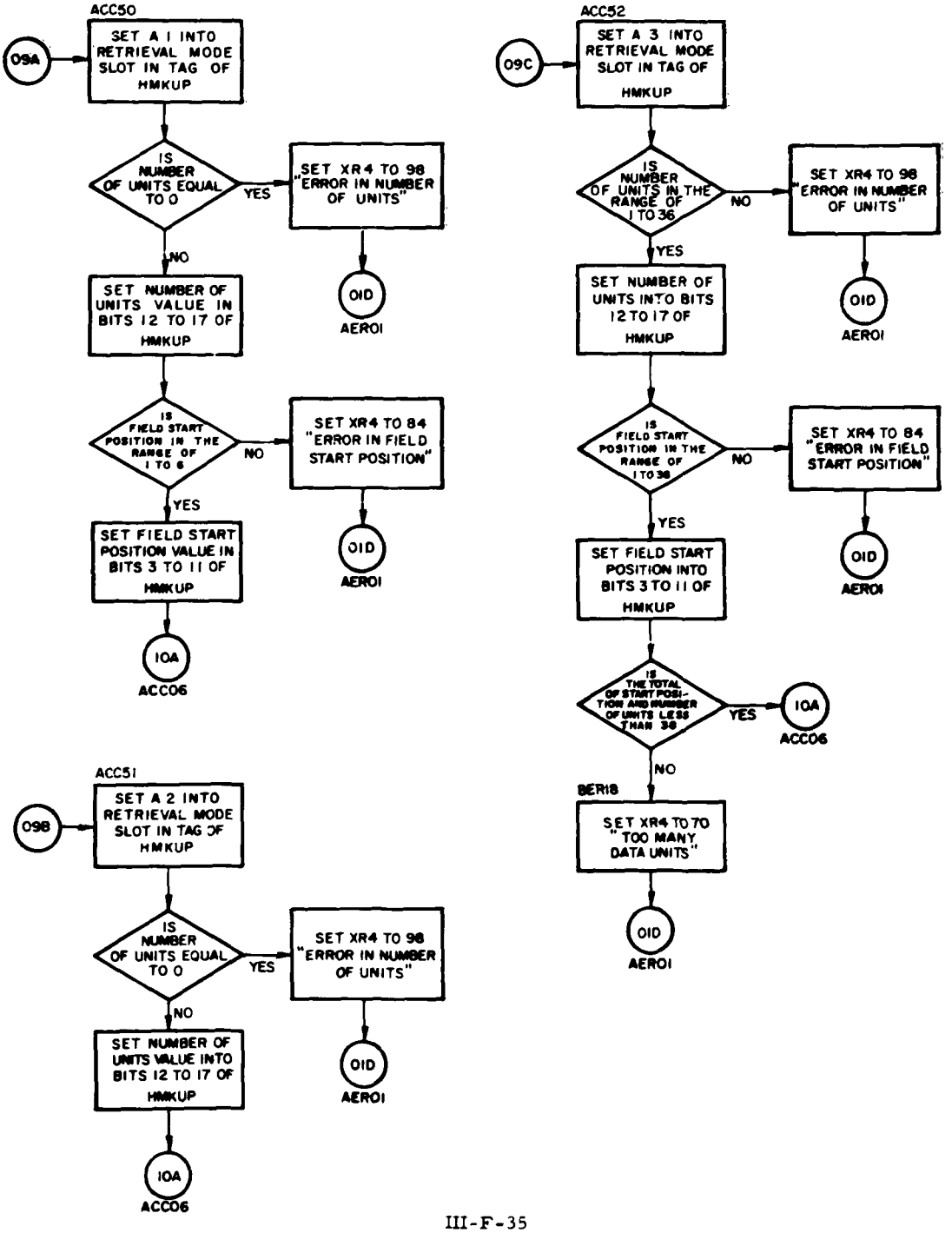

ABC06
04A
SET LENGTH OF LOGICAL RECORD INTO ADDRESS OF HMKUP
IS READ MODE BINARY
YES
04B
ABC10
NO
IS READ MODE BCD
NO
SET XR4 TO 147 "ERROR IN READ MODE"
01D
AER01
YES
ABC42
SET READ MODE INDICATOR IN SIGN OF LOCATION TO MINUS HMKUP+1
ABC10
04B
IS END OF BLOCK CODE EQUAL TO EOL
YES
ABC40
SET UP A 1 IN BIT 1 TO INDICATE EOL TYPE
04C
ABC02
IS END OF BLOCK CODE EQUAL TO EOR
NO
SET XR4 TO 168 "ERROR IN END OF BLOCK CODE"
01D
AER01
ABC41
SET UP A 1 IN BIT 2 TO INDICATE EOR TYPE
ABC02
04C
SET THE INFO IN BITS 1 AND 2 INTO LOCATION HMKUP
IS THE CODE IN VARIABLE RECORD INDICATOR A "V"
YES
06B
ABC20
NO
IS THIS CODE EQUAL TO A BLANK
NO
SET XR4 TO 161 "ERROR IN VARIABLE RECORD INDICATOR"
01D
AER01
YES
04D
ABC03
ABC03
04D
SET THE RECORD ID INTO LOCATION HMKUP+2
IS THE RECORD ID EQUAL TO BLANK
YES
05E
ABC11
NO
IS THE WORD POSITION FOR RECORD ID EQUAL TO ZERO
YES
04E
BER21
NO
SET THE WORD POSITION OF RECORD ID IN ADDRESS OF HMKUP+1
IS RETRIEVAL MODE INDICATOR EQUAL TO "C"
YES
05A
ABC44
NO
IS RETRIEVAL MODE INDICATOR EQUAL TO "W"
YES
05B
ABC45
NO
IS RETRIEVAL MODE INDICATOR EQUAL TO "B"
YES
06A
ABC46
NO
SET XR4 TO 154 "ERROR IN CODE MODE INDICATOR"
01D
AER01
BER21
04E
SET XR4 TO 35 "ERROR IN CODE WORD NUMBER"
01D
AER01

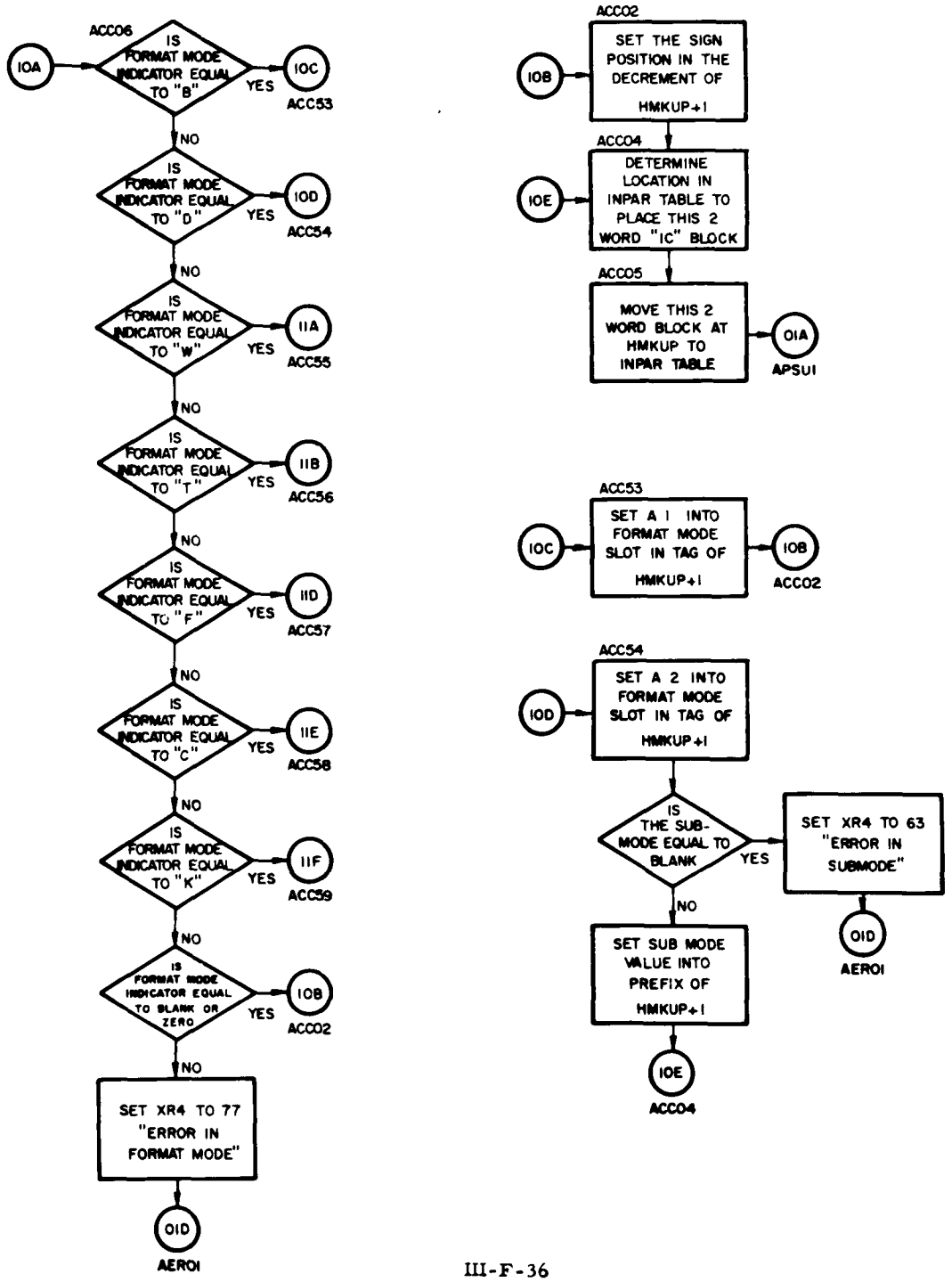

ABC44
05A
SET A 1 INTO RETRIEVAL MODE SLOT IN TAG OF HMKUP+1
IS NUMBER OF UNITS IN RANGE OF 1 TO 6
NO
SET XR4 TO 14 "ERROR IN NUMBER OF UNITS"
01D
AER01
YES
SET NUMBER OF UNITS FOR ID CODE IN BITS 12 TO 17 OF HMKUP+1
IS FIELD START POSITION IN RANGE OF 1 TO 6
NO
SET XR4 TO 7 "ERROR IN FIELD START POSITION"
01D
AER01
YES
SET FIELD START POSITION FOR ID IN BITS 3 TO 11 OF HMKUP+1
IS THE TOTAL OF START POSITION AND NUMBER OF UNITS LESS THAN 13
YES
05D
ABC07
NO
BER11
05F
SET XR4 TO 119 "TOO MANY DATA UNITS"
01D
AER01
ABC45
05B
SET A 2 INTO RETRIEVAL MODE SLOT IN TAG OF HMKUP+1
05C
ABC04
ABC04
05C
SET NUMBER OF UNITS FOR ID IN BITS 12-17 OF HMKUP+1
ABC07
05D
DETERMINE LOCATION IN INPAR TABLE TO PLACE THIS 4 WORD "IB" BLOCK
ABC09
MOVE THIS 4 WORD BLOCK AT HMKUP TO INPAR TABLE
01A
APSUI
ABC11
05E
SET RECORD ID BLOCK TO 0 HMKUP+2
IS WORD POSITION IN RECORD FOR ID EQUAL TO BLANK
YES
05D
ABC07
NO
SET XR4 TO 182 "RECORD ID MISSING"
01D
AER01

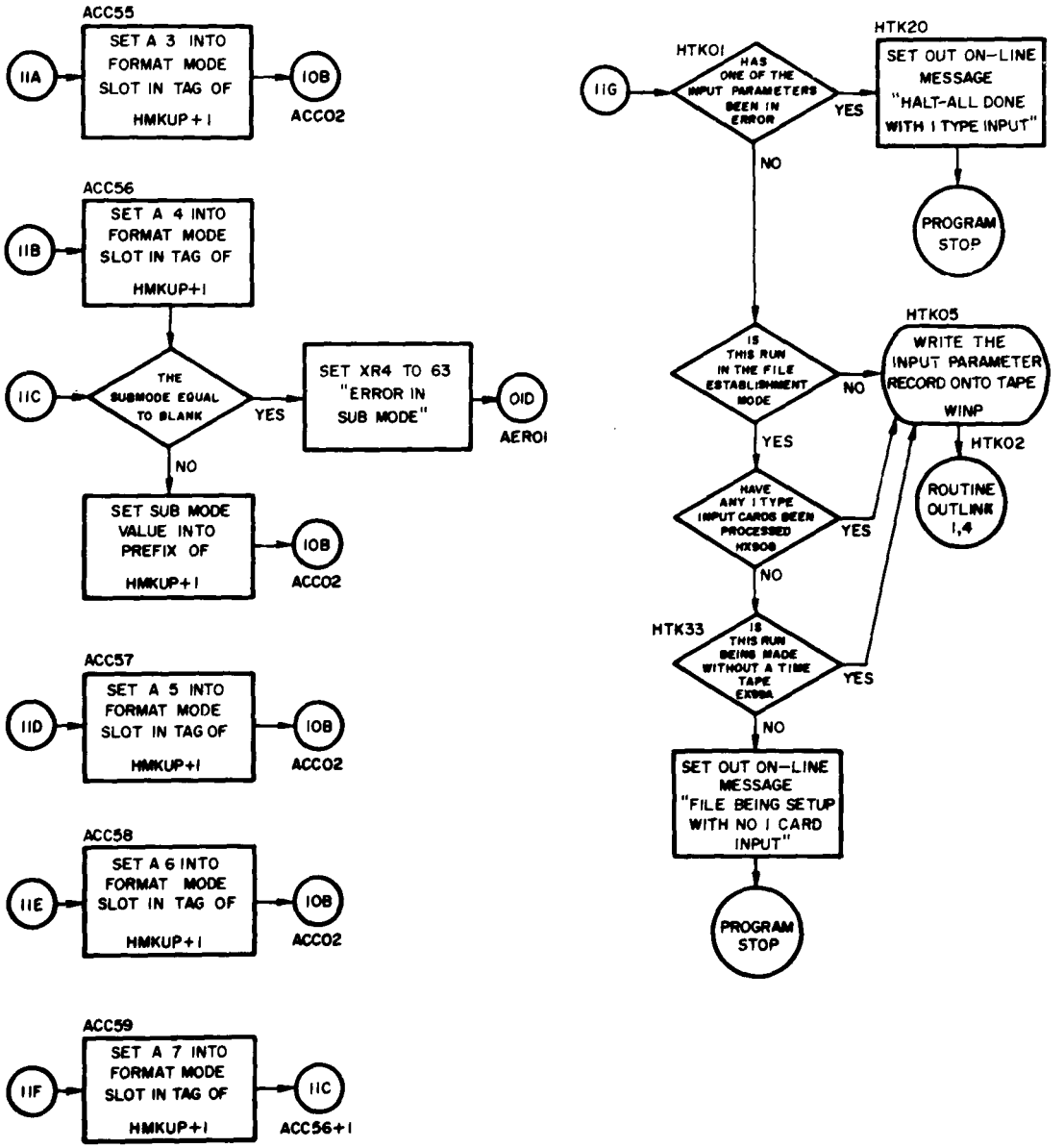

ABC46
06A
SET A 3 INTO RETRIEVAL MODE SLOT IN TAG OF HMKUP+1
IS NUMBER OF UNITS IN RANGE OF 1 TO 36
NO
SET XR4 TO 14 "ERROR IN NUMBER OF UNITS"
01D
AER01
YES
SET NUMBER OF UNITS FOR ID CODE IN BITS 12 TO 17 OF HMKUP+1
IS FIELD START POSITION IN RANGE OF 1 TO 36
NO
SET XR4 TO 7 "ERROR IN FIELD START POSITION"
01D
AER01
YES
SET FIELD START POSITION FOR ID IN BITS 3 TO 11 OF HMKUP+1
IS THE TOTAL OF START POSITION AND NUMBER OF UNITS LESS THAN 36
YES
05D
ABC07
NO
05F
BER11
ABC20
06B
SET A MINUS SIGN IN THE FOLLOWING LOCATION TO INDICATE A VARIABLE SIZED RECORD HMKUP
IS THE WORD POSITION FOR VARIABLE COUNT EQUAL TO ZERO
YES
06C
BER09
NO
SET THE WORD POSITION OF VARIABLE RECORD COUNT IN ADDRESS OF HMKUP+3
IS RETRIEVAL MODE INDICATOR EQUAL TO "C"
YES
07A
ABC47
NO
IS RETRIEVAL MODE INDICATOR EQUAL TO "B"
YES
07C
ABC49
NO
SET XR4 TO 126 "ERROR IN VARIABLE MODE INDICATOR"
01D
AER01
BER09
06C
SET XR4 TO 133 "ERROR IN VARIABLE WORD NUMBER"
01D
AER01


ABC47
07A
SET A 1 INTO RETRIEVAL MODE SLOT IN TAG OF HMKUP+3
ABC21
IS FIELD START POSITION IN RANGE OF 1 TO 6
NO
SET XR4 TO 28 "ERROR IN FIELD START POSITION"
01D
AER01
YES
SET FIELD START POSITION FOR VARIABLE COUNT IN BITS 3 TO 11 OF HMKUP+3
ABC22
IS NUMBER OF UNITS IN RANGE OF 1 TO 6
NO
SET XR4 TO 21 "ERROR IN NUMBER OF UNITS"
01D
AER01
YES
SET NUMBER OF UNITS FOR VARIABLE COUNT IN BITS 12 TO 17 OF HMKUP+3
IS THE TOTAL OF START POSITION AND NUMBER OF UNITS LESS THAN 13
04D
YES
ABC03
NO
BER12
07B
SET XR4 TO 112 "TOO MANY DATA UNITS"
01D
AER01
ABC49
07C
SET A 3 INTO RETRIEVAL MODE SLOT IN TAG OF HMKUP+3
IS NUMBER OF UNITS IN RANGE OF 1 TO 36
NO
SET XR4 TO 21 "ERROR IN NUMBER OF UNITS"
01D
AER01
YES
SET NUMBER OF UNITS FOR VARIABLE COUNT IN BITS 12 TO 17 OF HMKUP+3
IS FIELD START POSITION IN RANGE OF 1 TO 36
NO
SET XR4 TO 28 "ERROR IN FIELD START POSITION"
01D
AER01
YES
SET FIELD START POSITION FOR VARIABLE COUNT IN BITS 3 TO 11 OF HMKUP+3
IS THE TOTAL OF START POSITION AND NUMBER OF UNITS LESS THAN 38
04D
YES
ABC03
NO
07B
BER12


ACCRD
08A
CLEAR TO ZERO THE FIRST TWO WORDS OF WORK AREA
HMKUP
UNPACK CARD INTO HOLD AREA
-HUNPK-
UPCK
BER27
IS THE CARD NUMBER EQUAL TO ZERO
YES
SET XR4 TO 49 "ERROR ON CARD CODE"
01D
AER01
NO
IS THIS CARD NUMBER LARGER THAN THE PREVIOUS
NO
YES
BG31
SET THE NEW CARD NUMBER IN COMPARE LOCATION
HX911
SUBTRACT ONE FROM VALUE FOR LINK INTO INPAR-SET INTO LOCATION
HXX0A
BER15
DOES RECORD TYPE EQUAL A BLANK
YES
SET XR4 TO 91 "ERROR IN RECORD TYPE"
01D
AER01
NO
SET RECORD TYPE INTO PREFIX OF
HMKUP
BER26
DOES WORD POSITION IN RECORD EQUAL ZERO
YES
SET XR4 TO 0 "ERROR IN WORD POSITION OF RECORD"
01D
AER01
NO
08B
08B
SET WORD POSITION IN RECORD IN THE ADDRESS OF
HMKUP
IS RETRIEVAL MODE INDICATOR EQUAL TO "C"
YES
C9A
ACC50
NO
IS RETRIEVAL MODE INDICATOR EQUAL TO "W"
YES
09B
ACC51
NO
IS RETRIEVAL MODE INDICATOR EQUAL TO "B"
YES
09C
ACC52
NO
SET XR4 TO 105 "ERROR IN RETRIEVAL MODE"
01D
AER01


ACC50
09A
SET A 1 INTO RETRIEVAL MODE SLOT IN TAG OF HMKUP
IS NUMBER OF UNITS EQUAL TO 0
YES
SET XR4 TO 98 "ERROR IN NUMBER OF UNITS"
01D
AER01
NO
SET NUMBER OF UNITS VALUE IN BITS 12 TO 17 OF HMKUP
IS FIELD START POSITION IN THE RANGE OF 1 TO 6
NO
SET XR4 TO 84 "ERROR IN FIELD START POSITION"
01D
AER01
YES
SET FIELD START POSITION VALUE IN BITS 3 TO 11 OF HMKUP
10A
ACC06
ACC51
09B
SET A 2 INTO RETRIEVAL MODE SLOT IN TAG OF HMKUP
IS NUMBER OF UNITS EQUAL TO 0
YES
SET XR4 TO 98 "ERROR IN NUMBER OF UNITS"
01D
AER01
NO
SET NUMBER OF UNITS VALUE INTO BITS 12 TO 17 OF HMKUP
10A
ACC06
ACC52
09C
SET A 3 INTO RETRIEVAL MODE SLOT IN TAG OF HMKUP
IS NUMBER OF UNITS IN THE RANGE OF 1 TO 36
NO
SET XR4 TO 98 "ERROR IN NUMBER OF UNITS"
01D
AER01
YES
SET NUMBER OF UNITS INTO BITS 12 TO 17 OF HMKUP
IS FIELD START POSITION IN THE RANGE OF 1 TO 36
NO
SET XR4 TO 84 "ERROR IN FIELD START POSITION"
01D
AER01
YES
SET FIELD START POSITION INTO BITS 3 TO 11 OF HMKUP
IS THE TOTAL OF START POSITION AND NUMBER OF UNITS LESS THAN 36
YES
10A
ACC06
NO
BER18
SET XR4 TO 70 "TOO MANY DATA UNITS"
01D
AER01


ACC06
IS FORMAT MODE INDICATOR EQUAL TO "B"
10A
YES
10C
ACC53
NO
IS FORMAT MODE INDICATOR EQUAL TO "D"
YES
10D
ACC54
NO
IS FORMAT MODE INDICATOR EQUAL TO "W"
YES
11A
ACC55
NO
IS FORMAT MODE INDICATOR EQUAL TO "T"
YES
11B
ACC56
NO
IS FORMAT MODE INDICATOR EQUAL TO "F"
YES
11D
ACC57
NO
IS FORMAT MODE INDICATOR EQUAL TO "C"
YES
11E
ACC58
NO
IS FORMAT MODE INDICATOR EQUAL TO "K"
YES
11F
ACC59
NO
IS FORMAT MODE INDICATOR EQUAL TO BLANK OR ZERO
YES
10B
ACC02
NO
SET XR4 TO 77 "ERROR IN FORMAT MODE"
01D
AER01
ACC02
10B
SET THE SIGN POSITION IN THE DECREMENT OF HMKUP+1
ACC04
10E
DETERMINE LOCATION IN INPAR TABLE TO PLACE THIS 2 WORD "IC" BLOCK
ACC05
MOVE THIS 2 WORD BLOCK AT HMKUP TO INPAR TABLE
01A
APSU1
ACC53
10C
SET A 1 INTO FORMAT MODE SLOT IN TAG OF HMKUP+1
10B
ACC02
ACC54
10D
SET A 2 INTO FORMAT MODE SLOT IN TAG OF HMKUP+1
IS THE SUB-MODE EQUAL TO BLANK
YES
SET XR4 TO 63 "ERROR IN SUBMODE"
01D
AER01
NO
SET SUB MODE VALUE INTO PREFIX OF HMKUP+1
10E
ACC04


ACC55
SET A 3 INTO FORMAT MODE SLOT IN TAG OF HMKUP+1
11A
10B
ACC02
ACC56
SET A 4 INTO FORMAT MODE SLOT IN TAG OF HMKUP+1
11B
11C
THE SUBMODE EQUAL TO BLANK
YES
SET XR4 TO 63 "ERROR IN SUB MODE"
01D
AER01
NO
SET SUB MODE VALUE INTO PREFIX OF HMKUP+1
10B
ACC02
ACC57
SET A 5 INTO FORMAT MODE SLOT IN TAG OF HMKUP+1
11D
10B
ACC02
ACC58
SET A 6 INTO FORMAT MODE SLOT IN TAG OF HMKUP+1
11E
10B
ACC02
ACC59
SET A 7 INTO FORMAT MODE SLOT IN TAG OF HMKUP+1
11F
11C
ACC56+1
HTK01
HAS ONE OF THE INPUT PARAMETERS BEEN IN ERROR
11G
YES
HTK20
SET OUT ON-LINE MESSAGE "HALT-ALL DONE WITH I TYPE INPUT"
PROGRAM STOP
NO
IS THIS RUN IN THE FILE ESTABLISHMENT MODE
NO
HTK05
WRITE THE INPUT PARAMETER RECORD ONTO TAPE
WINP
HTK02
ROUTINE OUTLINK 1,4
YES
HAVE ANY I TYPE INPUT CARDS BEEN PROCESSED HK90B
YES
NO
HTK33
IS THIS RUN BEING MADE WITHOUT A TIME TAPE EX99A
YES
NO
SET OUT ON-LINE MESSAGE "FILE BEING SETUP WITH NO I CARD INPUT"
PROGRAM STOP

Time Merge Phase Tape Operations

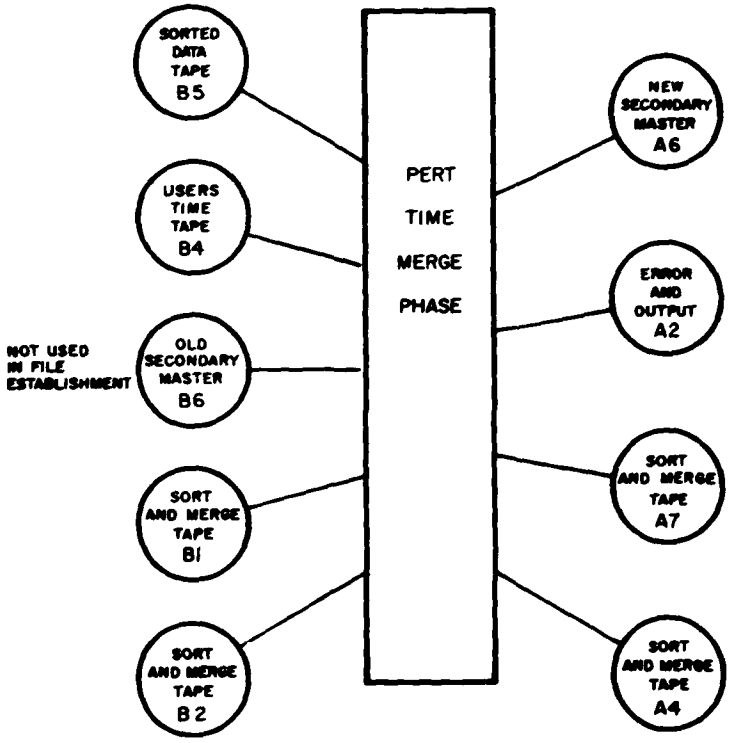
After the creation or bringing in of the input parameter table the Type 2 input cards are read in off the sorted input tape. If this is a file establishment run, the activity-to-charge-number information is developed from this data. This information is then stored on the NEW SECONDARY MASTER TAPE. If this is not a file establishment run, the Type 2 input cards will update the data on the OLD SECONDARY MASTER TAPE and then set the new data on the NEW SECONDARY MASTER TAPE. It is possible that there would be no Type 2 cards on an update run, and the data from the old tape would be set directly onto the new tape.

If one of the elements of data on the USERS TIME TAPE is the charge number, this could preclude any Type 2 input. In this case the merge function of this phase would be basically bypassed and the time record, after development by means of the input parameters, would be set out onto the sort tapes if the time record contained a charge number. For this situation the secondary master tape would not contain any activity-to-charge-number information but would have a pseudo record. This record would contain only a label and an end-of-file in order to use the normal program reads and writes. It is possible to have activity-to-charge-number inputs on the Secondary Master for the above situation. In this case the input data would then override any conflict of charge numbers for an activity.

A maximum of nine reels of the OLD SECONDARY MASTER TAPE can be read and up to nine reels of the NEW SECONDARY MASTER TAPE can be written. If any errors occur during the time merge processing, they will be set out on the SYSTEM ERROR TAPE. At the end of the merge phase and just prior to entering the activity-to-charge-number sort, the messages described on Page III-F-2 would be set out. If it is judged that the program

cannot continue because of the volume or type of errors, the SYSTEM ERROR TAPE is printed out. After correcting the problem the program is then re-started from the beginning.

The tape flow during the time merge phase will take the following form, which is the normal tape configuration used during the time merge phase. The tape operations are described below.



Tape Operation When Users Time Tape is to be Sorted

The USERS TIME TAPE is read into the system by means of the INPAR table and as each record is formed it is set out onto the sort and merge tapes A4 and A7. At the completion of the USERS TIME TAPE the 4-tape sort (see Subsec. 4.2) is operated, using tapes A4, A7, B1, and B2. When the last pass is to be completed in the merge phase, the control is returned to the program and the PERT time data is read into the system from the A or the B bank, depending on the number of passes. This data is now in

PE-SE sequence and can be merged with the charge numbers, which are also in PE-SE sequence and are stored on the OLD SECONDARY MASTER TAPE B6. The charge numbers in PE-SE sequence can be updated during this processing from data stored on the SORTED DATA TAPE B5. After which the merged activity/charge number data are set onto the NEW SECONDARY MASTER TAPE A6. During this processing of the data, the time records that are tied to a charge number are set out onto the 4-tape sort on the side opposite from which the PERT Time data is read. At the completion of the time merge phase the 4-tape sort is operated again, using tapes A4, A7, B1, and B2. This sort will set the time information into charge number sequence. The last phase of this sort is tied to the update phase (see Subsec III-G).

Tape Operation when USERS TIME TAPE is in PE-SE or SE-PE Sequence

The USERS TIME TAPE is read into the system by means of the INPAR table, and as each record is formed it is merged with the charge numbers which also are in PE-SE or SE-PE sequence. The charge numbers in activity sequence will be read in from the OLD SECONDARY MASTER TAPE B6, updated by input from the SORTED DATA TAPE B5, and set out on the NEW SECONDARY MASTER TAPE A6. During the processing of this data, the time records that are tied to a charge number are set out onto the 4-tape sort on tapes A7 and A4. At the completion of the time merge phase, the sort is operated using A4, A7, B1, and B2 as merge tapes. This sort will set the time information into charge number sequence for the update phase.

Tape Operation During Option G

During Option G the time merge phase is virtually bypassed, in that there is no Type 1 or Type 2 input data and no USERS TIME TAPE. The only operation performed during this phase under this option is a tape duplication operation for the SECONDARY MASTER. The input parameter records and labels and the SECONDARY MASTER data and its labels are duplicated from the OLD SECONDARY MASTER TAPE to the NEW SECONDARY

MASTER TAPE. The only exception to the duplication of this data is the program name, if it has been changed during this run. After this duplication is completed the program will go into the update phase.

Time Merge Phase On-Line Messages

The messages forthcoming on the on-line printer regarding the tapes used in the time merge phase will be:

(a) For File Establishment in Option D or F

TAPE B5 HAS BEEN SELECTED FOR READING
TAPE B4 HAS BEEN SELECTED FOR READING
TAPE A6 HAS BEEN SELECTED FOR WRITING
TAPE B4 IS NOW REWINDING AND SHOULD UNLOAD
END OF PERT COST TIME MERGE PHASE

The above set of messages will be followed by the error indication messages described in Subsec. 3.5.1. This will hold true for all of the examples below. After the error indication messages, the following two lines will also be set out on the on-line printer for examples (b), (c), and (d) below.

COMPLETED WRITING OF NEW SECONDARY TAPE A6
DO NOT REWIND

(b) For Regular Cyclic Runs in Option D or F

TAPE B5 HAS BEEN SELECTED FOR READING
TAPE B4 HAS BEEN SELECTED FOR READING
TAPE B6 HAS BEEN SELECTED FOR READING
TAPE A6 HAS BEEN SELECTED FOR WRITING
TAPE B4 IS NOW REWINDING AND SHOULD UNLOAD
COMPLETED READING OF OLD SECONDARY TAPE B6
DO NOT REWIND
END OF PERT COST TIME MERGE PHASE

If more than one OLD SECONDARY MASTER TAPE or NEW SECONDARY MASTER TAPE is used, the following messages will be inserted at the point the tape hits end-of-file or end-of-tape.

TAPE XX IS NOW REWINDING AND SHOULD UNLOAD
SET NEXT REEL OF THIS SERIES ON TAPE XX

If this tape is the old master, the next reel will indicate the next tape that was created subsequent to the one that is now rewinding. If this tape is the new master, the next reel will indicate a blank or scratch tape. The program will hold up at this point until the tapes are rewound and unloaded, and a new tape is set on for processing.

(c) For Regular Cyclic Runs in Option G

TAPE B6 HAS BEEN SELECTED FOR READING
TAPE A6 HAS BEEN SELECTED FOR WRITING
COMPLETED READING OF OLD SECONDARY TAPE B6
DO NOT REWIND
COMPLETED WRITING OF NEW SECONDARY TAPE B6
DO NOT REWIND

During this option the only operation accomplished in the time merge phase is the duplication of the OLD SECONDARY MASTER TAPE onto the new. These messages refer to this operation.

(d) For Regular Cyclic Runs in Option C and E

The tape messages for Option C and E will follow the same pattern set up for D and F in (b) above except that the following tape message will take place during this phase.

TAPE B5 IS NOW REWINDING AND SHOULD UNLOAD

In Option C and E the only input in should apply to the time data relationship and therefore the SORTED DATA TAPE should finish up in this phase.

Time Merge Phase Error Messages

The errors determined during the time merge phase are set out on the SYSTEM ERROR TAPE or the on-line printer. Any messages on the SYSTEM ERROR TAPE will not stop the processing during the time merge phase but the errors will be totaled and set out in the message described in Subsec. 3.5.1. Some of the on-line messages will stop the system, while others will contain an option to continue. A group of the on-line messages will cause no stop at all.

The errors messages that will be set out on the SYSTEM ERROR TAPE are explained below.

(a) ACTIVITY INDICATED ON SEC MASTER NOT ON USERS TAPE

An activity is located on the SECONDARY MASTER that cannot be found on the users tape. There will be one of two messages following this line, according to whether there is any Type 2 input for this activity. If there is not, the information from the SECONDARY MASTER is set out as follows in 42 characters:

Network no.-predecessor-successor-charge number

If there is Type 2 input, it will be set out as follows:

XX - 80 characters of input cards - XX

This 80-character line will also follow the messages (b), (c), and (d).

(b) CHANGE IS REQUESTED ON NON-EXISTENT ITEM IN SEC MASTER

A Type 2 input is attempting to change an activity-to-charge-number relationship on a non-existent item.

(c) ATTEMPTING TO ADD AN ACTIVITY ALREADY IN SEC MASTER

A Type 2 input is attempting to add a new activity-to-charge-number relationship on an existing item.

(d) MORE THAN ONE CHANGE INPUT FOR THIS ACTIVITY

Two input cards relating to the same activity are found during this run. The first is handled normally but the second is not operated upon at all and is set out on the SYSTEM ERROR TAPE.

(e) DUPLICATE ACTIVITIES ON SECONDARY MASTER

Two records relating to the same activity are found on the SECONDARY MASTER. The second record is removed from the NEW SECONDARY MASTER TAPE and this message plus a 42-character predecessor, successor, and charge-number message is set out.

(f) SAME ACTIVITY APPEARS MORE THAN ONCE ON USERS TAPE

Duplicate activities are found during the time merge phase reading of the USERS TIME TAPE. A second line of 24 characters indicating network code, predecessor. and successor numbers is also set out. The system will process the first activity and ignore its duplicate.

(g) CANNOT LOCATE MONTH XXX LN NN

When a field in the USERS TIME TAPE contains an alphabetic 3-character month which is not legitimate, this message is set out with the bad month located at the XXX positions. The LN number in this message will refer to the field involved and relates to the input parameter "1C" card numbers. A second line of 24 characters indicating network code, predecessor, and successor numbers is also set out.

The following error messages will be set out on the on-line printer, and will stop the system.

(h) A TYPE 1 CARD FOUND AFTER PARAMETER SETUP

During the reading of the Type 2 cards a Type 1 input parameter card was found. The SORTED DATA TAPE is out of sequence.

(i) FIRST RECORD ON SEC MASTER NOT NETWORK CODE

The first record found on the SECONDARY MASTER was not a network code record.

(j) CHANGE INPUT OUT OF SEQUENCE

CURRENT (network no. -predecessor-successor)

NEW (XX – 80 characters of input card – XX)

When the input from the SORTED DATA TAPE is not in sequence the above messages are set out, indicating the two sequence checking fields.

(k) SECONDARY MASTER OUT OF SEQUENCE

CURRENT (network no. -predecessor-successor)

NEW (network no. -predecessor-successor-charge no.)

When the input from the OLD SECONDARY MASTER is not in sequence the above messages are set out, indicating the two sequence checking fields.

(l) USERS PERT TIME TAPE OUT OF SEQUENCE

CURRENT (network no. -predecessor-successor)

NEW (network no. -predecessor-successor)

When the information from the USERS TIME TAPE is not in sequence the above messages are set out, indicating the two sequence checking fields.

(m) NETWORK CODE SET UP TWICE ON SEC MASTER - XXXXXX

The same network code is found in two consecutive network code records of the OLD SECONDARY MASTER. The network code is set into the field indicated by XXXXXX.

(n) TWO EOF MARKS FOUND WITH NO PARAMETER INDICATION

There is no "1B" card in the input parameters to indicate that a non-operative file is present.

(o) FIRST WORD ON INPUT PARAMETERS BLANK

The "1B" portion of the INPAR table indicates that the USERS TIME TAPE read is finished and nothing has yet been read.

(p) NO FIELDS TIED TO THIS RECORD TYPE X

One of the "1B" file cards describing a particular record type was not found in this file. The "X" will indicate the record type.

(q) BAD MONTH ON BASE DATE

The month field on the base date is an illegitimate value for a month.

(r) NO START DATE TO TIME NETWORK

The start date carried in the USERS TIME TAPE has a value of zero.

(s) START DATE OF NETWORK PRIOR TO 1945

The network start date is prior to the calendar used, which has a January 1, 1945 base.

The following error messages are set out on the on-line printer with an option to continue after stopping.

(t) NO ACTIVITIES TIED TO NETWORK CODE XXXXXX

When two network codes in a row are located on the SECONDARY MASTER the above message is set out with the first network code being set into the field indicated by XXXXXX. This error will not stop the system but will set this message out on-line.

(u) DATE DOES NOT AGREE ON USERS TAPE DDMMYY
IF LABEL IS TO BE IGNORED HIT START BUTTON TO CONTINUE

The report date on the USERS TIME TAPE does not match with the users date on the "A" control card. If the program is to be continued the start button is hit. The DDMMYY configuration in the first line will indicate the day, month and year of the report date in the USERS TIME TAPE.

Time Merge Phase Region Descriptions

The following region descriptions and flow charts will describe the major subroutines used in the time merge phase as well as the time merge phase itself.

Region PMRG

EXPLANATION OF REGION:

This routine will accomplish the tying together of activities and charge numbers. It will read the USERS TIME TAPE, OLD SECONDARY MASTER and SORTED DATA TAPE to perform this merging process and will produce a NEW SECONDARY MASTER. This routine will also develop the input parameter table, "INPAR."

CALLING SEQUENCE:

```
L     TRA   PMRG
```

INPUT:

Type 1 and type 2 input data from the SORTED DATA TAPE.

An input parameter table or the development of one.

An OLD SECONDARY MASTER TAPE.

A USERS TIME TAPE

OUTPUT:

A new input parameter table to go on NEW SECONDARY MASTER

A NEW SECONDARY MASTER

A selected set of time input linked to charge numbers to be sorted in charge number sequence for the update phase.

STORAGE USED:

INPAR	-	input parameter table
WKCH1	-	network code on changes
WKCH2	-	event no. on changes
WKSM1	-	network code on SEC MASTER
WKSM2	-	event no. on SEC MASTER
NNHLD	-	network name
WKBFF	-	input to be set on SEC MASTER
PTWKA	-	selected time info from USERS TAPE
PTWK7	-	start date & number
PTWK8	-	USERS TAPE network name
PTWK9	-	USERS TAPE network-pred-succ
PUBFF		users read-in buffer
PUBF1		

Region PMRG (continued)

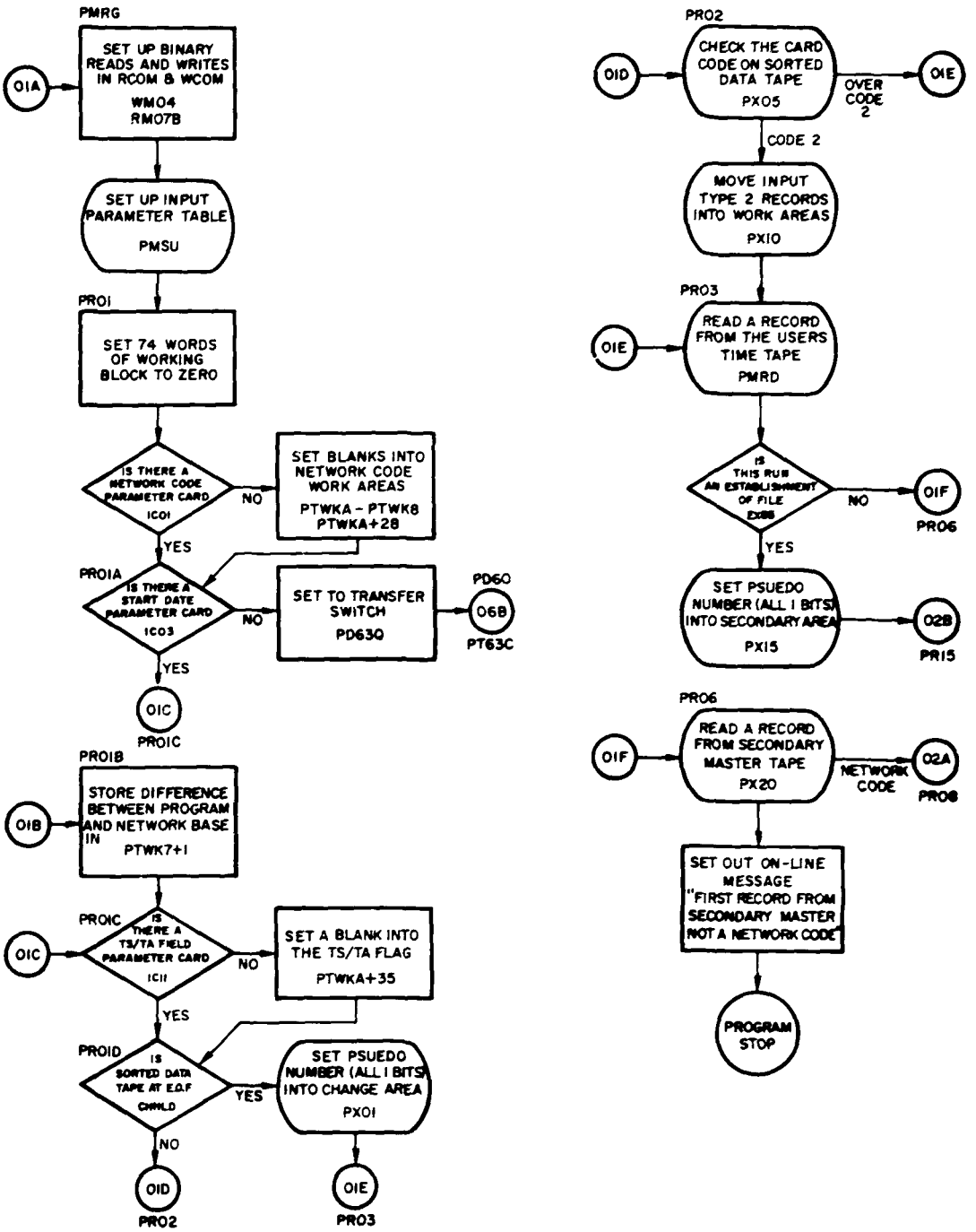
SUBREGIONS AND SUBROUTINES USED:

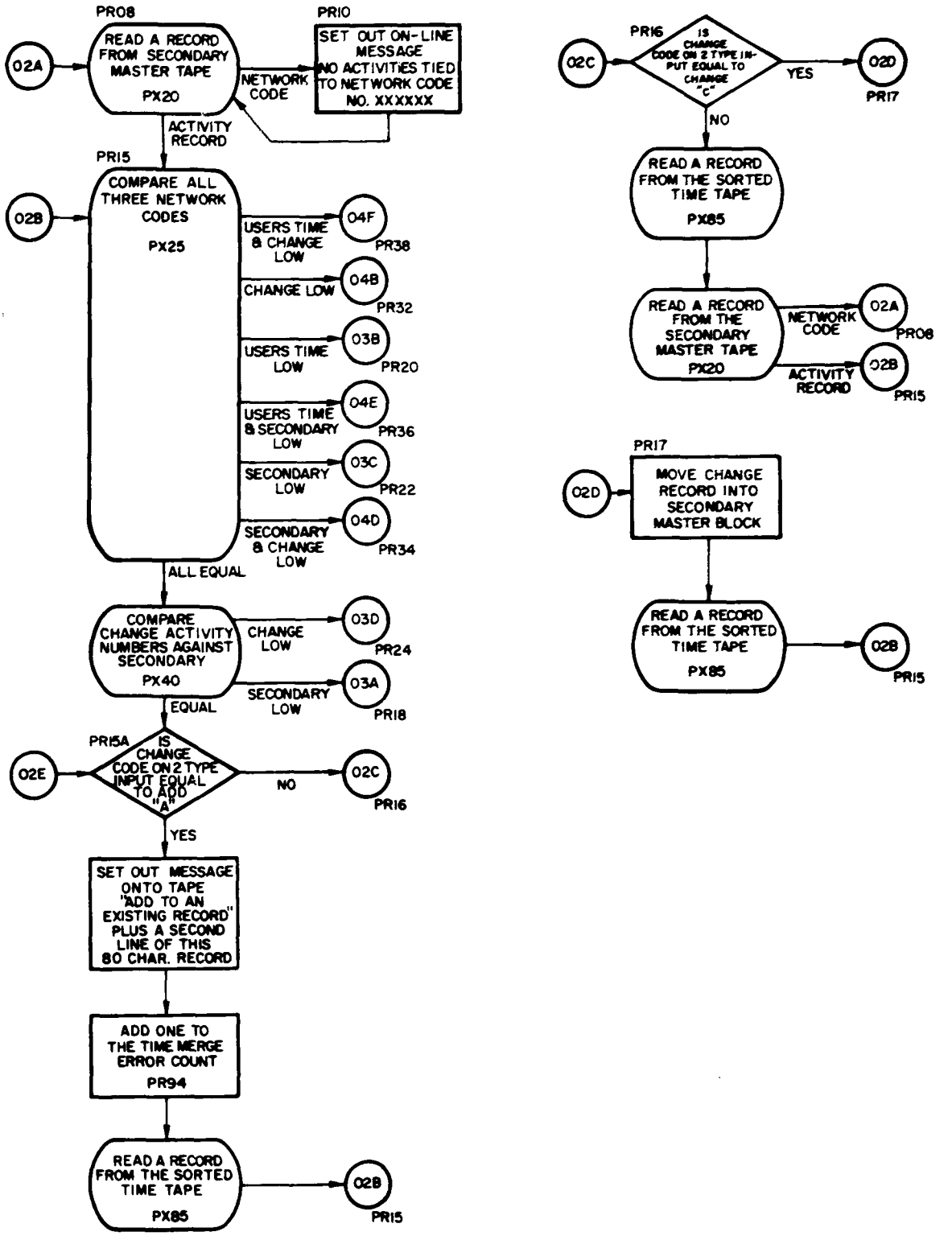
PMSU	PX20	PX60	PX85	PD60	PD70
PX01	PX25	PX65	ENDPM	PD65	PD75
PX05	PX30	PX70	PMRD	PD66	PD80
PX10	PX40	PX75	PD50	PD67	
PX15	PX50	PX80	PD55	PD68	

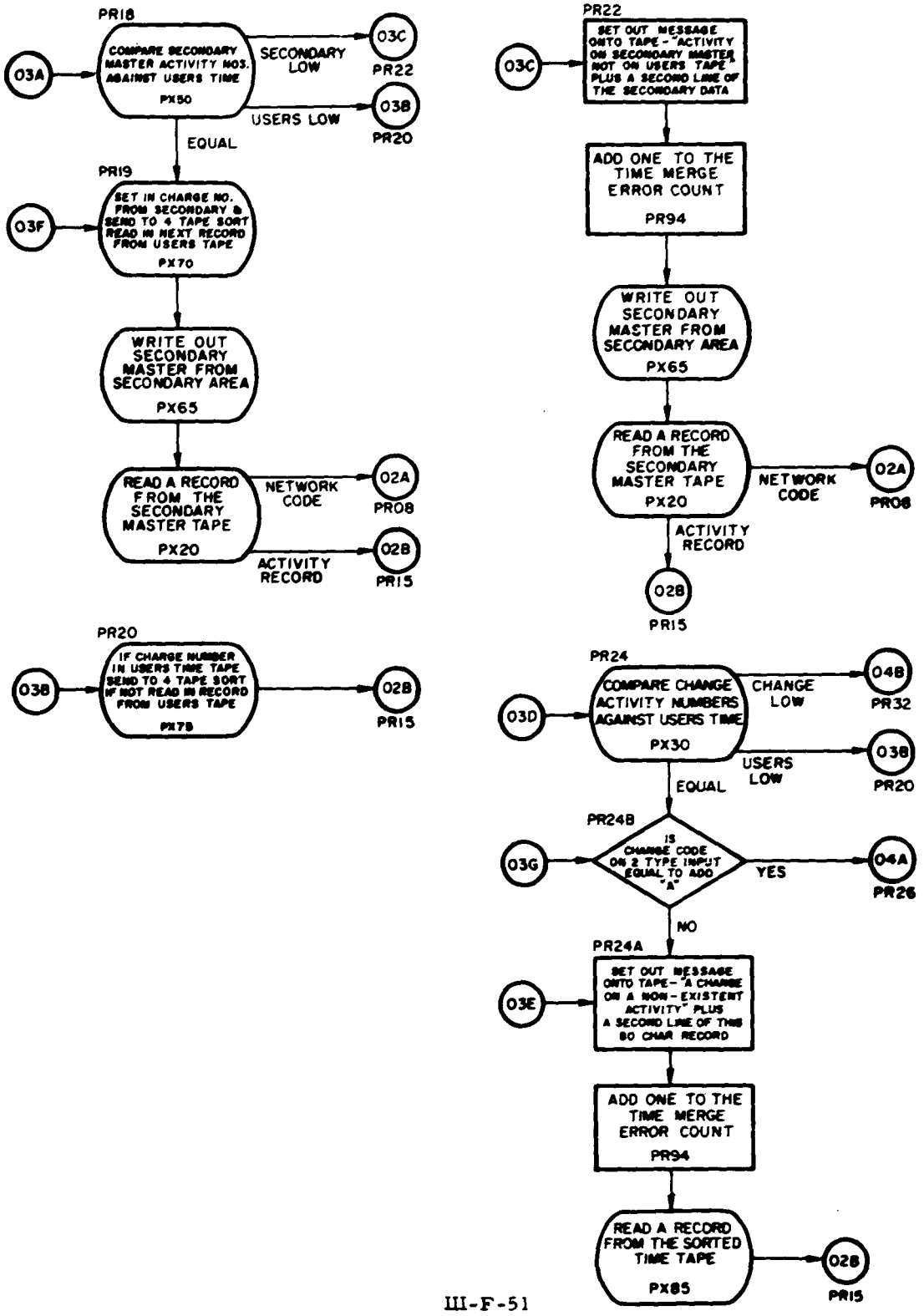
EXPLANATION OF CALLING SEQUENCE:

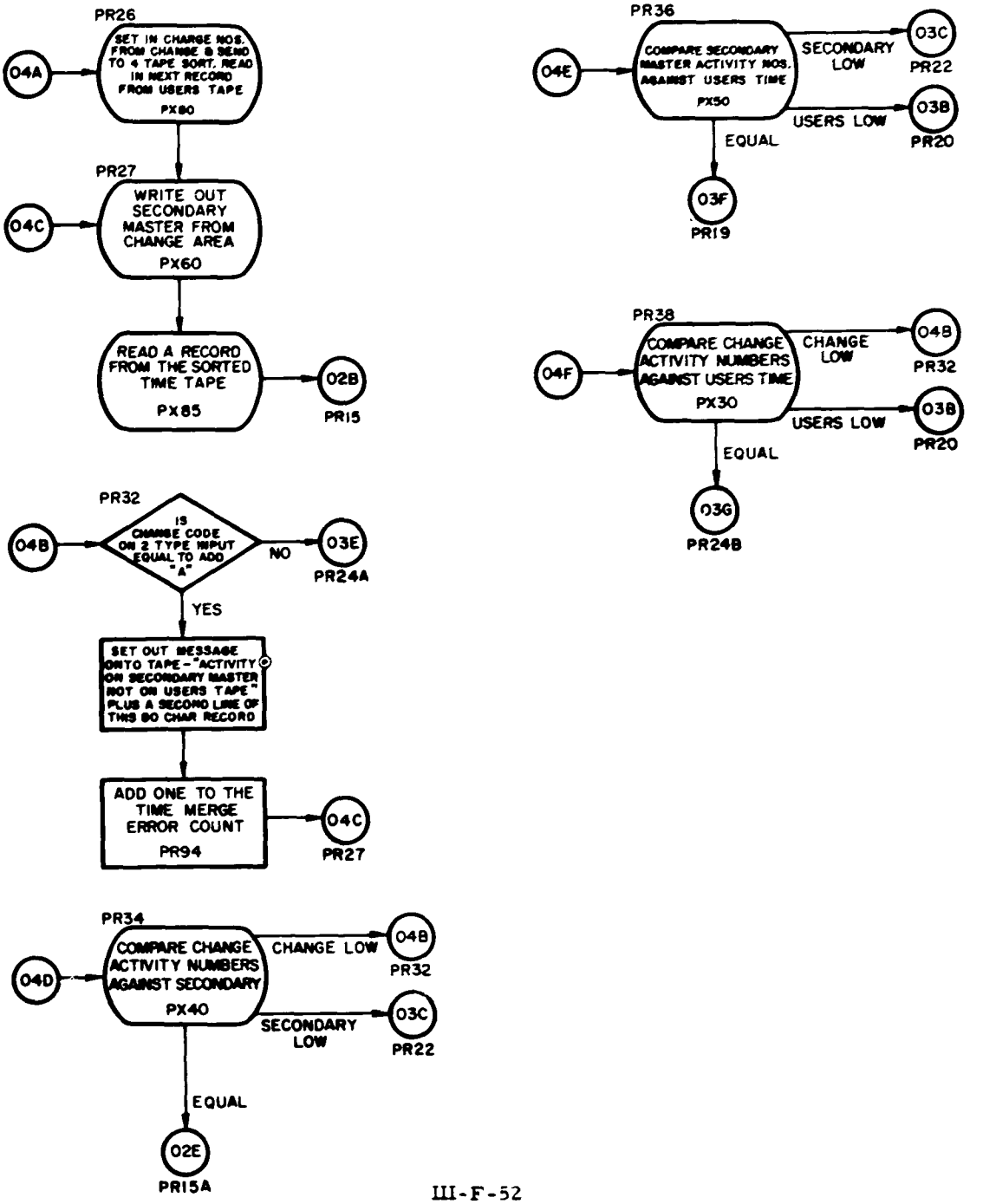
When the time merge phase is finished the outlink is a transfer to PUAOT, which will take the system into the update phase.

PERT TIME MERGE ROUTINE




PR08
READ A RECORD FROM SECONDARY MASTER TAPE
PX20
02A
PR10
SET OUT ON-LINE MESSAGE NO ACTIVITIES TIED TO NETWORK CODE NO. XXXXXX
NETWORK CODE
ACTIVITY RECORD
PR15
COMPARE ALL THREE NETWORK CODES
PX25
02B
USERS TIME & CHANGE LOW
04F
PR38
CHANGE LOW
04B
PR32
USERS TIME LOW
03B
PR20
USERS TIME & SECONDARY LOW
04E
PR36
SECONDARY LOW
03C
PR22
SECONDARY & CHANGE LOW
04D
PR34
ALL EQUAL
COMPARE CHANGE ACTIVITY NUMBERS AGAINST SECONDARY
PX40
CHANGE LOW
03D
PR24
SECONDARY LOW
03A
PR18
EQUAL
PR15A
IS CHANGE CODE ON 2 TYPE INPUT EQUAL TO ADD "A"
02E
NO
02C
PR16
YES
SET OUT MESSAGE ONTO TAPE "ADD TO AN EXISTING RECORD" PLUS A SECOND LINE OF THIS 80 CHAR. RECORD
ADD ONE TO THE TIME MERGE ERROR COUNT
PR94
READ A RECORD FROM THE SORTED TIME TAPE
PX85
02B
PR15
PR16
IS CHANGE CODE ON 2 TYPE INPUT EQUAL TO CHANGE "C"
02C
YES
02D
PR17
NO
READ A RECORD FROM THE SORTED TIME TAPE
PX85
READ A RECORD FROM THE SECONDARY MASTER TAPE
PX20
NETWORK CODE
02A
PR08
ACTIVITY RECORD
02B
PR15
PR17
02D
MOVE CHANGE RECORD INTO SECONDARY MASTER BLOCK
READ A RECORD FROM THE SORTED TIME TAPE
PX85
02B
PR15


PR18
03A
COMPARE SECONDARY MASTER ACTIVITY NOS. AGAINST USERS TIME
PX50
SECONDARY LOW
03C
PR22
USERS LOW
03B
PR20
EQUAL
PR19
03F
SET IN CHARGE NO. FROM SECONDARY & SEND TO 4 TAPE SORT READ IN NEXT RECORD FROM USERS TAPE
PX70
WRITE OUT SECONDARY MASTER FROM SECONDARY AREA
PX65
READ A RECORD FROM THE SECONDARY MASTER TAPE
PX20
NETWORK CODE
02A
PR08
ACTIVITY RECORD
02B
PR15
PR20
03B
IF CHARGE NUMBER IN USERS TIME TAPE SEND TO 4 TAPE SORT IF NOT READ IN RECORD FROM USERS TAPE
PX75
02B
PR15
PR22
03C
SET OUT MESSAGE ONTO TAPE - "ACTIVITY ON SECONDARY MASTER NOT ON USERS TAPE" PLUS A SECOND LINE OF THE SECONDARY DATA
ADD ONE TO THE TIME MERGE ERROR COUNT
PR94
WRITE OUT SECONDARY MASTER FROM SECONDARY AREA
PX65
READ A RECORD FROM THE SECONDARY MASTER TAPE
PX20
NETWORK CODE
02A
PR08
ACTIVITY RECORD
02B
PR15
PR24
03D
COMPARE CHANGE ACTIVITY NUMBERS AGAINST USERS TIME
PX30
CHANGE LOW
04B
PR32
USERS LOW
03B
PR20
EQUAL
PR24B
03G
IS CHANGE CODE ON 2 TYPE INPUT EQUAL TO ADD "A"
YES
04A
PR26
NO
PR24A
03E
SET OUT MESSAGE ONTO TAPE - "A CHANGE ON A NON-EXISTENT ACTIVITY" PLUS A SECOND LINE OF THIS 80 CHAR RECORD
ADD ONE TO THE TIME MERGE ERROR COUNT
PR94
READ A RECORD FROM THE SORTED TIME TAPE
PX85
02B
PR15


PR26
SET IN CHARGE NOS. FROM CHANGE & SEND TO 4 TAPE SORT. READ IN NEXT RECORD FROM USERS TAPE
PX80
04A
PR27
WRITE OUT SECONDARY MASTER FROM CHANGE AREA
PX60
04C
READ A RECORD FROM THE SORTED TIME TAPE
PX85
02B
PR15
PR32
IS CHANGE CODE ON 2 TYPE INPUT EQUAL TO ADD "A"
04B
NO
03E
PR24A
YES
SET OUT MESSAGE ONTO TAPE - "ACTIVITY ON SECONDARY MASTER NOT ON USERS TAPE" PLUS A SECOND LINE OF THIS 80 CHAR RECORD
ADD ONE TO THE TIME MERGE ERROR COUNT
PR94
04C
PR27
PR34
COMPARE CHANGE ACTIVITY NUMBERS AGAINST SECONDARY
PX40
04D
CHANGE LOW
04B
PR32
SECONDARY LOW
03C
PR22
EQUAL
02E
PR15A
PR36
COMPARE SECONDARY MASTER ACTIVITY NOS. AGAINST USERS TIME
PX50
04E
SECONDARY LOW
03C
PR22
USERS LOW
03B
PR20
EQUAL
03F
PR19
PR38
COMPARE CHANGE ACTIVITY NUMBERS AGAINST USERS TIME
PX30
04F
CHANGE LOW
04B
PR32
USERS LOW
03B
PR20
EQUAL
03G
PR24B

Region PX01

EXPLANATION OF REGION:

To set a pseudo number of all 1-bits into the change record blocks WKCH1 and WKCH2

CALLING SEQUENCE:

L TSX PX01, 4

L + 1 Normal return

INPUT:

Not applicable.

OUTPUT:

E. O. F. on change tape indicator PR99. It is set to a value other than zero and WKCH1 and WKCH2 contain all 1-bits.

STORAGE USED:

Not applicable.

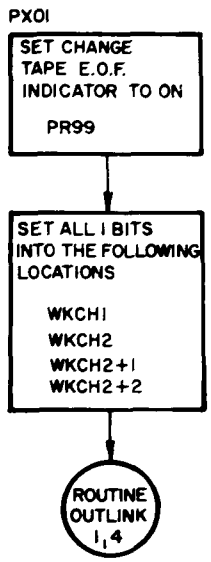
SUBREGIONS AND SUBROUTINES USED:

Not applicable.

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

SET PSEUDO NUMBER INTO CHANGE AREA



Region PX05

EXPLANATION OF REGION:

To test the input code on the data contained in the SORTED DATA TAPE for a type 2 code.

CALLING SEQUENCE:

L	TSX PX05, 4
L + 1	Normal return if code over 2
L + 2	Normal return if code equal to 2

INPUT:

The input data code.

OUTPUT:

Not applicable.

STORAGE USED:

Not applicable.

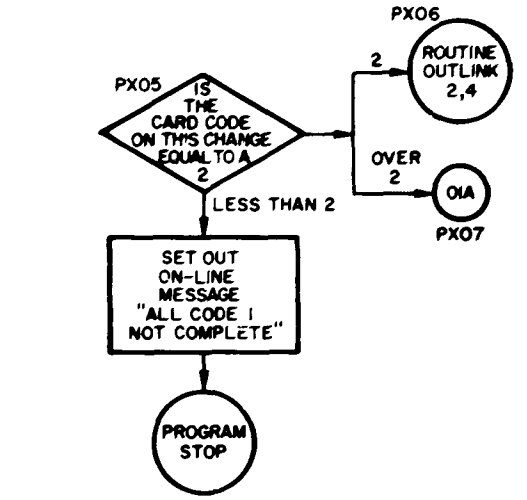
SUBREGIONS AND SUBROUTINES USED:

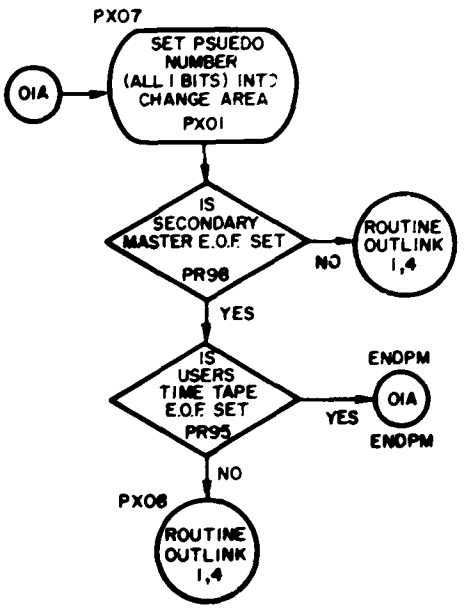
Not applicable.

EXPLANATION OF CALLING SEQUENCE:

If the code is a 1 an exception message is set out on the on-line printer and the system is stopped.

CHECK CARD CODE ON
SORTED DATA TAPE





Region PX10

EXPLANATION OF REGION:

This routine will move the input data record into its check area WKCH1 and WKCH2

CALLING SEQUENCE:

```
L       TSX   PX10, 4
L + 1   Normal return
```

INPUT:

Network code, predecessor, and successor from input data card.

OUTPUT:

The above input set into WKCH1 and WKCH2.

STORAGE USED:

Not applicable.

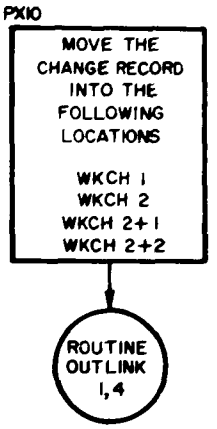
SUBREGIONS AND SUBROUTINES USED:

Not applicable.

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

MOVE CHANGE RECORD
INTO WORK AREA



Region PX15

EXPLANATION OF REGION:

To set a pseudo number of all 1-bits into the secondary master blocks WKSM1 and WKSM2

CALLING SEQUENCE:

L TSX PX15, 4

L + 1 Normal return

INPUT:

Not applicable.

OUTPUT:

E. O. F. on SECONDARY MASTER indicator PR98. It is set to a value other than zero and WKSM1 and WKSM2 contain all 1-bits.

STORAGE USED:

Not applicable.

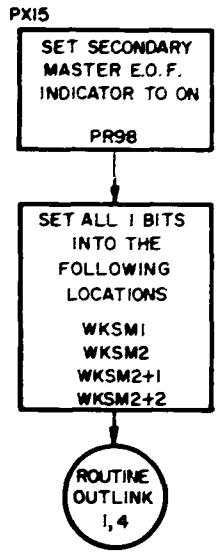
SUBREGIONS AND SUBROUTINES USED:

Not applicable.

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

SET PSEUDO NUMBERS
INTO SECONDARY
MASTER AREA



Region PX20

EXPLANATION OF REGION:

This routine will read the OLD SECONDARY MASTER, check sequence, and set the information into WKSM1 or WKSM2, according to the type of record.

CALLING SEQUENCE:

L TSX PX20, 4

L + 1 Normal return for network record

L + 2 Normal return for data record

INPUT:

OLD SECONDARY MASTER TAPE

OUTPUT:

The SECONDARY MASTER DATA set into WKSM1 and WKSM2.

STORAGE USED:

Not applicable.

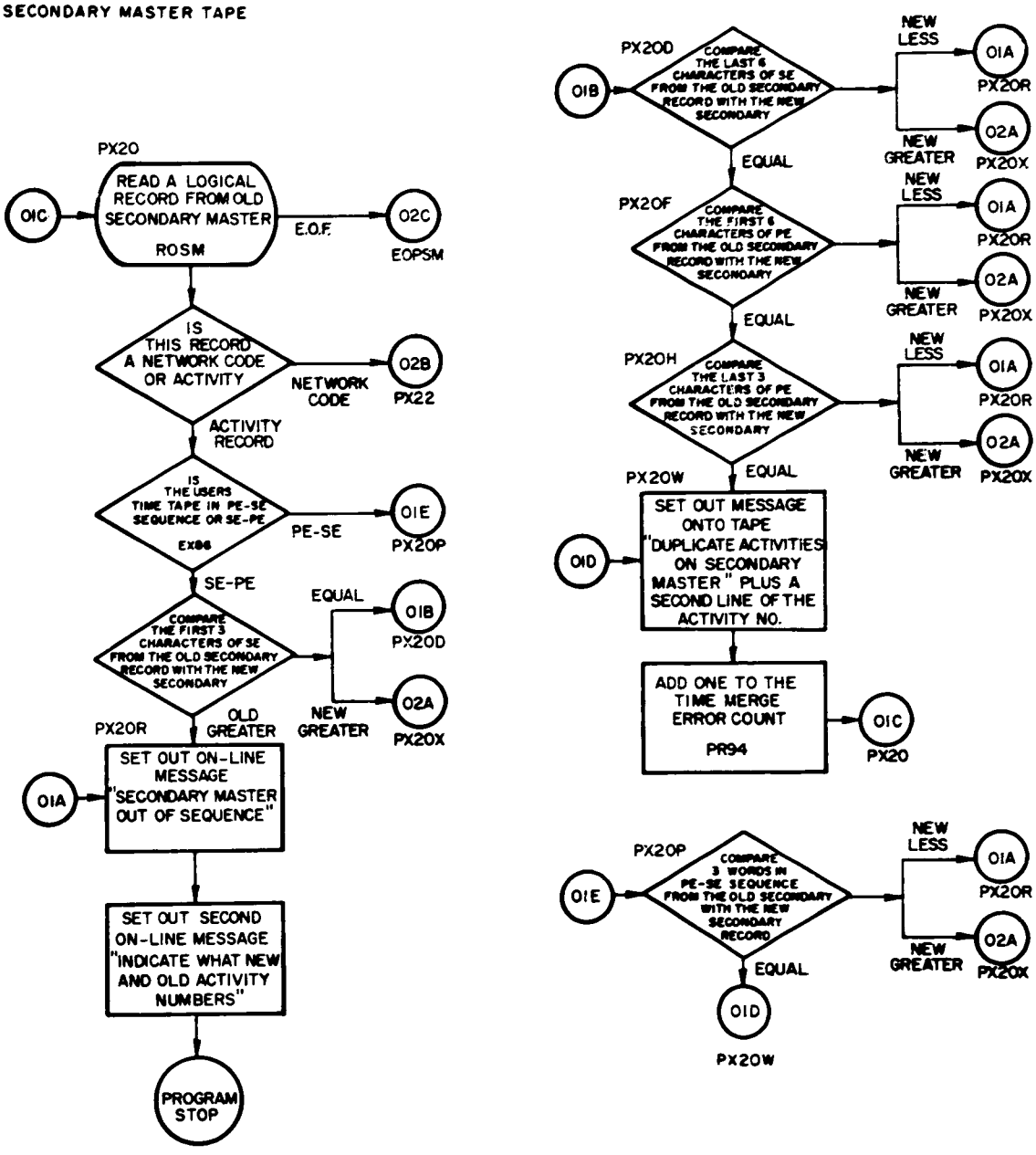
SUBREGIONS AND SUBROUTINES USED:

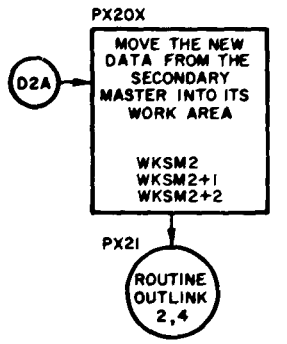
ROSM

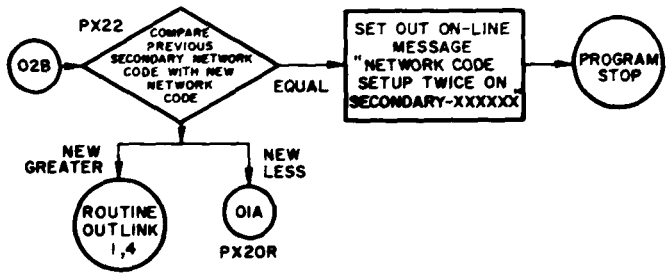
EXPLANATION OF CALLING SEQUENCE:

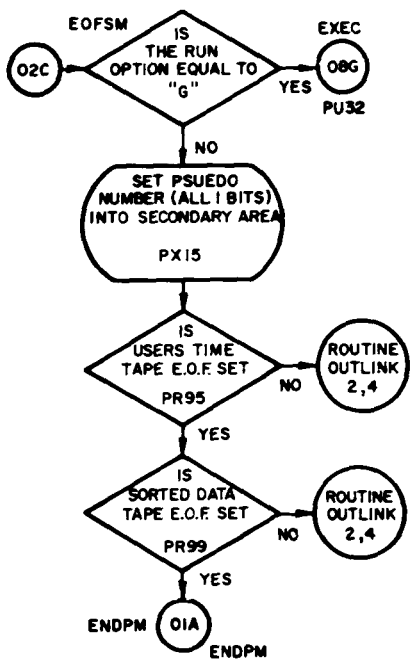
If an error occurs the reason for the error is printed out on-line and the system will stop.

READ A RECORD FROM
SECONDARY MASTER TAPE




PX20X
D2A
MOVE THE NEW DATA FROM THE SECONDARY MASTER INTO ITS WORK AREA
WKSM2
WKSM2+1
WKSM2+2
PX21
ROUTINE OUTLINK 2,4


PX22
COMPARE PREVIOUS SECONDARY NETWORK CODE WITH NEW NETWORK CODE
D2B
EQUAL
SET OUT ON-LINE MESSAGE "NETWORK CODE SETUP TWICE ON SECONDARY-XXXXXX"
PROGRAM STOP
NEW GREATER
NEW LESS
ROUTINE OUTLINK 1,4
O1A
PX20R


EOFSM
IS THE RUN OPTION EQUAL TO "G"
EXEC
O2C
YES
O8G
PU32
NO
SET PSUEDO NUMBER (ALL 1 BITS) INTO SECONDARY AREA
PX15
IS USERS TIME TAPE E.O.F SET
PR95
NO
ROUTINE OUTLINK 2,4
YES
IS SORTED DATA TAPE E.O.F SET
PR99
NO
ROUTINE OUTLINK 2,4
YES
ENDPM
O1A
ENDPM

Region PX25

EXPLANATION OF REGION:

This routine will compare all three files into the time merge (USERS TIME TAPE, SORTED DATA TAPE, and OLD SECONDARY MASTER) for the lowest network code value.

CALLING SEQUENCE:

L	TSX PX25, 4
L + 1	Users time and input low return
L + 2	Only input low return
L + 3	Only users time low return
L + 4	Users time and SECONDARY MASTER low return
L + 5	Only SECONDARY MASTER low return
L + 6	SECONDARY MASTER and input low return
L + 7	All three are equal return

INPUT:

The network codes for all three files.

OUTPUT:

Not applicable.

STORAGE USED:

Not applicable.

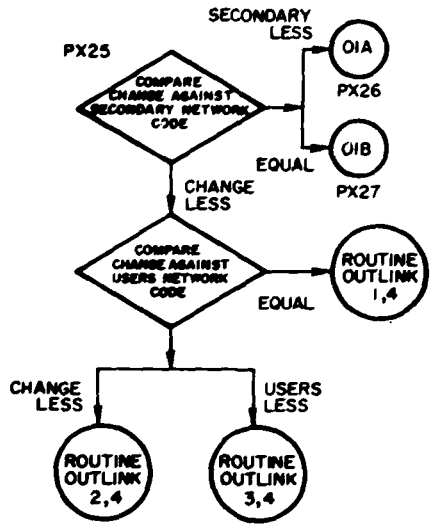
SUBREGIONS AND SUBROUTINES USED:

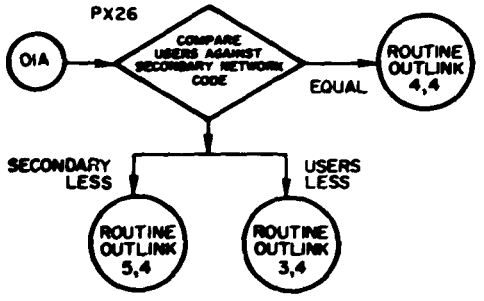
Not applicable.

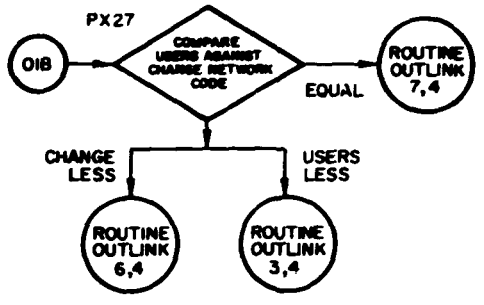
EXPLANATION OF CALLING SEQUENCE:

Not applicable.

NETWORK NUMBER
COMPARE ROUTINE







Region PX30

EXPLANATION OF REGION:

Check the USERS TIME TAPE activities against the SORTED DATA TAPE activities for the lower of the two.

CALLING SEQUENCE:

L	TSX PX30, 4
L + 1	Data input lower return
L + 2	Users information lower return
L + 3	Both of the above equal return

INPUT:

The data in WKCH2 and PTWKA for comparisons.

OUTPUT:

Not applicable.

STORAGE USED:

Nc applicable.

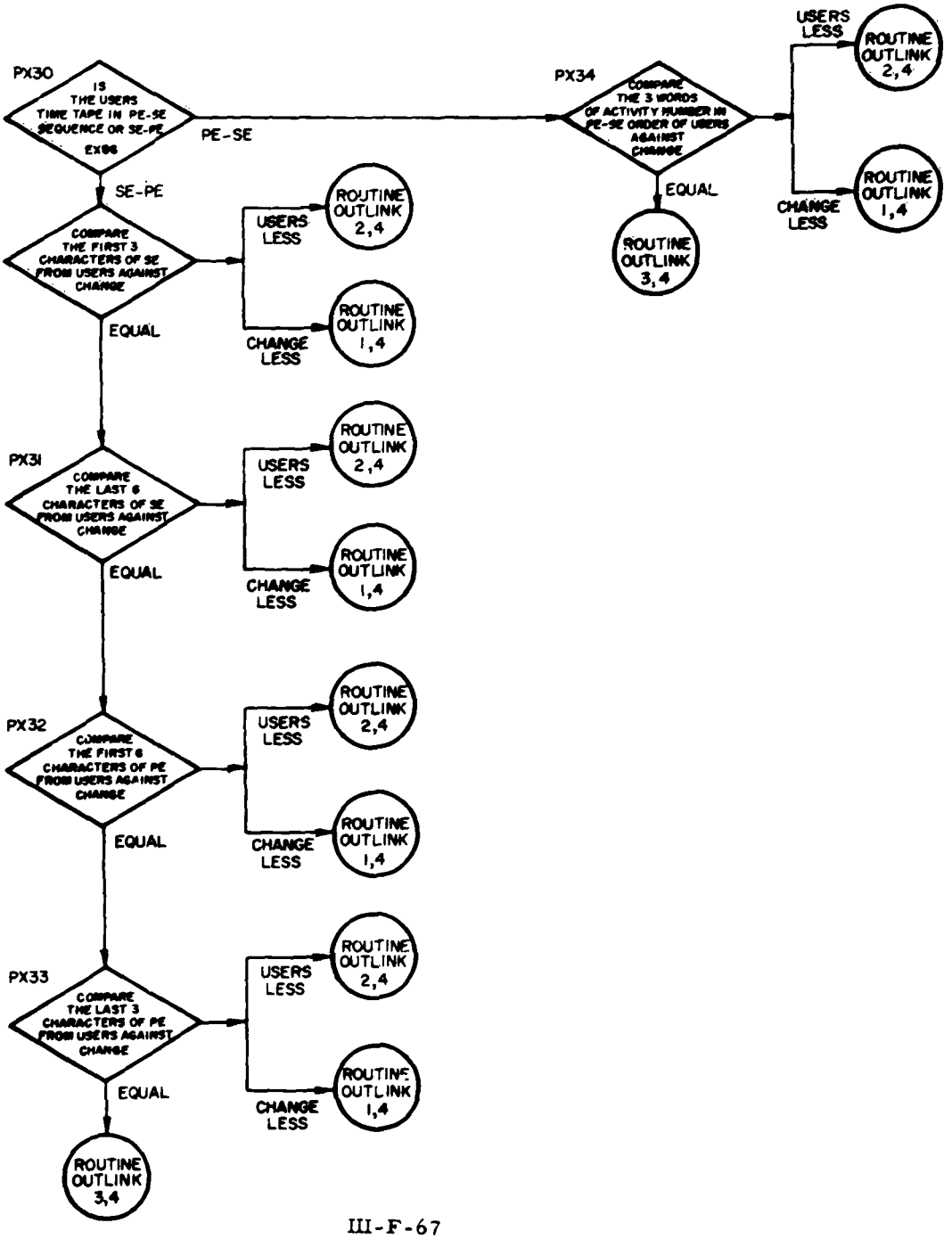
SUBREGIONS AND SUBROUTINES USED:

Not applicable.

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

CHECK USERS ACTIVITY
NUMBERS AGAINST CHANGES



Region PX40

EXPLANATION OF REGION:

Check the SORTED DATA TAPE activities against the OLD SECONDARY MASTER TAPE activities for the lower of the two.

CALLING SEQUENCE:

```
L       TSX   PX40, 4
L + 1   Data input lower return
L + 2   Secondary master input lower return
L + 3   Both of the above equal return
```

INPUT:

The data in WKCH2 and WKSM2 for comparisons.

OUTPUT:

Not applicable.

STORAGE USED:

Not applicable.

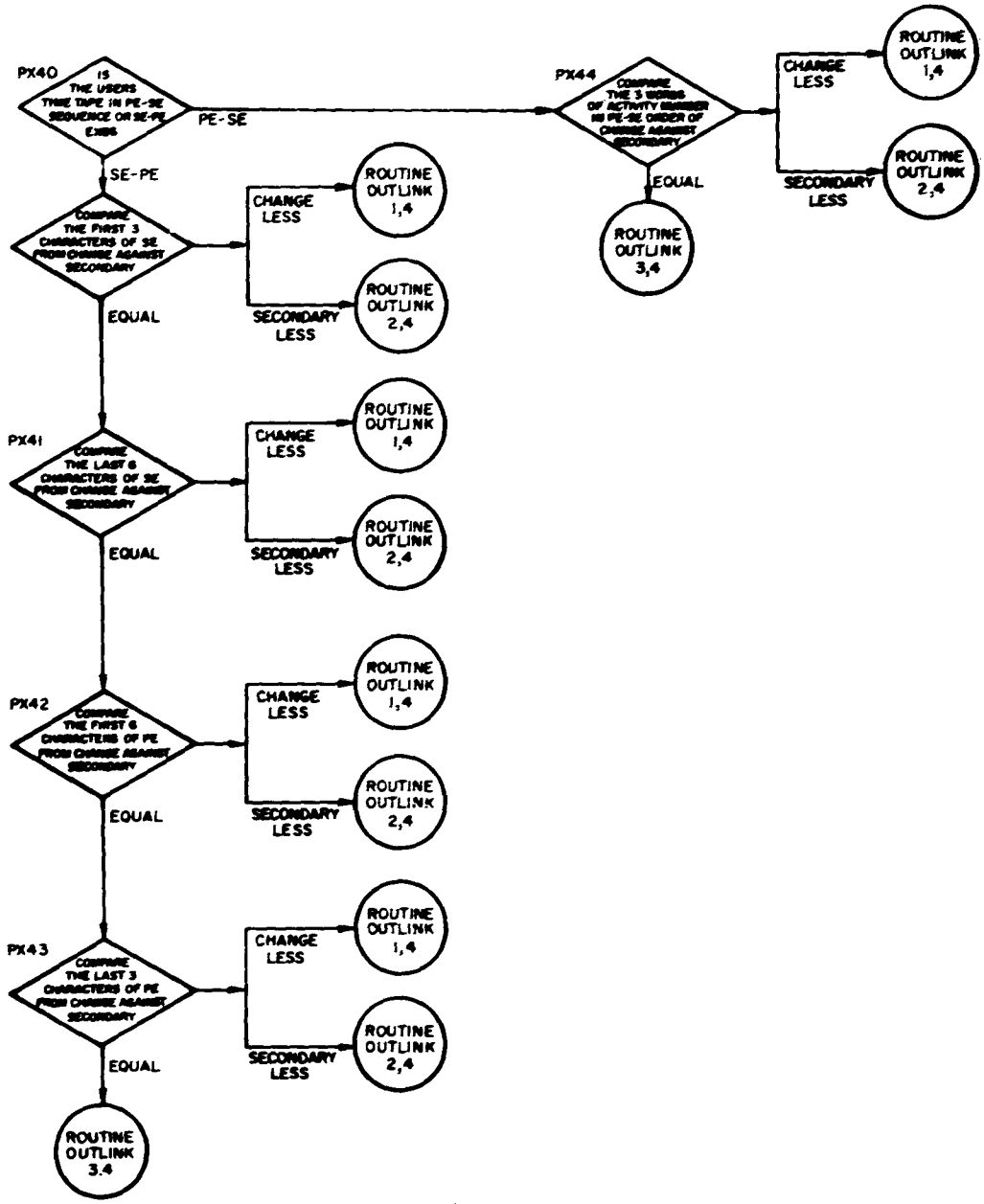
SUBREGIONS AND SUBROUTINES USED:

Not applicable.

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

CHECK CHANGE ACTIVITY NUMBERS
AGAINST SECONDARY MASTER



Region PX50

EXPLANATION OF REGION:

Check the OLD SECONDARY MASTER TAPE activities against the USERS TIME TAPE activities for the lower of the two.

CALLING SEQUENCE:

L	TSX PX50, 4
L + 1	Secondary master lower return
L + 2	Users tape lower return
L + 3	Both of the above equal return

INPUT:

The data in WKSM2 and PTWKA for comparisons.

OUTPUT:

Not applicable.

STORAGE USED:

Not applicable.

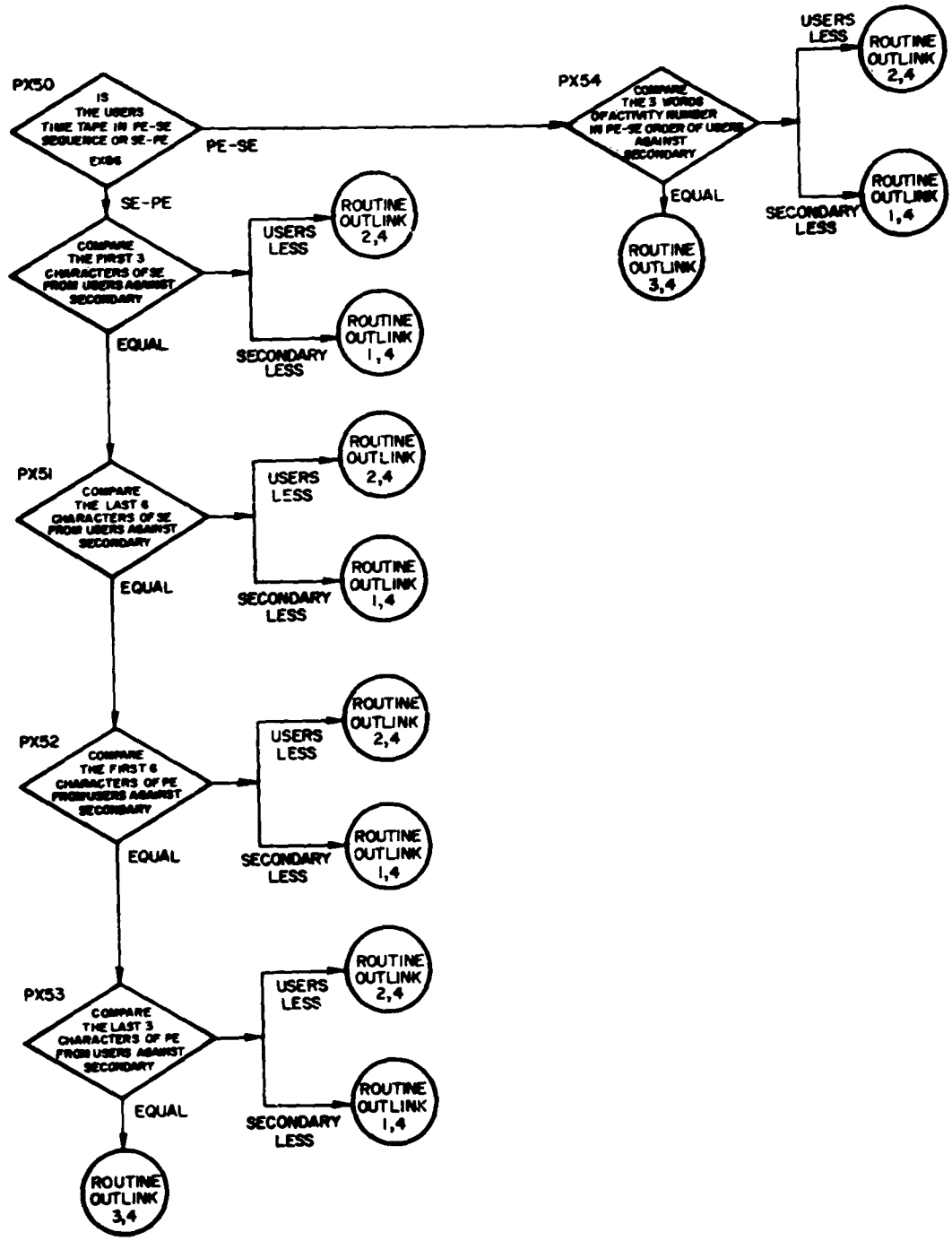
SUBREGIONS AND SUBROUTINES USED:

Not applicable.

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

CHECK USERS ACTIVITY NUMBERS
AGAINST SECONDARY MASTER



Region PX60

EXPLANATION OF REGION:

This routine will write the NEW SECONDARY MASTER from data that has been set up from the SORTED DATA TAPE.

CALLING SEQUENCE:

L TSX PX60, 4

L + 1 Normal return

INPUT:

SORTED DATA TAPE information in core.

OUTPUT:

A network code and data record or just a data record (depending on PR97) onto the NEW SECONDARY MASTER TAPE.

STORAGE USED:

PR97 - flag to indicate whether a network code has been already set onto the SECONDARY MASTER.

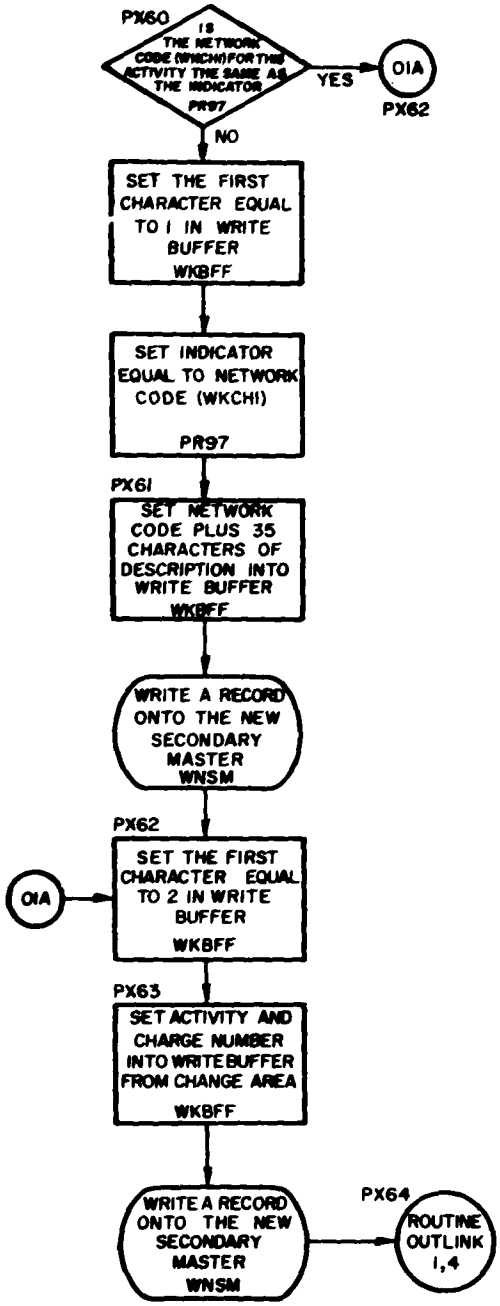
SUBREGIONS AND SUBROUTINES USED:

Not applicable.

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

WRITE OUT SECONDARY MASTER
FROM NEW ADDS



Region PX65

EXPLANATION OF REGION:

This routine will write the NEW SECONDARY MASTER from data that has been set up from the OLD SECONDARY MASTER.

CALLING SEQUENCE:

L TSX PX65, 4

L + 1 Normal return

INPUT:

OLD SECONDARY MASTER information in core.

OUTPUT:

A network code and data record or just a data record onto the NEW SECONDARY MASTER TAPE, depending on PR97.

STORAGE USED:

PR97 - flag to indicate whether a network code has been already set onto the SECONDARY MASTER.

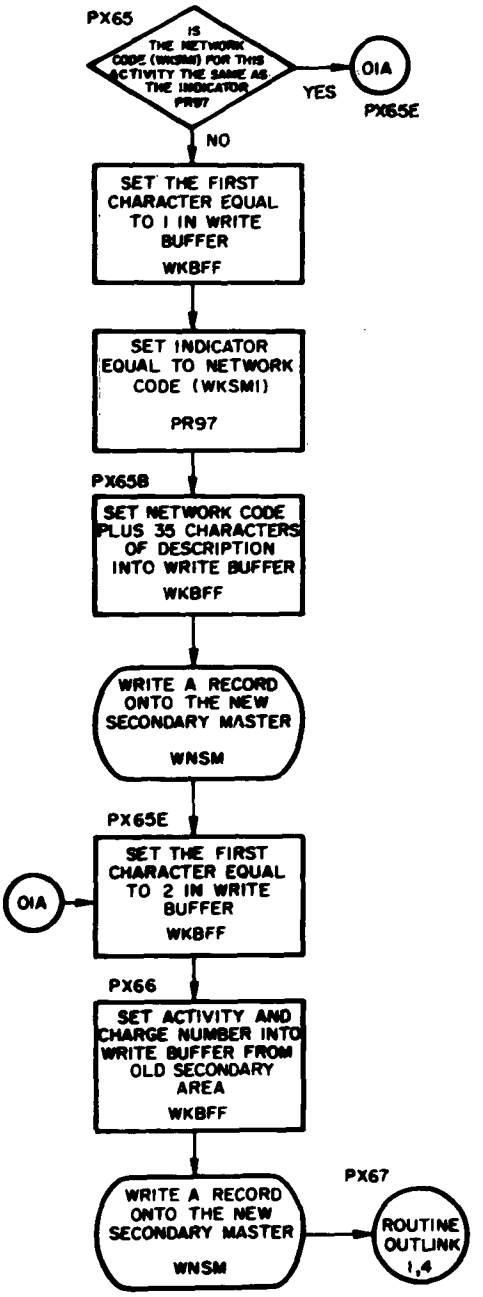
SUBREGIONS AND SUBROUTINES USED:

Not applicable.

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

WRITE OUT SECONDARY MASTER
FROM OLD SECONDARY AREA



Region PX70

EXPLANATION OF REGION:

This routine will set the charge number from the OLD SECONDARY MASTER into the selected time information and send the data into the sort routine. It will also read another record from the USERS TIME TAPE.

CALLING SEQUENCE:

L TSX PX70, 4

L + 1 Normal return

INPUT:

The charge number from the OLD SECONDARY MASTER.

OUTPUT:

A record on the sort tapes to be sorted in charge number sequence.

STORAGE USED:

Not applicable.

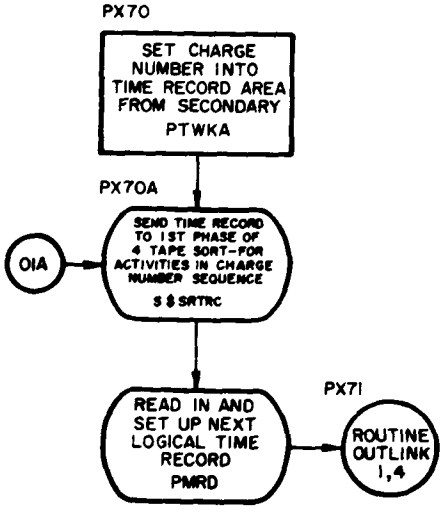
SUBREGIONS AND SUBROUTINES USED:

S$SRTRC PMRD

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

SET CHARGE NUMBER FROM SECONDARY INTO TIME RECORD AND SORT



Region PX75

EXPLANATION OF REGION:

This routine will check for the charge number in the USERS TIME TAPE to set the selected time information record out onto the sort tapes. If the USERS TIME TAPE does not contain the charge number no information is set out and the next users record is read.

CALLING SEQUENCE:

L TSX PX75,* 4

L + 1 Normal return

INPUT:

Selected time information record from USERS TIME TAPE at location PTWKA.

OUTPUT:

A record on the sort tapes to be sorted in charge number sequence if the record contains a charge number.

STORAGE USED:

Not applicable.

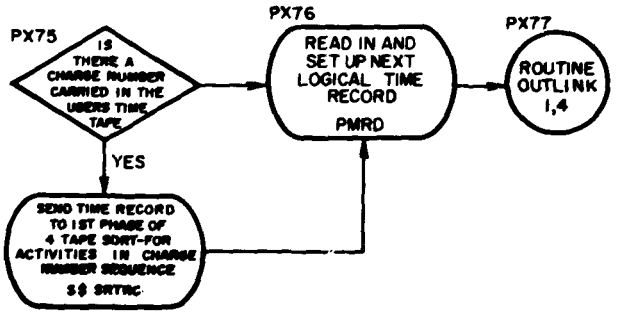
SUBREGIONS AND SUBROUTINES USED:

S$SRTRC PMRD

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

CHECK FOR USERS CHARGE
NUMBER IN TIME RECORD
AND SORT



Region PX80

EXPLANATION OF REGION:

This routine will set the charge number from the SORTED DATA TAPE into the selected time information and send the data into the sort routine. It will also read another record from the USERS TIME TAPE.

CALLING SEQUENCE:

L TSX PX80, 4

L + 1 Normal return

INPUT:

The charge number from new data off of the SORTED DATA TAPE.

OUTPUT:

A record on the sort tapes to be sorted in charge number sequence.

STORAGE USED:

Not applicable.

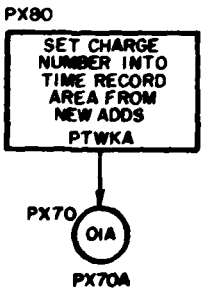
SUBREGIONS AND SUBROUTINES USED:

S$SRTRC PMRD

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

SET CHARGE NUMBER FROM
NEW ADDS INTO TIME RECORD
AND SORT



Region PX85

EXPLANATION OF REGION:

This routine will read the SORTED DATA TAPE, check sequence, and set the information into WKCH1 and WKCH2.

CALLING SEQUENCE:

L TSX PX85, 4

L + 1 Normal return

INPUT:

SORTED DATA TAPE

OUTPUT:

The type 2 input data set into WKCH1 and/or WKCH2.

STORAGE USED:

Not applicable.

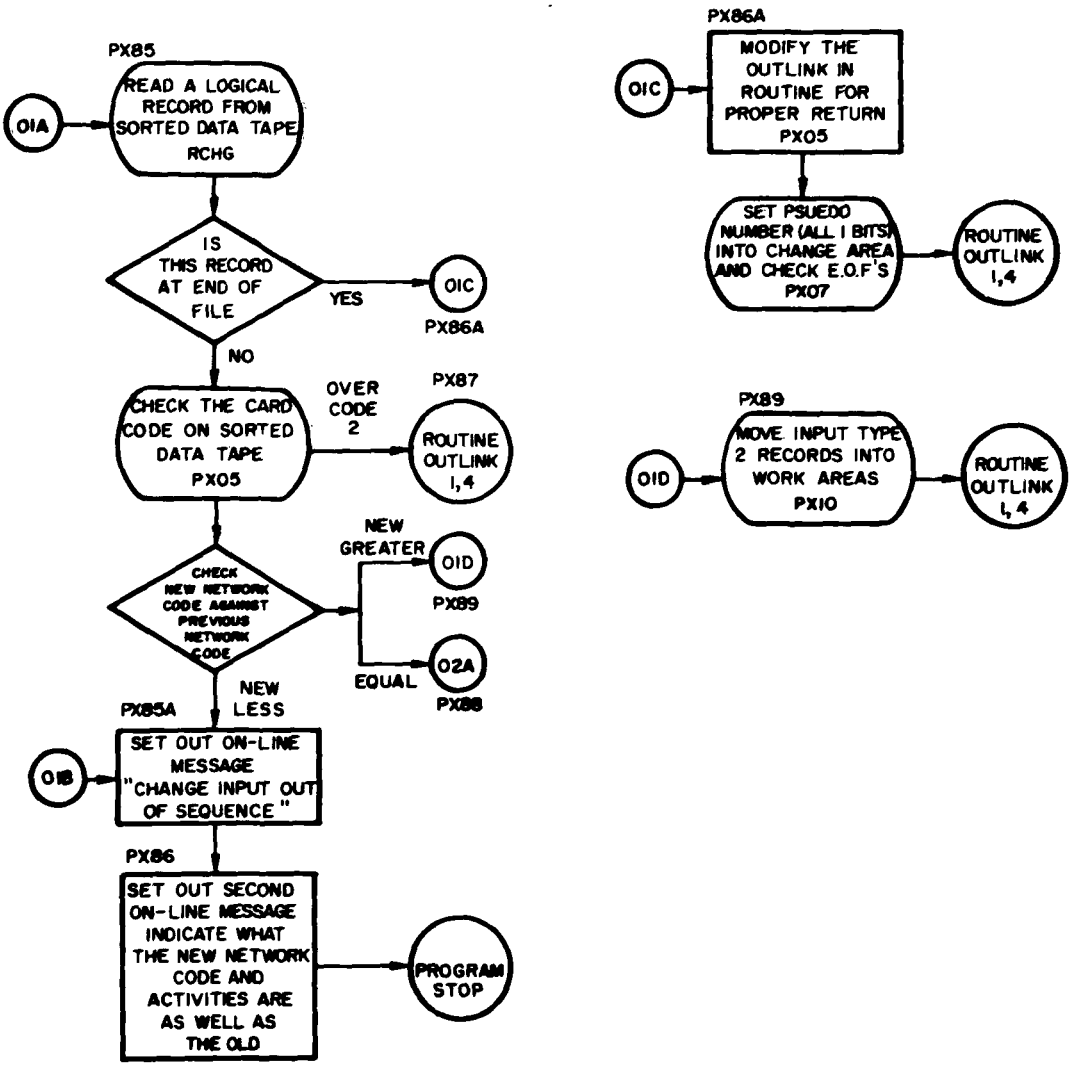
SUBREGIONS AND SUBROUTINES USED:

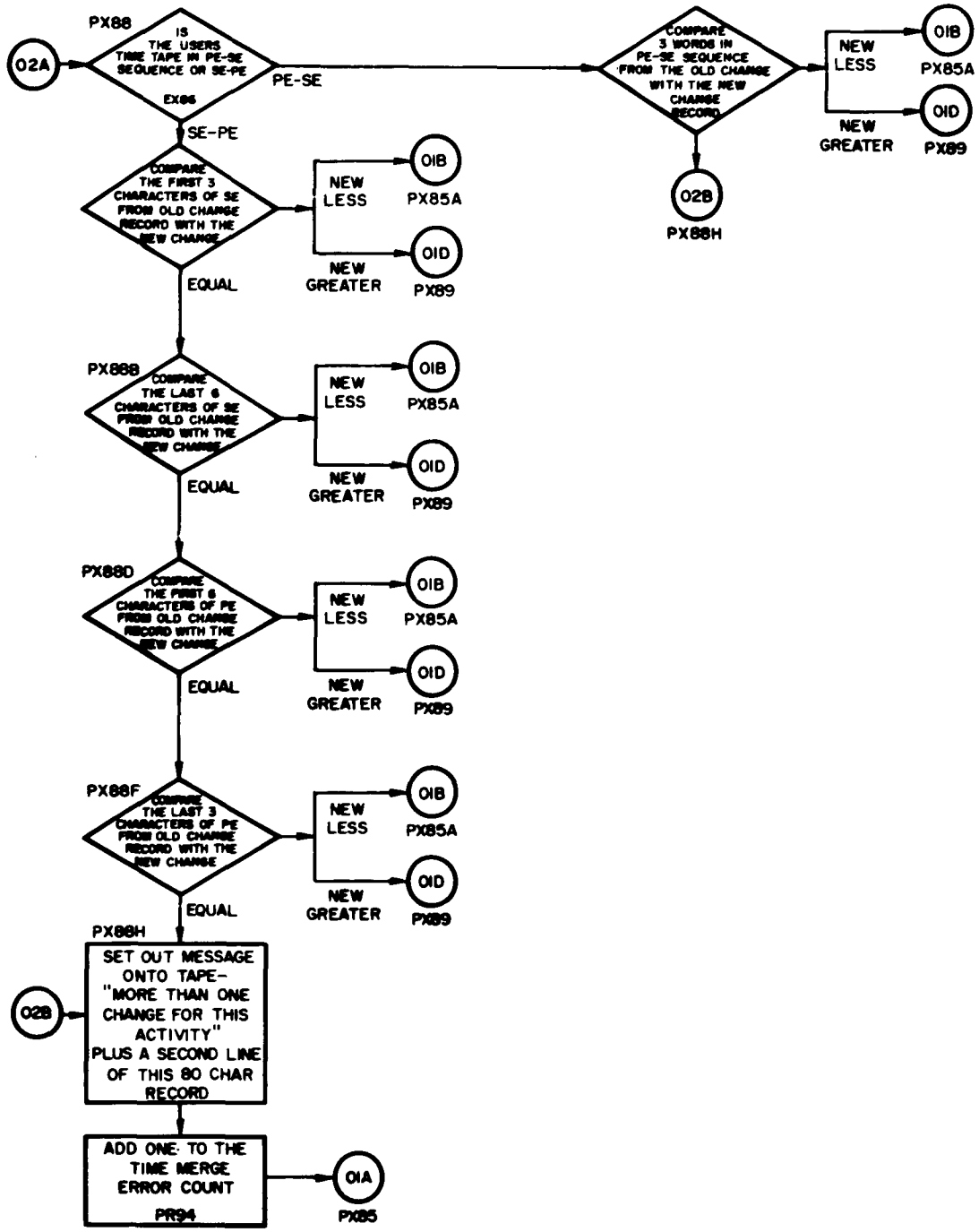
RCHG PX10 PX05

EXPLANATION OF CALLING SEQUENCE:

If an error occurs, the reason for the error is printed out on-line and the system will stop.

READ A RECORD FROM SORTED DATA TAPE




PX88
IS THE USERS TIME TAPE IN PE-SE SEQUENCE OR SE-PE
EX86
02A
PE-SE
SE-PE
COMPARE 3 WORDS IN PE-SE SEQUENCE FROM THE OLD CHANGE WITH THE NEW CHANGE RECORD
NEW LESS
NEW GREATER
01B
PX85A
01D
PX89
02B
PX88H
COMPARE THE FIRST 3 CHARACTERS OF SE FROM OLD CHANGE RECORD WITH THE NEW CHANGE
EQUAL
PX88B
COMPARE THE LAST 6 CHARACTERS OF SE FROM OLD CHANGE RECORD WITH THE NEW CHANGE
PX88D
COMPARE THE FIRST 6 CHARACTERS OF PE FROM OLD CHANGE RECORD WITH THE NEW CHANGE
PX88F
COMPARE THE LAST 3 CHARACTERS OF PE FROM OLD CHANGE RECORD WITH THE NEW CHANGE
SET OUT MESSAGE ONTO TAPE- "MORE THAN ONE CHANGE FOR THIS ACTIVITY" PLUS A SECOND LINE OF THIS 80 CHAR RECORD
ADD ONE TO THE TIME MERGE ERROR COUNT
PR94
01A
PX85

Region ENDPM

EXPLANATION OF REGION:

This routine will set out the ending messages for the time merge phase and contain the link into the PERT Cost update phase.

CALLING SEQUENCE:

```
L     TRA   ENDPM
```

INPUT:

Number of errors indicated in location PR94.

OUTPUT:

The on-line messages ending the PERT merge phase as shown on Page III-F-2.

STORAGE USED:

Not applicable.

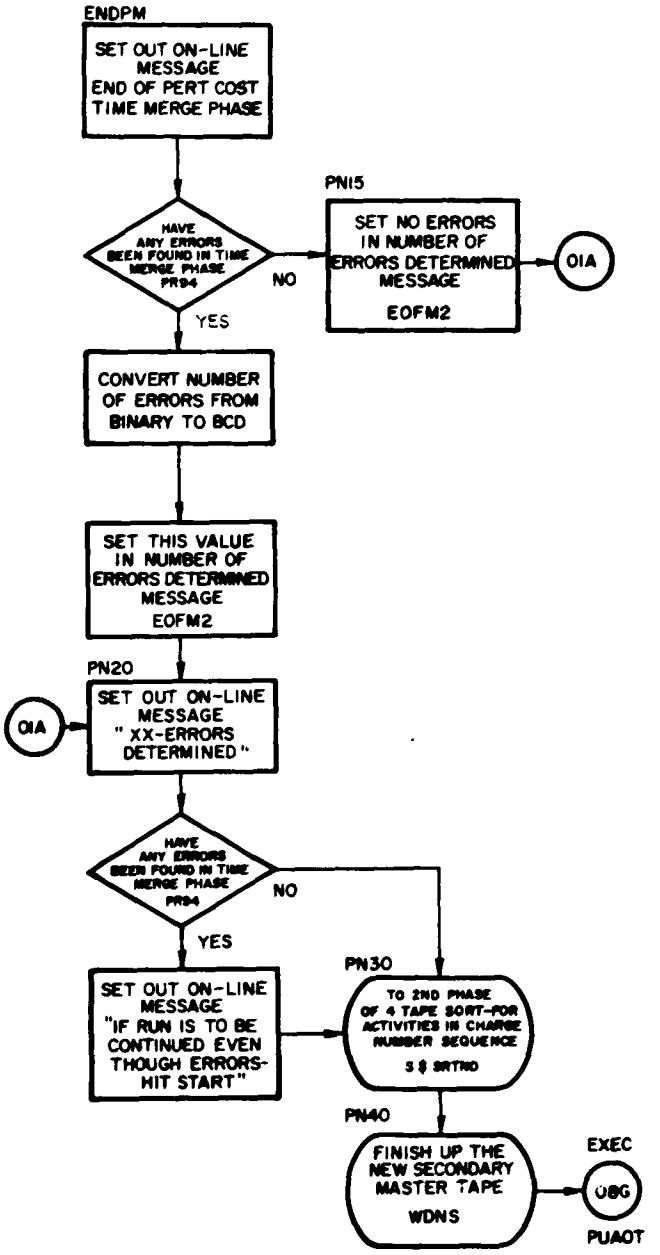
SUBREGIONS AND SUBROUTINES USED:

Not applicable.

EXPLANATION OF CALLING SEQUENCE:

When the time merge phase is in this routine it is finished and the outlink is a transfer to PUAOT, which will take the system into the update phase.

FINISH UP PERT TIME
MERGE PHASE



Region PMRD

EXPLANATION OF REGION:

This routine will read the USERS TIME TAPE from the input parameter table and set up one record in the PTWKA block. If a sort is necessary to get the information in PE-SE order this routine will accomplish it. The sequence of the USERS TIME TAPE is also verified in this area.

CALLING SEQUENCE:

```
L       TSX   PMRD, 4
L + 1   Normal return
```

INPUT:

INPAR parameter table

USERS TIME TAPE

OUTPUT:

A selected time information record in the PTWKA block.

STORAGE USED:

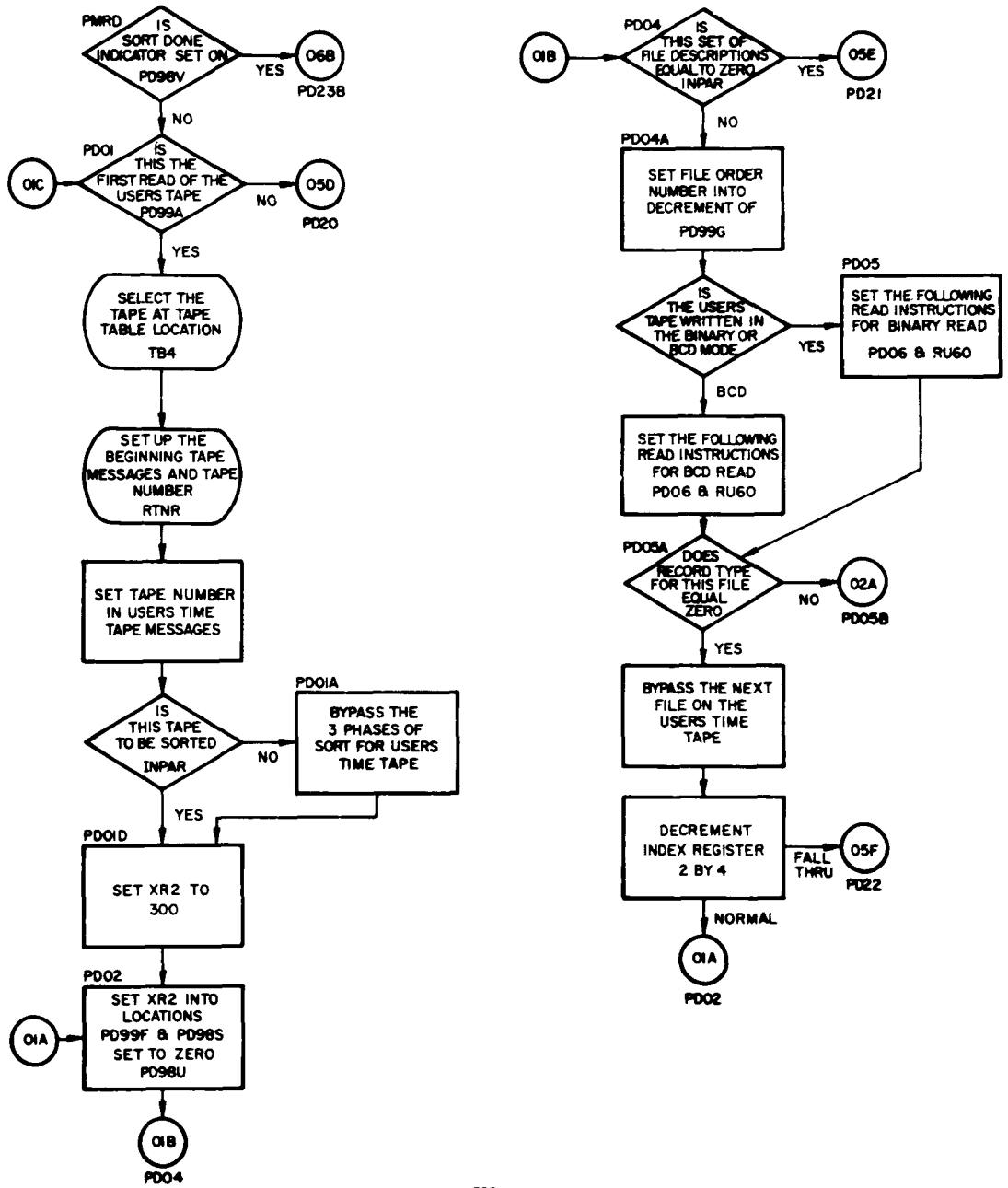
Not applicable.

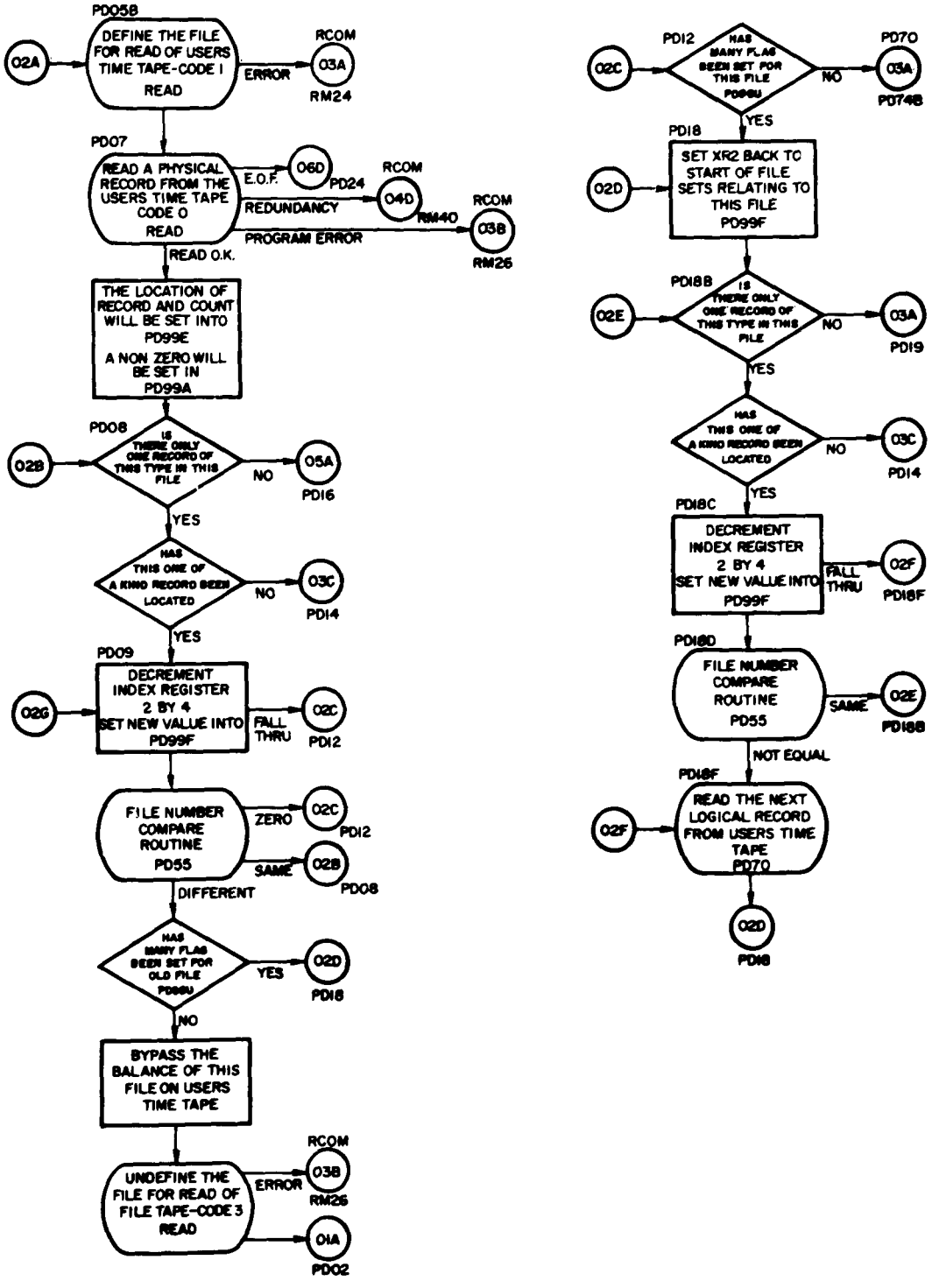
SUBREGIONS AND SUBROUTINES USED:

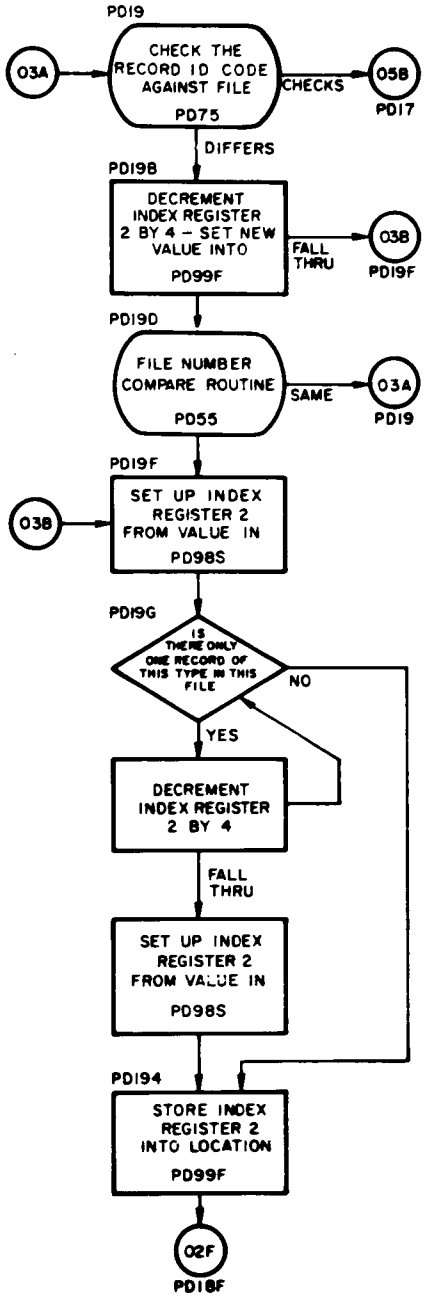
PD50	PD65	PD68	PD80
PD55	PD66	PD70	
PD60	PD67	PD75	

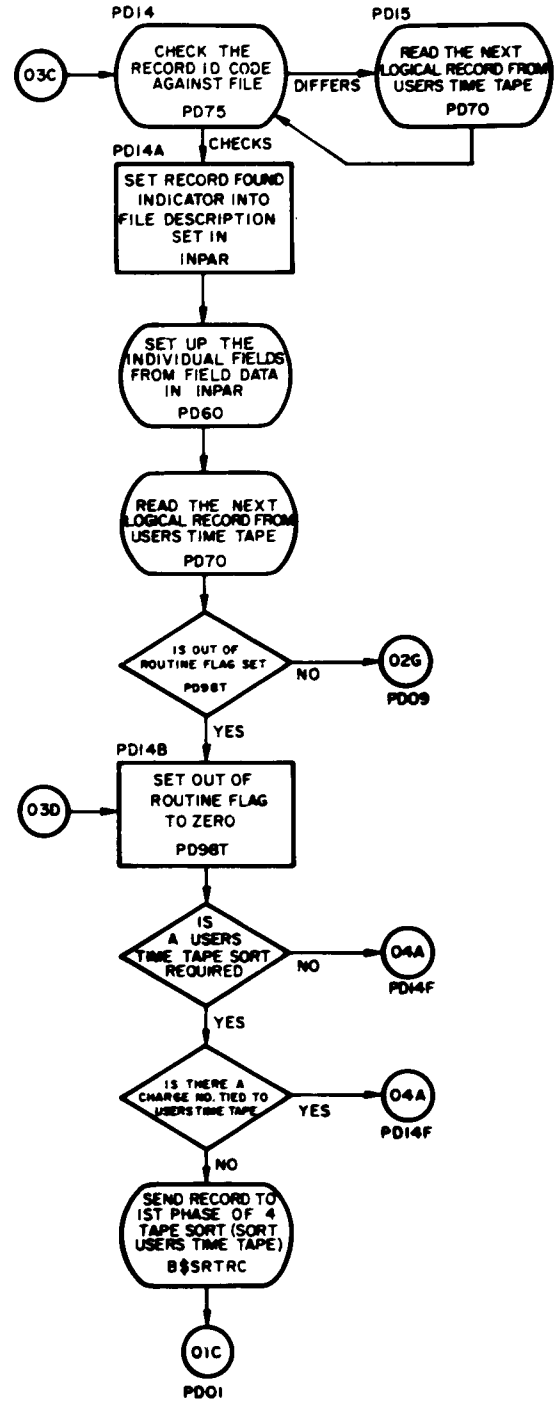
EXPLANATION OF CALLING SEQUENCE:

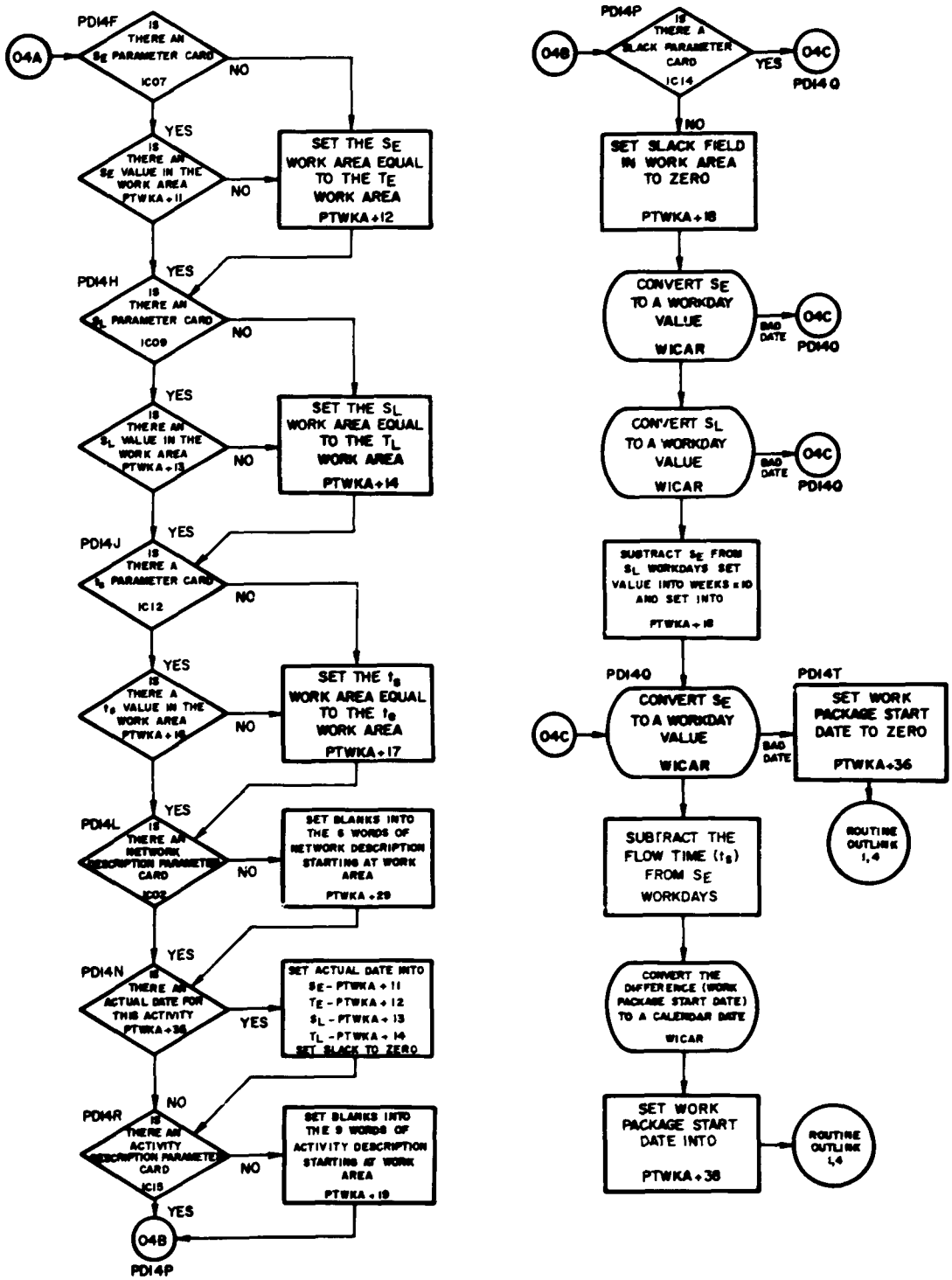
If an error occurs the reason for the error is set out either on the on-line printer or the SYSTEM ERROR TAPE. The system may then stop if the problem warrants it.

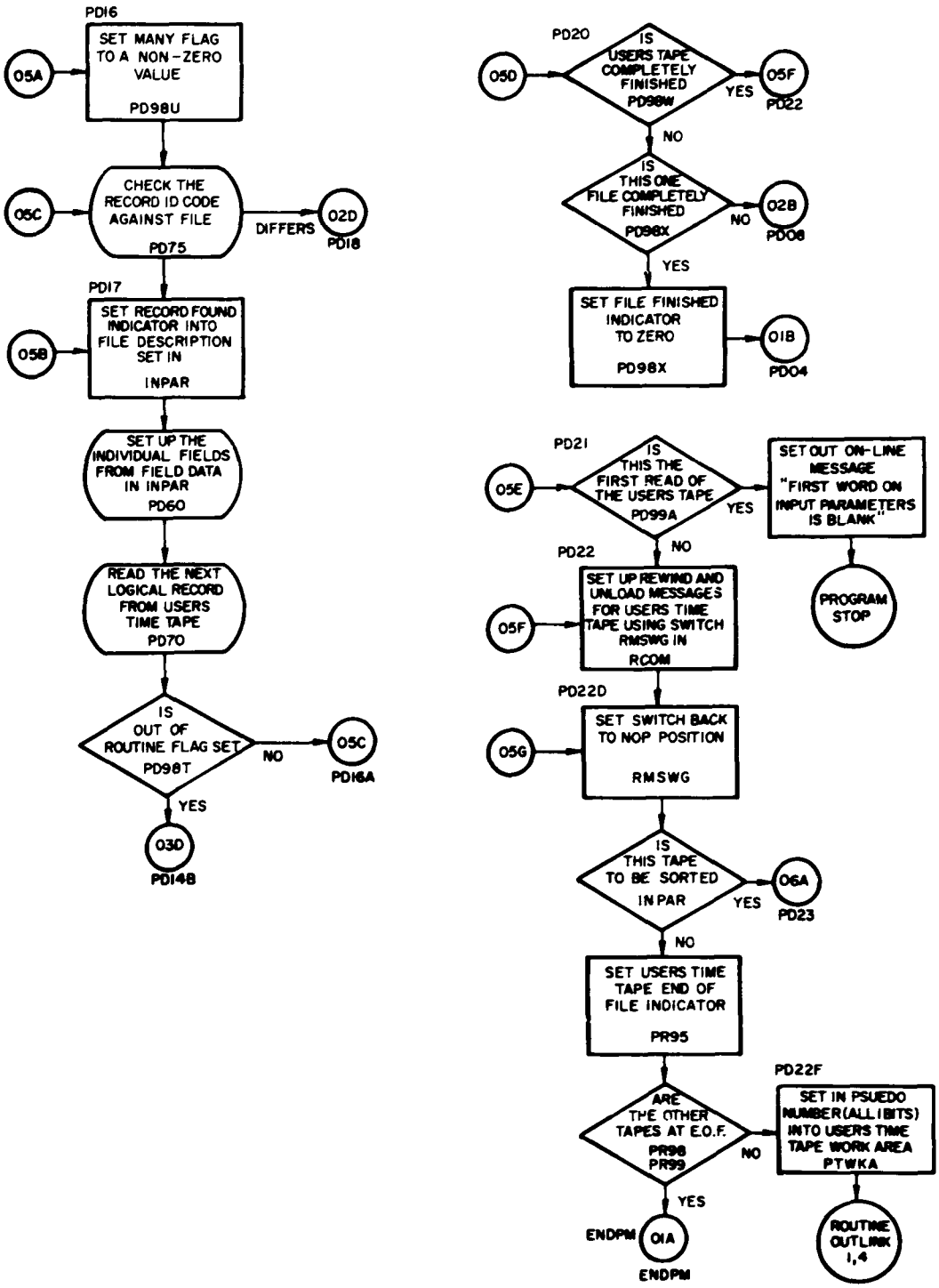

PMRD
IS SORT DONE INDICATOR SET ON PD98V
YES
068
PD23B
NO
PDOI
IS THIS THE FIRST READ OF THE USERS TAPE PD99A
NO
050
PD20
01C
YES
SELECT THE TAPE AT TAPE TABLE LOCATION TB4
SET UP THE BEGINNING TAPE MESSAGES AND TAPE NUMBER RTNR
SET TAPE NUMBER IN USERS TIME TAPE MESSAGES
PDOIA
IS THIS TAPE TO BE SORTED INPAR
NO
BYPASS THE 3 PHASES OF SORT FOR USERS TIME TAPE
YES
PDOID
SET XR2 TO 300
PD02
SET XR2 INTO LOCATIONS PD99F & PD98S SET TO ZERO PD98U
01A
01B
PD04
01B
PD04
IS THIS SET OF FILE DESCRIPTIONS EQUAL TO ZERO INPAR
YES
05E
PD21
NO
PD04A
SET FILE ORDER NUMBER INTO DECREMENT OF PD99G
PD05
IS THE USERS TAPE WRITTEN IN THE BINARY OR BCD MODE
YES
SET THE FOLLOWING READ INSTRUCTIONS FOR BINARY READ PD06 & RU60
BCD
SET THE FOLLOWING READ INSTRUCTIONS FOR BCD READ PD06 & RU60
PD05A
DOES RECORD TYPE FOR THIS FILE EQUAL ZERO
NO
02A
PD05B
YES
BYPASS THE NEXT FILE ON THE USERS TIME TAPE
DECREMENT INDEX REGISTER 2 BY 4
FALL THRU
05F
PD22
NORMAL
01A
PD02

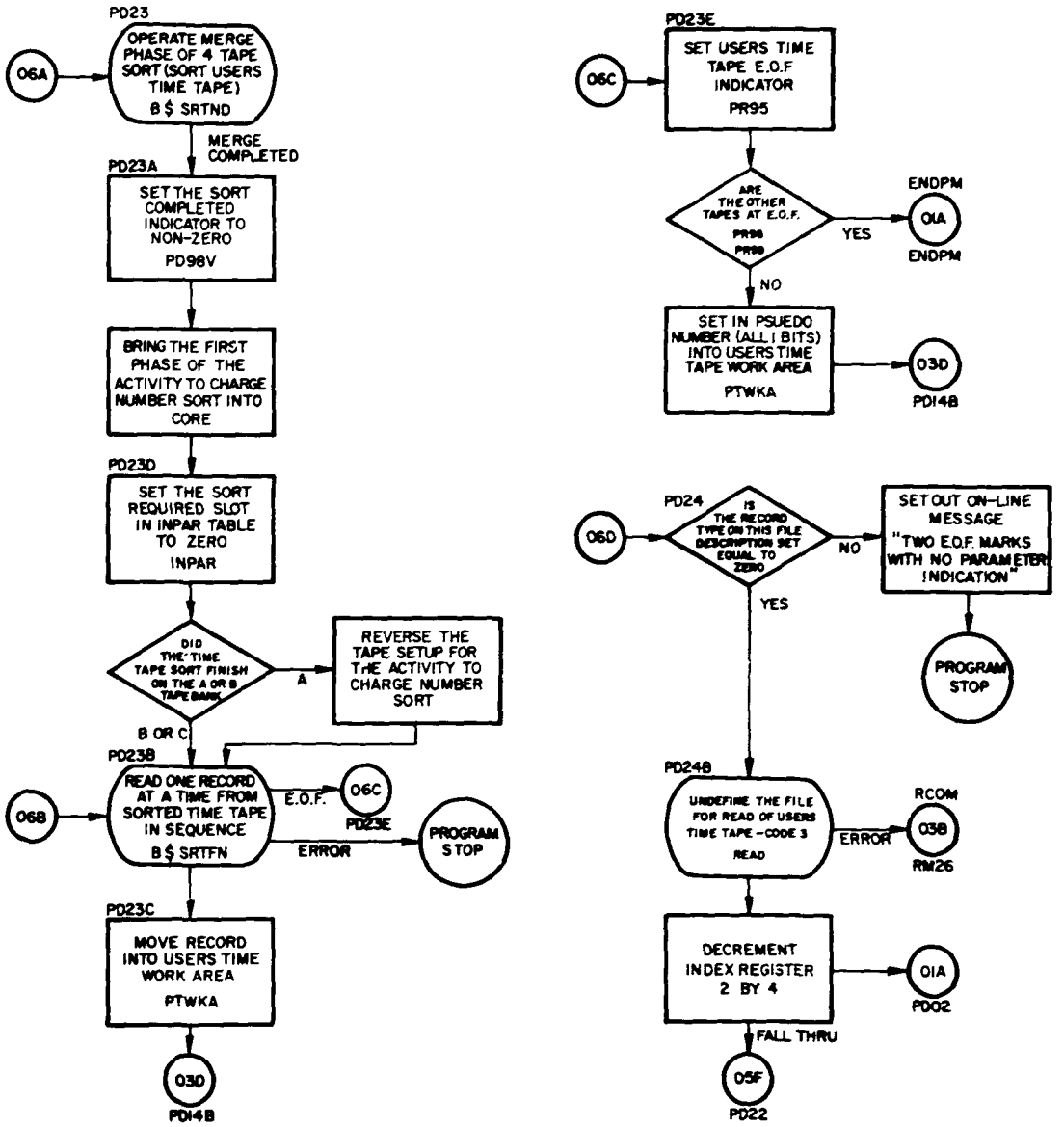

PD05B
DEFINE THE FILE FOR READ OF USERS TIME TAPE-CODE 1 READ
02A
ERROR
RCOM
03A
RM24
PD07
READ A PHYSICAL RECORD FROM THE USERS TIME TAPE CODE 0 READ
E.O.F.
06D
PD24
REDUNDANCY
RCOM
04D
RM40
PROGRAM ERROR
RCOM
03B
RM26
READ O.K.
THE LOCATION OF RECORD AND COUNT WILL BE SET INTO PD99E
A NON ZERO WILL BE SET IN PD99A
PD08
IS THERE ONLY ONE RECORD OF THIS TYPE IN THIS FILE
02B
NO
05A
PD16
YES
HAS THIS ONE OF A KIND RECORD BEEN LOCATED
NO
03C
PD14
YES
PD09
DECREMENT INDEX REGISTER 2 BY 4 SET NEW VALUE INTO PD99F
02G
FALL THRU
02C
PD12
FILE NUMBER COMPARE ROUTINE PD55
ZERO
02C
PD12
SAME
02B
PD08
DIFFERENT
HAS MANY FLAG BEEN SET FOR OLD FILE PD08U
YES
02D
PD18
NO
BYPASS THE BALANCE OF THIS FILE ON USERS TIME TAPE
UNDEFINE THE FILE FOR READ OF FILE TAPE-CODE 3 READ
ERROR
RCOM
03B
RM26
01A
PD02
PD12
HAS MANY FLAG BEEN SET FOR THIS FILE PD08U
02C
NO
03A
PD74B
PD070
YES
PD18
SET XR2 BACK TO START OF FILE SETS RELATING TO THIS FILE PD99F
02D
PD18B
IS THERE ONLY ONE RECORD OF THIS TYPE IN THIS FILE
02E
NO
03A
PD19
YES
HAS THIS ONE OF A KIND RECORD BEEN LOCATED
NO
03C
PD14
YES
PD18C
DECREMENT INDEX REGISTER 2 BY 4 SET NEW VALUE INTO PD99F
FALL THRU
02F
PD18F
PD18D
FILE NUMBER COMPARE ROUTINE PD55
SAME
02E
PD18B
NOT EQUAL
PD18F
READ THE NEXT LOGICAL RECORD FROM USERS TIME TAPE PD70
02F
02D
PD18


PD19
03A
CHECK THE RECORD ID CODE AGAINST FILE
PD75
CHECKS
058
PD17
DIFFERS
PD19B
DECREMENT INDEX REGISTER 2 BY 4 – SET NEW VALUE INTO
PD99F
FALL THRU
038
PD19F
PD19D
FILE NUMBER COMPARE ROUTINE
PD55
SAME
03A
PD19
PD19F
038
SET UP INDEX REGISTER 2 FROM VALUE IN
PD98S
PD19G
IS THERE ONLY ONE RECORD OF THIS TYPE IN THIS FILE
NO
YES
DECREMENT INDEX REGISTER 2 BY 4
FALL THRU
SET UP INDEX REGISTER 2 FROM VALUE IN
PD98S
PD19H
STORE INDEX REGISTER 2 INTO LOCATION
PD99F
02F
PD18F


PD14
03C
CHECK THE RECORD ID CODE AGAINST FILE
PD75
DIFFERS
PD15
READ THE NEXT LOGICAL RECORD FROM USERS TIME TAPE
PD70
CHECKS
PD14A
SET RECORD FOUND INDICATOR INTO FILE DESCRIPTION SET IN
INPAR
SET UP THE INDIVIDUAL FIELDS FROM FIELD DATA IN INPAR
PD60
READ THE NEXT LOGICAL RECORD FROM USERS TIME TAPE
PD70
IS OUT OF ROUTINE FLAG SET
PD98T
NO
02G
PD09
YES
PD14B
03D
SET OUT OF ROUTINE FLAG TO ZERO
PD98T
IS A USERS TIME TAPE SORT REQUIRED
NO
04A
PD14F
YES
IS THERE A CHARGE NO. TIED TO USERS TIME TAPE
YES
04A
PD14F
NO
SEND RECORD TO 1ST PHASE OF 4 TAPE SORT (SORT USERS TIME TAPE)
B$SRTRC
01C
PD01


04A
PDI4F
IS THERE AN S_E PARAMETER CARD
IC07
NO
YES
IS THERE AN S_E VALUE IN THE WORK AREA PTWKA+11
NO
SET THE S_E WORK AREA EQUAL TO THE T_E WORK AREA
PTWKA+12
YES
PDI4H
IS THERE AN S_L PARAMETER CARD
IC09
NO
YES
IS THERE AN S_L VALUE IN THE WORK AREA PTWKA+13
NO
SET THE S_L WORK AREA EQUAL TO THE T_L WORK AREA
PTWKA+14
YES
PDI4J
IS THERE A t_g PARAMETER CARD
IC12
NO
YES
IS THERE A t_g VALUE IN THE WORK AREA PTWKA+16
NO
SET THE t_g WORK AREA EQUAL TO THE t_g WORK AREA
PTWKA+17
YES
PDI4L
IS THERE AN NETWORK DESCRIPTION PARAMETER CARD
IC02
NO
SET BLANKS INTO THE 6 WORDS OF NETWORK DESCRIPTION STARTING AT WORK AREA
PTWKA+29
YES
PDI4N
IS THERE AN ACTUAL DATE FOR THIS ACTIVITY
PTWKA+36
YES
SET ACTUAL DATE INTO
S_E - PTWKA+11
T_E - PTWKA+12
S_L - PTWKA+13
T_L - PTWKA+14
SET SLACK TO ZERO
NO
PDI4R
IS THERE AN ACTIVITY DESCRIPTION PARAMETER CARD
IC15
NO
SET BLANKS INTO THE 9 WORDS OF ACTIVITY DESCRIPTION STARTING AT WORK AREA
PTWKA+19
YES
04B
PDI4P
04B
PDI4P
IS THERE A SLACK PARAMETER CARD
IC14
YES
04C
PDI4Q
NO
SET SLACK FIELD IN WORK AREA TO ZERO
PTWKA+18
CONVERT S_E TO A WORKDAY VALUE
WICAR
BAD DATE
04C
PDI4O
CONVERT S_L TO A WORKDAY VALUE
WICAR
BAD DATE
04C
PDI4O
SUBTRACT S_E FROM S_L WORKDAYS SET VALUE INTO WEEKS x10 AND SET INTO
PTWKA+18
PDI4O
04C
CONVERT S_E TO A WORKDAY VALUE
WICAR
BAD DATE
PDI4T
SET WORK PACKAGE START DATE TO ZERO
PTWKA+36
ROUTINE OUTLINE 1,4
SUBTRACT THE FLOW TIME (t_g) FROM S_E WORKDAYS
CONVERT THE DIFFERENCE (WORK PACKAGE START DATE) TO A CALENDAR DATE
WICAR
SET WORK PACKAGE START DATE INTO
PTWKA+38
ROUTINE OUTLINE 1,4


PD16
SET MANY FLAG TO A NON-ZERO VALUE
PD98U
05A
CHECK THE RECORD ID CODE AGAINST FILE
PD75
05C
DIFFERS
02D
PD18
PD17
SET RECORD FOUND INDICATOR INTO FILE DESCRIPTION SET IN
INPAR
05B
SET UP THE INDIVIDUAL FIELDS FROM FIELD DATA IN INPAR
PD60
READ THE NEXT LOGICAL RECORD FROM USERS TIME TAPE
PD70
IS OUT OF ROUTINE FLAG SET
PD98T
NO
05C
PD16A
YES
03D
PD14B
PD20
IS USERS TAPE COMPLETELY FINISHED
PD98W
05D
YES
05F
PD22
NO
IS THIS ONE FILE COMPLETELY FINISHED
PD98X
NO
02B
PD08
YES
SET FILE FINISHED INDICATOR TO ZERO
PD98X
01B
PD04
PD21
IS THIS THE FIRST READ OF THE USERS TAPE
PD99A
05E
YES
SET OUT ON-LINE MESSAGE "FIRST WORD ON INPUT PARAMETERS IS BLANK"
PROGRAM STOP
NO
PD22
SET UP REWIND AND UNLOAD MESSAGES FOR USERS TIME TAPE USING SWITCH RMSWG IN
RCOM
05F
PD22D
SET SWITCH BACK TO NOP POSITION
RMSWG
05G
IS THIS TAPE TO BE SORTED
IN PAR
YES
06A
PD23
NO
SET USERS TIME TAPE END OF FILE INDICATOR
PR95
PD22F
ARE THE OTHER TAPES AT E.O.F.
PR96
PR99
NO
SET IN PSUEDO NUMBER (ALL 1 BITS) INTO USERS TIME TAPE WORK AREA
PTWKA
YES
ENDPM
01A
ENDPM
ROUTINE OUTLINK
1,4


PD23
06A
OPERATE MERGE PHASE OF 4 TAPE SORT (SORT USERS TIME TAPE)
B $ SRTND
MERGE COMPLETED
PD23A
SET THE SORT COMPLETED INDICATOR TO NON-ZERO
PD98V
BRING THE FIRST PHASE OF THE ACTIVITY TO CHARGE NUMBER SORT INTO CORE
PD23D
SET THE SORT REQUIRED SLOT IN INPAR TABLE TO ZERO
INPAR
DID THE TIME TAPE SORT FINISH ON THE A OR B TAPE BANK
A
REVERSE THE TAPE SETUP FOR THE ACTIVITY TO CHARGE NUMBER SORT
B OR C
PD23B
06B
READ ONE RECORD AT A TIME FROM SORTED TIME TAPE IN SEQUENCE
B $ SRTFN
E.O.F.
06C
PD23E
ERROR
PROGRAM STOP
PD23C
MOVE RECORD INTO USERS TIME WORK AREA
PTWKA
03D
PD14B
PD23E
06C
SET USERS TIME TAPE E.O.F INDICATOR
PR95
ARE THE OTHER TAPES AT E.O.F.
PR96
PR99
YES
ENDPM
01A
ENDPM
NO
SET IN PSUEDO NUMBER (ALL 1 BITS) INTO USERS TIME TAPE WORK AREA
PTWKA
03D
PD14B
PD24
06D
IS THE RECORD TYPE ON THIS FILE DESCRIPTION SET EQUAL TO ZERO
NO
SET OUT ON-LINE MESSAGE "TWO E.O.F. MARKS WITH NO PARAMETER INDICATION"
PROGRAM STOP
YES
PD24B
UNDEFINE THE FILE FOR READ OF USERS TIME TAPE - CODE 3
READ
ERROR
RCOM
03B
RM26
DECREMENT INDEX REGISTER 2 BY 4
01A
PD02
FALL THRU
05F
PD22

Region PD50

EXPLANATION OF REGION:

This region will convert a binary predecessor or successor number to a BCD configuration.

CALLING SEQUENCE:

```
L     TRA   PD50
```

INPUT:

The binary value in the location PD69G.

OUTPUT:

The BCD configuration of the binary value in PTWKA.

STORAGE USED:

PD69W and PD69X contain the BCD value after the FTB subroutine.

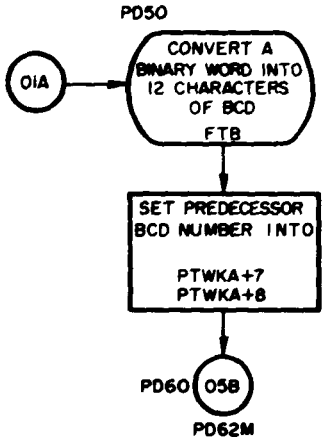
SUBREGIONS AND SUBROUTINES USED:

FTB

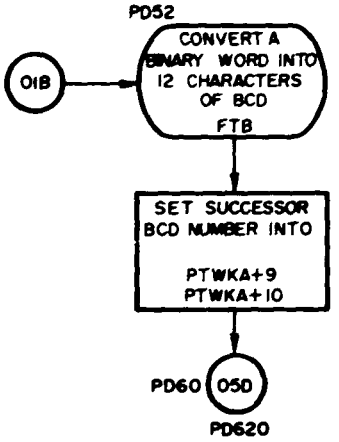
EXPLANATION OF CALLING SEQUENCE:

At the end of this routine, control is transferred back to the predecessor or successor area.

CONVERT BINARY PE NUMBER TO BCD



CONVERT BINARY SE NUMBER TO BCD



Region PD55

EXPLANATION OF REGION:

This routine will check the file number between two blocks in the file description area.

CALLING SEQUENCE:

L	TSX PD55, 4
L + 1	File number is zero return
L + 2	File numbers are equal return
L + 3	File numbers are different return

INPUT:

Old file number in PD99G.

OUTPUT:

Not applicable.

STORAGE USED:

Not applicable.

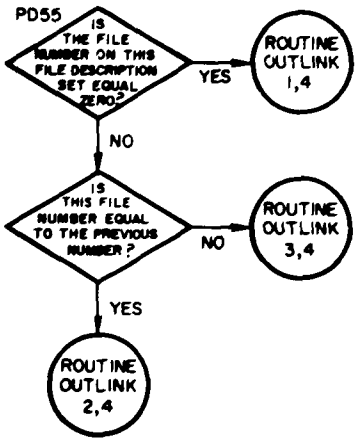
SUBREGIONS AND SUBROUTINES USED:

Not applicable.

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

COMPARE FILE NUMBERS
FROM INPAR FILE
DESCRIPTION SETS



Region PD60

EXPLANATION OF REGION:

This routine will set up the individual fields from the field description block translation of the USERS TIME TAPE. It will also check sequence on the USERS TIME TAPE.

CALLING SEQUENCE:

L TSX PD60, 4

L + 1 Normal return

INPUT:

USERS TIME TAPE

INPAR parameter table

OUTPUT:

A selected time information record in the PTWKA block.

STORAGE USED:

Not applicable.

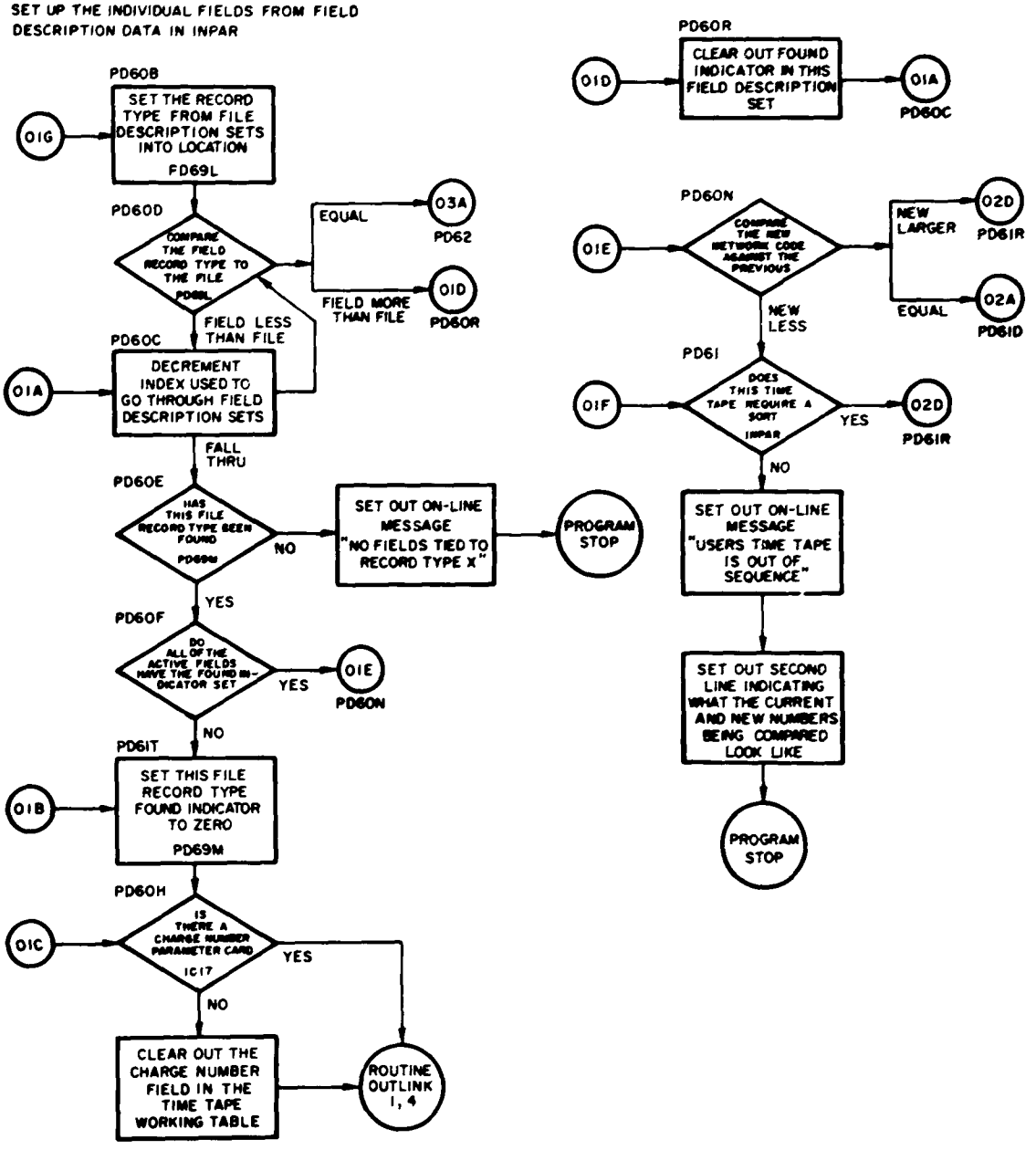
SUBREGIONS AND SUBROUTINES USED:

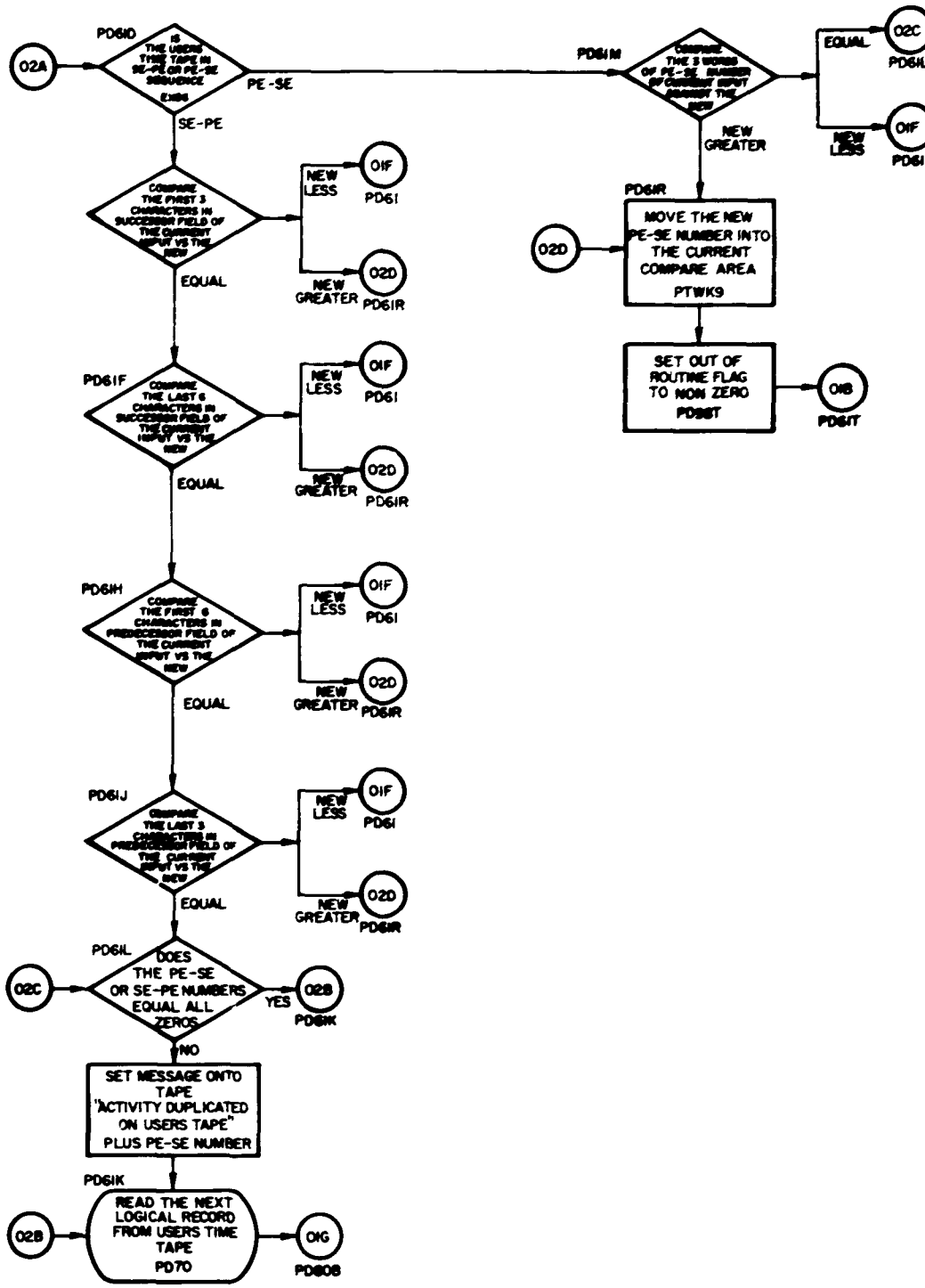
PD68	WICAR	PD66
PD67	PD65	

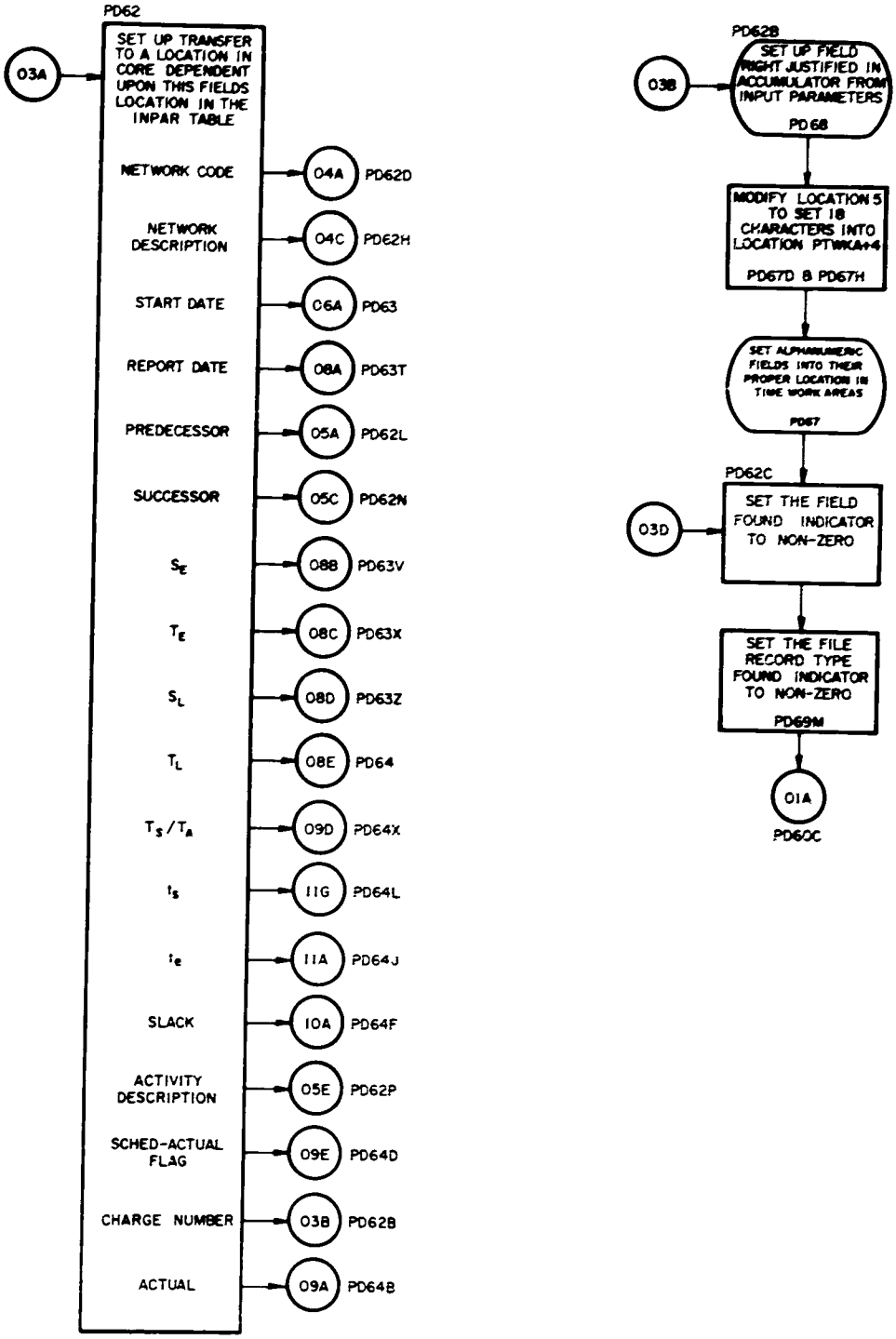
EXPLANATION OF CALLING SEQUENCE:

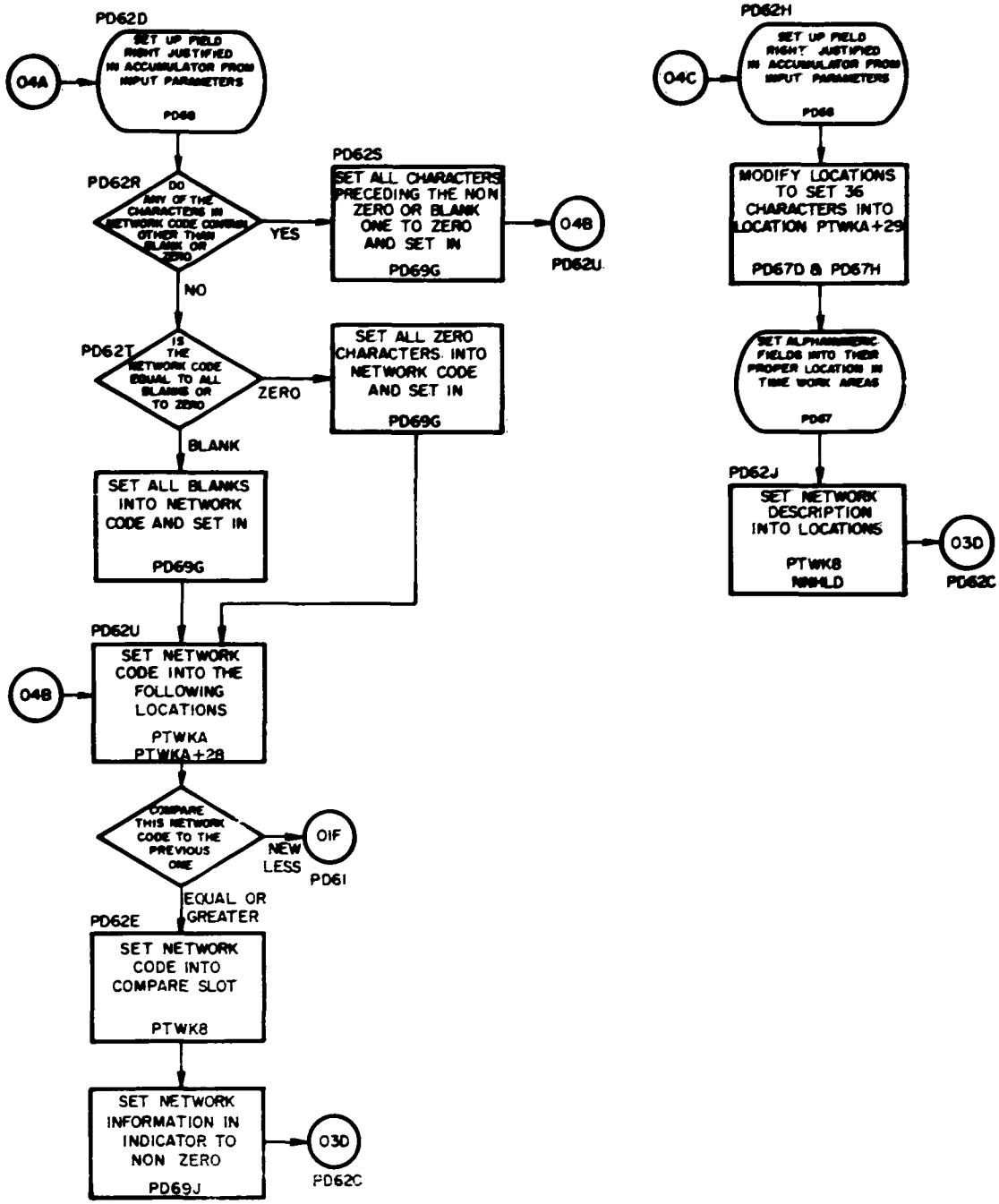
If an error occurs, the reason for the error is set out either on the on-line printer or the SYSTEM ERROR TAPE. The system may then stop if the problem warrants it.

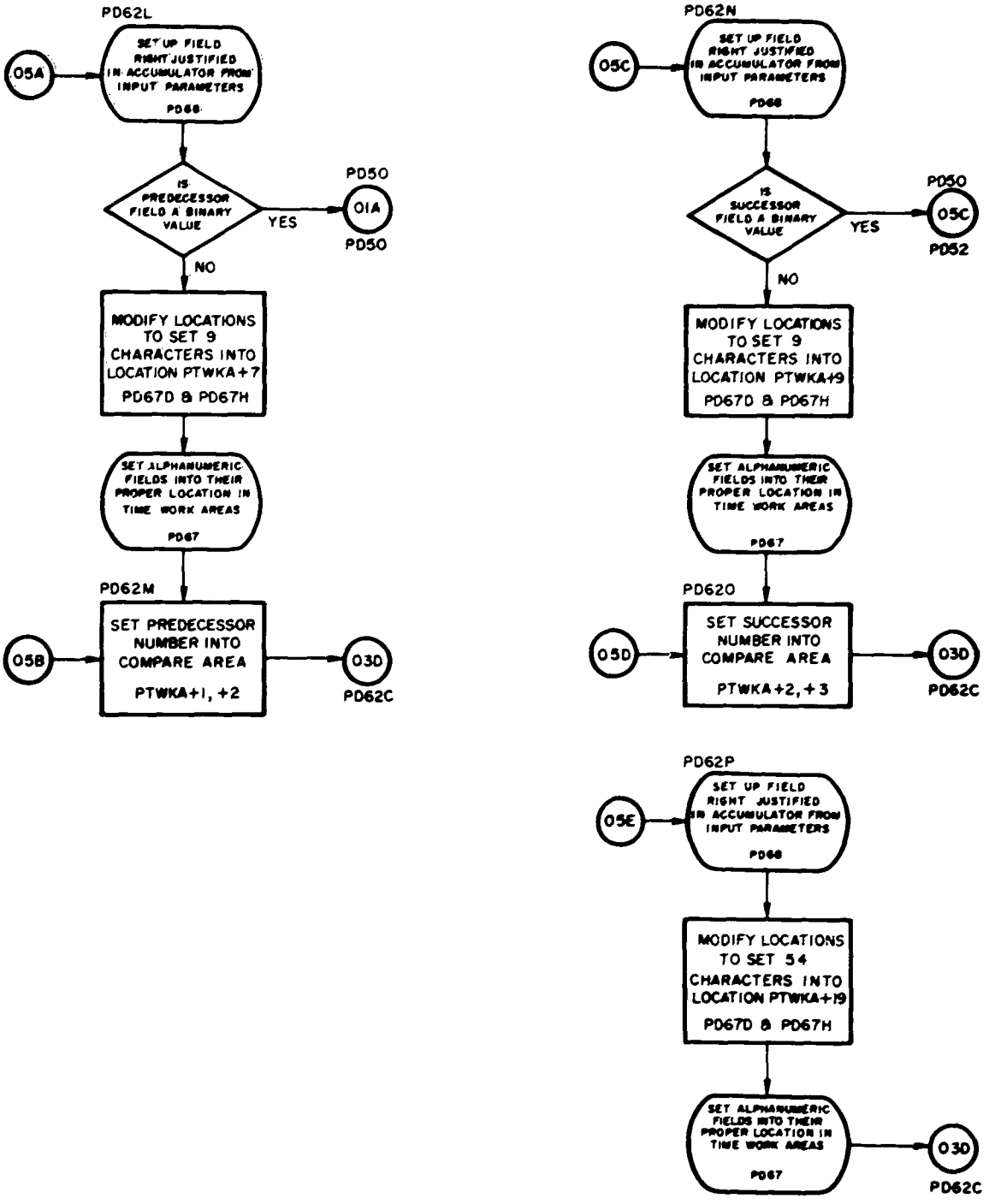
SET UP THE INDIVIDUAL FIELDS FROM FIELD DESCRIPTION DATA IN INPAR

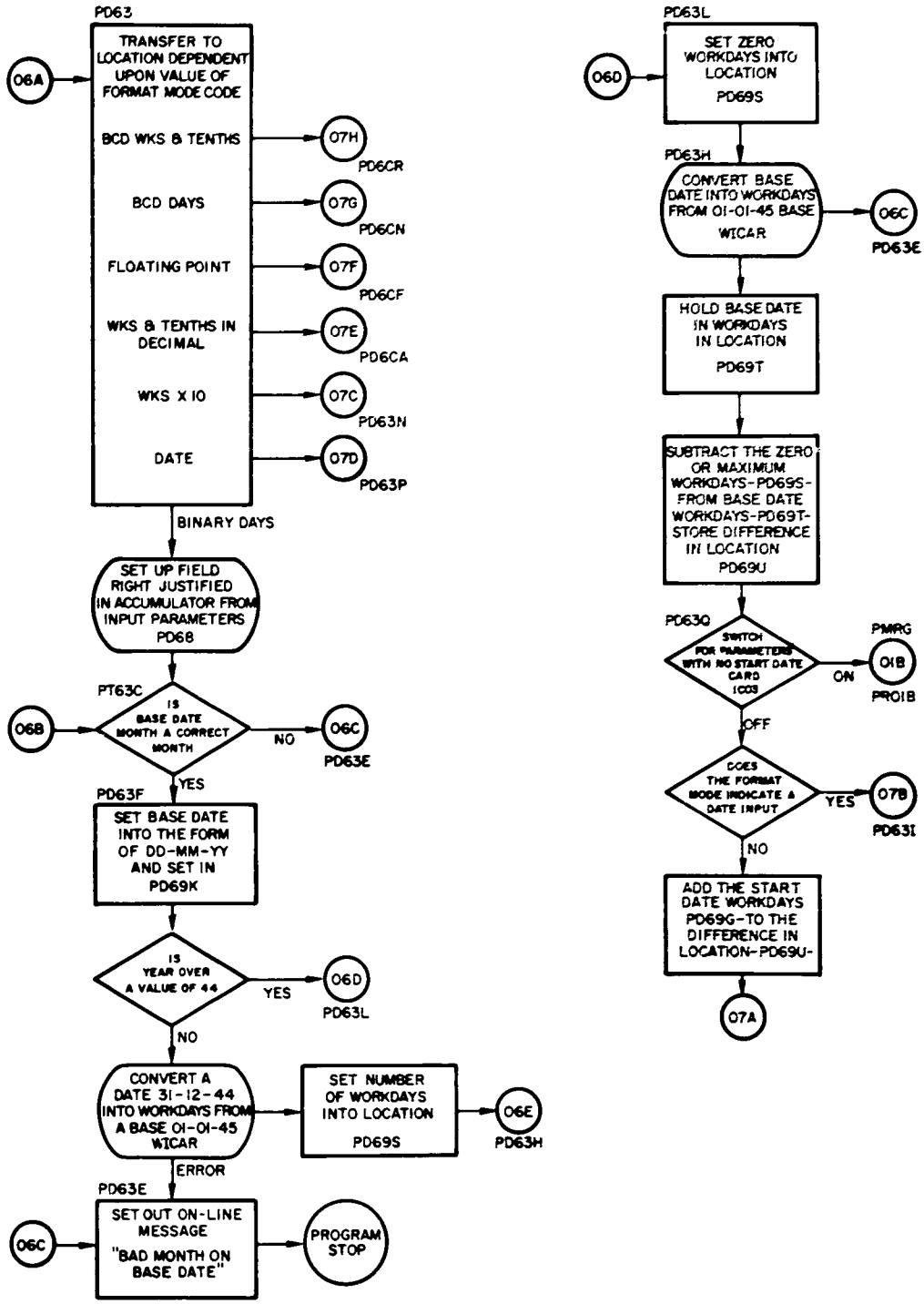


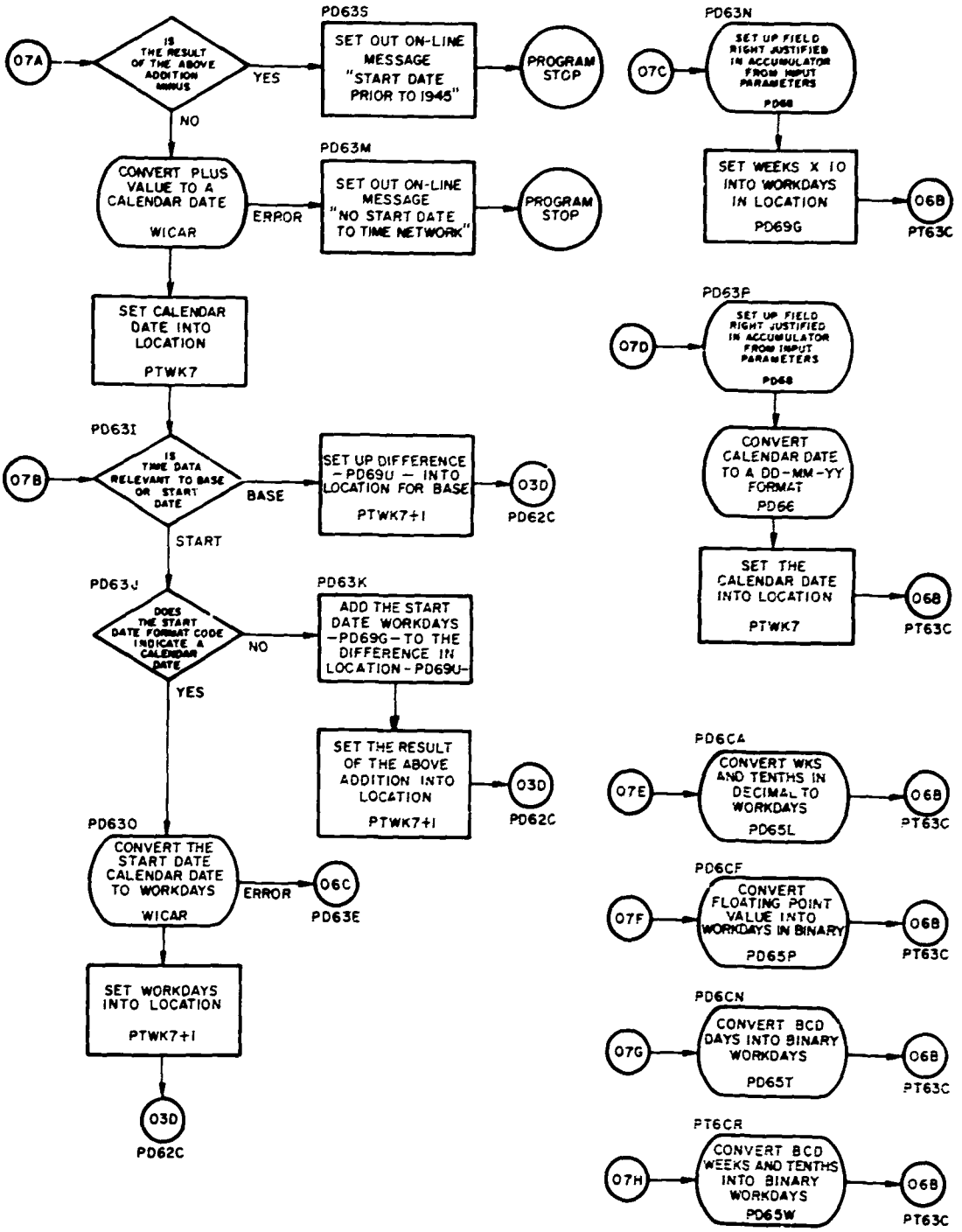

02A
PD61D
IS THE USERS TYPE TAPE IN SE-PE OR PE-SE SEQUENCE
EXISTS
PE-SE
SE-PE
PD61M
COMPARE THE 3 WORDS OF PE-SE NUMBER OF CURRENT INPUT AGAINST THE NEW
EQUAL
02C
PD61L
NEW LESS
01F
PD61
NEW GREATER
PD61R
02D
MOVE THE NEW PE-SE NUMBER INTO THE CURRENT COMPARE AREA
PTWK9
SET OUT OF ROUTINE FLAG TO NON ZERO
PD98T
01B
PD61T
COMPARE THE FIRST 3 CHARACTERS IN SUCCESSOR FIELD OF THE CURRENT INPUT VS THE NEW
EQUAL
PD61F
COMPARE THE LAST 6 CHARACTERS IN SUCCESSOR FIELD OF THE CURRENT INPUT VS THE NEW
PD61H
COMPARE THE FIRST 6 CHARACTERS IN PREDECESSOR FIELD OF THE CURRENT INPUT VS THE NEW
PD61J
COMPARE THE LAST 3 CHARACTERS IN PREDECESSOR FIELD OF THE CURRENT INPUT VS THE NEW
PD61L
DOES THE PE-SE OR SE-PE NUMBERS EQUAL ALL ZEROS
YES
02B
PD61K
NO
SET MESSAGE ONTO TAPE "ACTIVITY DUPLICATED ON USERS TAPE" PLUS PE-SE NUMBER
PD61K
READ THE NEXT LOGICAL RECORD FROM USERS TIME TAPE
PD70
01G
PD80B

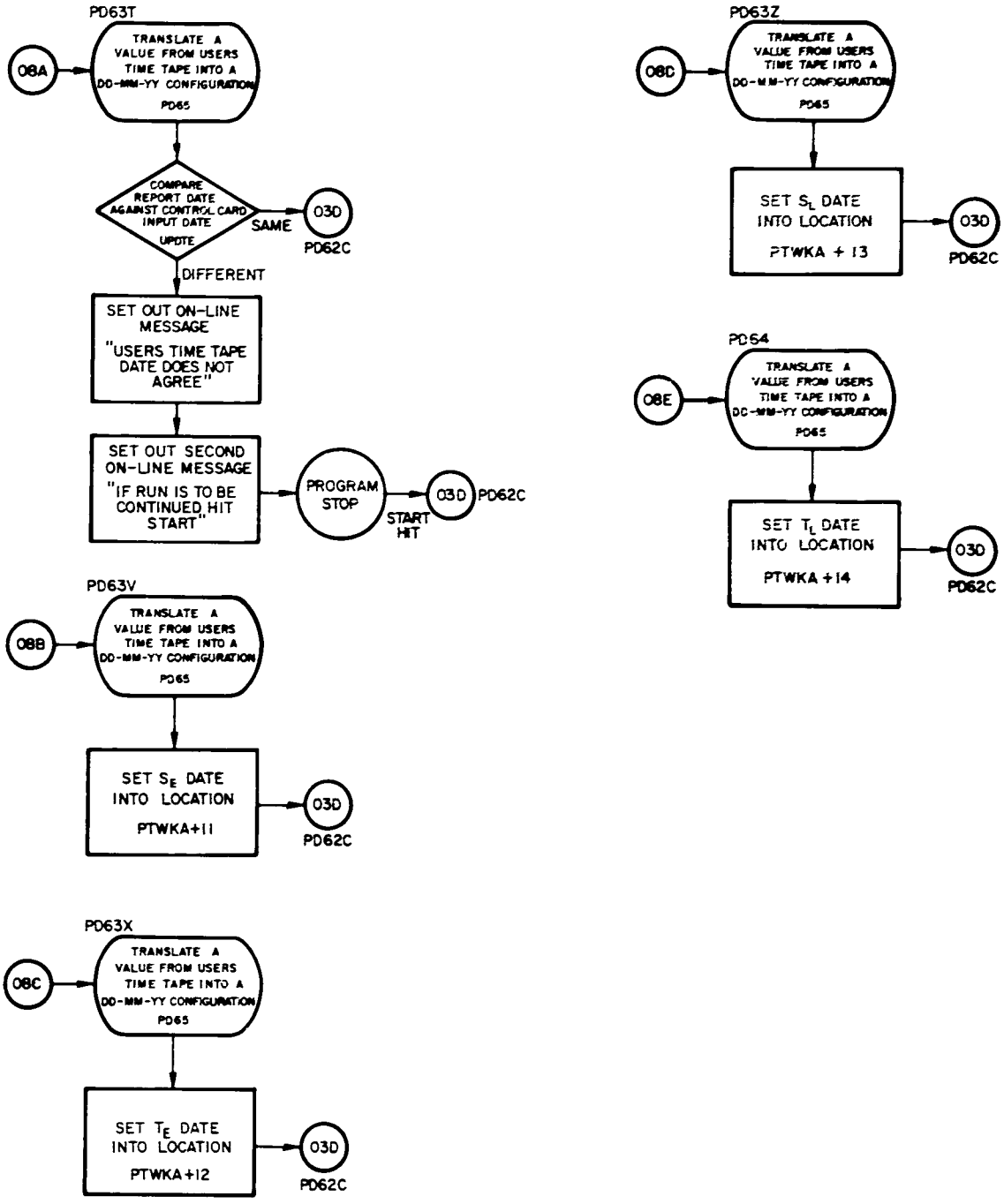

PD62
03A
SET UP TRANSFER TO A LOCATION IN CORE DEPENDENT UPON THIS FIELDS LOCATION IN THE INPAR TABLE
NETWORK CODE
04A
PD62D
NETWORK DESCRIPTION
04C
PD62H
START DATE
06A
PD63
REPORT DATE
08A
PD63T
PREDECESSOR
05A
PD62L
SUCCESSOR
05C
PD62N
S_E
08B
PD63V
T_E
08C
PD63X
S_L
08D
PD63Z
T_L
08E
PD64
T_S/T_A
09D
PD64X
t_s
11G
PD64L
t_e
11A
PD64J
SLACK
10A
PD64F
ACTIVITY DESCRIPTION
05E
PD62P
SCHED-ACTUAL FLAG
09E
PD64D
CHARGE NUMBER
03B
PD62B
ACTUAL
09A
PD64B
PD62B
03B
SET UP FIELD RIGHT JUSTIFIED IN ACCUMULATOR FROM INPUT PARAMETERS
PD68
MODIFY LOCATION 5 TO SET 18 CHARACTERS INTO LOCATION PTWKA+4
PD67D & PD67H
SET ALPHANUMERIC FIELDS INTO THEIR PROPER LOCATIONS IN TIME WORK AREAS
PD67
PD62C
03D
SET THE FIELD FOUND INDICATOR TO NON-ZERO
SET THE FILE RECORD TYPE FOUND INDICATOR TO NON-ZERO
PD69M
01A
PD60C

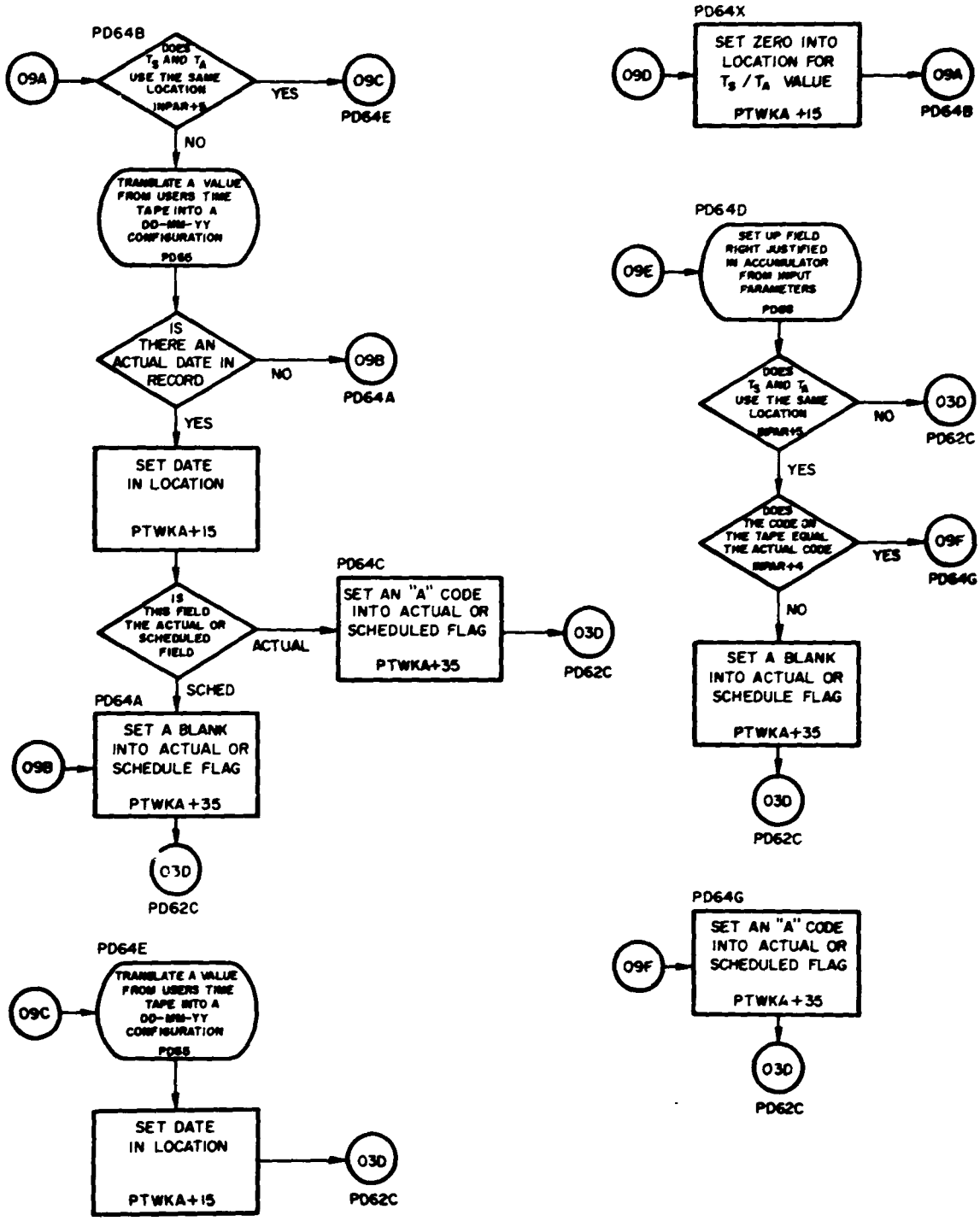

PD62D
SET UP FIELD RIGHT JUSTIFIED IN ACCUMULATOR FROM INPUT PARAMETERS
PD68
04A
PD62R
DO ANY OF THE CHARACTERS IN NETWORK CODE CONTAIN OTHER THAN BLANK OR ZERO
YES
PD62S
SET ALL CHARACTERS PRECEDING THE NON ZERO OR BLANK ONE TO ZERO AND SET IN
PD69G
04B
PD62U
NO
PD62T
IS THE NETWORK CODE EQUAL TO ALL BLANKS OR TO ZERO
ZERO
SET ALL ZERO CHARACTERS INTO NETWORK CODE AND SET IN
PD69G
BLANK
SET ALL BLANKS INTO NETWORK CODE AND SET IN
PD69G
PD62U
SET NETWORK CODE INTO THE FOLLOWING LOCATIONS
PTWKA
PTWKA+28
04B
COMPARE THIS NETWORK CODE TO THE PREVIOUS ONE
NEW LESS
01F
PD61
EQUAL OR GREATER
PD62E
SET NETWORK CODE INTO COMPARE SLOT
PTWK8
SET NETWORK INFORMATION IN INDICATOR TO NON ZERO
PD69J
03D
PD62C
PD62H
SET UP FIELD RIGHT JUSTIFIED IN ACCUMULATOR FROM INPUT PARAMETERS
PD68
04C
MODIFY LOCATIONS TO SET 36 CHARACTERS INTO LOCATION PTWKA+29
PD67D & PD67H
SET ALPHANUMERIC FIELDS INTO THEIR PROPER LOCATIONS IN TIME WORK AREAS
PD67
PD62J
SET NETWORK DESCRIPTION INTO LOCATIONS
PTWK8
NNNLD
03D
PD62C

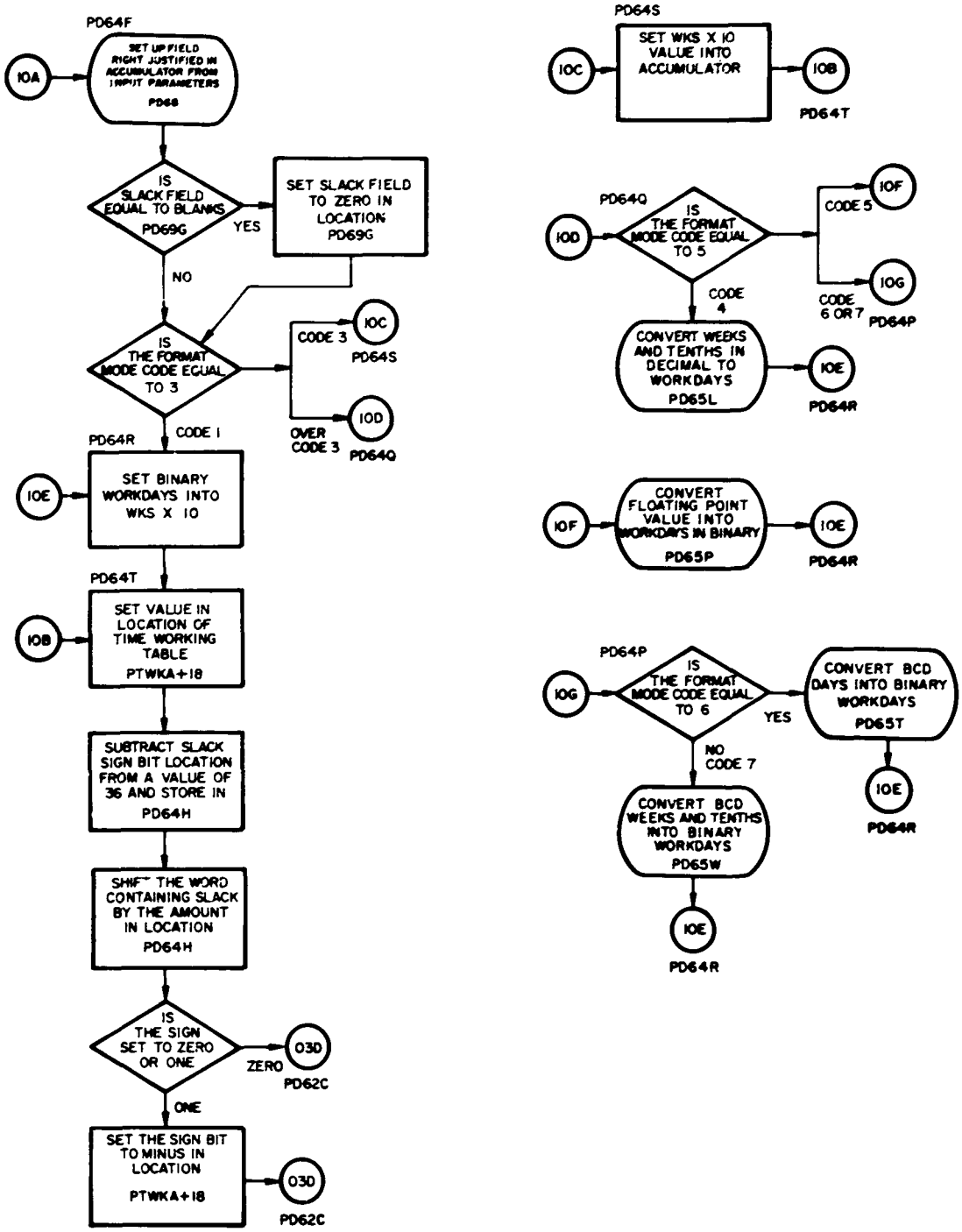

PD62L
05A
SET UP FIELD RIGHT JUSTIFIED IN ACCUMULATOR FROM INPUT PARAMETERS
PD68
IS PREDECESSOR FIELD A BINARY VALUE
YES
PD50
01A
PD50
NO
MODIFY LOCATIONS TO SET 9 CHARACTERS INTO LOCATION PTWKA+7
PD67D & PD67H
SET ALPHANUMERIC FIELDS INTO THEIR PROPER LOCATION IN TIME WORK AREAS
PD67
PD62M
05B
SET PREDECESSOR NUMBER INTO COMPARE AREA
PTWKA+1, +2
030
PD62C
PD62N
05C
SET UP FIELD RIGHT JUSTIFIED IN ACCUMULATOR FROM INPUT PARAMETERS
PD68
IS SUCCESSOR FIELD A BINARY VALUE
YES
PD50
05C
PD52
NO
MODIFY LOCATIONS TO SET 9 CHARACTERS INTO LOCATION PTWKA+9
PD67D & PD67H
SET ALPHANUMERIC FIELDS INTO THEIR PROPER LOCATION IN TIME WORK AREAS
PD67
PD62O
05D
SET SUCCESSOR NUMBER INTO COMPARE AREA
PTWKA+2, +3
030
PD62C
PD62P
05E
SET UP FIELD RIGHT JUSTIFIED IN ACCUMULATOR FROM INPUT PARAMETERS
PD68
MODIFY LOCATIONS TO SET 54 CHARACTERS INTO LOCATION PTWKA+19
PD67D & PD67H
SET ALPHANUMERIC FIELDS INTO THEIR PROPER LOCATION IN TIME WORK AREAS
PD67
030
PD62C

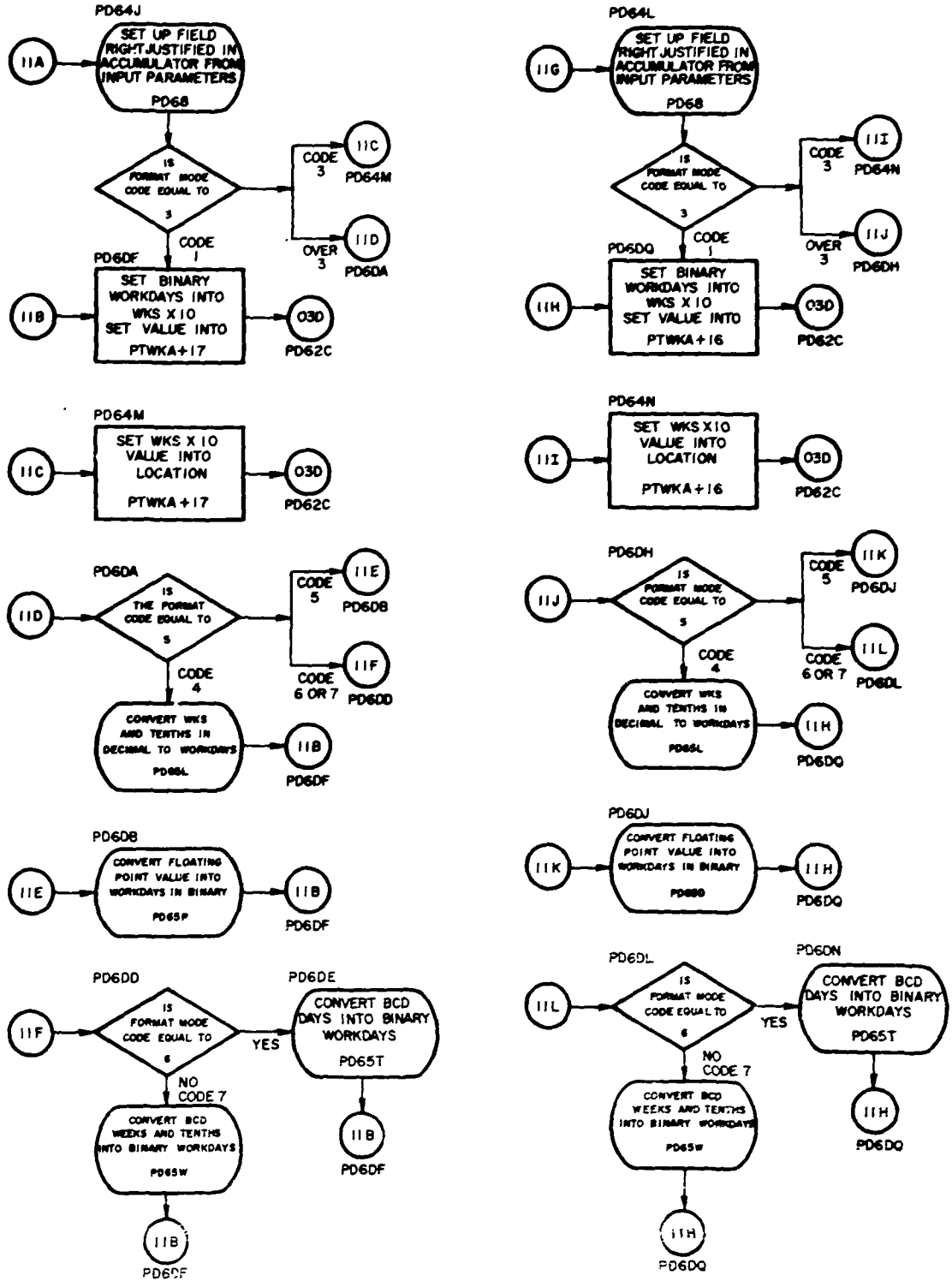

PD63
06A
TRANSFER TO LOCATION DEPENDENT UPON VALUE OF FORMAT MODE CODE
BCD WKS & TENTHS
07H
PD6CR
BCD DAYS
07G
PD6CN
FLOATING POINT
07F
PD6CF
WKS & TENTHS IN DECIMAL
07E
PD6CA
WKS X 10
07C
PD63N
DATE
07D
PD63P
BINARY DAYS
SET UP FIELD RIGHT JUSTIFIED IN ACCUMULATOR FROM INPUT PARAMETERS
PD68
PT63C
06B
IS BASE DATE MONTH A CORRECT MONTH
NO
06C
PD63E
YES
PD63F
SET BASE DATE INTO THE FORM OF DD-MM-YY AND SET IN PD69K
IS YEAR OVER A VALUE OF 44
YES
06D
PD63L
NO
CONVERT A DATE 31-12-44 INTO WORKDAYS FROM A BASE 01-01-45 WICAR
SET NUMBER OF WORKDAYS INTO LOCATION PD69S
06E
PD63H
ERROR
PD63E
06C
SET OUT ON-LINE MESSAGE "BAD MONTH ON BASE DATE"
PROGRAM STOP
PD63L
06D
SET ZERO WORKDAYS INTO LOCATION PD69S
PD63H
CONVERT BASE DATE INTO WORKDAYS FROM 01-01-45 BASE WICAR
06C
PD63E
HOLD BASE DATE IN WORKDAYS IN LOCATION PD69T
SUBTRACT THE ZERO OR MAXIMUM WORKDAYS-PD69S- FROM BASE DATE WORKDAYS-PD69T- STORE DIFFERENCE IN LOCATION PD69U
PD63Q
SWITCH FOR PARAMETERS WITH NO START DATE CARD ICO3
PMRG
ON
01B
PR01B
OFF
DOES THE FORMAT MODE INDICATE A DATE INPUT
YES
07B
PD63I
NO
ADD THE START DATE WORKDAYS PD69G-TO THE DIFFERENCE IN LOCATION-PD69U-
07A


07A
IS THE RESULT OF THE ABOVE ADDITION MINUS
YES
NO
PD63S
SET OUT ON-LINE MESSAGE "START DATE PRIOR TO 1945"
PROGRAM STOP
CONVERT PLUS VALUE TO A CALENDAR DATE
WICAR
ERROR
PD63M
SET OUT ON-LINE MESSAGE "NO START DATE TO TIME NETWORK"
PROGRAM STOP
SET CALENDAR DATE INTO LOCATION
PTWK7
PD63I
07B
IS TIME DATA RELEVANT TO BASE OR START DATE
BASE
START
SET UP DIFFERENCE -PD69U- INTO LOCATION FOR BASE
PTWK7+1
03D
PD62C
PD63J
DOES THE START DATE FORMAT CODE INDICATE A CALENDAR DATE
NO
YES
PD63K
ADD THE START DATE WORKDAYS -PD69G- TO THE DIFFERENCE IN LOCATION - PD69U-
SET THE RESULT OF THE ABOVE ADDITION INTO LOCATION
PTWK7+1
03D
PD62C
PD63O
CONVERT THE START DATE CALENDAR DATE TO WORKDAYS
WICAR
ERROR
06C
PD63E
SET WORKDAYS INTO LOCATION
PTWK7+1
03D
PD62C
PD63N
07C
SET UP FIELD RIGHT JUSTIFIED IN ACCUMULATOR FROM INPUT PARAMETERS
PD68
SET WEEKS X 10 INTO WORKDAYS IN LOCATION
PD69G
06B
PT63C
PD63P
07D
SET UP FIELD RIGHT JUSTIFIED IN ACCUMULATOR FROM INPUT PARAMETERS
PD68
CONVERT CALENDAR DATE TO A DD-MM-YY FORMAT
PD66
SET THE CALENDAR DATE INTO LOCATION
PTWK7
06B
PT63C
PD6CA
07E
CONVERT WKS AND TENTHS IN DECIMAL TO WORKDAYS
PD65L
06B
PT63C
PD6CF
07F
CONVERT FLOATING POINT VALUE INTO WORKDAYS IN BINARY
PD65P
06B
PT63C
PD6CN
07G
CONVERT BCD DAYS INTO BINARY WORKDAYS
PD65T
06B
PT63C
PT6CR
07H
CONVERT BCD WEEKS AND TENTHS INTO BINARY WORKDAYS
PD65W
06B
PT63C


PD63T
08A
TRANSLATE A VALUE FROM USERS TIME TAPE INTO A DD-MM-YY CONFIGURATION
PD65
COMPARE REPORT DATE AGAINST CONTROL CARD INPUT DATE
UPDTE
SAME
03D
PD62C
DIFFERENT
SET OUT ON-LINE MESSAGE "USERS TIME TAPE DATE DOES NOT AGREE"
SET OUT SECOND ON-LINE MESSAGE "IF RUN IS TO BE CONTINUED, HIT START"
PROGRAM STOP
START HIT
03D
PD62C
PD63V
08B
TRANSLATE A VALUE FROM USERS TIME TAPE INTO A DD-MM-YY CONFIGURATION
PD65
SET S_E DATE INTO LOCATION
PTWKA+11
03D
PD62C
PD63X
08C
TRANSLATE A VALUE FROM USERS TIME TAPE INTO A DD-MM-YY CONFIGURATION
PD65
SET T_E DATE INTO LOCATION
PTWKA+12
03D
PD62C
PD63Z
08D
TRANSLATE A VALUE FROM USERS TIME TAPE INTO A DD-MM-YY CONFIGURATION
PD65
SET S_L DATE INTO LOCATION
PTWKA + 13
03D
PD62C
PD64
08E
TRANSLATE A VALUE FROM USERS TIME TAPE INTO A DD-MM-YY CONFIGURATION
PD65
SET T_L DATE INTO LOCATION
PTWKA +14
03D
PD62C


PD64B
09A
DOES T_S AND T_A USE THE SAME LOCATION
IMPAR+5
YES
09C
PD64E
NO
TRANSLATE A VALUE FROM USERS TIME TAPE INTO A DD-MM-YY CONFIGURATION
PD66
IS THERE AN ACTUAL DATE IN RECORD
NO
09B
PD64A
YES
SET DATE IN LOCATION
PTWKA+15
PD64C
IS THIS FIELD THE ACTUAL OR SCHEDULED FIELD
ACTUAL
SET AN "A" CODE INTO ACTUAL OR SCHEDULED FLAG
PTWKA+35
03D
PD62C
SCHED
PD64A
09B
SET A BLANK INTO ACTUAL OR SCHEDULE FLAG
PTWKA+35
03D
PD62C
PD64E
09C
TRANSLATE A VALUE FROM USERS TIME TAPE INTO A DD-MM-YY CONFIGURATION
PD66
SET DATE IN LOCATION
PTWKA+15
03D
PD62C
PD64X
09D
SET ZERO INTO LOCATION FOR T_S / T_A VALUE
PTWKA+15
09A
PD64B
PD64D
09E
SET UP FIELD RIGHT JUSTIFIED IN ACCUMULATOR FROM INPUT PARAMETERS
PD66
DOES T_S AND T_A USE THE SAME LOCATION
IMPAR+5
NO
03D
PD62C
YES
DOES THE CODE ON THE TAPE EQUAL THE ACTUAL CODE
IMPAR+4
YES
09F
PD64G
NO
SET A BLANK INTO ACTUAL OR SCHEDULE FLAG
PTWKA+35
03D
PD62C
PD64G
09F
SET AN "A" CODE INTO ACTUAL OR SCHEDULED FLAG
PTWKA+35
03D
PD62C


PD64F
10A
SET UP FIELD RIGHT JUSTIFIED IN ACCUMULATOR FROM INPUT PARAMETERS
PD68
IS SLACK FIELD EQUAL TO BLANKS
PD69G
YES
SET SLACK FIELD TO ZERO IN LOCATION PD69G
NO
IS THE FORMAT MODE CODE EQUAL TO 3
CODE 3
10C
PD64S
OVER CODE 3
10D
PD64Q
CODE 1
PD64R
10E
SET BINARY WORKDAYS INTO WKS X 10
PD64T
10B
SET VALUE IN LOCATION OF TIME WORKING TABLE
PTWKA+18
SUBTRACT SLACK SIGN BIT LOCATION FROM A VALUE OF 36 AND STORE IN
PD64H
SHIFT THE WORD CONTAINING SLACK BY THE AMOUNT IN LOCATION
PD64H
IS THE SIGN SET TO ZERO OR ONE
ZERO
030
PD62C
ONE
SET THE SIGN BIT TO MINUS IN LOCATION
PTWKA+18
030
PD62C
PD64S
10C
SET WKS X 10 VALUE INTO ACCUMULATOR
10B
PD64T
PD64Q
10D
IS THE FORMAT MODE CODE EQUAL TO 5
CODE 5
10F
CODE 6 OR 7
10G
PD64P
CODE 4
CONVERT WEEKS AND TENTHS IN DECIMAL TO WORKDAYS
PD65L
10E
PD64R
10F
CONVERT FLOATING POINT VALUE INTO WORKDAYS IN BINARY
PD65P
10E
PD64R
PD64P
10G
IS THE FORMAT MODE CODE EQUAL TO 6
YES
CONVERT BCD DAYS INTO BINARY WORKDAYS
PD65T
10E
PD64R
NO
CODE 7
CONVERT BCD WEEKS AND TENTHS INTO BINARY WORKDAYS
PD65W
10E
PD64R


PD64J
11A
SET UP FIELD RIGHT JUSTIFIED IN ACCUMULATOR FROM INPUT PARAMETERS
PD68
IS FORMAT MODE CODE EQUAL TO 3
CODE 3
11C
PD64M
OVER 3
11D
PD6DA
CODE 1
PD6DF
11B
SET BINARY WORKDAYS INTO WKS X 10 SET VALUE INTO PTWKA+17
03D
PD62C
PD64L
11G
SET UP FIELD RIGHT JUSTIFIED IN ACCUMULATOR FROM INPUT PARAMETERS
PD68
IS FORMAT MODE CODE EQUAL TO 3
CODE 3
11I
PD64N
OVER 3
11J
PD6DH
CODE 1
PD6DQ
11H
SET BINARY WORKDAYS INTO WKS X 10 SET VALUE INTO PTWKA+16
03D
PD62C
PD64M
11C
SET WKS X 10 VALUE INTO LOCATION PTWKA+17
03D
PD62C
PD64N
11I
SET WKS X 10 VALUE INTO LOCATION PTWKA+16
03D
PD62C
PD6DA
11D
IS THE FORMAT CODE EQUAL TO 5
CODE 5
11E
PD6D8
CODE 6 OR 7
11F
PD6DD
CODE 4
CONVERT WKS AND TENTHS IN DECIMAL TO WORKDAYS
PD65L
11B
PD6DF
PD6DH
11J
IS FORMAT MODE CODE EQUAL TO 5
CODE 5
11K
PD6DJ
CODE 6 OR 7
11L
PD6DL
CODE 4
CONVERT WKS AND TENTHS IN DECIMAL TO WORKDAYS
PD65L
11H
PD6DQ
PD6D8
11E
CONVERT FLOATING POINT VALUE INTO WORKDAYS IN BINARY
PD65P
11B
PD6DF
PD6DJ
11K
CONVERT FLOATING POINT VALUE INTO WORKDAYS IN BINARY
PD65P
11H
PD6DQ
PD6DD
11F
IS FORMAT MODE CODE EQUAL TO 6
YES
PD6DE
CONVERT BCD DAYS INTO BINARY WORKDAYS
PD65T
11B
PD6DF
NO CODE 7
CONVERT BCD WEEKS AND TENTHS INTO BINARY WORKDAYS
PD65W
11B
PD6DF
PD6DL
11L
IS FORMAT MODE CODE EQUAL TO 6
YES
PD6DN
CONVERT BCD DAYS INTO BINARY WORKDAYS
PD65T
11H
PD6DQ
NO CODE 7
CONVERT BCD WEEKS AND TENTHS INTO BINARY WORKDAYS
PD65W
11H
PD6DQ

Region PD65

EXPLANATION OF REGION:

This routine will translate the date fields from the USERS TIME TAPE such as S_E, S_L, T_E, T_L, T_A, and T_S into a DD-MM-YY configuration for the PTWKA block.

CALLING SEQUENCE:

L TSX PD65, 4

L + 1 Normal return

INPUT:

USERS TIME TAPE

INPAR parameter table

OUTPUT:

In the accumulator will be the date in a DD-MM-YY configuration to be set into PTWKA.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

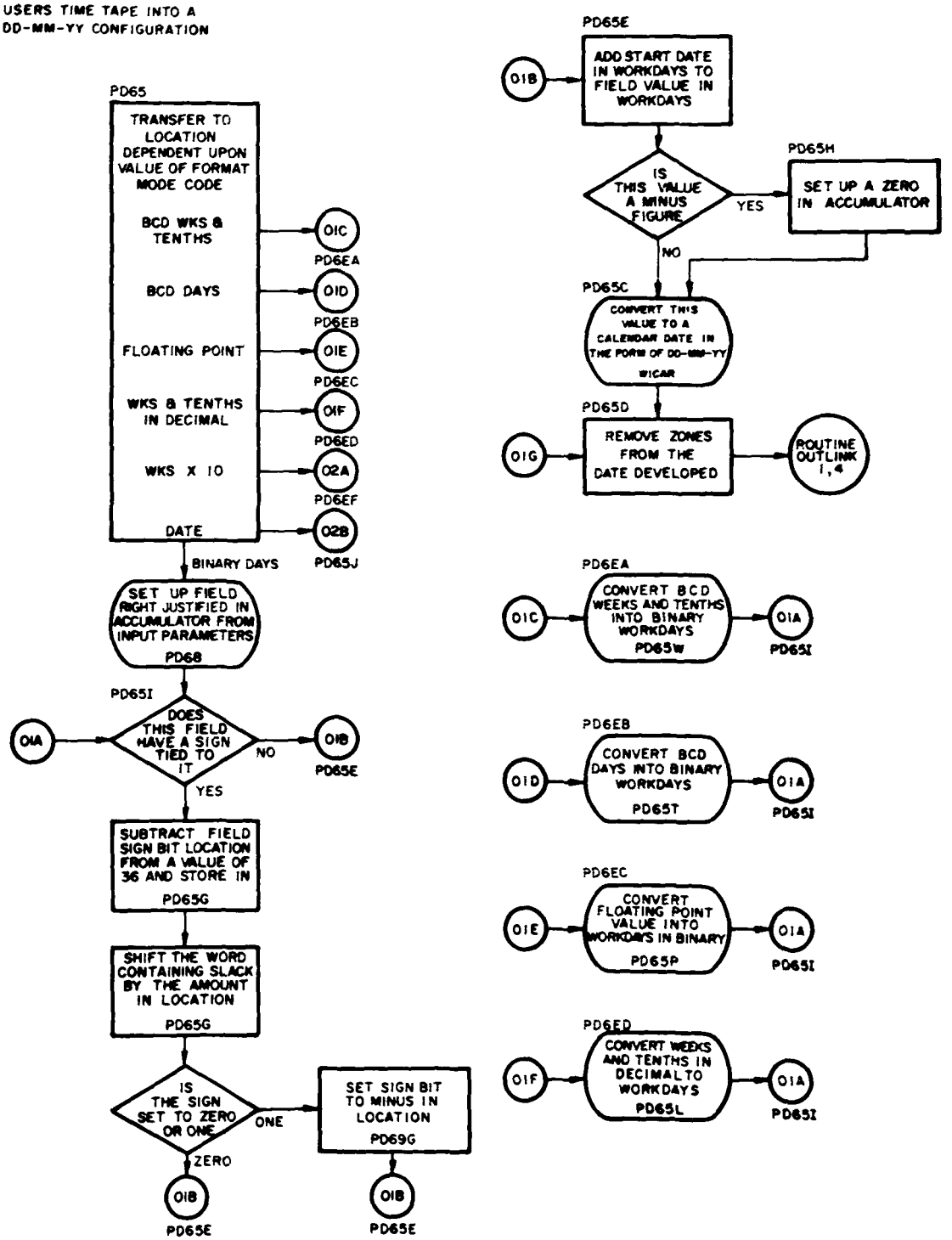
PD68 PD66

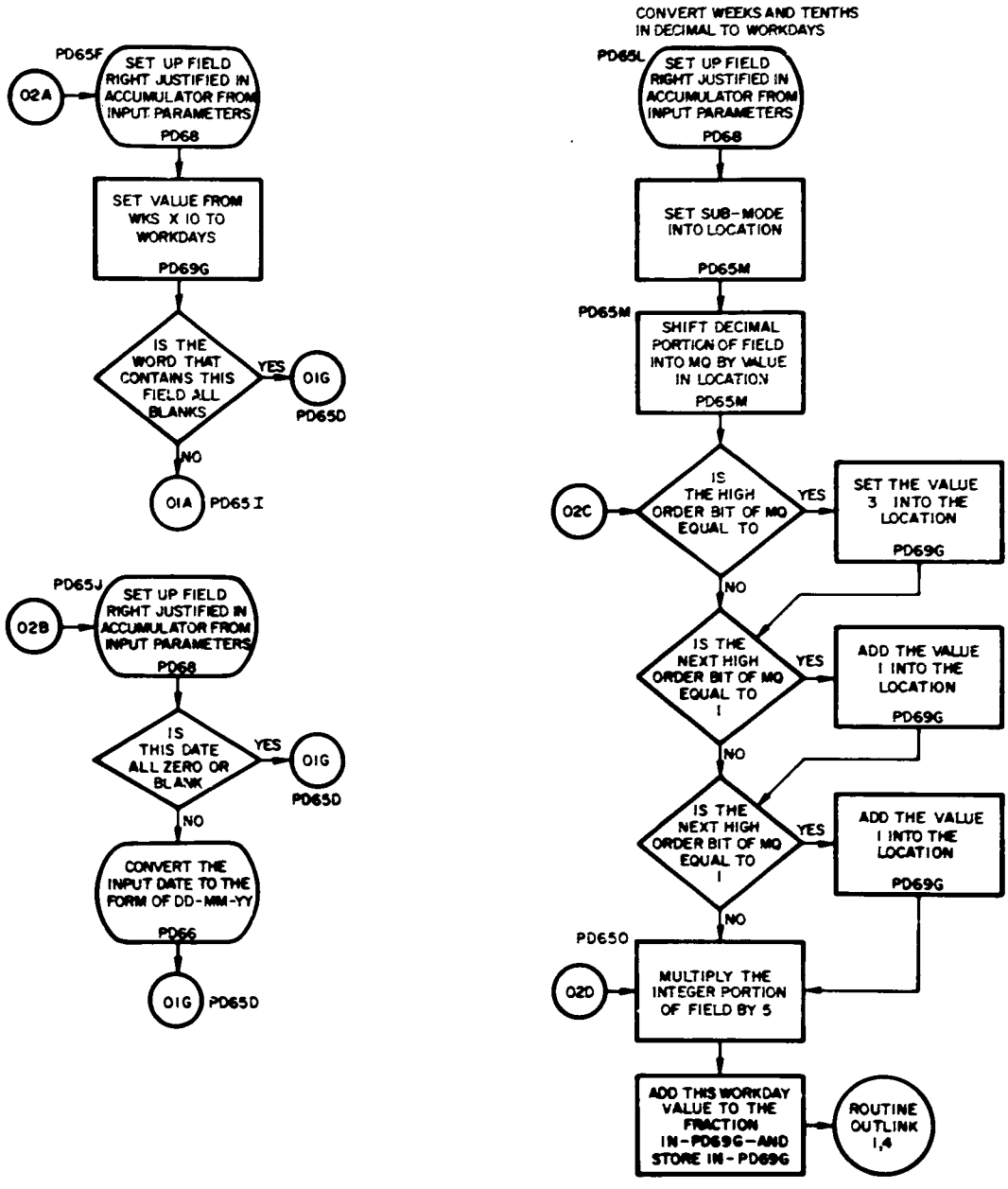
WICAR

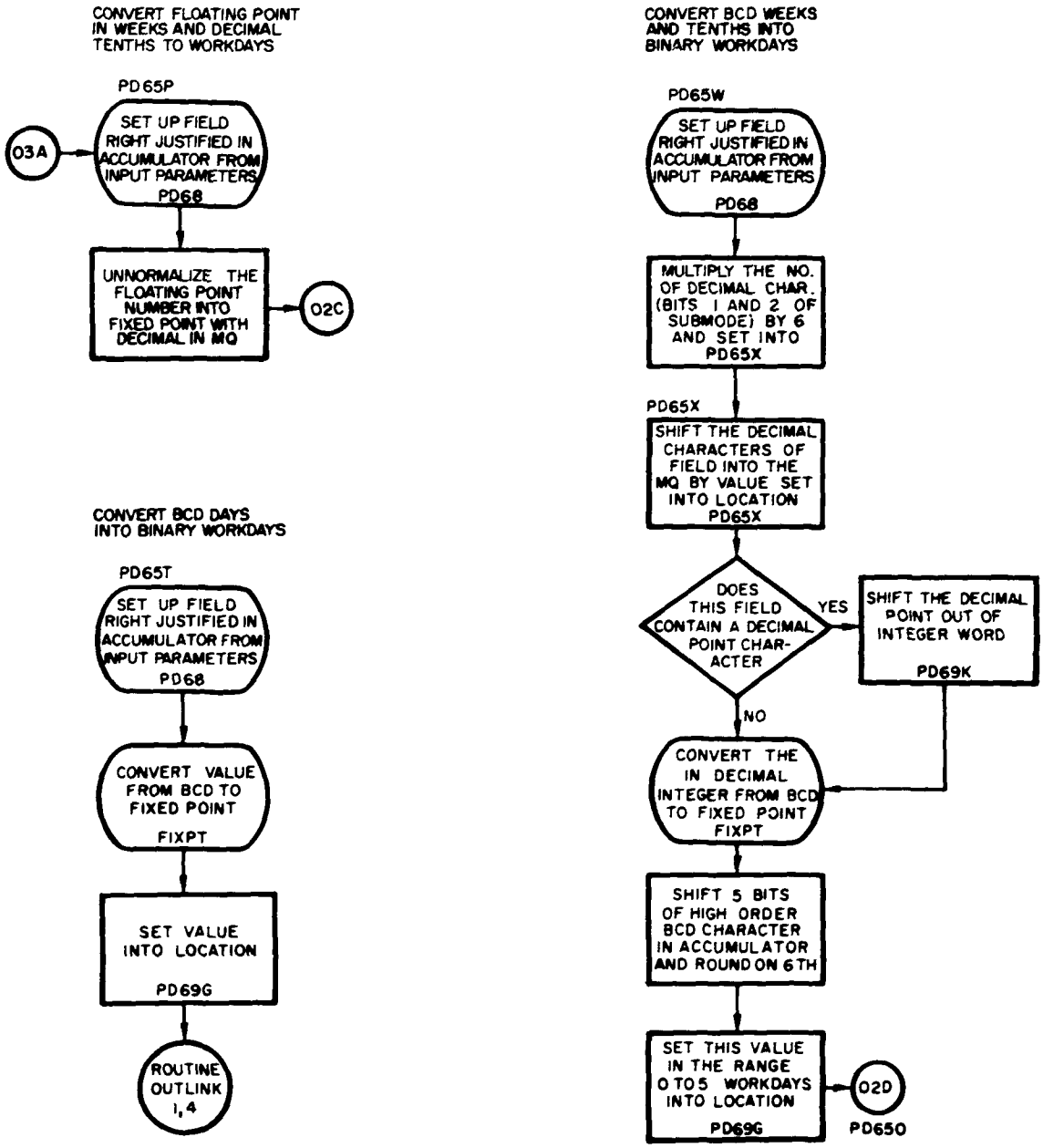
EXPLANATION OF CALLING SEQUENCE:

Not applicable.

TRANSLATE A VALUE FROM USERS TIME TAPE INTO A DD-MM-YY CONFIGURATION




PD65F
02A
SET UP FIELD RIGHT JUSTIFIED IN ACCUMULATOR FROM INPUT PARAMETERS
PD68
SET VALUE FROM WKS X 10 TO WORKDAYS
PD69G
IS THE WORD THAT CONTAINS THIS FIELD ALL BLANKS
YES
01G
PD65D
NO
01A
PD65I
PD65J
02B
SET UP FIELD RIGHT JUSTIFIED IN ACCUMULATOR FROM INPUT PARAMETERS
PD68
IS THIS DATE ALL ZERO OR BLANK
YES
01G
PD65D
NO
CONVERT THE INPUT DATE TO THE FORM OF DD-MM-YY
PD66
01G
PD65D
CONVERT WEEKS AND TENTHS IN DECIMAL TO WORKDAYS
PD65L
SET UP FIELD RIGHT JUSTIFIED IN ACCUMULATOR FROM INPUT PARAMETERS
PD68
SET SUB-MODE INTO LOCATION
PD65M
PD65M
SHIFT DECIMAL PORTION OF FIELD INTO MQ BY VALUE IN LOCATION
PD65M
02C
IS THE HIGH ORDER BIT OF MQ EQUAL TO
YES
SET THE VALUE 3 INTO THE LOCATION
PD69G
NO
IS THE NEXT HIGH ORDER BIT OF MQ EQUAL TO 1
YES
ADD THE VALUE 1 INTO THE LOCATION
PD69G
NO
IS THE NEXT HIGH ORDER BIT OF MQ EQUAL TO 1
YES
ADD THE VALUE 1 INTO THE LOCATION
PD69G
NO
PD65O
02D
MULTIPLY THE INTEGER PORTION OF FIELD BY 5
ADD THIS WORKDAY VALUE TO THE FRACTION IN-PD69G-AND STORE IN-PD69G
ROUTINE OUTLINK 1,4


CONVERT FLOATING POINT IN WEEKS AND DECIMAL TENTHS TO WORKDAYS
PD65P
03A
SET UP FIELD RIGHT JUSTIFIED IN ACCUMULATOR FROM INPUT PARAMETERS
PD68
UNNORMALIZE THE FLOATING POINT NUMBER INTO FIXED POINT WITH DECIMAL IN MQ
02C
CONVERT BCD DAYS INTO BINARY WORKDAYS
PD65T
SET UP FIELD RIGHT JUSTIFIED IN ACCUMULATOR FROM INPUT PARAMETERS
PD68
CONVERT VALUE FROM BCD TO FIXED POINT
FIXPT
SET VALUE INTO LOCATION
PD69G
ROUTINE OUTLINK 1,4
CONVERT BCD WEEKS AND TENTHS INTO BINARY WORKDAYS
PD65W
SET UP FIELD RIGHT JUSTIFIED IN ACCUMULATOR FROM INPUT PARAMETERS
PD68
MULTIPLY THE NO. OF DECIMAL CHAR. (BITS 1 AND 2 OF SUBMODE) BY 6 AND SET INTO
PD65X
PD65X
SHIFT THE DECIMAL CHARACTERS OF FIELD INTO THE MQ BY VALUE SET INTO LOCATION
PD65X
DOES THIS FIELD CONTAIN A DECIMAL POINT CHAR-ACTER
YES
SHIFT THE DECIMAL POINT OUT OF INTEGER WORD
PD69K
NO
CONVERT THE IN DECIMAL INTEGER FROM BCD TO FIXED POINT
FIXPT
SHIFT 5 BITS OF HIGH ORDER BCD CHARACTER IN ACCUMULATOR AND ROUND ON 6TH
SET THIS VALUE IN THE RANGE 0 TO 5 WORKDAYS INTO LOCATION
PD69G
02D
PD650

Region PD66

EXPLANATION OF REGION:

This routine will convert a date to a DD-MM-YY mode if the date is a calendar date, but is set up in a different configuration.

CALLING SEQUENCE:

```
L       TSX   PD66, 4
L + 1   Normal return
```

INPUT:

Calendar date in location PD69G.

OUTPUT:

In the accumulator will be the date in a DD-MM-YY configuration to be set into PTWKA.

STORAGE USED:

Not applicable.

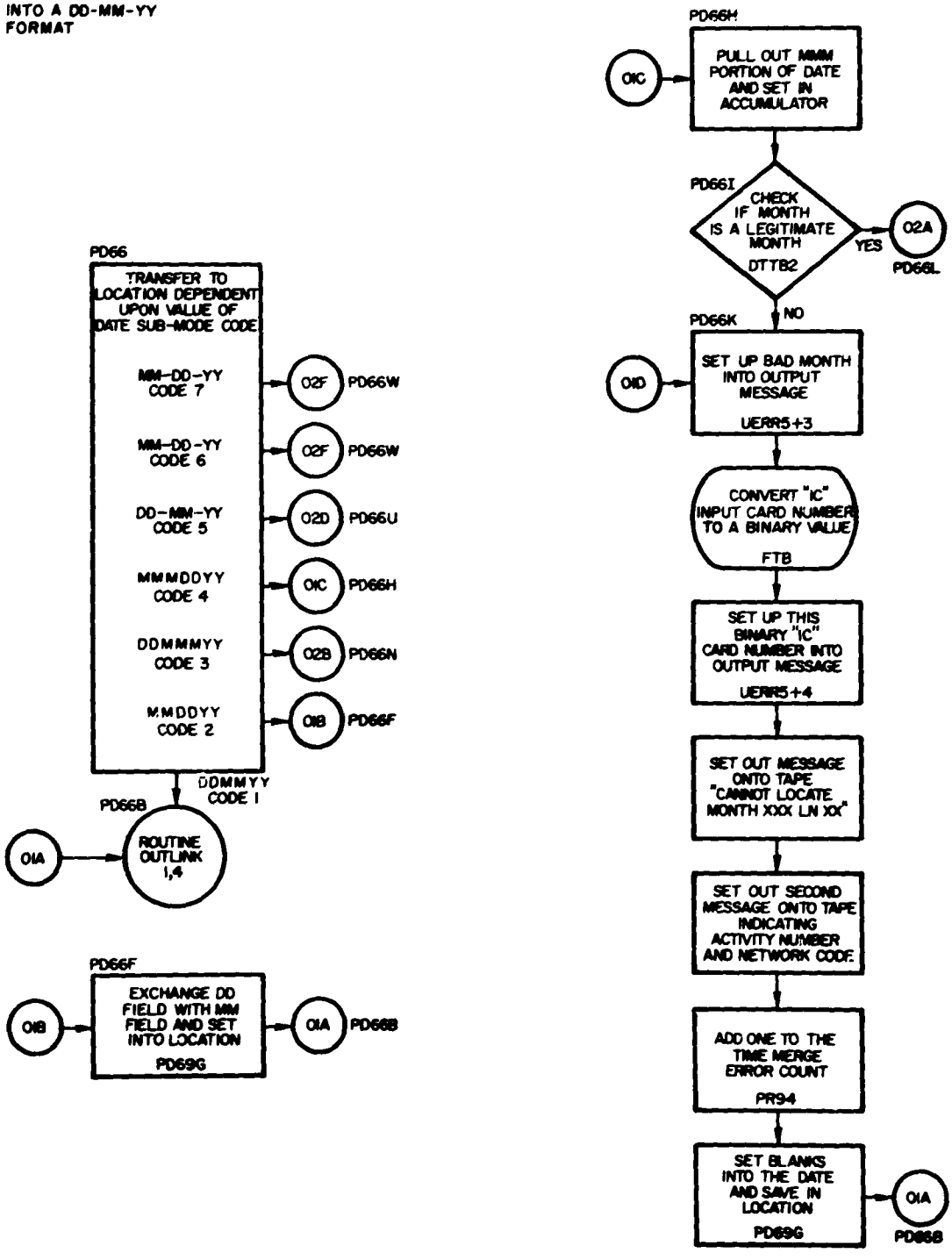
SUBREGIONS AND SUBROUTINES USED:

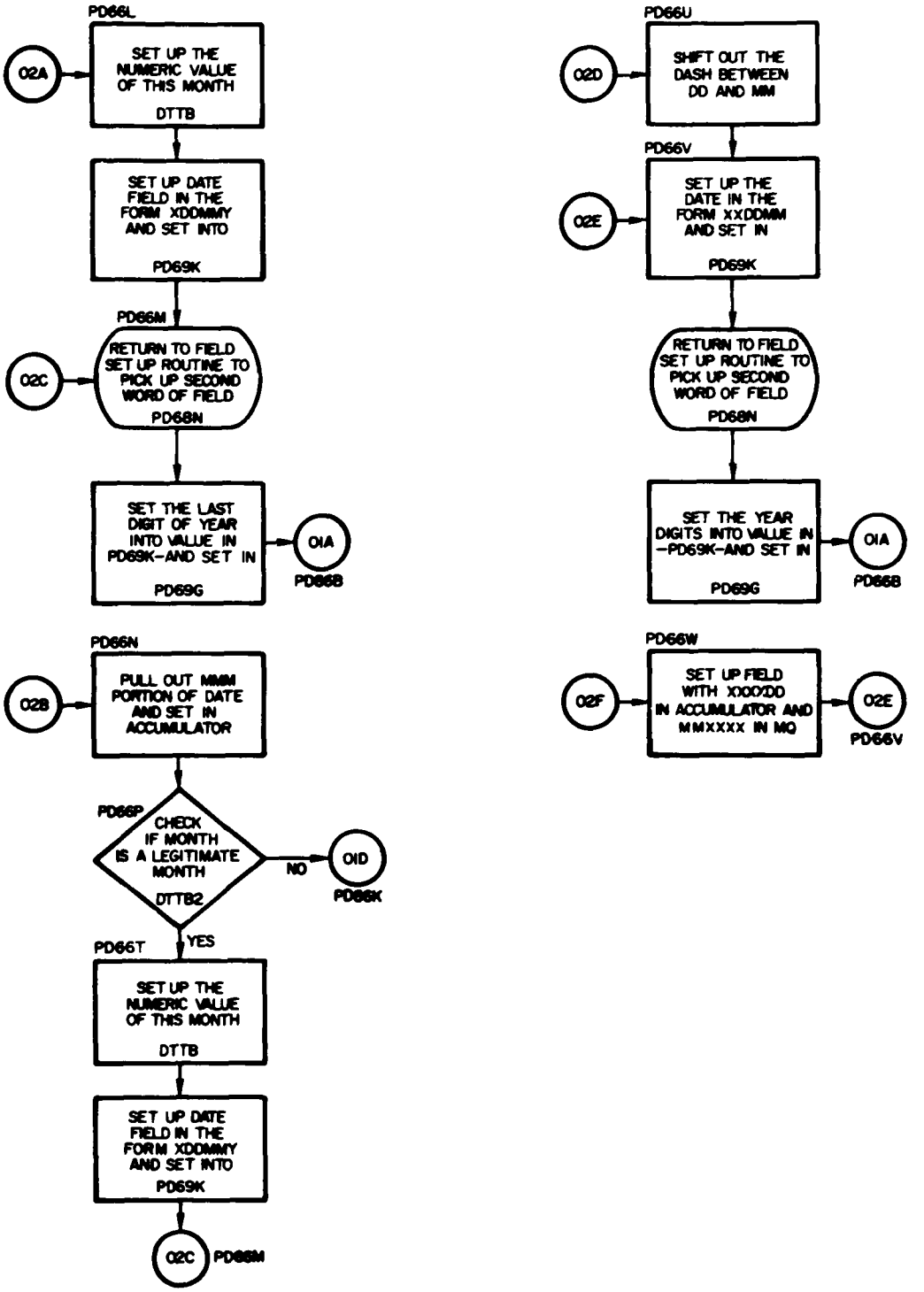
PD68

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

CONVERT A DATE
INTO A DD-MM-YY
FORMAT




PD66L
02A
SET UP THE NUMERIC VALUE OF THIS MONTH
DTTB
SET UP DATE FIELD IN THE FORM XDDMMY AND SET INTO
PD69K
PD66M
02C
RETURN TO FIELD SET UP ROUTINE TO PICK UP SECOND WORD OF FIELD
PD68N
SET THE LAST DIGIT OF YEAR INTO VALUE IN PD69K-AND SET IN
PD69G
01A
PD66B
PD66N
02B
PULL OUT MMM PORTION OF DATE AND SET IN ACCUMULATOR
PD66P
CHECK IF MONTH IS A LEGITIMATE MONTH
DTTB2
NO
01D
PD66K
YES
PD66T
SET UP THE NUMERIC VALUE OF THIS MONTH
DTTB
SET UP DATE FIELD IN THE FORM XDDMMY AND SET INTO
PD69K
02C
PD66M
PD66U
02D
SHIFT OUT THE DASH BETWEEN DD AND MM
PD66V
02E
SET UP THE DATE IN THE FORM XXDDMM AND SET IN
PD69K
RETURN TO FIELD SET UP ROUTINE TO PICK UP SECOND WORD OF FIELD
PD68N
SET THE YEAR DIGITS INTO VALUE IN -PD69K-AND SET IN
PD69G
01A
PD66B
PD66W
02F
SET UP FIELD WITH XXXXDD IN ACCUMULATOR AND MMXXXX IN MQ
02E
PD66V

Region PD67

EXPLANATION OF REGION:

This routine will set the alpha-numeric fields into PTWKA, which may range from 1 character to 9 words or 54 characters.

CALLING SEQUENCE:

L TSX PD67, 4

L + 1 Normal return

INPUT:

USERS TIME TAPE and INPAR parameter table.

The following locations will be modified when routine is used:

PD67D - number of characters in field

PD67H - location in PTWKA where this field is to be started.

OUTPUT:

The selected time information field set up in the PTWKA block.

STORAGE USED:

Not applicable.

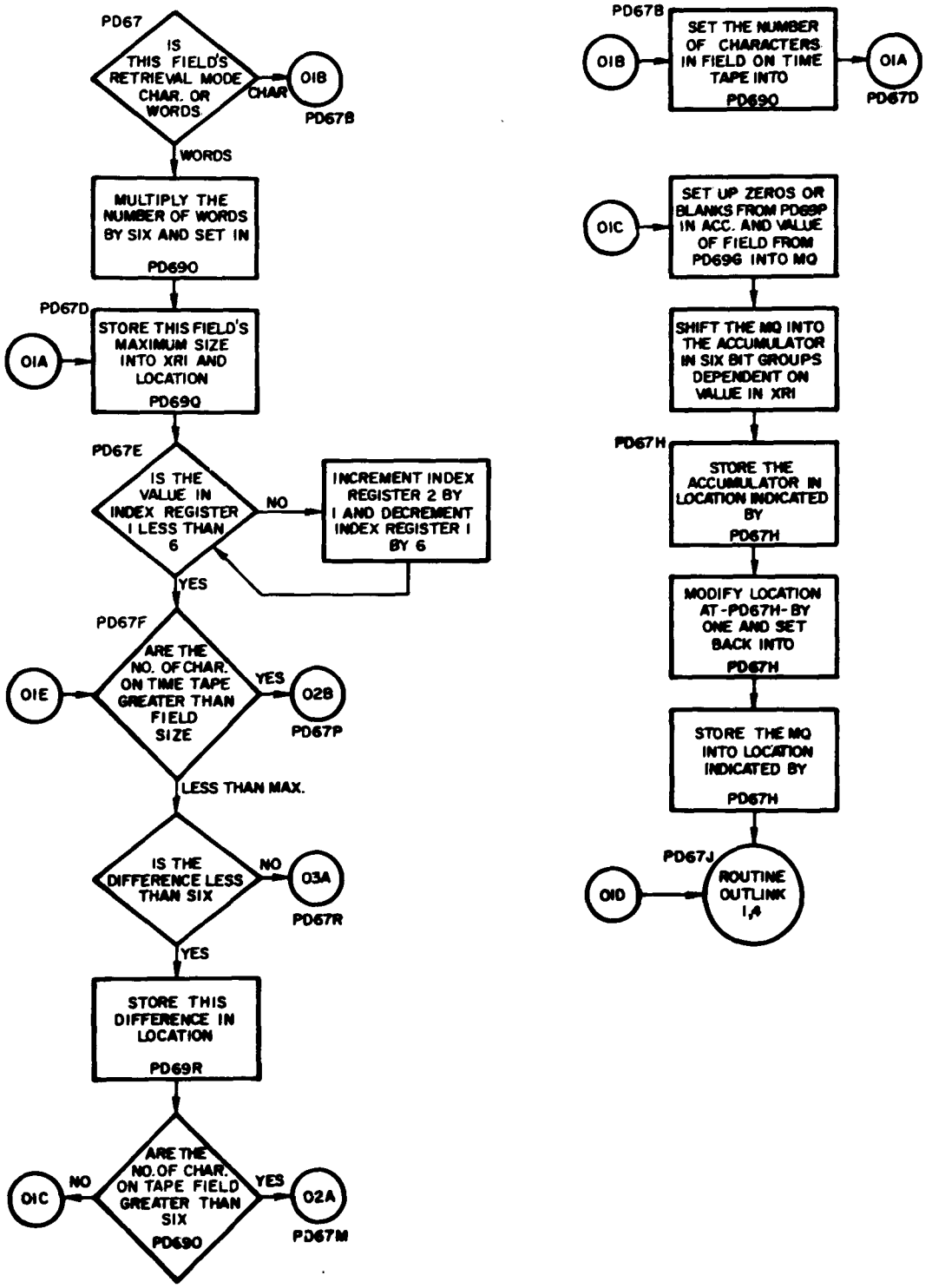
SUBREGIONS AND SUBROUTINES USED:

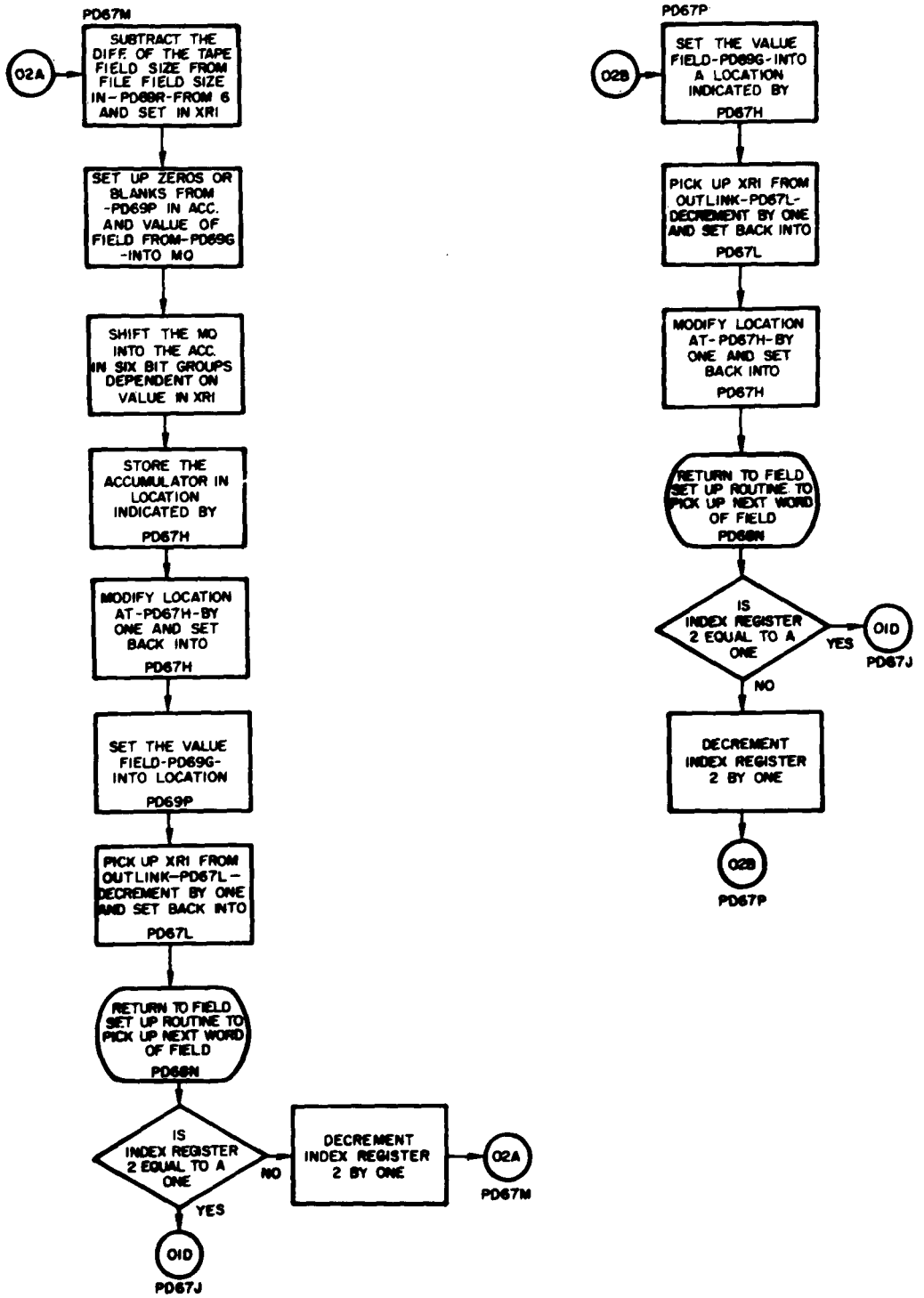
Not applicable.

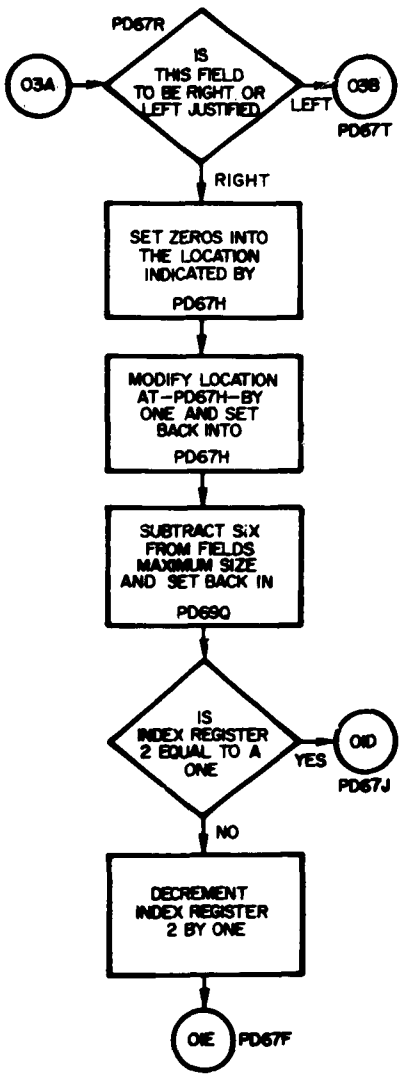
EXPLANATION OF CALLING SEQUENCE:

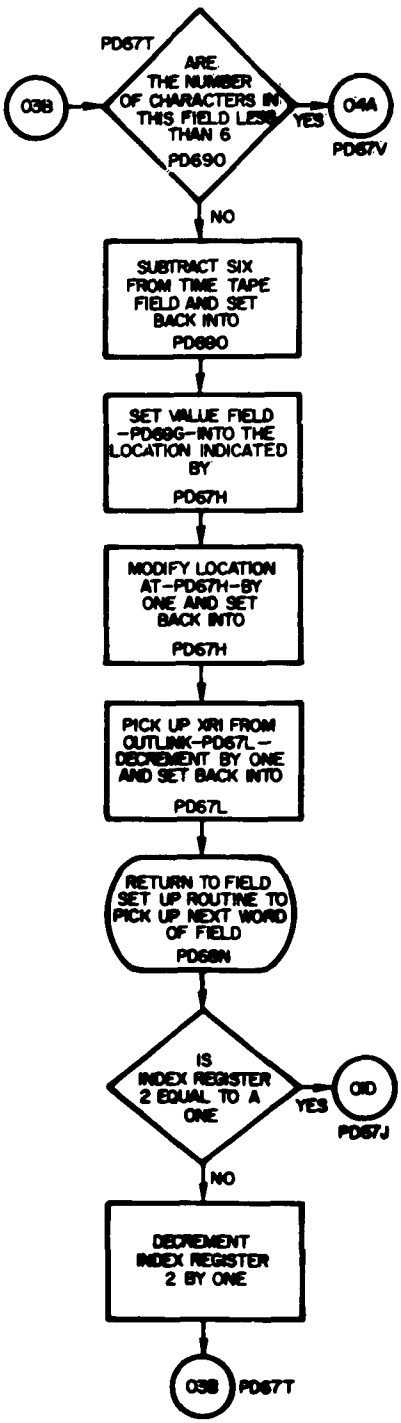
Not applicable.

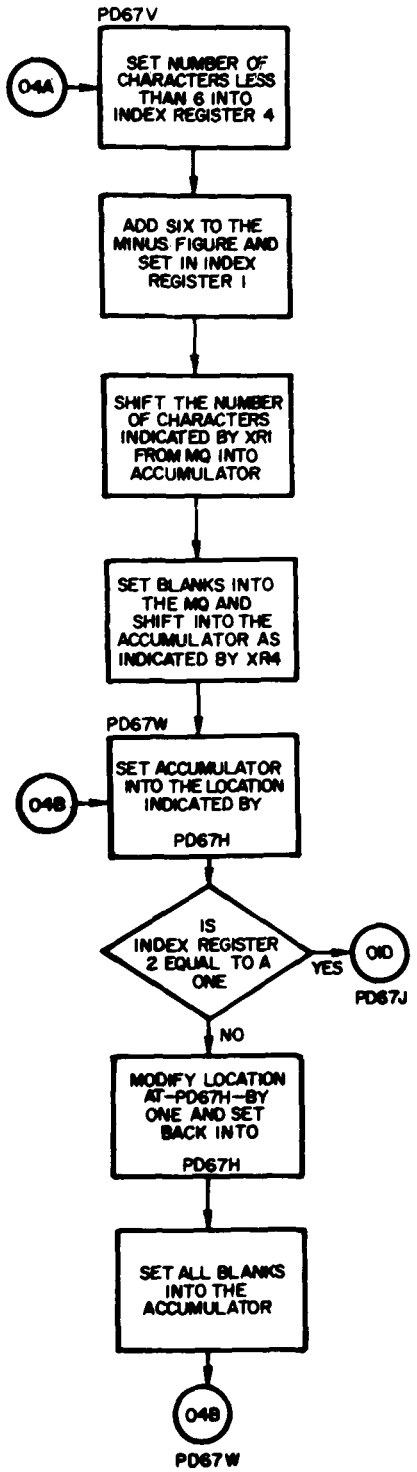
SET ALPHA NUMERIC FIELDS
INTO TIME WORKING AREA (PTWKA)




PD67M
02A
SUBTRACT THE DIFF. OF THE TAPE FIELD SIZE FROM FILE FIELD SIZE IN-PD68R-FROM 6 AND SET IN XR1
SET UP ZEROS OR BLANKS FROM -PD69P IN ACC. AND VALUE OF FIELD FROM-PD69G -INTO MQ
SHIFT THE MQ INTO THE ACC. IN SIX BIT GROUPS DEPENDENT ON VALUE IN XR1
STORE THE ACCUMULATOR IN LOCATION INDICATED BY PD67H
MODIFY LOCATION AT-PD67H-BY ONE AND SET BACK INTO PD67H
SET THE VALUE FIELD-PD69G- INTO LOCATION PD69P
PICK UP XR1 FROM OUTLINK-PD67L- DECREMENT BY ONE AND SET BACK INTO PD67L
RETURN TO FIELD SET UP ROUTINE TO PICK UP NEXT WORD OF FIELD PD68N
IS INDEX REGISTER 2 EQUAL TO A ONE
NO
DECREMENT INDEX REGISTER 2 BY ONE
02A
PD67M
YES
01D
PD67J
PD67P
02B
SET THE VALUE FIELD-PD69G-INTO A LOCATION INDICATED BY PD67H
PICK UP XR1 FROM OUTLINK-PD67L- DECREMENT BY ONE AND SET BACK INTO PD67L
MODIFY LOCATION AT-PD67H-BY ONE AND SET BACK INTO PD67H
RETURN TO FIELD SET UP ROUTINE TO PICK UP NEXT WORD OF FIELD PD68N
IS INDEX REGISTER 2 EQUAL TO A ONE
YES
01D
PD67J
NO
DECREMENT INDEX REGISTER 2 BY ONE
02B
PD67P


PD67R
IS THIS FIELD TO BE RIGHT OR LEFT JUSTIFIED
03A
LEFT
03B
PD67T
RIGHT
SET ZEROS INTO THE LOCATION INDICATED BY
PD67H
MODIFY LOCATION AT-PD67H-BY ONE AND SET BACK INTO
PD67H
SUBTRACT SIX FROM FIELDS MAXIMUM SIZE AND SET BACK IN
PD69Q
IS INDEX REGISTER 2 EQUAL TO A ONE
YES
01D
PD67J
NO
DECREMENT INDEX REGISTER 2 BY ONE
01E
PD67F


PD67T
ARE THE NUMBER OF CHARACTERS IN THIS FIELD LESS THAN 6
PD69O
03B
YES
04A
PD67V
NO
SUBTRACT SIX FROM TIME TAPE FIELD AND SET BACK INTO
PD69O
SET VALUE FIELD -PD69G- INTO THE LOCATION INDICATED BY
PD67H
MODIFY LOCATION AT-PD67H-BY ONE AND SET BACK INTO
PD67H
PICK UP XR1 FROM OUTLINK-PD67L- DECREMENT BY ONE AND SET BACK INTO
PD67L
RETURN TO FIELD SET UP ROUTINE TO PICK UP NEXT WORD OF FIELD
PD68N
IS INDEX REGISTER 2 EQUAL TO A ONE
YES
01D
PD67J
NO
DECREMENT INDEX REGISTER 2 BY ONE
03B
PD67T


PD67V
04A
SET NUMBER OF CHARACTERS LESS THAN 6 INTO INDEX REGISTER 4
ADD SIX TO THE MINUS FIGURE AND SET IN INDEX REGISTER 1
SHIFT THE NUMBER OF CHARACTERS INDICATED BY XR1 FROM MQ INTO ACCUMULATOR
SET BLANKS INTO THE MQ AND SHIFT INTO THE ACCUMULATOR AS INDICATED BY XR4
PD67W
04B
SET ACCUMULATOR INTO THE LOCATION INDICATED BY
PD67H
IS INDEX REGISTER 2 EQUAL TO A ONE
YES
01D
PD67J
NO
MODIFY LOCATION AT-PD67H-BY ONE AND SET BACK INTO
PD67H
SET ALL BLANKS INTO THE ACCUMULATOR
04B
PD67W

Region PD68

EXPLANATION OF REGION:

This routine will pick up the data from a location in core that contains the USERS TIME TAPE information and will set it into a computer word PD69G for further processing.

CALLING SEQUENCE:

L TSX PD68, 4

L + 1 Normal return

INPUT:

The USERS TIME TAPE and INPAR table.

The following locations will be modified according to the information in the field description blocks:

PD68B - the word location in the record that the first part of this field is located.

PD68D - the word location, if any, that the next part of field is located.

PD68F - the shifting necessary to get a full word of field.

PD68H - the masking necessary to set up this field.

PD68J - the blanks necessary to make this field usable.

OUTPUT:

The usable field located in PD69G.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

PD80

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

SET UP FIELDS
FROM INPUT PARAMETERS

PD68

SET UP THE FIELD DESCRIPTION SETS TO BE USED IN LOCATION
PD99J

SET UP THE LOCATION OF THE INSTRUCTION CONTAINING THE "CAL"
PD99M

SET UP THE LOCATION OF THE INSTRUCTION CONTAINING THE "LDQ"
PD99P

SET UP THE LOCATION OF THE INSTRUCTION CONTAINING THE SHIFT INSTRUCTIONS
PD99S

SET UP THE LOCATION OF THE INSTRUCTION CONTAINING THE "ORA"
PD99W

SET UP THE LOCATION OF THE INSTRUCTION CONTAINING THE "ANA"
PD99Z

MODIFY THE INSTRUCTIONS SET UP ABOVE BY THE INPUT PARAMETERS
PD80

OIA PD68B

SET UP A SECOND OR ADDITIONAL FIELD FROM INPUT PARAMETERS

PD68N

SET UP OUTLINK RETURN IN XR4
PD68L

PD68B

OIA

PICK UP WORD FROM USERS TIME TAPE-SHIFT AND MASK IT ACCORDING TO INPUT PARAMETERS

SET THE COMPLETED WORD INTO LOCATION
PD69G

PD68L

ROUTINE OUTLINK 1,4

Region PD70

EXPLANATION OF REGION:

This routine will do the reading of the USERS TIME TAPE from the file description section of the INPAR table.

CALLING SEQUENCE:

L TSX PD70, 4

L + 1 Normal return

INPUT:

The USERS TIME TAPE and INPAR table

The following locations will be modified according to the information in the field description block in order to develop the variable count field.

PD71 - the word location in the record that the first part of this field is located.

PD72 - the word location, if any, that next part of field is located

PD73 - the shifting necessary to get a full word of field.

PD73A - the masking necessary to set up this field.

PD74 - the blanks necessary to make this field usable.

OUTPUT:

A record from the USERS TIME TAPE to be processed.

STORAGE USED:

Not applicable.

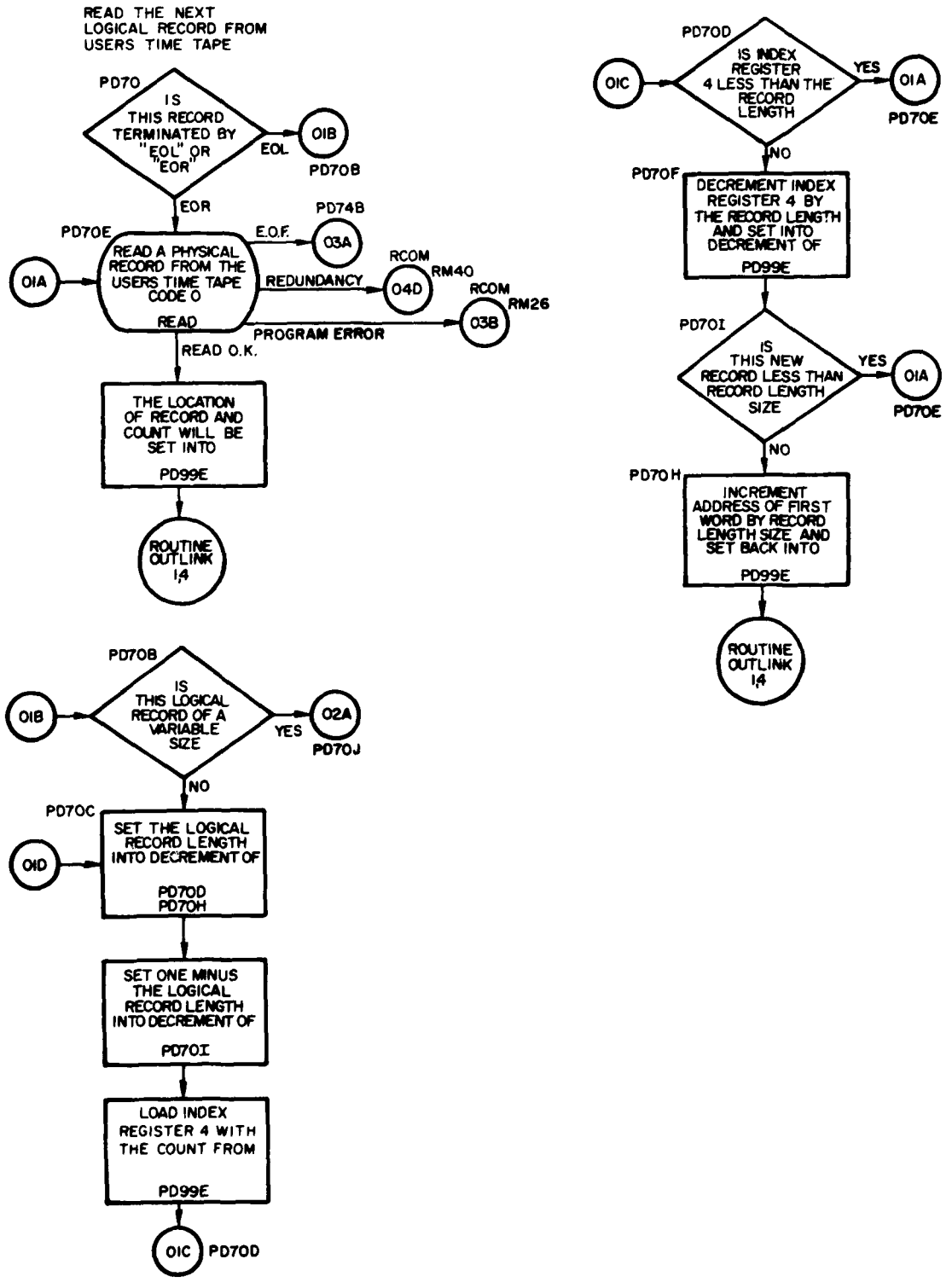
SUBREGIONS AND SUBROUTINES USED:

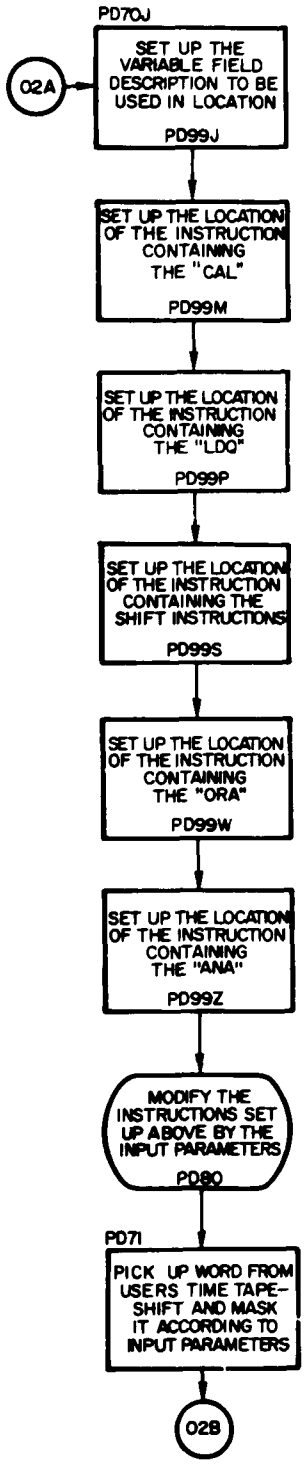
READ FIXPT

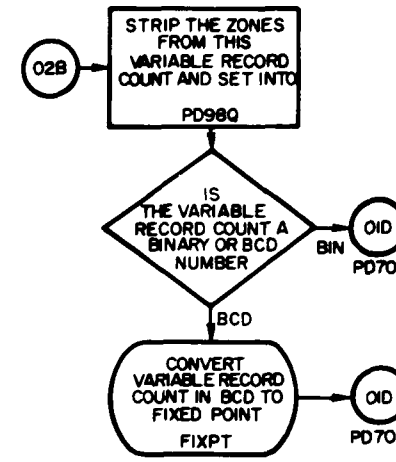
PD80

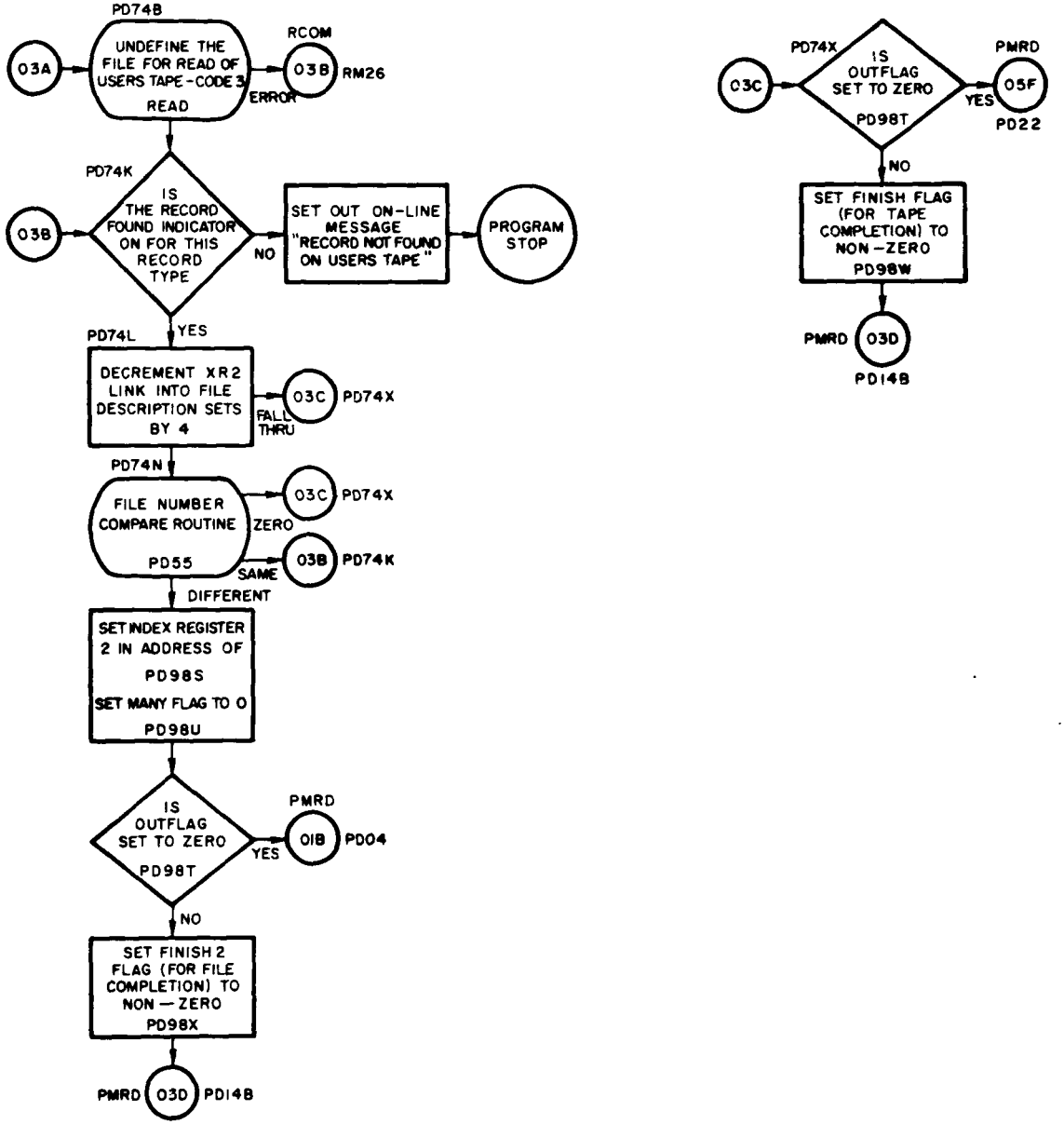
EXPLANATION OF CALLING SEQUENCE:

If E.O.F. or read errors are determined, the outlink will be to the read routines Page III-B-2. If an error occurs a message will be set out on-line and the system will stop.


READ THE NEXT LOGICAL RECORD FROM USERS TIME TAPE
PD70
IS THIS RECORD TERMINATED BY "EOL" OR "EOR"
EOL
01B
PD70B
EOR
PD74B
PD70E
READ A PHYSICAL RECORD FROM THE USERS TIME TAPE CODE 0
E.O.F.
03A
RCOM
RM40
REDUNDANCY
04D
RCOM
RM26
READ
PROGRAM ERROR
03B
01A
READ O.K.
THE LOCATION OF RECORD AND COUNT WILL BE SET INTO
PD99E
ROUTINE OUTLINK 1,4
PD70B
IS THIS LOGICAL RECORD OF A VARIABLE SIZE
01B
YES
02A
PD70J
NO
PD70C
SET THE LOGICAL RECORD LENGTH INTO DECREMENT OF
PD70D
PD70H
01D
SET ONE MINUS THE LOGICAL RECORD LENGTH INTO DECREMENT OF
PD70I
LOAD INDEX REGISTER 4 WITH THE COUNT FROM
PD99E
01C
PD70D
PD70D
IS INDEX REGISTER 4 LESS THAN THE RECORD LENGTH
01C
YES
01A
PD70E
NO
PD70F
DECREMENT INDEX REGISTER 4 BY THE RECORD LENGTH AND SET INTO DECREMENT OF
PD99E
PD70I
IS THIS NEW RECORD LESS THAN RECORD LENGTH SIZE
YES
01A
PD70E
NO
PD70H
INCREMENT ADDRESS OF FIRST WORD BY RECORD LENGTH SIZE AND SET BACK INTO
PD99E
ROUTINE OUTLINK 1,4


PD70J
02A
SET UP THE VARIABLE FIELD DESCRIPTION TO BE USED IN LOCATION
PD99J
SET UP THE LOCATION OF THE INSTRUCTION CONTAINING THE "CAL"
PD99M
SET UP THE LOCATION OF THE INSTRUCTION CONTAINING THE "LDQ"
PD99P
SET UP THE LOCATION OF THE INSTRUCTION CONTAINING THE SHIFT INSTRUCTIONS
PD99S
SET UP THE LOCATION OF THE INSTRUCTION CONTAINING THE "ORA"
PD99W
SET UP THE LOCATION OF THE INSTRUCTION CONTAINING THE "ANA"
PD99Z
MODIFY THE INSTRUCTIONS SET UP ABOVE BY THE INPUT PARAMETERS
PD80
PD71
PICK UP WORD FROM USERS TIME TAPE-SHIFT AND MASK IT ACCORDING TO INPUT PARAMETERS
02B


02B
STRIP THE ZONES FROM THIS VARIABLE RECORD COUNT AND SET INTO
PD98Q
IS THE VARIABLE RECORD COUNT A BINARY OR BCD NUMBER
BIN
OID
PD70C
BCD
CONVERT VARIABLE RECORD COUNT IN BCD TO FIXED POINT
FIXPT
OID
PD70C


PD74B
UNDEFINE THE FILE FOR READ OF USERS TAPE - CODE 3
READ
RCOM
03B
RM26
ERROR
03A
PD74K
IS THE RECORD FOUND INDICATOR ON FOR THIS RECORD TYPE
03B
NO
SET OUT ON-LINE MESSAGE "RECORD NOT FOUND ON USERS TAPE"
PROGRAM STOP
YES
PD74L
DECREMENT XR2 LINK INTO FILE DESCRIPTION SETS BY 4
03C
PD74X
FALL THRU
PD74N
FILE NUMBER COMPARE ROUTINE
PD55
03C
PD74X
ZERO
03B
PD74K
SAME
DIFFERENT
SET INDEX REGISTER 2 IN ADDRESS OF
PD98S
SET MANY FLAG TO 0
PD98U
IS OUTFLAG SET TO ZERO
PD98T
PMRD
01B
PD04
YES
NO
SET FINISH 2 FLAG (FOR FILE COMPLETION) TO NON — ZERO
PD98X
PMRD
03D
PD148
03C
PD74X
IS OUTFLAG SET TO ZERO
PD98T
PMRD
05F
PD22
YES
NO
SET FINISH FLAG (FOR TAPE COMPLETION) TO NON-ZERO
PD98W
PMRD
03D
PD148

Region PD75

EXPLANATION OF REGION:

This routine will develop the ID record from the USERS TIME TAPE and compare it with the ID records in the file description blocks of the INPAR table.

CALLING SEQUENCE:

L TSX PD75, 4

L + 1 Record ID not found return

L + 2 Record ID found return

INPUT:

The USERS TIME TAPE and INPAR table

The following locations will be modified according to the information in the field description block to develop the ID for each USERS TIME TAPE record.

PD76 - the word location in the record that the first part of the ID is located.

PD77 - the word location, if any, that the next part of field is located.

PD78 - the shifting necessary to get a full word of field.

PD78A - the masking necessary to set up this field.

PD79 - the blanks necessary to make this field usable.

OUTPUT:

Not applicable.

STORAGE USED:

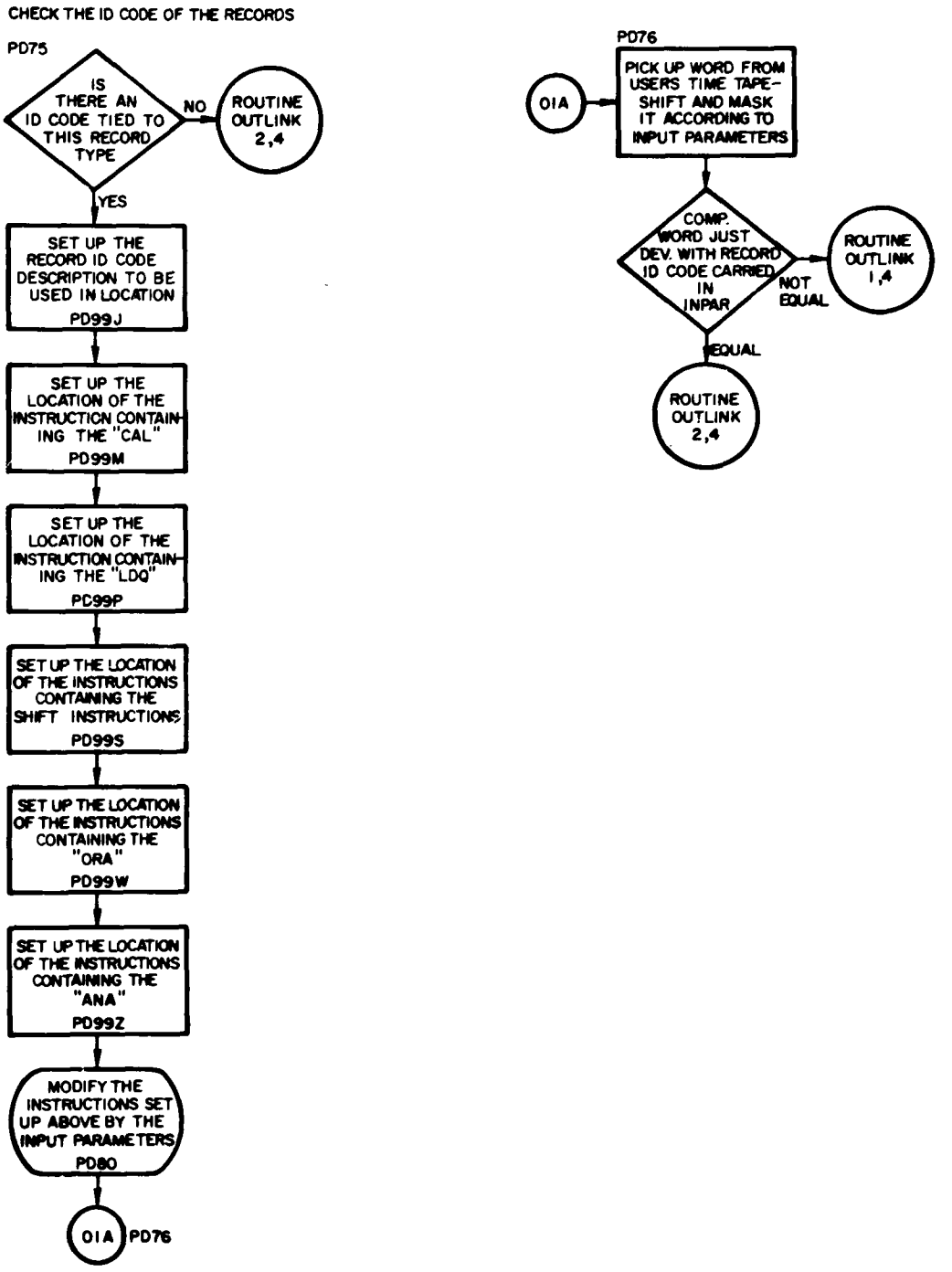
Not applicable.

SUBREGIONS AND SUBROUTINES USED:

PD80

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


CHECK THE ID CODE OF THE RECORDS
PD75
IS THERE AN ID CODE TIED TO THIS RECORD TYPE
NO
ROUTINE OUTLINK 2,4
YES
SET UP THE RECORD ID CODE DESCRIPTION TO BE USED IN LOCATION PD99J
SET UP THE LOCATION OF THE INSTRUCTION CONTAINING THE "CAL" PD99M
SET UP THE LOCATION OF THE INSTRUCTION CONTAINING THE "LDQ" PD99P
SET UP THE LOCATION OF THE INSTRUCTIONS CONTAINING THE SHIFT INSTRUCTIONS PD99S
SET UP THE LOCATION OF THE INSTRUCTIONS CONTAINING THE "ORA" PD99W
SET UP THE LOCATION OF THE INSTRUCTIONS CONTAINING THE "ANA" PD99Z
MODIFY THE INSTRUCTIONS SET UP ABOVE BY THE INPUT PARAMETERS PD80
01A PD76
PD76
01A
PICK UP WORD FROM USERS TIME TAPE- SHIFT AND MASK IT ACCORDING TO INPUT PARAMETERS
COMP. WORD JUST DEV. WITH RECORD ID CODE CARRIED IN INPAR
NOT EQUAL
ROUTINE OUTLINK 1,4
EQUAL
ROUTINE OUTLINK 2,4

Region PD80

EXPLANATION OF REGION:

This routine will set up the parameters used to read the fields in PD68, PD70 and PD75 from the INPAR table.

CALLING SEQUENCE:

```
L       TSX   PD80, 4
L + 1   Normal return
```

INPUT:

INPAR parameter table

OUTPUT:

Modify fields in PD68, PD70, and PD75.

STORAGE USED:

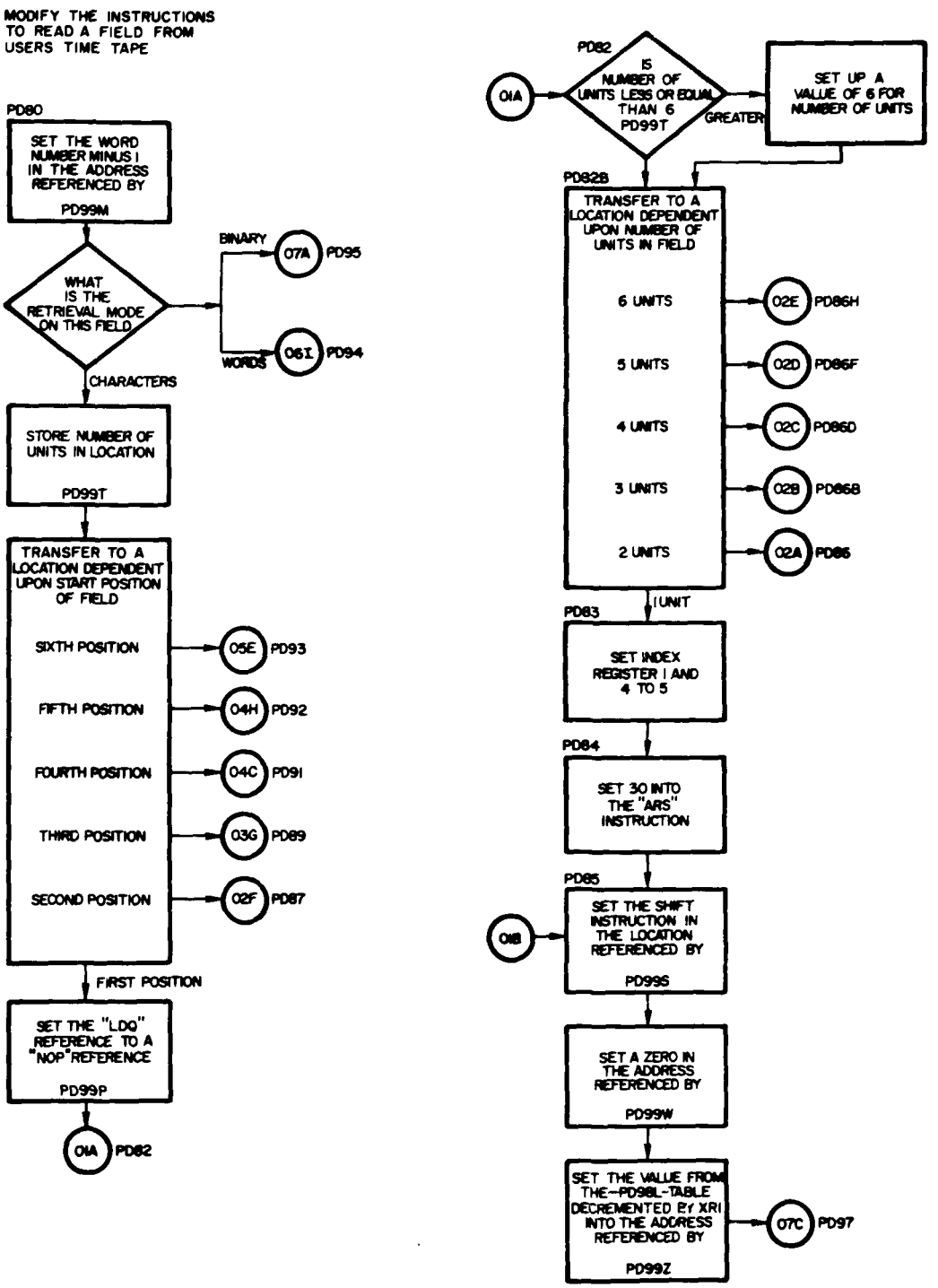
Not applicable.

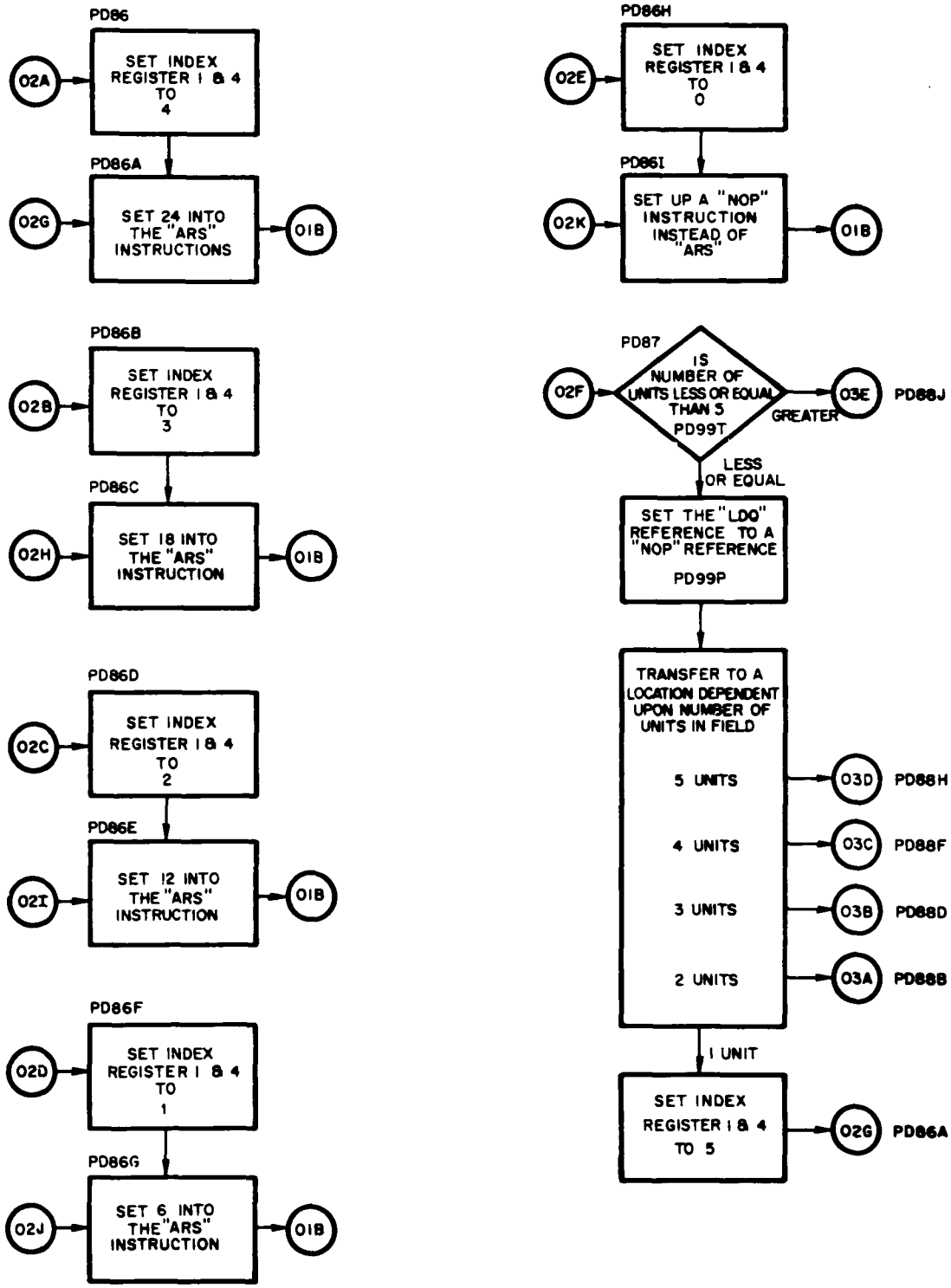
SUBREGIONS AND SUBROUTINES USED:

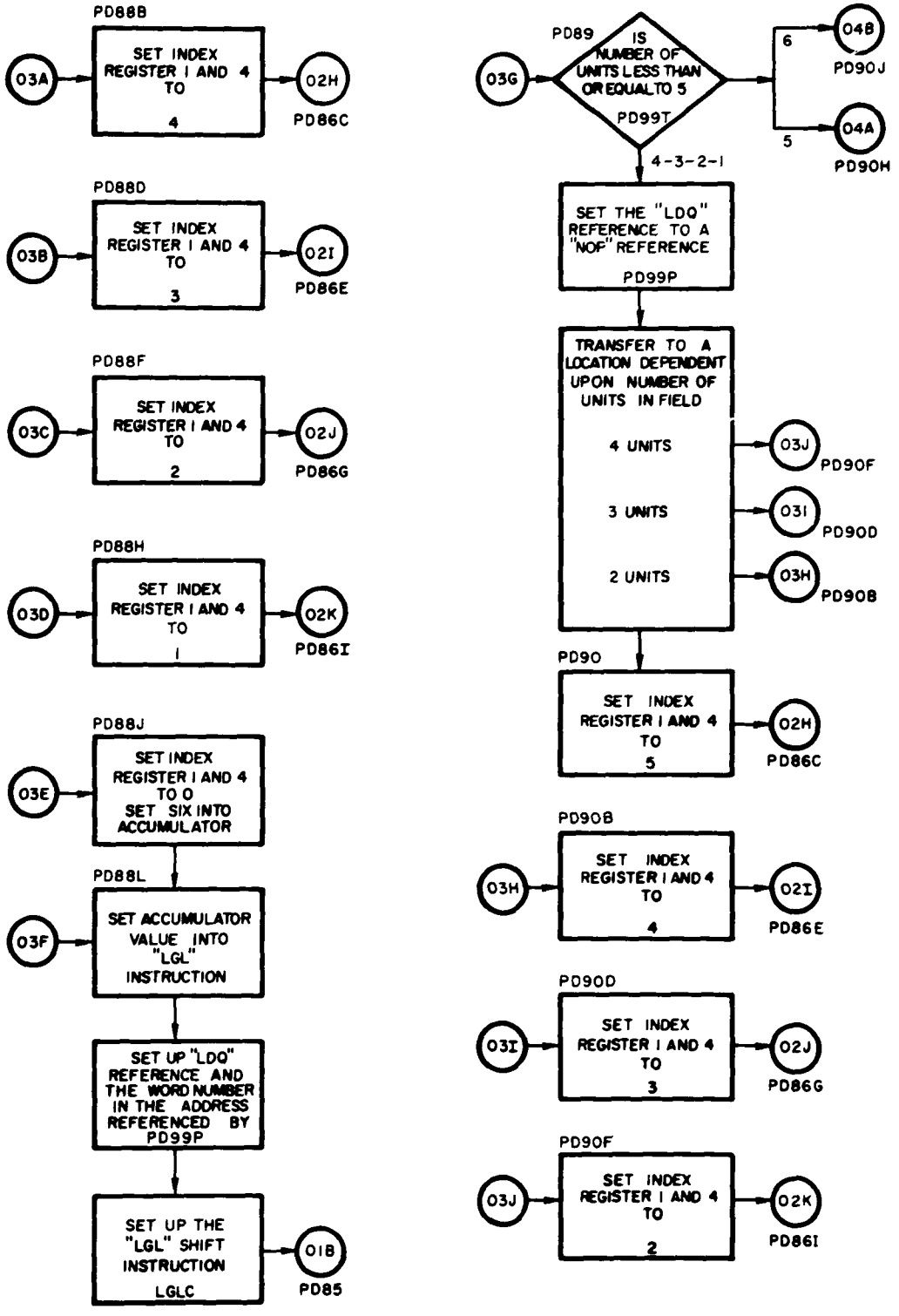
Not applicable.

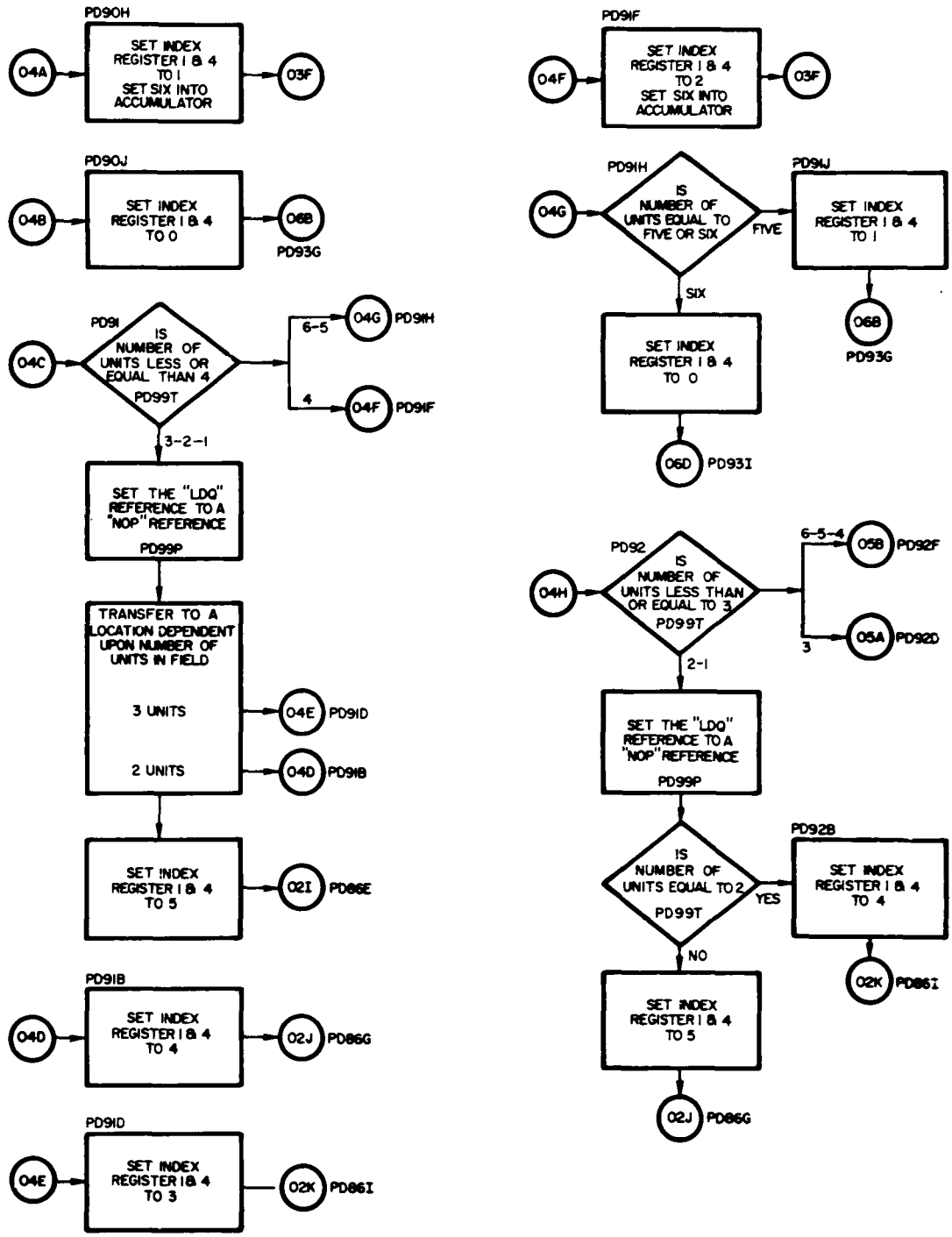
EXPLANATION OF CALLING SEQUENCE:

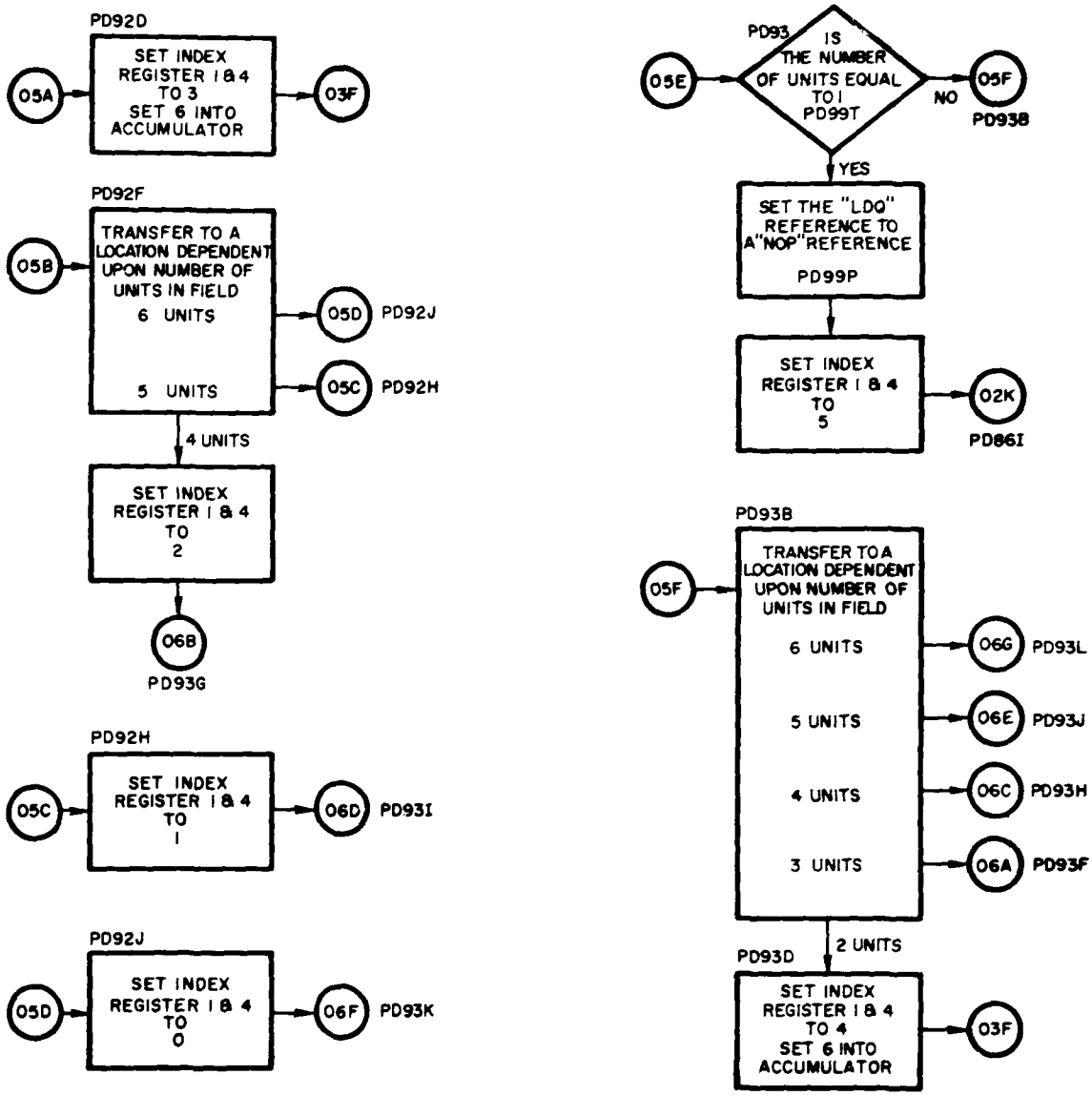
Not applicable.

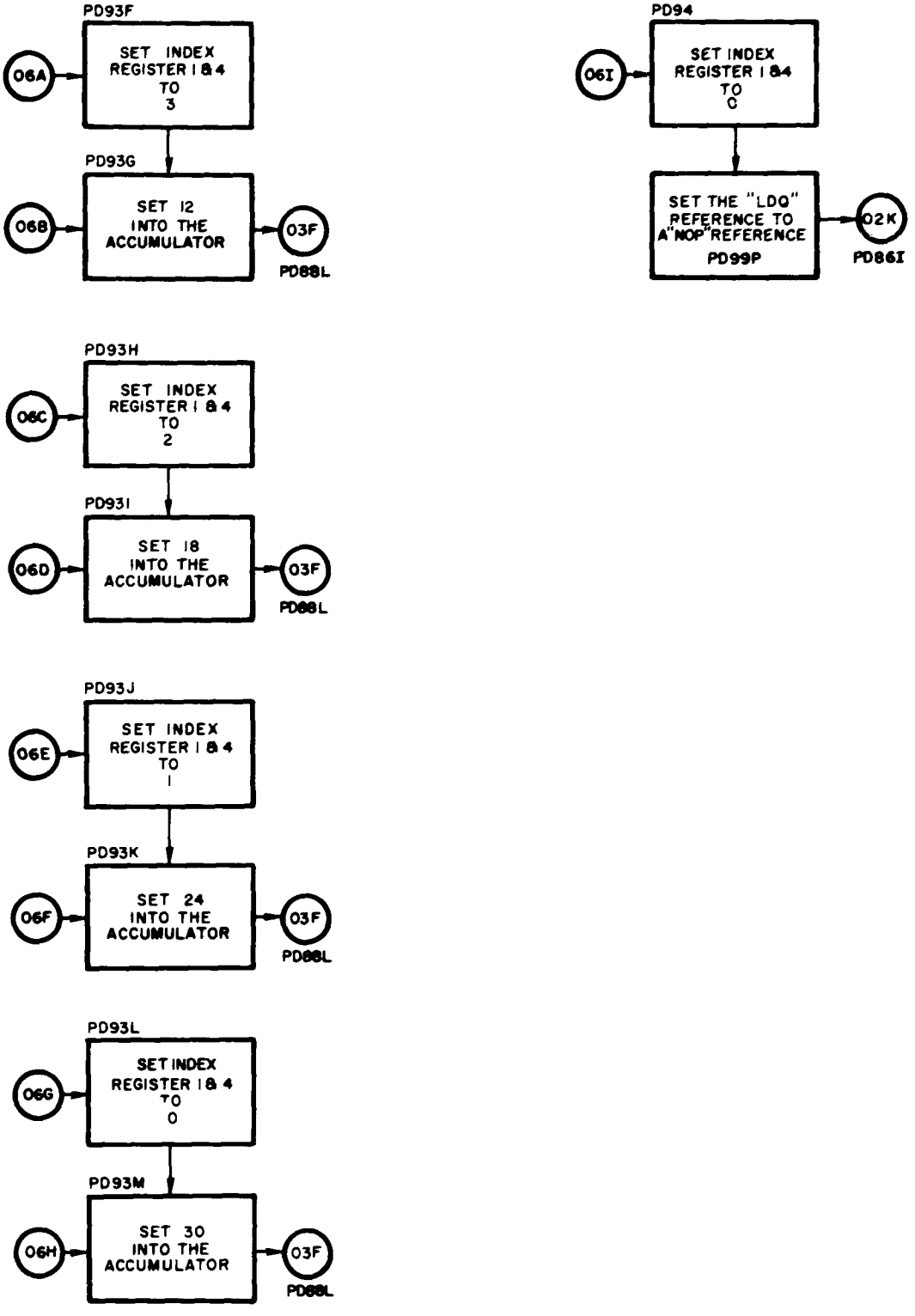

MODIFY THE INSTRUCTIONS TO READ A FIELD FROM USERS TIME TAPE
PD80
SET THE WORD NUMBER MINUS 1 IN THE ADDRESS REFERENCED BY
PD99M
WHAT IS THE RETRIEVAL MODE ON THIS FIELD
BINARY
07A PD95
WORDS
06I PD94
CHARACTERS
STORE NUMBER OF UNITS IN LOCATION
PD99T
TRANSFER TO A LOCATION DEPENDENT UPON START POSITION OF FIELD
SIXTH POSITION
05E PD93
FIFTH POSITION
04H PD92
FOURTH POSITION
04C PD91
THIRD POSITION
03G PD89
SECOND POSITION
02F PD87
FIRST POSITION
SET THE "LDQ" REFERENCE TO A "NOP" REFERENCE
PD99P
01A PD82
01A
PD82
IS NUMBER OF UNITS LESS OR EQUAL THAN 6
PD99T
GREATER
SET UP A VALUE OF 6 FOR NUMBER OF UNITS
PD82B
TRANSFER TO A LOCATION DEPENDENT UPON NUMBER OF UNITS IN FIELD
6 UNITS
02E PD86H
5 UNITS
02D PD86F
4 UNITS
02C PD86D
3 UNITS
02B PD86B
2 UNITS
02A PD86
1 UNIT
PD83
SET INDEX REGISTER 1 AND 4 TO 5
PD84
SET 30 INTO THE "ARS" INSTRUCTION
PD85
01B
SET THE SHIFT INSTRUCTION IN THE LOCATION REFERENCED BY
PD99S
SET A ZERO IN THE ADDRESS REFERENCED BY
PD99W
SET THE VALUE FROM THE-PD98L-TABLE DECREMENTED BY XR1 INTO THE ADDRESS REFERENCED BY
PD99Z
07C PD97

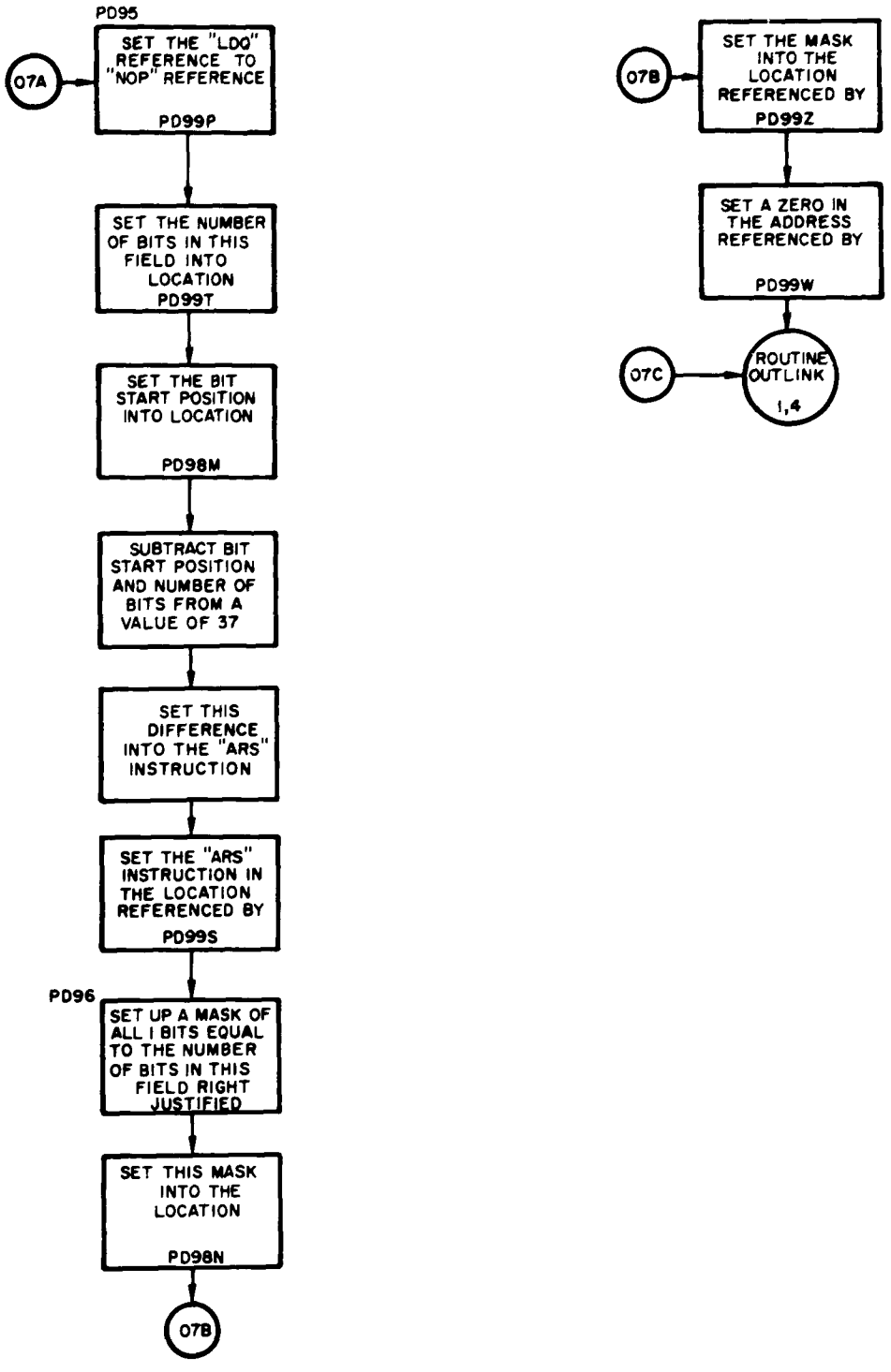

PD86
02A
SET INDEX REGISTER 1 & 4 TO 4
PD86A
02G
SET 24 INTO THE "ARS" INSTRUCTIONS
01B
PD86B
02B
SET INDEX REGISTER 1 & 4 TO 3
PD86C
02H
SET 18 INTO THE "ARS" INSTRUCTION
01B
PD86D
02C
SET INDEX REGISTER 1 & 4 TO 2
PD86E
02I
SET 12 INTO THE "ARS" INSTRUCTION
01B
PD86F
02D
SET INDEX REGISTER 1 & 4 TO 1
PD86G
02J
SET 6 INTO THE "ARS" INSTRUCTION
01B
PD86H
02E
SET INDEX REGISTER 1 & 4 TO 0
PD86I
02K
SET UP A "NOP" INSTRUCTION INSTEAD OF "ARS"
01B
PD87
02F
IS NUMBER OF UNITS LESS OR EQUAL THAN 5
PD99T
GREATER
03E
PD88J
LESS OR EQUAL
SET THE "LDQ" REFERENCE TO A "NOP" REFERENCE
PD99P
TRANSFER TO A LOCATION DEPENDENT UPON NUMBER OF UNITS IN FIELD
5 UNITS
03D
PD88H
4 UNITS
03C
PD88F
3 UNITS
03B
PD88D
2 UNITS
03A
PD88B
1 UNIT
SET INDEX REGISTER 1 & 4 TO 5
02G
PD86A


PD88B
03A
SET INDEX REGISTER 1 AND 4 TO 4
02H
PD86C
PD88D
03B
SET INDEX REGISTER 1 AND 4 TO 3
02I
PD86E
PD88F
03C
SET INDEX REGISTER 1 AND 4 TO 2
02J
PD86G
PD88H
03D
SET INDEX REGISTER 1 AND 4 TO 1
02K
PD86I
PD88J
03E
SET INDEX REGISTER 1 AND 4 TO 0 SET SIX INTO ACCUMULATOR
PD88L
03F
SET ACCUMULATOR VALUE INTO "LGL" INSTRUCTION
SET UP "LDQ" REFERENCE AND THE WORD NUMBER IN THE ADDRESS REFERENCED BY PD99P
SET UP THE "LGL" SHIFT INSTRUCTION LGLC
01B
PD85
PD89
03G
IS NUMBER OF UNITS LESS THAN OR EQUAL TO 5
PD99T
6
04B
PD90J
5
04A
PD90H
4-3-2-1
SET THE "LDQ" REFERENCE TO A "NOF" REFERENCE
PD99P
TRANSFER TO A LOCATION DEPENDENT UPON NUMBER OF UNITS IN FIELD
4 UNITS
03J
PD90F
3 UNITS
03I
PD90D
2 UNITS
03H
PD90B
PD90
SET INDEX REGISTER 1 AND 4 TO 5
02H
PD86C
PD90B
03H
SET INDEX REGISTER 1 AND 4 TO 4
02I
PD86E
PD90D
03I
SET INDEX REGISTER 1 AND 4 TO 3
02J
PD86G
PD90F
03J
SET INDEX REGISTER 1 AND 4 TO 2
02K
PD86I


PD90H
04A
SET INDEX REGISTER 1 & 4 TO 1
SET SIX INTO ACCUMULATOR
03F
PD90J
04B
SET INDEX REGISTER 1 & 4 TO 0
06B
PD93G
PD91
04C
IS NUMBER OF UNITS LESS OR EQUAL THAN 4
PD99T
6-5
04G
PD91H
4
04F
PD91F
3-2-1
SET THE "LDQ" REFERENCE TO A "NOP" REFERENCE
PD99P
TRANSFER TO A LOCATION DEPENDENT UPON NUMBER OF UNITS IN FIELD
3 UNITS
04E
PD91D
2 UNITS
04D
PD91B
SET INDEX REGISTER 1 & 4 TO 5
02I
PD86E
PD91B
04D
SET INDEX REGISTER 1 & 4 TO 4
02J
PD86G
PD91D
04E
SET INDEX REGISTER 1 & 4 TO 3
02K
PD86I
PD91F
04F
SET INDEX REGISTER 1 & 4 TO 2
SET SIX INTO ACCUMULATOR
03F
PD91H
04G
IS NUMBER OF UNITS EQUAL TO FIVE OR SIX
FIVE
PD91J
SET INDEX REGISTER 1 & 4 TO 1
06B
PD93G
SIX
SET INDEX REGISTER 1 & 4 TO 0
06D
PD93I
PD92
04H
IS NUMBER OF UNITS LESS THAN OR EQUAL TO 3
PD99T
6-5-4
05B
PD92F
3
05A
PD92D
2-1
SET THE "LDQ" REFERENCE TO A "NOP" REFERENCE
PD99P
PD92B
IS NUMBER OF UNITS EQUAL TO 2
PD99T
YES
SET INDEX REGISTER 1 & 4 TO 4
02K
PD86I
NO
SET INDEX REGISTER 1 & 4 TO 5
02J
PD86G


PD92D
05A
SET INDEX REGISTER 1 & 4 TO 3
SET 6 INTO ACCUMULATOR
03F
PD92F
05B
TRANSFER TO A LOCATION DEPENDENT UPON NUMBER OF UNITS IN FIELD
6 UNITS
05D PD92J
5 UNITS
05C PD92H
4 UNITS
SET INDEX REGISTER 1 & 4 TO 2
06B
PD93G
PD92H
05C
SET INDEX REGISTER 1 & 4 TO 1
06D PD93I
PD92J
05D
SET INDEX REGISTER 1 & 4 TO 0
06F PD93K
PD93
05E
IS THE NUMBER OF UNITS EQUAL TO 1 PD99T
NO
05F
PD93B
YES
SET THE "LDQ" REFERENCE TO A "NOP" REFERENCE
PD99P
SET INDEX REGISTER 1 & 4 TO 5
02K
PD86I
PD93B
05F
TRANSFER TO A LOCATION DEPENDENT UPON NUMBER OF UNITS IN FIELD
6 UNITS
06G PD93L
5 UNITS
06E PD93J
4 UNITS
06C PD93H
3 UNITS
06A PD93F
2 UNITS
PD93D
SET INDEX REGISTER 1 & 4 TO 4
SET 6 INTO ACCUMULATOR
03F


PD93F
06A
SET INDEX REGISTER 1 & 4 TO 3
PD93G
06B
SET 12 INTO THE ACCUMULATOR
03F
PD88L
PD94
06I
SET INDEX REGISTER 1 & 4 TO C
SET THE "LDQ" REFERENCE TO A "NOP" REFERENCE
PD99P
02K
PD86I
PD93H
06C
SET INDEX REGISTER 1 & 4 TO 2
PD93I
06D
SET 18 INTO THE ACCUMULATOR
03F
PD88L
PD93J
06E
SET INDEX REGISTER 1 & 4 TO 1
PD93K
06F
SET 24 INTO THE ACCUMULATOR
03F
PD88L
PD93L
06G
SET INDEX REGISTER 1 & 4 TO 0
PD93M
06H
SET 30 INTO THE ACCUMULATOR
03F
PD88L


PD95
07A
SET THE "LDQ" REFERENCE TO "NOP" REFERENCE
PD99P
SET THE NUMBER OF BITS IN THIS FIELD INTO LOCATION
PD99T
SET THE BIT START POSITION INTO LOCATION
PD98M
SUBTRACT BIT START POSITION AND NUMBER OF BITS FROM A VALUE OF 37
SET THIS DIFFERENCE INTO THE "ARS" INSTRUCTION
SET THE "ARS" INSTRUCTION IN THE LOCATION REFERENCED BY
PD99S
PD96
SET UP A MASK OF ALL 1 BITS EQUAL TO THE NUMBER OF BITS IN THIS FIELD RIGHT JUSTIFIED
SET THIS MASK INTO THE LOCATION
PD98N
07B
07B
SET THE MASK INTO THE LOCATION REFERENCED BY
PD99Z
SET A ZERO IN THE ADDRESS REFERENCED BY
PD99W
07C
ROUTINE OUTLINK
1,4

Time Merge Phase Tape and Record Layouts

The following layouts will show the tape and record configurations used in the time merge phase.

Figure III-F-6 shows the physical layout of the SECONDARY MASTER. It shows the label that is used with the input parameters and the 350-word input parameter block. Both the label and the input parameter block are ended with an end-of-record gap.

Following the input parameter block is the beginning of the activity-to-charge-number information. This area is headed by a two-record label. The first will indicate the type of information to follow, the date created, and the tape number if the tape is one of a series. The second label will contain the program name. After this label the data records will begin. These records are set in 600-word blocks for all blocks up to the last, which may be from 8 words to 600 words long. Each block will hold 75 logical 8-word records. These records are of two types, as described below.

(a) Network Code Record Type, Which Contains a 1 as the First Character of the First Word (see Fig. III-F-7).

Following this type code are the network code, which is set up for a maximum of 6 characters, and the network description, which allows for 35 characters. This record type will precede all of the activity-to-charge-number data for that network. There will be only one of these cards for each network code that is used. The network description will be truncated by one character to fit into this record. The last word of this logical record contains the check sum generated by the writer routine.

(b) Activity-to-Charge Number Record Type, Which Contains a 2 as the First Character of the First Word (see Fig. III-F-8).

Following this type code, the second word contains a predecessor number of 9 characters, a successor number of 9 characters, and a charge number of 18 characters. These Type 2 records will follow the network code record, and there can be any number of them within a network code, blocked into 600 word records. The last word of this logical record contains the check sum generated by the writer routine.

The end-of-tape conditions that are developed on this tape are shown in Fig. III-F-6. At the end of that SECONDARY MASTER there will always be two end-of-file marks indicating completion of this data.

The 35-word record of selected time information that is sent out to the activity-to-charge-number sort prior to the update phase is shown in Fig. III-F-8. This record will show the fields that are carried as well as how each field is set up. These fields include the following:

(1) Charge Number (18H). The charge number can contain up to 18 Hollerith characters.

(2) Activity Flow Time (Weeks × 10 at B35). The activity flow time is in weeks multiplied by 10 and is carried at a binary point of 35.

(3) Expected Complete (DDMMYY). The expected complete time is carried as a calendar date by day, month, and year.

(4) T_S-T_A Flag (Indicator). The first character of this word will contain a blank if it represents T_S or an "A" if it represents T_A.

When this record is developed in core during the time merge phase this record is actually a 39-word record, with the first four words containing the network code, predecessor number, and successor number for comparing operations. The balance of the record is as shown in Fig. III-F-8.

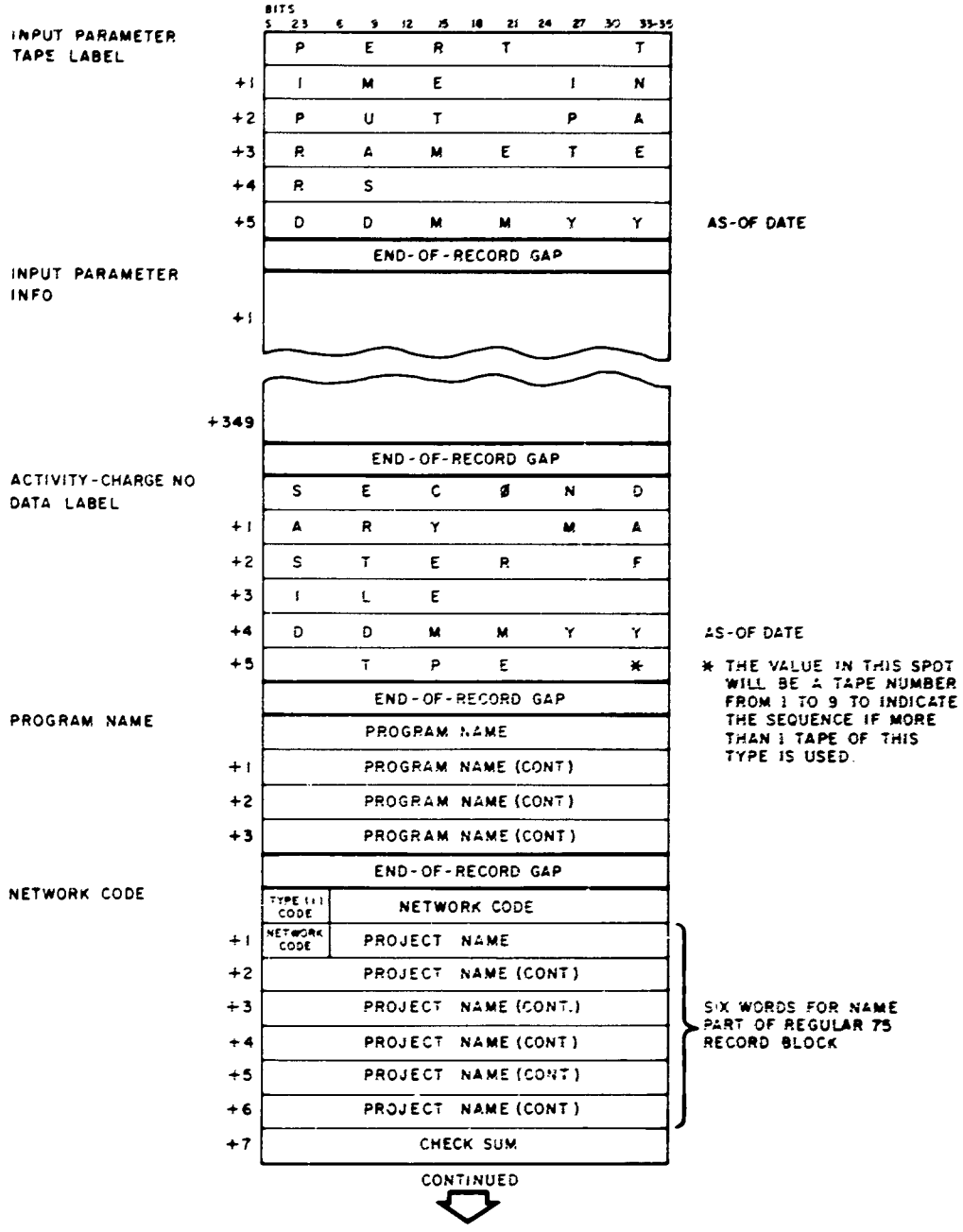


Fig III-F-6 Physical Layout of Secondary Master Tape

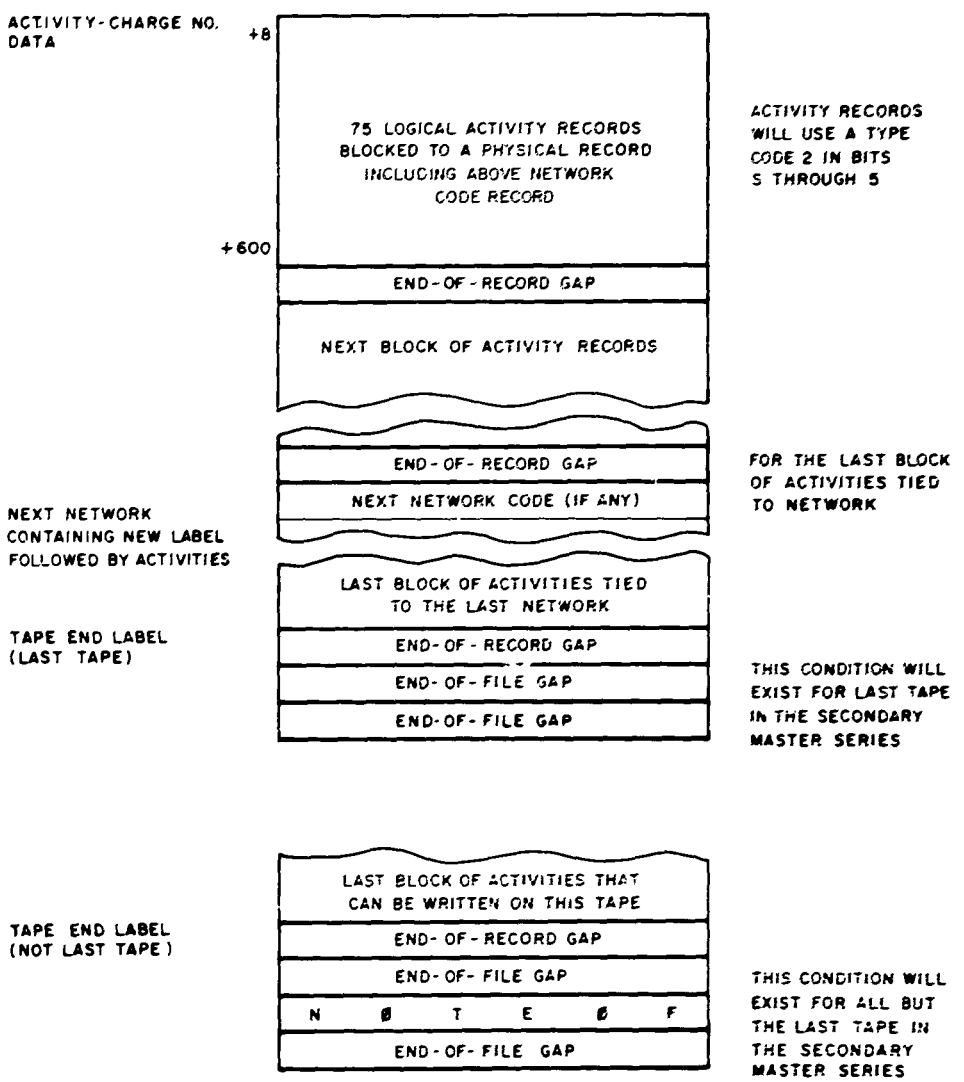


Fig. III-F-6 Physical Layout of Secondary Master Tape (Continued)

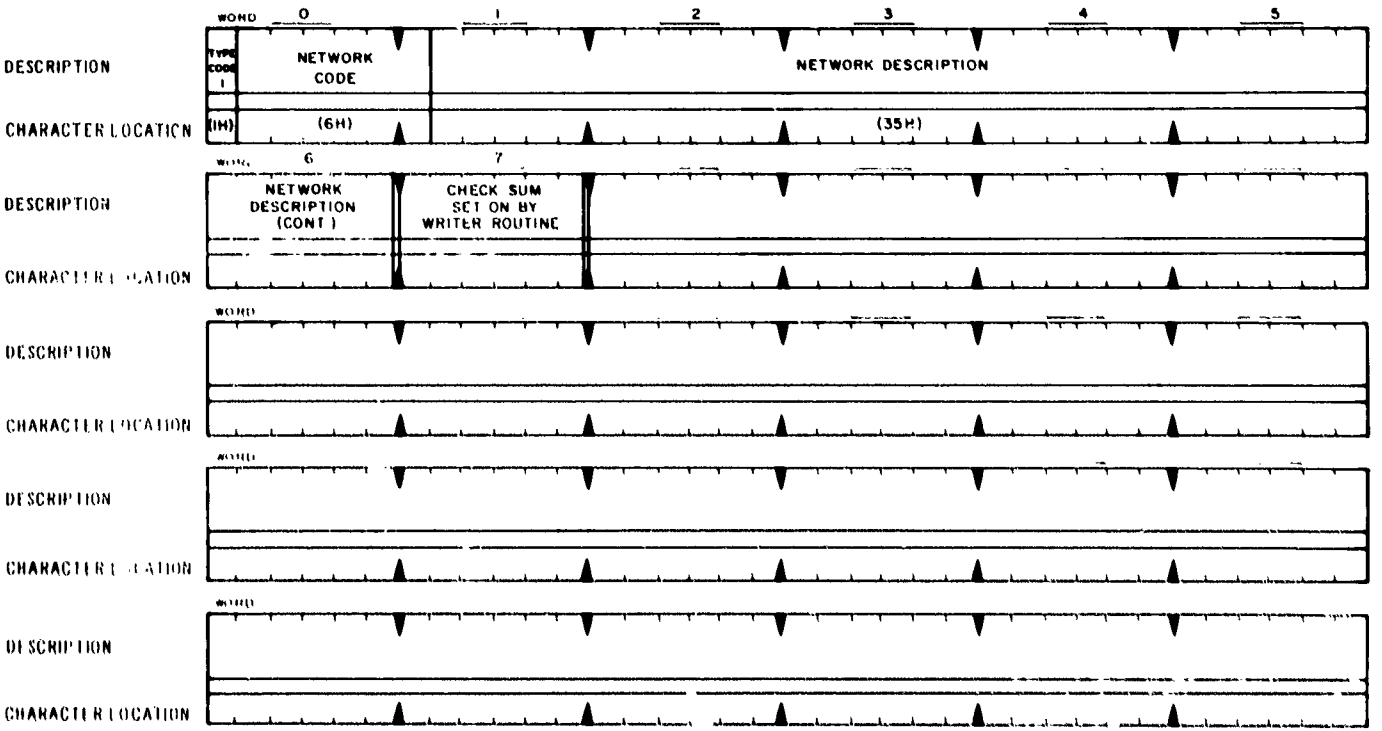


Fig. III-F-7 Secondary Master Network Code Logical Record

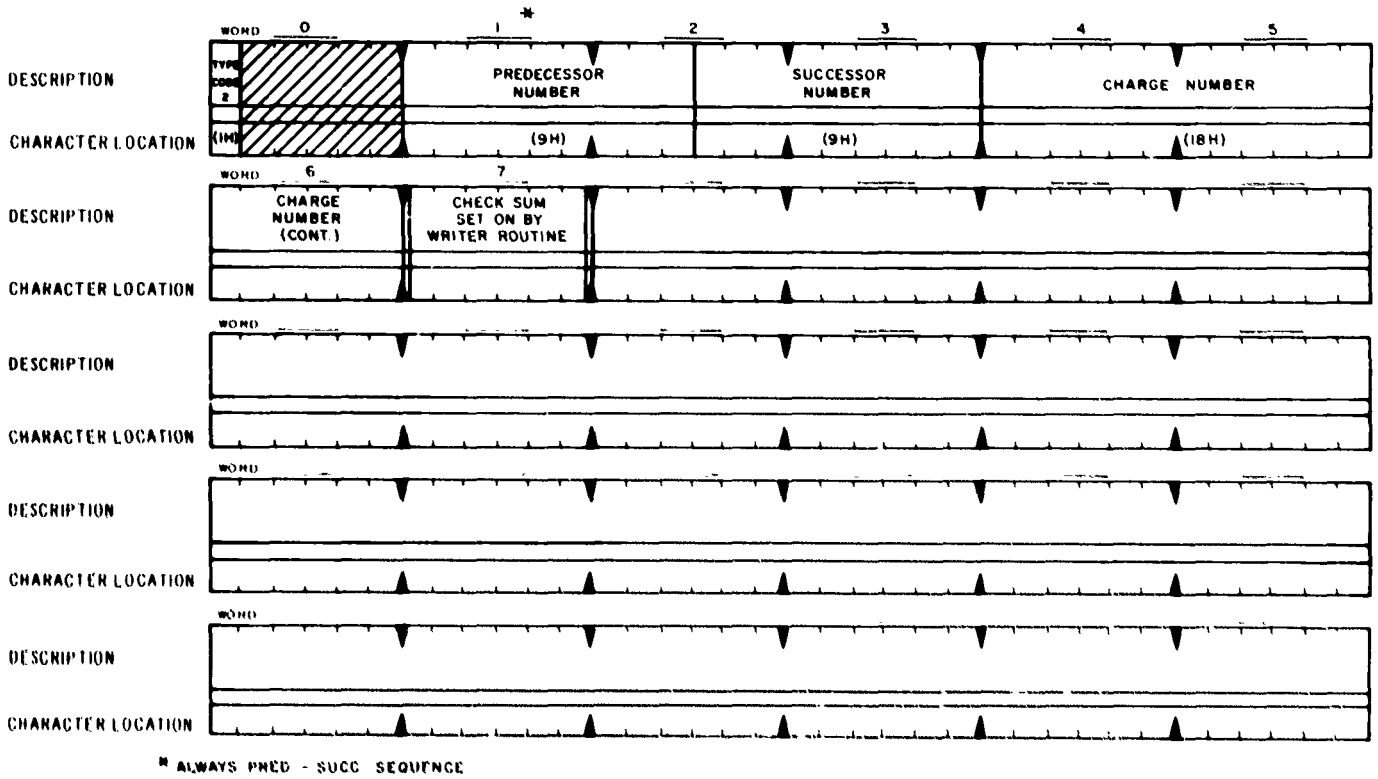


Fig. III-F-8 Secondary Master Data Logical Record

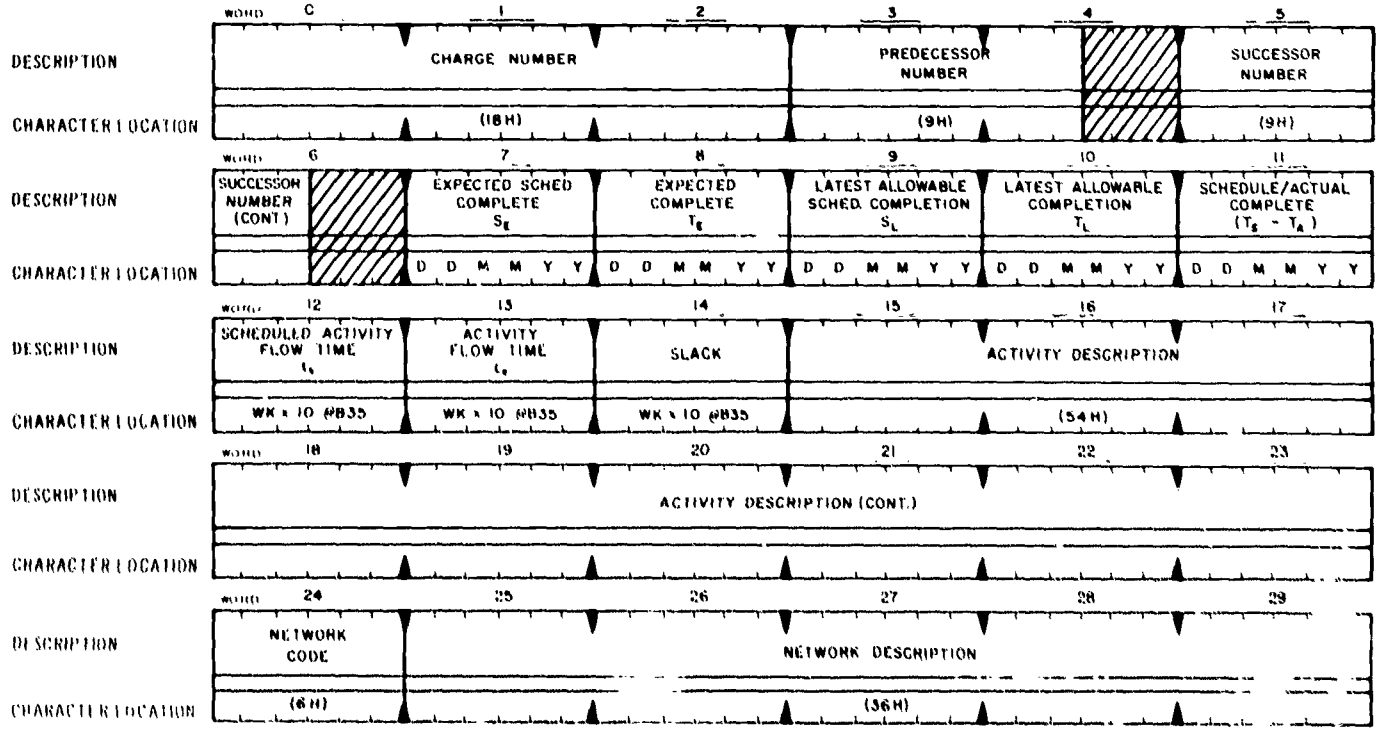
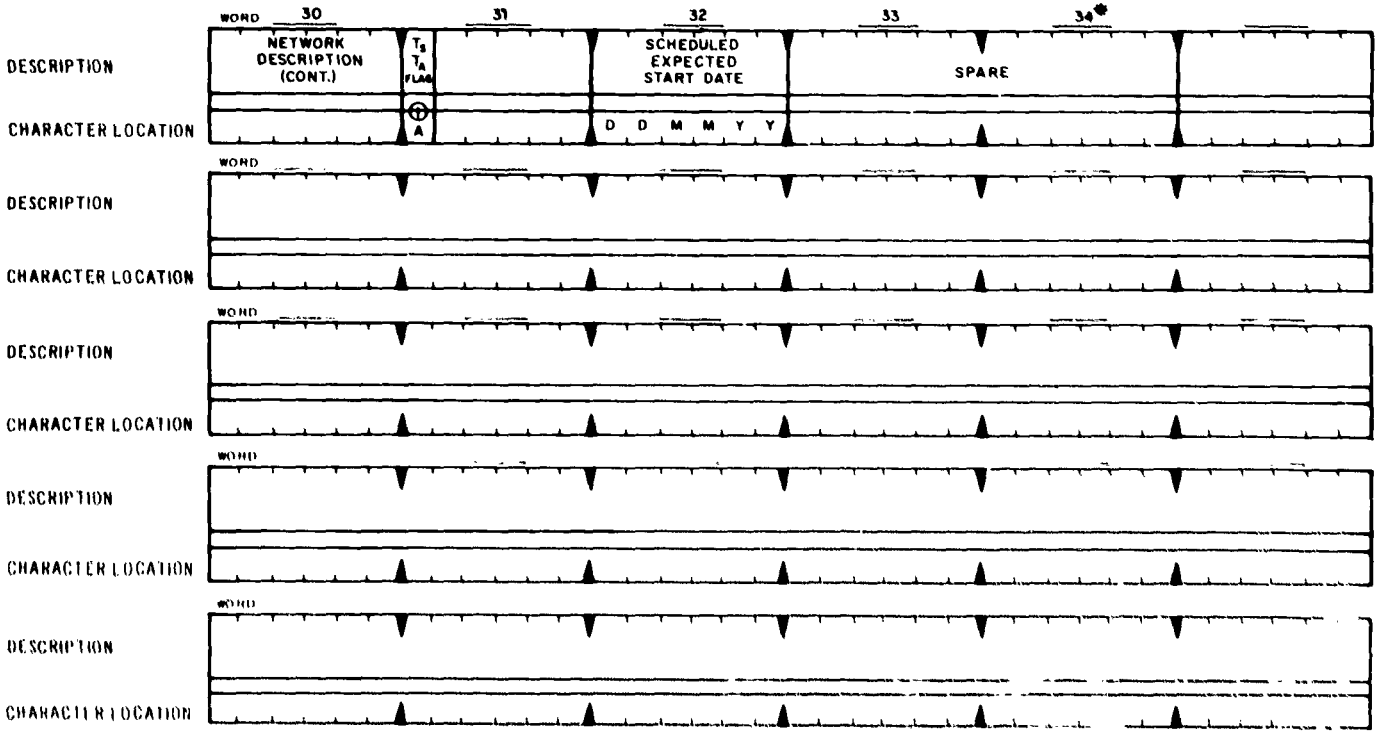


Fig. III-F-9 PERT Time Record Developed from User's Time Input and Secondary Master



*IN CORE DURING TIME MERGE - A 39 WORD RECORD IS SET UP - THE 1st 4 WORDS BEING NETWORK CODE - PREDECESSOR NO AND SUCCESSOR NO - THE BALANCE IS AS SHOWN

Fig. III-F-9 PERT Time Record Developed from User's Time Input and Secondary Master (Continued)

III-G PERT COST UPDATE PHASE

Cost Update General Description

The update phase can be considered to consist of two principal stages: (1) the creation or updating of the rate and skill tables and the initialization of the Update phase, and (2) the creation or updating of the master file and the transmission of data to the reporting phase. Figure III-G-1 diagrams the computer logic for this phase.

At the start of this phase an initialization procedure determines which sort tapes are now available for use and which indicators should be set up for this phase. These indicators will reflect the options and control indications from the control cards. The first record of the SORTED TIME TAPE, OLD PERT COST MASTER, and SORTED DATA TAPE will each be read into their respective buffers. If the program is being run under a "file establish" condition, an end-of-file indicator is set for the OLD PERT COST MASTER and no data will be expected from this tape. If the program is being run under a "no time tape" condition, an end-of-file indicator is set for the USERS TIME TAPE and time information will not be expected. If there have been no Type 7 cards read into the system, an end-of-file indicator is set for the SORTED DATA TAPE.

The rate table and skill table are developed at file establishment time and are carried on the PERT COST MASTER TAPE. These records are read in every cycle and can be updated by 4, 5, and 6 card inputs from the SORTED DATA TAPE.

During the master file creation and update phase a comparison of the charge (or summary) numbers is made between the OLD PERT COST MASTER FILE and the SORTED DATA TAPE (where both tapes are sorted in charge number order). Depending on the outcome of this comparison the program will transfer control to one of three routines:

(1) OLD MASTER charge number is less than the Input Tape (SORTED DATA TAPE) charge number

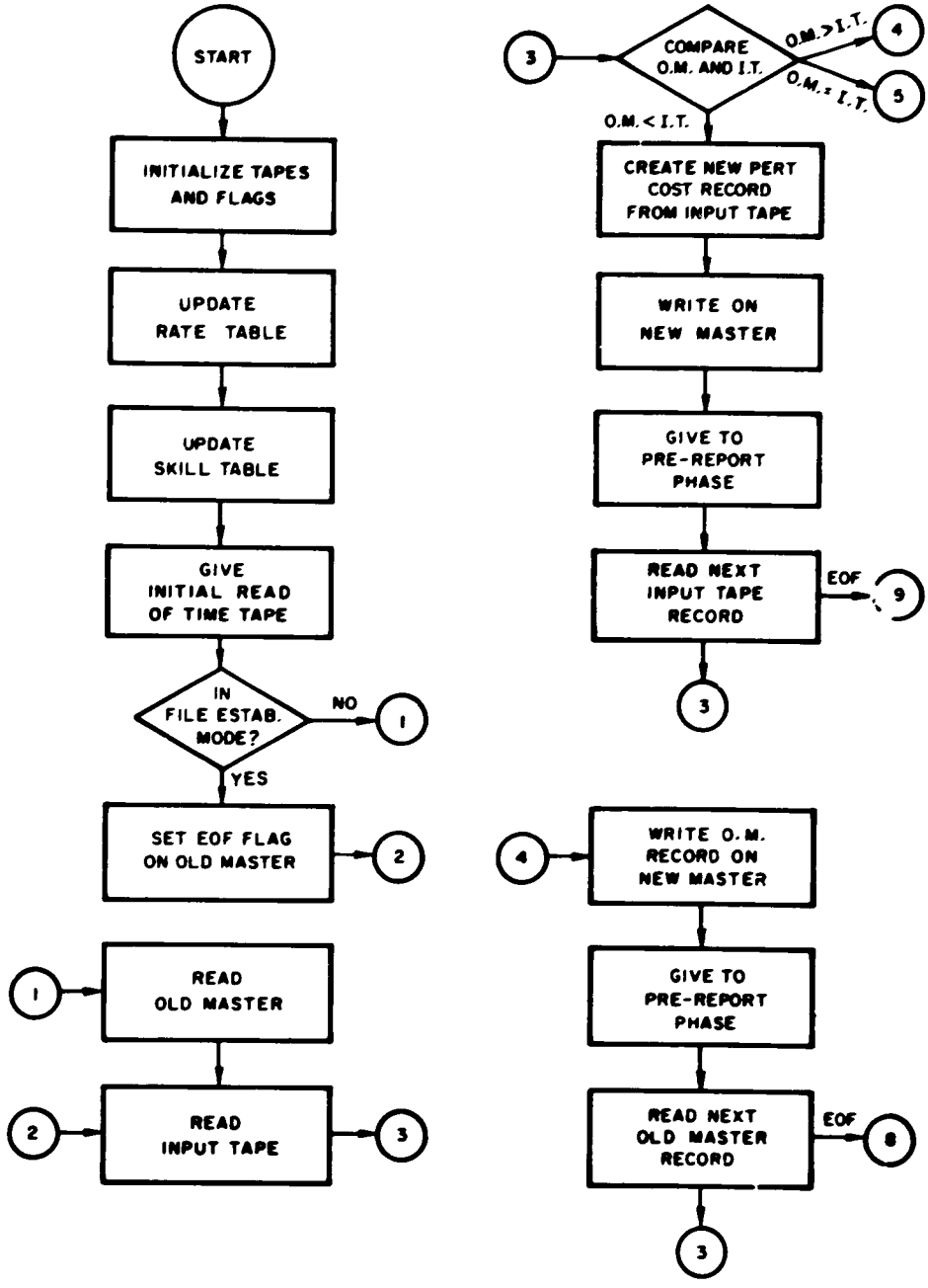


Fig. III-G-1 Flow Diagram of Update Phase

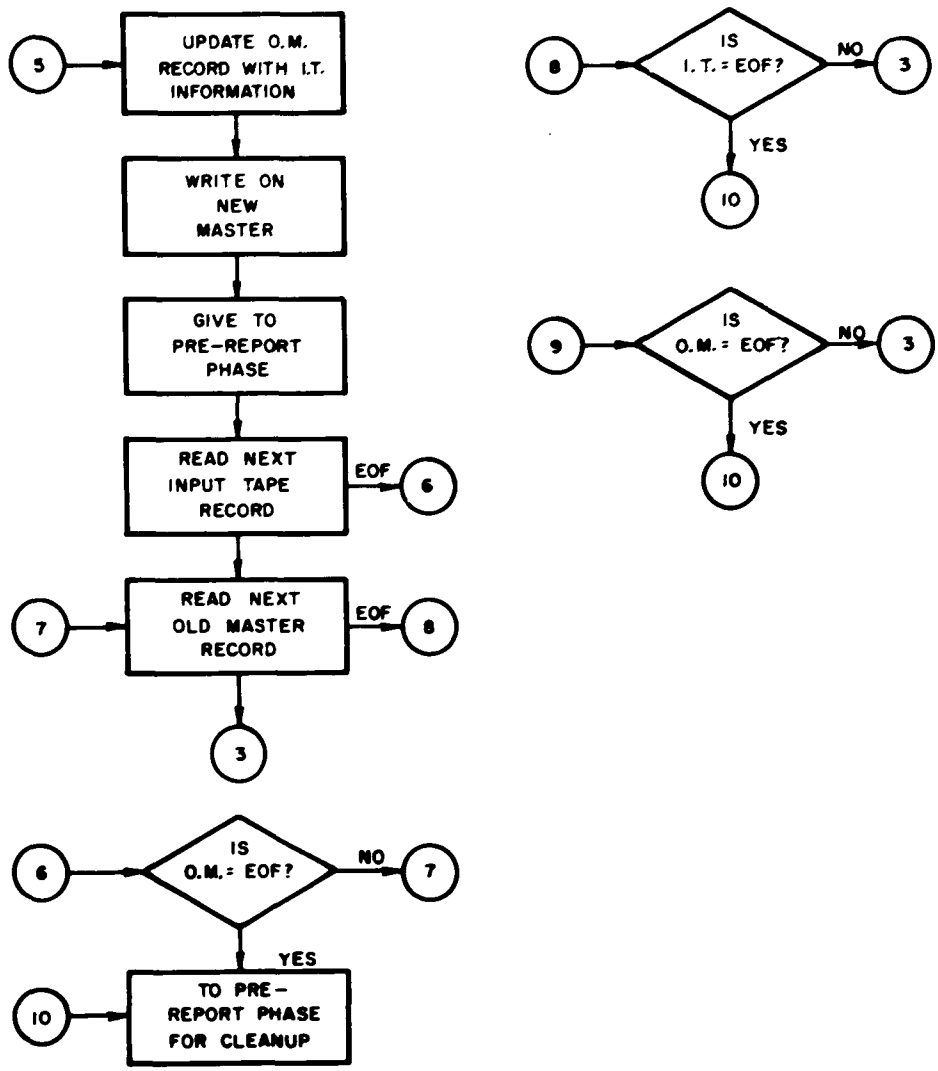


Fig. III-G-1. Flow Diagram of Update Phase (Continued)

(2) OLD MASTER charge number is greater than Input Tape charge number

(3) OLD MASTER charge number is equal to the Input Tape charge number

When the end-of-file indicator is set for either of these tapes, the charge number from that tape is set to all octal sevens (the greatest number possible).

For the condition when the OLD PERT COST MASTER TAPE is less than the input, only the information from the OLD MASTER is utilized and the Input Tape information is ignored. In this case the following operations are performed on the three types of information records.

(a) Type 1 (Charge Number information)

The Type 1 record from the OLD MASTER is placed in a storage block (UCHG). The SORTED TIME TAPE is searched for all activities related to the charge number in UCHG. The activity information is summarized and placed into the pseudo time storage block (UTIME). If no activities are related to the specified charge numbers, UTIME is cleared. The UCHG block is now written on the NEW PERT COST MASTER as a new Type 1 record.

(b) Type 2 (Performing Organization information)

The Type 2 record is placed in a storage block (UPUN) and then written on the NEW MASTER.

(c) Type 3 (Resource Code information)

The Type 3 information is placed in a storage block (QRES2), transferred to storage block (QRES1), and written on the NEW MASTER from QRES1. The data in QRES2 is extended through use of the rate table prior to being placed in QRES1. The information in UCHG, UPUN, QRES2, and UTIME is given to the Pre-reporting Phase for processing.

If a Type 1 record is immediately followed by a Type 3 record, or a new charge number is found to be less than the previous charge number, a sequence error message is printed on-line and the computer will halt.

For the condition when the OLD PERT COST MASTER is greater than the input, only the information from the Input Tape is used and the OLD

MASTER is ignored. This condition is essentially the establishment of a new charge number in the master file. The types of input cards used to establish a charge number will be as follows:

(a) Type 7-0, 7-1, 7-2 Cards

The Type 7-0 card must in this condition be entered with a transaction code of "A." The 7-0 card information is transferred into the UCHG block and then updated with the information from the 7-1 and 7-2 cards. The information in the UCHG block (after the search of the Time Tape is performed) is then written on the NEW PERT COST MASTER TAPE as a Type 1 record. If the transaction code of the 7-0 card is not an "A," an exception message will be written on the SYSTEM ERROR TAPE, followed by a display of the 7-0 card in error. The program will then read the next card from the Input Tape and continue normal processing.

If any Type 7 cards are entered for a certain charge number and the 7-0 card for this number is not available or was rejected due to an error in the card, these cards will be rejected and an exception message will be printed on the SYSTEM ERROR TAPE followed by a display of the card.

(b) Type 7-3, 7-4, 7-5 Cards

The Type 7-3, 7-4, and 7-5 cards are used in creating a Type 2 and a Type 3 record for the NEW PERT COST MASTER TAPE. The Performing Organization information will be placed in UPUN and then written out on the NEW MASTER TAPE. The 7-3 card will set the actual cost information into the correct months of the Resource Code block QRES2. The 7-4 and 7-5 cards will place the cost estimates and budgets into the correct months (with respect to the charge number start date) of the QRES2 block. The cost information is packed down and placed into the QRES1 block, from where it is written as a Type 3 record on the NEW MASTER TAPE. If the transaction code of the 7-4 or 7-5 card is not an "A," an exception message will be placed in the Error Report followed by an image of the incorrect card.

For the condition when the OLD PERT COST MASTER TAPE is equal to the SORTED DATA TAPE the records from the OLD MASTER are read into the appropriate storage blocks, are updated by the Type 7 cards from the Input

Tape, and then are written as Type 1, 2, or 3 records on the NEW MASTER TAPE. If a card with an "A" transaction code is received, the card will be rejected and an exception message will be printed on the Error Report. If a Type 7-0 card is input with a "D" transaction code, a "deletion" indicator is set. All charge number, performing organization, and resource code records which do not contain actual cost data will be deleted. If a resource code record contains actual costs, only the cost estimate and budget data will be deleted and the charge number, performing organization, and resource code records will be written on the NEW MASTER. If a 7-4 or 7-5 card is input with a "D" transaction code, the performing organization and resource code records will be deleted unless actual data appears in the record. If actual data appears and is removed from the record (using a 7-3 card), the record will be deleted if the "deletion" indicator is set. If actual data is contained in the record to be deleted, an exception message is placed on the error report.

If a 7-4 or 7-5 card containing a "C" transaction code is input and the "delete" indicator is set, an exception message will be set on the SYSTEM ERROR TAPE followed by a display of the card in error.

When the updating is completed, the NEW PERT COST MASTER will be rewound and unloaded. At the end of the update phase a message indicating the number of errors encountered during the processing will be displayed on the on-line printer. This message will take one of the following forms:

XXXX ERRORS DETERMINED

IF RUN IS TO BE CONTINUED EVEN THOUGH ERRORS INDICATED HIT START

NO ERRORS DETERMINED

If the first message is printed out, the program will stop. If these errors are to be ignored, the start button at the console is hit and they are by-passed. The program will then go into the output preprocessing sort and then into the output phase. Where no errors are indicated the program will go into the sort and output phase automatically.

Cost Update Rate Table

The rate table used with the PERT Cost system utilizes a very basic approach. It will contain rate information to be applied against the unit value to arrive at direct dollar totals or a rate to be applied against the direct dollars to arrive at total dollars. This table will be used with both estimates and budget values (but not actual values) tied to the performing-unit/resource-code combinations or to just the resource codes. The program will actually make two passes in searching through the rate table. The first pass will be to check whether the performing-unit/resource-code combination can be located in the rate table. If it cannot be found, a second pass is made against only the resource code. If the resource code still cannot be found, it is not in the table.

This table can be updated by means of the Type 4 input from the SORTED DATA TAPE. These input cards can change, add, or delete information in this table. On file establishment this table is developed in core at location RTBAR and, after completing the read-in of all Type 4 cards, is set out on the NEW PERT COST MASTER. On the cyclic updating runs, this table is read in from the OLD PERT COST MASTER and set into core at RTBAR. It is then updated, if any Type 4 cards are present, and then set out on the NEW PERT COST MASTER. The rate table will remain in core during the entire update phase.

The rate table will use the "next available slot" approach, which automatically packs the information and allows for fast retrieval. This approach will be discussed starting on Page III-G-8.

The unit rate information carried in this table is of a variable scaling in that any value from ".xxxxxx" to "xxxxxx." can be used. The indicator for the scaling factor is contained in bits 18 - 20 of the first word of a slot, as shown in Fig. III-G-7. The overhead rate is of fixed scaling in the form of "x.xxx" and no scaling factor is needed.

The rate table is broken down into two separate tables or sections. One is 800 words that contain information in 3-word sets. This information is

the performing unit (if any), resource code, and link to the first set of rate data in the second section of the table. The second section of the table is of 3203 words and will contain the rate information. These slots will indicate the year, the quarter (if any), the scaling factor (if any), the link to the next slot that contains information for this performing-unit/resource-code combination, and the overhead and unit rates. It is possible to have only an overhead or only a unit rate in any one slot, or both can be present.

Rate Table Next-Available-Slot Approach

It is believed that a brief description of the next-available-slot approach will help the reader understand the operation of this system. The following are some terms that will be used in the discussion of this method:

(a) Bucket - A bucket refers to a group or category that the information involved will be split into. An example is the performing-unit/resource-code or resource code combinations in section 1 of the rate table (see Fig. III-G-7).

(b) Downlink - The downlink portion of the word refers to the channel of the next slot that is part of the same bucket.

(c) Empty Control - Empty control is basically the bucket for all channels that are not in use.

The way the next-available-slot method works is that a group of buckets are set up, dependent upon input to the system. For discussion purposes, we will set up two locations called Bucket A and Bucket B, and all our information will be split into these categories. We also assume there is a maximum of ten slots in these categories at any one time.

At the start, the Empty Control will contain 10 words, each containing the downlink to the previous channel as shown conceptually in Fig. III-G-2. A bucket downlink of zero indicates this is the last link of the bucket. Thus, at this time, there are no links connected to Bucket A or B.

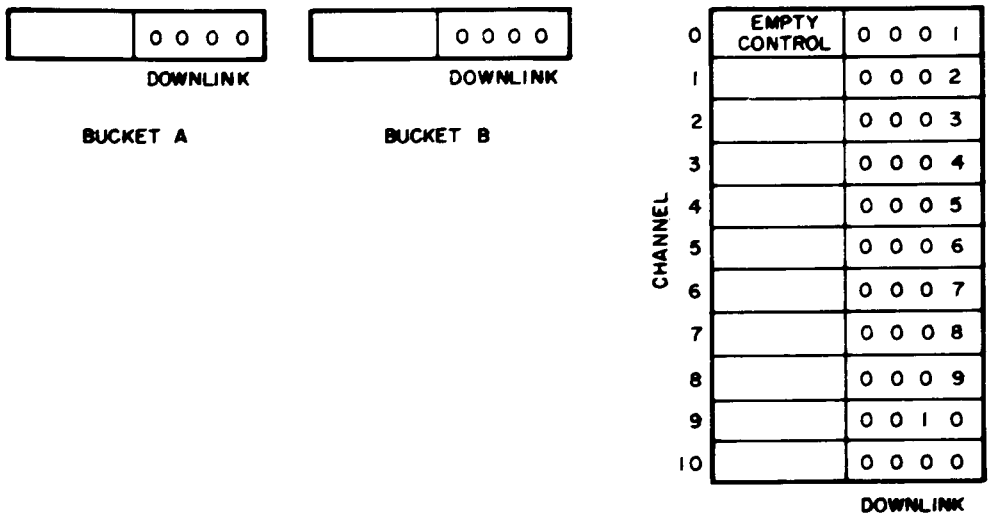


Fig. III-G-2 Start of Next-Available-Slot Method

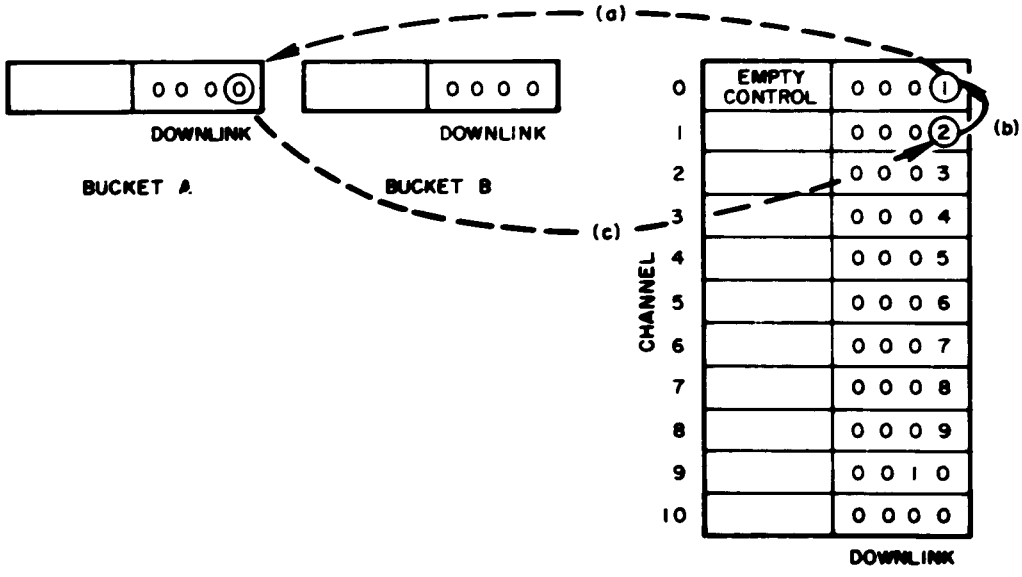


Fig. III-G-3 Sequence of Steps in Adding Information to Rate Table by Next-Available-Slot Method

As information comes into the system to be placed in the proper bucket, the following will result:

(a) The downlink of the Empty Control will give the channel number of the next empty channel to use, which will be placed in the downlink of the proper bucket.

(b) The downlink of the next empty channel replaces the previous downlink in Empty Control so as to set up the second empty channel for the next request.

(c) The downlink that had been in the bucket replaces the downlink in the empty channel.

These steps in adding information are indicated by arrows in Fig. III-G-3, under the assumption the information is to be added to Bucket A.

The above process is illustrated in Fig. III-G-4, using the simplified Bucket A and Bucket B example previously described. Suppose information A-1 and B-1 are to be added to the table. Empty Control will tell us that Channel 1 is the next empty channel. The information is entered in Channel 1, and the number 1 replaces zero as the Bucket A downlink, indicating that the last information in Category A is to be found in Channel 1. The zero

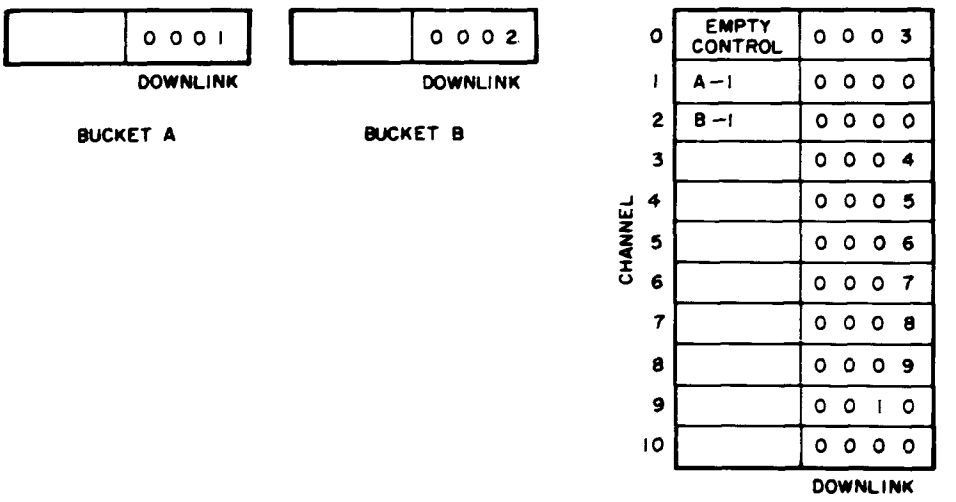


Fig. III-G-4 Adding A-1 and B-1 to Rate Table

now entered as downlink in Channel 1 indicates that no previous links to Bucket A exist in the table. This same procedure will be applied in setting up B-1, except that the information will be stored in Channel 2 and the Bucket B downlink to the table will be a 2. Channel 3 will be entered as the Empty Control downlink.

As additional information comes into the system, this same process continues. Assume A-2, A-5, and A-4 are added to the table, in that order. The results are shown in Fig. III-G-5.

Under the next-available-slot system, as some information becomes outdated it will have to be removed from the bucket in reverse manner to the addition process shown in Fig. III-G-3.

(a) The table is searched for the duplicate information control bit, such as A-1, A-4, etc. This is located by examining first the channel containing the last information added to this bucket category, as indicated by the appropriate bucket downlink. If the information in this channel does not match the control bit, the next channel up the downlink chain is examined, etc., until the duplicate information control bit is found. At this point, the channel just previously examined will have its downlink replaced by the

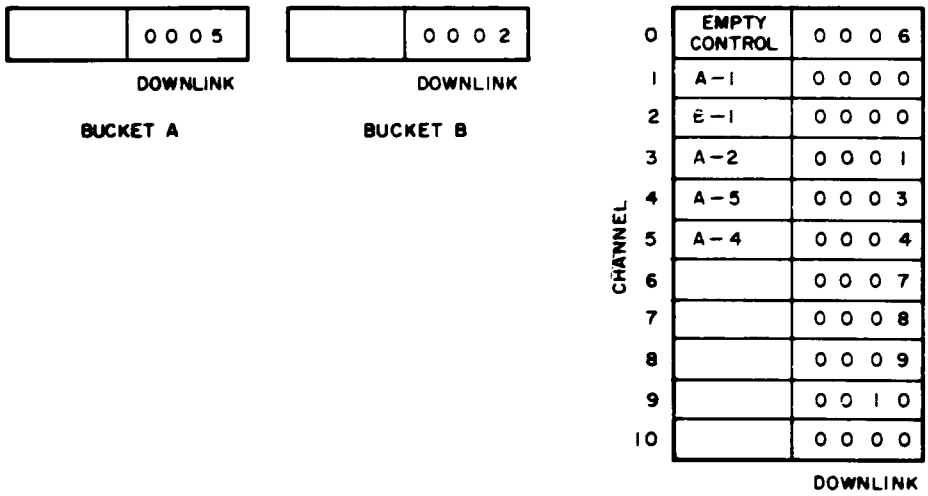


Fig. III-G-5. Adding A-2, A-5, and A-4, in Stated Order, to Rate Table

downlink of the channel being deleted. If the channel being removed is the last piece of information added to this bucket (i. e., the channel indicated by the bucket downlink), the downlink of the deleted channel replaces the downlink in the bucket.

(b) The downlink in the Empty Control will then replace the downlink in the deleted channel.

(c) The deleted (empty) channel becomes the value shown in the Empty Control downlink; that is, it becomes the next available channel.

Continuing the example previously set up, assume A-5 and B-1 are to be deleted. Searching through the table, we find A-5 in Channel 4, with Channel 5 being the next channel in the Bucket A downlink. The downlink from Channel 4 will then replace the downlink in Channel 5, thereby deleting A-5 from the bucket. The now-empty Channel 4 is entered as the downlink to Empty Control, while the previous Empty Control downlink is assigned to Channel 4. The same procedure is followed in deleting B-1 except that the downlink of the deleted B-1 becomes the Bucket B downlink. The result is shown in Fig. III-G-6.

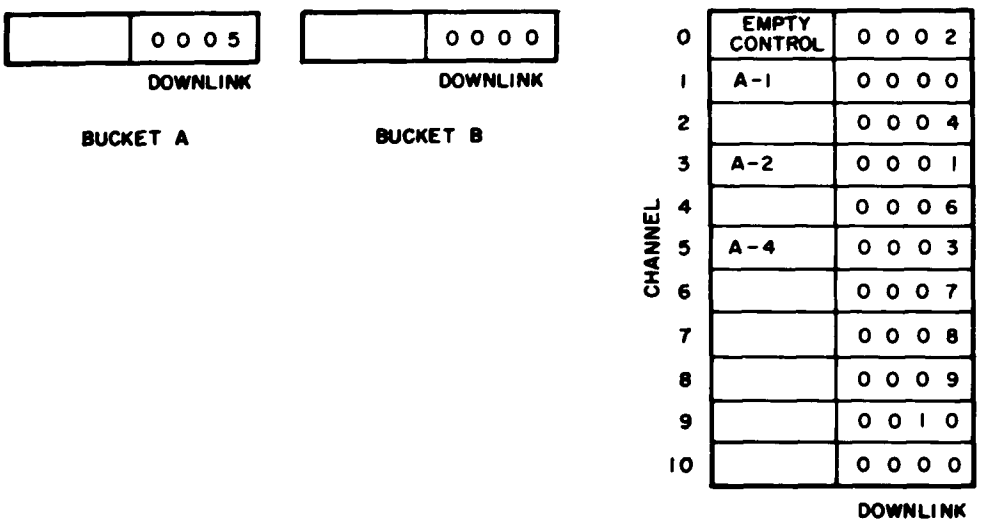


Fig. III-G-6. Deleting A-5 and B-1 from Rate Table

Rate Table Error Messages

In developing and updating the RTBAR table from the Type 4 input cards, the following error or exception messages can be produced, depending on the type of error. All of these errors will be set out on the SYSTEM ERROR TAPE.

(a) AN ERROR EXISTS ON THE FOLLOWING CARD
YEAR TO BE CHANGED NOT IN CURRENT FILE
XX - 80 characters of input card - XX

This message will be set out when a Type 4 input is attempting to change a rate for a year or a year-and-a-quarter that does not exist. The third line of this message will be an 80-character representation of the input card that caused this error. This representation will also follow all of the messages below.

(b) AN ERROR EXISTS ON THE FOLLOWING CARD
YEAR TO BE DELETED NOT IN CURRENT FILE

This message will be set out when a Type 4 input is attempting to delete a rate for a year or a year-and-a-quarter that does not exist.

(c) 15 RESOURCE CODE DELETIONS MAX. FROM RATE TABLE PER RUN. FOLLOWING CARD NOT ACCEPTED

More than 15 performing unit/resource code or resource code items have been deleted, which is the maximum size of the delete table. The card shown is ignored.

(d) AN ERROR EXISTS ON THE FOLLOWING CARD
PERF. UNIT AND RES. CODE NOT IN CURRENT FILE

This message will be set out when a Type 4 input is attempting to update the rate for a nonexistent performing unit/resource code combination or resource code.

(e) RATE TABLE FULL. FOLLOWING CARD NOT ACCEPTED

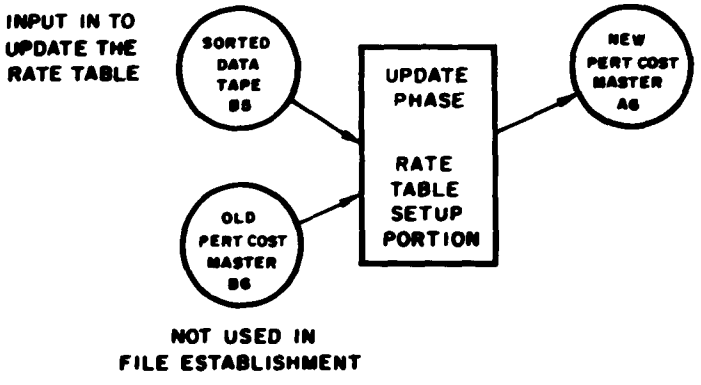
The table has reached its maximum of 266 performing unit/resource code or resource code combinations, and this card is not being processed or it has reached a maximum of 1601 individual year or year-and-a-quarter slots.

(f) AN ERROR EXISTS ON THE FOLLOWING CARD PERF. UNIT AND RES. CODE EXIST IN CURRENT FILE WITH DUPLICATE YEAR AND QUARTER

This message will be set out when a Type 4 input is attempting to add a rate for a year or a year-and-a-quarter that does exist. The program will then continue checking other fields on this card that contain other years and quarters for processing. It is possible to have up to four of these messages pertaining to the same card.

Rate Table Tape Operations

After the completion of the activity-to-charge-number sort, the tape on A6 will contain only the NEW SECONDARY MASTER TAPE. This tape will not be rewound, due to the fact that the NEW PERT COST MASTER will be set on as a second file. The first item set onto the NEW PERT COST MASTER TAPE will be the rate table. If the system is in a file establishment mode, the Type 4 inputs are set into the table at RTBAR, and this table is set out onto the NEW PERT COST MASTER. If this system is to be run without any rates, a rate table of 4003 words is still set out on tape but it will contain no rate information. If this system is not in a file establishment



mode, the rate table is read in from the OLD PERT COST MASTER into its core location at RTBAR. It is then updated, if any Type 4 inputs are present, and written out on the NEW PERT COST MASTER. The above sketch shows the tapes that can be used during this portion of the update phase.

Rate Table Restrictions and Operations

The following rate table restrictions and program operation approaches were used in developing this table.

(a) A maximum of 266 performing unit/resource code or resource code combinations can be set up in this rate table. This maximum is developed by dividing the block allocated to this area, which is 799, by the size of each set of data, which is 3.

(b) It will provide 1601 individual year-and-quarter or year slots that can be tied to any number of performing unit/ resource code slots from 1 to 266. This maximum is developed by dividing the block allocated to this area, which is 3202, by the size of each year-slot (which is 2).

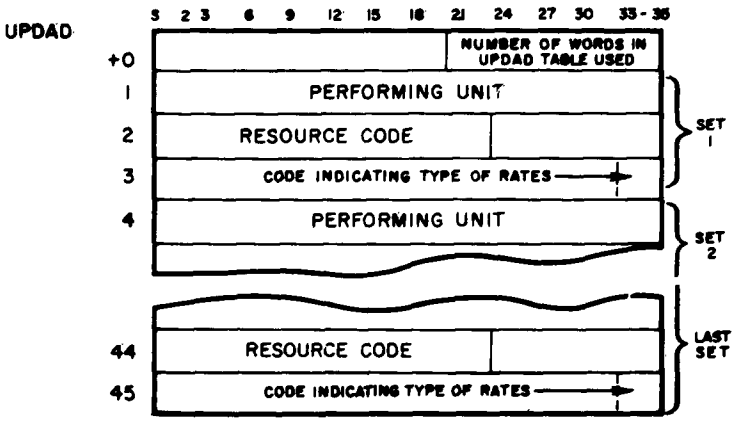
(c) A maximum of 15 performing unit/resource code or resource code combinations can be deleted from the rate table for any processing run. This maximum is developed by dividing the block allocation, which is 45, by the size of a delete set (3). The information carried in this block contains the performing unit, the resource code, and a code indicating the type of rates being deleted. This code will take the following form:

1 - Only unit rate carried by item deleted

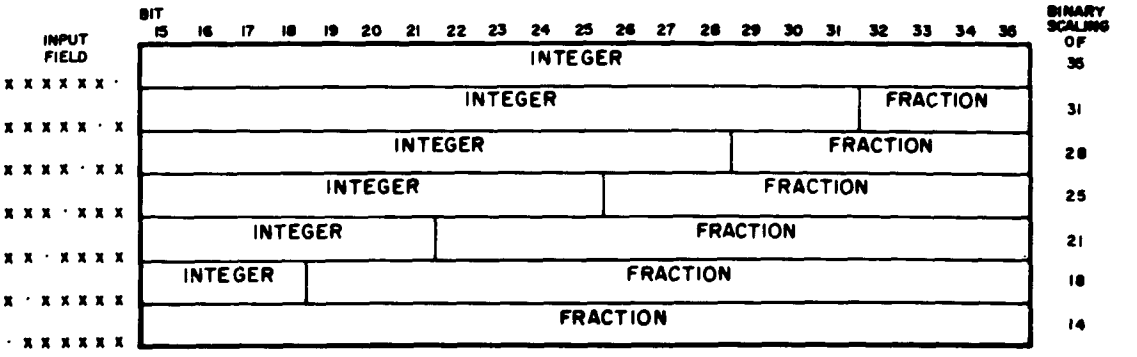
2 - Only overhead rate carried by item deleted

3 - Both unit and overhead rate carried by the item deleted.

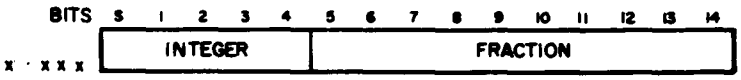
The purpose of this delete table located at UPDAD is to be able to remove any rate extensions that were developed in a prior run. The format of this table is shown on Page III-G-16.



(d) The floating decimal approach operates in the following manner. The unit rates will have a floating decimal point allowing for a value in the range of .000001 to 999999. This value is converted to a binary number and is carried in a 21-bit portion of the second word of a slot of the rate table (See Fig. III-G-7). These fields will have a fraction portion that varies according to the location of the decimal point. The decimal indicator will carry the number of decimal characters from 0 to 6. For example, 12345.6 will be a 1, while 12.3456 will be a 4. The scaling that will be used in the unit rate field will be as follows:

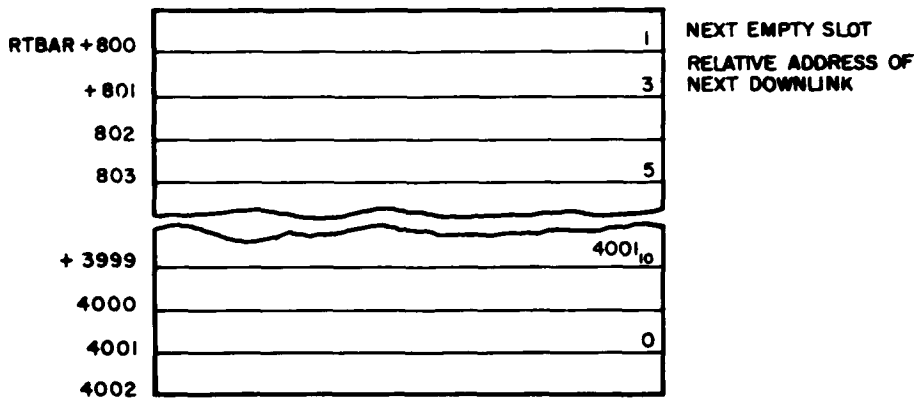


The format of the overhead rate will be fixed for all slots and will take on the following form



Rate Table Layouts

The layout shown in Fig. III-G-7 indicates the RTBAR table as it is carried in core. Initially, the second section of this table is preset with the relative address of its next available slot and will appear as follows



The values in the address of this table will represent relative locations of the next value tied to that word and are carried in binary. The last slot tied to the empty slot indicator will contain a zero.

From this initial setup, the rate table is built up by setting in the values developed from the Type 4 cards, using the next-available-slot approach. This table, as shown in Fig. III-G-7, is divided into two sections. The first section comprises the performing unit-resource code or resource code combination with a maximum of 266. The downlink tied to this combination refers to the relative address of the first slot that contains rate information for this item.

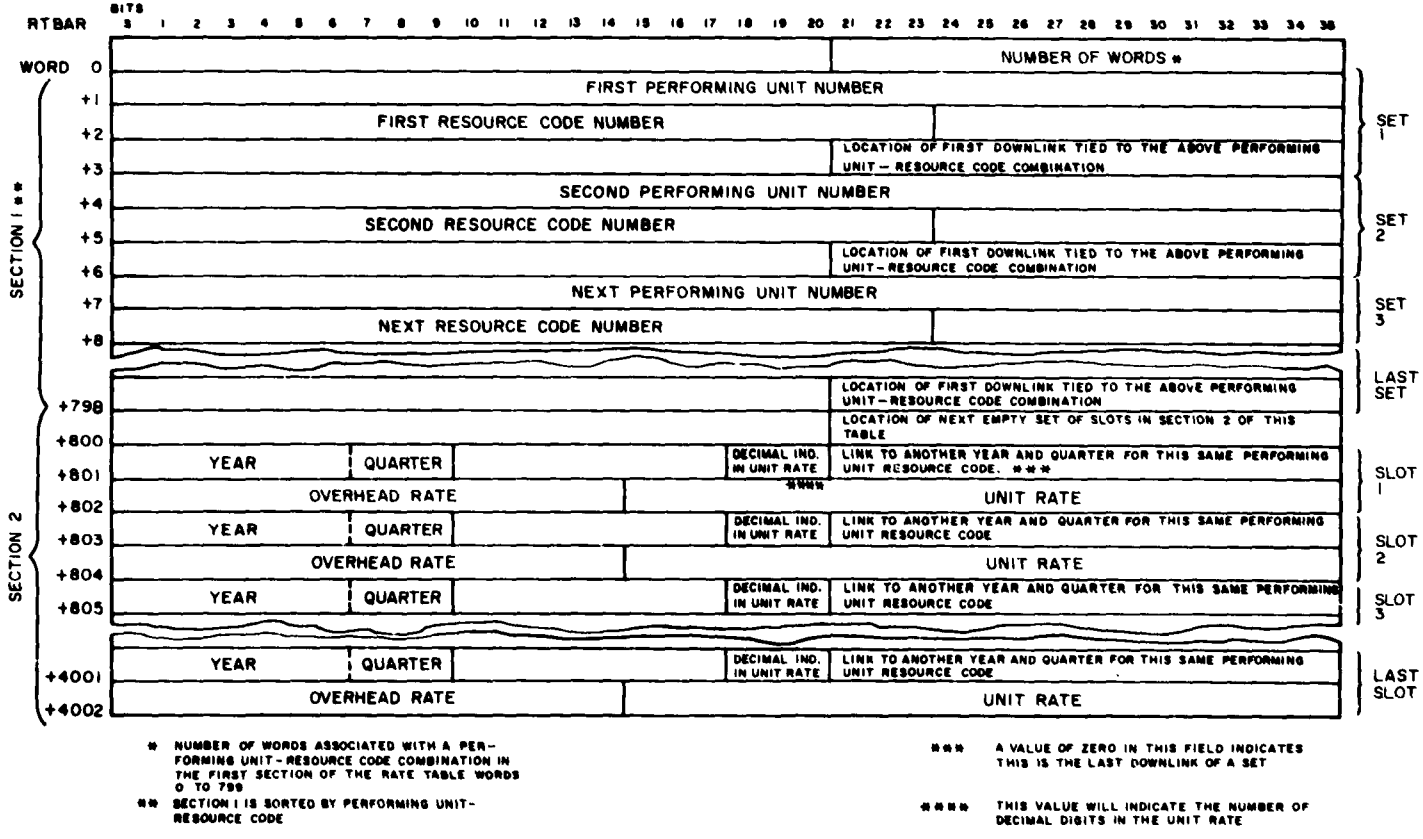


Fig. III-G-7. Rate Table Record

The second section comprises the rate information as related to a particular year or year-and-quarter. If there is only one year or year-and-quarter tied to an item in Section 1, the downlink is set to zero to indicate this. If there are more than one year or year-and-quarter tied to an item in Section 1, the downlink is set to the relative location of the next slot tied to this item. This linking will go on until the last slot tied to this item is found, and this slot will contain a zero in the downlink. The year-and-quarter in the first word of a Section 2 slot will be set up in binary.

At RTBAR +800 the relative location of the next available slot to be used can be found. When this number is zero it indicates there are no more slots available.

Rate Table Region Descriptions

This subsection describes the rate table subroutines used in the update phase of the program.

Region QRATE

EXPLANATION OF REGION:

This region will initially create and subsequently update the rate table from type 4 inputs. It will write this table out on the NEW PERT COST MASTER and on cyclic runs will read it in from the OLD PERT COST MASTER. For deletions of performing unit resource code sets this routine will develop the UPDAD delete table that is carried in core only.

CALLING SEQUENCE:

L TSX QRATE, 4

L + 1 Normal return

INPUT:

SORTED DATA TAPE (input type number 4)

OLD PERT COST MASTER TAPE

OUTPUT:

The RTBAR table developed in core and set out on the NEW PERT COST MASTER TAPE.

The UPDAD table

STORAGE USED:

RTBAR	-	4003 words	- rate table location
UPDAD	-	46 words	- delete table location
UP 450	-	14 words	- card image
UP 451	-	81 words	- unpacked card image

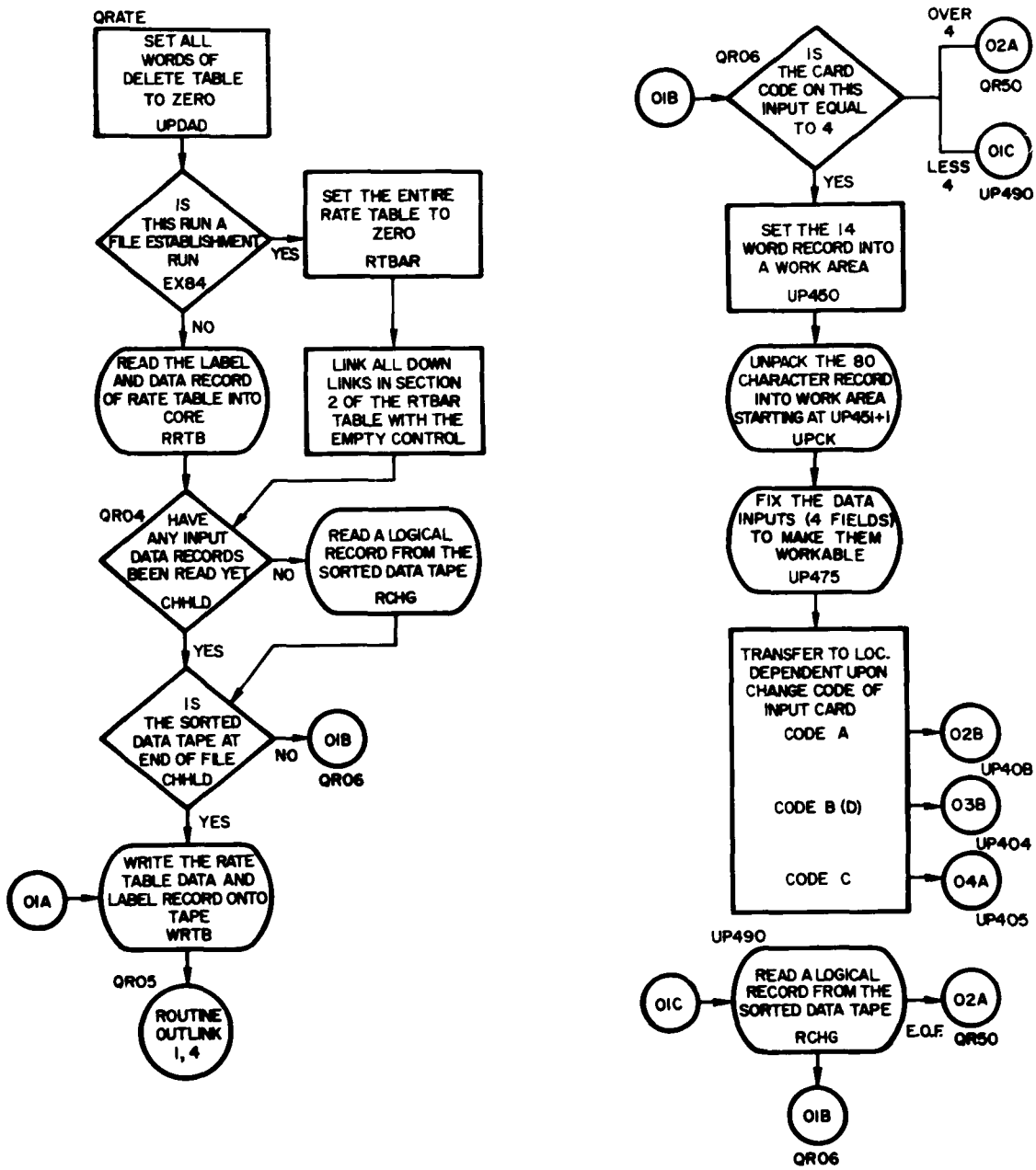
SUBREGIONS AND SUBROUTINES USED:

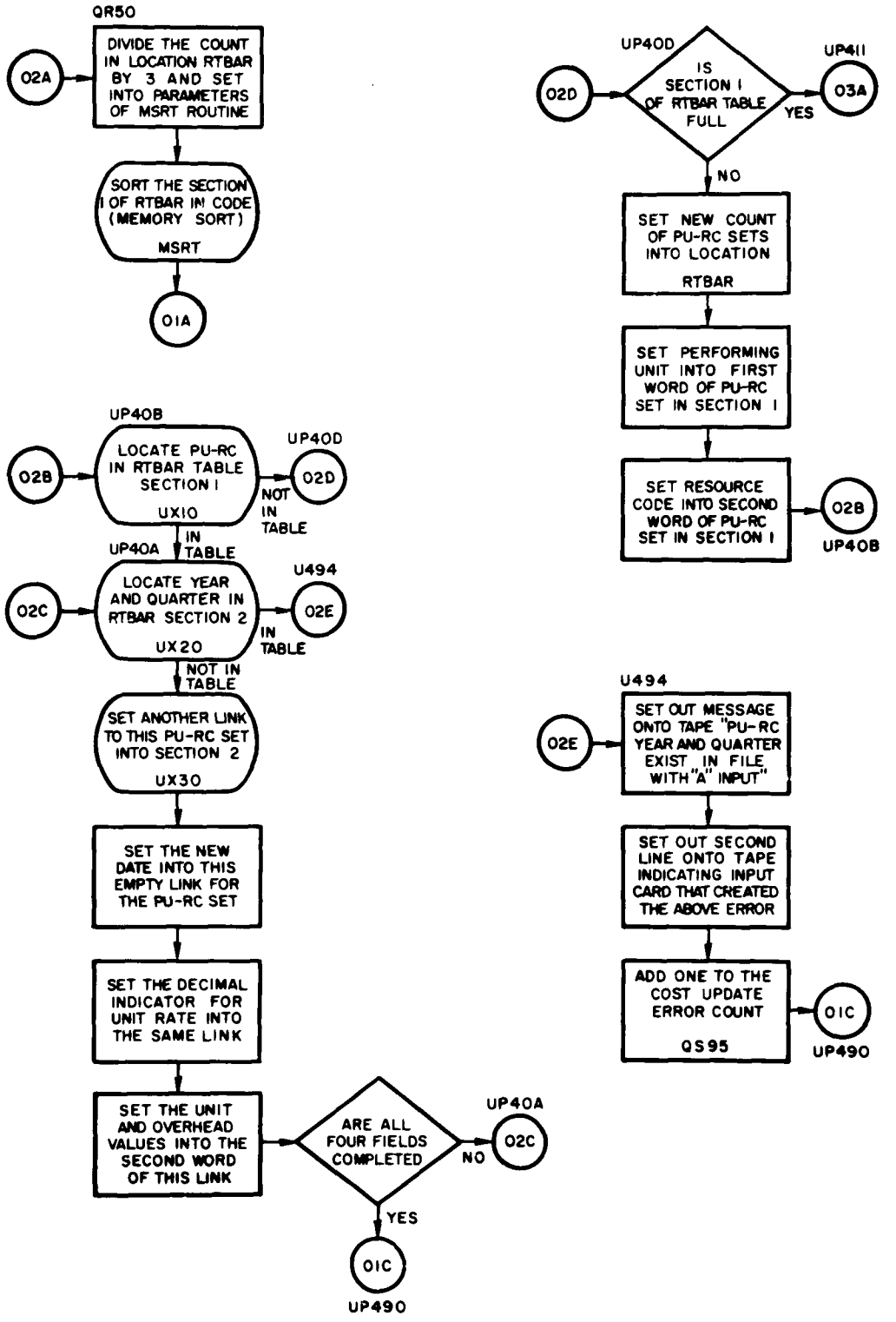
UX10	RRTB
UX20	RCHG
UX30	WRTB
UX40	UPCK
UP475	

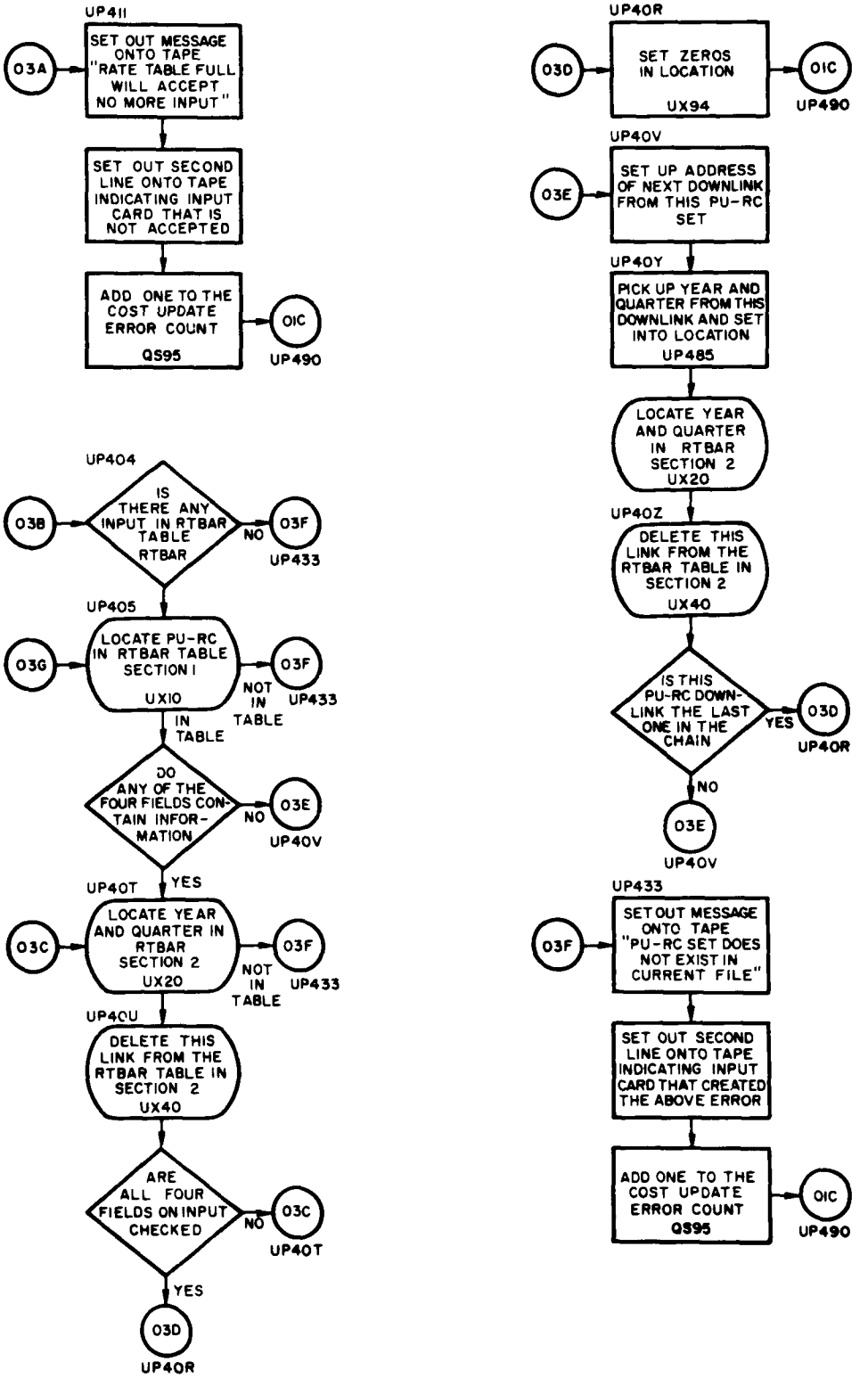
EXPLANATION OF CALLING SEQUENCE:

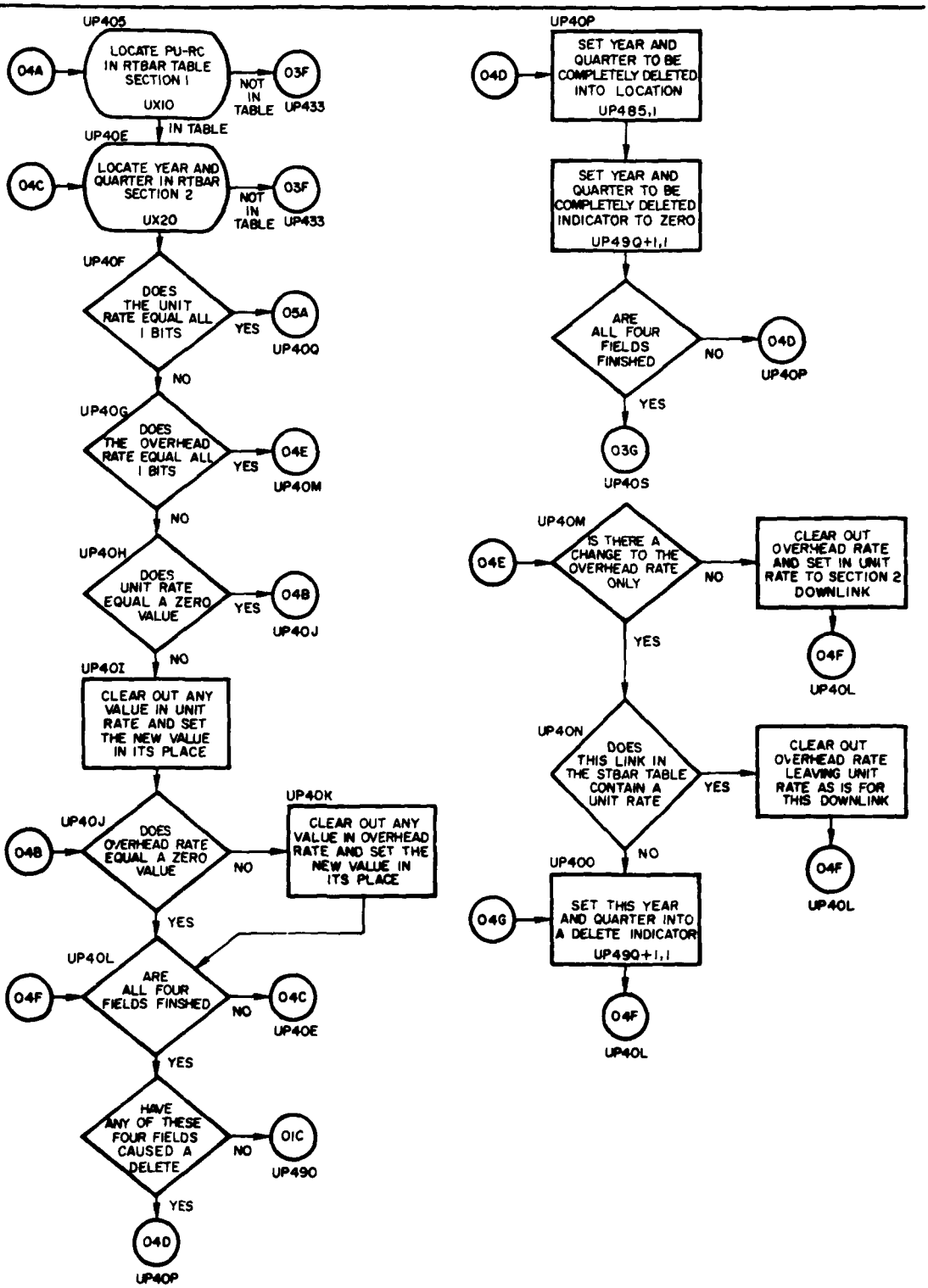
Not applicable.

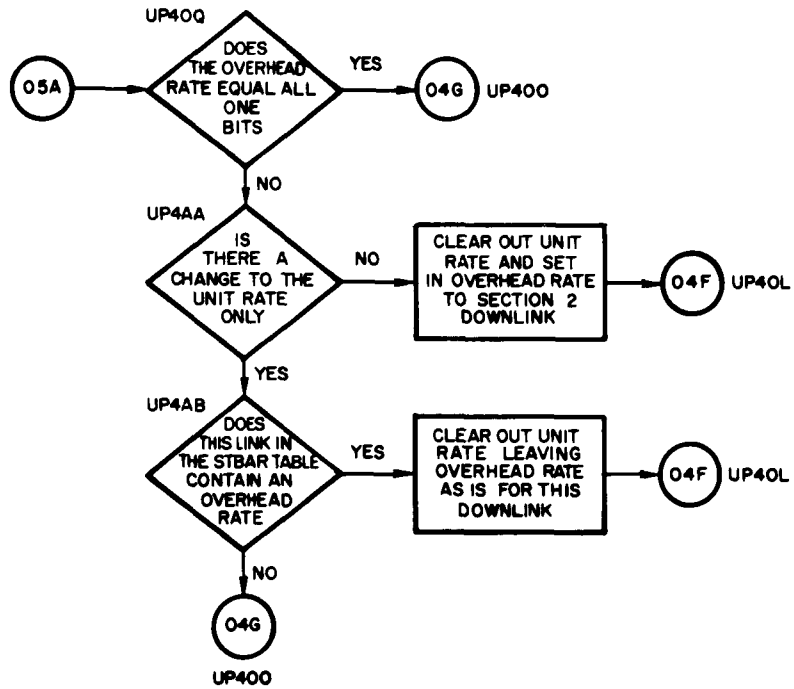
SET UP RATE TABLE




QR50
02A
DIVIDE THE COUNT IN LOCATION RTBAR BY 3 AND SET INTO PARAMETERS OF MSRT ROUTINE
SORT THE SECTION I OF RTBAR IN CODE (MEMORY SORT)
MSRT
01A
UP40B
02B
LOCATE PU-RC IN RTBAR TABLE SECTION I
UX10
UP40D
NOT IN TABLE
IN TABLE
UP40A
02C
LOCATE YEAR AND QUARTER IN RTBAR SECTION 2
UX20
U494
02E
IN TABLE
NOT IN TABLE
SET ANOTHER LINK TO THIS PU-RC SET INTO SECTION 2
UX30
SET THE NEW DATE INTO THIS EMPTY LINK FOR THE PU-RC SET
SET THE DECIMAL INDICATOR FOR UNIT RATE INTO THE SAME LINK
SET THE UNIT AND OVERHEAD VALUES INTO THE SECOND WORD OF THIS LINK
ARE ALL FOUR FIELDS COMPLETED
UP40A
02C
NO
YES
01C
UP490
UP40D
02D
IS SECTION I OF RTBAR TABLE FULL
UP411
03A
YES
NO
SET NEW COUNT OF PU-RC SETS INTO LOCATION RTBAR
SET PERFORMING UNIT INTO FIRST WORD OF PU-RC SET IN SECTION I
SET RESOURCE CODE INTO SECOND WORD OF PU-RC SET IN SECTION I
02B
UP40B
U494
02E
SET OUT MESSAGE ONTO TAPE "PU-RC YEAR AND QUARTER EXIST IN FILE WITH "A" INPUT"
SET OUT SECOND LINE ONTO TAPE INDICATING INPUT CARD THAT CREATED THE ABOVE ERROR
ADD ONE TO THE COST UPDATE ERROR COUNT
QS95
01C
UP490


UP411
03A
SET OUT MESSAGE ONTO TAPE "RATE TABLE FULL WILL ACCEPT NO MORE INPUT"
SET OUT SECOND LINE ONTO TAPE INDICATING INPUT CARD THAT IS NOT ACCEPTED
ADD ONE TO THE COST UPDATE ERROR COUNT
QS95
01C
UP490
UP404
03B
IS THERE ANY INPUT IN RTBAR TABLE RTBAR
NO
03F
UP433
UP405
03G
LOCATE PU-RC IN RTBAR TABLE SECTION 1
UX10
NOT IN TABLE
IN TABLE
DO ANY OF THE FOUR FIELDS CONTAIN INFORMATION
NO
03E
UP40V
YES
UP40T
03C
LOCATE YEAR AND QUARTER IN RTBAR SECTION 2
UX20
UP40U
DELETE THIS LINK FROM THE RTBAR TABLE IN SECTION 2
UX40
ARE ALL FOUR FIELDS ON INPUT CHECKED
03D
UP40R
UP40R
03D
SET ZEROS IN LOCATION
UX94
UP40V
03E
SET UP ADDRESS OF NEXT DOWNLINK FROM THIS PU-RC SET
UP40Y
PICK UP YEAR AND QUARTER FROM THIS DOWNLINK AND SET INTO LOCATION
UP485
LOCATE YEAR AND QUARTER IN RTBAR SECTION 2
UX20
UP40Z
DELETE THIS LINK FROM THE RTBAR TABLE IN SECTION 2
UX40
IS THIS PU-RC DOWN-LINK THE LAST ONE IN THE CHAIN
YES
NO
UP433
03F
SET OUT MESSAGE ONTO TAPE "PU-RC SET DOES NOT EXIST IN CURRENT FILE"
SET OUT SECOND LINE ONTO TAPE INDICATING INPUT CARD THAT CREATED THE ABOVE ERROR
ADD ONE TO THE COST UPDATE ERROR COUNT
QS95
01C
UP490


UP405
LOCATE PU-RC IN RTBAR TABLE SECTION 1
UX10
NOT IN TABLE
03F
UP433
IN TABLE
04A
UP40E
LOCATE YEAR AND QUARTER IN RTBAR SECTION 2
UX20
NOT IN TABLE
03F
UP433
04C
UP40F
DOES THE UNIT RATE EQUAL ALL 1 BITS
YES
05A
UP40Q
NO
UP40G
DOES THE OVERHEAD RATE EQUAL ALL 1 BITS
YES
04E
UP40M
NO
UP40H
DOES UNIT RATE EQUAL A ZERO VALUE
YES
04B
UP40J
NO
UP40I
CLEAR OUT ANY VALUE IN UNIT RATE AND SET THE NEW VALUE IN ITS PLACE
UP40J
DOES OVERHEAD RATE EQUAL A ZERO VALUE
04B
NO
UP40K
CLEAR OUT ANY VALUE IN OVERHEAD RATE AND SET THE NEW VALUE IN ITS PLACE
YES
UP40L
ARE ALL FOUR FIELDS FINSHED
04F
NO
04C
UP40E
YES
HAVE ANY OF THESE FOUR FIELDS CAUSED A DELETE
NO
01C
UP490
YES
04D
UP40P
UP40P
SET YEAR AND QUARTER TO BE COMPLETELY DELETED INTO LOCATION
UP485,1
04D
SET YEAR AND QUARTER TO BE COMPLETELY DELETED INDICATOR TO ZERO
UP490+1,1
ARE ALL FOUR FIELDS FINISHED
NO
04D
UP40P
YES
03G
UP40S
UP40M
IS THERE A CHANGE TO THE OVERHEAD RATE ONLY
04E
NO
CLEAR OUT OVERHEAD RATE AND SET IN UNIT RATE TO SECTION 2 DOWNLINK
04F
UP40L
YES
UP40N
DOES THIS LINK IN THE STBAR TABLE CONTAIN A UNIT RATE
YES
CLEAR OUT OVERHEAD RATE LEAVING UNIT RATE AS IS FOR THIS DOWNLINK
04F
UP40L
NO
UP400
04G
SET THIS YEAR AND QUARTER INTO A DELETE INDICATOR
UP490+1,1
04F
UP40L


UP40Q
05A
DOES THE OVERHEAD RATE EQUAL ALL ONE BITS
YES
04G
UP400
NO
UP4AA
IS THERE A CHANGE TO THE UNIT RATE ONLY
NO
CLEAR OUT UNIT RATE AND SET IN OVERHEAD RATE TO SECTION 2 DOWNLINK
04F
UP40L
YES
UP4AB
DOES THIS LINK IN THE STBAR TABLE CONTAIN AN OVERHEAD RATE
YES
CLEAR OUT UNIT RATE LEAVING OVERHEAD RATE AS IS FOR THIS DOWNLINK
04F
UP40L
NO
04G
UP400

Region UX10

EXPLANATION OF REGION:

This routine will attempt to match up a 4-card performing unit/ resource code or resource code combination with the Section 1 items in the table.

CALLING SEQUENCE:

L TSX UX10, 4

L + 1 This combination not located in table return

L + 2 This combination found in table return

INPUT:

The performing unit/resource code in words 2 and 3 of UP450.

OUTPUT:

XR 2 contains the channel of matched-up performing unit/resource code combination.

STORAGE USED:

Not applicable.

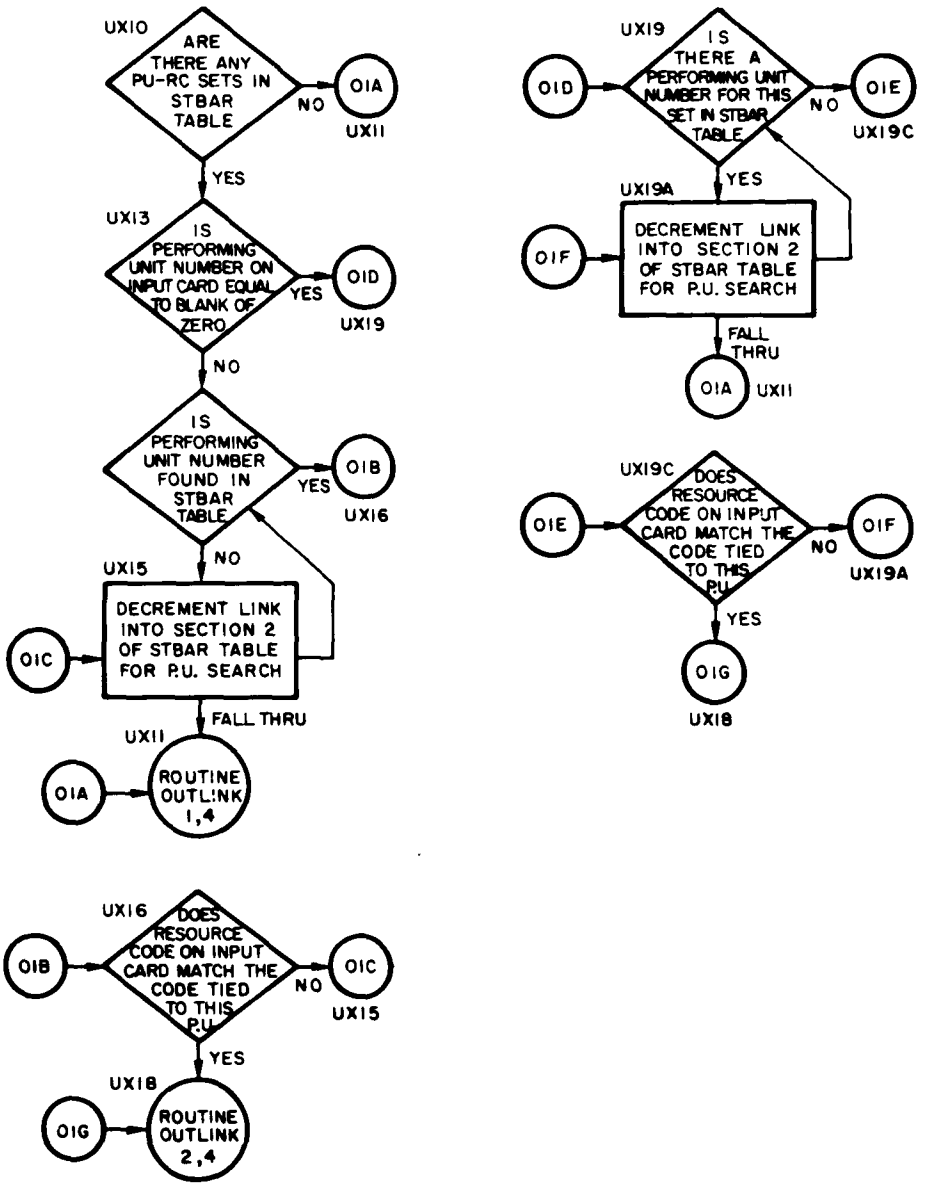
SUBREGIONS AND SUBROUTINES USED:

Not applicable.

EXPLANATION OF CALLING SEQUENCE:

The output described in this specification refers to line L+2 of the calling sequence.

LOCATE PU-RC IN STBAR TABLE – SECTION I



Region UX20

EXPLANATION OF REGION:

This routine will attempt to match up a 4-card year-and-quarter or year, relating to a Section 1 combination, with the data set up in Section 2 of the rate table.

CALLING SEQUENCE:

L	TSX UX20, 4
L + 1	The year-and-quarter located in table return
L + 2	The year-and-quarter not found in table return

INPUT:

The year-and-quarter set into location UP485.

OUTPUT:

The absolute location containing the year-and-quarter or year slot in the rate table at UX22.

STORAGE USED:

Not applicable.

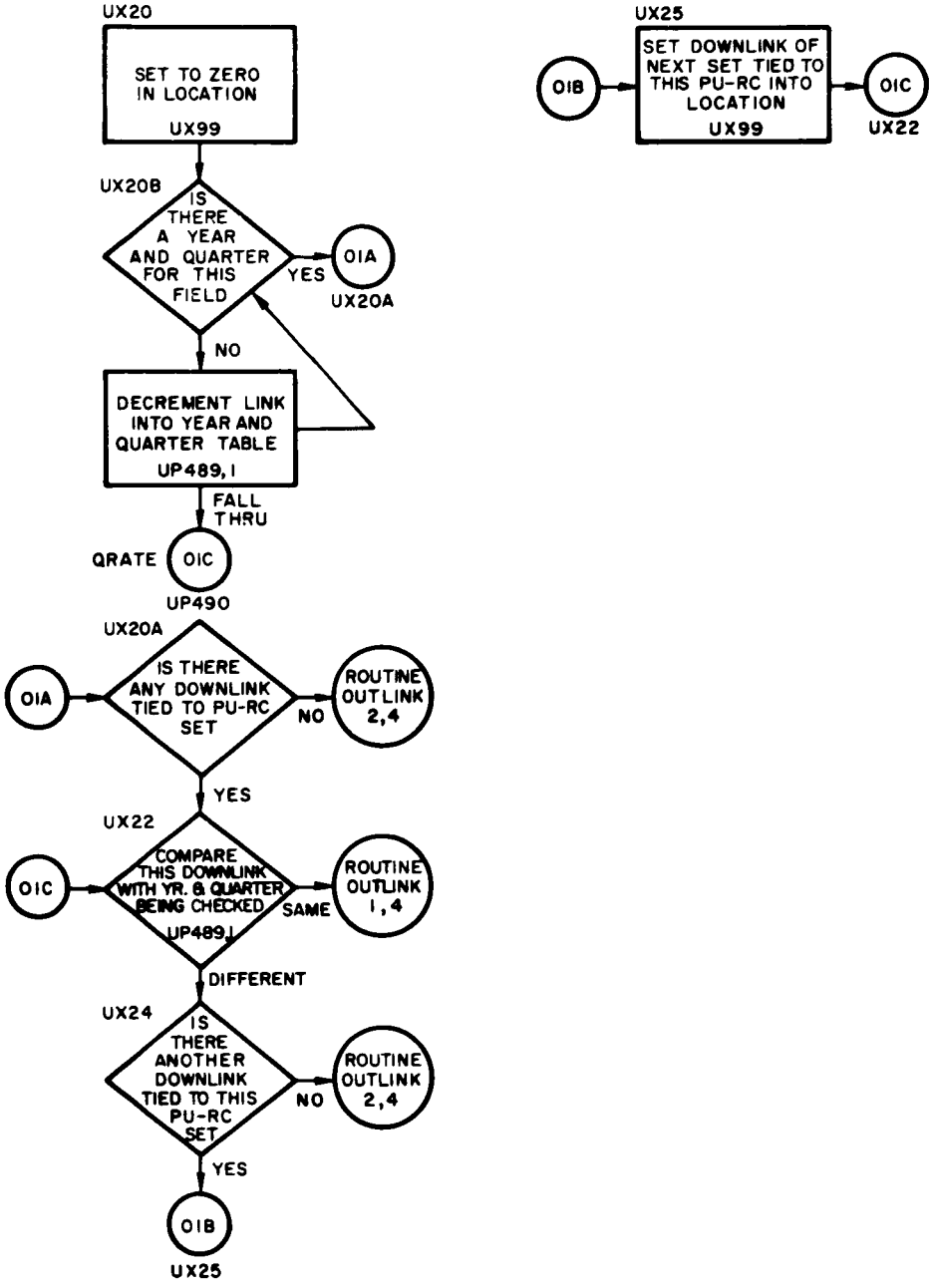
SUBREGIONS AND SUBROUTINES USED:

Not applicable.

EXPLANATION OF CALLING SEQUENCE:

The output described in this specification refers to line L+2 of the calling sequence.

LOCATE YEAR AND QUARTER TIED TO STBAR TABLE – SECTION 2



Region UX30

EXPLANATION OF REGION:

This routine will tie another link to the performing unit/resource code combination in Section 2 of the rate table. It will set in another year-and-quarter or year for this combination in Section 1.

CALLING SEQUENCE:

L TSX UX30, 4

L + 1 Normal return

INPUT:

Not applicable.

OUTPUT:

The address of UX31 will contain the slot being set up for the new link.

STORAGE USED:

Not applicable.

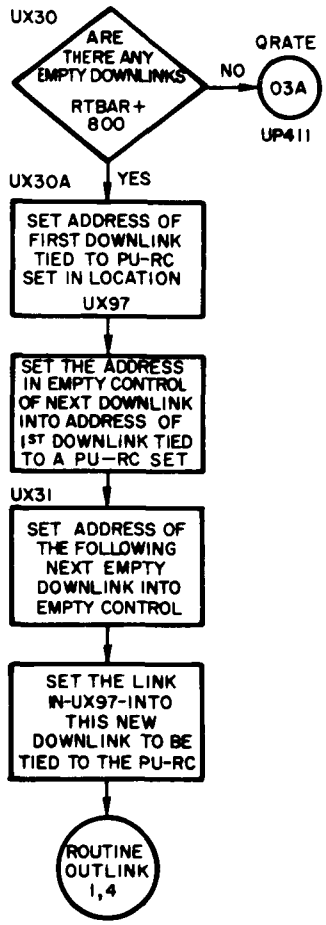
SUBREGIONS AND SUBROUTINES USED:

Not applicable.

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

SET ANOTHER LINK TO THE
PU-RC SET IN SECTION 2
OF RTBAR



Region UX40

EXPLANATION OF REGION:

This routine will remove a link from a performing unit/resource code combination in Section 2 of the rate table. If this link was the last one tied to this combination it will set it into the UPDAD delete table.

CALLING SEQUENCE:

L TSX UX40, 4

L + 1 Normal return

INPUT:

Not applicable.

OUTPUT:

UPDAD table.

STORAGE USED:

Not applicable.

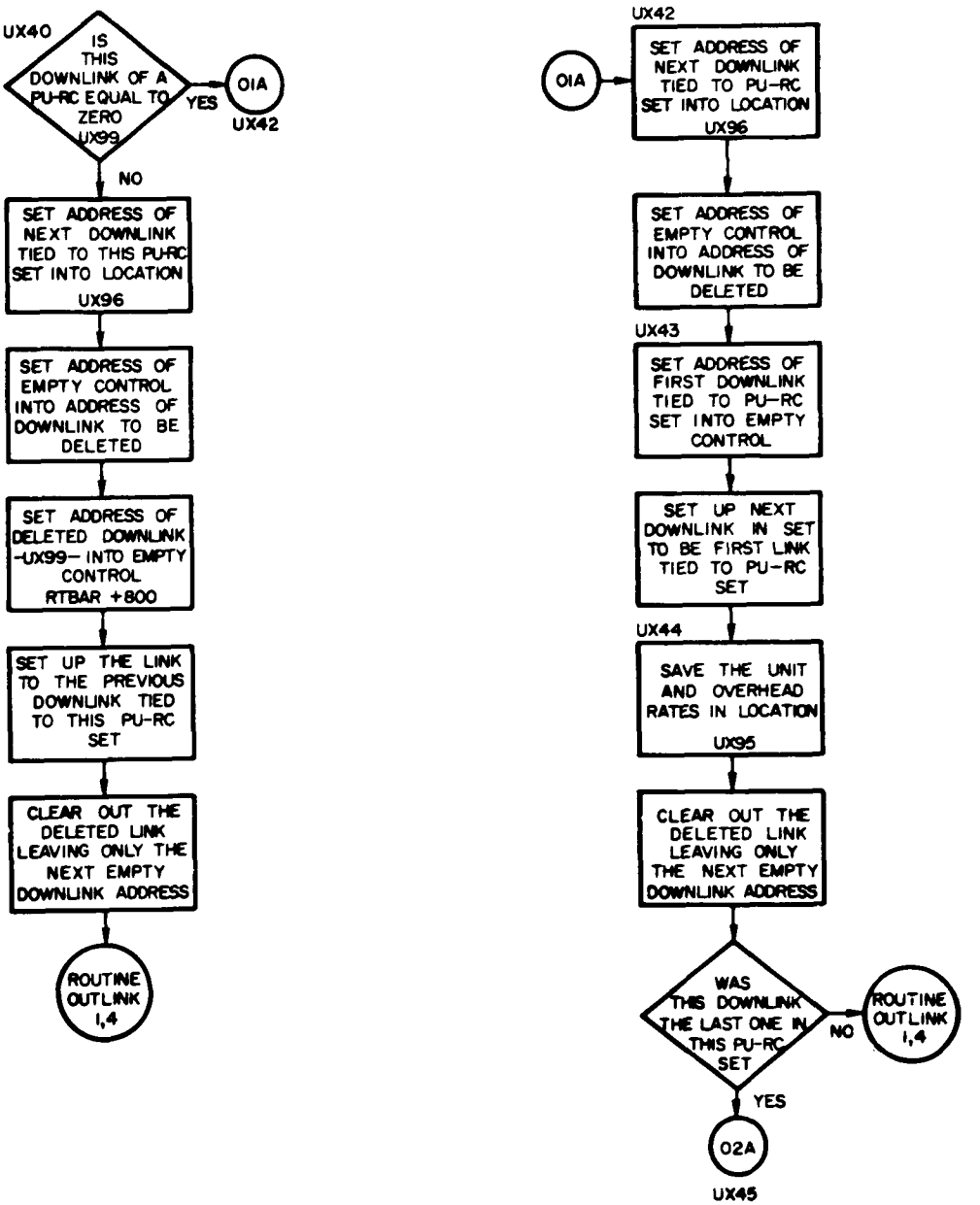
SUBREGIONS AND SUBROUTINES USED:

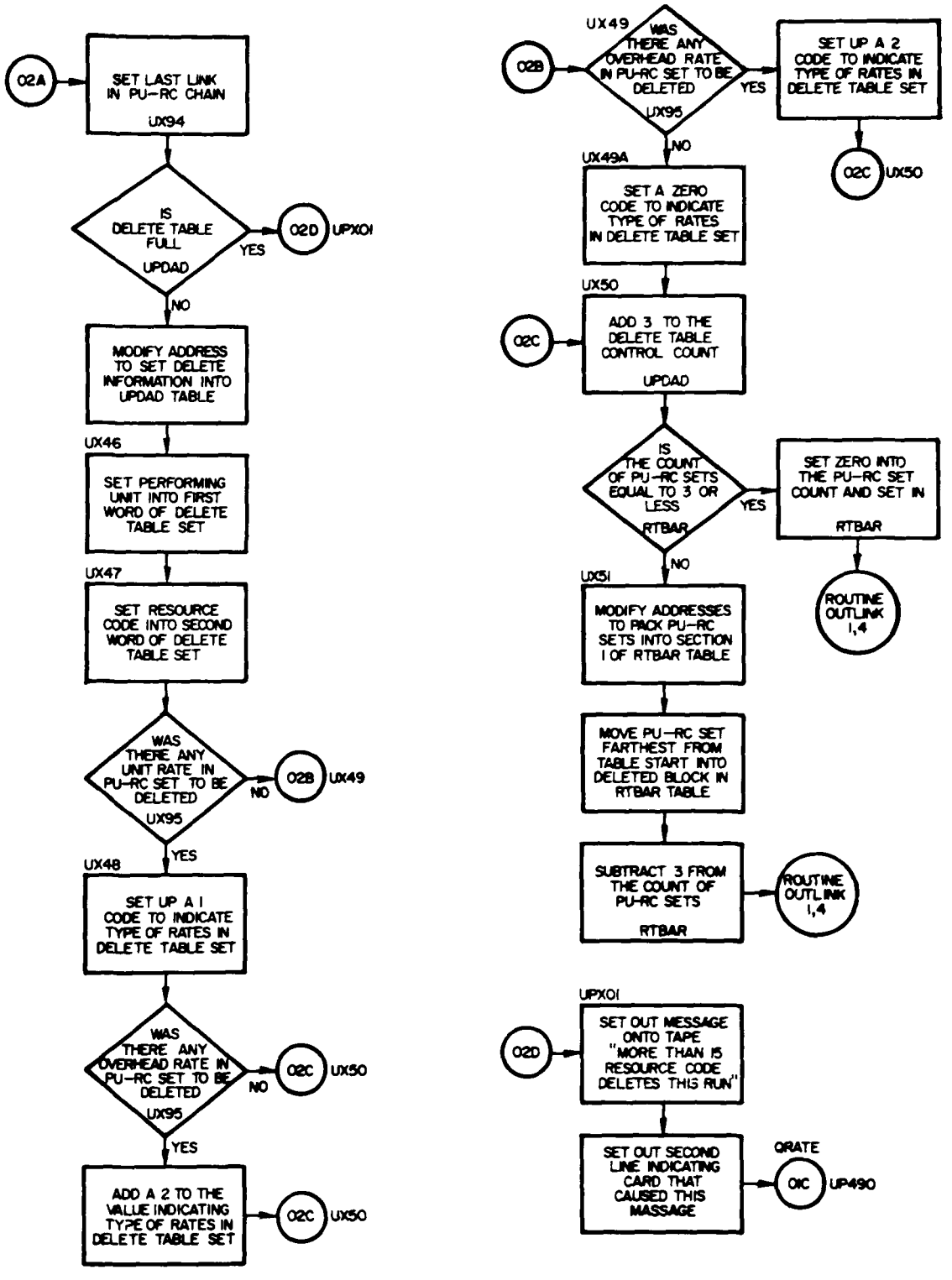
Not applicable.

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

REMOVE A DOWNLINK
FROM THE RTBAR TABLE




02A
SET LAST LINK IN PU-RC CHAIN
UX94
IS DELETE TABLE FULL
UPDAD
YES
02D
UPX01
NO
MODIFY ADDRESS TO SET DELETE INFORMATION INTO UPDAD TABLE
UX46
SET PERFORMING UNIT INTO FIRST WORD OF DELETE TABLE SET
UX47
SET RESOURCE CODE INTO SECOND WORD OF DELETE TABLE SET
WAS THERE ANY UNIT RATE IN PU-RC SET TO BE DELETED
UX95
NO
02B
UX49
YES
UX48
SET UP A 1 CODE TO INDICATE TYPE OF RATES IN DELETE TABLE SET
WAS THERE ANY OVERHEAD RATE IN PU-RC SET TO BE DELETED
UX95
NO
02C
UX50
YES
ADD A 2 TO THE VALUE INDICATING TYPE OF RATES IN DELETE TABLE SET
02C
UX50
UX49
WAS THERE ANY OVERHEAD RATE IN PU-RC SET TO BE DELETED
UX95
02B
YES
SET UP A 2 CODE TO INDICATE TYPE OF RATES IN DELETE TABLE SET
02C
UX50
NO
UX49A
SET A ZERO CODE TO INDICATE TYPE OF RATES IN DELETE TABLE SET
UX50
02C
ADD 3 TO THE DELETE TABLE CONTROL COUNT
UPDAD
IS THE COUNT OF PU-RC SETS EQUAL TO 3 OR LESS
RTBAR
YES
SET ZERO INTO THE PU-RC SET COUNT AND SET IN
RTBAR
ROUTINE OUTLINK 1,4
NO
UX51
MODIFY ADDRESSES TO PACK PU-RC SETS INTO SECTION 1 OF RTBAR TABLE
MOVE PU-RC SET FARTHEST FROM TABLE START INTO DELETED BLOCK IN RTBAR TABLE
SUBTRACT 3 FROM THE COUNT OF PU-RC SETS
RTBAR
ROUTINE OUTLINK 1,4
UPX01
02D
SET OUT MESSAGE ONTO TAPE "MORE THAN 15 RESOURCE CODE DELETES THIS RUN"
SET OUT SECOND LINE INDICATING CARD THAT CAUSED THIS MASSAGE
QRATE
01C
UP490

UP475

EXPLANATION OF REGION:

This routine will decipher the Type 4 card input and set all four fields into a form that is operable. It will set up the correct scaling factors for the unit rates.

CALLING SEQUENCE:

L TSX UP475, 4

L + 1 Normal return

INPUT:

Type 4 input cards

OUTPUT:

The data set into UP481 - UP488 and UP49C - UP49F. These locations represent the four quarters on the input card. If one or more of these quarters are blank these locations will be set to zero.

STORAGE USED:

UP481 - UP484 - 4 words - hold year-and-quarter or year

UP485 - UP488 - 4 words - hold unit and overhead rates

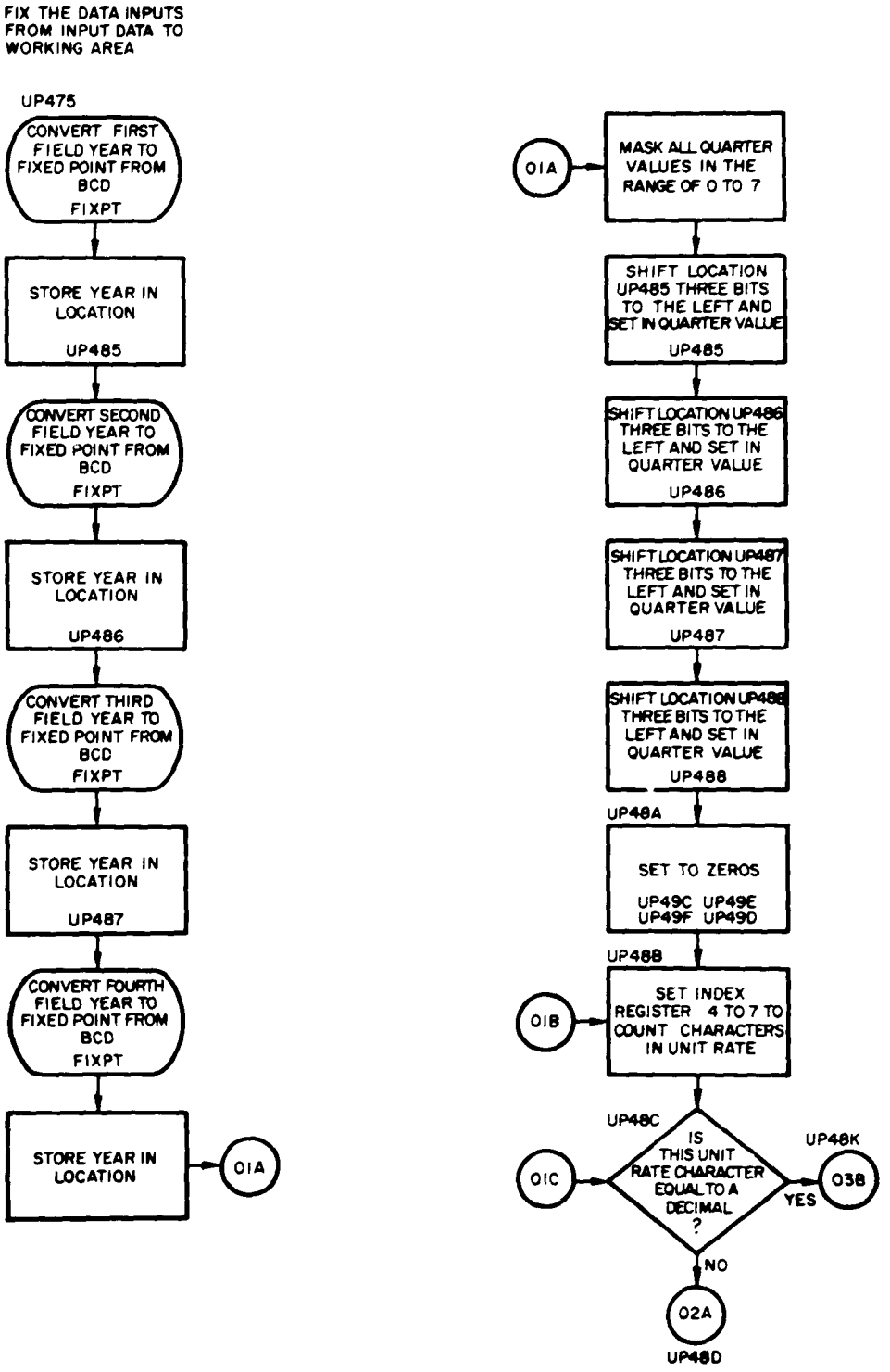
UP49C - UP49F - 4 words - hold decimal indicator for unit rate

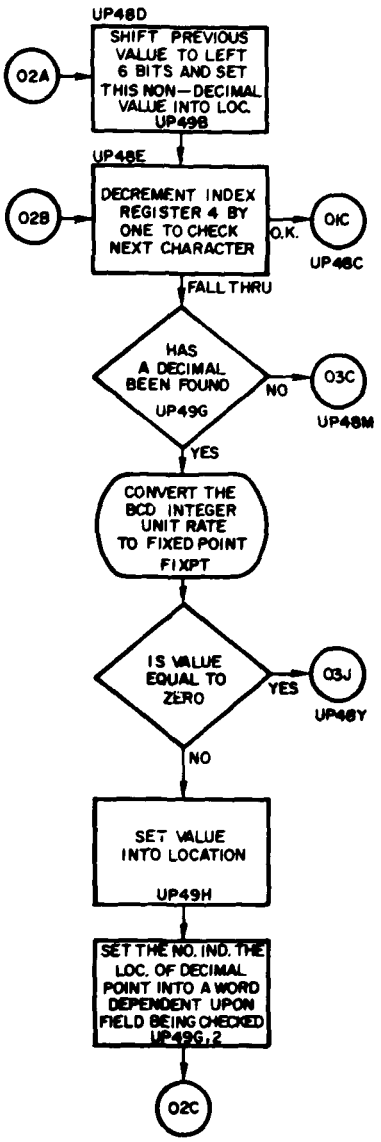
SUBREGIONS AND SUBROUTINES USED:

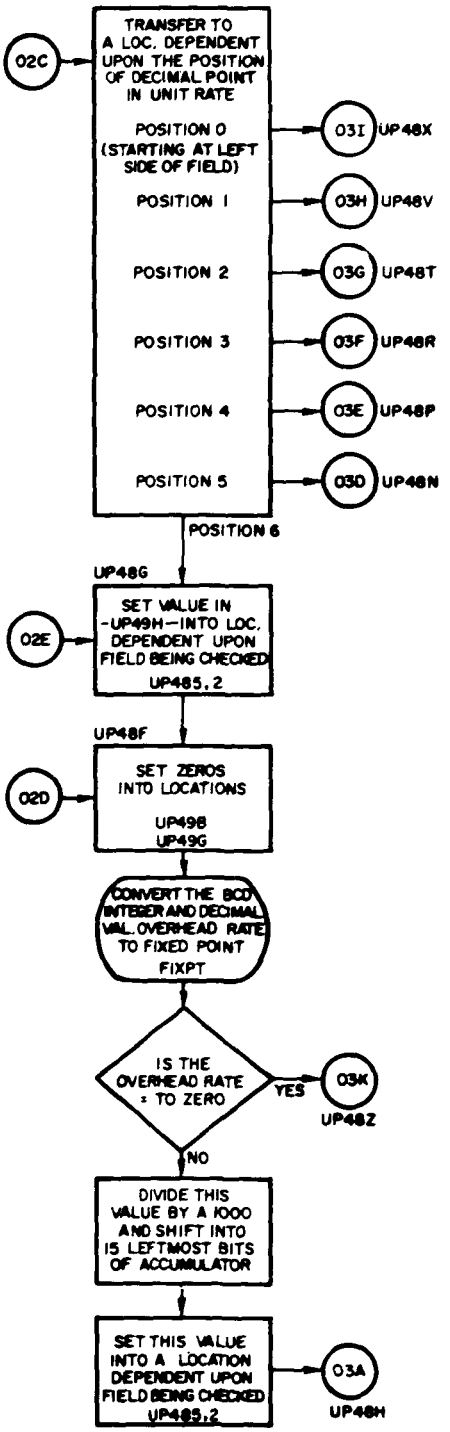
FIXPT

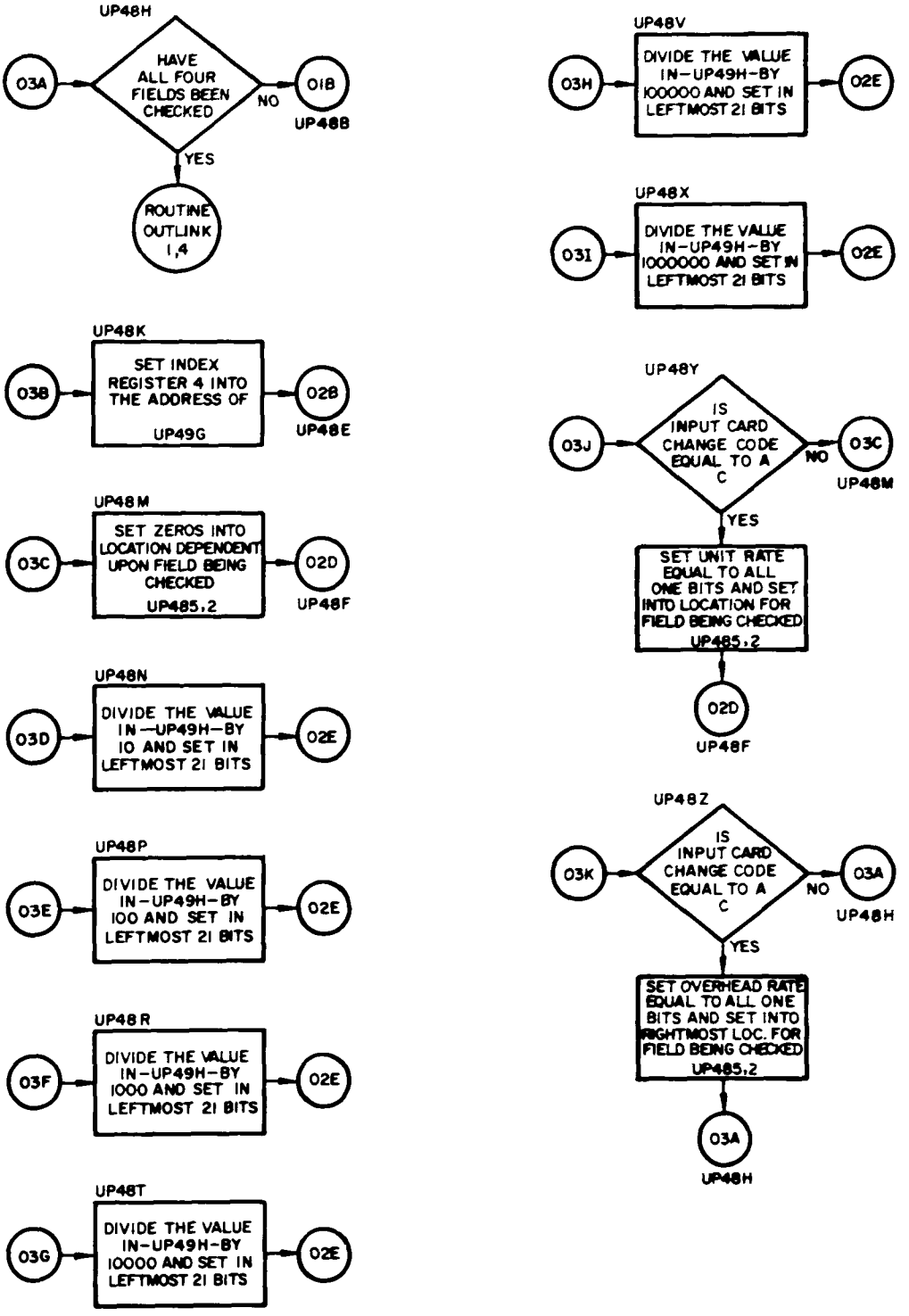
EXPLANATION OF CALLING SEQUENCE:

Not applicable.


FIX THE DATA INPUTS FROM INPUT DATA TO WORKING AREA
UP475
CONVERT FIRST FIELD YEAR TO FIXED POINT FROM BCD
FIXPT
STORE YEAR IN LOCATION
UP485
CONVERT SECOND FIELD YEAR TO FIXED POINT FROM BCD
FIXPT
STORE YEAR IN LOCATION
UP486
CONVERT THIRD FIELD YEAR TO FIXED POINT FROM BCD
FIXPT
STORE YEAR IN LOCATION
UP487
CONVERT FOURTH FIELD YEAR TO FIXED POINT FROM BCD
FIXPT
STORE YEAR IN LOCATION
01A
01A
MASK ALL QUARTER VALUES IN THE RANGE OF 0 TO 7
SHIFT LOCATION UP485 THREE BITS TO THE LEFT AND SET IN QUARTER VALUE
UP485
SHIFT LOCATION UP486 THREE BITS TO THE LEFT AND SET IN QUARTER VALUE
UP486
SHIFT LOCATION UP487 THREE BITS TO THE LEFT AND SET IN QUARTER VALUE
UP487
SHIFT LOCATION UP488 THREE BITS TO THE LEFT AND SET IN QUARTER VALUE
UP488
UP48A
SET TO ZEROS
UP49C UP49E UP49F UP49D
UP48B
01B
SET INDEX REGISTER 4 TO 7 TO COUNT CHARACTERS IN UNIT RATE
UP48C
01C
IS THIS UNIT RATE CHARACTER EQUAL TO A DECIMAL ?
YES
UP48K
038
NO
02A
UP48D


UP48D
SHIFT PREVIOUS VALUE TO LEFT 6 BITS AND SET THIS NON—DECIMAL VALUE INTO LOC. UP498
02A
UP48E
DECREMENT INDEX REGISTER 4 BY ONE TO CHECK NEXT CHARACTER
02B
O.K.
01C
UP48C
FALL THRU
HAS A DECIMAL BEEN FOUND
UP49G
NO
03C
UP48M
YES
CONVERT THE BCD INTEGER UNIT RATE TO FIXED POINT
FIXPT
IS VALUE EQUAL TO ZERO
YES
03J
UP48Y
NO
SET VALUE INTO LOCATION
UP49H
SET THE NO. IND. THE LOC. OF DECIMAL POINT INTO A WORD DEPENDENT UPON FIELD BEING CHECKED
UP49G,2
02C


02C
TRANSFER TO A LOC. DEPENDENT UPON THE POSITION OF DECIMAL POINT IN UNIT RATE
POSITION 0 (STARTING AT LEFT SIDE OF FIELD)
03I
UP48X
POSITION 1
03H
UP48V
POSITION 2
03G
UP48T
POSITION 3
03F
UP48R
POSITION 4
03E
UP48P
POSITION 5
03D
UP48N
POSITION 6
UP48G
02E
SET VALUE IN -UP49H- INTO LOC. DEPENDENT UPON FIELD BEING CHECKED
UP485,2
UP48F
02D
SET ZEROS INTO LOCATIONS
UP498
UP49G
CONVERT THE BCD INTEGER AND DECIMAL VAL. OVERHEAD RATE TO FIXED POINT
FIXPT
IS THE OVERHEAD RATE = TO ZERO
YES
03K
UP48Z
NO
DIVIDE THIS VALUE BY A 1000 AND SHIFT INTO 15 LEFTMOST BITS OF ACCUMULATOR
SET THIS VALUE INTO A LOCATION DEPENDENT UPON FIELD BEING CHECKED
UP485,2
03A
UP48H


UP48H
03A
HAVE ALL FOUR FIELDS BEEN CHECKED
NO
018
UP488
YES
ROUTINE OUTLINK 1,4
UP48K
03B
SET INDEX REGISTER 4 INTO THE ADDRESS OF UP49G
028
UP48E
UP48M
03C
SET ZEROS INTO LOCATION DEPENDENT UPON FIELD BEING CHECKED UP485,2
02D
UP48F
UP48N
03D
DIVIDE THE VALUE IN—UP49H—BY 10 AND SET IN LEFTMOST 21 BITS
02E
UP48P
03E
DIVIDE THE VALUE IN—UP49H—BY 100 AND SET IN LEFTMOST 21 BITS
02E
UP48R
03F
DIVIDE THE VALUE IN—UP49H—BY 1000 AND SET IN LEFTMOST 21 BITS
02E
UP48T
03G
DIVIDE THE VALUE IN—UP49H—BY 10000 AND SET IN LEFTMOST 21 BITS
02E
UP48V
03H
DIVIDE THE VALUE IN—UP49H—BY 100000 AND SET IN LEFTMOST 21 BITS
02E
UP48X
03I
DIVIDE THE VALUE IN—UP49H—BY 1000000 AND SET IN LEFTMOST 21 BITS
02E
UP48Y
03J
IS INPUT CARD CHANGE CODE EQUAL TO A C
NO
03C
UP48M
YES
SET UNIT RATE EQUAL TO ALL ONE BITS AND SET INTO LOCATION FOR FIELD BEING CHECKED UP485,2
02D
UP48F
UP48Z
03K
IS INPUT CARD CHANGE CODE EQUAL TO A C
NO
03A
UP48H
YES
SET OVERHEAD RATE EQUAL TO ALL ONE BITS AND SET INTO RIGHTMOST LOC. FOR FIELD BEING CHECKED UP485,2
03A
UP48H

Cost Update Skill Table

The skill table used in the PERT Cost program will actually perform two functions. It will tie a resource code to a rainbow category as well as to a cost category. Each of these functions will act independently of the other, and other than using the same table they will not have any common relationships. This table will tie together certain families of resource codes to cost categories, and other groupings of resource codes to rainbow categories. This tie-in is accomplished by use of the Type 5 and Type 6 inputs from THE SORTED DATA TAPE and is used to produce the "Cost Category and Rainbow Category Reports."

The Type 5 inputs from the SORTED DATA TAPE are used to change, add, or delete the rainbow category from a resource code, and Type 6 inputs are used to change, add, or delete the cost category from a resource code. Since, as stated earlier, each of these inputs will act independently of the other, an add to one of these categories may not actually add a new resource code to the table but may only set this cost or rainbow category in an existing resource code. This same premise holds true for deletes, in that if a category is deleted from a resource code this resource code may not be removed if the other category still relates to this resource code.

On file establishment, the skill table is developed in core at STBAR, and after completing the read-in of all Type 5 and 6 cards it is set out on the NEW PERT COST MASTER. On the cyclic updating runs, this table is read in from the OLD PERT COST MASTER and set into core at STBAR. It is then updated, if any Type 5 or 6 cards are present, and then set out on the NEW PERT COST MASTER. The skill table will remain in core during the entire cost update phase.

The skill table is broken down into two separate tables, or portions. One section is of 80 words and contains the 4-word rainbow categories, allowing for a maximum of 20 categories. The second portion of this table is of 1000 words consisting of the resource code, the cost category (if any), and the relative location of the rainbow category (if any) in Section 1. (At least one of these categories must be present in order for the resource code to remain in the table.) The resource code set of information will contain five words no matter what categories are present, thereby allowing for a maximum of 200 sets of resource codes in Section 2. It is then possible to have from 1 to 200 cost categories tied to the resource code sets, since each cost category is carried, by name, in the resource code set.

Skill Table Error Messages

In developing and updating the STBAR table from the types 5 and 6 input cards, the following error or exception messages can be produced, depending on the type of error. Both rainbow and cost category input errors will produce the same set of messages. The card image following the message will indicate which of the two categories caused the message. This card image will differ from the actual input due to a reformatting in the edit phase (see Page III-D-11). All of these errors will be set out on the SYSTEM ERROR TAPE.

(a) AN ERROR EXISTS ON THE FOLLOWING CARD
RESOURCE CODE NOT IN CURRENT FILE
XX - 80 characters of input card - XX

This message will be set out when a Type 5 or 6 input is attempting to change one of the categories that does not exist. The third line of this message will be an 80-character representation of the input card that caused this error. This representation will likewise follow all of the messages below.

(b) SKILL TABLE FULL. FOLLOWING CARD NOT ACCEPTED.

The table has reached its maximum of 200 resource code sets and this card is not being processed.

(c) AN ERROR EXISTS ON THE FOLLOWING CARD RESOURCE CODE EXISTS IN THE CURRENT FILE

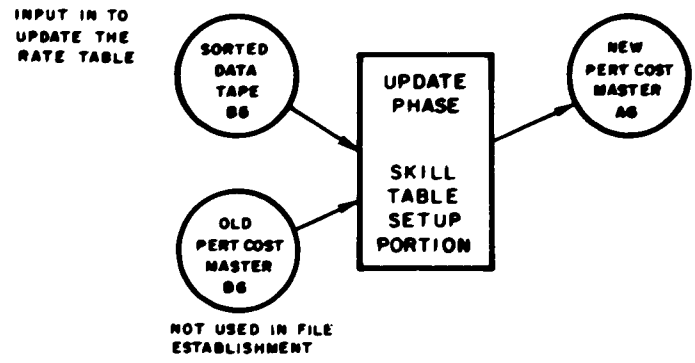
This message will be set out when a Type 5 or 6 input is attempting to add a category type to a resource code that currently contains a category.

(d) AN ERROR EXISTS ON THE FOLLOWING CARD RAINBOW CATEGORY NOT IN CURRENT FILE

This message will be set out when a Type 5 input is attempting to delete an entire rainbow category from Section 1 and cannot locate it in the STBAR table.

Skill Table Tape Operations

After the rate table has been set on the NEW PERT COST MASTER TAPE the skill table will be set on. If the system is in the file establishment mode, the Type 5 and Type 6 inputs are brought in from the SORTED DATA TAPE and are set into the table at STBAR. This table is set out onto the NEW PERT COST MASTER. If this system is to be run without any tie-in to the cost or rainbow categories, a skill table of 1080 words is set out on tape with all zeros. If this system is not in a file establishment mode, the skill table is read in from the OLD PERT COST MASTER into its core location at STBAR. It is then updated, if any Type 5 or 6 inputs are present, and written out on the NEW PERT COST MASTER. The following will show the tapes that can be used during this portion of the update phase.



Skill Table Layouts

The layout in Fig. III-G-8 shows the STBAR table as it is carried in core. The table is divided into two sections: one of 80 words, and one of 1000 words. The first section of this table will carry the rainbow categories in 4-word blocks. This data will be assigned a relative address in Section 1 of the table and will always be found at that location. The relative address will then be set into the fifth word of the Section 2 resource code set in order to link a rainbow category to a resource code. A zero in the fifth word of the resource code indicates that there is no tie-in to a rainbow category. The relative addresses will be in the range of 1 to 76.

Any rainbow category input entering the system as an add or change that cannot be found in Section 1 of the STBAR table will be automatically set in. The add or change code will refer only to the resource code and not the categories. The delete code, however, can refer to both resource codes and categories.

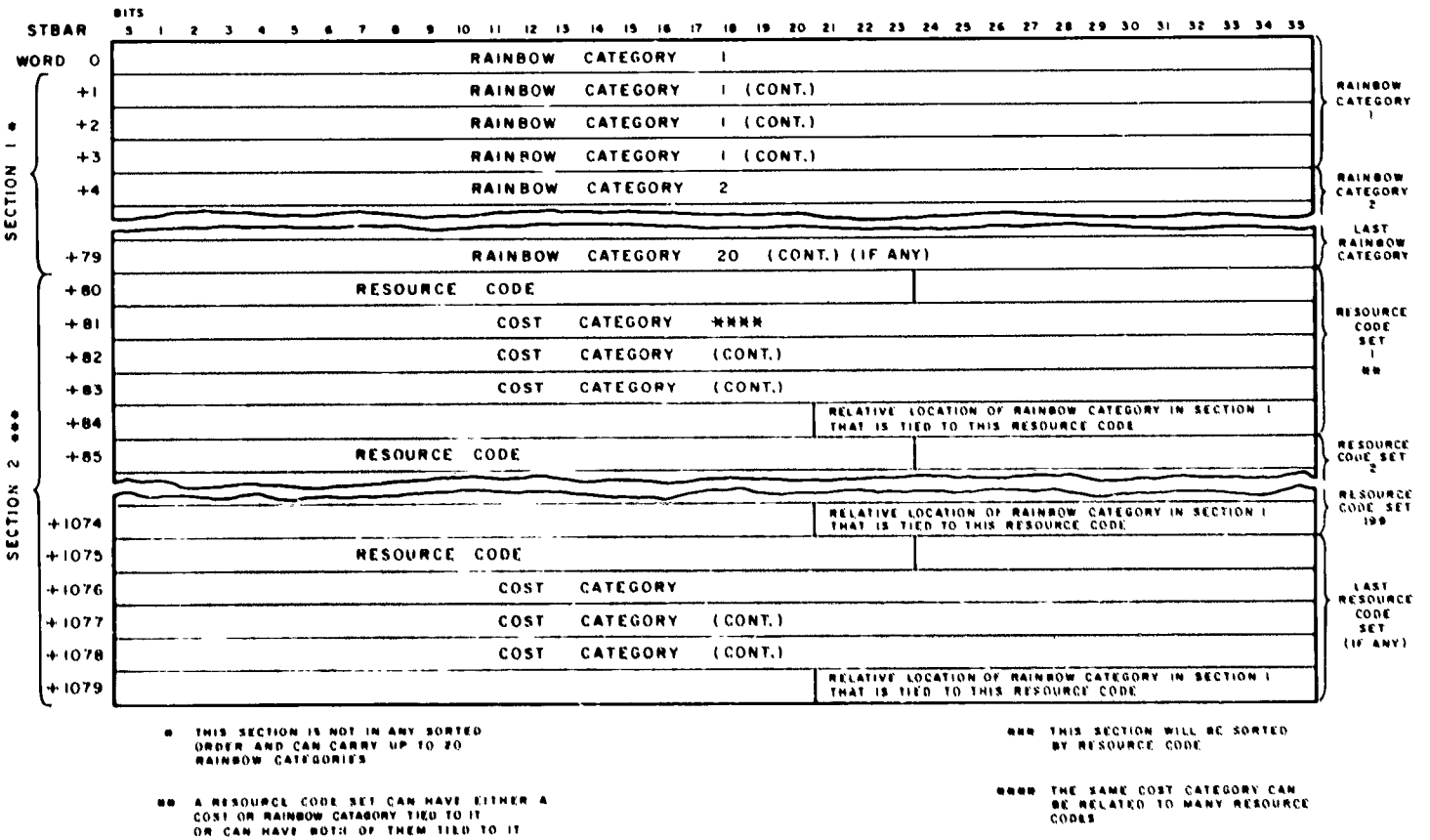


Fig. III-G-8. Skill Table Record

The second section of this table will be sorted by resource code and packed up to the top so that all unused portions will be at the bottom. The information carried in the second section will be the resource code number, cost category tied to that resource code, if any, and the relative location of the rainbow category in Section 1, if any. The STBAR table will allow for up to 200 resource code sets in Section 2.

Skill Table Region Descriptions

The following is a description of the skill table subroutine used in the update phase of the program.

Region QRAIN

EXPLANATION OF REGION:

This region will initially create and subsequently update the skill table from type 5 and type 6 inputs. It will write this table out on the NEW PERT COST MASTER and on cyclic runs will read it from the OLD PERT COST MASTER.

CALLING SEQUENCE:

L TSX QRAIN, 4

L + 1 Normal return

INPUT:

SORTED DATA TAPE (input types 5 and 6)

OLD PERT COST MASTER TAPE

OUTPUT:

The STBAR table developed in core and set out on the NEW PERT COST MASTER TAPE

STORAGE USED:

STBAR - 1080 words - skill table location

UP450 - 14 words - card image

UP451 - 81 words - unpacked card image

SUBREGIONS AND SUBROUTINES USED:

UPCK	RCHG
WSTR	RSTR
MSRT	

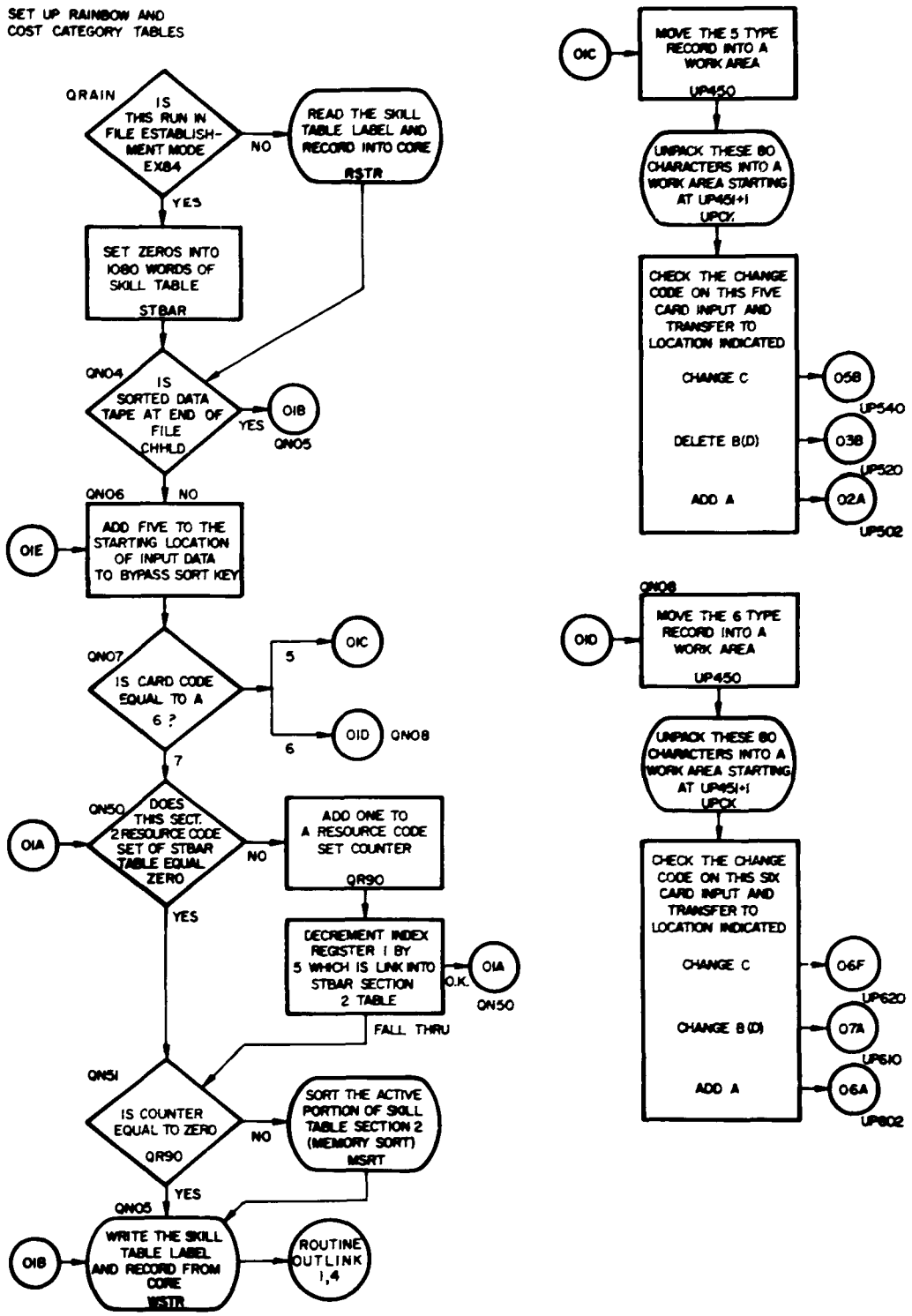
EXPLANATION OF CALLING SEQUENCE:

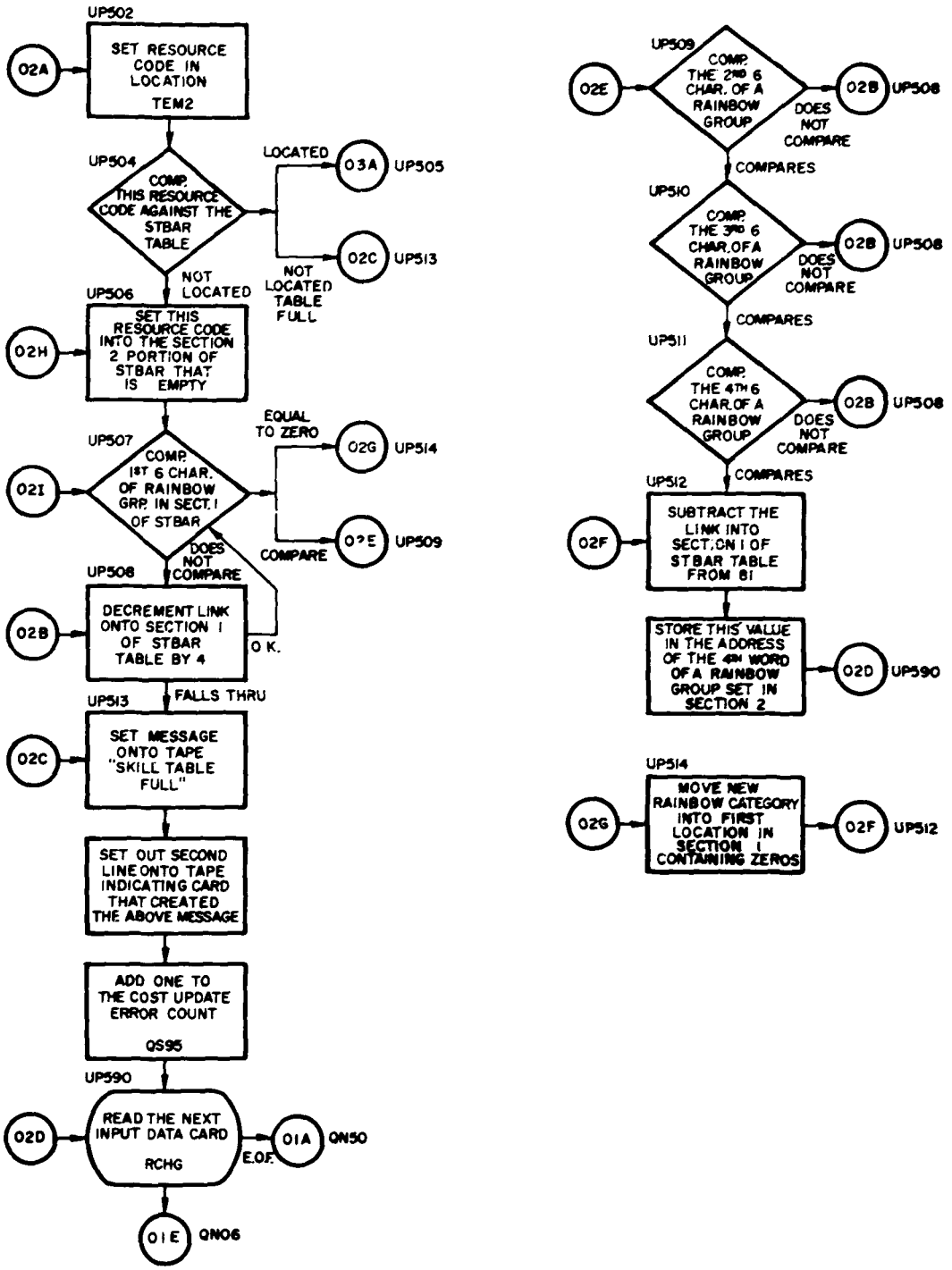
Entry into this subroutine will be made at QRAIN at which point by translating the input card type and change code a transfer will be made to one of the following locations:

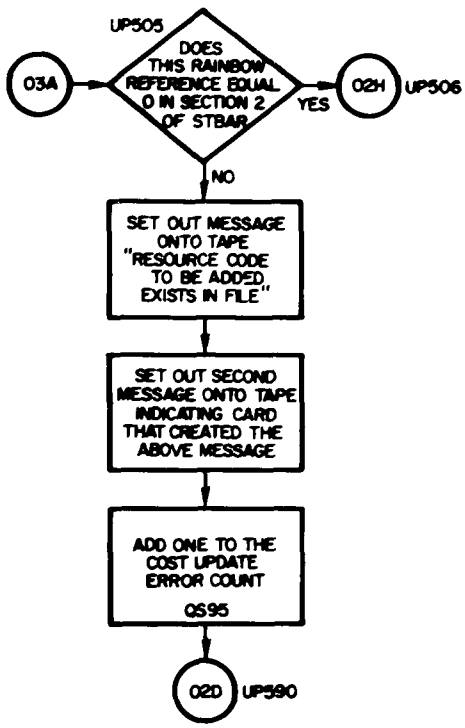
Type 5 Add - to UP502	Type 6 Add - to UP602
Type 5 Change - to UP540	Type 6 Change - to UP620
Type 5 Delete - to UP520	Type 6 Delete - to UP610

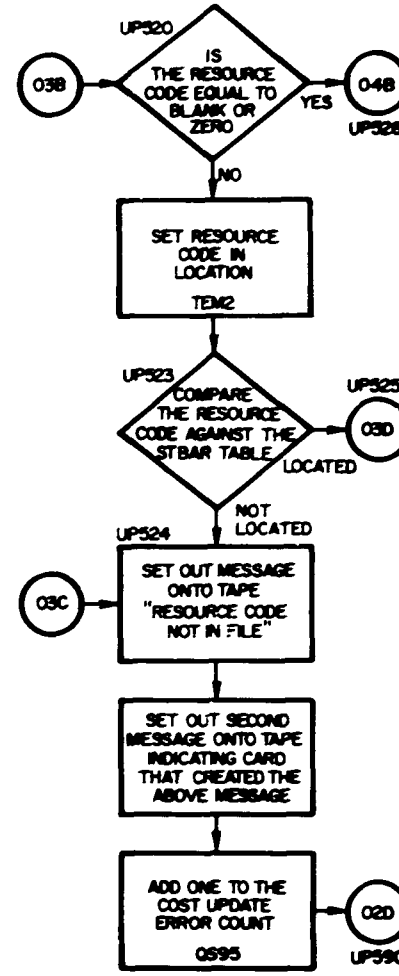
EXPLANATION OF CALLING SEQUENCE: (continued)

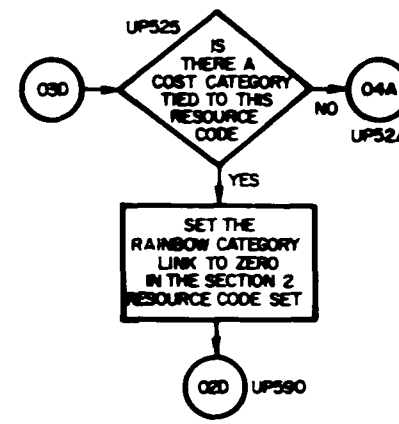
After processing has been completed in these areas the program will then go back and read another input card and transfer to one of the above locations again. After all 5 and 6 input cards have been processed control is returned to the outlink.

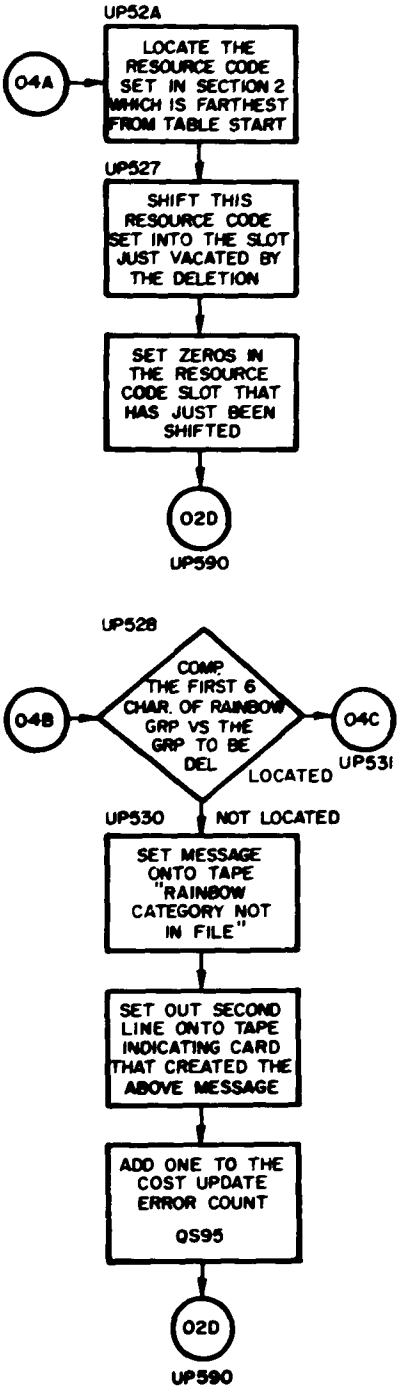

SET UP RAINBOW AND COST CATEGORY TABLES
QRAIN
IS THIS RUN IN FILE ESTABLISH-MENT MODE EX84
NO
READ THE SKILL TABLE LABEL AND RECORD INTO CORE
RSTR
YES
SET ZEROS INTO 1080 WORDS OF SKILL TABLE
STBAR
QN04
IS SORTED DATA TAPE AT END OF FILE CHHLD
YES
01B
QN05
QN06
NO
01E
ADD FIVE TO THE STARTING LOCATION OF INPUT DATA TO BYPASS SORT KEY
QN07
IS CARD CODE EQUAL TO A 6 ?
5
01C
6
01D
QN08
7
QN50
DOES THIS SECT. 2 RESOURCE CODE SET OF STBAR TABLE EQUAL ZERO
01A
NO
ADD ONE TO A RESOURCE CODE SET COUNTER
QR90
YES
DECREMENT INDEX REGISTER 1 BY 5 WHICH IS LINK INTO STBAR SECTION 2 TABLE
O.K.
01A
QN50
FALL THRU
QN51
IS COUNTER EQUAL TO ZERO
QR90
NO
SORT THE ACTIVE PORTION OF SKILL TABLE SECTION 2 (MEMORY SORT)
MSRT
YES
QN05
01B
WRITE THE SKILL TABLE LABEL AND RECORD FROM CORE
WSTR
ROUTINE OUTLINK 1,4
01C
MOVE THE 5 TYPE RECORD INTO A WORK AREA
UP450
UNPACK THESE 80 CHARACTERS INTO A WORK AREA STARTING AT UP451+1
UPCK
CHECK THE CHANGE CODE ON THIS FIVE CARD INPUT AND TRANSFER TO LOCATION INDICATED
CHANGE C
05B
UP540
DELETE B(D)
03B
UP520
ADD A
02A
UP502
QN08
01D
MOVE THE 6 TYPE RECORD INTO A WORK AREA
UP450
UNPACK THESE 80 CHARACTERS INTO A WORK AREA STARTING AT UP451+1
UPCK
CHECK THE CHANGE CODE ON THIS SIX CARD INPUT AND TRANSFER TO LOCATION INDICATED
CHANGE C
06F
UP620
CHANGE B(D)
07A
UP610
ADD A
06A
UP602

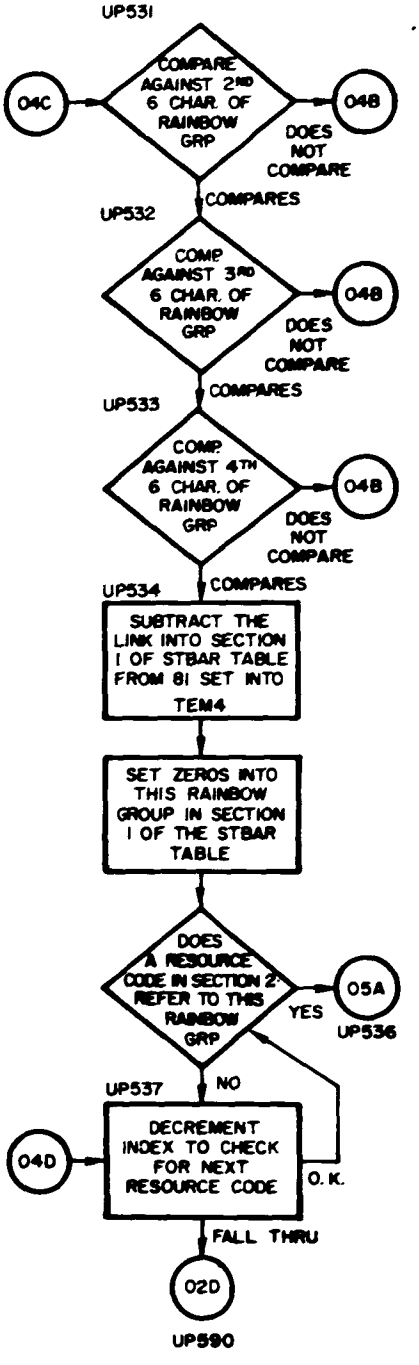

UP502
02A
SET RESOURCE CODE IN LOCATION TEM2
UP504
COMP. THIS RESOURCE CODE AGAINST THE STBAR TABLE
LOCATED
03A UP505
NOT LOCATED
02C UP513
NOT LOCATED TABLE FULL
UP506
02H
SET THIS RESOURCE CODE INTO THE SECTION 2 PORTION OF STBAR THAT IS EMPTY
UP507
02I
COMP. 1ST 6 CHAR. OF RAINBOW GRP. IN SECT. 1 OF STBAR
EQUAL TO ZERO
02G UP514
COMPARE
02E UP509
DOES NOT COMPARE
UP508
02B
DECREMENT LINK ONTO SECTION 1 OF STBAR TABLE BY 4
O K.
FALLS THRU
UP513
02C
SET MESSAGE ONTO TAPE "SKILL TABLE FULL"
SET OUT SECOND LINE ONTO TAPE INDICATING CARD THAT CREATED THE ABOVE MESSAGE
ADD ONE TO THE COST UPDATE ERROR COUNT
QS95
UP590
02D
READ THE NEXT INPUT DATA CARD
RCHG
E.O.F.
01A QN50
01E QN06
UP509
02E
COMP. THE 2ND 6 CHAR. OF A RAINBOW GROUP
02B UP508
DOES NOT COMPARE
COMPARES
UP510
COMP. THE 3RD 6 CHAR. OF A RAINBOW GROUP
02B UP508
DOES NOT COMPARE
COMPARES
UP511
COMP. THE 4TH 6 CHAR. OF A RAINBOW GROUP
02B UP508
DOES NOT COMPARE
COMPARES
UP512
02F
SUBTRACT THE LINK INTO SECT. ON 1 OF STBAR TABLE FROM 81
STORE THIS VALUE IN THE ADDRESS OF THE 4TH WORD OF A RAINBOW GROUP SET IN SECTION 2
02D UP590
UP514
02G
MOVE NEW RAINBOW CATEGORY INTO FIRST LOCATION IN SECTION 1 CONTAINING ZEROS
02F UP512

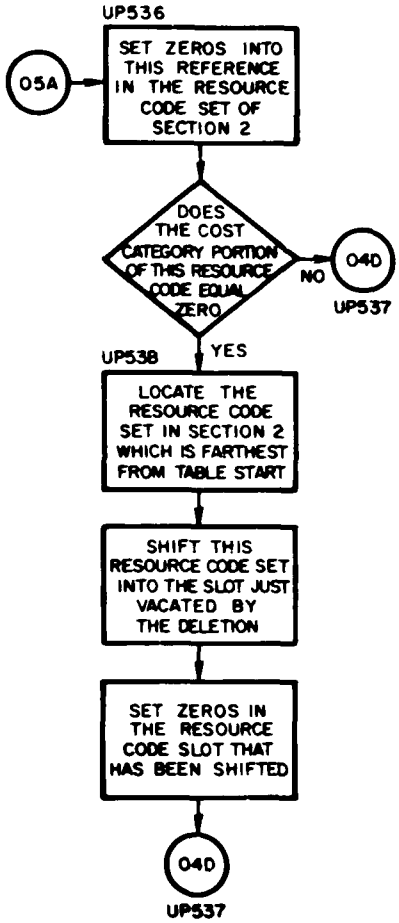

UP505
DOES THIS RAINBOW REFERENCE EQUAL 0 IN SECTION 2 OF STBAR
03A
YES
02H
UP506
NO
SET OUT MESSAGE ONTO TAPE "RESOURCE CODE TO BE ADDED, EXISTS IN FILE"
SET OUT SECOND MESSAGE ONTO TAPE INDICATING CARD THAT CREATED THE ABOVE MESSAGE
ADD ONE TO THE COST UPDATE ERROR COUNT
QS95
02D
UP590

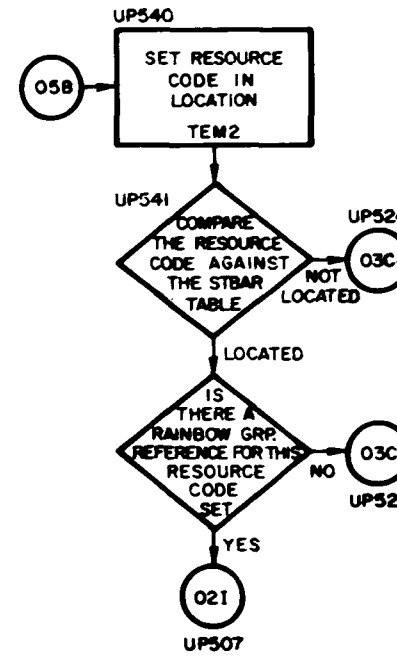

UP520
IS THE RESOURCE CODE EQUAL TO BLANK OR ZERO
03B
YES
04B
UP528
NO
SET RESOURCE CODE IN LOCATION
TEM2
UP523
COMPARE THE RESOURCE CODE AGAINST THE STBAR TABLE
UP525
03D
LOCATED
NOT LOCATED
UP524
03C
SET OUT MESSAGE ONTO TAPE "RESOURCE CODE NOT IN FILE"
SET OUT SECOND MESSAGE ONTO TAPE INDICATING CARD THAT CREATED THE ABOVE MESSAGE
ADD ONE TO THE COST UPDATE ERROR COUNT
QS95
02D
UP590

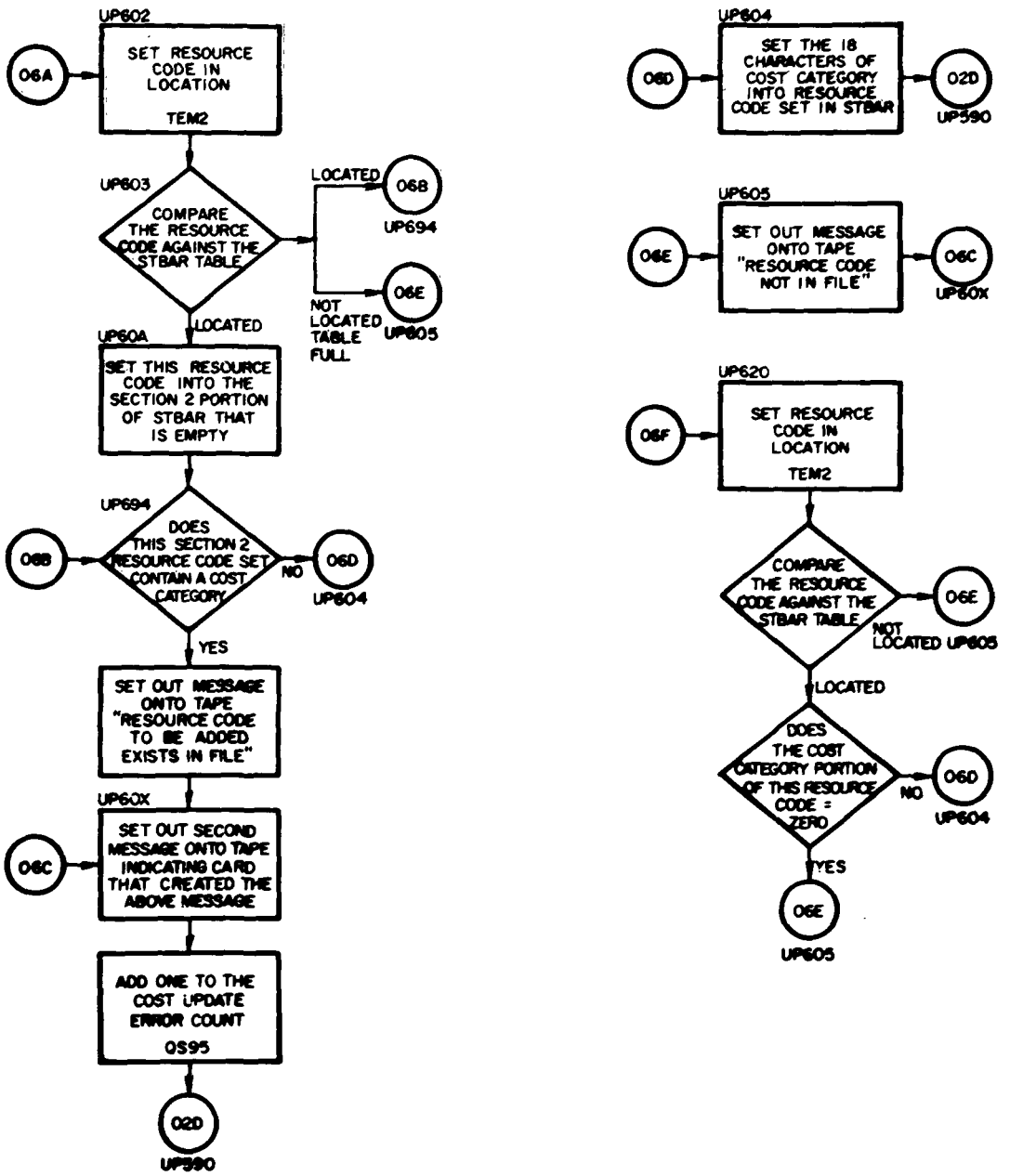

UP525
IS THERE A COST CATEGORY TIED TO THIS RESOURCE CODE
03D
NO
04A
UP52A
YES
SET THE RAINBOW CATEGORY LINK TO ZERO IN THE SECTION 2 RESOURCE CODE SET
02D
UP590

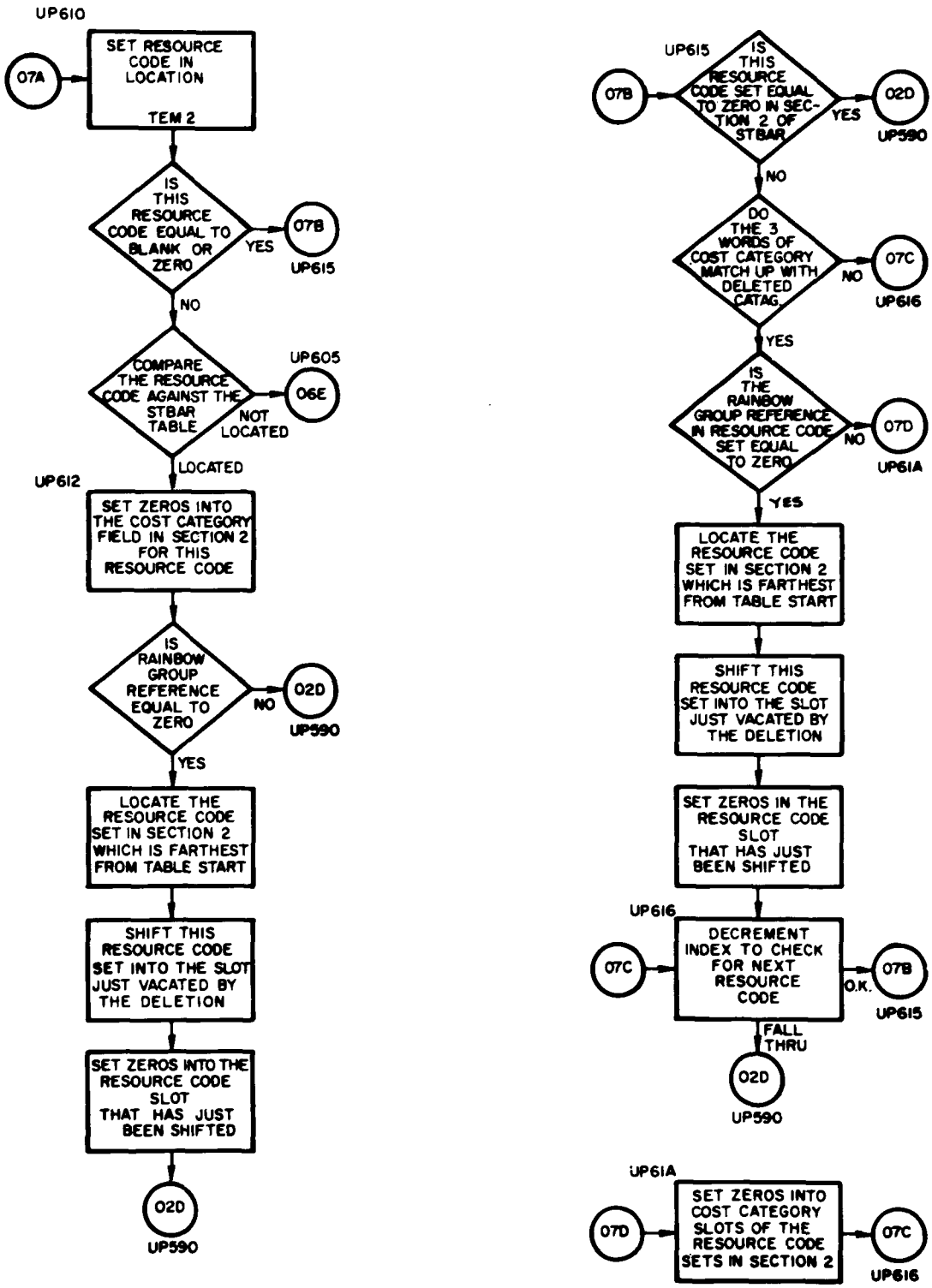

UP52A
04A
LOCATE THE RESOURCE CODE SET IN SECTION 2 WHICH IS FARTHEST FROM TABLE START
UP527
SHIFT THIS RESOURCE CODE SET INTO THE SLOT JUST VACATED BY THE DELETION
SET ZEROS IN THE RESOURCE CODE SLOT THAT HAS JUST BEEN SHIFTED
02D
UP590
UP528
04B
COMP. THE FIRST 6 CHAR. OF RAINBOW GRP VS THE GRP TO BE DEL
04C
UP531
LOCATED
UP530
NOT LOCATED
SET MESSAGE ONTO TAPE "RAINBOW CATEGORY NOT IN FILE"
SET OUT SECOND LINE ONTO TAPE INDICATING CARD THAT CREATED THE ABOVE MESSAGE
ADD ONE TO THE COST UPDATE ERROR COUNT
0S95
02D
UP590


UP531
04C
COMPARE AGAINST 2ND 6 CHAR. OF RAINBOW GRP
04B
DOES NOT COMPARE
COMPARES
UP532
COMP. AGAINST 3RD 6 CHAR. OF RAINBOW GRP
04B
DOES NOT COMPARE
COMPARES
UP533
COMP. AGAINST 4TH 6 CHAR. OF RAINBOW GRP
04B
DOES NOT COMPARE
COMPARES
UP534
SUBTRACT THE LINK INTO SECTION 1 OF STBAR TABLE FROM 81 SET INTO TEM4
SET ZEROS INTO THIS RAINBOW GROUP IN SECTION 1 OF THE STBAR TABLE
DOES A RESOURCE CODE IN SECTION 2 REFER TO THIS RAINBOW GRP
05A
YES
UP536
NO
UP537
04D
DECREMENT INDEX TO CHECK FOR NEXT RESOURCE CODE
O.K.
FALL THRU
02D
UP590


UP536
05A
SET ZEROS INTO THIS REFERENCE IN THE RESOURCE CODE SET OF SECTION 2
DOES THE COST CATEGORY PORTION OF THIS RESOURCE CODE EQUAL ZERO
NO
04D
UP537
YES
UP538
LOCATE THE RESOURCE CODE SET IN SECTION 2 WHICH IS FARTHEST FROM TABLE START
SHIFT THIS RESOURCE CODE SET INTO THE SLOT JUST VACATED BY THE DELETION
SET ZEROS IN THE RESOURCE CODE SLOT THAT HAS BEEN SHIFTED
04D
UP537


UP540
05B
SET RESOURCE CODE IN LOCATION TEM2
UP541
COMPARE THE RESOURCE CODE AGAINST THE STBAR TABLE
NOT LOCATED
UP524
03C
LOCATED
IS THERE A RAINBOW GRP. REFERENCE FOR THIS RESOURCE CODE SET
NO
03C
UP524
YES
021
UP507


UP602
06A
SET RESOURCE CODE IN LOCATION TEM2
UP603
COMPARE THE RESOURCE CODE AGAINST THE STBAR TABLE
LOCATED
06B
UP694
NOT LOCATED TABLE FULL
06E
UP605
LOCATED
UP60A
SET THIS RESOURCE CODE INTO THE SECTION 2 PORTION OF STBAR THAT IS EMPTY
UP694
06B
DOES THIS SECTION 2 RESOURCE CODE SET CONTAIN A COST CATEGORY
NO
06D
UP604
YES
SET OUT MESSAGE ONTO TAPE "RESOURCE CODE TO BE ADDED EXISTS IN FILE"
UP60X
06C
SET OUT SECOND MESSAGE ONTO TAPE INDICATING CARD THAT CREATED THE ABOVE MESSAGE
ADD ONE TO THE COST UPDATE ERROR COUNT 0S95
02D
UP590
UP604
06D
SET THE 18 CHARACTERS OF COST CATEGORY INTO RESOURCE CODE SET IN STBAR
02D
UP590
UP605
06E
SET OUT MESSAGE ONTO TAPE "RESOURCE CODE NOT IN FILE"
06C
UP60X
UP620
06F
SET RESOURCE CODE IN LOCATION TEM2
COMPARE THE RESOURCE CODE AGAINST THE STBAR TABLE
06E
NOT LOCATED UP605
LOCATED
DOES THE COST CATEGORY PORTION OF THIS RESOURCE CODE = ZERO
NO
06D
UP604
YES
06E
UP605

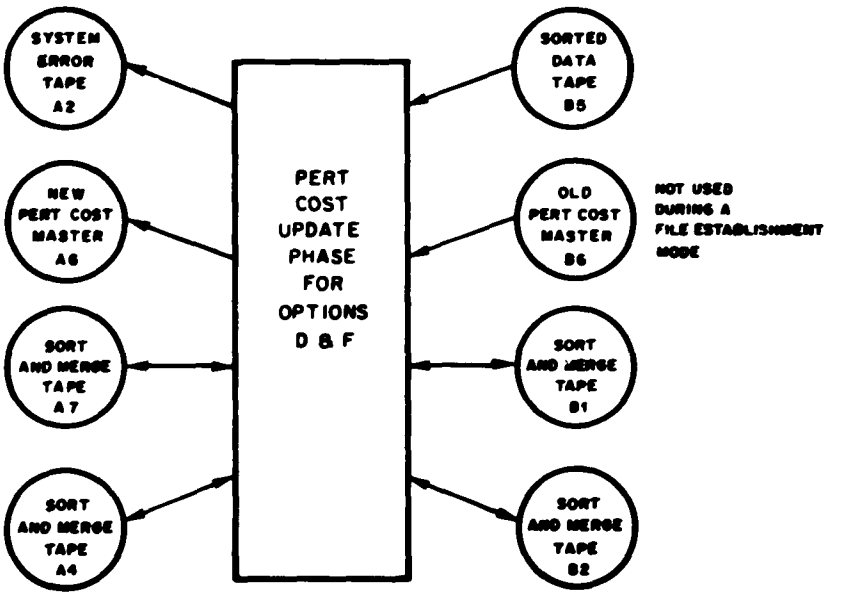

UP610
07A
SET RESOURCE CODE IN LOCATION
TEM 2
IS THIS RESOURCE CODE EQUAL TO BLANK OR ZERO
YES
07B
UP615
NO
COMPARE THE RESOURCE CODE AGAINST THE STBAR TABLE
UP605
06E
NOT LOCATED
LOCATED
UP612
SET ZEROS INTO THE COST CATEGORY FIELD IN SECTION 2 FOR THIS RESOURCE CODE
IS RAINBOW GROUP REFERENCE EQUAL TO ZERO
NO
02D
UP590
YES
LOCATE THE RESOURCE CODE SET IN SECTION 2 WHICH IS FARTHEST FROM TABLE START
SHIFT THIS RESOURCE CODE SET INTO THE SLOT JUST VACATED BY THE DELETION
SET ZEROS INTO THE RESOURCE CODE SLOT THAT HAS JUST BEEN SHIFTED
02D
UP590
UP615
IS THIS RESOURCE CODE SET EQUAL TO ZERO IN SECTION 2 OF STBAR
07B
YES
02D
UP590
NO
DO THE 3 WORDS OF COST CATEGORY MATCH UP WITH DELETED CATAG.
NO
07C
UP616
YES
IS THE RAINBOW GROUP REFERENCE IN RESOURCE CODE SET EQUAL TO ZERO
NO
07D
UP61A
YES
LOCATE THE RESOURCE CODE SET IN SECTION 2 WHICH IS FARTHEST FROM TABLE START
SHIFT THIS RESOURCE CODE SET INTO THE SLOT JUST VACATED BY THE DELETION
SET ZEROS IN THE RESOURCE CODE SLOT THAT HAS JUST BEEN SHIFTED
UP616
07C
DECREMENT INDEX TO CHECK FOR NEXT RESOURCE CODE
O.K.
07B
UP615
FALL THRU
02D
UP590
UP61A
07D
SET ZEROS INTO COST CATEGORY SLOTS OF THE RESOURCE CODE SETS IN SECTION 2
07C
UP616

Cost Update Phase Tape Operations

The tape manipulations that are required for the update phase will vary with the option requested. The tape configurations for these three groups of options will be set up as follows.

Options D and F

If the program is running under one of these options it will have read a USERS TIME TAPE in the PERT time merge phase. The time records are then sorted in charge number sequence using the 4-tape sort. The results can be either on channel A or B depending on the number of merge passes. The channel opposite the side containing the results of the time merge will be set up to receive the data to be sorted for output reports, again using the 4-tape sort. The information that is read in during the update phase, excluding file establishment time, will be the SORTED DATA TAPE B5, OLD PERT COST MASTER B6, and the time information from the 4-tape sort. The following tape flow will show the configuration for options D and F in the update phase.



The USERS TIME TAPE B4 has been rewound and unloaded during the time merge phase and is not used during this update phase. When the program is operating in a file establishment mode the OLD PERT COST MASTER TAPE B6 is not needed, since the program will be creating a NEW PERT COST MASTER TAPE from input data only.

Any error messages that will not stop the program will be set out on the SYSTEM ERROR TAPE A2 and the count of the errors will be set out as described on Page III-G-6. This tape will not be rewound at the end of this phase, since it will become the SYSTEM OUTPUT TAPE and most reports will be written as a second file on this tape. The SORTED DATA TAPE will hold all the cost inputs into the system. If these were inputs for the time merge, this tape will be positioned past the last time merge input and will read the first cost input at the beginning of this phase. At the end of the update phase all of the inputs on the SORTED DATA TAPE should be completed and this tape is rewound and unloaded. The OLD PERT COST MASTER, if not in a file establishment mode, and the NEW PERT COST MASTER are both rewound and unloaded at the end of this phase.

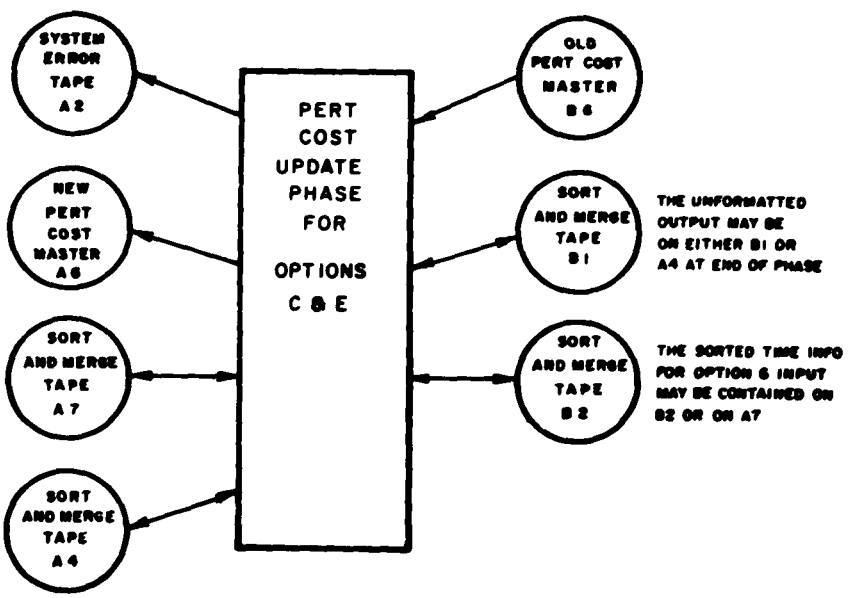
The information making up the PERT COST MASTER is actually the second data file on the tape. The first data file will be the input parameters and the activities tied to charge number information. Two end-of-file marks are placed on this tape behind the activities tied to charge number data when the time merge phase is completed, but the tape is not rewound. At the beginning of the Cost Update phase this second data file, consisting of rate table, skill table, and PERT Cost information, is set onto this PERT COST MASTER. When this phase is completed, two more end-of-file marks are placed on this tape, and it is rewound and unloaded. Both data files on this tape are created in a binary mode and are blocked. A maximum of nine reels of the NEW PERT COST MASTER can be created as well as a maximum of nine reels of the OLD PERT COST MASTER read for any program run.

If it is found necessary to list the SYSTEM ERROR TAPE, it will be printed out off-line at the completion of the update phase. If the errors indicated on this list have to be corrected before any reports can come out, the program

is then removed from the machine. The input errors then are removed from the data deck, corrected, and set back into the deck to begin operating again. The program will then be restarted from the beginning.

Options C and E

Under Option C or E the program essentially bypasses the update phase. During the preceding time merge phase, the program has created a SORTED TIME TAPE to be used when operating under Option G. In the update phase, the program will set out information to print the Work Package/Activity Report, which is an automatic feature for these options. These options can not run under a file establishment mode, since the data needed from the cost files would not be present if running under this mode. The following tape flow will show the configuration for Options C and E in the update phase. The USERS TIME TAPE B4 will have been read previous to this phase as explained in Options D and F. The handling of the sort tapes will vary from that explained in options D and F in that after the completion of the 4-tape sort, where the time records are sorted in charge number sequence, the output information does not go into a sort. The channel opposite the side containing the results of the time merge will be set up to write the SORTED TIME TAPE and the output data for the Work Package/Activity Report.



Tape A7 or B2, depending on the channel available, will be the tape that contains the sorted time information, and A4 or B1 will contain the unformatted output report information.

The SORTED DATA TAPE B5 should be completed during the time merge phase and rewound and unloaded during that phase. The program expects no cost input data during the update phase for Options C and E. The information on the OLD PERT COST MASTER is duplicated on the NEW PERT COST MASTER, with the exception of the program name if the name has changed. All other data is reproduced exactly as carried on the OLD PERT COST MASTER with the following fields being selected for use with the Work Package/Activity Report.

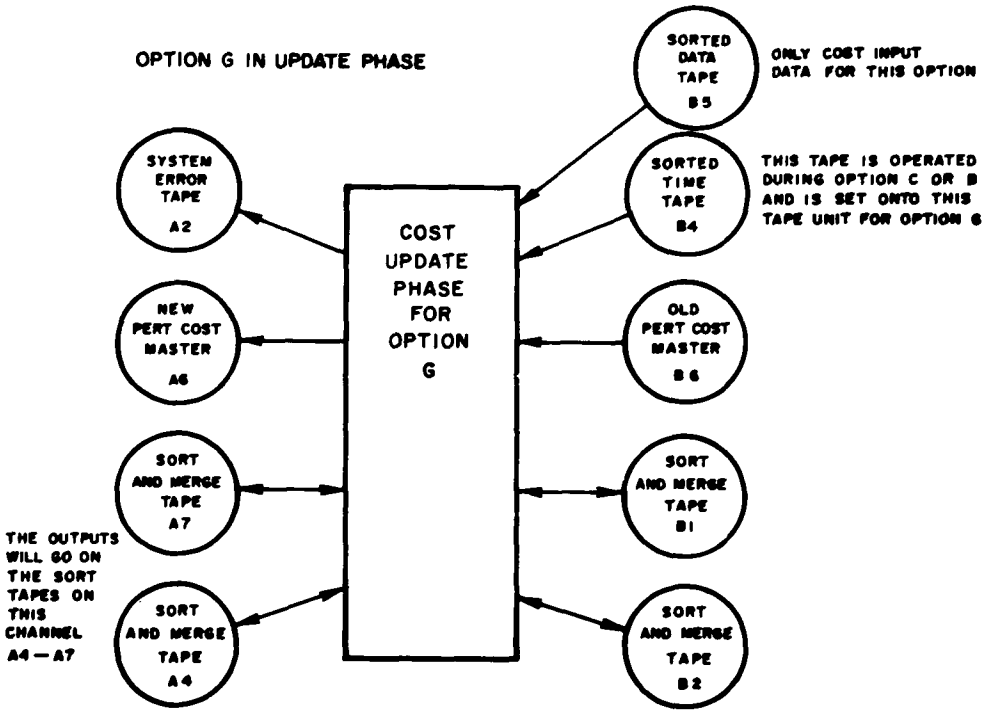
(1) charge number level
(2) charge number description
(3) responsible organization

Option G

Under this option the program will be handled similarly to Options D or F except for the following conditions.

The time information in charge number sequence will be on a SORTED TIME TAPE that was created during Option C or E. This tape will be set onto B4. Since there is no sort involved to get this time information during option G, the data for the output reports can be set on the "A" channel without interrogating the sort program for the right channel. Option G will essentially bypass the time merge phase and therefore does not expect any Type 1 or Type 2 input data. The first record read from the SORTED DATA TAPE will be cost input data for this phase. The following tape flow will show the configuration for Option G in the update phase. It is possible, without any time information, to run Option G for both file establishment and cyclic running as requested by control card input. If this condition is requested, the SORTED TIME TAPE does not have to be present because the program will ignore this tape, and for file establishment the OLD PERT COST

MASTER is ignored. Thus, when time information is to be suppressed, the tape configuration as shown below does not include B4 for cyclic running and omits B4 and B6 for file establishment.



Cost Update Phase On-Line Messages

The messages forthcoming on the on-line printer regarding the update phase are.

(a) For Option D or F on File Establishment

TAPE A6 HAS BEEN SELECTED FOR WRITING
TAPE B5 IS NOW REWINDING AND SHOULD UNLOAD
TAPE A6 IS NOW REWINDING AND SHOULD UNLOAD
END OF PERT COST UPDATE PHASE

Following this last line will be the phase-ending messages described on Page III-G-6. These phase-ending messages likewise will follow the messages shown below.

(b) For Option D or F Not a File Establishment

TAPE B6 HAS BEEN SELECTED FOR READING
TAPE A6 HAS BEEN SELECTED FOR WRITING
TAPE B6 IS NOW REWINDING AND SHOULD UNLOAD
TAPE B5 IS NOW REWINDING AND SHOULD UNLOAD
TAPE A6 IS NOW REWINDING AND SHOULD UNLOAD
END OF PERT COST UPDATE PHASE

Even though tapes B6 and A6 had been selected in the time merge phase they are again selected, since the program handles the SECONDARY MASTER and PERT COST MASTER as two separate master files though they are on the same physical tape.

(c) For Option D or F With Multiple Master Tapes

TAPE B6 HAS BEEN SELECTED FOR READING
TAPE A6 HAS BEEN SELECTED FOR WRITING
TAPE B6 IS NOW REWINDING AND SHOULD UNLOAD
SET NEXT REEL OF SERIES ON TAPE B6
TAPE B6 HAS BEEN SELECTED FOR READING
TAPE A6 IS NOW REWINDING AND SHOULD UNLOAD
SET NEXT REEL OF SERIES ON TAPE A6
TAPE A6 HAS BEEN SELECTED FOR WRITING
TAPE B6 IS NOW REWINDING AND SHOULD UNLOAD
TAPE B5 IS NOW REWINDING AND SHOULD UNLOAD
TAPE A6 IS NOW REWINDING AND SHOULD UNLOAD
END OF PERT COST UPDATE PHASE

The above process of setting the next reel of series onto the tape units can continue for up to nine tapes on both A6 and B6. When this next-reel-of-series

message refers to B6, it is concerned with the next tape in the series that was created in a prior cyclic run. When it refers to A6, it means to set a blank or utility onto this tape unit. Since these tapes are not alternating, the program must wait until the indicated tape is rewound, unloaded, and a new tape loaded before it can proceed.

(d) For Option C or E

TAPE XX HAS BEEN SELECTED FOR WRITING
TAPE B6 HAS BEEN SELECTED FOR READING
TAPE A6 HAS BEEN SELECTED FOR WRITING
TAPE XX IS NOW REWINDING AND SHOULD UNLOAD
*** SAVE TAPE XX FOR NEXT RUN ***
TAPE B6 IS NOW REWINDING AND SHOULD UNLOAD
TAPE A6 IS NOW REWINDING AND SHOULD UNLOAD
END OF PERT COST UPDATE PHASE

The tape indicated by XX will be the SORTED TIME TAPE that is created for use in Option G. Depending on the channel available for writing this tape, the number will be either A7 or B2. The SORTED DATA TAPE was completed in the time merge phase and the above series of messages does not refer to it.

(e) For Option G With No Time Information

This condition will take the same form as (b) above except for the inclusion of the following line prior to the referenced series of messages:

TAPE B5 HAS BEEN SELECTED FOR READING

This line will be found in the Update Phase messages because the only data carried on this tape will be cost inputs as indicated by Option G.

(f) For Option G With Time Information

This condition will read the SORTED TIME TAPE created in Option C and set onto the same physical tape as the USERS TIME TAPE. The series of messages for this situation are:

TAPE B5 HAS BEEN SELECTED FOR READING
TAPE B4 HAS BEEN SELECTED FOR READING
TAPE B6 HAS BEEN SELECTED FOR READING
TAPE A6 HAS BEEN SELECTED FOR WRITING
TAPE B5 IS NOW REWINDING AND SHOULD UNLOAD
TAPE B4 IS NOW REWINDING AND SHOULD UNLOAD
TAPE B6 IS NOW REWINDING AND SHOULD UNLOAD
TAPE A6 IS NOW REWINDING AND SHOULD UNLOAD
END OF PERT COST UPDATE PHASE

The order in which some of the tapes rewind and unload is dependent on the amount of information carried and the end-of-file mark. Therefore, some of the messages may vary slightly from that shown above.

Cost Update Phase Error Messages

The errors determined during the cost update phase are set out on the on-line printer when they will cause the system to stop, or they are set out on the SYSTEM ERROR TAPE if they do not cause a stop in the program.

The error messages that are set out on the SYSTEM ERROR TAPE, with the reason for each message, are as follows:

(a) AN INSERTION COULD NOT BE MADE FOR THE FOLLOWING CARD DUE TO NO 7-0 CARD.

XX - 80 characters of input card - XX

An input being processed by the system is attempting to add a new Performing Unit/Resource Code to a charge or summary number that has never been set up by means of a 7-0 card. The last line of this message will be a reproduction of the input card for which this message

applies. A reproduction of the troublesome input card will usually follow the other messages in this section.

(b) THE FOLLOWING CARD WAS AN UNMATCHED DELETION OR CHANGE

An input being processed by the system is attempting to delete or change a field in a charge or summary number record that does not exist.

(c) THE FOLLOWING CARD WAS A MATCHED ADDITION

An input being processed by the system is attempting to set up a charge or summary number, or Performing Unit/ Resource Code for one that presently exists.

(d) CANNOT UPDATE A DELETED RECORD, CARD REJECTED

The input is attempting to update a record that has been deleted by a prior input card. This record may be a charge or summary number, or a Performing Unit/ Resource Code.

(e) A DATE HAS NON-NUMERIC CHARACTERS IN THE DD OR YY

The charge number start or end date has a bad day or year in the 7-2 card as will be shown in the format set up below this message.

(f) CANNOT LOCATE AN INDICATED MONTH

The charge number start or end date has an illegitimate month field.

(g) THE DAYS DO NOT FALL IN THE RANGE SPECIFIED BY ITS MONTH

The number of days associated with a particular month does not fall in the range specified for that month.

(h) XXX FIELD IN ACTUAL INPUT CARD OUT OF BOUNDS

The date in one of the fields of this actual input varies by more than 60 months from the data presently carried in the file. The field on the actual input card that is involved will be indicated at the position marked XXX in the message.

The XXX will stand for the following information:
1 = 1st, 2 = 2nd, 3 = 3rd, 4 = 4th.

(i) XXX FIELD TRIED TO DELETE ACTUAL NOT IN FILE

One of the fields on an actual input card is attempting to delete an actual field that has never been set up. The XXX refers to the same data as explained in (h) above.

(j) INPUT ON A DELETED RESOURCE CODE

After a resource code of a particular charge number and performing unit has been deleted, additional input attempting to modify this resource code is found. Every input of this type will be bypassed, and the above message with a reproduction of the card in error will be set out.

(k) THIS RESOURCE CODE IS RESERVED FOR XXXXX

Each resource code, if tied to hours or units, is so flagged in its record, and any input at the hours or units level must match this indicator. The XXXXX field in this message refers to (1) HOURS or (2) UNITS.

(l) DOLLAR INPUT FOR RESOURCE CODE WITH UNIT RATE

Since the dollar value will be a result of an extension using the rate table, the program will not accept any dollar inputs if that Performing Unit/Resource Code or Resource Code combination is tied to a unit rate.

(m) TOTAL DOLLARS FOR RESOURCE CODE WITH OVERHEAD RATE

Since the total dollar value will be a result of an extension using the rate table, the program will not accept any total dollar inputs if that Performing Unit/Resource Code or Resource Code combination is tied to an overhead rate.

(n) DUPLICATE INPUTS FOR BUDGETS OR ESTIMATES

If two inputs are found to refer to the same charge number, performing unit, and resource code for the same months, the first input will be processed normally and the second will be bypassed, with the above message printed out.

The following messages will not have the 80 characters of the input card as a last line tied to the message.

(o) TOTAL DOLLAR FIELD IS LESS THAN DIRECT DOLLARS ON XXXXXXXXX

CHARGE NO. XXXXXXXXXXXXXXXXXX P. U. XXXXXX R. C. XXXX

When a particular month or set of months contain less dollar value in total dollars than in direct dollars, but not a zero value, this message is set out. On the first line the X's refer to one of the following three categories: (1) budgets, (2) estimates, (3) actuals. The second line will contain the charge number. Performing unit, and resource code involved in this situation.

(p) ACTUAL TOTAL DOLLAR FIELD IS ZERO WITH A VALUE IN DIRECT DOLLARS

CHARGE NO. XXXXXXXXXXXXXXXXX P. U. XXXXXX R. C. XXXX DATE MMMYY

When a particular month in the actual fields contains a zero in the total dollars and a value in direct dollars this message is set out. The second line will contain the charge number, performing unit, resource code, and month and year concerned with this problem. The program will move, for output purposes only, the direct dollars into the total dollars field. If budgets and estimates are also involved with this problem, the program will move the direct dollars into the total dollars field for output reporting only, but will not put out an exception message.

(q) THE FOLLOWING ITEM COULD NOT BE DELETED DUE TO ACTUALS IN FILE

CHARGE NO. - XXXXXXXXXXXXXXXXX

PERF. ORG. - XXXXXX

RES. CODE - XXXX

In attempting to delete a charge or summary number some actual dollar values were found which prevented this item from being deleted. The last portion of this message will contain the charge number, performing unit, and resource code that contain the actuals.

(r) TIME RECORD IN ERROR -
CHG. NO. XXXXXXXXXXXXXXXXXX
PRED. XXXXXXXXX SUCC. XXXXXXXXX

The SORTED TIME TAPE contains a charge number that does not exist on the PERT COST MASTER TAPE. This message will contain the charge number involved, plus its predecessor and successor numbers. Each record found in error will be printed out.

The following messages will be set out on the on-line printer and will stop the system.

(s) SEQUENCE ERROR ON FOLLOWING CARD

XX - 80 characters of input card - XX

If the input cards from the SORTED DATA TAPE are not in a correct sequence this message is forthcoming. It will also print out the card that is out of sequence.

(t) SEQUENCE ERROR ON OLD PERT MASTER

If the OLD PERT COST MASTER is not in a correct sequence this message will be set out. This will apply at the charge or summary number level as well as at the performing unit and resource code levels.

Cost Update Phase Region Descriptions

The following region descriptions will describe the major subroutines used in the cost update phase as well as the cost update itself.

Region PUAO-SA00

EXPLANATION OF REGION:

This region will handle the control section for the update phase. It will develop and modify the rate table, skill table, and PERT Cost data. It will read in the OLD PERT COST MASTER, the SORTED TIME TAPE and SORTED DATA TAPE, and write out the NEW PERT COST MASTER and the preliminary sort tape for the output phase.

CALLING SEQUENCE:

L TRA PUAO

INPUT:

OLD PERT COST MASTER FILE

SORTED TIME TAPE

SORTED DATA TAPE

OUTPUT:

NEW PERT COST MASTER FILE

Pre-reporting input tape

STORAGE USED:

UCHG	-	25 words	- charge number record in core
UPUN	-	2 words	- performing unit record in core
QRES1	-	600 words	- packed resource code information for writing on tape
QRES2	-	600 words	- unpacked resource code information for handling data

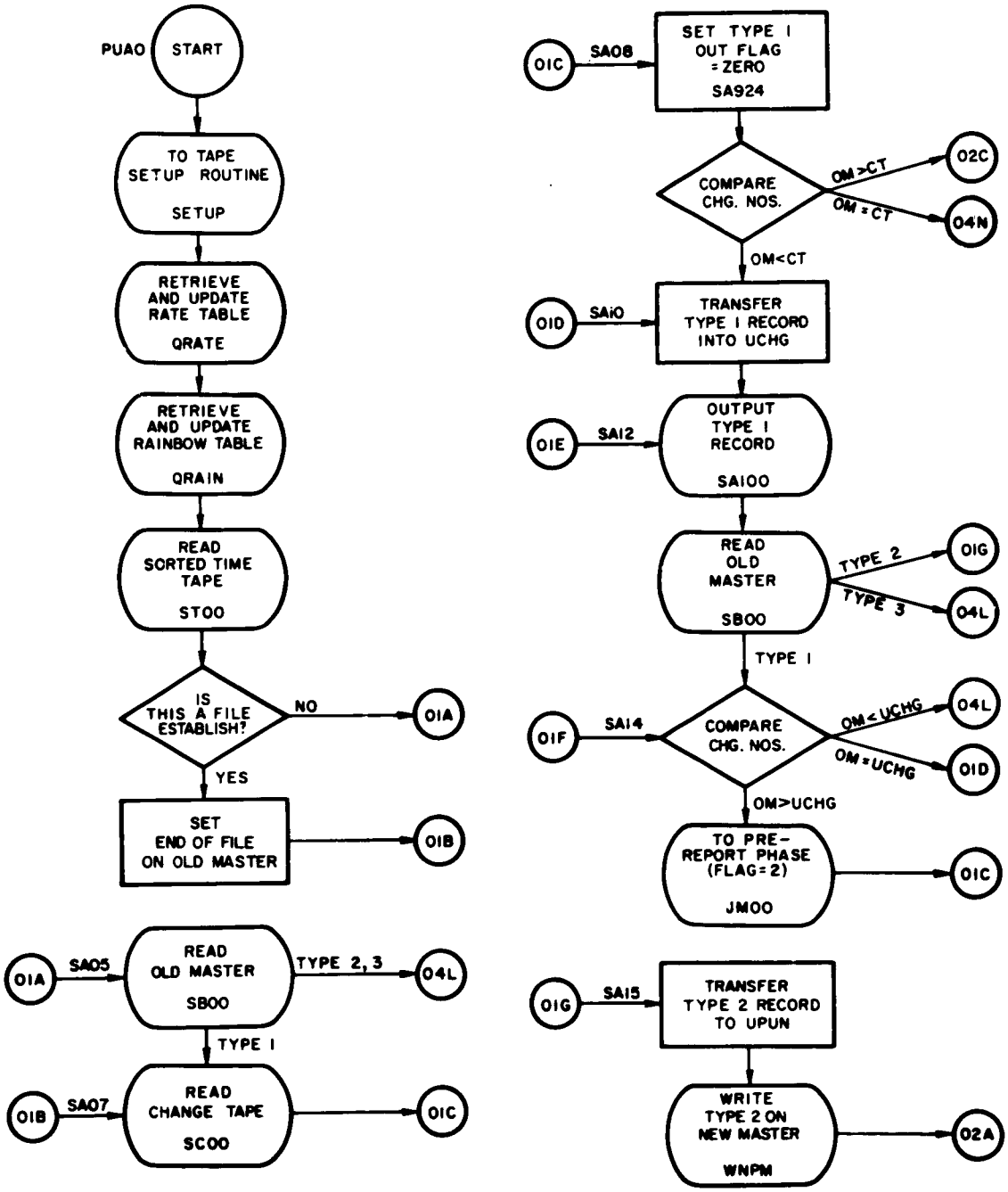
SUBREGIONS AND SUBROUTINES USED:

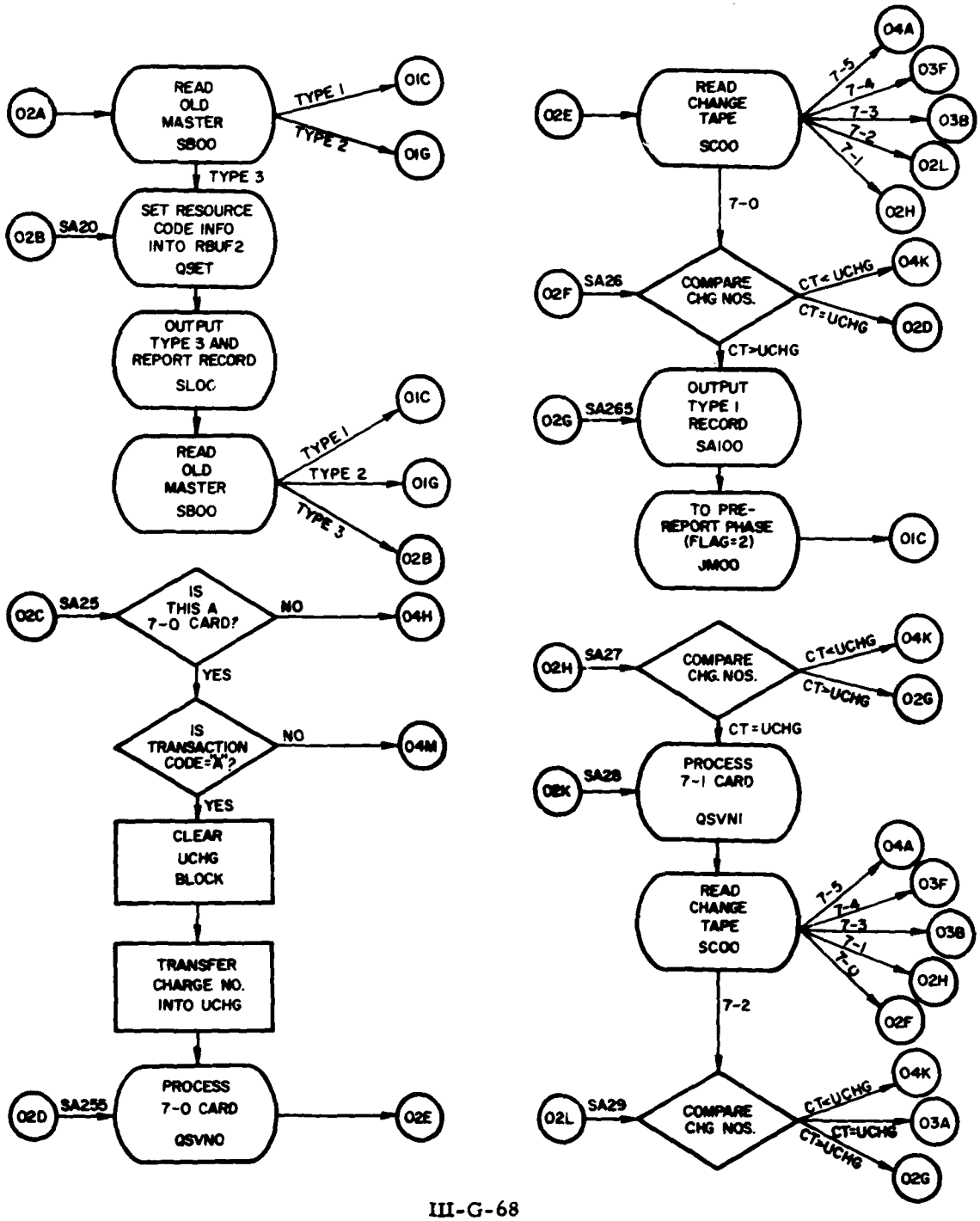
QRATE	QSET	STOO	QSVN1	QSVN5
QRAIN	QSRCH	SDOO	QSVN2	WNPM
SBOO	QCLN	SFOO	QSVN3	SETUP
SCOO	JMOO	QSVNO	QSVN4	QSRTB

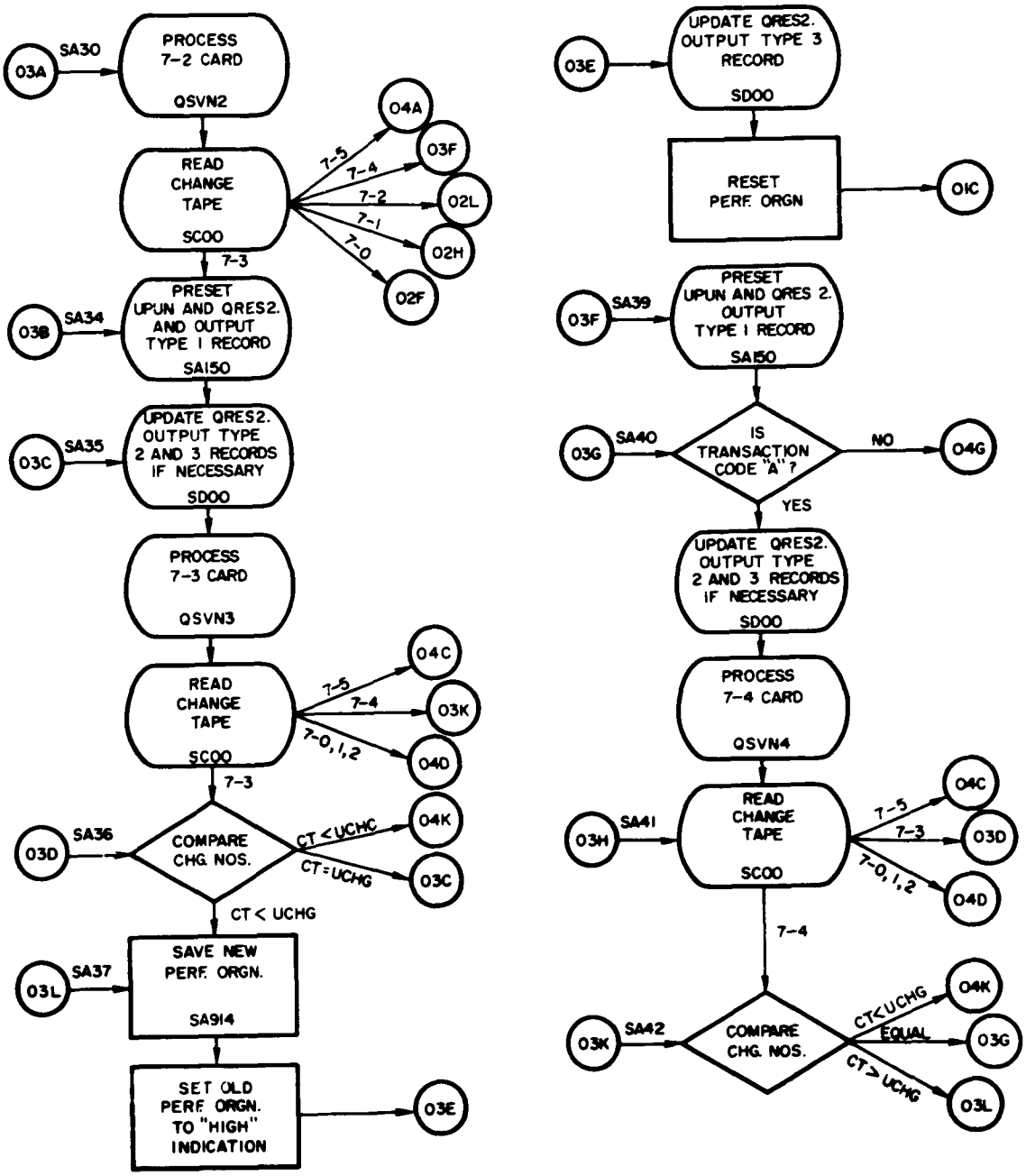
EXPLANATION OF CALLING SEQUENCE:

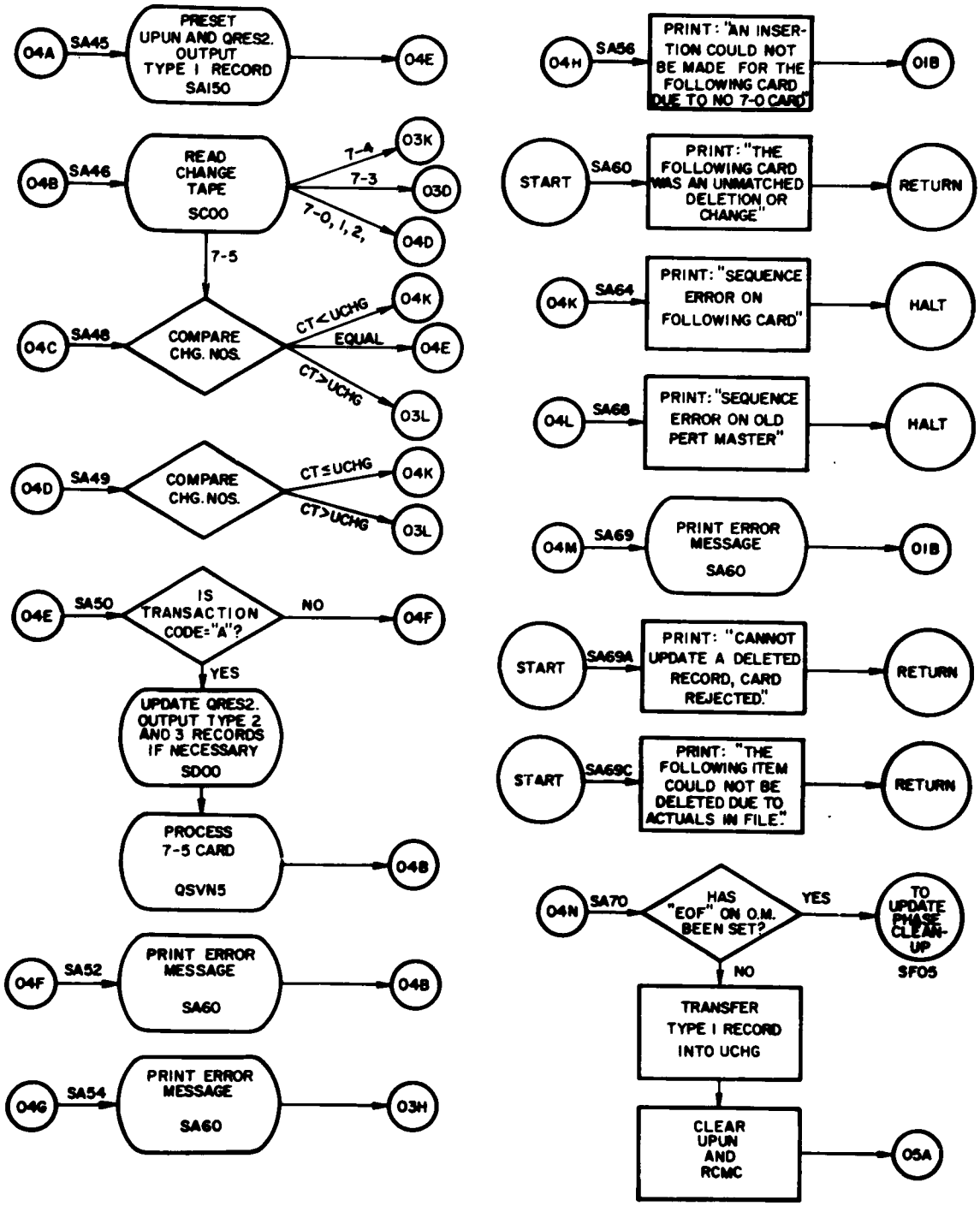
When all of the inputs are at end-of-file the program will transfer control out of the update into the 4-tape sort for preliminary sort on output data.

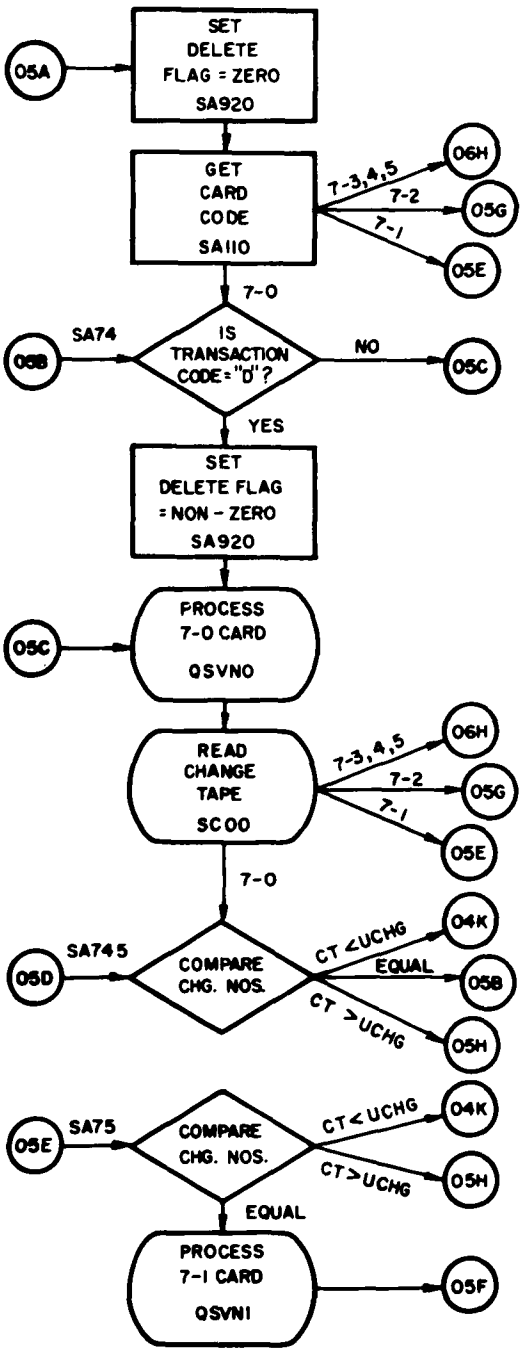
The locations PUAO and SA00 are equal.

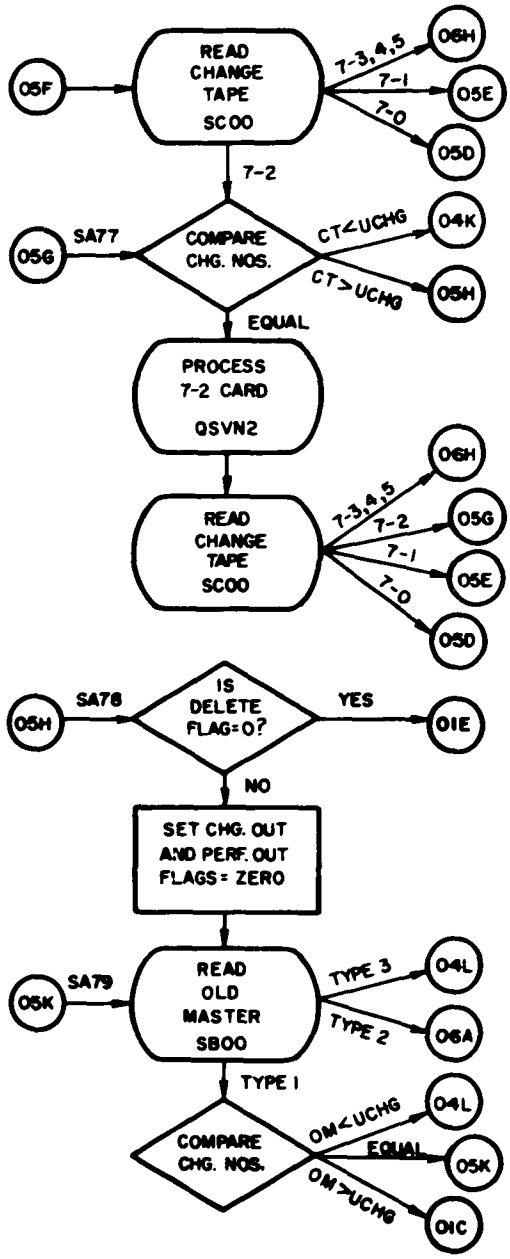

PUAO
START
TO TAPE SETUP ROUTINE
SETUP
RETRIEVE AND UPDATE RATE TABLE
QRATE
RETRIEVE AND UPDATE RAINBOW TABLE
QRAIN
READ SORTED TIME TAPE
ST00
IS THIS A FILE ESTABLISH?
NO
01A
YES
SET END OF FILE ON OLD MASTER
01B
01A
SA05
READ OLD MASTER
SB00
TYPE 2, 3
04L
TYPE 1
01B
SA07
READ CHANGE TAPE
SC00
01C
01C
SA08
SET TYPE 1 OUT FLAG = ZERO
SA924
COMPARE CHG. NOS.
OM>CT
02C
OM=CT
04N
OM<CT
01D
SA10
TRANSFER TYPE 1 RECORD INTO UCHG
01E
SA12
OUTPUT TYPE 1 RECORD
SA100
READ OLD MASTER
SB00
TYPE 2
01G
TYPE 3
04L
TYPE 1
01F
SA14
COMPARE CHG. NOS.
OM<UCHG
04L
OM=UCHG
01D
OM>UCHG
TO PRE-REPORT PHASE (FLAG=2)
JM00
01C
01G
SA15
TRANSFER TYPE 2 RECORD TO UPUN
WRITE TYPE 2 ON NEW MASTER
WNPM
02A

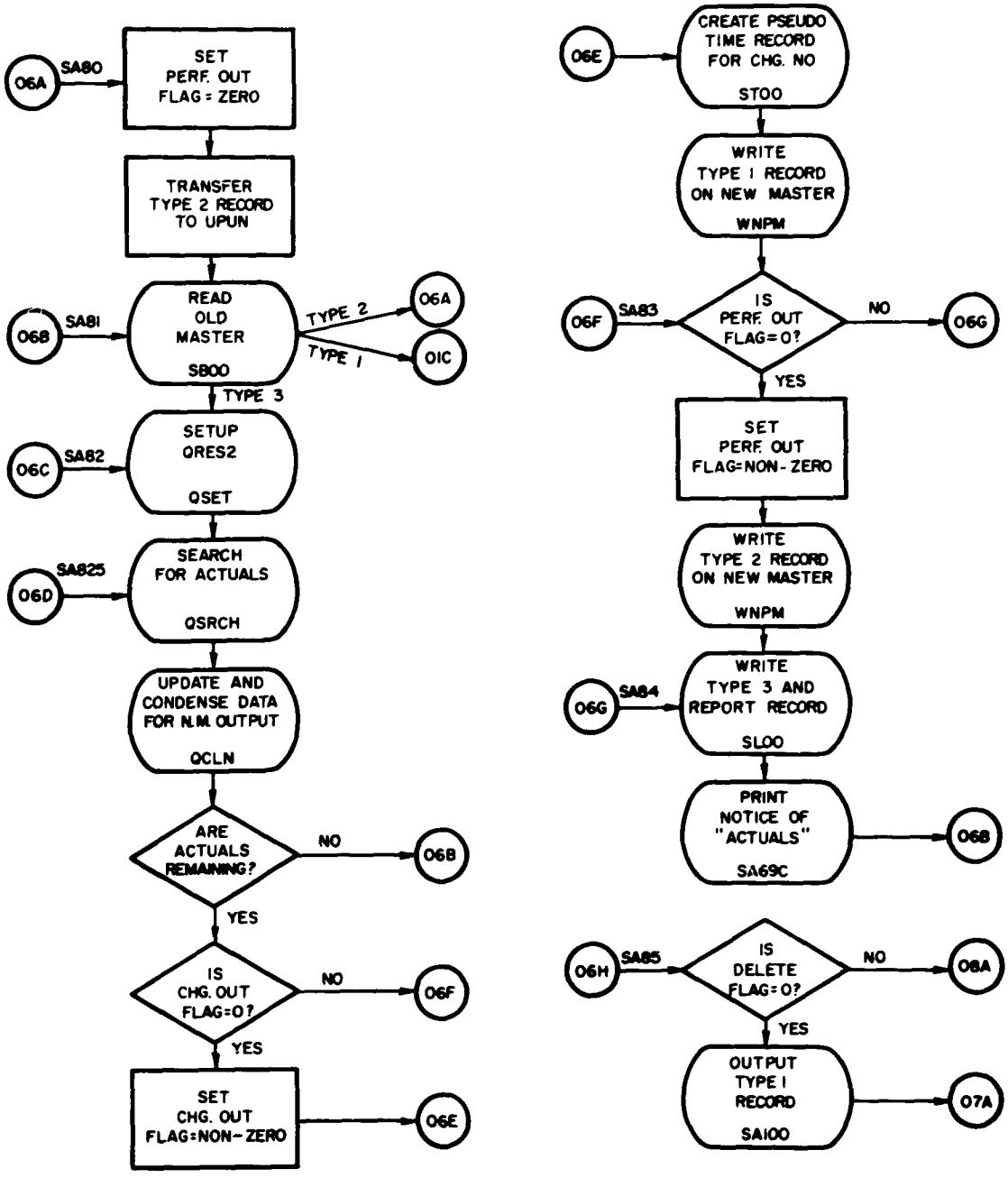

02A
READ OLD MASTER S800
TYPE 1
TYPE 2
TYPE 3
01C
01G
02B
SA20
SET RESOURCE CODE INFO INTO RBUF2 QSET
OUTPUT TYPE 3 AND REPORT RECORD SLOC
READ OLD MASTER S800
02C
SA25
IS THIS A 7-0 CARD?
NO
04H
YES
IS TRANSACTION CODE="A"?
04M
CLEAR UCHG BLOCK
TRANSFER CHARGE NO. INTO UCHG
02D
SA255
PROCESS 7-0 CARD QSVN0
02E
02E
READ CHANGE TAPE SC00
7-5
7-4
7-3
7-2
7-1
7-0
04A
03F
03B
02L
02H
02F
SA26
COMPARE CHG NOS.
CT<UCHG
CT=UCHG
CT>UCHG
04K
02D
02G
SA265
OUTPUT TYPE 1 RECORD SA100
TO PRE-REPORT PHASE (FLAG=2) J100
02H
SA27
COMPARE CHG. NOS.
02K
SA28
PROCESS 7-1 CARD QSVN1
02L
SA29
COMPARE CHG NOS.
03A

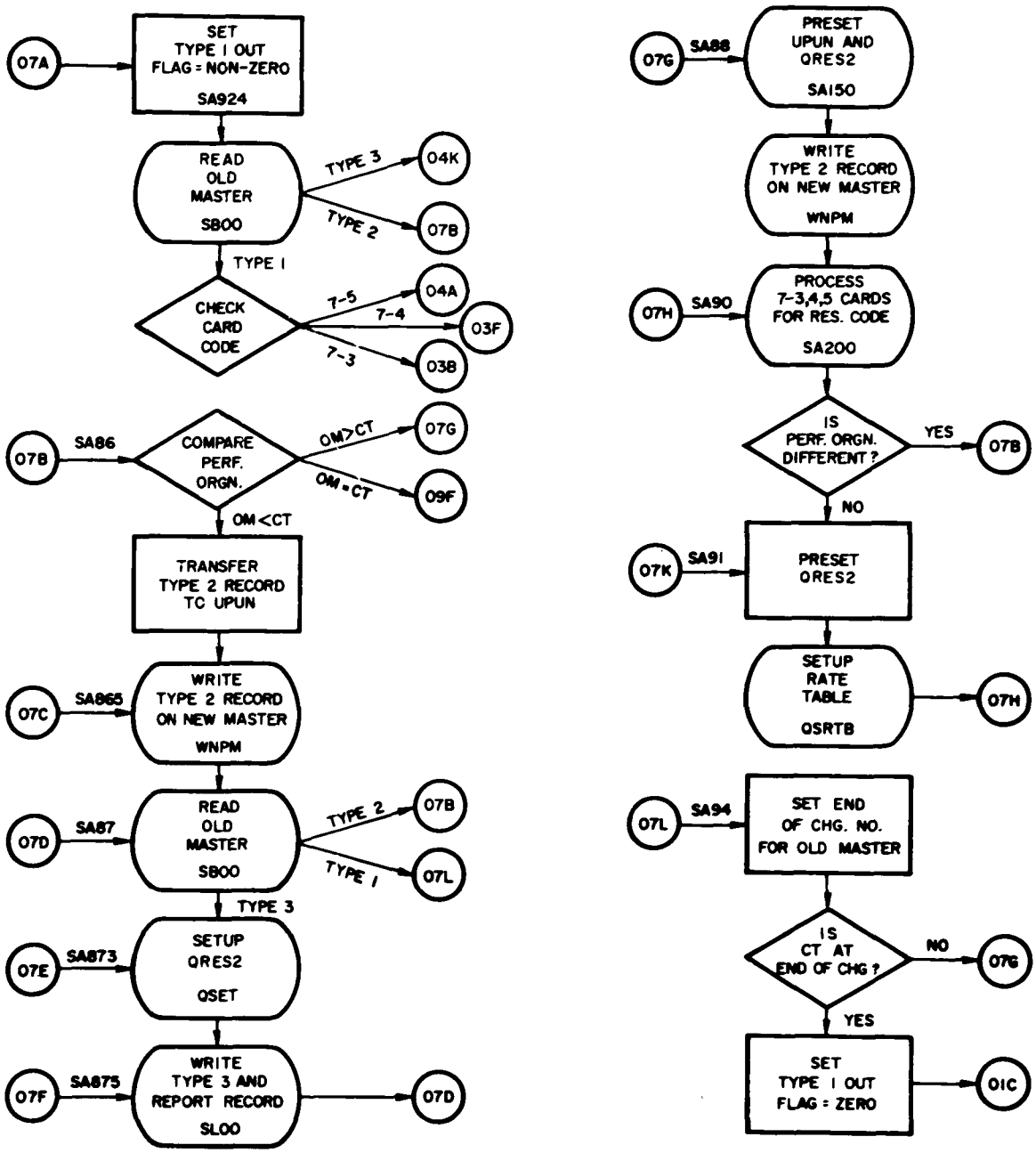

03A
SA30
PROCESS 7-2 CARD
QSVN2
READ CHANGE TAPE
SCOO
7-5
7-4
7-2
7-1
7-0
04A
03F
02L
02H
02F
7-3
03B
SA34
PRESET UPUN AND QRES2. AND OUTPUT TYPE 1 RECORD
SA150
03C
SA35
UPDATE QRES2. OUTPUT TYPE 2 AND 3 RECORDS IF NECESSARY
SDOO
PROCESS 7-3 CARD
QSVN3
READ CHANGE TAPE
SCOO
7-5
7-4
7-0,1,2
04C
03K
04D
7-3
03D
SA36
COMPARE CHG. NOS.
CT < UCHG
CT = UCHG
04K
03C
CT < UCHG
03L
SA37
SAVE NEW PERF. ORGN.
SA914
SET OLD PERF. ORGN. TO "HIGH" INDICATION
03E
UPDATE QRES2. OUTPUT TYPE 3 RECORD
SDOO
RESET PERF. ORGN
01C
03F
SA39
PRESET UPUN AND QRES 2. OUTPUT TYPE 1 RECORD
SA150
03G
SA40
IS TRANSACTION CODE "A"?
NO
04G
YES
UPDATE QRES2. OUTPUT TYPE 2 AND 3 RECORDS IF NECESSARY
SDOO
PROCESS 7-4 CARD
QSVN4
03H
SA41
READ CHANGE TAPE
SCOO
7-5
7-3
7-0,1,2
04C
03D
04D
7-4
03K
SA42
COMPARE CHG. NOS.
CT<UCHG
EQUAL
CT>UCHG
04K
03G
03L

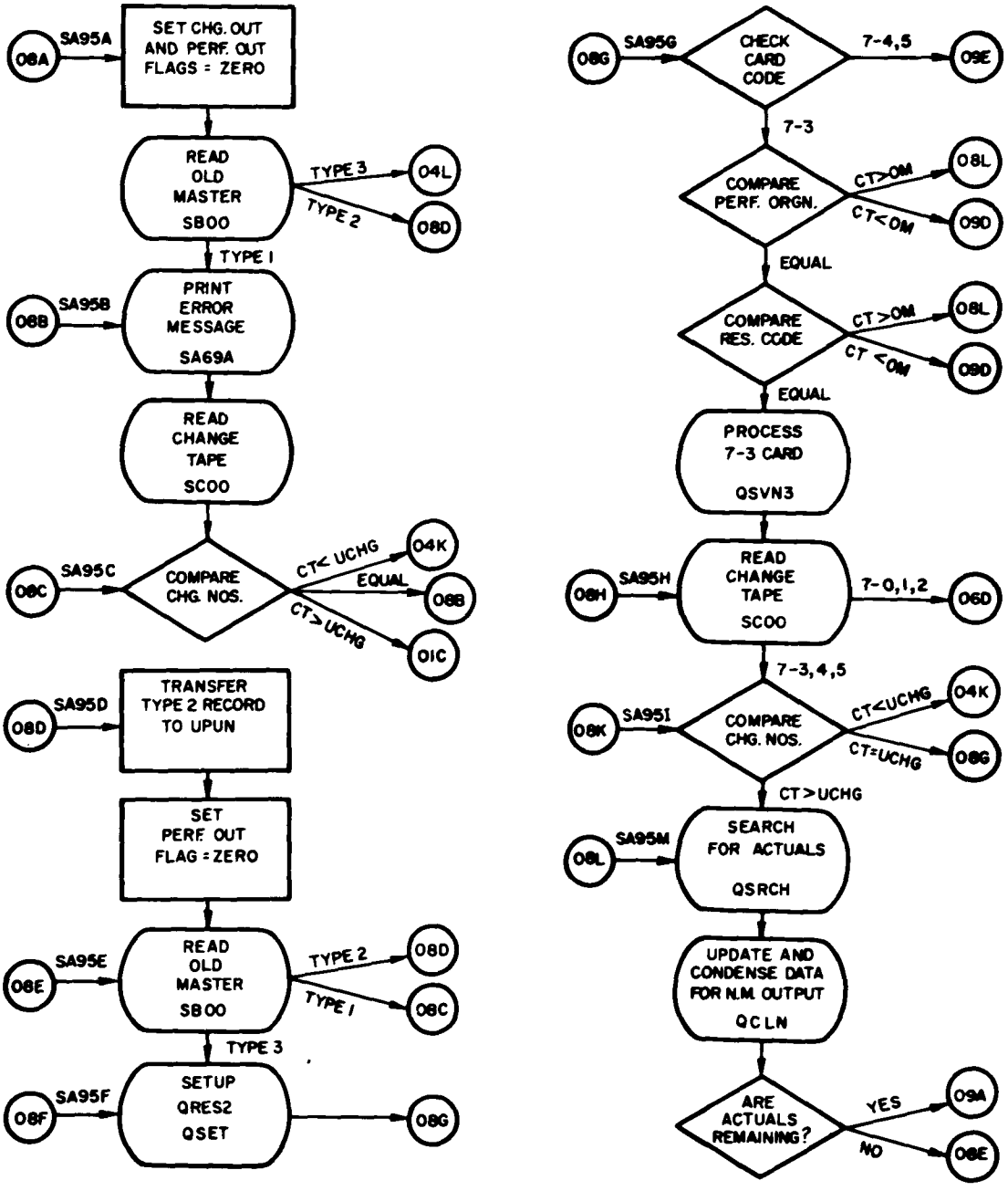

04A
SA45
PRESET UPUN AND QRES2. OUTPUT TYPE I RECORD SAI50
04E
04B
SA46
READ CHANGE TAPE SC00
7-4
7-3
7-0, 1, 2,
7-5
03K
030
04D
04C
SA48
COMPARE CHG. NOS.
CT<UCHG
EQUAL
CT>UCHG
04K
04E
03L
04D
SA49
COMPARE CHG. NOS.
CT≤UCHG
CT>UCHG
04K
03L
04E
SA50
IS TRANSACTION CODE="A"?
NO
04F
YES
UPDATE QRES2. OUTPUT TYPE 2 AND 3 RECORDS IF NECESSARY SD00
PROCESS 7-5 CARD QSVN5
04B
04F
SA52
PRINT ERROR MESSAGE SA60
04B
04G
SA54
PRINT ERROR MESSAGE SA60
03H
04H
SA56
PRINT: "AN INSERTION COULD NOT BE MADE FOR THE FOLLOWING CARD DUE TO NO 7-0 CARD"
01B
START
SA60
PRINT: "THE FOLLOWING CARD WAS AN UNMATCHED DELETION OR CHANGE"
RETURN
04K
SA64
PRINT: "SEQUENCE ERROR ON FOLLOWING CARD"
HALT
04L
SA68
PRINT: "SEQUENCE ERROR ON OLD PERT MASTER"
HALT
04M
SA69
PRINT ERROR MESSAGE SA60
01B
START
SA69A
PRINT: "CANNOT UPDATE A DELETED RECORD, CARD REJECTED."
RETURN
START
SA69C
PRINT: "THE FOLLOWING ITEM COULD NOT BE DELETED DUE TO ACTUALS IN FILE."
RETURN
04N
SA70
HAS "EOF" ON O.M. BEEN SET?
YES
TO UPDATE PHASE CLEAN-UP
SF05
NO
TRANSFER TYPE I RECORD INTO UCHG
CLEAR UPUN AND RCMC
05A

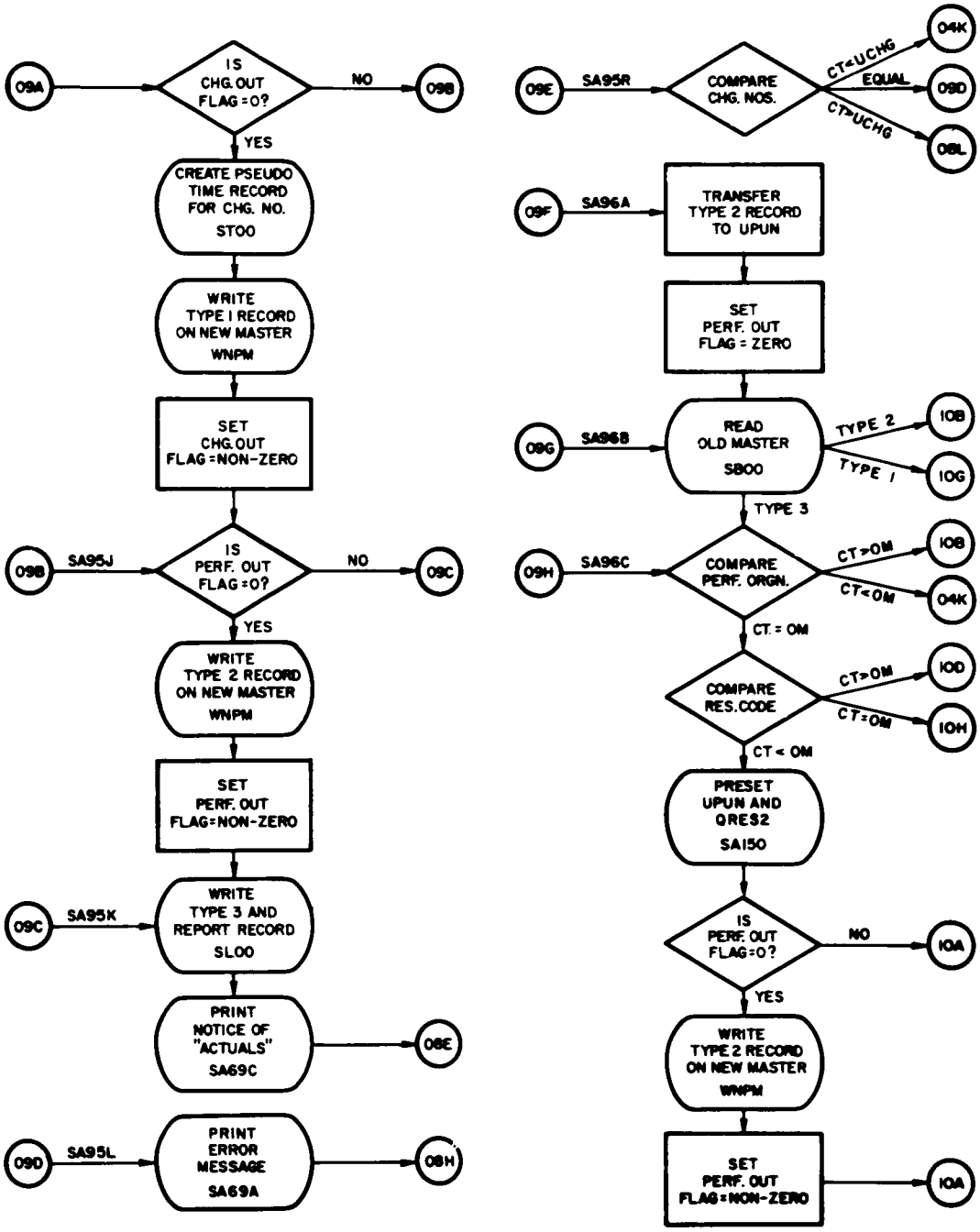

05A
SET DELETE FLAG = ZERO
SA920
GET CARD CODE
SA110
7-3,4,5
7-2
7-1
06H
05G
05E
7-0
05B
SA74
IS TRANSACTION CODE = "0"?
NO
05C
YES
SET DELETE FLAG = NON-ZERO
SA920
05C
PROCESS 7-0 CARD
QSVN0
READ CHANGE TAPE
SC00
7-3,4,5
7-2
7-1
06H
05G
05E
7-0
05D
SA745
COMPARE CHG. NOS.
CT < UCHG
EQUAL
CT > UCHG
04K
05B
05H
05E
SA75
COMPARE CHG. NOS.
CT < UCHG
CT > UCHG
04K
05H
EQUAL
PROCESS 7-1 CARD
QSVN1
05F

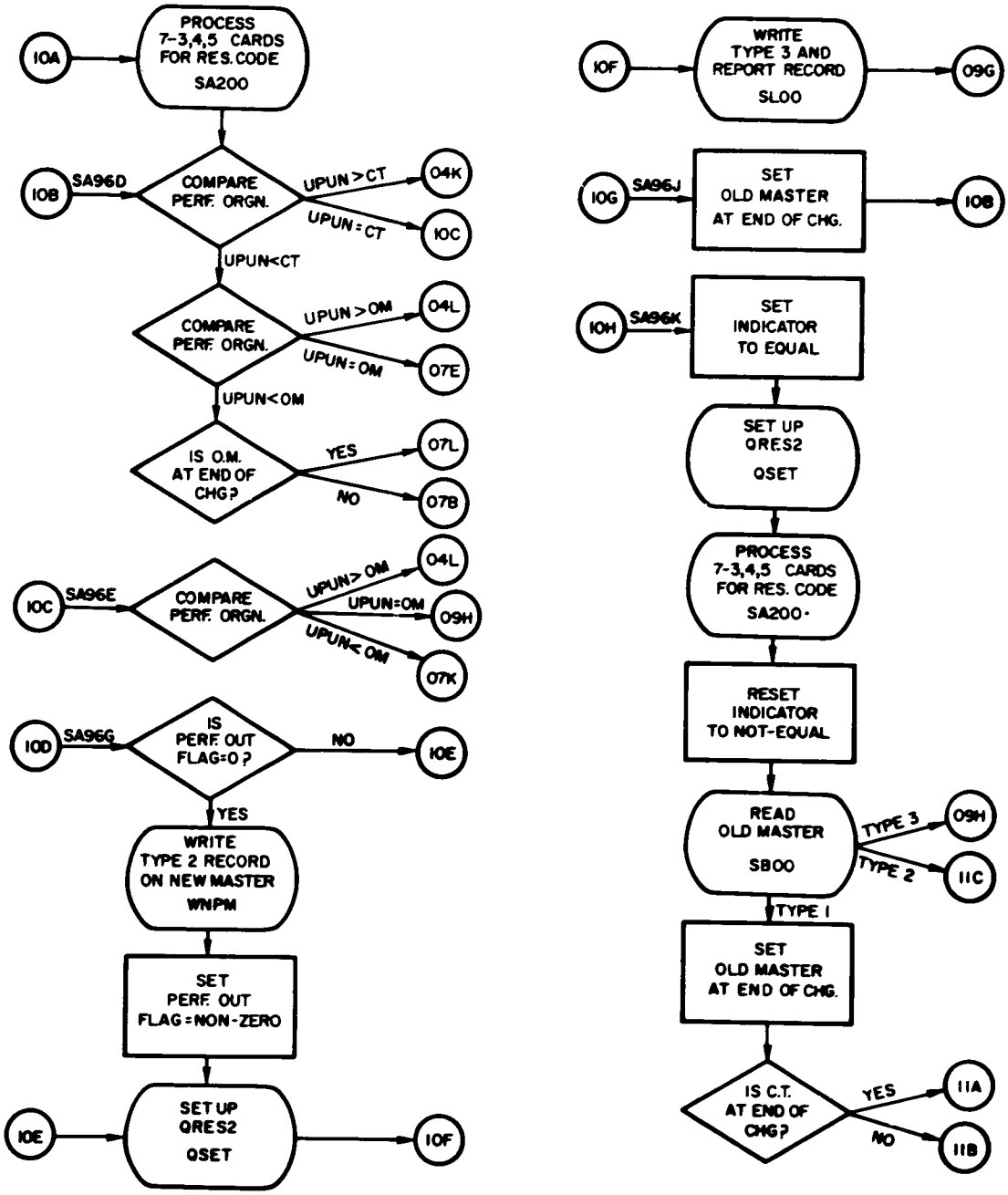

05F
READ CHANGE TAPE
SC00
7-3,4,5
7-1
7-0
06H
05E
05D
7-2
05G
SA77
COMPARE CHG. NOS.
CT < UCHG
CT > UCHG
04K
05H
EQUAL
PROCESS 7-2 CARD
QSVN2
READ CHANGE TAPE
SC00
7-3,4,5
7-2
7-1
7-0
06H
05G
05E
05D
05H
SA78
IS DELETE FLAG=0?
YES
01E
NO
SET CHG. OUT AND PERF. OUT FLAGS = ZERO
05K
SA79
READ OLD MASTER
SB00
TYPE 3
TYPE 2
04L
06A
TYPE 1
COMPARE CHG. NOS.
OM < UCHG
EQUAL
OM > UCHG
04L
05K
01C

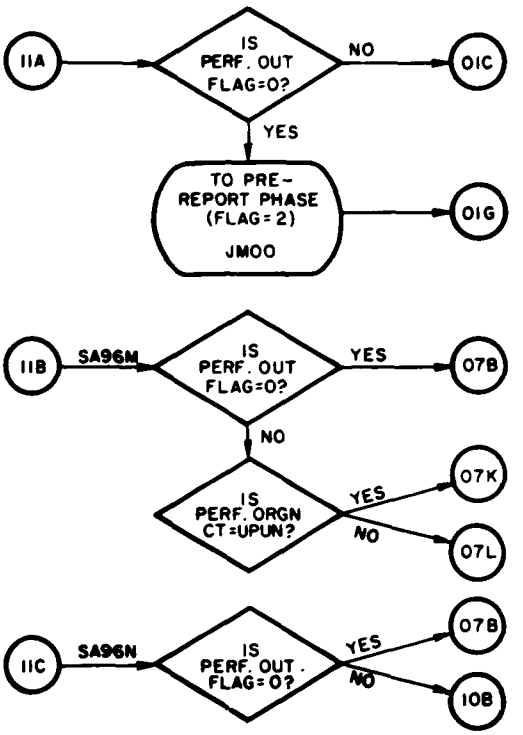

06A
SA80
SET PERF. OUT FLAG = ZERO
TRANSFER TYPE 2 RECORD TO UPUN
06B
SA81
READ OLD MASTER
S800
TYPE 2
TYPE 1
06A
01C
TYPE 3
06C
SA82
SETUP QRES2
QSET
06D
SA825
SEARCH FOR ACTUALS
QSRCH
UPDATE AND CONDENSE DATA FOR N.M. OUTPUT
QCLN
ARE ACTUALS REMAINING?
NO
06B
YES
IS CHG. OUT FLAG=0?
NO
06F
YES
SET CHG. OUT FLAG=NON-ZERO
06E
06E
CREATE PSEUDO TIME RECORD FOR CHG. NO
ST00
WRITE TYPE 1 RECORD ON NEW MASTER
WNPM
06F
SA83
IS PERF. OUT FLAG=0?
NO
06G
YES
SET PERF. OUT FLAG=NON-ZERO
WRITE TYPE 2 RECORD ON NEW MASTER
WNPM
06G
SA84
WRITE TYPE 3 AND REPORT RECORD
SL00
PRINT NOTICE OF "ACTUALS"
SA69C
06B
06H
SA85
IS DELETE FLAG=0?
NO
08A
YES
OUTPUT TYPE 1 RECORD
SA100
07A

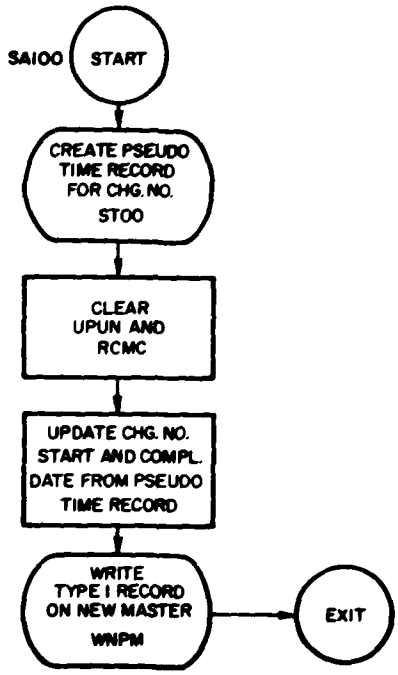

07A
SET
TYPE 1 OUT
FLAG = NON-ZERO
SA924
READ
OLD
MASTER
SB00
TYPE 3
04K
TYPE 2
07B
TYPE 1
CHECK
CARD
CODE
7-5
04A
7-4
03F
7-3
03B
07B
SA86
COMPARE
PERF.
ORGN.
OM>CT
07G
OM=CT
09F
OM<CT
TRANSFER
TYPE 2 RECORD
TC UPUN
07C
SA865
WRITE
TYPE 2 RECORD
ON NEW MASTER
WNPM
07D
SA87
READ
OLD
MASTER
SB00
TYPE 2
07B
TYPE 1
07L
TYPE 3
07E
SA873
SETUP
QRES2
QSET
07F
SA875
WRITE
TYPE 3 AND
REPORT RECORD
SL00
07D
07G
SA88
PRESET
UPUN AND
QRES2
SA150
WRITE
TYPE 2 RECORD
ON NEW MASTER
WNPM
07H
SA90
PROCESS
7-3,4,5 CARDS
FOR RES. CODE
SA200
IS
PERF. ORGN.
DIFFERENT ?
YES
07B
NO
07K
SA91
PRESET
QRES2
SETUP
RATE
TABLE
QSRTB
07H
07L
SA94
SET END
OF CHG. NO.
FOR OLD MASTER
IS
CT AT
END OF CHG ?
NO
07G
YES
SET
TYPE 1 OUT
FLAG = ZERO
01C

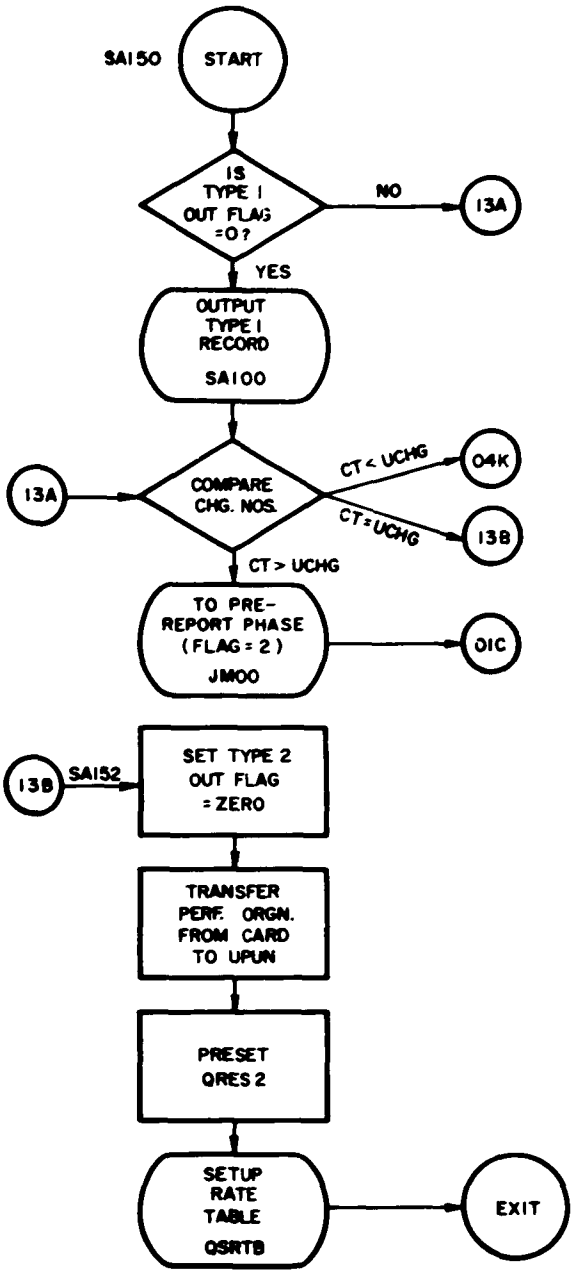

08A
SA95A
SET CHG. OUT AND PERF. OUT FLAGS = ZERO
READ OLD MASTER SB00
TYPE 3
04L
TYPE 2
08D
TYPE 1
08B
SA95B
PRINT ERROR MESSAGE SA69A
READ CHANGE TAPE SC00
08C
SA95C
COMPARE CHG. NOS.
CT< UCHG
04K
EQUAL
08B
CT> UCHG
01C
08D
SA95D
TRANSFER TYPE 2 RECORD TO UPUN
SET PERF. OUT FLAG = ZERO
08E
SA95E
READ OLD MASTER SB00
TYPE 2
08D
TYPE 1
08C
TYPE 3
08F
SA95F
SETUP QRES2 QSET
08G
08G
SA95G
CHECK CARD CODE
7-4,5
09E
7-3
COMPARE PERF. ORGN.
CT>OM
08L
CT<OM
09D
EQUAL
COMPARE RES. CODE
CT>OM
08L
CT <OM
09D
EQUAL
PROCESS 7-3 CARD QSVN3
08H
SA95H
READ CHANGE TAPE SC00
7-0,1,2
06D
7-3,4,5
08K
SA95I
COMPARE CHG. NOS.
CT<UCHG
04K
CT=UCHG
08G
CT>UCHG
08L
SA95M
SEARCH FOR ACTUALS QSRCH
UPDATE AND CONDENSE DATA FOR N.M. OUTPUT QCLN
ARE ACTUALS REMAINING?
YES
09A
NO
08E

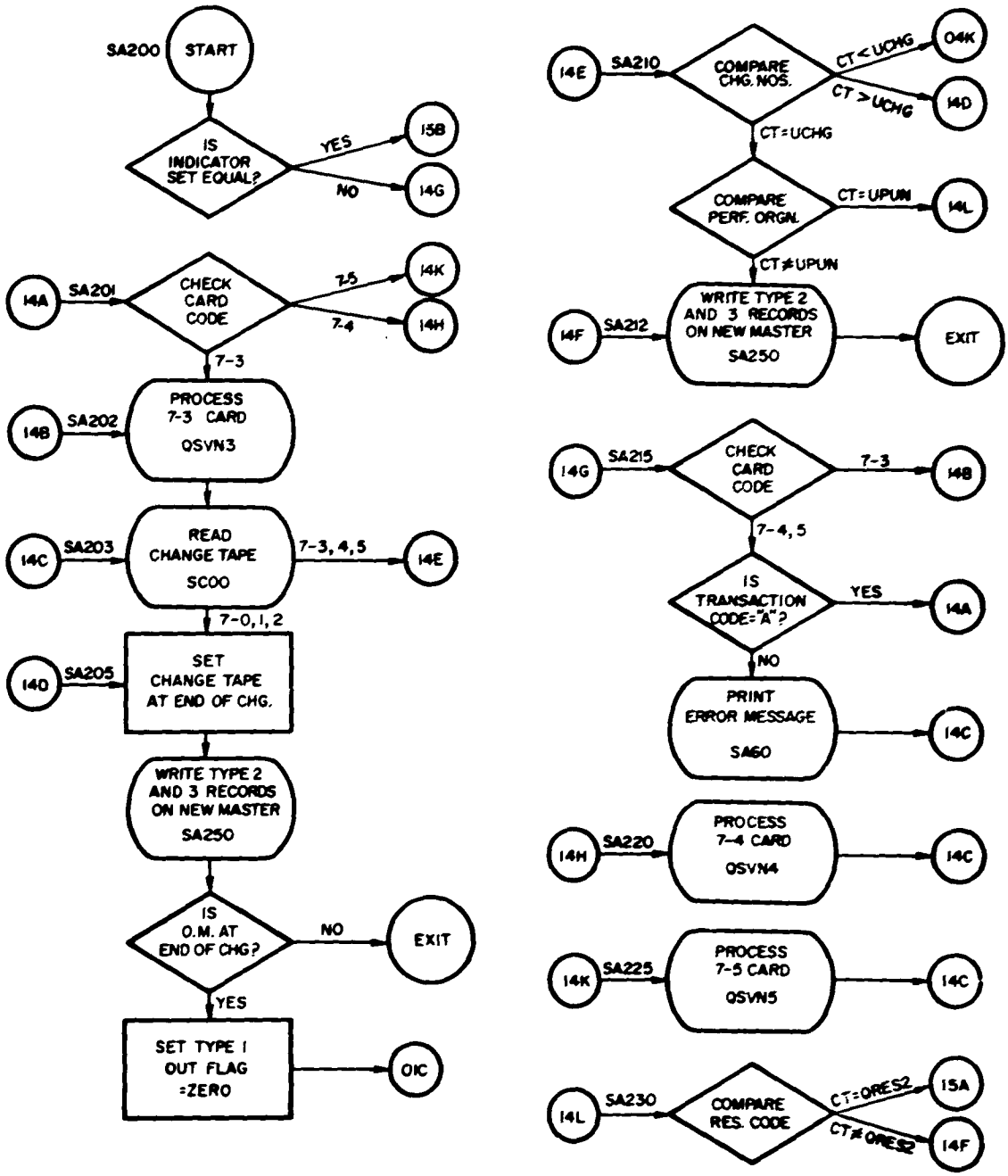

09A
IS CHG.OUT FLAG=0?
NO
09B
YES
CREATE PSEUDO TIME RECORD FOR CHG. NO.
ST00
WRITE TYPE 1 RECORD ON NEW MASTER
WNPM
SET CHG.OUT FLAG=NON-ZERO
09B
SA95J
IS PERF. OUT FLAG=0?
NO
09C
YES
WRITE TYPE 2 RECORD ON NEW MASTER
WNPM
SET PERF. OUT FLAG=NON-ZERO
09C
SA95K
WRITE TYPE 3 AND REPORT RECORD
SL00
PRINT NOTICE OF "ACTUALS"
SA69C
06E
09D
SA95L
PRINT ERROR MESSAGE
SA69A
08H
09E
SA95R
COMPARE CHG. NOS.
CT<UCHG
EQUAL
CT>UCHG
04K
09D
06L
09F
SA96A
TRANSFER TYPE 2 RECORD TO UPUN
SET PERF. OUT FLAG = ZERO
09G
SA96B
READ OLD MASTER
SB00
TYPE 2
TYPE 1
10B
10G
TYPE 3
09H
SA96C
COMPARE PERF. ORGN.
CT>OM
CT<OM
10B
04K
CT = OM
COMPARE RES.CODE
CT>OM
CT=OM
10D
10H
CT < OM
PRESET UPUN AND QRES2
SA150
IS PERF. OUT FLAG=0?
NO
10A
YES
WRITE TYPE 2 RECORD ON NEW MASTER
WNPM
SET PERF. OUT FLAG=NON-ZERO
10A

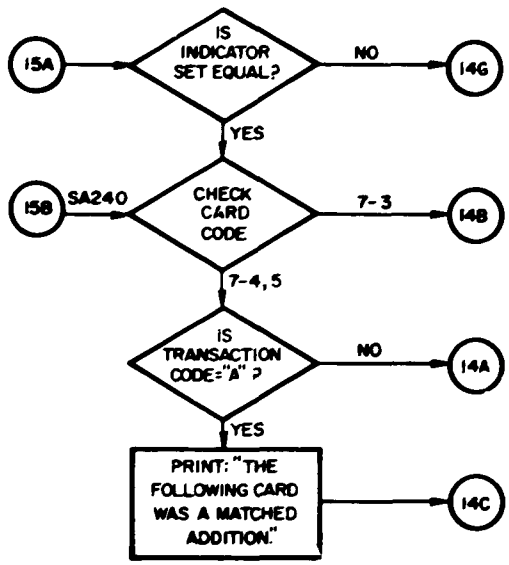

10A
PROCESS 7-3,4,5 CARDS FOR RES. CODE SA200
10B
SA96D
COMPARE PERF. ORGN.
UPUN>CT
04K
UPUN=CT
10C
UPUN<CT
COMPARE PERF. ORGN.
UPUN>OM
04L
UPUN=OM
07E
UPUN<OM
IS O.M. AT END OF CHG?
YES
07L
NO
07B
10C
SA96E
COMPARE PERF. ORGN.
UPUN>OM
04L
UPUN=OM
09H
UPUN<OM
07K
10D
SA96G
IS PERF. OUT FLAG=0?
NO
10E
YES
WRITE TYPE 2 RECORD ON NEW MASTER WNPM
SET PERF. OUT FLAG=NON-ZERO
10E
SET UP QRES2 QSET
10F
10F
WRITE TYPE 3 AND REPORT RECORD SL00
09G
10G
SA96J
SET OLD MASTER AT END OF CHG.
10B
10H
SA96K
SET INDICATOR TO EQUAL
SET UP QRES2 QSET
PROCESS 7-3,4,5 CARDS FOR RES. CODE SA200.
RESET INDICATOR TO NOT-EQUAL
READ OLD MASTER SB00
TYPE 3
09H
TYPE 2
11C
TYPE 1
SET OLD MASTER AT END OF CHG.
IS C.T. AT END OF CHG?
YES
11A
NO
11B

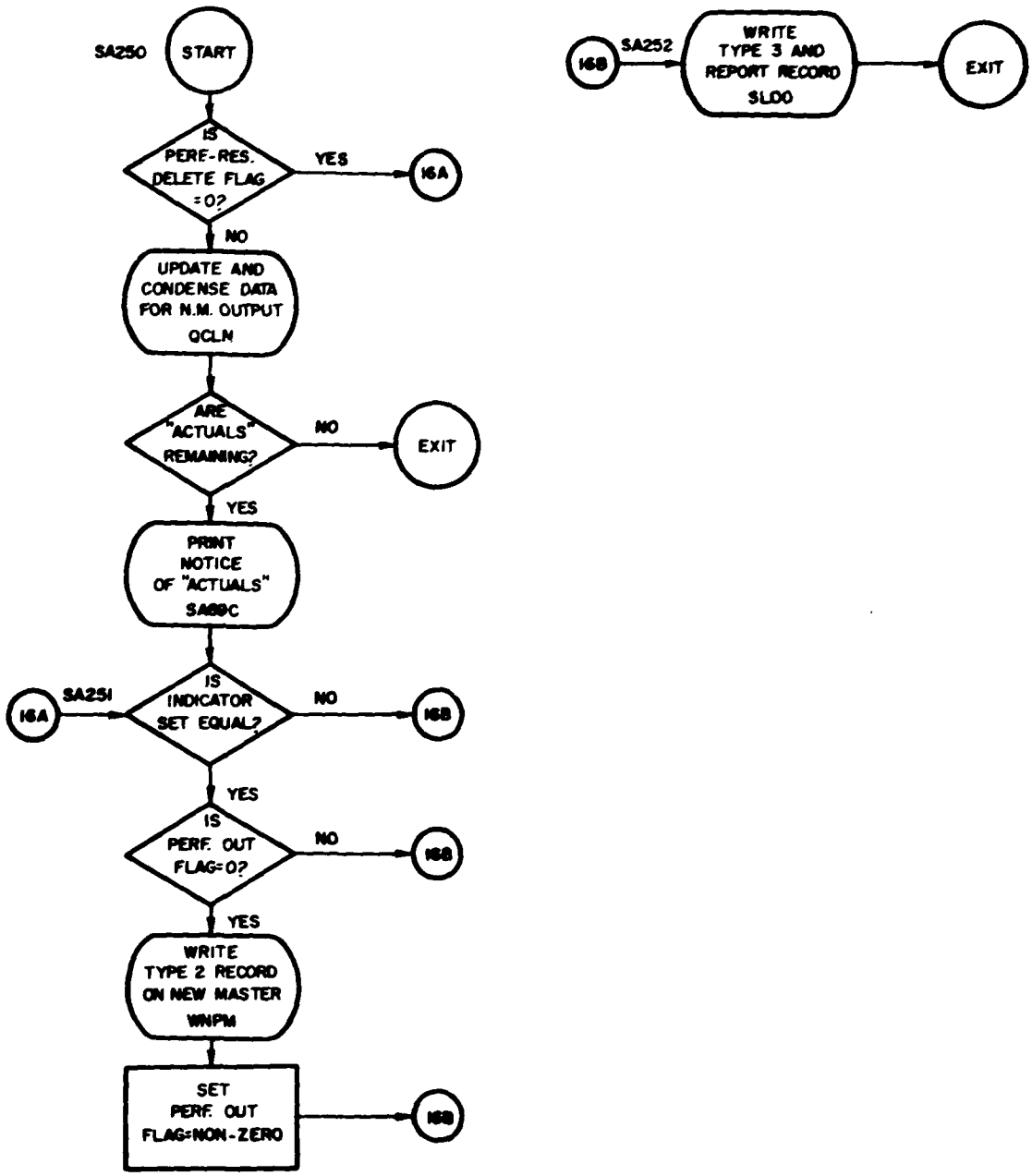

11A
IS PERF. OUT FLAG=0?
NO
01C
YES
TO PRE-REPORT PHASE (FLAG=2)
JM00
01G
11B
SA96M
IS PERF. OUT FLAG=0?
YES
07B
NO
IS PERF. ORGN CT=UPUN?
YES
07K
NO
07L
11C
SA96N
IS PERF. OUT FLAG=0?
YES
07B
NO
10B


SAIOO
START
CREATE PSEUDO TIME RECORD FOR CHG. NO.
ST00
CLEAR UPUN AND RCMC
UPDATE CHG. NO. START AND COMPL. DATE FROM PSEUDO TIME RECORD
WRITE TYPE I RECORD ON NEW MASTER
WNPM
EXIT


SAI50
START
IS TYPE I OUT FLAG =0?
NO
13A
YES
OUTPUT TYPE I RECORD
SAI00
13A
COMPARE CHG. NOS.
CT < UCHG
04K
CT=UCHG
13B
CT > UCHG
TO PRE-REPORT PHASE (FLAG = 2)
JM00
01C
13B
SAI52
SET TYPE 2 OUT FLAG = ZERO
TRANSFER PERF. ORGN. FROM CARD TO UPUN
PRESET QRES 2
SETUP RATE TABLE
QSRTB
EXIT


SA200
START
IS INDICATOR SET EQUAL?
YES
NO
15B
14G
14A
SA201
CHECK CARD CODE
7-5
7-4
7-3
14K
14H
14B
SA202
PROCESS 7-3 CARD
QSVN3
14C
SA203
READ CHANGE TAPE
SCOO
7-3,4,5
14E
7-0,1,2
14D
SA205
SET CHANGE TAPE AT END OF CHG.
WRITE TYPE 2 AND 3 RECORDS ON NEW MASTER
SA250
IS O.M. AT END OF CHG?
NO
EXIT
YES
SET TYPE 1 OUT FLAG =ZERO
01C
14E
SA210
COMPARE CHG. NOS.
CT<UCHG
CT>UCHG
04K
14D
CT=UCHG
COMPARE PERF. ORGN.
CT=UPUN
14L
CT≠UPUN
14F
SA212
WRITE TYPE 2 AND 3 RECORDS ON NEW MASTER
SA250
EXIT
14G
SA215
CHECK CARD CODE
7-3
14B
7-4,5
IS TRANSACTION CODE="A"?
YES
14A
NO
PRINT ERROR MESSAGE
SA60
14C
14H
SA220
PROCESS 7-4 CARD
QSVN4
14C
14K
SA225
PROCESS 7-5 CARD
QSVN5
14C
14L
SA230
COMPARE RES. CODE
CT=ORES2
CT≠ORES2
15A
14F


15A
IS INDICATOR SET EQUAL?
NO
14G
YES
15B
SA240
CHECK CARD CODE
7-3
14B
7-4,5
IS TRANSACTION CODE="A" ?
NO
14A
YES
PRINT: "THE FOLLOWING CARD WAS A MATCHED ADDITION."
14C


SA250
START
IS PERE-RES. DELETE FLAG =0?
YES
16A
NO
UPDATE AND CONDENSE DATA FOR N.M. OUTPUT
QCLN
ARE "ACTUALS" REMAINING?
NO
EXIT
YES
PRINT NOTICE OF "ACTUALS"
SA89C
16A
SA251
IS INDICATOR SET EQUAL?
NO
16B
YES
IS PERF. OUT FLAG=0?
NO
16B
YES
WRITE TYPE 2 RECORD ON NEW MASTER
WNPM
SET PERF. OUT FLAG=NON-ZERO
16B
16B
SA252
WRITE TYPE 3 AND REPORT RECORD
SLDO
EXIT

Region SB00

EXPLANATION OF REGION:

To read a record from the OLD PERT COST MASTER FILE

CALLING SEQUENCE:

L	TSX	SB00, 4
L + 1	Exit	with Type 3 record
L + 2	Exit	with Type 2 record
L + 3	Exit	with Type 1 record or end-of-file*

INPUT:

OLD PERT COST MASTER FILE

OUTPUT:

SA901 = Location of record in address, count in decrement.

If Type 1, charge number in SA904 (3 words)

If Type 2, performing organization in SA904+3 (1 word)

If Type 3, resource code in SA904+4 (1 word)

STORAGE USED:

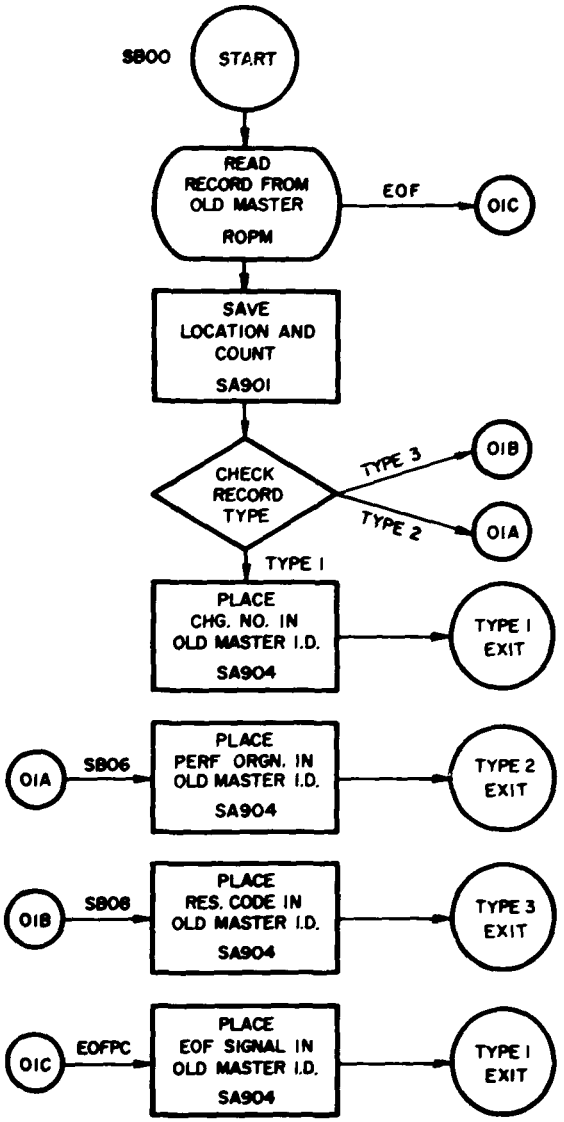
Not applicable

SUBREGIONS AND SUBROUTINES USED:

ROPM

EXPLANATION OF CALLING SEQUENCE:

* If end-of-file, SA904 contains 3 words of octal 7's.


SB00
START
READ RECORD FROM OLD MASTER
ROPM
EOF
OIC
SAVE LOCATION AND COUNT
SA901
CHECK RECORD TYPE
TYPE 3
TYPE 2
OIB
OIA
TYPE 1
PLACE CHG. NO. IN OLD MASTER I.D.
SA904
TYPE 1 EXIT
OIA
SB06
PLACE PERF ORGN. IN OLD MASTER I.D.
SA904
TYPE 2 EXIT
OIB
SB06
PLACE RES. CODE IN OLD MASTER I.D.
SA904
TYPE 3 EXIT
OIC
EOFPC
PLACE EOF SIGNAL IN OLD MASTER I.D.
SA904
TYPE 1 EXIT

Region SC00

EXPLANATION OF REGION:

To read one card from the SORTED DATA TAPE.

CALLING SEQUENCE:

L	TSX	SC00, 4
L + 1	Exit	with Type 75 card
L + 2	Exit	with Type 74 card
L + 3	Exit	with Type 73 card
L + 4	Exit	with Type 72 card
L + 5	Exit	with Type 71 card
L + 6	Exit	with Type 70 card or end-of-file*

INPUT:

SORTED DATA TAPE

OUTPUT:

CHHLD = Location of card in address, count in decrement

SA905 = Charge number (3 words)

SA905+3 = Performing organization (1 word) } type 73, 74, 75 cards only

SA905+4 = Resource code (1 word) }

UP451+1 - UP451+80 contains card image, one character per word

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

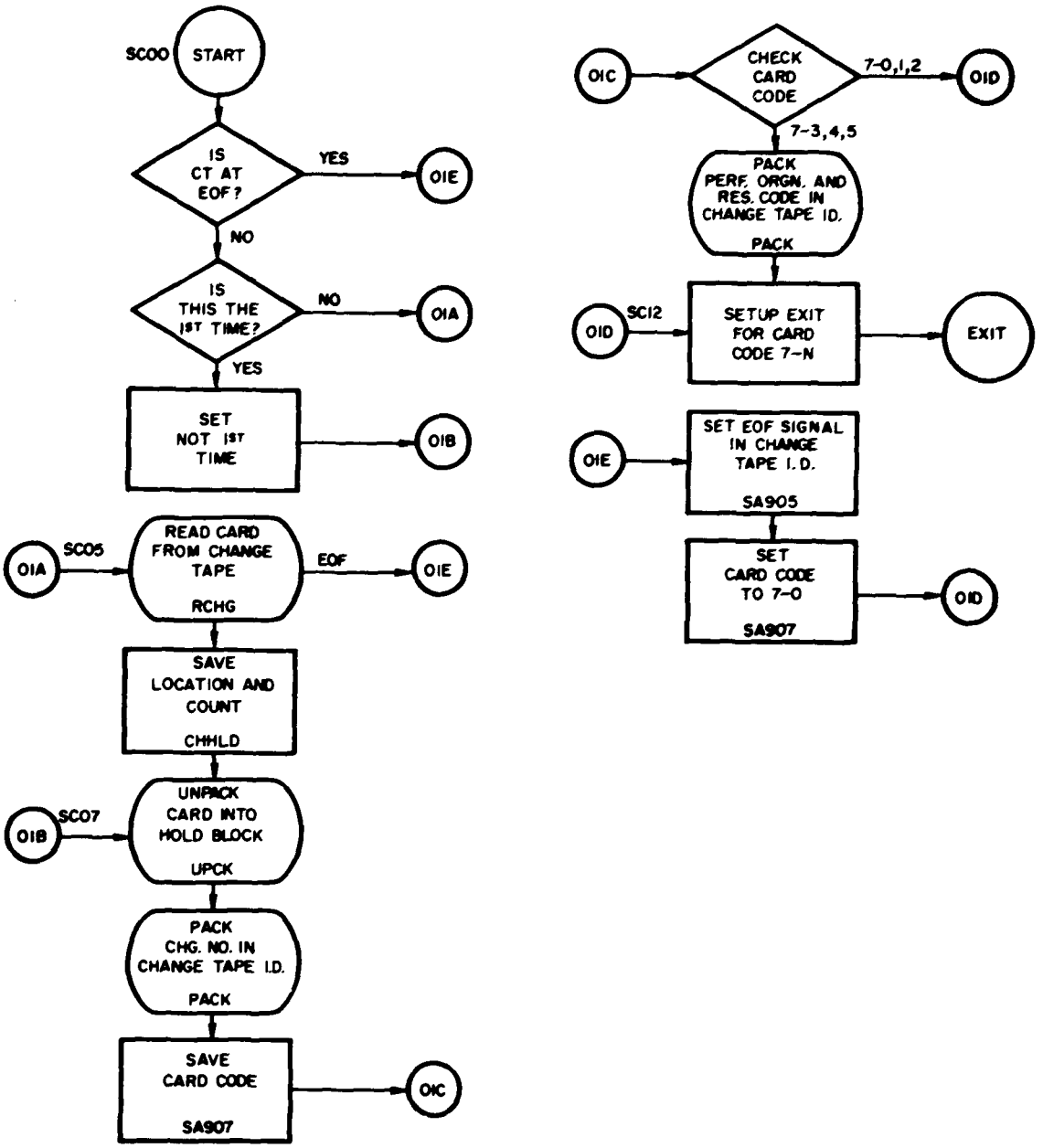
RCHG

UPCK

PACK

EXPLANATION OF CALLING SEQUENCE:

If end of file, SA905 contains 5 words of octal 7's and CHHLD = 0.


SCOO
START
IS CT AT EOF?
YES
01E
NO
IS THIS THE 1ST TIME?
NO
01A
YES
SET NOT 1ST TIME
01B
01A
SC05
READ CARD FROM CHANGE TAPE
RCHG
EOF
01E
SAVE LOCATION AND COUNT
CHHLD
01B
SC07
UNPACK CARD INTO HOLD BLOCK
UPCK
PACK CHG. NO. IN CHANGE TAPE I.D.
PACK
SAVE CARD CODE
SA907
01C
01C
CHECK CARD CODE
7-0,1,2
01D
7-3,4,5
PACK PERF. ORGN. AND RES. CODE IN CHANGE TAPE ID.
PACK
01D
SC12
SETUP EXIT FOR CARD CODE 7-N
EXIT
01E
SET EOF SIGNAL IN CHANGE TAPE I.D.
SA905
SET CARD CODE TO 7-0
SA907
01D

Region SD00

EXPLANATION OF REGION:

To write performing organization and resource code records on NEW PERT COST MASTER FILE and give one charge number, performing organization, resource code item to pre-reporting control routine.

CALLING SEQUENCE:

L TSX SD00, 4

L + 1 Normal return

INPUT:

Performing organization in UPUN (2 words)

Resource code in ORES2 (N words, 600 max)

OUTPUT:

Type 2 and 3 records on NEW PERT COST MASTER

One CHG-PERF-RES item to pre-reporting (JM00)

STORAGE USED:

Not applicable

SUBREGIONS AND SUBROUTINES USED:

WNPM

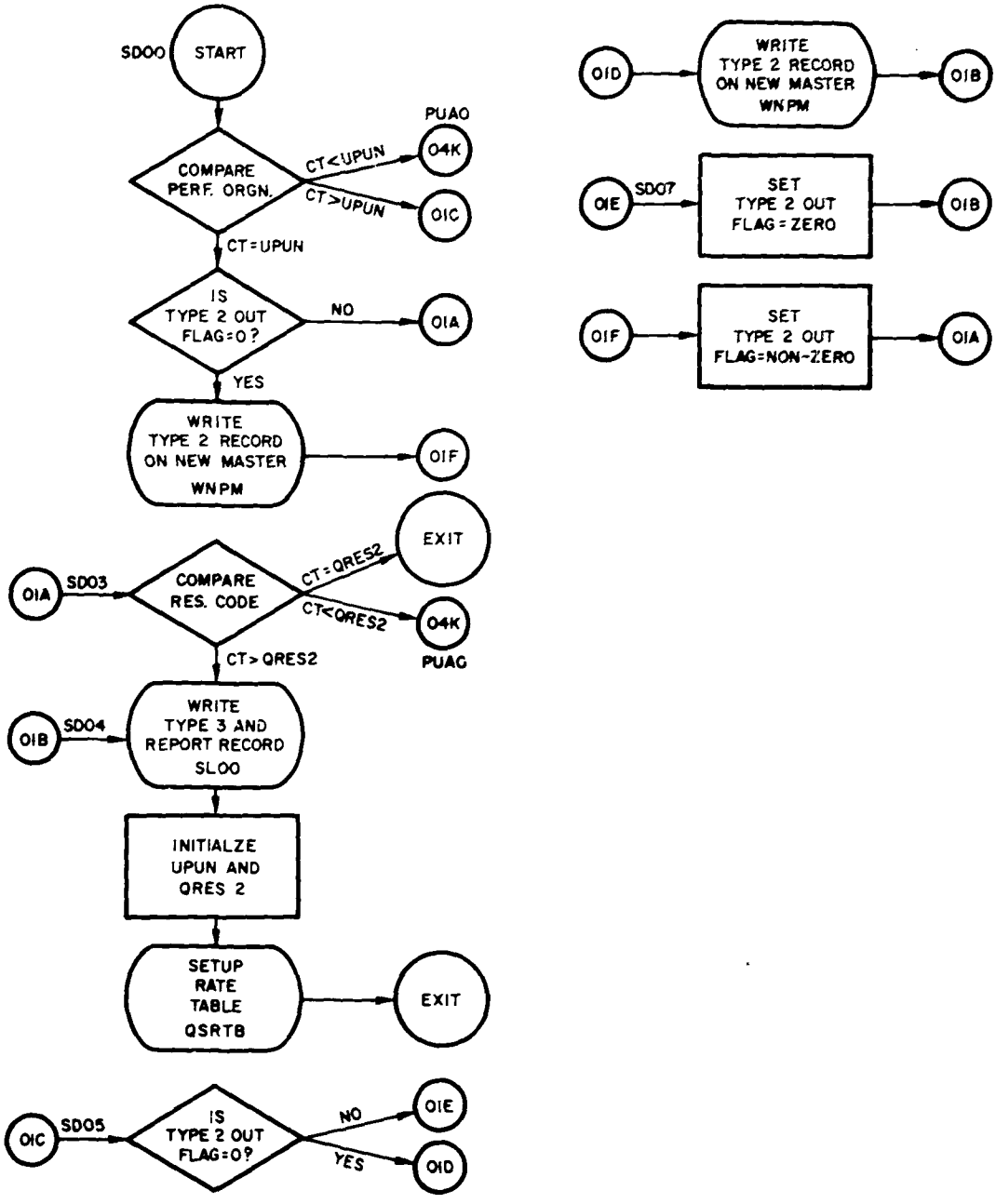
JM00

QCLN

QSRTB

EXPLANATION OF CALLING SEQUENCE:

Not applicable


SDOO
START
COMPARE PERF. ORGN.
CT<UPUN
CT>UPUN
PUAO
04K
01C
CT=UPUN
IS TYPE 2 OUT FLAG=0?
NO
01A
YES
WRITE TYPE 2 RECORD ON NEW MASTER WNPM
01F
01A
SD03
COMPARE RES. CODE
CT=QRES2
EXIT
CT<QRES2
04K
PUAO
CT>QRES2
01B
SD04
WRITE TYPE 3 AND REPORT RECORD SL00
INITIALZE UPUN AND QRES 2
SETUP RATE TABLE QSRTB
EXIT
01C
SD05
IS TYPE 2 OUT FLAG=0?
NO
01E
YES
01D
01D
WRITE TYPE 2 RECORD ON NEW MASTER WNPM
01B
01E
SD07
SET TYPE 2 OUT FLAG=ZERO
01B
01F
SET TYPE 2 OUT FLAG=NON-ZERO
01A

Region SF00

EXPLANATION OF REGION:

Cleanup of Update phase.

CALLING SEQUENCE:

L TRA SF05

INPUT:

Not applicable

OUTPUT:

End-of-update-phase message.

Exit to cleanup pre-reporting phase.

STORAGE USED:

Not applicable

SUBREGIONS AND SUBROUTINES USED:

WDNP

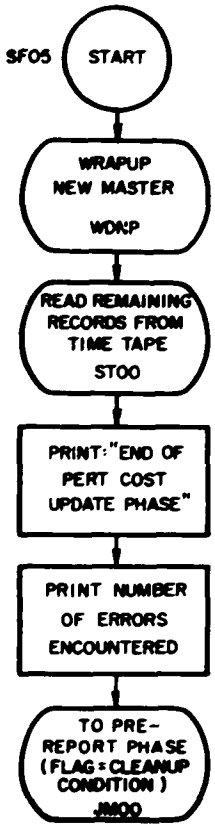
ST00

FTB

JM00

EXPLANATION OF CALLING SEQUENCE:

Not applicable


SF05
START
WRAPUP
NEW MASTER
WDMP
READ REMAINING
RECORDS FROM
TIME TAPE
ST00
PRINT: "END OF
PERT COST
UPDATE PHASE"
PRINT NUMBER
OF ERRORS
ENCOUNTERED
TO PRE-
REPORT PHASE
(FLAG = CLEANUP
CONDITION)
JM00

Region ST00

EXPLANATION OF REGION:

To read from SORTED TIME TAPE all activities concerned with present charge number and print out activities connected to non-existent charge numbers.

CALLING SEQUENCE:

L TSX ST00, 4

L + 1 Normal return

INPUT:

UCHG+1 = charge number (3 words)

SORTED TIME TAPE

OUTPUT:

PSEUDO TIME RECORD - UTIME

Activity records to pre-reporting routine.

STORAGE USED:

UTIME - 25 words - layout in sec 3.7

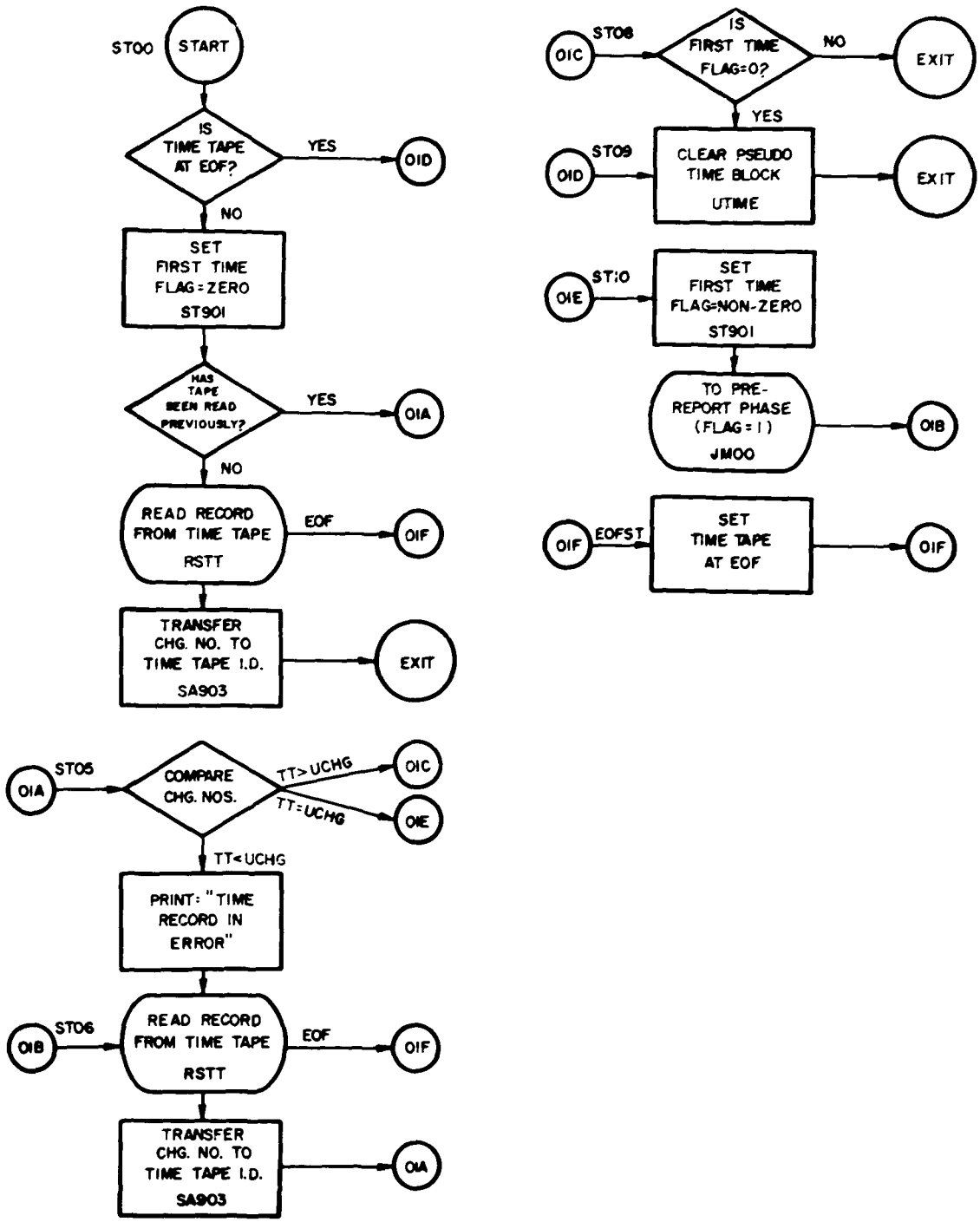
SUBREGIONS AND SUBROUTINES USED:

JM00

RSTT

EXPLANATION OF CALLING SEQUENCE:

Not applicable


ST00
START
IS TIME TAPE AT EOF?
YES
01D
NO
SET FIRST TIME FLAG=ZERO
ST901
HAS TAPE BEEN READ PREVIOUSLY?
YES
01A
NO
READ RECORD FROM TIME TAPE
RSTT
EOF
01F
TRANSFER CHG. NO. TO TIME TAPE I.D.
SA903
EXIT
01A
ST05
COMPARE CHG. NOS.
TT>UCHG
01C
TT=UCHG
01E
TT<UCHG
PRINT: "TIME RECORD IN ERROR"
01B
ST06
READ RECORD FROM TIME TAPE
RSTT
EOF
01F
TRANSFER CHG. NO. TO TIME TAPE I.D.
SA903
01A
01C
ST08
IS FIRST TIME FLAG=0?
NO
EXIT
YES
01D
ST09
CLEAR PSEUDO TIME BLOCK
UTIME
EXIT
01E
ST10
SET FIRST TIME FLAG=NON-ZERO
ST901
TO PRE-REPORT PHASE (FLAG=1)
JM00
01B
01F
EOFST
SET TIME TAPE AT EOF
01F

Region SL00

EXPLANATION OF REGION:

To write out Resource Code record on the new Master File, extend the costs thru the Rate Table, and write a Charge No., Performing Organization, Resource Code record on the Report Tape.

CALLING SEQUENCE:

L TSX SL00, 4

L+1 Normal return

INPUT:

Information: UCHG - charge No.
UPUN - performing organization
RBUF2 - resource code (unextended costs)
UTIME - pseudo time

OUTPUT:

1. Resource Code record on the New Master File
2. Report record on the Report Tape

STORAGE USED:

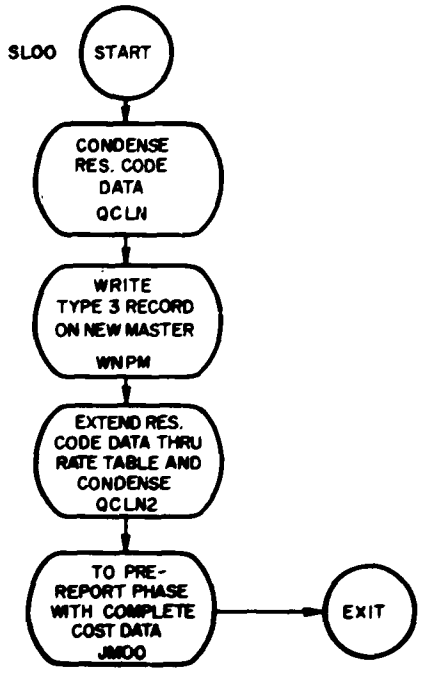
RBUF1 - resource code (extended costs)

SUB-REGIONS AND SUBROUTINES USED:

QCLN JM00
WNPM
QCLN2

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


SLOO
START
CONDENSE RES. CODE DATA
QCLN
WRITE TYPE 3 RECORD ON NEW MASTER
WNPM
EXTEND RES. CODE DATA THRU RATE TABLE AND CONDENSE
QCLN2
TO PRE-REPORT PHASE WITH COMPLETE COST DATA
JMOO
EXIT

Region QSET

EXPLANATION OF REGION:

This routine will set up the rate table for the resource code being operated upon, as well as set up QRES2 with the resource code data cleared of the rate table extensions from the previous cycle.

CALLING SEQUENCE:

L TSX QSET, 4

L + 1 Location of resource code record in PTBF5 or PTBF6

L + 2 Normal return

INPUT:

Record in PTBF5 or PTBF6 from OLD SECONDARY MASTER.

OUTPUT:

A resource code record that has been cleared of all rate extensions, located in an unpacked format in QRES2.

STORAGE USED:

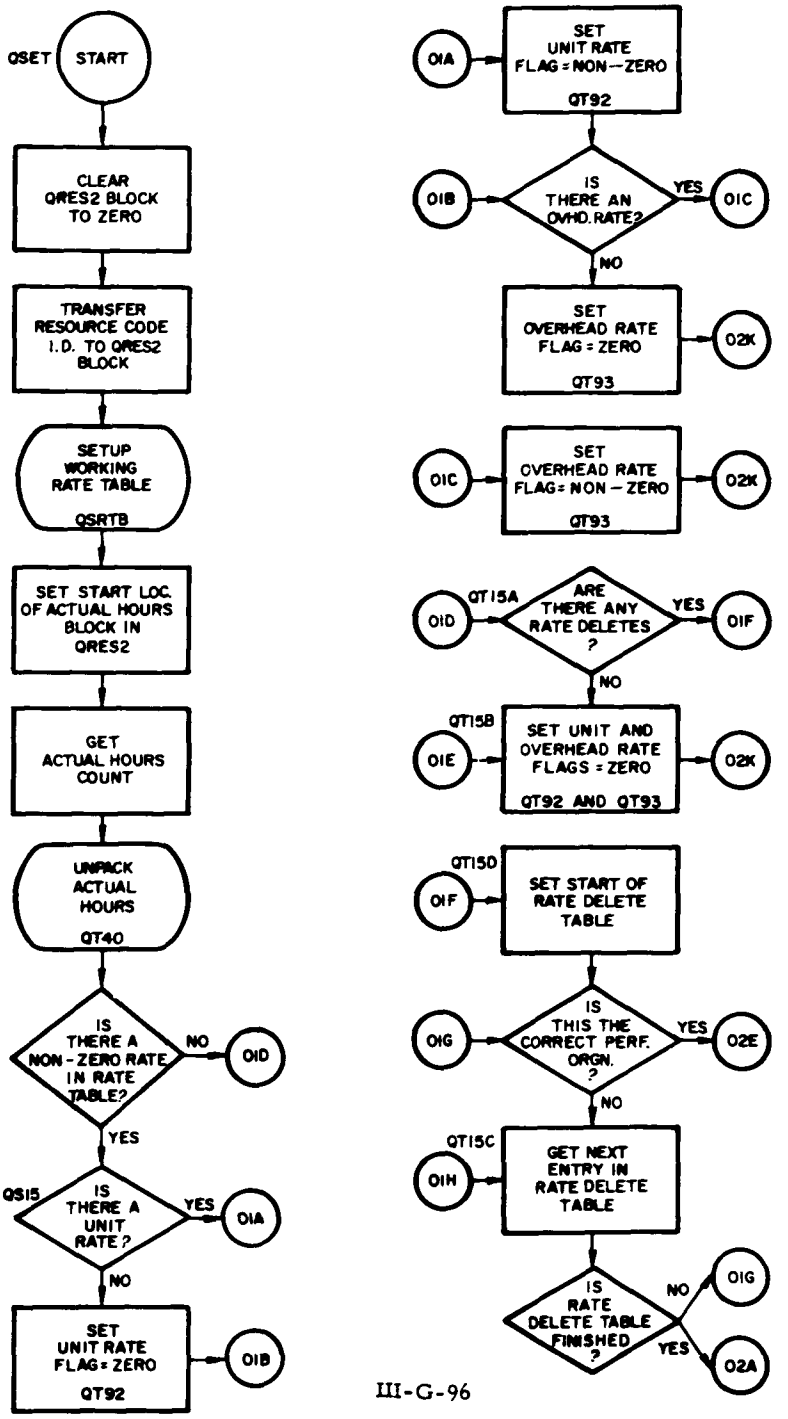
QRES2 - 600 words - unpacked resource code block.

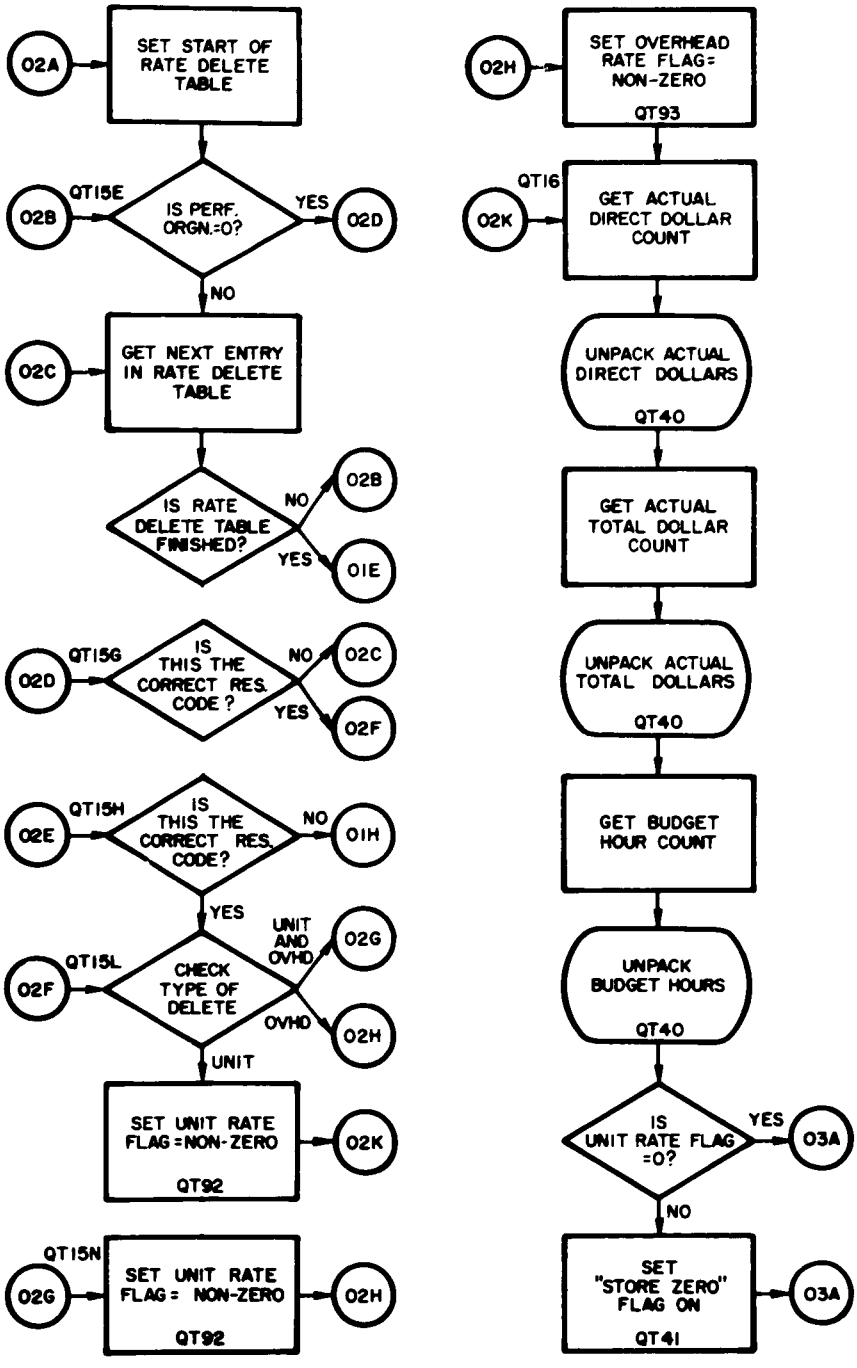
SUBREGIONS AND SUBROUTINES USED:

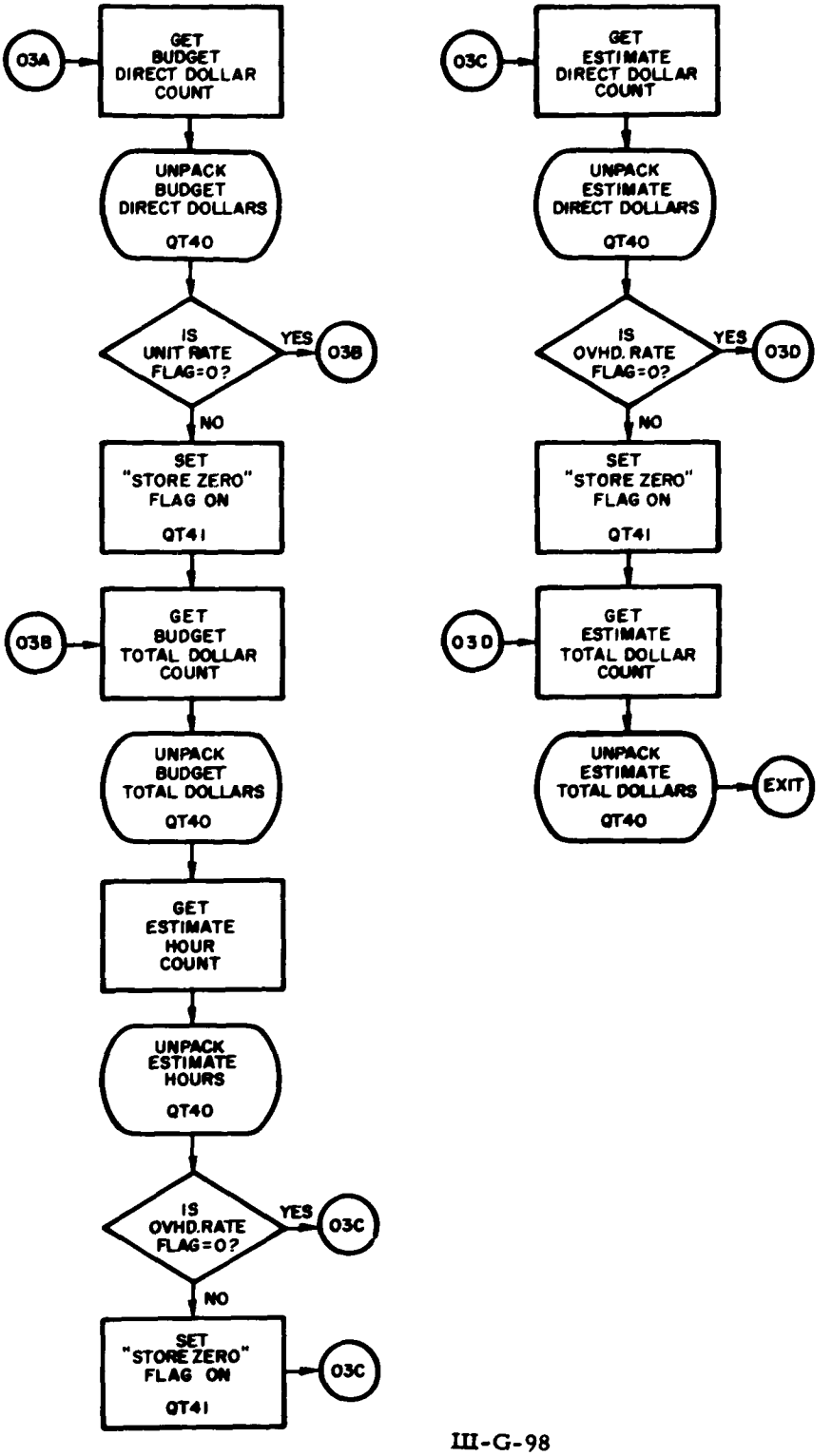
QSRTB

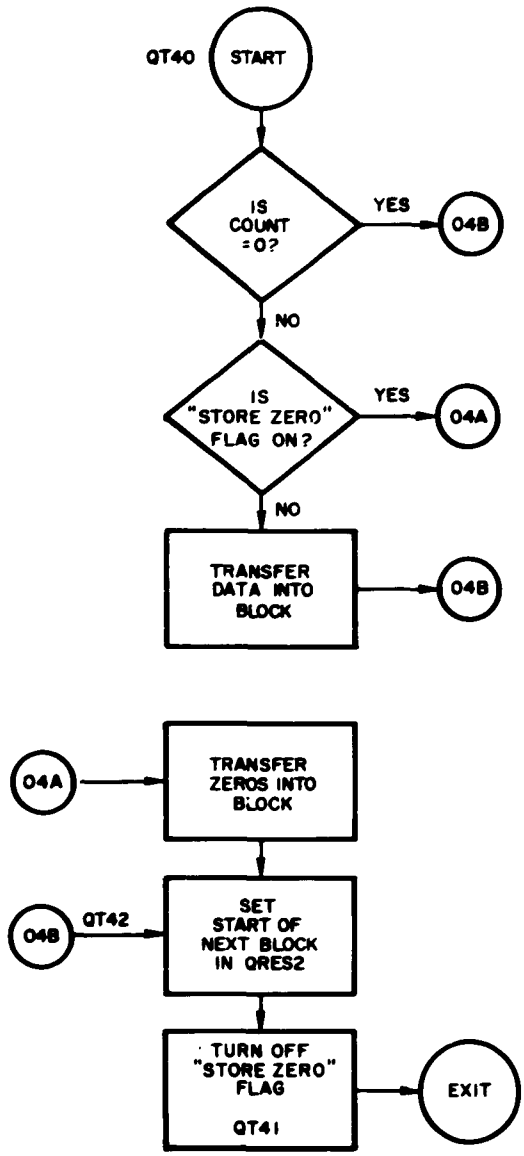
EXPLANATION OF CALLING SEQUENCE:

Not applicable


QSET
START
CLEAR QRES2 BLOCK TO ZERO
TRANSFER RESOURCE CODE I.D. TO QRES2 BLOCK
SETUP WORKING RATE TABLE
QSRTB
SET START LOC. OF ACTUAL HOURS BLOCK IN QRES2
GET ACTUAL HOURS COUNT
UNPACK ACTUAL HOURS
QT40
IS THERE A NON-ZERO RATE IN RATE TABLE?
NO
O1D
YES
QS15
IS THERE A UNIT RATE?
YES
O1A
NO
SET UNIT RATE FLAG = ZERO
QT92
O1B
O1A
SET UNIT RATE FLAG = NON-ZERO
QT92
O1B
IS THERE AN OVHD. RATE?
YES
O1C
NO
SET OVERHEAD RATE FLAG = ZERO
QT93
O2K
O1C
SET OVERHEAD RATE FLAG = NON-ZERO
QT93
O2K
O1D
QT15A
ARE THERE ANY RATE DELETES ?
YES
O1F
NO
QT15B
O1E
SET UNIT AND OVERHEAD RATE FLAGS = ZERO
QT92 AND QT93
O2K
QT15D
O1F
SET START OF RATE DELETE TABLE
O1G
IS THIS THE CORRECT PERF. ORGN. ?
YES
O2E
NO
QT15C
O1H
GET NEXT ENTRY IN RATE DELETE TABLE
IS RATE DELETE TABLE FINISHED ?
NO
O1G
YES
O2A


02A
SET START OF RATE DELETE TABLE
02B
QT15E
IS PERF. ORGN.=0?
YES
02D
NO
02C
GET NEXT ENTRY IN RATE DELETE TABLE
IS RATE DELETE TABLE FINISHED?
NO
02B
YES
01E
02D
QT15G
IS THIS THE CORRECT RES. CODE ?
NO
02C
YES
02F
02E
QT15H
IS THIS THE CORRECT RES. CODE?
NO
01H
YES
02F
QT15L
CHECK TYPE OF DELETE
UNIT AND OVHD
02G
OVHD
02H
UNIT
SET UNIT RATE FLAG=NON-ZERO
QT92
02K
02G
QT15N
SET UNIT RATE FLAG= NON-ZERO
QT92
02H
02H
SET OVERHEAD RATE FLAG= NON-ZERO
QT93
02K
QT16
GET ACTUAL DIRECT DOLLAR COUNT
UNPACK ACTUAL DIRECT DOLLARS
QT40
GET ACTUAL TOTAL DOLLAR COUNT
UNPACK ACTUAL TOTAL DOLLARS
QT40
GET BUDGET HOUR COUNT
UNPACK BUDGET HOURS
QT40
IS UNIT RATE FLAG =0?
YES
03A
NO
SET "STORE ZERO" FLAG ON
QT41
03A


03A
GET BUDGET DIRECT DOLLAR COUNT
UNPACK BUDGET DIRECT DOLLARS QT40
IS UNIT RATE FLAG=0?
YES
03B
NO
SET "STORE ZERO" FLAG ON QT41
03B
GET BUDGET TOTAL DOLLAR COUNT
UNPACK BUDGET TOTAL DOLLARS QT40
GET ESTIMATE HOUR COUNT
UNPACK ESTIMATE HOURS QT40
IS OVHD.RATE FLAG=0?
YES
03C
NO
SET "STORE ZERO" FLAG ON QT41
03C
03C
GET ESTIMATE DIRECT DOLLAR COUNT
UNPACK ESTIMATE DIRECT DOLLARS QT40
IS OVHD. RATE FLAG=0?
YES
03D
NO
SET "STORE ZERO" FLAG ON QT41
03D
GET ESTIMATE TOTAL DOLLAR COUNT
UNPACK ESTIMATE TOTAL DOLLARS QT40
EXIT


QT40
START
IS COUNT =0?
YES
04B
NO
IS "STORE ZERO" FLAG ON?
YES
04A
NO
TRANSFER DATA INTO BLOCK
04B
04A
TRANSFER ZEROS INTO BLOCK
04B
QT42
SET START OF NEXT BLOCK IN QRES2
TURN OFF "STORE ZERO" FLAG
QT41
EXIT

Region QSRCH

EXPLANATION OF REGION:

This routine will delete all of the estimates and budgets, hours or units, and direct dollars and total dollars from the QRES2 table.

CALLING SEQUENCE:

L TSX QSRCH, 4

L + 1 Normal return

INPUT:

Resource code record set into QRES2.

OUTPUT:

Resource code record in QRES2 without any budget or estimate values.

STORAGE USED:

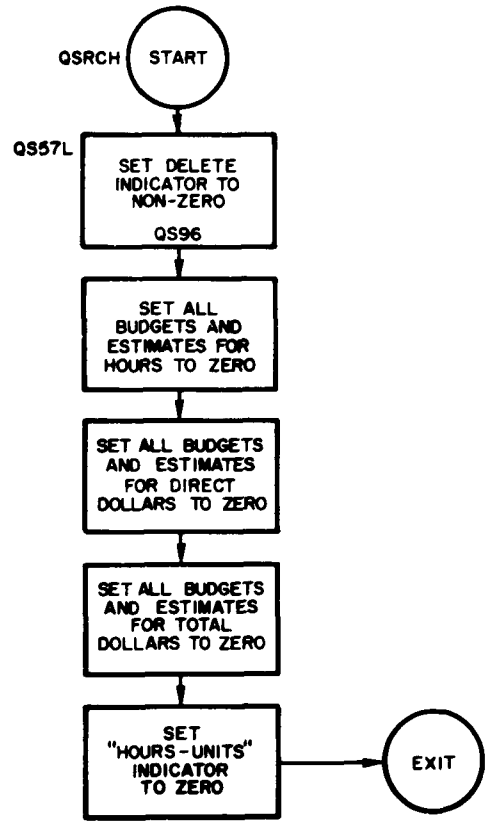
Not applicable.

SUBREGIONS AND SUBROUTINES USED:

Not applicable.

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


QSRCH
START
QS57L
SET DELETE INDICATOR TO NON-ZERO
QS96
SET ALL BUDGETS AND ESTIMATES FOR HOURS TO ZERO
SET ALL BUDGETS AND ESTIMATES FOR DIRECT DOLLARS TO ZERO
SET ALL BUDGETS AND ESTIMATES FOR TOTAL DOLLARS TO ZERO
SET "HOURS-UNITS" INDICATOR TO ZERO
EXIT

Region QCLN

EXPLANATION OF REGION:

This routine will set up the rainbow and cost category record and will extend the budget and estimate hours (and direct dollars, where applicable) by the rate table. It will also move and pack the resource code record into QRES1.

CALLING SEQUENCE:

L	TSX QCLN
L+1	Normal return

INPUT:

The resource code record in QRES2.

OUTPUT:

An extended resource code record in QRES1 in a packed format and the count of the number of words in this resource code record less the indicative information.

The rainbow and cost category record in RCMC

STORAGE USED:

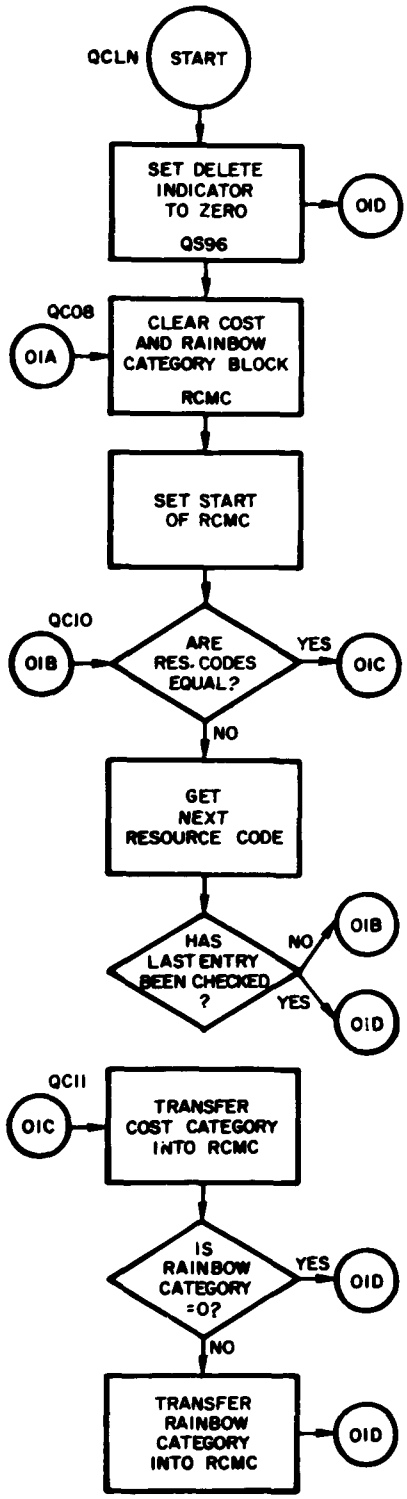
QRES1 - 600 words - packed resource code record.

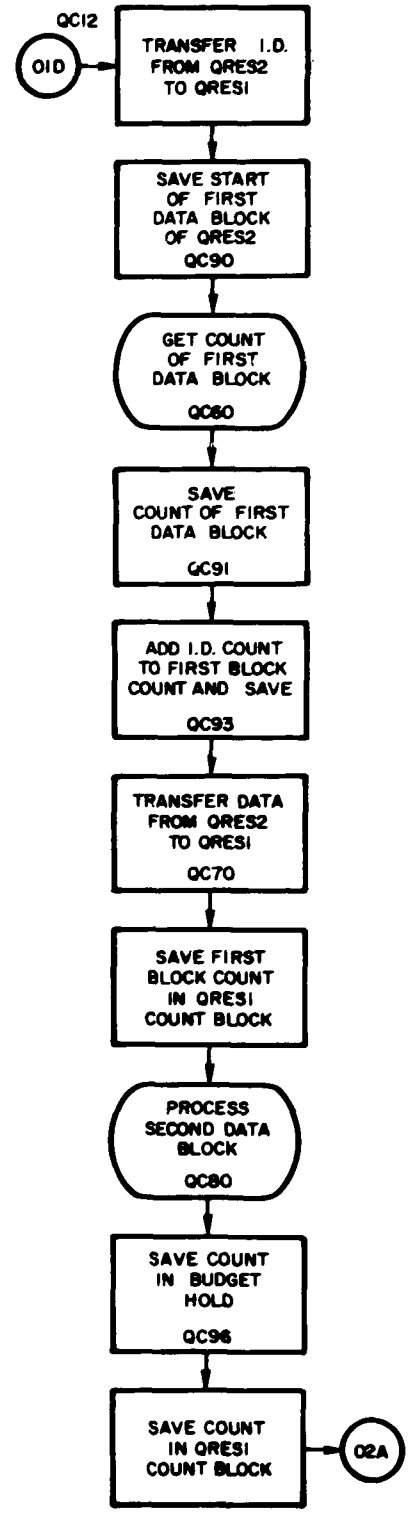
SUBREGIONS AND SUBROUTINES USED:

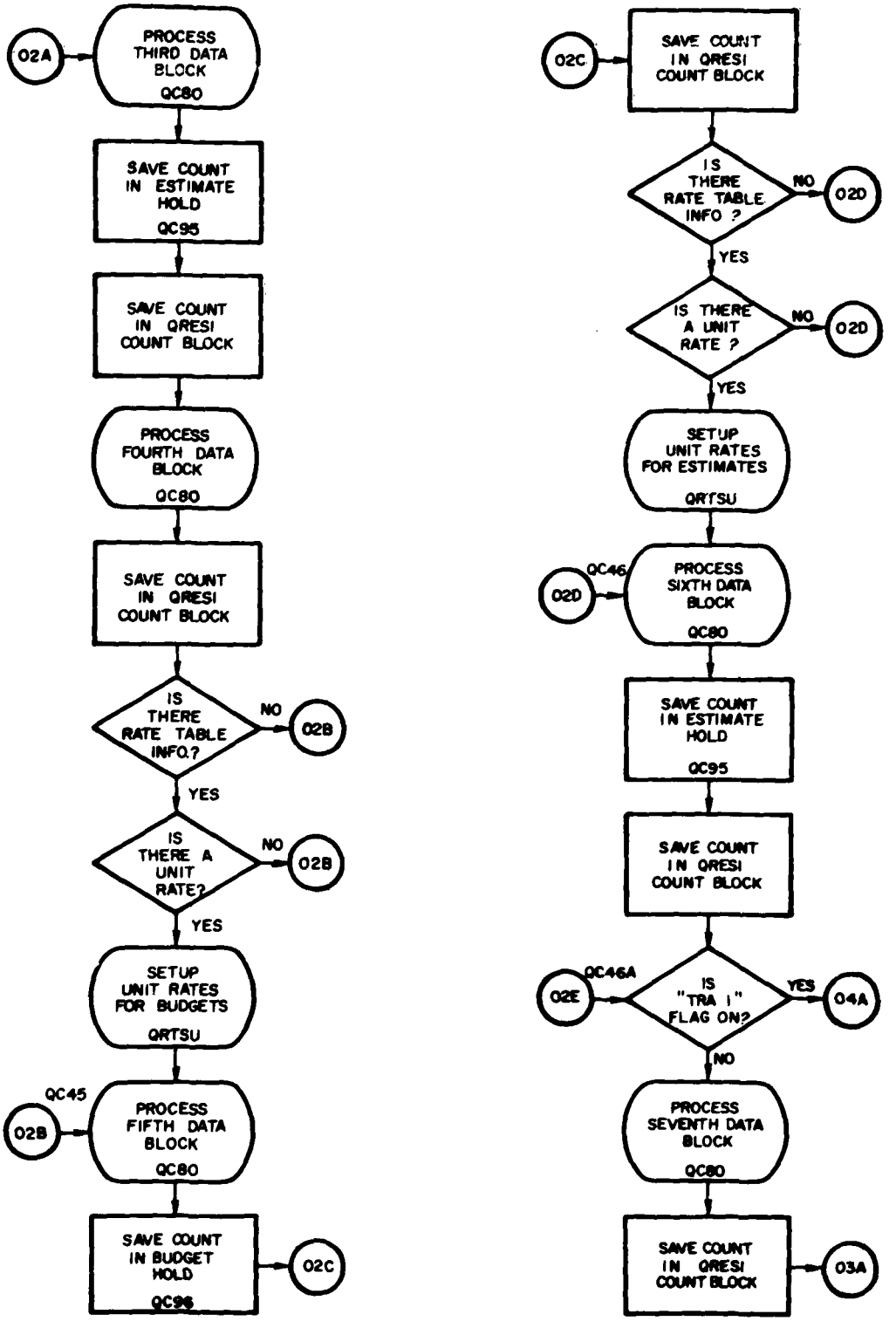
Not applicable.

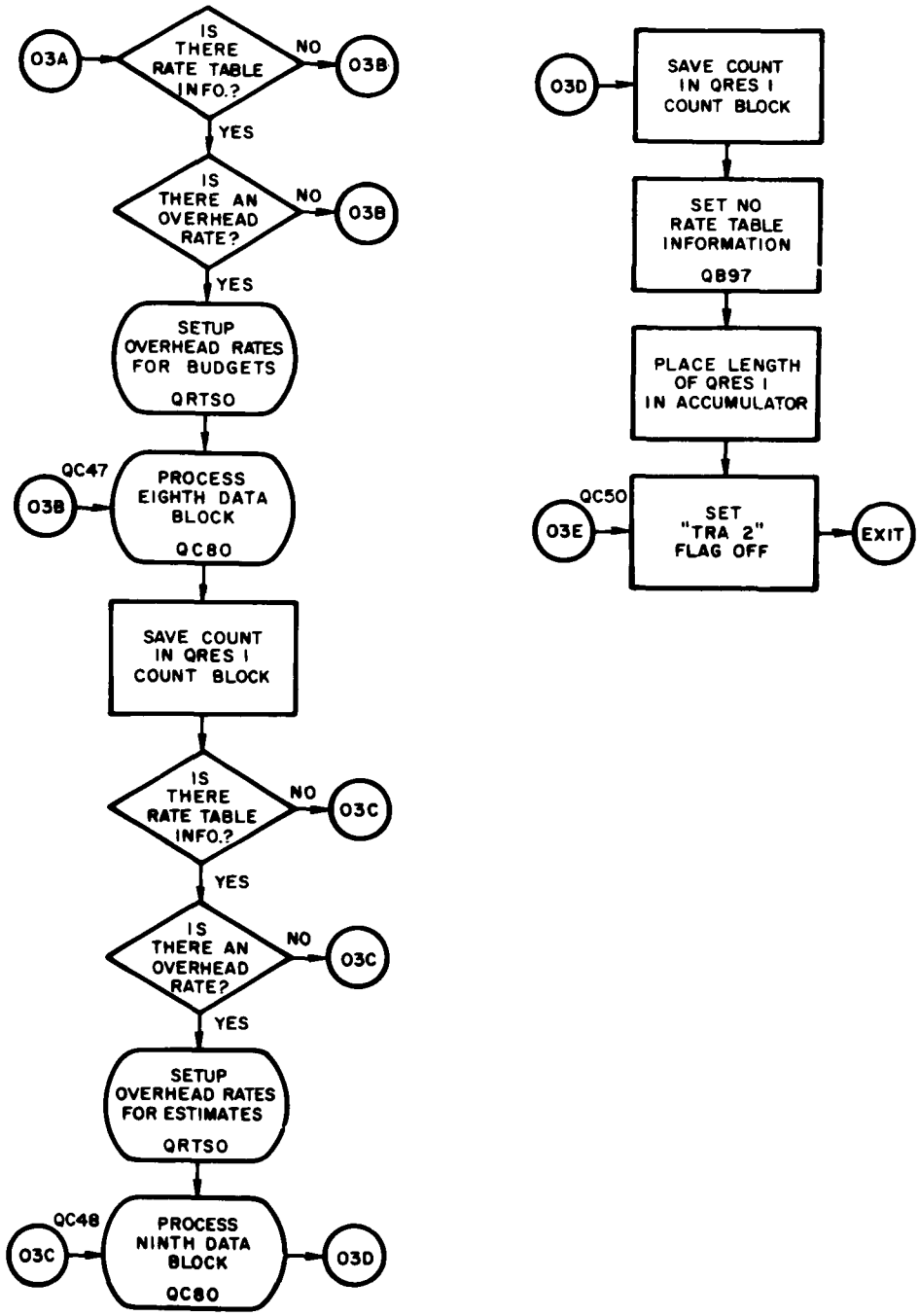
EXPLANATION OF CALLING SEQUENCE:

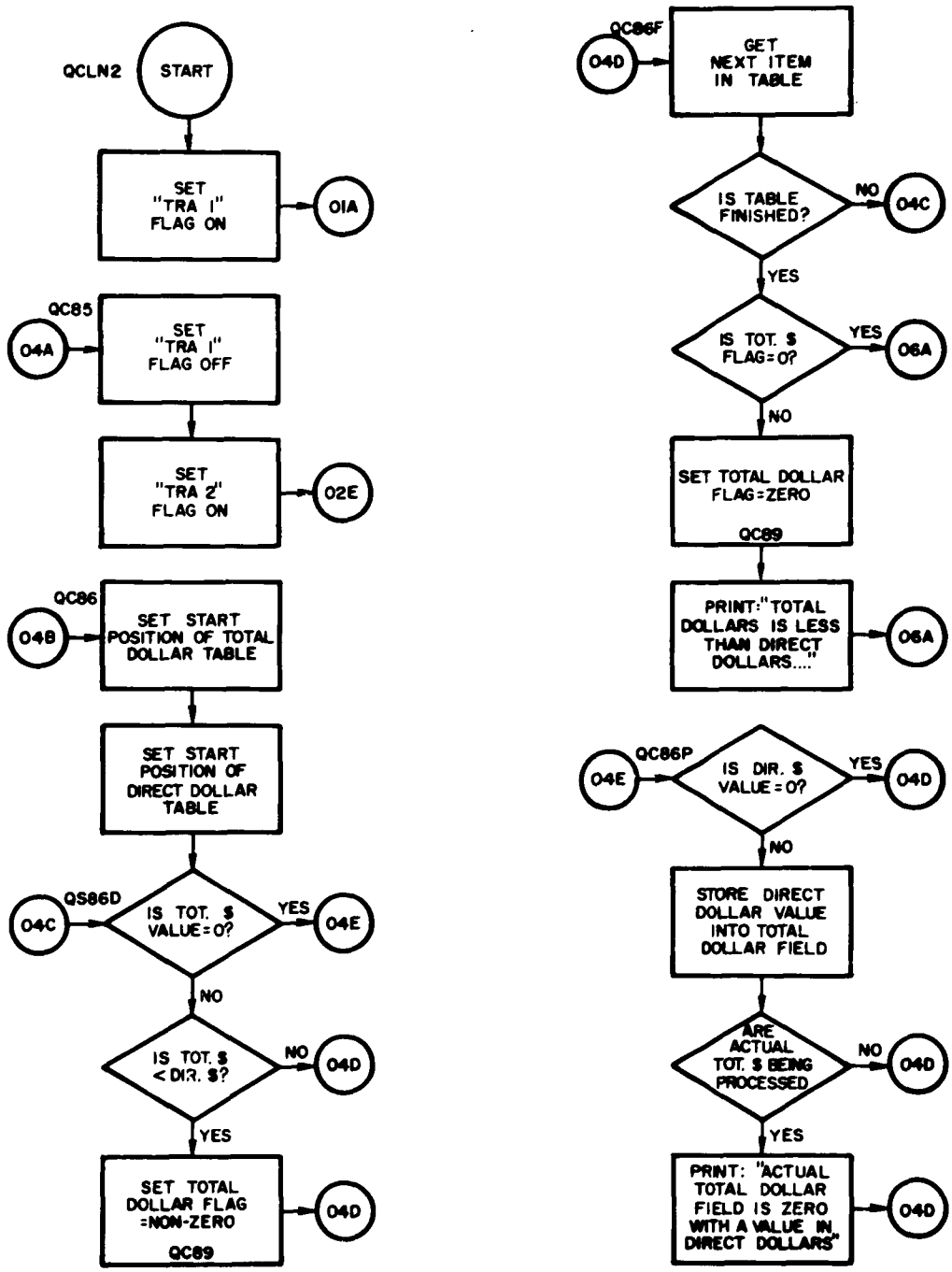
Not applicable.

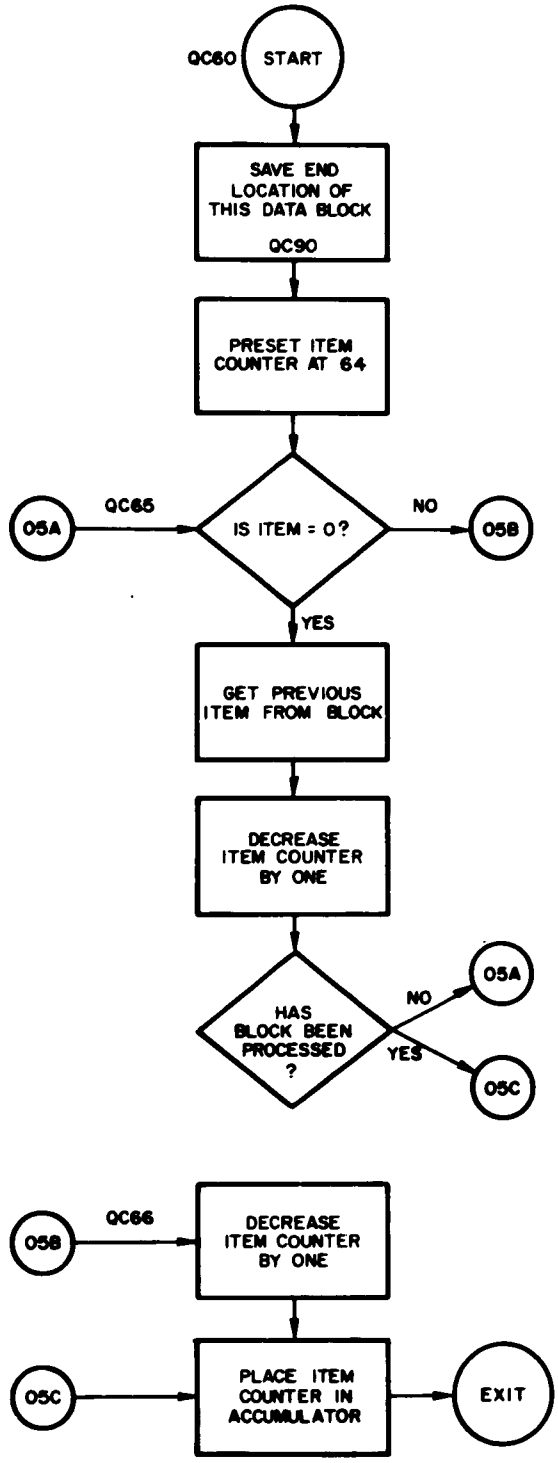

QCLN
START
SET DELETE INDICATOR TO ZERO
QS96
01D
QC08
01A
CLEAR COST AND RAINBOW CATEGORY BLOCK
RCMC
SET START OF RCMC
QC10
01B
ARE RES. CODES EQUAL?
YES
01C
NO
GET NEXT RESOURCE CODE
HAS LAST ENTRY BEEN CHECKED ?
NO
01B
YES
01D
QC11
01C
TRANSFER COST CATEGORY INTO RCMC
IS RAINBOW CATEGORY =0?
YES
01D
NO
TRANSFER RAINBOW CATEGORY INTO RCMC
01D

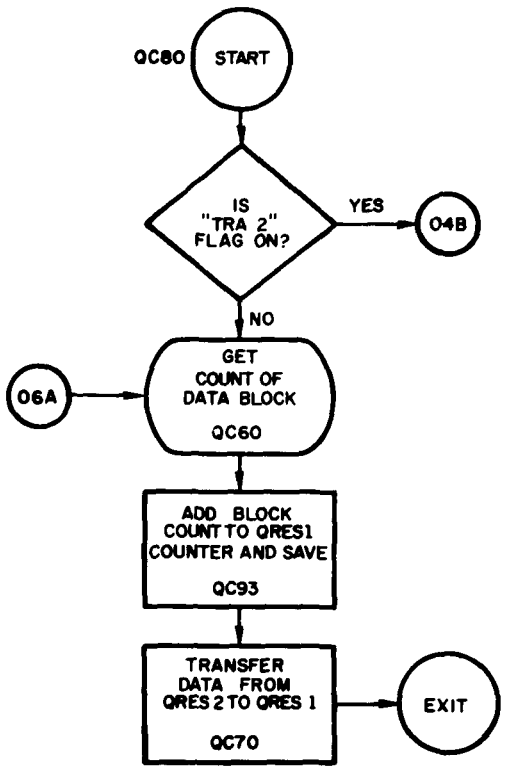

QC12
01D
TRANSFER I.D. FROM QRES2 TO QRESI
SAVE START OF FIRST DATA BLOCK OF QRES2
QC90
GET COUNT OF FIRST DATA BLOCK
QC80
SAVE COUNT OF FIRST DATA BLOCK
QC91
ADD I.D. COUNT TO FIRST BLOCK COUNT AND SAVE
QC93
TRANSFER DATA FROM QRES2 TO QRESI
QC70
SAVE FIRST BLOCK COUNT IN QRESI COUNT BLOCK
PROCESS SECOND DATA BLOCK
QC80
SAVE COUNT IN BUDGET HOLD
QC96
SAVE COUNT IN QRESI COUNT BLOCK
02A

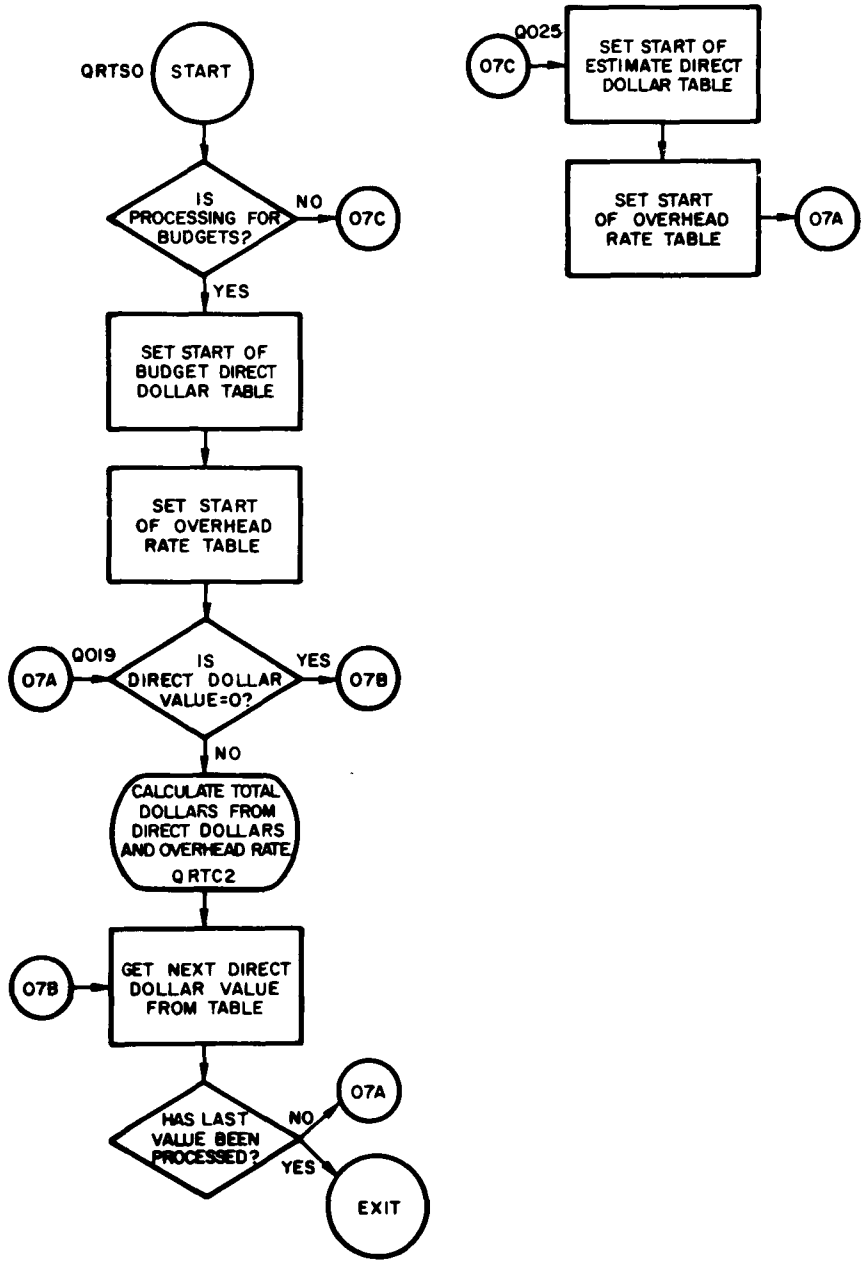

02A
PROCESS THIRD DATA BLOCK QC80
SAVE COUNT IN ESTIMATE HOLD QC95
SAVE COUNT IN QRESI COUNT BLOCK
PROCESS FOURTH DATA BLOCK QC80
SAVE COUNT IN QRESI COUNT BLOCK
IS THERE RATE TABLE INFO.?
NO
02B
YES
IS THERE A UNIT RATE?
NO
02B
YES
SETUP UNIT RATES FOR BUDGETS QRTSU
QC45
02B
PROCESS FIFTH DATA BLOCK QC80
SAVE COUNT IN BUDGET HOLD QC96
02C
02C
SAVE COUNT IN QRESI COUNT BLOCK
IS THERE RATE TABLE INFO ?
NO
02D
YES
IS THERE A UNIT RATE ?
NO
02D
YES
SETUP UNIT RATES FOR ESTIMATES QRTSU
QC46
02D
PROCESS SIXTH DATA BLOCK QC80
SAVE COUNT IN ESTIMATE HOLD QC95
SAVE COUNT IN QRESI COUNT BLOCK
QC46A
02E
IS "TRA 1" FLAG ON?
YES
04A
NO
PROCESS SEVENTH DATA BLOCK QC80
SAVE COUNT IN QRESI COUNT BLOCK
03A

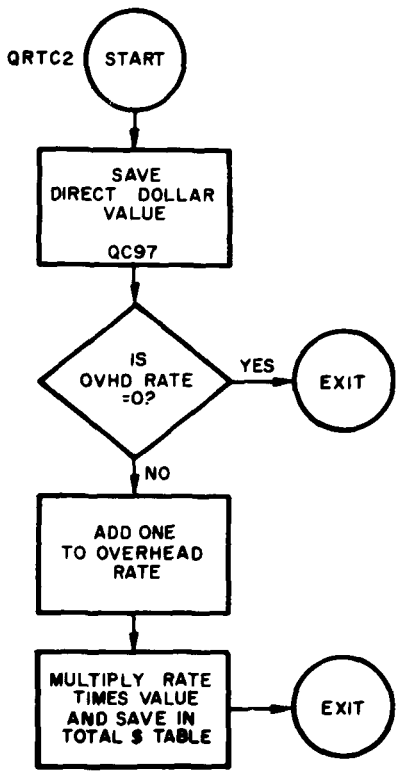

03A
IS THERE RATE TABLE INFO.?
NO
03B
YES
IS THERE AN OVERHEAD RATE?
NO
03B
YES
SETUP OVERHEAD RATES FOR BUDGETS
QRTSO
QC47
03B
PROCESS EIGHTH DATA BLOCK
QC80
SAVE COUNT IN QRES I COUNT BLOCK
IS THERE RATE TABLE INFO.?
NO
03C
YES
IS THERE AN OVERHEAD RATE?
NO
03C
YES
SETUP OVERHEAD RATES FOR ESTIMATES
QRTSO
QC48
03C
PROCESS NINTH DATA BLOCK
QC80
03D
03D
SAVE COUNT IN QRES I COUNT BLOCK
SET NO RATE TABLE INFORMATION
QB97
PLACE LENGTH OF QRES I IN ACCUMULATOR
QC50
03E
SET "TRA 2" FLAG OFF
EXIT

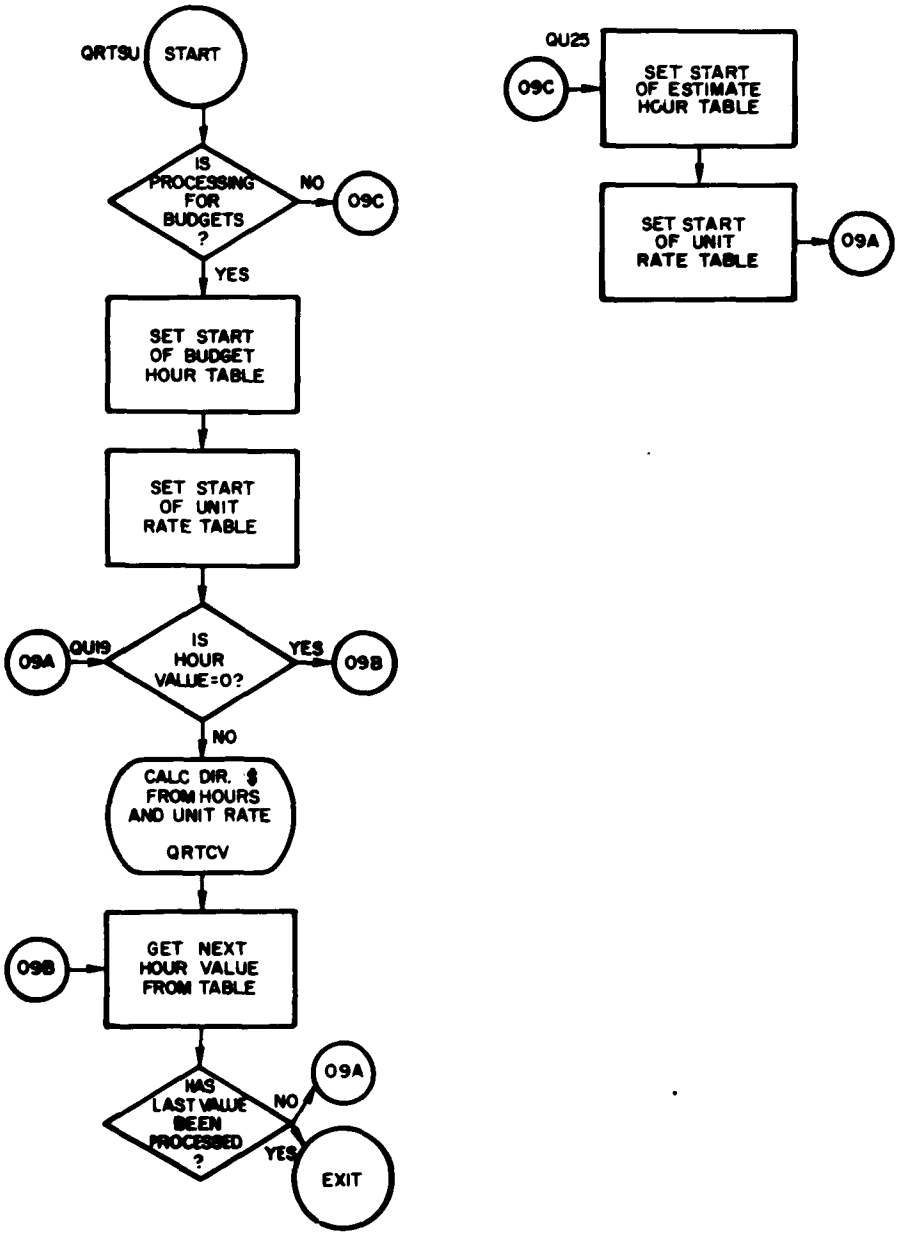

QCLN2
START
SET "TRA 1" FLAG ON
01A
QC85
04A
SET "TRA 1" FLAG OFF
SET "TRA 2" FLAG ON
02E
QC86
04B
SET START POSITION OF TOTAL DOLLAR TABLE
SET START POSITION OF DIRECT DOLLAR TABLE
QS86D
04C
IS TOT. $ VALUE=0?
YES
04E
NO
IS TOT. $ < DIR. $?
NO
04D
YES
SET TOTAL DOLLAR FLAG =NON-ZERO
QC89
04D
QC86F
GET NEXT ITEM IN TABLE
IS TABLE FINISHED?
NO
04C
YES
IS TOT. $ FLAG=0?
YES
06A
NO
SET TOTAL DOLLAR FLAG=ZERO
QC89
PRINT:"TOTAL DOLLARS IS LESS THAN DIRECT DOLLARS...."
06A
QC86P
04E
IS DIR. $ VALUE=0?
YES
04D
NO
STORE DIRECT DOLLAR VALUE INTO TOTAL DOLLAR FIELD
ARE ACTUAL TOT. $ BEING PROCESSED
NO
04D
YES
PRINT: "ACTUAL TOTAL DOLLAR FIELD IS ZERO WITH A VALUE IN DIRECT DOLLARS"
04D

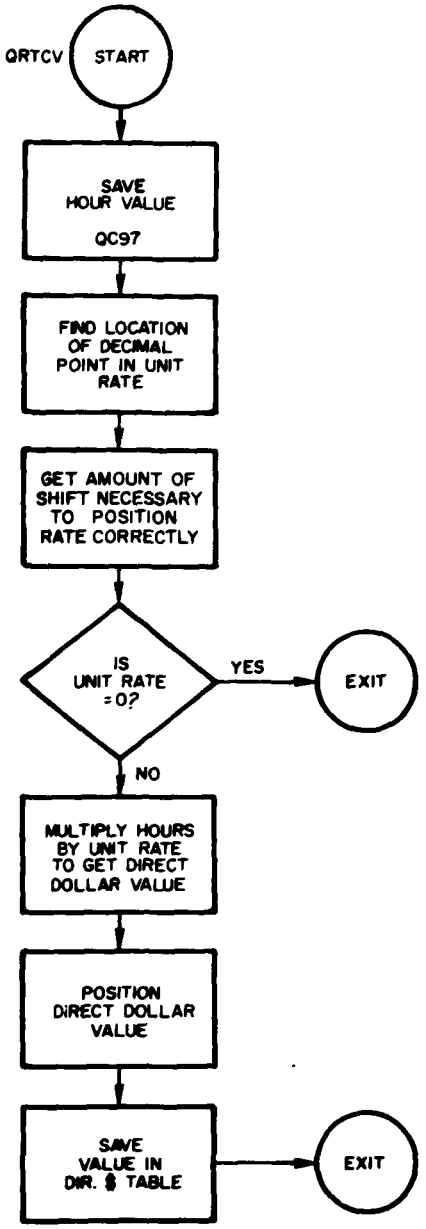

QC60
START
SAVE END LOCATION OF THIS DATA BLOCK
QC90
PRESET ITEM COUNTER AT 64
05A
QC65
IS ITEM = 0?
NO
05B
YES
GET PREVIOUS ITEM FROM BLOCK
DECREASE ITEM COUNTER BY ONE
HAS BLOCK BEEN PROCESSED ?
NO
05A
YES
05C
05B
QC66
DECREASE ITEM COUNTER BY ONE
05C
PLACE ITEM COUNTER IN ACCUMULATOR
EXIT


QC80
START
IS
"TRA 2"
FLAG ON?
YES
04B
NO
06A
GET
COUNT OF
DATA BLOCK
QC60
ADD BLOCK
COUNT TO QRES1
COUNTER AND SAVE
QC93
TRANSFER
DATA FROM
QRES 2 TO QRES 1
QC70
EXIT


QRTSO
START
IS PROCESSING FOR BUDGETS?
NO
07C
YES
SET START OF BUDGET DIRECT DOLLAR TABLE
SET START OF OVERHEAD RATE TABLE
Q019
07A
IS DIRECT DOLLAR VALUE=0?
YES
07B
NO
CALCULATE TOTAL DOLLARS FROM DIRECT DOLLARS AND OVERHEAD RATE
QRTC2
07B
GET NEXT DIRECT DOLLAR VALUE FROM TABLE
HAS LAST VALUE BEEN PROCESSED?
NO
07A
YES
EXIT
Q025
07C
SET START OF ESTIMATE DIRECT DOLLAR TABLE
SET START OF OVERHEAD RATE TABLE
07A


QRTC2
START
SAVE DIRECT DOLLAR VALUE
QC97
IS OVHD RATE =0?
YES
EXIT
NO
ADD ONE TO OVERHEAD RATE
MULTIPLY RATE TIMES VALUE AND SAVE IN TOTAL $ TABLE
EXIT


QRTSU
START
IS PROCESSING FOR BUDGETS ?
NO
09C
YES
SET START OF BUDGET HOUR TABLE
SET START OF UNIT RATE TABLE
09A
QU19
IS HOUR VALUE=0?
YES
09B
NO
CALC DIR. $ FROM HOURS AND UNIT RATE
QRTCV
09B
GET NEXT HOUR VALUE FROM TABLE
HAS LAST VALUE BEEN PROCESSED ?
NO
09A
YES
EXIT
QU25
09C
SET START OF ESTIMATE HOUR TABLE
SET START OF UNIT RATE TABLE
09A


QRTCV
START
SAVE HOUR VALUE QC97
FIND LOCATION OF DECIMAL POINT IN UNIT RATE
GET AMOUNT OF SHIFT NECESSARY TO POSITION RATE CORRECTLY
IS UNIT RATE = 0?
YES
EXIT
NO
MULTIPLY HOURS BY UNIT RATE TO GET DIRECT DOLLAR VALUE
POSITION DIRECT DOLLAR VALUE
SAVE VALUE IN DIR. $ TABLE
EXIT

Region QSVN0

EXPLANATION OF REGION:

This region will operate on all the 7-0 cards that are to be processed by the system.

CALLING SEQUENCE:

L	TSX QSVN0, 4
L+1	Normal return

INPUT:

A 7-0 type input card from SORTED DATA TAPE.

OUTPUT:

The 7-0 information set into the UCHG record.

STORAGE USED:

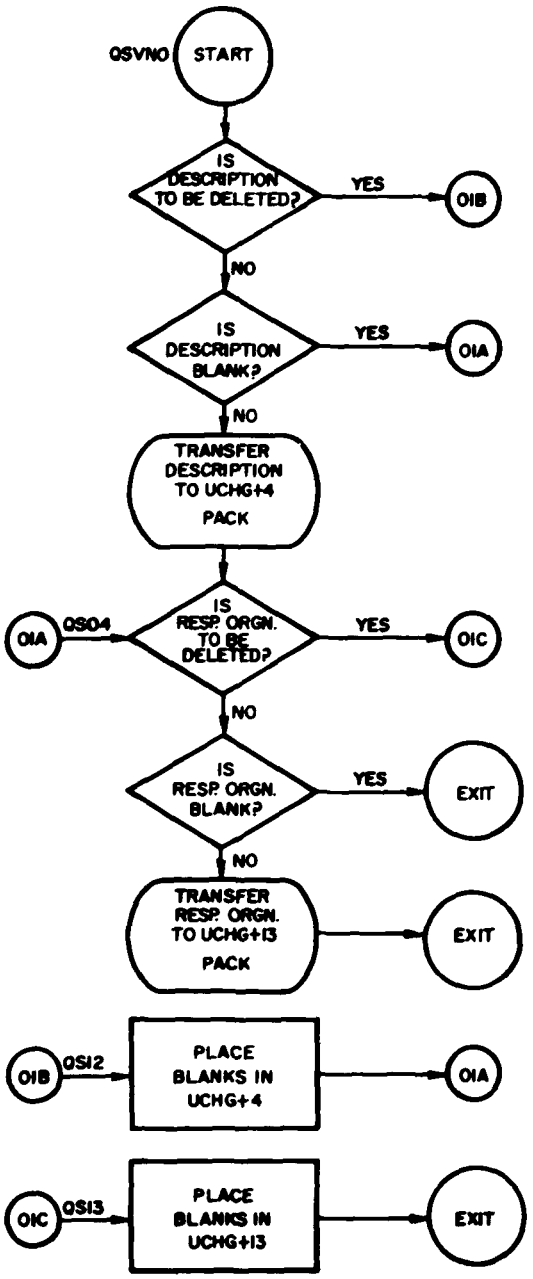
Not applicable.

SUBREGIONS AND SUBROUTINES USED:

Not applicable.

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


QSVNO
START
IS DESCRIPTION TO BE DELETED?
YES
O1B
NO
IS DESCRIPTION BLANK?
YES
O1A
NO
TRANSFER DESCRIPTION TO UCHG+4 PACK
O1A
QS04
IS RESP. ORGN. TO BE DELETED?
YES
O1C
NO
IS RESP. ORGN. BLANK?
YES
EXIT
NO
TRANSFER RESP. ORGN. TO UCHG+13 PACK
EXIT
O1B
QS12
PLACE BLANKS IN UCHG+4
O1A
O1C
QS13
PLACE BLANKS IN UCHG+13
EXIT

Region QSVN1

EXPLANATION OF REGION:

This region will operate on all the 7-1 cards that are to be processed by the system.

CALLING SEQUENCE:

L	TSX QSVN1, 4
L+1	Normal return

INPUT:

A 7-1 type input card from SORTED DATA TAPE.

OUTPUT:

The 7-1 information set into the UCHG record.

STORAGE USED:

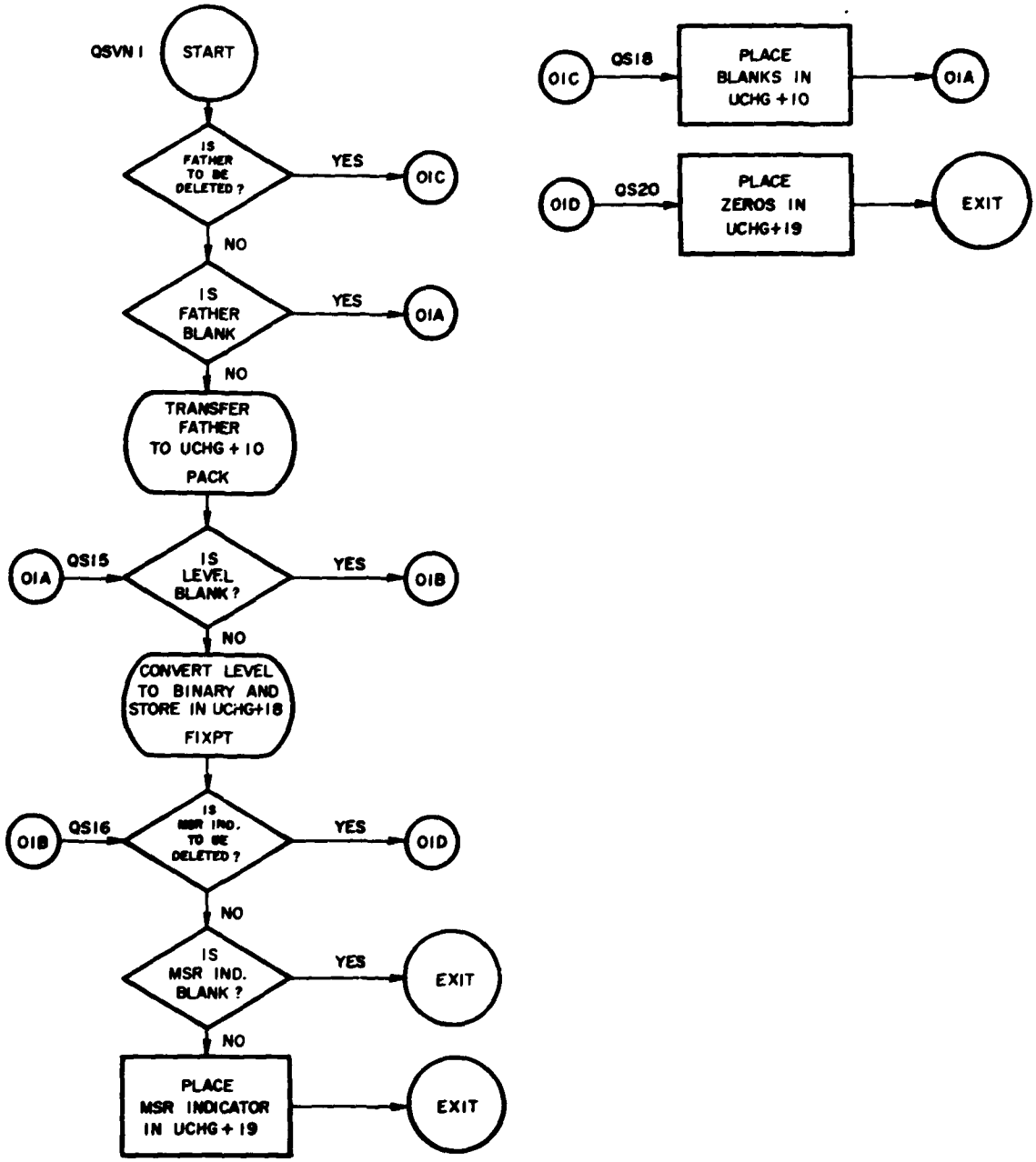
Not applicable.

SUBREGIONS AND SUBROUTINES USED:

Not applicable.

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


QSVN1
START
IS FATHER TO BE DELETED ?
YES
01C
NO
IS FATHER BLANK
YES
01A
NO
TRANSFER FATHER TO UCHG + 10
PACK
01A
QS15
IS LEVEL BLANK ?
YES
01B
NO
CONVERT LEVEL TO BINARY AND STORE IN UCHG+18
FIXPT
01B
QS16
IS MSR IND. TO BE DELETED ?
YES
01D
NO
IS MSR IND. BLANK ?
YES
EXIT
NO
PLACE MSR INDICATOR IN UCHG + 19
EXIT
01C
QS18
PLACE BLANKS IN UCHG + 10
01A
01D
QS20
PLACE ZEROS IN UCHG+19
EXIT

Region QSVN2

EXPLANATION OF REGION:

This region will operate on all the 7-2 cards that are to be processed by the system.

CALLING SEQUENCE:

L	TSX QSVN2, 4
L+1	Normal return

INPUT:

A 7-2 type input card from the SORTED DATA TAPE.

OUTPUT:

The 7-2 information set into the UCHG record.

STORAGE USED:

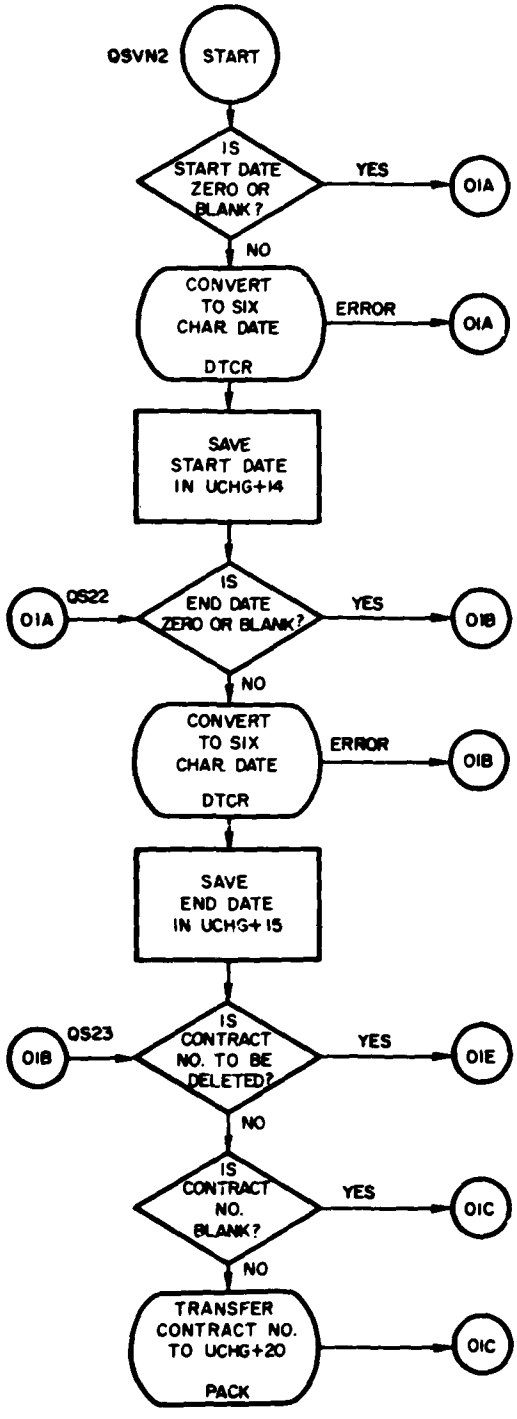
Not applicable.

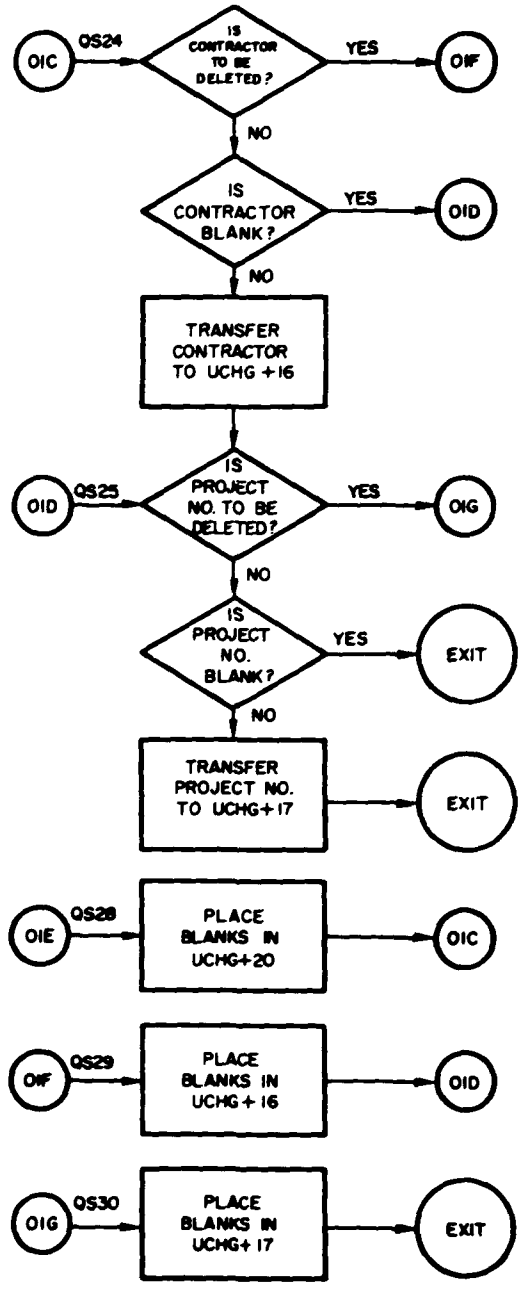
SUBREGIONS AND SUBROUTINES USED:

Not applicable.

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


QSVN2
START
IS START DATE ZERO OR BLANK?
YES
01A
NO
CONVERT TO SIX CHAR DATE
DTCR
ERROR
01A
SAVE START DATE IN UCHG+14
01A
QS22
IS END DATE ZERO OR BLANK?
YES
01B
NO
CONVERT TO SIX CHAR DATE
DTCR
ERROR
01B
SAVE END DATE IN UCHG+15
01B
QS23
IS CONTRACT NO. TO BE DELETED?
YES
01E
NO
IS CONTRACT NO. BLANK?
YES
01C
NO
TRANSFER CONTRACT NO. TO UCHG+20
PACK
01C


01C
QS24
IS CONTRACTOR TO BE DELETED?
YES
01F
NO
IS CONTRACTOR BLANK?
YES
01D
NO
TRANSFER CONTRACTOR TO UCHG+16
01D
QS25
IS PROJECT NO. TO BE DELETED?
YES
01G
NO
IS PROJECT NO. BLANK?
YES
EXIT
NO
TRANSFER PROJECT NO. TO UCHG+17
EXIT
01E
QS28
PLACE BLANKS IN UCHG+20
01C
01F
QS29
PLACE BLANKS IN UCHG+16
01D
01G
QS30
PLACE BLANKS IN UCHG+17
EXIT

Region QSVN3

EXPLANATION OF REGION:

This region will operate on all 7-3 cards that are to be processed by the system.

CALLING SEQUENCE:

L	TSX QSVN3, 4
L+1	Normal return

INPUT:

A 7-3 type input card from the SORTED DATA TAPE.

OUTPUT:

The 7-3 information set into UPUN or QRES2 records in core.

STORAGE USED:

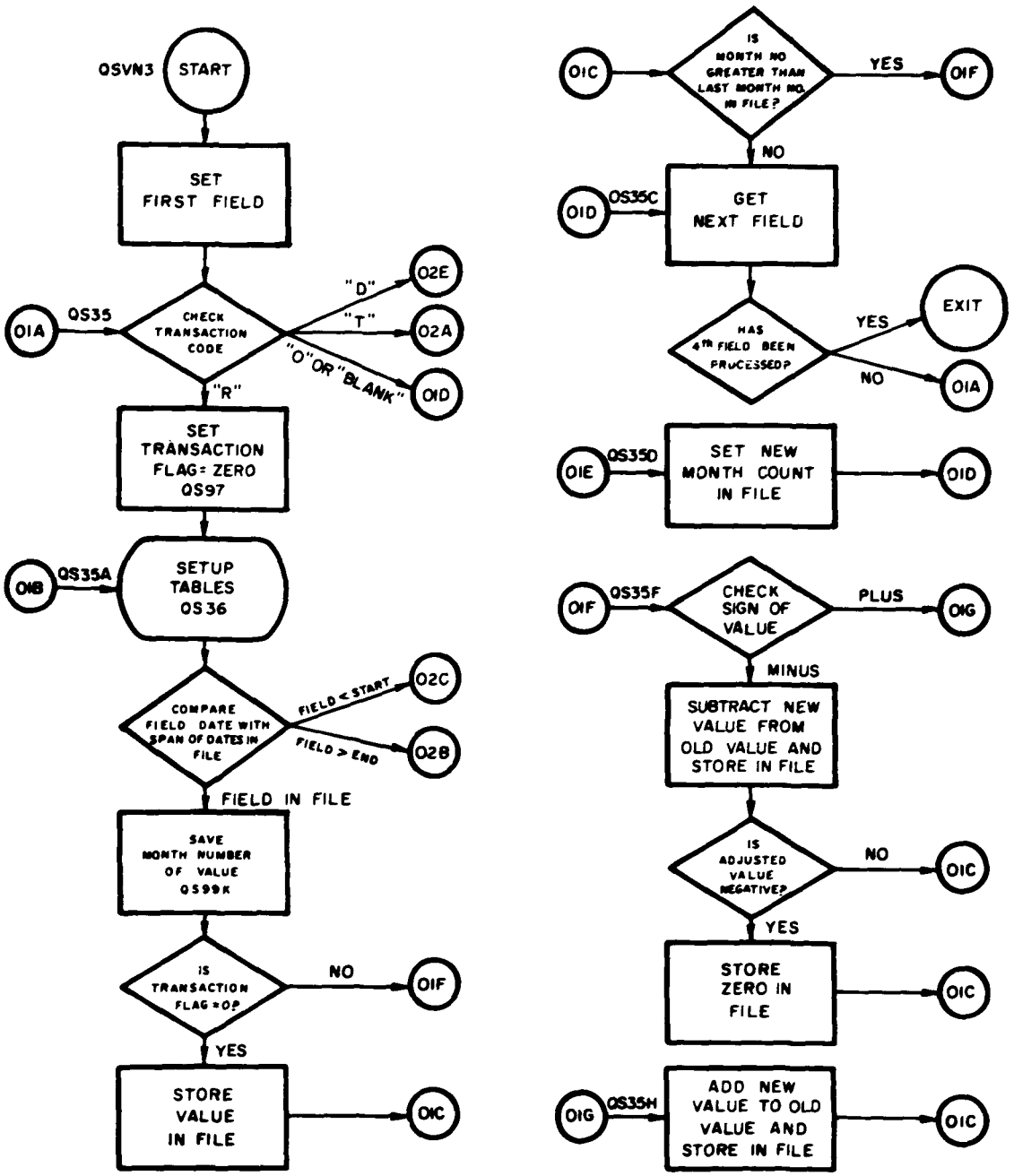
Not applicable.

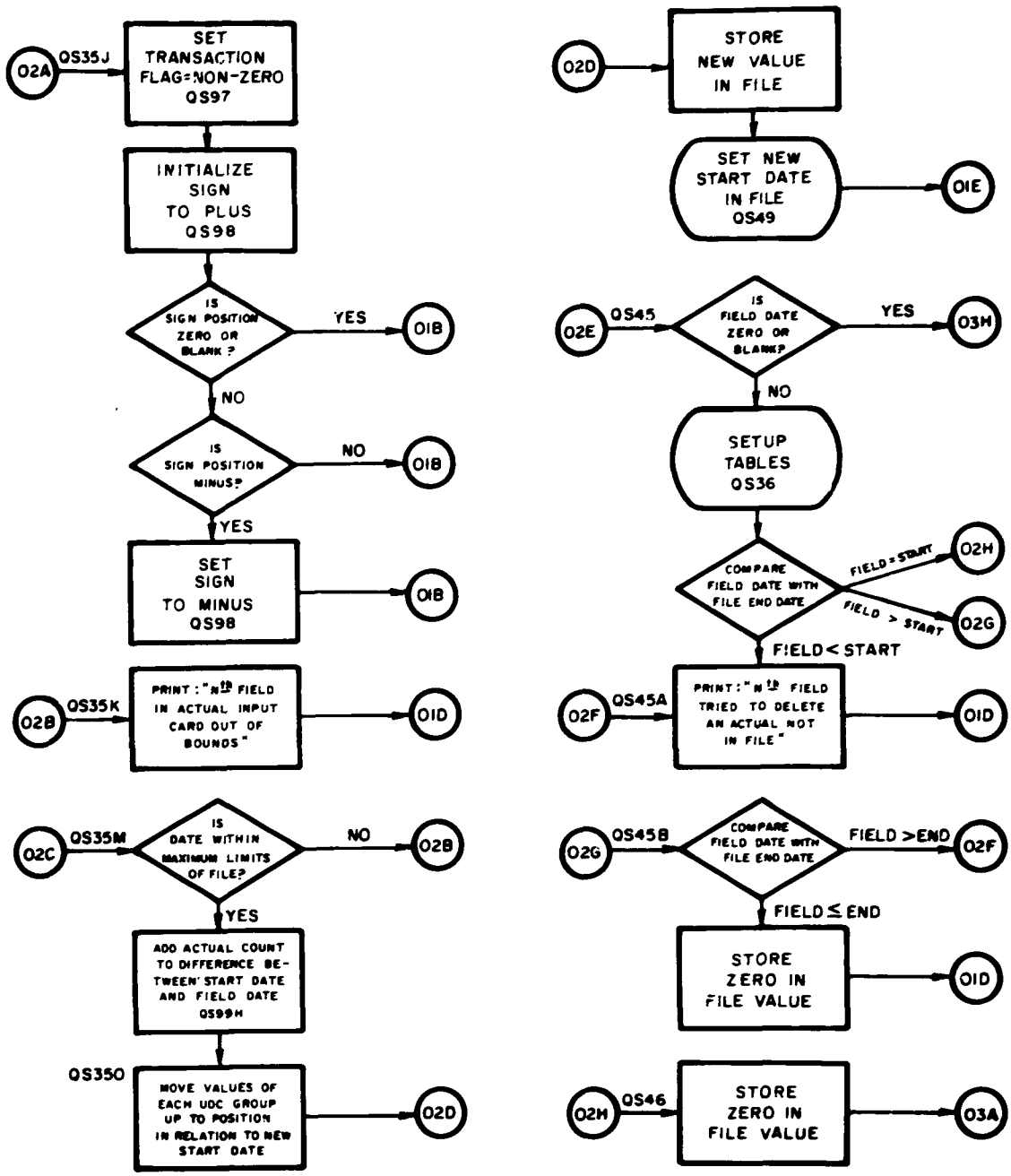
SUBREGIONS AND SUBROUTINES USED:

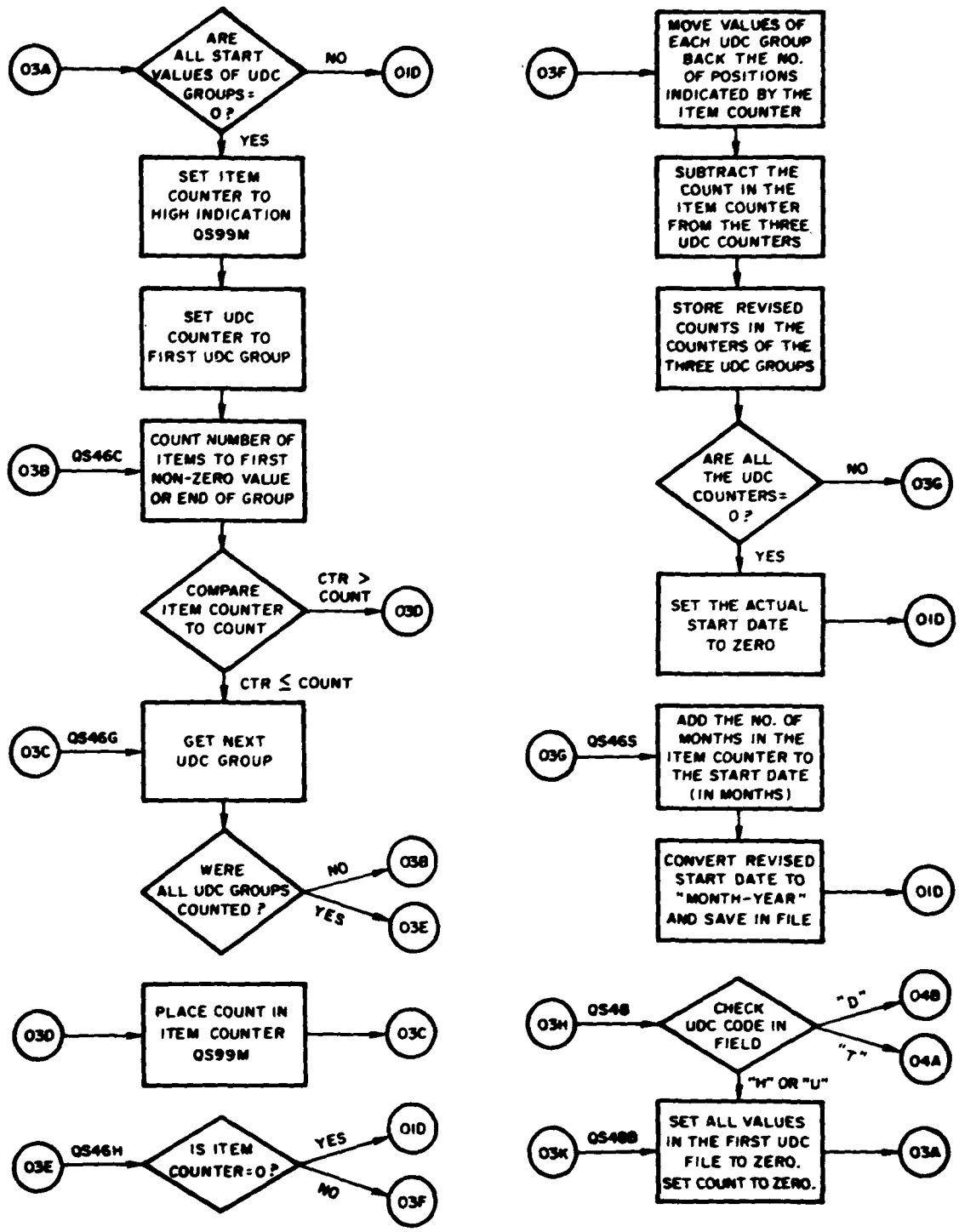
Not applicable.

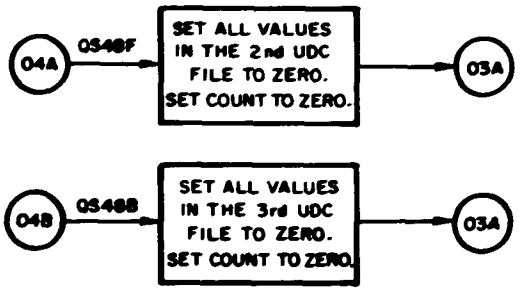
EXPLANATION OF CALLING SEQUENCE:

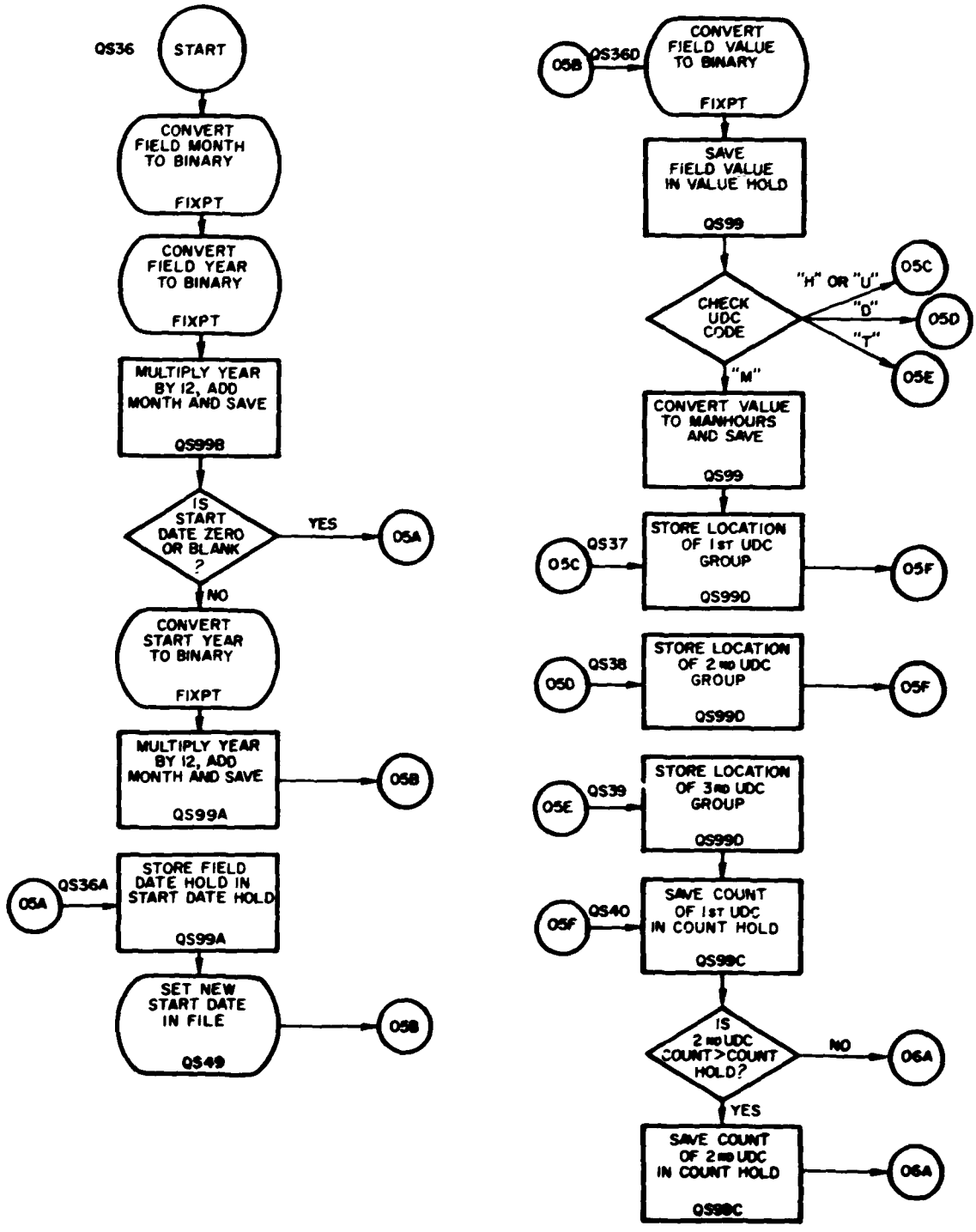
Not applicable.

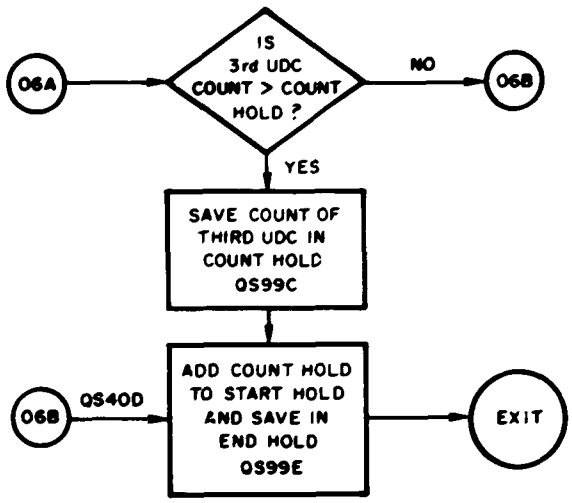

QSVN3 START
SET FIRST FIELD
01A QS35
CHECK TRANSACTION CODE
"D"
"T"
"O" OR "BLANK"
"R"
02E
02A
01D
SET TRANSACTION FLAG = ZERO QS97
01B QS35A
SETUP TABLES QS36
COMPARE FIELD DATE WITH SPAN OF DATES IN FILE
FIELD < START
FIELD > END
FIELD IN FILE
02C
02B
SAVE MONTH NUMBER OF VALUE QS99K
IS TRANSACTION FLAG = OP
NO
YES
01F
STORE VALUE IN FILE
01C
01C
IS MONTH NO GREATER THAN LAST MONTH NO. IN FILE?
YES
NO
01F
01D QS35C
GET NEXT FIELD
HAS 4TH FIELD BEEN PROCESSED?
YES
NO
EXIT
01A
01E QS35D
SET NEW MONTH COUNT IN FILE
01D
01F QS35F
CHECK SIGN OF VALUE
PLUS
MINUS
01G
SUBTRACT NEW VALUE FROM OLD VALUE AND STORE IN FILE
IS ADJUSTED VALUE NEGATIVE?
NO
YES
01C
STORE ZERO IN FILE
01C
01G QS35H
ADD NEW VALUE TO OLD VALUE AND STORE IN FILE
01C

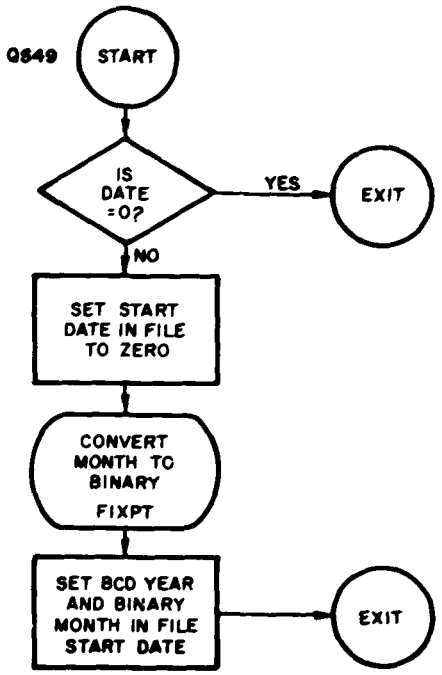

02A
QS35J
SET TRANSACTION FLAG=NON-ZERO QS97
INITIALIZE SIGN TO PLUS QS98
IS SIGN POSITION ZERO OR BLANK ?
YES
01B
NO
IS SIGN POSITION MINUS?
NO
01B
YES
SET SIGN TO MINUS QS98
01B
02B
QS35K
PRINT: "N[12] FIELD IN ACTUAL INPUT CARD OUT OF BOUNDS"
01D
02C
QS35M
IS DATE WITHIN MAXIMUM LIMITS OF FILE?
NO
02B
YES
ADD ACTUAL COUNT TO DIFFERENCE BETWEEN START DATE AND FIELD DATE QS99H
QS35O
MOVE VALUES OF EACH UDC GROUP UP TO POSITION IN RELATION TO NEW START DATE
02D
02D
STORE NEW VALUE IN FILE
SET NEW START DATE IN FILE QS49
01E
02E
QS45
IS FIELD DATE ZERO OR BLANK?
YES
03H
NO
SETUP TABLES QS36
COMPARE FIELD DATE WITH FILE END DATE
FIELD = START
02H
FIELD > START
02G
FIELD < START
02F
QS45A
PRINT: "N[12] FIELD TRIED TO DELETE AN ACTUAL NOT IN FILE"
01D
02G
QS45B
COMPARE FIELD DATE WITH FILE END DATE
FIELD > END
02F
FIELD ≤ END
STORE ZERO IN FILE VALUE
01D
02H
QS46
STORE ZERO IN FILE VALUE
03A


03A
ARE ALL START VALUES OF UDC GROUPS = 0 ?
NO
01D
YES
SET ITEM COUNTER TO HIGH INDICATION QS99M
SET UDC COUNTER TO FIRST UDC GROUP
03B
QS46C
COUNT NUMBER OF ITEMS TO FIRST NON-ZERO VALUE OR END OF GROUP
COMPARE ITEM COUNTER TO COUNT
CTR > COUNT
03D
CTR ≤ COUNT
03C
QS46G
GET NEXT UDC GROUP
WERE ALL UDC GROUPS COUNTED ?
NO
03B
YES
03E
03D
PLACE COUNT IN ITEM COUNTER QS99M
03C
03E
QS46H
IS ITEM COUNTER = 0 ?
YES
01D
NO
03F
03F
MOVE VALUES OF EACH UDC GROUP BACK THE NO. OF POSITIONS INDICATED BY THE ITEM COUNTER
SUBTRACT THE COUNT IN THE ITEM COUNTER FROM THE THREE UDC COUNTERS
STORE REVISED COUNTS IN THE COUNTERS OF THE THREE UDC GROUPS
ARE ALL THE UDC COUNTERS = 0 ?
NO
03G
YES
SET THE ACTUAL START DATE TO ZERO
01D
03G
QS46S
ADD THE NO. OF MONTHS IN THE ITEM COUNTER TO THE START DATE (IN MONTHS)
CONVERT REVISED START DATE TO "MONTH-YEAR" AND SAVE IN FILE
01D
03H
QS46I
CHECK UDC CODE IN FIELD
"D"
04B
"Y"
04A
"M" OR "U"
03K
QS46B
SET ALL VALUES IN THE FIRST UDC FILE TO ZERO. SET COUNT TO ZERO.
03A


04A
QS48F
SET ALL VALUES IN THE 2nd UDC FILE TO ZERO. SET COUNT TO ZERO.
03A
04B
QS48B
SET ALL VALUES IN THE 3rd UDC FILE TO ZERO. SET COUNT TO ZERO.
03A


QS36
START
CONVERT FIELD MONTH TO BINARY
FIXPT
CONVERT FIELD YEAR TO BINARY
FIXPT
MULTIPLY YEAR BY 12, ADD MONTH AND SAVE
QS99B
IS START DATE ZERO OR BLANK ?
YES
05A
NO
CONVERT START YEAR TO BINARY
FIXPT
MULTIPLY YEAR BY 12, ADD MONTH AND SAVE
QS99A
05B
05A
QS36A
STORE FIELD DATE HOLD IN START DATE HOLD
QS99A
SET NEW START DATE IN FILE
QS49
05B
05B
QS36D
CONVERT FIELD VALUE TO BINARY
FIXPT
SAVE FIELD VALUE IN VALUE HOLD
QS99
CHECK UDC CODE
"H" OR "U"
05C
"D"
05D
"T"
05E
"M"
CONVERT VALUE TO MANHOURS AND SAVE
QS99
05C
QS37
STORE LOCATION OF 1ST UDC GROUP
QS99D
05F
05D
QS38
STORE LOCATION OF 2ND UDC GROUP
QS99D
05F
05E
QS39
STORE LOCATION OF 3RD UDC GROUP
QS99D
05F
QS40
SAVE COUNT OF 1ST UDC IN COUNT HOLD
QS99C
IS 2ND UDC COUNT > COUNT HOLD?
NO
06A
YES
SAVE COUNT OF 2ND UDC IN COUNT HOLD
QS99C
06A


06A
IS
3rd UDC
COUNT > COUNT
HOLD ?
NO
06B
YES
SAVE COUNT OF
THIRD UDC IN
COUNT HOLD
QS99C
06B
QS40D
ADD COUNT HOLD
TO START HOLD
AND SAVE IN
END HOLD
QS99E
EXIT


Q849
START
IS DATE =0?
YES
EXIT
NO
SET START DATE IN FILE TO ZERO
CONVERT MONTH TO BINARY
FIXPT
SET BCD YEAR AND BINARY MONTH IN FILE START DATE
EXIT

Region QSVN4

EXPLANATION OF REGION:

This region will operate on all the 7-4 cards that are to be processed by the system.

CALLING SEQUENCE:

L TSX QSVN4, 4

L+1 Normal return

INPUT:

A 7-4 type input card from the SORTED DATA TAPE.

OUTPUT:

The 7-4 information set into the UPUN or QRES2 records in core.

STORAGE USED:

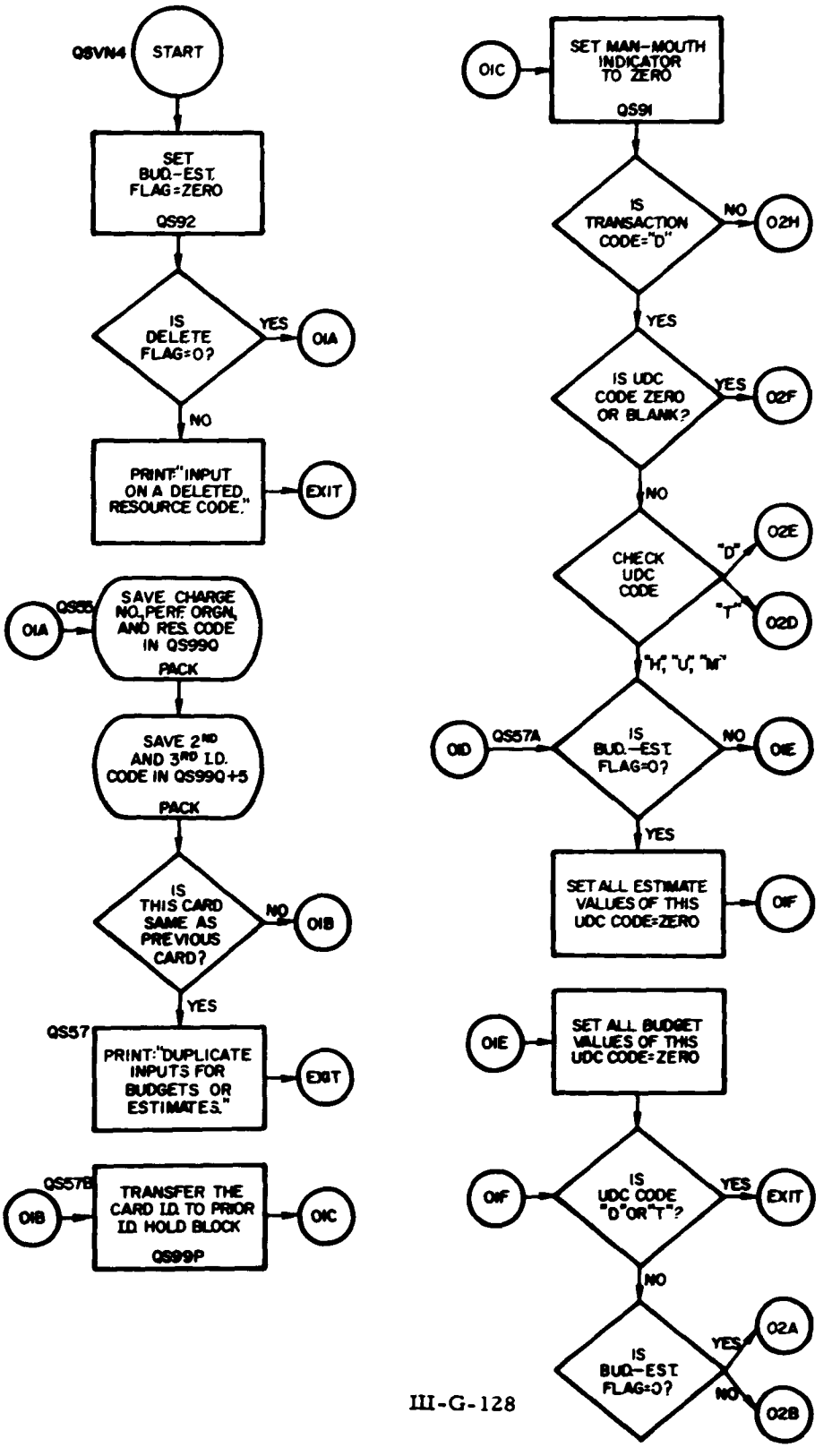
Not applicable.

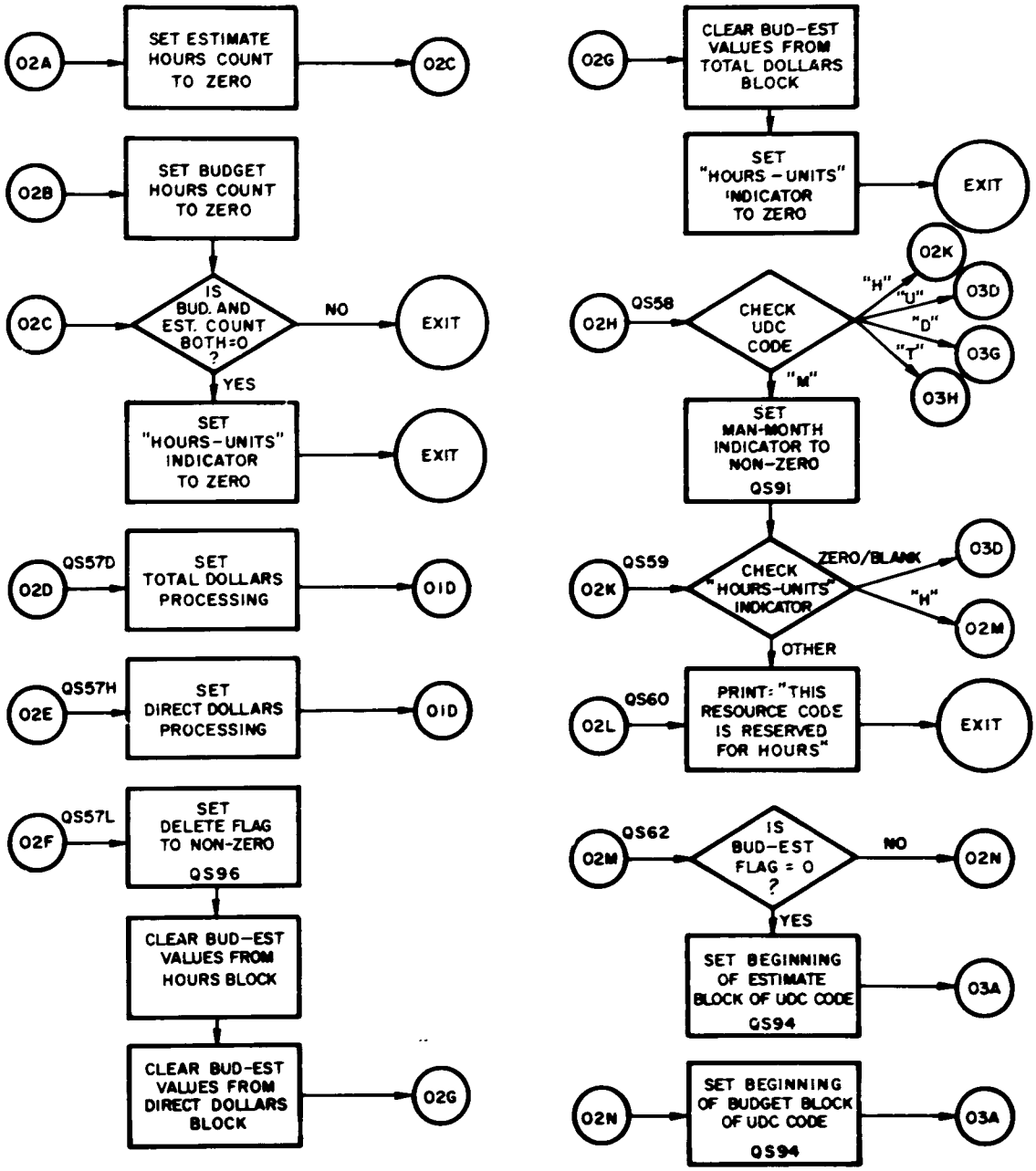
SUBREGIONS AND SUBROUTINES USED:

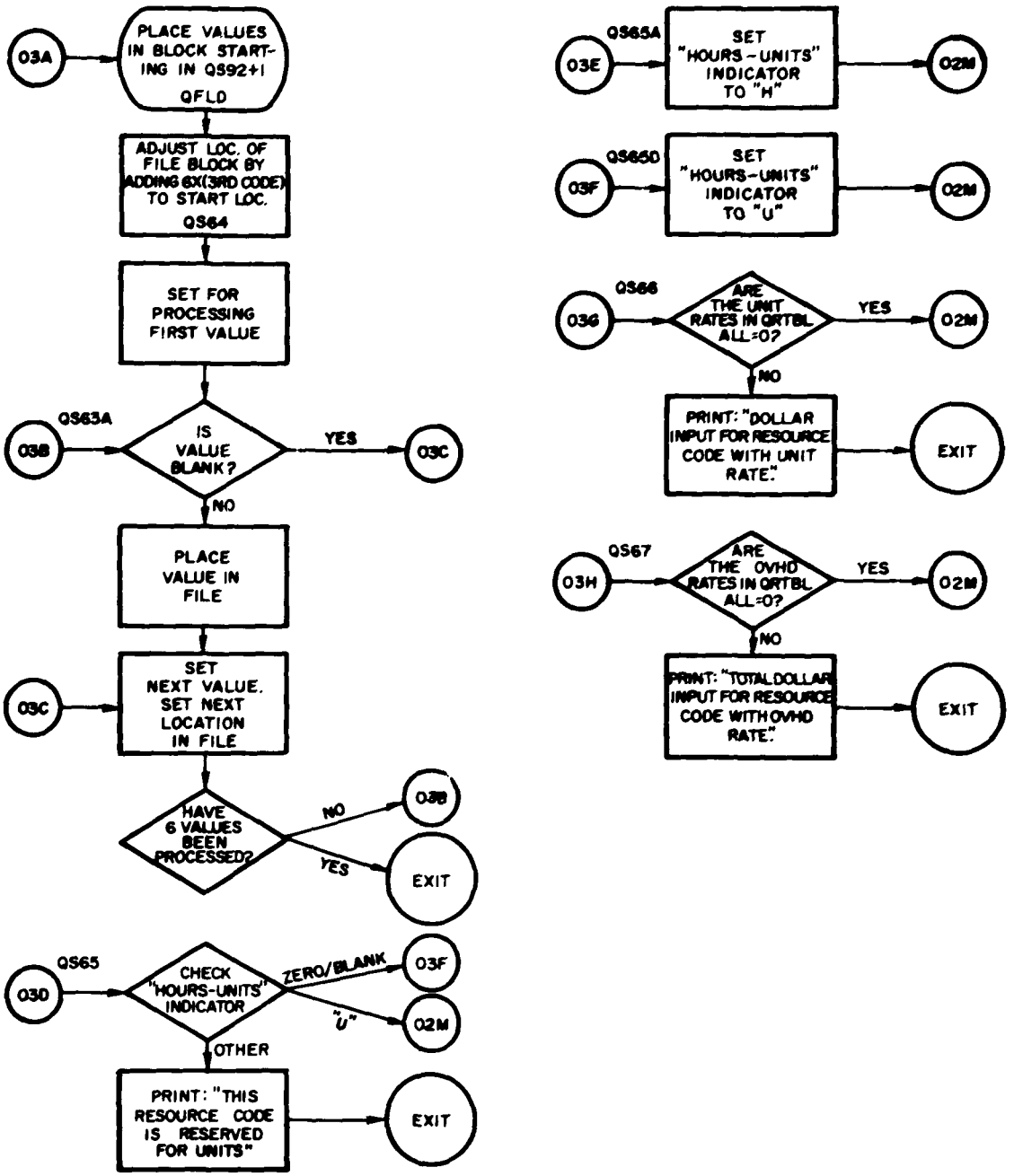
Not applicable.

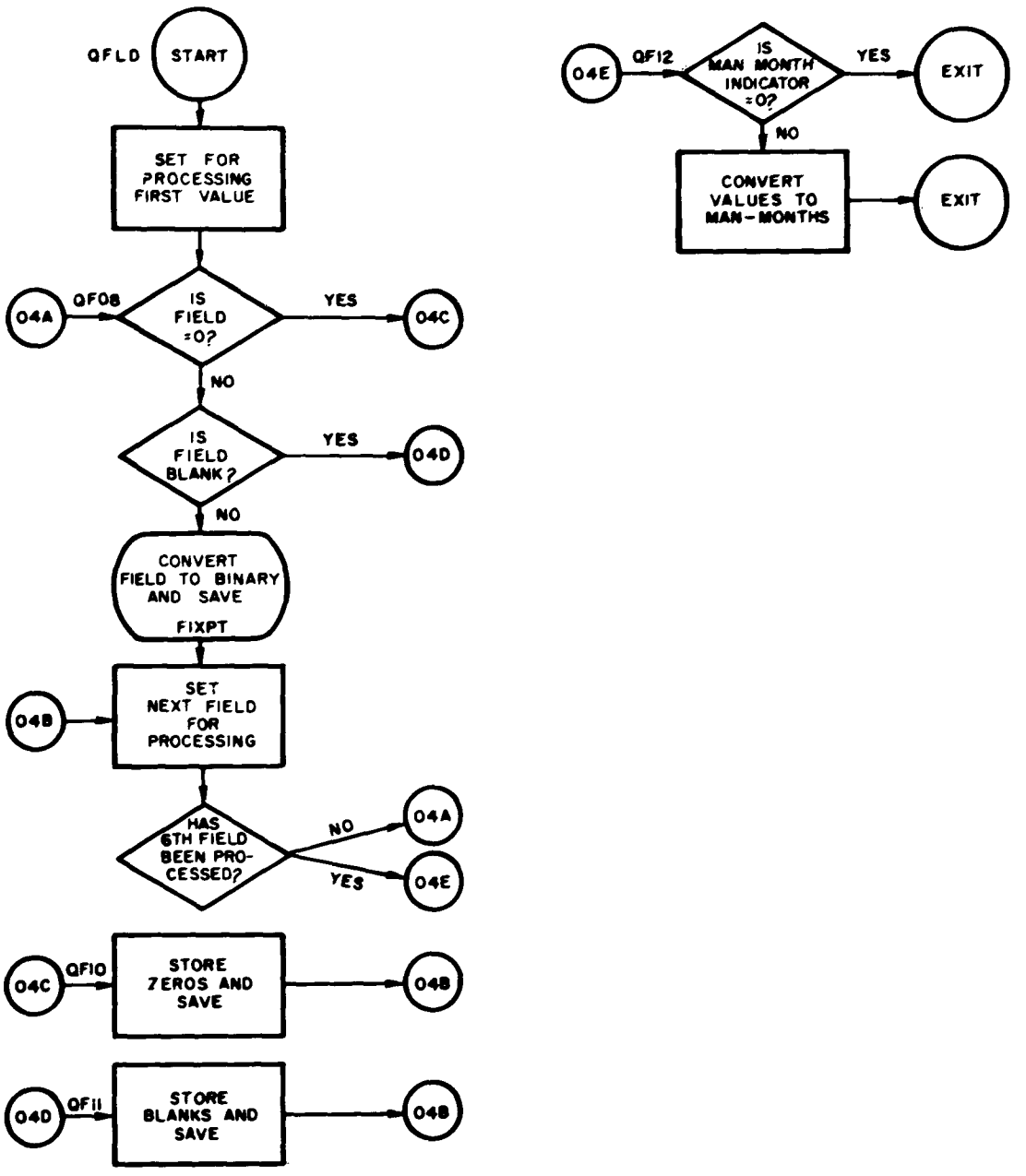
EXPLANATION OF CALLING SEQUENCE:

Not applicable.


QSVN4
START
SET BUD.-EST. FLAG=ZERO
QS92
IS DELETE FLAG=0?
YES
01A
NO
PRINT:"INPUT ON A DELETED RESOURCE CODE."
EXIT
QS55
01A
SAVE CHARGE NO., PERF. ORGN. AND RES. CODE IN QS990
PACK
SAVE 2ND AND 3RD I.D. CODE IN QS990+5
PACK
IS THIS CARD SAME AS PREVIOUS CARD?
NO
01B
YES
QS57
PRINT:"DUPLICATE INPUTS FOR BUDGETS OR ESTIMATES."
EXIT
QS57B
01B
TRANSFER THE CARD I.D. TO PRIOR I.D. HOLD BLOCK
QS99P
01C
01C
SET MAN-MOUTH INDICATOR TO ZERO
QS91
IS TRANSACTION CODE="D"
NO
02H
YES
IS UDC CODE ZERO OR BLANK?
YES
02F
NO
CHECK UDC CODE
"D"
02E
"T"
02D
"H", "U", "M"
01D
QS57A
IS BUD.-EST. FLAG=0?
NO
01E
YES
SET ALL ESTIMATE VALUES OF THIS UDC CODE=ZERO
01F
01E
SET ALL BUDGET VALUES OF THIS UDC CODE=ZERO
01F
IS UDC CODE "D" OR "T"?
YES
EXIT
NO
IS BUD.-EST. FLAG=0?
YES
02A
NO
02B


02A
SET ESTIMATE HOURS COUNT TO ZERO
02C
02B
SET BUDGET HOURS COUNT TO ZERO
02C
IS BUD. AND EST. COUNT BOTH=0 ?
NO
EXIT
YES
SET "HOURS-UNITS" INDICATOR TO ZERO
EXIT
QS57D
02D
SET TOTAL DOLLARS PROCESSING
01D
QS57H
02E
SET DIRECT DOLLARS PROCESSING
01D
QS57L
02F
SET DELETE FLAG TO NON-ZERO
QS96
CLEAR BUD-EST VALUES FROM HOURS BLOCK
CLEAR BUD-EST VALUES FROM DIRECT DOLLARS BLOCK
02G
02G
CLEAR BUD-EST VALUES FROM TOTAL DOLLARS BLOCK
SET "HOURS-UNITS" INDICATOR TO ZERO
EXIT
QS58
02H
CHECK UDC CODE
"H"
"U"
"D"
"T"
"M"
02K
03D
03G
03H
SET MAN-MONTH INDICATOR TO NON-ZERO
QS91
QS59
02K
CHECK "HOURS-UNITS" INDICATOR
ZERO/BLANK
"H"
03D
02M
OTHER
QS60
02L
PRINT: "THIS RESOURCE CODE IS RESERVED FOR HOURS"
EXIT
QS62
02M
IS BUD-EST FLAG = 0 ?
NO
02N
YES
SET BEGINNING OF ESTIMATE BLOCK OF UDC CODE
QS94
03A
02N
SET BEGINNING OF BUDGET BLOCK OF UDC CODE
QS94
03A


03A
PLACE VALUES IN BLOCK STARTING IN Q592+1
QFLD
ADJUST LOC. OF FILE BLOCK BY ADDING 6X(3RD CODE) TO START LOC.
QS64
SET FOR PROCESSING FIRST VALUE
QS63A
03B
IS VALUE BLANK?
YES
03C
NO
PLACE VALUE IN FILE
03C
SET NEXT VALUE. SET NEXT LOCATION IN FILE
HAVE 6 VALUES BEEN PROCESSED?
NO
03B
YES
EXIT
QS65
030
CHECK "HOURS-UNITS" INDICATOR
ZERO/BLANK
03F
"U"
02M
OTHER
PRINT: "THIS RESOURCE CODE IS RESERVED FOR UNITS"
EXIT
QS65A
03E
SET "HOURS-UNITS" INDICATOR TO "H"
02M
QS65D
03F
SET "HOURS-UNITS" INDICATOR TO "U"
02M
QS66
03G
ARE THE UNIT RATES IN QRTBL ALL=0?
YES
02M
NO
PRINT: "DOLLAR INPUT FOR RESOURCE CODE WITH UNIT RATE."
EXIT
QS67
03H
ARE THE OVHD RATES IN QRTBL ALL=0?
YES
02M
NO
PRINT: "TOTAL DOLLAR INPUT FOR RESOURCE CODE WITH OVHD RATE."
EXIT


QFLD
START
SET FOR PROCESSING FIRST VALUE
04A
QF08
IS FIELD =0?
YES
04C
NO
IS FIELD BLANK?
YES
04D
NO
CONVERT FIELD TO BINARY AND SAVE
FIXPT
04B
SET NEXT FIELD FOR PROCESSING
HAS 6TH FIELD BEEN PROCESSED?
NO
04A
YES
04E
04C
QF10
STORE ZEROS AND SAVE
04B
04D
QF11
STORE BLANKS AND SAVE
04B
04E
QF12
IS MAN MONTH INDICATOR =0?
YES
EXIT
NO
CONVERT VALUES TO MAN-MONTHS
EXIT

Region QSVN5

EXPLANATION OF REGION:

This region will operate on all the 7-5 cards that are to be processed by the system.

CALLING SEQUENCE:

L	TSX QSVN5, 4
L+1	Normal return

INPUT:

A 7-5 type input card from the SORTED DATA TAPE.

OUTPUT:

The 7-5 information set into the UPUN or QRES2 records in core.

STORAGE USED:

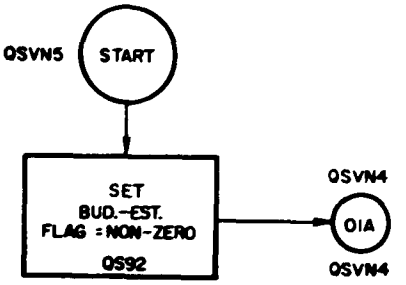
Not applicable.

SUBREGIONS AND SUBROUTINES USED:

Not applicable.

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


QSVN5
START
SET
BUD.-EST.
FLAG = NON-ZERO
QS92
QSVN4
O1A
QSVN4

Region SETUP

EXPLANATION OF REGION:

This region will set up the proper channels on the sort tapes for the output pre processing using the 4-tape sort.

CALLING SEQUENCE:

```
L      TSX  SETUP, 4
L+1    Normal return
```

INPUT:

Not applicable.

OUTPUT:

Proper setup of sort tapes.

STORAGE USED:

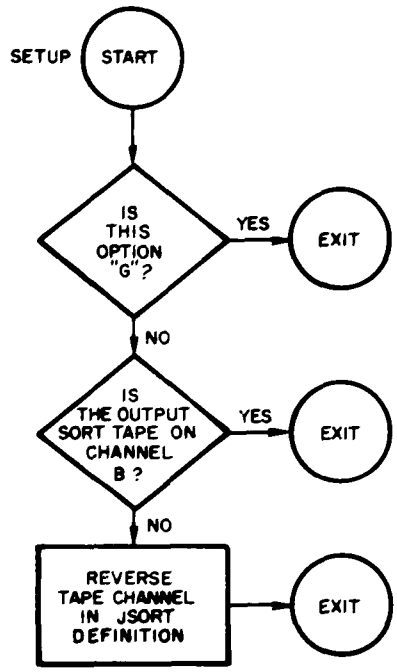
Not applicable.

SUBREGIONS AND SUBROUTINES USED:

Not applicable.

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


SETUP
START
IS THIS OPTION "G"?
YES
EXIT
NO
IS THE OUTPUT SORT TAPE ON CHANNEL B ?
YES
EXIT
NO
REVERSE TAPE CHANNEL IN JSORT DEFINITION
EXIT

Region QSRTB

EXPLANATION OF REGION:

This routine will set up the working rate table to be used in extending rates into QRES2. This table will be set up at core location QRTBL and QRTB2.

CALLING SEQUENCE:

L TSX QSRTB, 4

L+1 Normal return

INPUT:

The rate table at RTBAR.

OUTPUT:

A working rate table for a particular Performing Unit/Resource Code combination at QRTBL and QRTB2.

STORAGE USED:

QRTBL - 64 words - the unit and overhead rates for a particular month tied to charge number start date.

QRTB2 - 64 words - the scaling indicator for the unit rate.

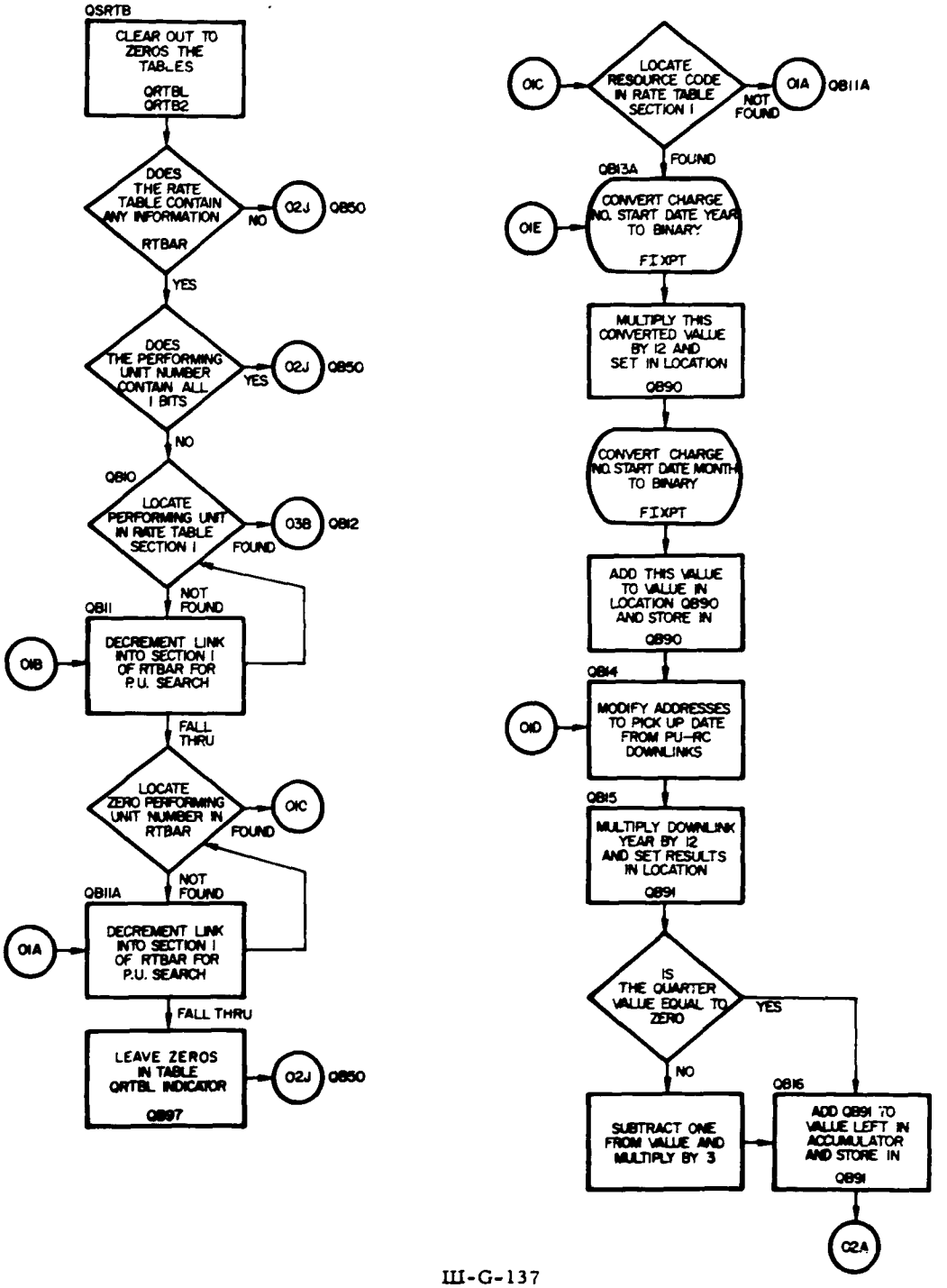
SUBREGIONS AND SUBROUTINES USED:

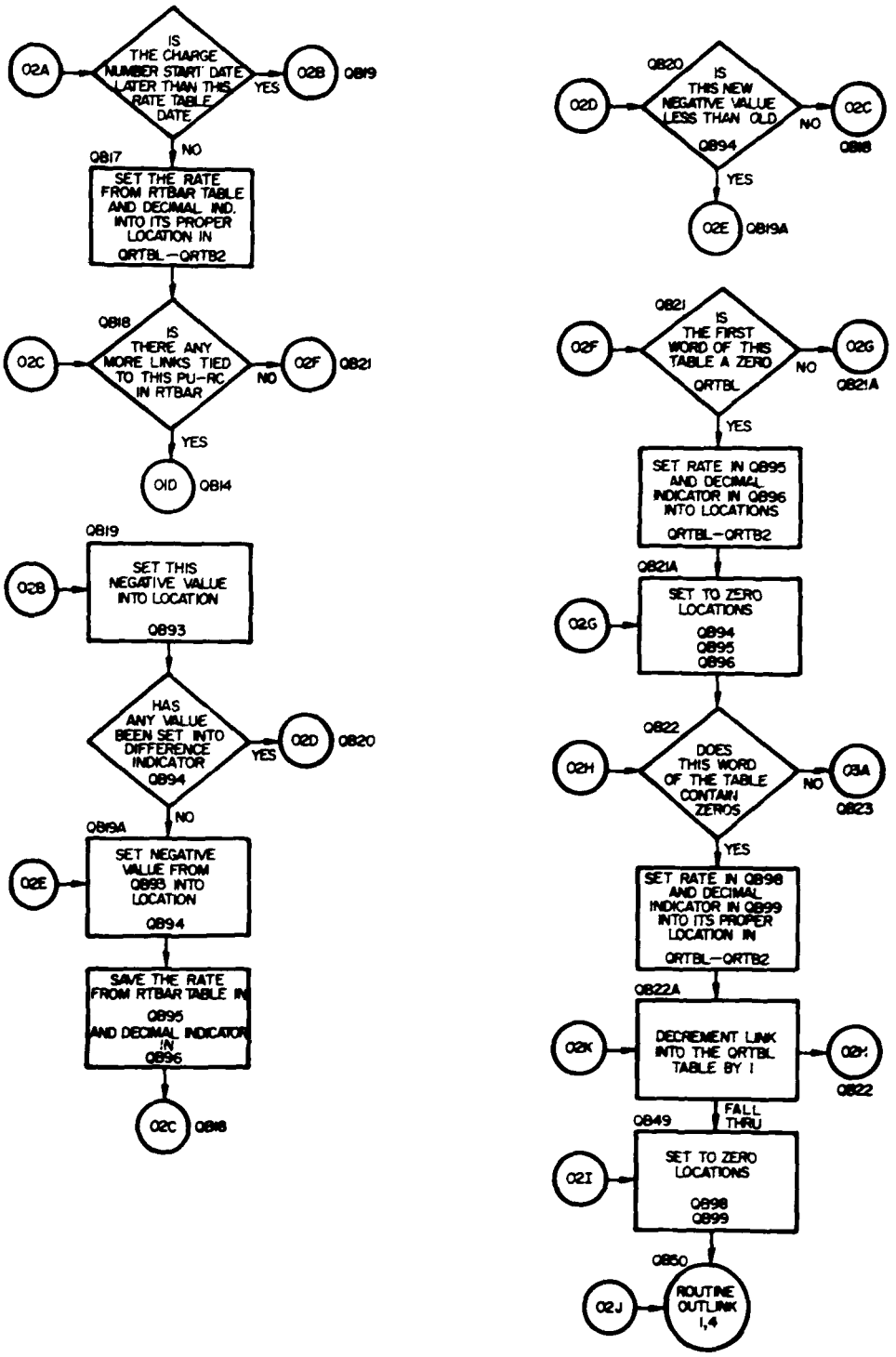
FIXPT

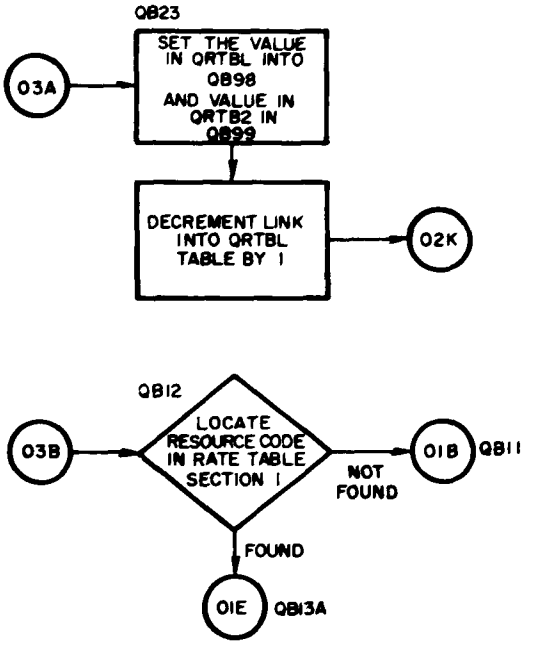
EXPLANATION OF CALLING SEQUENCE:

Not applicable.

SET UP RATE TABLE
FOR A PU-RC USAGE




02A
IS THE CHARGE NUMBER START DATE LATER THAN THIS RATE TABLE DATE
YES
02B
QB19
NO
QB17
SET THE RATE FROM RTBAR TABLE AND DECIMAL IND. INTO ITS PROPER LOCATION IN ORTBL-ORTB2
02C
QB18
IS THERE ANY MORE LINKS TIED TO THIS PU-RC IN RTBAR
NO
02F
QB21
YES
01D
QB14
02B
QB19
SET THIS NEGATIVE VALUE INTO LOCATION QB93
HAS ANY VALUE BEEN SET INTO DIFFERENCE INDICATOR QB94
YES
02D
QB20
NO
02E
QB19A
SET NEGATIVE VALUE FROM QB93 INTO LOCATION QB94
SAVE THE RATE FROM RTBAR TABLE IN QB95 AND DECIMAL INDICATOR IN QB96
02C
QB18
02D
QB20
IS THIS NEW NEGATIVE VALUE LESS THAN OLD QB94
NO
02C
QB18
YES
02E
QB19A
02F
QB21
IS THE FIRST WORD OF THIS TABLE A ZERO ORTBL
NO
02G
QB21A
YES
SET RATE IN QB95 AND DECIMAL INDICATOR IN QB96 INTO LOCATIONS ORTBL-ORTB2
02G
QB21A
SET TO ZERO LOCATIONS QB94 QB95 QB96
02H
QB22
DOES THIS WORD OF THE TABLE CONTAIN ZEROS
NO
03A
QB23
YES
SET RATE IN QB98 AND DECIMAL INDICATOR IN QB99 INTO ITS PROPER LOCATION IN ORTBL-ORTB2
02K
QB22A
DECREMENT LINK INTO THE ORTBL TABLE BY 1
02I
QB22
FALL THRU
02I
QB49
SET TO ZERO LOCATIONS QB98 QB99
02J
QB50
ROUTINE OUTLINK 1,4


QB23
SET THE VALUE IN QRTBL INTO QB98 AND VALUE IN QRTB2 IN QB99
03A
DECREMENT LINK INTO QRTBL TABLE BY 1
02K
QB12
LOCATE RESOURCE CODE IN RATE TABLE SECTION 1
03B
NOT FOUND
01B
QB11
FOUND
01E
QB13A

Cost Update Tape and Table Layouts

The following tape and table layouts will illustrate the manner in which the cost update phase will operate.

PERT COST MASTER FILE Tape Layout

The PERT Cost data is actually the second file on this physical tape, the first being the SECONDARY MASTER TAPE. The data carried on this second file consists of a rate table and a skill table, both preceded by a label, and a data file, also preceded by a label (see Fig. III-G-9). This file is written in a binary mode.

The rate table label is one record of 6 words, which is followed by the rate table record of 4003 words. This table is the first item on the PERT COST MASTER TAPE and will contain no checksum, since it is a fixed-length write. The date in the label refers to the last update cycle date for cost data processing.

The skill table label is one record of 6 words, which is followed by the skill table record of 1080 words. This table is the second item on the PERT COST MASTER TAPE and will contain no checksum, since it is a fixed-length write. The date in the label refers to the last update cycle date for cost data processing.

The charge or summary number data file label is made up of two records. One is the label name, date, and tape number; the other is the program name. These labels will contain no checksum, since they are a fixed-length write. Following the labels will be the data records in blocks up to 600 words. These records, since they are variable and written by the Writer routine (Page IV-G-1), will contain a count record and a checksum.

Each charge or summary number record will begin with a type 1 record in bits S through 2. This is the fixed-portion data of this number and will relate to all of the following Performing Unit Resource Code combinations, if any. This fixed portion record will always contain a word count, preceding

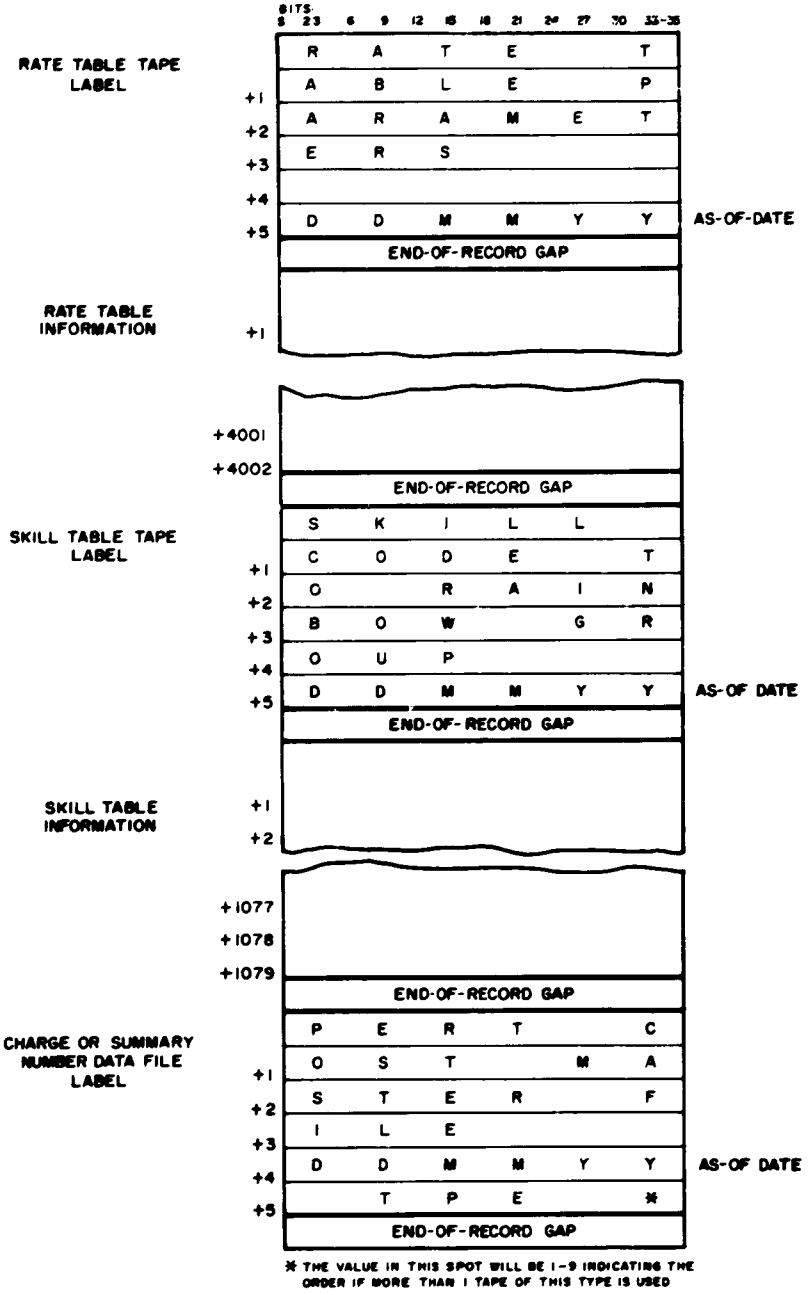


Fig. III-G-9. Physical Layout of PERT COST MASTER

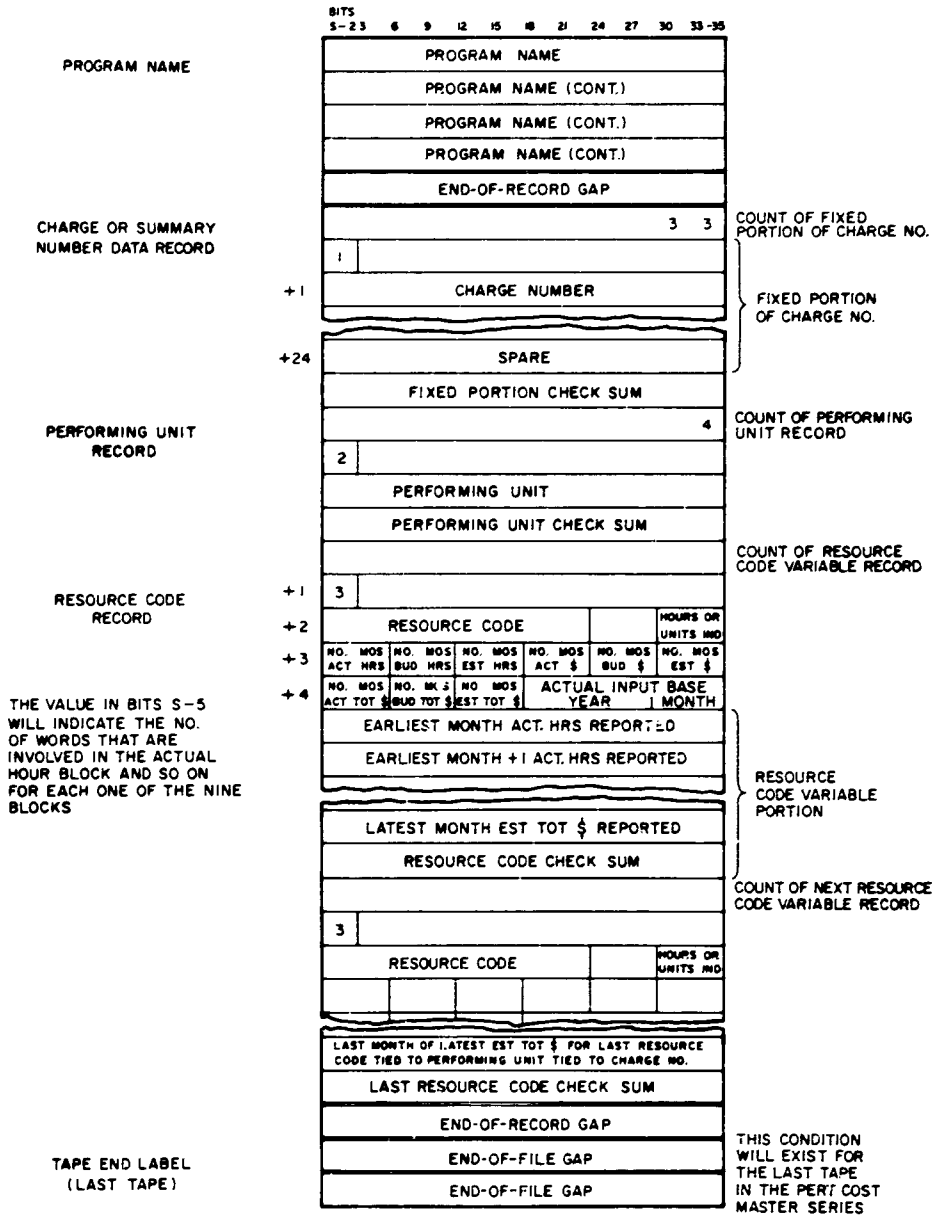


Fig. III-G-9. Physical Layout of PERT COST MASTER (Continued)

the code 1 word, of an octal 33, indicating there are 27 decimal words in this logical record including the count and checksum.

If the charge or summary number contains a Performing Unit/Resource Code combination, the record following the fixed portion changes is a performing unit record. This record may have one or many resource codes tied to it, but in either case it will appear only once in front of all of its tied resource codes. This performing unit record will always contain a word count of 4 in bits S through 2 preceding the code 2, indicating there are 4 words in this logical record including the count and checksum.

The resource code record is the lowest level of record on the PERT COST MASTER TAPE and varies in size according to the number of months that carry costs. This records count will vary from a minimum of 6 to a maximum of 573 and in the word following the count will be a 3 code in bits S through 2 to signify a resource code record. An indicator is carried in the word following the 3 code, in the sixth character, to signify whether hours or units are carried by this resource code. An "H" will signify hours and a "U" will mean units. The information following this code in the +3 and +4 words will indicate the number of words that are involved with each one of the nine blocks that is associated with this data. Each of the nine blocks will contain a number from 0 to octal 77, indicating the number of months that carry costs for that particular field. The variable portion of the resource code will be made up by packing the number of words carried in each one of the blocks, starting with actual hours and ending with estimated total dollars. The actual input base date in the +4 word will contain the BCD year in characters 4 and 5 and the month in octal in character 6. Following each resource code logical record will be a checksum.

PERT Cost Charge Number, Performing Unit, and Resource Code Table Layouts

These record layouts will show the 3 types of records making up the PERT Cost data file. They will show in detail the information carried as well as

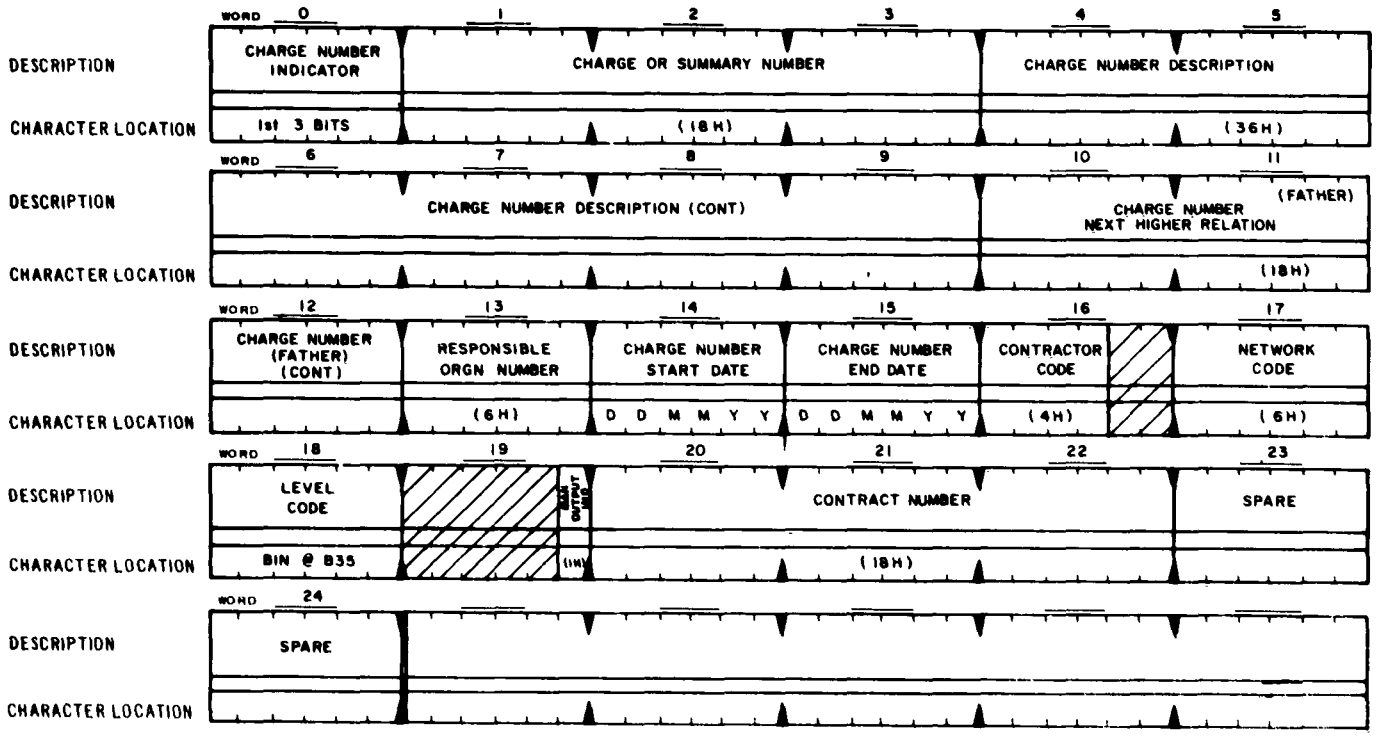


Fig. III-G-10. Tape Format of Charge or Summary Number Fixed-Portion Record (UCHG)

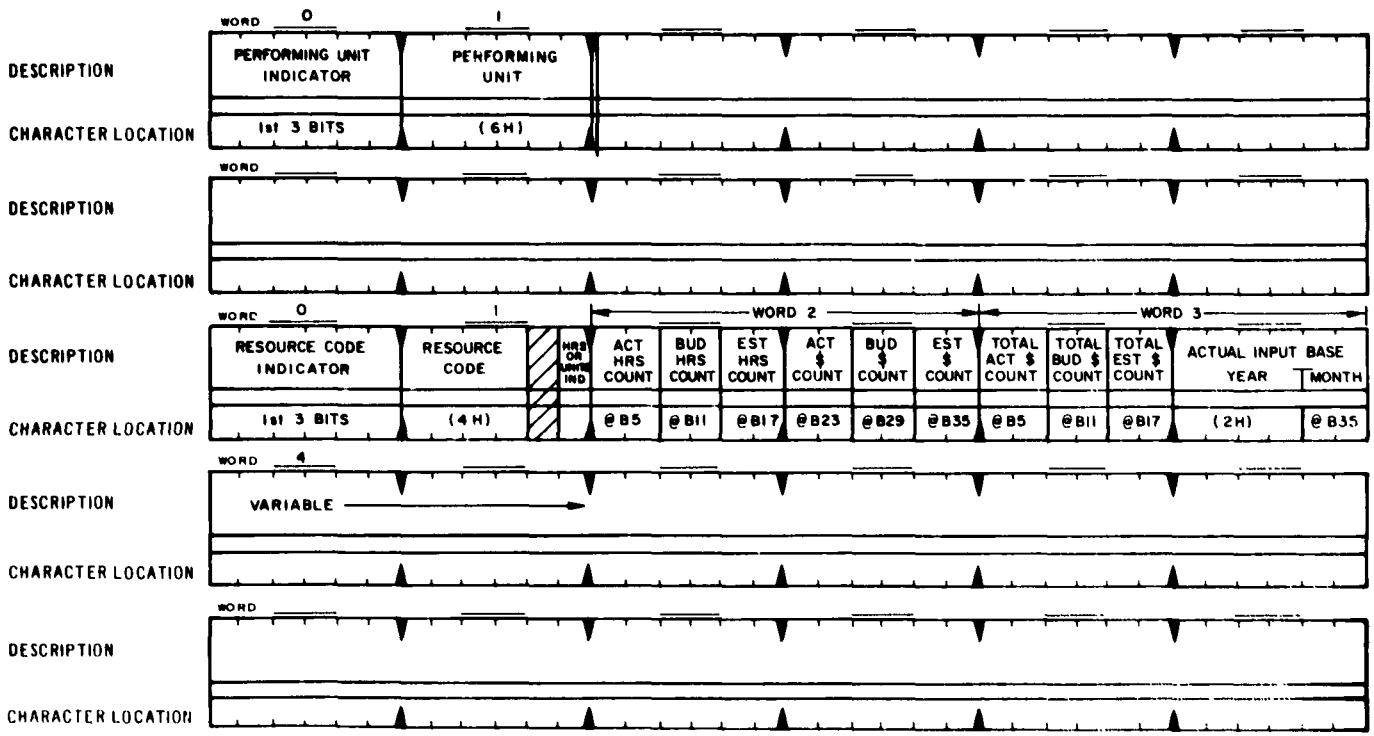


Fig. III-G-11. Tape Format of QRES2 and QRES1 Logical Records on PERT COST MASTER

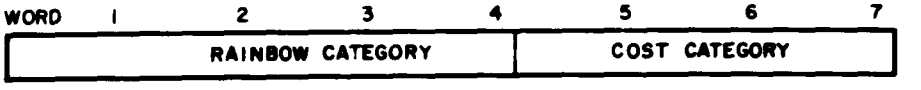
the position in the record of this data. Figure III-G-10 is the record format for the charge number fixed-portion data, and is carried in core at location UCHG. Figure III-G-11 shows the detail record layouts for both the performing unit and resource code indicators which would be carried in core at UPUN and QRES2, respectively.

Resource Code Tables in Core

The record area in the QRES2 Table (Fig. III-G-12) is the working area for the resource code. Each of the nine fields is set up to its maximum and the packed data from the OLD PERT COST MASTER is unpacked into its respective field. The actual data is shifted in this record relative to a change in the actual base date, and the rate extensions are made in this table, where applicable, for the budgets and estimates. When 7-3, 7-4, or 7-5 input for this resource code is processed from the SORTED DATA TAPE, the changes will be made in the QRES2 Table. At the completion of all inputs for this table the data is packed again and set out onto QRES 1 (Figure III-G-13) to be written on the NEW PERT COST MASTER TAPE.

Rainbow Category and Cost Category Record

This record will contain the rainbow category and cost category related to a particular resource code. It will be set up in core location RCMC in the following format.



RECORD RCMC

Working Rate Table

The working rate table is created for a particular Performing Unit/ Resource Code or resource code combination related to the charge number start date. This table will set up the rates carried in the rate table at

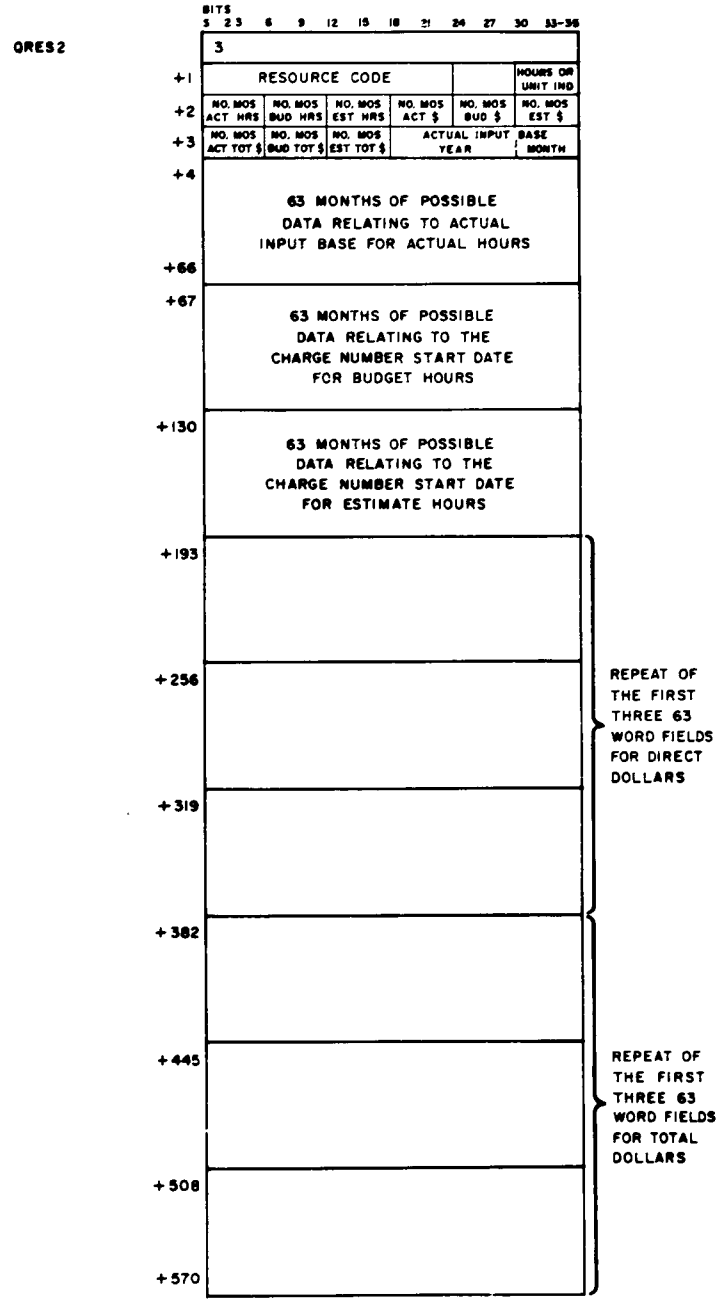


Fig. III-G-12. Physical Layout of QRES2 Table

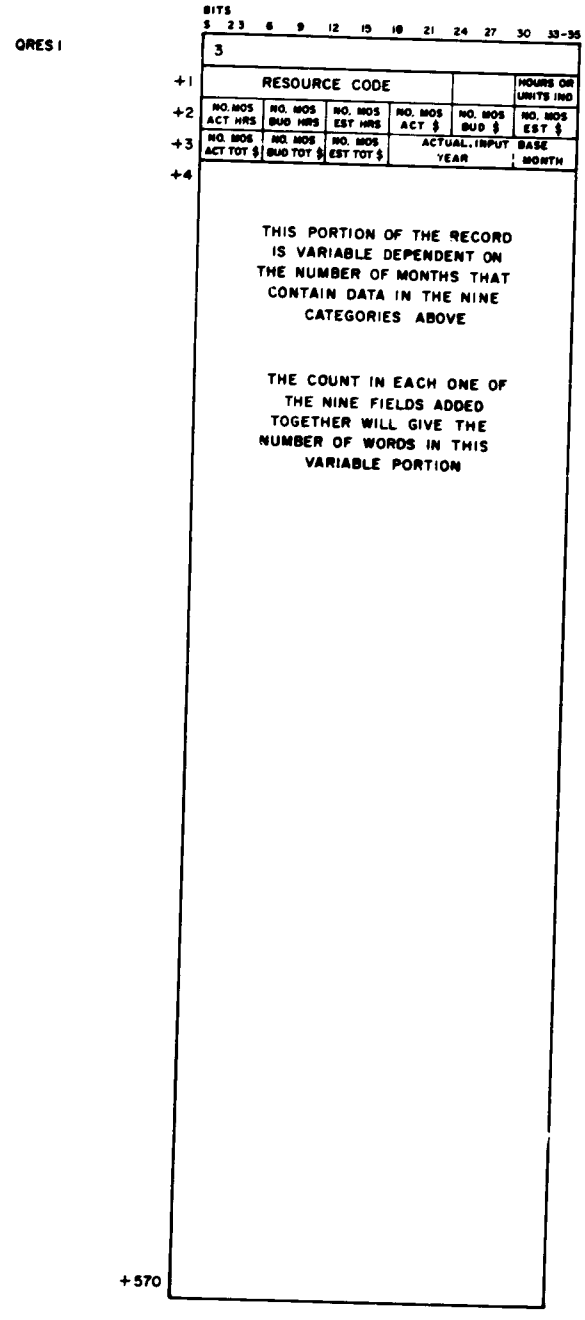


Fig. III-G-13. Physical Layout of QRES1 Table

RTBAR, if any, for 63 individual months from the charge number start date. The program will use this working rate table to make all rate extensions that are needed. This table will be located in core at QRTBL and QRTB2. If the rate information for unit and overhead rates are in the RTBAR Table, the table at QRTB2 will contain the rates in the same format as the RTBAR Table. The only difference will be that the rates in the QRTBL Table refer to a month period. If there are no rates for a particular resource code, this table will contain zeros. The table at QRTB2 will contain the scaling factor for the unit rates that relate to a respective month. Both of these tables will be 63 words in length.

III-H PRE-REPORTING PHASE

All the information from the Update Phase is input to the Pre-Reporting Phase. This includes the Updated PERT Cost master file items and the information selected from the User's PERT Time tape.

Input of PERT Time Record

To input a record from the PERT Time tape, the following calling sequence is used:

```
L       TSX    JM00, 4
L + 1   PZE    L, 1, C
L + 2   Normal return
```

where the "1" indicates a time record, "L" is the location of the record, and "C" is the count. This information is used to create a Work Package/Activity Report record to be given to the JSORT routine. The information is also used to generate a Pseudo Time record for the charge number contained in the UCHG block. The Pseudo Time record is the summarized information of all the activities connected to the specific charge number.

Input of Complete PERT Cost Item

To input a complete PERT cost item (charge number, performing organization, and resource code information), the following calling sequence is used:

```
L       TSX     JM00, 4
L + 1   PZE     L, 0, C
L + 2   Normal return
```

where the "0" indicates a PERT cost item, and "L" and "C" are the location and count of the resource code information. The charge number information will be found in UCHG, the performing organization will be in UPUN, the rainbow category and cost category in RCMC, and the Pseudo-Time information in UTIME. This information will generate the Type 3, Type 4, Type 5, and Type 6 records of the JSORT routine.

Input of Partial PERT Cost Item

To input a partial PERT Cost item (only charge number information is available), the following calling sequence will be used:

```
L       TSX     JM00, 4
L + 1   PZE     0, 2, 0
L + 2   Normal return
```

where the "2" denotes a partial PERT Cost item. The charge number information will be found in UCHG, the Pseudo Time information in UTIME, and no performing organization, resource code, rainbow category, or cost category information is available. This information will generate the Type 3, 4, 5, and 6 records for JSORT.

End of Data Condition

When all the PERT Cost information has been processed, control is given to the Pre-Reporting Phase with the following calling sequence:

```
L       TSX     JM00, 4
L + 1   PZE     0, 0, 0
```

where all zeros indicate the end-of-data condition. A cleanup is performed in the Pre-Reporting Phase and control is then given to the JSORT routine, where the information is sorted for input into the Intermediate Reporting Phase.

Option C or E Condition

If the program is run under option "C" or "E", only Report 1 information is generated. On the end of data condition, the information is sorted and transferred to the Intermediate Reporting Phase.

Pre-Reporting Phase Region Descriptions

(See following pages.)

Region JM00

EXPLANATION OF REGION:

To set up information for Work Package/Activity reports (1 and 2), Christmas Tree routine, and Reporting master file.

CALLING SEQUENCE:

L	TSX	JM00, 4
L + 1	PZE	L, F, C
L + 2	Normal return	

INPUT:

UCHG - Charge number information

UPUN - Performing organization information

L, 0, C - Resource code information location

L, 1, C - Individual time record location

OUTPUT:

Reports 1 and 2 to JSORT.

Type 3, 4, 5, 6 records to JSORT.

UTIME - Pseudo-time information

STORAGE USED:

Not applicable

SUBREGIONS AND SUBROUTINES USED:

JN00	JSORT
JP00	JX00
JR00	

EXPLANATION OF CALLING SEQUENCE:

L = location of 1st word of block of information

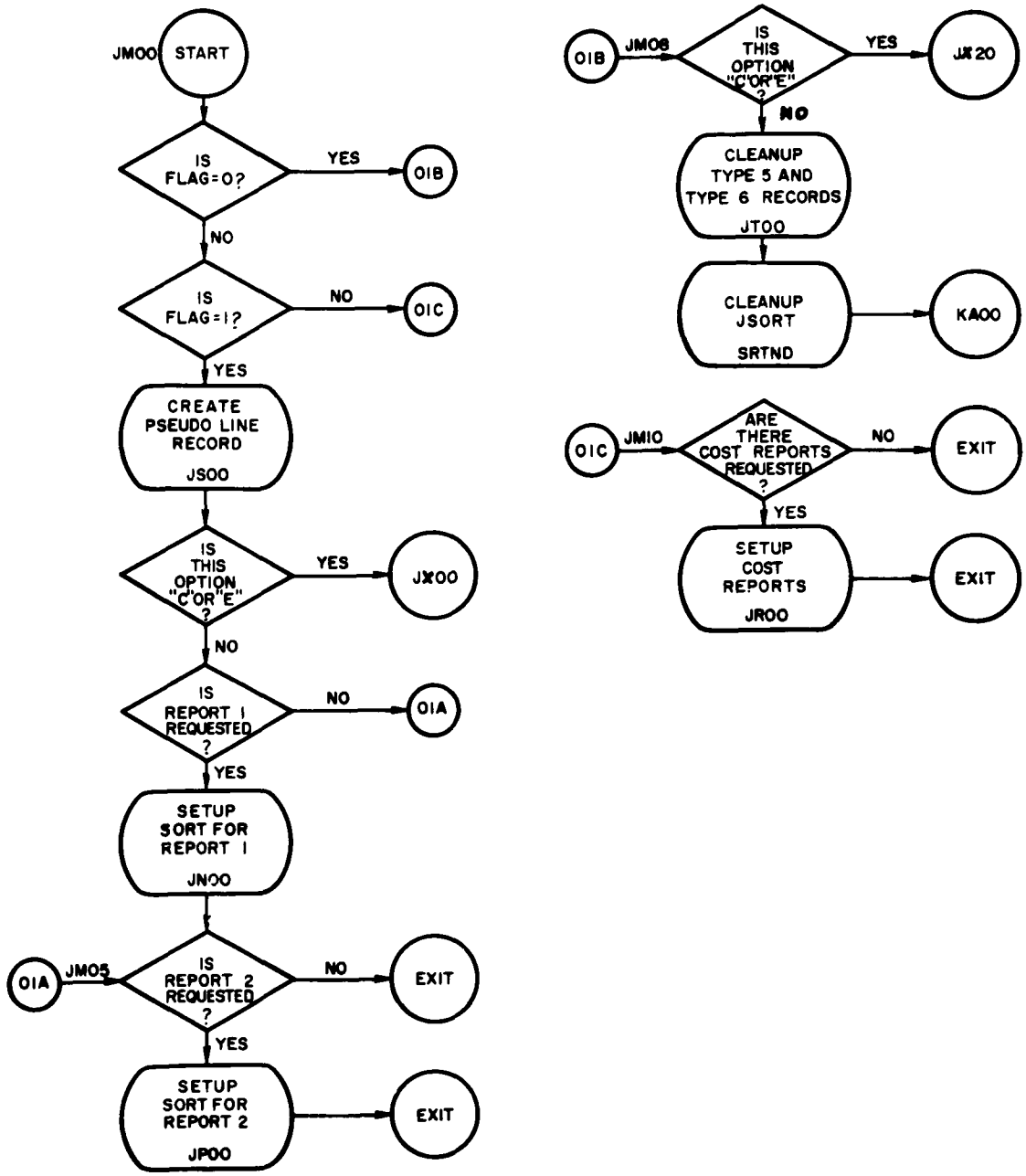
C = count of the number of items in block

F = 0: L and C refer to resource code

= 1: L and C refer to individual time record

= 2: No resource code information available

If L, C, and F are all zero, the end-of-data is indicated


JM00
START
IS FLAG=0?
YES
01B
NO
IS FLAG=1?
NO
01C
YES
CREATE PSEUDO LINE RECORD
JS00
IS THIS OPTION "C'OR'E" ?
YES
JX00
NO
IS REPORT 1 REQUESTED ?
NO
01A
YES
SETUP SORT FOR REPORT 1
JN00
01A
JM05
IS REPORT 2 REQUESTED ?
NO
EXIT
YES
SETUP SORT FOR REPORT 2
JP00
EXIT
01B
JM06
IS THIS OPTION "C'OR'E" ?
YES
JX20
NO
CLEANUP TYPE 5 AND TYPE 6 RECORDS
JT00
CLEANUP JSORT
SRTND
KA00
01C
JM10
ARE THERE COST REPORTS REQUESTED ?
NO
EXIT
YES
SETUP COST REPORTS
JR00
EXIT

Region JN00

EXPLANATION OF REGION:

To select information needed for producing Report 1 and give it to JSORT.

CALLING SEQUENCE:

```
L       TSX     JN00, 4
L + 1   Normal return
```

INPUT:

1. Time record information
2. Associated charge number information

OUTPUT:

Report 1 record

STORAGE USED:

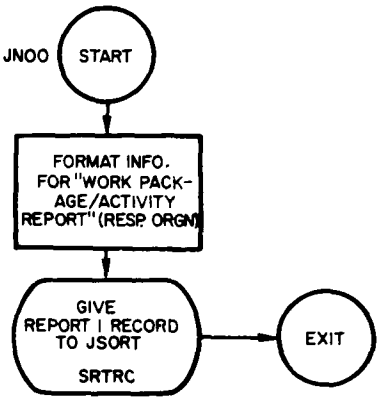
Not applicable

SUBREGIONS AND SUBROUTINES USED:

JSORT

EXPLANATION OF CALLING SEQUENCE:

Not applicable


JNOO
START
FORMAT INFO. FOR "WORK PACK-AGE/ACTIVITY REPORT" (RESP ORGN)
GIVE REPORT I RECORD TO JSORT
SRTRC
EXIT

RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 1

NAME OF RECORD REPORT 1

	WORD * 1	2	3	4	5	6
DESCRIPTION	REPORT NO.	RESPONSIBLE ORGN.	CHARGE NUMBER			PREDECESSOR EVENT
CHARACTER LOCATION	1@835	(6H)	(18H)			(9H)

	WORD 7	8	9	10	11	12
DESCRIPTION	PRED. EVENT (CONT.)	SUCCESSOR EVENT	CHARGE NUMBER			PREDECESSOR EVENT
CHARACTER LOCATION		(9H)	(18H)			(9H)

	WORD 13	14	15	16	17	18
DESCRIPTION	PRED. EVENT (CONT.)	SUCCESSOR EVENT		SCHED. EXP. COMPL. DATE	EXPECTED COMPL. DATE	SCHED. LATEST COMPL. DATE
CHARACTER LOCATION		(9H)		D D M M Y Y	D D M M Y Y	D D M M Y Y

	WORD 19	20	21	22	23	24
DESCRIPTION	LATEST COMPL. DATE	SCHED/ACTUAL COMPL. DATE	SCHEDULED FLOW TIME	EXPECTED FLOW TIME	SLACK	ACTIVITY DESCR.
CHARACTER LOCATION	D D M M Y Y	D D M M Y Y	WK x 10 @ 835	WK x 10 @ 835	WK x 10 @ 835	(54H)

	WORD 25	26	27	28	29	30
DESCRIPTION	ACTIVITY DESCRIPTOR (CONT.)					
CHARACTER LOCATION						

* FIRST 7 WORDS ARE FOR SORTING PURPOSES ONLY

Fig. III-H-1. Tape Format of Report 1 Record

RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 2

NAME OF RECORD REPORT 1 (CONT.)

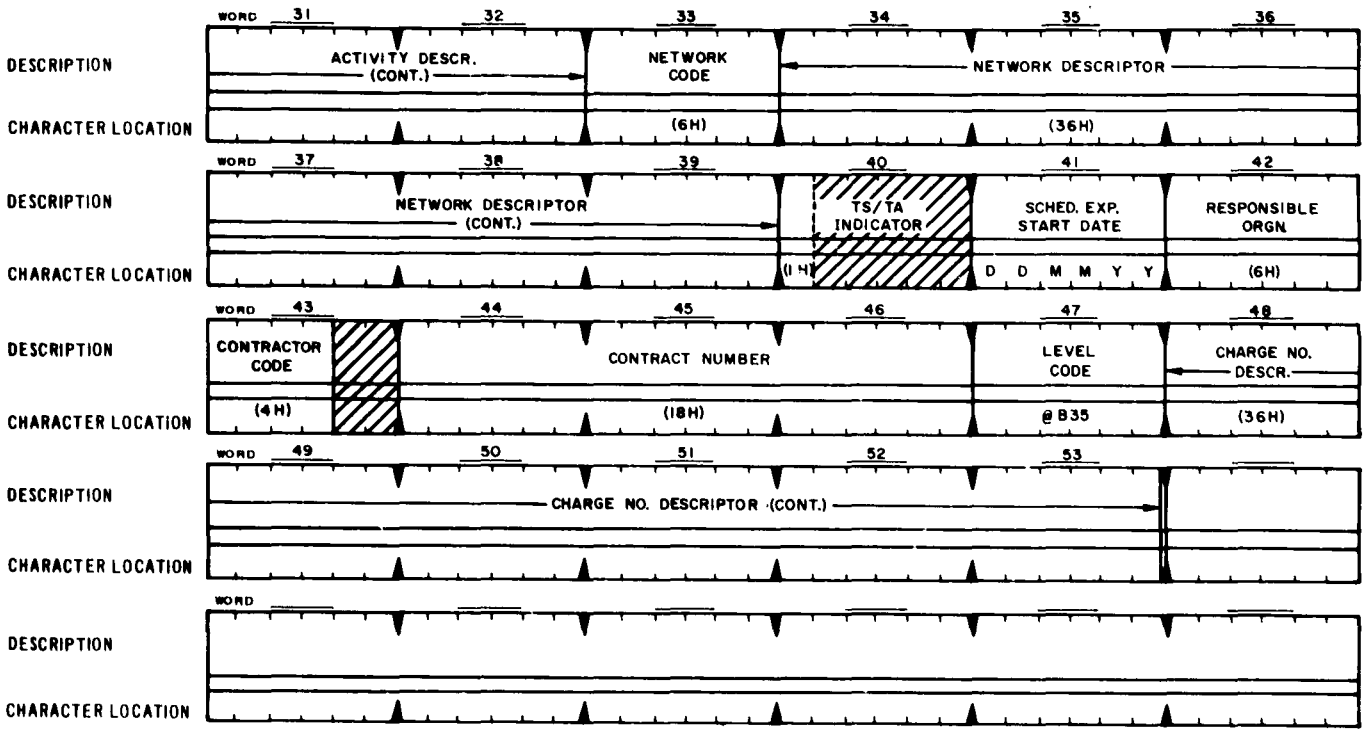


Fig. III-H-1. Tape Format of Report 1 Record (Continued)

Region JP00

EXPLANATION OF REGION:

To select information needed for producing Report 2 and give it to JSORT.

CALLING SEQUENCE:

```
L       TSX     JP00, 4
L + 1   Normal return
```

INPUT:

1. Time record information
2. Associated charge number information

OUTPUT:

Report 2 record

STORAGE USED:

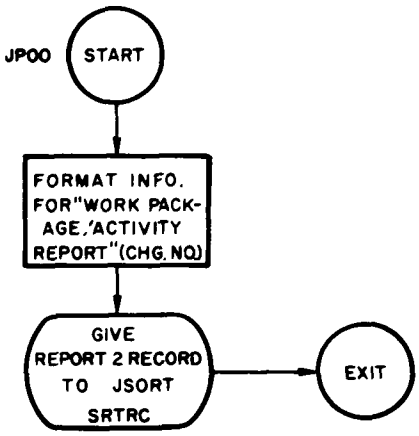
Not applicable

SUBREGIONS AND SUBROUTINES USED:

JSORT

EXPLANATION OF CALLING SEQUENCE:

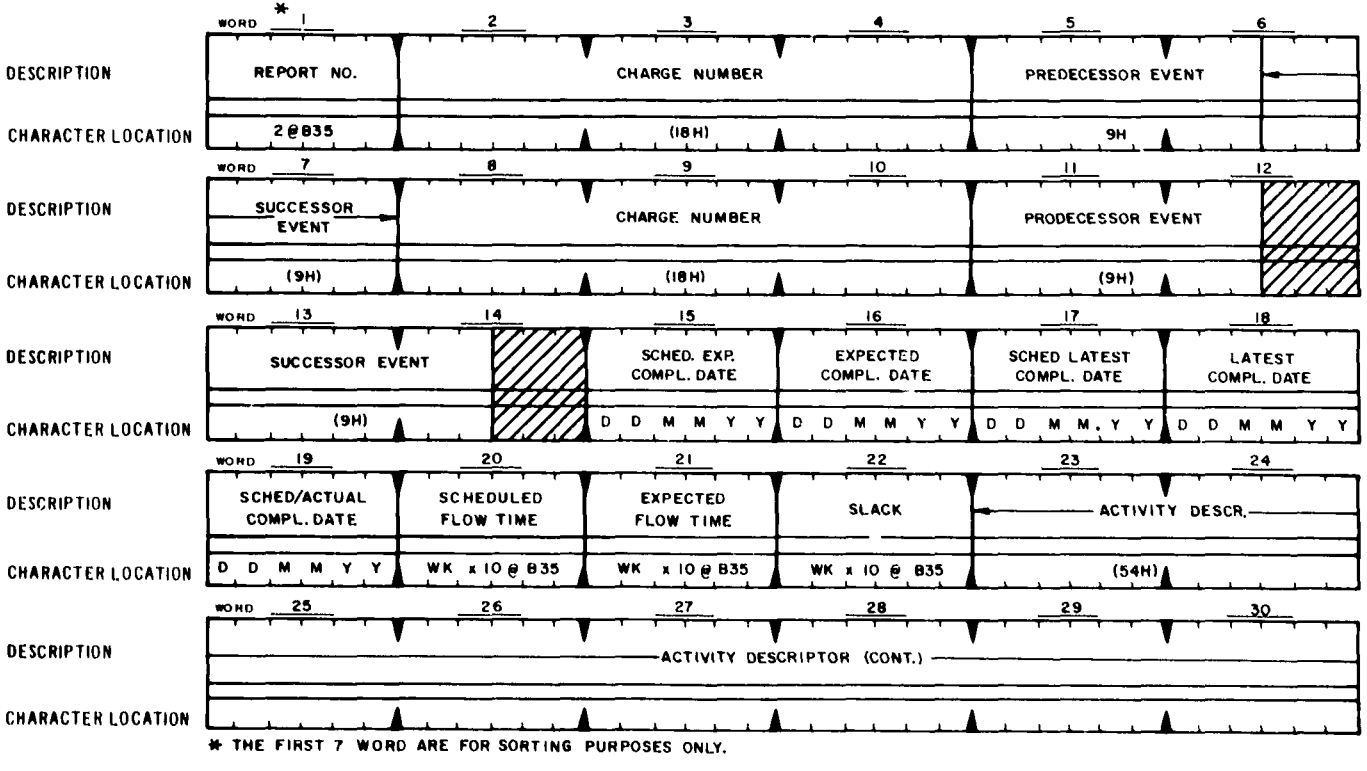
Not applicable


JP00
START
FORMAT INFO. FOR "WORK PACK-AGE, 'ACTIVITY REPORT" (CHG. NO)
GIVE REPORT 2 RECORD TO JSORT SRTRC
EXIT

RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 1

NAME OF RECORD REPORT 2



* THE FIRST 7 WORD ARE FOR SORTING PURPOSES ONLY.

Fig. III-H-2. Tape Format of Report 2 Record

RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 2

NAME OF RECORD REPORT 2 (CONT.)

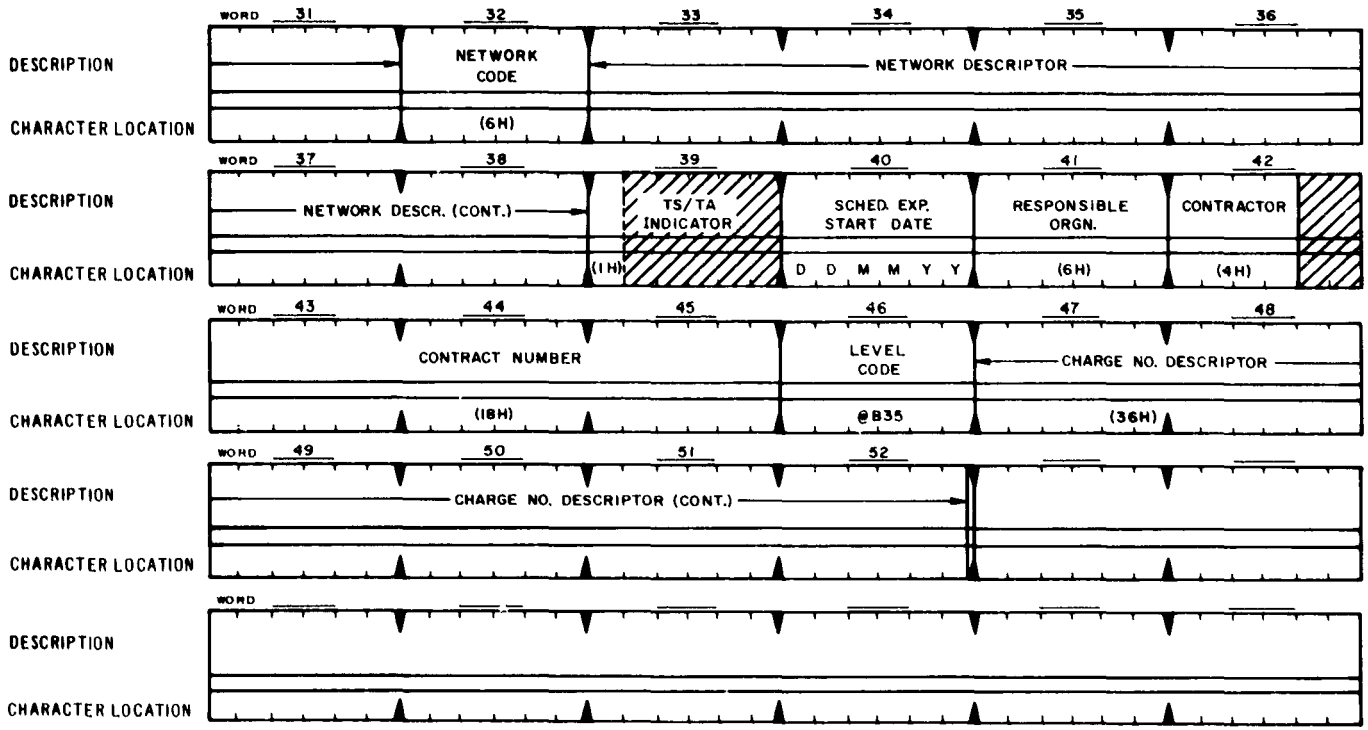


Fig. III-H-2. Tape Format of Report 2 Record (Continued)

Region JR00

EXPLANATION OF REGION:

To set up information for Christmas Tree routine and Reporting master file, and give it to JSORT.

CALLING SEQUENCE:

L	TSX	JR00, 4
L + 1	Normal return	

INPUT:

UCHG - Charge number information

UPUN - Performing organization information

QRES1 - Resource code information

UTIME - Pseudo-time information

OUTPUT:

Type 3, 4, 5, 6 records for JSORT

STORAGE USED:

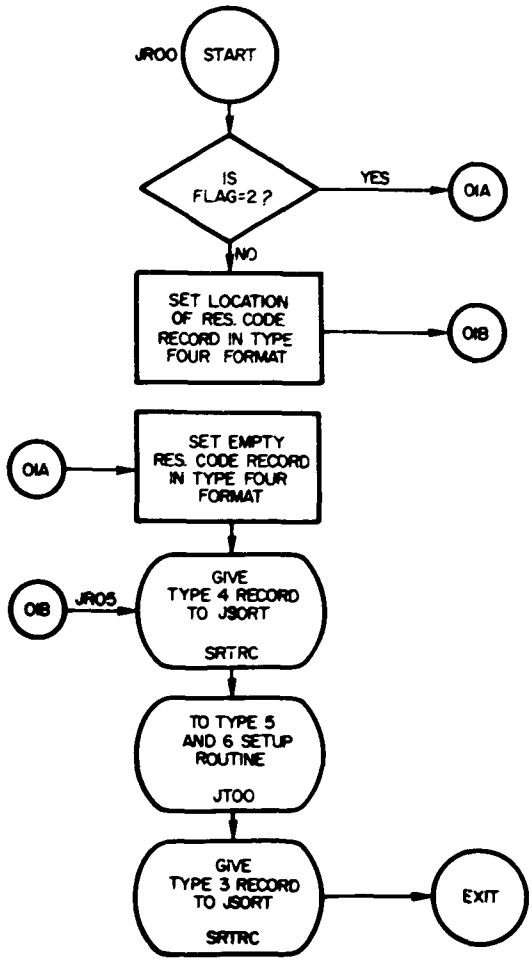
Not applicable

SUBREGIONS AND SUBROUTINES USED:

JSORT JT00

EXPLANATION OF CALLING SEQUENCE:

Not applicable


JR00
START
IS FLAG=2 ?
YES
01A
NO
SET LOCATION OF RES. CODE RECORD IN TYPE FOUR FORMAT
01B
01A
SET EMPTY RES. CODE RECORD IN TYPE FOUR FORMAT
01B
JR05
GIVE TYPE 4 RECORD TO JSORT
SRTRC
TO TYPE 5 AND 6 SETUP ROUTINE
JT00
GIVE TYPE 3 RECORD TO JSORT
SRTRC
EXIT

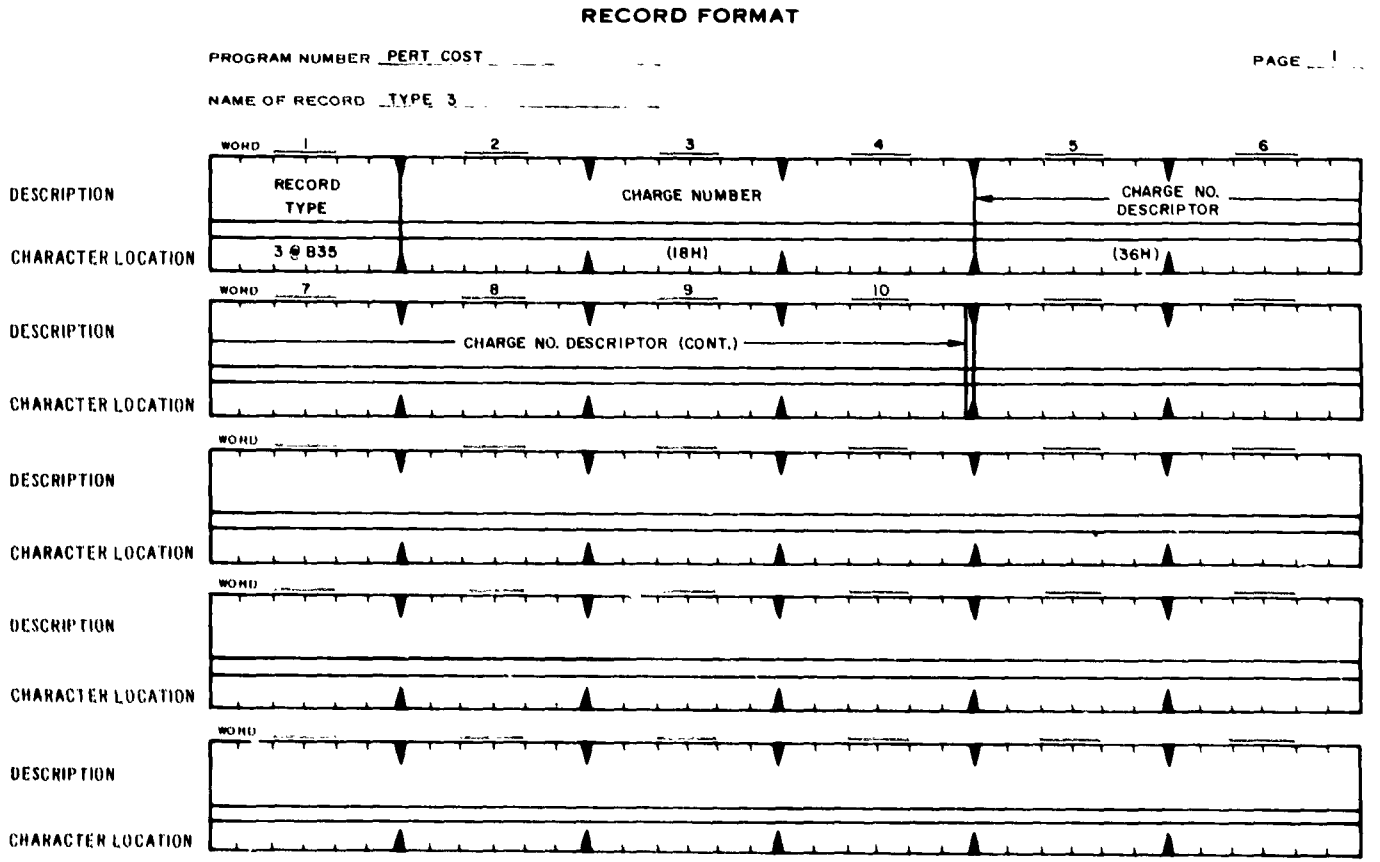


Fig. III-H-3. Tape Format of Type 3 Record

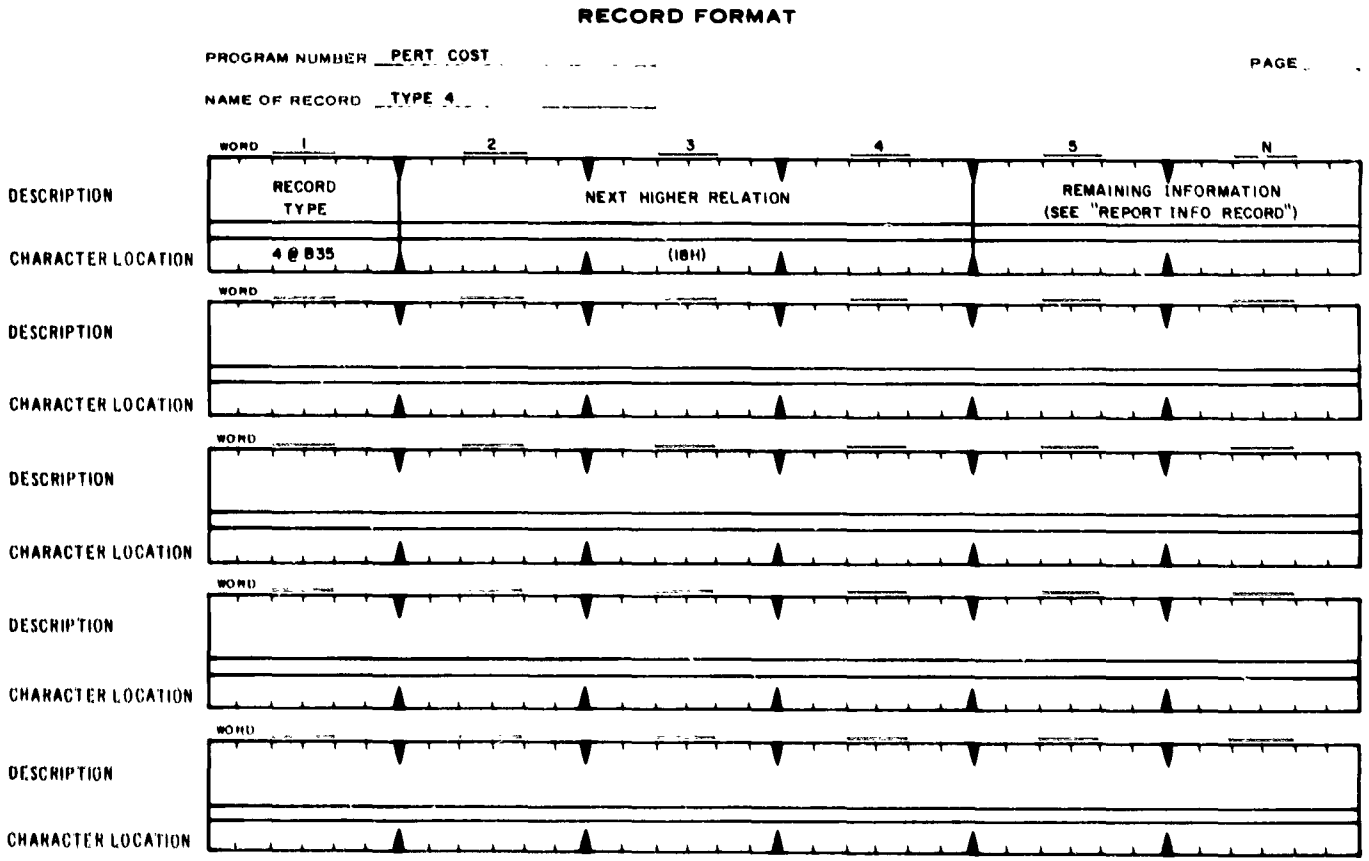


Fig. III-H-4. Tape Format of Type 4 Record

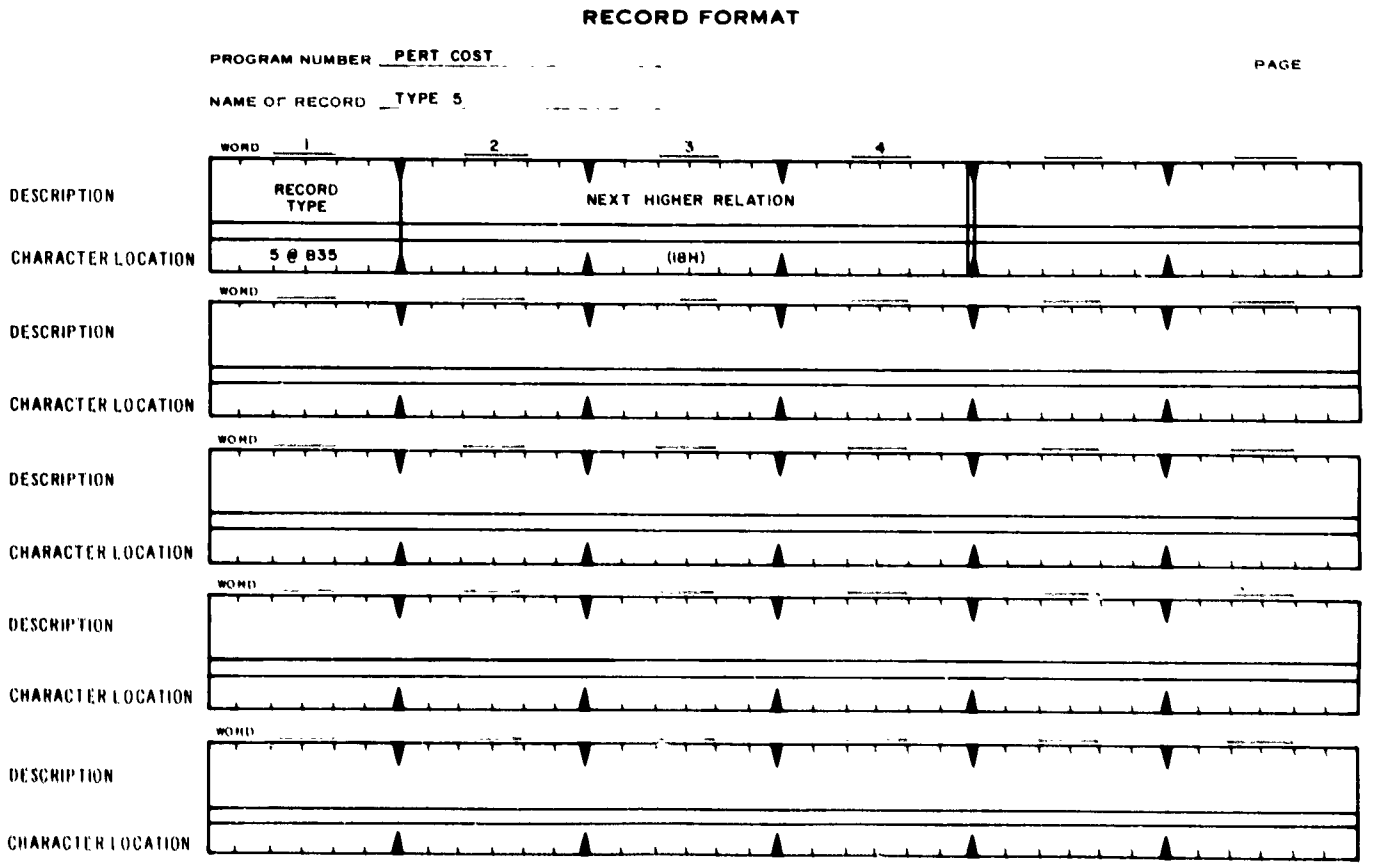


Fig. III-H-5. Tape Format of Type 5 Record

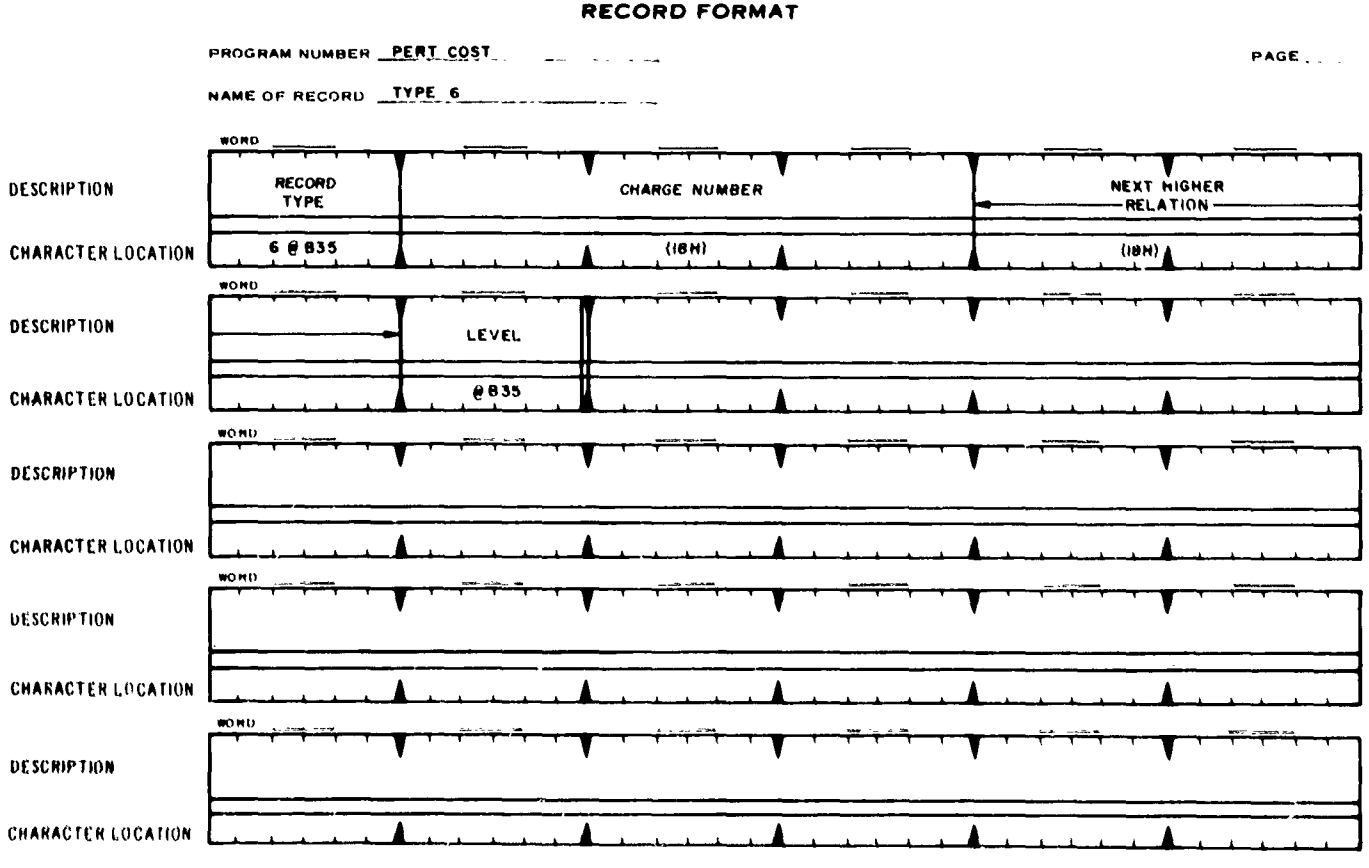


Fig. III-H-6. Tape Format of Type 6 Record

Region JS00

EXPLANATION OF REGION:

To create and update pseudo time-record.

CALLING SEQUENCE:

L	TSX	JS00, 4
L + 1	Normal return	

INPUT:

Address of JM900 contains start of time record.

OUTPUT:

Pseudo-time record starting in UTIME.

STORAGE USED:

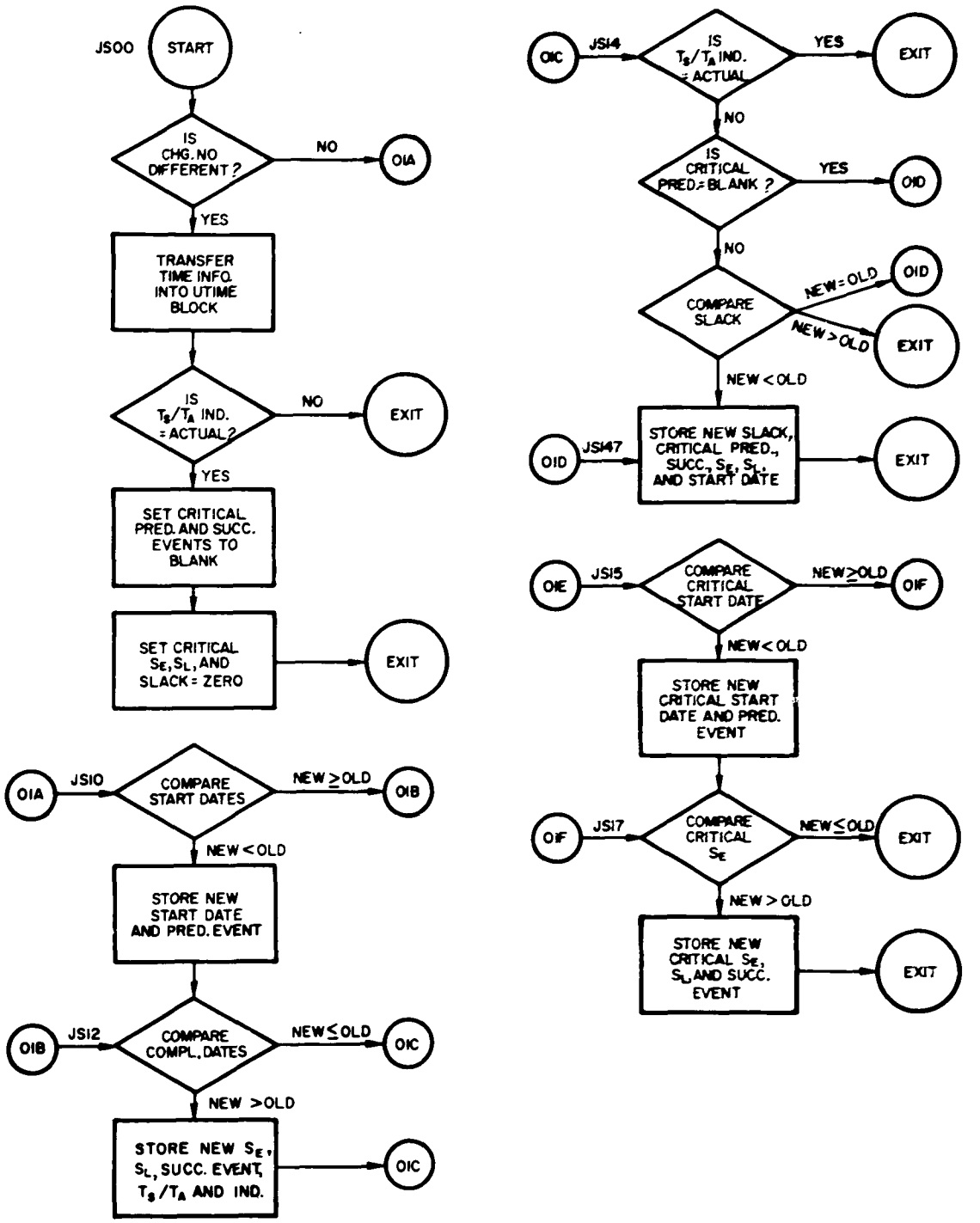
Not applicable

SUBREGIONS AND SUBROUTINES USED:

YDCMP YCOMP

EXPLANATION OF CALLING SEQUENCE:

Not applicable


JS00
START
IS CHG. NO DIFFERENT?
NO
01A
YES
TRANSFER TIME INFO. INTO UTIME BLOCK
IS T_S/T_A IND. = ACTUAL?
NO
EXIT
YES
SET CRITICAL PRED. AND SUCC. EVENTS TO BLANK
SET CRITICAL S_E, S_L, AND SLACK = ZERO
EXIT
01A
JS10
COMPARE START DATES
NEW ≥ OLD
01B
NEW < OLD
STORE NEW START DATE AND PRED. EVENT
01B
JS12
COMPARE COMPL. DATES
NEW ≤ OLD
01C
NEW > OLD
STORE NEW S_E, S_L, SUCC. EVENT, T_S/T_A AND IND.
01C
01C
JS14
IS T_S/T_A IND. = ACTUAL
YES
EXIT
NO
IS CRITICAL PRED. = BLANK ?
YES
01D
NO
COMPARE SLACK
NEW = OLD
01D
NEW > OLD
EXIT
NEW < OLD
01D
JS147
STORE NEW SLACK, CRITICAL PRED., SUCC., S_E, S_L, AND START DATE
EXIT
01E
JS15
COMPARE CRITICAL START DATE
NEW ≥ OLD
01F
NEW < OLD
STORE NEW CRITICAL START DATE AND PRED. EVENT
01F
JS17
COMPARE CRITICAL S_E
NEW ≤ OLD
EXIT
NEW > OLD
STORE NEW CRITICAL S_E, S_L, AND SUCC. EVENT
EXIT

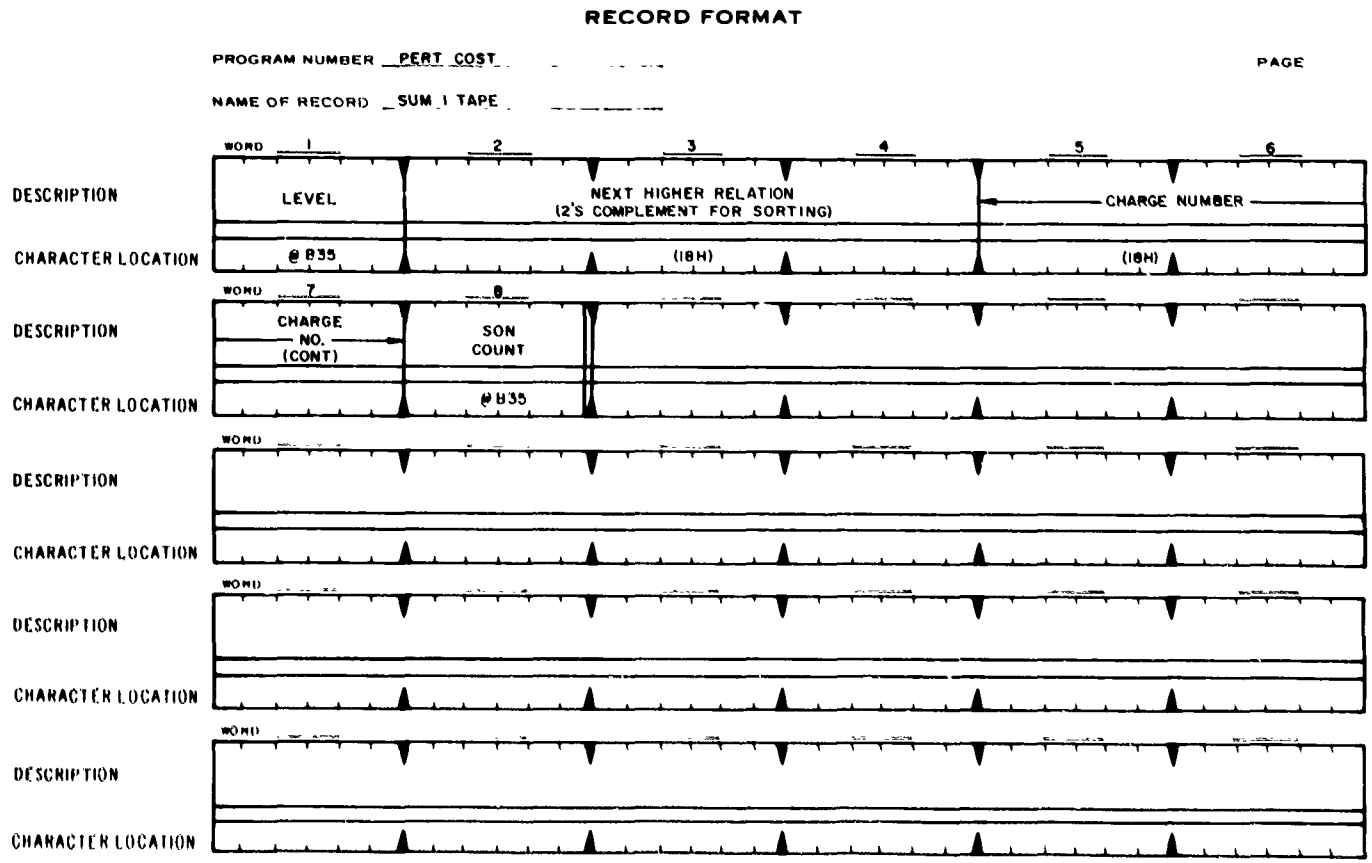


Fig. III-H-7. Tape Format of Pseudo Time Record

Region JT00

EXPLANATION OF REGION:

To set up Record Types 5 and 6 and give them to JSORT

CALLING SEQUENCE:

```
L       TSX     JT00, 4
L + 1   Normal return
```

INPUT:

UCHG - Charge number information

OUTPUT:

Types 5 and 6 records for JSORT

STORAGE USED:

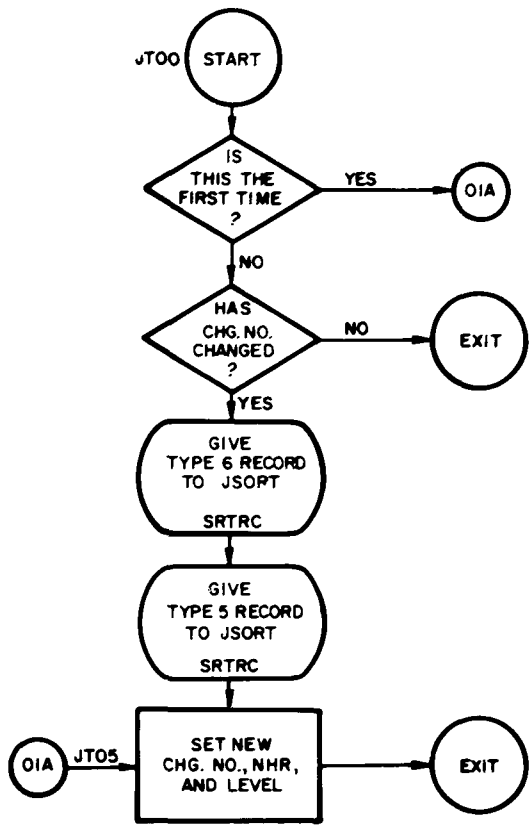
Not applicable

SUBREGIONS AND SUBROUTINES USED:

JSORT

EXPLANATION OF CALLING SEQUENCE:

Not applicable


JTOO
START
IS THIS THE FIRST TIME ?
YES
01A
NO
HAS CHG. NO. CHANGED ?
NO
EXIT
YES
GIVE TYPE 6 RECORD TO JSORT
SRTRC
GIVE TYPE 5 RECORD TO JSORT
SRTRC
01A
JT05
SET NEW CHG. NO., NHR, AND LEVEL
EXIT

Region JX00

EXPLANATION OF REGION:

To select information needed for producing Report 1. On end of data condition, sort the information and transfer control to Intermediate Reporting Phase.

CALLING SEQUENCE:

```
L       TRA     JX00
```

INPUT:

1. Time information
2. Associated charge number information

OUTPUT:

Report 1 record.

STORAGE USED:

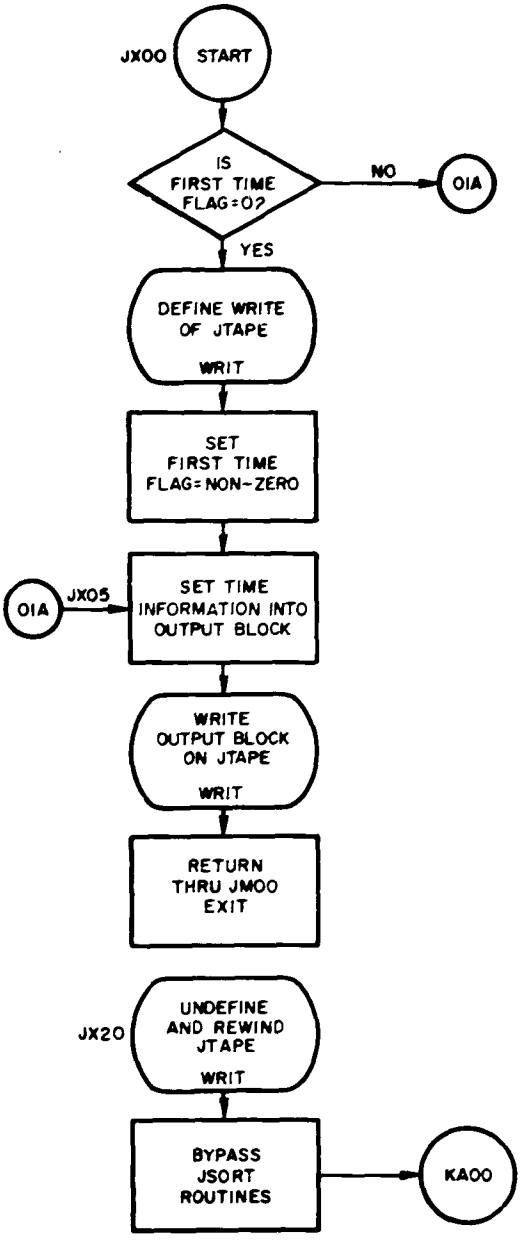
Not applicable

SUBREGIONS AND SUBROUTINES USED:

SORT

EXPLANATION OF CALLING SEQUENCE:

Not applicable


JX00
START
IS FIRST TIME FLAG=0?
NO
01A
YES
DEFINE WRITE OF JTAPE
WRIT
SET FIRST TIME FLAG=NON-ZERO
01A
JX05
SET TIME INFORMATION INTO OUTPUT BLOCK
WRITE OUTPUT BLOCK ON JTAPE
WRIT
RETURN THRU JM00 EXIT
JX20
UNDEFINE AND REWIND JTAPE
WRIT
BYPASS JSORT ROUTINES
KA00

III-I INTERMEDIATE REPORTING PHASE

In the Intermediate Reporting Phase the Work Package/Activity Reports (if requested) are generated on the output tape, the Christmas Tree Indicators for the Work Breakdown structure are generated, and the information necessary for the construction of the specified reports is gathered for input into the Final Reporting Phase.

No Reports or Time Reports Only

If no reports are selected, the processing will end in this phase with a message:

> THERE WERE NO REPORTS PRODUCED DURING THIS RUN

If only Work Package/Activity Reports were selected, processing will end after these reports are generated.

Option C or E

If running under the control of option "C" or "E", processing will end after Report 1 is generated (Work Package/Activity Report with responsible organization as the major sort item).

Insertion of Next Higher Relation Descriptor

Since the descriptor of the "next higher relation" of the charge number is not readily available from the PERT Cost master file, and is necessary in the generation of the reports, it must be inserted into the Report Information master file. This is accomplished by generating a list of charge numbers and their descriptors sorted in charge number order (Type 3 record) and merging them with their "next higher relation" counterparts in the Cost Report file sorted by "next higher relation" (Type 4 record). The Cost Report file is then sorted back into charge number order. The sorted Cost Report file will be referred to as the FILE 1 tape.

Christmas Tree Generation Routine

General Description

The "Christmas Tree" routine is a method by which each charge number or summary number in the Work Breakdown Structure can be related to all its predecessor charge numbers (father, grandfather, etc.) and to all its successor charge numbers (sons, grandsons, etc.). The Christmas Tree Indicators which will be created will enable cost and time information to be summarized up the levels of the Work Breakdown structure to the charge numbers at the indicated reporting levels.

Procedure

The Work Breakdown Structure of Fig. III-I-1 will be used to better illustrate the procedure necessary for the creation of the Christmas Tree Indicators. The charge number information, sorted with charge number major, will enter the routine as illustrated in Table III-I-1.

Table III-I-1

Data Sorted by Charge Number (Son)

Charge No. (Son)	Next Higher Relation (Father)	Level	Related Information
100	000	1	-
200	100	2	-
300	100	2	-
400	100	2	-
500	200	3	-
600	200	3	-
700	400	3	-
800	400	3	-
900	500	4	-
1000	600	4	-
1100	300	4	-
1200	800	4	-

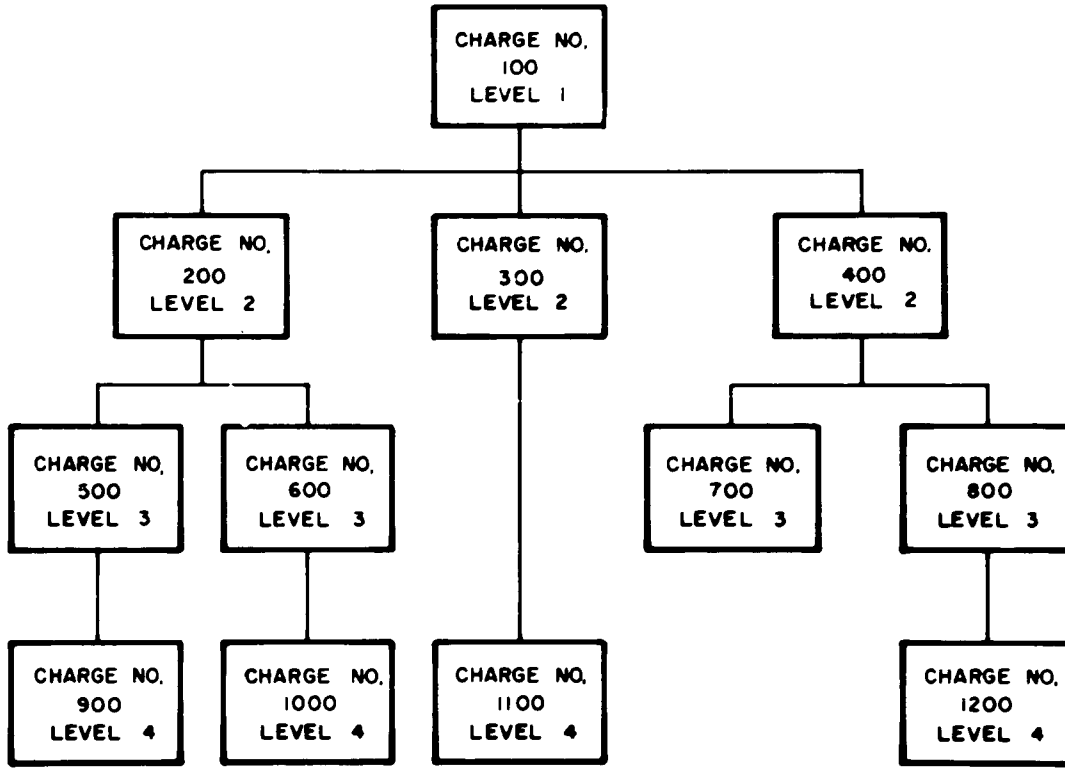


Figure III-I-1 - Sample Work Breakdown Structure

The "next higher relation" or father of each charge number will be retrieved from Table III-I-1 , placed into Table III-I-2 , and then sorted.

Table III-I-2

Father Sort

000
100
100
100
200
200
300
400
400
500
600
800

The number of times each father appears in the table is then determined and the count is placed in Table III-I-3. This count will be the number of sons directly related to each individual charge number. Those charge numbers not appearing in Table III-I-3 will have zero sons.

Table III-I-3

Father-Son Count

Charge No.	Count	Charge No.	Count
000	1	400	2
100	3	500	1
200	2	600	1
300	1	800	1

The charge number, next higher relation, and level information from Table III-I-1 is then merged with Table III-I-3 to form Table III-I-4 Table III-I-4 will be sorted with level major and father minor.

Table III-I-4

Data Sorted by Level and by Father

Item No.	Level	Son	Father	Count
1	-	000	-	1
2	1	100	000	3
3	2	200	100	2
4	2	300	100	1
5	2	400	100	2
6	3	500	200	1
7	3	600	200	1
8	3	700	400	0
9	3	800	400	1
10	4	1100	300	0
11	4	900	500	0
12	4	1000	600	0
13	4	1200	800	0

A set of sixteen 6-bit indicators are formed to associate an individual charge number with all of its predecessor charge numbers. There will be one 6-bit indicator for each of the 16 levels possible. The set of 16 indicators forms one Christmas Tree Indicator.

Method of Generating Christmas Tree Indicators

A. Get the first item (charge number record) from Table III-I-4 . Place the son (all zeros), count and a Christmas Tree Indicator (CTI) of all zeros into a "working table."

B. Get the next charge number item from Table III-I-4

C. Find the son in the working table that matches the father in the current charge number item. Decrease the count for this working table item by one.

D. Get the CTI in the working table item and increase by one the Lth level indicator (i.e., the indicator pertaining to the level of the current charge number item).

E. Place the son from the current charge number item and the new CTI in an output table.

F. If the count of the working table item is zero, set the item in the Working Table to a "complete" condition.

G. If the count of the current item in Table III-I-4 is non-zero, place the son, count, and new CTI into the Working Table, and return to step B. If the count is zero, return directly to step B.

Exception Messages

If the Working Table should become filled, the completed items will be removed and the table will be condensed to fill the vacant spaces. If there are no completed items to remove, the following message will be printed:

WORKING TABLE TOO SMALL

and the computer will halt.

Cleanup

When all the items in Table III-I-4 have been processed, the information in the Output Table is sorted on son (charge number) and then the CTI is merged with the information in Table III-I-5 to create a Pert Cost Reporting File. By sorting the PERT Cost Reporting File with CTI major, the Work Breakdown structure will be placed in a topological order from the top to the bottom. To invert this ordering, the CTI may be complemented (one's complement) prior to sorting.

If a charge number has a "next higher relation" that does not appear as a charge number elsewhere in the Work Breakdown Structure, the following message will be printed:

THE FOLLOWING SON HAS NO FATHER XXXXXX

When all the charge numbers of this type have been printed, the computer will halt.

Illustration of Christmas Tree Indicator Generation

The illustration of the generation of the CTI will utilize the data in Table III-I-4 , and reference the steps given on Page III-I-5 under

"Method of Generating Christmas Tree Indicators." For reasons of space, only the first four indicators of the CTI will be shown in the illustration.

Step A

Place the son and count of item No. 1 along with a CTI of all zeros into the Working Table. The Working Table now contains:

Son	Count	CTI
000	1	00/00/00/00/...

Step B

Get item 2 from Table III-I-4 , showing:

Level	Son	Father	Count
1	100	000	3

Step C

Find son 000 in the Working Table and decrease its count by 1. The Working Table now contains:

Son	Count	CTI
000	0	00/00/00/00/...

Step D

Increase the first indicator of the CTI of the item in the Working Table by 1. The Working Table now contains:

Son	Count	CTI
000	0	01/00/00/00/...

Step E

Place the son in item No. 2 of Table III-I-4 together with the new CTI from the Working Table into the Output Table. The Output Table now contains:

Son	CTI
100	01/00/00/00/...

Step F

Since the count of the item in the Working Table is now 0, the item will be set to a completed condition. The Working Table now contains:

Son	Count	CTI
~~000~~	0	01/00/00/00/...

Step G

Since the count of item 2 in Table III-I-4 is non-zero, the son, count, and new CTI is placed in the Working Table. The Working Table now contains:

Son	Count	CTI
~~000~~	0	01/00/00/00/...
100	3	01/00/00/00/...

Control is now returned to Step B and the next charge number item in Table III-I-4 is processed.

Step B

Get item No. 3 from Table III-I-4 .

Step C

After the completion of this step, the Working Table will contain:

Son	Count	CTI
~~000~~	0	01/00/00/00/...
100	2	01/00/00/00/...

Step D

Upon the completion of this step the Working Table contains:

Son	Count	CTI
~~000~~	0	01/00/00/00/...
100	2	01/01/00/00/...

Step E

Upon completion of this step the Output Table contains:

Son	CTI
100	01/00/00/00/...
200	01/01/00/00/...

Step F

The count of the Working Table item is non-zero, and the Working Table is unchanged.

Step G

Upon completion of this step the Working Table contains:

Son	Count	CTI
~~000~~	0	01/00/00/00/...
100	2	01/01/00/00/...
200	2	01/01/00/00/...

After all the items in Table III-I-4 have been processed, the Output Table will contain:

Charge Number	CTI
100	01/00/00/00/...
200	01/01/00/00/...
300	01/02/00/00/...
400	01/03/00/00/...
500	01/01/01/00/...
600	01/01/02/00/...
700	01/03/01/00/...
800	01/03/02/00/...
1100	01/02/00/01/...
900	01/01/01/01/...
1000	01/01/02/01/...
1200	01/03/02/01/...

Intermediate Reporting Phase Region Descriptions

The region specifications are given on the following pages, together with corresponding report formats or tape record formats when appropriate.

Region KA00

EXPLANATION OF REGION:

This is the master control region for the Intermediate Reporting Phase, controlling output of time reports, Christmas Tree generation, and initial sort for remaining reports.

CALLING SEQUENCE:

```
L       TRA     KA00
```

INPUT:

Sorted PRE-REPORTING TAPE.

OUTPUT:

Reporting tape with information for generation of each report broken down by report and level.

STORAGE USED:

Not applicable

SUBREGIONS AND SUBROUTINES USED

KB00

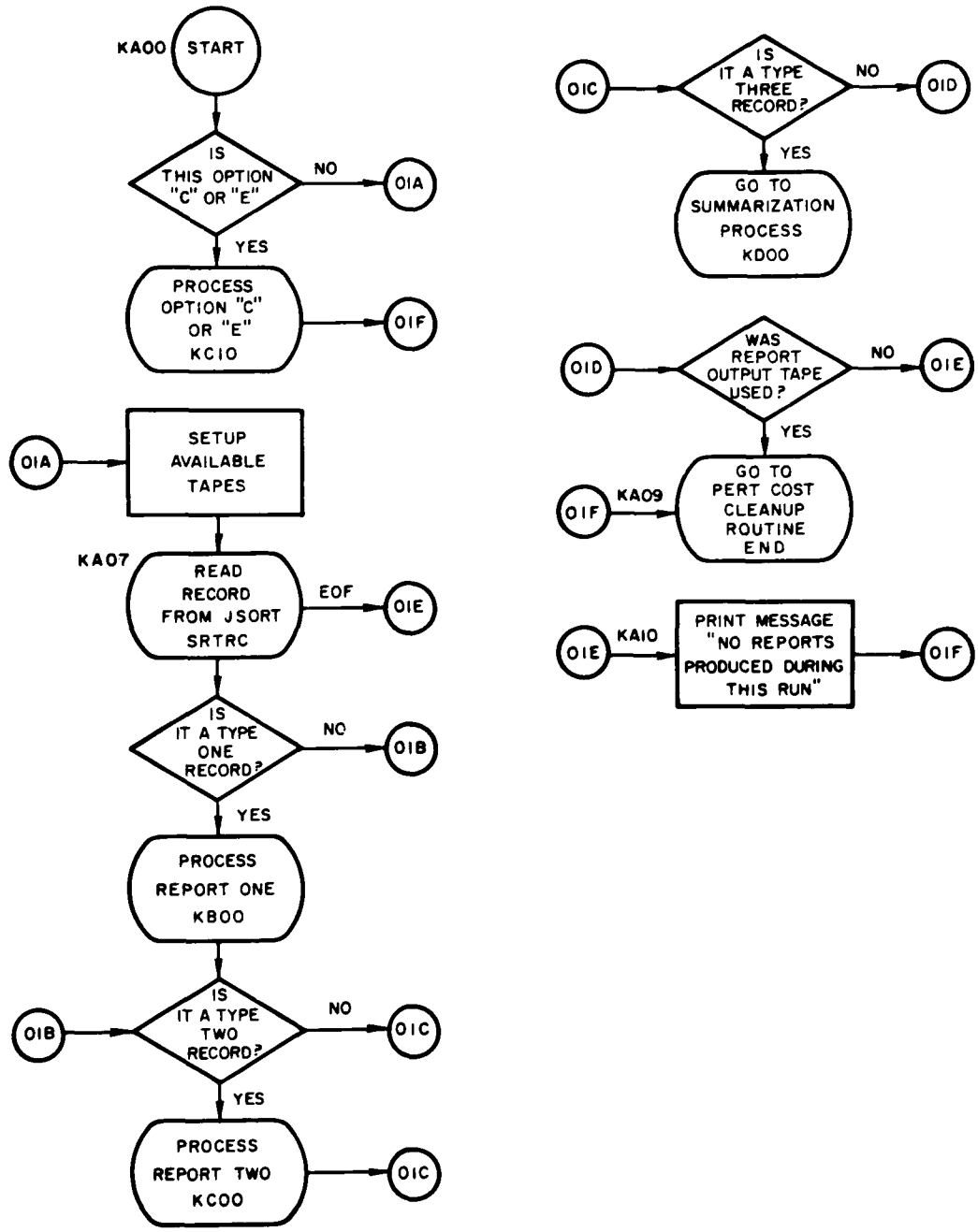
KC00

KC10

KD00

EXPLANATION OF CALLING SEQUENCE:

Not applicable


KA00
START
IS THIS OPTION "C" OR "E"
NO
01A
YES
PROCESS OPTION "C" OR "E" KC10
01F
01A
SETUP AVAILABLE TAPES
KA07
READ RECORD FROM JSORT SRTRC
EOF
01E
IS IT A TYPE ONE RECORD?
NO
01B
YES
PROCESS REPORT ONE KB00
01B
IS IT A TYPE TWO RECORD?
NO
01C
YES
PROCESS REPORT TWO KC00
01C
IS IT A TYPE THREE RECORD?
NO
01D
YES
GO TO SUMMARIZATION PROCESS KD00
01D
WAS REPORT OUTPUT TAPE USED?
NO
01E
YES
01F
KA09
GO TO PERT COST CLEANUP ROUTINE END
01E
KA10
PRINT MESSAGE "NO REPORTS PRODUCED DURING THIS RUN"
01F

Region KB00

EXPLANATION OF REGION:

To print Report No. 1, "Work Package/Activity." Sort sequence: responsible organization, charge number, predecessor charge number, successor charge number.

CALLING SEQUENCE:

L	TSX	KB00, 4
L + 1	Normal return	

INPUT:

First sorted item of information for report number 1 located in address of YCNT.

OUTPUT:

Report number 1 on OUTPUT REPORT TAPE.

STORAGE USED:

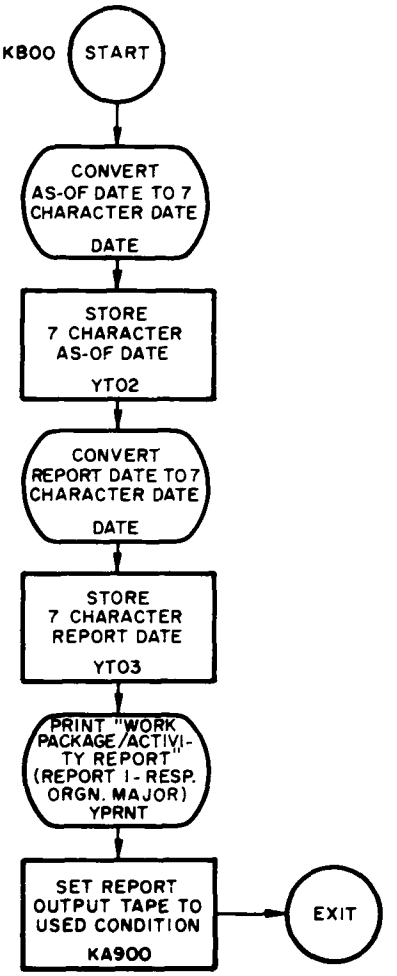
Not applicable

SUBREGIONS AND SUBROUTINES USED:

DATE YPRNT

EXPLANATION OF CALLING SEQUENCE:

Not applicable


KB00
START
CONVERT AS-OF DATE TO 7 CHARACTER DATE
DATE
STORE 7 CHARACTER AS-OF DATE
YT02
CONVERT REPORT DATE TO 7 CHARACTER DATE
DATE
STORE 7 CHARACTER REPORT DATE
YT03
PRINT "WORK PACKAGE/ACTIVITY REPORT" (REPORT 1 - RESP. ORGN. MAJOR)
YPRNT
SET REPORT OUTPUT TAPE TO USED CONDITION
KA900
EXIT

Region KC00

EXPLANATION OF REGION:

To print report number 2, "Work Package/Activity." Sort sequence: charge number, predecessor number, successor number.

CALLING SEQUENCE:

L	TSX	KC00, 4
L + 1	Normal return	

INPUT:

First sorted item of information for report number 2 located in address of YCNT

OUTPUT:

Report number 2 on output report tape

STORAGE USED:

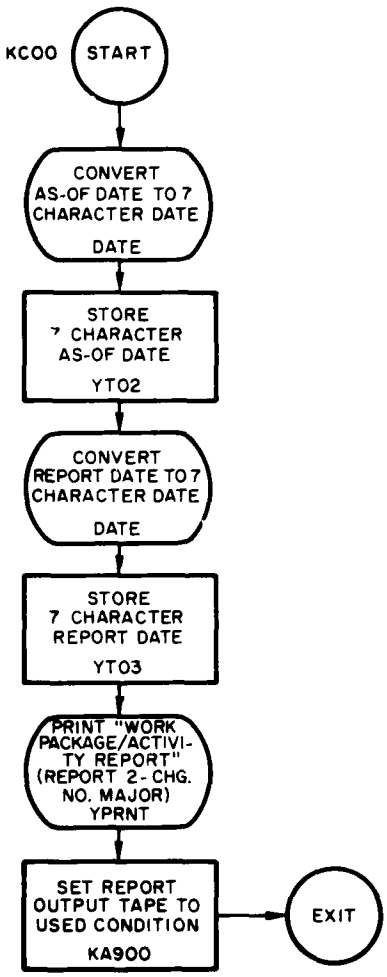
Not applicable

SUBREGIONS AND SUBROUTINES USED:

DATE YPRNT

EXPLANATION OF CALLING SEQUENCE:

Not applicable


KC00
START
CONVERT AS-OF DATE TO 7 CHARACTER DATE
DATE
STORE 7 CHARACTER AS-OF DATE
YT02
CONVERT REPORT DATE TO 7 CHARACTER DATE
DATE
STORE 7 CHARACTER REPORT DATE
YT03
PRINT "WORK PACKAGE/ACTIVITY REPORT" (REPORT 2- CHG. NO. MAJOR)
YPRNT
SET REPORT OUTPUT TAPE TO USED CONDITION
KA900
EXIT

Region KC10

EXPLANATION OF REGION:

To print Report 1 under option "C" or "E."

CALLING SEQUENCE:

```
L       TRA     KC10
```

INPUT:

Report 1 information on JTAPE.

OUTPUT:

Report 1 on OUTPUT REPORT TAPE.

STORAGE USED:

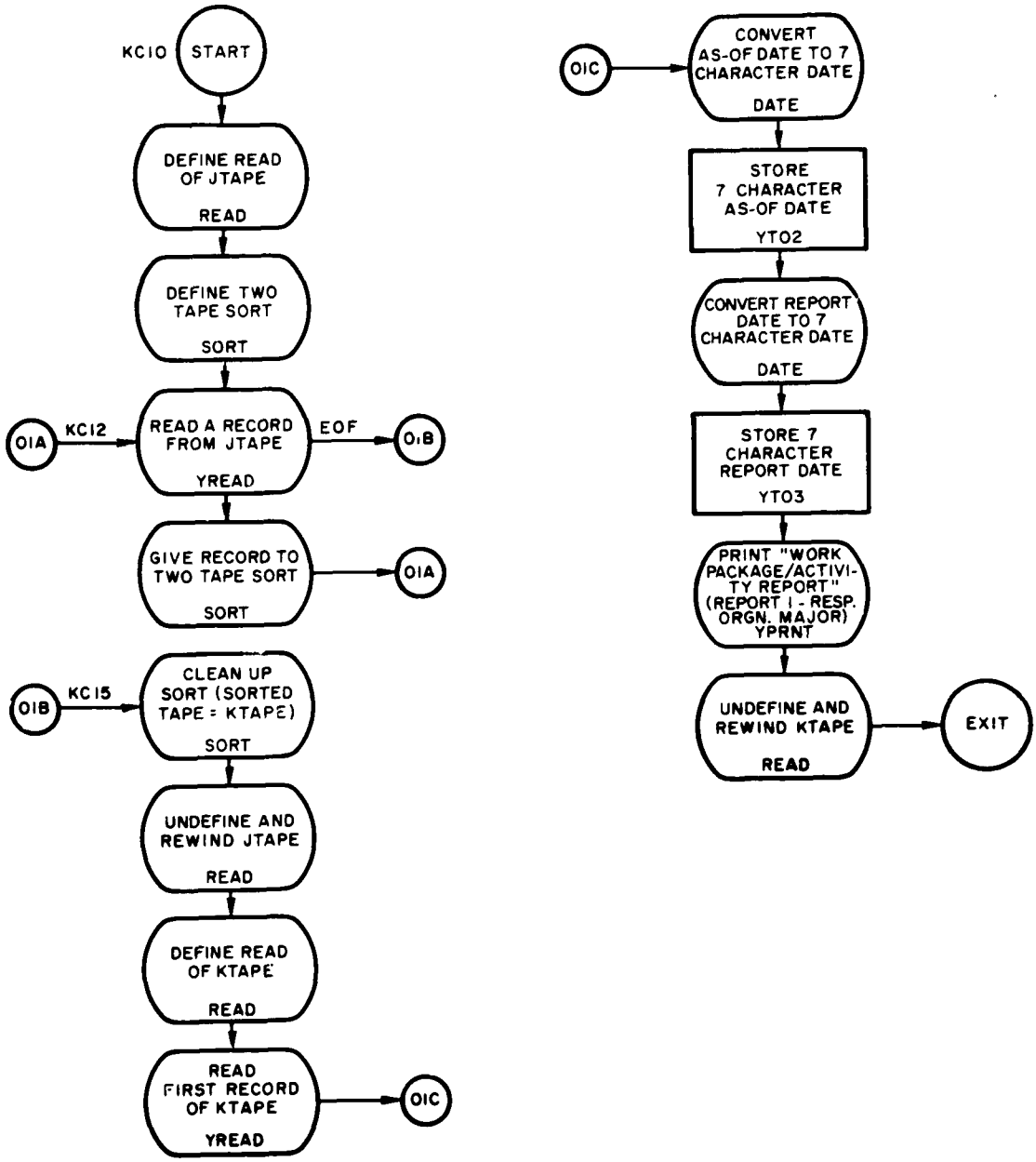
Not applicable

SUBREGIONS AND SUBROUTINES USED:

DATE YPRINT READ SORT

EXPLANATION OF CALLING SEQUENCE:

Not applicable


KC10
START
DEFINE READ OF JTAPE
READ
DEFINE TWO TAPE SORT
SORT
01A
KC12
READ A RECORD FROM JTAPE
YREAD
EOF
01B
GIVE RECORD TO TWO TAPE SORT
SORT
01A
01B
KC15
CLEAN UP SORT (SORTED TAPE = KTAPE)
SORT
UNDEFINE AND REWIND JTAPE
READ
DEFINE READ OF KTAPE
READ
READ FIRST RECORD OF KTAPE
YREAD
01C
01C
CONVERT AS-OF DATE TO 7 CHARACTER DATE
DATE
STORE 7 CHARACTER AS-OF DATE
YTO2
CONVERT REPORT DATE TO 7 CHARACTER DATE
DATE
STORE 7 CHARACTER REPORT DATE
YTO3
PRINT "WORK PACKAGE/ACTIVITY REPORT" (REPORT I - RESP. ORGN. MAJOR)
YPRNT
UNDEFINE AND REWIND KTAPE
READ
EXIT

Region YPRNT

EXPLANATION OF REGION:

To print the "Work Package/Activity Report"

CALLING SEQUENCE:

L	TSX	YPRNT, 4
L+1	PZE	T, , K
L+2	PZE	R
L+3	PZE	B, I, C
L+4	PZE	L_T, F, L_B
L+5	PZE	L, , N
L+6	Normal return	

INPUT:

Report 1 or 2 from Intermediate Report Tape

OUTPUT:

Report 1 or 2 on Output Report tape

STORAGE USED:

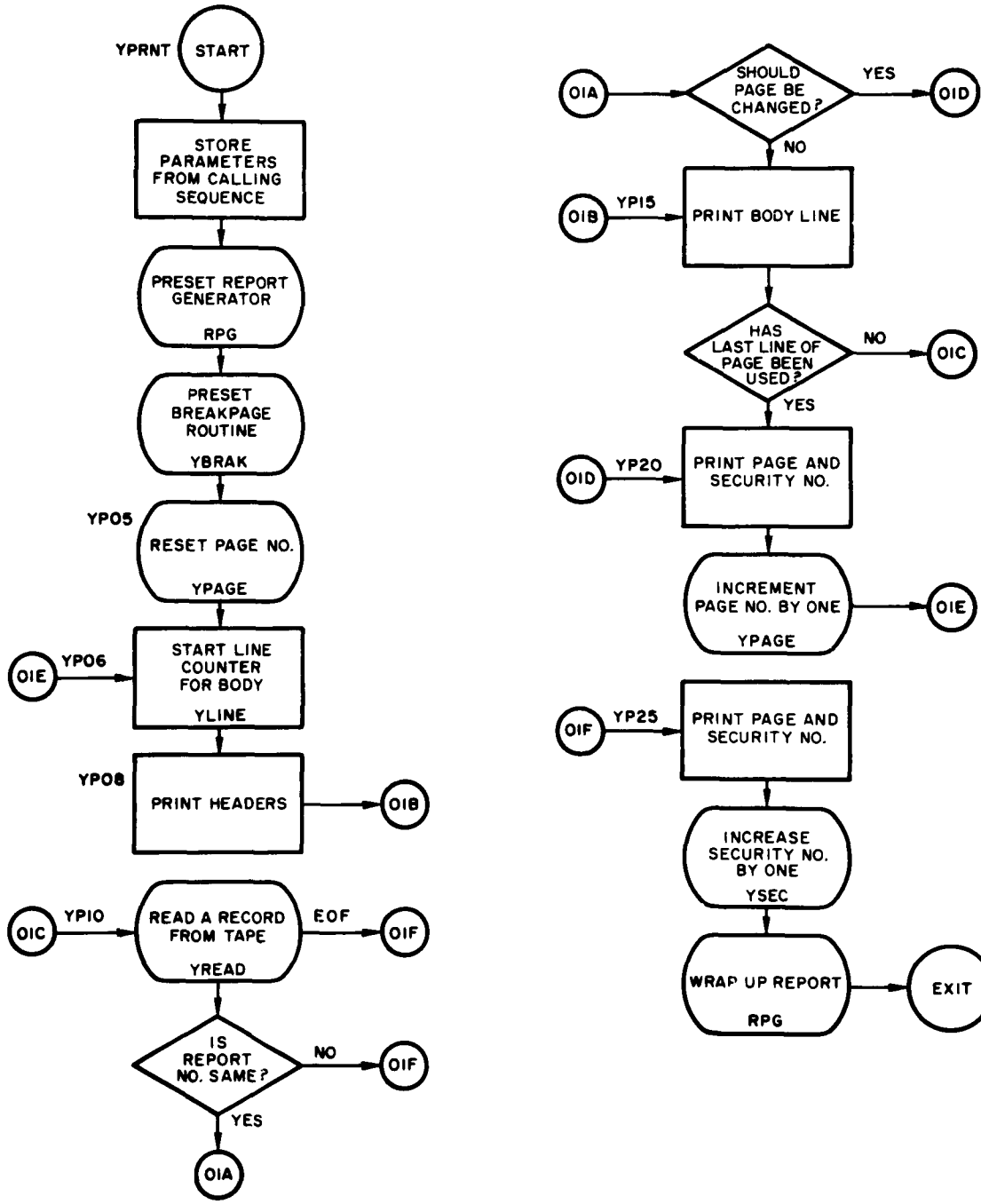
Not applicable.

SUBREGIONS AND SUBROUTINES USED:

YBRAK YPAGE YSEC YREAD

EXPLANATION OF CALLING SEQUENCE:

K	= length of sort key	L_T	= location of top header
R	= report number	L_B	= location of bottom title
B, I	= location of field for break page	L	= location of body format region
C	= length of break page field (words)	N	= number of lines allocated to body portion of report
T	= 0: read from J SORT tape	F	= 0: security No. not used
	= X: read from tape X		= 1: security No. used


YPRNT
START
STORE PARAMETERS FROM CALLING SEQUENCE
PRESET REPORT GENERATOR
RPG
PRESET BREAKPAGE ROUTINE
YBRAK
YP05
RESET PAGE NO.
YPAGE
01E
YP06
START LINE COUNTER FOR BODY
YLINE
YP08
PRINT HEADERS
018
01C
YP10
READ A RECORD FROM TAPE
YREAD
EOF
01F
IS REPORT NO. SAME?
NO
01F
YES
01A
01A
SHOULD PAGE BE CHANGED?
YES
01D
NO
018
YP15
PRINT BODY LINE
HAS LAST LINE OF PAGE BEEN USED?
NO
01C
YES
01D
YP20
PRINT PAGE AND SECURITY NO.
INCREMENT PAGE NO. BY ONE
YPAGE
01E
01F
YP25
PRINT PAGE AND SECURITY NO.
INCREASE SECURITY NO. BY ONE
YSEC
WRAP UP REPORT
RPG
EXIT

Region KD00

EXPLANATION OF REGION:

Master control for summarization routines and report data breakdown.

CALLING SEQUENCE:

L	TSX	KD00, 4
L + 1	Normal return	

INPUT:

1. Summarization routine information.
2. PERT Cost master file in report form.

OUTPUT:

Reporting tape with report breakdown.

STORAGE USED:

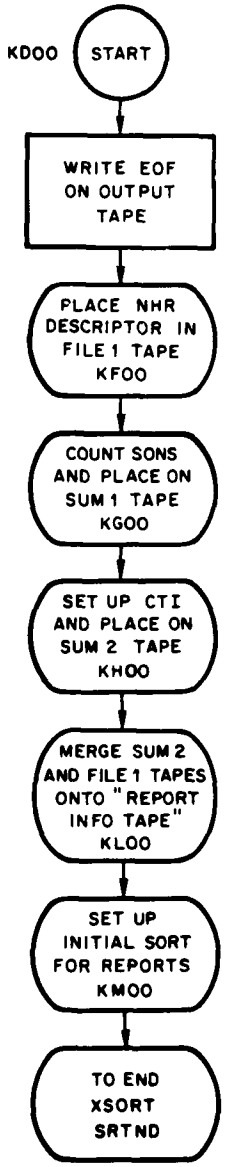
Not applicable

SUBREGIONS AND SUBROUTINES USED:

KF00	KL00
KG00	KM00
KH00	

EXPLANATION OF CALLING SEQUENCE:

Not applicable


KDOO
START
WRITE EOF ON OUTPUT TAPE
PLACE NHR DESCRIPTOR IN FILE 1 TAPE KFOO
COUNT SONS AND PLACE ON SUM 1 TAPE KGOO
SET UP CTI AND PLACE ON SUM 2 TAPE KHOO
MERGE SUM 2 AND FILE 1 TAPES ONTO "REPORT INFO TAPE" KLOO
SET UP INITIAL SORT FOR REPORTS KMOO
TO END XSORT SRTND

Region KF00

EXPLANATION OF REGION:

To place the "next higher relation" description onto the FILE 1 tape.

CALLING SEQUENCE:

L	TSX	KF00, 4
L + 1	Normal return	

INPUT:

1. TYPE 3 record on JSORT tape.
2. TYPE 4 record on JSORT tape.

OUTPUT:

FILE 1 tape

STORAGE USED:

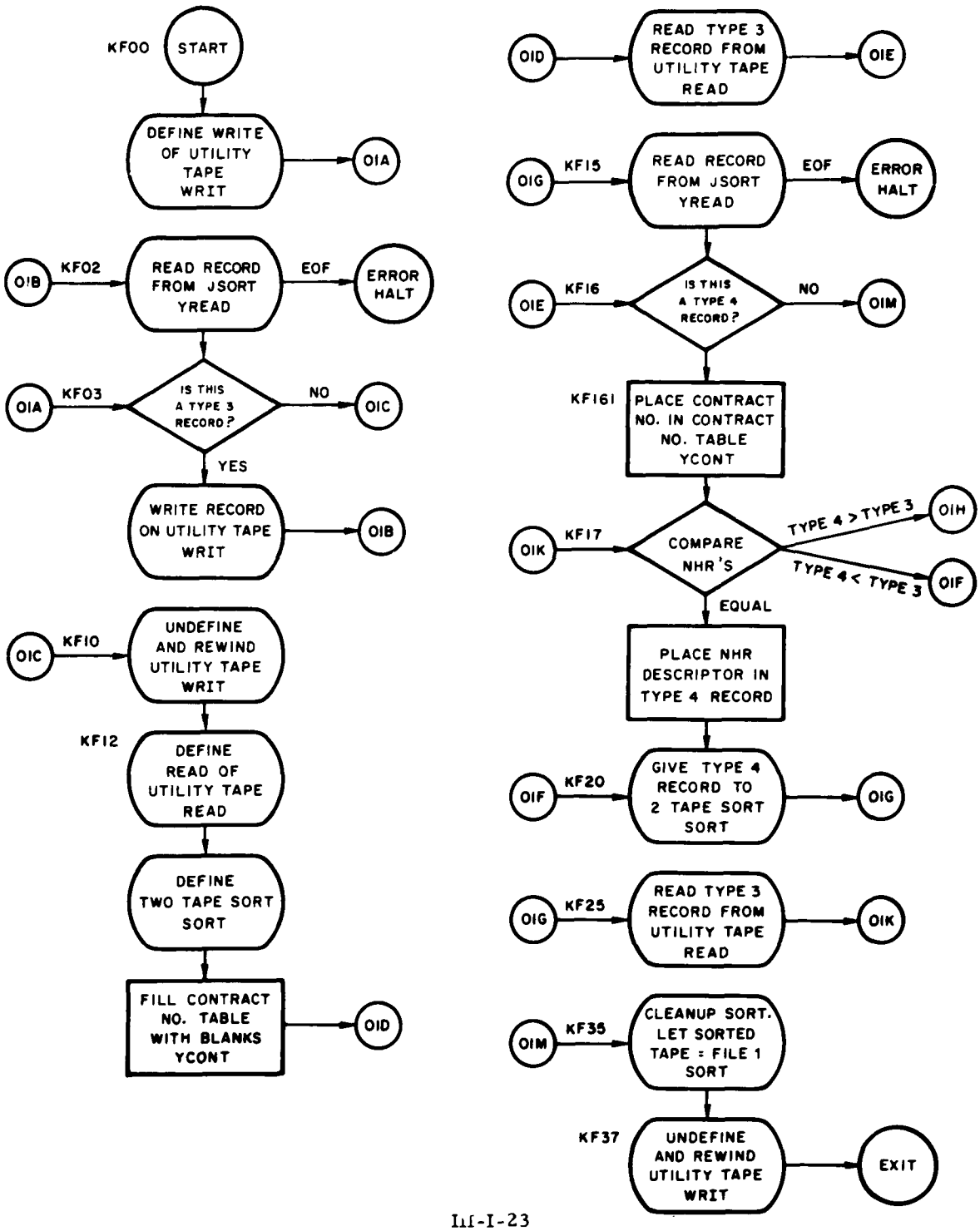
Not applicable

SUBREGIONS AND SUBROUTINES USED:

READ	YREAD
WRIT	YCOMP
SORT	

EXPLANATION OF CALLING SEQUENCE:

Not applicable


KF00
START
DEFINE WRITE OF UTILITY TAPE WRIT
O1A
O1B
KF02
READ RECORD FROM JSORT YREAD
EOF
ERROR HALT
O1A
KF03
IS THIS A TYPE 3 RECORD?
NO
O1C
YES
WRITE RECORD ON UTILITY TAPE WRIT
O1B
O1C
KF10
UNDEFINE AND REWIND UTILITY TAPE WRIT
KF12
DEFINE READ OF UTILITY TAPE READ
DEFINE TWO TAPE SORT SORT
FILL CONTRACT NO. TABLE WITH BLANKS YCONT
O1D
O1D
READ TYPE 3 RECORD FROM UTILITY TAPE READ
O1E
O1G
KF15
READ RECORD FROM JSORT YREAD
EOF
ERROR HALT
O1E
KF16
IS THIS A TYPE 4 RECORD?
NO
O1M
KF161
PLACE CONTRACT NO. IN CONTRACT NO. TABLE YCONT
O1K
KF17
COMPARE NHR'S
TYPE 4 > TYPE 3
O1H
TYPE 4 < TYPE 3
O1F
EQUAL
PLACE NHR DESCRIPTOR IN TYPE 4 RECORD
O1F
KF20
GIVE TYPE 4 RECORD TO 2 TAPE SORT SORT
O1G
O1G
KF25
READ TYPE 3 RECORD FROM UTILITY TAPE READ
O1K
O1M
KF35
CLEANUP SORT. LET SORTED TAPE = FILE 1 SORT
KF37
UNDEFINE AND REWIND UTILITY TAPE WRIT
EXIT

Region KG00

EXPLANATION OF REGION:

To count the number of sons for each charge number and place the counts on the SUM 1 tape.

CALLING SEQUENCE:

L	TSX	KG00, 4
L + 1	Normal return	

INPUT:

1. TYPE 5 record from JSORT tape.
2. TYPE 6 record from JSORT tape.

OUTPUT:

SUM 1 tape.

STORAGE USED:

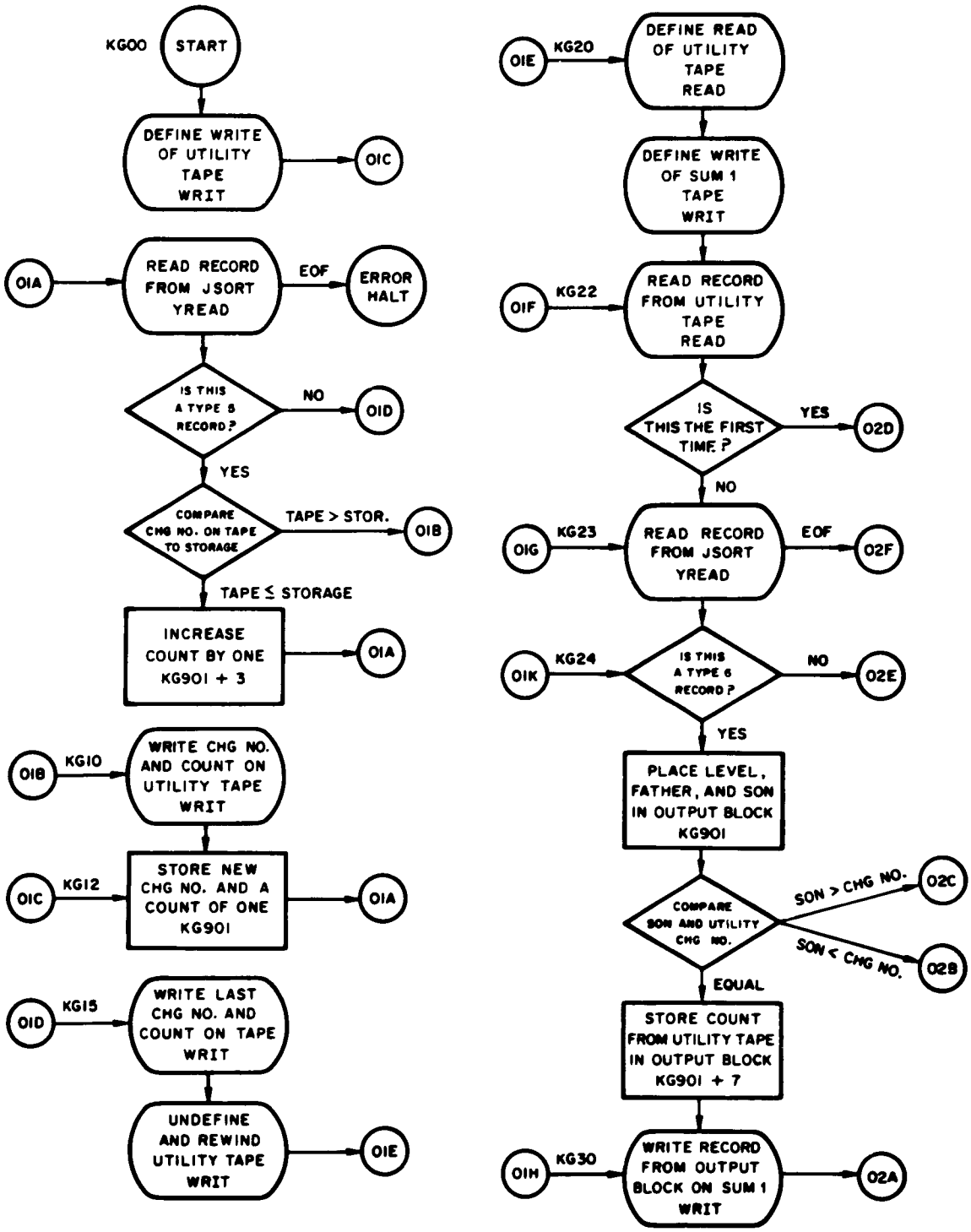
Not applicable

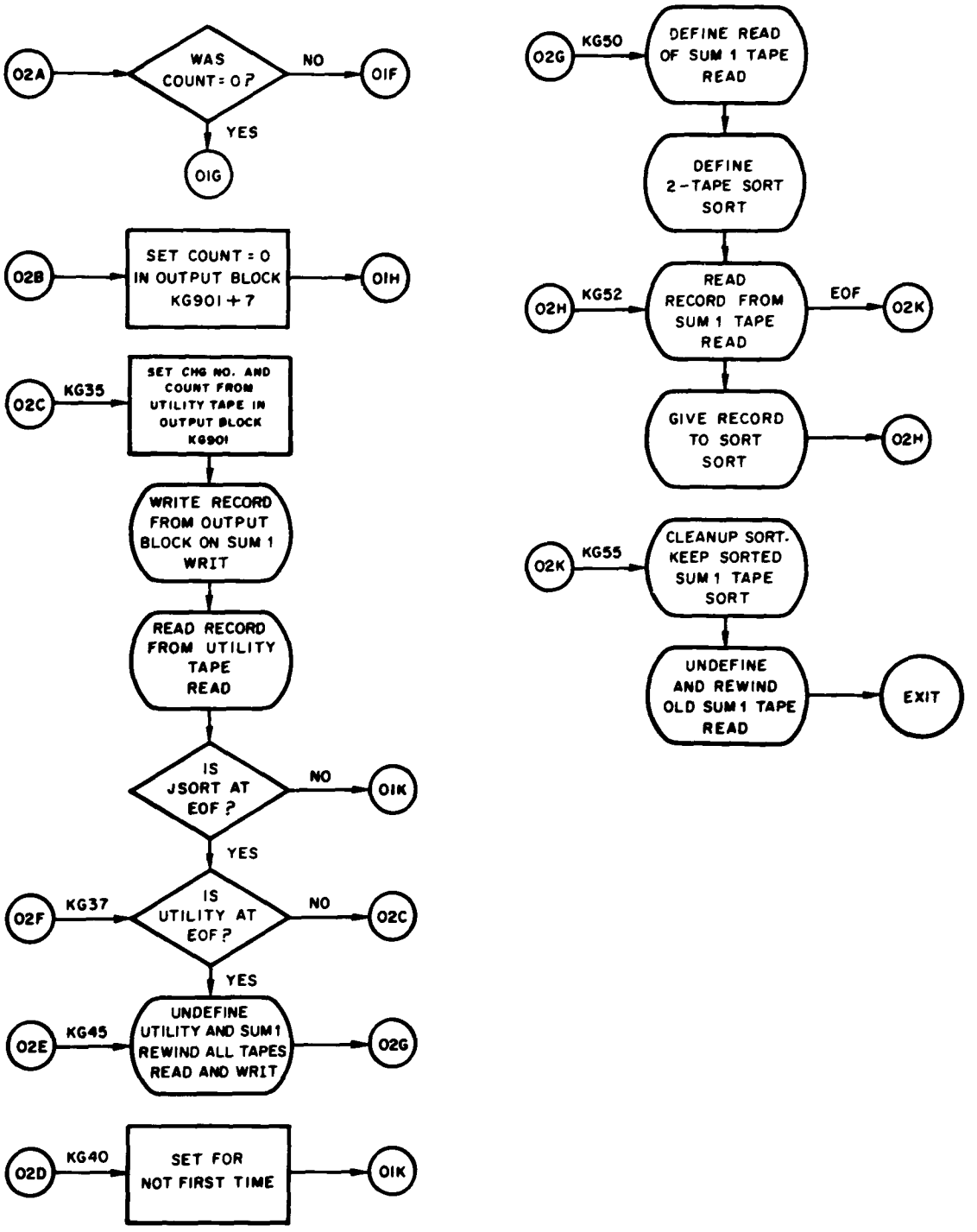
SUBREGIONS AND SUBROUTINES USED:

READ	YCOMP
WRIT	YREAD
SORT	

EXPLANATION OF CALLING SEQUENCE:

Not applicable


KG00
START
DEFINE WRITE OF UTILITY TAPE WRIT
01C
01A
READ RECORD FROM JSORT YREAD
EOF
ERROR HALT
IS THIS A TYPE 5 RECORD?
NO
01D
YES
COMPARE CHG NO. ON TAPE TO STORAGE
TAPE > STOR.
01B
TAPE ≤ STORAGE
INCREASE COUNT BY ONE KG901 + 3
01A
01B
KG10
WRITE CHG NO. AND COUNT ON UTILITY TAPE WRIT
01C
KG12
STORE NEW CHG NO. AND A COUNT OF ONE KG901
01A
01D
KG15
WRITE LAST CHG NO. AND COUNT ON TAPE WRIT
UNDEFINE AND REWIND UTILITY TAPE WRIT
01E
01E
KG20
DEFINE READ OF UTILITY TAPE READ
DEFINE WRITE OF SUM 1 TAPE WRIT
01F
KG22
READ RECORD FROM UTILITY TAPE READ
IS THIS THE FIRST TIME?
YES
02D
NO
01G
KG23
READ RECORD FROM JSORT YREAD
EOF
02F
01K
KG24
IS THIS A TYPE 6 RECORD?
NO
02E
YES
PLACE LEVEL, FATHER, AND SON IN OUTPUT BLOCK KG901
COMPARE SON AND UTILITY CHG NO.
SON > CHG NO.
02C
SON < CHG NO.
02B
EQUAL
STORE COUNT FROM UTILITY TAPE IN OUTPUT BLOCK KG901 + 7
01H
KG30
WRITE RECORD FROM OUTPUT BLOCK ON SUM 1 WRIT
02A


02A
WAS COUNT = 0 ?
NO
01F
YES
01G
02B
SET COUNT = 0 IN OUTPUT BLOCK KG9001 + 7
01H
02C
KG35
SET CHG NO. AND COUNT FROM UTILITY TAPE IN OUTPUT BLOCK KG901
WRITE RECORD FROM OUTPUT BLOCK ON SUM 1 WRIT
READ RECORD FROM UTILITY TAPE READ
IS JSORT AT EOF ?
NO
01K
YES
02F
KG37
IS UTILITY AT EOF ?
NO
02C
YES
02E
KG45
UNDEFINE UTILITY AND SUM1 REWIND ALL TAPES READ AND WRIT
02G
02D
KG40
SET FOR NOT FIRST TIME
01K
02G
KG50
DEFINE READ OF SUM 1 TAPE READ
DEFINE 2-TAPE SORT SORT
02H
KG52
READ RECORD FROM SUM 1 TAPE READ
EOF
02K
GIVE RECORD TO SORT SORT
02H
02K
KG55
CLEANUP SORT. KEEP SORTED SUM 1 TAPE SORT
UNDEFINE AND REWIND OLD SUM 1 TAPE READ
EXIT

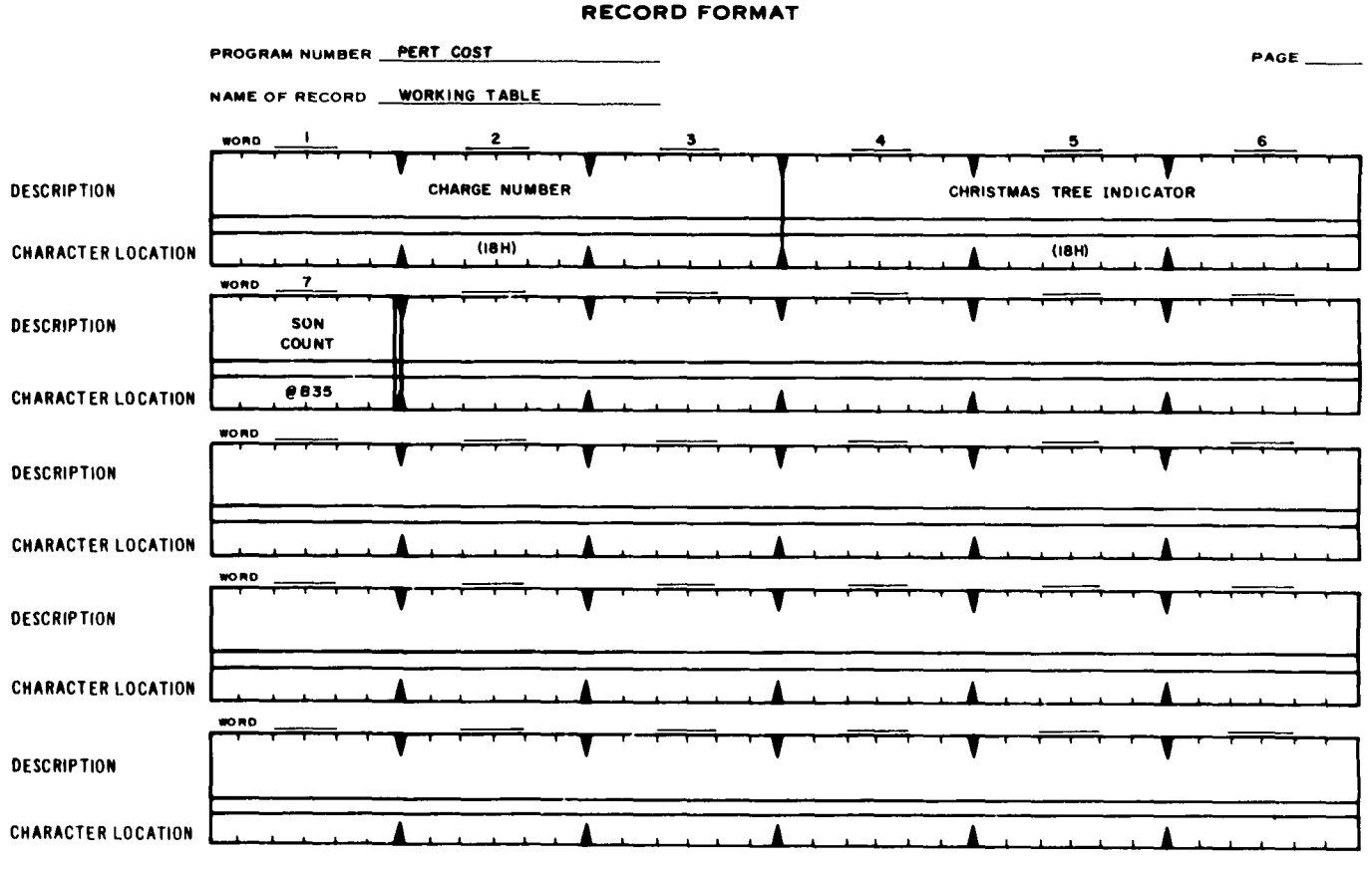


Fig. III-I-2 Format of SUM1 Tape Record

Region KH00

EXPLANATION OF REGION:

To set-up Christmas Tree Indicators and place them on SUM 2 tape in charge number order.

CALLING SEQUENCE:

L	TSX	KH00, 4
L + 1	Normal return	

INPUT:

SUM 1 tape.

OUTPUT:

SUM 2 tape

STORAGE USED:

Working table - 5000 Words

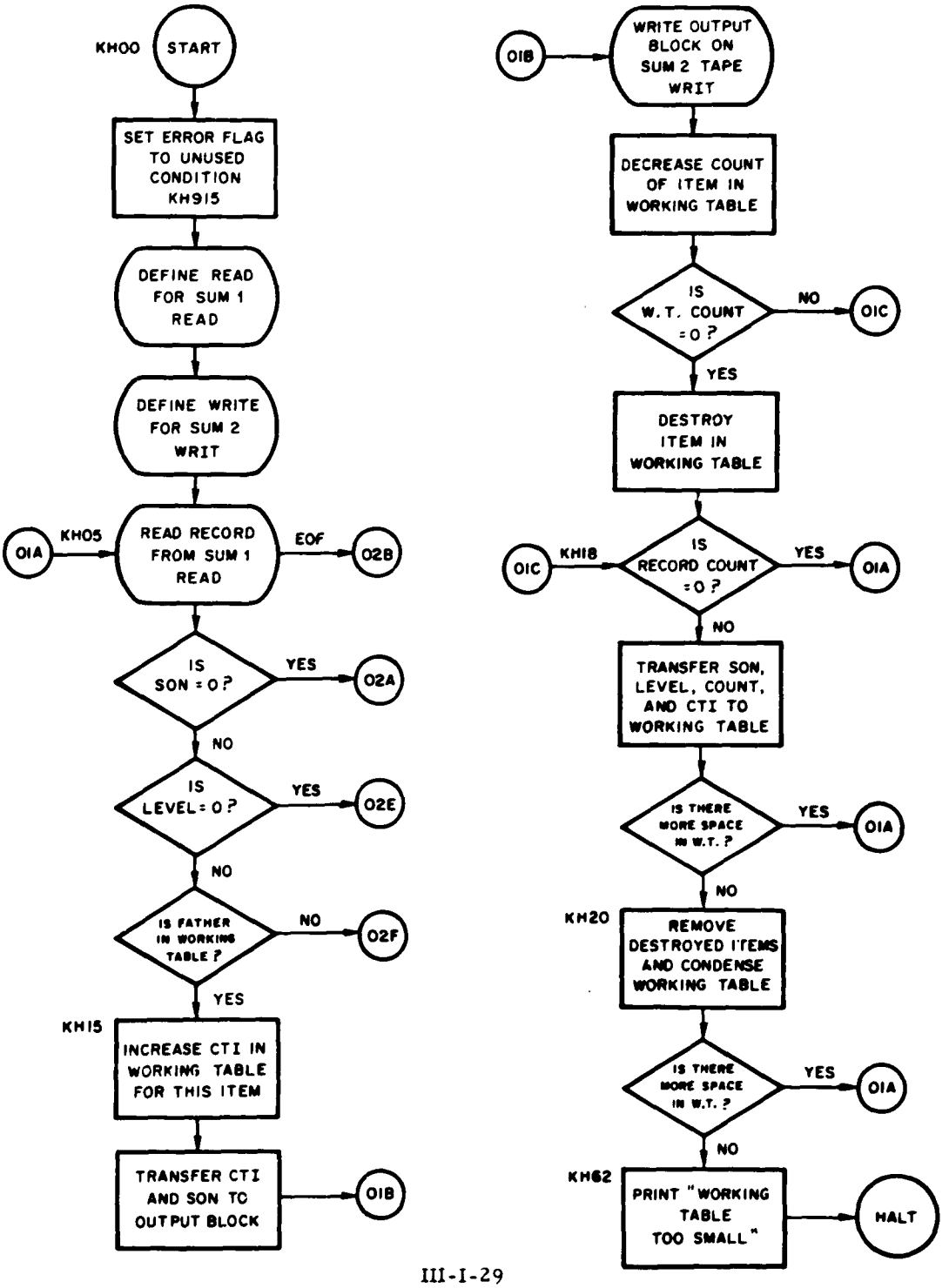
Output table - 6 Words

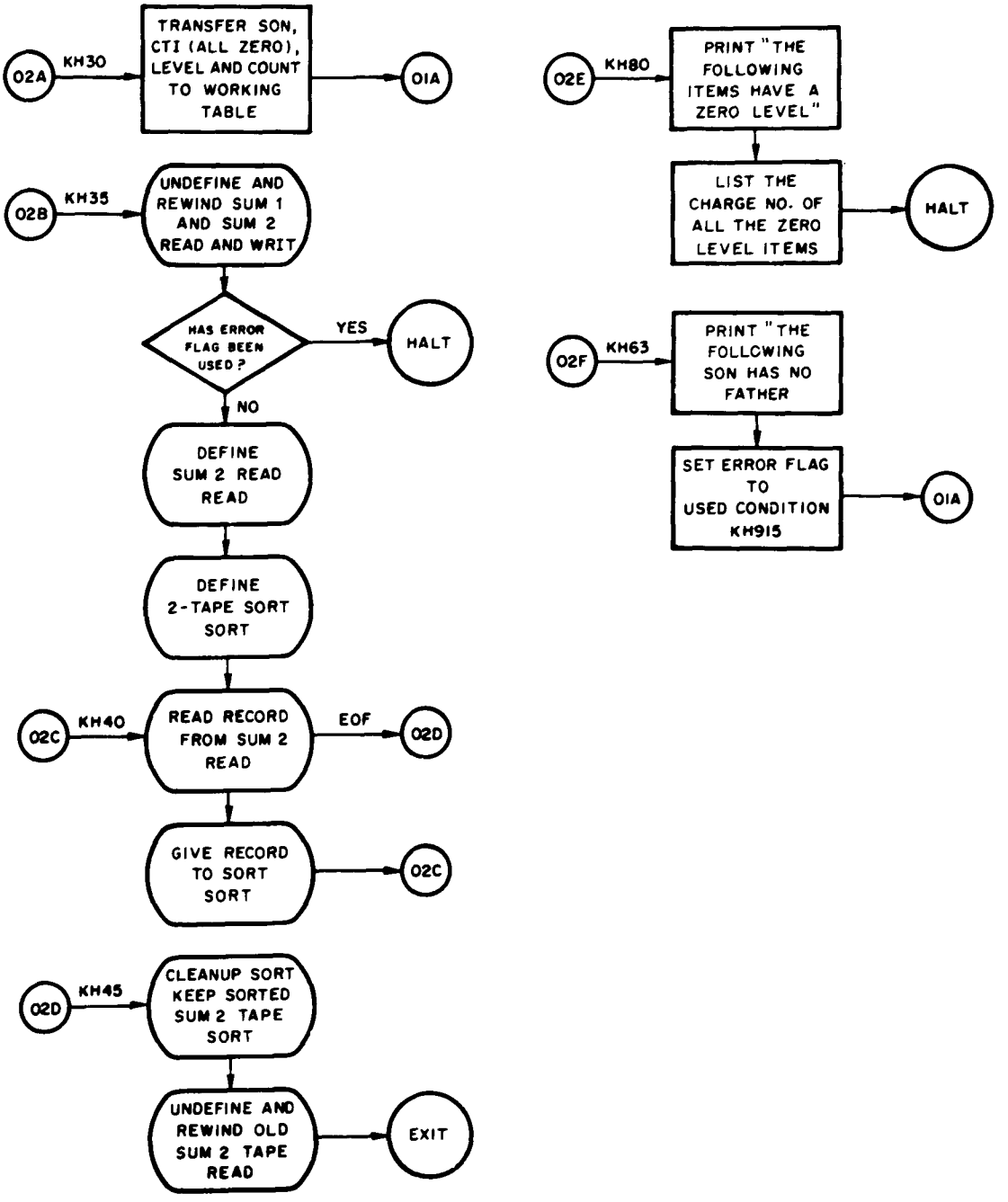
SUBREGIONS AND SUBROUTINES USED:

READ	SORT
WRIT	YCOMP

EXPLANATION OF CALLING SEQUENCE:

Not applicable


KH00
START
SET ERROR FLAG TO UNUSED CONDITION KH915
DEFINE READ FOR SUM 1 READ
DEFINE WRITE FOR SUM 2 WRIT
01A
KH05
READ RECORD FROM SUM 1 READ
EOF
02B
IS SON = 0?
YES
02A
NO
IS LEVEL = 0?
YES
02E
NO
IS FATHER IN WORKING TABLE?
NO
02F
YES
KH15
INCREASE CTI IN WORKING TABLE FOR THIS ITEM
TRANSFER CTI AND SON TO OUTPUT BLOCK
01B
01B
WRITE OUTPUT BLOCK ON SUM 2 TAPE WRIT
DECREASE COUNT OF ITEM IN WORKING TABLE
IS W.T. COUNT = 0?
NO
01C
YES
DESTROY ITEM IN WORKING TABLE
01C
KH18
IS RECORD COUNT = 0?
YES
01A
NO
TRANSFER SON, LEVEL, COUNT, AND CTI TO WORKING TABLE
IS THERE MORE SPACE IN W.T.?
YES
01A
NO
KH20
REMOVE DESTROYED ITEMS AND CONDENSE WORKING TABLE
IS THERE MORE SPACE IN W.T.?
YES
01A
NO
KH62
PRINT "WORKING TABLE TOO SMALL"
HALT


02A
KH30
TRANSFER SON, CTI (ALL ZERO), LEVEL AND COUNT TO WORKING TABLE
01A
02B
KH35
UNDEFINE AND REWIND SUM 1 AND SUM 2 READ AND WRIT
HAS ERROR FLAG BEEN USED ?
YES
HALT
NO
DEFINE SUM 2 READ READ
DEFINE 2-TAPE SORT SORT
02C
KH40
READ RECORD FROM SUM 2 READ
EOF
02D
GIVE RECORD TO SORT SORT
02C
02D
KH45
CLEANUP SORT KEEP SORTED SUM 2 TAPE SORT
UNDEFINE AND REWIND OLD SUM 2 TAPE READ
EXIT
02E
KH80
PRINT "THE FOLLOWING ITEMS HAVE A ZERO LEVEL"
LIST THE CHARGE NO. OF ALL THE ZERO LEVEL ITEMS
HALT
02F
KH63
PRINT "THE FOLLOWING SON HAS NO FATHER
SET ERROR FLAG TO USED CONDITION KH915
01A

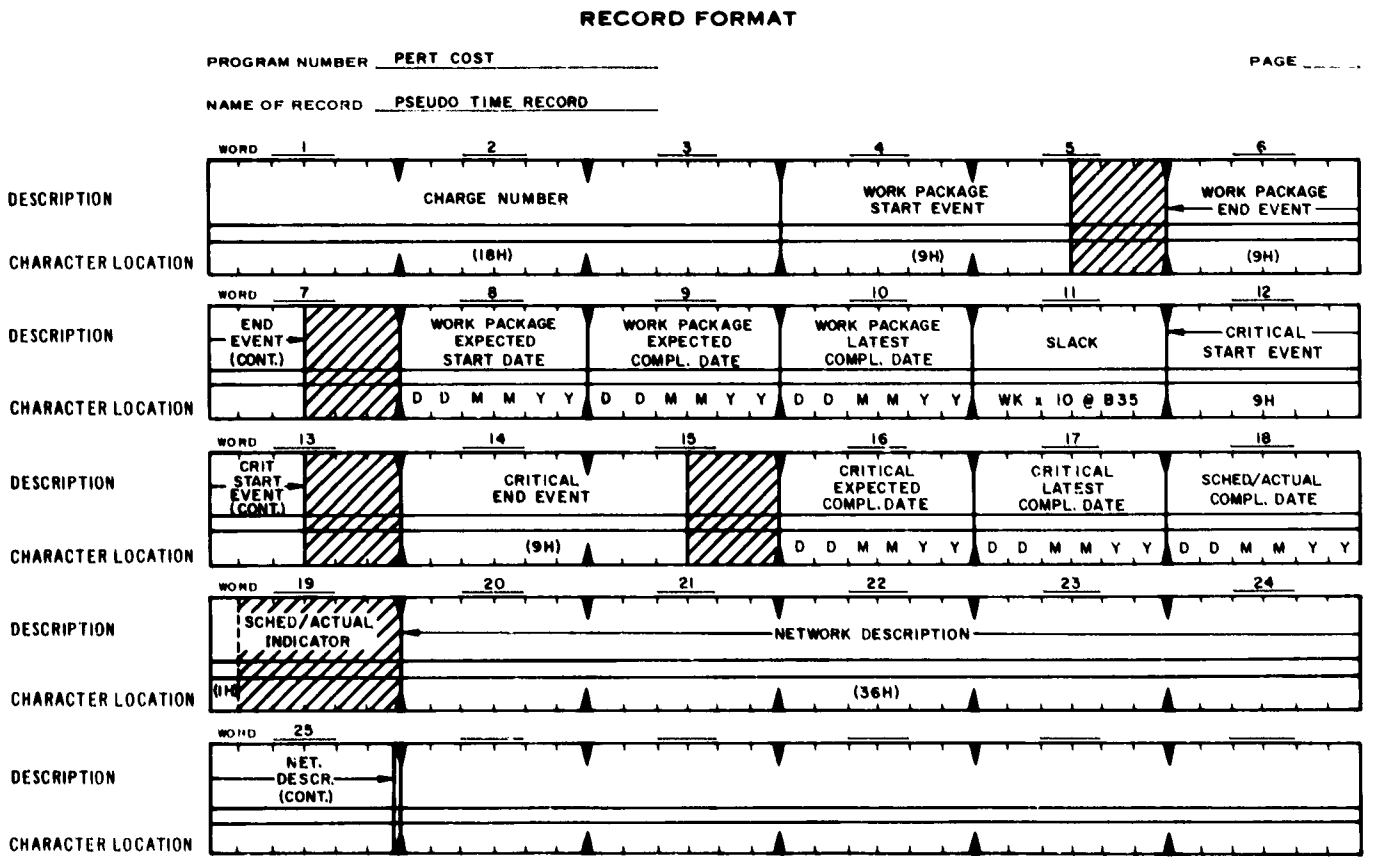


Fig. III-I-3 Tape Format of Working Table

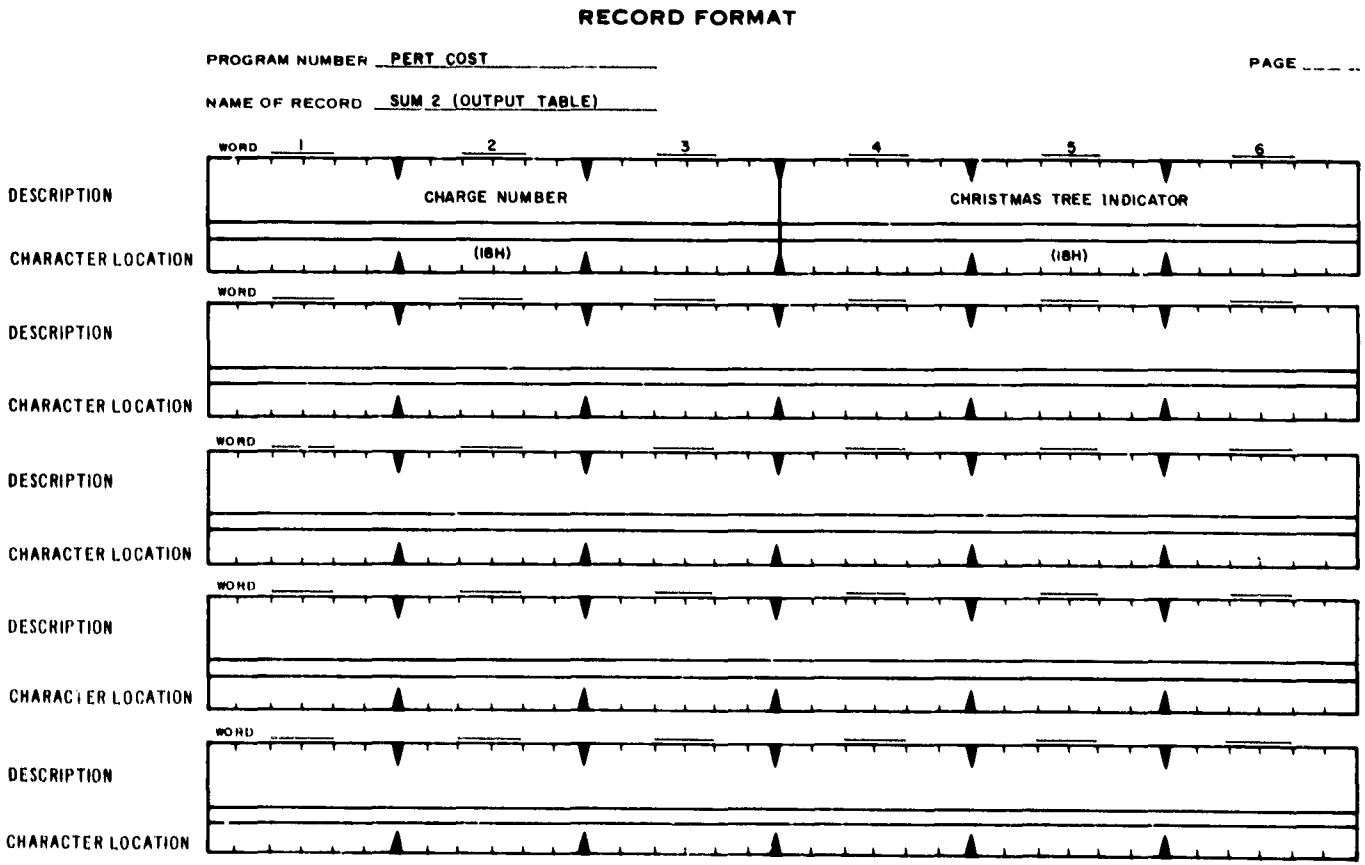


Fig. III-I-4 Tape Format of Output Table (SUM2 Tape)

Region KL00

EXPLANATION OF REGION:

To insert the Christmas Tree Indicator from SUM 2 tape into the corresponding record of the FILE 1 tape and create the REPORT INFO. TAPE.

CALLING SEQUENCE:

L	TSX	KL00, 4
L + 1	Normal return	

INPUT:

SUM 2 tape

FILE 1 tape

OUTPUT:

REPORT INFO. TAPE

STORAGE USED:

Not applicable

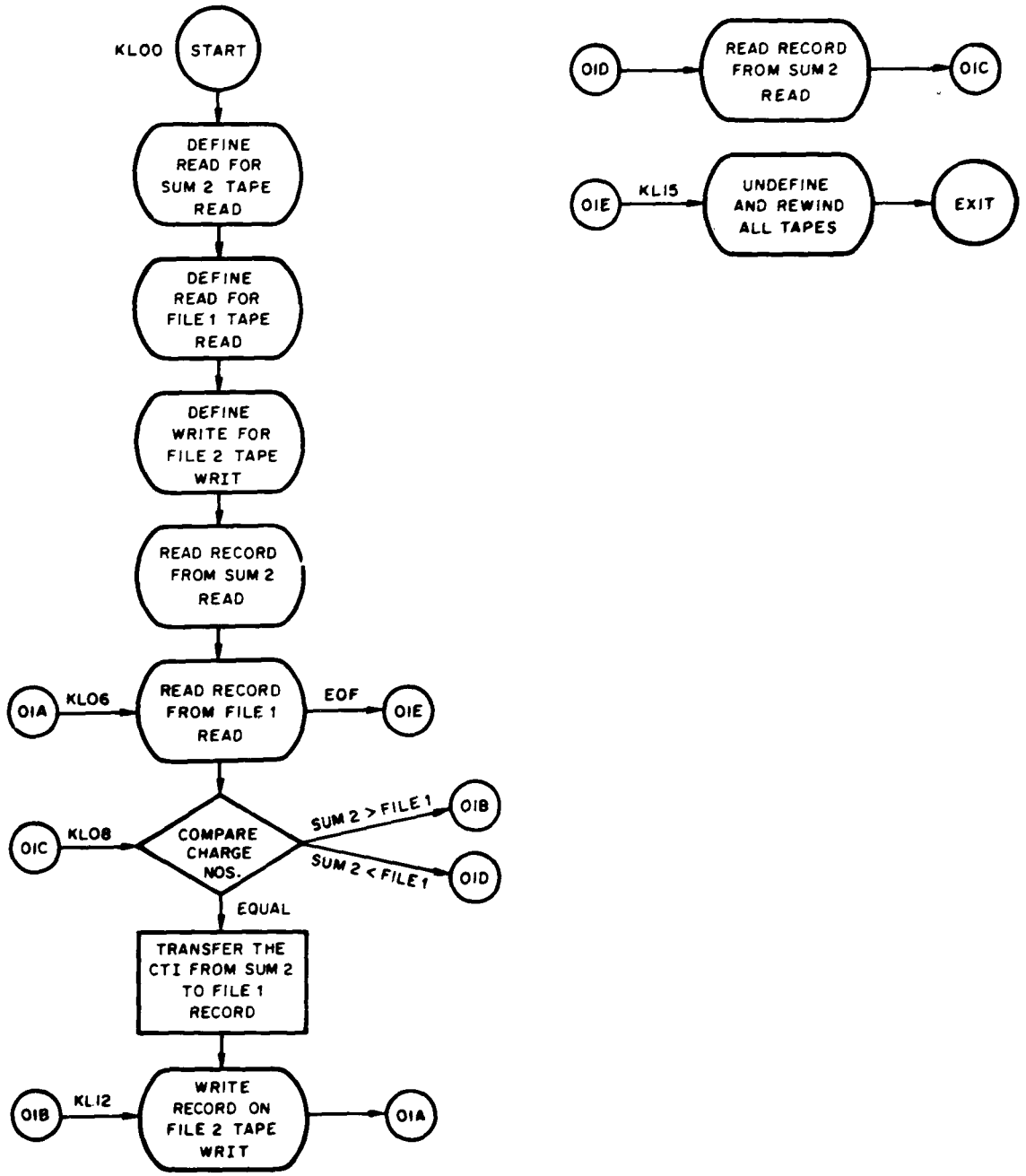
SUBREGIONS AND SUBROUTINES USED:

READ YCOMP

WRIT

EXPLANATION OF CALLING SEQUENCE:

Not applicable


KL00
START
DEFINE READ FOR SUM 2 TAPE READ
DEFINE READ FOR FILE 1 TAPE READ
DEFINE WRITE FOR FILE 2 TAPE WRIT
READ RECORD FROM SUM 2 READ
01A
KL06
READ RECORD FROM FILE 1 READ
EOF
01E
01C
KL08
COMPARE CHARGE NOS.
SUM 2 > FILE 1
01B
SUM 2 < FILE 1
01D
EQUAL
TRANSFER THE CTI FROM SUM 2 TO FILE 1 RECORD
01B
KL12
WRITE RECORD ON FILE 2 TAPE WRIT
01A
01D
READ RECORD FROM SUM 2 READ
01C
01E
KL15
UNDEFINE AND REWIND ALL TAPES
EXIT

RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 1

NAME OF RECORD REPORT INFO RECORD

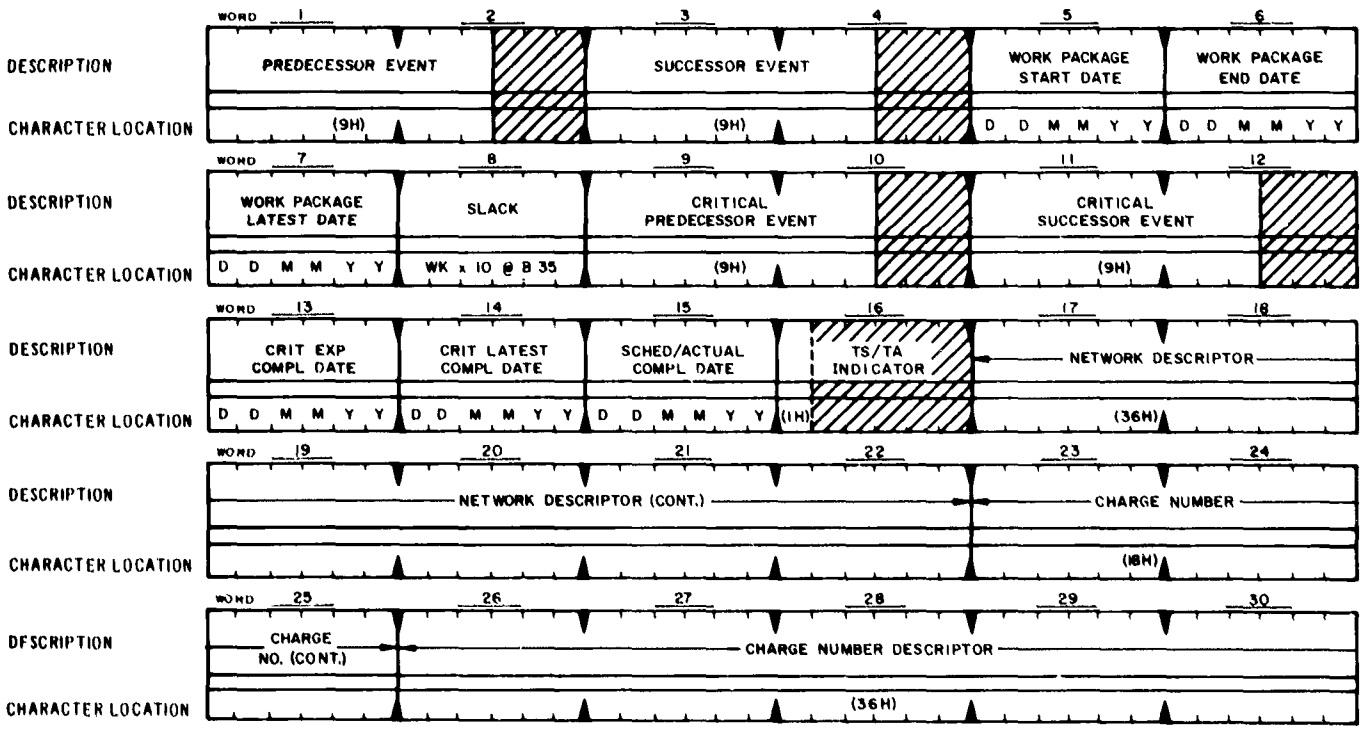


Fig. III-I-5. Tape Format of Report Information Record

RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 2

NAME OF RECORD REPORT INFO. RECORD (CONT.)

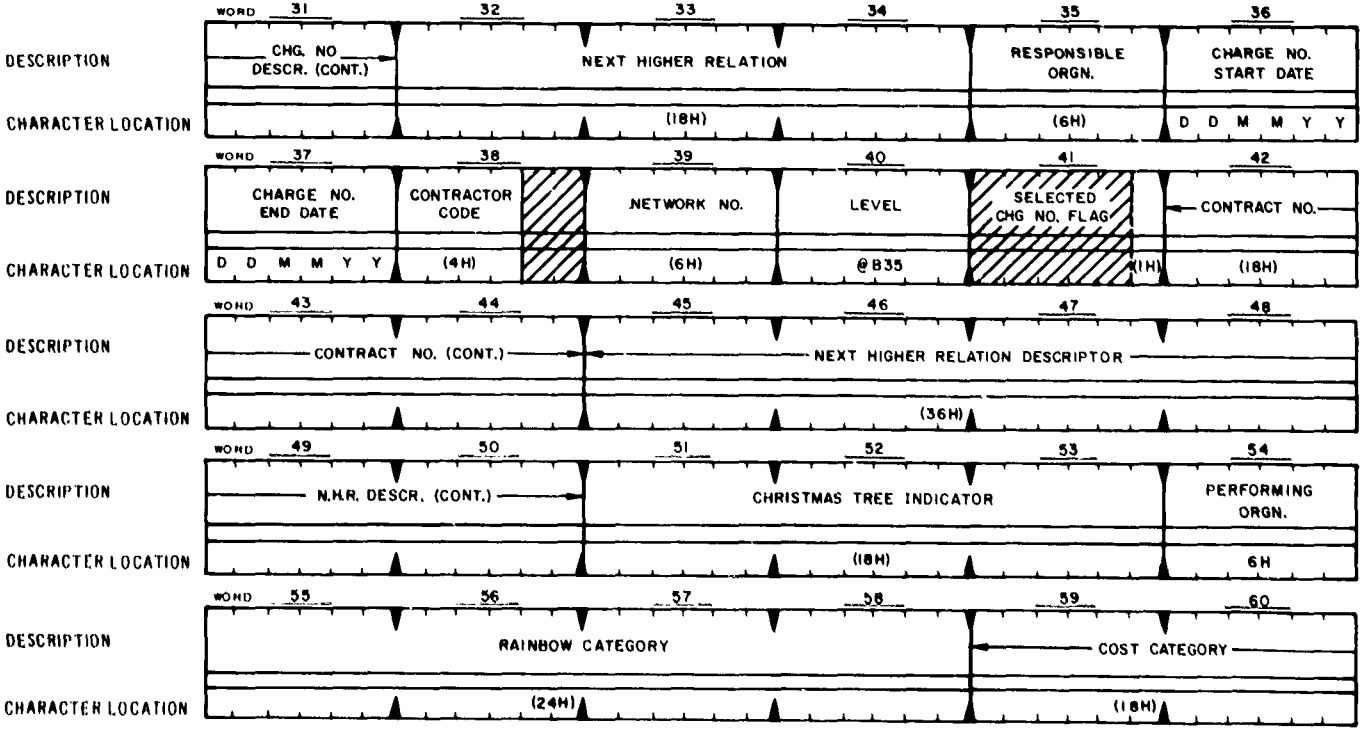


Fig. III-I-5. Tape Format of Report Information Record (Continued)

RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 3

NAME OF RECORD REPORT INFO. RECORD (CONT.)

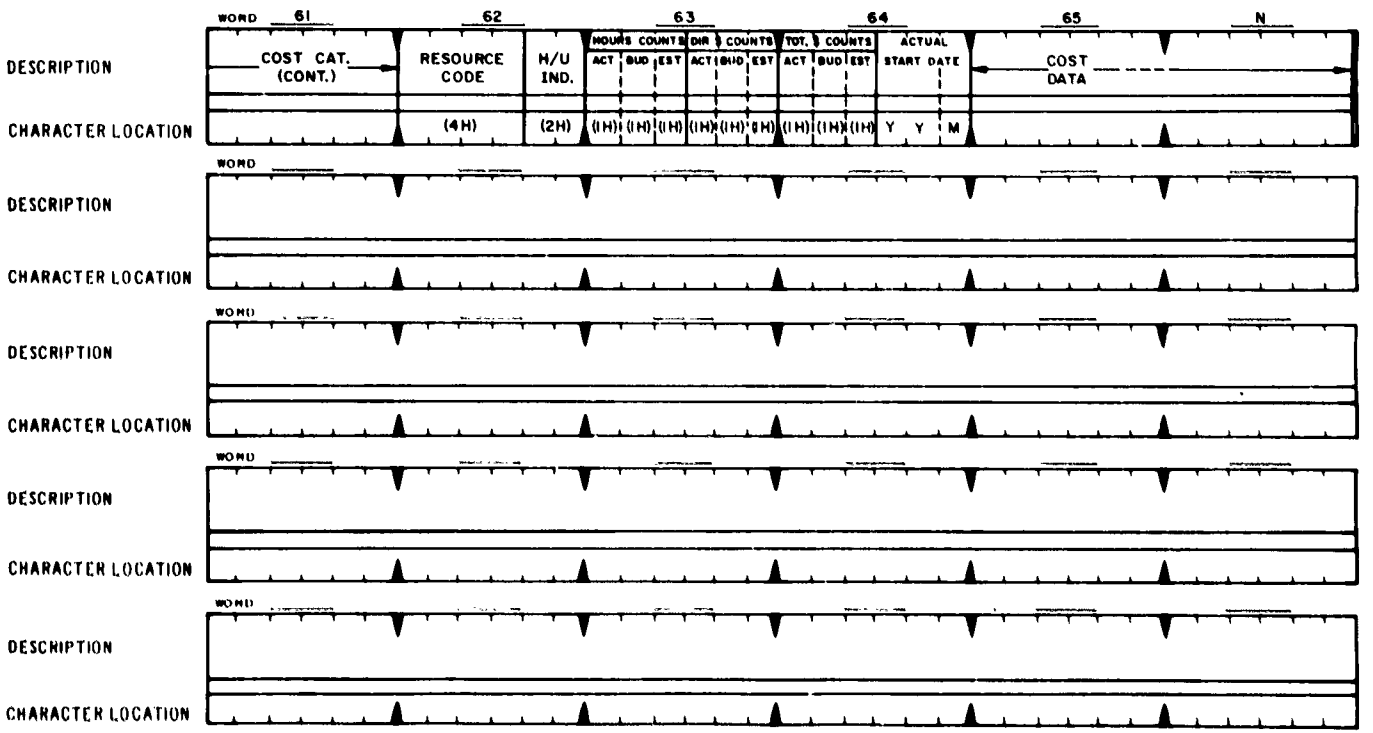
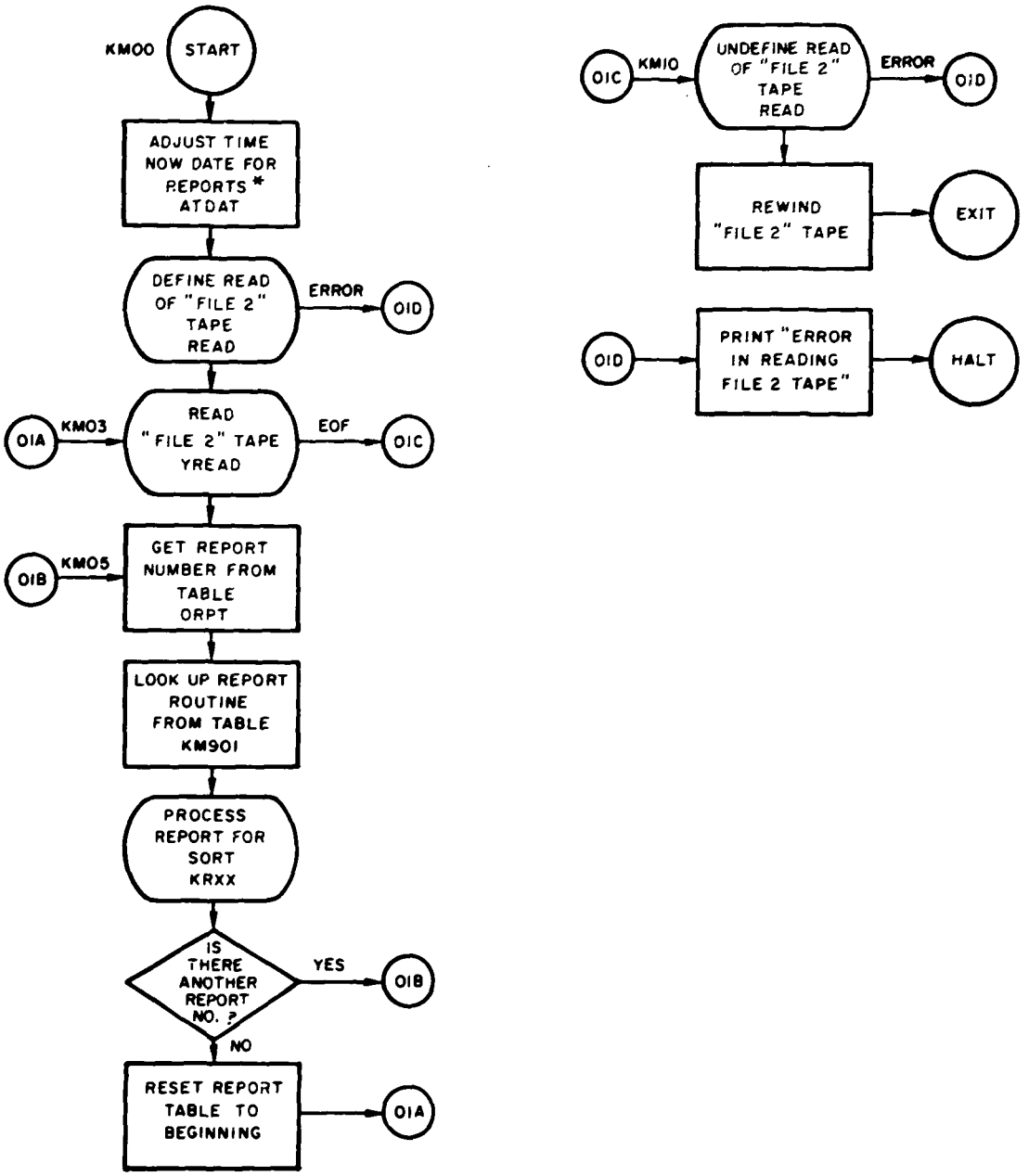


Fig. III-1-5. Tape Format of Report Information Record (Continued)



* IF TIME NOW "DAY" ≤ 10, ADJUST TO PREVIOUS MONTH
IF TIME NOW "DAY" > 10, USE PRESENT MONTH

Region KM00

EXPLANATION OF REGION:

To set up initial sort for Cost Reports.

CALLING SEQUENCE:

L TSX KM00,,4

L+1 Normal return

INPUT:

REPORT INFORMATION TAPE containing PERT Cost data records.

OUTPUT:

Reporting tape with Report breakdown.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

YREAD KRxx - Report routines

READ

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

Region KN00

EXPLANATION OF REGION:

To total the cost information for actuals, budgets, and estimates, by hours, direct dollars, and total dollars, and to calculate the overrun/underrun.

CALLING SEQUENCE:

L TSX KN00, 4

L+1 Normal return

INPUT:

XR1 = Location of start of data record (complemented).

Z+10 thru Z+21 cleared to zero.

OUTPUT:

Z+10 = act. hrs to date	Z+16 = latest rev. est. (dir. $)
Z+11 = contract est. (hrs)	Z+17 = (over) underrun (dir. $)
Z+12 = latest rev. est. (hrs)	Z+i8 = act. total $ to date
Z+13 = (overrun) underrun (hrs)	Z+19 = contract est. (total $)
Z+14 = act. dir. $ to date	Z+20 = latest rev. est (total $)
Z+15 = contract est. (dir. $)	Z+21 = (over) underrun (total $)

STORAGE USED:

Z+10 thru Z+21

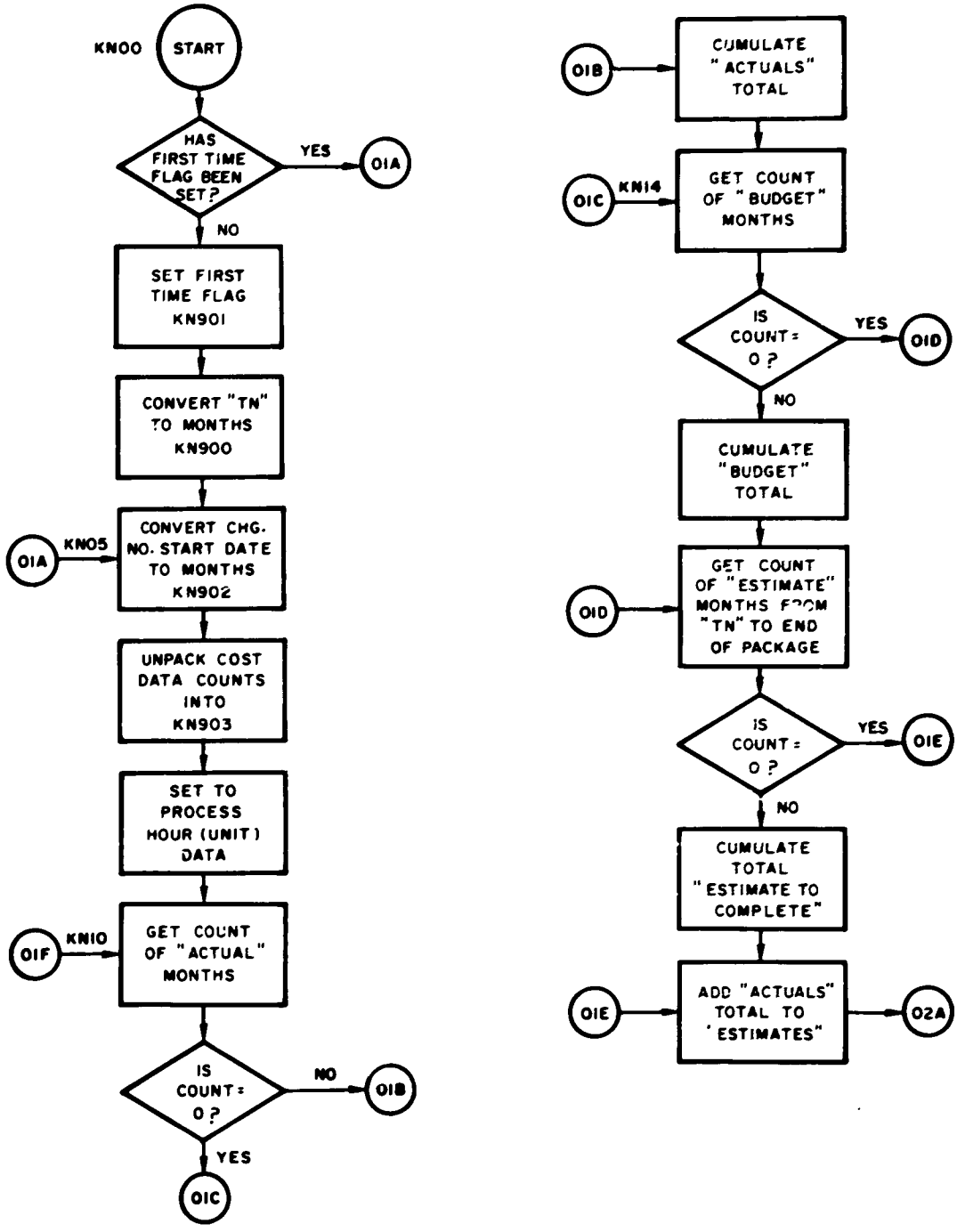
Z, Z+1

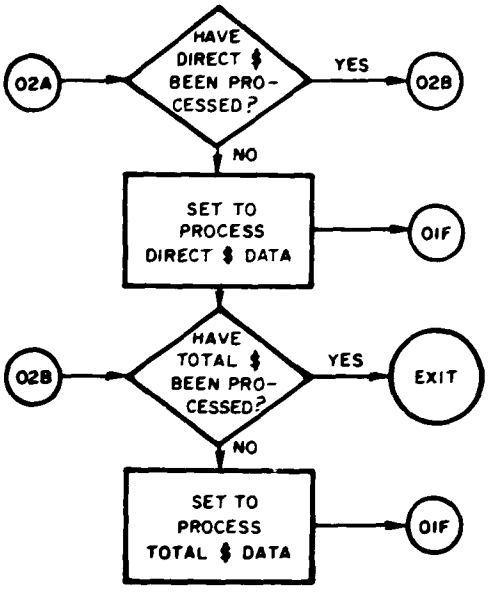
SUBREGIONS AND SUBROUTINES USED:

FIXPT UPCK

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


KN00
START
HAS FIRST TIME FLAG BEEN SET?
YES
01A
NO
SET FIRST TIME FLAG KN901
CONVERT "TN" TO MONTHS KN900
01A
KN05
CONVERT CHG. NO. START DATE TO MONTHS KN902
UNPACK COST DATA COUNTS INTO KN903
SET TO PROCESS HOUR (UNIT) DATA
01F
KN10
GET COUNT OF "ACTUAL" MONTHS
IS COUNT = 0 ?
NO
01B
YES
01C
01B
CUMULATE "ACTUALS" TOTAL
01C
KN14
GET COUNT OF "BUDGET" MONTHS
IS COUNT = 0 ?
YES
01D
NO
CUMULATE "BUDGET" TOTAL
01D
GET COUNT OF "ESTIMATE" MONTHS FROM "TN" TO END OF PACKAGE
IS COUNT = 0 ?
YES
01E
NO
CUMULATE TOTAL "ESTIMATE TO COMPLETE"
01E
ADD "ACTUALS" TOTAL TO "ESTIMATES"
02A


02A
HAVE DIRECT $ BEEN PRO-CESSED?
YES
02B
NO
SET TO PROCESS DIRECT $ DATA
01F
02B
HAVE TOTAL $ BEEN PRO-CESSED?
YES
EXIT
NO
SET TO PROCESS TOTAL $ DATA
01F

Region KN50

EXPLANATION OF REGION:

To adjust dollar amounts to nearest thousands.

CALLING SEQUENCE:

L TSX KN50, 4

L+1 Normal return

INPUT:

Dollar amounts in Z storage block.

OUTPUT:

Adjusted dollar amounts in Z storage block.

STORAGE USED:

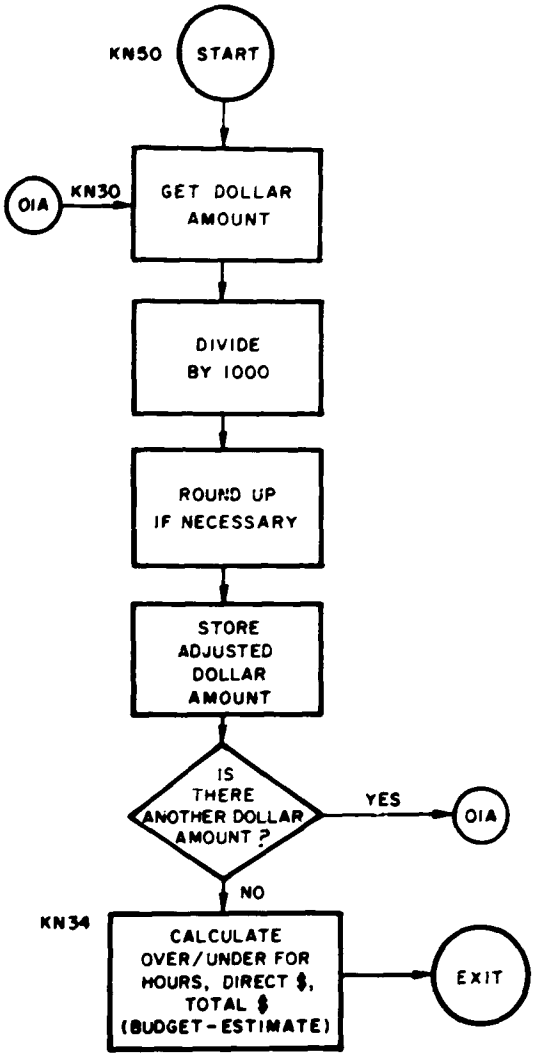
Z+14 thru Z+21.

SUBREGIONS AND SUBROUTINES USED:

Not applicable.

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


KN50
START
01A
KN30
GET DOLLAR AMOUNT
DIVIDE BY 1000
ROUND UP IF NECESSARY
STORE ADJUSTED DOLLAR AMOUNT
IS THERE ANOTHER DOLLAR AMOUNT ?
YES
01A
NO
KN34
CALCULATE OVER/UNDER FOR HOURS, DIRECT $, TOTAL $ (BUDGET-ESTIMATE)
EXIT

Region KN100

EXPLANATION OF REGION:

To compute planned work to date for hours, direct dollars, and total dollars.

CALLING SEQUENCE:

L TSX KN100, 4

L+1 Normal return

INPUT:

XR1 = location of PERT Cost data record (complemented).

OUTPUT:

KN909 = Planned hours to date

KN909+1 = Planned direct dollars to date

KN909+2 = Planned total dollars to date

STORAGE USED:

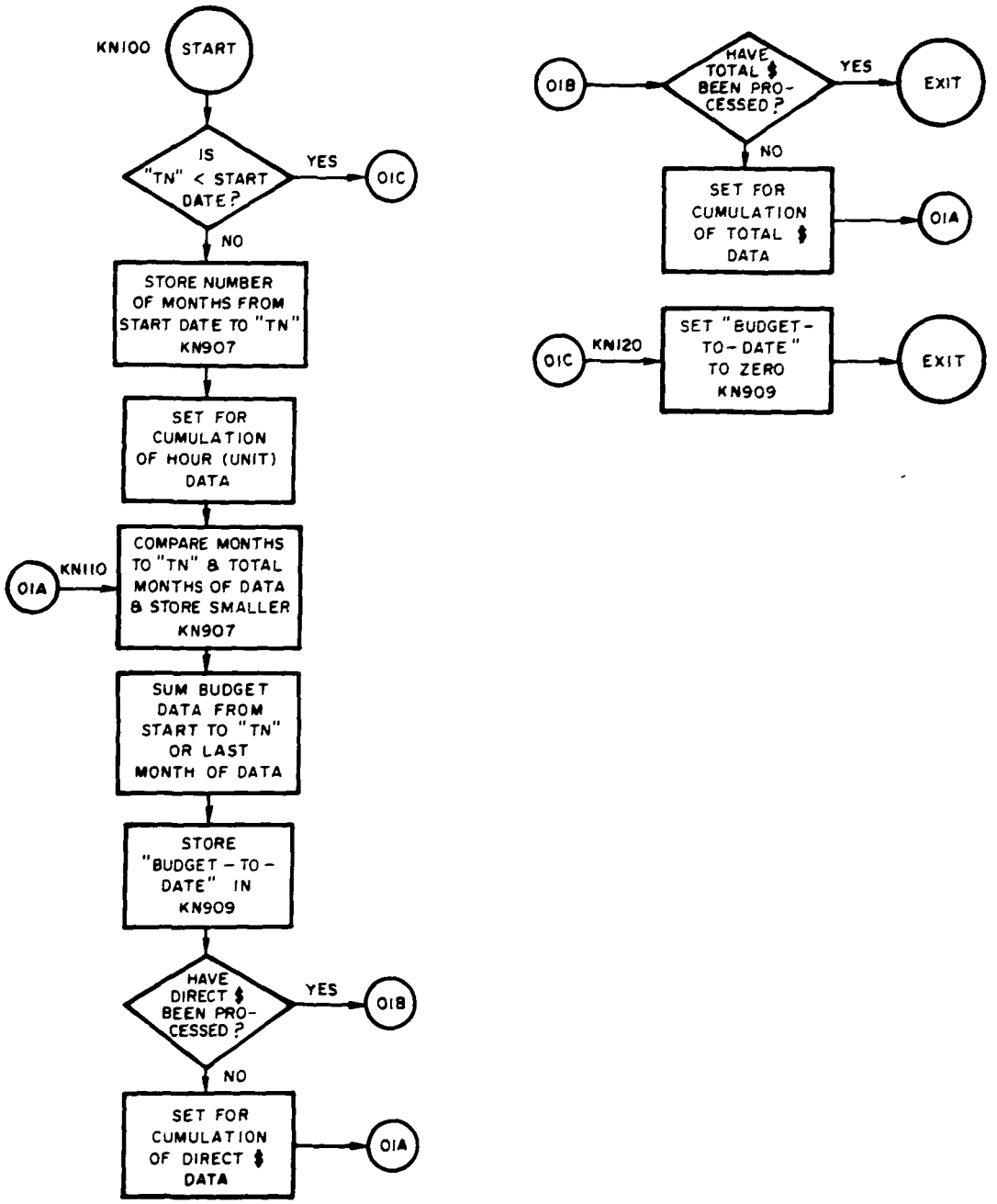
Not applicable.

SUBREGIONS AND SUBROUTINES USED:

Not applicable.

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


KN100
START
IS "TN" < START DATE?
YES
01C
NO
STORE NUMBER OF MONTHS FROM START DATE TO "TN" KN907
SET FOR CUMULATION OF HOUR (UNIT) DATA
01A
KN110
COMPARE MONTHS TO "TN" & TOTAL MONTHS OF DATA & STORE SMALLER KN907
SUM BUDGET DATA FROM START TO "TN" OR LAST MONTH OF DATA
STORE "BUDGET-TO-DATE" IN KN909
HAVE DIRECT $ BEEN PROCESSED?
YES
01B
NO
SET FOR CUMULATION OF DIRECT $ DATA
01A
01B
HAVE TOTAL $ BEEN PROCESSED?
YES
EXIT
NO
SET FOR CUMULATION OF TOTAL $ DATA
01A
01C
KN120
SET "BUDGET-TO-DATE" TO ZERO KN909
EXIT

Region KP00

EXPLANATION OF REGION:

To format "Organization Status Report" data and give to sort routine.

CALLING SEQUENCE:

```
L     TSX   KP00, 4
L+1   PZE   N
L+2   Normal return
```

INPUT:

PERT Cost data record.

OUTPUT:

"Organization Status Report" data records.

STORAGE USED:

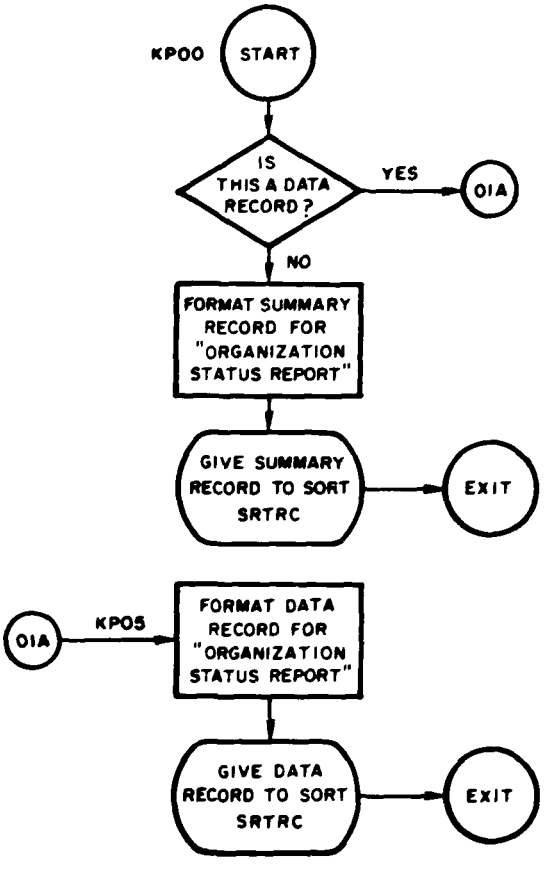
Not applicable.

SUBREGIONS AND SUBROUTINES USED:

XSORT

EXPLANATION OF CALLING SEQUENCE:

N: 0 = summary record to be formatted
   1 = data record to be formatted


KP00
START
IS THIS A DATA RECORD?
YES
01A
NO
FORMAT SUMMARY RECORD FOR "ORGANIZATION STATUS REPORT"
GIVE SUMMARY RECORD TO SORT SRTRC
EXIT
01A
KP05
FORMAT DATA RECORD FOR "ORGANIZATION STATUS REPORT"
GIVE DATA RECORD TO SORT SRTRC
EXIT

Region KP10

EXPLANATION OF REGION:

To determine acceptability of data record for Reports 10 and 20.

CALLING SEQUENCE:

L TSX KP10, 4

L+1 Normal return

INPUT:

PERT Cost data record.

OUTPUT:

Reports 10 and 20 data records.

STORAGE USED:

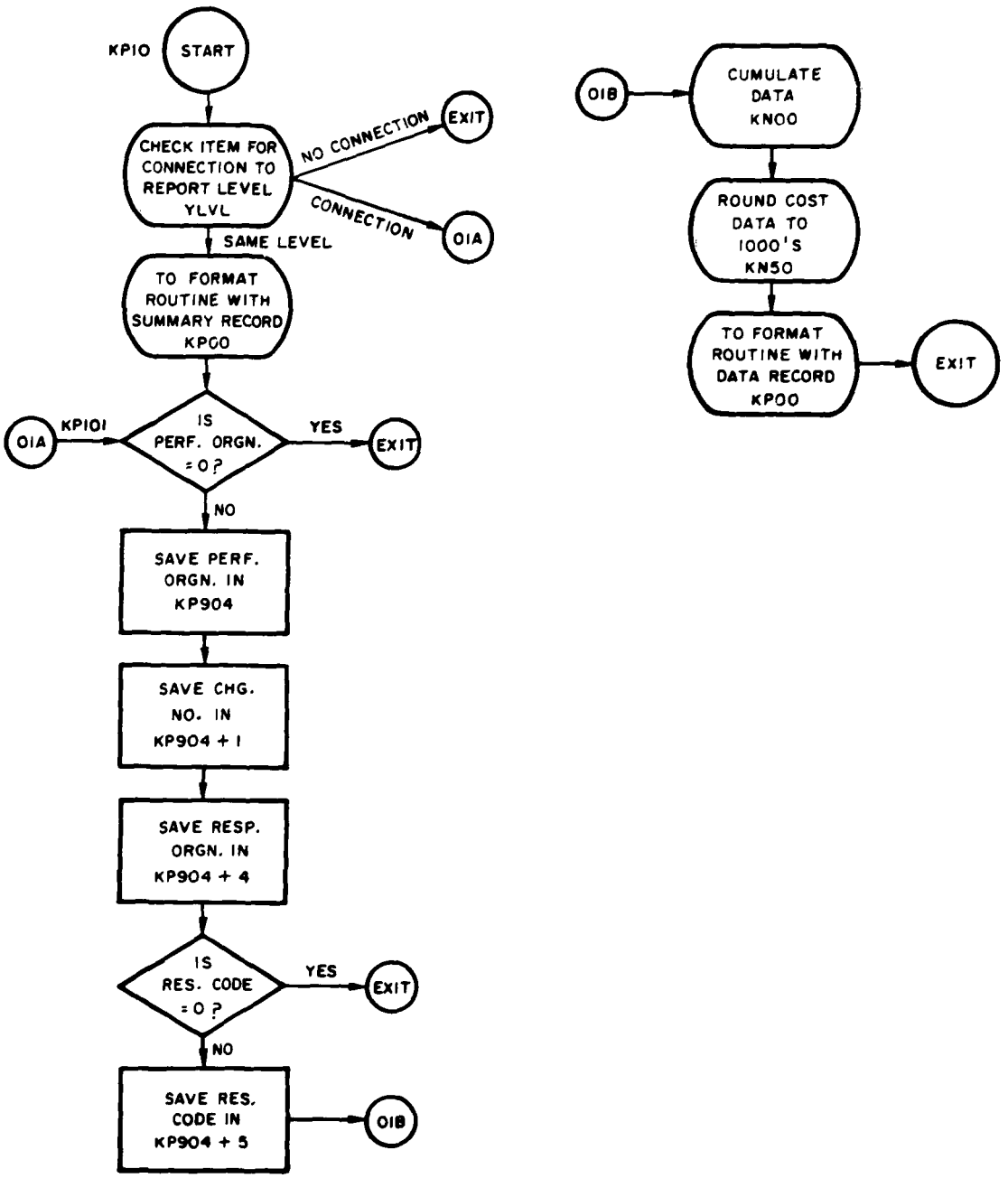
Not applicable.

SUBREGIONS AND SUBROUTINES USED:

YLVL	KP00 (see Subsec. 3.8.5.14)
KN00 (see Subsec. 3.8.5.11)	KN50 (see Subsec. 3.8.5.12)

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


KP10
START
CHECK ITEM FOR CONNECTION TO REPORT LEVEL YLVL
NO CONNECTION
EXIT
CONNECTION
01A
SAME LEVEL
TO FORMAT ROUTINE WITH SUMMARY RECORD KP00
01A
KP101
IS PERF. ORGN. = 0 ?
YES
EXIT
NO
SAVE PERF. ORGN. IN KP904
SAVE CHG. NO. IN KP904 + 1
SAVE RESP. ORGN. IN KP904 + 4
IS RES. CODE = 0 ?
YES
EXIT
NO
SAVE RES. CODE IN KP904 + 5
01B
01B
CUMULATE DATA KN00
ROUND COST DATA TO 1000'S KN50
TO FORMAT ROUTINE WITH DATA RECORD KP00
EXIT

Region KP11

EXPLANATION OF REGION:

To determine acceptability of data record for Reports 11 and 21.

CALLING SEQUENCE:

```
L     TSX   KP11, 4
L+1   Normal return
```

INPUT:

PERT Cost data record.

OUTPUT:

Reports 11 and 21 data records.

STORAGE USED:

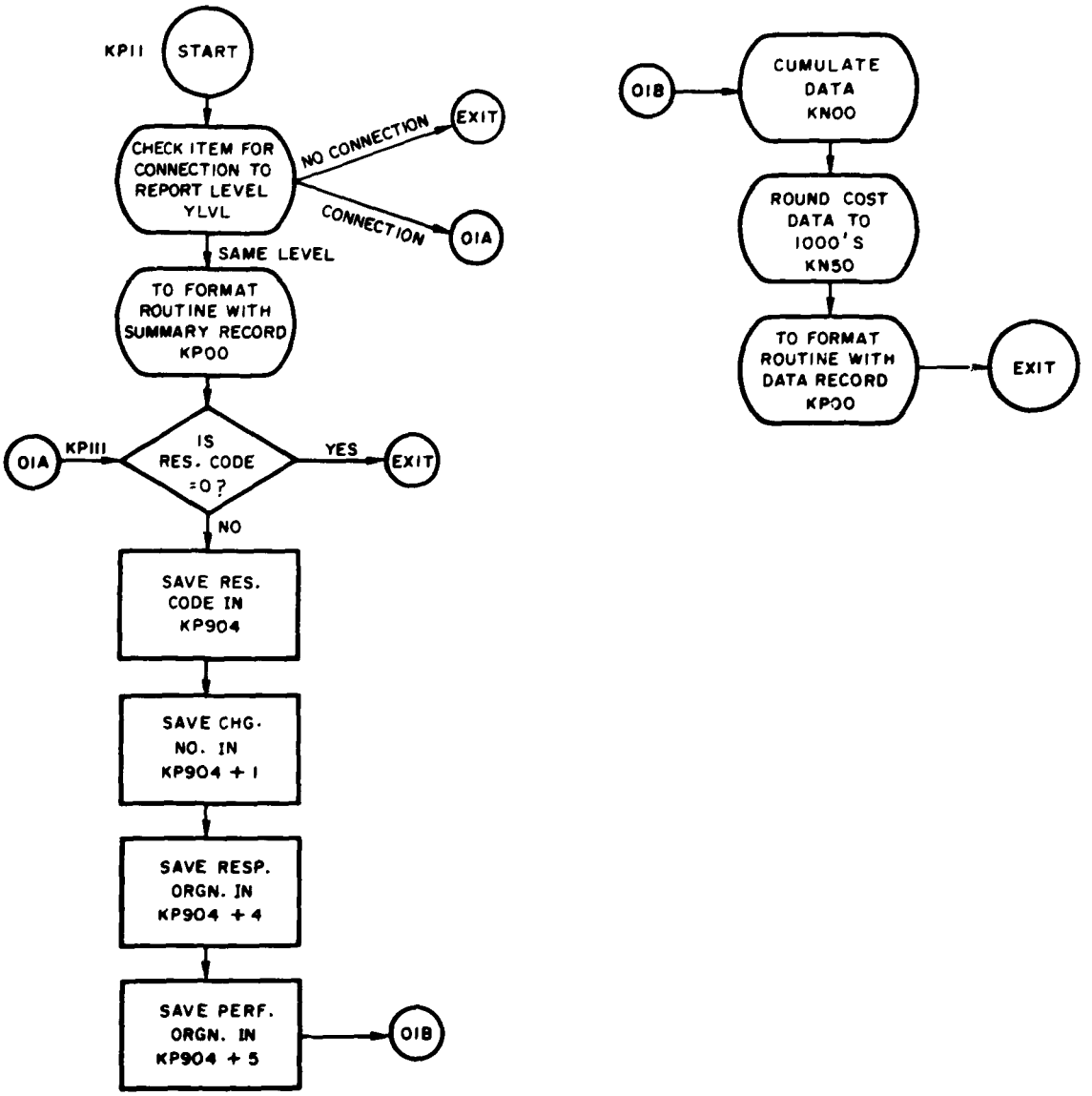
Not applicable.

SUBREGIONS AND SUBROUTINES USED:

YLVL	KP00
KN00	KN50

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


KP11
START
CHECK ITEM FOR CONNECTION TO REPORT LEVEL YLVL
NO CONNECTION
EXIT
CONNECTION
01A
SAME LEVEL
TO FORMAT ROUTINE WITH SUMMARY RECORD KP00
01A
KP111
IS RES. CODE =0 ?
YES
EXIT
NO
SAVE RES. CODE IN KP904
SAVE CHG. NO. IN KP904 + 1
SAVE RESP. ORGN. IN KP904 + 4
SAVE PERF. ORGN. IN KP904 + 5
01B
01B
CUMULATE DATA KN00
ROUND COST DATA TO 1000'S KN50
TO FORMAT ROUTINE WITH DATA RECORD KP00
EXIT

Region KP12

EXPLANATION OF REGION:

To determine acceptability of data record for Reports 12 and 22.

CALLING SEQUENCE:

L TSX KP12, 4

L+1 Normal return

INPUT:

PERT Cost data record.

OUTPUT:

Reports 12 and 22 data records.

STORAGE USED:

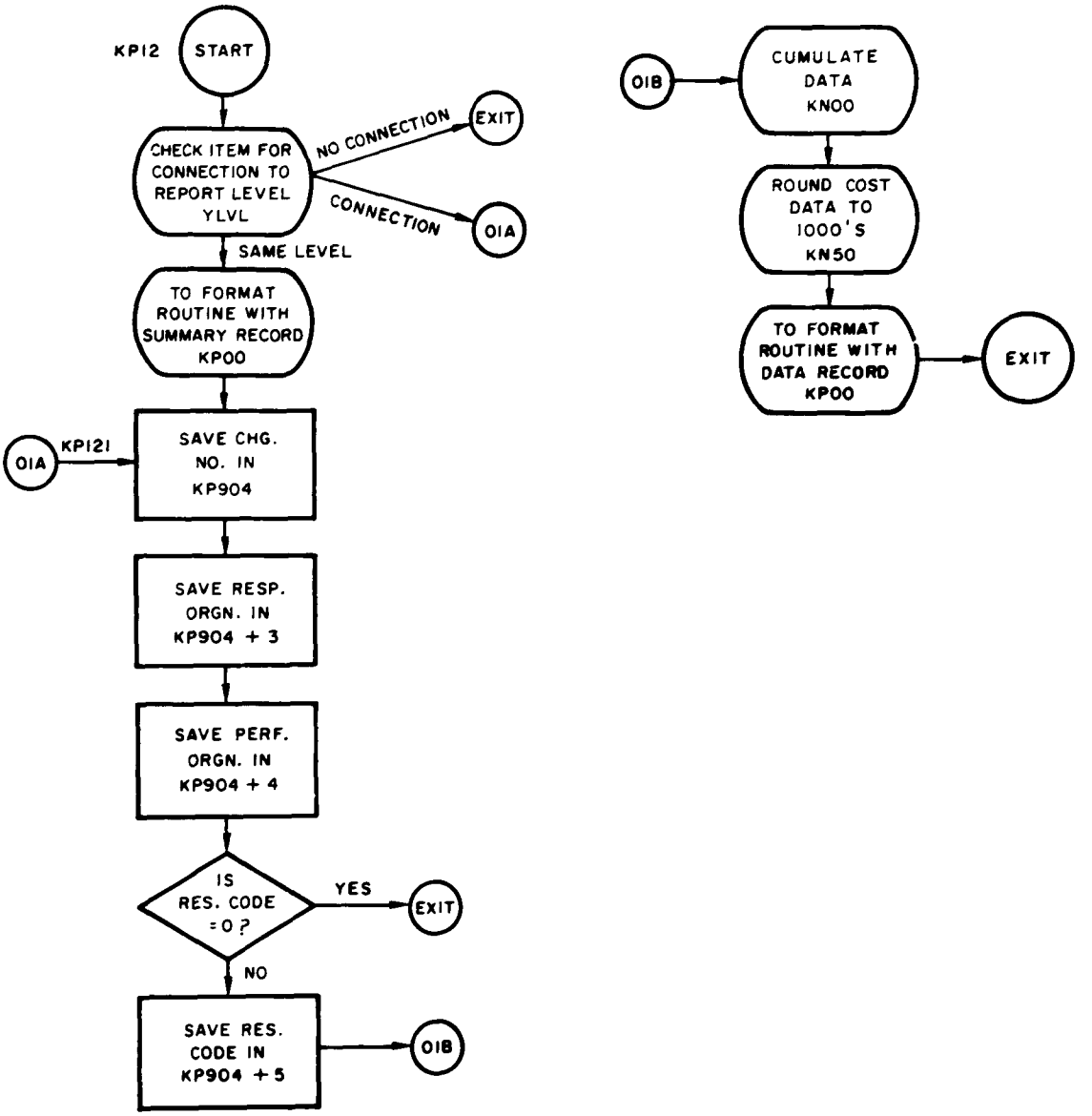
Not applicable.

SUBREGIONS AND SUBROUTINES USED:

YLVL	KP00
KN00	KN50

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


KP12
START
CHECK ITEM FOR CONNECTION TO REPORT LEVEL YLVL
NO CONNECTION
EXIT
CONNECTION
01A
SAME LEVEL
TO FORMAT ROUTINE WITH SUMMARY RECORD KP00
01A
KP121
SAVE CHG. NO. IN KP904
SAVE RESP. ORGN. IN KP904 + 3
SAVE PERF. ORGN. IN KP904 + 4
IS RES. CODE = 0 ?
YES
EXIT
NO
SAVE RES. CODE IN KP904 + 5
01B
01B
CUMULATE DATA KN00
ROUND COST DATA TO 1000'S KN50
TO FORMAT ROUTINE WITH DATA RECORD KP00
EXIT

Region KP13

EXPLANATION OF REGION:

To determine acceptability of data record for Reports 13 and 23.

CALLING SEQUENCE:

L TSX KP13, 4

L+1 Normal return

INPUT:

PERT Cost data record.

OUTPUT:

Reports 13 and 23 data records.

STORAGE USED:

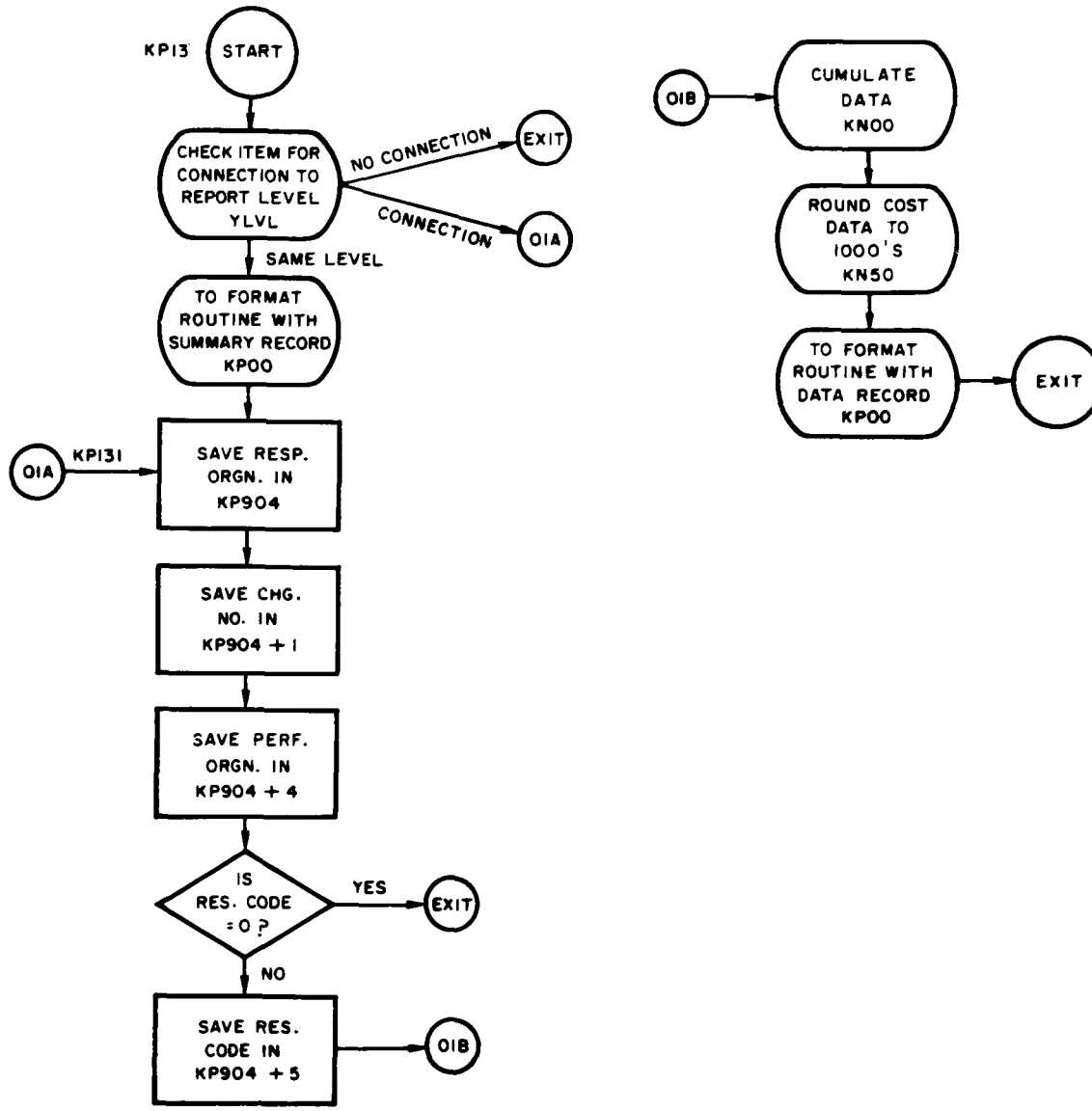
Not applicable.

SUBREGIONS AND SUBROUTINES USED:

YLVL	KP00
KN00	KN50

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


KP13
START
CHECK ITEM FOR CONNECTION TO REPORT LEVEL YLVL
NO CONNECTION
EXIT
CONNECTION
01A
SAME LEVEL
TO FORMAT ROUTINE WITH SUMMARY RECORD KP00
01A
KP131
SAVE RESP. ORGN. IN KP904
SAVE CHG. NO. IN KP904 + 1
SAVE PERF. ORGN. IN KP904 + 4
IS RES. CODE = 0 ?
YES
EXIT
NO
SAVE RES. CODE IN KP904 + 5
01B
01B
CUMULATE DATA KN00
ROUND COST DATA TO 1000'S KN50
TO FORMAT ROUTINE WITH DATA RECORD KP00
EXIT

Region KR10

EXPLANATION OF REGION:

To select and set up sequence for sorting "Organization Status Report" by performing organization, charge number, responsible organization, resource code. (Report 10)

CALLING SEQUENCE:

L TSX KR10, 4

L+1 Normal return

INPUT:

Accumulator: Report level,, Report no.

YCNT: Location of PERT Cost data record.

OUTPUT:

Data record for Report 10.

STORAGE USED:

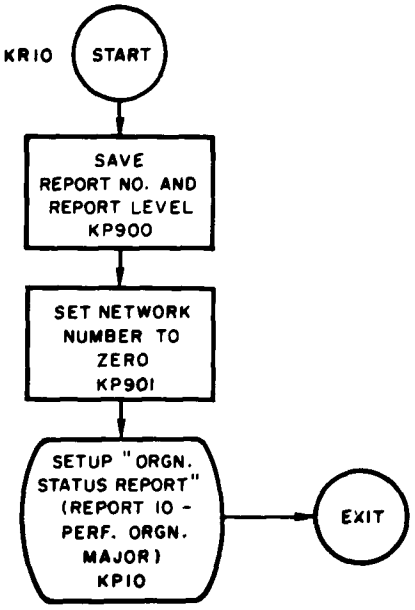
Not applicable.

SUBREGIONS AND SUBROUTINES USED:

KP10 (see Subsec. 3.8.5.15)

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


KRIO
START
SAVE REPORT NO. AND REPORT LEVEL KP900
SET NETWORK NUMBER TO ZERO KP901
SETUP "ORGN. STATUS REPORT" (REPORT 10 - PERF. ORGN. MAJOR) KP10
EXIT

RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE

NAME OF RECORD REPORT 10 (SUMMARY)

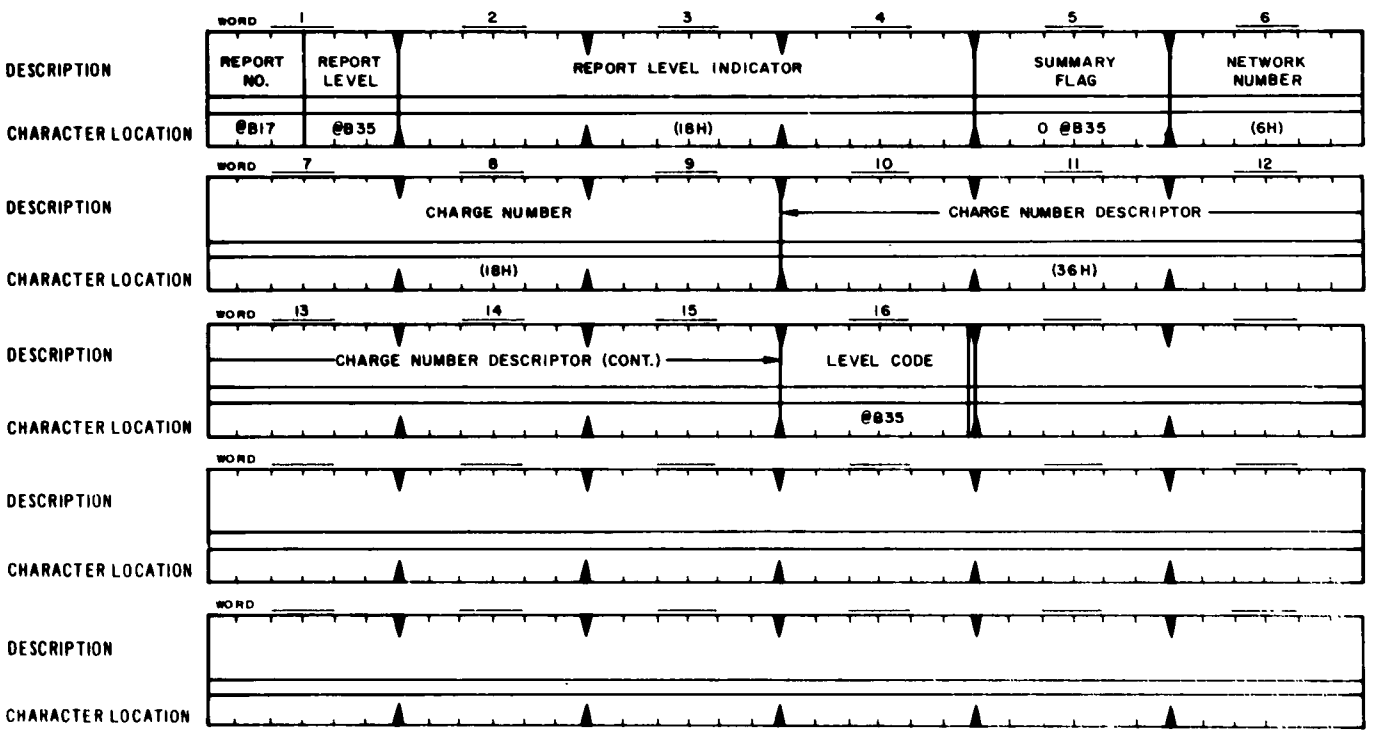


Fig III-I-6. Tape Format of Report 10, Summary

RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 1

NAME OF RECORD REPORT 10 (DATA)

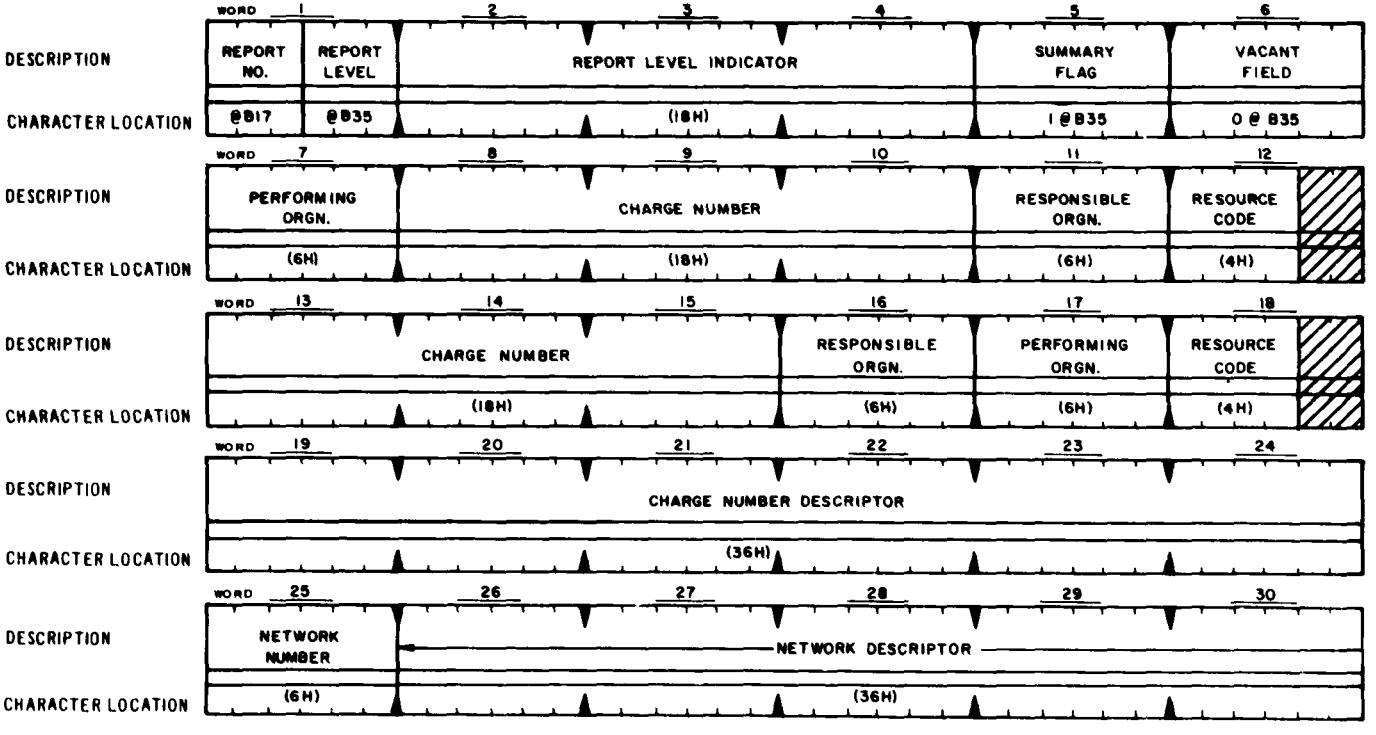


Fig. III-I-7. Tape Format of Report 10, Data

RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 2

NAME OF RECORD REPORT 10 (DATA (CONT))

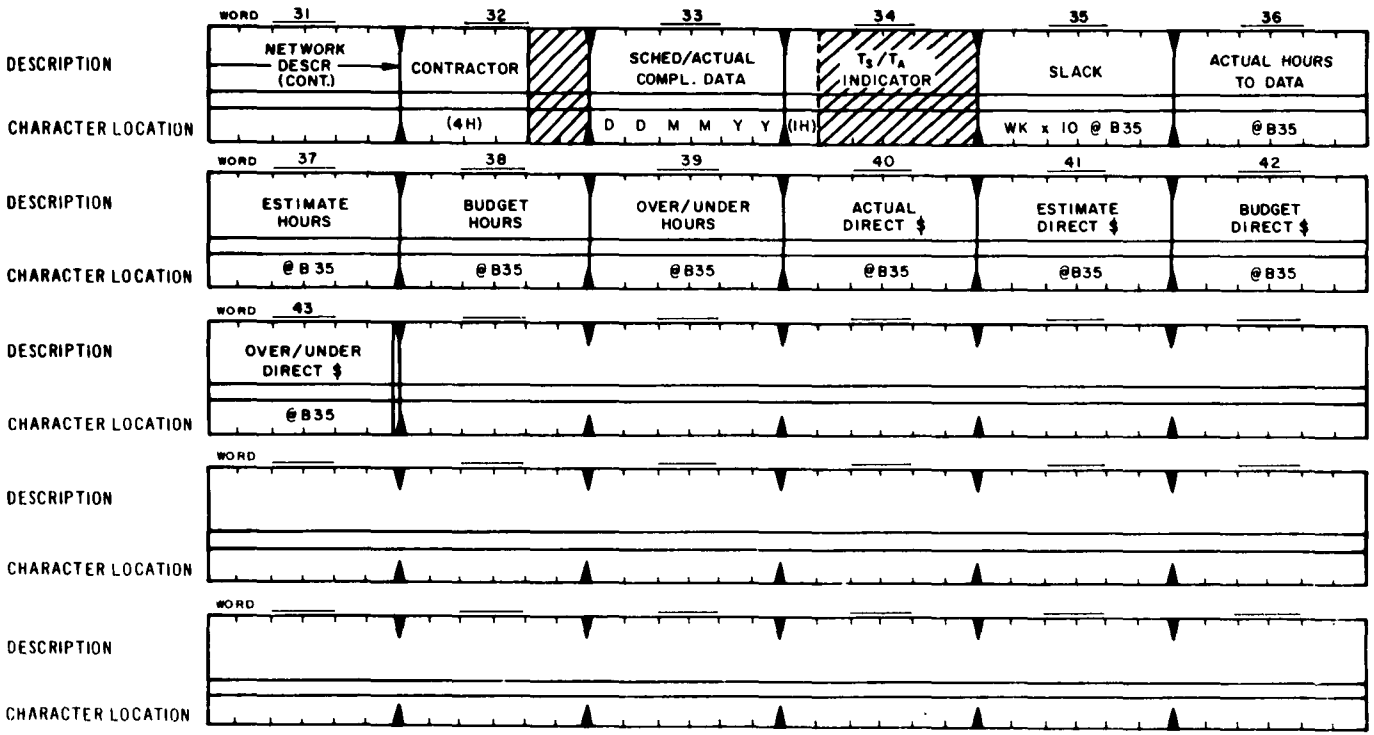


Fig. III-I-7. Tape Format of Report 10, Data (Continued)

Region KR11

EXPLANATION OF REGION:

To select and set up sequence for sorting "Organization Status Report" by resource code, charge number, responsible organization, performing organization (Report 11).

CALLING SEQUENCE:

L TSX KR11, 4

L+1 Normal return

INPUT:

Accumulator: Report level, , Report number.

YCNT: Location of PERT Cost data record.

OUTPUT:

Report 11 data record.

STORAGE USED:

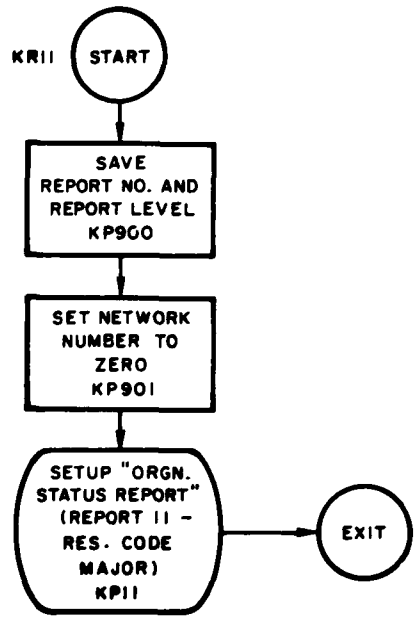
Not applicable.

SUBREGIONS AND SUBROUTINES USED:

KP11

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


KR11
START
SAVE REPORT NO. AND REPORT LEVEL KP900
SET NETWORK NUMBER TO ZERO KP901
SETUP "ORGN. STATUS REPORT" (REPORT 11 - RES. CODE MAJOR) KP11
EXIT

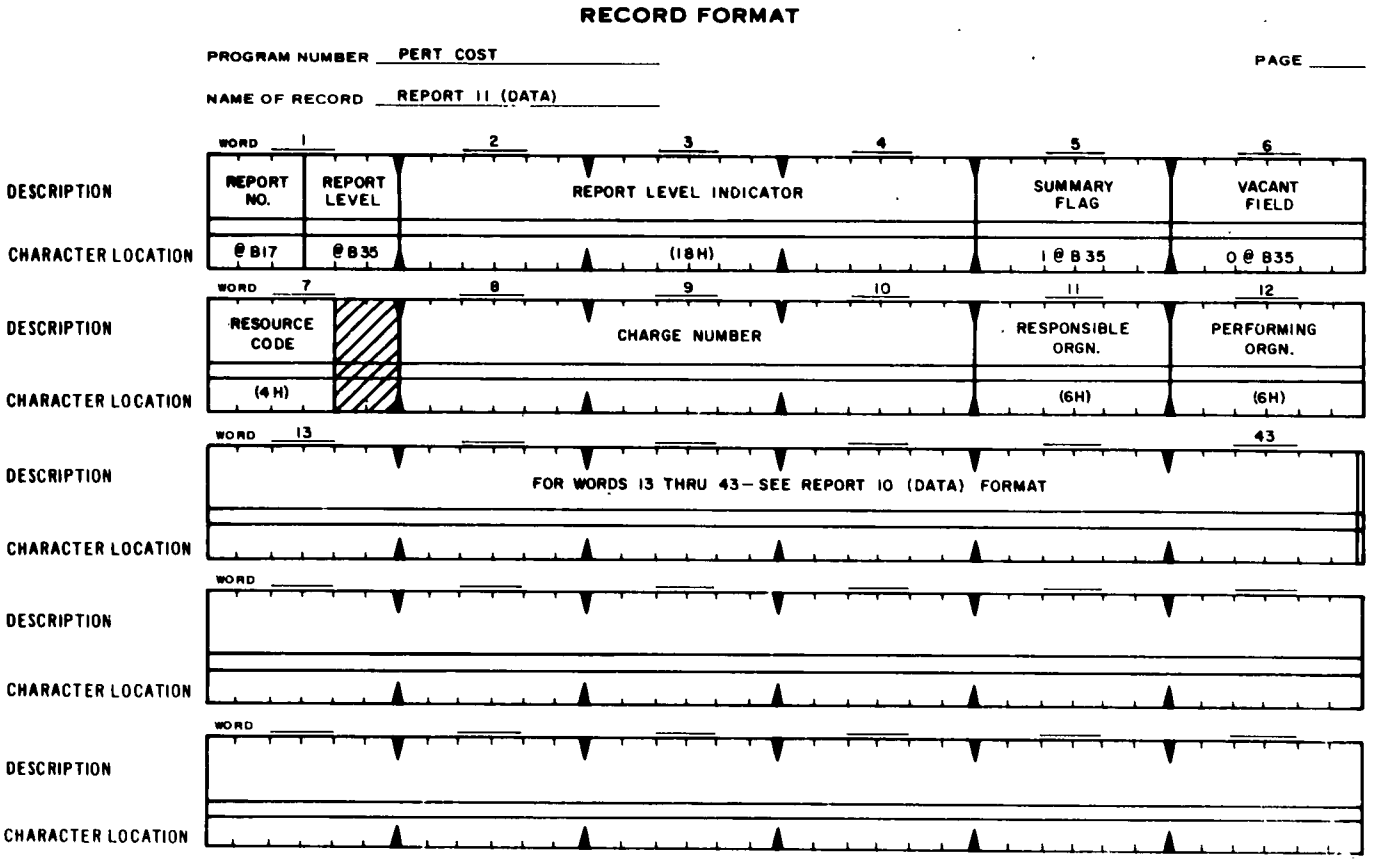


Fig. III-I-8. Tape Format of Report 11, Data

Region KR12

EXPLANATION OF REGION:

To select and set up sequence for sorting "Organization Status Report" by charge number, responsible organization, performing organization, resource code (Report 12).

CALLING SEQUENCE:

L TSX KR12, 4

L+1 Normal return

INPUT:

Accumulator: Report level,, Report number.

YCNT: Location of PERT Cost data record.

OUTPUT:

Report 12 data record.

STORAGE USED:

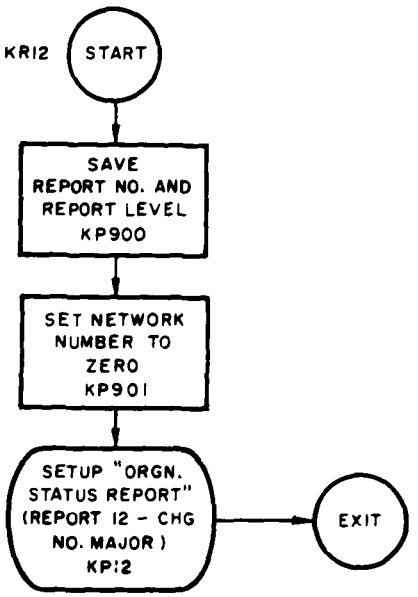
Not applicable.

SUBREGIONS AND SUBROUTINES USED:

KP12

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


KR12
START
SAVE REPORT NO. AND REPORT LEVEL KP900
SET NETWORK NUMBER TO ZERO KP901
SETUP "ORGN. STATUS REPORT" (REPORT 12 - CHG NO. MAJOR) KP12
EXIT

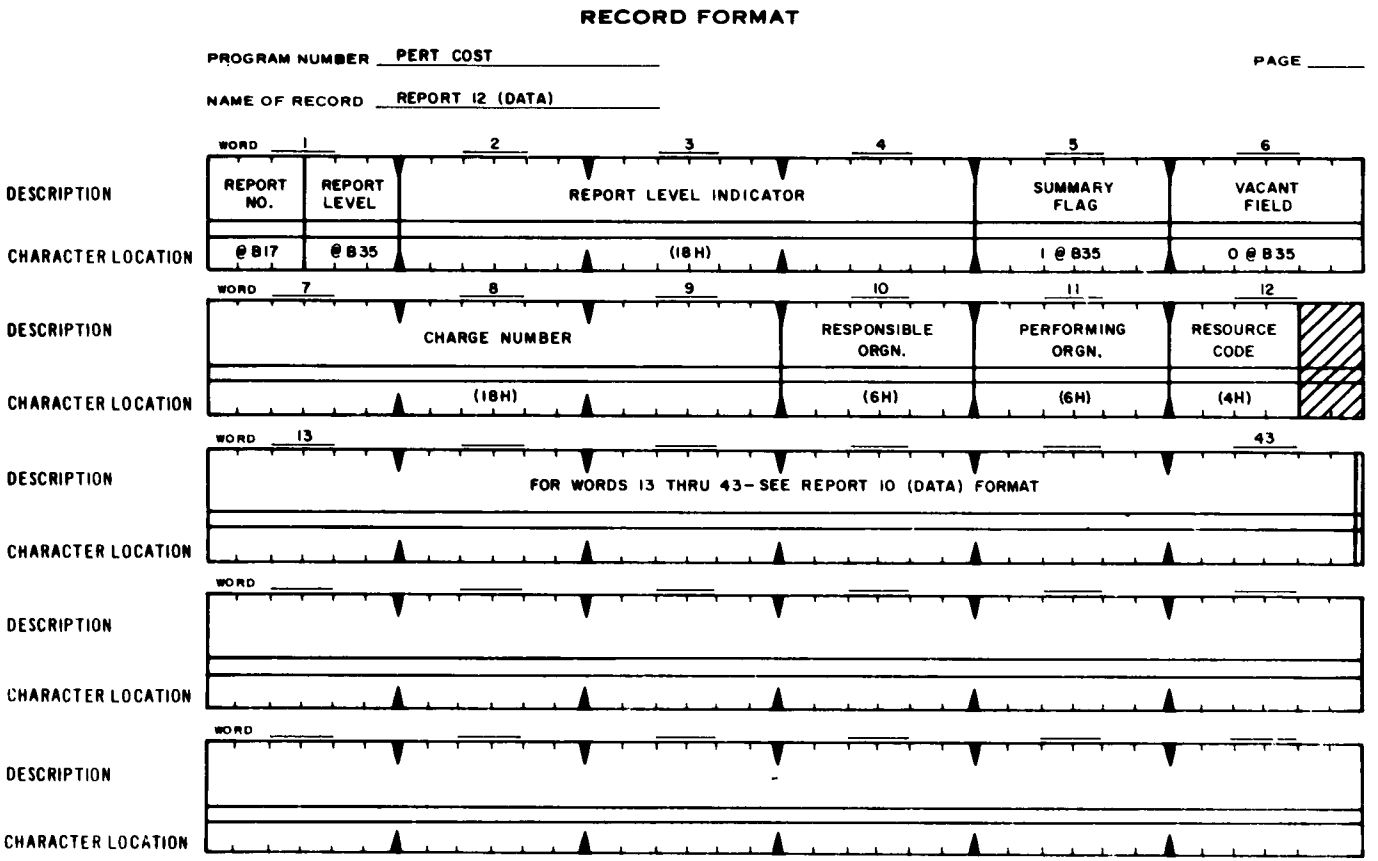


Fig III-I-9. Tape Format of Report 12, Data

Region KR13

EXPLANATION OF REGION:

To select and set up sequence for sorting "Organization Status Report" by responsible organization, charge number, performing organization, resource code (Report 13).

CALLING SEQUENCE:

L TSX KR13, 4

L+1 Normal return

INPUT:

Accumulator: Report level,, Report number.

YCNT: Location of PERT Cost data record.

OUTPUT:

Report 13 data record.

STORAGE USED:

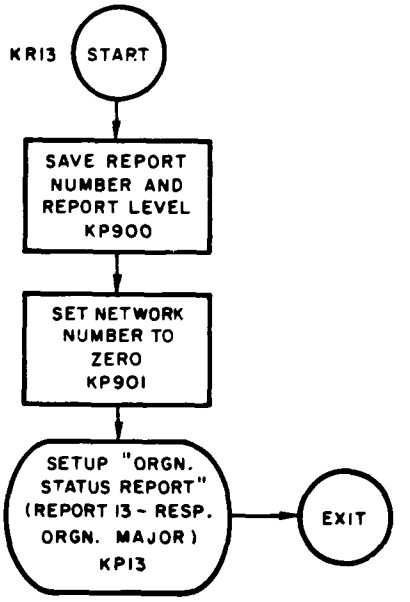
Not applicable.

SUBREGIONS AND SUBROUTINES USED:

KP13

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


KR13
START
SAVE REPORT NUMBER AND REPORT LEVEL KP900
SET NETWORK NUMBER TO ZERO KP901
SETUP "ORGN. STATUS REPORT" (REPORT 13 - RESP. ORGN. MAJOR) KP13
EXIT

RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 1

NAME OF RECORD REPORT 13 (DATA)

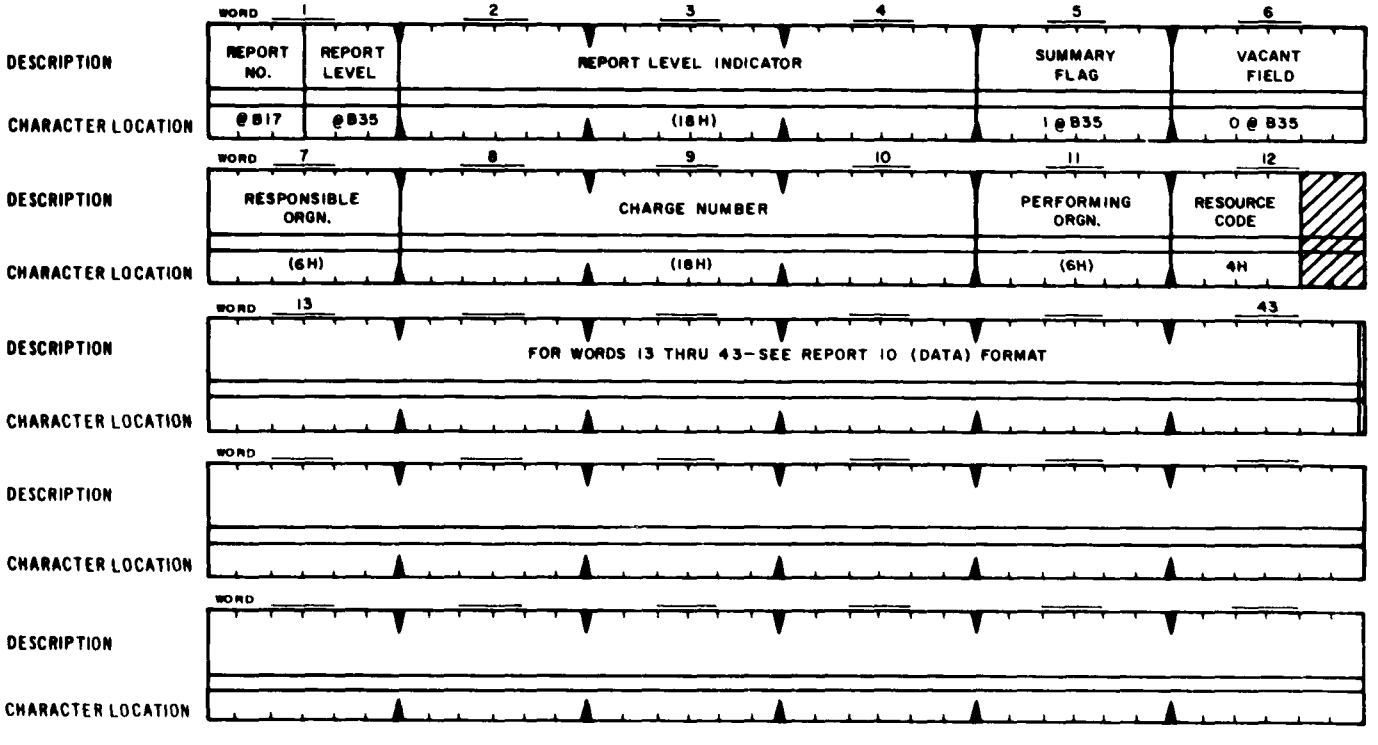


Fig III-I-10. Tape Format of Report 13, Data

Region KR20

EXPLANATION OF REGION:

To select and set up sequence for sorting "Organization Status Report" by network number, performing organization, charge number, responsible organization, resource code (Report 20).

CALLING SEQUENCE:

L TSX KR20, 4

L+1 Normal return

INPUT:

Accumulator: Report level, , Report number.

YCNT: Location of PERT Cost data record.

OUTPUT:

Report 20 data record.

STORAGE USED:

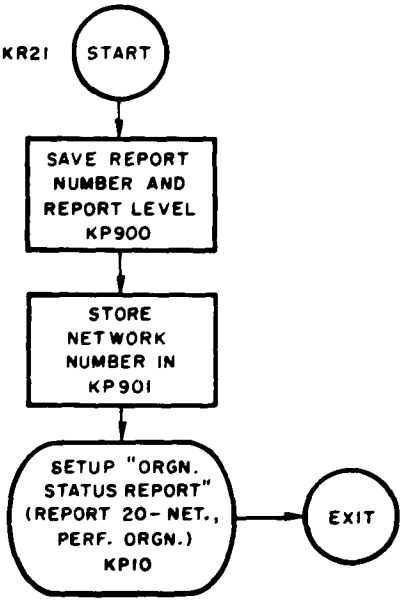
Not applicable.

SUBREGIONS AND SUBROUTINES USED:

KP10

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


KR21
START
SAVE REPORT NUMBER AND REPORT LEVEL KP900
STORE NETWORK NUMBER IN KP901
SETUP "ORGN. STATUS REPORT" (REPORT 20- NET., PERF. ORGN.) KP10
EXIT

RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 1

NAME OF RECORD REPORT 20 (DATA)

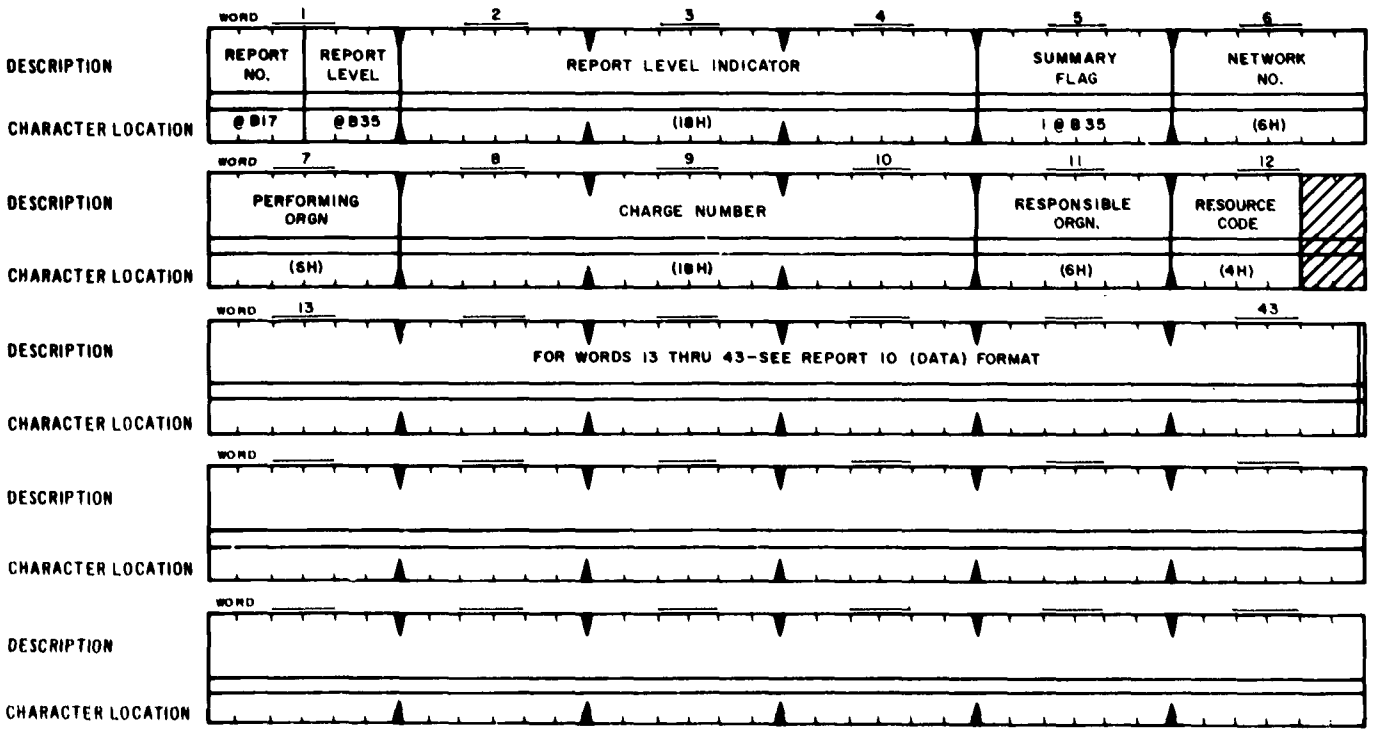


Fig. III-I-11. Tape Format of Report 20, Data

Region KR21

EXPLANATION OF REGION:

To select and set up sequence for sorting "Organization Status Report" by network number, resource code, charge number, responsible organization, performing organization (Report 21).

CALLING SEQUENCE:

L TSX KR21, 4

L+1 Normal return

INPUT:

Accumulator: Report level,, Report number.

YCNT: Location of PERT Cost data record.

OUTPUT:

Report 21 data record.

STORAGE USED:

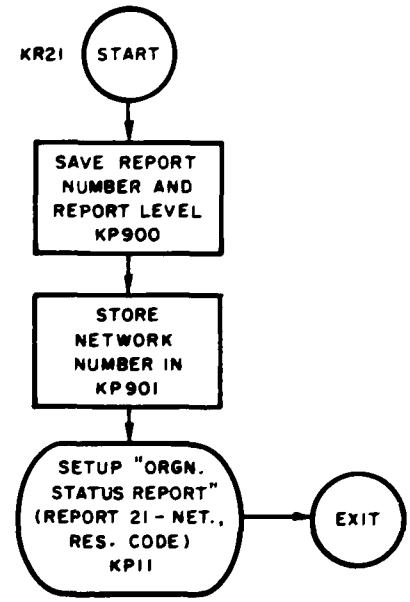
Not applicable.

SUBREGIONS AND SUBROUTINES USED:

KP11

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


KR21
START
SAVE REPORT NUMBER AND REPORT LEVEL KP900
STORE NETWORK NUMBER IN KP901
SETUP "ORGN. STATUS REPORT" (REPORT 21 - NET., RES. CODE) KP11
EXIT

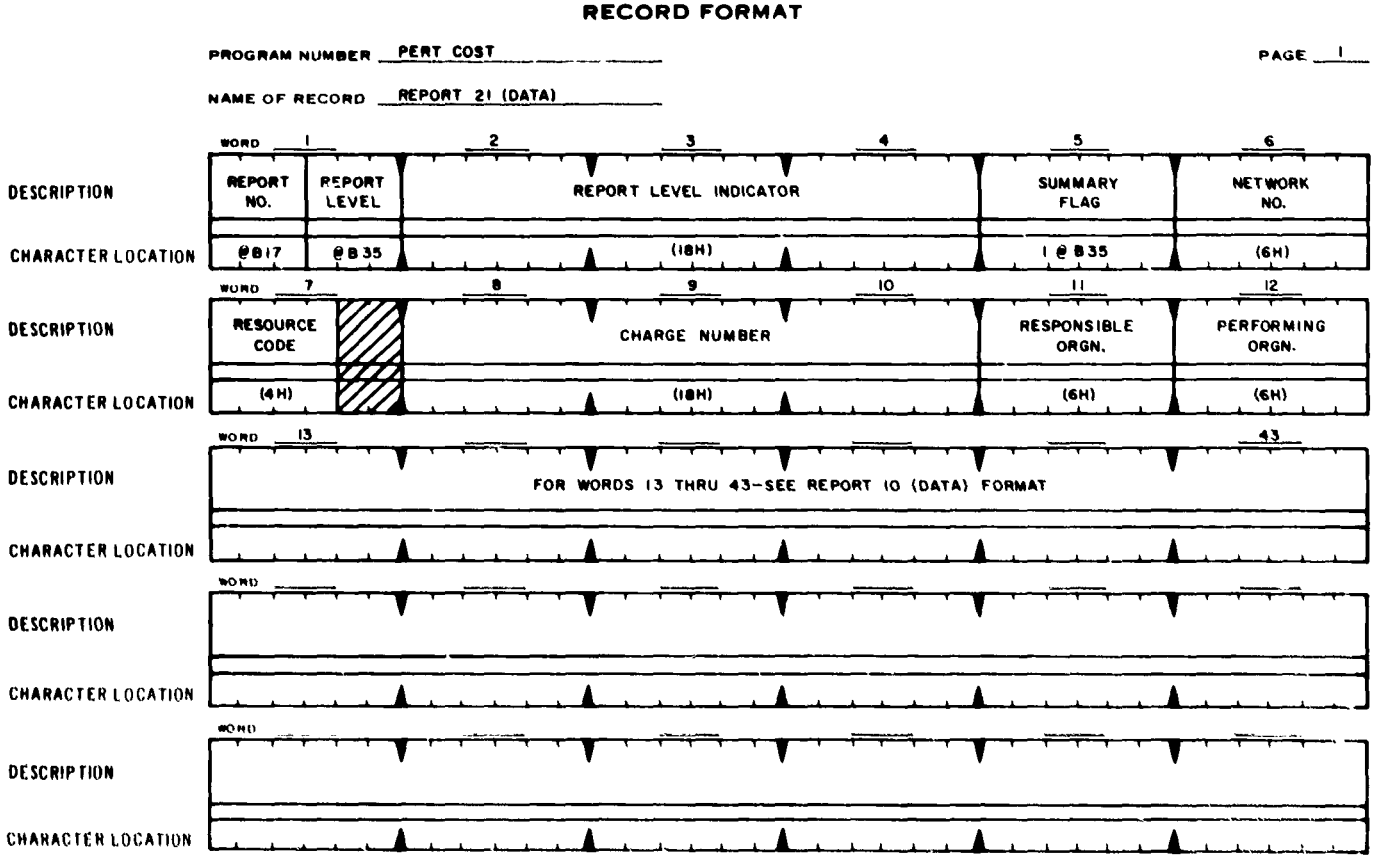


Fig. III-I-12. Tape Format of Report 21, Data

Region KR22

EXPLANATION OF REGION:

To select and set up sequence for sorting "Organization Status Report" by network number, charge number, responsible organization, performing organization, resource code (Report 22).

CALLING SEQUENCE:

L TSX KR22, 4

L+1 Normal return

INPUT:

Accumulator: Report level,, Report number.

YCNT: Location of PERT Cost data record.

OUTPUT:

Report 22 data record.

STORAGE USED:

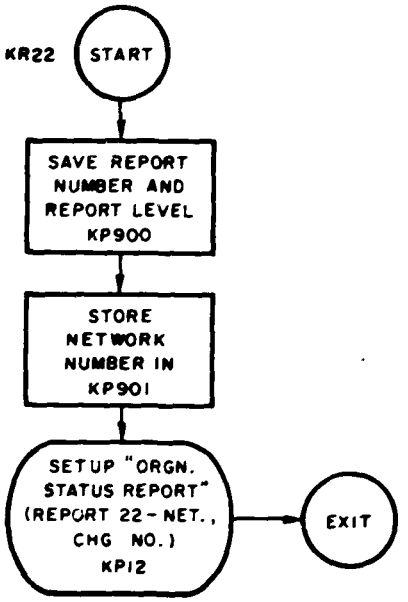
Not applicable.

SUBREGIONS AND SUBROUTINES USED:

KP12

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


KR22
START
SAVE REPORT NUMBER AND REPORT LEVEL KP900
STORE NETWORK NUMBER IN KP901
SETUP "ORGN. STATUS REPORT" (REPORT 22 - NET., CHG NO.) KP12
EXIT

RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 1

NAME OF RECORD REPORT 22 (DATA)

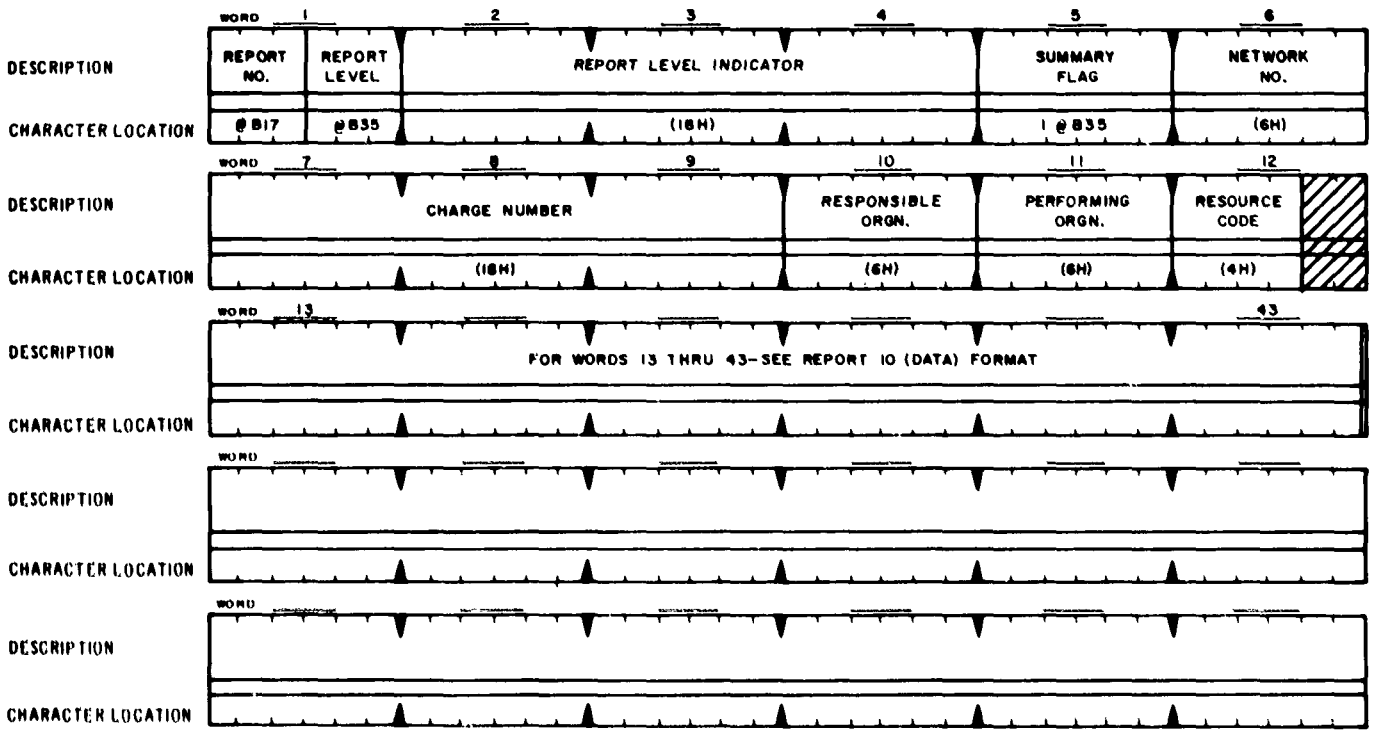


Fig. III-I-13. Tape Format of Report 22, Data

Region KR23

EXPLANATION OF REGION:

To select and set up sequence for sorting "Organization Status Report" by network number, responsible organization, charge number, performing organization, resource code (Report 23).

CALLING SEQUENCE:

L TSX KR23, 4

L+1 Normal return

INPUT:

Accumulator: Report level, , Report number.

YCNT: Location of PERT Cost data record.

OUTPUT:

Report 23 data record.

STORAGE USED:

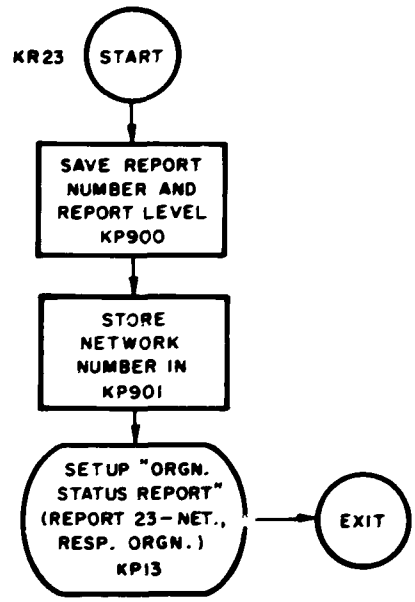
Not applicable.

SUBREGIONS AND SUBROUTINES USED:

KP13

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


KR23
START
SAVE REPORT NUMBER AND REPORT LEVEL KP900
STORE NETWORK NUMBER IN KP901
SETUP "ORGN. STATUS REPORT" (REPORT 23-NET., RESP. ORGN.) KP13
EXIT

RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 1

NAME OF RECORD REPORT 23 (DATA)

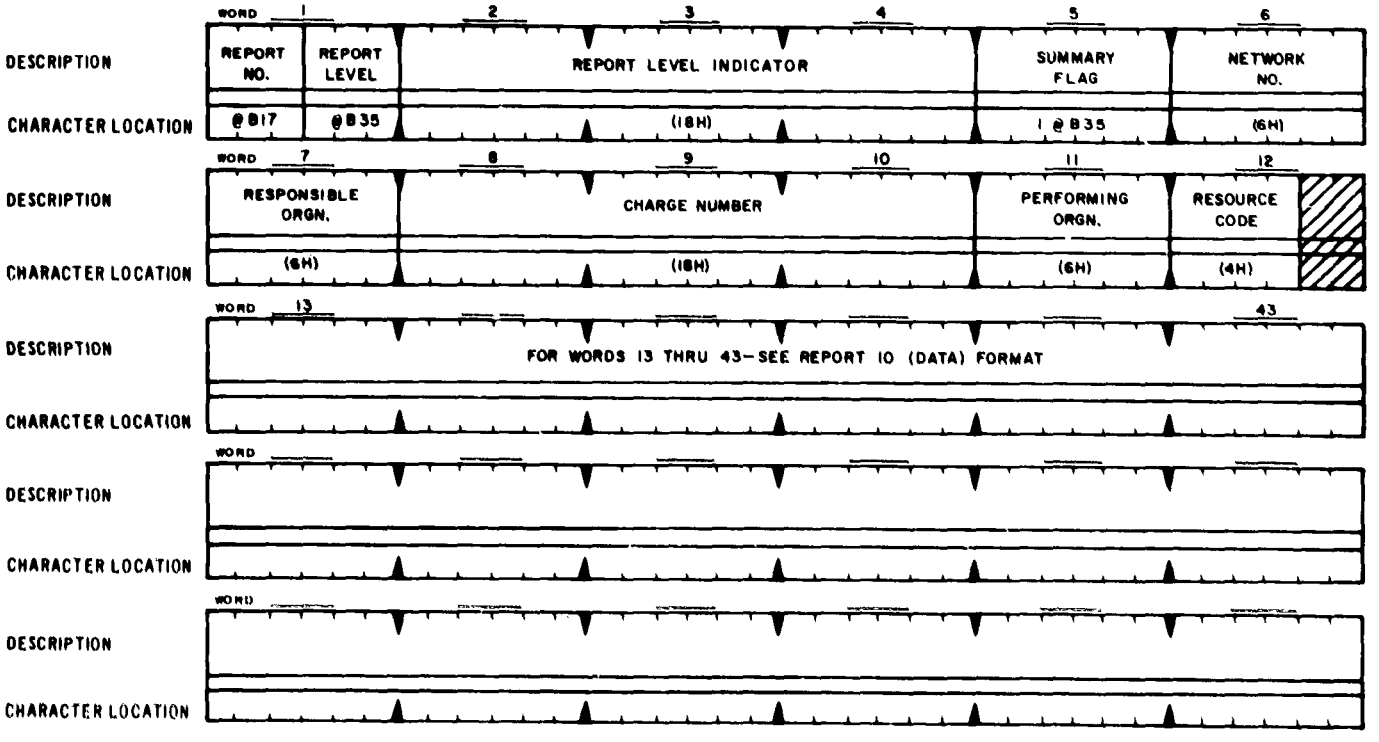


Fig. III-I-14. Tape Format of Report 23, Data

Region KR30

EXPLANATION OF REGION:

To select and set up information for the initial sort of the "Management Summary Report" (Report 30).

CALLING SEQUENCE:

L TSX KR30, 4

L+1 Normal return

INPUT:

Accumulator: Report level, , Report number.

YCNT: Location of PERT Cost data record.

OUTPUT:

Report 30 data record.

STORAGE USED:

Not applicable.

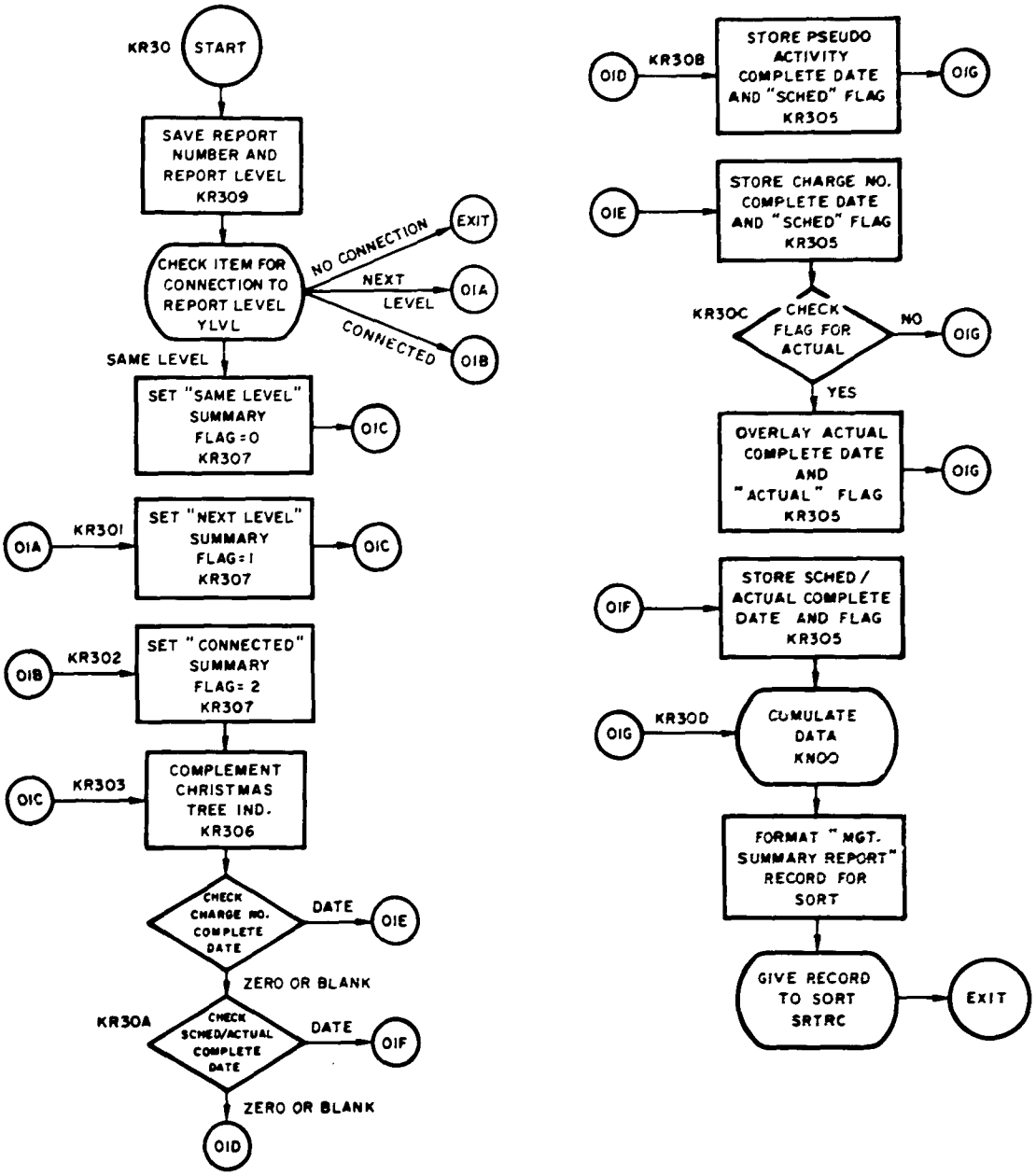
SUBREGIONS AND SUBROUTINES USED:

YLVL KN00

XSORT

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


KR30
START
SAVE REPORT NUMBER AND REPORT LEVEL KR309
CHECK ITEM FOR CONNECTION TO REPORT LEVEL YLVL
NO CONNECTION
EXIT
NEXT LEVEL
01A
CONNECTED
01B
SAME LEVEL
SET "SAME LEVEL" SUMMARY FLAG=0 KR307
01C
01A
KR301
SET "NEXT LEVEL" SUMMARY FLAG=1 KR307
01C
01B
KR302
SET "CONNECTED" SUMMARY FLAG= 2 KR307
01C
KR303
COMPLEMENT CHRISTMAS TREE IND. KR306
CHECK CHARGE NO. COMPLETE DATE
DATE
01E
ZERO OR BLANK
KR30A
CHECK SCHED/ACTUAL COMPLETE DATE
DATE
01F
ZERO OR BLANK
01D
01D
KR308
STORE PSEUDO ACTIVITY COMPLETE DATE AND "SCHED" FLAG KR305
01G
01E
STORE CHARGE NO. COMPLETE DATE AND "SCHED" FLAG KR305
KR30C
CHECK FLAG FOR ACTUAL
NO
01G
YES
OVERLAY ACTUAL COMPLETE DATE AND "ACTUAL" FLAG KR305
01G
01F
STORE SCHED / ACTUAL COMPLETE DATE AND FLAG KR305
01G
KR30D
CUMULATE DATA KN00
FORMAT "MGT. SUMMARY REPORT" RECORD FOR SORT
GIVE RECORD TO SORT SRTRC
EXIT

RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 1

NAME OF RECORD REPORT 30

WORD	1	2	3	4	5	6
DESCRIPTION	REPORT NO.	REPORT LEVEL	REPORT LEVEL INDICATOR		CHRISTMAS TREE INDICATOR (COMP.)	
CHARACTER LOCATION	@B17	@B35	(18H)		(18H)	
WORD	7	8	9	10	11	12
DESCRIPTION	C. T. I (CONT.)	SUMMARY FLAG	LEVEL	CHARGE NUMBER		
CHARACTER LOCATION		@B35	@B35	(18H)		
WORD	13	14	15	16	17	18
DESCRIPTION	CHARGE NUMBER DESCRIPTOR					
CHARACTER LOCATION	(36H)					
WORD	19	20	21	22	23	24
DESCRIPTION	CONTRACTOR	SLACK	CRITICAL S_E	CRITICAL S_L	T_S/T_A	T_S/T_A INDICATOR
CHARACTER LOCATION	(4H)	WK, x 10 @ B35	D D M M Y Y	D D M M Y Y	D D M M Y Y	(1H)
WORD	25	26	27	28		
DESCRIPTION	ACTUAL TOTAL DOLLARS	BUDGET TOTAL DOLLARS	ESTIMATE TOTAL DOLLARS	OVER/UNDER TOTAL DOLLARS		
CHARACTER LOCATION	@B35	@B35	@B35	@B35		

Fig III-I-15. Tape Format of Report 30

Region KR35

EXPLANATION OF REGION:

To select and set up information for the initial sort of the "Program Project Status Report" (Report 35).

CALLING SEQUENCE:

L TSX KR35, 4

L+1 Normal return

INPUT:

Accumulator: Report level, , Report number.

YCNT: Location of PERT Cost data record.

OUTPUT:

Report 35 data record.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

YLVL KN00

XSORT

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

Region KR35

EXPLANATION OF REGION:

To select and set up information for the initial sort of the "Program Project Status Report" (Report 35).

CALLING SEQUENCE:

```
L     TSX   KR35, 4
L+1   Normal return
```

INPUT:

Accumulator: Report level,, Report number.

YCNT: Location of PERT Cost data record.

OUTPUT:

Report 35 data record.

STORAGE USED:

Not applicable.

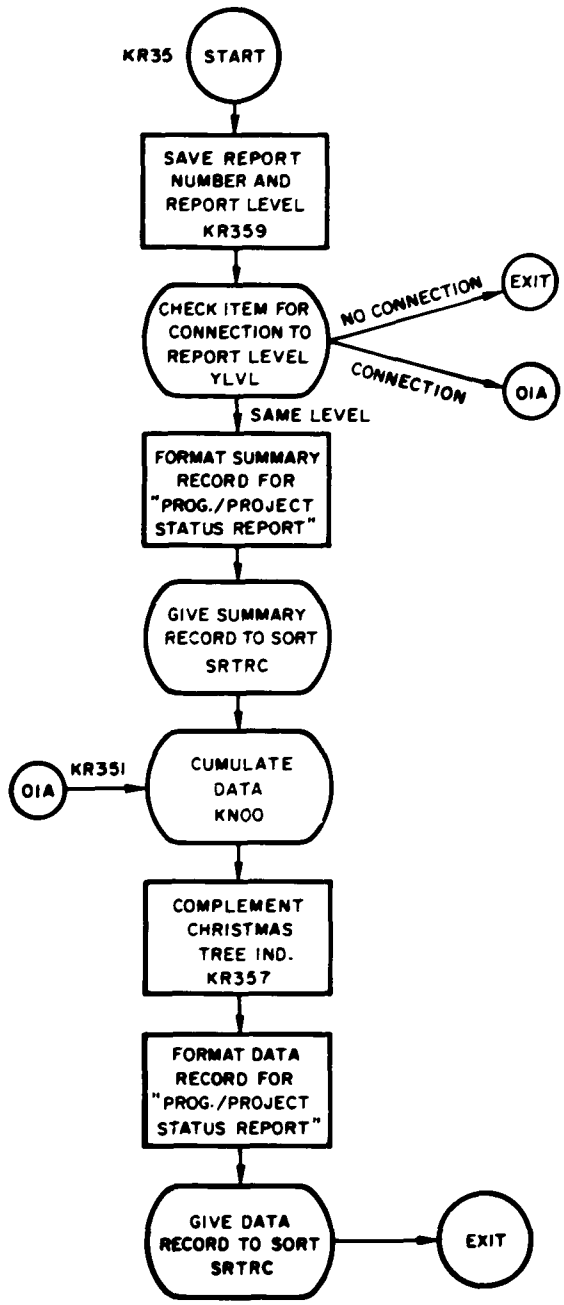
SUBREGIONS AND SUBROUTINES USED:

YLVL KN00

XSORT

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


KR35
START
SAVE REPORT NUMBER AND REPORT LEVEL KR359
CHECK ITEM FOR CONNECTION TO REPORT LEVEL YLVL
NO CONNECTION
EXIT
CONNECTION
01A
SAME LEVEL
FORMAT SUMMARY RECORD FOR "PROG./PROJECT STATUS REPORT"
GIVE SUMMARY RECORD TO SORT SRTRC
01A
KR351
CUMULATE DATA KN00
COMPLEMENT CHRISTMAS TREE IND. KR357
FORMAT DATA RECORD FOR "PROG./PROJECT STATUS REPORT"
GIVE DATA RECORD TO SORT SRTRC
EXIT

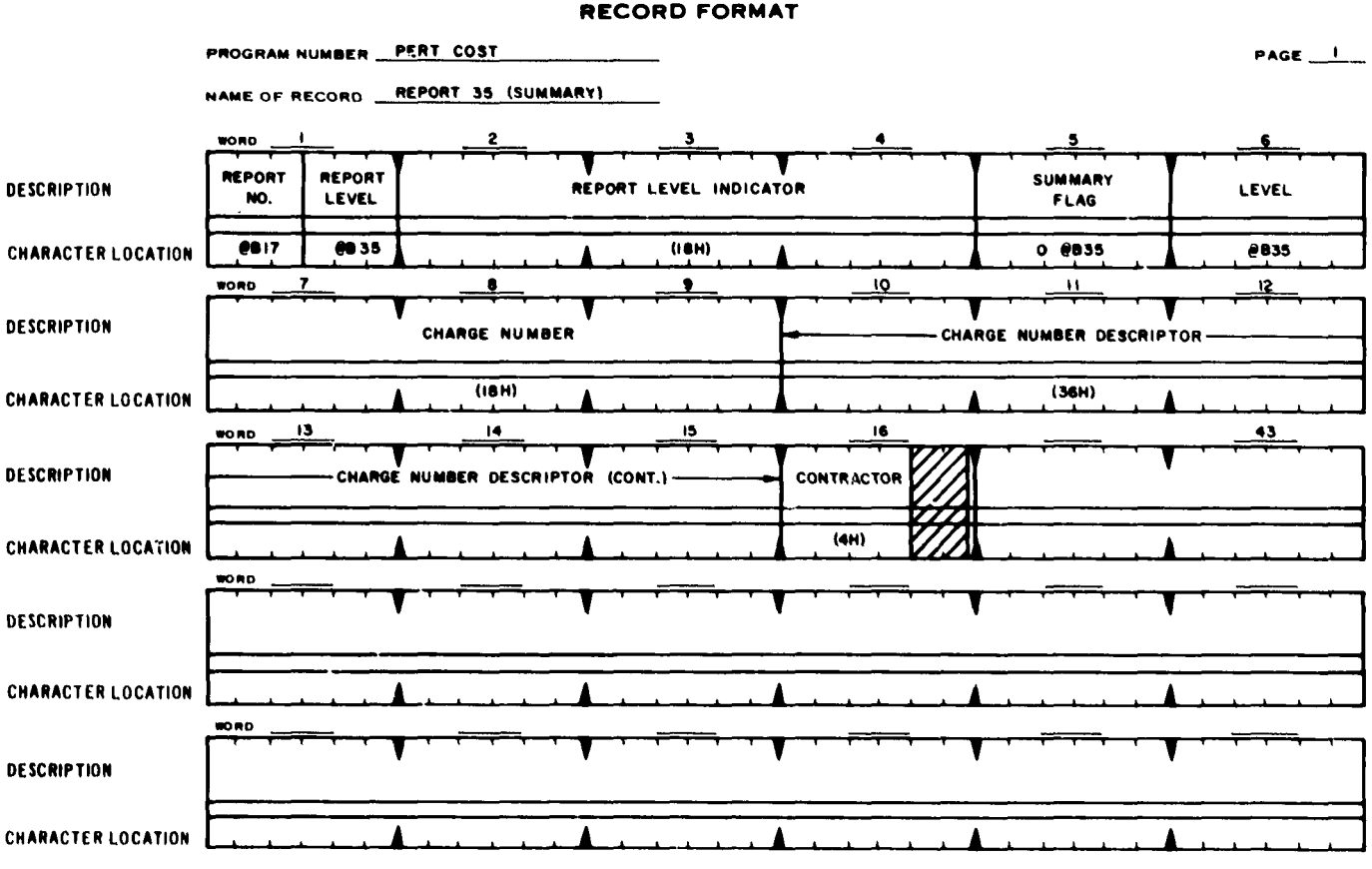


Fig. III-I-16. Tape Format of Report 35, Summary

RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 1

NAME OF RECORD REPORT 35 (DATA)

WORD	1	2	3	4	5	6
DESCRIPTION	REPORT NO.	REPORT LEVEL	REPORT LEVEL INDICATOR		SUMMARY FLAG	C.T.I
CHARACTER LOCATION	@817	@835	(18H)		1 @835	(18H)
WORD	7	8	9	10	11	12
DESCRIPTION	C.T.I. (CONT.)		LEVEL	CHARGE NUMBER		
CHARACTER LOCATION			@835	(18H)		
WORD	13	14	15	16	17	18
DESCRIPTION	CHARGE NUMBER DESCRIPTOR					
CHARACTER LOCATION	(36H)					
WORD	19	20	21	22	23	24
DESCRIPTION	PREDECESSOR EVENT		SUCCESSOR EVENT		CRITICAL SUCC. EVENT	
CHARACTER LOCATION	(9H)		(9H)		(9H)	
WORD	25	26	27	28	29	30
DESCRIPTION	SCHED EXP. COMPL DATE	SCHED LATEST COMPL DATE	SCHED EXP. START DATE	T_s/T_A	T_s/T_A INDICATOR	SLACK
CHARACTER LOCATION	D D M M Y Y	D D M M Y Y	D D M M Y Y	D D M M Y Y	(1H)	WK x 10 @835

Fig. III-I-17. Tape Format of Report 35, Data

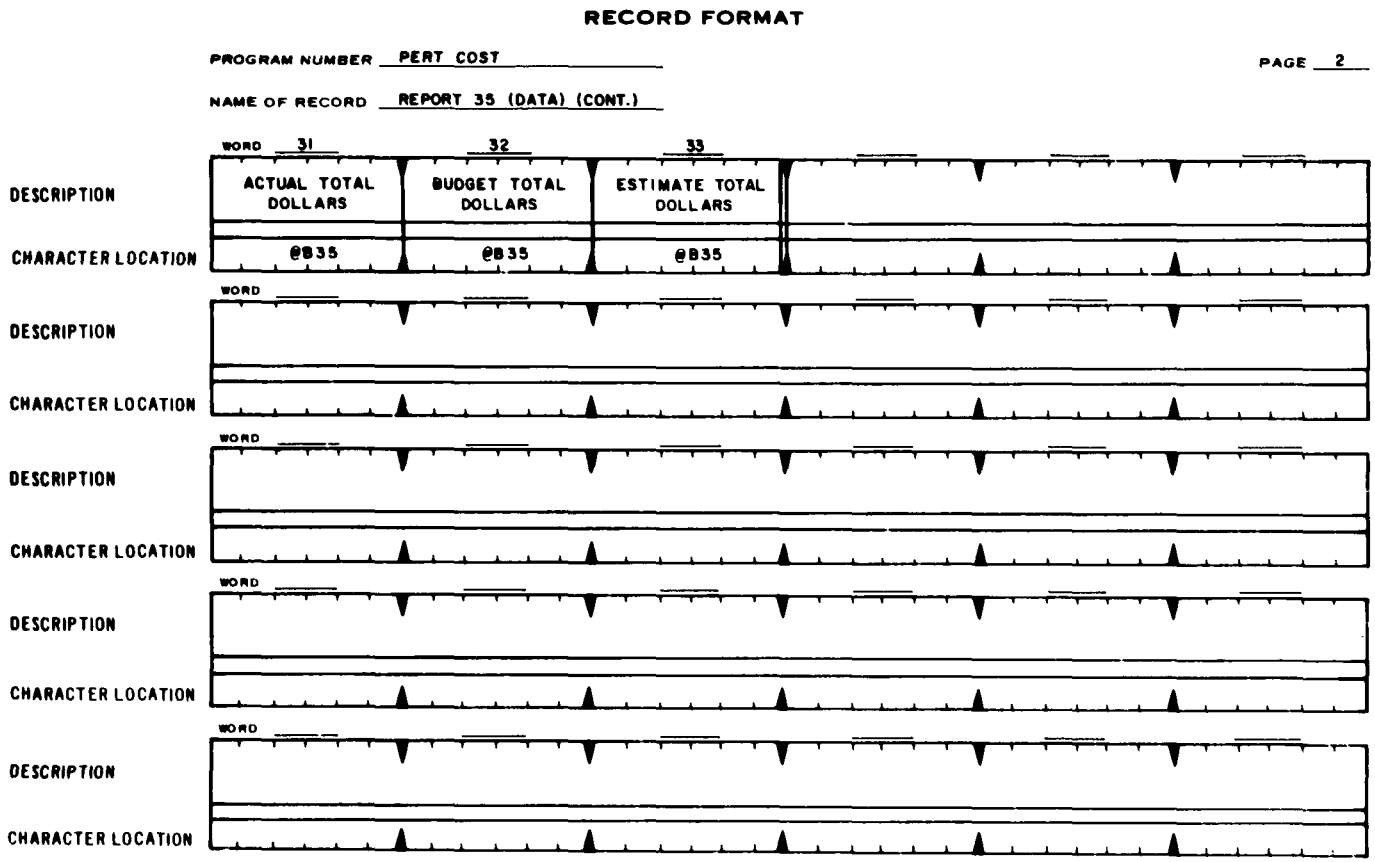


Fig III-I-17. Tape Format of Report 35, Data (Continued)

Region KR40

EXPLANATION OF REGION:

To select and set up information for sorting the "Financial Plan and Status Report" (Reports 40 and 41).

CALLING SEQUENCE:

L TSX KR40, 4

L+1 Normal return

INPUT:

Accumulator: Report level, Report number.

YCNT: Location of PERT Cost data record.

OUTPUT:

Report 40 data record (by month, charge number).

Report 41 data record (by month).

STORAGE USED:

Not applicable.

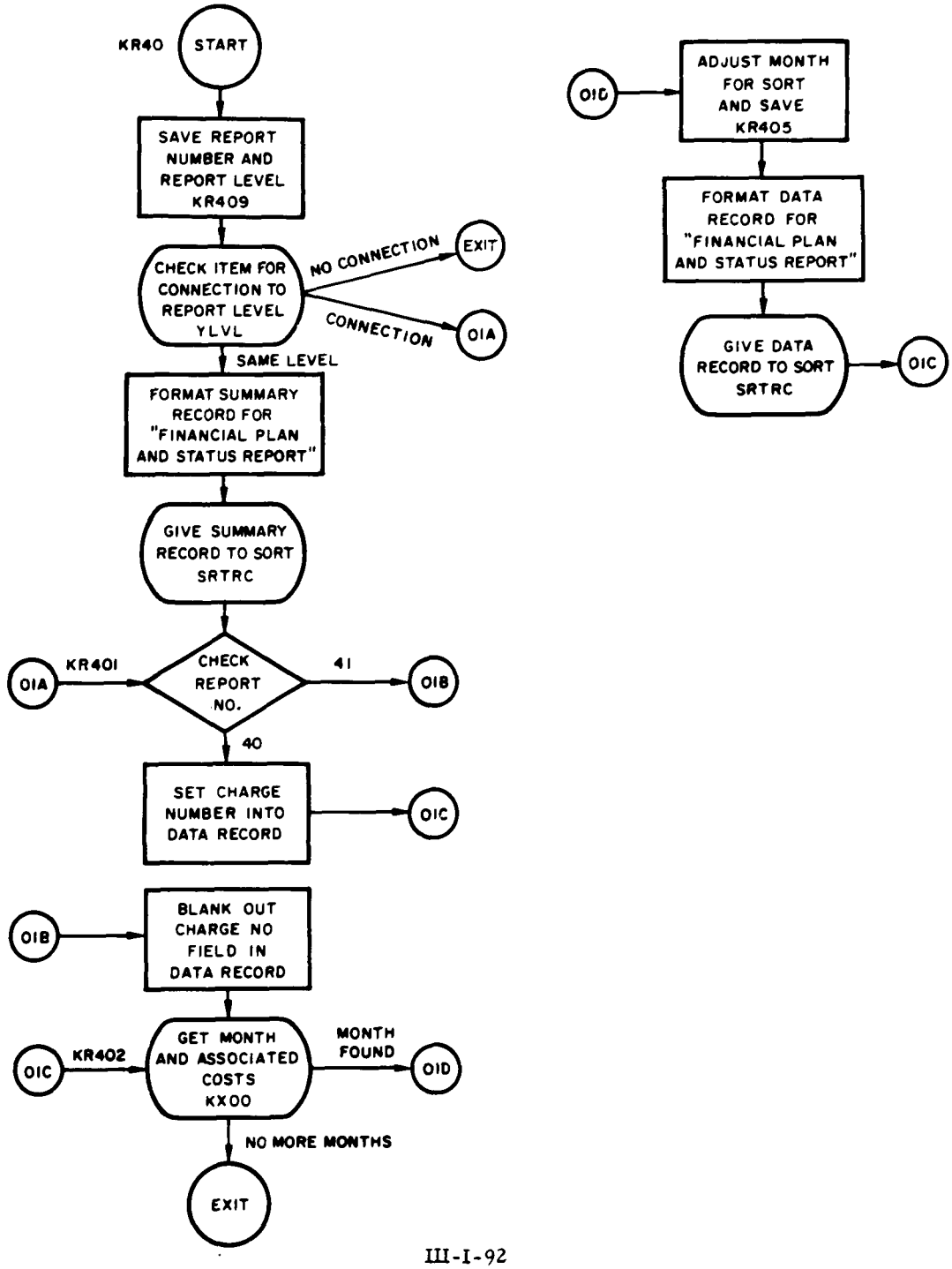
SUBREGIONS AND SUBROUTINES USED:

YLVL KX00

XSORT

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


KR40
START
SAVE REPORT NUMBER AND REPORT LEVEL KR409
CHECK ITEM FOR CONNECTION TO REPORT LEVEL YLVL
NO CONNECTION
EXIT
CONNECTION
01A
SAME LEVEL
FORMAT SUMMARY RECORD FOR "FINANCIAL PLAN AND STATUS REPORT"
GIVE SUMMARY RECORD TO SORT SRTRC
01A
KR401
CHECK REPORT NO.
41
01B
40
SET CHARGE NUMBER INTO DATA RECORD
01C
01B
BLANK OUT CHARGE NO FIELD IN DATA RECORD
01C
KR402
GET MONTH AND ASSOCIATED COSTS KX00
MONTH FOUND
01D
NO MORE MONTHS
EXIT
01D
ADJUST MONTH FOR SORT AND SAVE KR405
FORMAT DATA RECORD FOR "FINANCIAL PLAN AND STATUS REPORT"
GIVE DATA RECORD TO SORT SRTRC
01C

RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 1

NAME OF RECORD REPORT 40 & 41 (SUMMARY)

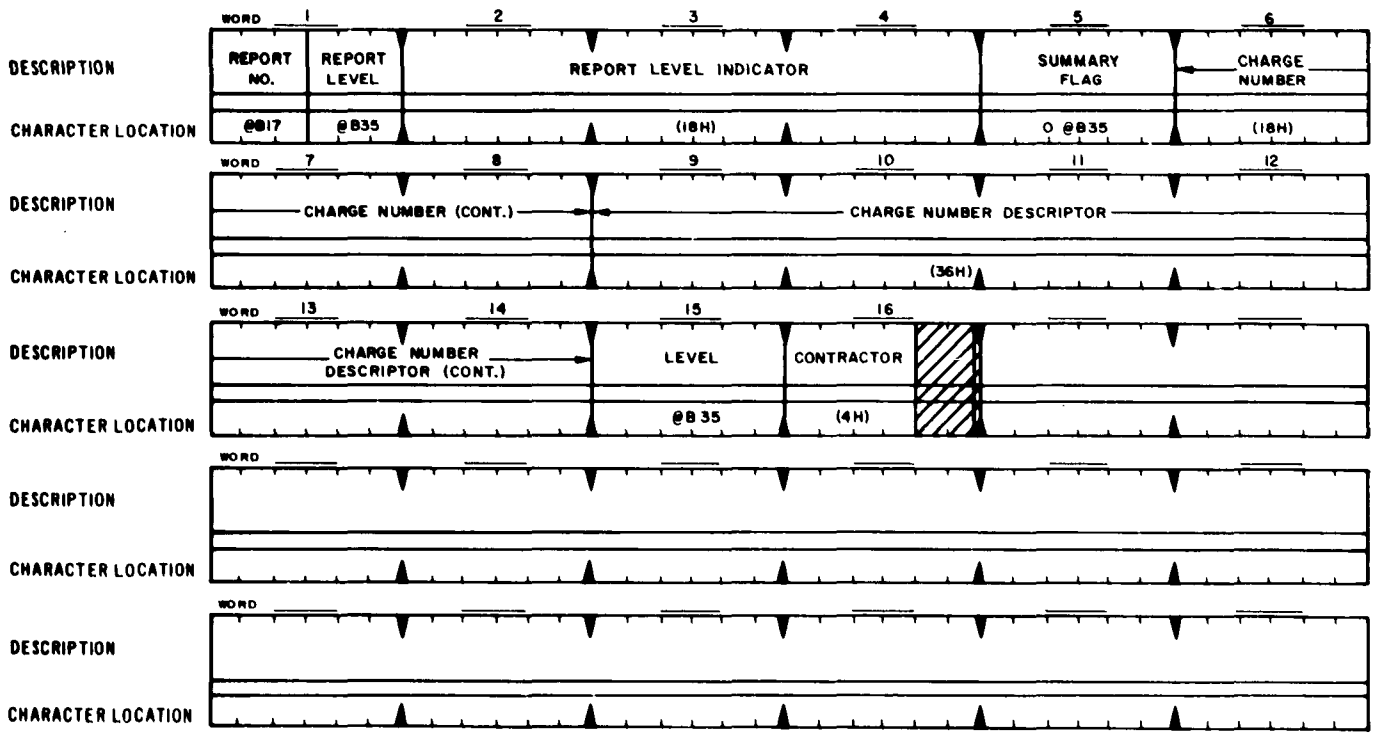


Fig. III-I-18. Tape Format of Reports 40 and 41, Summary

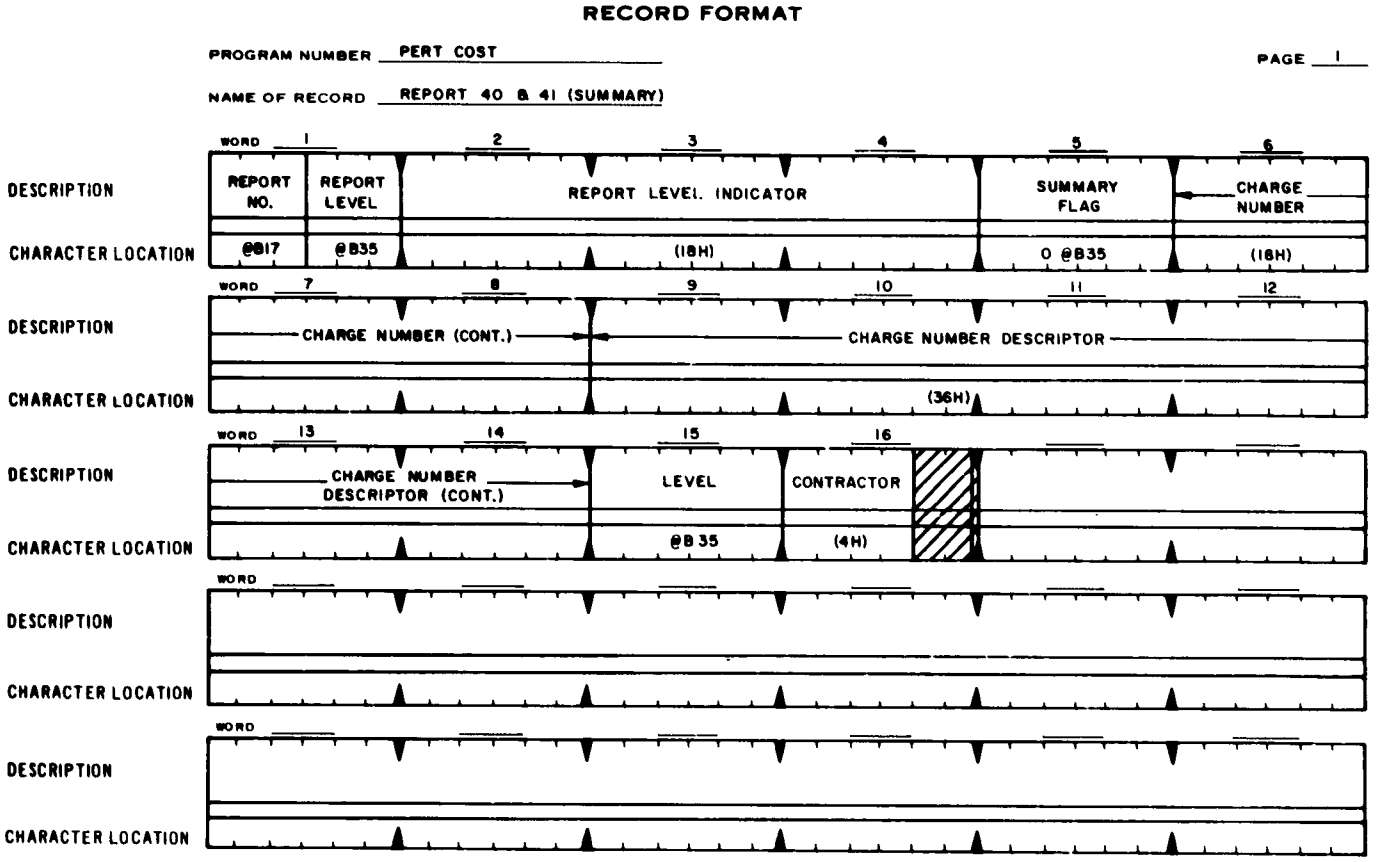


Fig. III-I-18. Tape Format of Reports 40 and 41, Summary

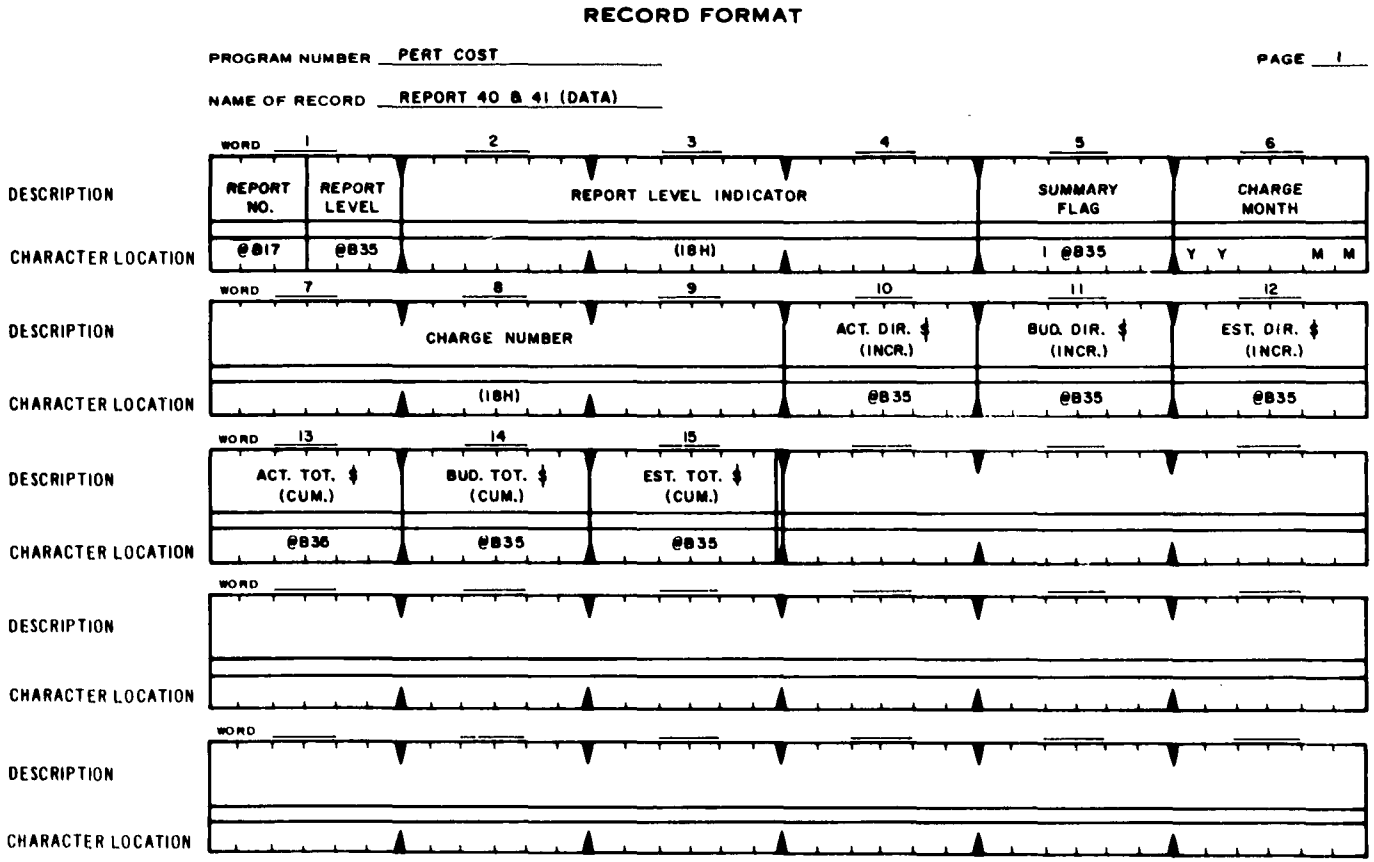


Fig. III-I-19. Tape Format of Reports 40 and 41, Data

Region KR50

EXPLANATION OF REGION:

To select and set up information for sorting the "Manpower Loading Report" (Reports 50 and 51).

CALLING SEQUENCE:

L TSX KR50, 4

L+1 Normal return

INPUT:

Accumulator: Report level, , Report number.

YCNT: Location of PERT Cost data record.

OUTPUT:

Report 50 data record (by resource code, month, perf. org., charge no.)

Report 51 data record (by resource code, month)

STORAGE USED:

Not applicable.

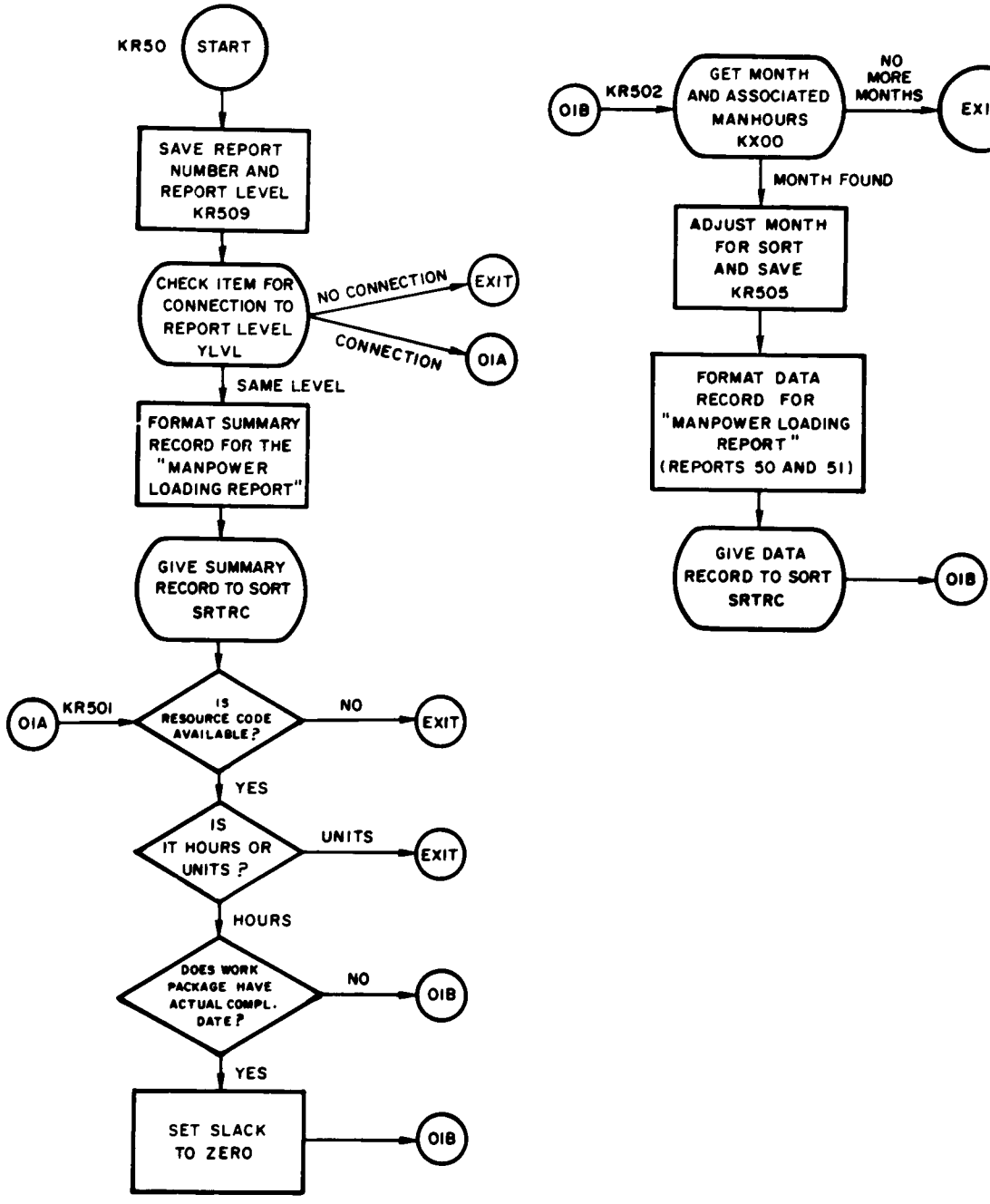
SUBREGIONS AND SUBROUTINES USED:

YLVL KX00

XSORT

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


KR50
START
SAVE REPORT NUMBER AND REPORT LEVEL KR509
CHECK ITEM FOR CONNECTION TO REPORT LEVEL YLVL
NO CONNECTION
EXIT
CONNECTION
01A
SAME LEVEL
FORMAT SUMMARY RECORD FOR THE "MANPOWER LOADING REPORT"
GIVE SUMMARY RECORD TO SORT SRTRC
01A
KR501
IS RESOURCE CODE AVAILABLE?
NO
EXIT
YES
IS IT HOURS OR UNITS ?
UNITS
EXIT
HOURS
DOES WORK PACKAGE HAVE ACTUAL COMPL. DATE?
NO
01B
YES
SET SLACK TO ZERO
01B
KR502
GET MONTH AND ASSOCIATED MANHOURS KX00
NO MORE MONTHS
EXIT
MONTH FOUND
ADJUST MONTH FOR SORT AND SAVE KR505
FORMAT DATA RECORD FOR "MANPOWER LOADING REPORT" (REPORTS 50 AND 51)
GIVE DATA RECORD TO SORT SRTRC
01B

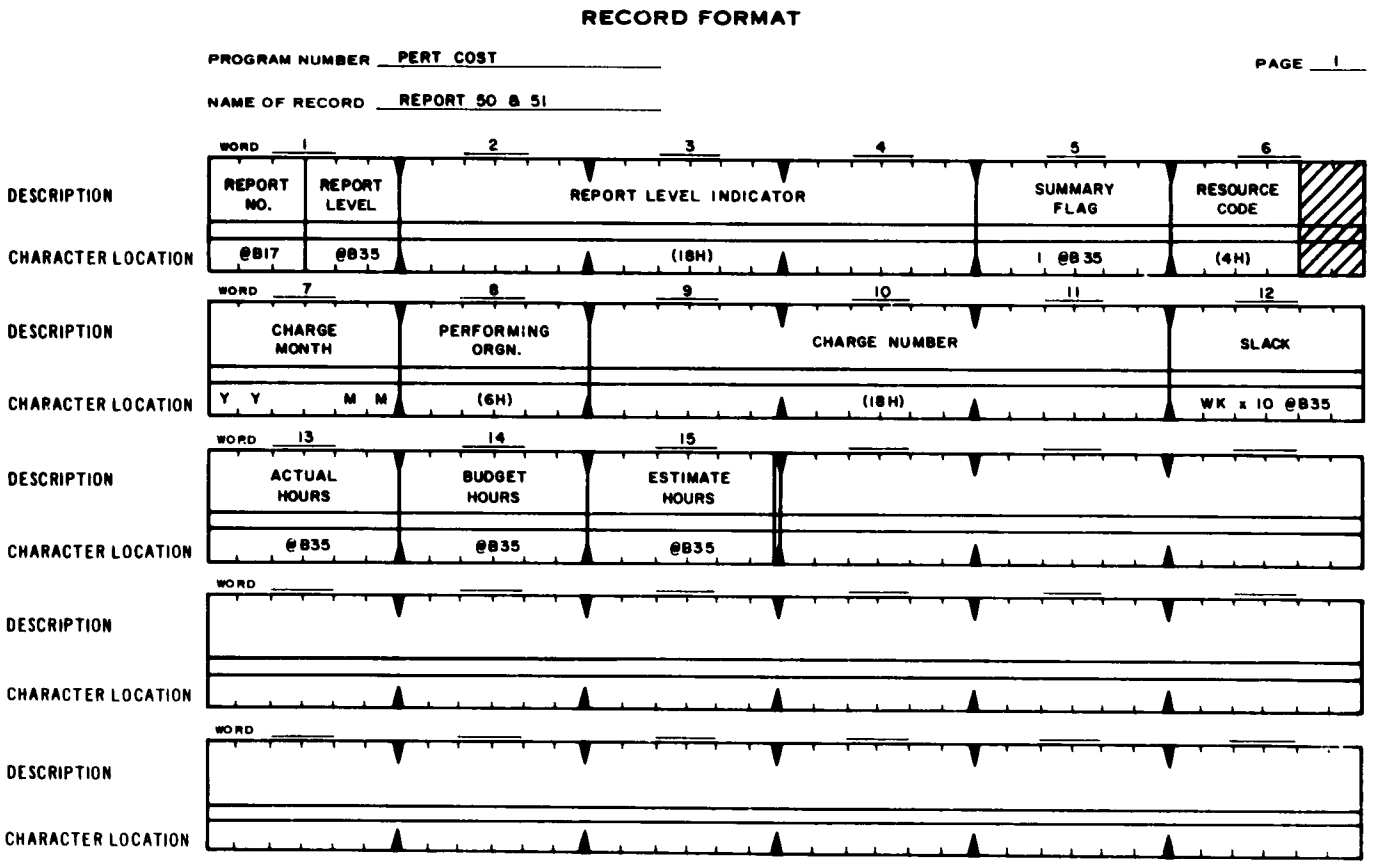


Fig. III-I-20. Tape Format of Reports 50 and 51, Data

Region KR52

EXPLANATION OF REGION:

To select and set up information for sorting the "Manpower Loading Report" by performing organization, month, resource code (Report 52).

CALLING SEQUENCE:

L TSX KR52, 4

L+1 Normal return

INPUT:

Accumulator: Report level, , Report number.

YCNT: Location of PERT Cost data record.

OUTPUT:

Report 52 data record.

STORAGE USED:

Not applicable.

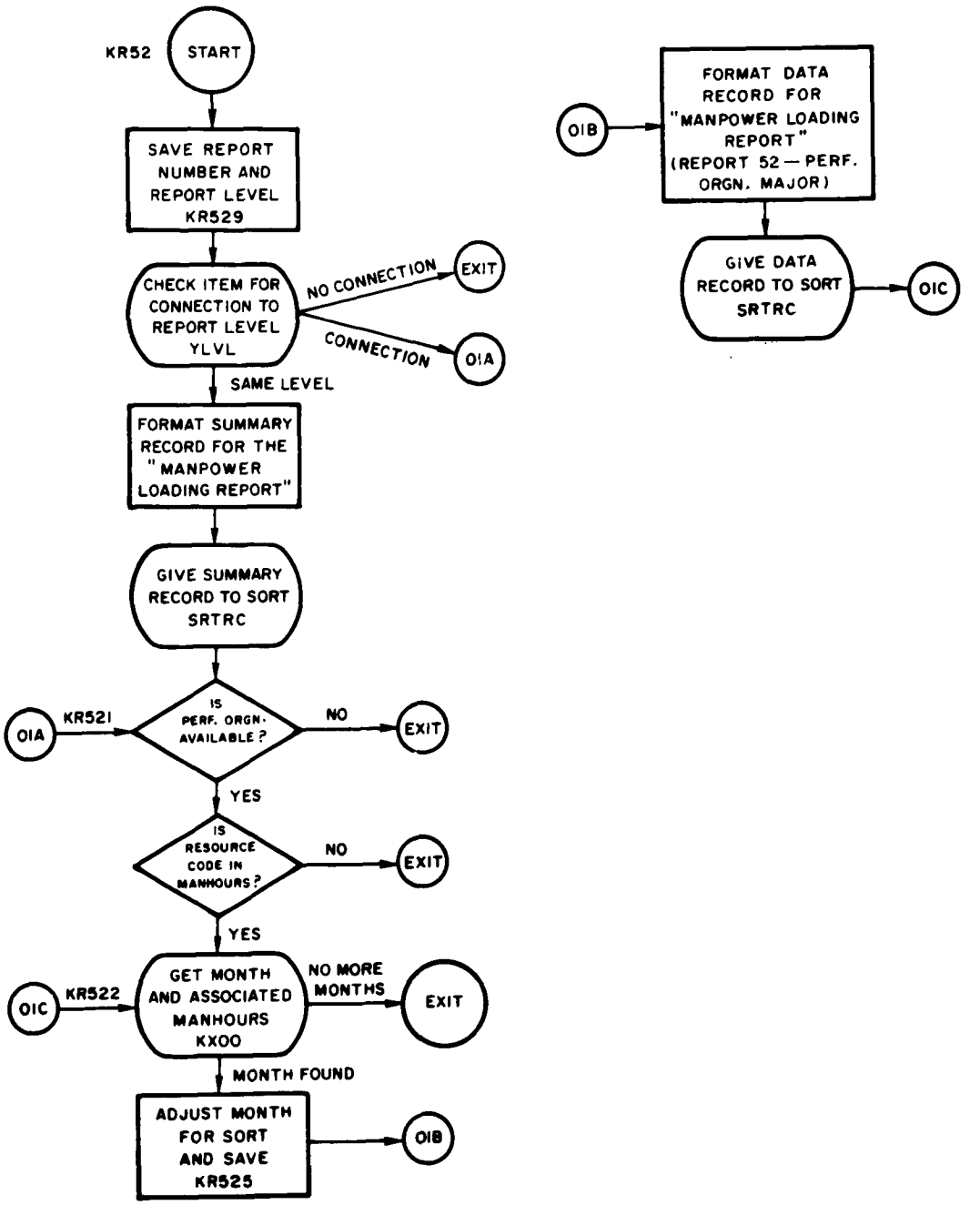
SUBREGIONS AND SUBROUTINES USED:

YLVL KX00

XSORT

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


KR52
START
SAVE REPORT NUMBER AND REPORT LEVEL KR529
CHECK ITEM FOR CONNECTION TO REPORT LEVEL YLVL
NO CONNECTION
EXIT
CONNECTION
O1A
SAME LEVEL
FORMAT SUMMARY RECORD FOR THE "MANPOWER LOADING REPORT"
GIVE SUMMARY RECORD TO SORT SRTRC
O1A
KR521
IS PERF. ORGN. AVAILABLE ?
NO
EXIT
YES
IS RESOURCE CODE IN MANHOURS?
NO
EXIT
YES
O1C
KR522
GET MONTH AND ASSOCIATED MANHOURS KX00
NO MORE MONTHS
EXIT
MONTH FOUND
ADJUST MONTH FOR SORT AND SAVE KR525
O1B
O1B
FORMAT DATA RECORD FOR "MANPOWER LOADING REPORT" (REPORT 52 — PERF. ORGN. MAJOR)
GIVE DATA RECORD TO SORT SRTRC
O1C

RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 1

NAME OF RECORD REPORT 52 (DATA)

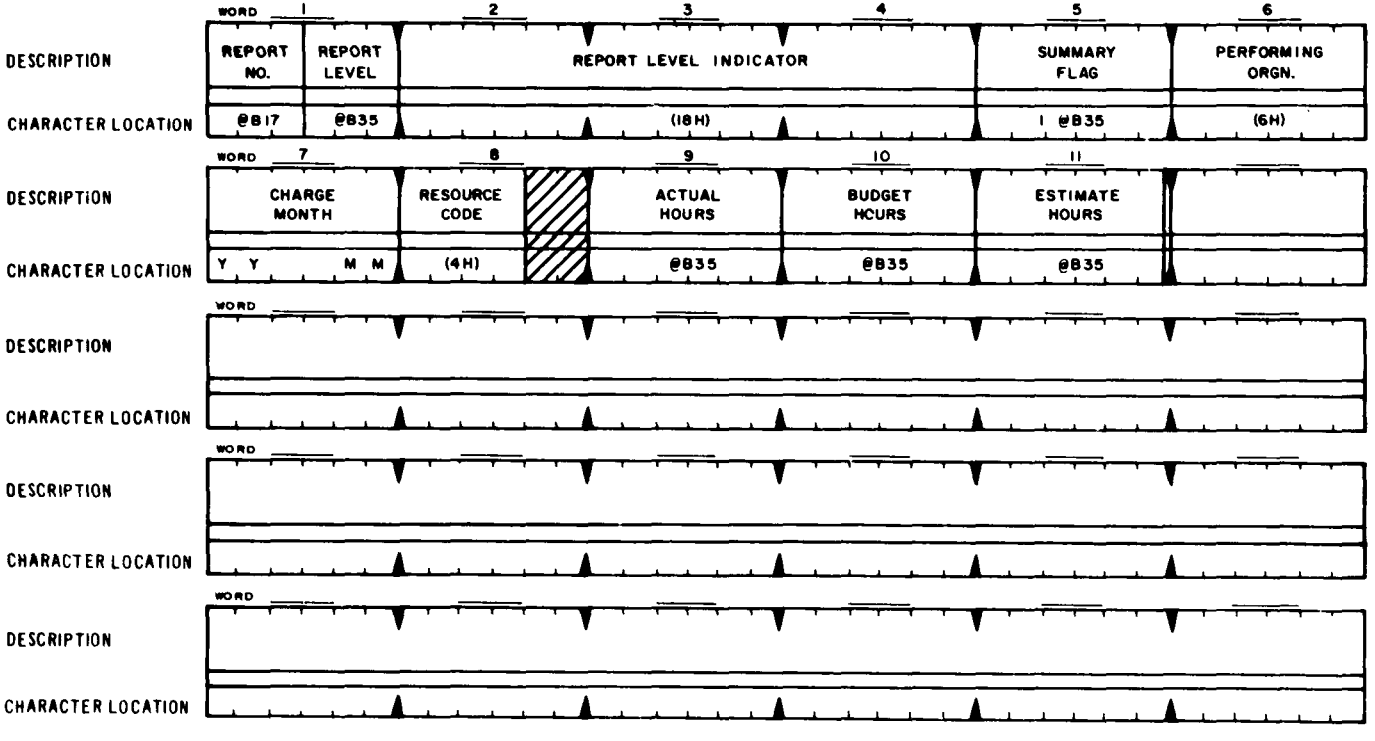


Fig. III-I-21. Tape Format of Report 52, Data

Region KR55

EXPLANATION OF REGION:

To select and set up information for sorting the "Rainbow Category Report" (Report 55).

CALLING SEQUENCE:

L TSX KR55, 4

L+1 Normal return

INPUT:

Accumulator: Report level, , Report number.

YCNT: Location of PERT Cost data record.

OUTPUT:

Report 55 data record.

STORAGE USED:

Not applicable.

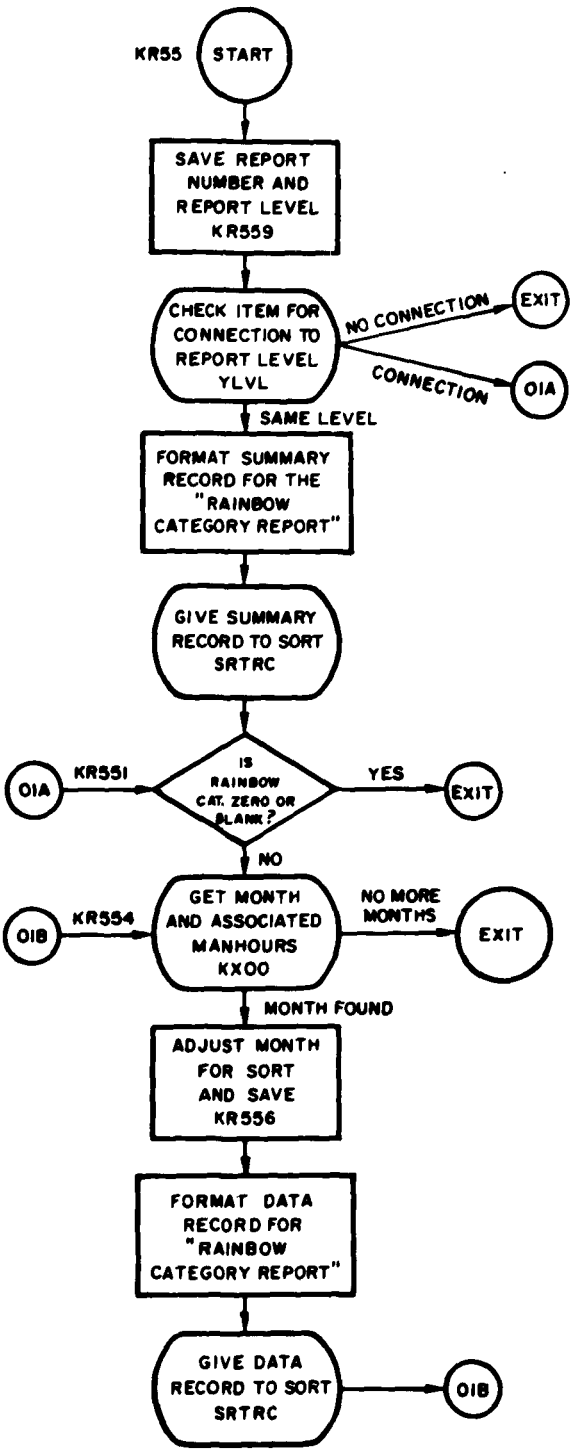
SUBREGIONS AND SUBROUTINES USED:

YLVL KX00

XSORT

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


KR55
START
SAVE REPORT NUMBER AND REPORT LEVEL KR559
CHECK ITEM FOR CONNECTION TO REPORT LEVEL YLVL
NO CONNECTION
EXIT
CONNECTION
01A
SAME LEVEL
FORMAT SUMMARY RECORD FOR THE "RAINBOW CATEGORY REPORT"
GIVE SUMMARY RECORD TO SORT SRTRC
01A
KR551
IS RAINBOW CAT. ZERO OR BLANK?
YES
EXIT
NO
01B
KR554
GET MONTH AND ASSOCIATED MANHOURS KX00
NO MORE MONTHS
EXIT
MONTH FOUND
ADJUST MONTH FOR SORT AND SAVE KR556
FORMAT DATA RECORD FOR "RAINBOW CATEGORY REPORT"
GIVE DATA RECORD TO SORT SRTRC
01B

RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 1

NAME OF RECORD REPORT 55 (DATA)

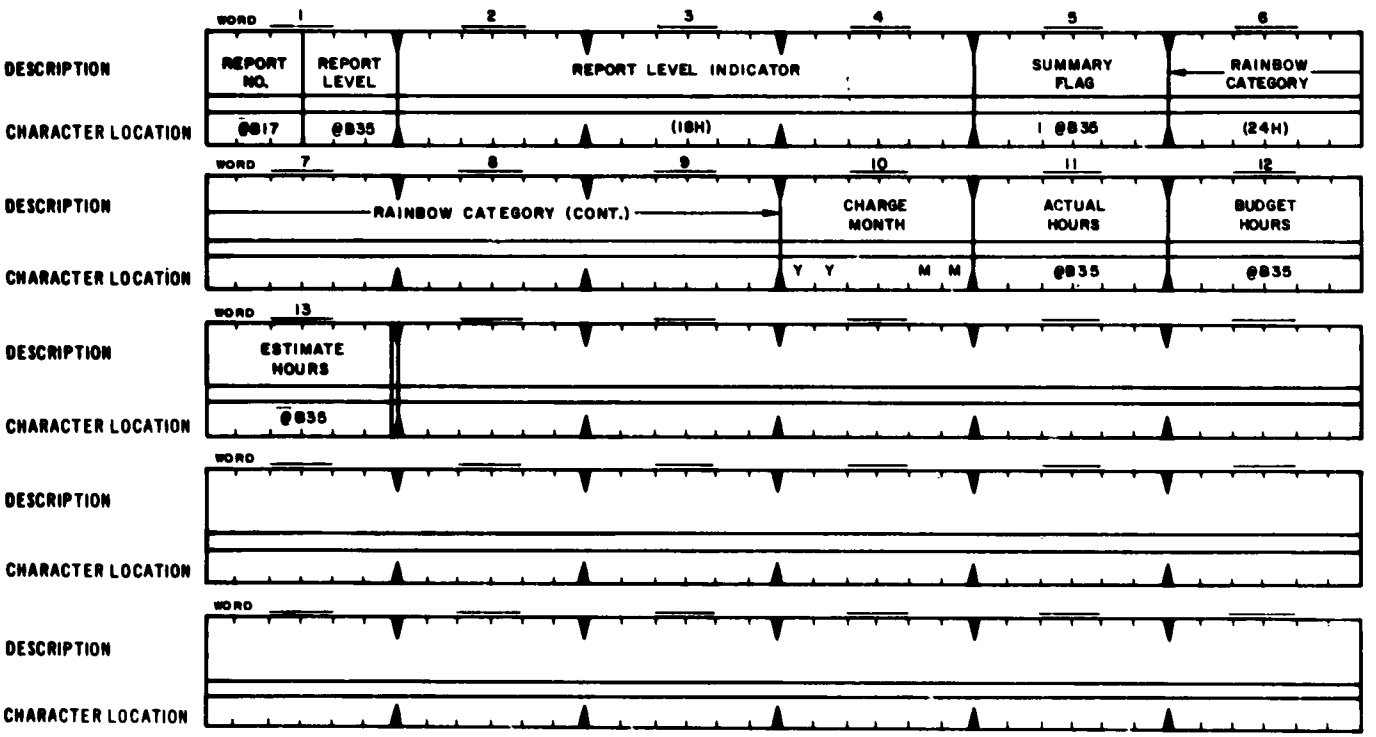


Fig. III-I-22. Tape Format of Report 55, Data

Region KR60

EXPLANATION OF REGION:

To select and set up information for sorting the "Cost Category Status Report" (Report 60).

CALLING SEQUENCE:

L TSX KR60, 4

L+1 Normal return

INPUT:

Accumulator: Report level, Report number.

YCNT: Location of PERT Cost data record.

OUTPUT:

Report 60 data record.

STORAGE USED:

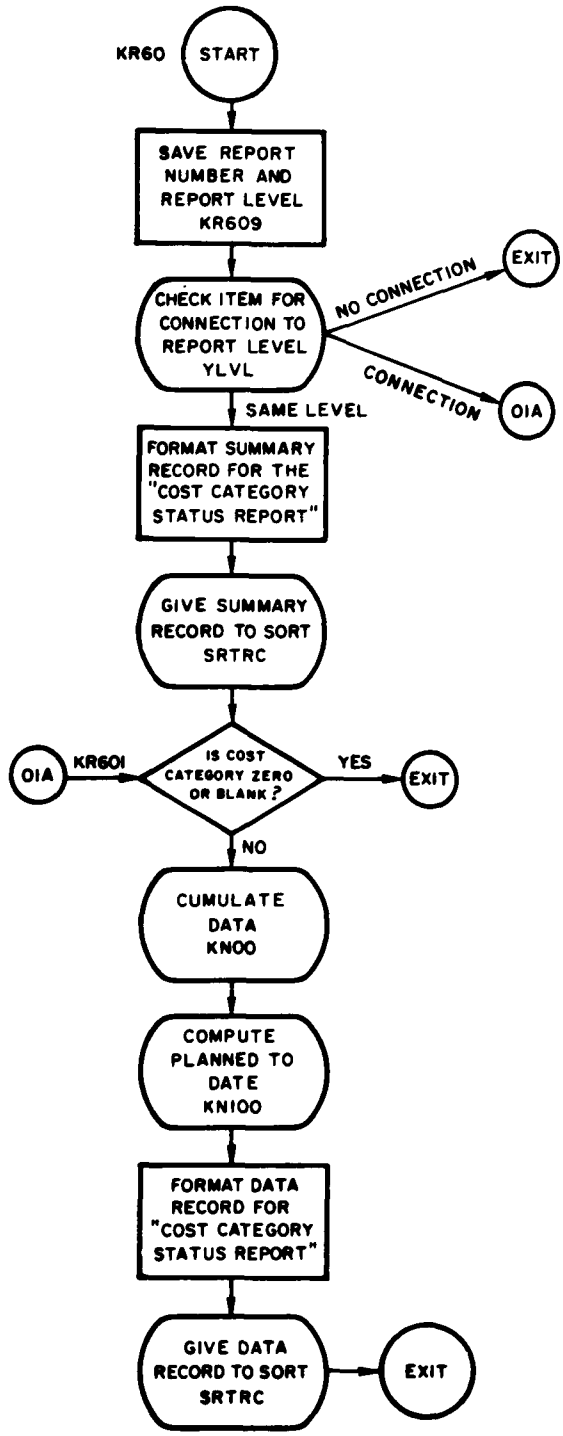
Not applicable.

SUBREGIONS AND SUBROUTINES USED:

YLVL	KN00
KN100	XSORT

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


KR60
START
SAVE REPORT NUMBER AND REPORT LEVEL KR609
CHECK ITEM FOR CONNECTION TO REPORT LEVEL YLVL
NO CONNECTION
EXIT
CONNECTION
OIA
SAME LEVEL
FORMAT SUMMARY RECORD FOR THE "COST CATEGORY STATUS REPORT"
GIVE SUMMARY RECORD TO SORT SRTRC
OIA
KR601
IS COST CATEGORY ZERO OR BLANK?
YES
EXIT
NO
CUMULATE DATA KN00
COMPUTE PLANNED TO DATE KN100
FORMAT DATA RECORD FOR "COST CATEGORY STATUS REPORT"
GIVE DATA RECORD TO SORT SRTRC
EXIT

RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 1

NAME OF RECORD REPORT 60 (DATA)

WORD	1	2	3	4	5	6
DESCRIPTION	REPORT NO.	REPORT LEVEL	REPORT LEVEL INDICATOR		SUMMARY FLAG	COST CATEGORY
CHARACTER LOCATION	@B17	@B35	(18H)		1 @B35	(18H)
WORD	7	8	9	10	11	12
DESCRIPTION	COST CATEGORY (CONT.)		ACTUAL HOURS	BUDGET HOURS	ESTIMATE HOURS	PLAN HOURS TO DATE
CHARACTER LOCATION			@B35	@B35	@B35	@B35
WORD	13	14	15	16		
DESCRIPTION	ACTUAL TOTAL $	BUDGET TOTAL $	ESTIMATE TOTAL $	PLAN TOT. $ TO DATE		
CHARACTER LOCATION	@B35	@B35	@B35	@B35		
WORD						
DESCRIPTION						
CHARACTER LOCATION						
WORD						
DESCRIPTION						
CHARACTER LOCATION						

Fig III-I-23. Tape Format of Report 60, Data

Region KR70

EXPLANATION OF REGION:

To select and set up information for sorting the "Summary Financial Forecast" by summary item (Reports 70 and 75).

CALLING SEQUENCE:

L TSX KR70, 4

L+1 Normal return

INPUT:

Accumulator: Report level, , Report number.

YCNT: Location of PERT Cost data record.

OUTPUT:

Report 70 data record (by summary item, fiscal year).

Report 75 data record (by summary item, months of current fiscal year).

STORAGE USED:

Not applicable.

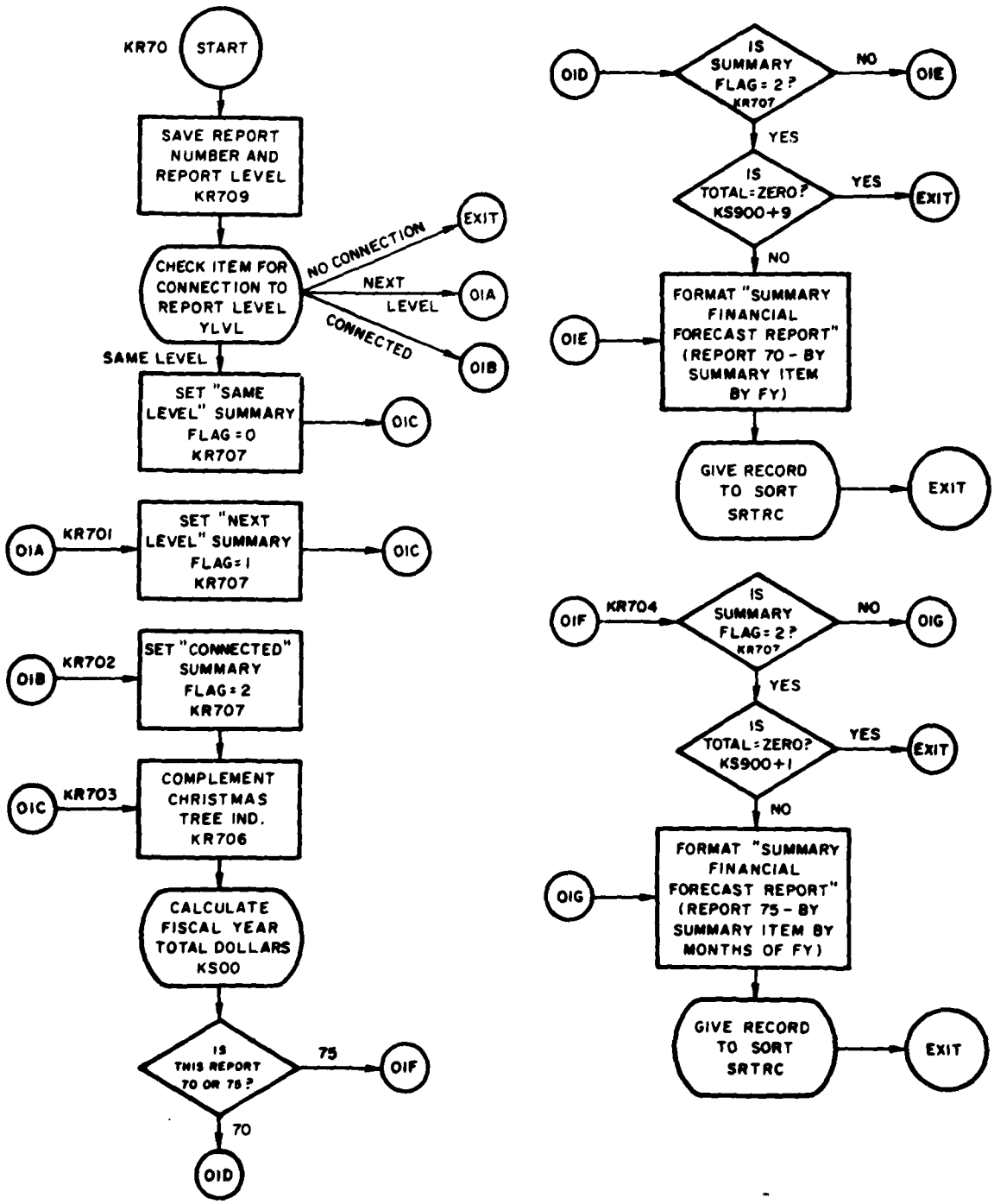
SUBREGIONS AND SUBROUTINES USED:

YLVL KS00

XSORT

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


KR70 START
SAVE REPORT NUMBER AND REPORT LEVEL KR709
CHECK ITEM FOR CONNECTION TO REPORT LEVEL YLVL
NO CONNECTION
EXIT
NEXT LEVEL
01A
CONNECTED
01B
SAME LEVEL
SET "SAME LEVEL" SUMMARY FLAG=0 KR707
01C
01A
KR701
SET "NEXT LEVEL" SUMMARY FLAG=1 KR707
01C
01B
KR702
SET "CONNECTED" SUMMARY FLAG=2 KR707
01C
KR703
COMPLEMENT CHRISTMAS TREE IND. KR706
CALCULATE FISCAL YEAR TOTAL DOLLARS KS00
IS THIS REPORT 70 OR 75?
75
01F
70
01D
01D
IS SUMMARY FLAG=2? KR707
NO
01E
YES
IS TOTAL=ZERO? KS900+9
YES
EXIT
NO
01E
FORMAT "SUMMARY FINANCIAL FORECAST REPORT" (REPORT 70 - BY SUMMARY ITEM BY FY)
GIVE RECORD TO SORT SRTRC
EXIT
01F
KR704
IS SUMMARY FLAG=2? KR707
NO
01G
YES
IS TOTAL=ZERO? KS900+1
YES
EXIT
NO
01G
FORMAT "SUMMARY FINANCIAL FORECAST REPORT" (REPORT 75 - BY SUMMARY ITEM BY MONTHS OF FY)
GIVE RECORD TO SORT SRTRC
EXIT

RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 1

NAME OF RECORD REPORT 70

WORD	1	2	3	4	5	6
DESCRIPTION	REPORT NO.	REPORT LEVEL	REPORT LEVEL INDICATOR		CHRISTMAS TREE INDICATOR	
CHARACTER LOCATION	@B17	@B35	(18H)		(18H)	
WORD	7	8	9	10	11	12
DESCRIPTION	C. T. I. (CONT.)	SUMMARY FLAG	LEVEL	CHARGE NUMBER		
CHARACTER LOCATION		@B35	@B35	(18H)		
WORD	13	14	15	16	17	18
DESCRIPTION	CHARGE NUMBER DESCRIPTOR					
CHARACTER LOCATION	(36H)					
WORD	19	20	21	22	23	24
DESCRIPTION	CONTRACTOR	PRIOR FYS	CURRENT FY	CURRENT FY+1	CURRENT FY+2	CURRENT FY+3
CHARACTER LOCATION	(4H)	@B35	@B35	@B35	@B35	@B35
WORD	25	26	27	28	29	
DESCRIPTION	CURRENT FY+4	CURRENT FY+5	CURRENT FY+6	TOTALS TO COMPLETE	TOTAL	
CHARACTER LOCATION	@B35	@B35	@B35	@B35	@B35	

Fig. III-I-24. Tape Format of Report 70

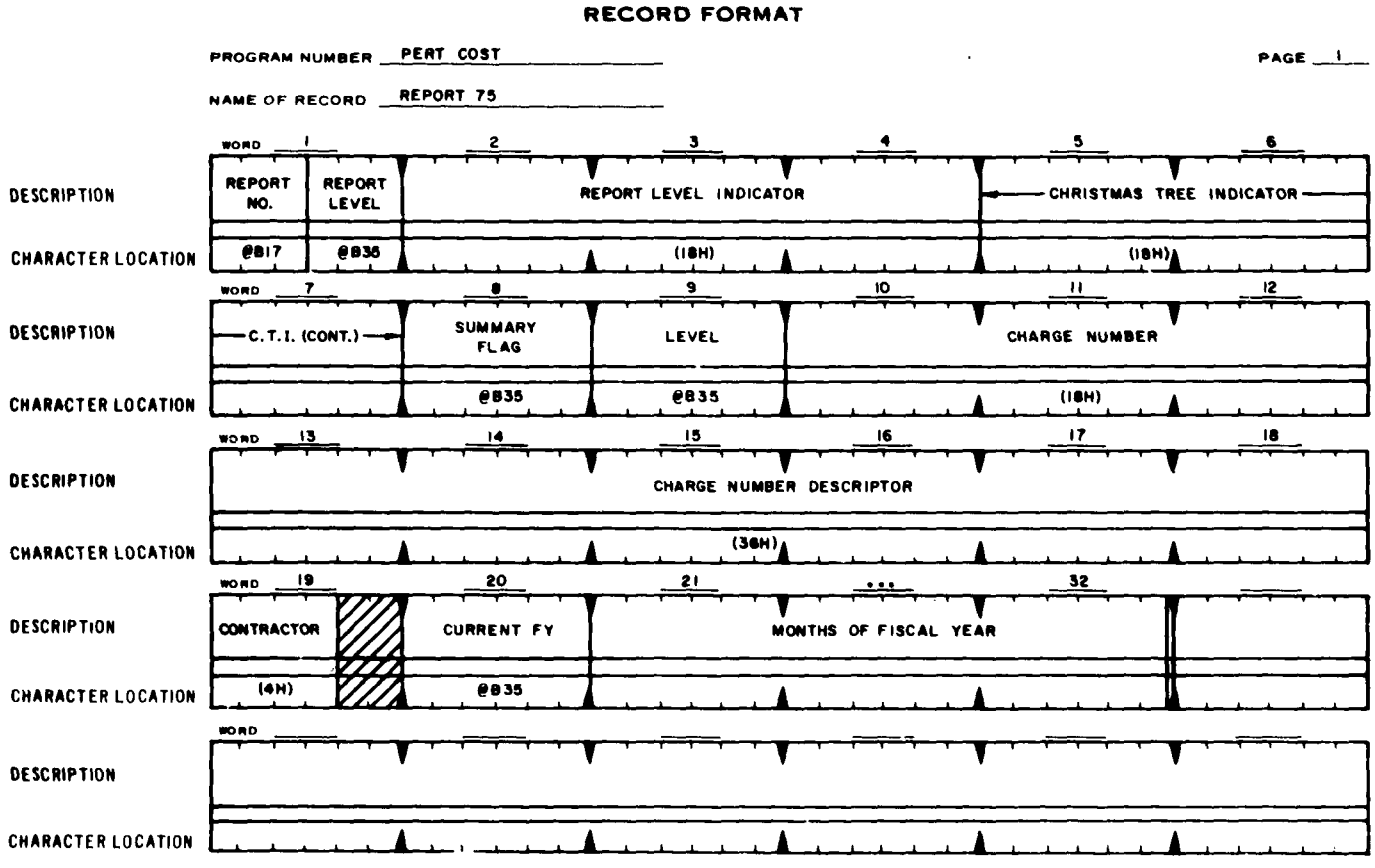


Fig. III-1-25. Tape Format of Report 75

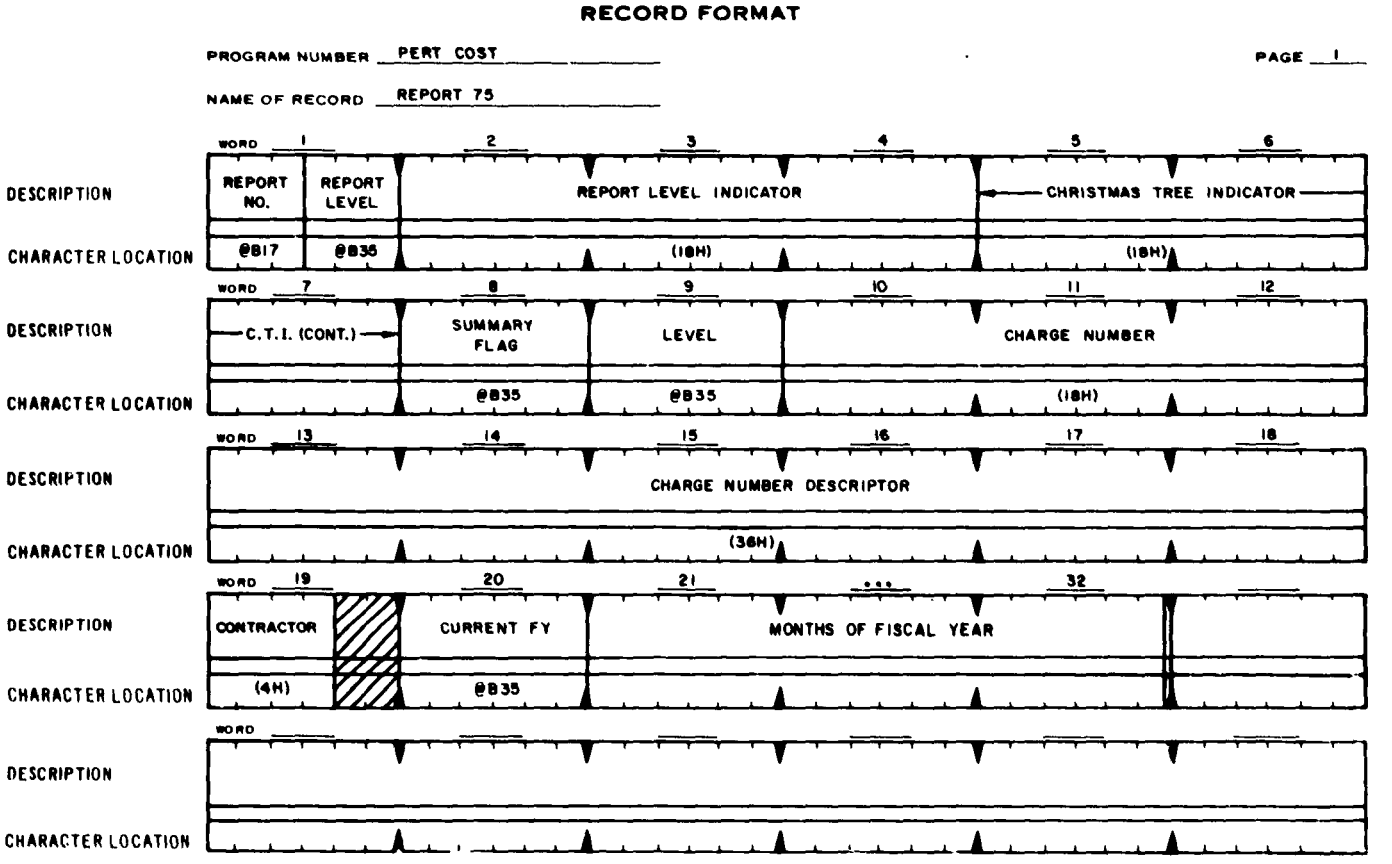


Fig. III-I-25. Tape Format of Report 75

Region KR71

EXPLANATION OF RECION:

To select and set up information for sorting the "Summary Financial Forecast" by cost category (Reports 71 and 76).

CALLING SEQUENCE:

L TSX KR71, 4

L+1 Normal return

INPUT:

Accumulator: Report level, , Report number.

YCNT: Location of PERT Cost data record.

OUTPUT:

Report 71 data record (by cost category, fiscal year).

Report 76 data record (by cost category, months of current fiscal year).

STORAGE USED:

Not applicable.

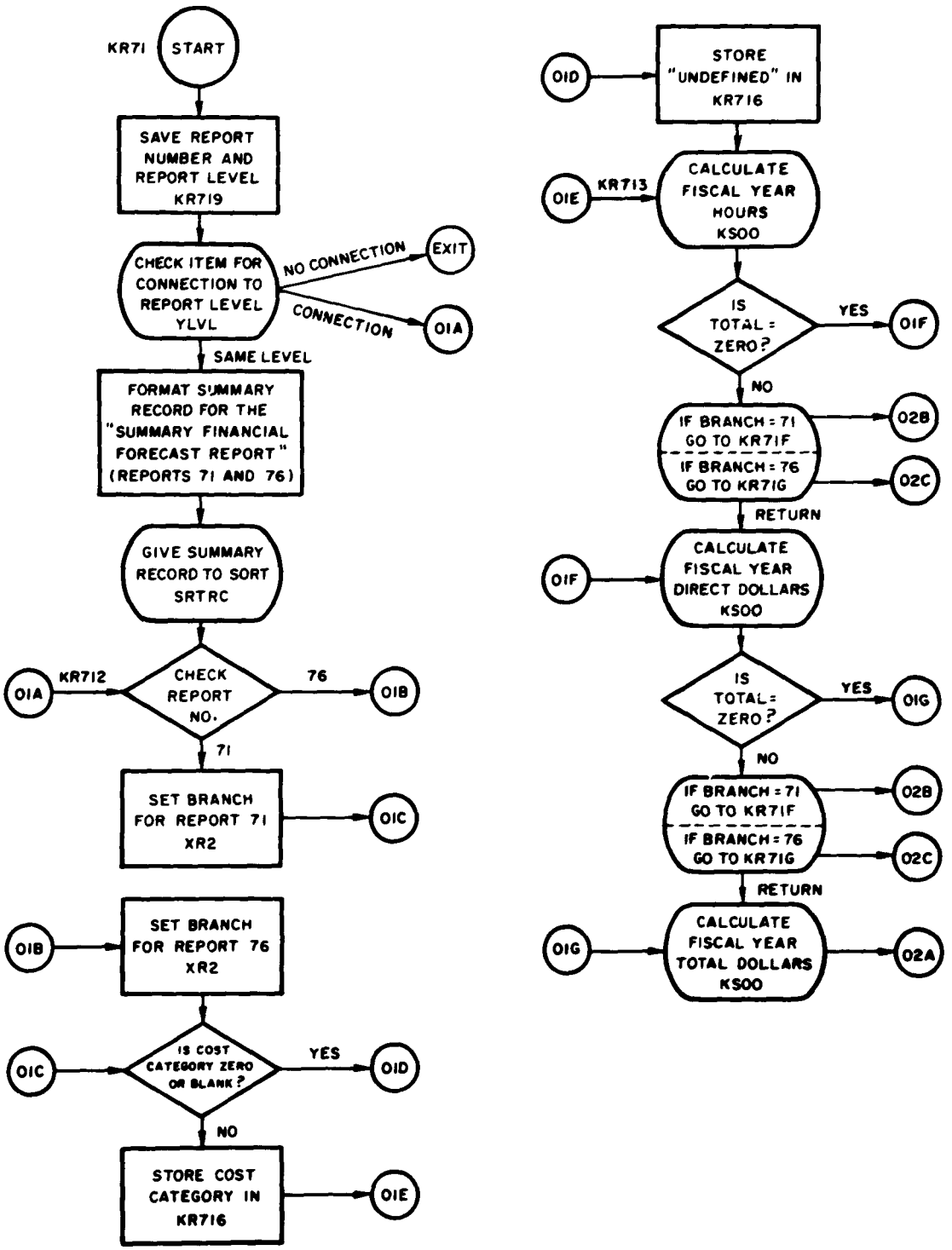
SUBREGIONS AND SUBROUTINES USED:

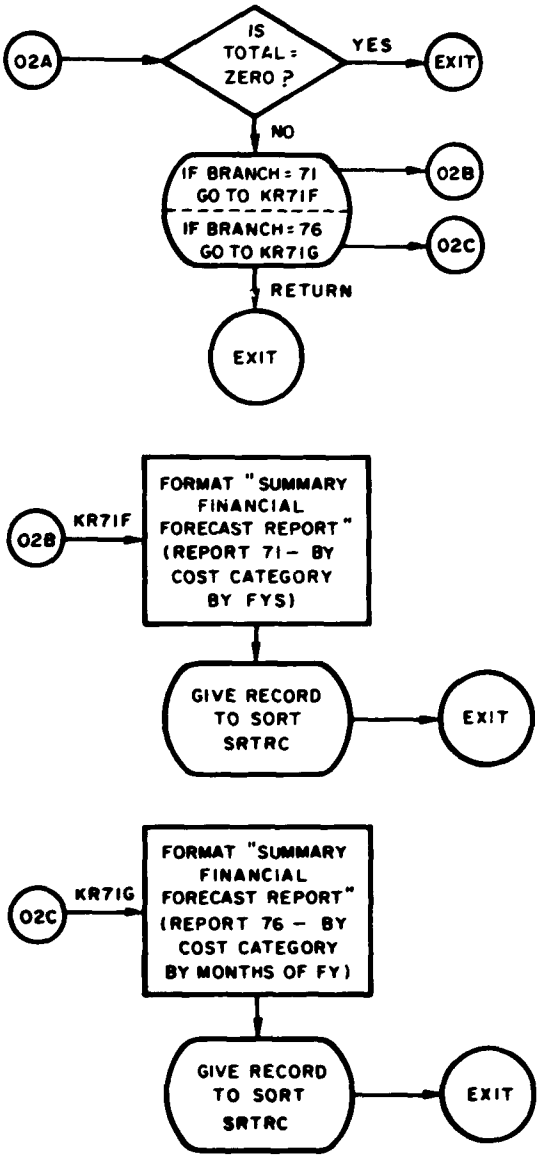
YLVL KS00

XSORT

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


KR71
START
SAVE REPORT NUMBER AND REPORT LEVEL KR719
CHECK ITEM FOR CONNECTION TO REPORT LEVEL YLVL
NO CONNECTION
EXIT
CONNECTION
01A
SAME LEVEL
FORMAT SUMMARY RECORD FOR THE "SUMMARY FINANCIAL FORECAST REPORT" (REPORTS 71 AND 76)
GIVE SUMMARY RECORD TO SORT SRTRC
01A
KR712
CHECK REPORT NO.
76
01B
71
SET BRANCH FOR REPORT 71 XR2
01C
01B
SET BRANCH FOR REPORT 76 XR2
01C
IS COST CATEGORY ZERO OR BLANK?
YES
01D
NO
STORE COST CATEGORY IN KR716
01E
01D
STORE "UNDEFINED" IN KR716
01E
KR713
CALCULATE FISCAL YEAR HOURS KS00
IS TOTAL = ZERO?
YES
01F
NO
IF BRANCH = 71 GO TO KR71F
IF BRANCH = 76 GO TO KR71G
02B
02C
RETURN
01F
CALCULATE FISCAL YEAR DIRECT DOLLARS KS00
IS TOTAL = ZERO?
YES
01G
NO
IF BRANCH = 71 GO TO KR71F
IF BRANCH = 76 GO TO KR71G
02B
02C
RETURN
01G
CALCULATE FISCAL YEAR TOTAL DOLLARS KS00
02A


02A
IS TOTAL = ZERO ?
YES
EXIT
NO
IF BRANCH = 71 GO TO KR71F
IF BRANCH = 76 GO TO KR71G
02B
02C
RETURN
EXIT
02B
KR71F
FORMAT "SUMMARY FINANCIAL FORECAST REPORT" (REPORT 71 - BY COST CATEGORY BY FYS)
GIVE RECORD TO SORT SRTRC
EXIT
02C
KR71G
FORMAT "SUMMARY FINANCIAL FORECAST REPORT" (REPORT 76 - BY COST CATEGORY BY MONTHS OF FY)
GIVE RECORD TO SORT SRTRC
EXIT

RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 1

NAME OF RECORD REPORT 71 & 76 (SUMMARY)

WORD	1	2	3	4	5	6
DESCRIPTION	REPORT NO	REPORT LEVEL	REPORT LEVEL INDICATOR		SUMMARY FLAG	LEVEL
CHARACTER LOCATION	@817	@835	(18H)		0 @835	@835
WORD	7	8	9	10	11	12
DESCRIPTION	CHARGE NUMBER			CHARGE NUMBER DESCRIPTOR		
CHARACTER LOCATION	(18H)			(36H)		
WORD	13	14	15	16		
DESCRIPTION	CHARGE NUMBER DESCRIPTOR (CONT.)			CONTRACTOR		
CHARACTER LOCATION				(4H)		
WORD						
DESCRIPTION						
CHARACTER LOCATION						
WORD						
DESCHIPTION						
CHARACTER LOCATION						

Fig. III-I-26. Tape Format of Reports 71 and 76, Summary

RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 1

NAME OF RECORD REPORT 71 (DATA)

	WORD 1	2	3	4	5	6
DESCRIPTION	REPORT NO.	REPORT LEVEL	REPORT LEVEL INDICATOR		SUMMARY FLAG	COST CATEGORY
CHARACTER LOCATION	@B17	@B35	(18H)		1 @B35	(18H)

	WORD 7	8	9	10	11	12
DESCRIPTION	COST CATEGORY (CONT.)		COST CAT. CODE	PRIOR FYS	CURRENT FY	CURRENT FY+1
CHARACTER LOCATION			(6H)	@B35	@B35	@B35

	WORD 13	14	15	16	17	18
DESCRIPTION	CURRENT FY+2	CURRENT FY+3	CURRENT FY+4	CURRENT FY+5	CURRENT FY+6	TOTALS TO COMPLETE
CHARACTER LOCATION	@B35	@B35	@B35	@B35	@B35	@B35

	WORD 19
DESCRIPTION	TOTAL
CHARACTER LOCATION	@B35

	WORD
DESCRIPTION	
CHARACTER LOCATION	

Fig. III-I-27. Tape Format of Report 71, Data

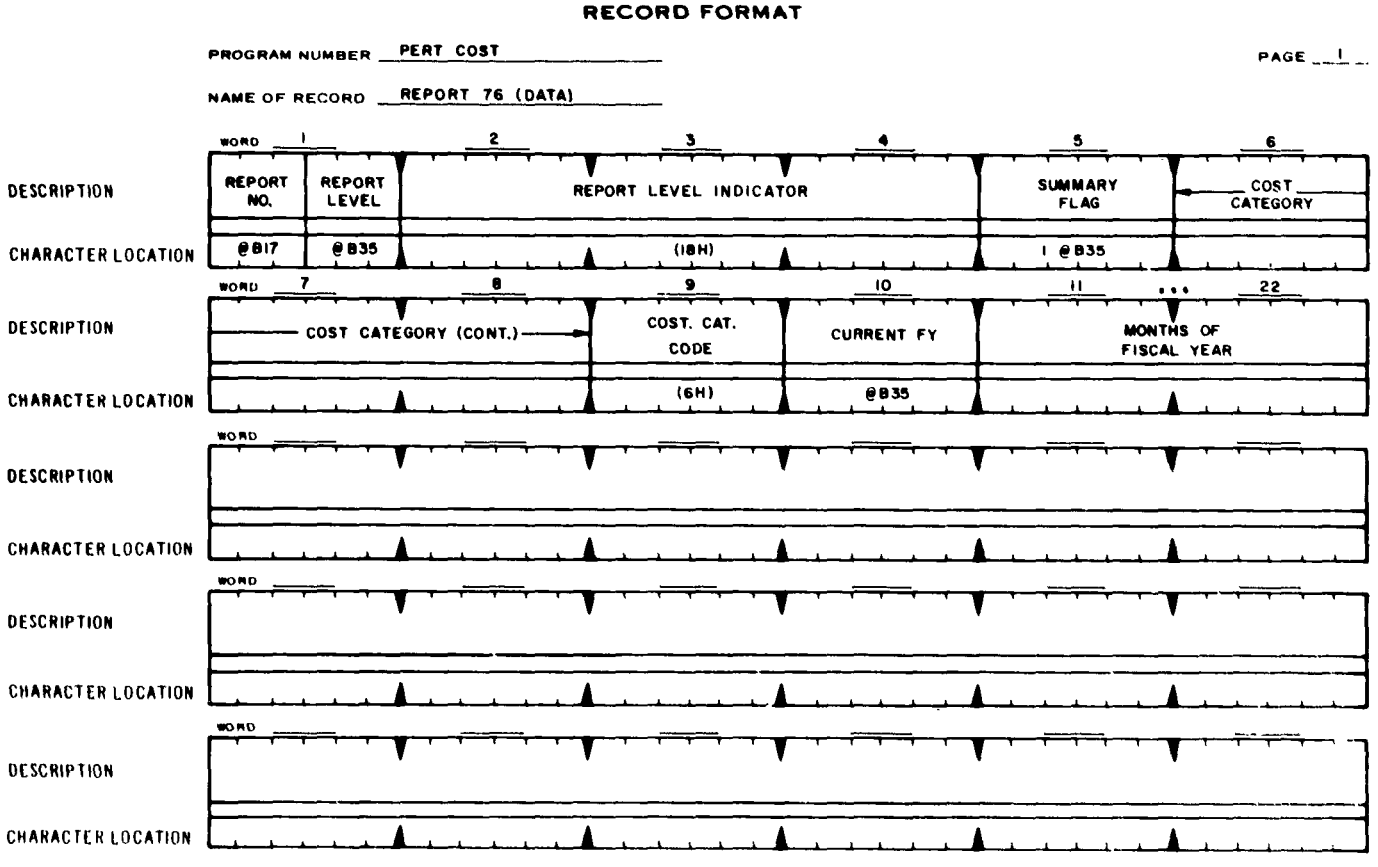


Fig. III-I-28. Tape Format of Report 76, Data

Region KR80

EXPLANATION OF REGION:

To select and set up information for sorting the "Budget Authorization and Updating Form" (Report 80) and "Cost Estimating and Updating Form" (Report 85).

CALLING SEQUENCE:

L TSX KR80, 4

L+1 Normal return

INPUT:

Accumulator: 0,, Report number.

YCNT: Location of PERT Cost data record.

OUTPUT:

Report 80 data record.

Report 85 data record.

STORAGE USED:

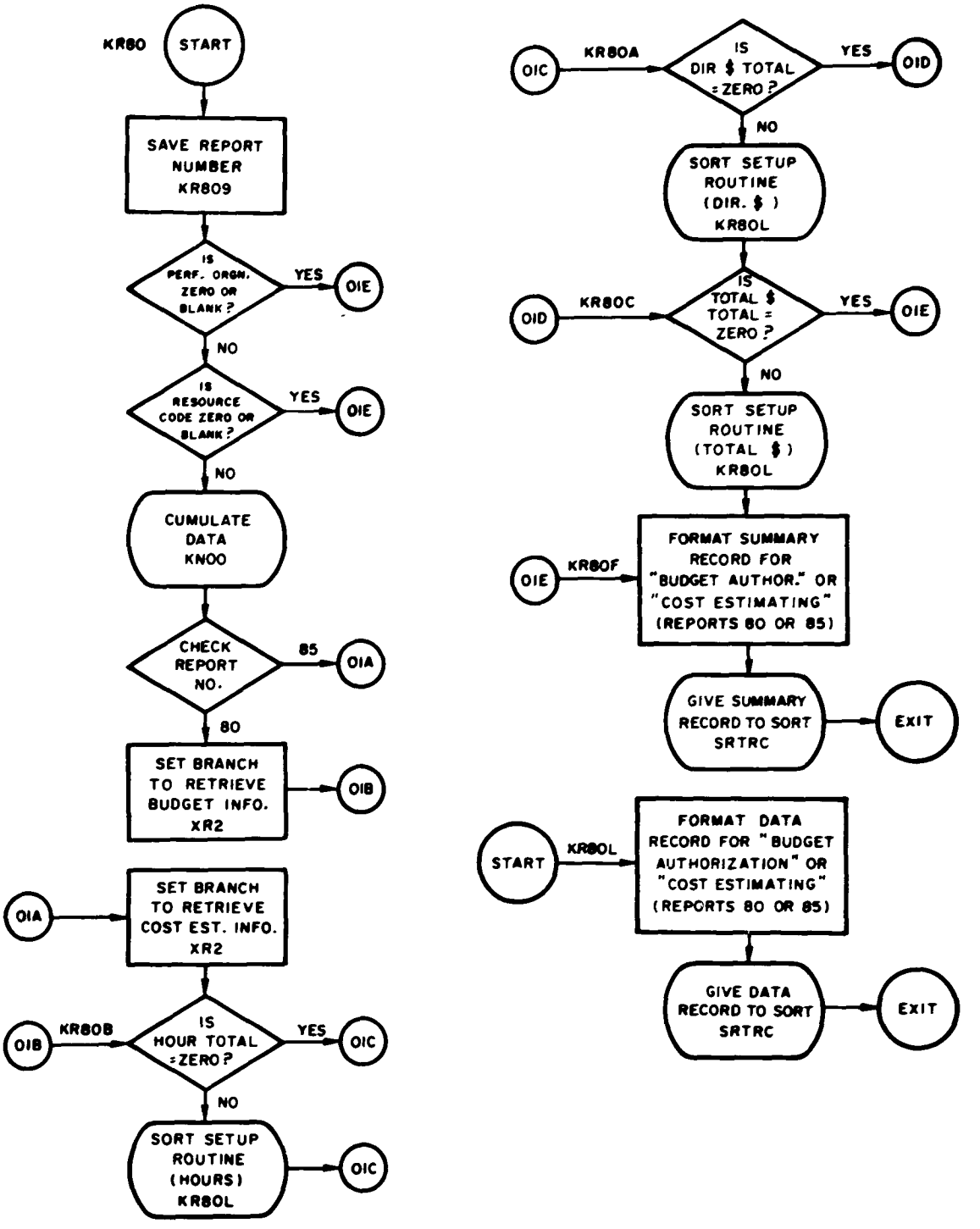
Not applicable.

SUBREGIONS AND SUBROUTINES USED:

KN00 XSORT

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


KR80
START
SAVE REPORT NUMBER KR809
IS PERF. ORGN. ZERO OR BLANK?
YES
01E
NO
IS RESOURCE CODE ZERO OR BLANK?
YES
01E
NO
CUMULATE DATA KN00
CHECK REPORT NO.
85
01A
80
SET BRANCH TO RETRIEVE BUDGET INFO. XR2
01B
01A
SET BRANCH TO RETRIEVE COST EST. INFO. XR2
01B
KR80B
IS HOUR TOTAL = ZERO?
YES
01C
NO
SORT SETUP ROUTINE (HOURS) KR80L
01C
KR80A
IS DIR $ TOTAL = ZERO?
YES
01D
NO
SORT SETUP ROUTINE (DIR. $) KR80L
01D
KR80C
IS TOTAL $ TOTAL = ZERO?
YES
01E
NO
SORT SETUP ROUTINE (TOTAL $) KR80L
01E
KR80F
FORMAT SUMMARY RECORD FOR "BUDGET AUTHOR." OR "COST ESTIMATING" (REPORTS 80 OR 85)
GIVE SUMMARY RECORD TO SORT SRTRC
EXIT
START
KR80L
FORMAT DATA RECORD FOR "BUDGET AUTHORIZATION" OR "COST ESTIMATING" (REPORTS 80 OR 85)
GIVE DATA RECORD TO SORT SRTRC
EXIT

RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 1

NAME OF RECORD REPORT 80 & 85 (SUMMARY)

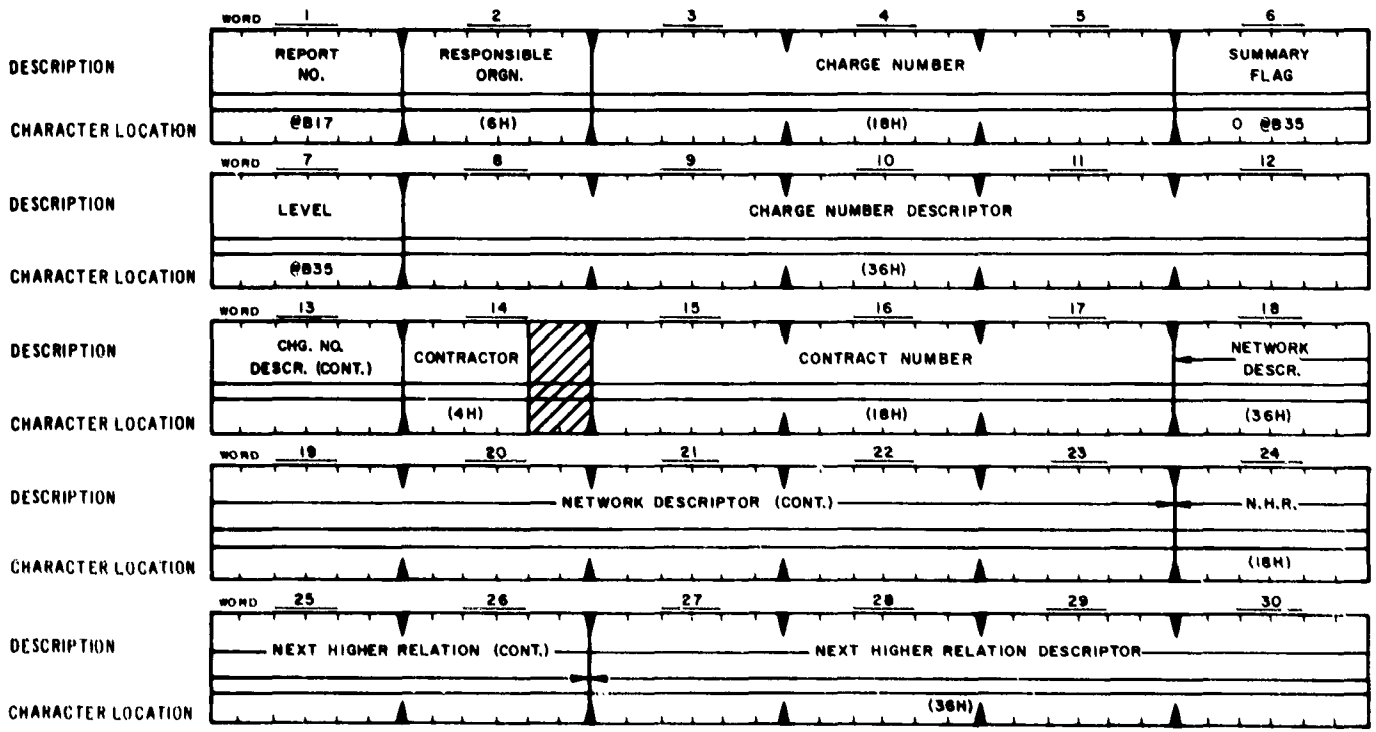


Fig. III-I-29. Tape Format of Reports 80 and 85, Summary

RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 2

NAME OF RECORD REPORT 80 & 85 (SUMMARY) (CONT.)

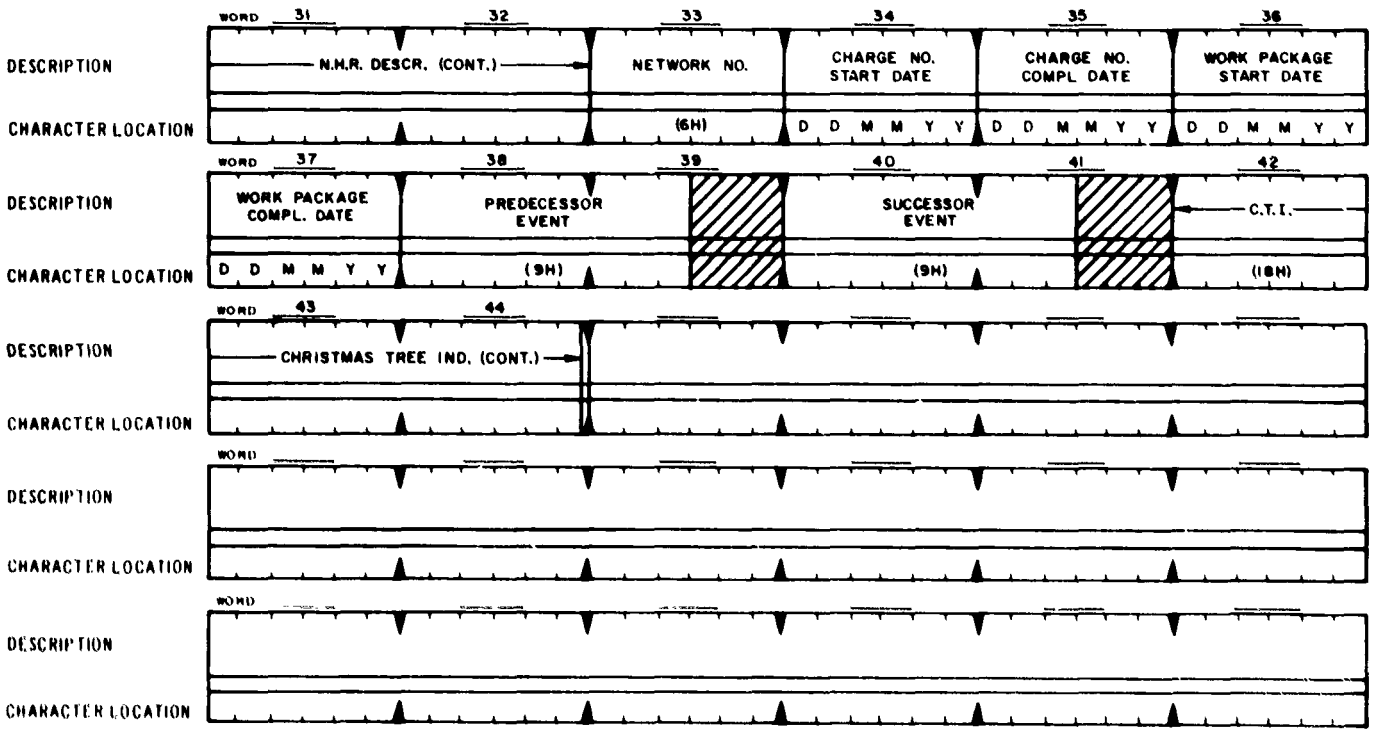


Fig. III-I-29. Tape Format of Reports 80 and 85, Summary (Continued)

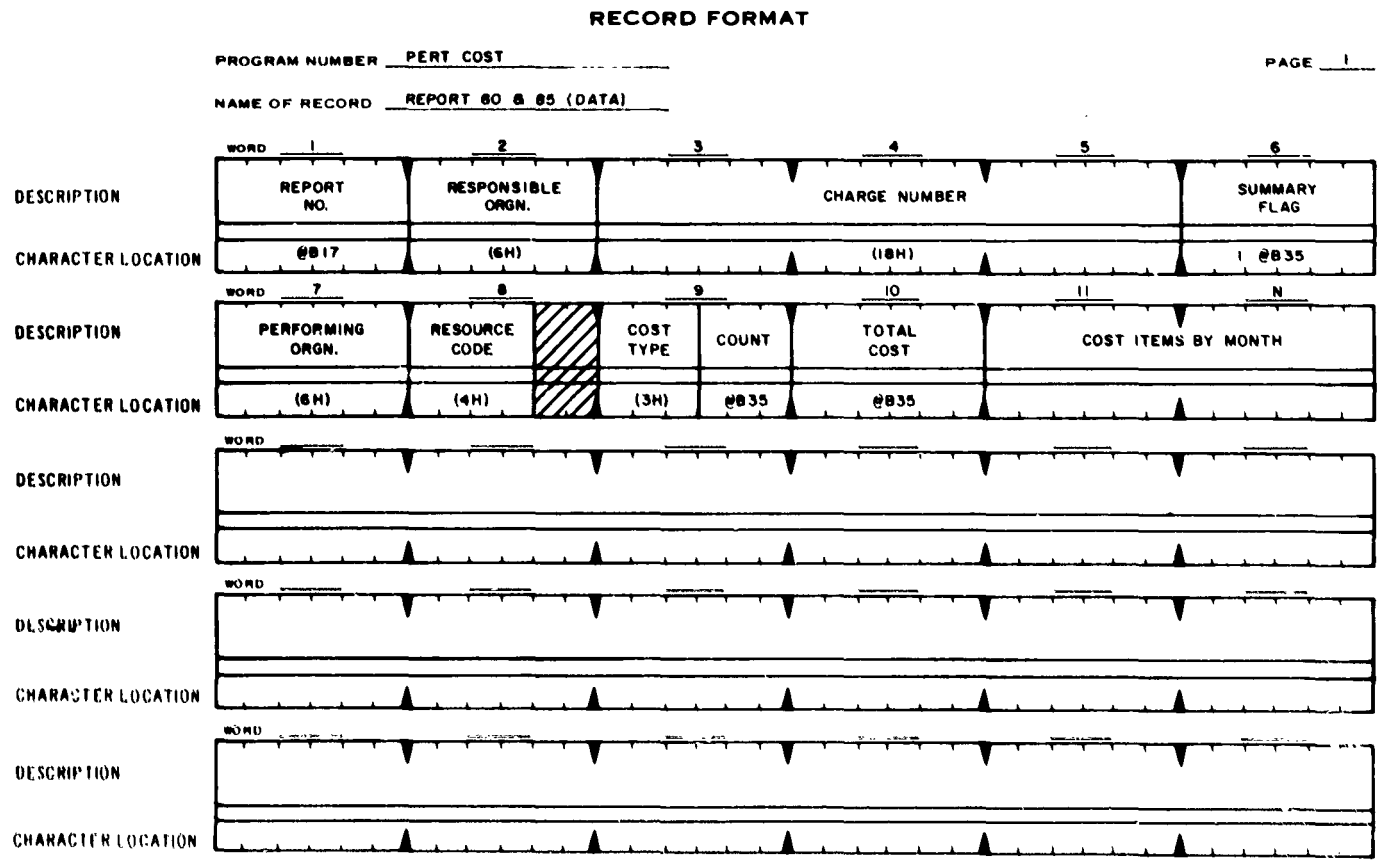


Fig III-I-30. Tape Format of Reports 80 and 85, Data

Region KS00

EXPLANATION OF REGION:

To cumulate budget by fiscal year.

CALLING SEQUENCE:

```
L     TSX   KS00, 4
L+1   PZE   N
L+2   Normal return
```

INPUT:

XR1 = Location of PERT Cost data record (complemented).

OUTPUT:

KS900 = Prior FY's
+1 = Current FY
+2 = Current FY+1
+3 = Current FY+2
+4 = Current FY+3
+6 = Current FY+4
+7 = Current FY+5
KS900+8 = Current FY+6
+9 = To complete
+10 = Total
KS910 = C.C. Code
KS901 thru KS901+11 = Months of current FY

STORAGE USED:

KBUF3 - 1000 words

SUBREGIONS AND SUBROUTINES USED:

UPCK FIXPT

EXPLANATION OF CALLING SEQUENCE:

If N = 1, cumulate hours or units.
= 2, cumulate direct dollars.
= 3, cumulate total dollars.

Region KS00

EXPLANATION OF REGION:

To cumulate budget by fiscal year.

CALLING SEQUENCE:

```
L     TSX   KS00, 4
L+1   PZE   N
L+2   Normal return
```

INPUT:

XR1 = Location of PERT Cost data record (complemented).

OUTPUT:

KS900 = Prior FY's
+1 = Current FY
+2 = Current FY+1
+3 = Current FY+2
+4 = Current FY+3
+6 = Current FY+4
+7 = Current FY+5
KS900+8 = Current FY+6
+9 = To complete
+10 = Total
KS910 = C.C. Code
KS901 thru KS901+11 = Months of current FY

STORAGE USED:

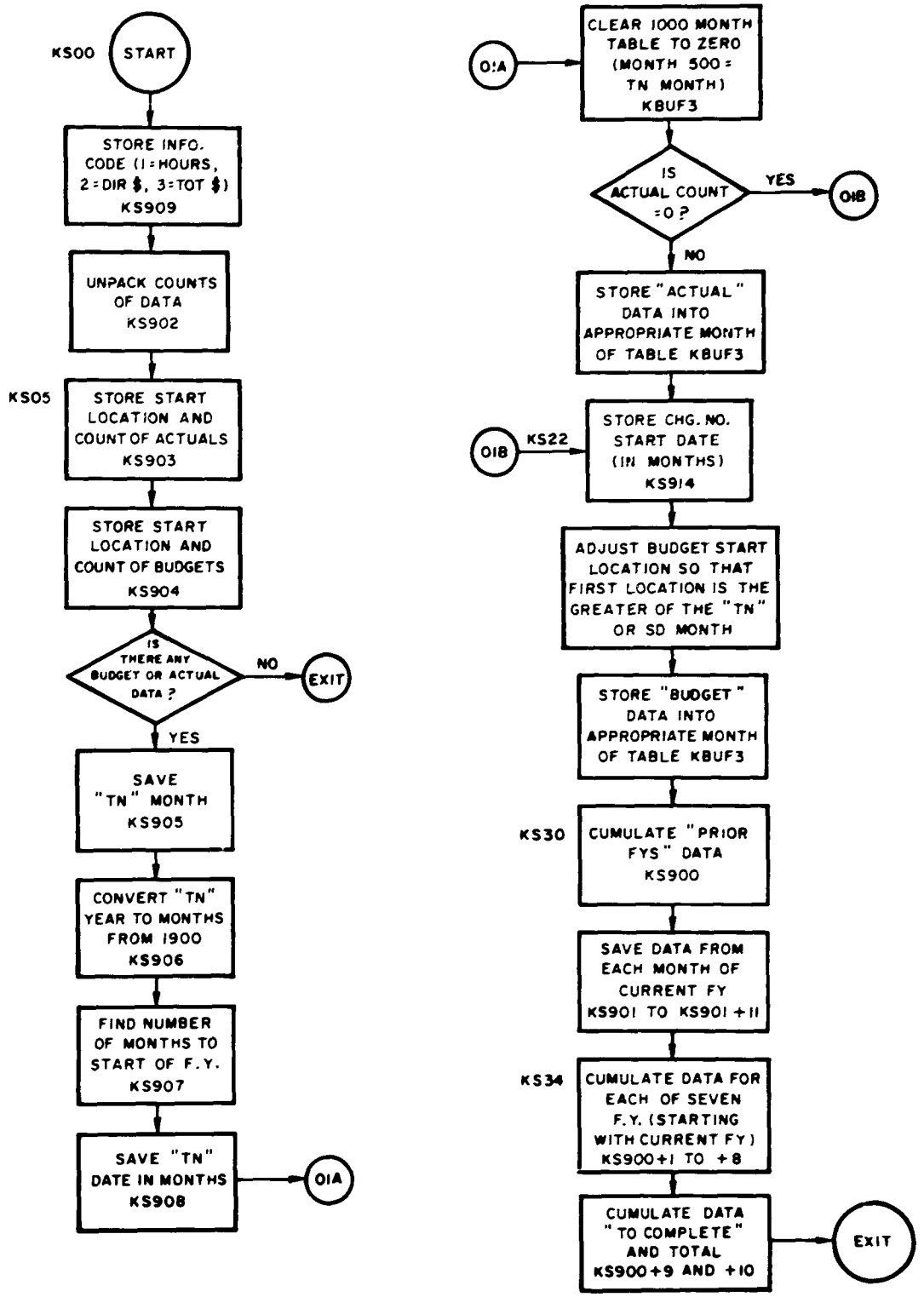
KBUF3 - 1000 words

SUBREGIONS AND SUBROUTINES USED:

UPCK FIXPT

EXPLANATION OF CALLING SEQUENCE:

If N = 1, cumulate hours or units.
= 2, cumulate direct dollars.
= 3, cumulate total dollars.


KS00
START
STORE INFO. CODE (1=HOURS, 2=DIR $, 3=TOT $) KS909
UNPACK COUNTS OF DATA KS902
KS05
STORE START LOCATION AND COUNT OF ACTUALS KS903
STORE START LOCATION AND COUNT OF BUDGETS KS904
IS THERE ANY BUDGET OR ACTUAL DATA ?
NO
EXIT
YES
SAVE "TN" MONTH KS905
CONVERT "TN" YEAR TO MONTHS FROM 1900 KS906
FIND NUMBER OF MONTHS TO START OF F.Y. KS907
SAVE "TN" DATE IN MONTHS KS908
01A
01A
CLEAR 1000 MONTH TABLE TO ZERO (MONTH 500 = TN MONTH) KBUF3
IS ACTUAL COUNT =0 ?
YES
01B
NO
STORE "ACTUAL" DATA INTO APPROPRIATE MONTH OF TABLE KBUF3
01B
KS22
STORE CHG. NO. START DATE (IN MONTHS) KS914
ADJUST BUDGET START LOCATION SO THAT FIRST LOCATION IS THE GREATER OF THE "TN" OR SD MONTH
STORE "BUDGET" DATA INTO APPROPRIATE MONTH OF TABLE KBUF3
KS30
CUMULATE "PRIOR FYS" DATA KS900
SAVE DATA FROM EACH MONTH OF CURRENT FY KS901 TO KS901+11
KS34
CUMULATE DATA FOR EACH OF SEVEN F.Y. (STARTING WITH CURRENT FY) KS900+1 TO +8
CUMULATE DATA "TO COMPLETE" AND TOTAL KS900+9 AND +10
EXIT

Region KX00

EXPLANATION OF REGION:

To locate actuals, budgets, and estimates for an individual month.

CALLING SEQUENCE:

L TSX KX00, 4

L+1 Normal return

INPUT:

XRI = Location of PERT Cost data record (complemented).

OUTPUT:

KX902 = date

KX903 = actual

KX904 = budget

KX905 = estimate

KX906 = overrun/underrun

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

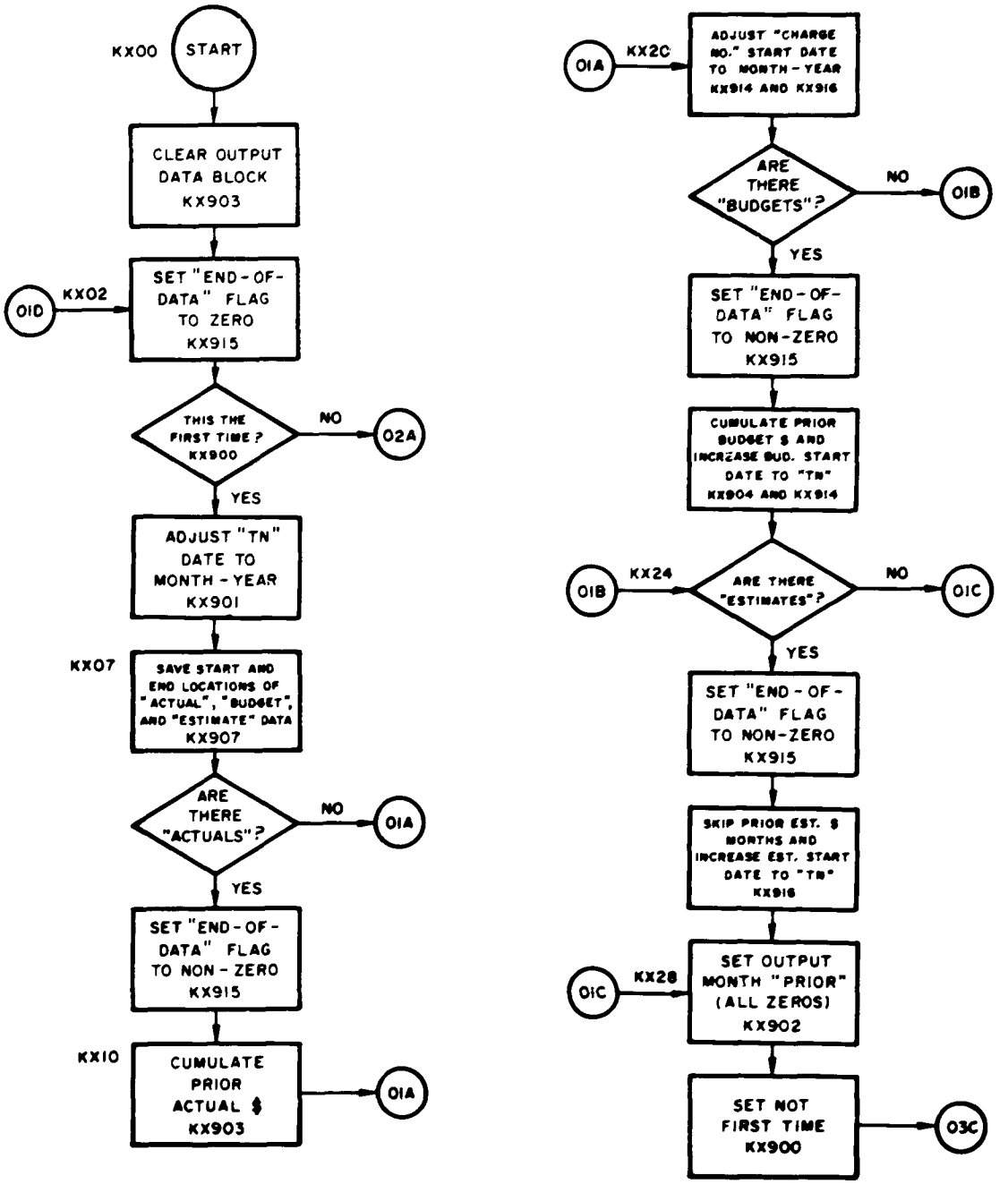
FIXPT

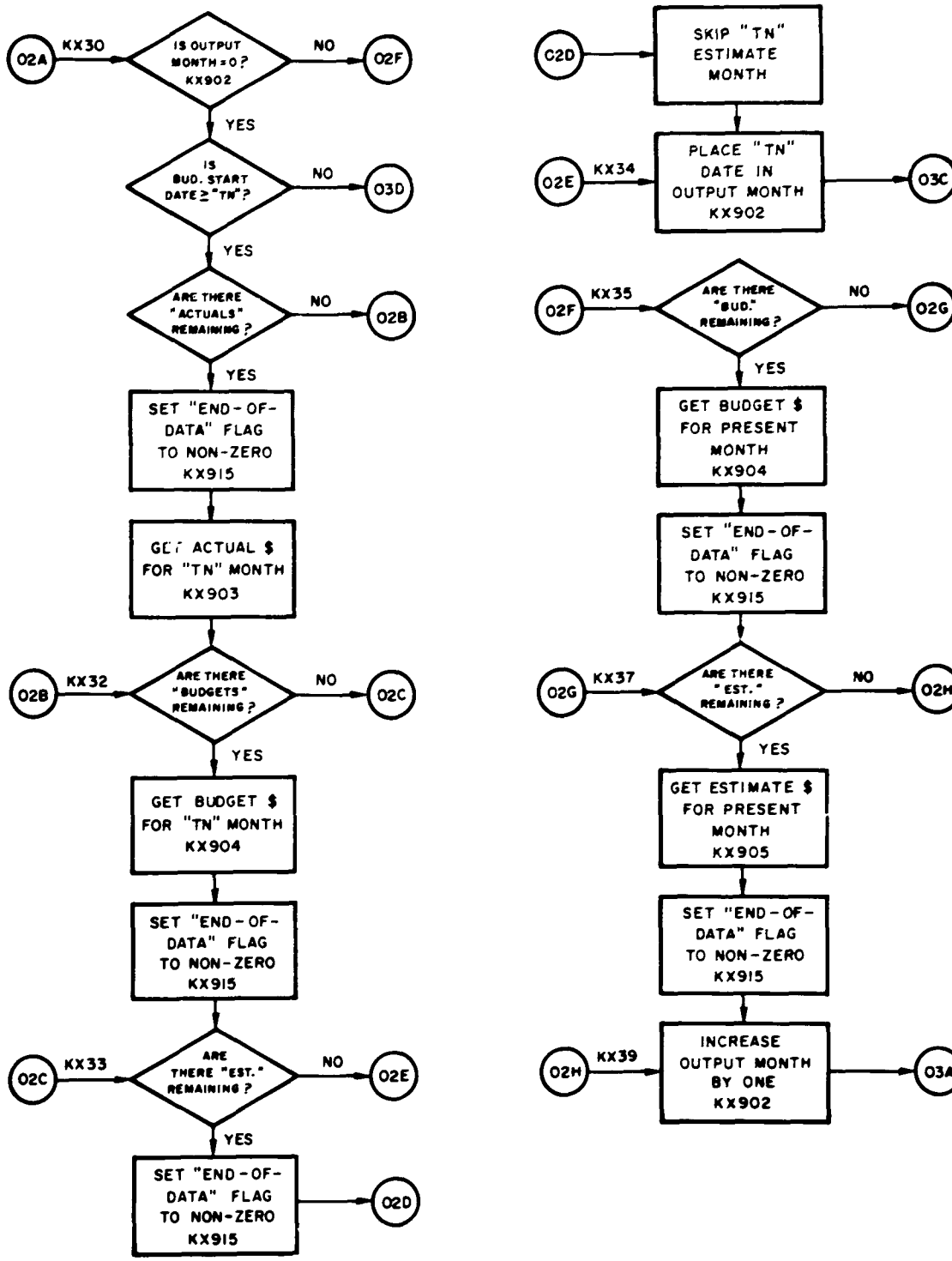
PACK

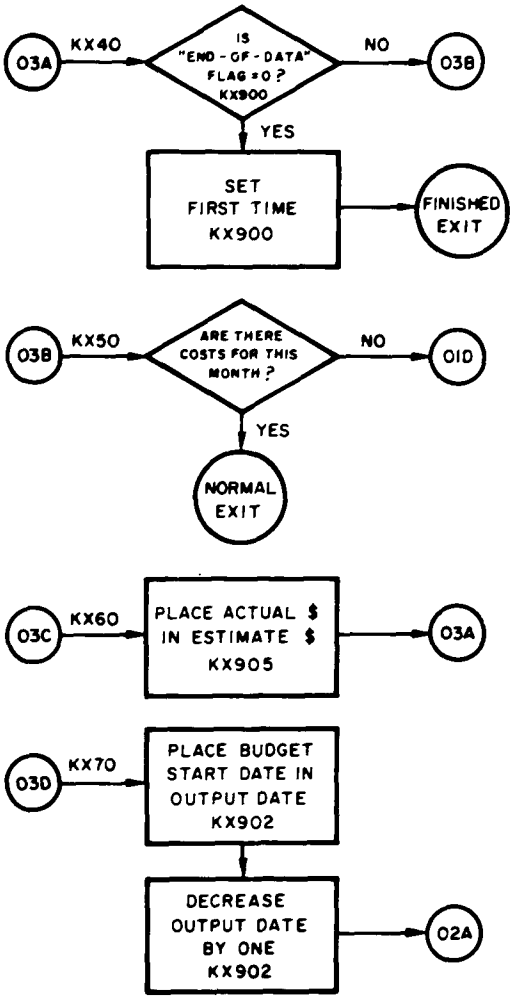
UPCK

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


KX00
START
CLEAR OUTPUT DATA BLOCK KX903
01D
KX02
SET "END-OF-DATA" FLAG TO ZERO KX915
THIS THE FIRST TIME? KX900
NO
02A
YES
ADJUST "TN" DATE TO MONTH-YEAR KX901
KX07
SAVE START AND END LOCATIONS OF "ACTUAL", "BUDGET", AND "ESTIMATE" DATA KX907
ARE THERE "ACTUALS"?
NO
01A
YES
SET "END-OF-DATA" FLAG TO NON-ZERO KX915
KX10
CUMULATE PRIOR ACTUAL $ KX903
01A
01A
KX2C
ADJUST "CHARGE NO." START DATE TO MONTH-YEAR KX914 AND KX916
ARE THERE "BUDGETS"?
NO
01B
YES
SET "END-OF-DATA" FLAG TO NON-ZERO KX915
CUMULATE PRIOR BUDGET $ AND INCREASE BUD. START DATE TO "TN" KX904 AND KX914
01B
KX24
ARE THERE "ESTIMATES"?
NO
01C
YES
SET "END-OF-DATA" FLAG TO NON-ZERO KX915
SKIP PRIOR EST. 8 MONTHS AND INCREASE EST. START DATE TO "TN" KX916
01C
KX28
SET OUTPUT MONTH "PRIOR" (ALL ZEROS) KX902
SET NOT FIRST TIME KX900
03C


02A
KX30
IS OUTPUT MONTH = 0? KX902
NO
02F
YES
IS BUD. START DATE ≥ "TN"?
NO
03D
YES
ARE THERE "ACTUALS" REMAINING?
NO
02B
YES
SET "END-OF-DATA" FLAG TO NON-ZERO KX915
GET ACTUAL $ FOR "TN" MONTH KX903
02B
KX32
ARE THERE "BUDGETS" REMAINING?
NO
02C
YES
GET BUDGET $ FOR "TN" MONTH KX904
SET "END-OF-DATA" FLAG TO NON-ZERO KX915
02C
KX33
ARE THERE "EST." REMAINING?
NO
02E
YES
SET "END-OF-DATA" FLAG TO NON-ZERO KX915
02D
02D
SKIP "TN" ESTIMATE MONTH
02E
KX34
PLACE "TN" DATE IN OUTPUT MONTH KX902
03C
02F
KX35
ARE THERE "BUD." REMAINING?
NO
02G
YES
GET BUDGET $ FOR PRESENT MONTH KX904
SET "END-OF-DATA" FLAG TO NON-ZERO KX915
02G
KX37
ARE THERE "EST." REMAINING?
NO
02H
YES
GET ESTIMATE $ FOR PRESENT MONTH KX905
SET "END-OF-DATA" FLAG TO NON-ZERO KX915
02H
KX39
INCREASE OUTPUT MONTH BY ONE KX902
03A


03A
KX40
IS "END-OF-DATA" FLAG=0? KX900
NO
03B
YES
SET FIRST TIME KX900
FINISHED EXIT
03B
KX50
ARE THERE COSTS FOR THIS MONTH?
NO
01D
YES
NORMAL EXIT
03C
KX60
PLACE ACTUAL $ IN ESTIMATE $ KX905
03A
03D
KX70
PLACE BUDGET START DATE IN OUTPUT DATE KX902
DECREASE OUTPUT DATE BY ONE KX902
02A

III-J FINAL REPORTING PHASE

In the final reporting phase the reports are generated from the cost and time information and set onto the Output Print tape.

Input

The tapes from the XSORT sorting routine (prior to the final merge pass) will be used as input into this phase. These tapes will contain all the information necessary for producing the requested reports and will be sequenced by report number major and report level minor. Each report will contain all the information necessary for producing that individual report.

Procedure

Each report is operated upon separately and in report number order. The bulk of the computations necessary to produce a given report is done at this time. These computations may involve cumulating cost data or summarizing time data up the work breakdown structure, calculating "value" or "percent overrun/underrun," or totaling cost information for an individual cost category. After the computations are completed, it is sometimes necessary to perform an additional sort in order to put the data into the sequence required by the report. The data is then put into the specified report format and placed on the output report tape.

List of Reports Produced

Report No.	Level Report?	Report Title	Sort Sequence
10	yes	Organization Status Report	Perf. Orgn., Charge No., Resp. Orgn., Res. Code
11	yes	Organization Status Report	Res. Code, Charge No., Resp. Orgn., Perf. Orgn.

List of Reports Produced (Continued)

Report No.	Level Report?	Report Title	Sort Sequence
12	yes	Organization Status Report	Charge No., Resp. Orgn., Perf. Orgn., Res. Code
13	yes	Organization Status Report	Resp. Orgn., Charge No., Perf. Orgn., Res. Code
20	yes	Organization Status Report	Net No., Perf. Orgn., Charge No., Resp. Orgn., Res. Code
21	yes	Organization Status Report	Net No., Res. Code Charge No., Resp. Orgn., Perf. Orgn.
22	yes	Organization Status Report	Net No., Charge No., Resp. Orgn., Perf. Orgn., Res. Code
23	yes	Organization Status Report	Net No., Resp. Orgn., Charge No., Perf. Orgn., Res. Code
30	yes	Management Summary Report	
35	yes	Program/Project Status Report	
40	yes	Financial Plan and Status Report	Month, Charge No.
41	yes	Financial Plan and Status Report	Month
50	yes	Manpower Loading Report	Res. Code, Month, Perf. Orgn., Charge No.
51	yes	Manpower Loading Report	Res. Code, Month

List of Reports Produced (Continued)

Report No.	Level Report?	Report Title	Sort Sequence
52	yes	Manpower Loading Report	Perf. Orgn., Month, Res. Code
55	yes	Rainbow Category Report	
60	yes	Cost Category Status Report	
70	yes	Summary Financial Forecast	Summary, Year
71	yes	Summary Financial Forecast	Cost Cat., Year
75	yes	Summary Financial Forecast	Summary, Month
76	yes	Summary Financial Forecast	Cost Cat., Month
80	no	Budget Authorization and Updating Form	
85	no	Cost Estimating and Updating Form	

Final Reporting Phase Region Descriptions

The major subroutines in this phase are described below. A flow diagram of the master control region for this phase is given as Fig III-J-1.

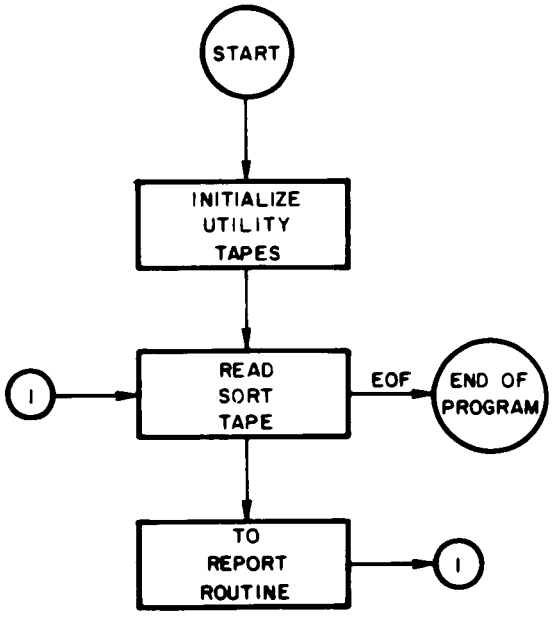


Fig III-J-1. Flow Diagram of Final Report Phase

Region LA00

EXPLANATION OF REGION:

Master control region for final reporting phase. Initializes tapes and communicates with report routines.

CALLING SEQUENCE:

```
L   TRA   LA00
```

INPUT:

Sorted tape from XSORT routine.

OUTPUT:

Report tape for printing.

STORAGE USED:

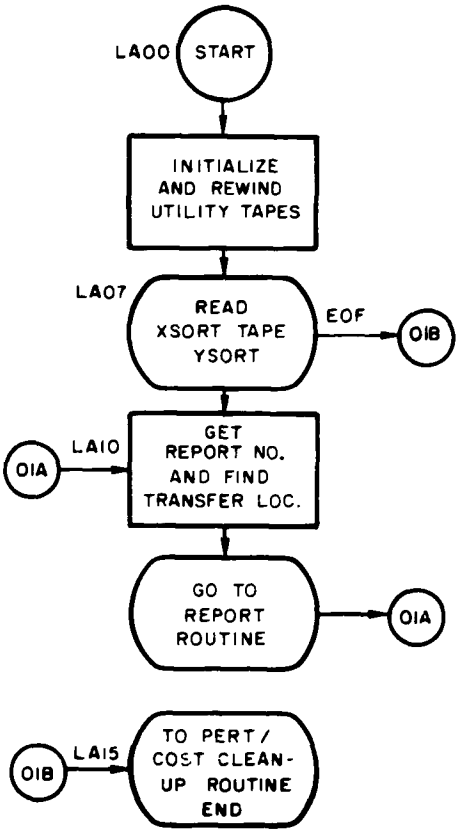
Not applicable.

SUBREGIONS AND SUBROUTINES USED:

YREAD	Report regions

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


LA00
START
INITIALIZE AND REWIND UTILITY TAPES
LA07
READ XSORT TAPE YSORT
EOF
01B
01A
LA10
GET REPORT NO. AND FIND TRANSFER LOC.
GO TO REPORT ROUTINE
01A
01B
LA15
TO PERT/ COST CLEAN-UP ROUTINE
END

Region LA100

EXPLANATION OF REGION:

To print bottom titles (security number and page number).

CALLING SEQUENCE:

L TSX LA100, 4

L+1 Normal return

INPUT:

ZSEC - security number

ZPAGE - page number

OUTPUT:

Bottom title printed on line 59.

STORAGE USED:

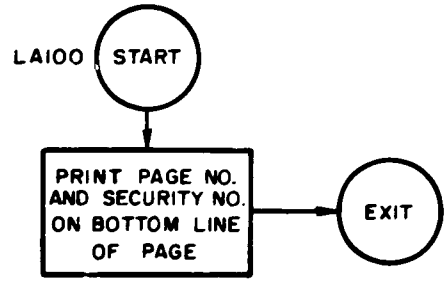
Not applicable.

SUBREGIONS AND SUBROUTINES USED:

Not applicable.

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


LA100
START
PRINT PAGE NO. AND SECURITY NO. ON BOTTOM LINE OF PAGE
EXIT

Region LB00

EXPLANATION OF REGION:

To cumulate a major and subtotal for the first two items in the sort, and print out the "Organization Status Report."

CALLING SEQUENCE:

```
L     TSX   LB00, 4
L+1   PZE   0, 0, R
L+2   PZE   H
L+3   PZE   T2,, T1
L+4   PZE   S1,, S2
L+5   PZE   S3,, S4
L+6   Normal return
```

INPUT:

Information from XSORT routine.

OUTPUT:

Report on output print tape.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

YPAGE	YREAD	LB200
LT00	LA100	YSEC
YCOMP		

EXPLANATION OF CALLING SEQUENCE:

R = report no.

H = location of sort sequence print routine

T1 = location of major total print routine

T2 = location of subtotal print routine

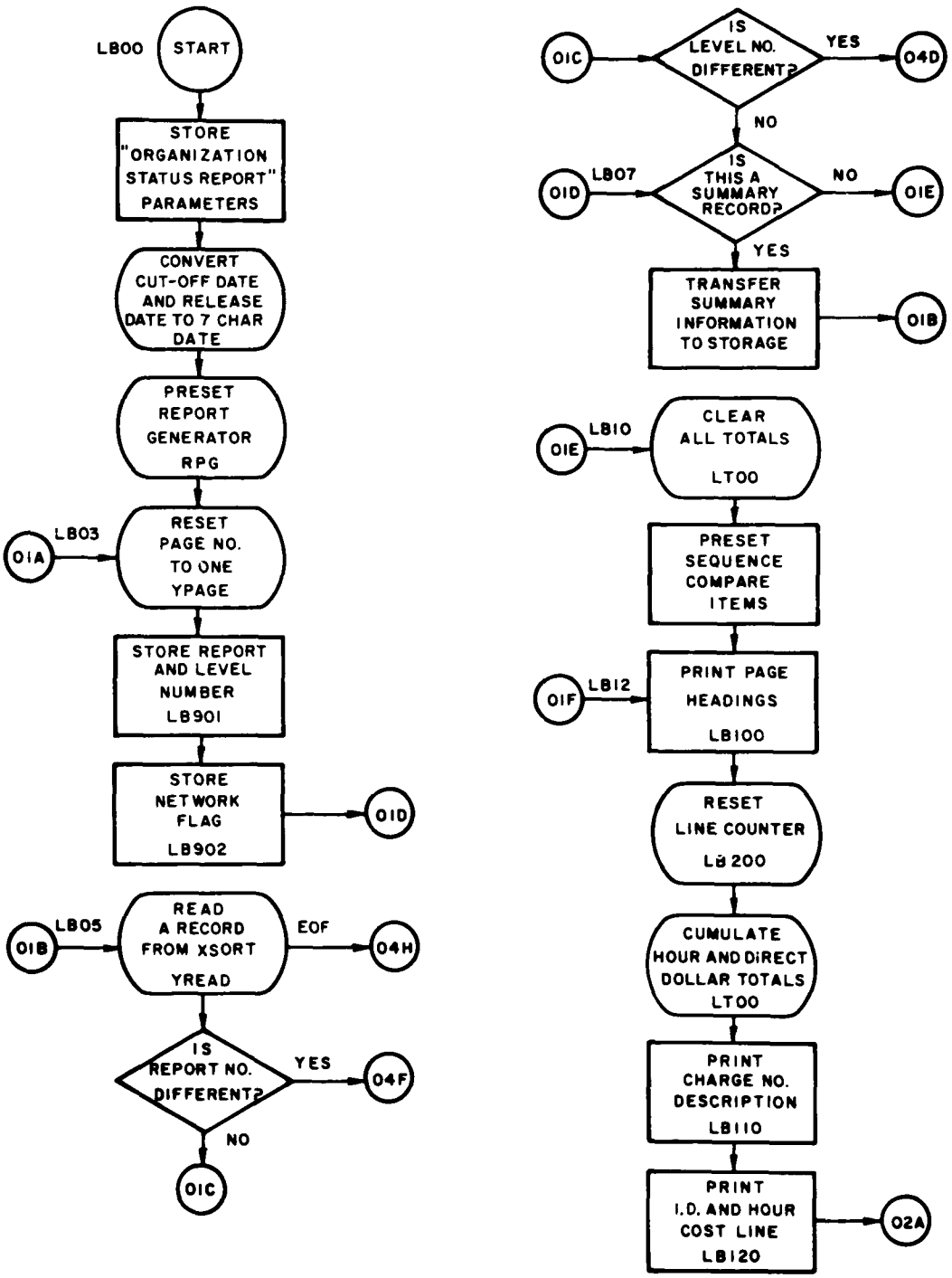
S1 through S4 = sort sequence of report, where:

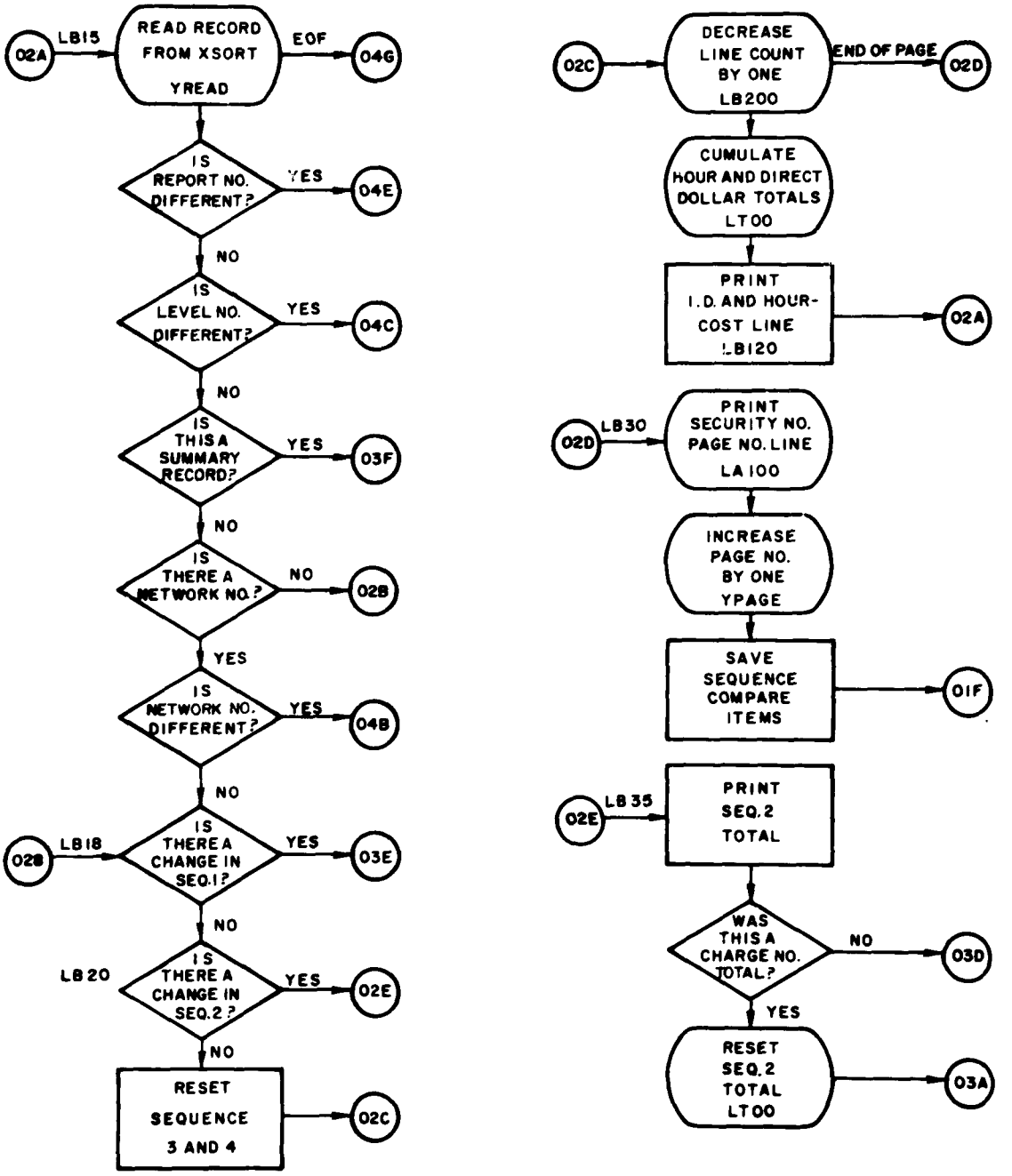
1 = charge no.

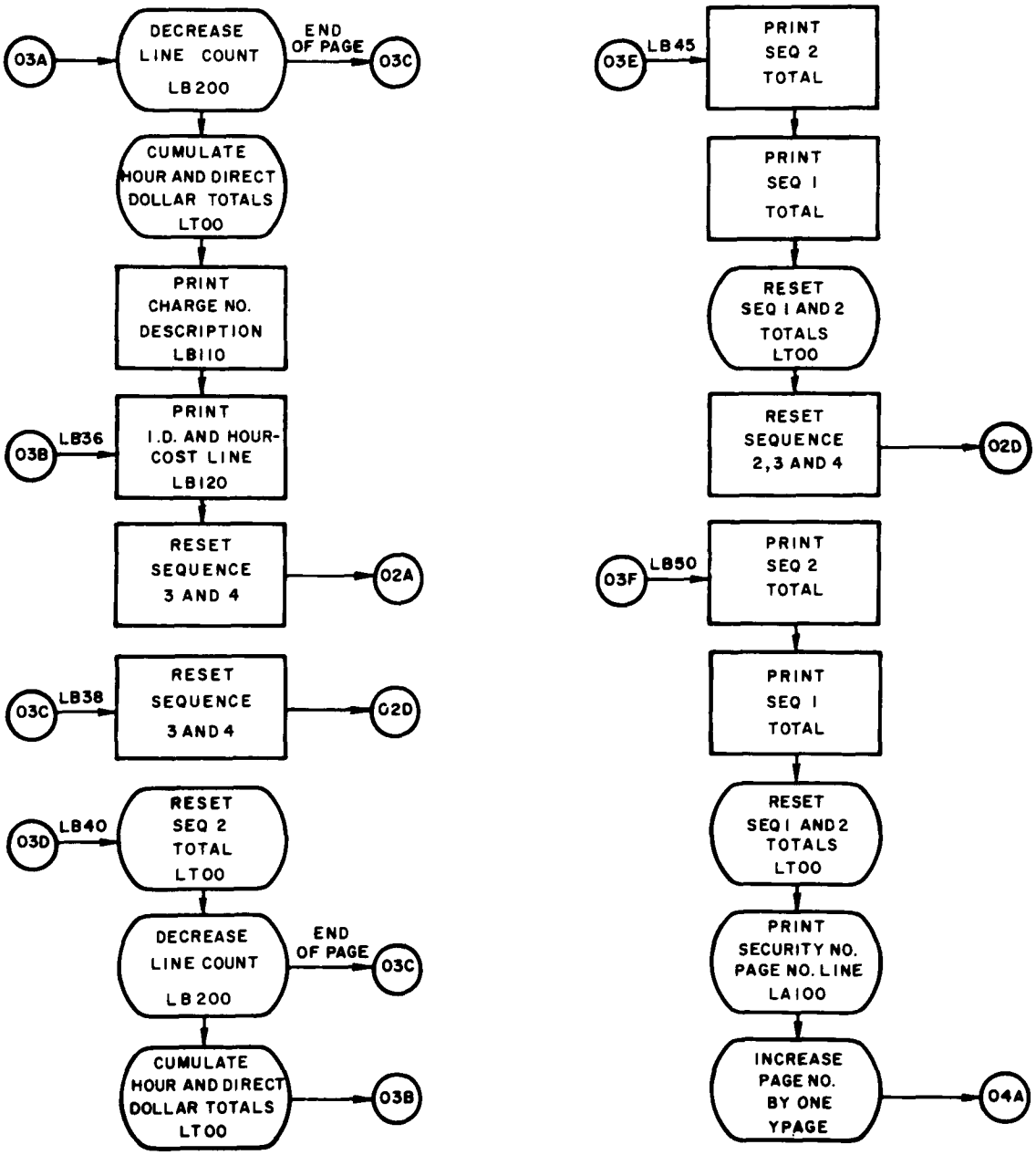
2 = responsible orgn.

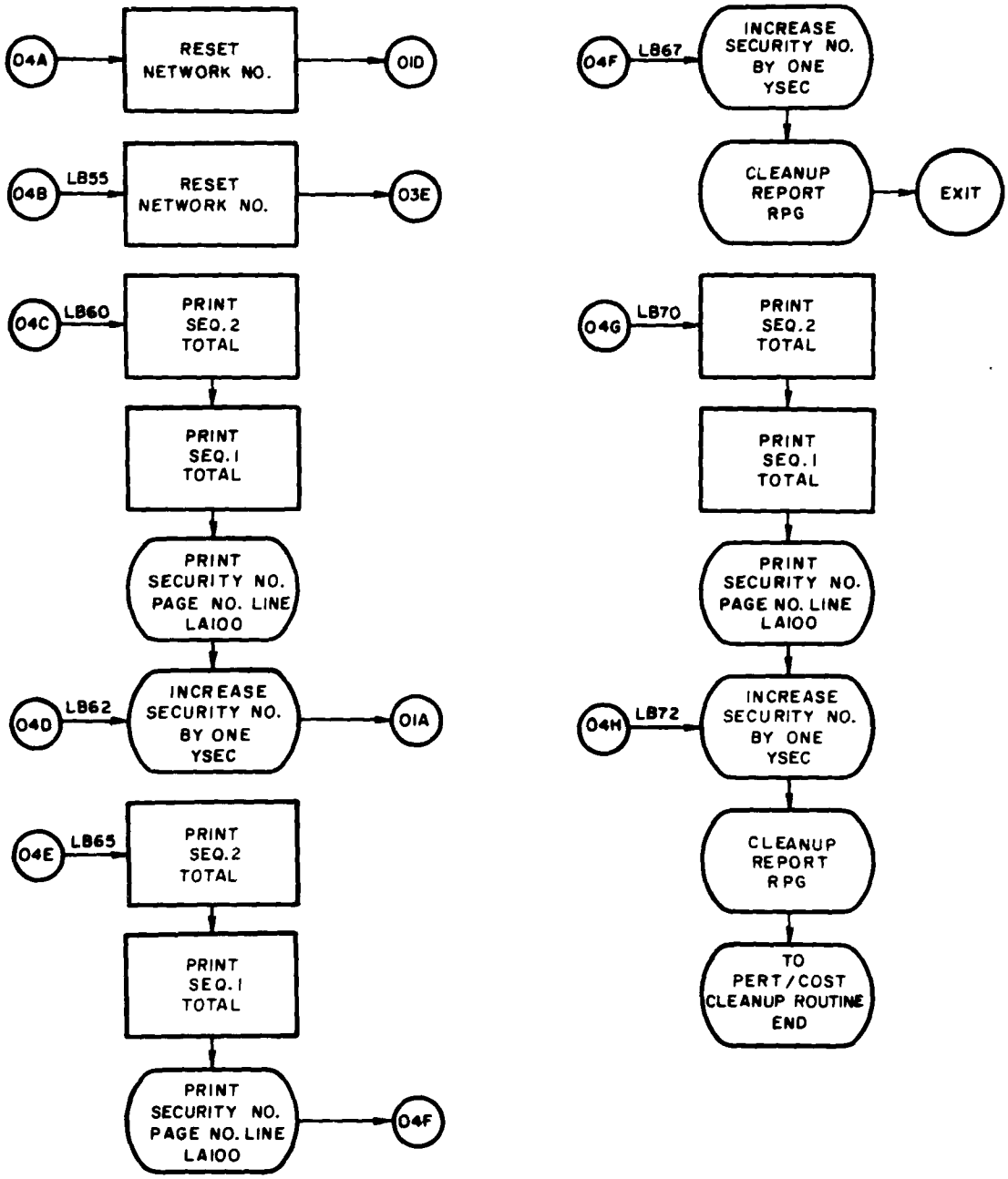
3 = performing orgn.

4 = resource code


LB00
START
STORE "ORGANIZATION STATUS REPORT" PARAMETERS
CONVERT CUT-OFF DATE AND RELEASE DATE TO 7 CHAR DATE
PRESET REPORT GENERATOR RPG
LB03
01A
RESET PAGE NO. TO ONE YPAGE
STORE REPORT AND LEVEL NUMBER LB901
STORE NETWORK FLAG LB902
01D
LB05
01B
READ A RECORD FROM XSORT YREAD
EOF
04H
IS REPORT NO. DIFFERENT?
YES
04F
NO
01C
01C
IS LEVEL NO. DIFFERENT?
YES
04D
NO
01D
LB07
IS THIS A SUMMARY RECORD?
NO
01E
YES
TRANSFER SUMMARY INFORMATION TO STORAGE
01B
01E
LB10
CLEAR ALL TOTALS LT00
PRESET SEQUENCE COMPARE ITEMS
01F
LB12
PRINT PAGE HEADINGS LB100
RESET LINE COUNTER LB200
CUMULATE HOUR AND DIRECT DOLLAR TOTALS LT00
PRINT CHARGE NO. DESCRIPTION LB110
PRINT I.D. AND HOUR COST LINE LB120
02A


02A
LB15
READ RECORD FROM XSORT
YREAD
EOF
04G
IS REPORT NO. DIFFERENT?
YES
04E
NO
IS LEVEL NO. DIFFERENT?
YES
04C
NO
IS THIS A SUMMARY RECORD?
YES
03F
NO
IS THERE A NETWORK NO.?
NO
02B
YES
IS NETWORK NO. DIFFERENT?
YES
04B
NO
02B
LB18
IS THERE A CHANGE IN SEQ.1?
YES
03E
NO
LB20
IS THERE A CHANGE IN SEQ.2?
YES
02E
NO
RESET SEQUENCE 3 AND 4
02C
02C
DECREASE LINE COUNT BY ONE
LB200
END OF PAGE
02D
CUMULATE HOUR AND DIRECT DOLLAR TOTALS
LT00
PRINT I.D. AND HOUR-COST LINE
LB120
02A
02D
LB30
PRINT SECURITY NO. PAGE NO. LINE
LA100
INCREASE PAGE NO. BY ONE
YPAGE
SAVE SEQUENCE COMPARE ITEMS
01F
02E
LB35
PRINT SEQ.2 TOTAL
WAS THIS A CHARGE NO. TOTAL?
NO
03D
YES
RESET SEQ.2 TOTAL
LT00
03A


03A
DECREASE LINE COUNT LB200
END OF PAGE
03C
CUMULATE HOUR AND DIRECT DOLLAR TOTALS LTOO
PRINT CHARGE NO. DESCRIPTION LBIIO
03B
LB36
PRINT I.D. AND HOUR-COST LINE LBI20
RESET SEQUENCE 3 AND 4
02A
03C
LB38
RESET SEQUENCE 3 AND 4
02D
03D
LB40
RESET SEQ 2 TOTAL LTOO
DECREASE LINE COUNT LB200
END OF PAGE
03C
CUMULATE HOUR AND DIRECT DOLLAR TOTALS LTOO
03B
03E
LB45
PRINT SEQ 2 TOTAL
PRINT SEQ 1 TOTAL
RESET SEQ 1 AND 2 TOTALS LTOO
RESET SEQUENCE 2,3 AND 4
02D
03F
LB50
PRINT SEQ 2 TOTAL
PRINT SEQ 1 TOTAL
RESET SEQ1 AND 2 TOTALS LTOO
PRINT SECURITY NO. PAGE NO. LINE LA100
INCREASE PAGE NO. BY ONE YPAGE
04A


04A
RESET NETWORK NO.
01D
04B
LB55
RESET NETWORK NO.
03E
04C
LB60
PRINT SEQ.2 TOTAL
PRINT SEQ.1 TOTAL
PRINT SECURITY NO. PAGE NO. LINE LA100
04D
LB62
INCREASE SECURITY NO. BY ONE YSEC
01A
04E
LB65
PRINT SEQ.2 TOTAL
PRINT SEQ.1 TOTAL
PRINT SECURITY NO. PAGE NO. LINE LA100
04F
04F
LB67
INCREASE SECURITY NO. BY ONE YSEC
CLEANUP REPORT RPG
EXIT
04G
LB70
PRINT SEQ.2 TOTAL
PRINT SEQ.1 TOTAL
PRINT SECURITY NO. PAGE NO. LINE LA100
04H
LB72
INCREASE SECURITY NO. BY ONE YSEC
CLEANUP REPORT RPG
TO PERT/COST CLEANUP ROUTINE END

Region LB200

EXPLANATION OF REGION:

To control page spacing and give end-of-page indication.

CALLING SEQUENCE:

```
L     TSX   LB200, 4
L+1   PZE   A
L+2   End-of-page return
L+3   Normal return
```

INPUT:

Not applicable.

OUTPUT:

Not applicable.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

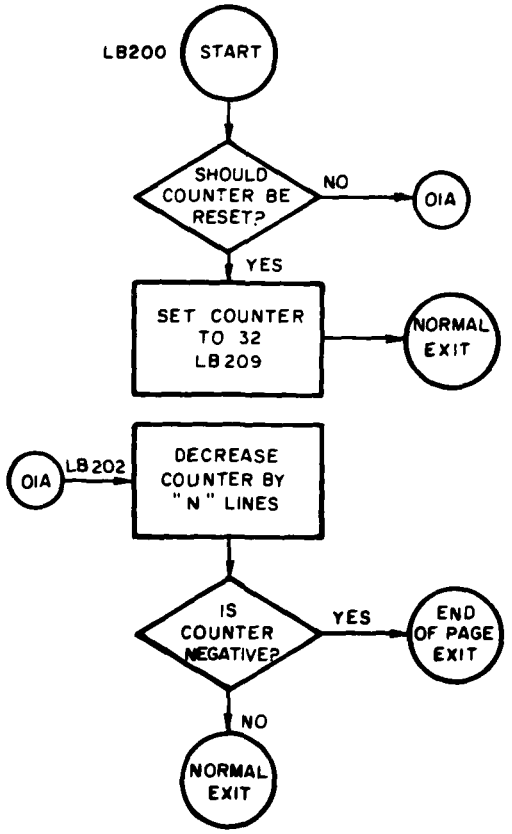
Not applicable.

EXPLANATION OF CALLING SEQUENCE:

If A = 0, line counter is set to total lines available,

If A = N (where N is non-zero) the line counter is decreased by N.

When the line counter is negative, the routine will exit at end of page.


LB200
START
SHOULD COUNTER BE RESET?
NO
OIA
YES
SET COUNTER TO 32 LB209
NORMAL EXIT
OIA
LB202
DECREASE COUNTER BY "N" LINES
IS COUNTER NEGATIVE?
YES
END OF PAGE EXIT
NO
NORMAL EXIT

Region LC10

EXPLANATION OF REGION:

Setup region for printing Report 10.

CALLING SEQUENCE:

L TSX LC10, 4

L+1 Normal return

INPUT:

Report 10 information from XSORT.

OUTPUT:

Report 10 on output report tape.

STORAGE USED:

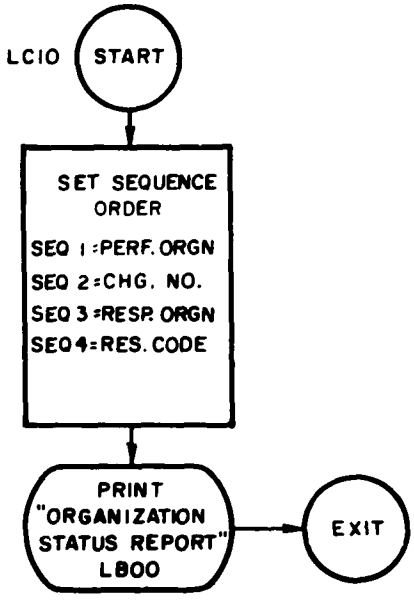
Not applicable.

SUBREGIONS AND SUBROUTINES USED:

LB00

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


LC10
START
SET SEQUENCE ORDER
SEQ 1 =PERF. ORGN
SEQ 2 =CHG. NO.
SEQ 3 =RESP. ORGN
SEQ 4 =RES. CODE
PRINT "ORGANIZATION STATUS REPORT" L800
EXIT

Region LC11

EXPLANATION OF REGION:

Setup region for printing Report 11.

CALLING SEQUENCE:

```
L     TSX   LC11, 4
L+1   Normal return
```

INPUT:

Report 11 information from XSORT.

OUTPUT:

Report 11 on output report tape.

STORAGE USED:

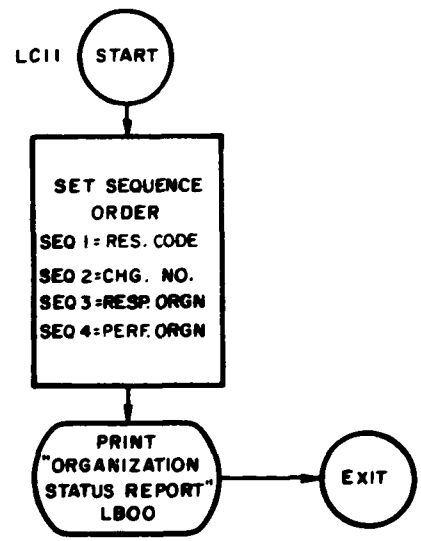
Not Applicable.

SUBREGIONS AND SUBROUTINES USED:

LB00

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


LC11
START
SET SEQUENCE ORDER
SEQ 1 = RES. CODE
SEQ 2=CHG. NO.
SEQ 3=RESP. ORGN
SEQ 4=PERF. ORGN
PRINT "ORGANIZATION STATUS REPORT" LB00
EXIT

Region LC12

EXPLANATION OF REGION:

Setup region for printing Report 12.

CALLING SEQUENCE:

```
L     TSX    LC12, 4
L+1   Normal return
```

INPUT:

Report 12 information from XSORT.

OUTPUT:

Report 12 on output report tape.

STORAGE USED:

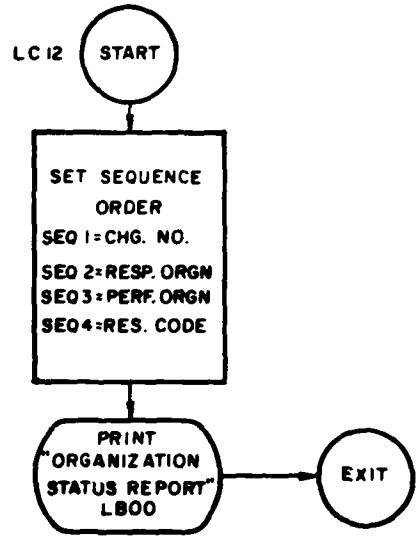
Not applicable.

SUBREGIONS AND SUBROUTINES USED:

LB00

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


LC 12
START
SET SEQUENCE ORDER
SEQ 1=CHG. NO.
SEQ 2=RESP. ORGN
SEQ 3=PERF. ORGN
SEQ 4=RES. CODE
PRINT "ORGANIZATION STATUS REPORT" LB00
EXIT

Region LC13

EXPLANATION OF REGION:

Setup region for printing Report 13.

CALLING SEQUENCE:

```
L     TSX    LC13, 4
L+1   Normal return
```

INPUT:

Report 13 information from XSORT.

OUTPUT:

Report 13 on output report tape.

STORAGE USED:

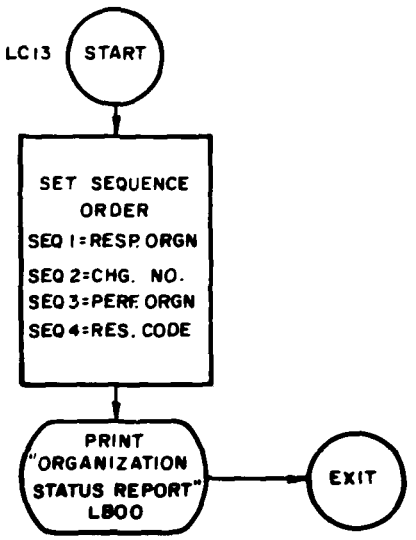
Not applicable.

SUBREGIONS AND SUBROUTINES USED:

LB00

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


LC13
START
SET SEQUENCE ORDER
SEQ 1=RESP. ORGN
SEQ 2=CHG. NO.
SEQ 3=PERF. ORGN
SEQ 4=RES. CODE
PRINT "ORGANIZATION STATUS REPORT" LB00
EXIT

Region LC20

EXPLANATION OF REGION:

Setup region for printing Report 20.

CALLING SEQUENCE:

L TSX LC20, 4

L+1 Normal return

INPUT:

Report 20 information from XSORT.

OUTPUT:

Report 20 on output report tape.

STORAGE USED:

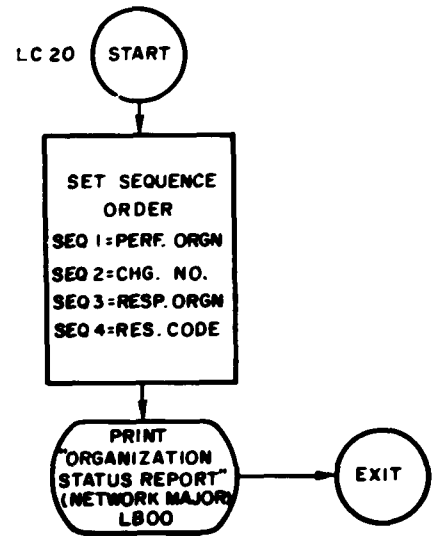
Not applicable.

SUBREGIONS AND SUBROUTINES USED:

LB00

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


LC 20
START
SET SEQUENCE ORDER
SEQ 1=PERF. ORGN
SEQ 2=CHG. NO.
SEQ 3=RESP. ORGN
SEQ 4=RES. CODE
PRINT "ORGANIZATION STATUS REPORT" (NETWORK MAJOR) LB00
EXIT

Region LC21

EXPLANATION OF REGION:

Setup region for printing report 21.

CALLING SEQUENCE:

L TSX LC21, 4

L+1 Normal return

INPUT:

Report 21 information from XSORT.

OUTPUT:

Report 21 on output report tape.

STORAGE USED:

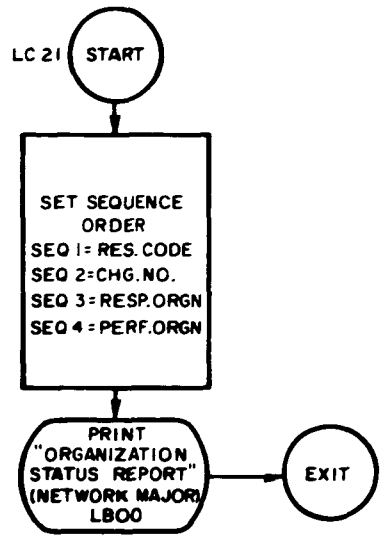
Not applicable.

SUBREGIONS AND SUBROUTINES USED:

LB00

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


LC 21
START
SET SEQUENCE ORDER
SEQ 1 = RES. CODE
SEQ 2 = CHG. NO.
SEQ 3 = RESP. ORGN
SEQ 4 = PERF. ORGN
PRINT "ORGANIZATION STATUS REPORT" (NETWORK MAJOR) LB00
EXIT

Region LC22

EXPLANATION OF REGION:

Setup region for printing Report 22.

CALLING SEQUENCE:

```
L     TSX    LC22, 4
L+1   Normal return
```

INPUT:

Report 22 information from XSORT.

OUTPUT:

Report 22 on output Report tape.

STORAGE USED:

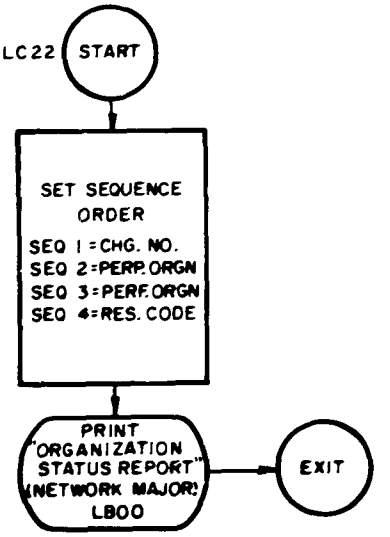
Not applicable.

SUBREGIONS AND SUBROUTINES USED:

LB00

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


LC22
START
SET SEQUENCE ORDER
SEQ 1 = CHG. NO.
SEQ 2 = PERF. ORGN
SEQ 3 = PERF. ORGN
SEQ 4 = RES. CODE
PRINT "ORGANIZATION STATUS REPORT" (NETWORK MAJOR) LB00
EXIT

Region LC23

EXPLANATION OF REGION:

Setup region for printing Report 23.

CALLING SEQUENCE:

L TSX LC23, 4

L+1 Normal return

INPUT:

Report 23 information from XSORT.

OUTPUT:

Report 23 on output report tape.

STORAGE USED:

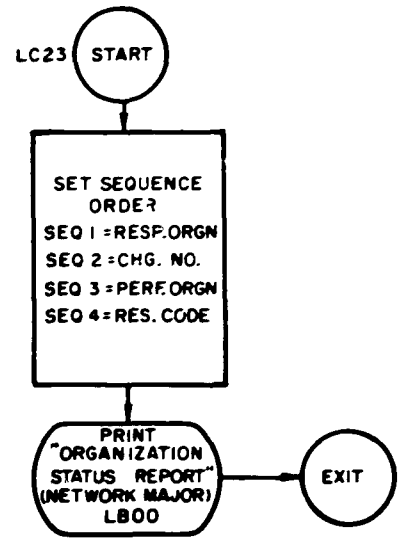
Not applicable.

SUBREGIONS AND SUBROUTINES USED:

LB00

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


LC23
START
SET SEQUENCE ORDER
SEQ 1 = RESP. ORGN
SEQ 2 = CHG. NO.
SEQ 3 = PERF. ORGN
SEQ 4 = RES. CODE
PRINT "ORGANIZATION STATUS REPORT" (NETWORK MAJOR) LB00
EXIT

Region LD00

EXPLANATION OF REGION:

To cumulate cost data and summarize time data up the work breakdown structure and print Report 30 (only items at the requested level and the next lower level connected to the item).

CALLING SEQUENCE:

L TSX LD00, 4

L+1 Normal return

INPUT:

Report 30 information from XSORT.

OUTPUT:

Report 30 on output report tape.

STORAGE USED:

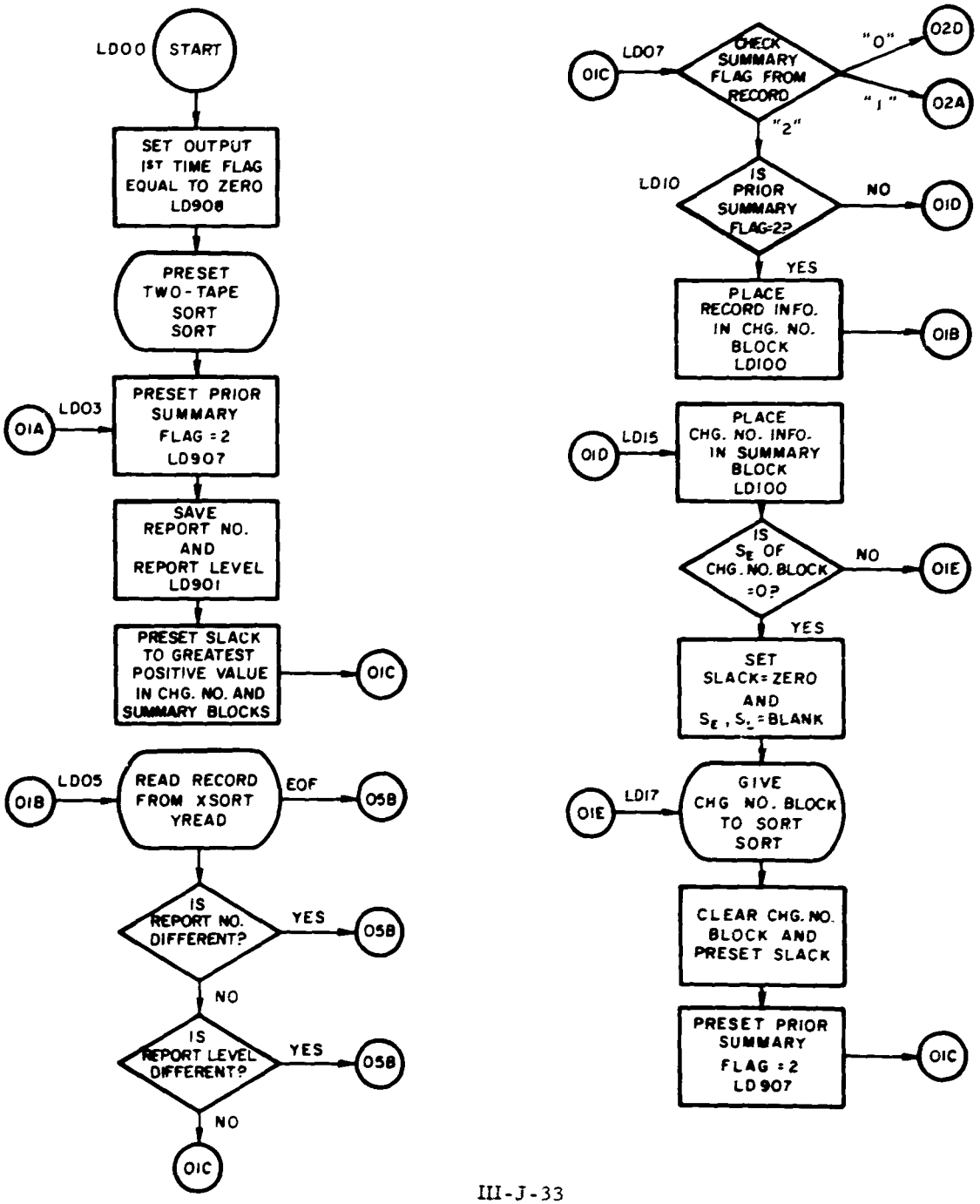
Not applicable.

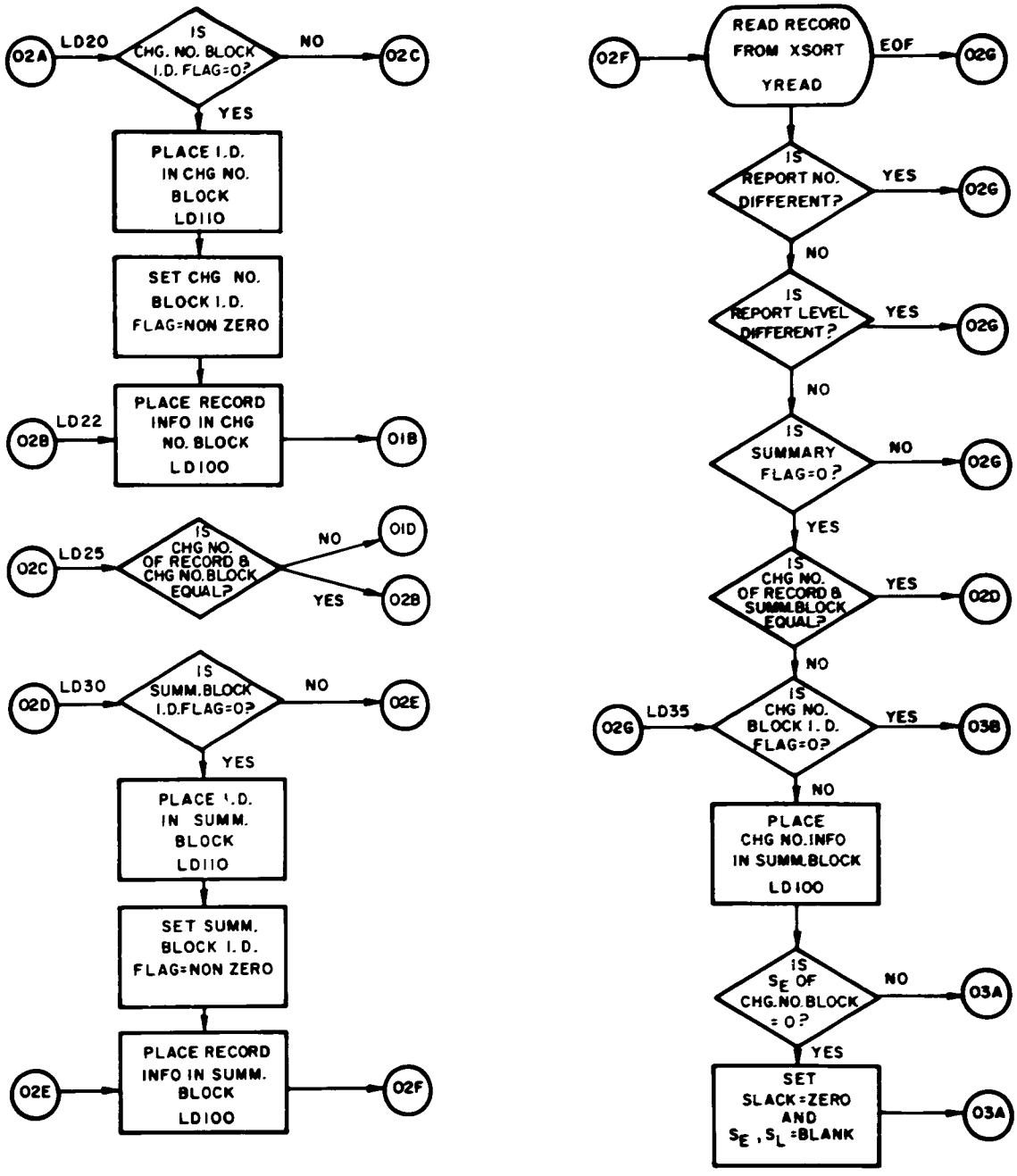
SUBREGIONS AND SUBROUTINES USED:

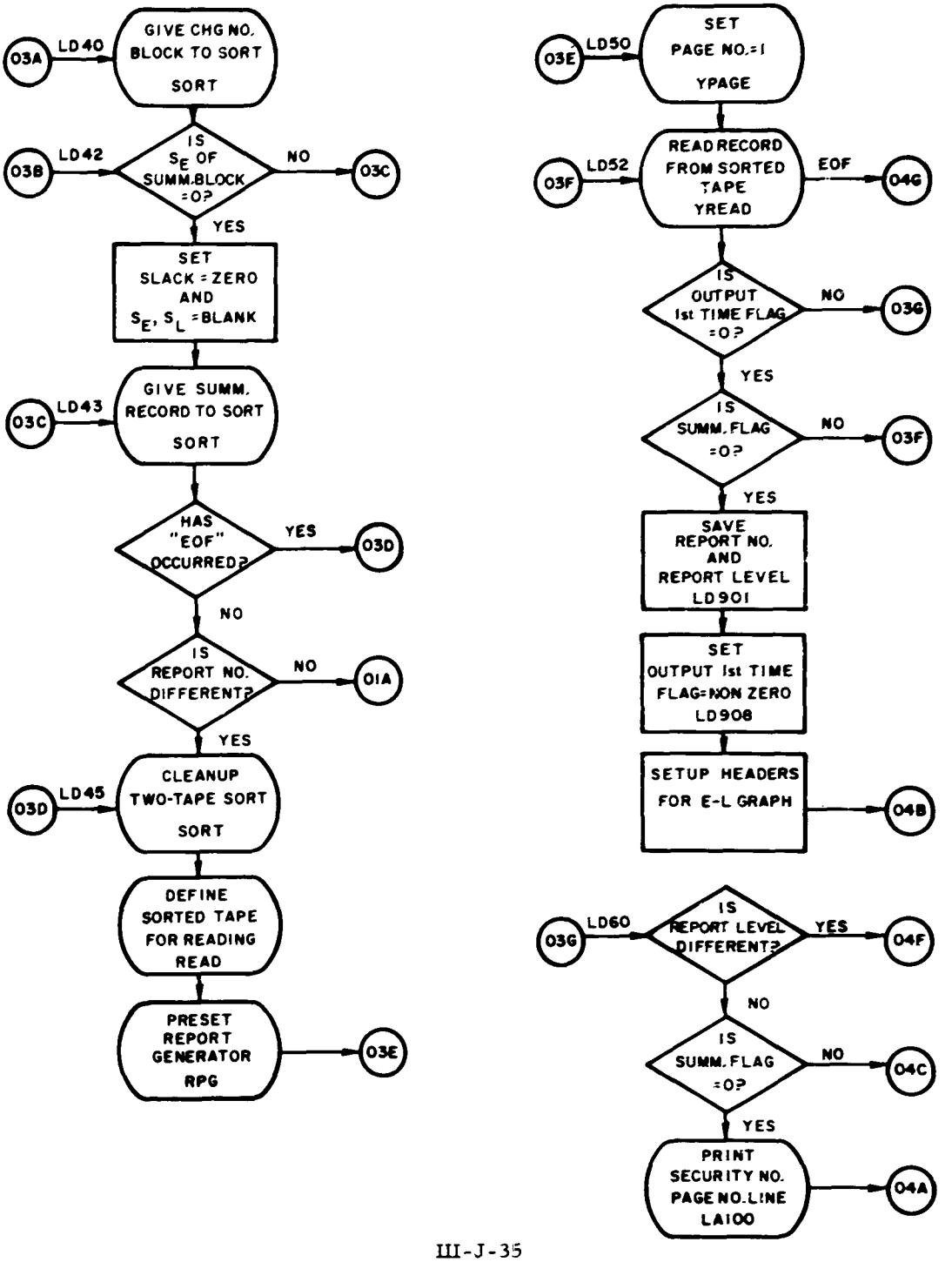
SORT	YREAD	YCOMP
READ	YPAGE	UPCK
PACK	LA100	YSEC
LX00		

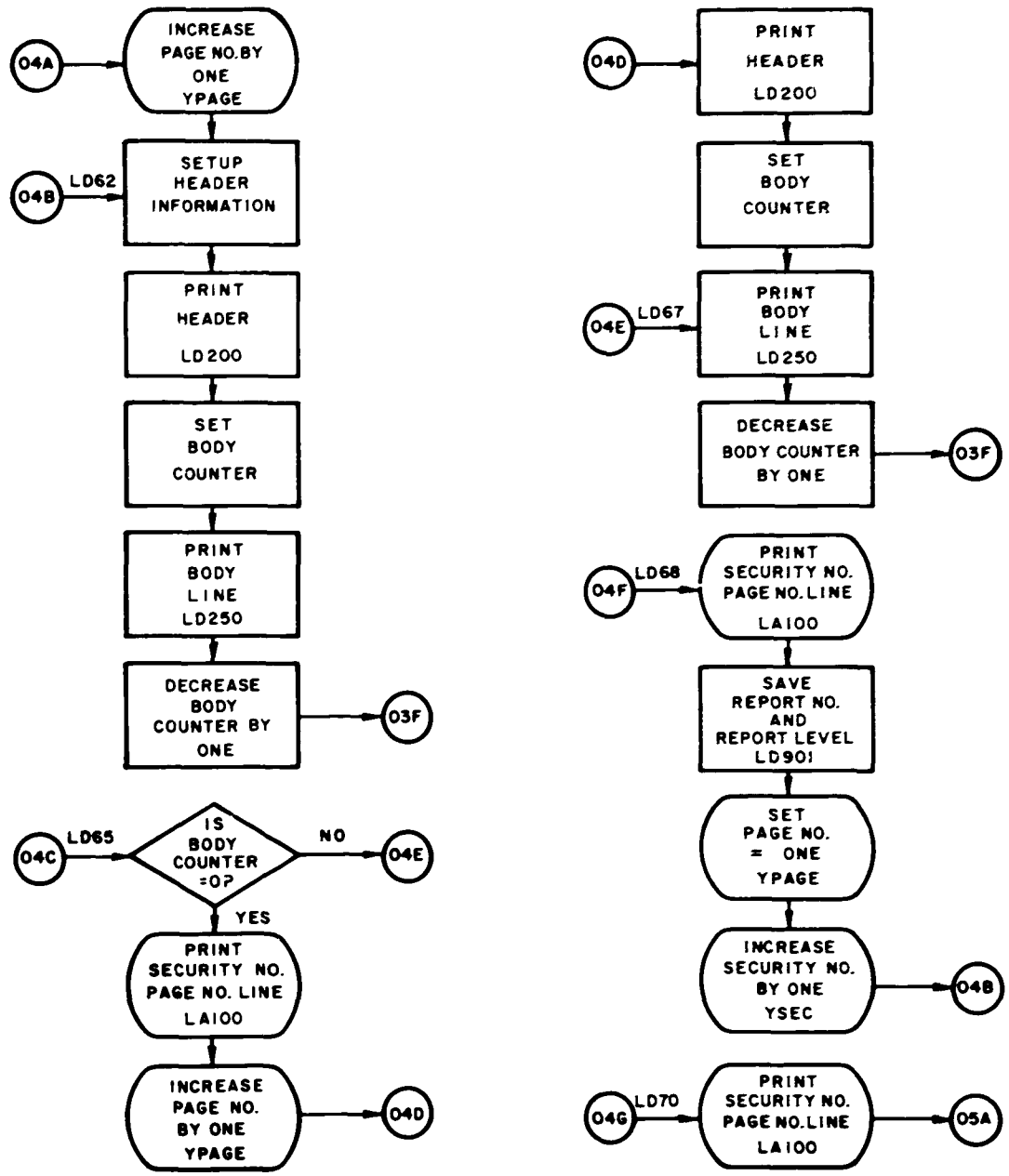
EXPLANATION OF CALLING SEQUENCE:

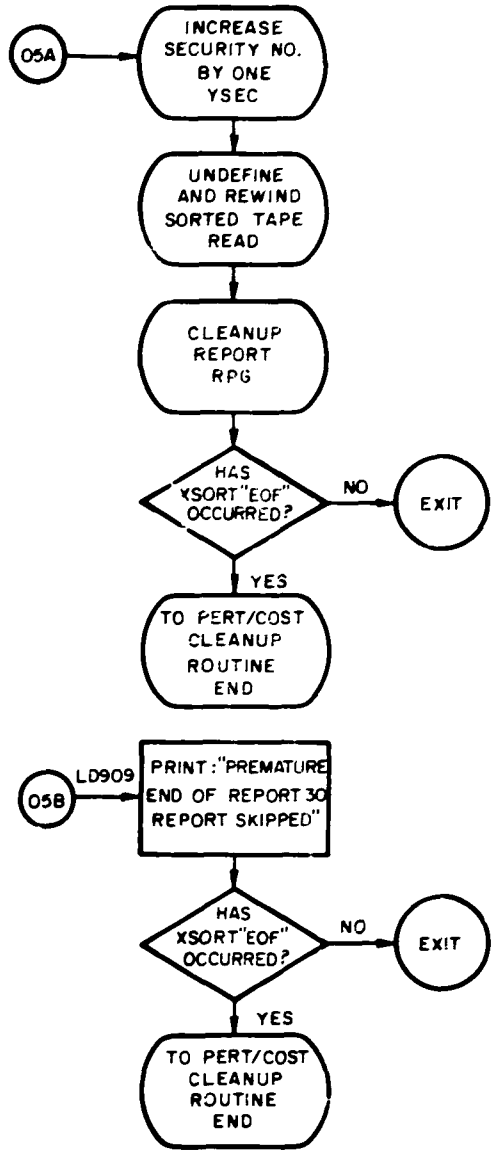
Not applicable.


LD00
START
SET OUTPUT 1ST TIME FLAG EQUAL TO ZERO LD908
PRESET TWO-TAPE SORT SORT
LD03
01A
PRESET PRIOR SUMMARY FLAG = 2 LD907
SAVE REPORT NO. AND REPORT LEVEL LD901
PRESET SLACK TO GREATEST POSITIVE VALUE IN CHG. NO. AND SUMMARY BLOCKS
01C
LD05
01B
READ RECORD FROM XSORT YREAD
EOF
05B
IS REPORT NO. DIFFERENT?
YES
05B
NO
IS REPORT LEVEL DIFFERENT?
YES
05B
NO
01C
LD07
01C
CHECK SUMMARY FLAG FROM RECORD
"0"
02D
"1"
02A
"2"
LD10
IS PRIOR SUMMARY FLAG=2?
NO
01D
YES
PLACE RECORD INFO. IN CHG. NO. BLOCK LD100
01B
LD15
01D
PLACE CHG. NO. INFO. IN SUMMARY BLOCK LD100
IS S_E OF CHG. NO. BLOCK =0?
NO
01E
YES
SET SLACK=ZERO AND S_E, S_-=BLANK
LD17
01E
GIVE CHG NO. BLOCK TO SORT SORT
CLEAR CHG. NO. BLOCK AND PRESET SLACK
PRESET PRIOR SUMMARY FLAG = 2 LD907
01C


02A
LD20
IS CHG. NO. BLOCK I.D. FLAG=0?
NO
02C
YES
PLACE I.D. IN CHG NO. BLOCK LD110
SET CHG NO. BLOCK I.D. FLAG=NON ZERO
02B
LD22
PLACE RECORD INFO IN CHG NO. BLOCK LD100
01B
02C
LD25
IS CHG NO. OF RECORD & CHG NO. BLOCK EQUAL?
NO
01D
YES
02B
02D
LD30
IS SUMM. BLOCK I.D. FLAG=0?
NO
02E
YES
PLACE I.D. IN SUMM. BLOCK LD110
SET SUMM. BLOCK I.D. FLAG=NON ZERO
02E
PLACE RECORD INFO IN SUMM. BLOCK LD100
02F
02F
READ RECORD FROM XSORT YREAD
EOF
02G
IS REPORT NO. DIFFERENT?
YES
02G
NO
IS REPORT LEVEL DIFFERENT?
YES
02G
NO
IS SUMMARY FLAG=0?
NO
02G
YES
IS CHG NO. OF RECORD & SUMM. BLOCK EQUAL?
YES
02D
NO
02G
LD35
IS CHG NO. BLOCK I. D. FLAG=0?
YES
03B
NO
PLACE CHG NO. INFO IN SUMM. BLOCK LD100
IS S_E OF CHG. NO. BLOCK = 0?
NO
03A
YES
SET SLACK=ZERO AND S_E, S_L=BLANK
03A


03A
LD40
GIVE CHG NO. BLOCK TO SORT
SORT
03B
LD42
IS S_E OF SUMM.BLOCK =0?
NO
03C
YES
SET SLACK = ZERO AND S_E, S_L = BLANK
03C
LD43
GIVE SUMM. RECORD TO SORT
SORT
HAS "EOF" OCCURRED?
YES
03D
NO
IS REPORT NO. DIFFERENT?
NO
01A
YES
03D
LD45
CLEANUP TWO-TAPE SORT
SORT
DEFINE SORTED TAPE FOR READING
READ
PRESET REPORT GENERATOR
RPG
03E
03E
LD50
SET PAGE NO.=1
YPAGE
03F
LD52
READ RECORD FROM SORTED TAPE
YREAD
EOF
04G
IS OUTPUT 1st TIME FLAG =0?
NO
03G
YES
IS SUMM. FLAG =0?
NO
03F
YES
SAVE REPORT NO. AND REPORT LEVEL
LD901
SET OUTPUT 1st TIME FLAG=NON ZERO
LD908
SETUP HEADERS FOR E-L GRAPH
04B
03G
LD60
IS REPORT LEVEL DIFFERENT?
YES
04F
NO
IS SUMM. FLAG =0?
NO
04C
YES
PRINT SECURITY NO. PAGE NO. LINE
LA100
04A


04A
INCREASE PAGE NO.BY ONE YPAGE
04B
LD62
SETUP HEADER INFORMATION
PRINT HEADER LD200
SET BODY COUNTER
PRINT BODY LINE LD250
DECREASE BODY COUNTER BY ONE
03F
04C
LD65
IS BODY COUNTER =0?
NO
04E
YES
PRINT SECURITY NO. PAGE NO. LINE LA100
INCREASE PAGE NO. BY ONE YPAGE
04D
04D
PRINT HEADER LD200
SET BODY COUNTER
04E
LD67
PRINT BODY LINE LD250
DECREASE BODY COUNTER BY ONE
03F
04F
LD68
PRINT SECURITY NO. PAGE NO. LINE LA100
SAVE REPORT NO. AND REPORT LEVEL LD901
SET PAGE NO. = ONE YPAGE
INCREASE SECURITY NO. BY ONE YSEC
04B
04G
LD70
PRINT SECURITY NO. PAGE NO. LINE LA100
05A


05A
INCREASE SECURITY NO. BY ONE YSEC
UNDEFINE AND REWIND SORTED TAPE READ
CLEANUP REPORT RPG
HAS XSORT "EOF" OCCURRED?
NO
EXIT
YES
TO PERT/COST CLEANUP ROUTINE END
05B
LD909
PRINT: "PREMATURE END OF REPORT 30 REPORT SKIPPED"
HAS XSORT "EOF" OCCURRED?
NO
EXIT
YES
TO PERT/COST CLEANUP ROUTINE END

Region LE00

EXPLANATION OF REGION:

Setup region for printing Report 40.

CALLING SEQUENCE:

L TSX LE00, 4

L+1 Normal return

INPUT:

Report 40 information from XSORT.

OUTPUT:

Report 40 on output report tape.

STORAGE USED:

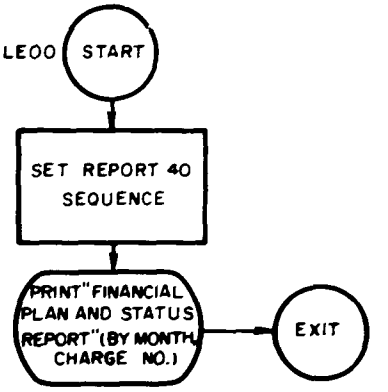
Not applicable.

SUBREGIONS AND SUBROUTINES USED:

LE10

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


LE00
START
SET REPORT 40 SEQUENCE
PRINT "FINANCIAL PLAN AND STATUS REPORT" (BY MONTH, CHARGE NO.)
EXIT

Region LE05

EXPLANATION OF REGION:

Setup region for printing Report 40.

CALLING SEQUENCE:

L TSX LE05, 4

L+1 Normal return

INPUT:

Report 41 information from XSORT.

OUTPUT:

Report 41 on output report tape.

STORAGE USED:

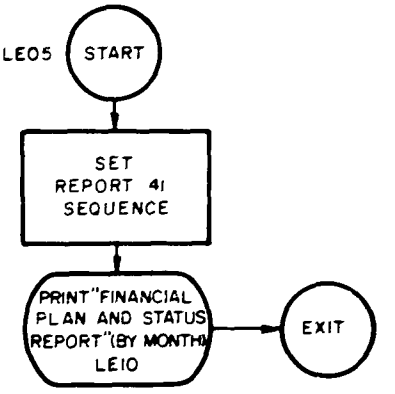
Not applicable.

SUBREGIONS AND SUBROUTINES USED:

LE10

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


LE05
START
SET
REPORT 41
SEQUENCE
PRINT "FINANCIAL
PLAN AND STATUS
REPORT" (BY MONTH)
LE10
EXIT

Region LE10

EXPLANATION OF REGION:

To cumulate cost information and print out "Financial Plan and Status Report."

CALLING SEQUENCE:

```
L     TSX   LE10, 4
L+1   PZE   0, 0, R
L+2   PZE   A,, B
L+3   Normal return
```

INPUT:

Information from XSORT routine.

OUTPUT:

Report on output print tape.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

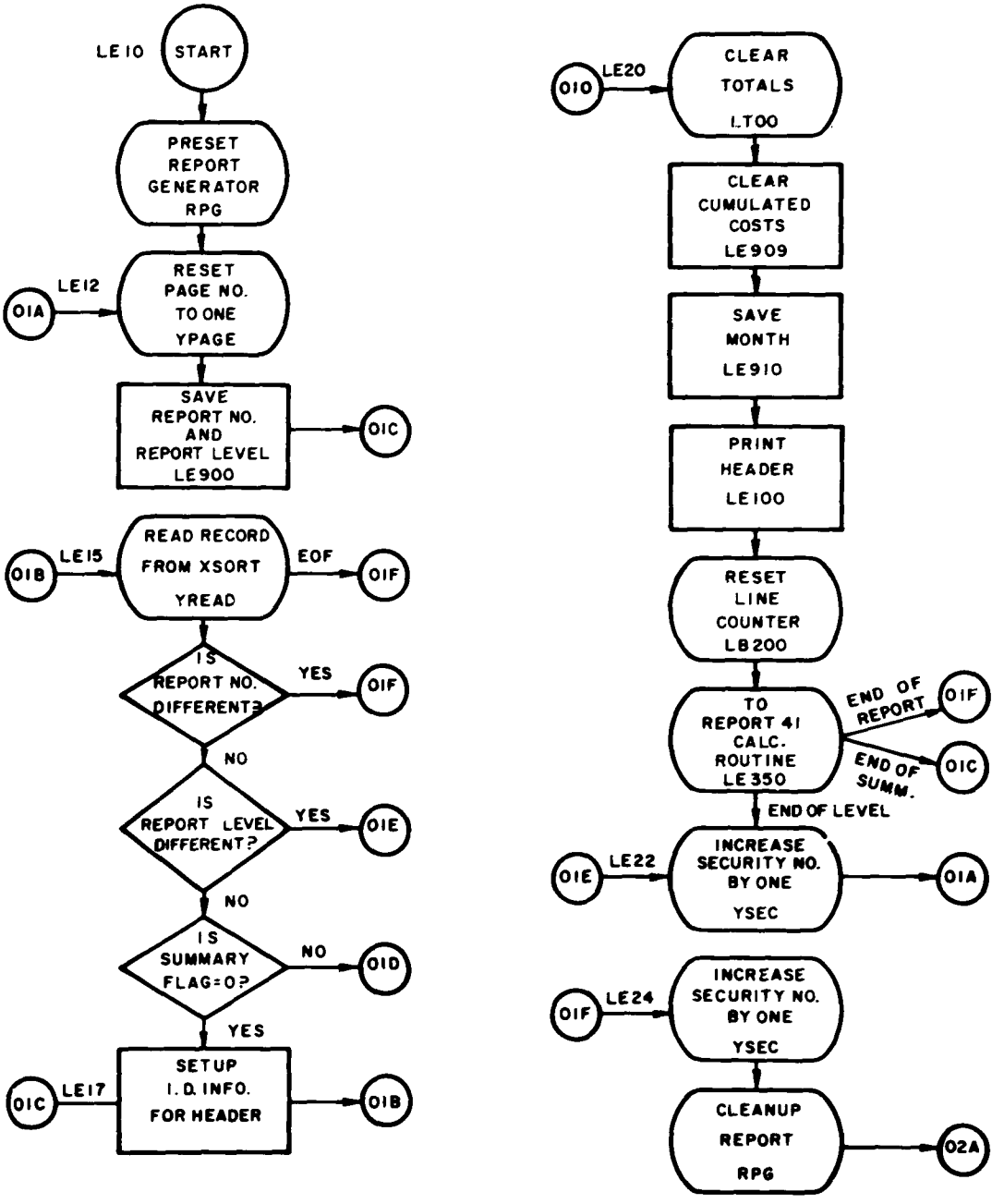
YPAGE	YREAD	LT00
LB200	YSEC	LX00
DATE	YCOMP	LA100

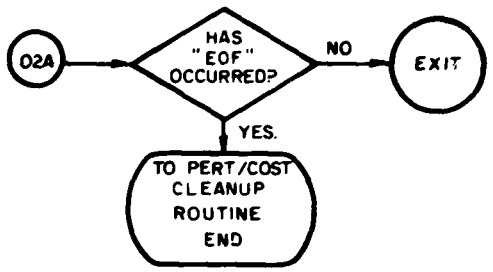
EXPLANATION OF CALLING SEQUENCE:

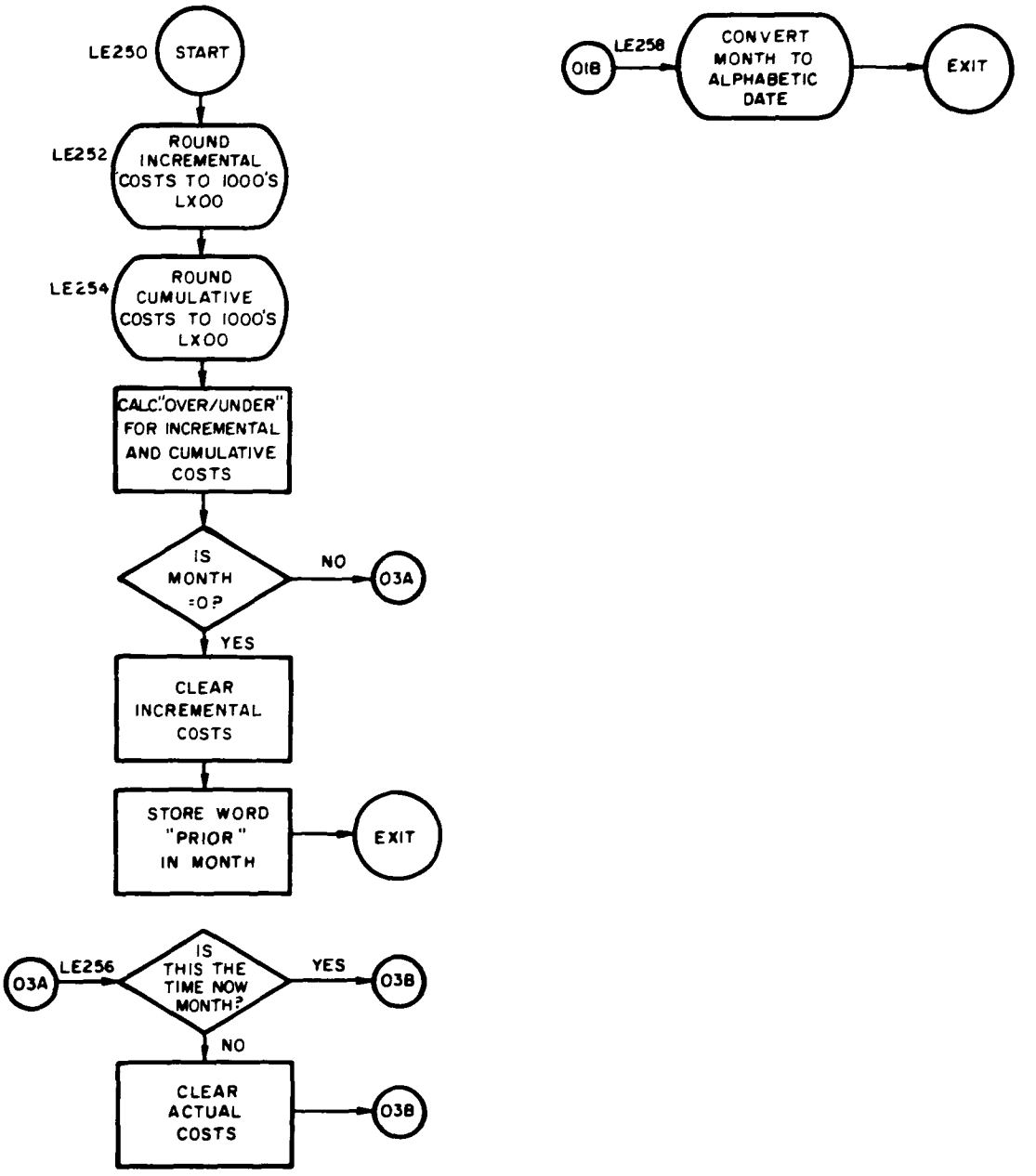
R = report number

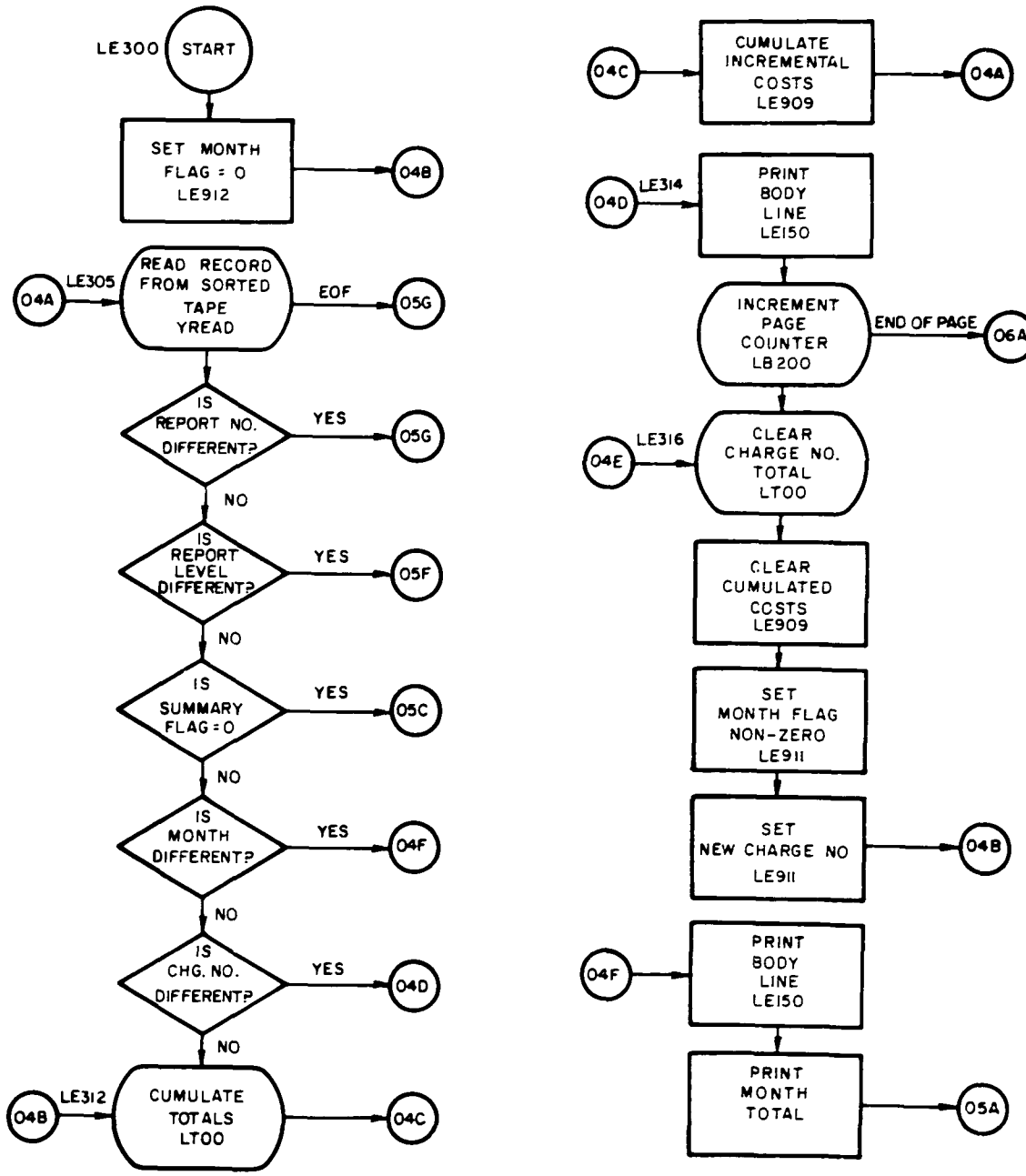
A = location of calculation

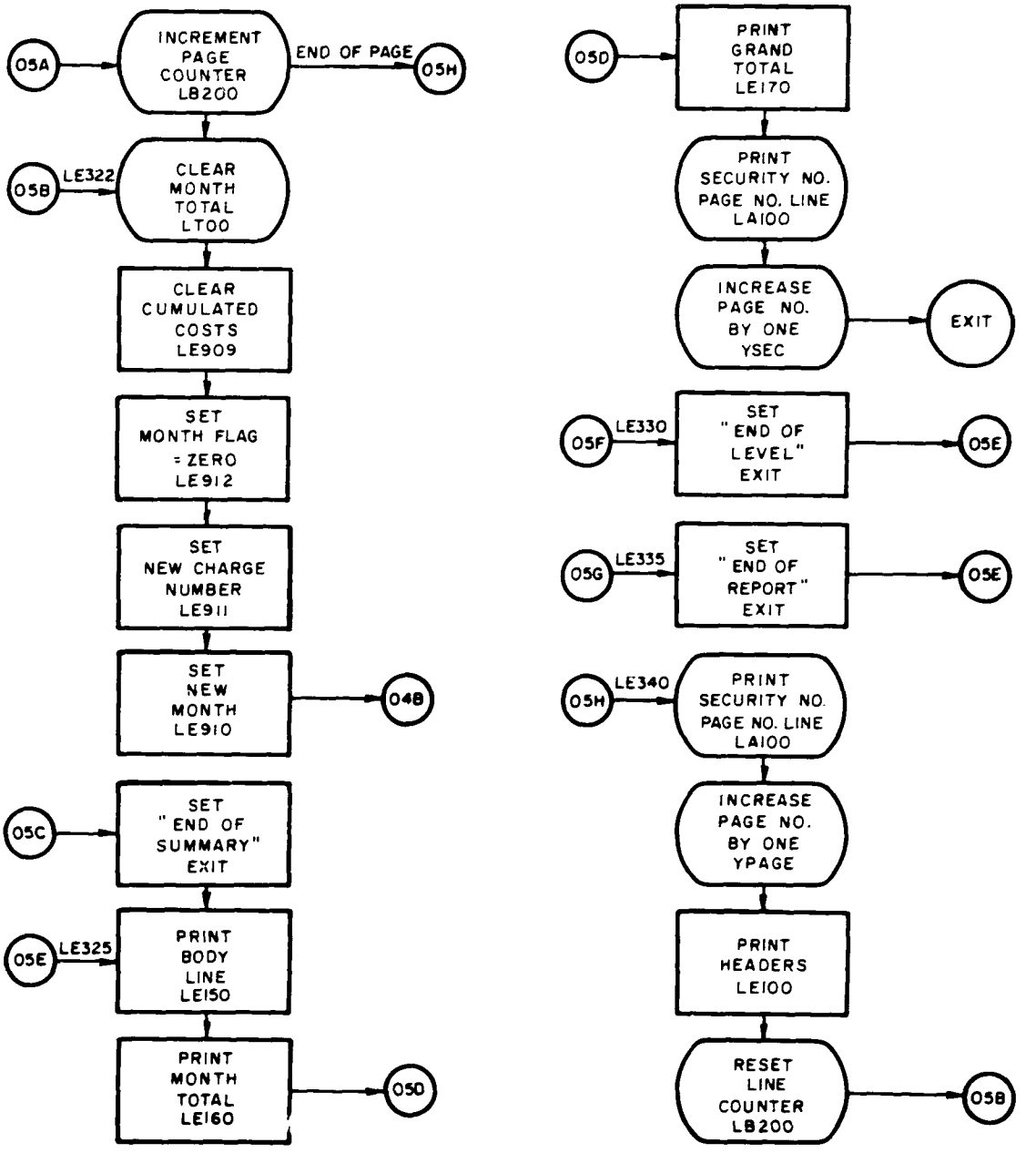
B = location of sort sequence title

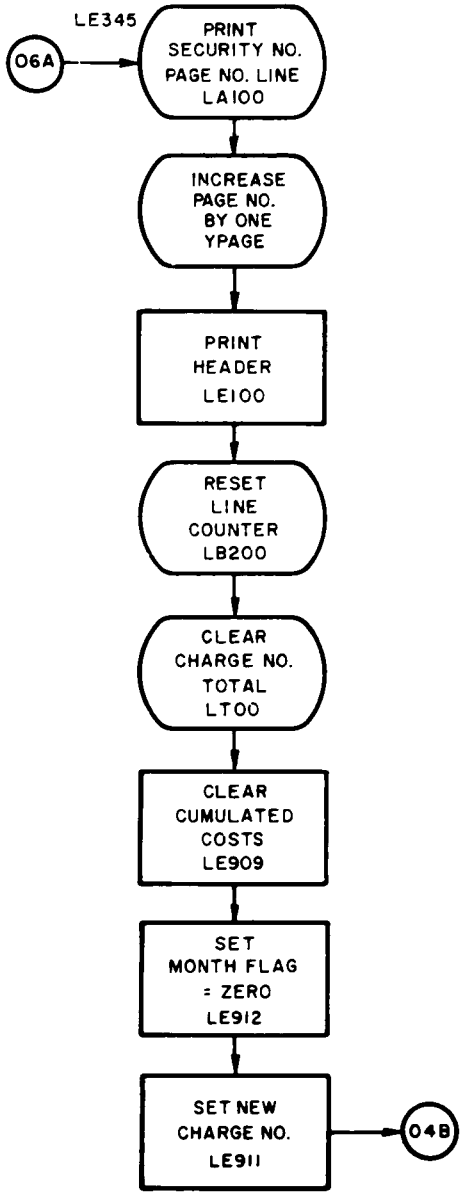

LE10
START
PRESET REPORT GENERATOR RPG
LE12
01A
RESET PAGE NO. TO ONE YPAGE
SAVE REPORT NO. AND REPORT LEVEL LE900
01C
LE15
01B
READ RECORD FROM XSORT YREAD
EOF
01F
IS REPORT NO. DIFFERENT?
YES
01F
NO
IS REPORT LEVEL DIFFERENT?
YES
01E
NO
IS SUMMARY FLAG=0?
NO
01D
YES
01C
LE17
SETUP I.D. INFO. FOR HEADER
01B
01D
LE20
CLEAR TOTALS I.TOO
CLEAR CUMULATED COSTS LE909
SAVE MONTH LE910
PRINT HEADER LE100
RESET LINE COUNTER LB200
TO REPORT 41 CALC. ROUTINE LE350
END OF REPORT
01F
END OF SUMM.
01C
END OF LEVEL
01E
LE22
INCREASE SECURITY NO. BY ONE YSEC
01A
01F
LE24
INCREASE SECURITY NO. BY ONE YSEC
CLEANUP REPORT RPG
02A

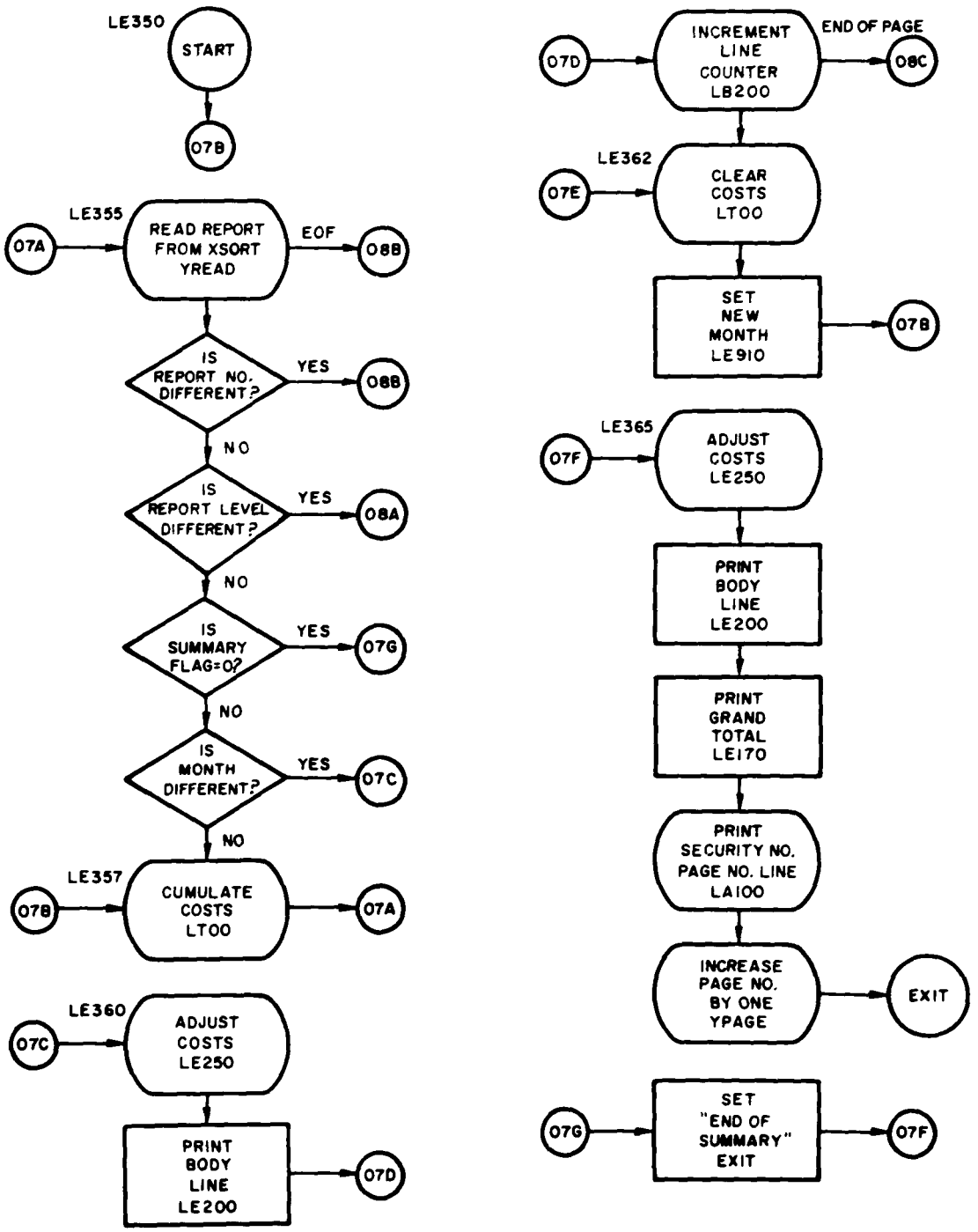

02A
HAS
"EOF"
OCCURRED?
NO
EXIT
YES.
TO PERT/COST
CLEANUP
ROUTINE
END

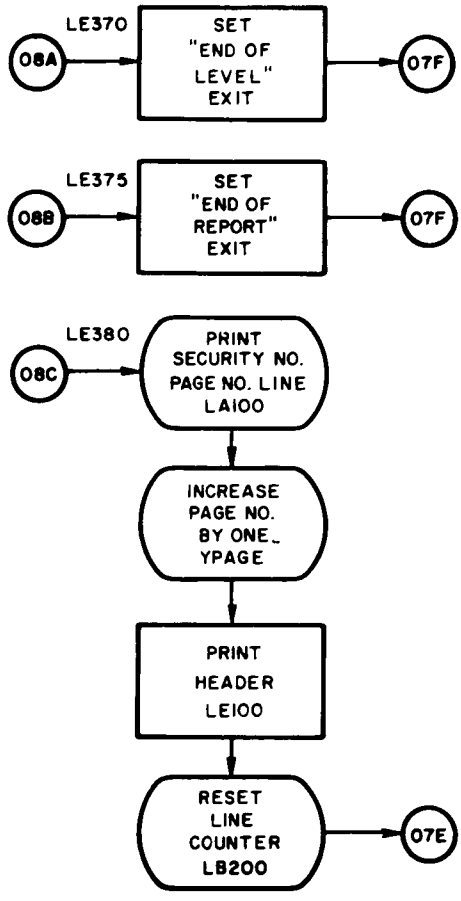

LE250
START
LE252
ROUND INCREMENTAL COSTS TO 1000'S LX00
LE254
ROUND CUMULATIVE COSTS TO 1000'S LX00
CALC "OVER/UNDER" FOR INCREMENTAL AND CUMULATIVE COSTS
IS MONTH =0?
NO
03A
YES
CLEAR INCREMENTAL COSTS
STORE WORD "PRIOR" IN MONTH
EXIT
03A
LE256
IS THIS THE TIME NOW MONTH?
YES
03B
NO
CLEAR ACTUAL COSTS
03B
018
LE258
CONVERT MONTH TO ALPHABETIC DATE
EXIT

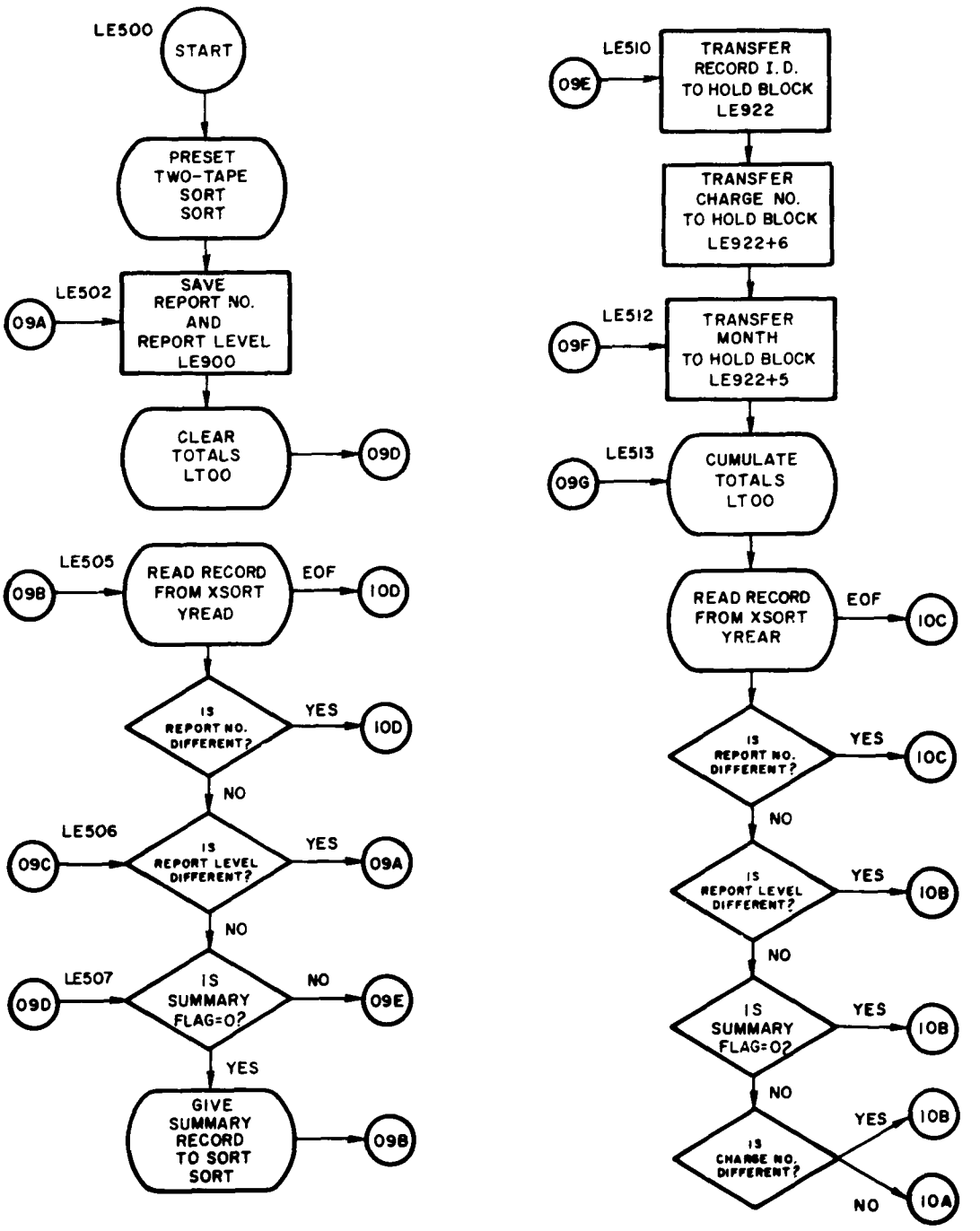

LE300
START
SET MONTH FLAG = 0 LE912
04B
04A
LE305
READ RECORD FROM SORTED TAPE YREAD
EOF
05G
IS REPORT NO. DIFFERENT?
YES
05G
NO
IS REPORT LEVEL DIFFERENT?
YES
05F
NO
IS SUMMARY FLAG = 0
YES
05C
NO
IS MONTH DIFFERENT?
YES
04F
NO
IS CHG. NO. DIFFERENT?
YES
04D
NO
04B
LE312
CUMULATE TOTALS LT00
04C
04C
CUMULATE INCREMENTAL COSTS LE909
04A
04D
LE314
PRINT BODY LINE LE150
INCREMENT PAGE COUNTER LB200
END OF PAGE
06A
04E
LE316
CLEAR CHARGE NO. TOTAL LT00
CLEAR CUMULATED COSTS LE909
SET MONTH FLAG NON-ZERO LE911
SET NEW CHARGE NO LE911
04B
04F
PRINT BODY LINE LE150
PRINT MONTH TOTAL
05A

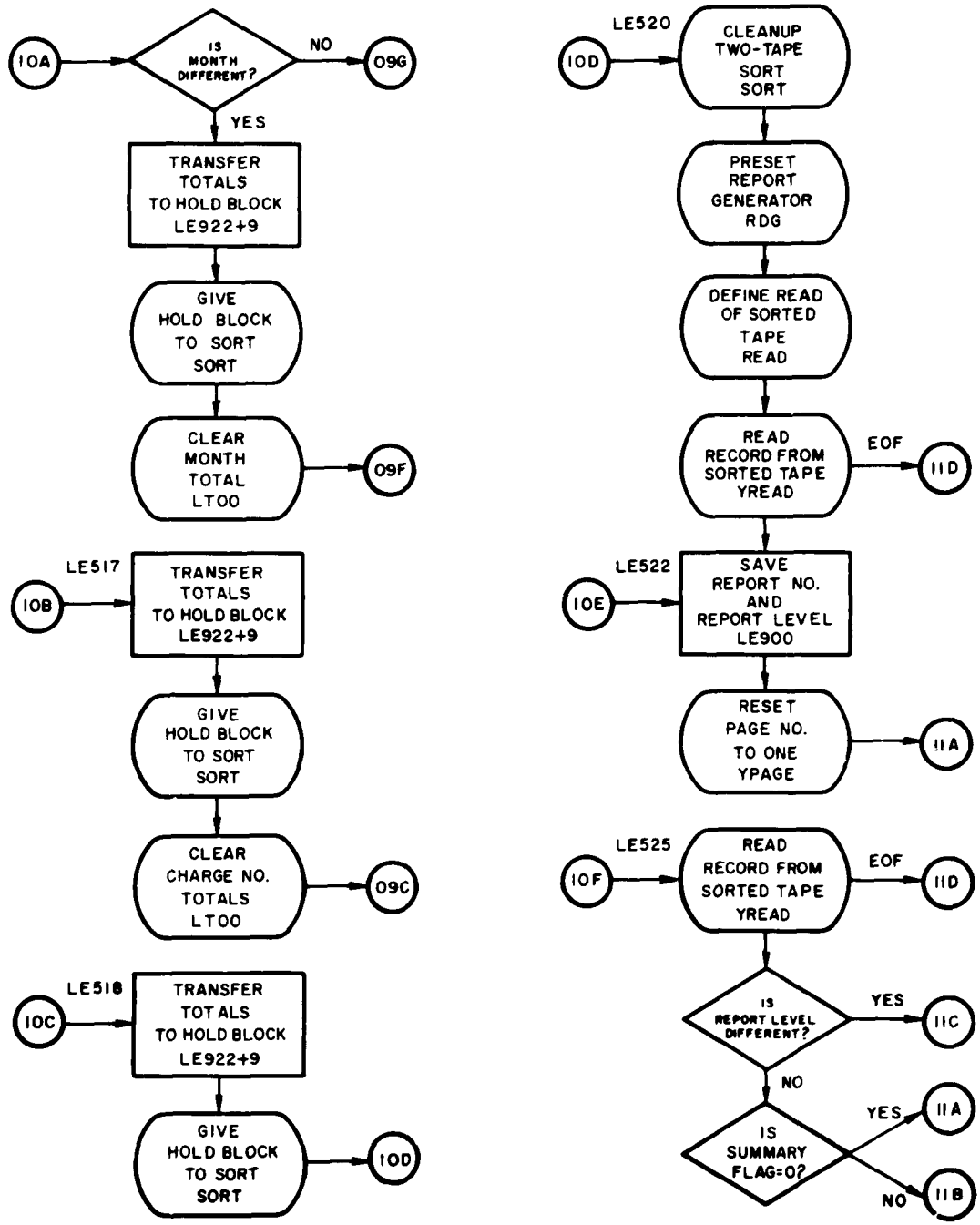

05A
INCREMENT PAGE COUNTER LB200
END OF PAGE
05H
05B
LE322
CLEAR MONTH TOTAL LT00
CLEAR CUMULATED COSTS LE909
SET MONTH FLAG = ZERO LE912
SET NEW CHARGE NUMBER LE911
SET NEW MONTH LE910
04B
05C
SET "END OF SUMMARY" EXIT
05E
LE325
PRINT BODY LINE LE150
PRINT MONTH TOTAL LE160
050
05D
PRINT GRAND TOTAL LE170
PRINT SECURITY NO. PAGE NO. LINE LA100
INCREASE PAGE NO. BY ONE YSEC
EXIT
05F
LE330
SET "END OF LEVEL" EXIT
05E
05G
LE335
SET "END OF REPORT" EXIT
05E
05H
LE340
PRINT SECURITY NO. PAGE NO. LINE LA100
INCREASE PAGE NO. BY ONE YPAGE
PRINT HEADERS LE100
RESET LINE COUNTER LB200
058

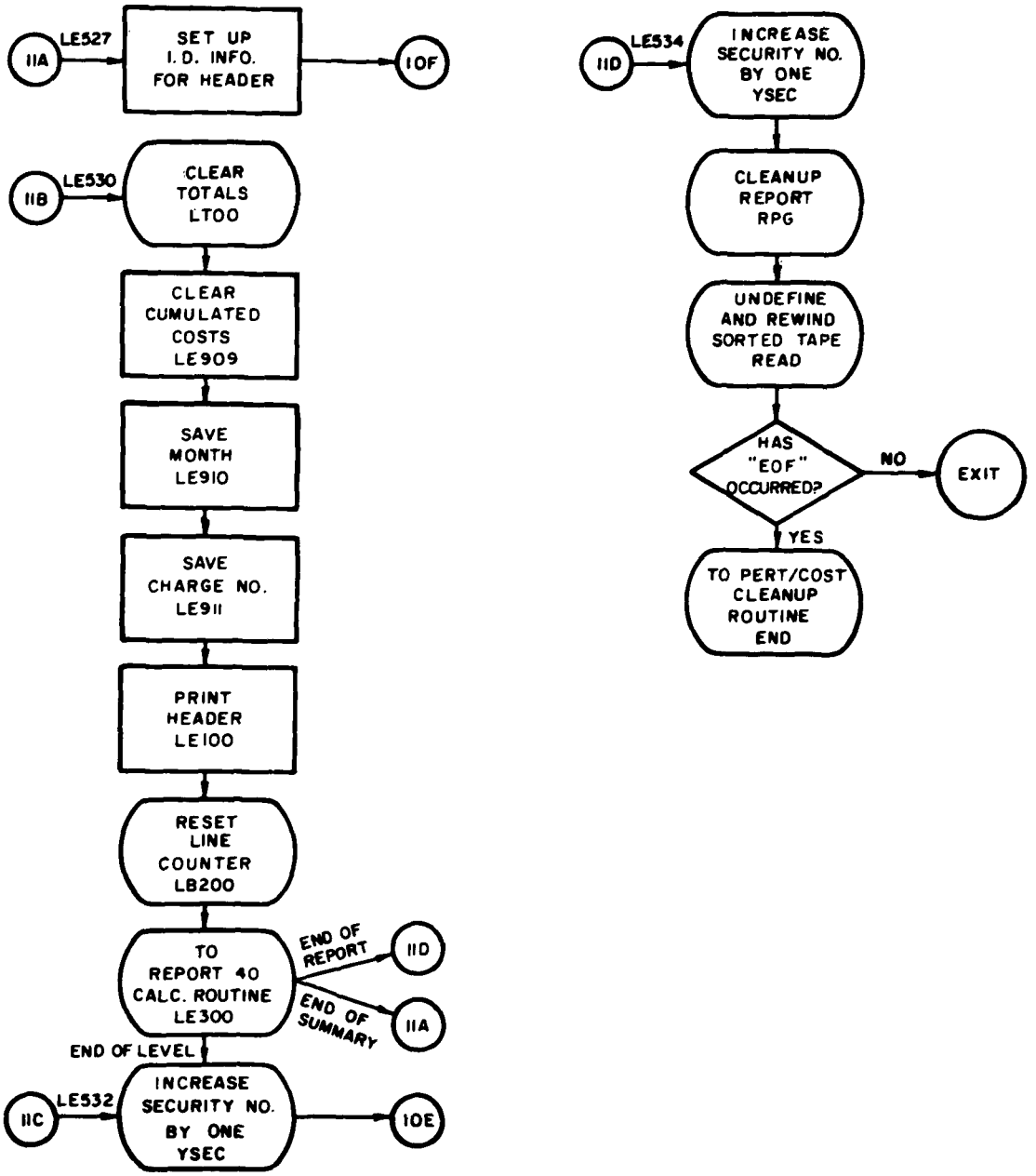

LE345
06A
PRINT SECURITY NO. PAGE NO. LINE LA100
INCREASE PAGE NO. BY ONE YPAGE
PRINT HEADER LE100
RESET LINE COUNTER LB200
CLEAR CHARGE NO. TOTAL LT00
CLEAR CUMULATED COSTS LE909
SET MONTH FLAG = ZERO LE912
SET NEW CHARGE NO. LE911
04B


LE350
START
07B
LE355
READ REPORT FROM XSORT YREAD
07A
EOF
08B
IS REPORT NO. DIFFERENT?
YES
08B
NO
IS REPORT LEVEL DIFFERENT?
YES
08A
NO
IS SUMMARY FLAG=0?
YES
07G
NO
IS MONTH DIFFERENT?
YES
07C
NO
LE357
CUMULATE COSTS LT00
07B
07A
LE360
ADJUST COSTS LE250
07C
PRINT BODY LINE LE200
07D
INCREMENT LINE COUNTER LB200
07D
END OF PAGE
08C
LE362
CLEAR COSTS LT00
07E
SET NEW MONTH LE910
07B
LE365
ADJUST COSTS LE250
07F
PRINT BODY LINE LE200
PRINT GRAND TOTAL LE170
PRINT SECURITY NO. PAGE NO. LINE LA100
INCREASE PAGE NO. BY ONE YPAGE
EXIT
SET "END OF SUMMARY" EXIT
07G
07F


LE370
08A
SET "END OF LEVEL" EXIT
07F
LE375
08B
SET "END OF REPORT" EXIT
07F
LE380
08C
PRINT SECURITY NO. PAGE NO. LINE LA100
INCREASE PAGE NO. BY ONE_ YPAGE
PRINT HEADER LE100
RESET LINE COUNTER LB200
07E


LE500
START
PRESET TWO-TAPE SORT SORT
LE502
09A
SAVE REPORT NO. AND REPORT LEVEL LE900
CLEAR TOTALS LT00
09D
LE505
09B
READ RECORD FROM XSORT YREAD
EOF
10D
IS REPORT NO. DIFFERENT?
YES
10D
NO
LE506
09C
IS REPORT LEVEL DIFFERENT?
YES
09A
NO
LE507
09D
IS SUMMARY FLAG=0?
NO
09E
YES
GIVE SUMMARY RECORD TO SORT SORT
09B
LE510
09E
TRANSFER RECORD I.D. TO HOLD BLOCK LE922
TRANSFER CHARGE NO. TO HOLD BLOCK LE922+6
LE512
09F
TRANSFER MONTH TO HOLD BLOCK LE922+5
LE513
09G
CUMULATE TOTALS LT00
READ RECORD FROM XSORT YREAR
EOF
10C
IS REPORT NO. DIFFERENT?
YES
10C
NO
IS REPORT LEVEL DIFFERENT?
YES
10B
NO
IS SUMMARY FLAG=0?
YES
10B
NO
IS CHARGE NO. DIFFERENT?
YES
10B
NO
10A


10A
IS MONTH DIFFERENT?
NO
09G
YES
TRANSFER TOTALS TO HOLD BLOCK LE922+9
GIVE HOLD BLOCK TO SORT SORT
CLEAR MONTH TOTAL LTOO
09F
LE517
10B
TRANSFER TOTALS TO HOLD BLOCK LE922+9
GIVE HOLD BLOCK TO SORT SORT
CLEAR CHARGE NO. TOTALS LTOO
09C
LE518
10C
TRANSFER TOTALS TO HOLD BLOCK LE922+9
GIVE HOLD BLOCK TO SORT SORT
10D
LE520
10D
CLEANUP TWO-TAPE SORT SORT
PRESET REPORT GENERATOR RDG
DEFINE READ OF SORTED TAPE READ
READ RECORD FROM SORTED TAPE YREAD
EOF
11D
LE522
10E
SAVE REPORT NO. AND REPORT LEVEL LE900
RESET PAGE NO. TO ONE YPAGE
11A
LE525
10F
READ RECORD FROM SORTED TAPE YREAD
EOF
11D
IS REPORT LEVEL DIFFERENT?
YES
11C
NO
IS SUMMARY FLAG=0?
YES
11A
NO
11B


IIA
LE527
SET UP I. D. INFO. FOR HEADER
10F
IIB
LE530
CLEAR TOTALS LT00
CLEAR CUMULATED COSTS LE909
SAVE MONTH LE910
SAVE CHARGE NO. LE911
PRINT HEADER LE100
RESET LINE COUNTER LB200
TO REPORT 40 CALC. ROUTINE LE300
END OF REPORT
IID
END OF SUMMARY
IIA
END OF LEVEL
IIC
LE532
INCREASE SECURITY NO. BY ONE YSEC
10E
IID
LE534
INCREASE SECURITY NO. BY ONE YSEC
CLEANUP REPORT RPG
UNDEFINE AND REWIND SORTED TAPE READ
HAS "EOF" OCCURRED?
NO
EXIT
YES
TO PERT/COST CLEANUP ROUTINE END

Region LF00

EXPLANATION OF REGION:

To cumulate cost information up the work breakdown structure and print report 35.

CALLING SEQUENCE:

L	TSX	LF00, 4
L+1	Normal return	

INPUT:

Report 35 information from XSORT.

OUTPUT:

Report 35 on output report tape.

STORAGE USED:

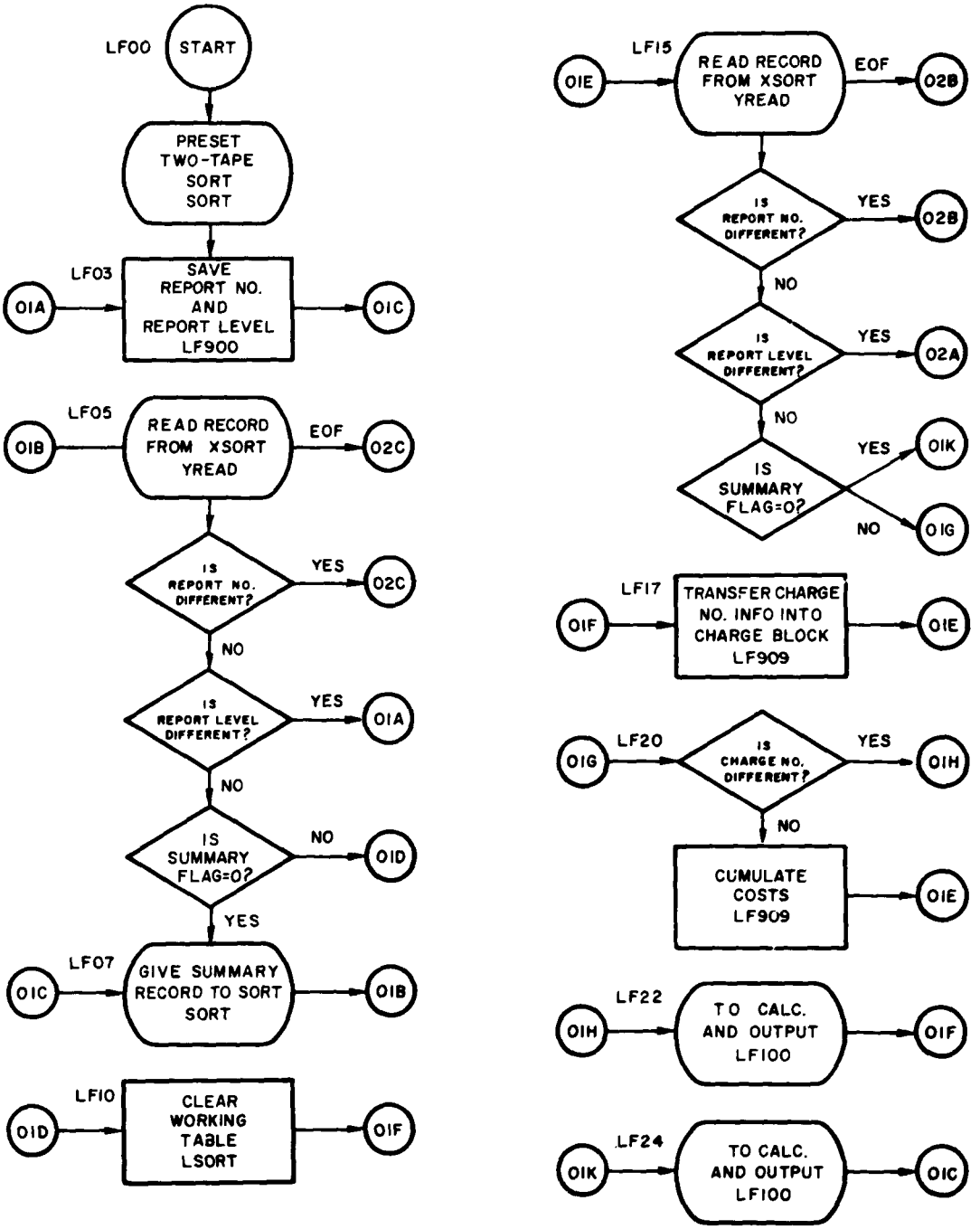
Not applicable.

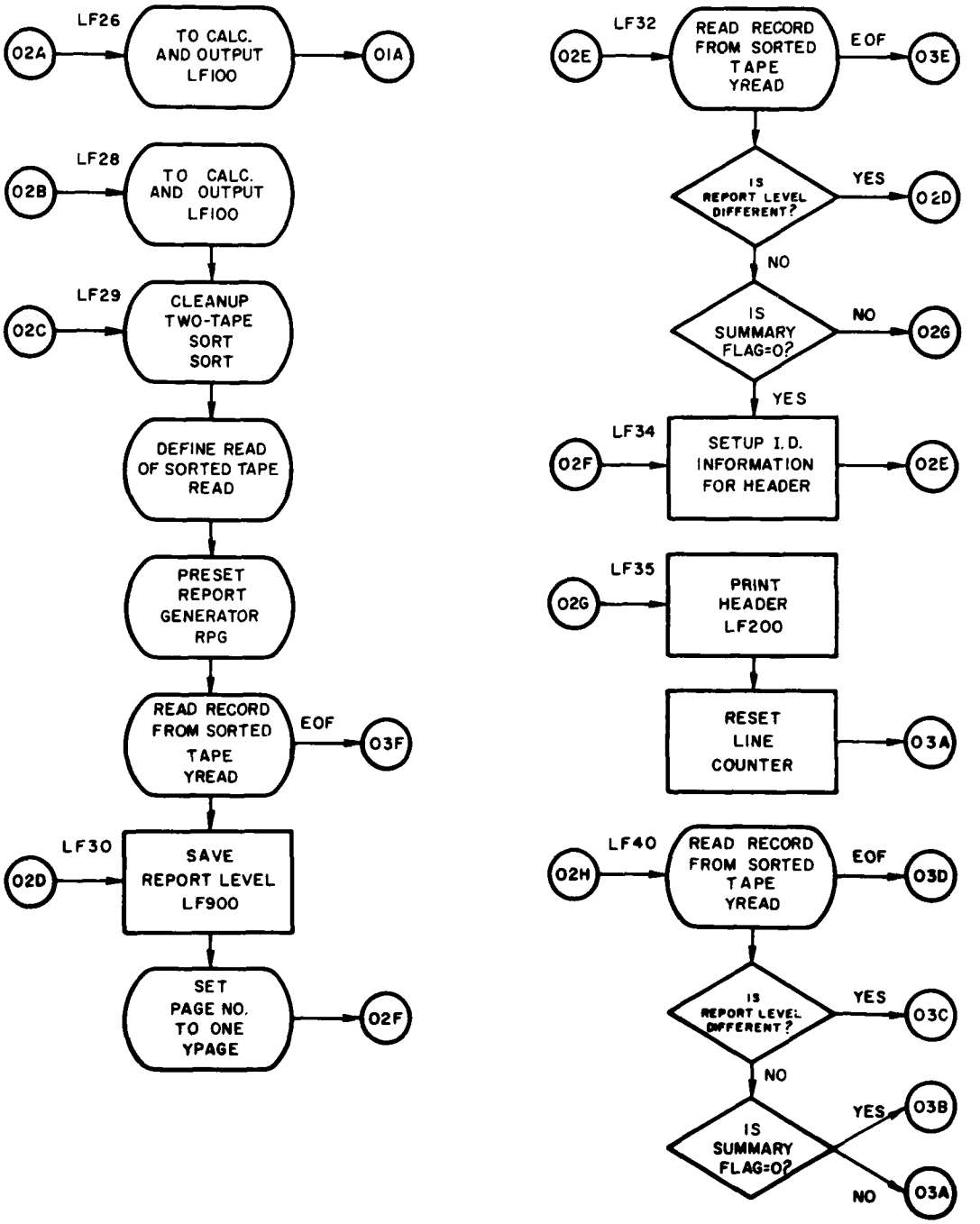
SUBREGIONS AND SUBROUTINES USED:

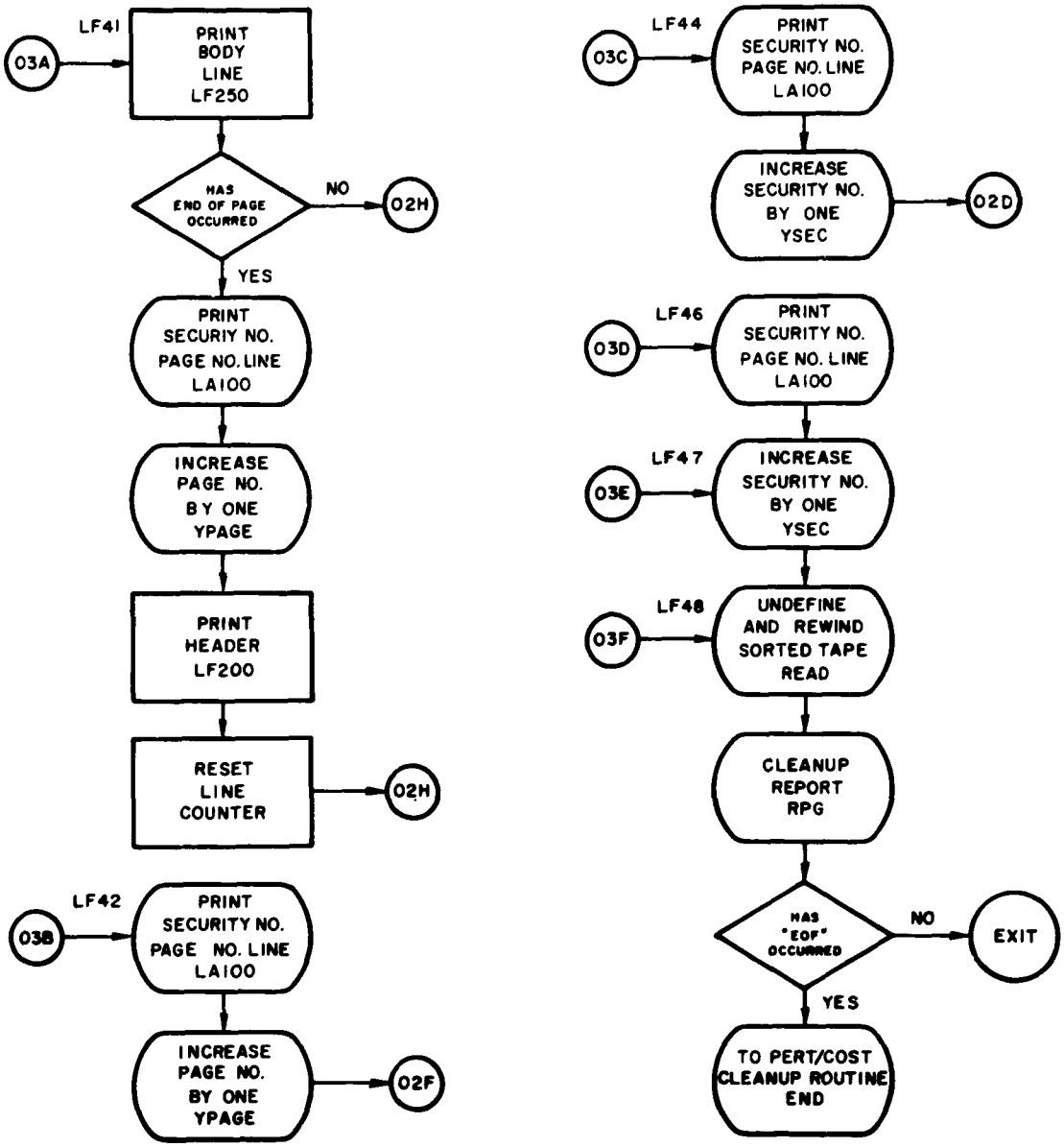
SORT	YREAD	YCOMP
READ	YPAGE	LA100
YSEC	LX00	UPCK

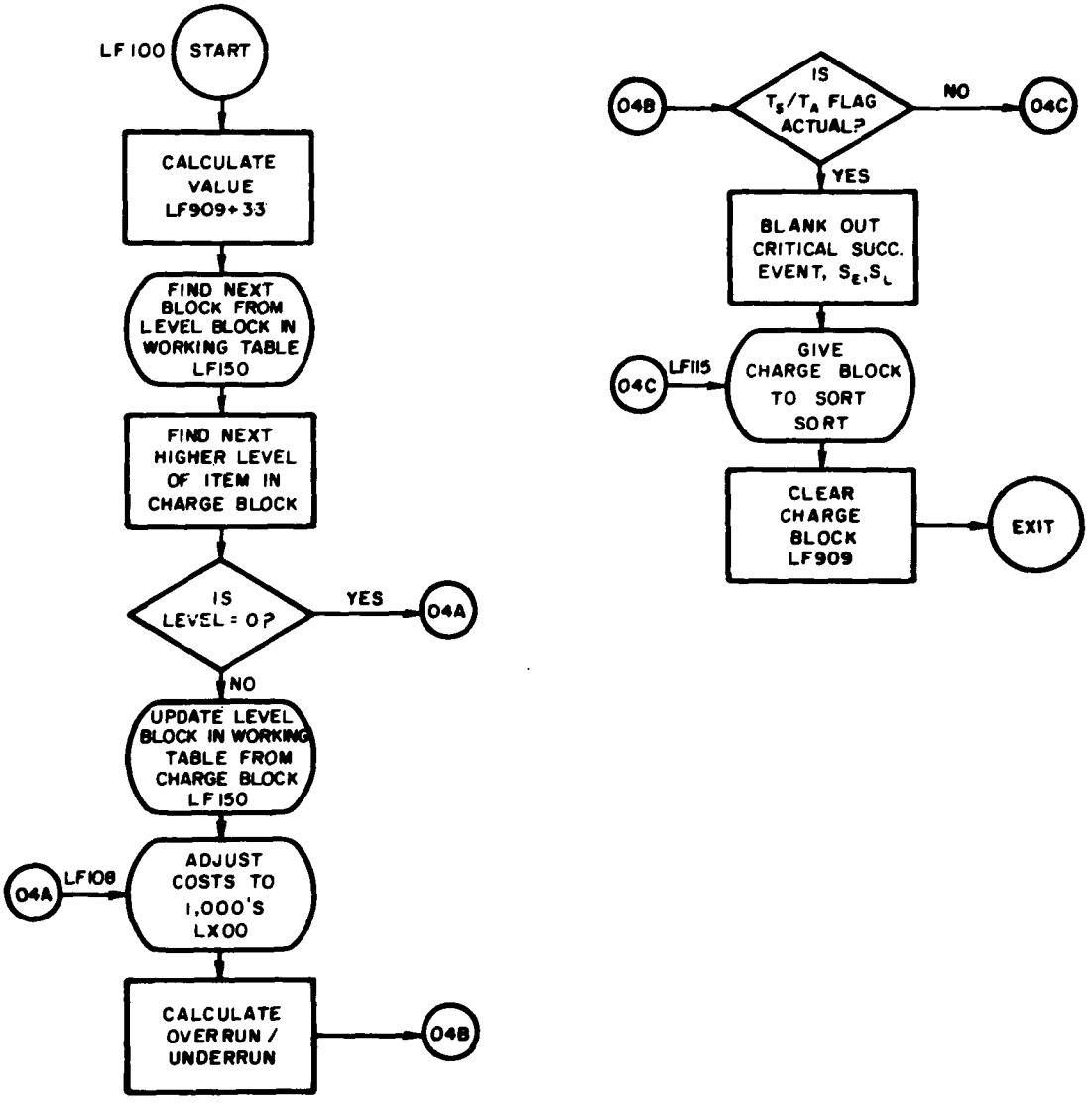
EXPLANATION OF CALLING SEQUENCE:

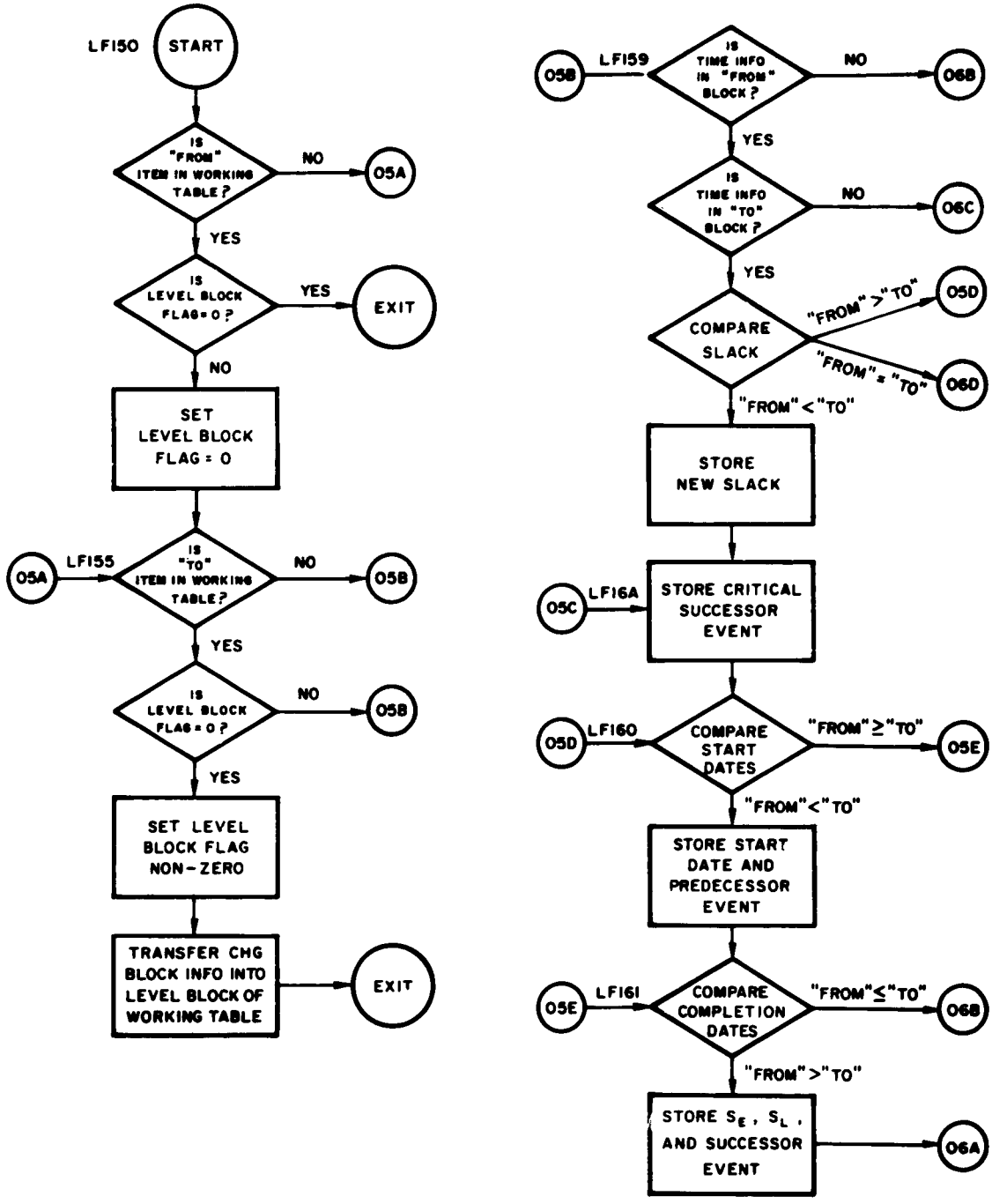
Not applicable.

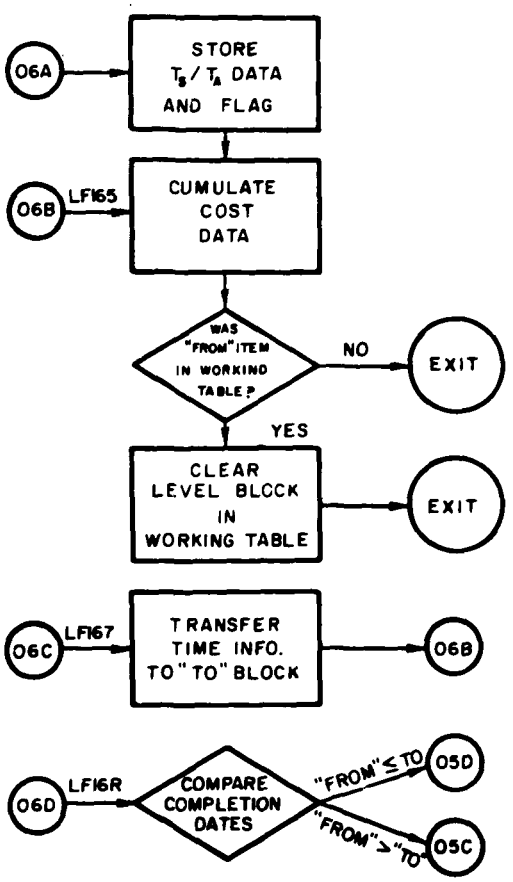

LF00
START
PRESET TWO-TAPE SORT SORT
LF03
01A
SAVE REPORT NO. AND REPORT LEVEL LF900
01C
LF05
01B
READ RECORD FROM XSORT YREAD
EOF
02C
IS REPORT NO. DIFFERENT?
YES
02C
NO
IS REPORT LEVEL DIFFERENT?
YES
01A
NO
IS SUMMARY FLAG=0?
NO
01D
YES
LF07
01C
GIVE SUMMARY RECORD TO SORT SORT
01B
LF10
01D
CLEAR WORKING TABLE LSORT
01F
LF15
01E
READ RECORD FROM XSORT YREAD
EOF
02B
IS REPORT NO. DIFFERENT?
YES
02B
NO
IS REPORT LEVEL DIFFERENT?
YES
02A
NO
IS SUMMARY FLAG=0?
YES
01K
NO
01G
LF17
01F
TRANSFER CHARGE NO. INFO INTO CHARGE BLOCK LF909
01E
LF20
01G
IS CHARGE NO. DIFFERENT?
YES
01H
NO
CUMULATE COSTS LF909
01E
LF22
01H
TO CALC. AND OUTPUT LF100
01F
LF24
01K
TO CALC. AND OUTPUT LF100
01C


LF26
02A
TO CALC. AND OUTPUT LF100
01A
LF28
02B
TO CALC. AND OUTPUT LF100
LF29
02C
CLEANUP TWO-TAPE SORT SORT
DEFINE READ OF SORTED TAPE READ
PRESET REPORT GENERATOR RPG
READ RECORD FROM SORTED TAPE YREAD
EOF
03F
LF30
02D
SAVE REPORT LEVEL LF900
SET PAGE NO. TO ONE YPAGE
02F
LF32
02E
READ RECORD FROM SORTED TAPE YREAD
EOF
03E
IS REPORT LEVEL DIFFERENT?
YES
02D
NO
IS SUMMARY FLAG=0?
NO
02G
YES
LF34
02F
SETUP I.D. INFORMATION FOR HEADER
02E
LF35
02G
PRINT HEADER LF200
RESET LINE COUNTER
03A
LF40
02H
READ RECORD FROM SORTED TAPE YREAD
EOF
03D
IS REPORT LEVEL DIFFERENT?
YES
03C
NO
IS SUMMARY FLAG=0?
YES
03B
NO
03A


LF41
03A
PRINT BODY LINE LF250
HAS END OF PAGE OCCURRED
NO
02H
YES
PRINT SECURIY NO. PAGE NO. LINE LA100
INCREASE PAGE NO. BY ONE YPAGE
PRINT HEADER LF200
RESET LINE COUNTER
02H
LF42
03B
PRINT SECURITY NO. PAGE NO. LINE LA100
INCREASE PAGE NO. BY ONE YPAGE
02F
LF44
03C
PRINT SECURITY NO. PAGE NO. LINE LA100
INCREASE SECURITY NO. BY ONE YSEC
02D
LF46
03D
PRINT SECURITY NO. PAGE NO. LINE LA100
LF47
03E
INCREASE SECURITY NO. BY ONE YSEC
LF48
03F
UNDEFINE AND REWIND SORTED TAPE READ
CLEANUP REPORT RPG
HAS "EOF" OCCURRED
NO
EXIT
YES
TO PERT/COST CLEANUP ROUTINE END


LF100
START
CALCULATE VALUE LF909+33
FIND NEXT BLOCK FROM LEVEL BLOCK IN WORKING TABLE LF150
FIND NEXT HIGHER LEVEL OF ITEM IN CHARGE BLOCK
IS LEVEL = 0?
YES
04A
NO
UPDATE LEVEL BLOCK IN WORKING TABLE FROM CHARGE BLOCK LF150
04A
LF108
ADJUST COSTS TO 1,000'S LX00
CALCULATE OVERRUN / UNDERRUN
04B
04B
IS T_S/T_A FLAG ACTUAL?
NO
04C
YES
BLANK OUT CRITICAL SUCC. EVENT, S_E,S_L
04C
LF115
GIVE CHARGE BLOCK TO SORT SORT
CLEAR CHARGE BLOCK LF909
EXIT


LF150
START
IS "FROM" ITEM IN WORKING TABLE?
NO
05A
YES
IS LEVEL BLOCK FLAG = 0?
YES
EXIT
NO
SET LEVEL BLOCK FLAG = 0
05A
LF155
IS "TO" ITEM IN WORKING TABLE?
NO
05B
YES
IS LEVEL BLOCK FLAG = 0?
NO
05B
YES
SET LEVEL BLOCK FLAG NON-ZERO
TRANSFER CHG BLOCK INFO INTO LEVEL BLOCK OF WORKING TABLE
EXIT
05B
LF159
IS TIME INFO IN "FROM" BLOCK?
NO
06B
YES
IS TIME INFO IN "TO" BLOCK?
NO
06C
YES
COMPARE SLACK
"FROM" > "TO"
05D
"FROM" = "TO"
06D
"FROM" < "TO"
STORE NEW SLACK
05C
LF16A
STORE CRITICAL SUCCESSOR EVENT
05D
LF160
COMPARE START DATES
"FROM" ≥ "TO"
05E
"FROM" < "TO"
STORE START DATE AND PREDECESSOR EVENT
05E
LF161
COMPARE COMPLETION DATES
"FROM" ≤ "TO"
06B
"FROM" > "TO"
STORE S_E, S_L, AND SUCCESSOR EVENT
06A


06A
STORE
T_S / T_A DATA
AND FLAG
06B
LF165
CUMULATE
COST
DATA
WAS "FROM" ITEM IN WORKING TABLE?
NO
EXIT
YES
CLEAR
LEVEL BLOCK
IN
WORKING TABLE
EXIT
06C
LF167
TRANSFER
TIME INFO.
TO "TO" BLOCK
06B
06D
LF16R
COMPARE
COMPLETION
DATES
"FROM" ≤ "TO"
05D
"FROM" > "TO"
05C

Region LG00

EXPLANATION OF REGION:

Setup region for printing Report 50.

CALLING SEQUENCE:

L TSX LG00, 4

L+1 Normal return

INPUT:

Report 50 information from XSORT.

OUTPUT:

Report 50 on output report tape.

STORAGE USED:

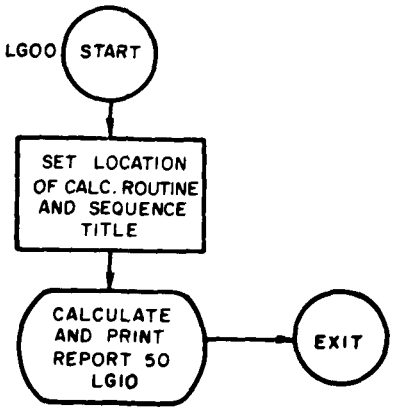
Not applicable.

SUBREGIONS AND SUBROUTINES USED:

LG10

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


LGOO
START
SET LOCATION OF CALC. ROUTINE AND SEQUENCE TITLE
CALCULATE AND PRINT REPORT 50 LGIO
EXIT

Region LG05

EXPLANATION OF REGION:

Setup region for printing Report 51.

CALLING SEQUENCE:

```
L     TSX    LG05, 4
L+1   Normal return
```

INPUT:

Report 51 information from XSORT.

OUTPUT:

Report 51 on output report tape.

STORAGE USED:

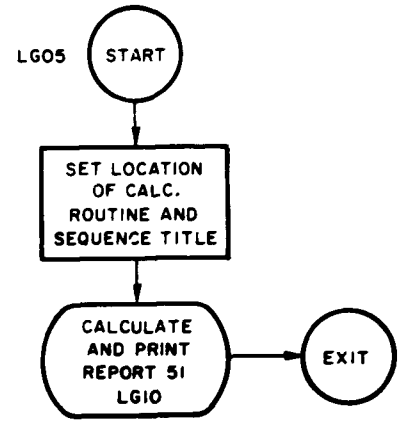
Not applicable.

SUBREGIONS AND SUBROUTINES USED:

LG10

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


LG05
START
SET LOCATION OF CALC. ROUTINE AND SEQUENCE TITLE
CALCULATE AND PRINT REPORT 51 LG10
EXIT

Region LG07

EXPLANATION OF REGION:

Setup region for Report 52.

CALLING SEQUENCE:

```
L     TSX    LG07, 4
L+1   Normal return
```

INPUT:

Report 52 information from XSORT.

OUTPUT:

Report 52 on output report tape.

STORAGE USED:

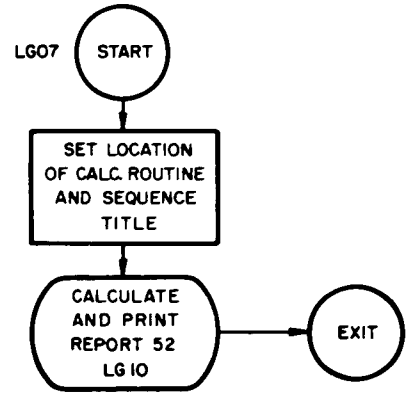
Not applicable.

SUBREGIONS AND SUBROUTINES USED:

LG10

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


LG07
START
SET LOCATION OF CALC. ROUTINE AND SEQUENCE TITLE
CALCULATE AND PRINT REPORT 52 LG 10
EXIT

Region LG10

EXPLANATION OF REGION:

To cumulate data and print "Manpower Loading Report."

CALLING SEQUENCE:

```
L     TSX   LG10, 4
L+1   PZE   0, 0, R
L+2   PZE   A,, B
L+3   Normal return
```

INPUT:

Information from XSORT routine.

OUTPUT:

Report on output report tape.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

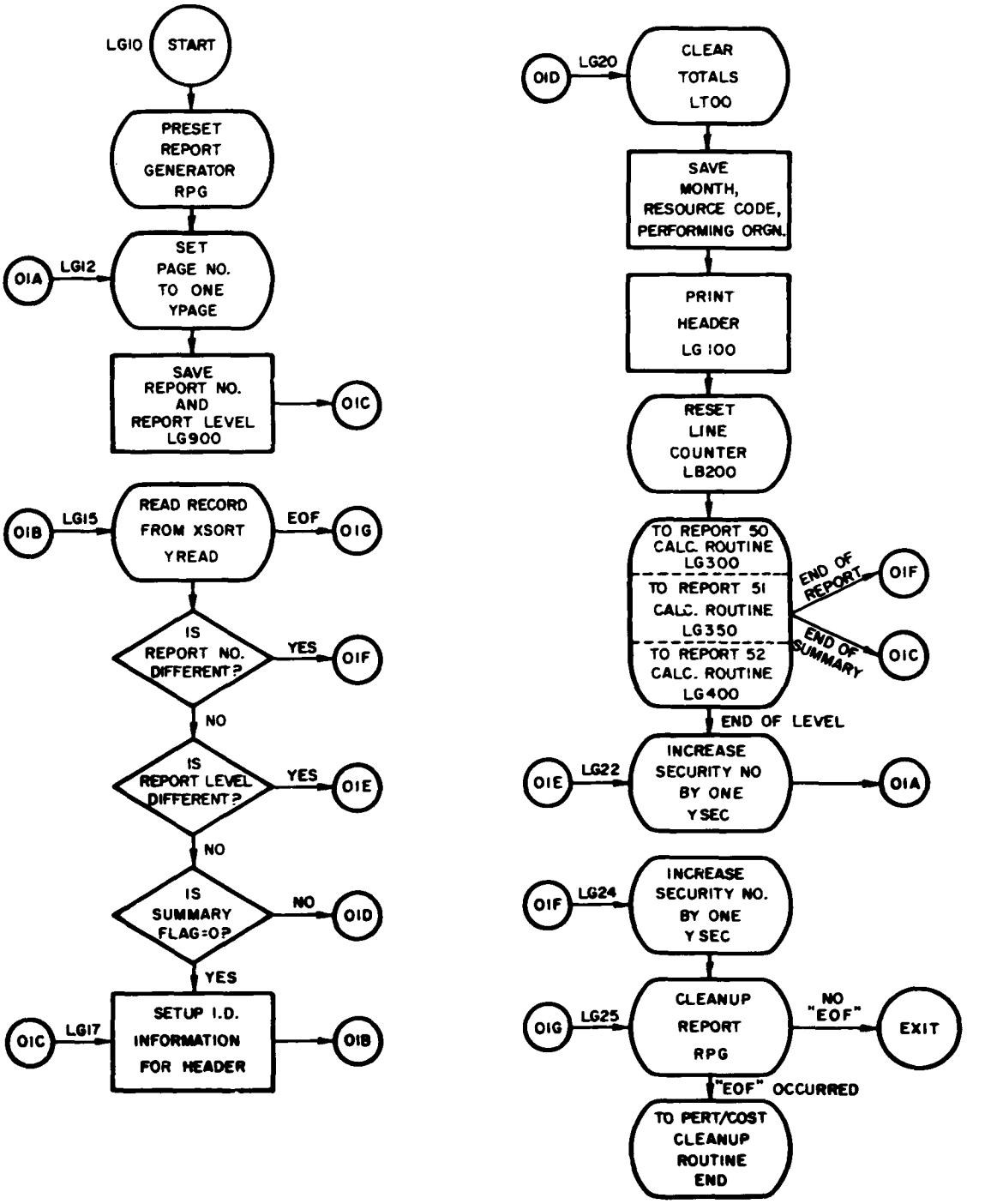
YPAGE	YREAD	LT00
LB200	YSEC	DATE
LA100		

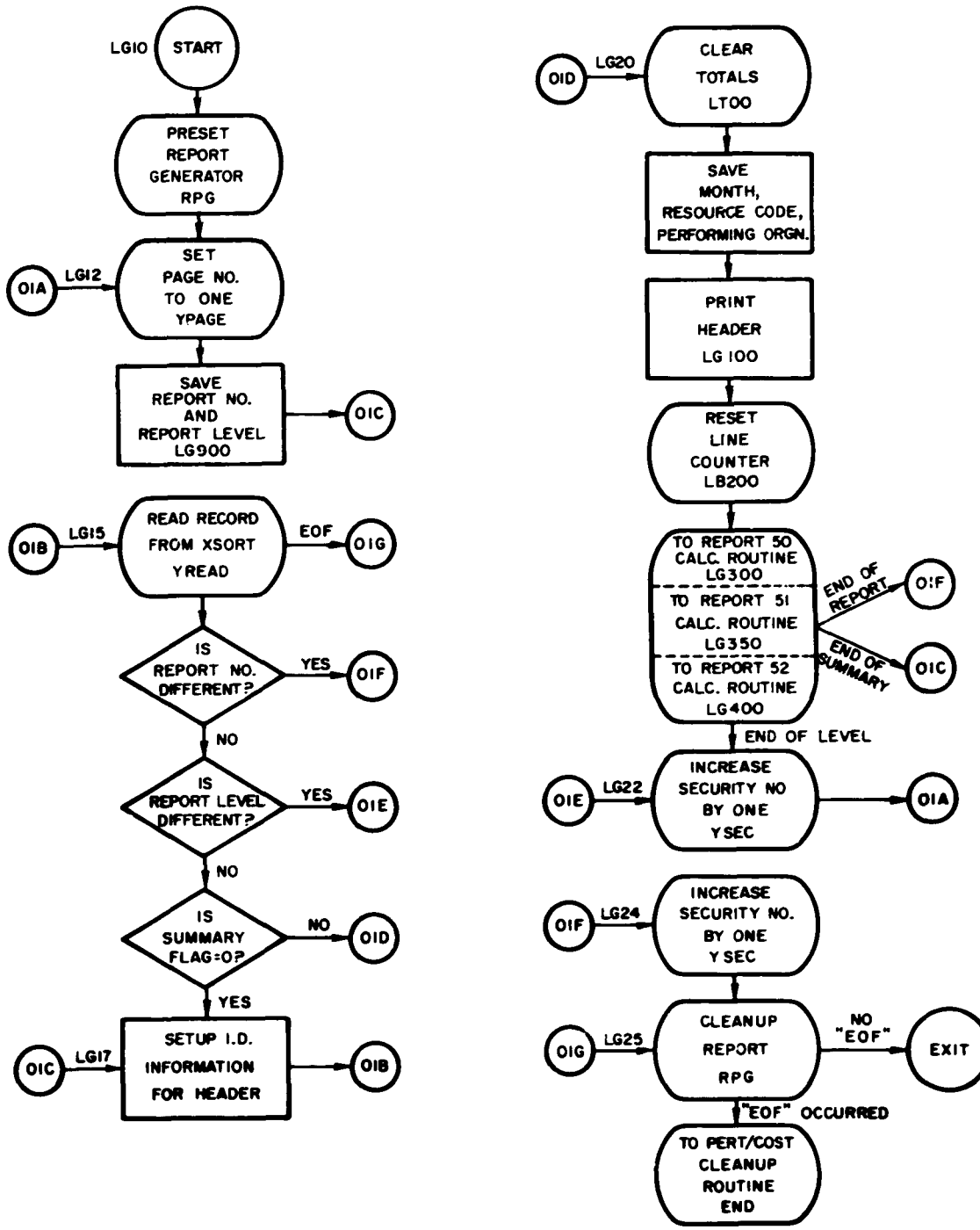
EXPLANATION OF CALLING SEQUENCE:

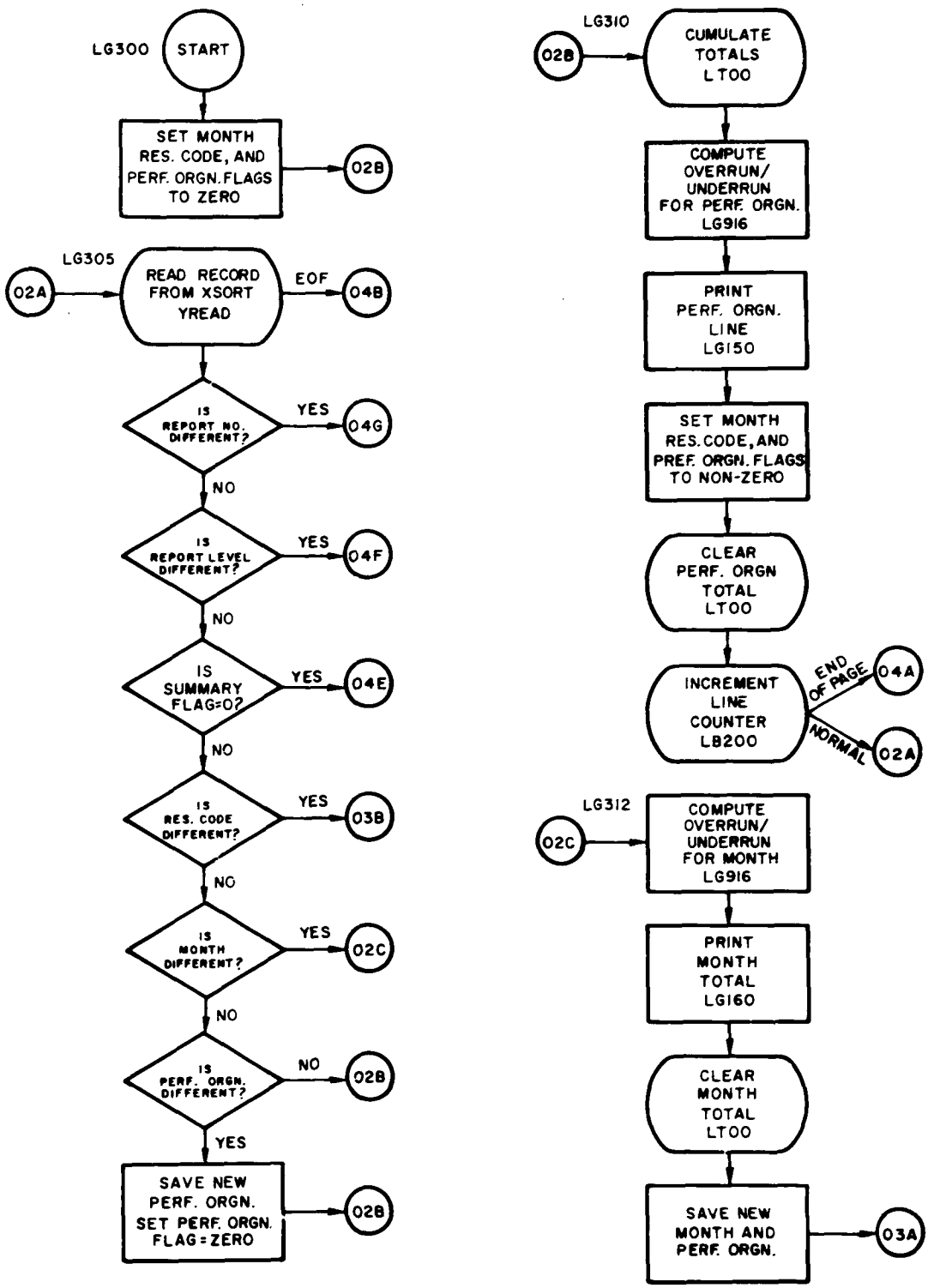
R = report number

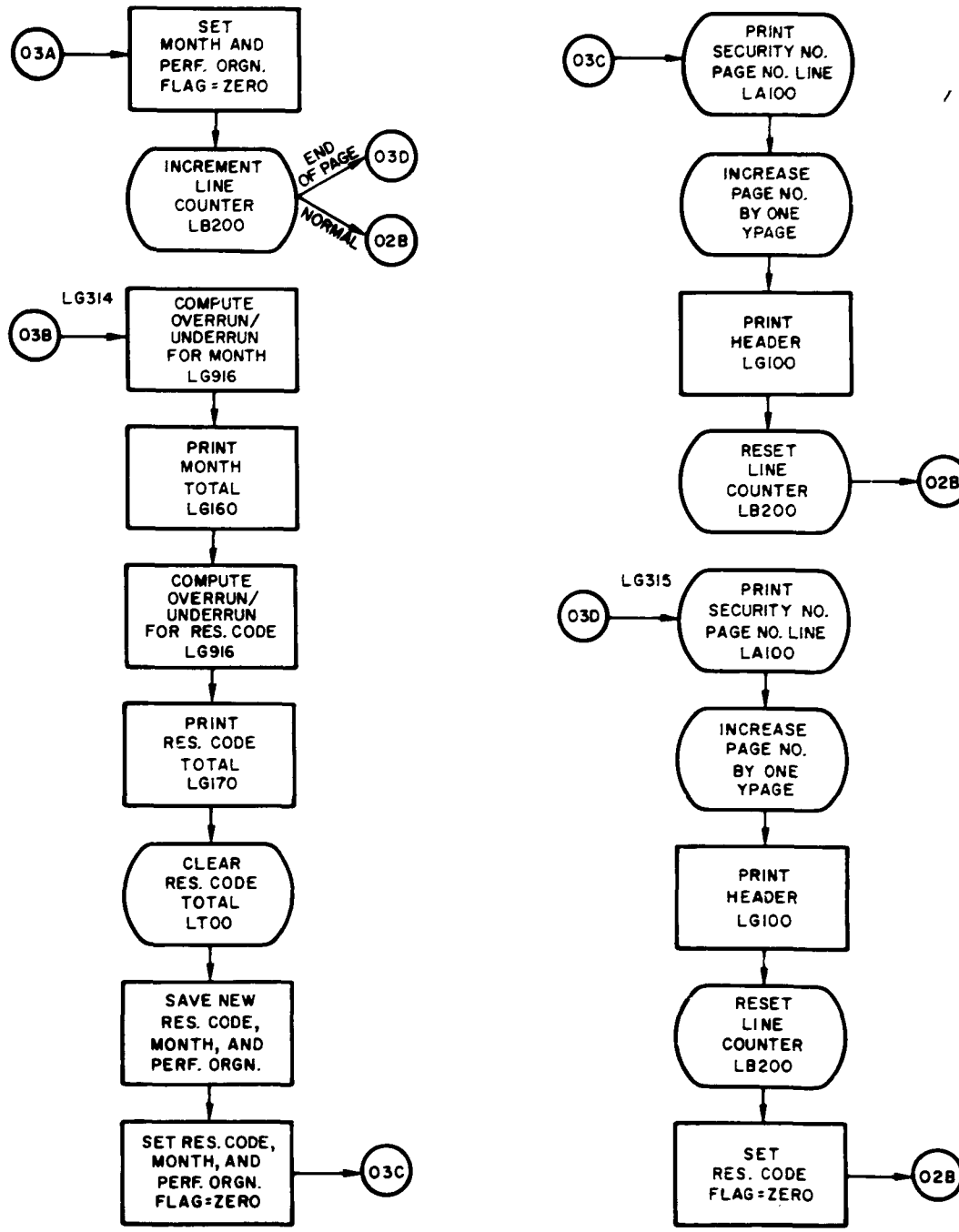
A = location of calculation routine

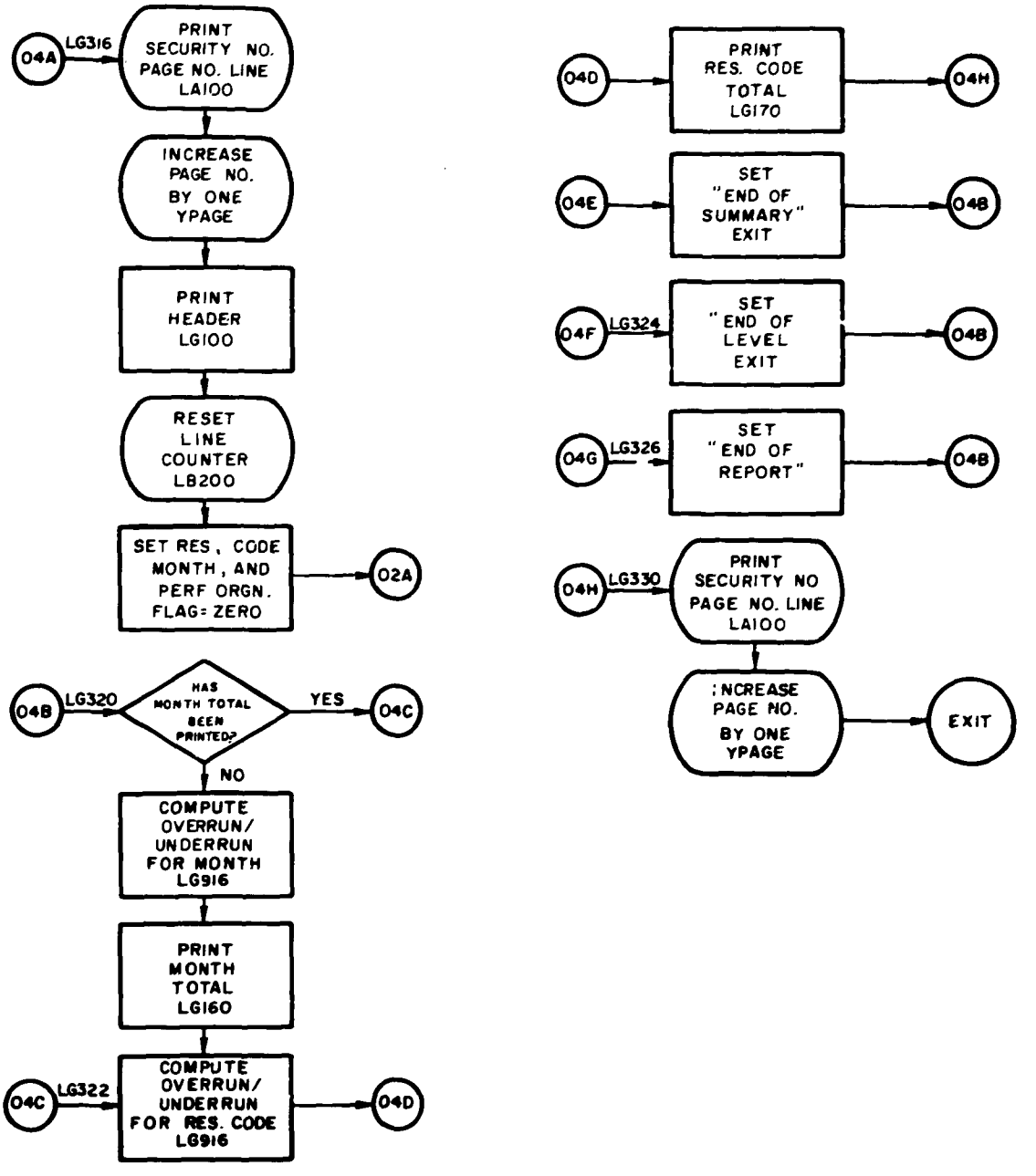
B = location of sort sequence title

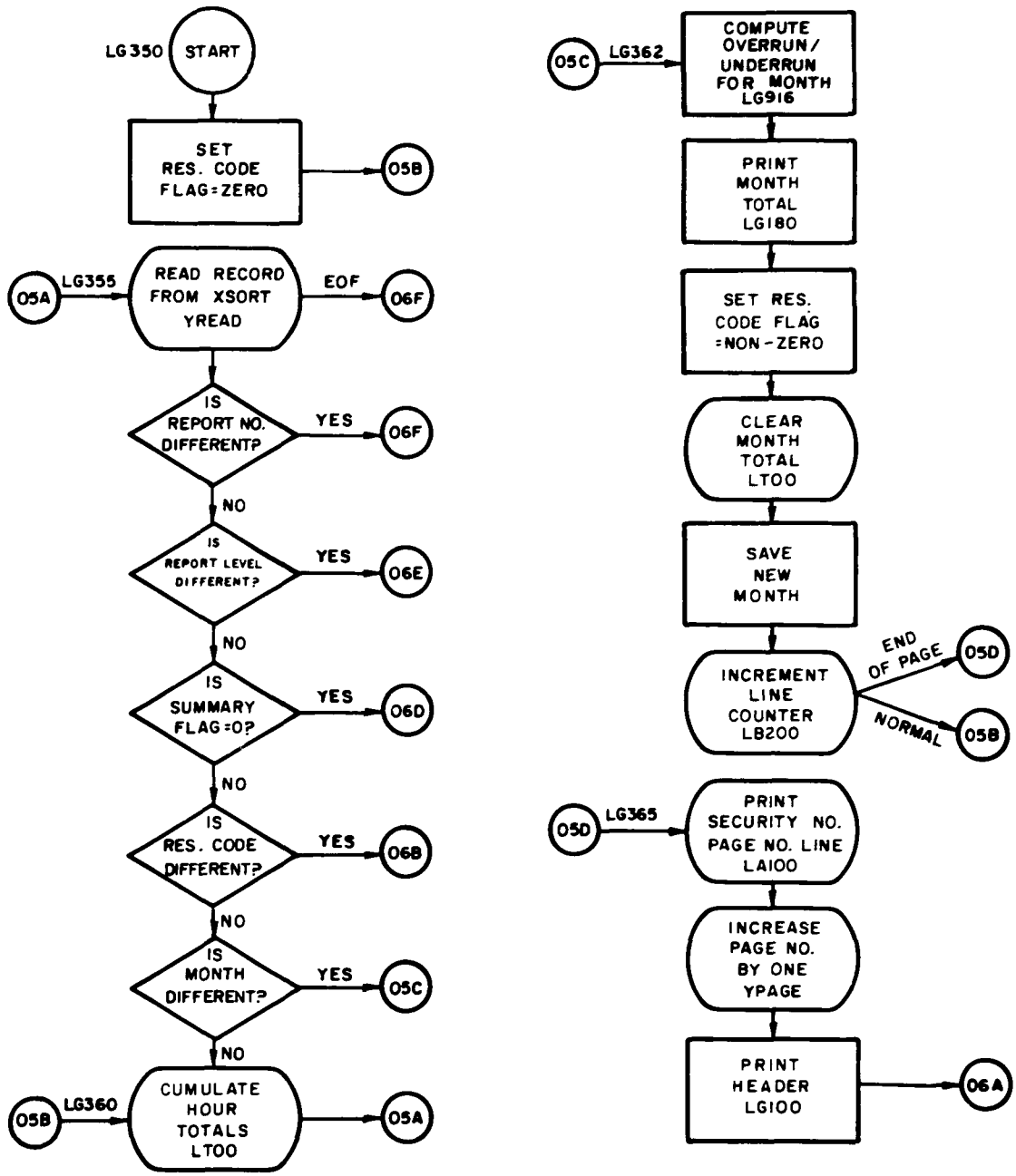

LG10
START
PRESET REPORT GENERATOR RPG
01A
LG12
SET PAGE NO. TO ONE YPAGE
SAVE REPORT NO. AND REPORT LEVEL LG900
01C
01B
LG15
READ RECORD FROM XSORT YREAD
EOF
01G
IS REPORT NO. DIFFERENT?
YES
01F
NO
IS REPORT LEVEL DIFFERENT?
YES
01E
NO
IS SUMMARY FLAG=0?
NO
01D
YES
01C
LG17
SETUP I.D. INFORMATION FOR HEADER
01B
01D
LG20
CLEAR TOTALS LT00
SAVE MONTH, RESOURCE CODE, PERFORMING ORGN.
PRINT HEADER LG100
RESET LINE COUNTER LB200
TO REPORT 50 CALC. ROUTINE LG300
TO REPORT 51 CALC. ROUTINE LG350
TO REPORT 52 CALC. ROUTINE LG400
END OF REPORT
01F
END OF SUMMARY
01C
END OF LEVEL
01E
LG22
INCREASE SECURITY NO BY ONE YSEC
01A
01F
LG24
INCREASE SECURITY NO. BY ONE YSEC
01G
LG25
CLEANUP REPORT RPG
NO "EOF"
EXIT
"EOF" OCCURRED
TO PERT/COST CLEANUP ROUTINE END

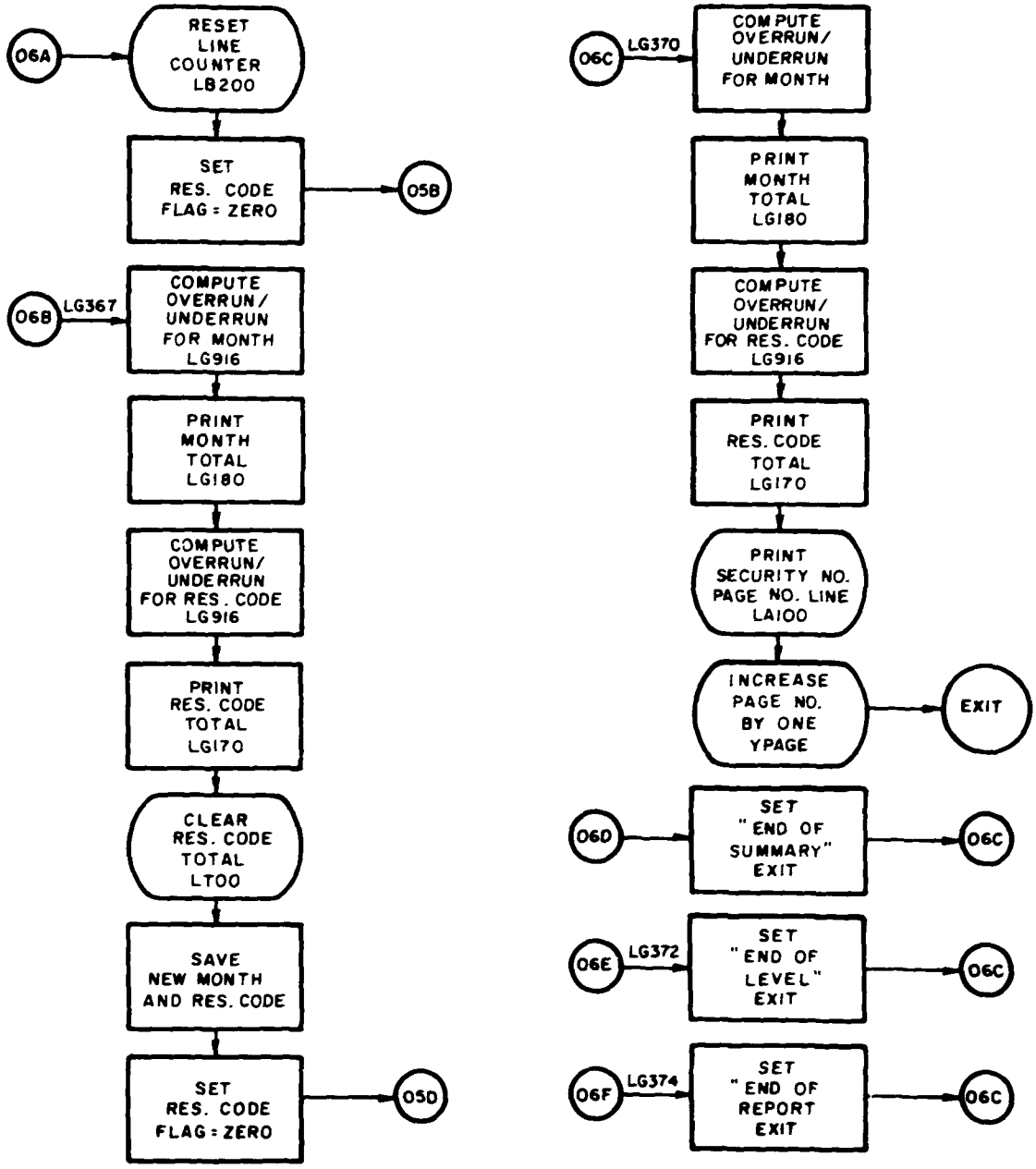

LG10
START
PRESET REPORT GENERATOR RPG
01A
LG12
SET PAGE NO. TO ONE YPAGE
SAVE REPORT NO. AND REPORT LEVEL LG900
01C
01B
LG15
READ RECORD FROM XSORT YREAD
EOF
01G
IS REPORT NO. DIFFERENT?
YES
01F
NO
IS REPORT LEVEL DIFFERENT?
YES
01E
NO
IS SUMMARY FLAG=0?
NO
01D
YES
01C
LG17
SETUP I.D. INFORMATION FOR HEADER
01B
01D
LG20
CLEAR TOTALS LT00
SAVE MONTH, RESOURCE CODE, PERFORMING ORGN.
PRINT HEADER LG100
RESET LINE COUNTER LB200
TO REPORT 50 CALC. ROUTINE LG300
TO REPORT 51 CALC. ROUTINE LG350
TO REPORT 52 CALC. ROUTINE LG400
END OF REPORT
01F
END OF SUMMARY
01C
END OF LEVEL
01E
LG22
INCREASE SECURITY NO BY ONE YSEC
01A
01F
LG24
INCREASE SECURITY NO. BY ONE Y SEC
01G
LG25
CLEANUP REPORT RPG
NO "EOF"
EXIT
"EOF" OCCURRED
TO PERT/COST CLEANUP ROUTINE END

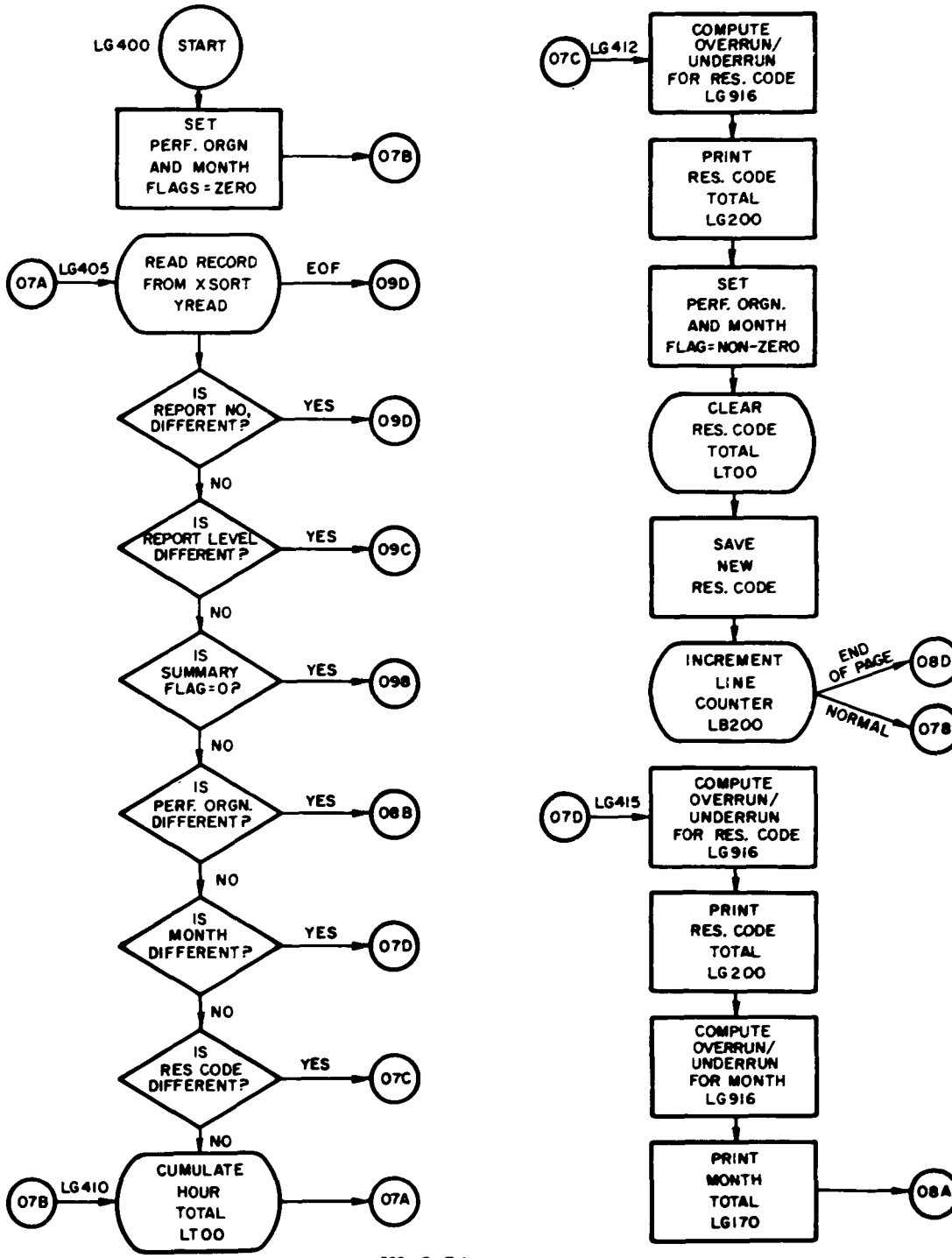

LG300
START
SET MONTH RES. CODE, AND PERF. ORGN. FLAGS TO ZERO
02B
LG305
02A
READ RECORD FROM XSORT YREAD
EOF
04B
IS REPORT NO. DIFFERENT?
YES
04G
NO
IS REPORT LEVEL DIFFERENT?
YES
04F
NO
IS SUMMARY FLAG=0?
YES
04E
NO
IS RES. CODE DIFFERENT?
YES
03B
NO
IS MONTH DIFFERENT?
YES
02C
NO
IS PERF. ORGN. DIFFERENT?
NO
02B
YES
SAVE NEW PERF. ORGN. SET PERF. ORGN. FLAG=ZERO
02B
LG310
02B
CUMULATE TOTALS LTOO
COMPUTE OVERRUN/ UNDERRUN FOR PERF. ORGN. LG916
PRINT PERF. ORGN. LINE LG150
SET MONTH RES. CODE, AND PREF. ORGN. FLAGS TO NON-ZERO
CLEAR PERF. ORGN TOTAL LTOO
INCREMENT LINE COUNTER LB200
END OF PAGE
04A
NORMAL
02A
LG312
02C
COMPUTE OVERRUN/ UNDERRUN FOR MONTH LG916
PRINT MONTH TOTAL LG160
CLEAR MONTH TOTAL LTOO
SAVE NEW MONTH AND PERF. ORGN.
03A

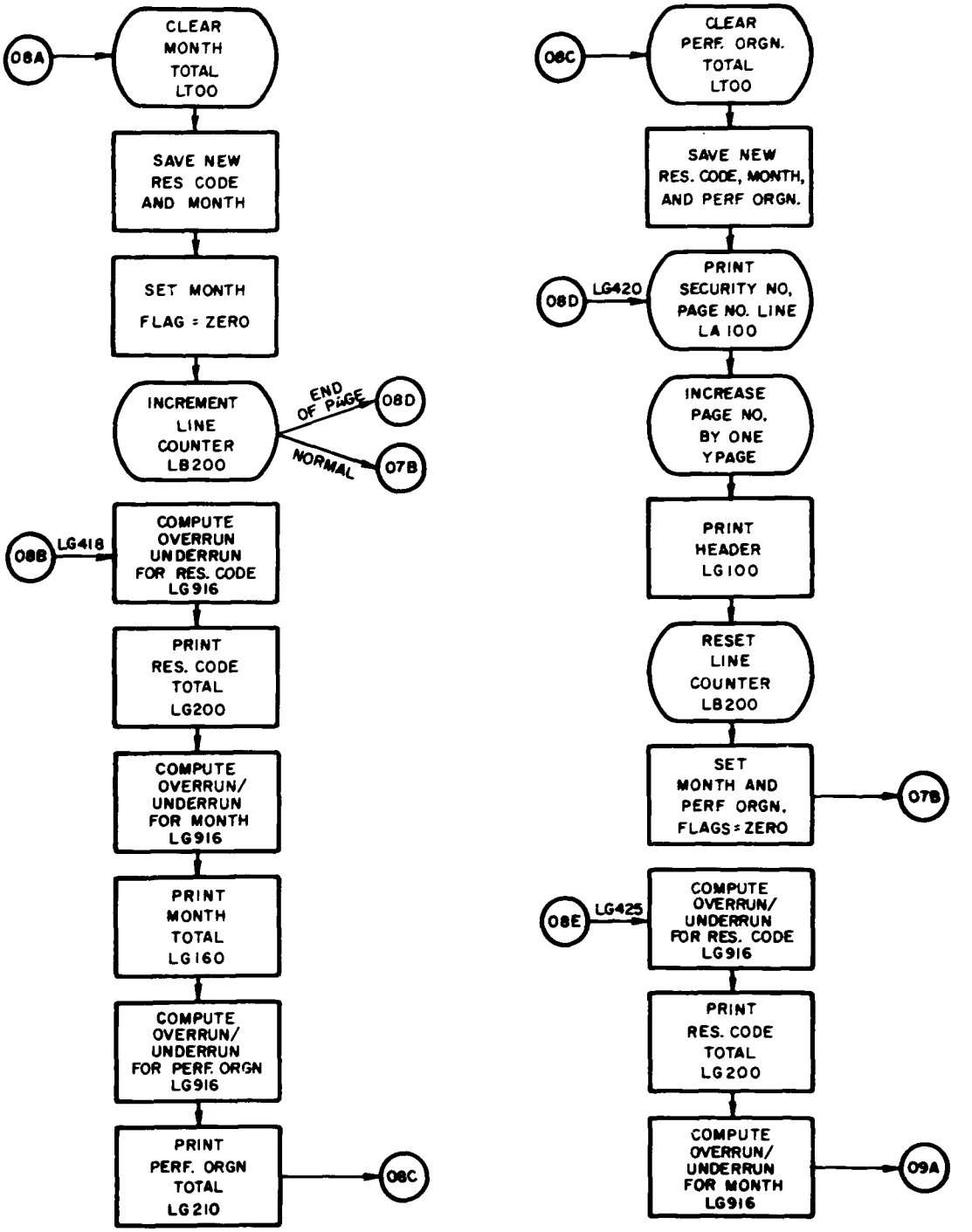

03A
SET MONTH AND PERF. ORGN. FLAG = ZERO
INCREMENT LINE COUNTER LB200
END OF PAGE
03D
NORMAL
02B
LG314
03B
COMPUTE OVERRUN/ UNDERRUN FOR MONTH LG916
PRINT MONTH TOTAL LG160
COMPUTE OVERRUN/ UNDERRUN FOR RES. CODE LG916
PRINT RES. CODE TOTAL LG170
CLEAR RES. CODE TOTAL LT00
SAVE NEW RES. CODE, MONTH, AND PERF. ORGN.
SET RES. CODE, MONTH, AND PERF. ORGN. FLAG=ZERO
03C
03C
PRINT SECURITY NO. PAGE NO. LINE LA100
INCREASE PAGE NO. BY ONE YPAGE
PRINT HEADER LG100
RESET LINE COUNTER LB200
02B
LG315
03D
PRINT SECURITY NO. PAGE NO. LINE LA100
INCREASE PAGE NO. BY ONE YPAGE
PRINT HEADER LG100
RESET LINE COUNTER LB200
SET RES. CODE FLAG=ZERO
02B

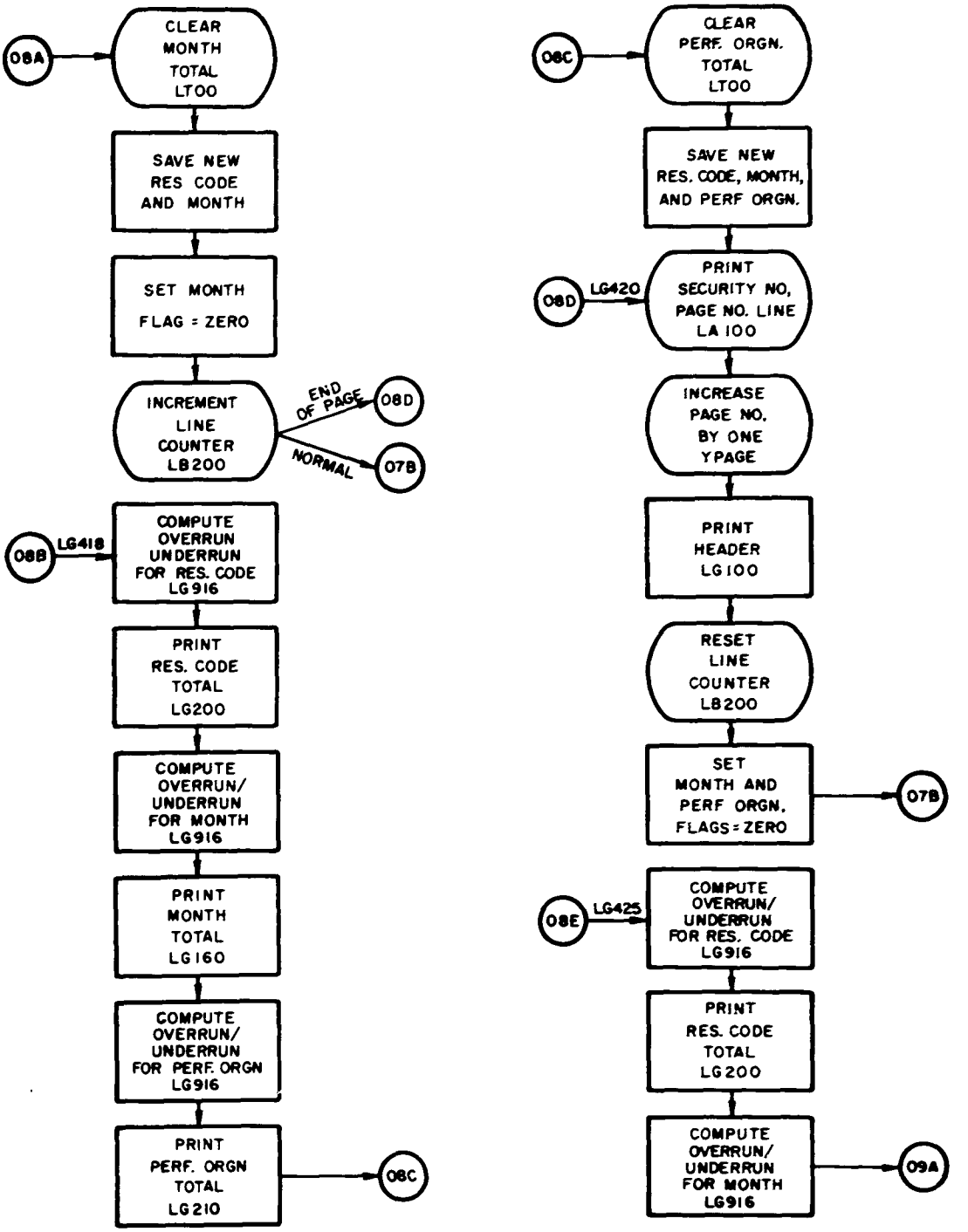

04A
LG316
PRINT SECURITY NO. PAGE NO. LINE LA100
INCREASE PAGE NO. BY ONE YPAGE
PRINT HEADER LG100
RESET LINE COUNTER LB200
SET RES. CODE MONTH, AND PERF ORGN. FLAG=ZERO
02A
04B
LG320
HAS MONTH TOTAL BEEN PRINTED?
YES
04C
NO
COMPUTE OVERRUN/ UNDERRUN FOR MONTH LG916
PRINT MONTH TOTAL LG160
04C
LG322
COMPUTE OVERRUN/ UNDERRUN FOR RES. CODE LG916
04D
04D
PRINT RES. CODE TOTAL LG170
04H
04E
SET "END OF SUMMARY" EXIT
04B
04F
LG324
SET "END OF LEVEL EXIT
04B
04G
LG326
SET "END OF REPORT"
04B
04H
LG330
PRINT SECURITY NO PAGE NO. LINE LA100
INCREASE PAGE NO. BY ONE YPAGE
EXIT

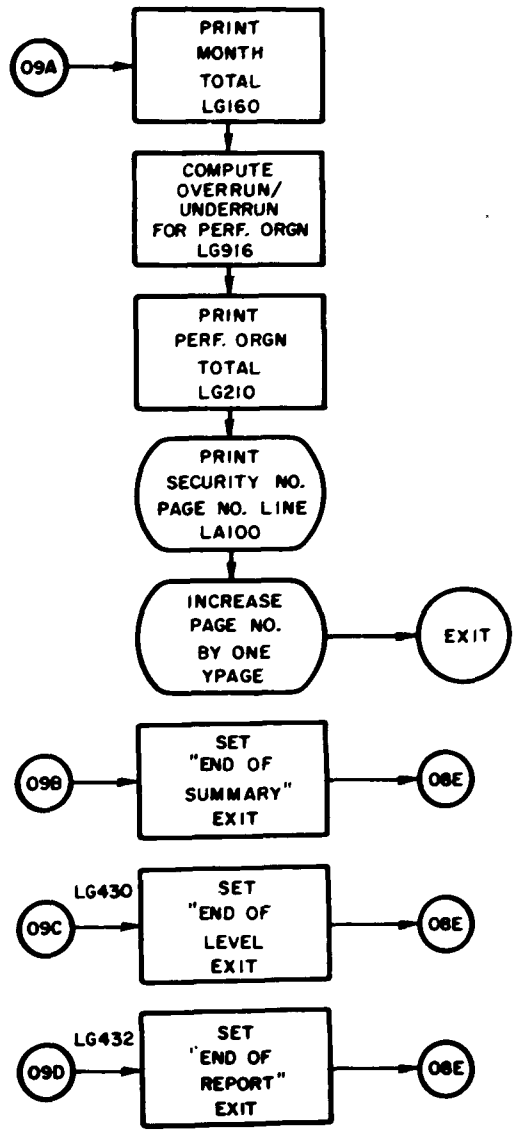

LG350
START
SET RES. CODE FLAG=ZERO
05B
05A
LG355
READ RECORD FROM XSORT YREAD
EOF
06F
IS REPORT NO. DIFFERENT?
YES
06F
NO
IS REPORT LEVEL DIFFERENT?
YES
06E
NO
IS SUMMARY FLAG=0?
YES
06D
NO
IS RES. CODE DIFFERENT?
YES
06B
NO
IS MONTH DIFFERENT?
YES
05C
NO
05B
LG360
CUMULATE HOUR TOTALS LT00
05A
05C
LG362
COMPUTE OVERRUN/ UNDERRUN FOR MONTH LG916
PRINT MONTH TOTAL LG180
SET RES. CODE FLAG =NON-ZERO
CLEAR MONTH TOTAL LT00
SAVE NEW MONTH
INCREMENT LINE COUNTER LB200
END OF PAGE
05D
NORMAL
05B
05D
LG365
PRINT SECURITY NO. PAGE NO. LINE LA100
INCREASE PAGE NO. BY ONE YPAGE
PRINT HEADER LG100
06A


06A
RESET LINE COUNTER LB200
SET RES. CODE FLAG = ZERO
058
068
LG367
COMPUTE OVERRUN/ UNDERRUN FOR MONTH LG916
PRINT MONTH TOTAL LG180
COMPUTE OVERRUN/ UNDERRUN FOR RES. CODE LG916
PRINT RES. CODE TOTAL LG170
CLEAR RES. CODE TOTAL LT00
SAVE NEW MONTH AND RES. CODE
SET RES. CODE FLAG = ZERO
05D
06C
LG370
COMPUTE OVERRUN/ UNDERRUN FOR MONTH
PRINT MONTH TOTAL LG180
COMPUTE OVERRUN/ UNDERRUN FOR RES. CODE LG916
PRINT RES. CODE TOTAL LG170
PRINT SECURITY NO. PAGE NO. LINE LA100
INCREASE PAGE NO. BY ONE YPAGE
EXIT
06D
SET "END OF SUMMARY" EXIT
06C
06E
LG372
SET "END OF LEVEL" EXIT
06C
06F
LG374
SET "END OF REPORT EXIT
06C


LG400
START
SET PERF. ORGN AND MONTH FLAGS = ZERO
07B
07A
LG405
READ RECORD FROM XSORT YREAD
EOF
09D
IS REPORT NO. DIFFERENT?
YES
09D
NO
IS REPORT LEVEL DIFFERENT?
YES
09C
NO
IS SUMMARY FLAG=0?
YES
09B
NO
IS PERF. ORGN. DIFFERENT?
YES
08B
NO
IS MONTH DIFFERENT?
YES
07D
NO
IS RES CODE DIFFERENT?
YES
07C
NO
07B
LG410
CUMULATE HOUR TOTAL LT00
07A
07C
LG412
COMPUTE OVERRUN/ UNDERRUN FOR RES. CODE LG916
PRINT RES. CODE TOTAL LG200
SET PERF. ORGN. AND MONTH FLAG=NON-ZERO
CLEAR RES. CODE TOTAL LT00
SAVE NEW RES. CODE
INCREMENT LINE COUNTER LB200
END OF PAGE
08D
NORMAL
07B
07D
LG415
COMPUTE OVERRUN/ UNDERRUN FOR RES. CODE LG916
PRINT RES. CODE TOTAL LG200
COMPUTE OVERRUN/ UNDERRUN FOR MONTH LG916
PRINT MONTH TOTAL LG170
08A


08A
CLEAR MONTH TOTAL LT00
SAVE NEW RES CODE AND MONTH
SET MONTH FLAG = ZERO
INCREMENT LINE COUNTER LB200
END OF PAGE
08D
NORMAL
07B
08B
LG418
COMPUTE OVERRUN UNDERRUN FOR RES. CODE LG916
PRINT RES. CODE TOTAL LG200
COMPUTE OVERRUN/ UNDERRUN FOR MONTH LG916
PRINT MONTH TOTAL LG160
COMPUTE OVERRUN/ UNDERRUN FOR PERF ORGN LG916
PRINT PERF. ORGN TOTAL LG210
08C
08C
CLEAR PERF. ORGN. TOTAL LT00
SAVE NEW RES. CODE, MONTH, AND PERF ORGN.
08D
LG420
PRINT SECURITY NO, PAGE NO. LINE LA100
INCREASE PAGE NO. BY ONE YPAGE
PRINT HEADER LG100
RESET LINE COUNTER LB200
SET MONTH AND PERF ORGN. FLAGS=ZERO
07B
08E
LG425
COMPUTE OVERRUN/ UNDERRUN FOR RES. CODE LG916
PRINT RES. CODE TOTAL LG200
COMPUTE OVERRUN/ UNDERRUN FOR MONTH LG916
09A


08A
CLEAR MONTH TOTAL LT00
SAVE NEW RES CODE AND MONTH
SET MONTH FLAG = ZERO
INCREMENT LINE COUNTER LB200
END OF PAGE
08D
NORMAL
07B
08B
LG418
COMPUTE OVERRUN UNDERRUN FOR RES. CODE LG916
PRINT RES. CODE TOTAL LG200
COMPUTE OVERRUN/ UNDERRUN FOR MONTH LG916
PRINT MONTH TOTAL LG160
COMPUTE OVERRUN/ UNDERRUN FOR PERF ORGN LG916
PRINT PERF. ORGN TOTAL LG210
08C
08C
CLEAR PERF. ORGN. TOTAL LT00
SAVE NEW RES. CODE, MONTH, AND PERF ORGN.
08D
LG420
PRINT SECURITY NO, PAGE NO. LINE LA100
INCREASE PAGE NO. BY ONE YPAGE
PRINT HEADER LG100
RESET LINE COUNTER LB200
SET MONTH AND PERF ORGN. FLAGS=ZERO
07B
08E
LG425
COMPUTE OVERRUN/ UNDERRUN FOR RES. CODE LG916
PRINT RES. CODE TOTAL LG200
COMPUTE OVERRUN/ UNDERRUN FOR MONTH LG916
09A


09A
PRINT MONTH TOTAL LG160
COMPUTE OVERRUN/ UNDERRUN FOR PERF. ORGN LG916
PRINT PERF. ORGN TOTAL LG210
PRINT SECURITY NO. PAGE NO. LINE LA100
INCREASE PAGE NO. BY ONE YPAGE
EXIT
09B
SET "END OF SUMMARY" EXIT
08E
LG430
09C
SET "END OF LEVEL EXIT
08E
LG432
09D
SET "END OF REPORT" EXIT
08E

Region LH00

EXPLANATION OF REGION:

To cumulate data and print Report 55.

CALLING SEQUENCE:

```
L     TSX    LH00, 4
L+1   Normal return
```

INPUT:

Report 55 information from XSORT.

OUTPUT:

Report 55 on output print tape.

STORAGE USED:

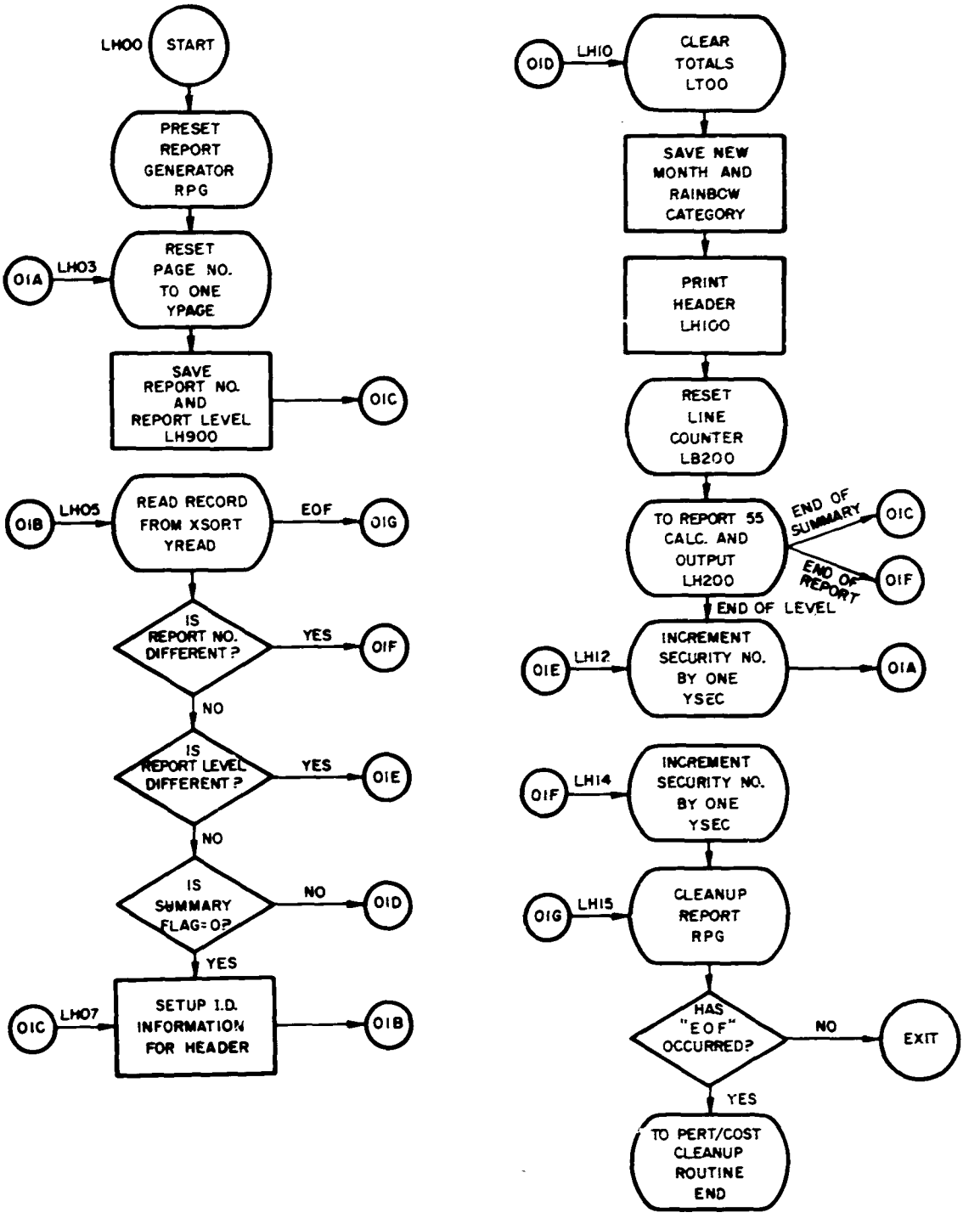
Not applicable.

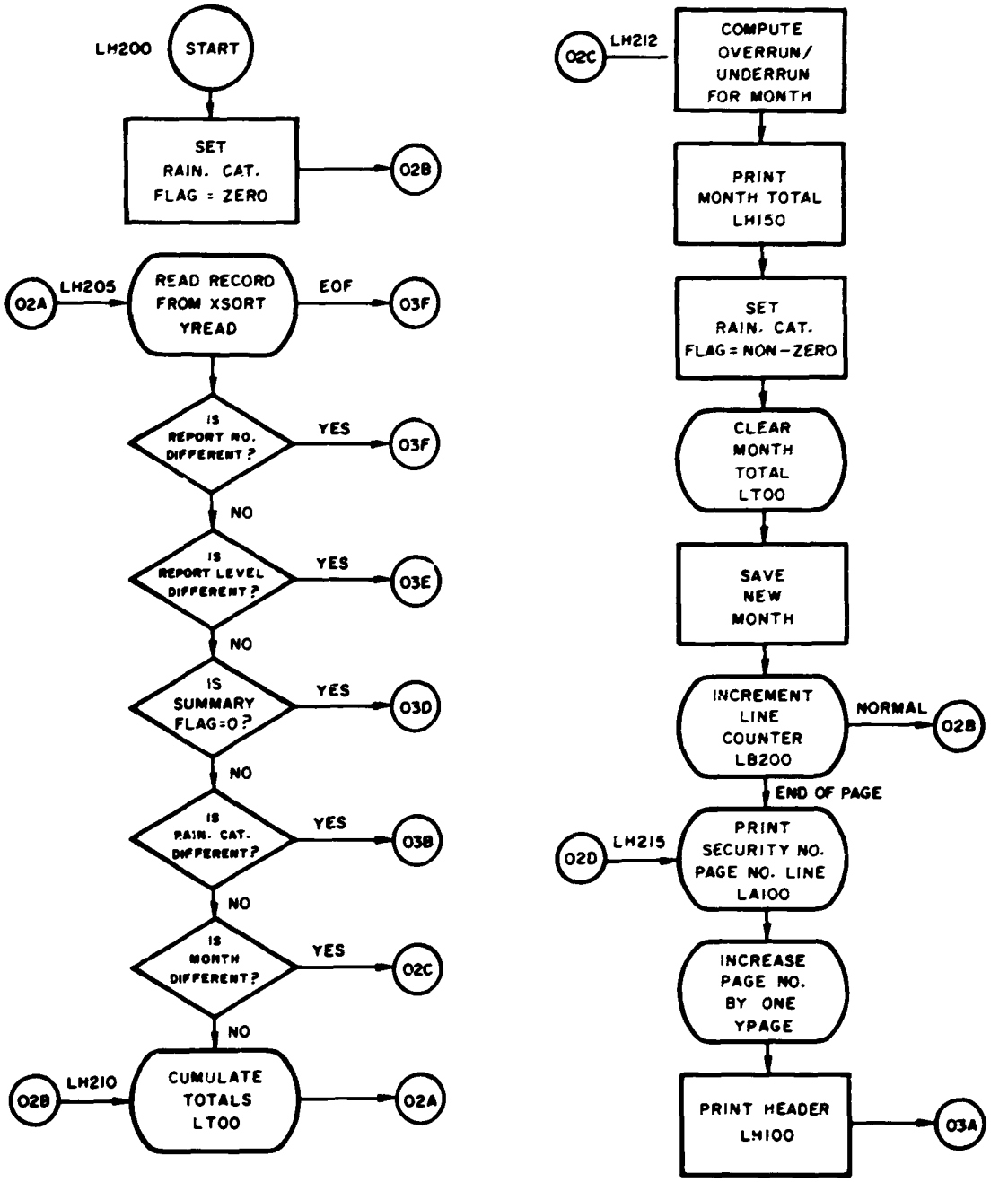
SUBREGIONS AND SUBROUTINES USED:

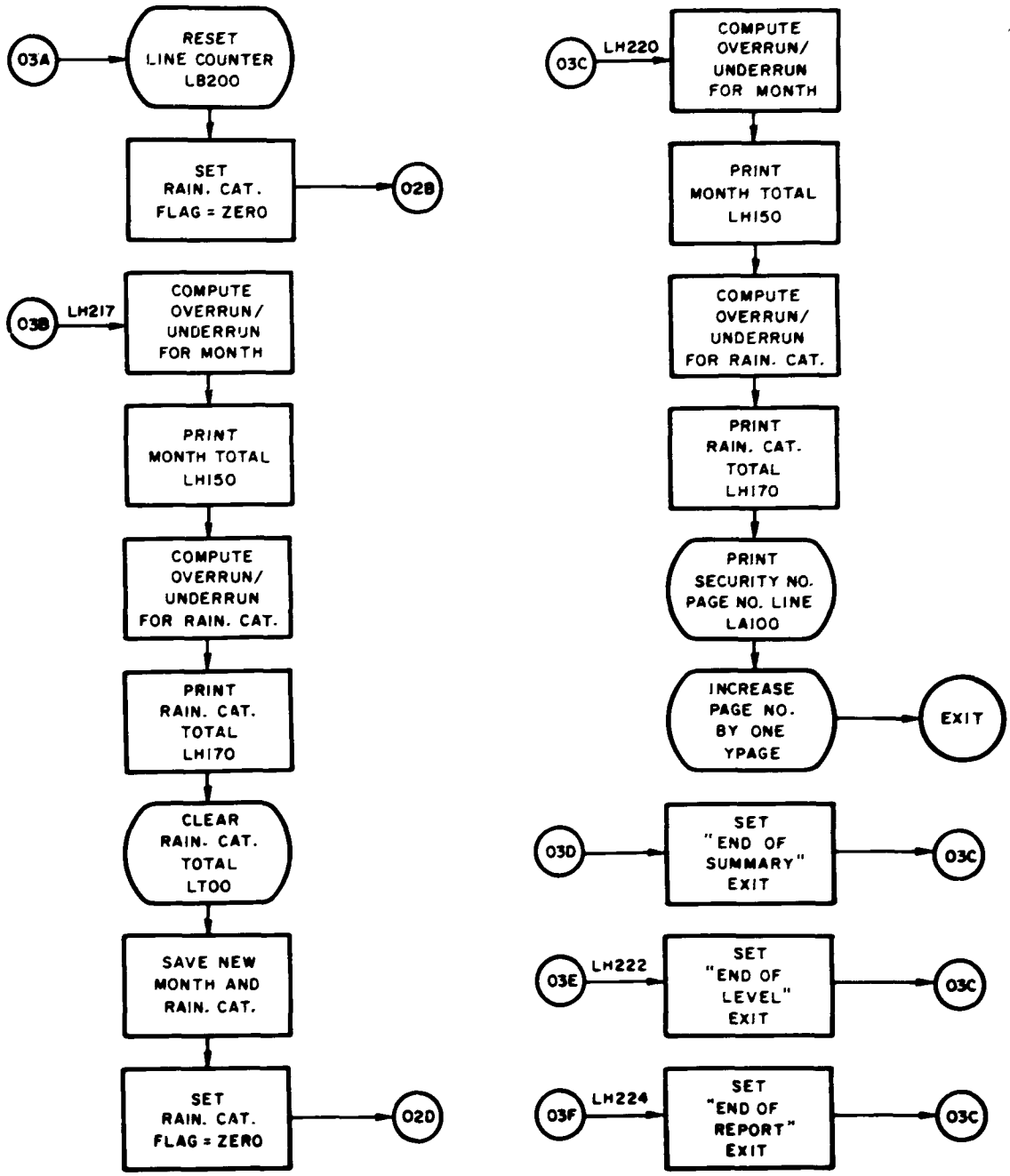
YPAGE	YREAD	LT00
LB200	YSEC	DATE
LA100		

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


LH00
START
PRESET REPORT GENERATOR RPG
01A
LH03
RESET PAGE NO. TO ONE YPAGE
SAVE REPORT NO. AND REPORT LEVEL LH900
01C
01B
LH05
READ RECORD FROM XSORT YREAD
EOF
01G
IS REPORT NO. DIFFERENT?
YES
01F
NO
IS REPORT LEVEL DIFFERENT?
YES
01E
NO
IS SUMMARY FLAG=0?
NO
01D
YES
01C
LH07
SETUP I.D. INFORMATION FOR HEADER
01B
01D
LH10
CLEAR TOTALS LT00
SAVE NEW MONTH AND RAINBOW CATEGORY
PRINT HEADER LH100
RESET LINE COUNTER LB200
TO REPORT 55 CALC. AND OUTPUT LH200
END OF SUMMARY
01C
END OF REPORT
01F
END OF LEVEL
01E
LH12
INCREMENT SECURITY NO. BY ONE YSEC
01A
01F
LH14
INCREMENT SECURITY NO. BY ONE YSEC
01G
LH15
CLEANUP REPORT RPG
HAS "EOF" OCCURRED?
NO
EXIT
YES
TO PERT/COST CLEANUP ROUTINE END


LH200
START
SET RAIN. CAT. FLAG = ZERO
02B
02A
LH205
READ RECORD FROM XSORT YREAD
EOF
03F
IS REPORT NO. DIFFERENT?
YES
03F
NO
IS REPORT LEVEL DIFFERENT?
YES
03E
NO
IS SUMMARY FLAG=0?
YES
03D
NO
IS RAIN. CAT. DIFFERENT?
YES
03B
NO
IS MONTH DIFFERENT?
YES
02C
NO
02B
LH210
CUMULATE TOTALS LT00
02A
02C
LH212
COMPUTE OVERRUN/ UNDERRUN FOR MONTH
PRINT MONTH TOTAL LH150
SET RAIN. CAT. FLAG = NON-ZERO
CLEAR MONTH TOTAL LT00
SAVE NEW MONTH
INCREMENT LINE COUNTER LB200
NORMAL
02B
END OF PAGE
02D
LH215
PRINT SECURITY NO. PAGE NO. LINE LA100
INCREASE PAGE NO. BY ONE YPAGE
PRINT HEADER LH100
03A


03A
RESET LINE COUNTER LB200
SET RAIN. CAT. FLAG = ZERO
02B
03B
LH217
COMPUTE OVERRUN/ UNDERRUN FOR MONTH
PRINT MONTH TOTAL LH150
COMPUTE OVERRUN/ UNDERRUN FOR RAIN. CAT.
PRINT RAIN. CAT. TOTAL LH170
CLEAR RAIN. CAT. TOTAL LT00
SAVE NEW MONTH AND RAIN. CAT.
SET RAIN. CAT. FLAG = ZERO
02D
03C
LH220
COMPUTE OVERRUN/ UNDERRUN FOR MONTH
PRINT MONTH TOTAL LH150
COMPUTE OVERRUN/ UNDERRUN FOR RAIN. CAT.
PRINT RAIN. CAT. TOTAL LH170
PRINT SECURITY NO. PAGE NO. LINE LA100
INCREASE PAGE NO. BY ONE YPAGE
EXIT
03D
SET "END OF SUMMARY" EXIT
03C
03E
LH222
SET "END OF LEVEL" EXIT
03C
03F
LH224
SET "END OF REPORT" EXIT
03C

Region LK00

EXPLANATION OF REGION:

To cumulate data and print Report 60.

CALLING SEQUENCE:

```
L     TSX    LK00, 4
L+1   Normal return
```

INPUT:

Report 60 information from XSORT.

OUTPUT:

Report 60 on output print tape.

STORAGE USED:

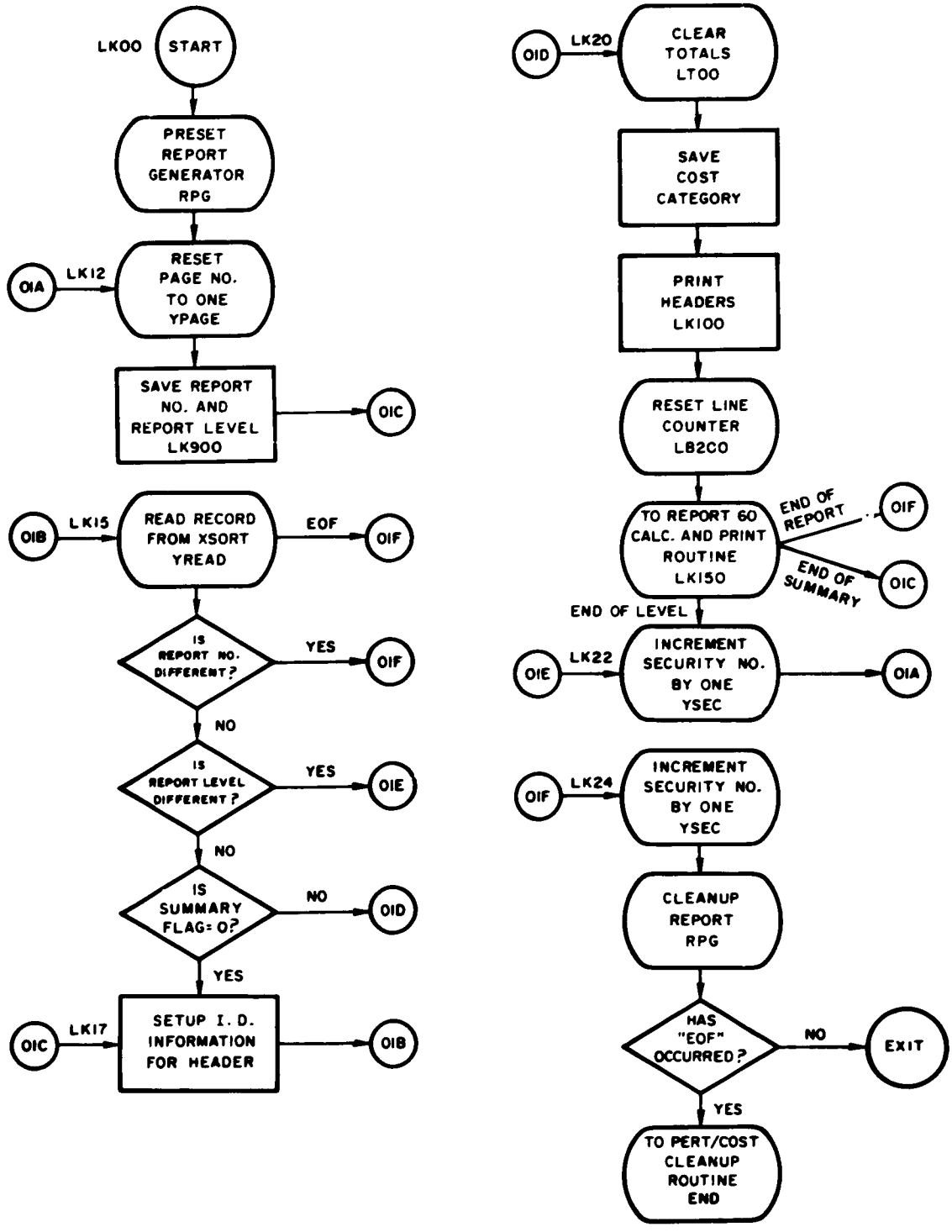
Not applicable.

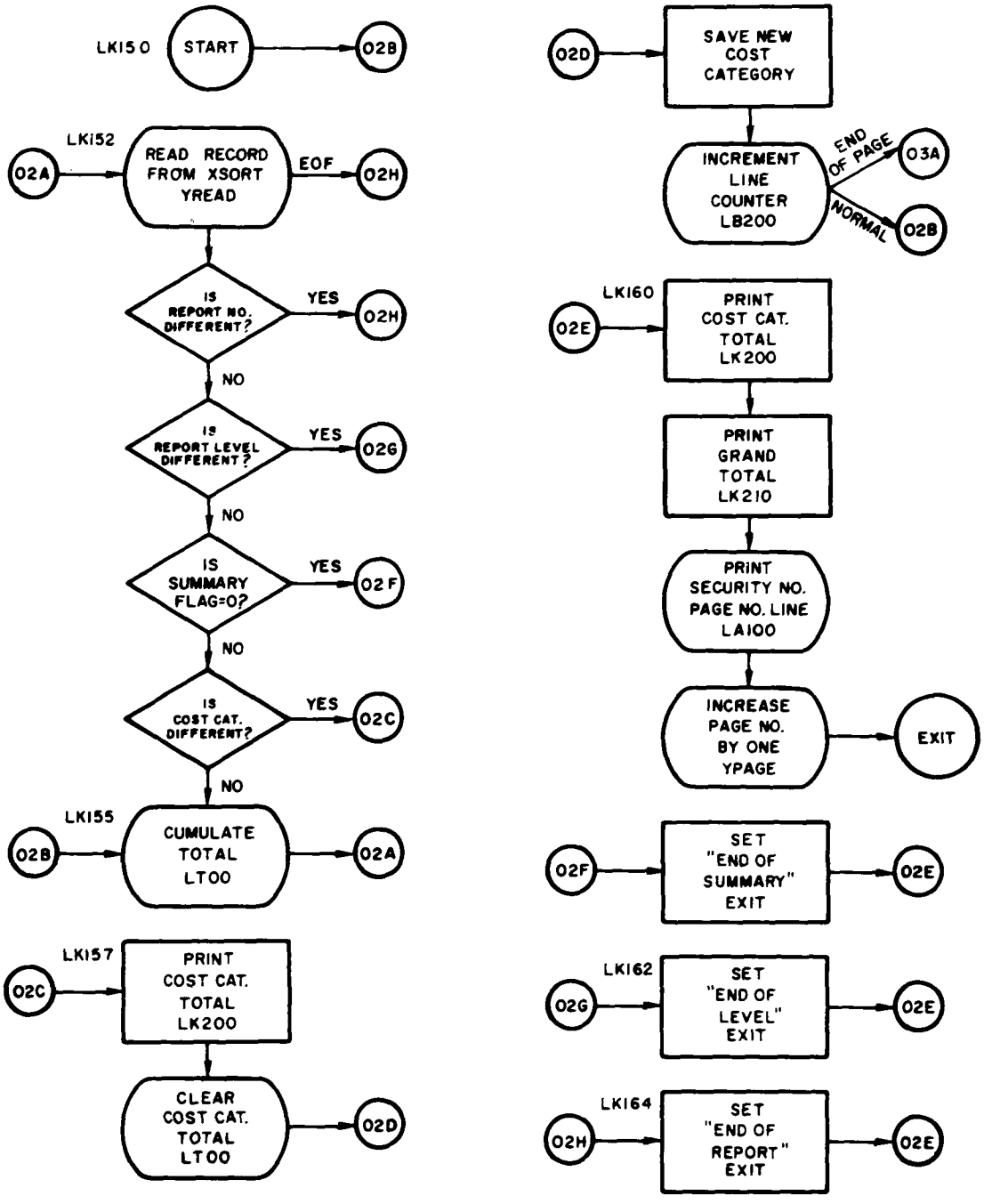
SUBREGIONS AND SUBROUTINES USED:

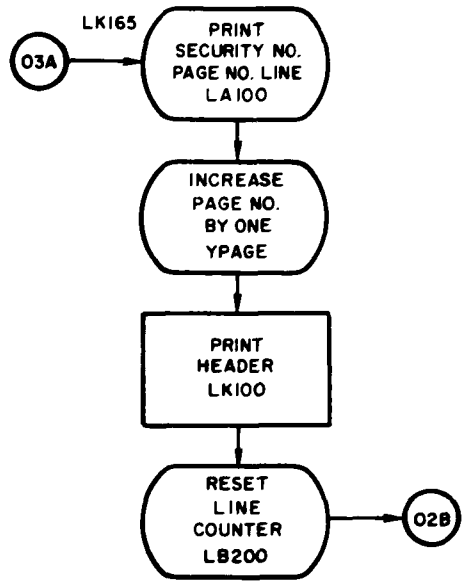
YPAGE	YREAD	LT00
LB200	YSEC	LA100
LX00		

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


LK00
START
PRESET REPORT GENERATOR RPG
01A
LK12
RESET PAGE NO. TO ONE YPAGE
SAVE REPORT NO. AND REPORT LEVEL LK900
01C
01B
LK15
READ RECORD FROM XSORT YREAD
EOF
01F
IS REPORT NO. DIFFERENT?
YES
01F
NO
IS REPORT LEVEL DIFFERENT?
YES
01E
NO
IS SUMMARY FLAG=0?
NO
01D
YES
01C
LK17
SETUP I. D. INFORMATION FOR HEADER
01B
01D
LK20
CLEAR TOTALS LT00
SAVE COST CATEGORY
PRINT HEADERS LK100
RESET LINE COUNTER LB200
TO REPORT 60 CALC. AND PRINT ROUTINE LK150
END OF REPORT
01F
END OF SUMMARY
01C
END OF LEVEL
01E
LK22
INCREMENT SECURITY NO. BY ONE YSEC
01A
01F
LK24
INCREMENT SECURITY NO. BY ONE YSEC
CLEANUP REPORT RPG
HAS "EOF" OCCURRED?
NO
EXIT
YES
TO PERT/COST CLEANUP ROUTINE END


LK150
START
02B
LK152
02A
READ RECORD FROM XSORT YREAD
EOF
02H
IS REPORT NO. DIFFERENT?
YES
02H
NO
IS REPORT LEVEL DIFFERENT?
YES
02G
NO
IS SUMMARY FLAG=0?
YES
02F
NO
IS COST CAT. DIFFERENT?
YES
02C
NO
LK155
02B
CUMULATE TOTAL LT00
02A
LK157
02C
PRINT COST CAT. TOTAL LK200
CLEAR COST CAT. TOTAL LT00
02D
02D
SAVE NEW COST CATEGORY
INCREMENT LINE COUNTER LB200
END OF PAGE
03A
NORMAL
02B
LK160
02E
PRINT COST CAT. TOTAL LK200
PRINT GRAND TOTAL LK210
PRINT SECURITY NO. PAGE NO. LINE LA100
INCREASE PAGE NO. BY ONE YPAGE
EXIT
02F
SET "END OF SUMMARY" EXIT
02E
LK162
02G
SET "END OF LEVEL" EXIT
02E
LK164
02H
SET "END OF REPORT" EXIT
02E


LK165
03A
PRINT
SECURITY NO.
PAGE NO. LINE
LA100
INCREASE
PAGE NO.
BY ONE
YPAGE
PRINT
HEADER
LK100
RESET
LINE
COUNTER
LB200
02B

Region LM00

EXPLANATION OF REGION:

Setup region for printing Report 80.

CALLING SEQUENCE:

L BX LM00, 4

L+1 Normal return

INPUT:

Report 80 information from XSORT.

OUTPUT:

Report 80 on output report tape.

STORAGE USED:

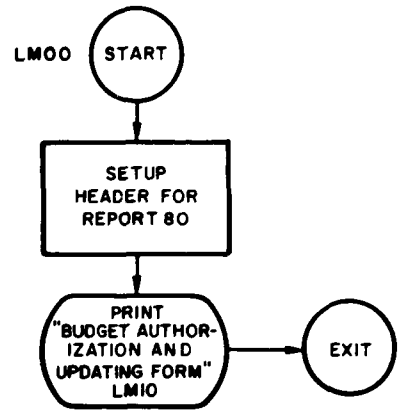
Not applicable.

SUBREGIONS AND SUBROUTINES USED:

LM10

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


LM00
START
SETUP HEADER FOR REPORT 80
PRINT "BUDGET AUTHORIZATION AND UPDATING FORM" LM10
EXIT

Region LM05

EXPLANATION OF REGION:

Setup region for printing Report 85.

CALLING SEQUENCE:

L TSX LM05, 4

L+1 Normal return

INPUT:

Report 85 information from XSORT.

OUTPUT:

Report 85 on output report tape.

STORAGE USED:

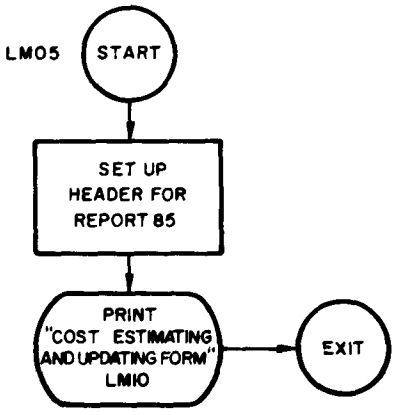
Not applicable.

SUBREGIONS AND SUBROUTINES USED:

LM10

EXPLANATION OF CALLING SEQUENCE:

Not applicable.


LM05
START
SET UP HEADER FOR REPORT 85
PRINT "COST ESTIMATING AND UPDATING FORM" LM10
EXIT

Region LM10

EXPLANATION OF REGION:

To print "Budget Authorization and Updating Form" or "Cost Estimating and Updating Form."

CALLING SEQUENCE:

```
L     TSX   LM10, 4
L+1   PZE   0, 0, R
L+2   PZE   A,, B
L+3   Normal return
```

INPUT:

Information from XSORT routine.

OUTPUT:

Report on output print tape.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

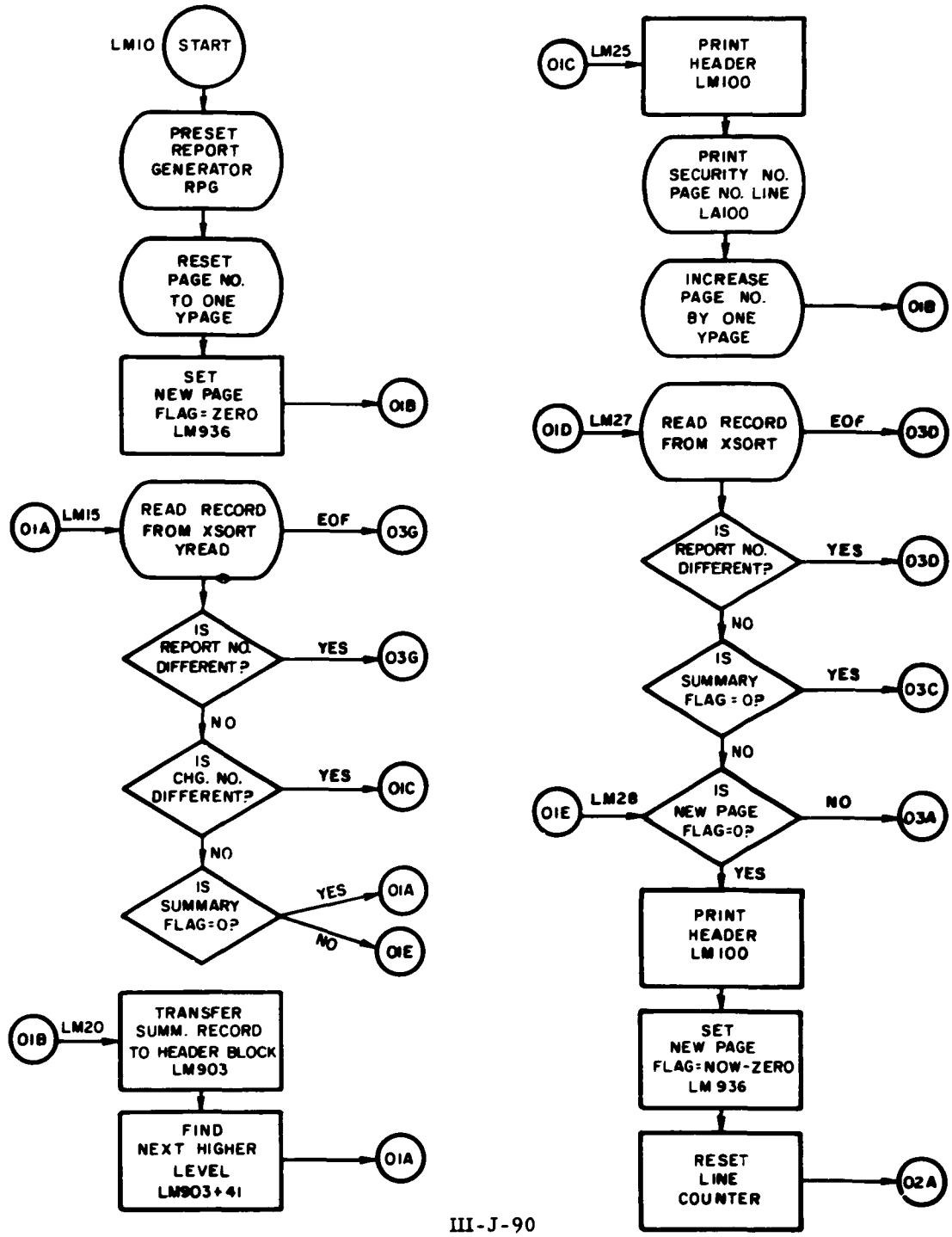
YPAGE	YREAD	YCOMP
UPCK	LA100	YSEC

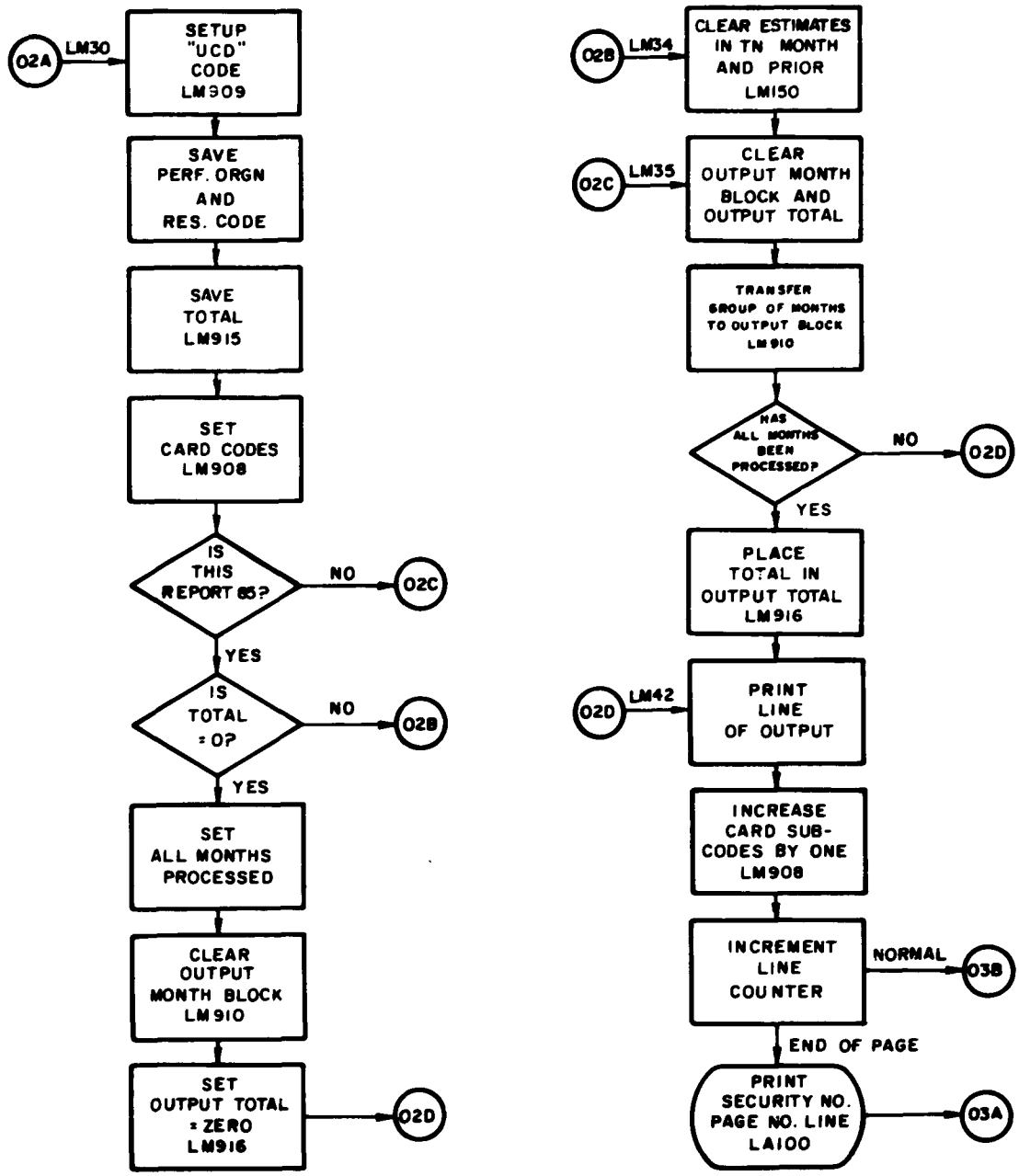
EXPLANATION OF CALLING SEQUENCE:

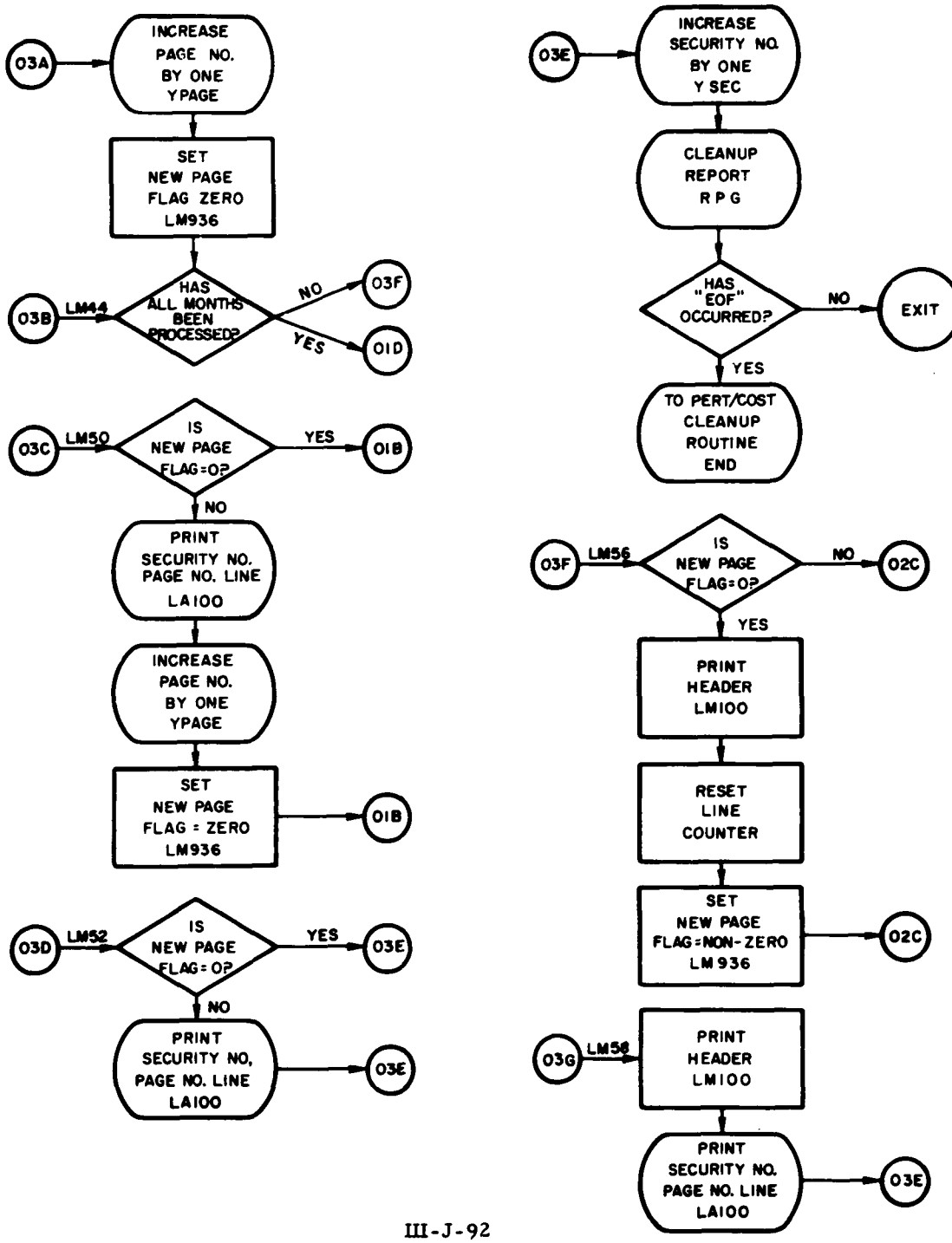
R = report number

A = location of report name

B = location of report heading information


LM10
START
PRESET REPORT GENERATOR RPG
RESET PAGE NO. TO ONE YPAGE
SET NEW PAGE FLAG=ZERO LM936
01B
01A
LM15
READ RECORD FROM XSORT YREAD
EOF
03G
IS REPORT NO. DIFFERENT?
YES
03G
NO
IS CHG. NO. DIFFERENT?
YES
01C
NO
IS SUMMARY FLAG=0?
YES
01A
NO
01E
01B
LM20
TRANSFER SUMM. RECORD TO HEADER BLOCK LM903
FIND NEXT HIGHER LEVEL LM903+41
01A
01C
LM25
PRINT HEADER LM100
PRINT SECURITY NO. PAGE NO. LINE LA100
INCREASE PAGE NO. BY ONE YPAGE
01B
01D
LM27
READ RECORD FROM XSORT
EOF
03D
IS REPORT NO. DIFFERENT?
YES
03D
NO
IS SUMMARY FLAG=0?
YES
03C
NO
01E
LM28
IS NEW PAGE FLAG=0?
NO
03A
YES
PRINT HEADER LM100
SET NEW PAGE FLAG=NOW-ZERO LM936
RESET LINE COUNTER
02A


02A
LM30
SETUP "UCD" CODE LM909
SAVE PERF. ORGN AND RES. CODE
SAVE TOTAL LM915
SET CARD CODES LM908
IS THIS REPORT 65?
NO
02C
YES
IS TOTAL = 0?
NO
02B
YES
SET ALL MONTHS PROCESSED
CLEAR OUTPUT MONTH BLOCK LM910
SET OUTPUT TOTAL = ZERO LM916
02D
02B
LM34
CLEAR ESTIMATES IN TN MONTH AND PRIOR LM150
02C
LM35
CLEAR OUTPUT MONTH BLOCK AND OUTPUT TOTAL
TRANSFER GROUP OF MONTHS TO OUTPUT BLOCK LM910
HAS ALL MONTHS BEEN PROCESSED?
NO
02D
YES
PLACE TOTAL IN OUTPUT TOTAL LM916
02D
LM42
PRINT LINE OF OUTPUT
INCREASE CARD SUB-CODES BY ONE LM908
INCREMENT LINE COUNTER
NORMAL
03B
END OF PAGE
PRINT SECURITY NO. PAGE NO. LINE LA100
03A


03A
INCREASE PAGE NO. BY ONE YPAGE
SET NEW PAGE FLAG ZERO LM936
03B
LM44
HAS ALL MONTHS BEEN PROCESSED?
NO
YES
03F
01D
03C
LM50
IS NEW PAGE FLAG=0?
YES
01B
NO
PRINT SECURITY NO. PAGE NO. LINE LA100
INCREASE PAGE NO. BY ONE YPAGE
SET NEW PAGE FLAG = ZERO LM936
01B
03D
LM52
IS NEW PAGE FLAG=0?
YES
03E
NO
PRINT SECURITY NO, PAGE NO. LINE LA100
03E
03E
INCREASE SECURITY NO. BY ONE Y SEC
CLEANUP REPORT R P G
HAS "EOF" OCCURRED?
NO
EXIT
YES
TO PERT/COST CLEANUP ROUTINE END
03F
LM56
IS NEW PAGE FLAG=0?
NO
02C
YES
PRINT HEADER LM100
RESET LINE COUNTER
SET NEW PAGE FLAG=NON-ZERO LM936
02C
03G
LM58
PRINT HEADER LM100
PRINT SECURITY NO. PAGE NO. LINE LA100
03E

Region LN00

EXPLANATION OF REGION:

To cumulate cost information up work breakdown structure and print Reports 70 and 75.

CALLING SEQUENCE:

L TSX LN00, 4

L+1 Normal return

INPUT:

Report 70 or 75 information from XSORT.

OUTPUT:

Report 70 or 75 on output reporting tape.

STORAGE USED:

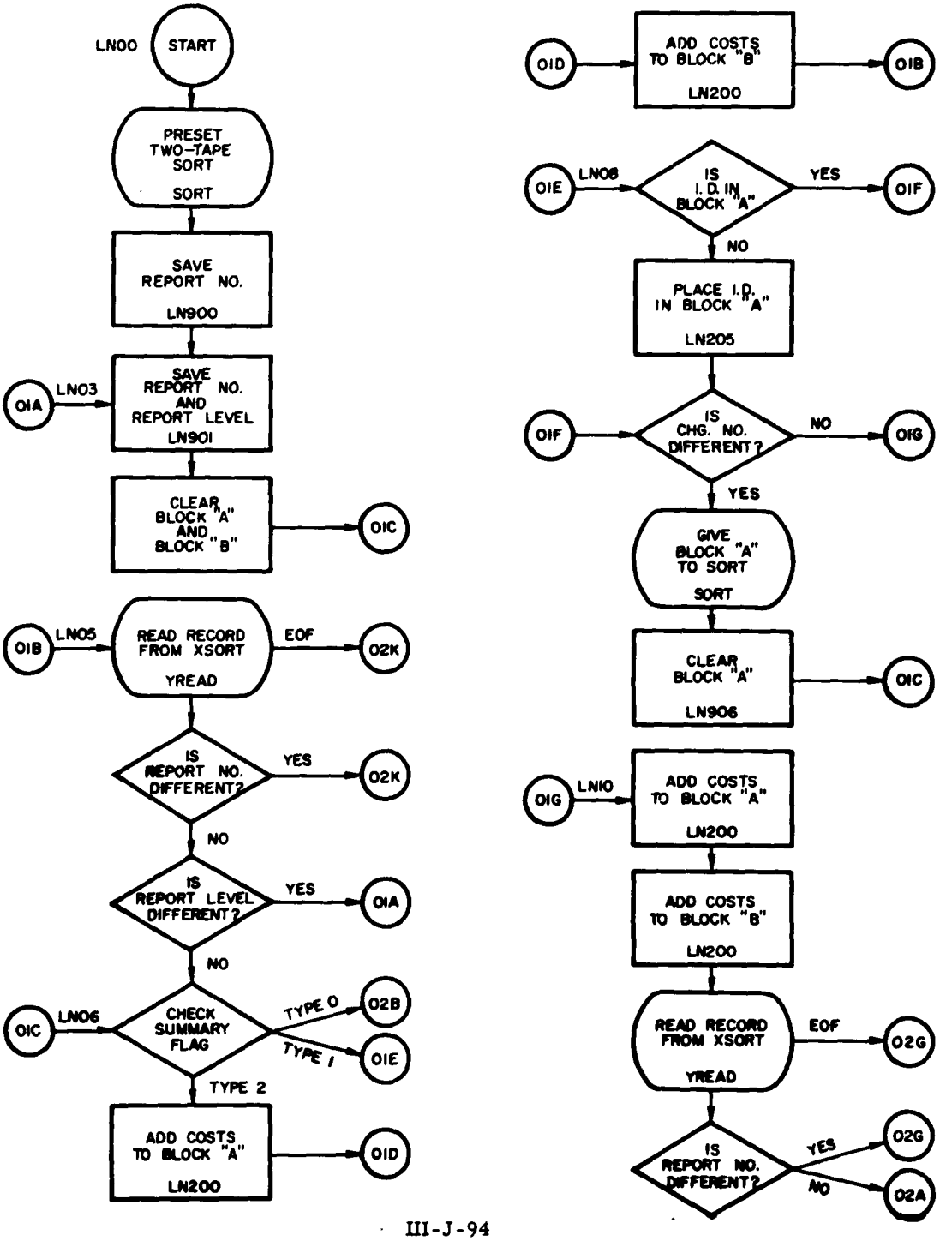
Not applicable.

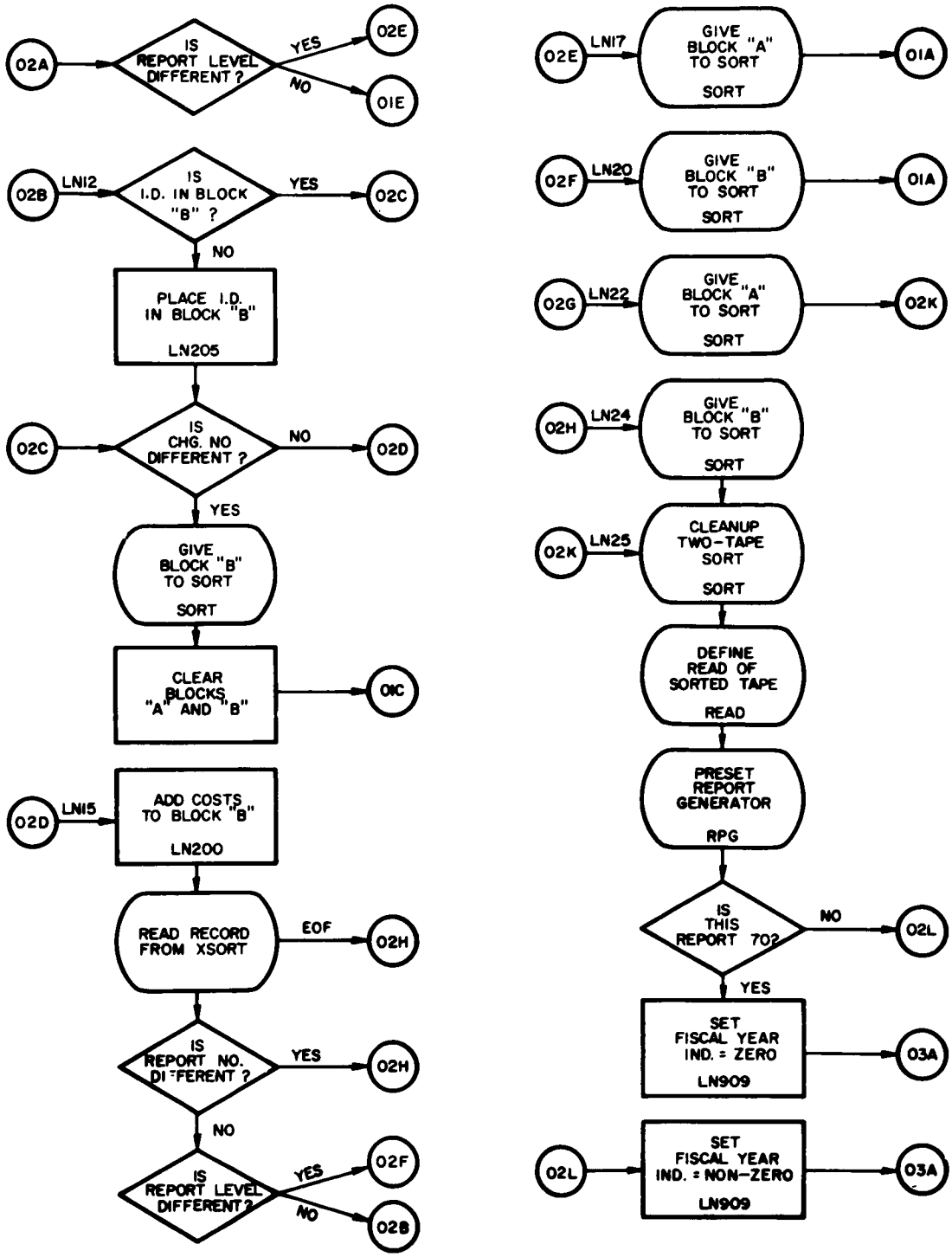
SUBREGIONS AND SUBROUTINES USED:

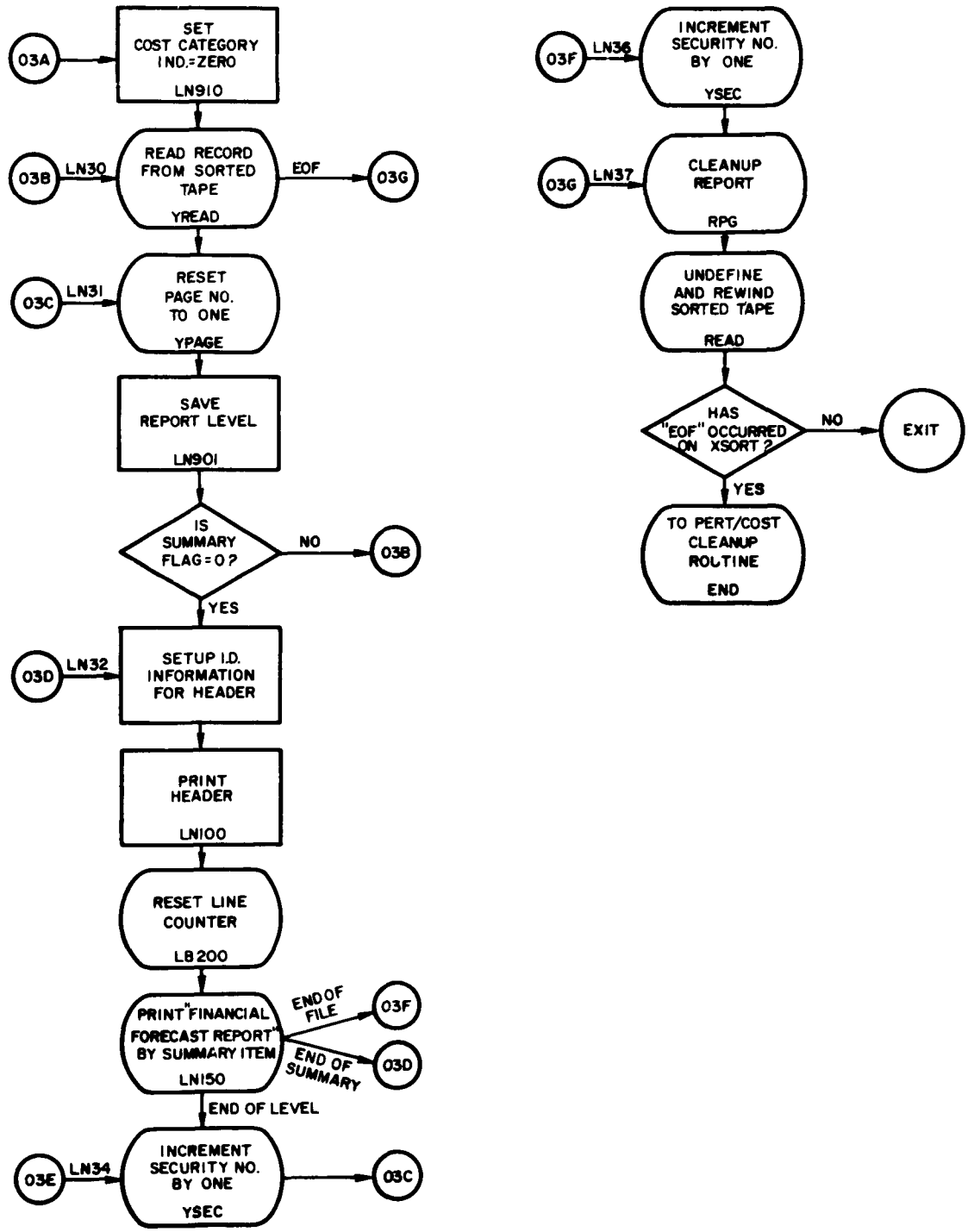
SORT	YREAD	YCOMP
READ	YPAGE	LB200
YSEC	LA100	LX00

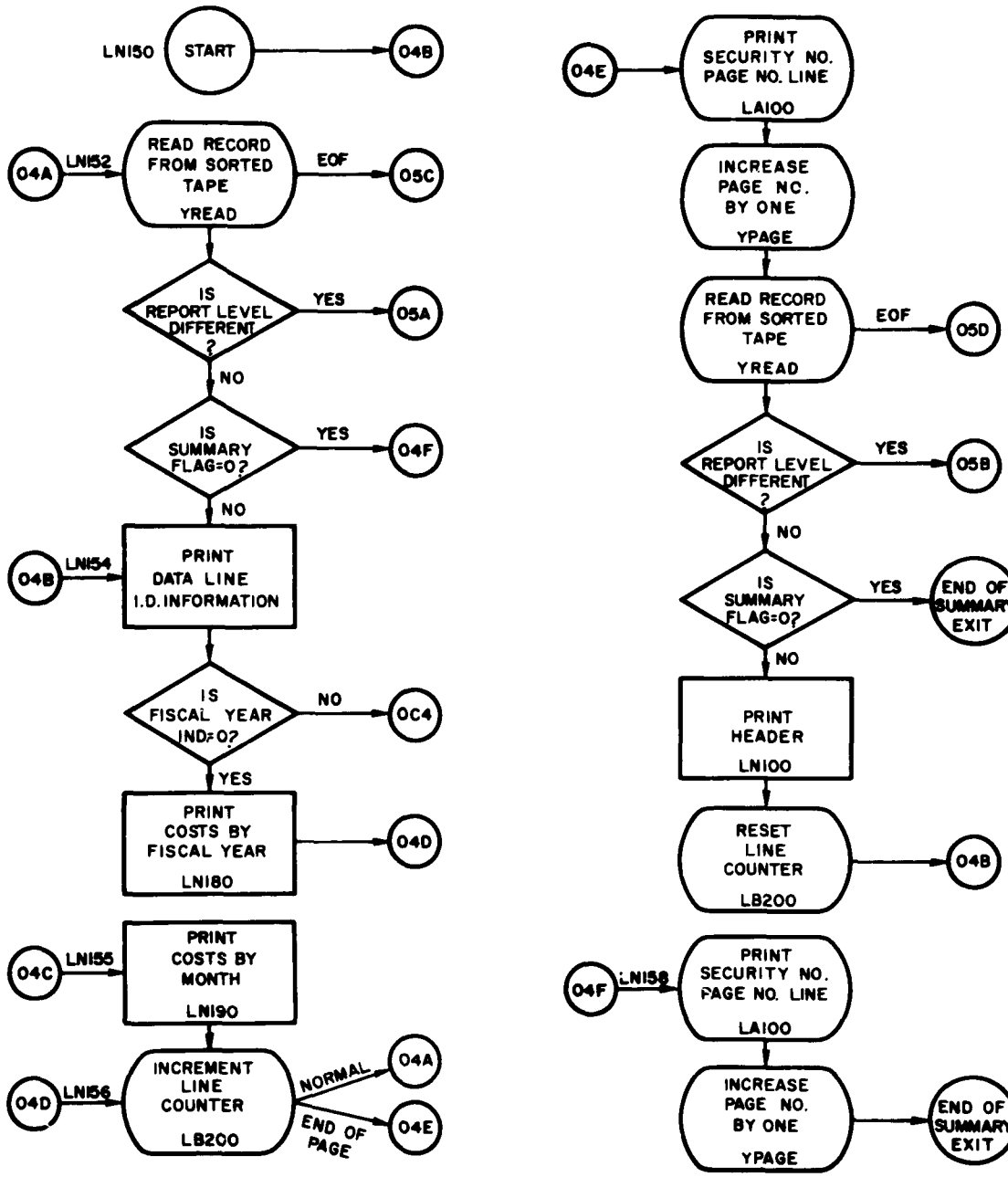
EXPLANATION OF CALLING SEQUENCE:

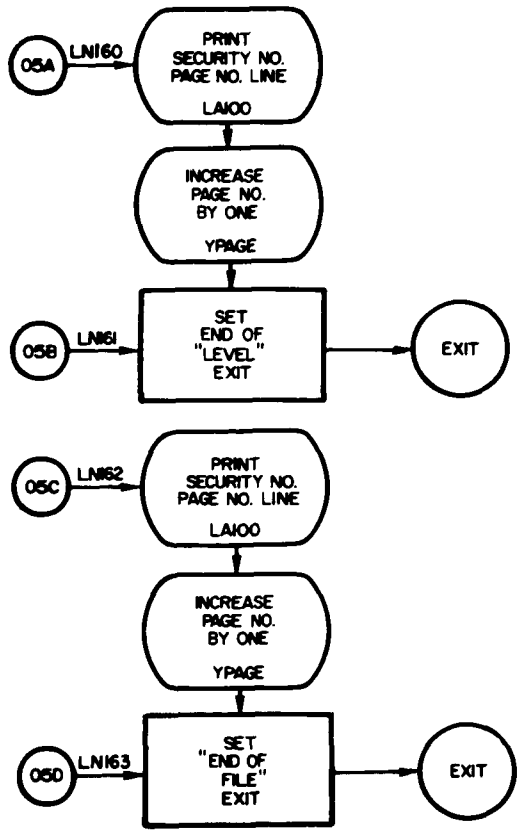
Not applicable.


LN00
START
PRESET TWO-TAPE SORT
SORT
SAVE REPORT NO.
LN900
01A
LN03
SAVE REPORT NO. AND REPORT LEVEL
LN901
CLEAR BLOCK "A" AND BLOCK "B"
01C
01B
LN05
READ RECORD FROM XSORT
YREAD
EOF
02K
IS REPORT NO. DIFFERENT?
YES
02K
NO
IS REPORT LEVEL DIFFERENT?
YES
01A
NO
01C
LN06
CHECK SUMMARY FLAG
TYPE 0
02B
TYPE 1
01E
TYPE 2
ADD COSTS TO BLOCK "A"
LN200
01D
01D
ADD COSTS TO BLOCK "B"
LN200
01B
01E
LN08
IS I. D. IN BLOCK "A"
YES
01F
NO
PLACE I.D. IN BLOCK "A"
LN205
01F
IS CHG. NO. DIFFERENT?
NO
01G
YES
GIVE BLOCK "A" TO SORT
SORT
CLEAR BLOCK "A"
LN906
01C
01G
LN10
ADD COSTS TO BLOCK "A"
LN200
ADD COSTS TO BLOCK "B"
LN200
READ RECORD FROM XSORT
YREAD
EOF
02G
IS REPORT NO. DIFFERENT?
YES
02G
NO
02A


02A
IS REPORT LEVEL DIFFERENT ?
YES
NO
02E
01E
02B
LN12
IS I.D. IN BLOCK "B" ?
YES
02C
NO
PLACE I.D. IN BLOCK "B"
LN205
02C
IS CHG. NO DIFFERENT ?
NO
02D
YES
GIVE BLOCK "B" TO SORT
SORT
CLEAR BLOCKS "A" AND "B"
01C
02D
LN15
ADD COSTS TO BLOCK "B"
LN200
READ RECORD FROM XSORT
EOF
02H
IS REPORT NO. DIFFERENT ?
YES
02H
NO
IS REPORT LEVEL DIFFERENT ?
YES
02F
NO
02B
02E
LN17
GIVE BLOCK "A" TO SORT
SORT
01A
02F
LN20
GIVE BLOCK "B" TO SORT
SORT
01A
02G
LN22
GIVE BLOCK "A" TO SORT
SORT
02K
02H
LN24
GIVE BLOCK "B" TO SORT
SORT
02K
LN25
CLEANUP TWO-TAPE SORT
SORT
DEFINE READ OF SORTED TAPE
READ
PRESET REPORT GENERATOR
RPG
IS THIS REPORT 702
NO
02L
YES
SET FISCAL YEAR IND. = ZERO
LN909
03A
02L
SET FISCAL YEAR IND. = NON-ZERO
LN909
03A


03A
SET COST CATEGORY IND.=ZERO
LN910
03B
LN30
READ RECORD FROM SORTED TAPE
YREAD
EOF
03G
03C
LN31
RESET PAGE NO. TO ONE
YPAGE
SAVE REPORT LEVEL
LN901
IS SUMMARY FLAG=0?
NO
03B
YES
03D
LN32
SETUP I.D. INFORMATION FOR HEADER
PRINT HEADER
LN100
RESET LINE COUNTER
LB200
PRINT "FINANCIAL FORECAST REPORT" BY SUMMARY ITEM
LN150
END OF FILE
03F
END OF SUMMARY
03D
END OF LEVEL
03E
LN34
INCREMENT SECURITY NO. BY ONE
YSEC
03C
03F
LN36
INCREMENT SECURITY NO. BY ONE
YSEC
03G
LN37
CLEANUP REPORT
RPG
UNDEFINE AND REWIND SORTED TAPE
READ
HAS "EOF" OCCURRED ON XSORT?
NO
EXIT
YES
TO PERT/COST CLEANUP ROUTINE
END


LNI50
START
04B
04A
LNI52
READ RECORD FROM SORTED TAPE
YREAD
EOF
05C
IS REPORT LEVEL DIFFERENT ?
YES
05A
NO
IS SUMMARY FLAG=0?
YES
04F
NO
04B
LNI54
PRINT DATA LINE I.D. INFORMATION
IS FISCAL YEAR IND=0?
NO
0C4
YES
PRINT COSTS BY FISCAL YEAR
LNI80
04D
04C
LNI55
PRINT COSTS BY MONTH
LNI90
04D
LNI56
INCREMENT LINE COUNTER
LB200
NORMAL
04A
END OF PAGE
04E
04E
PRINT SECURITY NO. PAGE NO. LINE
LAI00
INCREASE PAGE NO. BY ONE
YPAGE
READ RECORD FROM SORTED TAPE
YREAD
EOF
05D
IS REPORT LEVEL DIFFERENT ?
YES
05B
NO
IS SUMMARY FLAG=0?
YES
END OF SUMMARY EXIT
NO
PRINT HEADER
LNI00
RESET LINE COUNTER
LB200
04B
04F
LNI58
PRINT SECURITY NO. PAGE NO. LINE
LAI00
INCREASE PAGE NO. BY ONE
YPAGE
END OF SUMMARY EXIT


05A
LN160
PRINT SECURITY NO. PAGE NO. LINE
LA100
INCREASE PAGE NO. BY ONE
YPAGE
05B
LN161
SET END OF "LEVEL" EXIT
EXIT
05C
LN162
PRINT SECURITY NO. PAGE NO. LINE
LA100
INCREASE PAGE NO. BY ONE
YPAGE
05D
LN163
SET "END OF FILE" EXIT
EXIT

Region LP00

EXPLANATION OF REGION:

To cumulate cost information by cost category and print Reports 71 and 76.

CALLING SEQUENCE:

```
L     TSX   LP00, 4
L+1   Normal return
```

INPUT:

Report 71 or 76 information from XSORT.

OUTPUT:

Report 71 or 76 on output reporting tape.

STORAGE USED:

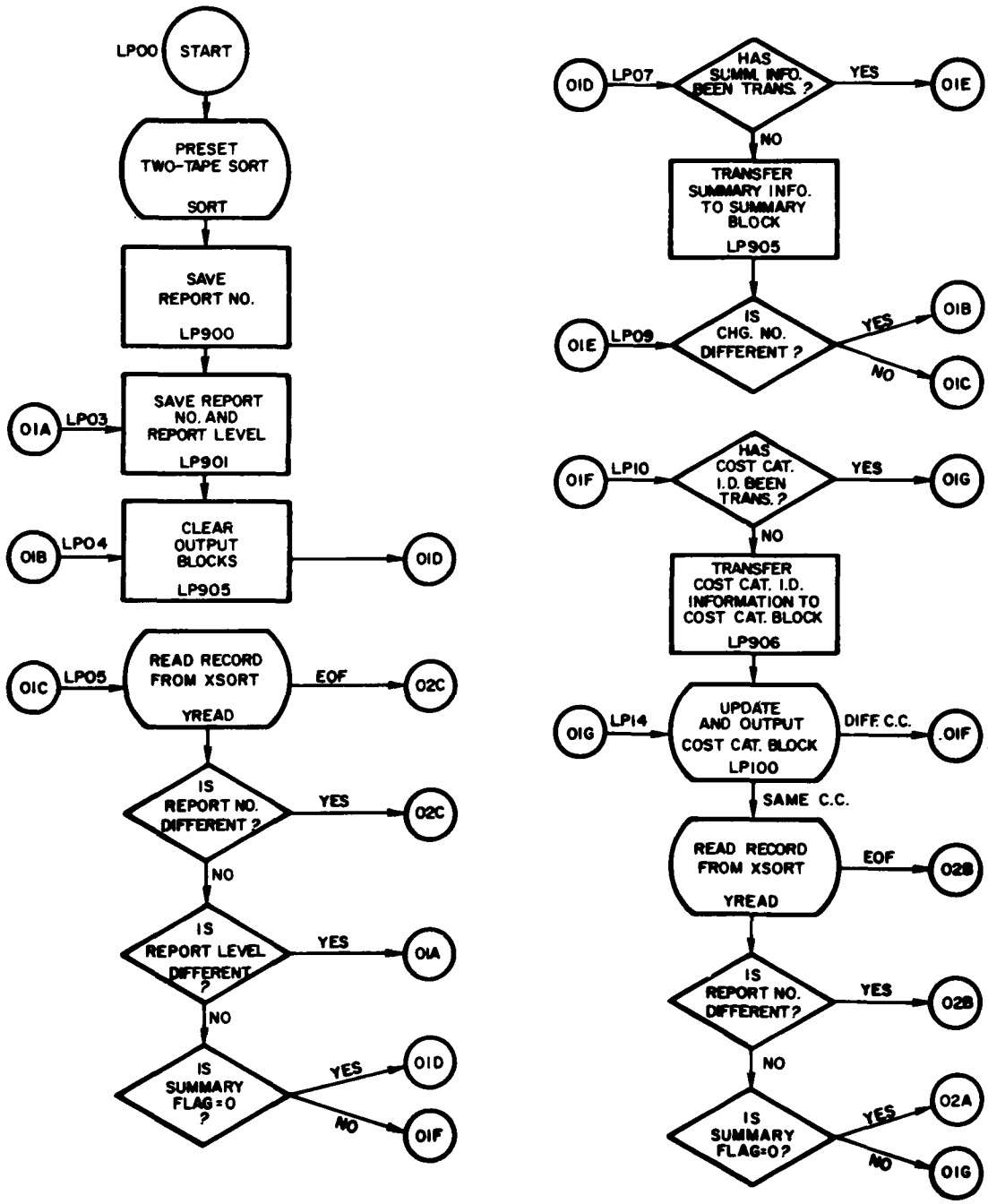
Not applicable.

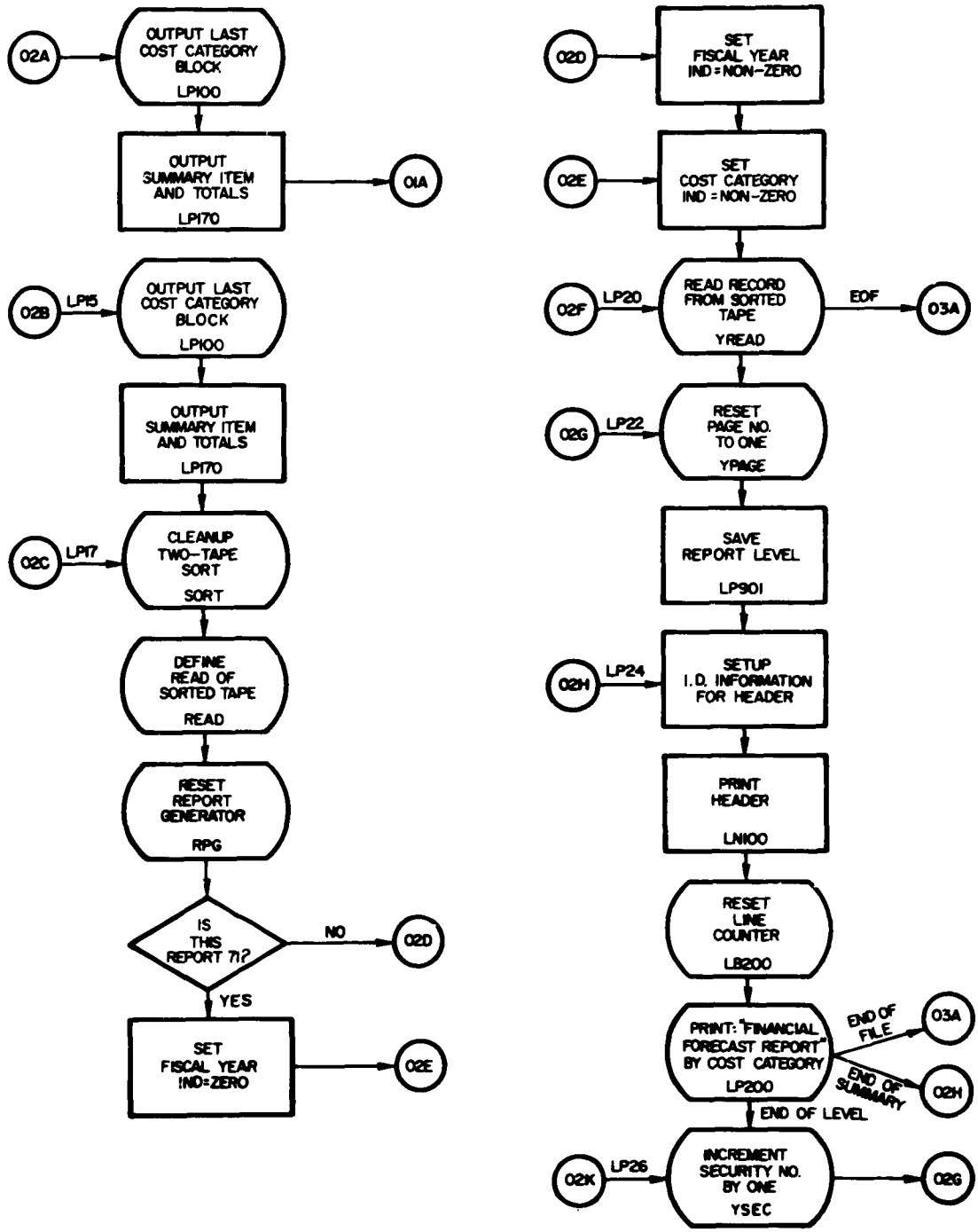
SUBREGIONS AND SUBROUTINES USED:

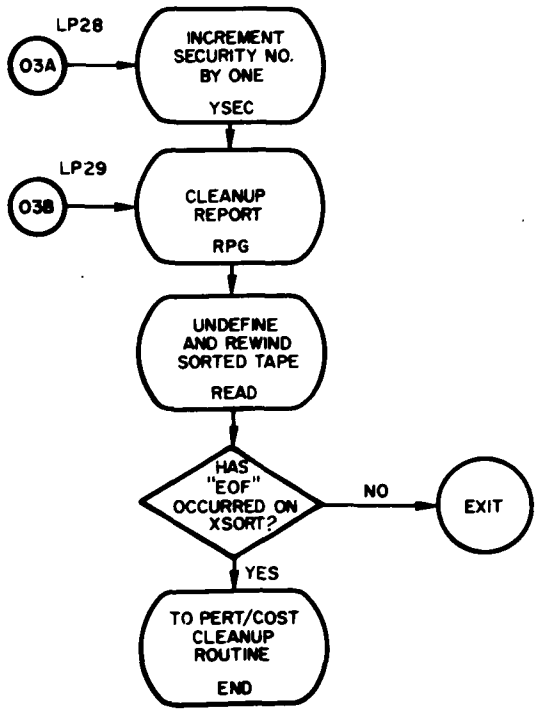
SORT	YREAD	YCOMP
READ	LB200	YSEC
YPAGE	LA100	

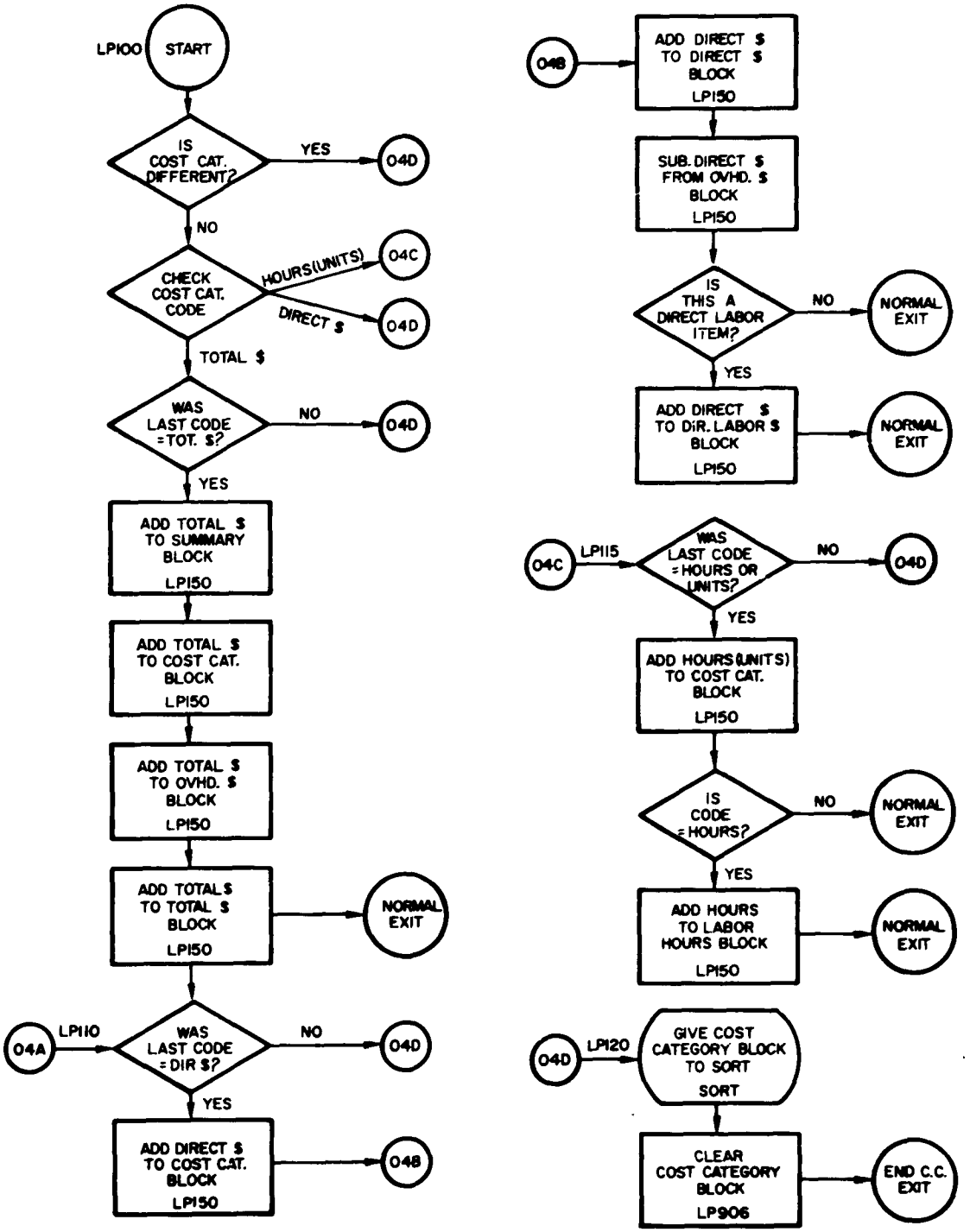
EXPLANATION OF CALLING SEQUENCE:

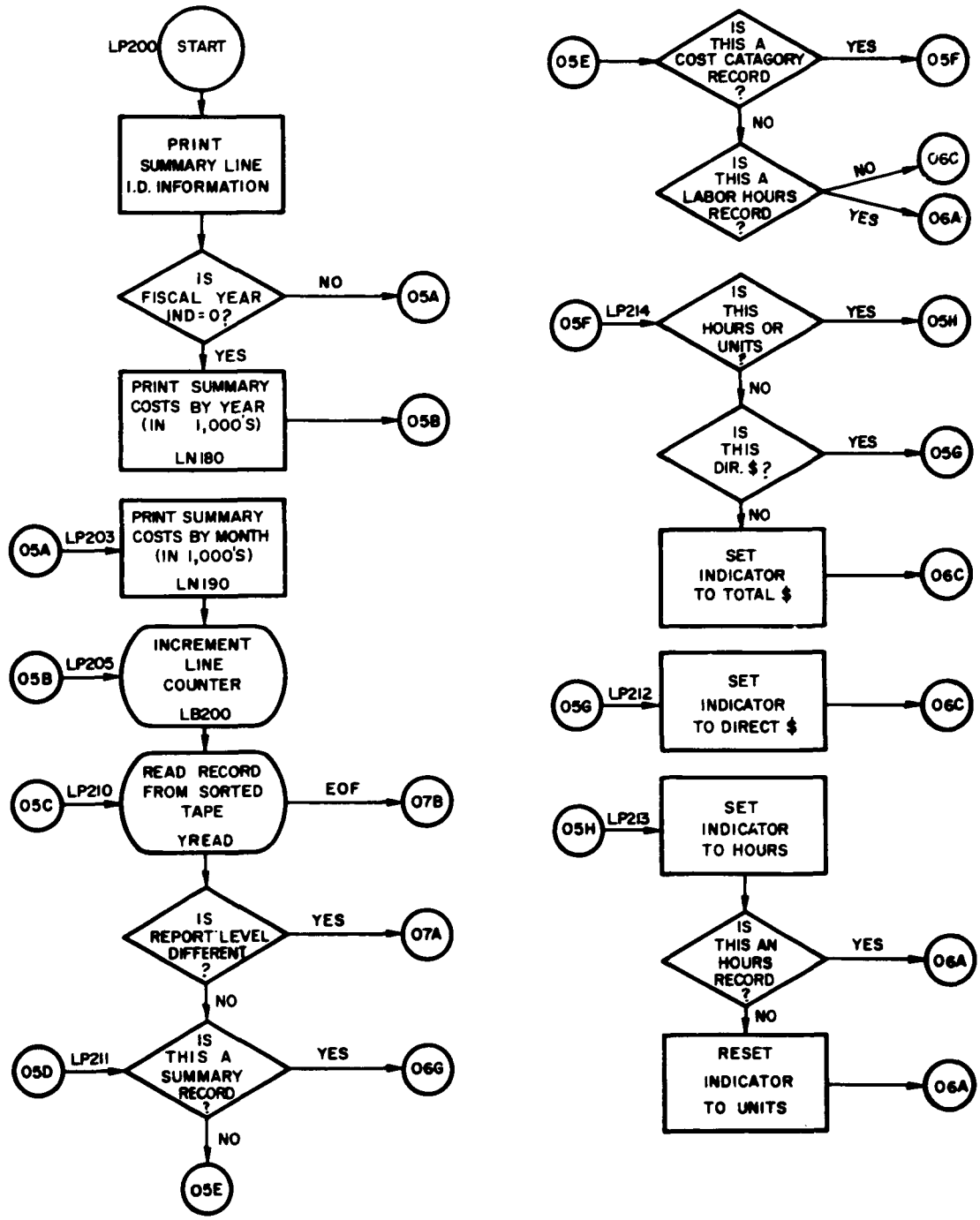
Not applicable.

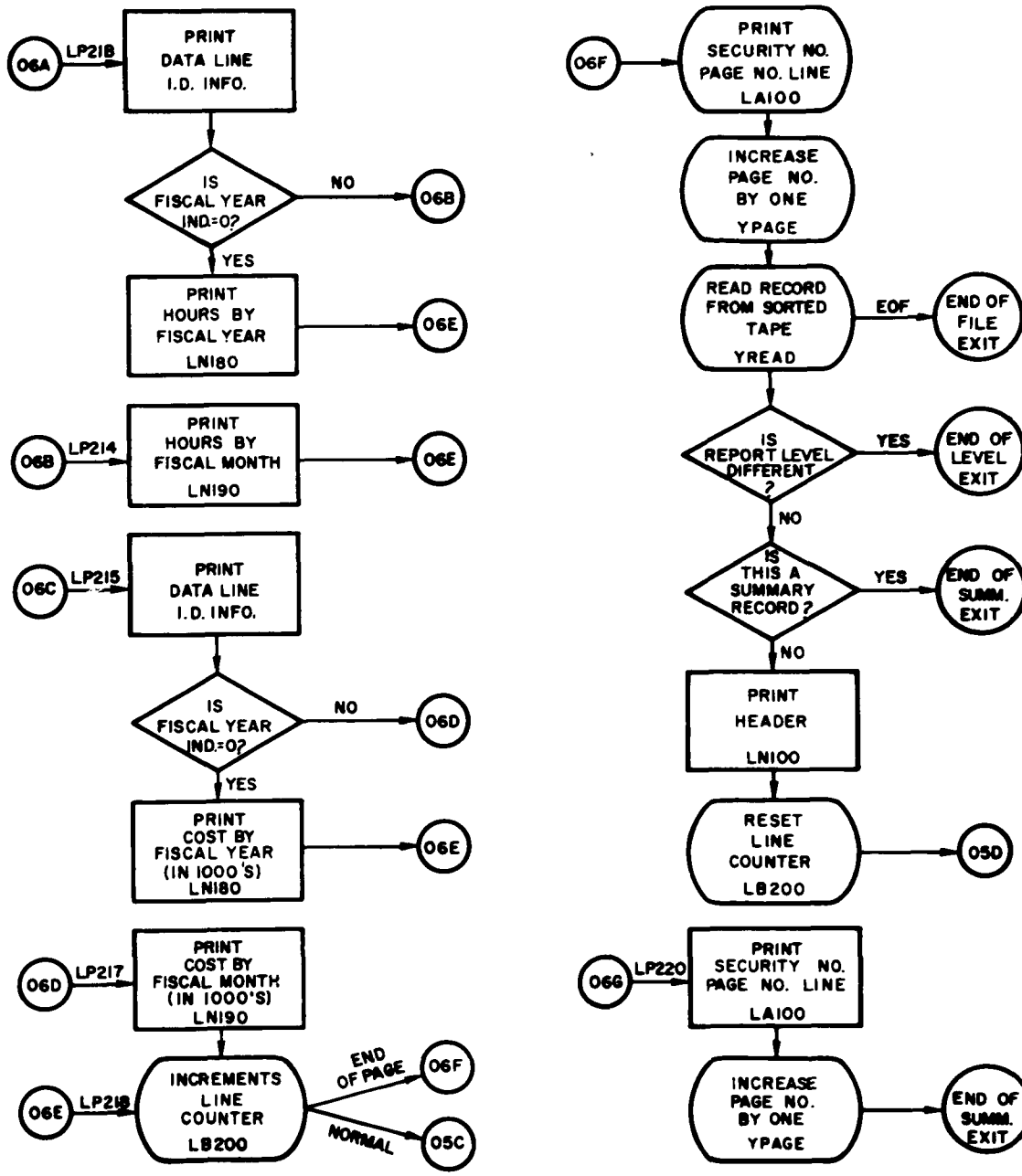

LP00
START
PRESET TWO-TAPE SORT
SORT
SAVE REPORT NO.
LP900
01A
LP03
SAVE REPORT NO. AND REPORT LEVEL
LP901
01B
LP04
CLEAR OUTPUT BLOCKS
LP905
01D
01C
LP05
READ RECORD FROM XSORT
YREAD
EOF
02C
IS REPORT NO. DIFFERENT ?
YES
02C
NO
IS REPORT LEVEL DIFFERENT ?
YES
01A
NO
IS SUMMARY FLAG=0 ?
YES
01D
NO
01F
01D
LP07
HAS SUMM. INFO. BEEN TRANS. ?
YES
01E
NO
TRANSFER SUMMARY INFO. TO SUMMARY BLOCK
LP905
01E
LP09
IS CHG. NO. DIFFERENT ?
YES
01B
NO
01C
01F
LP10
HAS COST CAT. I.D. BEEN TRANS. ?
YES
01G
NO
TRANSFER COST CAT. I.D. INFORMATION TO COST CAT. BLOCK
LP906
01G
LP14
UPDATE AND OUTPUT COST CAT. BLOCK
LP100
DIFF. C.C.
01F
SAME C.C.
READ RECORD FROM XSORT
YREAD
EOF
02B
IS REPORT NO. DIFFERENT?
YES
02B
NO
IS SUMMARY FLAG=0?
YES
02A
NO
01G

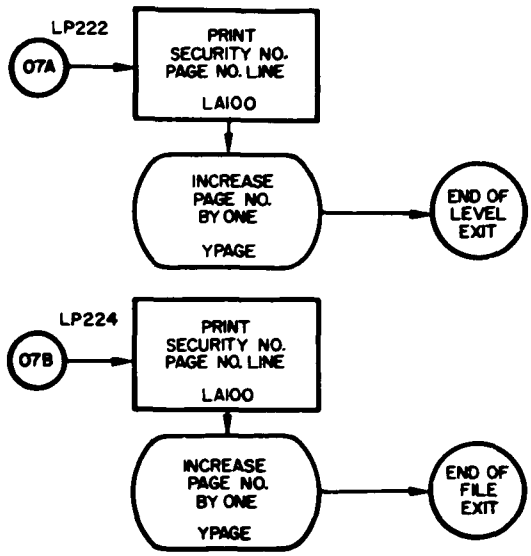

02A
OUTPUT LAST COST CATEGORY BLOCK
LP100
OUTPUT SUMMARY ITEM AND TOTALS
LP170
01A
02B
LP15
OUTPUT LAST COST CATEGORY BLOCK
LP100
OUTPUT SUMMARY ITEM AND TOTALS
LP170
02C
LP17
CLEANUP TWO-TAPE SORT
SORT
DEFINE READ OF SORTED TAPE
READ
RESET REPORT GENERATOR
RPG
IS THIS REPORT 71?
NO
02D
YES
SET FISCAL YEAR IND=ZERO
02E
02D
SET FISCAL YEAR IND=NON-ZERO
02E
SET COST CATEGORY IND=NON-ZERO
02F
LP20
READ RECORD FROM SORTED TAPE
YREAD
EOF
03A
02G
LP22
RESET PAGE NO. TO ONE
YPAGE
SAVE REPORT LEVEL
LP901
02H
LP24
SETUP I.D. INFORMATION FOR HEADER
PRINT HEADER
LN100
RESET LINE COUNTER
LB200
PRINT: "FINANCIAL FORECAST REPORT" BY COST CATEGORY
LP200
END OF FILE
03A
END OF SUMMARY
02H
END OF LEVEL
02K
LP26
INCREMENT SECURITY NO. BY ONE
YSEC
02G


LP28
03A
INCREMENT SECURITY NO. BY ONE
YSEC
LP29
03B
CLEANUP REPORT
RPG
UNDEFINE AND REWIND SORTED TAPE
READ
HAS "EOF" OCCURRED ON XSORT?
NO
EXIT
YES
TO PERT/COST CLEANUP ROUTINE
END


LP100
START
IS COST CAT. DIFFERENT?
YES
04D
NO
CHECK COST CAT. CODE
HOURS(UNITS)
04C
DIRECT $
04D
TOTAL $
WAS LAST CODE = TOT. $?
NO
04D
YES
ADD TOTAL $ TO SUMMARY BLOCK
LP150
ADD TOTAL $ TO COST CAT. BLOCK
LP150
ADD TOTAL $ TO OVHD. $ BLOCK
LP150
ADD TOTAL $ TO TOTAL $ BLOCK
LP150
NORMAL EXIT
04A
LP110
WAS LAST CODE = DIR $?
NO
04D
YES
ADD DIRECT $ TO COST CAT. BLOCK
LP150
04B
ADD DIRECT $ TO DIRECT $ BLOCK
LP150
SUB. DIRECT $ FROM OVHD. $ BLOCK
LP150
IS THIS A DIRECT LABOR ITEM?
NO
NORMAL EXIT
YES
ADD DIRECT $ TO DIR. LABOR $ BLOCK
LP150
NORMAL EXIT
04C
LP115
WAS LAST CODE = HOURS OR UNITS?
NO
04D
YES
ADD HOURS (UNITS) TO COST CAT. BLOCK
LP150
IS CODE = HOURS?
NO
NORMAL EXIT
YES
ADD HOURS TO LABOR HOURS BLOCK
LP150
NORMAL EXIT
04D
LP120
GIVE COST CATEGORY BLOCK TO SORT
SORT
CLEAR COST CATEGORY BLOCK
LP906
END C.C. EXIT


LP200
START
PRINT SUMMARY LINE I.D. INFORMATION
IS FISCAL YEAR IND = 0?
NO
05A
YES
PRINT SUMMARY COSTS BY YEAR (IN 1,000'S)
LN180
05B
05A
LP203
PRINT SUMMARY COSTS BY MONTH (IN 1,000'S)
LN190
05B
LP205
INCREMENT LINE COUNTER
LB200
05C
LP210
READ RECORD FROM SORTED TAPE
YREAD
EOF
07B
IS REPORT LEVEL DIFFERENT ?
YES
07A
NO
05D
LP211
IS THIS A SUMMARY RECORD ?
YES
06G
NO
05E
05E
IS THIS A COST CATAGORY RECORD ?
YES
05F
NO
IS THIS A LABOR HOURS RECORD ?
NO
06C
YES
06A
05F
LP214
IS THIS HOURS OR UNITS ?
YES
05H
NO
IS THIS DIR. $?
YES
05G
NO
SET INDICATOR TO TOTAL $
06C
05G
LP212
SET INDICATOR TO DIRECT $
06C
05H
LP213
SET INDICATOR TO HOURS
IS THIS AN HOURS RECORD ?
YES
06A
NO
RESET INDICATOR TO UNITS
06A


06A
LP218
PRINT DATA LINE I.D. INFO.
IS FISCAL YEAR IND.=0?
NO
06B
YES
PRINT HOURS BY FISCAL YEAR LN180
06E
06B
LP214
PRINT HOURS BY FISCAL MONTH LN190
06E
06C
LP215
PRINT DATA LINE I.D. INFO.
IS FISCAL YEAR IND.=0?
NO
06D
YES
PRINT COST BY FISCAL YEAR (IN 1000'S) LN180
06E
06D
LP217
PRINT COST BY FISCAL MONTH (IN 1000'S) LN190
06E
LP219
INCREMENTS LINE COUNTER LB200
END OF PAGE
06F
NORMAL
05C
06F
PRINT SECURITY NO. PAGE NO. LINE LA100
INCREASE PAGE NO. BY ONE YPAGE
READ RECORD FROM SORTED TAPE YREAD
EOF
END OF FILE EXIT
IS REPORT LEVEL DIFFERENT ?
YES
END OF LEVEL EXIT
NO
IS THIS A SUMMARY RECORD?
YES
END OF SUMM. EXIT
NO
PRINT HEADER LN100
RESET LINE COUNTER LB200
05D
06G
LP220
PRINT SECURITY NO. PAGE NO. LINE LA100
INCREASE PAGE NO. BY ONE YPAGE
END OF SUMM. EXIT


LP222
07A
PRINT
SECURITY NO.
PAGE NO. LINE
LA100
INCREASE
PAGE NO.
BY ONE
YPAGE
END OF
LEVEL
EXIT
LP224
07B
PRINT
SECURITY NO.
PAGE NO. LINE
LA100
INCREASE
PAGE NO.
BY ONE
YPAGE
END OF
FILE
EXIT

Region LT00

EXPLANATION OF REGION:

To cumulate four levels of totals.

CALLING SEQUENCE:

```
L     TSX   LT00, 4
L+1   PZE   A, 1, N (or MZE L)
L+2   Normal return
```

INPUT:

Not applicable.

OUTPUT:

Level 1 totals start in LT901
Level 2 totals start in LT902
Level 3 totals start in LT903
Level 4 totals start in LT904

STORAGE USED:

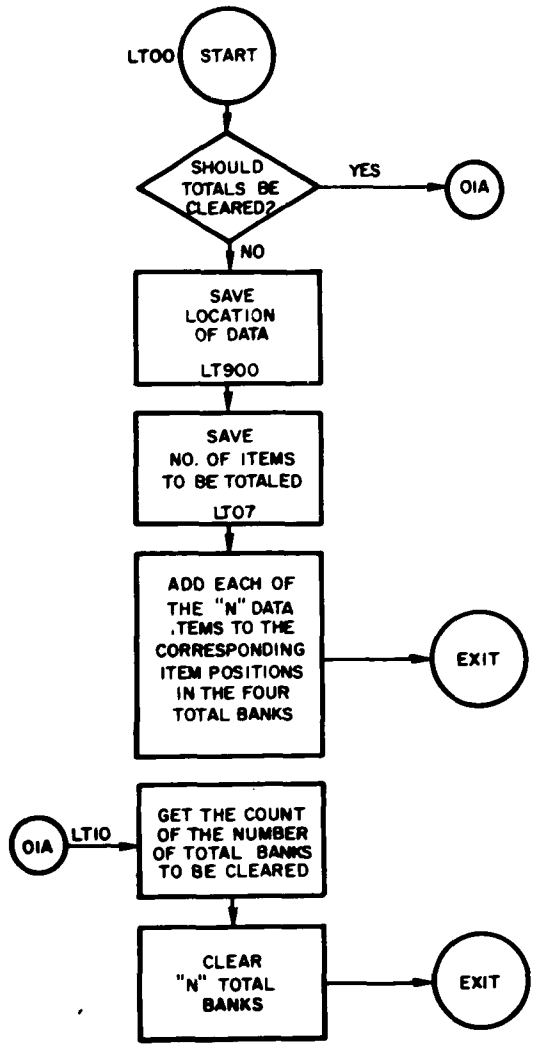
Not applicable.

SUBREGIONS AND SUBROUTINES USED:

Not applicable.

EXPLANATION OF CALLING SEQUENCE:

PZE A, 1, N = cumulate totals for N items starting in A, 1
MZE L = reset totals on levels 1 thru L to zero


LT00
START
SHOULD TOTALS BE CLEARED?
YES
01A
NO
SAVE LOCATION OF DATA
LT900
SAVE NO. OF ITEMS TO BE TOTALED
LT07
ADD EACH OF THE "N" DATA ITEMS TO THE CORRESPONDING ITEM POSITIONS IN THE FOUR TOTAL BANKS
EXIT
01A
LT10
GET THE COUNT OF THE NUMBER OF TOTAL BANKS TO BE CLEARED
CLEAR "N" TOTAL BANKS
EXIT

Region LX00

EXPLANATION OF REGION:

To adjust a dollar amount to the nearest thousands of dollars.

CALLING SEQUENCE:

```
L     TSX    LX00, 4
L+1   Normal return
```

INPUT:

MQ = dollar amount to be adjusted.

OUTPUT:

Accumulator = dollar amount adjusted to the nearest thousands of dollars.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

Not applicable.

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

CHAPTER IV

SUBROUTINES

CHAPTER IV

SUBROUTINES

IV-A INTRODUCTION

This section will explain the subroutines that are used in the PERT Cost Program. These subroutines can be used in any one of the four program phases, or in all of them. The topical subsections are listed below with the corresponding page references.

IV-B Report Generator IV-B-1
Purpose IV-B-1
Description IV-B-1
Usage IV-B-1
Storage Requirements IV-B-6
Buffer Pool Concert IV-B-6
Tape Switching IV-B-7
Tape Errors IV-B-7
Programmer Errors IV-B-7
Paging and Titling IV-B-8
Use of REPEAT Macro IV-B-9
Editing IV-B-11
Macro-Instruction Expansions IV-B-13

IV-C Four-Tape Sort Routine IV-C-1
Definition IV-C-1
Procedure IV-C-1
Parameter Setup IV-C-3
Exception Messages IV-C-6

IV-D Two-Tape Sort Routine IV-D-1
Definition IV-D-1
Calling Sequence IV-D-1

Regions Used by Sort Routine IV-D-2
Restriction IV-D-3
Exception Messages IV-D-3

IV-E WICAR Calendar Routine IV-E-1

IV-F Conversion Routines IV-F-1
Date Conversion Routine (DATE). IV-F-1
BCD to Fixed-Point Conversion Routine (FIXPT) IV-F-3
Fixed Point to BCD Conversion Routine (FTB). . IV-F-5

IV-G The Writer IV-G-1
Restrictions IV-G-1
Defining a Logical File IV-G-2
Definition Table IV-G-2
Writing a Logical Record. IV-G-3
Tape Changes IV-G-4
Undefine IV-G-5

IV-H The Reader IV-H-1
Restrictions IV-H-1
Defining a Logical File IV-H-1
Definition Table IV-H-2
Reading a Logical Record IV-H-3
Tape Changes IV-H-4
Undefine IV-H-4

IV-I Output Phase Read Routine. IV-I-1
Definition IV-I-1
Calling Sequence IV-I-1
Explanation of Calling Sequence IV-I-1
Output From Routine. IV-I-1
Exception Messages IV-I-2

IV-J Other Subroutines IV-J-1
Unpacking Routine (UPCK) IV-J-1
Packing Routine (PACK) IV-J-2
Memory Sort (MSRT) IV-J-3
Three-Word to Three-Word Comparison Routine (YCOMP) IV-J-4
Date Comparison Routine (YDCMP) IV-J-6
Page Count Routine (YPAGE) IV-J-8
Security Number Incrementer Routine (YSEC) . . IV-J-10
Level Checking Routine (YLVL) IV-J-12
Field Change Routine (YBRAK) IV-J-14
Output Subroutine (ZKOUT) IV-J-16

IV-B REPORT GENERATOR

Purpose

This subroutine sets up and controls the printing of the output for a report generating program.

Description

The subroutine, by means of macro-instructions, enables the programmer to handle all the print output associated with any amount of information processing. Specifically, it facilitates the setting up of print fields, lines or paragraphs for specific reports and, if desired, provides for automatic paging and titling. Also, if page dimensions are specified, the printing may be done on any non-standard page and/or in any desired format.

Usage

(a) Initialization Macros

These macros provide for initial definitions and need only be given once for all the reports that are to be considered.

BUCKET L1, L2

This macro makes available to the subroutine the block of storage from L1 to L2 inclusive. If n reports are to be processed, the number of words per block should be at least

$$\sum_{i=1}^{n} M_i\left(N_i + \frac{2}{3}\right) \qquad (i=1,\ 2,\ \ldots\ ,\ n)$$

where M_i = no. lines per page for report i

N_i = no. words per line for report i

The use of this macro is mandatory.

FILDEF T_{11}, T_{12}, T_{21}, ... , T_{62}

This macro defines the symbolic tapes that constitute a logical file. The tapes T_{ij} are defined as the symbolic address of the IOEX tape address. Two tapes T_{i1}, T_{i2} may be attached to a given file i and as many as six files may be defined. The first two parameters in the macro define file number 1, the second two define file 2, etc. The use of this macro is mandatory.

ATTACH K, F

This macro assigns report number K to file number F: $1 \leq K \leq 20$, $1 \leq F \leq 6$. Any number of reports may be attached to one file. The use of this macro is mandatory, but it may be given at any time prior to the use of any page description or line generating macros. The FILDEF macro defining file F must be given prior to the ATTACH macro.

(b) Page Description Macros

These macros specify the page dimensions, title lines and basic information associated with a particular report.

PAGDEF P, N, L_o, L, K

This macro defines the page dimensions for a particular report K and need only be given once for each report.

$0 \leq P \leq 131$ = no. of blank characters to the left of each line.

$1 \leq N \leq 132$ = no. of characters per line.

$0 \leq L_o \leq 59$ = no. of blank lines before line 1.

$1 \leq L \leq 60$ = no. of lines per page.

The page dimensions are with respect to a standard page of 60 lines with 120 characters per line (13 1/2 inch × 11 inch sheet). If PAGDEF is not given, the standard page will be assumed; i.e., P = 0, N = 120, L_o = 0, L = 60.

In the later descriptions of DATPAG, TITLES, LINE, FIELD, EDIT and PARAG, the references to print position and line number will take into account P and L_o; i.e.,

A specified print position P_i will correspond to actual print wheel $P_i + P$.

A specified line number L_i will correspond to actual line number $L_i + L_o$.

DATPAG L_d, P_d, K

This macro specifies where on each page of a particular report K the date and page number will be printed:

L_d = line ($L_d = 0$, indicates first line; $L_d \neq 0$, indicates last line)

P_d = print position

The date and page consists of 24 characters, as in the following example:

M	A	Y		2	7	,		1	9	6	0		P	A	G	E		K	K	-	X	X	X

where KK = report number, XXX = page number.

If DATPAG is not given, no date and page line will be printed.

TITLES Y, T, N_t, K

This macro establishes a set of titles to be printed at the beginning of each page of a particular report K. N_t words from (Y, T) will be stored in the appropriate print images beginning with print position 1 of line 1 as defined by PAGDEF and continuing for as many lines as are implied by N_t words. If DATPAG has also been given for line 1, the titles will begin on line 2. Each succeeding line in the titles will be single space. This macro need only be given once but may be given at any time for the purpose of changing titles. However, since the subroutine does not save the titles, they must remain intact at (Y, T) for the duration of the report.

(c) The Report Identification Macro

REPORT K, T

This macro must be given at the beginning of any sequence of line-generating macros. If T = 0, K represents the report number to be associated with the printing described by the succeeding macros.

If $T \neq 0$, the report number is in the address portion of the word in (K, T).

If the report number is zero, the printing will be associated with the most recently specified report.

(d) Line-Generating Macros

These macros set up any field, line, or paragraph associated with a particular report. Any sequence of line-generating macros must be immediately preceded by a REPORT macro and terminated by an ENDFLD macro. No other coding may be interspersed in the sequence.

SPACER N

This macro indicates that a new line or part of a line is to start. N specifies the number of line spaces before printing the next line.

N = 0 (or blank) indicates space suppress

= 1 indicates single space

= 2 double space

.
.
.

= 60 indicates space 60 lines

See Page IV-B-8 for exceptions. If no SPACER has been given, it will be assumed that subsequent macros refer to the current line.

LINE N

This macro indicates on which line the output specified by subsequent macros is to be printed. N represents the line number ($1 \leq N \leq 60$). See Page IV-B-8 for exceptions.

FIELD Y, T, E, P_f, I_p

This macro picks up E characters, beginning with the Cth character of the word in (L, T), and stores them in the appropriate print image beginning at print position P_f. The word in (Y, T) has the form:

(Y, T) XXX L, T, I_L

where

XXX = C = PZE for 1st character

= PON for 2nd character

= PTW for 3rd character

= PTH for 4th character

= FOR for 5th character

= FVE for 6th character

I_p is the print position incrementer, and I_L is the location incrementer used in conjunction with the REPEAT macro.

PARAG Y, T, N

This macro picks up N words beginning with the word in (L, T) and stores them in as many lines as are implied by N words. The first character will be stored in the first print position of the current line and all succeeding lines of the paragraph will be single space. The word in (Y, T) has the form:

(Y, T) PZE L, T

REPEAT N, M

This macro executes the next N macros M times. No more than two levels of REPEAT are permitted, see Page IV-B-10.

EDIT Y, T, P_f, C, E, B, I_p

This macro "edits" the quantity in L, T and stores it in the appropriate image beginning with print position P_f.

C=0 for signed BCD input (no conversion required)

C=1 for fixed point binary input

C=3 for unsigned BCD input

$0 \leq B \leq 35$; binary point of input (fixed point input)

E = no. of BCD characters in input quantity (including sign if C = 0).

The word in (Y, T) has the form.

(Y, T) PZE L, T, I_L

I_p is the print position incrementer, and I_L is the location incrementer used in conjunction with the REPEAT macro.

For BCD input the sign will appear as a BCD character in the first character position of the word in (L, T); i. e, + = 20_8, - = 40_8.

For binary input, one more than the specified number of fractional digits is generated and the quantity is rounded if this digit is greater than 5.

The format of the output is described by a sequence of no more than 24 BCD characters beginning with the first character in (Y, T+1), where each character corresponds to a potential print position (i. e., the first character corresponds to print position P_f), see Page IV-B-11.

ENDFLD

This macro indicates the termination of a series of line generating macros referring to one report.

(e) Report Termination Macro

WRAPUP K

This macro completes all remaining lines for report K. If K = 0, all remaining reports are completed.

(f) File Termination Macro

CLOSEF F

This macro closes file F by writing an end-of-file mark and rewinding the tape. If F = 0, all open files are closed.

Storage Requirements

The subroutine itself occupies a total of 2000 cells but requires an auxiliary storage capable of retaining at least one page for each report that is to be processed. This storage is assigned by the programmer with the use of the BUCKET macro.

Buffer Pool Concept

The storage assigned by the BUCKET macro is divided into blocks of 103 words each capable of retaining five 132 character lines together with their carriage control characters and record marks. An additional word is reserved for a block-availability indication. The output for a particular report is then accumulated in grouped records containing no more than five

lines. When a block has been filled and a new record is to start, the next available block is called for from the pool and the old block is set to "unavailable." When enough such records have been formed to comprise a page of printing they are put out on the specified tape. After the tape has been checked, the blocks are made available again and released to the pool. Thus priorities for reports are handled automatically and depend only on their frequency of occurrence.

Note: The grouped record procedure assures a saving in tape time but requires the use of a Model 720, 730, or a Model 1403 printer.

Tape Switching

When an end-of-tape has been encountered during writing, an "end-of-file" message and a "rewind and unload" message are given. The following note is then written on-line:

TAPE XXXX MAY NOW BE REMOVED FOR PRINTING
AND REPLACED WITH A BLANK TAPE

where XXXX is the tape address in octal. At this time the alternate tape of the file specified by the FILDEF macro will be rewound and used from then on as the primary output tape of the file. If no alternate tape has been specified, the subroutine will continue using the primary tape unit after a new tape reel has been mounted.

Tape Errors

If an unrecoverable redundancy error has occurred during writing, the following note is written on-line and the program will halt.

TAPE XXXX IS CAUSING REDUNDANCIES DURING WRITE.
CONTROL RETURNED TO SYSTEM.

Programmer Errors

The following errors are detected by the subroutines and corresponding notes printed off-line. Where applicable, the program will halt.

(a) LOC. XXXXX REPORT XX. LINE MACRO PARAMETER EXCEEDS MAX. LINES PER PAGE. SUBSEQUENT INFORMATION WILL BE PRINTED ON NEXT LINE.

(b) LOC. XXXXX REPORT XX. NO FILE ASSIGNED. RETURNED TO SYSTEM.

(c) LOC. XXXXX REPORT XX. NO TAPE ASSIGNED TO FILE. RETURNED TO SYSTEM.

(d) LOC. XXXXX REPORT XX. ILLEGAL CHARACTER IN EDIT FORMAT. RETURNED TO SYSTEM.

(e) LOC. XXXXX REPORT XX. NOT ENOUGH BUFFER SPACE ASSIGNED. RETURNED TO SYSTEM.

(f) LOC. XXXXX REPORT XX. ILLEGAL REPORT NUMBER. RETURNED TO SYSTEM.

(g) LOC. XXXXX REPORT XX. ILLEGAL MACRO. PROBABLY NO ENDFLD. RETURNED TO SYSTEM.

Paging and Titling

The subroutine maintains a current line count for each page of a report and, if specified, will perform automatic page restoring together with title and page identification printing without programmer interference. This feature will be operative if and only if any of the page description macros have been given; otherwise it will be assumed that paging is under programmer control. The various conditions of spacing and page restoring in the automatic mode are described below where

L_{max} = specified number of lines per page
L_{curr} = current line number
L = LINE macro parameter
N = SPACER macro parameter

(a) Using LINE Macro

If $L_{max} > L > L_{curr}$ the next line will be printed on line L this page.

If $L \leq L_{curr}$ the next line will be printed on line L next page.

If $L > L_{max}$ the next line will be printed on line L_{curr} + 1 this page, but an error condition will be recorded.

(b) Using SPACER Macro

If $L_{curr} + N < L_{max}$ the next line will be printed on line L_{curr} +N this page.

For the conditions $L_{curr} + N \geq L_{max}$, the location of the next line will depend upon whether or not any titles or date-page lines have been specified. The various possibilities under these constraints may be summarized as follows:

DATPAG On 1st Line ?	DATPAG On Last Line ?	Titles ?	Next Line If $L_{curr}+N = L_{max}$	Next Line If $L_{curr}+N > L_{max}$
No	No	No	L_{max} this page	Line 1 next page
No	No	Yes	L_{max} this page	2 lines after last title line next page
No	Yes	No	Line 1 next page	Line 1 next page
No	Yes	Yes	2 lines after last title line next page	2 lines after last title line next page
Yes	No	No	L_{max} this page	Line 2 next page
Yes	No	Yes	L_{max} this page	2 lines after last title line next page

Use of REPEAT Macro

(a) One-Level REPEAT:

```
REPORT
[REPEAT    2, 3
 SPACER    1
 FIELD
```

```
REPEAT    5,4
FIELD
FIELD
FIELD
EDIT
FIELD
ENDFLD
```

(b) Two-Level REPEAT:

```
REPORT
REPEAT    7,50
SPACER    1
FIELD
REPEAT    1,5
EDIT
REPEAT    2,3
EDIT
FIELD
ENDFLD
```

For each FIELD or EDIT macro appearing within the range of a REPEAT (either one- or two-level), the base location L, T will be incremented by $I_L(k-1)$ to form a new base location L, T + $I_L(k-1)$ every time the macro is encountered. Here k is the number of times the macro has been encountered and I_L is the location incrementer. Also, the base print position P_f will be incremented by $I_p(k-1)$ to form a new print position $P_f + I_p(k-1)$ every time the macro is encountered. However, at the completion of a REPEAT, the incrementer is reset to zero so that the next time the macro is executed, the print position will be the original P_f.

Editing

The following is a list of characters that are permitted in the output format description:

Blank (b)	This represents a character in the input quantity which will appear in the corresponding output position except under zero-suppression.
0	This is placed in the format description in the rightmost position in which zero-suppression is to occur. If it appears in the first fraction position and if the output fraction is zero, the number will appear as an integer (see examples).
$	This will appear unconditionally in the corresponding output position.
.	This will appear in the corresponding output position unless zero-suppression is in effect.
,	This will appear in the corresponding output position unless zero-suppression is in effect.
S	A "+" or "-" will appear in the corresponding output position if the input quantity is positive or negative, respectively.
+	A "+" will appear in the corresponding output position if the input quantity is positive. If it is negative a blank will appear.
-	A "-" will appear in the corresponding output position if the input quantity is negative. If it is positive, a blank will appear.
(	A "(" will appear in the corresponding output position if the input quantity is negative.
)	A ")" will always appear in the corresponding output position if the input quantity is negative.
	If zero suppression is in effect and no "$" has been specified, the sign or left parenthesis will appear in the position immediately preceding the first non-blank. (If a "trailing sign" is specified it will unconditionally appear in the corresponding output position.) If no sign definition has been made, then the output quantity will be unsigned.
*	This represents the termination of an output format description sequence.

Examples

```
(a)             EDIT    Y, 0, 12, 0, 9      (BCD input)
        Y       PZE     L
                BCI     3, S$bbb, bb0. 0bb*
        L       BCI     2, -32659635

        PRINT POSITION  12 13 14 15 16 17 18 19 20 21 22 23 24
                        -  $     3  2  ,  6  5  9  .  6  3  5
```

```
(b)             EDIT    Y, 0, 40, 1, 0, 13  (Binary input)
        Y       PZE     L
                BCI     2, Sbbb, bb0. 0b*
        L       OCT     26 71 60 00 55 70   (Equivalent to
                                             5863. 0007)

        PRINT POSITION  40 41 42 43 44 45 46 47
                           +  5  ,  8  6  3
```

```
(c)             EDIT    Y, 0, 3, 0, 16      (BCD input)
        Y       PZE     L
                BCI     2, bb0. bb*
        L       BCI     3, -bbbbbbbbbbb4421

        PRINT POSITION  3 4 5 6 7 8
                        4 4 . 2 1
```

```
(d)             EDIT    Y, 0, 10, 0, 7      (BCD input)
        Y       PZE     L
                BCI     2, 0. bbbS*
        L       BCI     2, +bbb987

        PRINT POSITION  10 11 12 13 14 15
                           .  9  8  7  +
```

Note: For BCD input, the quantity must be right-justified with respect to E character positions.

Macro-Instruction Expansions

```
REPORT      MACRO     K,T
            STL       REPLOC
            TXI       REPLOC+1,0,0
            PZE       K,T
            END

SPACER      MACRO     N
            PZE       N,0,1
            END

LINE        MACRO     L
            PZE       L,0,2
            END

FIELD       MACRO     Y,T,E,P,I
            PZE       Y,T,3
            VFD       8/E,8/P,8/I,12/0
            END

PARAG       MACRO     Y,T,N
            PZE       N,0,4
            PZE       Y,T
            END

REPEAT      MACRO     N,M
            PZE       N,0,5
            PZE       M
            END

ENDFLD      MACRO
            PZE       0,0,6
            END

PAGDEF      MACRO     P,N,L,M,K
            STL       REPLOC
            TXI       REPLOC+1,0,7
            VFD       5/K,8/N,8/P,6/M,6/L,3/0
            END

DATPAG      MACRO     L,P,K
            STL       REPLOC
            TXI       REPLOC+1,0,8
            VFD       8/P,6/L,17/0,5/K
            END
```

```
TITLES      MACRO     Y,T,N,K
            STL       REPLOC
            TXI       REPLOC+1,0,9
            VFD       5/K,13/N,3/T,15/Y
            END

BUCKET      MACRO     L1,L2
            STL       REPLOC
            TXI       REPLOC+1,0,10
            PZE       L1,0,L2
            END

FILDEF      MACRO     T11,T12,T21,T22,T31,T32,
                      T41,T42,T51,T52,T61,T62
            STL       REPLOC
            TXI       REPLOC+1,0,11
            VFD       H18/T11,H18/T12
            VFD       H18/T21,H18/T22
            VFD       H18/T31,H18/T32
            VFD       H18/T41,H18/T42
            VFD       H18/T51,H18/T52
            VFD       H18/T61,H18/T62
            END

ATTACH      MACRO     K,F
            STL       REPLOC
            TXI       REPLOC+1,0,12
            PZE       F,0,K
            END

WRAPUP      MACRO     K
            STL       REPLOC
            TXI       REPLOC+1,0,13
            PZE       K
            END

CLOSEF      MACRO     F
            STL       REPLOC
            TXI       REPLOC+1,0,14
            PZE       F
            END

EDIT        MACRO     Y,T,P,C,E,B,I
            PZE       Y,T,15
            VFD       8/E,8/P,8/I,8/B,4/C
            END
```

IV-C FOUR-TAPE SORT ROUTINE

Definition

From the programmer's point of view, this routine consists of three basic steps. First, the programmer specifies the form of the records which he wants included in the sort. Second, he indicates that he is through adding to the file which is to be sorted and therefore sorting may commence. Finally, he calls for the sorted items in sequence.

Procedure

Record specification is accomplished by calling sequence:

```
L          TSX    SRTRC, 4
L + 1      PZE    A1, A2
L + 2      YYY1   B1, T1, N1
  .          .      .  .  .
  .          .      .  .  .
  .          .      .  .  .
L + j + 1  YYYj   Bj, Tj, Nj     (j = 1, 2, . . . , m)
             .      .  .  .
             .      .  .  .
             .      .  .  .
L + m + 1  YYYm   Bm, Tm, Nm
```

where

A1 = the number of words required for this sort record. Where A1 is zero, the sort program immediately returns without taking any action. (Note: A1 should be consistent with the Nj, below.)

A2 = the number of field parameters which follow.

YYYj = PZE to indicate this parameter refers to whole words. PON thru SIX to indicate this parameter refers to characters, the first of which is to be taken from this character position in the word Bj, Tj.

Bj, Tj = the word in core with which this field begins.

Nj = the number of words (or characters) to be moved to the sort record. Nj = 0 will cause a skip to the next parameter.

The fields specified by calling sequences of this form are moved, in the order called, to a sort record which is built up in a sort buffer. Each entry of the calling sequence generates a record which will be sorted as an integral unit by the program. "Character-specified" fields are "packed" into the sort record. However, "word specified" fields will only be moved beginning with the next whole word available in the sort record. Thus, some character positions preceding such fields may be unused (zeros).

The programmer terminates the sort file and initiates intermediate sort phases by giving:

```
L      TSX  SRTND, 4
L + 1  PZE  R
```

where R is the location to which control is returned on completion of the sort.

In the final phase the programmer may call in the sorted file by giving:

```
L      TSX  SRTFN, 4
L + 1  End-of-file return
L + 2  Sequence error return
L + 3  Normal return
```

which, except for EOF, will return with the address of the first word of successive records in the address portion of the AC and the record size, in words, in the decrement of the AC. Calling a record may result in the loss of that previously called, hence the records which are to be saved should move to a save area when called.

Where the programmer has not given any records to be sorted, an immediate end-of-file return will result.

Parameter Setup

In using the sort program it is necessary to specify the following parameters--all of which must appear consecutively, in order, and immediately preceding the sort program to which they apply:

```
SRTTP   PZE  STAPE1
        PZE  STAPE2
          .     .
          .     .
          .     .
        PZE  STAPEr
MRGTP   PZE  MTAPE1
        PZE  MTAPE2
          .     .
          .     .
          .     .
        PZE  MTAPEs
FINTP   PZE  FTAPE1
        PZE  FTAPE2
          .     .
          .     .
          .     .
        PZE  FTAPEt
SRTKY   EQU  L
SXCOR   EQU  X
MXCOR   EQU  Y
FXCOR   EQU  Z
Sort Program
```

STAPE, MTAPE, and FTAPE are the symbolic locations of the BCD select addresses of the tapes (i.e., PZE A1 or PZE B4).

SRTTP specifies r tape units that will be written as the sort buffers are filled with records specified by the programmer. These buffers are sorted prior to writing, so that even though the programmer is externally concerned only with specifying sort records, sorting actually takes place during the entire process.

MRGTP specifies s tape units in addition to SRTTP's which are to be made available to the sort program for whatever merge passes are necessary. Therefore, they are not required until after the SRTND is given and may be used by the programmer prior to that time. Since each input (or output) operation is completed and checked prior to initiating the next, greater efficiency will be realized if MRGTP and SRTTP specify tape units on separate channels. Where the programmer does not wish to assign merge tapes he may give

```
MRGTP   BCI  1, NONE
```

which implies to the sort program that one merge pass will suffice to put the file into sequence. In this case, exceeding capacity (one sequence block per SRTTP) will result in an error stop.

FINTP specifies t tape units which are to be made available to the programmer after the sort is completed and he is ready to process the sorted file. The program does not make a final merge pass on the file. At the time the programmer calls on the sorted file the records are not actually merged, but are provided one at a time, in sequence, to the programmer. Specification of FINTP's can result in extra passes if it turns out that the most efficient merge would terminate with part of the file on one of the FINTP's. If FINTP's are not to be specified by the programmer he may specify:

```
FINTP    BCI  1, NONE
```

Beginning in SRTFN+1, the symbolic addresses of those tapes which do not contain any part of the sorted file (and hence are available to the programmer) are listed. The list terminates in a zero word and will, of course, include FINTP's.

All sort records will be sorted into sequence on the first L words, as specified by SRTKY. Fields to be sorted in any other than normal 7090 sequence (e.g., descending sequence, EAM sequence) must be converted by the programmer before moving them into a sort record. There is no restriction on the size of SRTKY except that it must not be less than the length of the records to be sorted.

SXCOR, MXCOR, and FXCOR specify the amount of core available to each of the three sort phases, including buffers. In case the programmer desires to save any part of core until the phase in which the sorted file is to be read, it should be understood that both the merge and final phases with their buffers occupy upper core, i.e., from 32768 - MXCOR and 32768 - FXCOR to 32767.

Since the various program phases are not in core together, the sort routine includes a TCD card following the first phase which returns control to BGN when loading of this phase (which will normally include the programmer's first phase) is completed.

Some of the more likely sources of error in using the sort program have been found to be:

1. Using SRTTP's or MRGTP's in a later phase before they have been released from an earlier phase.

2. Excessive allocations of MXCOR and FXCOR, which result in reading over areas of core which the programmer wishes to reserve.

3. Failing to preserve as many words in the first parameter following TSX SRTRC, 4 as are called out by the field parameters following.

4. Returning for additional sort records after the sort EOF has been reached.

Exception Messages

Error checking includes I/O parity checks plus checks on word and physical record counts. The exception messages will be printed on-line, as follows:

Sort Phase:

WRITE ERROR OR TAPE END ON OUTPUT TAPE XX

CANNOT WRITE LAST RECORD ON OUTPUT TAPE XX

CANNOT WRITE END-OF-FILE ON OUTPUT TAPE XX

CANNOT WRITE COMMUNICATION RECORD EOF XX

CANNOT WRITE COMMUNICATION RECORD. – TPE XX

OVERFLOW IN INTERNAL SORT.

INCORRECT CORE ALLOCATIONS.

CANNOT LOAD MERGE PHASE.

Merge Phase:

CANNOT READ MERGE PASS INPUT TAPE XX

CANNOT FIND EOF ON INPUT TAPE.

COMMUNICATION RECORD WORD COUNT IN ERROR.

CANNOT FIND COMMUNICATION RECORD EOF.

CANNOT READ COMMUNICATION RECORD XX

NUMBER OF WORDS READ FAILS TO AGREE WITH NO. WRITTEN.

CANNOT READ INITIAL INPUT RECORDS XX

*CANNOT WRITE END-OF-FILE ON OUTPUT TAPE XX

NUMBER OF PHYSICAL RECORDS READ FAILS TO AGREE WITH NO. WRITTEN.

*CANNOT WRITE COMMUNICATION RECORD XX

CANNOT LOAD FINAL PHASE.

WRITE ERROR OR EOT ON OUTPUT TAPE XX

Final Phase:

CANNOT READ FINAL PASS INPUT TAPE XX

NO. OF WORDS READ FAILS TO AGREE WITH NO. WRITTEN.

NO. OF PHYSICAL RECORDS READ FAILS TO AGREE WITH NO. WRITTEN.

CANNOT FIND EOF ON OUTPUT TAPE.

CANNOT READ COMMUNICATION RECORD XX

COMMUNICATION RECORD WORD COUNT ERROR.

CANNOT FIND COMMUNICATION RECORD EOF.

The errors indicated with an asterisk are under operator control. All other errors will cause the system to stop. The following message will be printed on-line:

RECOVERY POSSIBLE – CHANGE BAD TAPE – HIT START

The recovery routine reruns the merge pass in which the error occurred. The XX in the above messages refer to tape numbers.

IV-D TWO-TAPE SORT ROUTINE

Definition

This sort routine utilizes two tapes and functions to produce a sorted tape file of logical records (of fixed or of variable length) by repeating the following steps:

1. The SORT region is given one record at a time, which it stores in a table in memory.
2. When the table is full, the records are sorted.
3. The sorted records in memory are merged with a sorted tape file and written on a second tape. The tapes are rewound and the process is repeated, the second tape now being considered the sorted tape file.

Calling Sequence

The sort routine is entered to preset the region, receive a record for setting, or to terminate the sorting process.

(a) Sequence to Preset the Region

```
L       TSX   SORT, 4
L+1     PZE   TAPE 1,, TAPE 2
L+2     PZE   C,, D
L+3     PZE   E,, F
L+4     PZE   G,, H
L+5     Normal return
```

TAPE1 and TAPE2 are symbolic locations containing the IOEX select addresses of the two tapes to be used by the region. The tapes must be selected and rewound by the programmer.

C is the address of the first word of the definition table required by the Reader (READ).

D is the address of the first word of the definition table required by the Writer (WRIT).

E is the first address of a table of length F which is used by the region to perform memory sorts. F should be as large as possible.

The key for sorting the records begins in word number G of each record and is H words in length.

(b) Sequence to Give a Record to the Region for Sorting

```
L       TSX   SORT, 4
L+1     MZE   L, T, M
L+2     Normal return
```

L, T is the address of the first word of a record in memory.

M is the number of words in the record. M must be given even if the records are of fixed length.

(c) Sequence to Terminate the Sorting Process

```
L       TSX   SORT, 4
L+1     PZE   0
L+2     Normal return
```

At return, the following conditions exist:

The address of the accumulator contains the symbolic location of the IOEX select address of the tape that has the sorted information.

The decrement of the accumulator contains a count of the number of logical records in the sorted file.

Bits 21 through 35 of the MQ contain the count of the number of logical records lost during the sorting process due to tape error. Bits S through 20 of the MQ contain zero.

Both tapes will be in a rewound condition.

Regions Used by the Sort Routine

The sort routine uses both the Reader (READ) and the Writer (WRIT). The define and undefine of these regions are performed by the sort routine.

Restriction

The sorted file must fit on either of the tapes TAPE1 or TAPE2.

Exception Messages

If an error is encountered, the following error message will be printed and the program will halt:

ERROR IN SORT XX

where XX is the error code.

If a program error was encountered in the Reader or Writer, XX will be the code number for the type of error detected (see error codes specified in Subsecs. IV-G and IV-H for the READ and WRIT routines, respectively.) For errors encountered in the sort routine, the following codes will be used:

Code	Type of Error
1	Error in sorting records in memory
8	Writing failure occurred
9	End of tape has been encountered
10	Error while writing end-of-file or rewinding tapes.

IV-E WICAR CALENDAR ROUTINE

The WICAR calendar routine can compute the number of work days from a base date of January 1, 1945, to any given date, and, alternatively, can convert the number of work days from January 1, 1945, to a calendar date. This routine is based on two premises: that this calendar repeats itself every 28 years, and that every year as well as every month will begin on a predetermined day within the cycle. (Note: Exceptions to the 28-year cycle are the century years that are not leap years—i. e., are not divisible by 400. The year 2000 is a leap year.) Thus, in developing this program, a table of 28 years has been set up which will suffice for any 28 year period in calendar time.

This table of years, called TLNK, will indicate how many work days have elapsed up to a particular year. The TLNK table will also link into a second set of tables that are set up according to the day that this particular year starts on. If it is not a leap year, one of this set of tables, called TMON-TSUN, will indicate how many work days have elapsed up to a particular month. This table will also indicate the holidays that have occurred up to this particular month, as well as list the holidays that fall in the month. It will allow for up to 3 holidays in any one month. In the TMON-TSUN table there will be a link into the TMWD table by the day the month starts on. The TMWD table will indicate the number of work days up to a particular day. If the particular year is a leap year, the second table is called TLMO-TLSU and will contain two links. The first link is used if the month of the leap year falls prior to March. It will return to the TMON-TSUN table at the same location as if it were not a leap year. The second link is used for March and all subsequent months in the leap year. The days will be modified by a value in the TLMO-TLSU table and then return to the TMON-TSUN table at a location one day later than the day the year starts on.

The same tables are used for both the date-to-workday and workday-to-date conversions. This routine will not put out any dates that fall on Saturday or Sunday. If a Saturday or Sunday date comes into the system, it will be

handled as if it were the previous Friday. This program is presently set up to handle the following six holidays: New Year's Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving, Christmas. No dates generated by the system will fall on these days.

The following calling sequence will convert the number of work days from the established base to a date expressed as a binary number.

```
CLA   X  A non-zero value should be set in the accumulator
LDQ   Y  The binary number in MQ at B35
TSX   WICAR, 4
Error return
Normal return
```

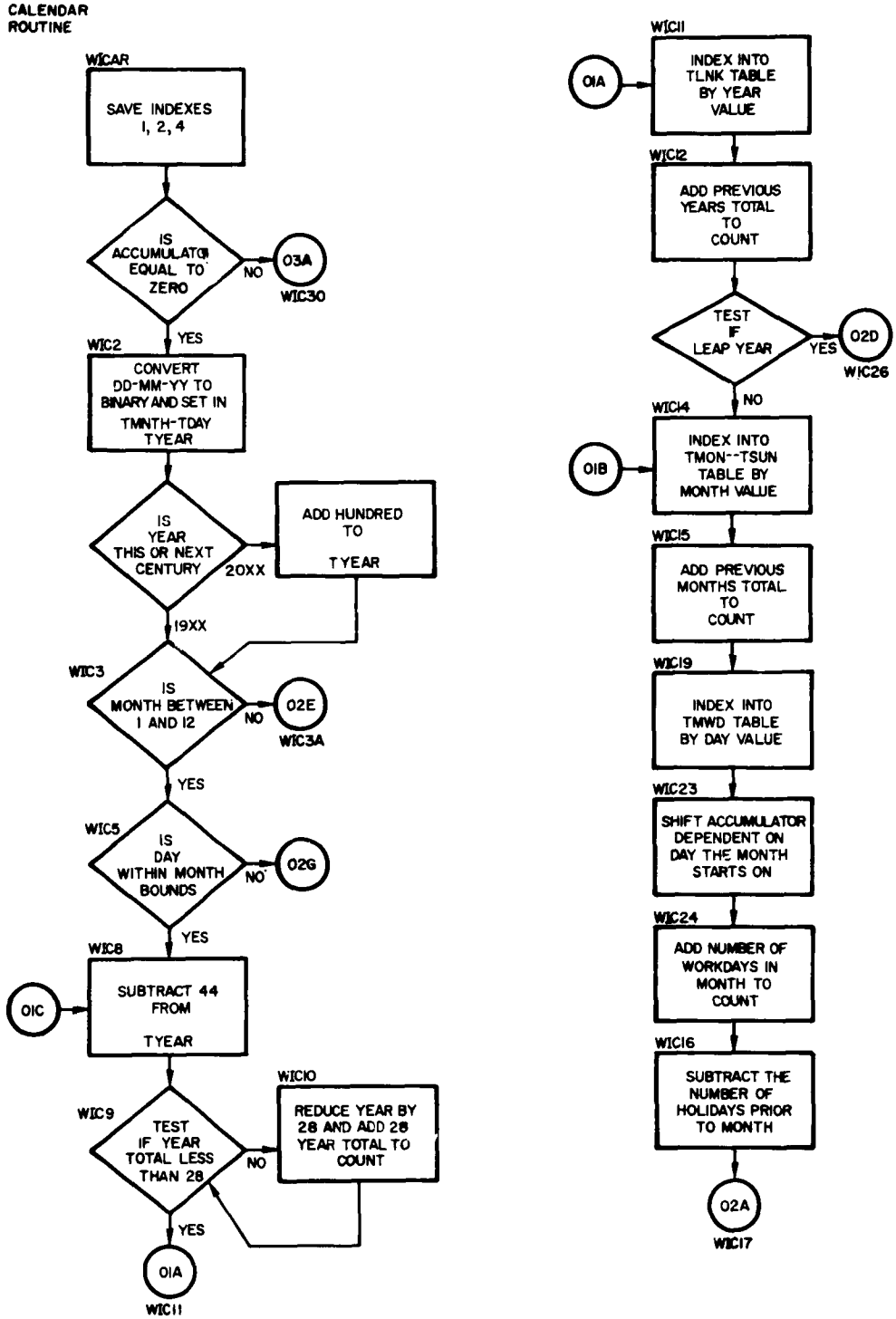
The error return will indicate that a zero value for work days has been entered into the system. At the normal return the accumulator will contain the date that has been developed in the form of MM-DD-YY.

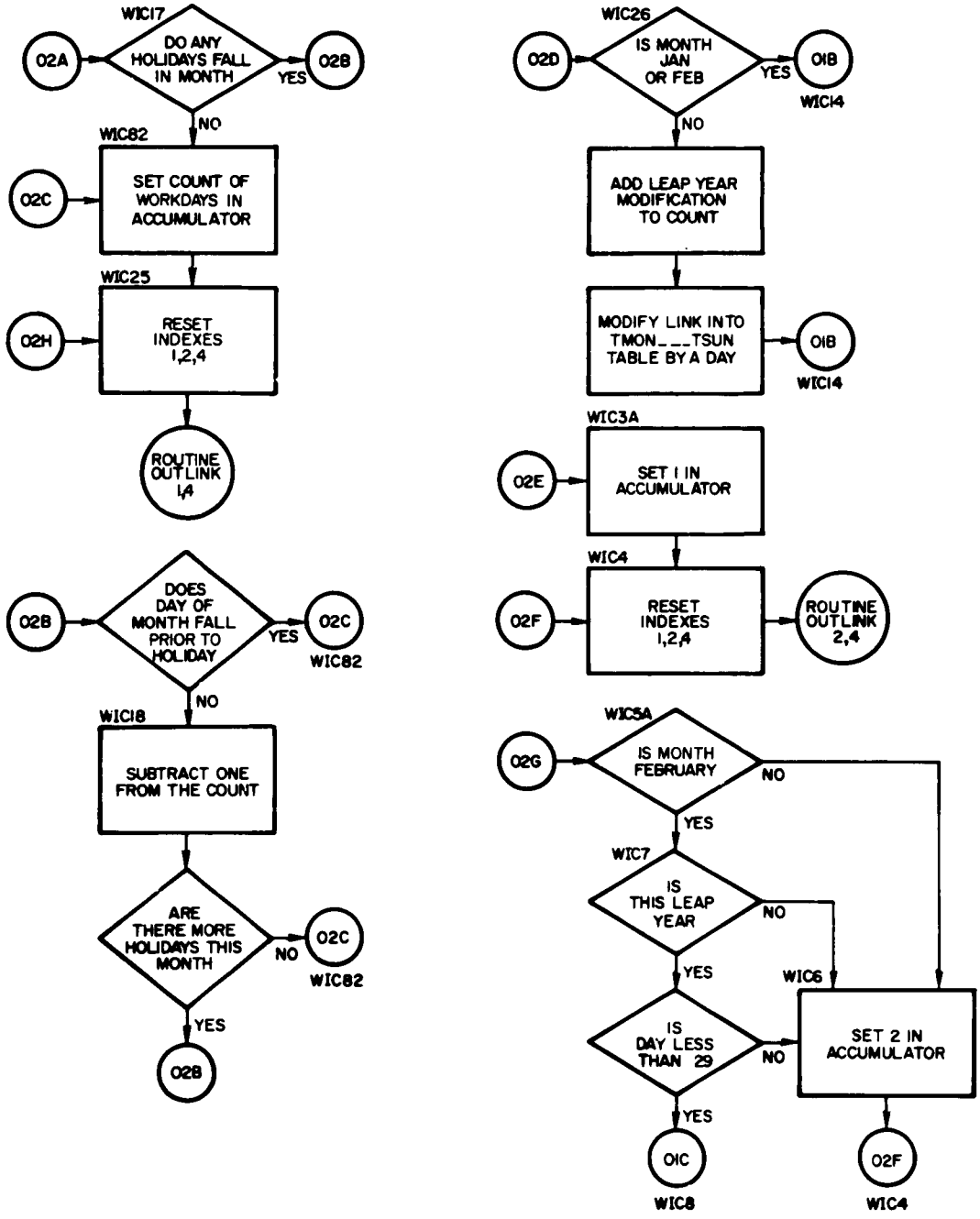
The calling sequence will convert a calendar date to work days in binary from a pre-established base.

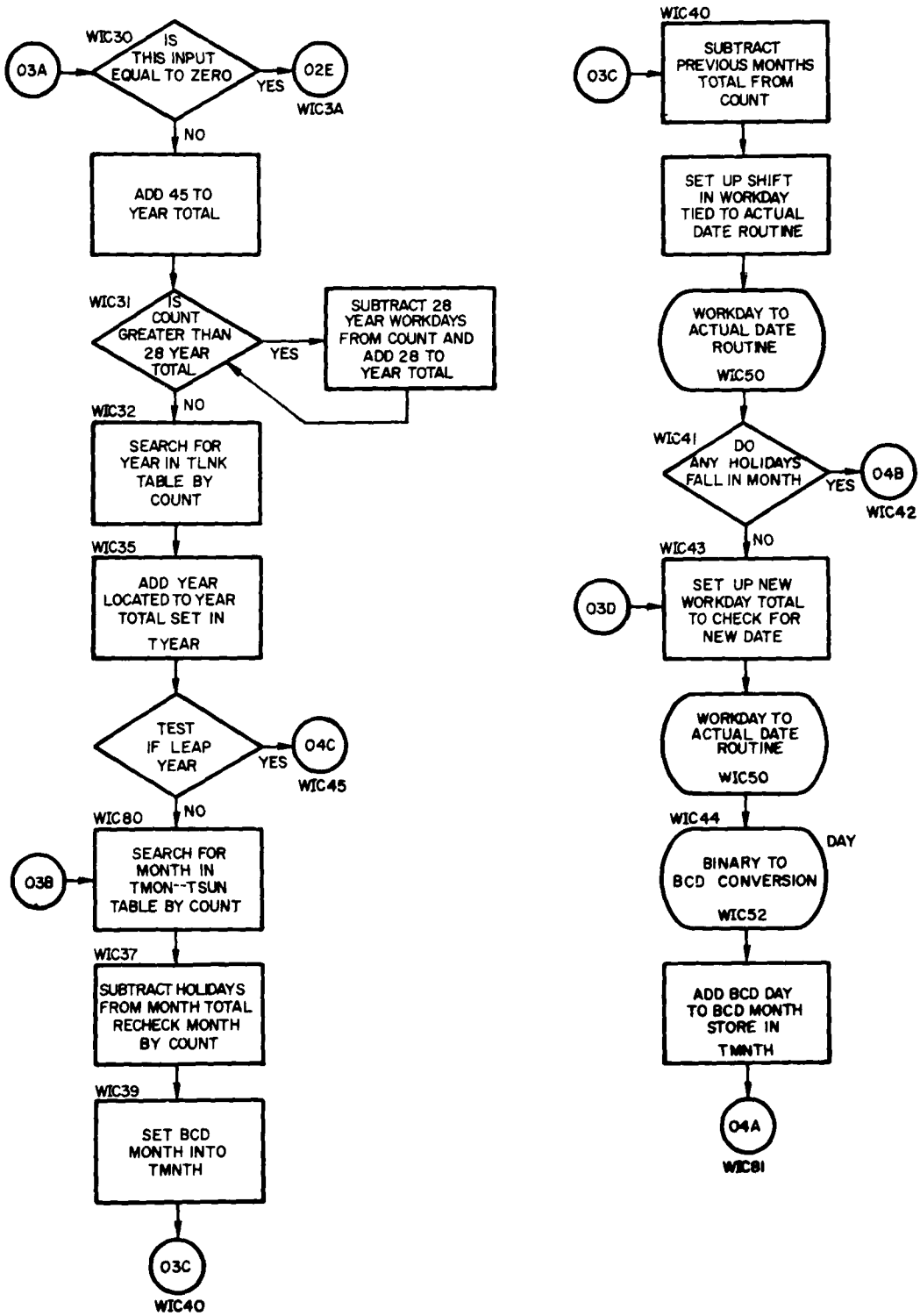
```
CLA   X  A zero value should be set in the accumulator
LDQ   Y  The date to be converted in the MQ in the form of MM-DD-YY
TSX   WICAR, 4
Error return
Normal return
```

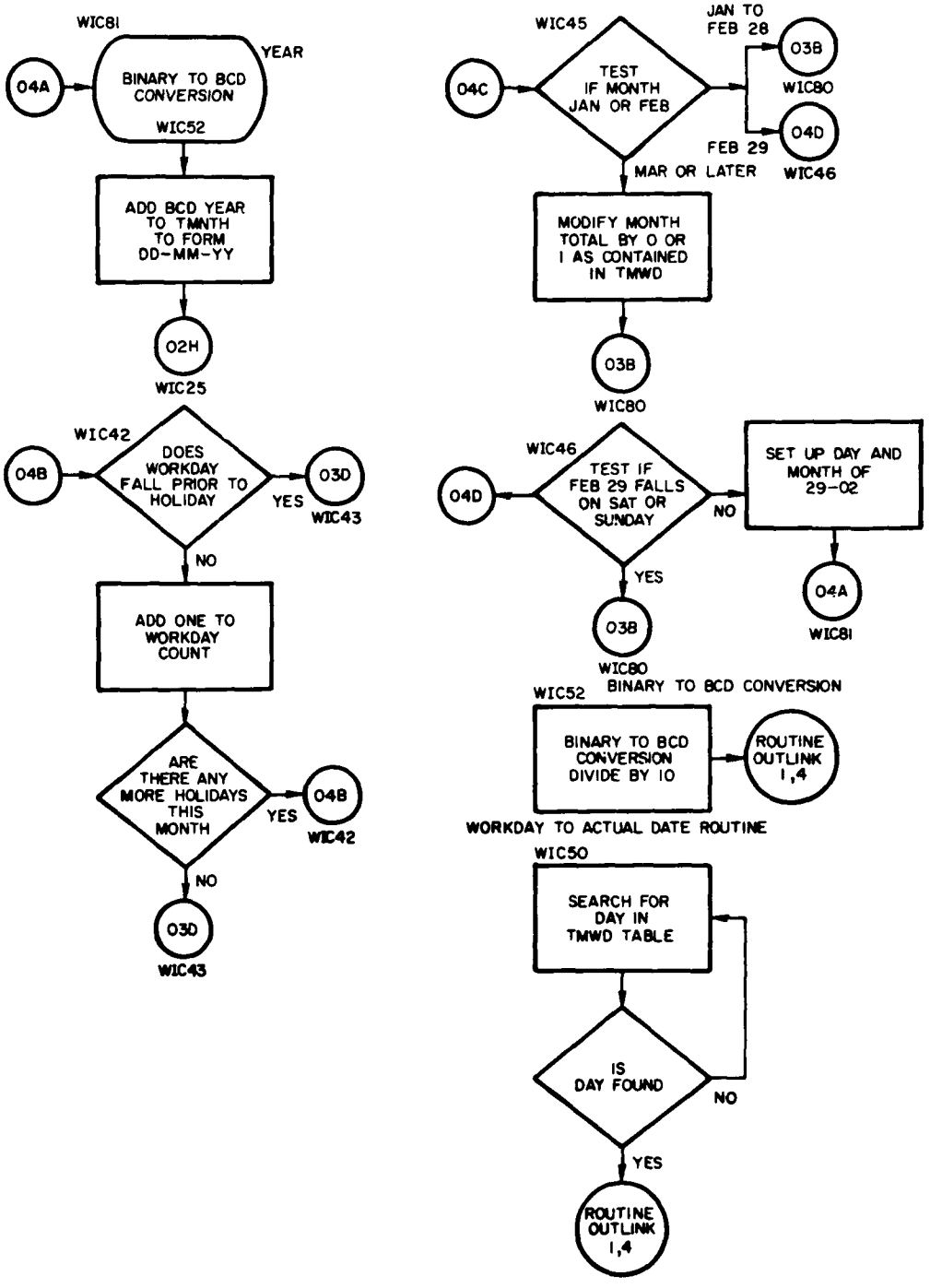
The error return will indicate input problems and contain either a 1 or 2 in the address of the accumulator. These values will indicate the following errors: 1 = the month is not between 1 and 12; 2 = the day of the month is not within prescribed limits. The normal return will contain the binary number in the address of the accumulator.

CALENDAR ROUTINE




WIC17
02A
DO ANY HOLIDAYS FALL IN MONTH
YES
02B
NO
WIC82
02C
SET COUNT OF WORKDAYS IN ACCUMULATOR
WIC25
02H
RESET INDEXES 1,2,4
ROUTINE OUTLINK 1,4
02B
DOES DAY OF MONTH FALL PRIOR TO HOLIDAY
YES
02C
WIC82
NO
WIC18
SUBTRACT ONE FROM THE COUNT
ARE THERE MORE HOLIDAYS THIS MONTH
NO
02C
WIC82
YES
02B
WIC26
02D
IS MONTH JAN OR FEB
YES
01B
WIC14
NO
ADD LEAP YEAR MODIFICATION TO COUNT
MODIFY LINK INTO TMON___TSUN TABLE BY A DAY
01B
WIC14
WIC3A
02E
SET 1 IN ACCUMULATOR
WIC4
02F
RESET INDEXES 1,2,4
ROUTINE OUTLINK 2,4
WIC5A
02G
IS MONTH FEBRUARY
NO
YES
WIC7
IS THIS LEAP YEAR
NO
YES
WIC6
IS DAY LESS THAN 29
NO
SET 2 IN ACCUMULATOR
YES
01C
WIC8
02F
WIC4


03A
WIC30
IS THIS INPUT EQUAL TO ZERO
YES
02E
WIC3A
NO
ADD 45 TO YEAR TOTAL
WIC31
IS COUNT GREATER THAN 28 YEAR TOTAL
YES
SUBTRACT 28 YEAR WORKDAYS FROM COUNT AND ADD 28 TO YEAR TOTAL
NO
WIC32
SEARCH FOR YEAR IN TLNK TABLE BY COUNT
WIC35
ADD YEAR LOCATED TO YEAR TOTAL SET IN TYEAR
TEST IF LEAP YEAR
YES
04C
WIC45
NO
WIC80
03B
SEARCH FOR MONTH IN TMON--TSUN TABLE BY COUNT
WIC37
SUBTRACT HOLIDAYS FROM MONTH TOTAL RECHECK MONTH BY COUNT
WIC39
SET BCD MONTH INTO TMNTH
03C
WIC40
WIC40
03C
SUBTRACT PREVIOUS MONTHS TOTAL FROM COUNT
SET UP SHIFT IN WORKDAY TIED TO ACTUAL DATE ROUTINE
WORKDAY TO ACTUAL DATE ROUTINE
WIC50
WIC41
DO ANY HOLIDAYS FALL IN MONTH
YES
04B
WIC42
NO
WIC43
03D
SET UP NEW WORKDAY TOTAL TO CHECK FOR NEW DATE
WORKDAY TO ACTUAL DATE ROUTINE
WIC50
WIC44
DAY
BINARY TO BCD CONVERSION
WIC52
ADD BCD DAY TO BCD MONTH STORE IN TMNTH
04A
WIC81


WIC81
BINARY TO BCD CONVERSION
YEAR
WIC52
04A
ADD BCD YEAR TO TMNTH TO FORM DD-MM-YY
02H
WIC25
WIC42
DOES WORKDAY FALL PRIOR TO HOLIDAY
04B
03D
YES
WIC43
NO
ADD ONE TO WORKDAY COUNT
ARE THERE ANY MORE HOLIDAYS THIS MONTH
04B
YES
WIC42
NO
03D
WIC43
WIC45
TEST IF MONTH JAN OR FEB
04C
JAN TO FEB 28
03B
WIC80
FEB 29
04D
WIC46
MAR OR LATER
MODIFY MONTH TOTAL BY 0 OR 1 AS CONTAINED IN TMWD
03B
WIC80
WIC46
TEST IF FEB 29 FALLS ON SAT OR SUNDAY
04D
NO
SET UP DAY AND MONTH OF 29-02
04A
WIC81
YES
03B
WIC80
WIC52
BINARY TO BCD CONVERSION
BINARY TO BCD CONVERSION DIVIDE BY 10
ROUTINE OUTLINK 1,4
WORKDAY TO ACTUAL DATE ROUTINE
WIC50
SEARCH FOR DAY IN TMWD TABLE
IS DAY FOUND
NO
YES
ROUTINE OUTLINK 1,4

IV-F CONVERSION ROUTINES

The regions for converting alphabetic month descriptions to all number descriptions (and vice versa) and for converting BCD data to fixed-point (and vice versa) are described below.

Date Conversion Routine (DATE)

EXPLANATION OF REGION:

This routine converts a 7-character (alphabetic month) military or standard date to a 6-character all-numeric date, or vice-versa.

CALLING SEQUENCE:

```
L     TSX   DATE, 4
L+1   PZE   N,, M
L+2   Normal return
```

INPUT:

Accumulator = first six characters of the date

MQ = seventh character of the date (if necessary) in s, 1, . . . , 5

OUTPUT:

Accumulator = first six characters of the date

MQ = seventh character of the date (if necessary) in s, 1, . . . , 5

STORAGE USED:

Not applicable.

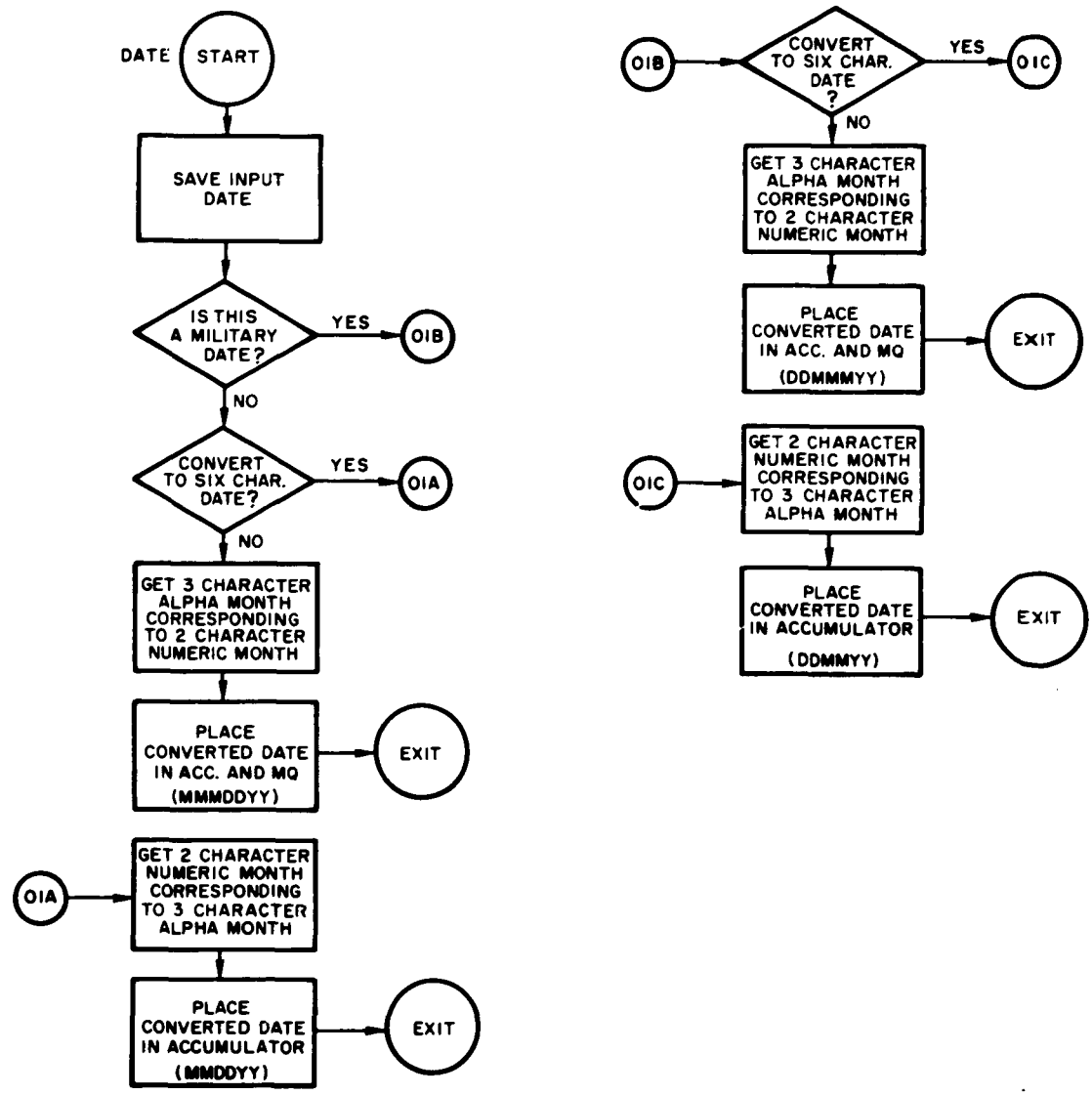
SUBREGIONS AND SUBROUTINES USED:

Not applicable.

EXPLANATION OF CALLING SEQUENCE:

N = 0 if military date (DDMMYY or DDMMMYY)
= 1 if standard date (MMDDYY or MMMDDYY)

M = 0 if converting a 7-character date to a 6-character date
= 1 if converting a 6-character date to a 7-character date


DATE
START
SAVE INPUT DATE
IS THIS A MILITARY DATE?
YES
01B
NO
CONVERT TO SIX CHAR. DATE?
YES
01A
NO
GET 3 CHARACTER ALPHA MONTH CORRESPONDING TO 2 CHARACTER NUMERIC MONTH
PLACE CONVERTED DATE IN ACC. AND MQ
(MMMDDYY)
EXIT
01A
GET 2 CHARACTER NUMERIC MONTH CORRESPONDING TO 3 CHARACTER ALPHA MONTH
PLACE CONVERTED DATE IN ACCUMULATOR
(MMDDYY)
EXIT
01B
CONVERT TO SIX CHAR. DATE ?
YES
01C
NO
GET 3 CHARACTER ALPHA MONTH CORRESPONDING TO 2 CHARACTER NUMERIC MONTH
PLACE CONVERTED DATE IN ACC. AND MQ
(DDMMMYY)
EXIT
01C
GET 2 CHARACTER NUMERIC MONTH CORRESPONDING TO 3 CHARACTER ALPHA MONTH
PLACE CONVERTED DATE IN ACCUMULATOR
(DDMMYY)
EXIT

BCD to Fixed Point Conversion Routine (FIXPT)

EXPLANATION OF REGION

To convert N BCD numbers to a fixed-point integer.

CALLING SEQUENCE:

```
L-1   LDQ   A, T
L     TSX   FIXPT, 4
L+1   PZE   N
L+2   Normal return
```

INPUT:

A, T = location of the word to be converted.

N = number of characters to be converted ($N \leq 6$) (characters must be left-justified).

OUTPUT:

Fixed-point integer in Accumulator at B35.

STORAGE USED:

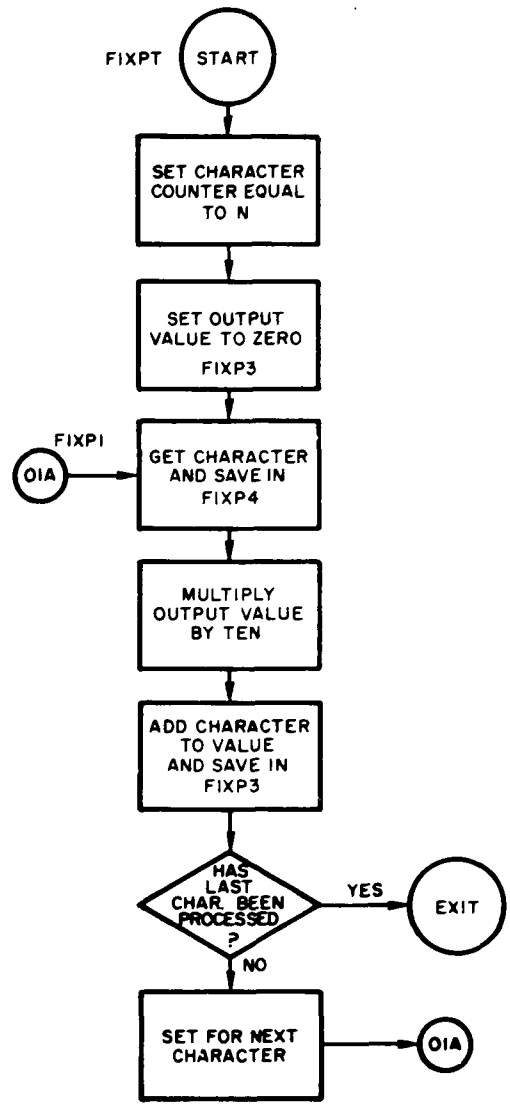
Not applicable.

SUBREGIONS AND SUBROUTINES USED:

Not applicable.

EXPLANATION OF CALLING SEQUENCE:

Not Applicable.


FIXPT
START
SET CHARACTER COUNTER EQUAL TO N
SET OUTPUT VALUE TO ZERO
FIXP3
FIXP1
01A
GET CHARACTER AND SAVE IN FIXP4
MULTIPLY OUTPUT VALUE BY TEN
ADD CHARACTER TO VALUE AND SAVE IN FIXP3
HAS LAST CHAR. BEEN PROCESSED ?
YES
EXIT
NO
SET FOR NEXT CHARACTER
01A

Fixed Point to BCD Conversion Routine (FTB)

EXPLANATION OF REGION:

To convert a fixed point integer at B35 to BCD number.

CALLING SEQUENCE:

```
L     TSX   FTB, 4
L+1   PZE   A,, B
L+2   Normal return
```

INPUT:

Fixed-point integer at B35 in location A.

OUTPUT:

Twelve BCD characters (right-justified) starting in location B (two words).

STORAGE USED:

Not applicable.

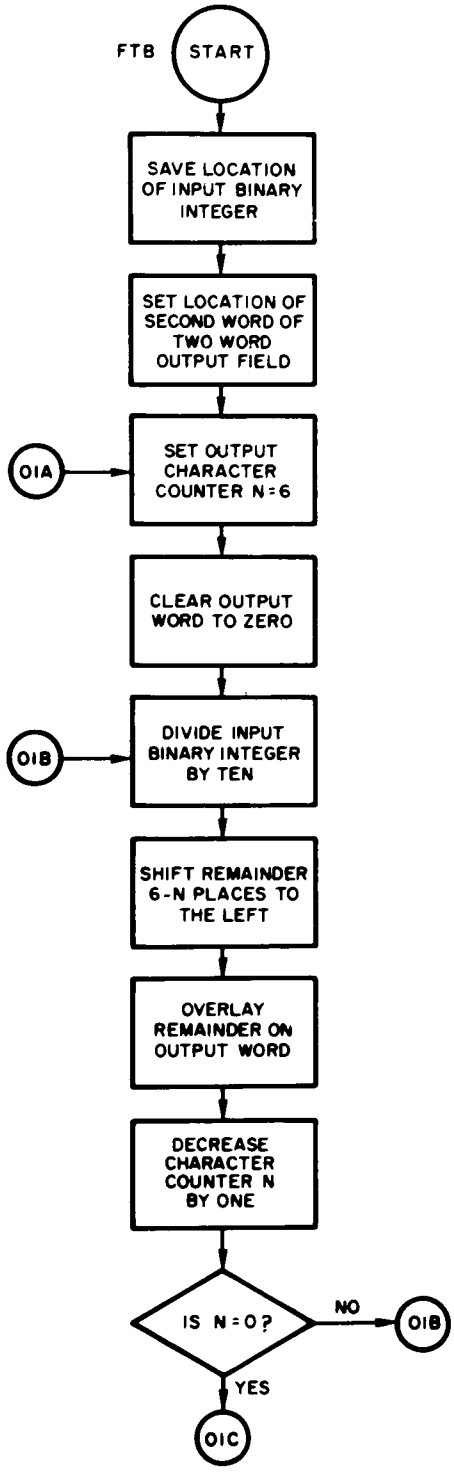
SUBREGIONS AND SUBROUTINES USED:

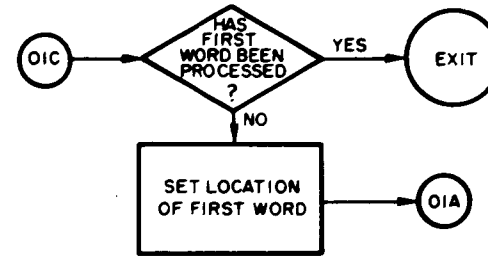
Not applicable.

EXPLANATION OF CALLING SEQUENCE:

A = location of the fixed point integer.

B = location of the first of two words where the BCD number will be stored.


FTB
START
SAVE LOCATION OF INPUT BINARY INTEGER
SET LOCATION OF SECOND WORD OF TWO WORD OUTPUT FIELD
01A
SET OUTPUT CHARACTER COUNTER N=6
CLEAR OUTPUT WORD TO ZERO
01B
DIVIDE INPUT BINARY INTEGER BY TEN
SHIFT REMAINDER 6-N PLACES TO THE LEFT
OVERLAY REMAINDER ON OUTPUT WORD
DECREASE CHARACTER COUNTER N BY ONE
IS N=0?
NO
01B
YES
01C


01C
HAS FIRST WORD BEEN PROCESSED ?
YES
EXIT
NO
SET LOCATION OF FIRST WORD
01A

IV-G THE WRITER

The following is a description of a routine (WRIT) that will write a logical file on one or more tapes.

Restrictions

1. Tapes written by the Writer will be in one of the following two formats:

   a) If logical records are not grouped, each physical record will contain one logical record (of fixed or variable length) followed by its checksum. (The checksum is only examined in case of a redundancy error.)

      If logical records are grouped, each physical record contains several fixed-length logical records or one or more variable-length records, as follows:

      (1) Each fixed-length logical record is followed by its checksum.

      (2) Each variable-length logical record is preceded by the word length of the logical record as an integer at a B-value of 35 and is followed by its checksum.

2. A tape must be selected, positioned, and its logical file defined before it can be written on by the Writer.

3. A logical file must be undefined after the program has finished with it. If it is not, the Writer may fail to write all the information from the buffers onto the tape.

4. It it is desired to write more than one physical file on the same tape, it is necessary to undefine and define that logical file after each physical file is written.

5. If the Writer is re-entered after having exited due to a program error, the program will halt.

6. The Writer will write only complete physical files.

7. The Writer cannot change tapes until an end-of-tape return has been made for the tape it is finishing.

Defining A Logical File

The following calling sequence must be used to define a logical file if the Writer is to be used to write the file. The logical file should not be redefined for each tape written. The calling sequence defines only one logical file; however, the programmer may define as many logical files as he desires with as many calling sequences.

```
L       TSX   WRIT, 4
L+1     PZE   TAPE, 1, K
L+2     Program error
L+3     Normal return
```

The writer will begin writing the logical file on the tape whose IOEX select address is contained in symbolic location "TAPE."

"K" is the address of the appropriate definition table in memory. (See Definition Table below).

The Program Error exit is used by the routine if it detects a program error. (See Page IV-G-4).

Definition Table

```
PZE  A, C, B
PZE  D, 0, F
```

In the above, the symbols represent the following:

A

A represents the address of the first of consecutive locations in memory in which the Writer is to store a physical record to be written on tape. The A-block must be large enough to hold the largest number of words to be written as a physical record.

B

If buffering is desired, B is a block of storage equal to A. The A- and B-blocks must not overlap. B is zero if buffering is not desired.

C

If logical records are not to be grouped by the Writer, C equals zero. If logical records are to be grouped, C is not equal to zero.

D

D is the maximum length of a physical record to be written by the Writer.

F

If logical records are of variable length, F equals zero. If logical records are of fixed length, F equals record length. The record length does not include the checksum. The Writer computes the checksum.

Writing a Logical Record

Each write entry into the Writer prepares one logical record for writing on a tape. A physical record is written each time the A or B storage block is filled. The calling sequence to write is:

Load accumulator with X (if variable length logical records are being written).

```
L     TSX   WRIT, 4
L+1   PZE   TAPE, , M
L+2   Program error
L+3   Writing failure
L+4   End-of-tape
L+5   Normal return
```

In the above, the symbols represent the following:

X

X represents the word length (integer, B=35) of the logical record (not used for fixed length records). The word length does not include the checksum. The Writer computes the checksum.

TAPE

This is the symbolic location containing the IOEX select address of the tape to be written.

M

M is the address of the first of consecutive words to be written on tape as a logical record.

Program Error

When the Writer transfers to the program error return, the decrement of the MQ contains a code number from 1 to 8 which specifies the type of error detected by the Writer. If a program transfers to the Writer after a return has been made to a program error exit, the program will halt. The codes are as follows:

1. Tried to write on a tape after an end-of-tape return.
2. Error in calling sequence.
3. Tried to write, change tapes, or undefine a logical file when the logical file mentioned had not been previously defined.
4. Error in Writer.
5. Tried to change tapes before an end-of-tape return has been made from the Writer.
6. (not used)
7. Tried to write on a tape which had not been selected.
8. Tried to undefine a logical file after a return to end-of-tape and before a change tape was given for the appropriate logical file.

Writing Failure

The Writer returns here if a redundancy error occurred when writing a record.

End-of-Tape

The Writer returns here if it encountered an end-of-tape while writing the last physical record. An end-of-file has been written by the Writer. The program must change tapes before the Writer is given another logical record to write on the logical file concerned.

On all returns, the address of the accumulator contains a count of the number of logical records given to the Writer to write on the logical file. The decrement contains a count of the number of logical records already written on the logical file.

Tape Changes

The program may only change tapes after an end-of-tape return from a write entry to the Writer. Before the Writer is instructed to change tapes, the

program must initialize the tape selection for the next tape to be written on. The calling sequence to change tapes is:

```
L     TSX    WRIT, 4
L+1   PZE    TAPE 2, 2, TAPE 1
L+2   Program error
L+3   Normal return
```

TAPE 2 is the symbolic location containing the IOEX select address of the tape to be written.

TAPE 1 is the symbolic location containing the IOEX select address the writer has just finished writing.

PROGRAM ERROR is the program error return described on Page IV-G-4.

Undefine

A logical file must be undefined after the program is finished with it and before the tape is selected or repositioned. The calling sequence to undefine is:

```
L     TSX    WRIT, 4
L+1   PZE    TAPE, 3, 0
L+2   Program error
L+3   Normal return
```

TAPE is the symbolic location containing the IOEX select address of the tape.

PROGRAM ERROR is as previously described in Subsec. 4.6.4.

When the writer exits to NORMAL RETURN, an end-of-file has been written on the tape described by TAPE. The address of the accumulator contains a count of the number of logical records written on the logical file.

IV-H THE READER

The following is a description of a routine (READ) that will read a logical file from one or more tapes.

Restrictions

1. A tape must be selected, positioned, and its logical file defined before it can be read by the Reader.
2. A logical file must be undefined after the program has finished with it.
3. It it is desired to read more than one physical file in the same logical file on the same tape, it is necessary to undefine and define the logical file after each physical end-of-file before reading the next file.
4. If the reader is re-entered after having exited due to a program error, the program will halt.
5. The reader does not rewind tapes.

Defining a Logical File

The following calling sequence must be used to define a logical file if the Reader is to be used to read the file. The calling sequence defines only one logical file; however, the programmer may define as many logical files as he desires with as many calling sequences.

```
L       TSX   READ, 4
L+1     PZE   TAPE, 1, K
L+2     Program error
L+3     Normal return
```

TAPE is the symbolic location containing the IOEX select address of the tape to be read.

K is the address of the appropriate definition table.

Definition Table

```
PZE  A, C, B
PZE  D, E, F
```

In the above, the symbols represent the following:

A

A represents the address of the first of consecutive locations in memory into which the reader is to read a physical record from tape. The A-block must be long enough to hold the largest number of words to be read into memory from one physical record.

B

If buffering is desired, B is a block of storage equal to A. The A- and B-blocks must not overlap. B is zero if buffering is not desired.

C

If records are not grouped, C equals zero. If records are grouped C is not equal to zero.

D

D is the maximum length of any physical record in the logical file if the programmer desires the Reader to read complete physical records into memory. D is the number of beginning words of the physical record which are to be read into memory if only the first part of the record is desired.

E

E equals zero, if complete physical records are to be read into memory. E is not equal to zero if only the first D words of a physical record are to be read into memory. If logical records are grouped, then complete physical records must be read.

F

F equals zero if logical records are of variable length. F equals the record length, if logical records are of fixed length. The record length is the length of the logical record excluding the checksum.

Reading a Logical Record

Each read entry into the Reader supplies the program with one logical record. The calling sequence to read a logical record is:

```
L     TSX   READ, 4
L+1   PZE   TAPE
L+2   Program error
L+3   End-of-file
L+4   Checksum error
L+5   Normal return
```

In the above, the symbols represent the following:

TAPE

This is the symbolic location containing the IOEX select address of the tape to be read.

PROGRAM ERROR

At this return, the decrement of the MQ contains a code number from 1 to 6 which specifies the type of error detected.

1. Tried to read tape after an EOF return for that tape.
2. Error in calling sequence.
3. Tried to read, change tapes, or undefine a logical file which had not been previously defined.
4. Error in the Reader.
5. (not used)
6. Tried to read a tape which had not been selected.

End-of-File

Return is made to this location if an end-of-file has been read by the Reader. The last logical record has been processed in the previous read entry.

Checksum Error

If a redundancy occurs and the Reader is to read only the first D words of the physical record into memory, transfer is made to the checksum error exit. If the Reader is to read the entire physical record into memory and a redundancy error occurs, the

checksum of the logical record called for is checked. If the checksum is correct, processing of the record continues and transfer is made to the normal return. If it is not, transfer is made to the checksum error return. The checksum return is the same as the normal return in all respects except the location to which it returns. The logical record is set up for use even though it is in error.

Normal Return

The address of the accumulator contains the address of the logical record and the decrement contains a count of the number of words (excluding the checksum) in the logical record.

Tape Changes

The program may change tapes when or before an end-of-file is read by the Reader. Before the Reader is instructed to change tapes, the program must select the next tape to be read by the reader. The calling sequence to change tapes is:

```
L     TSX    READ, 4
L+1   PZE    TAPE 2, 2, TAPE 1
L+2   Program error
L+3   Normal return
```

TAPE 2 is the symbolic location containing the IOEX select address of the tape to be read.

TAPE 1 is the symbolic location containing the IOEX select address of the tape just read.

PROGRAM ERROR is the location to which the routine returns if the program tries to change a tape which has not been defined.

Undefine

A logical file must be undefined after the program is finished reading it. The calling sequence to undefine is:

```
L     TSX    READ, 4
L+1   PZE    TAPE, 3, 0
L+2   Program error
L+3   Normal return
```

TAPE is the symbolic location containing the IOEX select address of Tape.

Transfer is made of PROGRAM ERROR if the program tried to undefine a tape which had not been defined.

NORMAL RETURN, the address of the MQ contains a count of the number of logical records (without checksum error) read from the logical file.

IV-I OUTPUT PHASE READ ROUTINE

Definition

This routine (YREAD) will read one logical record from the **JSORT, XSORT,** or Tape Reader (READ) subroutines.

Calling Sequence

```
L     TSX   YREAD, 4
L+1   PZE   T, , K
L+2   End of file return
L+3   Normal return
```

Explanation of Calling Sequence

(a) Tape Option T

If T equals zero, a logical record will be read from the JSORT sorting routine.

If T equals 1, a logical record will be read from the XSORT sorting routine.

If T equals TX (where TX is the symbolic name of a tape), one logical record will be read from tape TX utilizing the READ subroutine.

(b) Sort Sequence Length K

K is the number of words in the sort key and is expressed as a number from 0 to N.

K is used only when the sort key is to be removed from the logical record for processing. If the sort key contains information necessary for the processing of the logical record, K should be set to zero.

Output from Routine

(a) Location YCNT contains the location of the first word of the logical record (including the sort key) in the address and a count of the number of words in the logical record (including the sort key) in the decrement. On the end-of-file condition, both the address and the decrement contain zero.

(b) Index Register 1 contains the location of the first word (complemented) of the logical record (excluding the sort key of length K).

Exception Messages

If the JSORT or XSORT sorting routines are used and a sequence error occurs during the reading of the sort tapes, the following message is printed on-line:

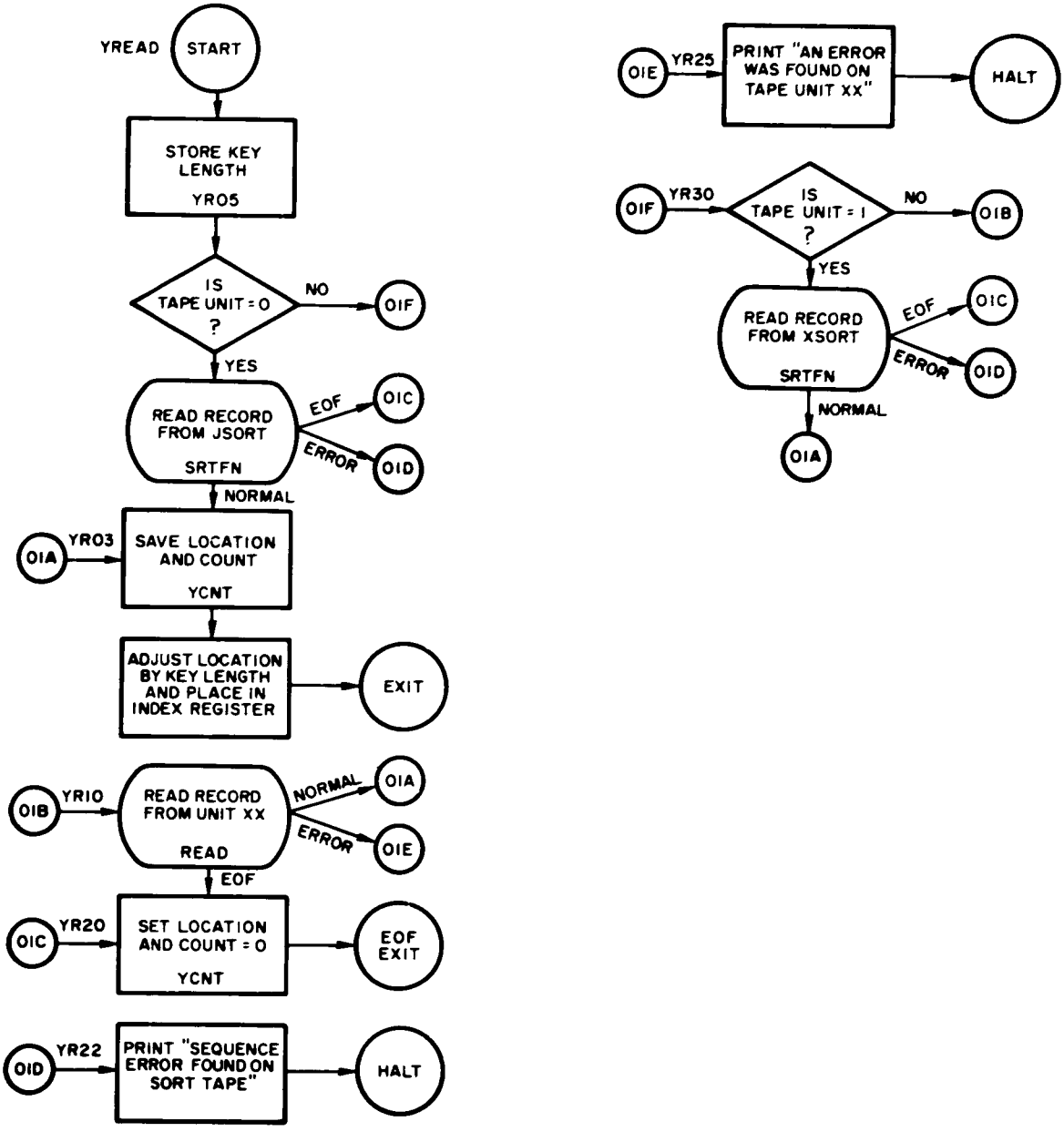
A SEQUENCE ERROR WAS FOUND ON THE SORT TAPE IN THE REPORTING PHASE

and the computer will halt. The program should be rerun.

If the READ subroutine is used and a redundancy error occurs, the following message is printed on-line:

AN ERROR WAS FOUND IN THE REPORTING PHASE ON TAPE UNIT XX

and the computer will halt. The tape on unit XX should be replaced and the program rerun.


YREAD
START
STORE KEY LENGTH
YR05
IS TAPE UNIT = 0 ?
NO
01F
YES
READ RECORD FROM JSORT
SRTFN
EOF
01C
ERROR
01D
NORMAL
01A
YR03
SAVE LOCATION AND COUNT
YCNT
ADJUST LOCATION BY KEY LENGTH AND PLACE IN INDEX REGISTER
EXIT
01B
YR10
READ RECORD FROM UNIT XX
READ
NORMAL
01A
ERROR
01E
EOF
01C
YR20
SET LOCATION AND COUNT = 0
YCNT
EOF EXIT
01D
YR22
PRINT "SEQUENCE ERROR FOUND ON SORT TAPE"
HALT
01E
YR25
PRINT "AN ERROR WAS FOUND ON TAPE UNIT XX"
HALT
01F
YR30
IS TAPE UNIT = 1 ?
NO
01B
YES
READ RECORD FROM XSORT
SRTFN
EOF
01C
ERROR
01D
NORMAL
01A

IV-J OTHER SUBROUTINES

Other subroutines used in processing PERT data are described on the remaining pages of this Subroutines section.

Unpacking Routine (UPCK)

EXPLANATION OF REGION:

This region takes one or more words in memory (6 characters per word) and stores each character into bits 30-35 of consecutive word in memory.

CALLING SEQUENCE:

```
L     TSX     UPCK, 4
L+1   PZE     A, T, N
L+2   PZE     B, I
L+3   Normal return
```

INPUT:

One or more words containing the N characters to be unpacked.

OUTPUT:

N characters contained in bits 30 through 35 of N consecutive words. Bits S through 29 are zero.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

Not applicable.

EXPLANATION OF CALLING SEQUENCE:

A, T = Beginning location of the words to be unpacked (first character in bits s, 1, ..., 5).

B, I = Beginning location of N words each containing one character in bits 30-35.

N = Number of characters to be unpacked.

Packing Routine (PACK)

EXPLANATION OF REGION:

This region takes one or more characters, located in bits 30-35 of consecutive locations in memory, and forms one or more packed words (6 characters per word) in consecutive locations in memory.

CALLING SEQUENCE:

```
L     TSX     PACK, 4
L+1   PZE     A, T, N
L+2   PZE     B, I
L+3   Normal return
```

INPUT:

N characters starting in location B, I.

OUTPUT:

One or more packed words (6 characters each) beginning in location A, T. Incomplete words are justified left and filled out with zeros.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

Not applicable.

EXPLANATION OF CALLING SEQUENCE:

A, T = Beginning location of packed words.

B, I = Beginning location of unpacked characters.

N = Number of characters to be packed.

Memory Sort (MSRT)

EXPLANATION OF REGION:

To internally sort one file of items in the same storage locations originally occupied by the file.

CALLING SEQUENCE:

```
L     TSX     MSRT, 4
L+1   PZE     A,, C
L+2   PZE     L,, N
L+3   PZE     K,, M
L+4   Normal return
```

INPUT:

One file of items stored in consecutive locations in memory.

OUTPUT:

One file of sorted items arranged in memory in increasing order.

STORAGE USED:

Not applicable

SUBREGIONS AND SUBROUTINES USED:

Not applicable

EXPLANATION OF CALLING SEQUENCE:

A = Location of first word of first item

C = Number of words in the key

L = Location of first word of key (L = 1, 2, ...)

N = Number of words in each item

K = 0, logical sort

= 1, algebraic sort

M = Number of items to be sorted

Three-Word to Three-Word Comparison Routine (YCOMP)

EXPLANATION OF REGION:

To compare two 3-word fields.

CALLING SEQUENCE:

```
L      TSX      YCOMP, 4
L+1    CAL      A, T
L+2    LAS      B, T
L+3    Return   A > B
L+4    Return   A = B
L+5    Return   A < B
```

INPUT:

Not applicable

OUTPUT:

Not applicable

STORAGE USED:

Not applicable

SUBREGIONS AND SUBROUTINES USED:

Not applicable

EXPLANATION OF CALLING SEQUENCE:

Compares three words of field A, T to three words of field B, T.

Three-Word to Three-Word Comparison Routine (YCOMP)

EXPLANATION OF REGION:

To compare two 3-word fields.

CALLING SEQUENCE:

```
L      TSX      YCOMP, 4
L+1    CAL      A, T
L+2    LAS      B, T
L+3    Return   A > B
L+4    Return   A = B
L+5    Return   A < B
```

INPUT:

Not applicable

OUTPUT:

Not applicable

STORAGE USED:

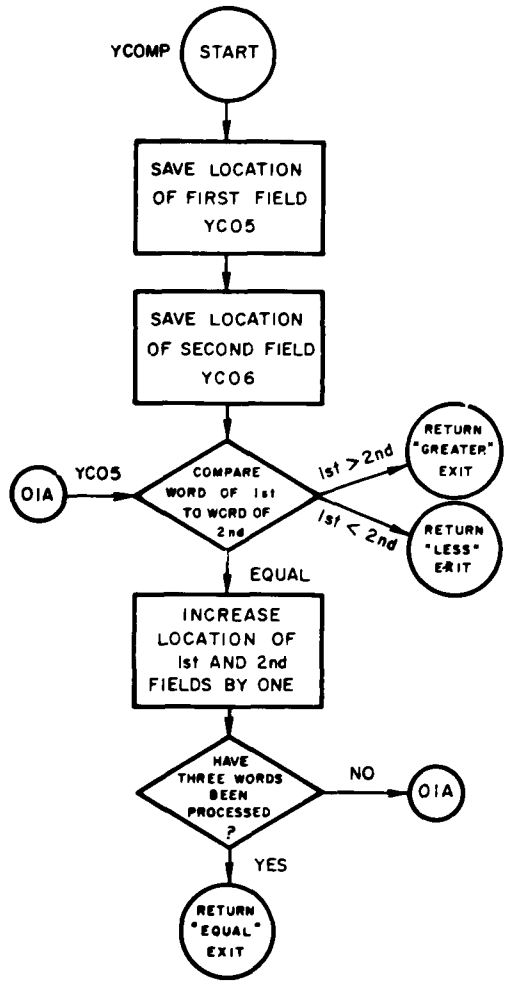
Not applicable

SUBREGIONS AND SUBROUTINES USED:

Not applicable

EXPLANATION OF CALLING SEQUENCE:

Compares three words of field A, T to three words of field B, T.


YCOMP
START
SAVE LOCATION OF FIRST FIELD YCO5
SAVE LOCATION OF SECOND FIELD YCO6
YCO5
O1A
COMPARE WORD OF 1st TO WORD OF 2nd
1st > 2nd
RETURN "GREATER" EXIT
1st < 2nd
RETURN "LESS" EXIT
EQUAL
INCREASE LOCATION OF 1st AND 2nd FIELDS BY ONE
HAVE THREE WORDS BEEN PROCESSED ?
NO
O1A
YES
RETURN "EQUAL" EXIT

Date Comparison Routine (YDCMP)

EXPLANATION OF REGION:

To compare two dates in the form of DDMMYY.

CALLING SEQUENCE:

```
L     TSX     YDCMP, 4
L+1   first date greater than second
L+2   first date equal to second
L+3   first date less than second
```

INPUT:

First date in Accumulator.

Second date in MQ.

OUTPUT:

Not applicable

STORAGE USED:

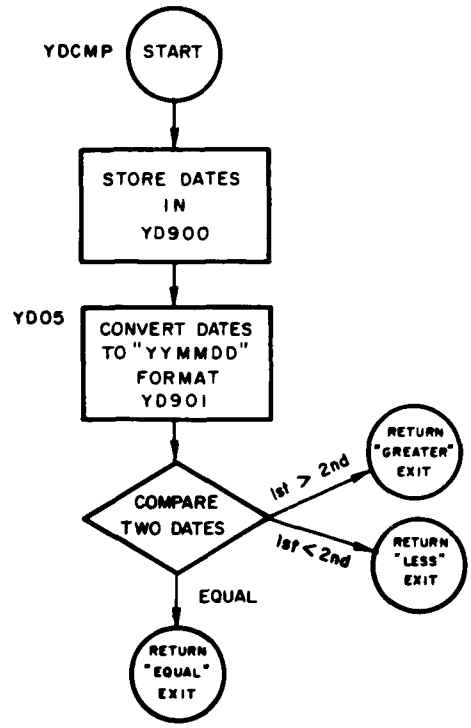
Not applicable

SUBREGIONS AND SUBROUTINES USED:

Not applicable

EXPLANATION OF CALLING SEQUENCE:

Not applicable


YDCMP
START
STORE DATES IN YD900
YD05
CONVERT DATES TO "YYMMDD" FORMAT YD901
COMPARE TWO DATES
1st > 2nd
RETURN "GREATER" EXIT
1st < 2nd
RETURN "LESS" EXIT
EQUAL
RETURN "EQUAL" EXIT

Page Count Routine (YPAGE)

EXPLANATION OF REGION:

To reset or increment page counter.

CALLING SEQUENCE:

```
L     TSX     YPAGE, 4
L+1   PZE     S
L+2   Normal return
```

INPUT:

Page number in ZPAGE.

OUTPUT:

Adjusted page number in ZPAGE.

STORAGE USED:

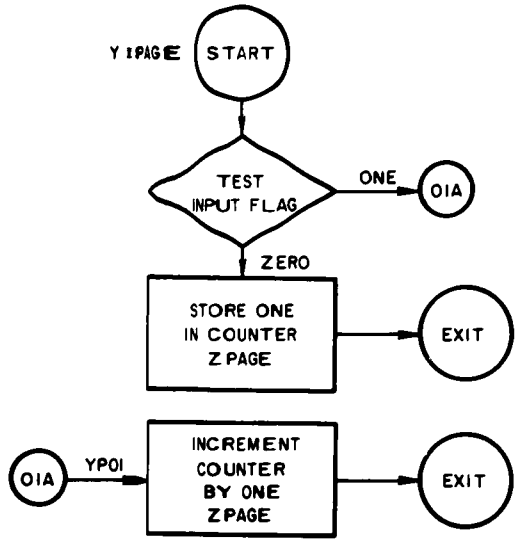
Not applicable

SUBREGIONS AND SUBROUTINES USED:

Not applicable

EXPLANATION OF CALLING SEQUENCE:

S: 0 = reset page number to 1;
1 = increment page number by 1.


YPAGE
START
TEST
INPUT FLAG
ONE
01A
ZERO
STORE ONE
IN COUNTER
Z PAGE
EXIT
01A
YP01
INCREMENT
COUNTER
BY ONE
Z PAGE
EXIT

Security Number Incrementer Routine (YSEC)

EXPLANATION OF REGION:

To increment the security number by one.

CALLING SEQUENCE:

```
L     TSX     YSEC, 4
L+1   Normal return
```

INPUT:

ZSEC = previous security number.

ZSECI = character of section number to be incremented.

OUTPUT:

ZSEC = new security number.

STORAGE USED:

None

SUBREGIONS AND SUBROUTINES USED:

PACK

UPCK

EXPLANATION OF CALLING SEQUENCE:

Not applicable

Security Number Incrementer Routine (YSEC)

EXPLANATION OF REGION:

To increment the security number by one.

CALLING SEQUENCE:

```
L     TSX     YSEC, 4
L+1   Normal return
```

INPUT:

ZSEC = previous security number.

ZSECI = character of section number to be incremented.

OUTPUT:

ZSEC = new security number.

STORAGE USED:

None

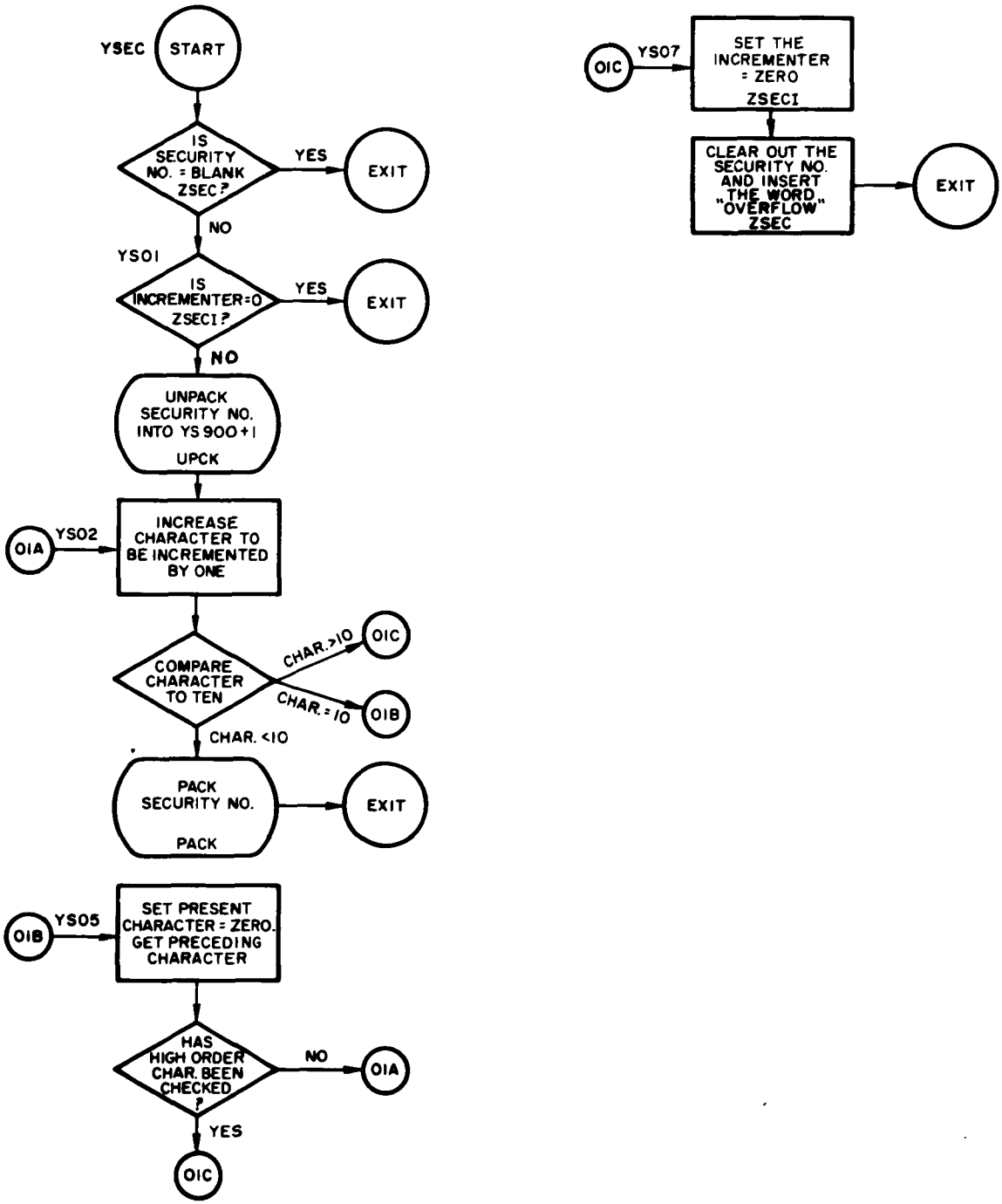
SUBREGIONS AND SUBROUTINES USED:

PACK

UPCK

EXPLANATION OF CALLING SEQUENCE:

Not applicable


YSEC
START
IS SECURITY NO. = BLANK ZSEC?
YES
EXIT
NO
YS01
IS INCREMENTER=0 ZSECI?
YES
EXIT
NO
UNPACK SECURITY NO. INTO YS 900+1
UPCK
01A
YS02
INCREASE CHARACTER TO BE INCREMENTED BY ONE
COMPARE CHARACTER TO TEN
CHAR.>10
01C
CHAR.=10
01B
CHAR. <10
PACK SECURITY NO.
PACK
EXIT
01B
YS05
SET PRESENT CHARACTER = ZERO. GET PRECEDING CHARACTER
HAS HIGH ORDER CHAR. BEEN CHECKED ?
NO
01A
YES
01C
01C
YS07
SET THE INCREMENTER = ZERO
ZSECI
CLEAR OUT THE SECURITY NO. AND INSERT THE WORD "OVERFLOW"
ZSEC
EXIT

Level Checking Routine (YLVL)

EXPLANATION OF REGION:

To check whether a charge number is on or connected to level L.

CALLING SEQUENCE:

```
L     TSX     YLVL, 4
L+1   PZE     A, T, B
L+2   No connection exit
L+3   Connection to level exit
L+4   Next lower level exit
L+5   On level exit
```

INPUT:

Accumulator = level number "L" in address

OUTPUT:

Christmas Tree Indicator of level "L" in B (3 words).

STORAGE USED:

Not applicable

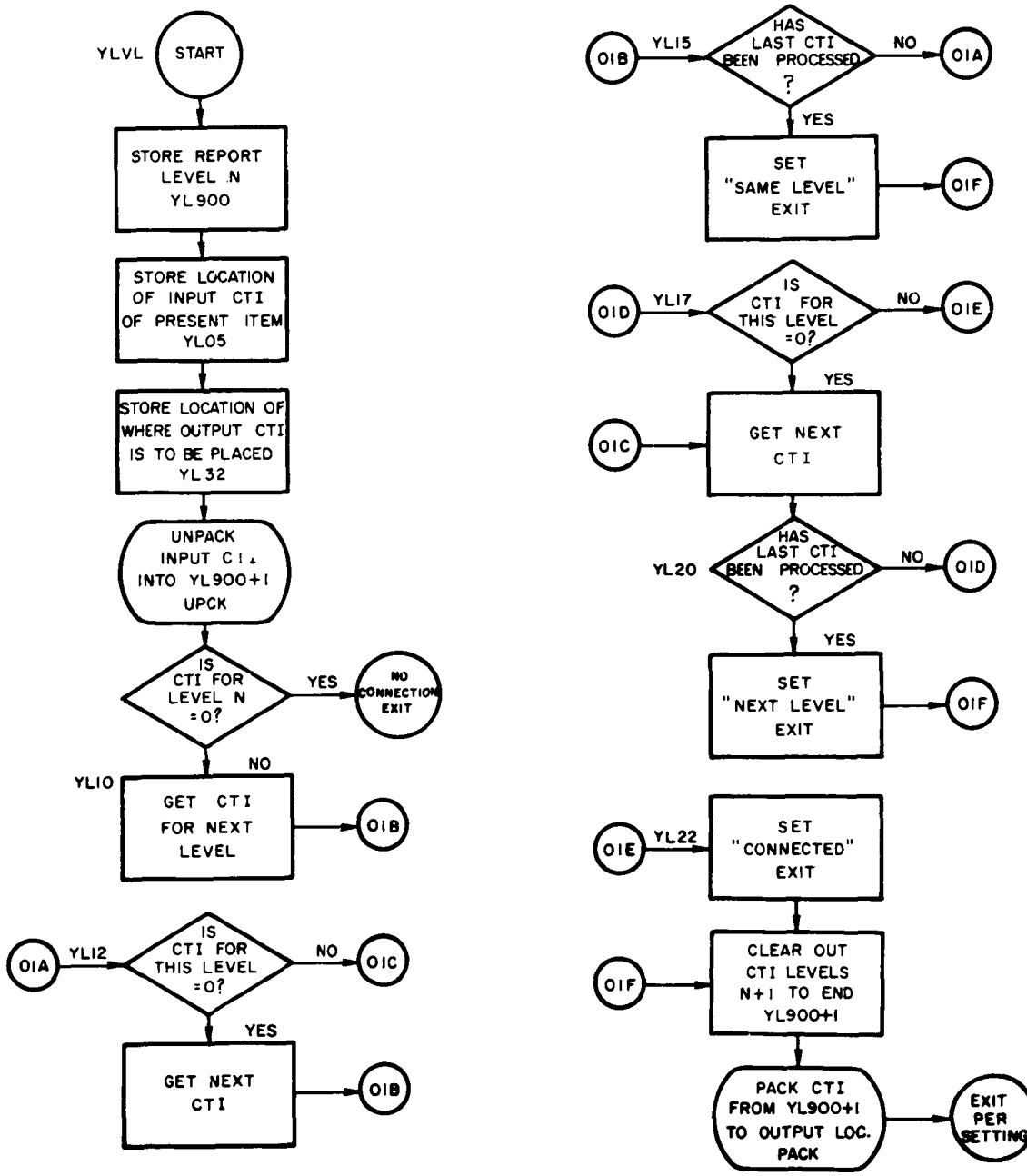
SUBREGIONS AND SUBROUTINES USED:

Not applicable

EXPLANATION OF CALLING SEQUENCE:

A, T = Location of CTI for charge number.

B = Location where CTI for level "L" will be stored.


YLVL
START
STORE REPORT LEVEL N YL900
STORE LOCATION OF INPUT CTI OF PRESENT ITEM YL05
STORE LOCATION OF WHERE OUTPUT CTI IS TO BE PLACED YL32
UNPACK INPUT CTI INTO YL900+1 UPCK
IS CTI FOR LEVEL N =0?
YES
NO CONNECTION EXIT
NO
YL10
GET CTI FOR NEXT LEVEL
01B
01A
YL12
IS CTI FOR THIS LEVEL =0?
NO
01C
YES
GET NEXT CTI
01B
01B
YL15
HAS LAST CTI BEEN PROCESSED ?
NO
01A
YES
SET "SAME LEVEL" EXIT
01F
01D
YL17
IS CTI FOR THIS LEVEL =0?
NO
01E
YES
01C
GET NEXT CTI
YL20
HAS LAST CTI BEEN PROCESSED ?
NO
01D
YES
SET "NEXT LEVEL" EXIT
01F
01E
YL22
SET "CONNECTED" EXIT
01F
CLEAR OUT CTI LEVELS N+1 TO END YL900+1
PACK CTI FROM YL900+1 TO OUTPUT LOC. PACK
EXIT PER SETTING

Field Change Routine (YBRAK)

EXPLANATION OF REGION:

To check for change in field.

CALLING SEQUENCE:

```
L     TSX     YBRAK, 4
L+1   Change exit
L+2   No change exit
```

INPUT

Accumulator: Location of field in address and tag number of words in field in decrementer.

OUTPUT:

If a change occurs in the field, the new field will be saved for future comparisons, and return will be made through the change exit.

STORAGE USED:

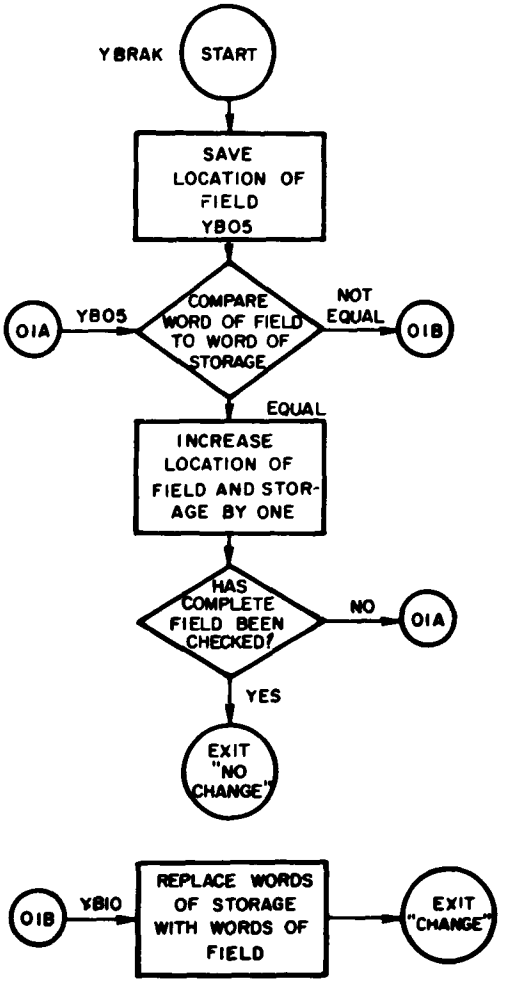
Not applicable

SUBREGIONS AND SUBROUTINES USED:

Not applicable

EXPLANATION OF CALLING SEQUENCE:

Not applicable


YBRAK
START
SAVE LOCATION OF FIELD YB05
01A
YB05
COMPARE WORD OF FIELD TO WORD OF STORAGE
NOT EQUAL
01B
EQUAL
INCREASE LOCATION OF FIELD AND STORAGE BY ONE
HAS COMPLETE FIELD BEEN CHECKED?
NO
01A
YES
EXIT "NO CHANGE"
01B
YB10
REPLACE WORDS OF STORAGE WITH WORDS OF FIELD
EXIT "CHANGE"

Output Subroutine (ZKOUT)

EXPLANATION OF REGION:

This region processes and writes output messages on the output tape and/or the on-line printer.

CALLING SEQUENCE:

Output

PTH A, T, 1000 · N + PW (Note 1)

⋮

PTH

XXX XXX = PON or FVE

INPUT:

1. Location of a BCI image in core (A, T).
2. Number of words in image (N).
3. Right-most print-wheel desired in message (PW).
4. Off-line and/or on-line indicator.
5. Carriage control indicator (CC).

OUTPUT:

A message written on the output tape (SYSOU1) and/or the on-line printer.

SUBREGIONS AND SUBROUTINES USED:

PACK

UPCK

EXPLANATION OF CALLING SEQUENCE:

(a) PTH A, T, 1000 · N + PW (Note 1)

Prints N BCI words ($1 \leq N \leq 20$) where the first word is located in A, T. The last sixth character of the Nth word is printed by print wheel PW; i.e., PTH L, 0, 20120 will print the contents of L through L + 19 using print wheels 1-120.

(b) CC = 1, Single space before printing.

2, Double space before printing.

3, Restore page before printing.

(c) FVE Causes the line already set up by previous PTH pseudo-operations to be printed on the on-line printer regardless of Switch 2. (Note 1)

(d) PON Causes the line already set up by previous PTH pseudo-operations to be output:

1) on the on-line printer and on SYSOU1 if Sense Switch 2 is on, or

2) on SYSOU1 alone if Sense Switch 2 is off.

3) on the on-line printer and on SYSOU1 if the decrement of the PON is not zero.

Note 1: HTH may be interchanged with PTH with the same results by writing the input parameters in the following format:

HTH A, T, N, PW

The same definitions apply. HTH L, 0, 20, 120 will print the contents of L through L + 19, using print wheels 1-120.