AD NUMBER
ADB007215
LIMITATION CHANGES
TO: **Approved for public release; distribution is unlimited.**
FROM: **Distribution authorized to U.S. Gov't. agencies only; Test and Evaluation; JUL 1975. Other requests shall be referred to Aeronautical Systems Division, Attn: YHCD, Wright-Patterson AFB, OH 45433.**
AUTHORITY
ASD ltr 11 Jul 1977

(2)

Calspan

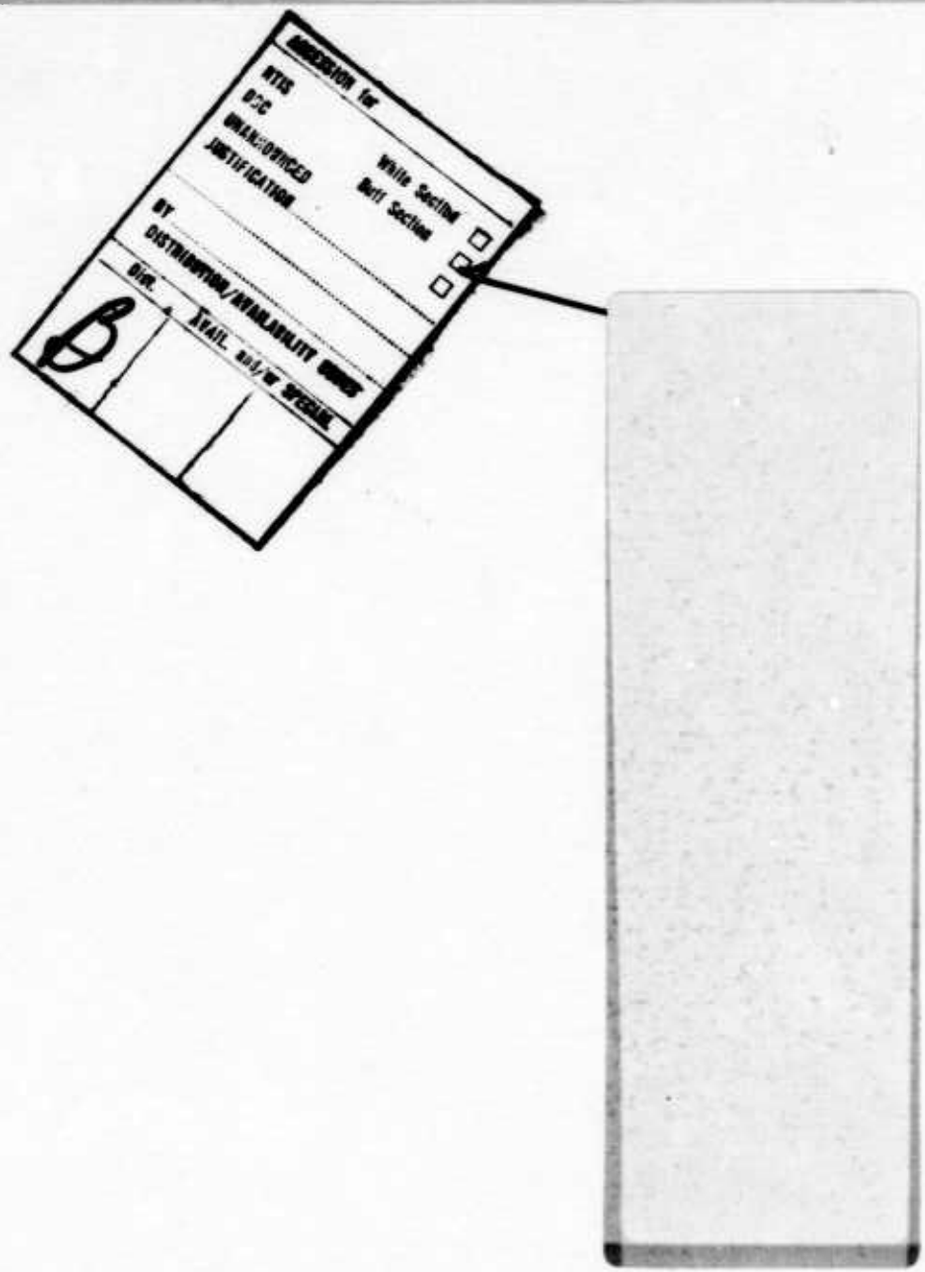
Technical Report

AD B007215

DDC
RECEIVED
SEP 29 1975
C

AD No. _____
DDC FILE COPY

Calspan Corporation
Buffalo, New York 14221


ACCESSION for
NTIS
DDC
UNANNOUNCED
JUSTIFICATION
White Section
Buff Section
BY
DISTRIBUTION/AVAILABILITY CODES
Dist. AVAIL. and/or SPECIAL
B

Calspan

B-1 SYSTEMS APPROACH TO TRAINING
TECHNICAL MEMORANDUM SAT-6

TRAINING RESOURCES ANALYTICAL MODEL (TRAM)
PROGRAMMER'S MANUAL

JULY 1975

PREPARED BY: William F. H. Ring
William F. H. Ring

George Gaidasz
George Gaidasz

John R. Menig
John R. Menig

Walter L. Stortz
Walter L. Stortz

APPROVED BY: Robert C. Sugarman
Robert C. Sugarman
SAT Task Manager

APPROVED BY: D. Barry Dahm
D. Barry Dahm, Head
Environmental & Energy
Systems Department

APPROVED BY: Richard J. Taylor for
Robert C. Kidder
Program Manager
B-1 Technical Support Program

CALSPAN CORPORATION
CONTRACT NO. F33657-75-C-0021

Calspan Corporation
Buffalo, New York 14221

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER

2. GOVT ACCESSION NO.

3. RECIPIENT'S CATALOG NUMBER

4. TITLE (and Subtitle)

B-1 Systems Approach to Training. [redacted] Training Resources Analytic Model (TRAM). Programmer's Manual.

5. TYPE OF REPORT & PERIOD COVERED

Final Report
Technical Memorandum
July 1974 - October 1975

6. PERFORMING ORG. REPORT NUMBER

SAT-6

7. AUTHOR(s)

William F.H. Ring, Walter L. Stortz
George Gaidasz
John R. Menig

8. CONTRACT OR GRANT NUMBER(s)

F33657-75-C-0021

9. PERFORMING ORGANIZATION NAME AND ADDRESS

Calspan Corporation
P. O. Box 235
Buffalo, New York 14221

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

11. CONTROLLING OFFICE NAME AND ADDRESS

Aeronautical Systems Division
B-1 Systems Project Office
Wright-Patterson Air Force Base, OH 45433

12. REPORT DATE

JULY 1975

13. NUMBER OF PAGES

640

14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)

CALSPAN-TM-SAT-6

15. SECURITY CLASS. (of this report)

Unclassified

15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Distribution limited to U.S. Government Agencies only: test and evaluation; July 1975. Other requests for this document must be referred to B-1 Systems Program Office, ASD/YHCD, Wright-Patterson Air Force Base, Ohio 45433.

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

18. SUPPLEMENTARY NOTES

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

Instructional Systems Development
Systems Approach to Training
B-1
Economic Modeling
Resource Management
Computer Storage
Training
Training Resources

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

The TRAM is a multiphase set of computer programs. Each program except for the sorting steps is described by a user's guide and programmer's guide. This document is the Programmer's Guide. The programmer's guide is intended to be a supplement to the user's guide, thereby saving unnecessary repitition except where the repitition is useful for understanding the material.

(AD-B001 214)

(Over)

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

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

407 727

20. (Continued)

The purpose of Phase 1 is to assemble most of the data and to check it for consistency and completeness. The result of Phase 1 is normally a tape which is passed to Phase 2. Phase 2 makes further checks on linkages and network integrity. Phase 2 prepares lists of names, student demands, trainee source lists and resource lists. Phase 3 resolves the trainee demands into classes and determines the amount of resources used by simulating the training system. The output of Phase 3 consists of source and lag records which indicate the occurrence of trainee matriculation, lags due to lack of resources, and an unused resources file. Phase 4 computes the amount of resources used by comparing the unused and original resources, and then prepares an economic analysis of the run. Phase 5 processes the trainee source and lag records and writes a report on these uses.

TROLIE is a quick-look version of Phases 1,2 and 3 of TRAM which can be used for less detailed analysis.

PREFACE

This document is one of several technical memoranda which have been delivered to the B-1 Systems Project Office (B-1 SPO) in performance of the Systems Approach to Training (SAT) Task under Contract Number F33657-75-C-0021. Each of the separate SAT documents is listed below. Additional copies may be requested from: B-1 Systems Project Office, Data Configuration Division, Wright-Patterson Air Force Base, Ohio.

Technical Memoranda	Number	Author(s)	Date
B-1 Systems Approach to Training, Final Report.	SAT- 1 Vol. 1	R. Sugarman S. Johnson W. Ring	July 1975
B-1 Systems Approach to Training, Final Report. Appendix A: Cost Details.	SAT- 1 Vol. 2	H. Reif W. Ring	July 1975
B-1 Systems Approach to Training, Final Report. Appendix B: Bibliography and Data Collection Trips.	SAT- 1 Vol. 3	A. Blair	July 1975
Behavioral Objectives for the Pilot, Copilot, and Offensive Systems Operator.	SAT- 2 Vol. 1 & 2	J. Mitchell W. Hinton S. Johnson	July 1975
Simulation Technology Assessment Report (STAR).	SAT- 3	S. Johnson J. Knight R. Sugarman	July 1975
Sorting Model for B-1 Aircrew Training Data. User's and Programmer's Guide.	SAT- 4	J. Menig T. Ranney	July 1975
Training Resources Analytic Model (TRAM). User's Manual.	SAT- 5	W. Ring G. Gaidasz J. Menig W. Stortz	July 1975
Training Resources Analytic Model (TRAM). Programmer's Manual.	SAT- 6	W. Ring G. Gaidasz J. Menig W. Stortz	July 1975
Task Analysis Listings.	SAT- 7	J. Mitchell T. Ranney	July 1975
Control/Display Catalog and Action Verb Thesaurus.	SAT- 8	T. Ranney A. Blair	July 1975

July 1975
SAT-6

TRAINING RESOURCES ANALYTIC MODEL
(TRAM)
PROGRAMMER'S MANUAL

William F.H. Ring
George Gaidasz
John R. Menig
Walter L. Stortz

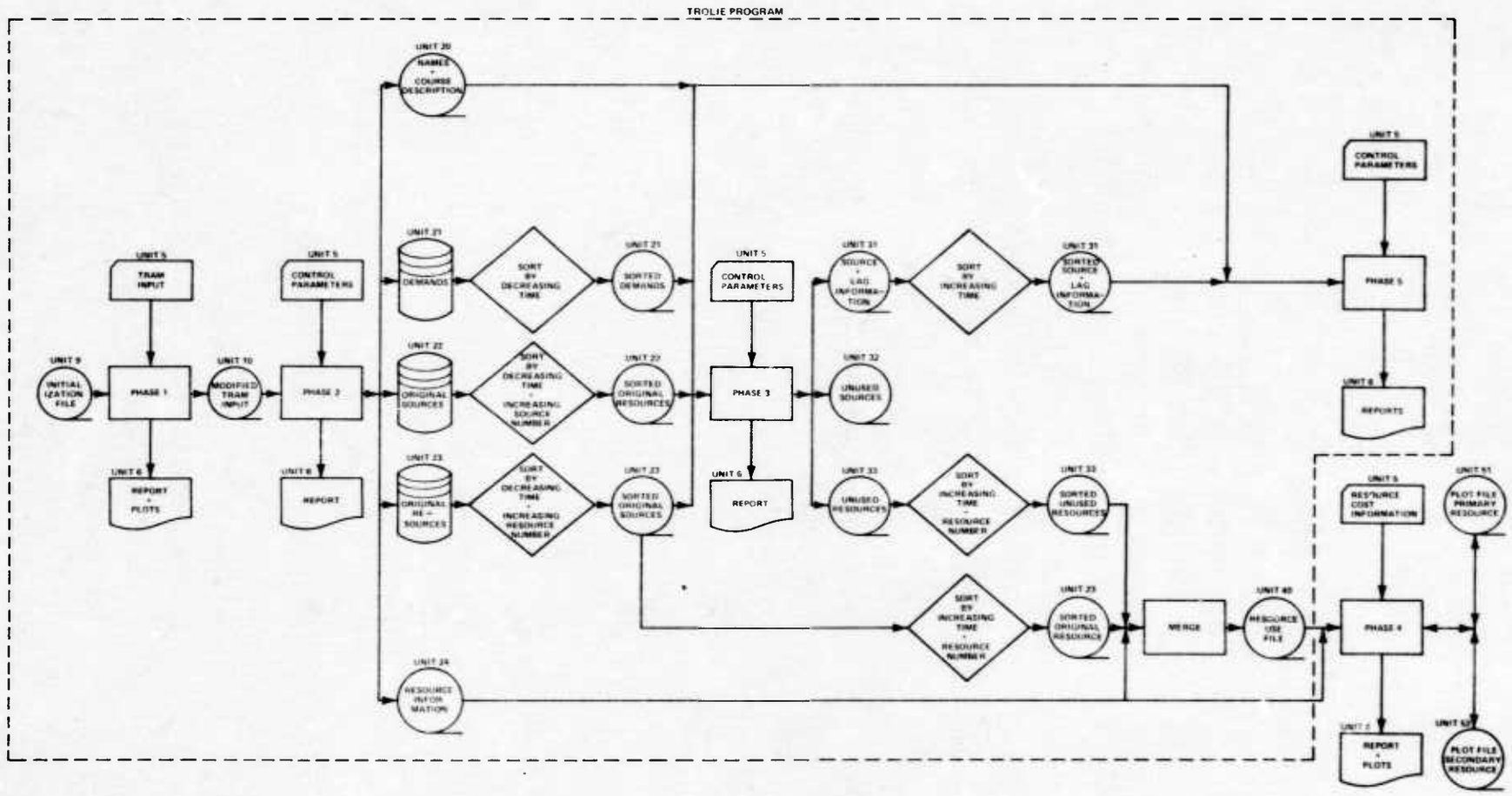
SUMMARY

The TRAM is a multiphase set of computer programs. The following figure is the overall flow diagram which depicts each program within TRAM and the data sets associated with it. Each program except for the sorting steps is described by a user's guide and programmer's guide. This document is the Programmer's Guide.

The programmer's guide is intended to be a supplement to the user's guide thereby saving unnecessary repitition except where the repetition is useful for understanding the material.

The purpose of Phase 1 is to assemble most of the data and to check it for consistency and completeness. The result of Phase 1 is normally a tape which is passed to Phase 2. Phase 2 makes further checks on linkages and network integrity. Phase 2 prepares lists of names, student demands, trainee source lists and resource lists. Phase 3 resolves the trainee demands into classes and determines the amount of resources used by simulating the training system. The output of Phase 3 consists of source and lag records which indicate the occurrence of trainee matriculation, lags due to lack of resources, and an unused resources file. Phase 4 computes the amount of resources used by comparing the unused and original resources, and then prepares an economic analysis of the run. Phase 5 processes the trainee source and lag records and writes a report on these uses.

TROLIE is a quick-look version of Phases 1,2 and 3 of TRAM which can be used for less detailed analysis.



TRAM OVERALL ORGANIZATION

(Dashed lines indicate portions of TRAM replaced by TROLIE-the quick-look program)

TABLE OF CONTENTS

TABLE OF CONTENTS (CONT)

Section 1.1

INTRODUCTION

The purpose of phase 1 is to read the user inputs and convert them to the internal format required for phase 2. It also tests the inputs for validity and provides the necessary outputs to document the run.

The manual is intended to aid the programmer in the operation and modification of the computer program by supplementing the users' guide.

Section 1.2

PROGRAM DESCRIPTION

Phase 1 performs the following functions:

- reads the input cards and prints them
- checks all values for validity
- prints formatted tables of the inputs
- replaces user assigned names with an internal ID number
- plots a course block diagram
- sorts the data records and writes them onto unit 10 for phase 2.

Phase 1 initializes certain common areas with data contained on its initialization file (unit 9). The values on this file are considered program constants, rather than inputs, and any changes to them are usually accompanied with program modifications. See Section 10 for for a description of this file.

The values from each input card are printed as they are read. Also, each numeric value is tested against a range of acceptable values to see if it is valid. If it is not, a diagnostic message is printed, which will appear immediately after the card on the input card listing.

The inputs are stored in data blocks that are held in a single large array. The blocks of each type are chained together by pointers to form a sequential file. For a detailed description of this system, see the description of common FILE (in Section 1.7), and then the internal data block descriptions (Section 1.8).

After all inputs have been read, they may be optionally re-printed in formatted tables. The purpose of this printout is to show all the inputs in an easily readable form.

The next processing performed is to generate a table of all user ıgned names, and to replace all references to these names with internal ID ımbers. Some of the subroutines that do this are table driven. That is, they locate where names are defined, and where they are referenced by the use of tables read from the initialization file. It is during this processing that undefined or multiply defined names are detected and flagged.

If no errors have been detected up to this point, the course block diagram is plotted (optional). Additional error messages are printed if the processing blocks are not in the proper order for plotting.

Next, a subroutine is called to complete the information in the CCTS, PMT group, and PMT data blocks. This consists of filling in the airbase number and the time, which are obtained from the airbase event that is specified by the block.

The final processing performed in phase 1 is to sort the input data and write it to file 10 for input to phase 2.

Section 1.3

DESCRIPTION OF INPUTS

The input cards for the TRAM model have fixed format fields, and a separate card is provided for each different type of information. Coding forms for each of these input cards, along with a detailed description of the input variables, can be found in the Users' Guide. The following paragraphs give a more general description of the inputs.

All cards have a card name field, which is used to identify the card type. Although the different card types contain different information, most of them conform to a standard field layout. This consists of the card name field in columns 1-10, followed by two ten-column character data fields and ten five-column numeric data fields. All numeric data are read in integer format. Variables whose values can take on non-integral values are read with an implied decimal point. These values are converted internally, using the position of the implied decimal point shown on the coding forms. Character data are left justified and numeric data are right justified.

Cards that do not conform to the standard field layout (TASK, RUB, RUDB), must be preceded by a set header card. This card identifies the type of cards that are to follow. Note that these non-standard cards have a blank card name field, since the card type is identified by the header card. Each set is terminated by a SETEND card.

Some input cards require additional continuation cards. Such cards have parameters to give the number of each type of card that is to follow it. The formats for these additional cards are shown on the same coding form as the header card so that they may be easily coded in the proper sequence. Note that these continuation cards also have blank card name fields, since the card type is identified by the header card.

In general, these cards, or groups of cards, can be coded in any order. The only exception to this is the course and the processing block cards. The processing blocks for each course must follow the course card. Also, the processing blocks within a course must start with the graduation block and proceed

towards matriculation. This is because the position of each processing block is given as an offset from the block connected to it on the right. If there is more than one block to the right, as in the case of fan-outs, the first one encountered is the one used as the reference position.

The input deck must be ended with an end card, which consists of the word "END" punched in the first field.

Section 1.4

DESCRIPTION OF OUTPUTS

Input Card Listing

This listing shows the values exactly as they are read from each card. Field numbers are marked across the top of the page for reference by error messages. These fields correspond to five card columns. Character data are spread across two such fields, and would be referred to by the number of the second field. Also, card sequence numbers are printed for later reference by error messages. This listing is always printed.

Formatted Input Tables

These tables duplicate the information shown by the input card listing, but present it in a conveniently readable form. All variables are identified by column titles, and the meanings of integer codes are printed rather than the codes themselves. Also, these values will show the results of any input conversion that was done. The user may suppress this listing by use of the input routine control card.

Course Block Diagram

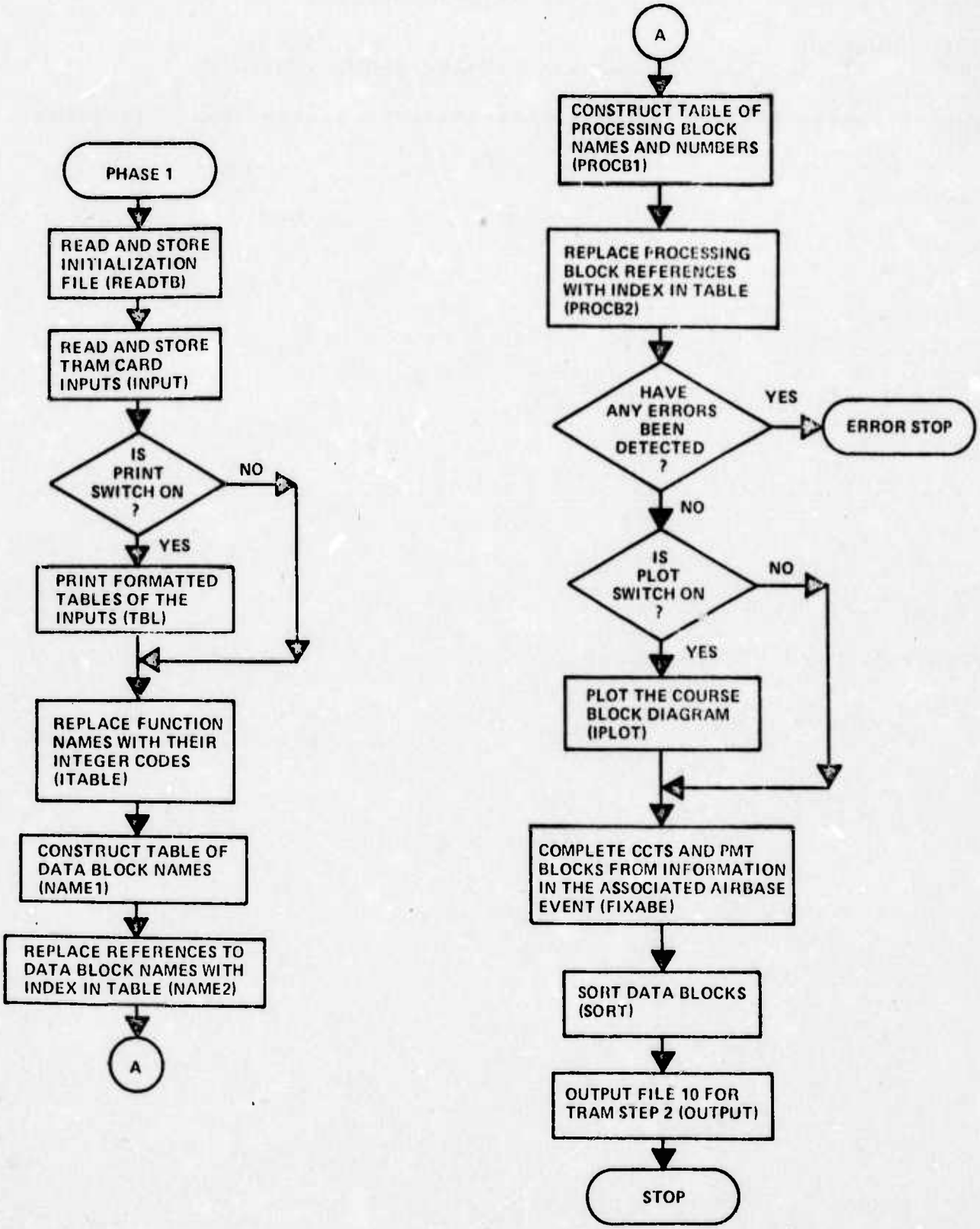
This plot shows the structure of the courses by displaying each processing block in the course as a rectangle, with the flow of students shown by connecting lines from one processing block to the next. Inside each rectangle, the block number, block name, synchronize-correlate reference (if any), and task names are shown. The course name is plotted above each graduation block. The input routine control card specifies if this plot is to be produced.

Section 1.5

SUBPROGRAM DESCRIPTIONS

This section contains the descriptions of the individual subroutines that comprise phase 1 of the TRAM program. The description for each subprogram consists of a statement of the purpose of the routine, the calling sequence, a description of its parameters, the method used, and a list of the subprograms required. A high level flowchart, which shows the logical decision points and the processing accomplished, is also included for each of the major subprograms.

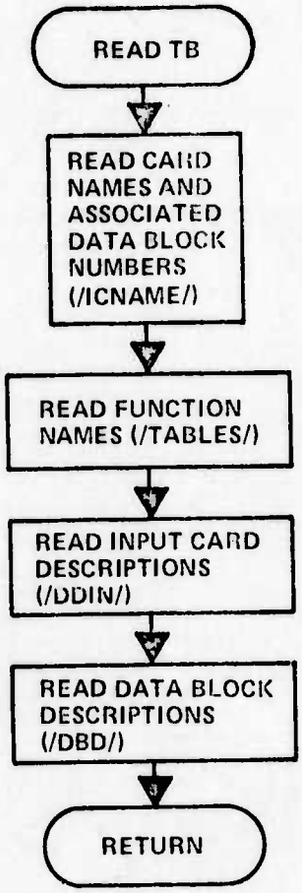
```
CC******************************  PHASE1  ********************************
CC*                                                                      *
CC*                        PHASE1 MAIN PROGRAM                           *
CC*                                                                      *
CC*   PURPOSE                                                            *
CC*      TO PERFORM THE FOLLOWING FUNCTIONS                              *
CC*      - READ THE TRAM INPUT CARDS AND PRINT THEM                      *
CC*      - CHECK VALUES FOR VALIDITY                                     *
CC*      - PRINT FORMATTED TABLES OF THE INPUTS                          *
CC*      - REPLACE USER ASSIGNED NAMES WITH INTERNAL ID NUMBERS          *
CC*      - PLOT THE COURSE BLOCK DIAGRAM                                 *
CC*      - SORT THE INPUTS AND WRITE THEM TO UNIT 10 FOR PHASE 2         *
CC*                                                                      *
CC*   REFERENCES                                                         *
CC*      SEE TRAM USERS GUIDE AND TRAM PROGRAMMERS MANUAL                *
CC*                                                                      *
CC*   SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                       *
CC*      READTB                                                          *
CC*      INPUT                                                           *
CC*      ITABLE                                                          *
CC*      NAME1                                                           *
CC*      NAME2                                                           *
CC*      PROCB1                                                          *
CC*      PROCB2                                                          *
CC*      FIXABE                                                          *
CC*      SORT                                                            *
CC*      OUTPUT                                                          *
CC*      IPLOT                                                           *
CC*                                                                      *
CC************************************************************************
```



PHASE 1 MAIN PROGRAM

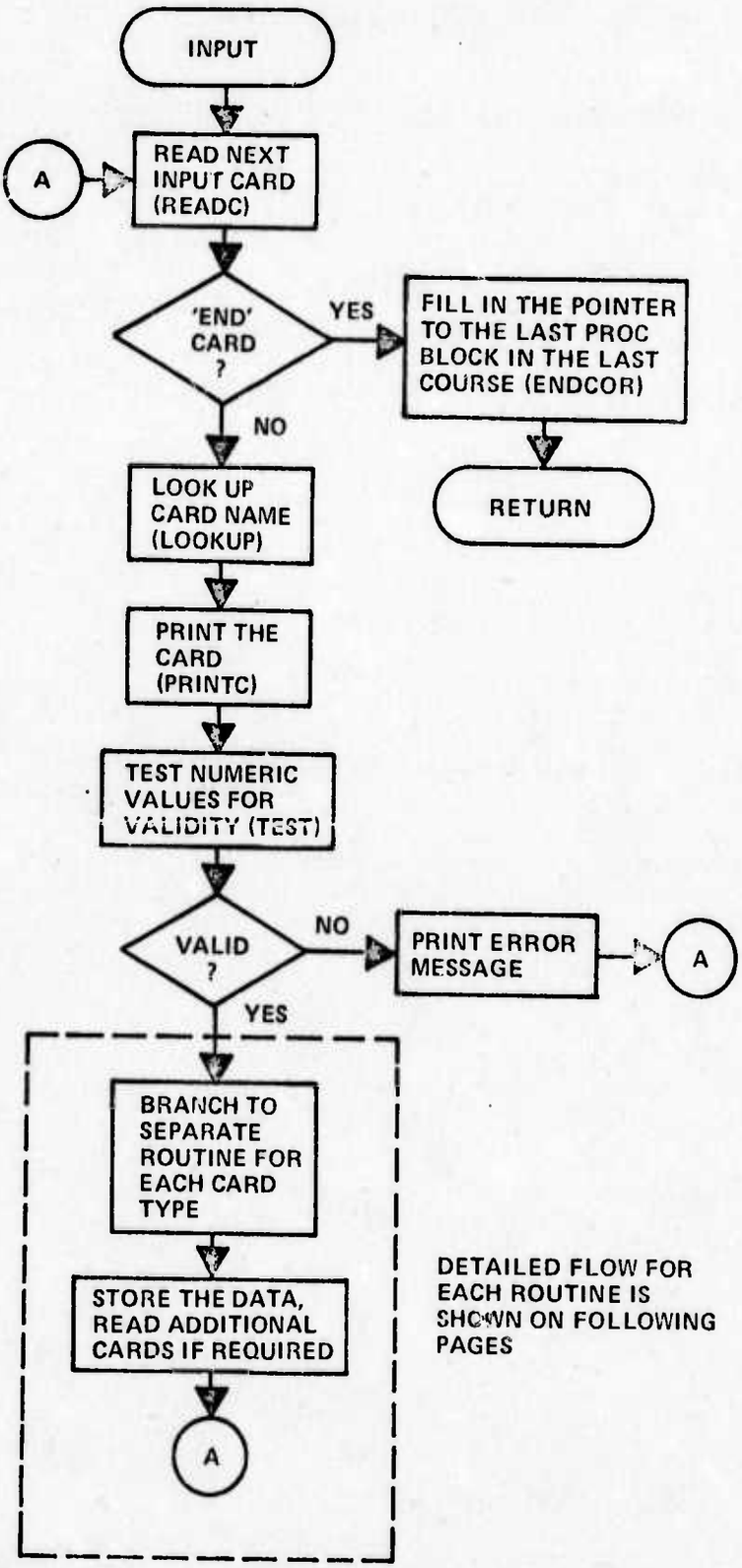
```
CC********************************  BLOCKD  ********************************
CC*                                                                        *
CC*                         BLOCK DATA BLOCKD                              *
CC*                                                                        *
CC*   PURPOSE                                                              *
CC*      TO INITIALIZE COMMON AREAS FOR INPUT ROUTINES                     *
CC*                                                                        *
CC**************************************************************************
```

```
CC******************************  READTB  ******************************
CC*                                                                    *
CC*                         SUBROUTINE READTB                          *
CC*                                                                    *
CC*   PURPOSE                                                          *
CC*      TO READ THE PHASE 1 INITIALIZATION FILE                       *
CC*                                                                    *
CC*   CALLING SEQUENCE                                                 *
CC*      CALL  READTB                                                  *
CC*                                                                    *
CC*   DESCRIPTION OF PARAMETERS                                        *
CC*      NONE                                                          *
CC*                                                                    *
CC*   SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                     *
CC*      NONE                                                          *
CC*                                                                    *
CC**********************************************************************
```

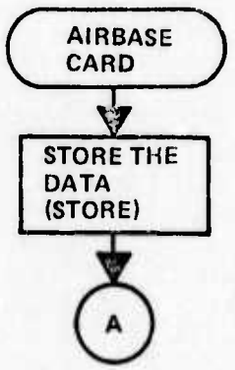


SUBROUTINE READTB

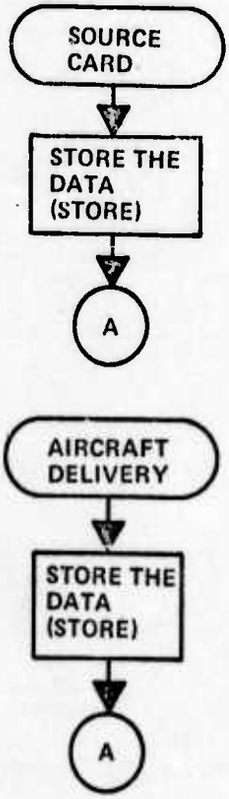
```
CC*****************************  INPUT  ********************************
CC*                                                                    *
CC*                         SUBROUTINE INPUT                           *
CC*                                                                    *
CC*   PURPOSE                                                          *
CC*      TO READ THE INPUT CARDS AND STORE THEM                        *
CC*                                                                    *
CC*   CALLING SEQUENCE                                                 *
CC*      CALL  INPUT (IERROR)                                          *
CC*                                                                    *
CC*   DESCRIPTION OF PARAMETERS                                        *
CC*      OUTPUT                                                        *
CC*        IERROR - NUMBER OF ERRORS FOUND                             *
CC*                                                                    *
CC*   SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                     *
CC*        READC                                                       *
CC*        LOOKUP                                                      *
CC*        PRINTC                                                      *
CC*        TEST                                                        *
CC*        RPT                                                         *
CC*        STORE                                                       *
CC*        SHIFTR                                                      *
CC*        ENDCOR                                                      *
CC*        ADDREC                                                      *
CC*        TRNSFR                                                      *
CC*                                                                    *
CC**********************************************************************
```



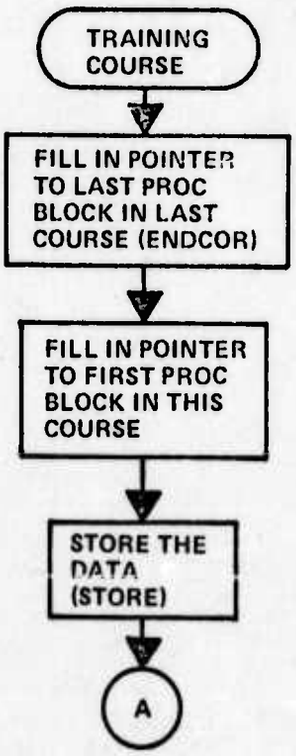
SUBROUTINE INPUT



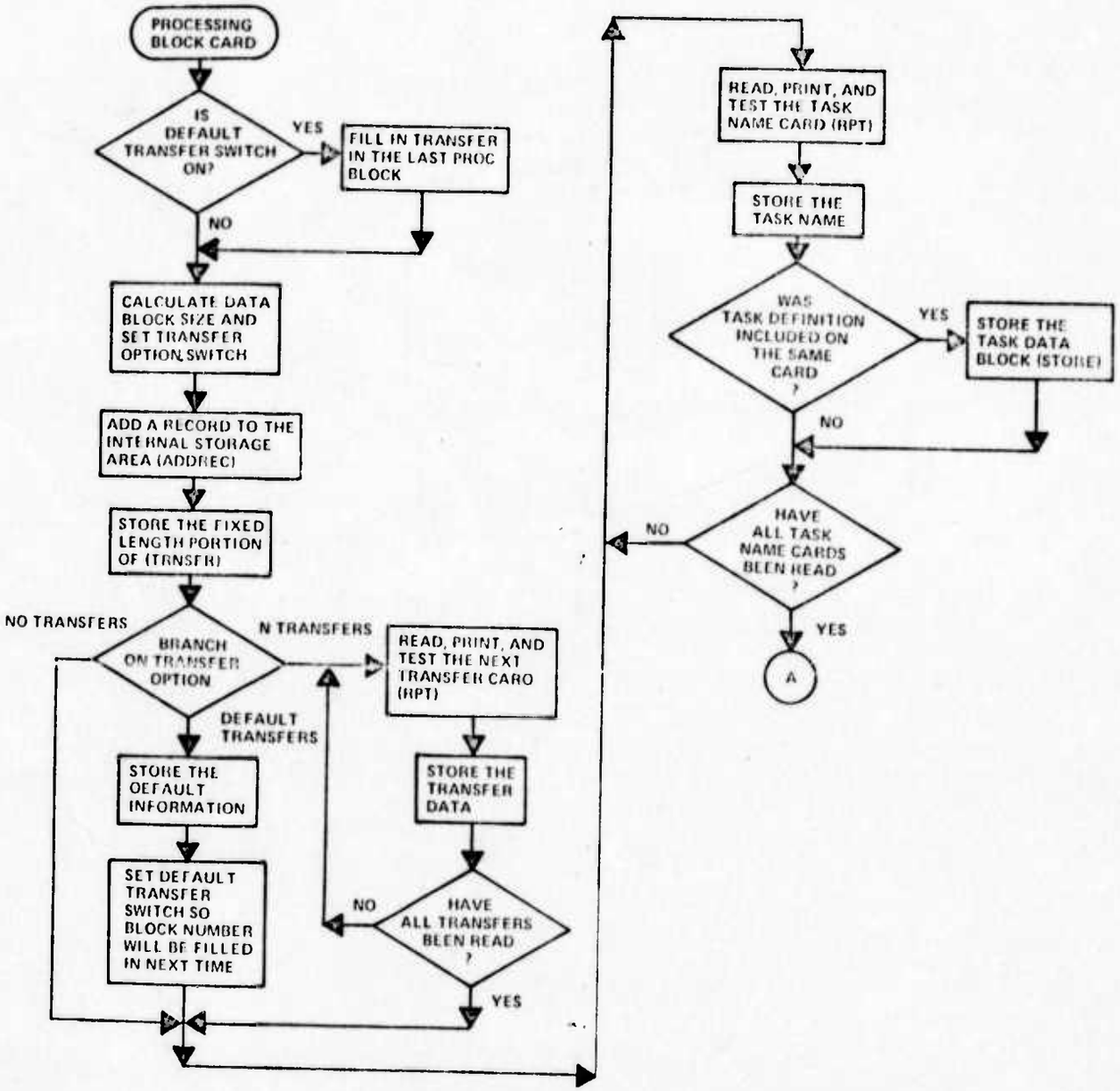
SUBROUTINE INPUT – CONTINUED



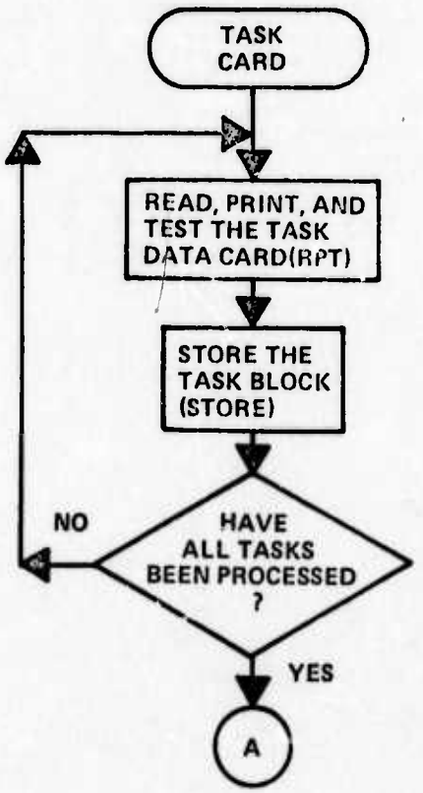
SUBROUTINE INPUT – CONTINUED



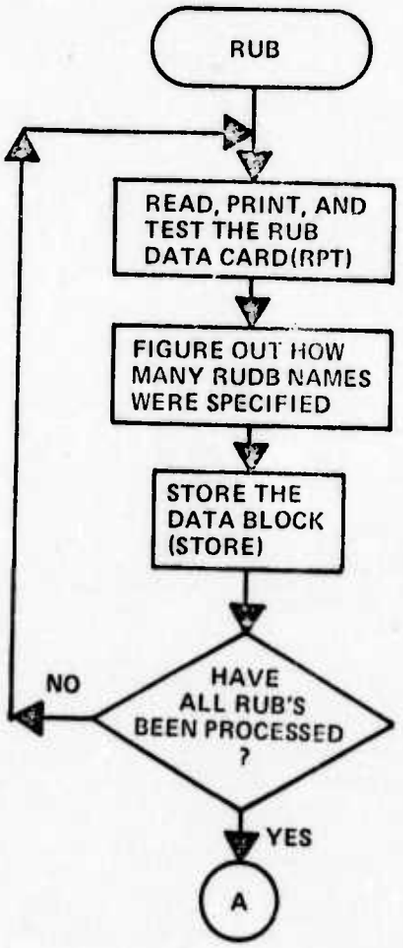
SUBROUTINE INPUT – CONTINUED



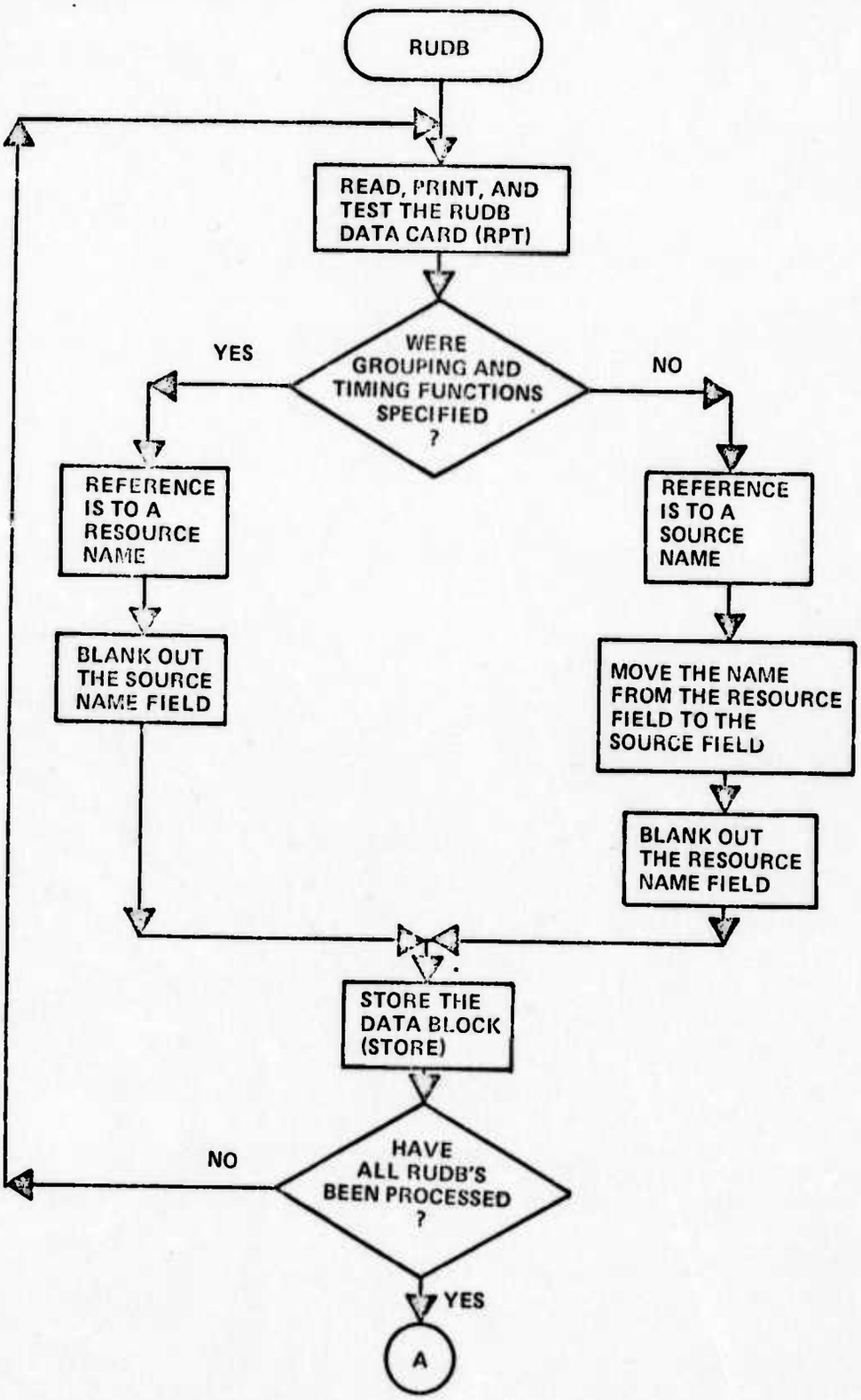
SUBROUTINE INPUT – CONTINUED



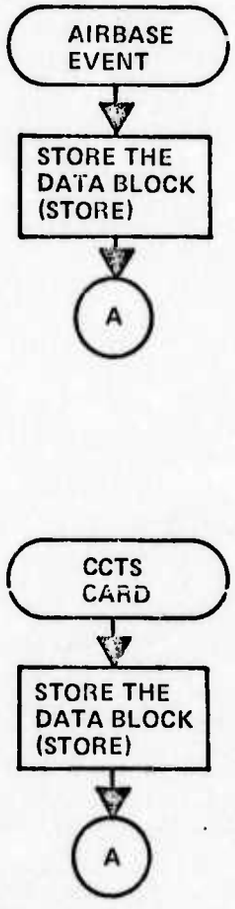
SUBROUTINE INPUT – CONTINUED



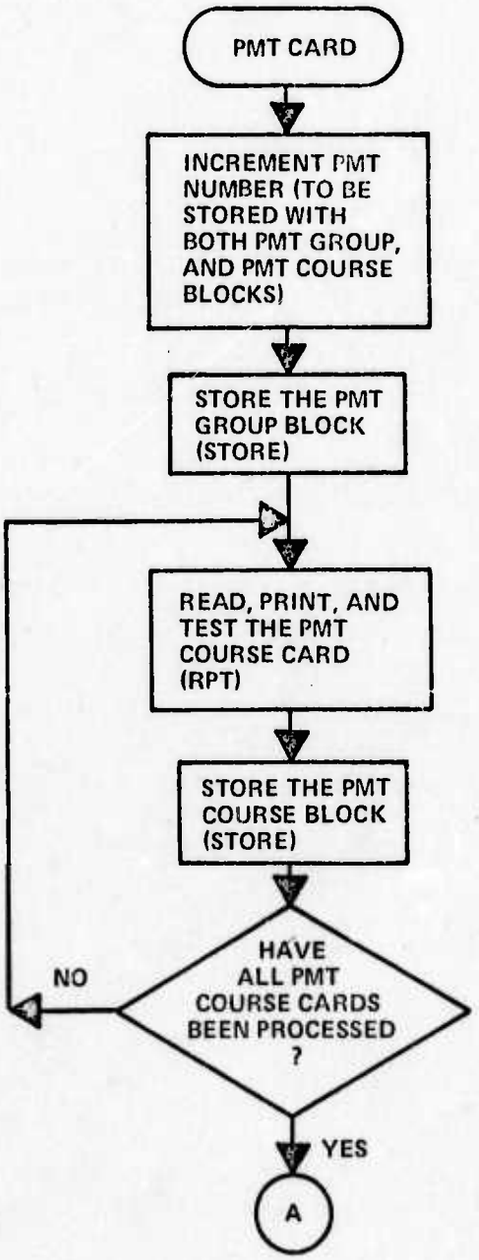
SUBROUTINE INPUT – CONTINUED



SUBROUTINE INPUT – CONTINUED



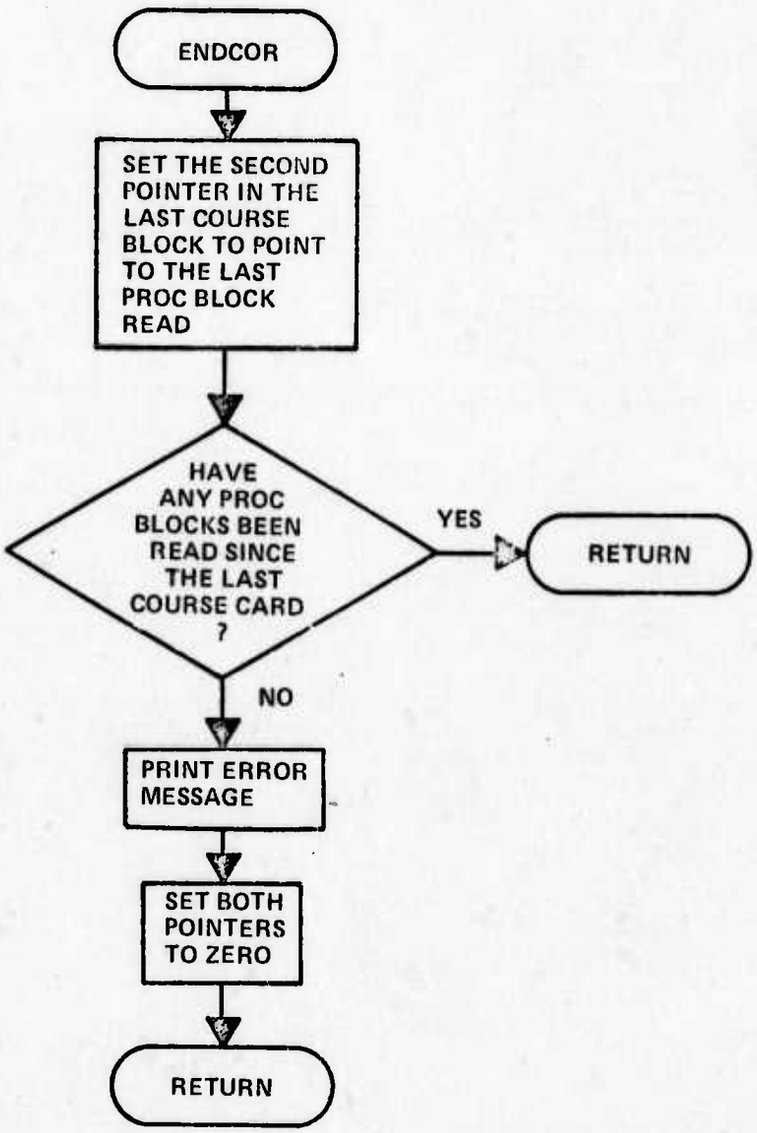
SUBROUTINE INPUT – CONTINUED



SUBROUTINE INPUT – CONTINUED

```
CC*****************************  SHIFTR  ******************************
CC*                                                                    *
CC*                          SUBROUTINE SHIFTR                         *
CC*                                                                    *
CC*    PURPOSE                                                         *
CC*        TO REPACK THE ARRAY OF VALUES READ FROM INPUT CARDS IN ORDER *
CC*        TO ELIMINATE WASTED STORAGE OCCUPIED BY UNUSED CHARACTER     *
CC*        FIELDS AT THE BEGINNING OF THE CARD                         *
CC*                                                                    *
CC*    CALLING SEQUENCE                                                *
CC*        CALL  SHIFTR (IP, N1, N2)                                   *
CC*                                                                    *
CC*    DESCRIPTION OF PARAMETERS                                       *
CC*       INPUT                                                        *
CC*        N1     - NUMBER OF CHARACTER FIELDS WHICH ARE USED          *
CC*        N2     - NUMBER OF UNUSED CHARACTER FIELDS WHICH FOLLOW THE *
CC*                 FIRST N1 USED FIELDS                               *
CC*       INPUT-OUTPUT                                                 *
CC*        IP     - ARRAY OF PARAMETERS READ FROM A DATA CARD BY       *
CC*                 SUBROUTINE READC                                   *
CC*                                                                    *
CC*    SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                    *
CC*       NONE                                                         *
CC*                                                                    *
CC*********************************************************************
```

```
CC*****************************  ENDCOR  *********************************
CC*                                                                       *
CC*                          SUBROUTINE ENDCOR                            *
CC*                                                                       *
CC*    PURPOSE                                                            *
CC*       TO SET THE PROCESSING BLOCK POINTERS IN THE TRAINING COURSE     *
CC*       BLOCK, AFTER ALL PROCESSING BLOCKS FOR THE COURSE HAVE BEEN     *
CC*       READ                                                            *
CC*                                                                       *
CC*    CALLING SEQUENCE                                                   *
CC*       CALL  ENCOR (IERR)                                              *
CC*                                                                       *
CC*    DESCRIPTION OF PARAMETERS                                          *
CC*       OUTPUT                                                          *
CC*        IERR  - ERROR FLAG, SET WHEN COURSE CONTAINS NO PROCESSING     *
CC*                BLOCKS                                                 *
CC*                                                                       *
CC*    SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                       *
CC*       NONE                                                            *
CC*                                                                       *
CC***********************************************************************
```



SUBROUTINE ENDCOR

```
CC*****************************  READC  ******************************
CC*                                                                   *
CC*                          SUBROUTINE READC                         *
CC*                                                                   *
CC*    PURPOSE                                                        *
CC*       TO READ AN INPUT CARD                                       *
CC*                                                                   *
CC*    CALLING SEQUENCE                                               *
CC*       CALL READC (ICARD,IPARMS)                                   *
CC*                                                                   *
CC*    DESCRIPTION OF PARAMETERS                                      *
CC*       INPUT                                                       *
CC*        ICARD - CARD ID NUMBER OF CARD TO BE READ, OR              *
CC*                ZERO TO READ AN UNKNOWN CARD IN STANDARD FORMAT    *
CC*       OUTPUT                                                      *
CC*        IPARMS- ARRAY OF UP TO 13 VALUES READ FROM THE CARD        *
CC*                                                                   *
CC*    REMARKS                                                        *
CC*       THIS SUBROUTINE DETERMINES THE NUMBER OF PARAMETERS TO BE   *
CC*       READ, AND THEIR FORMAT FROM COMMON /DDIN/                   *
CC*                                                                   *
CC*    SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                   *
CC*       NONE                                                        *
CC*                                                                   *
CC*********************************************************************
```

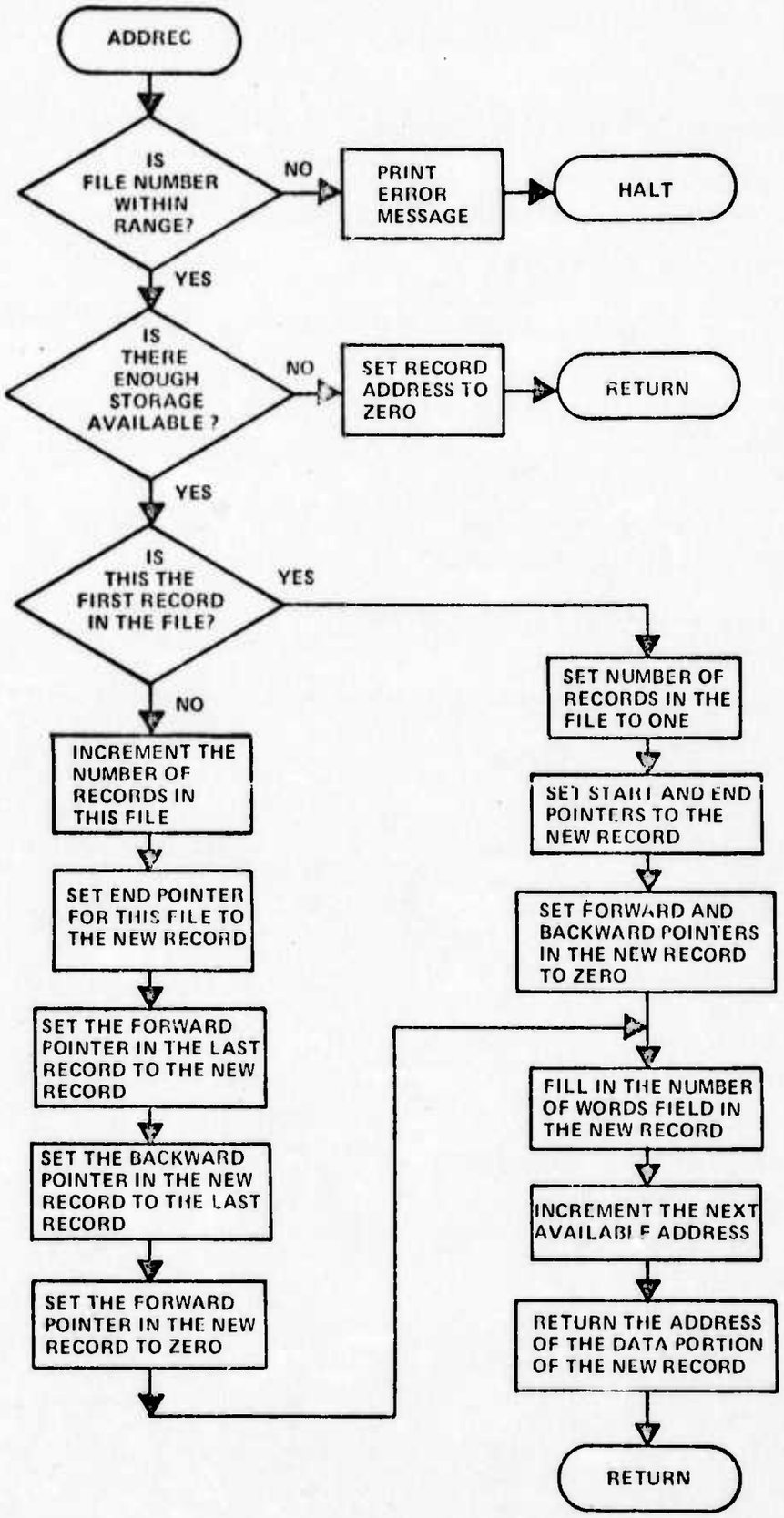
```
CC*******************************  PRINTC  *********************************
CC*                                                                        *
CC*                          SUBROUTINE PRINTC                             *
CC*                                                                        *
CC*   PURPOSE                                                              *
CC*      TO PRINT THE INPUT CARD LISTING                                   *
CC*                                                                        *
CC*   CALLING SEQUENCE                                                     *
CC*      CALL  PRINTC (ICARD,ISEQ,IPARMS)                                  *
CC*                                                                        *
CC*   DESCRIPTION OF PARAMETERS                                            *
CC*      INPUTS                                                            *
CC*        ICARD  - CARD NUMBER OF THE CARD TO BE PRINTED,                 *
CC*                 ZERO IF NOT KNOWN                                      *
CC*        ISEQ   - CARD SEQUENCE NUMBER                                   *
CC*        IPARMS - ARRAY OF VALUES THAT WERE READ FROM THE                *
CC*                 CARD                                                   *
CC*                                                                        *
CC*   REMARKS                                                              *
CC*     1THIS SUBROUTINE USES COMMON /DDIN/ TO DETERMINE THE NUMBER        *
CC*      OF DATA FIELDS ON THE CARD, AND HOW MANY OF THEM ARE CHARACTER*
CC*      DATA.                                                             *
CC*     2 OUTPUT LINES ARE COUNTED, AND TITLES ARE PRINTED AT THE TOP      *
CC*      OF EACH PAGE                                                      *
CC*                                                                        *
CC*   SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                         *
CC*      NONE                                                              *
CC*                                                                        *
CC**************************************************************************
```

```
CC******************************* TEST *************************************
CC*                                                                        *
CC*                         SUBROUTINE TEST                                *
CC*                                                                        *
CC*   PURPOSE                                                              *
CC*      TO TEST ALL NUMERIC INPUT VALUES TO SEE IF THEY ARE WITHIN        *
CC*      THE RANGE OF ACCEPTABLE VALUES                                    *
CC*                                                                        *
CC*   CALLING SEQUENCE                                                     *
CC*      CALL TEST (ICARD, IARRAY, IERR)                                   *
CC*                                                                        *
CC*   DESCRIPTION OF PARAMETERS                                            *
CC*      INPUT                                                             *
CC*       ICARD - CARD NUMBER FROM WHICH THE VALUES WERE READ              *
CC*       IARRAY- ARRAY OF VALUES THAT WERE READ FROM THE                  *
CC*               CARD                                                     *
CC*      OUTPUT                                                            *
CC*       IERR  - NUMBER OF ERRORS DETECTED                                *
CC*                                                                        *
CC*   SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                         *
CC*      NONE                                                              *
CC*                                                                        *
CC**************************************************************************
```

```
CC*****************************  STORE  ***********************************
CC*                                                                        *
CC*                           SUBROUTINE STORE                             *
CC*                                                                        *
CC*   PURPOSE                                                              *
CC*      TO STORE A BLOCK OF INPUT DATA                                    *
CC*                                                                        *
CC*   CALLING SEQUENCE                                                     *
CC*      CALL  STORE (IBLK, NWDS, ISEQ, IP, IADDR)                         *
CC*                                                                        *
CC*   DESCRIPTION OF PARAMETERS                                            *
CC*      INPUT                                                             *
CC*       IBLK  - BLOCK NUMBER                                             *
CC*       NWDS  - NUMBER OF WORDS IN THE DATA BLOCK                        *
CC*       ISEQ  - CARD SEQUENCE NUMBER TO BE ASSOCIATED WITH THIS BLOCK*
CC*       IP    - ARRAY OF DATA WORDS TO BE STORED                         *
CC*      OUTPUT                                                            *
CC*       IADDR - POINTER TO LOCATION IN COMMON /IFILE/ WHERE THE DATA *
CC*               WAS STORED  (IF LESS THAN 1, NOT ENOUGH SPACE WAS    *
CC*               AVAILABLE IN /IFILE/ )                                   *
CC*                                                                        *
CC*   SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                         *
CC*      ADDREC                                                            *
CC*      TRNSFR                                                            *
CC*                                                                        *
CC*************************************************************************
```

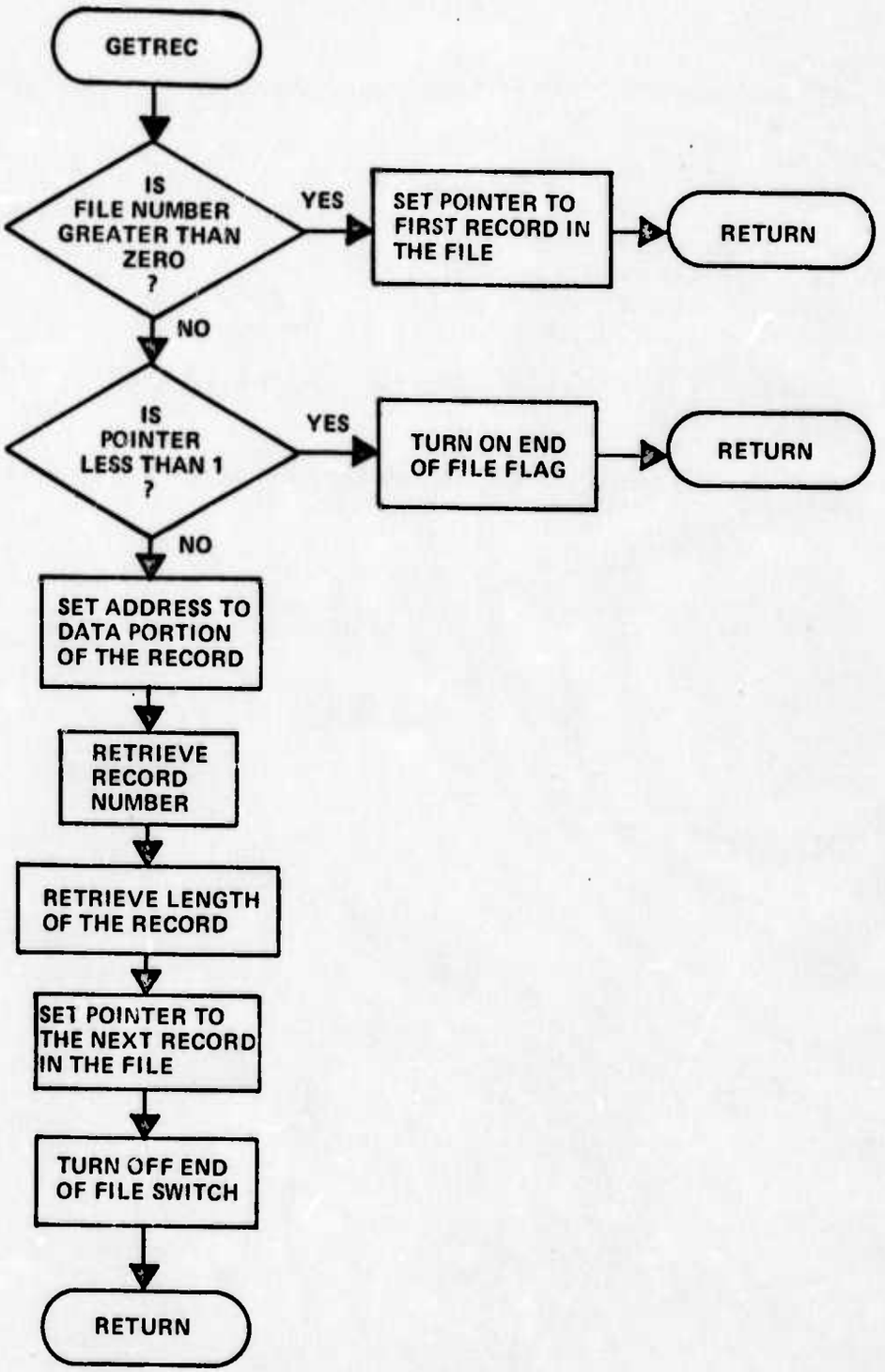
```
CC******************************  RPT  ************************************
CC*                                                                        *
CC*                          SUBROUTINE RPT                                *
CC*                                                                        *
CC*   PURPOSE                                                              *
CC*      TO READ AN INPUT CARD, PRINT IT, AND TEST THE NUMERIC FIELDS      *
CC*      FOR VALIDITY                                                      *
CC*                                                                        *
CC*   CALLING SEQUENCE                                                     *
CC*      CALL  RPT (ICARD, ISEQ, IP, IERR)                                 *
CC*                                                                        *
CC*   DESCRIPTION OF PARAMETERS                                            *
CC*      INPUT                                                             *
CC*       ICARD  - CARD TYPE TO BE READ                                    *
CC*      INPUT-OUTPUT                                                      *
CC*       ISEQ   - CARD SEQUENCE NUMBER, INCREMENTED BY EACH CALL          *
CC*      OUTPUT                                                            *
CC*       IP     - ARRAY OF VALUES READ FROM THE CARD                      *
CC*       IERR   - NUMBER OF ERRORS DETECTED                               *
CC*                                                                        *
CC*                                                                        *
CC*   SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                         *
CC*      READC                                                             *
CC*      PRINTC                                                            *
CC*      TEST                                                              *
CC*                                                                        *
CC*************************************************************************
```

```
CC******************************** ADDREC *********************************
CC*                                                                       *
CC*                          SUBROUTINE ADDREC                            *
CC*                                                                       *
CC*   PURPOSE                                                             *
CC*      TO ADD A RECORD TO A FILE IN COMMON AREA /IFILE/                 *
CC*                                                                       *
CC*   CALLING SEQUENCE                                                    *
CC*      CALL ADDREC (INDEX, NWDS, IADDR)                                 *
CC*                                                                       *
CC*   DESCRIPTION OF PARAMETERS                                           *
CC*      INPUT                                                            *
CC*        INDEX  - INDEX NUMBER OF THE FILE TO WHICH THE RECORD IS TO    *
CC*                 ADDED                                                 *
CC*        NWDS   - NUMBER OF WORDS IN THE RECORD                         *
CC*      OUTPUT                                                           *
CC*        IADDR  - ADDRESS OF THE DATA AREA OF THE NEW RECORD            *
CC*                 (SUBSCRIPT IN IFILE ARRAY) SET TO ZERO IF ERROR       *
CC*                 OCCURS                                                *
CC*                                                                       *
CC*   SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                        *
CC*      NONE                                                             *
CC*                                                                       *
CC*************************************************************************
```



SUBROUTINE ADDREC

```
CC*******************************  GETREC  ********************************
CC*                                                                       *
CC*                           SUBROUTINE GETREC                           *
CC*                                                                       *
CC*   PURPOSE                                                             *
CC*      TO LOCATE THE NEXT SEQUENTIAL RECORD IN A FILE                   *
CC*                                                                       *
CC*   CALLING SEQUENCE                                                    *
CC*      CALL GETREC (INDEX,IREC,NWDS,IADDR,IEOF)                         *
CC*                                                                       *
CC*   DESCRIPTION OF PARAMETERS                                           *
CC*      INPUT                                                            *
CC*       INDEX - FILE INDEX NUMBER FOR INITIALIZATION CALL               *
CC*               OR                                                      *
CC*               ZERO TO LOCATE THE NEXT RECORD IN THE FILE SPECIFIED    *
CC*               IN THE LAST INITIALIZATION CALL                         *
CC*      OUTPUT                                                           *
CC*       IREC  - RECORD NUMBER                                           *
CC*       NWDS  - NUMBER OF WORDS IN THE RECORD                           *
CC*       IADDR - ADDRESS (SUBSCRIPT IN IFILE ARRAY) OF DATA              *
CC*       IEOF  - END OF FILE FLAG                                        *
CC*                                                                       *
CC*   SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                        *
CC*      NONE                                                             *
CC*                                                                       *
CC*************************************************************************
```



SUBROUTINE GETREC

```
CC***************************** TRNSFR **********************************
CC*                                                                     *
CC*                        SUBROUTINE TRNSFR                            *
CC*                                                                     *
CC*   PURPOSE                                                           *
CC*      TO TRANSFER AN ARRAY FROM ONE LOCATION TO ANOTHER              *
CC*                                                                     *
CC*   CALLING SEQUENCE                                                  *
CC*      CALL  TRNSFR (I1, I2, NWDS)                                    *
CC*                                                                     *
CC*   DESCRIPTION OF PARAMETERS                                         *
CC*      I1     - ARRAY TO BE MOVED                                     *
CC*      I2     - ARRAY TO WHICH I1 IS TO BE MOVED                      *
CC*      NWDS   - NUMBER OF ELEMENTS TO BE MOVED                        *
CC*                                                                     *
CC*   SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                      *
CC*      NONE                                                           *
CC*                                                                     *
CC***********************************************************************
```

```
CC******************************  TBL  *********************************
CC*                                                                    *
CC*                           SUBROUTINE TBL                           *
CC*                                                                    *
CC*   PURPOSE                                                          *
CC*      TO PRINT THE FORMATTED TABLES OF THE INPUTS                   *
CC*                                                                    *
CC*   CALLING SEQUENCE                                                 *
CC*      CALL  TBL                                                     *
CC*                                                                    *
CC*   DESCRIPTION OF PARAMETERS                                        *
CC*      NONE                                                          *
CC*                                                                    *
CC*   METHOD                                                           *
CC*      THIS SUBROUTINE CALLS A SEPARATE SUBROUTINE TO PRINT EACH OF  *
CC*      THE DATA TABLES                                               *
CC*                                                                    *
CC*   SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                     *
CC*        TBL2                                                        *
CC*        TBL3                                                        *
CC*        TBL4                                                        *
CC*        TBL5                                                        *
CC*        TBL6                                                        *
CC*        TBL7                                                        *
CC*        TBL8                                                        *
CC*        TBL9                                                        *
CC*        TBL10                                                       *
CC*        TBL12                                                       *
CC*        TBL13                                                       *
CC*        TBL14                                                       *
CC*                                                                    *
CC**********************************************************************
```

```
CC*****************************  TBL2  ***********************************
CC*                                                                       *
CC*                          SUBROUTINE TBL2                              *
CC*                                                                       *
CC*    PURPOSE                                                            *
CC*       TO PRINT THE TABLE OF AIRBASE INVENTORIES                       *
CC*                                                                       *
CC*************************************************************************


CC*****************************  TBL3  ***********************************
CC*                                                                       *
CC*                          SUBROUTINE TBL3                              *
CC*                                                                       *
CC*    PURPOSE                                                            *
CC*       TO PRINT THE TABLE OF THE RESOURCE INVENTORIES                  *
CC*                                                                       *
CC*************************************************************************


CC*****************************  TBL4  ***********************************
CC*                                                                       *
CC*                          SUBROUTINE TBL4                              *
CC*                                                                       *
CC*    PURPOSE                                                            *
CC*       TO PRINT THE TABLE OF THE SOURCE CARDS                          *
CC*                                                                       *
CC*************************************************************************


CC*****************************  TBL5  ***********************************
CC*                                                                       *
CC*                          SUBROUTINE TBL5                              *
CC*                                                                       *
CC*    PURPOSE                                                            *
CC*       TO PRINT THE TABLE OF AIRCRAFT DELIVERY INPUTS                  *
CC*                                                                       *
CC*************************************************************************
```

```
CC******************************  TBL6  ***********************************
CC*                                                                       *
CC*                         SUBROUTINE TBL6                               *
CC*                                                                       *
CC*   PURPOSE                                                             *
CC*      TO PRINT THE TABLE OF COURSE BLOCKS                              *
CC*                                                                       *
CC*************************************************************************
```

```
CC******************************  TBL7  ***********************************
CC*                                                                       *
CC*                         SUBROUTINE TBL7                               *
CC*                                                                       *
CC*   PURPOSE                                                             *
CC*      TO PRINT THE TABLE OF THE PROCESSING BLOCKS                      *
CC*                                                                       *
CC*************************************************************************
```

```
CC******************************  TBL8  ***********************************
CC*                                                                       *
CC*                         SUBROUTINE TBL8                               *
CC*                                                                       *
CC*   PURPOSE                                                             *
CC*      TO PRINT THE TABLE OF TASK BLOCKS                                *
CC*                                                                       *
CC*************************************************************************
```

```
CC******************************  TBL9  ***********************************
CC*                                                                       *
CC*                         SUBROUTINE TBL9                               *
CC*                                                                       *
CC*   PURPOSE                                                             *
CC*      TO PRINT THE TABLE OF RESOURCE UTILIZATION BLOCKS                *
CC*                                                                       *
CC*************************************************************************
```

```
CC*****************************  TBL10  ********************************
CC*                                                                     *
CC*                          SUBROUTINE TBL10                           *
CC*                                                                     *
CC*   PURPOSE                                                           *
CC*      TO PRINT THE TABLE OF RESOURCE UTILIZATION DESCRIPTION BLOCKS *
CC*                                                                     *
CC***********************************************************************
```

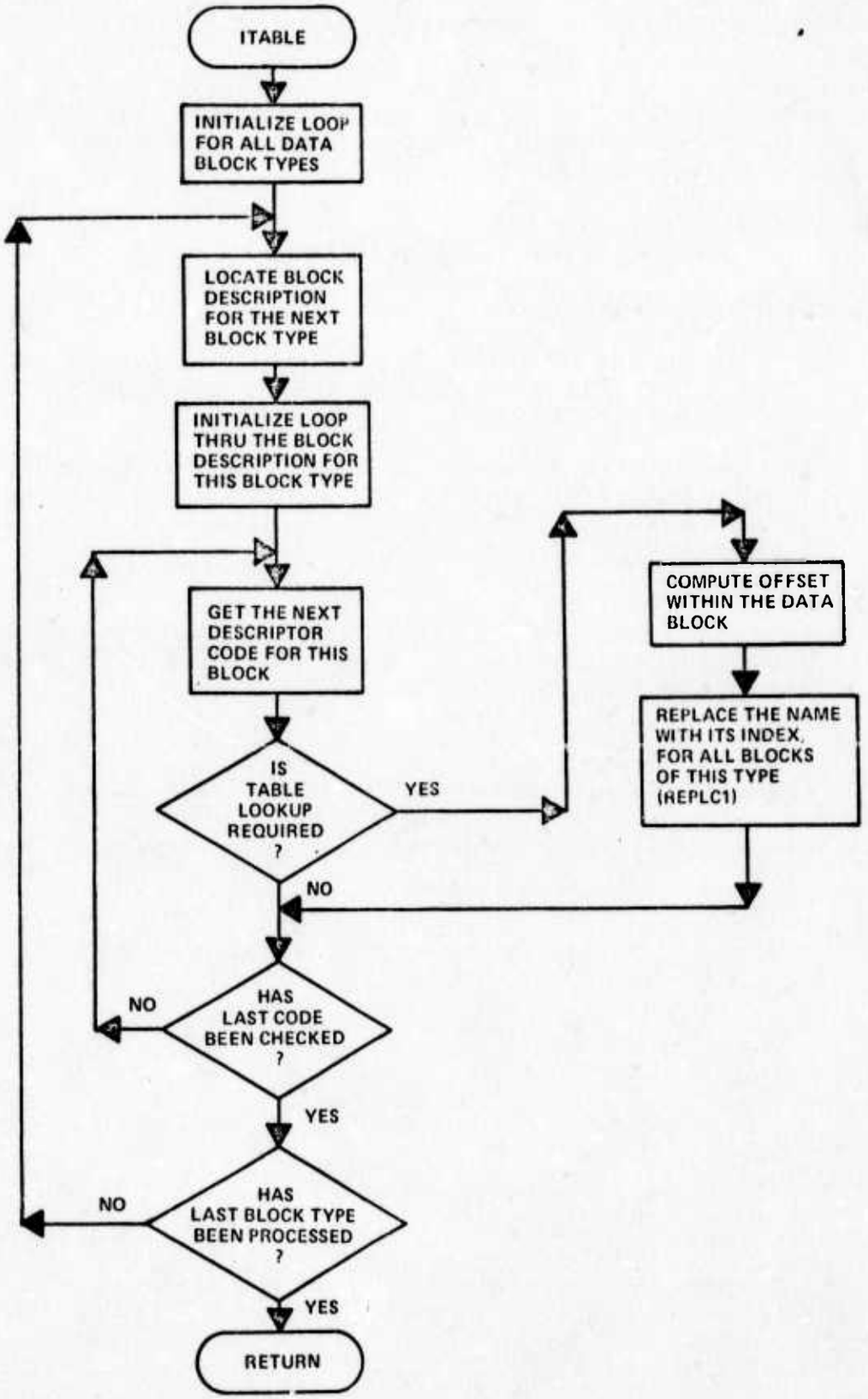
```
CC*****************************  TBL12  ********************************
CC*                                                                     *
CC*                          SUBROUTINE TBL12                           *
CC*                                                                     *
CC*   PURPOSE                                                           *
CC*      TO PRINT THE TABLE OF AIRBASE EVENT CARDS                      *
CC*                                                                     *
CC***********************************************************************
```

```
CC*****************************  TBL13  ********************************
CC*                                                                     *
CC*                          SUBROUTINE TBL13                           *
CC*                                                                     *
CC*   PURPOSE                                                           *
CC*      TO PRINT THE TABLE OF CCTS CARDS                               *
CC*                                                                     *
CC***********************************************************************
```

```
CC*****************************  TBL14  ********************************
CC*                                                                     *
CC*                          SUBROUTINE TBL14                           *
CC*                                                                     *
CC*   PURPOSE                                                           *
CC*      TO PRINT THE TABLE OF PMT CARDS                                *
CC*                                                                     *
CC***********************************************************************
```

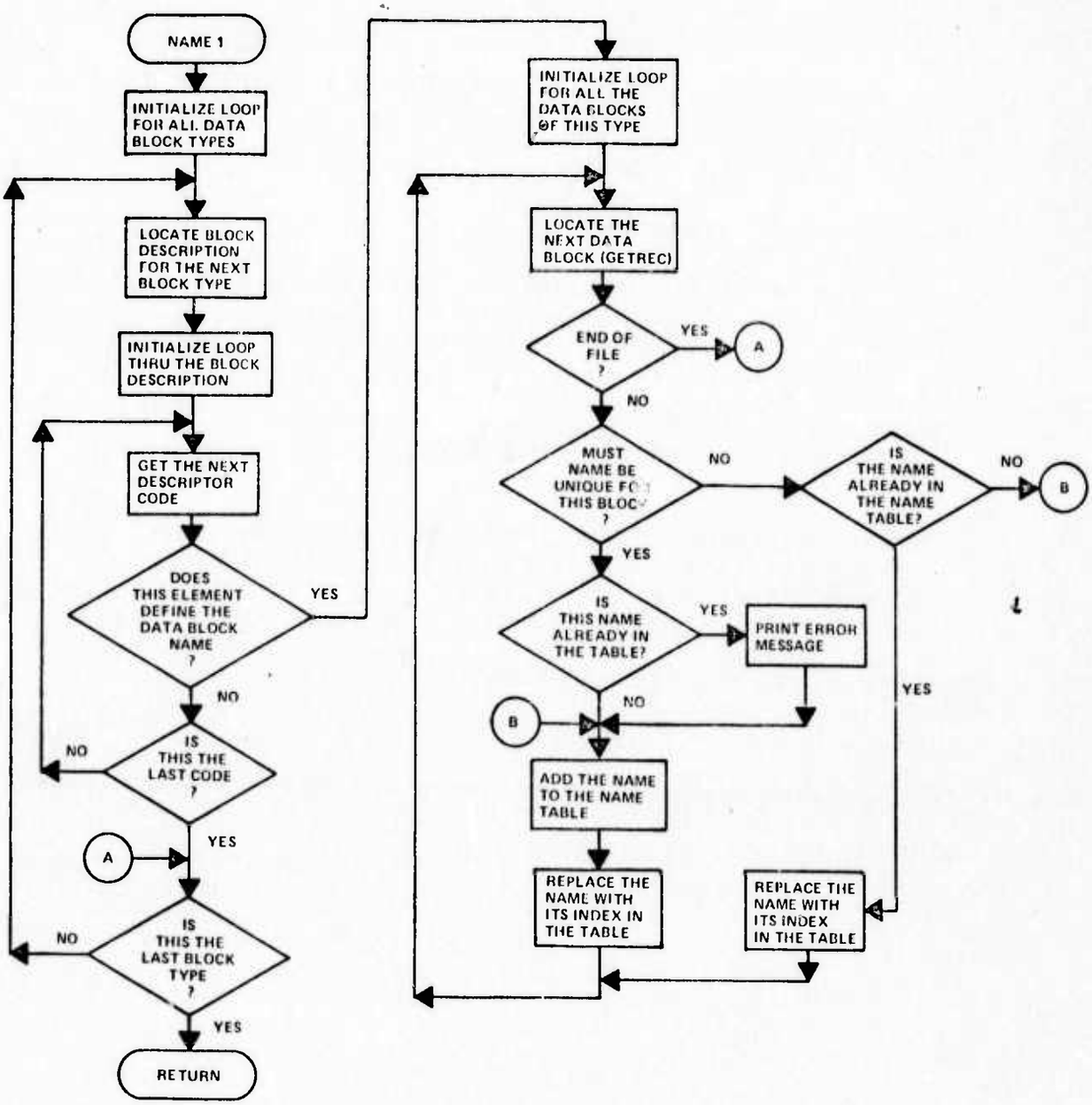
```
CC********************************  PTYPE  **********************************
CC*                                                                        *
CC*                         SUBROUTINE PTYPE                               *
CC*                                                                        *
CC*  PURPOSE                                                               *
CC*     TO DECODE THE PERSONNEL TYPE CODE AND RETURN A CHARACTER          *
CC*     ARRAY OF THE TYPES SPECIFIED BY THE CODE.  THE PERSONNEL          *
CC*     TYPE CODE IS A 4 BIT INTEGER NUMBER, WITH EACH BIT USED           *
CC*     TO INDICATE A PERSONNEL TYPE AS FOLLOWS  (GOING FROM              *
CC*     LEFT TO RIGHT)                                                    *
CC*           1   PILOTS                                                  *
CC*           2   COPILOTS                                                *
CC*           3   OSO                                                     *
CC*           4   DSO                                                     *
CC*                                                                        *
CC*  CALLING SEQUENCE                                                      *
CC*      CALL  PTYPE (ICODE, IARRAY)                                       *
CC*                                                                        *
CC*  DESCRIPTION OF PARAMETERS                                             *
CC*     INPUT                                                              *
CC*      ICODE  - PERSONNEL TYPE CODE                                      *
CC*     OUTPUT                                                             *
CC*      IARRAY - ARRAY OF PERSONNEL TYPE NAMES SPECIFIED BY ICODE         *
CC*                                                                        *
CC**************************************************************************
```

```
CC*****************************  ITABLE  *********************************
CC*                                                                       *
CC*                          SUBROUTINE ITABLE                            *
CC*                                                                       *
CC*   PURPOSE                                                             *
CC*      TO REPLACE CHARACTER INPUT PARAMETERS WITH ITS INTEGER CODE.     *
CC*      ERROR MESSAGES ARE PRINTED FOR VALUES NOT FOUND IN THE TABLES.   *
CC*                                                                       *
CC*   CALLING SEQUENCE                                                    *
CC*      CALL  ITABLE (IERR)                                              *
CC*                                                                       *
CC*   DESCRIPTION OF PARAMETERS                                           *
CC*      OUTPUT                                                           *
CC*       IERR  - NUMBER OF ERRORS ENCOUNTERED                            *
CC*                                                                       *
CC*   METHOD                                                              *
CC*      THIS SUBROUTINE USES COMMON /DBD/ TO LOCATE THESE PARAMETERS     *
CC*      AND TO FIND OUT WHICH TABLE THEY ARE TO BE LOOKED UP IN          *
CC*                                                                       *
CC*   SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                        *
CC*      REPLC1                                                           *
CC*                                                                       *
CC*************************************************************************
```



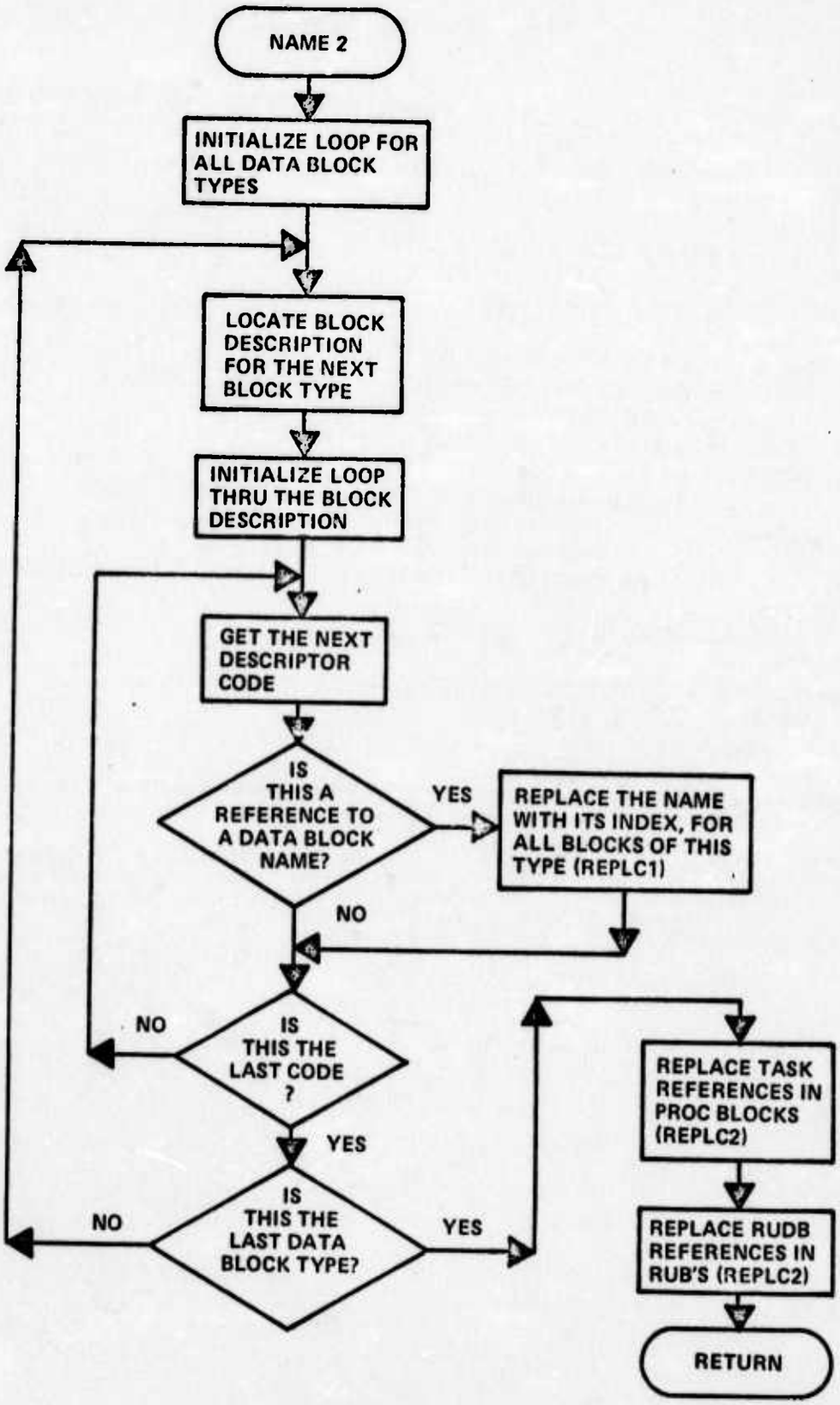
SUBROUTINE ITABLE

```
CC******************************* NAME1 ************************************
CC*                                                                        *
CC*                         SUBROUTINE NAME1                               *
CC*                                                                        *
CC*   PURPOSE                                                              *
CC*      TO MAKE A TABLE OF THE NAMES OF ALL NAMED DATA BLOCKS, AND TO     *
CC*      REPLACE THE CHARACTER NAME IN THE DATA BLOCK WITH THE INDEX       *
CC*      OF THE NAME IN THE TABLE                                          *
CC*                                                                        *
CC*   CALLING SEQUENCE                                                     *
CC*      CALL  NAME1 (IP,INUM,ITBL,NTBL,IERR)                              *
CC*                                                                        *
CC*   DESCRIPTION OF PARAMETERS                                            *
CC*      INPUT-OUTPUT                                                      *
CC*       NTBL  - NUMBER OF ELEMENTS IN ITBL ARRAY (GIVES NUMBER OF        *
CC*               ELEMENTS AVAILABLE AT ENTRY, AND NUMBER OF ELEMENTS      *
CC*               USED AT EXIT)                                            *
CC*      OUTPUT                                                            *
CC*       IP    - POINTER TO START OF NAME TABLE FOR EACH DATA BLOCK       *
CC*       INUM  - NUMBER OF ENTRIES IN NAME TABLE FOR EACH DATA BLOCK      *
CC*       ITBL  - NAME TABLES  (CONTAINS ORIGINAL CHARACTER NAMES)         *
CC*       IERR  - NUMBER OF ERRORS ENCOUNTERED                             *
CC*                                                                        *
CC*   METHOD                                                               *
CC*       THIS SUBROUTINE USES COMMON /DBD/ TO DETERMINE WHICH DATA        *
CC*       BLOCKS ARE NAMED, AND TO LOCATE THE POSITION OF THE NAME         *
CC*       WITHIN THE BLOCK                                                 *
CC*                                                                        *
CC*   SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                         *
CC*      GETREC                                                            *
CC*      LOOKUP                                                            *
CC*                                                                        *
CC*************************************************************************
```



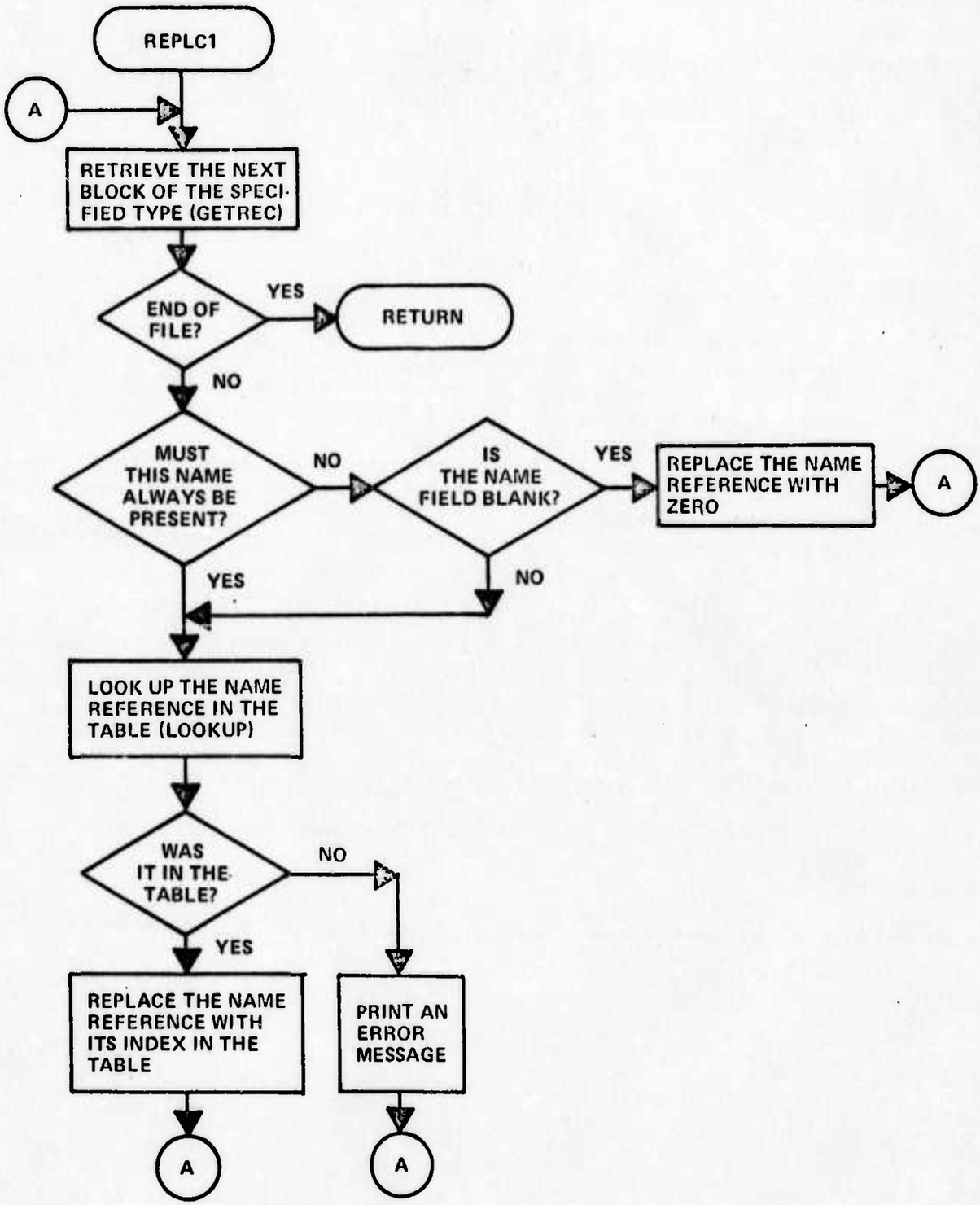
SUBROUTINE NAME1

```
CC****************************** NAME2 ************************************
CC*                                                                       *
CC*                          SUBROUTINE NAME2                             *
CC*                                                                       *
CC*   PURPOSE                                                             *
CC*      TO REPLACE ALL BLOCK NAME REFERENCES WITH THEIR INTEGER CODES   *
CC*                                                                       *
CC*   CALLING SEQUENCE                                                    *
CC*      CALL  NAME2 (IP,INUM,ITBL,IERR)                                  *
CC*                                                                       *
CC*   DESCRIPTION OF PARAMETERS                                           *
CC*      INPUT                                                            *
CC*       IP     - ARRAY OF POINTERS TO FIRST ELEMENT OF NAME TABLE       *
CC*                FOR EACH DATA BLOCK                                    *
CC*       INUM   - ARRAY GIVING NUMBER OF ENTRIES IN NAME TABLE FOR       *
CC*                EACH DATA BLOCK                                        *
CC*       ITBL   - NAME TABLE                                             *
CC*      OUTPUT                                                           *
CC*       IERR   - NUMBER OF ERRORS DETECTED                              *
CC*                                                                       *
CC*   METHOD                                                              *
CC*       THIS SUBROUTINE USES COMMON /DBD/ TO LOCATE BLOCK NAME          *
CC*       REFERENCES IN THE FIXED PORTION OF DATA BLOCKS.  THE POSITION*
CC*       OF NAME REFERENCES IN VARIABLE LENGTH PORTION OF DATA BLOCKS *
CC*       IS HARD CODED (THIS OCCURS IN PROCBLOCK AND RUB)                *
CC*                                                                       *
CC*   SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                        *
CC*      REPLC1                                                           *
CC*      REPLC2                                                           *
CC*                                                                       *
CC*************************************************************************
```



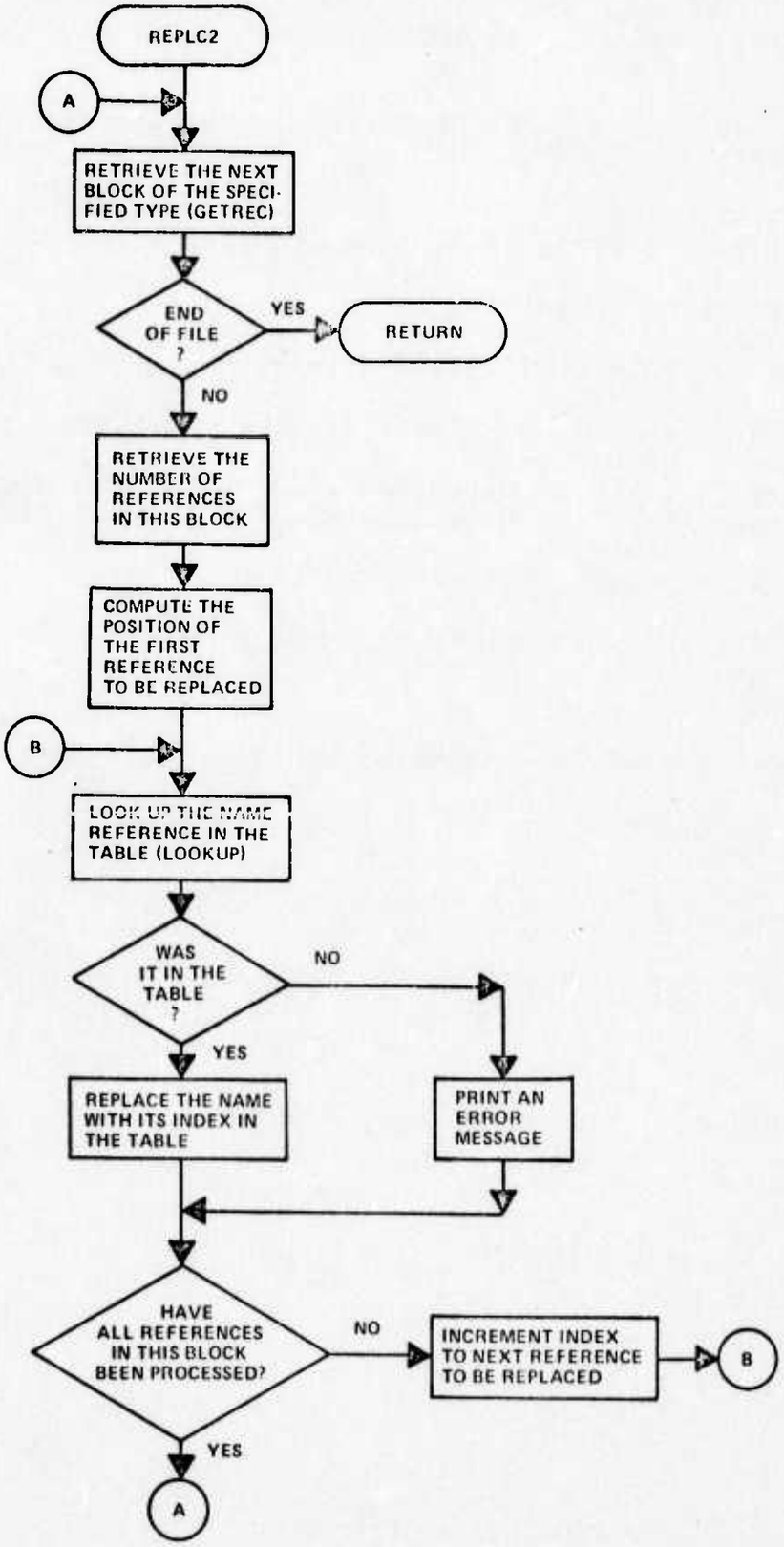
SUBROUTINE NAME2

```
CC******************************  REPLC1  ******************************
CC*                                                                    *
CC*                       SUBROUTINE REPLC1                            *
CC*                                                                    *
CC*   PURPOSE                                                          *
CC*      TO REPLACE A BLOCK NAME REFERENCE WITH ITS INTEGER CODE IN    *
CC*      ALL DATA BLOCKS OF A GIVEN TYPE.  THIS ROUTINE IS ONLY FOR    *
CC*      REFERENCES IN THE FIXED PORTION OF VARIABLE LENGTH DATA BLOCKS*
CC*                                                                    *
CC*   CALLING SEQUENCE                                                 *
CC*      CALL  REPLC1 (IBLK, IOFF, ITBL, NTBL, INDOFF, ICODE, IERR)    *
CC*                                                                    *
CC*   DESCRIPTION OF PARAMETERS                                        *
CC*      INPUT                                                         *
CC*       IBLK   - DATA BLOCK NUMBER                                   *
CC*       IOFF   - OFFSET OF REFERENCE IN THE DATA BLOCK               *
CC*       ITBL   - NAME TABLE                                          *
CC*       NTBL   - NUMBER OF ELEMENTS IN ITBL                          *
CC*       INDOFF- OFFSET TO BE ADDED TO THE INDEX OF A NAME IN THE     *
CC*               TABLE IN ORDER TO GET ITS INTEGER CODE               *
CC*       ICODE - 1 IF THE NAMES ARE INTEGER DATA                      *
CC*               2 IF THE NAMES ARE CHARACTER DATA                    *
CC*               3 IF CHARACTER DATA AND BLANKS ARE ALLOWED           *
CC*      OUTPUT                                                        *
CC*       IERR   - NUMBER OF ERRORS DETECTED                           *
CC*                                                                    *
CC*   SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                     *
CC*      GETREC                                                        *
CC*      LOOKUP                                                        *
CC*                                                                    *
CC**********************************************************************
```



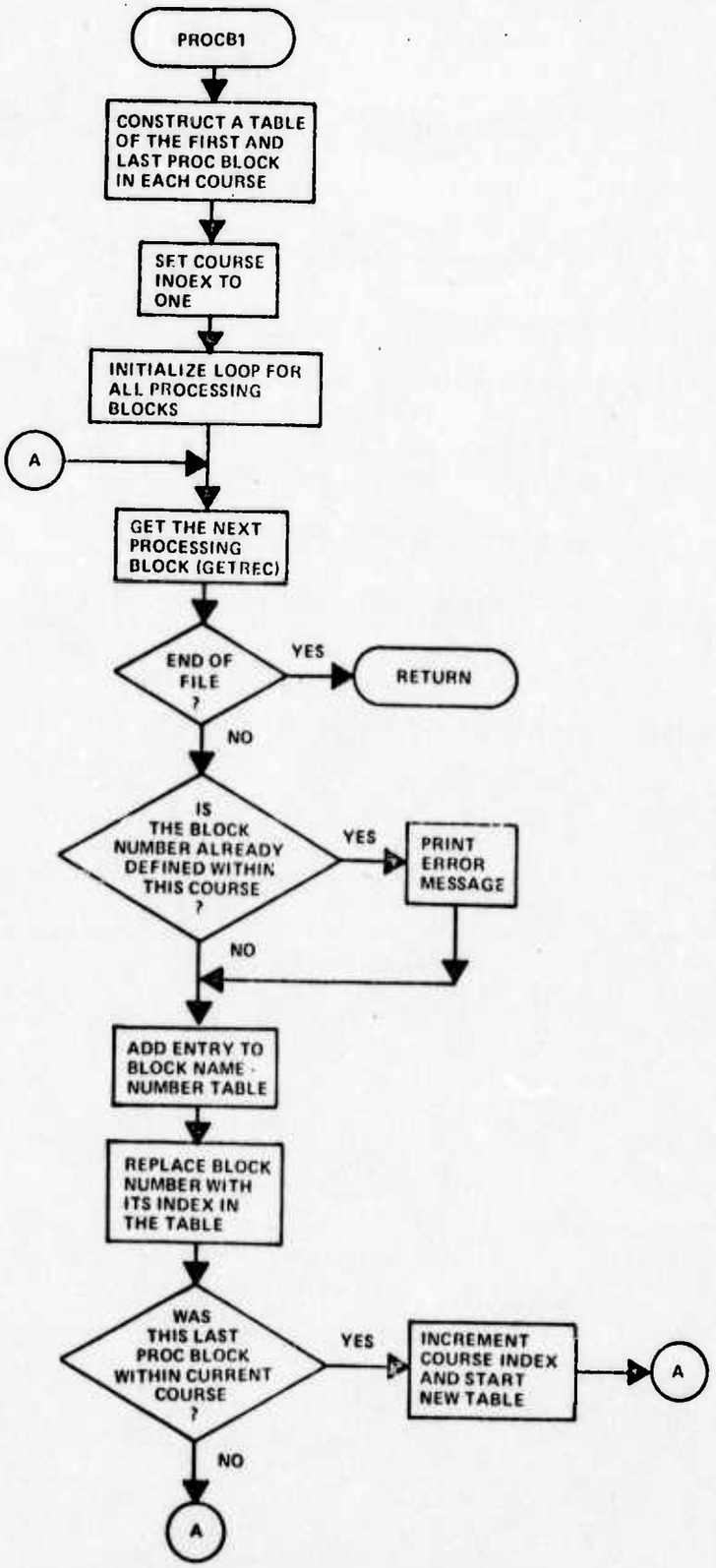
SUBROUTINE REPLC1

```
CC*******************************************  REPLC2  ***********************************
CC*                                                                                      *
CC*                           SUBROUTINE REPLC2                                          *
CC*                                                                                      *
CC*   PURPOSE                                                                            *
CC*      TO REPLACE A BLOCK NAME REFERENCE WITH ITS INTEGER CODE IN                      *
CC*      ALL DATA BLOCKS OF A GIVEN TYPE.  THIS ROUTINE IS ONLY FOR                      *
CC*      REFERENCES IN THE VARIABLE PORTION OF VARIABLE LENGTH DATA                      *
CC*      BLOCKS                                                                          *
CC*                                                                                      *
CC*   CALLING SEQUENCE                                                                   *
CC*      CALL  REPLC2 (IBLK,IOFF1,IDX,NDX,N,IOFF2,ITBL,NTBL,INDOFF,                      *
CC*                   ICODE, IERR)                                                       *
CC*                                                                                      *
CC*   DESCRIPTION OF PARAMETERS                                                          *
CC*      INPUT                                                                           *
CC*       IBLK   - DATA BLOCK NUMBER                                                     *
CC*       IOFF1  - OFFSET WITHIN THE DATA BLOCK TO THE WORDS GIVING THE                  *
CC*                NUMBER OF ENTRIES IN EACH VARIABLE LENGTH ITEM                        *
CC*       IDX1   - ARRAY WHICH GIVES THE NUMBER OF WORDS IN EACH ENTRY                   *
CC*                OF EACH VARIABLE LENGTH ITEM                                          *
CC*       NDX    - NUMBER OF VARIABLE LENGTH ITEMS IN THE DATA BLOCK                     *
CC*       N      - THE NUMBER OF THE ITEM IN WHICH THE REPLACEMENT IS                    *
CC*                TO BE DONE                                                            *
CC*       IOFF2  - THE OFFSET WITHIN THE ITEM OF THE WORD CONTAINING                     *
CC*                THE REFERENCES TO BE REPLACED                                         *
CC*       ITBL   - NAME TABLE                                                            *
CC*       NTBL   - NUMBER OF NAMES IN ITBL                                               *
CC*       INDOFF - OFFSET TO BE ADDED TO A NAMES INDEX IN THE NAME TABLE                 *
CC*                TO GET ITS INTEGER CODE                                               *
CC*       ICODE  - 2 IF NAMES ARE CHARACTER DATA                                         *
CC*                1 IF NAMES ARE INTEGER DATA                                           *
CC*      OUTPUT                                                                          *
CC*       IERR   - NUMBER OF ERRORS DETECTED                                             *
CC*                                                                                      *
CC*   SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                                       *
CC*      GETREC                                                                          *
CC*      LOOKUP                                                                          *
CC*                                                                                      *
CC****************************************************************************************
```



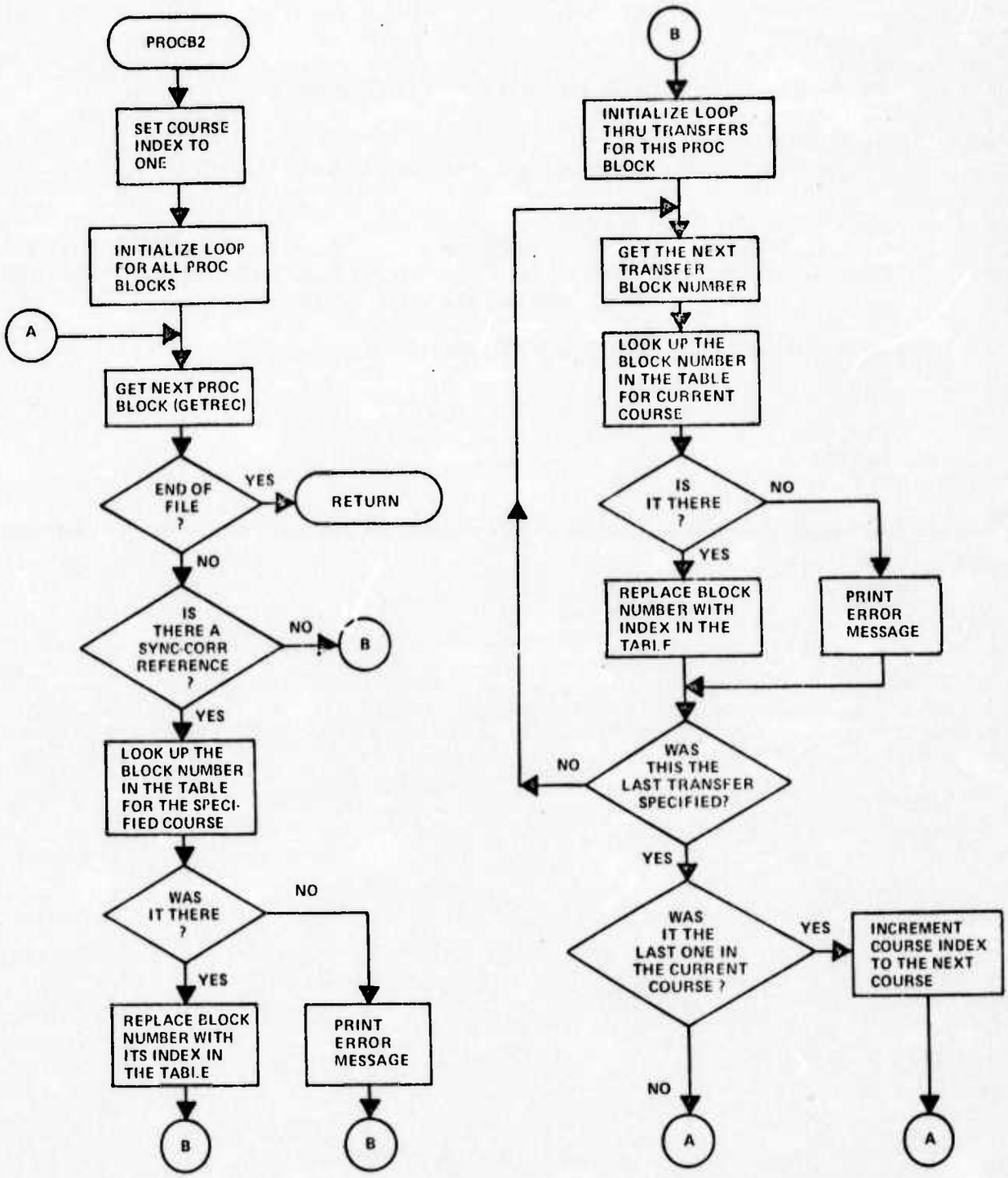
SUBROUTINE REPLC2

```
CC*****************************  PROCB1  *********************************
CC*                                                                       *
CC*                            SUBROUTINE PROCB1                          *
CC*                                                                       *
CC*    PURPOSE                                                            *
CC*       TO CONSTRUCT A TABLE OF PROCESSING BLOCK NAMES AND NUMBERS      *
CC*       ASSIGNED BY THE USER                                            *
CC*                                                                       *
CC*    CALLING SEQUENCE                                                   *
CC*       CALL PROCB1 (IP1, INUM, NAME, NUMBER, IERR)                     *
CC*                                                                       *
CC*    DESCRIPTION OF PARAMETERS                                          *
CC*       OUTPUT                                                          *
CC*        IP1    - POINTER TO START OF NAME AND NUMBER TABLES FOR EACH    *
CC*                 COURSE                                                *
CC*        INUM   - NUMBER OF ENTRIES IN NAME AND NUMBER TABLES FOR        *
CC*                 EACH COURSE                                           *
CC*        NAME   - TABLE OF NAMES FOR EACH PROCESSING BLOCK               *
CC*        NUMBER- TABLE OF USER ASSIGNED NUMBERS FOR EACH PROCESSING      *
CC*                 BLOCK                                                 *
CC*        IERR   - NUMBER OF ERRORS DETECTED                              *
CC*                                                                       *
CC*    SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                       *
CC*       GETREC                                                          *
CC*       LOCKUP                                                          *
CC*                                                                       *
CC***************************************************************************
```



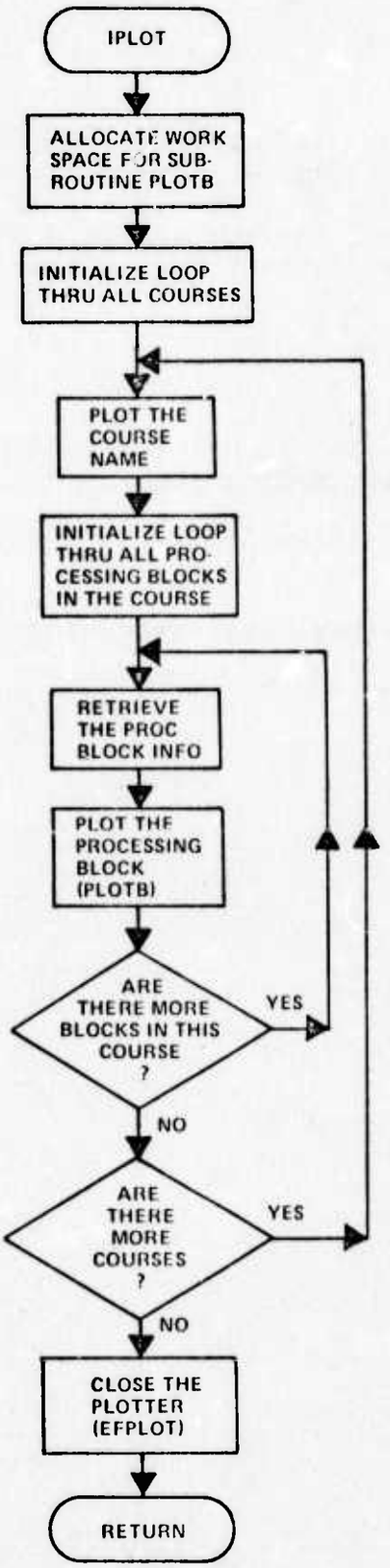
SUBROUTINE PROCB1

```
CC*****************************  PROCB2  ********************************
CC*                                                                     *
CC*                        SUBROUTINE PROCB2                            *
CC*                                                                     *
CC*   PURPOSE                                                           *
CC*      TO REPLACE ALL BLOCK NUMBER REFERENCES WITH THEIR INTERNAL     *
CC*      ID NUMBERS                                                     *
CC*                                                                     *
CC*   CALLING SEQUENCE                                                  *
CC*      CALL  PROCB2 (IP1,INUM,NAME,NUMBER,IERR)                       *
CC*                                                                     *
CC*   DESCRIPTION OF PARAMETERS                                         *
CC*      INPUT                                                          *
CC*       IP1    - POINTER TO NAME AND NUMBER TABLE FOR EACH COURSE     *
CC*       INUM   - NUMBER OF ENTRIES IN TABLE FOR EACH COURSE           *
CC*       NAME   - PROCESSING BLOCK NAME TABLE                          *
CC*       NUMBER- PROCESSING BLOCK NUMBER TABLE                         *
CC*      OUTPUT                                                         *
CC*       IERR   - NUMBER OF ERRORS DETECTED                            *
CC*                                                                     *
CC*   SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                      *
CC*      GETREC                                                         *
CC*      LOOKUP                                                         *
CC*                                                                     *
CC***********************************************************************
```



SUBROUTINE PROCB2

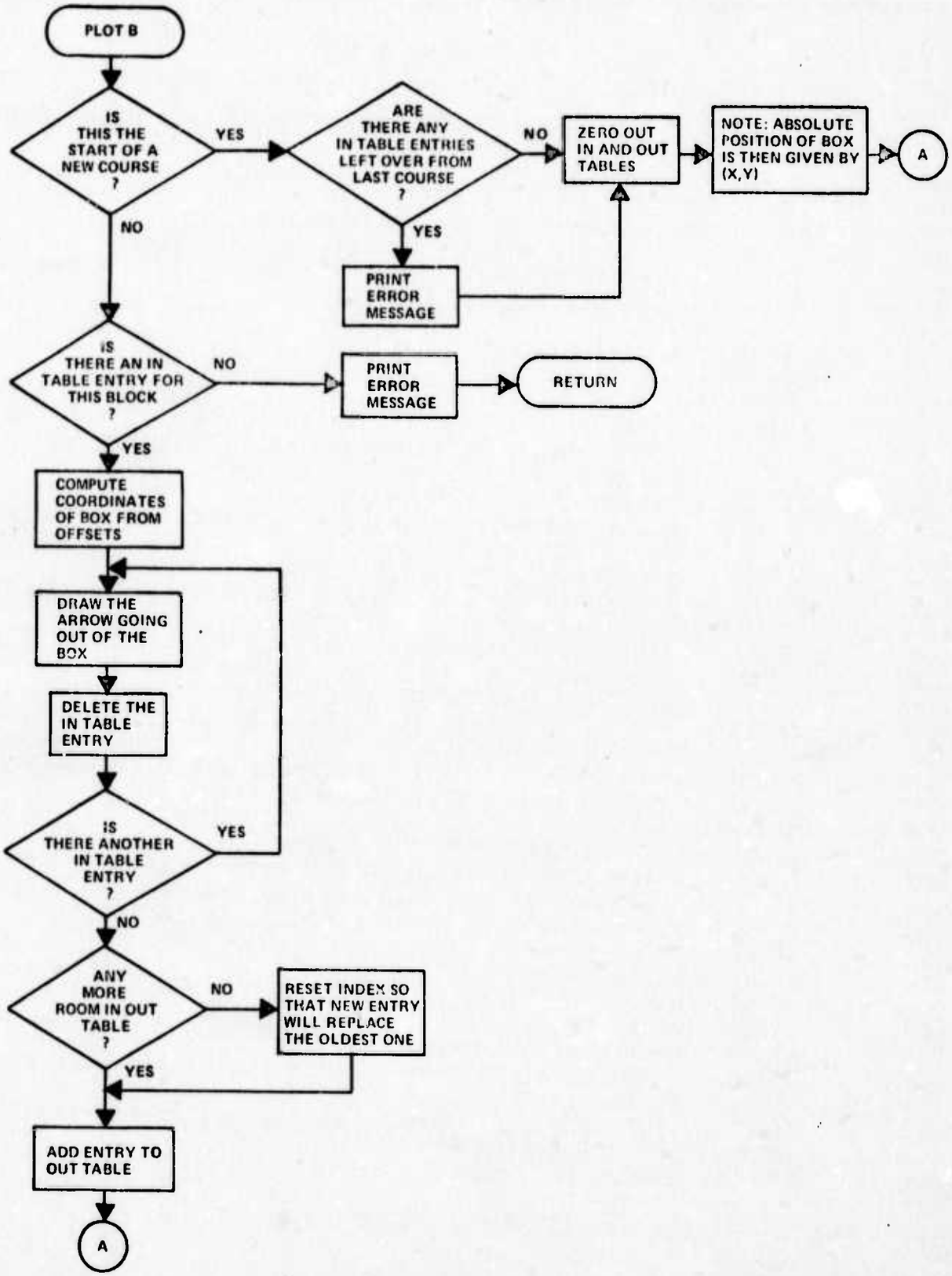
```
CC****************************  IPLOT  ********************************
CC*                                                                   *
CC*                         SUBROUTINE IPLOT                          *
CC*                                                                   *
CC*   PURPOSE                                                         *
CC*      TO PRODUCE THE CALCOMP PLOT OF THE COURSES                   *
CC*                                                                   *
CC*   CALLING SEQUENCE                                                *
CC*      CALL IPLOT (IPN,NUMN,NTBL, IPB,NUMB,NAME,NUMBER)             *
CC*                                                                   *
CC*   DESCRIPTION OF PARAMETERS                                       *
CC*      IPN,NUMN,NTBL    - DATA BLOCK NAME TABLE (SEE SUBROUTINE NAME1)*
CC*      IPB,NUMB,NAME,NUMBER - PROCESSING BLOCK NAME AND NUMBER TABLE *
CC*                         (SEE SUBROUTINE PROCB1)                   *
CC*                                                                   *
CC*   SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                    *
CC*      PLOTB                                                        *
CC*      PLOT                                                         *
CC*      SYMBOL                                                       *
CC*      GETREC                                                       *
CC*      EFPLOT                                                       *
CC*                                                                   *
CC*********************************************************************
```



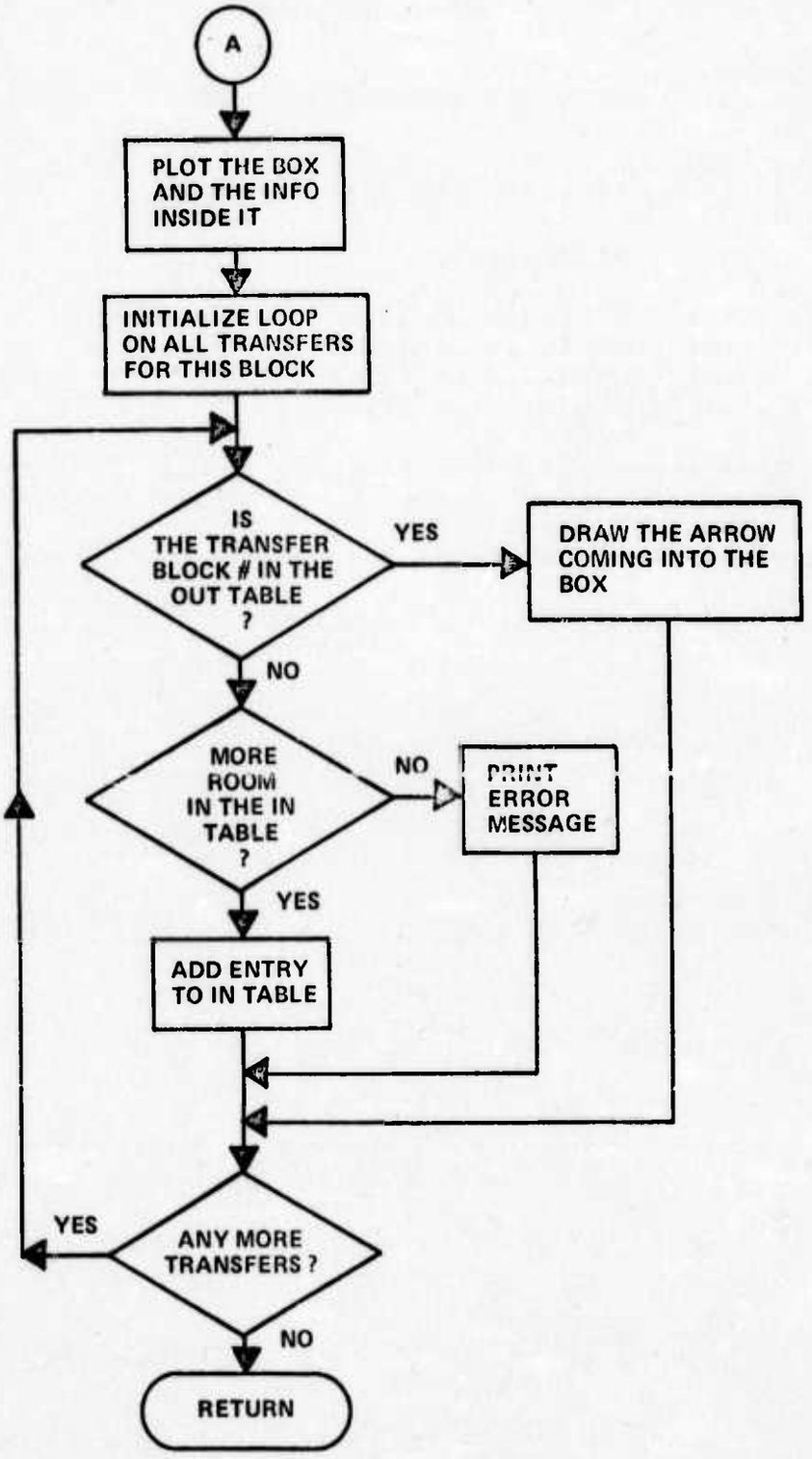
SUBROUTINE IPLOT

```
CC********************************  PLOTX  ********************************
CC*                                                                       *
CC*                          SUBROUTINE PLOTX                             *
CC*                                                                       *
CC*    PURPOSE                                                            *
CC*        TO MOVE THE PEN TO A NEW POSITION AND INTERCEPT PLOT CALLS     *
CC*        WHICH CAUSE PEN TRAVEL FARTHER THAN TEN FEET.  WHEN THIS       *
CC*        OCCURS, THE PEN MOVEMENT IS BROKEN UP INTO SMALLER MOVES.      *
CC*        TEN FEET IS THE MAXIMUM TRAVEL ALLOWED IN A SINGLE CALL TO     *
CC*        THE CALSPAN VERSION OF SUBROUTINE PLOT.                        *
CC*                                                                       *
CC*    CALLING SEQUENCE                                                   *
CC*        CALL  PLOTX (X, Y)                                             *
CC*                                                                       *
CC*    DESCRIPTION OF PARAMETERS                                          *
CC*        X     - X POSITION TO WHICH PEN IS TO BE MOVED                 *
CC*        Y     - Y POSITION TO WHICH PEN IS TO BE MOVED                 *
CC*                                                                       *
CC*    SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                       *
CC*        PLOT                                                           *
CC*                                                                       *
CC***********************************************************************
```

```
CC*****************************  PLOTB  ***********************************
CC*                                                                        *
CC*                          SUBROUTINE PLOTB                              *
CC*                                                                        *
CC*   PURPOSE                                                              *
CC*      TO PLOT THE PROCESSING BLOCKS AND CONNECT THEM WITH ARROWS TO     *
CC*      SHOW THE FLOW                                                     *
CC*                                                                        *
CC*   CALLING SEQUENCE                                                     *
CC*      CALL  PLOTB (XYIN, IBLKIN, NUMIN, MAXIN,                          *
CC*                   XYOUT, IBLKOT, NUMOUT, MAXOUT, ICODE,                *
CC*                  X, Y, IBLKNO, INAME, NTASKS, ITASKS, NTRAN, ITRAN,    *
CC*                  ISYNC, ICSYNC, IBSYNC)                                *
CC*                                                                        *
CC*   DESCRIPTION OF PARAMETERS                                            *
CC*      WORK AREAS                                                        *
CC*          *****  IN TABLE  *****                                        *
CC*       XYIN   - ARRAY DIMENSIONED (MAXIN,2), USED TO STORE THE          *
CC*                COORDINATES OF THE POINTS WHICH NEED ARROWS             *
CC*                POINTING INTO THEM                                      *
CC*       IBLKIN - ARRAY DIMENSIONED (MAXIN), USED TO STORE THE            *
CC*                BLOCK NUMBER FROM WHICH EACH UNRESOLVED TRANSFER        *
CC*                IS TO COME FROM                                         *
CC*       NUMIN  - NUMBER OF ENTRIES IN XYIN AND IBLKIN ARRAYS             *
CC*       MAXIN  - MAXIMUM NUMBER OF ENTRIES IN XYIN AND IBLKIN ARRAYS     *
CC*           *****  OUT TABLE  *****                                      *
CC*       XYOUT  - ARRAY DIMENSIONED (MAXOUT,2), USED TO STORE THE         *
CC*                COORDINATES OF THE START OF THE OUTGOING ARROWS         *
CC*               FROM EACH PROCESSING BLOCK                               *
CC*       IBLKOT- ARRAY DIMENSIONED (MAXOUT), USED TO STORE BLOCK          *
CC*               NUMBERS OF ENTRIES IN XYOUT ARRAY                        *
CC*       NUMOUT- NUMBER OF ENTRIES IN THE XYOUT AND IBLKOT ARRAYS         *
CC*       MAXOUT- MAXIMUM NUMBER OF ENTRIES IN XYOUT ARRAY                 *
CC*      INPUT PARAMETERS                                                  *
CC*       ICODE - 1  INITIALIZE FOR A NEW COURSE                           *
CC*               2  CONTINUE WORKING ON THE SAME COURSE                   *
CC*       X     - X COORDINATE OF LOWER LEFT CORNER OF BOX                 *
CC*       Y     - Y COORDINATE OF LOWER LEFT CORNER OF BOX                 *
CC*       IBLKNO- BLOCK NUMBER                                             *
CC*       INAME - BLOCK NAME                                               *
CC*       NTASKS- NUMBER OF TASKS IN THE BLOCK                             *
CC*       ITASKS- ARRAY OF TASK NAMES                                      *
CC*       NTRAN - NUMBER OF TRANSFERS INTO THE BLOCK                       *
CC*       ITRAN - ARRAY OF BLOCK NUMBERS FROM WHICH EACH TRANSFER          *
CC*               TAKES PLACE                                              *
CC*       ISYNC - SYNC CODE (0-NO SYNC,  1-SYNC TO,  2-CORRELATE WITH)     *
CC*       ICSYNC- SYNC COURSE NAME                                         *
CC*       IBSYNC- SYNC BLOCK NUMBER                                        *
CC*                                                                        *
CC*   SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                         *
CC*       PLOT                                                             *
CC*       SYMBOL                                                           *
CC*       NUMBER                                                           *
CC*       ARROW                                                            *
CC*       LOOKUP                                                           *
CC*                                                                        *
CC**************************************************************************
```



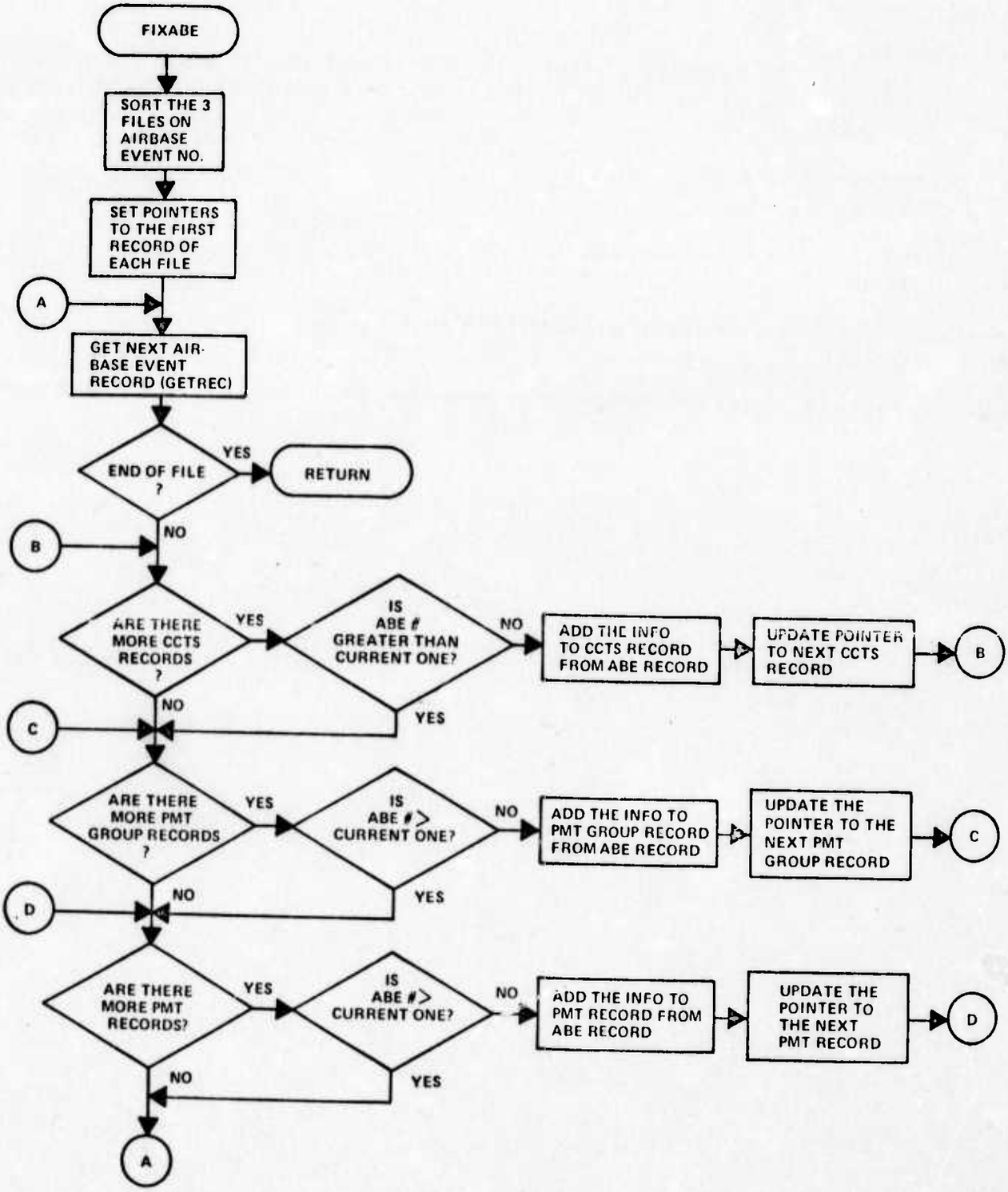
SUBROUTINE PLOTB



SUBROUTINE PLOTB – CONTINUED

```
CC*******************************  ARROW  ********************************
CC*                                                                      *
CC*                          SUBROUTINE ARROW                            *
CC*                                                                      *
CC*   PURPOSE                                                            *
CC*      TO DRAW AN ARROW FOR SUBROUTINE PLOTB                           *
CC*                                                                      *
CC*   CALLING SEQUENCE                                                   *
CC*      CALL  ARROW (X1, Y1, X2, Y2)                                    *
CC*                                                                      *
CC*   DESCRIPTION OF PARAMETERS                                          *
CC*      INPUT                                                           *
CC*        X1    - X COORDINATE OF START OF ARROW                        *
CC*        Y1    - Y COORDINATE OF START OF ARROW                        *
CC*        X2    - X COORDINATE OF END POINT                             *
CC*        Y2    - Y COORDINATE OF END POINT                             *
CC*                                                                      *
CC*   SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                       *
CC*        PLOT                                                          *
CC*                                                                      *
CC************************************************************************
```

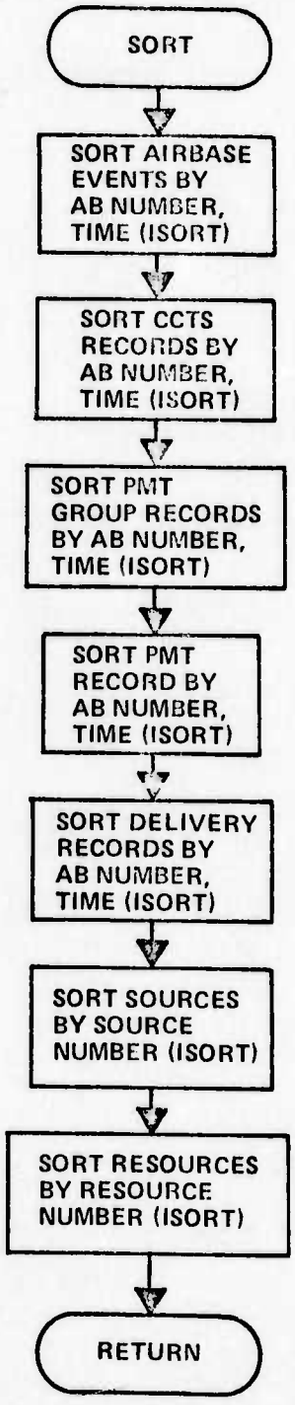
```
CC******************************** FIXABE ***********************************
CC*                                                                          *
CC*                           SUBROUTINE FIXABE                              *
CC*                                                                          *
CC*   PURPOSE                                                                *
CC*      TO ADD THE AIRBASE NUMBER AND TIME(FROM THE ASSOCIATED AIRBASE*
CC*      EVENT RECORD) TO THE CCTS RECORDS, PMT GROUP RECORDS, AND THE *
CC*      PMT RECORDS                                                         *
CC*                                                                          *
CC*   CALLING SEQUENCE                                                       *
CC*      CALL  FIXABE                                                        *
CC*                                                                          *
CC*   DESCRIPTION OF PARAMETERS                                              *
CC*      NONE                                                                *
CC*                                                                          *
CC*   SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                           *
CC*      GETREC                                                              *
CC*                                                                          *
CC****************************************************************************
```



SUBROUTINE FIXABE

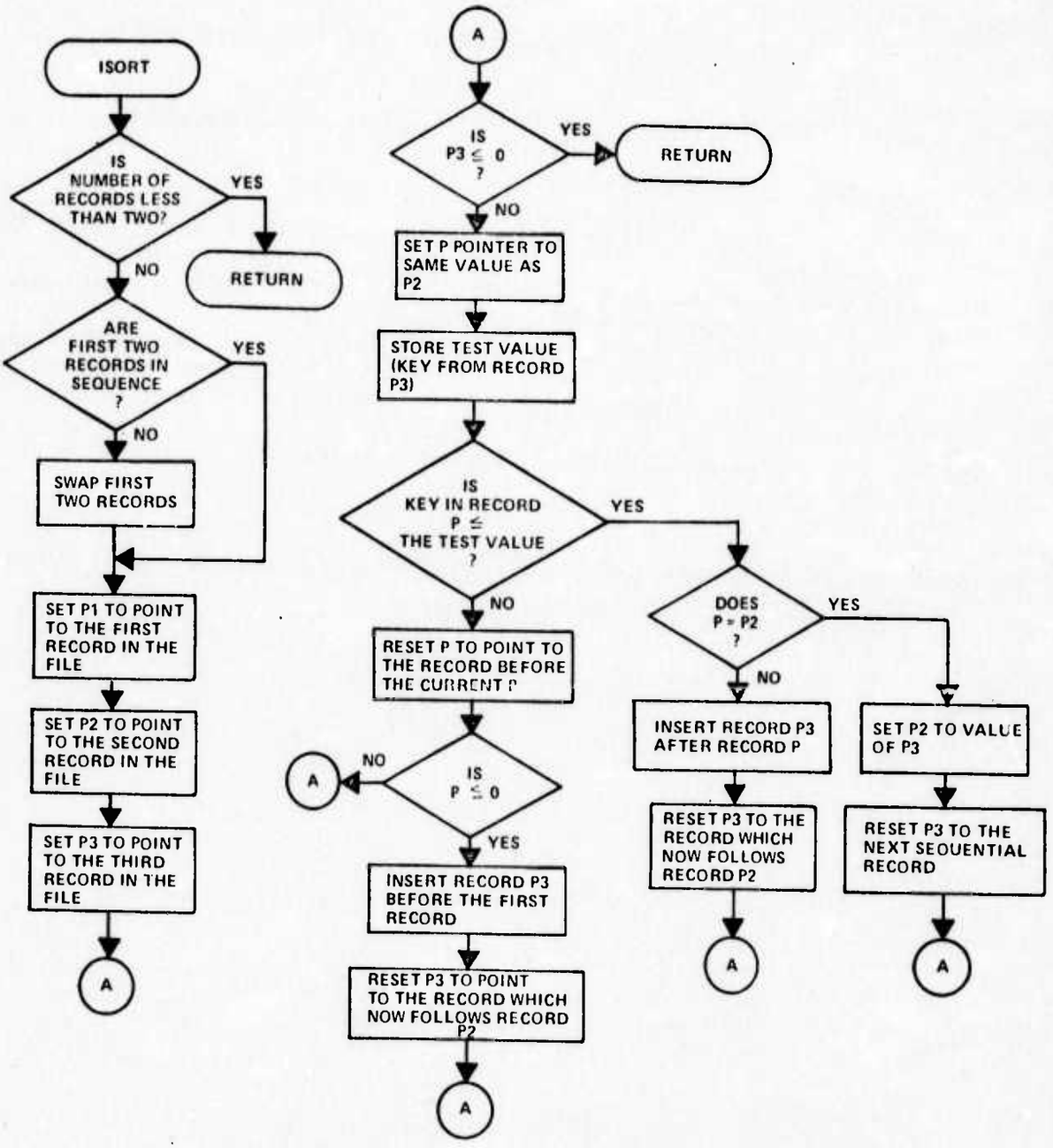
```
CC*****************************  FIXPRO  *********************************
CC*                                                                       *
CC*                          SUBROUTINE FIXPRO                            *
CC*                                                                       *
CC*    PURPOSE                                                            *
CC*       TO REPLACE THE SYNC TYPE IN THE PROCESSING BLOCKS WITH THE      *
CC*       COURSE NUMBER TO WHICH THE BLOCK BELONGS.  THIS IS DONE         *
CC*       FOR USE BY PHASE 3                                              *
CC*                                                                       *
CC*    CALLING SEQUENCE                                                   *
CC*       CALL  FIXPRO (IP1, INUM)                                        *
CC*                                                                       *
CC*    DESCRIPTION OF PARAMETERS                                          *
CC*       IP1   - ARRAY OF POINTERS TO THE FIRST PROC BLOCK IN EACH       *
CC*               COURSE                                                  *
CC*       INUM  - NUMBER OF PROCESSING BLOCKS IN EACH COURSE              *
CC*                                                                       *
CC*    SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                       *
CC*       GETREC                                                          *
CC*                                                                       *
CC***************************************************************************
```

```
CC*****************************  SORT  ****************************************
CC*                                                                           *
CC*                          SUBROUTINE SORT                                  *
CC*                                                                           *
CC*   PURPOSE                                                                 *
CC*      TO SORT THE DATA BLOCKS SO THAT THEY ARE IN THE PROPER               *
CC*      SEQUENCE FOR STEP 2 OF TRAM MODEL                                    *
CC*                                                                           *
CC*   CALLING SEQUENCE                                                        *
CC*      CALL  SORT                                                           *
CC*                                                                           *
CC*   DESCRIPTION OF PARAMETERS                                               *
CC*      NONE                                                                 *
CC*                                                                           *
CC*   SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                            *
CC*      ISORT                                                                *
CC*                                                                           *
CC*****************************************************************************
```



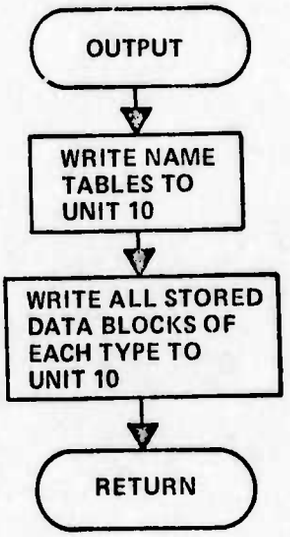
SUBROUTINE SORT

```
CC*****************************  ISORT  ***********************************
CC*                                                                        *
CC*                            SUBROUTINE ISORT                            *
CC*                                                                        *
CC*    PURPOSE                                                             *
CC*       TO SORT THE RECORDS OF A GIVEN FILE IN COMMON /FILE/ INTO        *
CC*       ASCENDING SEQUENCE                                               *
CC*                                                                        *
CC*    CALLING SEQUENCE                                                    *
CC*       CALL  ISORT (INDEX, IWORD)                                       *
CC*                                                                        *
CC*    DESCRIPTION OF PARAMETERS                                           *
CC*       INPUT                                                            *
CC*        INDEX  - FILE NUMBER TO BE SORTED                               *
CC*        IWORD  - WORD NUMBER WITHIN THE RECORDS ON WHICH TO SORT        *
CC*                                                                        *
CC*    SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                        *
CC*       NONE                                                             *
CC*                                                                        *
CC************************************************************************
```



SUBROUTINE ISORT

```
CC*****************************  OUTPUT  *******************************
CC*                                                                     *
CC*                          SUBROUTINE OUTPUT                          *
CC*                                                                     *
CC*   PURPOSE                                                           *
CC*      TO WRITE THE INPUT DATA ONTO THE FILE FOR TRAM STEP 2          *
CC*                                                                     *
CC*   CALLING SEQUENCE                                                  *
CC*      CALL  OUTPUT (IPN,NUMN,NTBL, IPB,NUMB,NAME,NUMBER)             *
CC*                                                                     *
CC*   DESCRIPTION OF PARAMETERS                                         *
CC*      INPUT                                                          *
CC*       IPN,NUMN,NTBL  - DATA BLOCK NAME TABLE (SEE SUBROUTINE NAME1)*
CC*      INPUT-OUTPUT                                                   *
CC*       IPB,NUMB,NAME,NUMBER  - PROCESSING BLOCK NAME AND NUMBER      *
CC*                 TABLE (SEE SUBROUTINE PROCB1)                       *
CC*               NOTE - PROCESSING BLOCK NAME TABLE IS DESTROYED BY    *
CC*                      THE PROCESS OF CONVERTING PROCESSING BLOCK     *
CC*                      NUMBER TABLE TO CHARACTER FORMAT FOR OUTPUT    *
CC*                                                                     *
CC*   SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                      *
CC*      GETREC                                                         *
CC*      WRITE                                                          *
CC*                                                                     *
CC*********************************************************************
```



SUBROUTINE OUTPUT

```
CC***************************** WRITE ***********************************
CC*                                                                       *
CC*                        SUBROUTINE WRITE                               *
CC*                                                                       *
CC*   PURPOSE                                                             *
CC*      TO WRITE OUT AN ARRAY FOR SUBROUTINE OUTPUT                      *
CC*                                                                       *
CC*   CALLING SEQUENCE                                                    *
CC*      CALL  WRITE (LU, IARRAY, NWDS)                                   *
CC*                                                                       *
CC*   DESCRIPTION OF PARAMETERS                                           *
CC*      INPUT                                                            *
CC*       LU     - FORTRAN LOGICAL UNIT NUMBER                            *
CC*       IARRAY - DATA ARRAY                                             *
CC*       NWDS   - NUMBER OF WORDS IN IARRAY                              *
CC*                                                                       *
CC*   SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                        *
CC*      NONE                                                             *
CC*                                                                       *
CC*************************************************************************
```

```
CC***************************** LOOKUP *********************************
CC*                                                                    *
CC*                       SUBROUTINE LOOKUP                            *
CC*                                                                    *
CC*   PURPOSE                                                          *
CC*      TO LOOK UP A VALUE IN A TABLE AND RETURN ITS POSITION         *
CC*                                                                    *
CC*   CALLING SEQUENCE                                                 *
CC*      CALL  LOOKUP (IVAL, IARRAY, N, ICODE, INDEX)                  *
CC*                                                                    *
CC*   DESCRIPTION OF PARAMETERS                                        *
CC*      INPUT                                                         *
CC*       IVAL   - VALUE TO BE SEARCHED FOR                            *
CC*       IARRAY- TABLE OF VALUES TO BE SEARCHED FOR                   *
CC*       N      - NUMBER OF ENTRIES IN IARRAY                         *
CC*       ICODE  - 1 - DATA VALUES OCCUPY ONE WORD                     *
CC*                2 - DATA VALUES OCCUPY THREE WORDS, USED FOR 10     *
CC*                    CHARACTER FIELDS ON IBM COMPUTER                *
CC*                    (REQUIRES  IVAL(3), IARRAY(3,N)  )              *
CC*                                                                    *
CC*      OUTPUT                                                        *
CC*       INDEX - INDEX OF THE VALUE IN THE TABLE, ZERO IF THE VALUE   *
CC*               IS NOT FOUND                                         *
CC*                                                                    *
CC*   SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                      *
CC*      NONE                                                          *
CC*                                                                    *
CC**********************************************************************
```

Section 1.6

SUBROUTINE CROSS REFERENCE TABLE

In the table on the following pages, the column headings show the subroutine names that do the calling, and the row headings give the subroutine names that are called.

SUBROUTINE CROSS REFERENCE SUMMARY C********** PHASE1 **********

ROUTINE OR ENTRY — USAGE SUMMARY

	MAIN	*BLOCK	TBL	TBL3	TBL4	TBL5	PTYPE	TBL6	TBL7	TBL8	TBL9	TBL10
ADDREC												
ARROW												
ENDCOR												
FIXABE	X											
FIXPRO	X											
GETREC				X	X	X		X	X	X	X	X
INPUT	X											
IPLOT	X											
ISORT												
ITABLE	X											
LOOKUP												
NAME1	X											
NAME2	X											
OUTPUT	X											
PLOTB												
PLOTX												
PRINTC												
PROCB1	X											
PROCB2	X											
PTYPE								X				
READC												
READTB	X											
REPLC1												
REPLC2												
RPT												
SHIFTR												
SORT	X											

SUBROUTINE CROSS REFERENCE SUMMARY C********** PHASE1 **********

ROUTINE OR ENTRY — USAGE SUMMARY

	TBL2	TBL12	TBL13	TBL14	ADDREC	GETREC	TRNSFR	FIXABE	OUTPUT	WRITE	IPLOT	PLOTX
ADDREC												
ARROW												
ENDCOR												
FIXABE												
FIXPRO												
GETREC	X	X	X	X				X	X		X	
INPUT												
IPLOT												
ISORT								X				
ITABLE												
LOOKUP												
NAME1												
NAME2												
OUTPUT												
PLOTB											X	
PLOTX											X	
PRINTC												
PROCB1												
PROCB2												
PTYPE			X	X								
READC												
READTB												
REPLC1												
REPLC2												
RPT												
SHIFTR												
SORT												

SUBROUTINE CROSS REFERENCE SUMMARY [illegible]

ROUTINE OR ENTRY	USAGE SUMMARY											
	PLOTB	ARROW	ITABLE	NAME1	NAME2	REPLC1	REPLC2	PROCB1	PROCB2	LOOKUP	SORT	ISORT
ADDREC												
ARROW	X											
ENDCOR												
FIXABE												
FIXPRO												
GETREC				X		X	X	X	X			
INPUT												
IPLOT												
ISORT												
ITABLE											X	
LOOKUP	X			X		X	X	X	X			
NAME1												
NAME2												
OUTPUT												
PLOTB												
PLOTX	X											
PRINTC												
PROCB1												
PROCB2												
PTYPE												
READC												
READTB												
REPLC1			X		X							
REPLC2					X							
RPT												
SHIFTR												
SORT												

SUBROUTINE CROSS REFERENCE SUMMARY C********** PHASE1 **********

ROUTINE OR ENTRY — USAGE SUMMARY

	READTB	READC	PRINTC	TEST	STORE	RPT	INPUT	SHIFTR	ENDCOR	FIXPRO
ADDREC					X		X			
ARROW										
ENDCOR							X			
FIXABE										
FIXPRO										
GETREC										X
INPUT										
IPLOT										
ISORT										
ITABLE										
LOOKUP							X			
NAME1										
NAME2										
OUTPUT										
PLOTB										
PLOTX										
PRINTC						X	X			
PROCB1										
PROCB2										
PTYPE										
READC						X	X			
READTB										
REPLC1										
REPLC2										
RPT							X			
SHIFTR							X			
SORT										

SUBROUTINE CROSS REFERENCE SUMMARY (********** PHASE1 **********

ROUTINE OR ENTRY — USAGE SUMMARY

	MAIN	*BLOCK	TBL	TBL3	TBL4	TBL5	PTYPE	TBL6	TBL7	TBL8	TBL9	TBL10
STORE												
TBL	X											
TBL10			X									
TBL12			X									
TBL13			X									
TBL14			X									
TBL2			X									
TBL3			X									
TBL4			X									
TBL5			X									
TBL6			X									
TBL7			X									
TBL8			X									
TBL9			X									
TEST												
TRNSFR												
WRITE												

SUBROUTINE CROSS REFERENCE SUMMARY C********** PHASE1 **********

ROUTINE OR ENTRY

USAGE SUMMARY

	TBL2	TBL12	TBL13	TBL14	ADDREC	GETREC	TRNSFR	FIXABE	OUTPUT	WRITE	IPLOT	PLOTX
STORE												
TBL												
TBL10												
TBL12												
TBL13												
TBL14												
TBL2												
TBL3												
TBL4												
TBL5												
TBL6												
TBL7												
TBL8												
TBL9												
TEST												
TRNSFR												
WRITE									X			

SUBROUTINE CROSS REFERENCE SUMMARY C********** PAGE 1 **********

ROUTINE OR ENTRY

USAGE SUMMARY

	PLOTB	ARROW	ITABLE	NAME1	NAME2	REPLC1	REPLC2	PROCB1	PROCB2	LOCKUP	SORT	ISORT
STORE												
TBL												
TBL10												
TBL12												
TBL13												
TBL14												
TBL2												
TBL3												
TBL4												
TBL5												
TBL6												
TBL7												
TBL8												
TBL9												
TEST												
TRNSFR												
WRITE												

SUBROUTINE CROSS REFERENCE SUMMARY C********** PHASE1 **********

ROUTINE OR ENTRY — USAGE SUMMARY

	READTB	READC	PRINTC	TEST	STORE	RPT	INPUT	SHIFTR	ENDCOR	FIXPRG
STORE							X			
TBL										
TBL1C										
TBL12										
TBL13										
TBL14										
TBL2										
TBL3										
TBL4										
TBL5										
TBL6										
TBL7										
TBL8										
TBL9										
TEST						X	X			
TRNSFR					X		X			
WRITE										

Section 1.7

COMMON VARIABLE DEFINITIONS

The tables on the following pages define the meaning of each variable contained in each of the common blocks used by this program.

```
*****************************************************************************
*                                                                           *
*     COMMON  /FILE/   -   INTERNAL STORAGE FOR DATA BLOCKS                 *
*                                                                           *
*****************************************************************************
*             *                                                             *
* VARIABLE    *  DESCRIPTION                                                *
*             *                                                             *
*****************************************************************************
*             *                                                             *
* MAXFLE      * MAXIMUM NUMBER OF BLOCK TYPES WHICH CAN BE STORED           *
* ISTRT(J)    * POINTER TO THE FIRST BLOCK STORED OF EACH TYPE              *
* IEND(J)     * POINTER TO THE LAST BLOCK STORED OF EACH TYPE               *
* NRECS(J)    * NUMBER OF BLOCKS CURRENTLY STORED FOR EACH TYPE             *
* MAXADR      * DIMENSION OF VARIABLE IFILE                                 *
* NEXTAD      * POINTER TO THE NEXT AVAILABLE LOCATION IN THE IFILE ARRAY   *
* IFILE(I)    * STORAGE AREA FOR THE DATA BLOCKS.  EACH BLOCK HAS THE       *
*             * FOLLOWING FORMAT                                            *
*             * WORD NUMBER      DESCRIPTION                                *
*             *     1          POINTER TO THE NEXT BLOCK                    *
*             *     2          POINTER TO THE LAST BLOCK                    *
*             *     3          NUMBER OF WORDS IN THIS BLOCK                *
*             *     4          DATA WORDS                                   *
*             *     .                                                       *
*             *     .                                                       *
*             *     .                                                       *
*             *  3+NWDS                                                     *
*             *                                                             *
*****************************************************************************
```

```
*****************************************************************************
*                                                                           *
*     COMMON  /TABLES/   -   FUNCTION NAME LOOKUP TABLES                    *
*                                                                           *
*****************************************************************************
*                 *                                                         *
* VARIABLE        *  DESCRIPTION                                            *
*                 *                                                         *
*****************************************************************************
*                 *                                                         *
* NTBLS           * NUMBER OF TABLES                                        *
* ITBLS(3,I,J)    * FUNCTION NAME LOOKUP TABLES                             *
*                 * SUBSCRIPT     DESCRIPTION                               *
*                 *      1        ALLOWS 3 WORDS PER TEN CHARACTER NAME     *
*                 *      2        INDEX OF EACH ENTRY IN A TABLE            *
*                 *               NOTE - THE FIRST ENTRY (ITBLS(1,1,J)) GIVES THE *
*                 *               NUMBER OF NAMES, AND THE REST OF THE ENDRIES *
*                 *               CONTAIN THE NAMES                         *
*                 *      3        INDEX OF TABLE NUMBER                     *
*                 *                                                         *
*****************************************************************************
```

```
*****************************************************************************
*                                                                           *
*     COMMON  /ICNAME/  --  CARD NAME TABLE                                 *
*                                                                           *
*****************************************************************************
*                 *                                                         *
* VARIABLE        *  DESCRIPTION                                            *
*                 *                                                         *
*****************************************************************************
*                 *                                                         *
* NNAMES          * NUMBER OF CARD TYPES                                    *
* INAMES(3,J)     * CARD NAME OF EACH CARD TYPE                             *
*                 * (3 WORDS PER 10 CHARACTER NAME, BLANK FOR THOSE CARDS WHICH *
*                 * ARE IDENTIFIED BY A HEADER CARD)                        *
* IBLKNO(J)       * INTERNAL DATA BLOCK NUMBER ASSOCIATED WITH EACH INPUT CARD *
*                 *                                                         *
*****************************************************************************
```

```
*****************************************************************************
*                                                                           *
*     COMMON  /DDIN/    -    INPUT DATA CARD DESCRIPTION TABLE              *
*                                                                           *
*****************************************************************************
*           *                                                               *
* VARIABLE  *  DESCRIPTION                                                  *
*           *                                                               *
*****************************************************************************
*           *                                                               *
*N1(J)      * NUMBER OF CHARACTER DATA FIELDS CONTAINED ON EACH CARD         *
*           * TYPE  (INCLUDES CARD NAME FIELD)                              *
*N2(J)      * NUMBER OF NUMERIC PARAMETERS CONTAINED ON EACH CARD            *
*IRNG1(I,J)* LOWER BOUND OF ACCEPTANCE RANGE FOR EACH NUMERIC VALUE         *
*           * ON EACH CARD TYPE                                             *
*IRNG2(I,J)* UPPER BOUND OF ACCEPTANCE RANGE FOR EACH NUMERIC VALUE         *
*           * ON EACH CARD TYPE                                             *
*           *                                                               *
*****************************************************************************
```

```
*****************************************************************************
*                                                                           *
*     COMMON  /DBD/    -    INTERNAL DATA BLOCK DESCRIPTION TABLE           *
*                                                                           *
*****************************************************************************
*            *                                                              *
* VARIABLE   *  DESCRIPTION                                                 *
*            *                                                              *
*****************************************************************************
*            *                                                              *
* NBLKS      * NUMBER OF DATA BLOCKS                                        *
* ID1(I)     * POINTER TO START OF DATA BLOCK DESCRIPTION (IN IFMT ARRAY)   *
*            * FOR EACH DATA BLOCK                                          *
* ID2(I)     * NUMBER OF WORDS OF DESCRIPTION FOR EACH DATA BLOCK           *
* IFMT(J)    * DATA BLOCK DESCRIPTION CODES                                 *
*            * THE FOLLOWING CODES ARE CURRENTLY BEING USED                 *
*            *                                                              *
*            * CODE     MEANING                                            *
*            *  -N      DATA WORD CONTAINS THE NUMBER OF ENTRIES OF VARIABLE*
*            *          LENGTH DATA TO FOLLOW.  N GIVES THE NUMBER OF DATA *
*            *          WORDS PER ENTRY, AND THE NEXT N CODES DESCRIBE THE *
*            *          ENTRIES                                            *
*            *   0      NO DATA, OR A CONTINUATION                         *
*            *   1      INTEGER                                            *
*            *   4      FLOATING POINT                                     *
*            *   8      CHARACTER DATA                                     *
*            *   9      DATA BLOCK NAME (MUST BE UNIQUE)                   *
*            *  10      DATA BLOCK NAME (MAY NOT BE UNIQUE)                *
*            *11-30     BLOCK NAME REFERENCE                               *
*            *          CODE MINUS 10 GIVES THE BLOCK NUMBER               *
*            *31-50     BLOCK NAME REFERENCE (MAY BE BLANK)                *
*            *          CODE MINUS 30 GIVES THE BLOCK NUMBER               *
*            *51-60     FUNCTION NAME                                      *
*            *          CODE MINUS 50 GIVES TABLE NUMBER                   *
*            *61-70     FUNCTION NAME (MAY BE BLANK)                       *
*            *          CODE MINUS 60 GIVES TABLE NUMBER                   *
*            *                                                              *
*****************************************************************************
```

Section 1.8

INTERNAL DATA BLOCK DESCRIPTIONS

The tables on the following pages define the contents of each of the data blocks used to store the TRAM inputs in phase 1. These data blocks are stored in common area /FILE/. The format code associated with each data word is used by the program to determine what data are contained in that word. See the description of common block /DBD/ for the definition of these codes.

DATA BLOCK NUMBER 1 - CONTROL PARAMETERS (NOT CURRENTLY USED)

WORD	FORMAT CODE	DESCRIPTION
1		CARD SEQUENCE NUMBER
2		NOT USED
3		NOT USED
4	4	ATTRITION RATIO
5	4	
6	4	
7	4	
8	1	DELAY TIME CONSTANT
9	1	
10	1	
11	1	
12	4	PERCENT COPILOTS RECOVERABLE AS PILOTS
13	1	COPILOT HOLDING PERIOD
14	1	NUMBER OF CALENDAR UNITS/YEAR

DATA BLOCK NUMBER 2 - AIR BASES

WORD	FORMAT CODE	DESCRIPTION
1		CARD SEQUENCE NUMBER
2		NOT USED
3		NOT USED
4	9	AIR BASE NAME
5	0	
6	0	
7	1	INITIAL INVENTORY OF AIRCRAFT
8	1	INITIAL NUMBER OF PILOTS
9	1	INITIAL NUMBER OF COPILOTS
10	1	INITIAL NUMBER OF OSO
11	1	INITIAL NUMBER OF DSO

DATA BLOCK NUMBER 3 - RESOURCE INVENTORY

WORD	FORMAT CODE	DESCRIPTION
1		CARD SEQUENCE NUMBER
2		NOT USED
3		NOT USED
4	10	RESOURCE NAME
5	0	
6	0	
7	51	GENERATING FUNCTION NAME
8	0	
9	0	
10	1	START DATE
11	1	END DATE
12	-1	NUMBER OF PARAMETERS
-	1	PARAMETERS

DATA BLOCK NUMBER 4 - SOURCE

WORD	FORMAT CODE	DESCRIPTION
1		CARD SEQUENCE NUMBER
2		NOT USED
3		NOT USED
4	10	NAME OF SOURCE
5	0	
6	0	
7	51	GENERATING FUNCTION NAME
8	0	
9	0	
10	1	START DATE
11	1	END DATE
12	-1	NUMBER OF PARAMETERS
-	1	PARAMETERS

DATA BLOCK NUMBER 5 – AIRCRAFT DELIVERIES

WORD	FORMAT CODE	DESCRIPTION
1		CARD SEQUENCE NUMBER
2		NOT USED
3		NOT USED
4	12	AIR BASE NAME
5	0	
6	0	
7	1	DATL
8	1	NUMBER OF A/C

DATA BLOCK NUMBER 6 - COURSE BLOCK

WORD	FORMAT CODE	DESCRIPTION
1		CARD SEQUENCE NUMBER
2		NOT USED
3		NOT USED
4	9	COURSE NAME
5	0	
6	0	
7	1	COURSE TYPE
8	1	PERSONNEL TYPE
9	4	X
10	4	Y
11	1	MAX CLASS SIZE
12	1	CLASS PERIOD
13	1	PRIORITY
14	1	EARLIEST GRADUATION DATE
15	1	POINTER TO FIRST PROC BLOCK IN THIS COURSE
16	1	POINTER TO LAST PROC BLOCK IN THIS COURSE

DATA BLOCK NUMBER 7 - PROC BLOCK

WORD	FORMAT CODE	DESCRIPTION
1		CARD SEQUENCE NUMBER
2		NOT USED
3		NOT USED
4	8	PROC BLOCK NAME
5	0	
6	0	
7	36	SYNC COURSE NAME
8	0	
9	0	
10	1	SYNC BLOCK NO
11	1	SYNC CODE
12	1	BLOCK NUMBER
13	1	DURATION
14	4	X
15	4	Y
16	1	PRIORITY
17	-3	NUMBER TRANSFERS
18	-3	NUMBER TASKS
-	1	BLOCK NUMBER TRANSFERRED FROM
-	1	PRIORITY
-	4	RATIO
-	18	TASK NAME
-	0	
-	0	

DATA BLOCK NUMBER 8 - TASK

WORD	FORMAT CODE	DESCRIPTION
1		CARD SEQUENCE NUMBER
2		NOT USED
3		NOT USED
4	9	TASK NAME
5	0	
6	0	
7	52	TASK FUNCTION NAME
8	0	
9	0	
10	39	RUB NAME
11	0	
12	0	
13	1	TASK TYPE
14	-1	NUMBER OF PARAMETERS
-	1	PARAMETERS

DATA BLOCK NUMBER 9 - RUB

WORD	FORMAT CODE	DESCRIPTION
1		CARD SEQUENCE NUMBER
2		NOT USED
3		NOT USED
4	9	RUB NAME
5	0	
6	0	
7	-3	NUMBER OF RESOURCES
-	20	NAME OF RUDB
-	0	
-	0	

DATA BLOCK NUMBER 10 - RUDB

WORD	FORMAT CODE	DESCRIPTION
1		CARD SEQUENCE NUMBER
2		NOT USED
3		NOT USED
4	9	RUDB NAME
5	0	
6	0	
7	33	RESOURCE NAME
8	0	
9	0	
10	63	GROUPING FUNCTION
11	0	
12	0	
13	64	TIMING FUNCTION
14	0	
15	0	
16	39	SECONDARY RUB
17	0	
18	0	
19	40	ALTERNATE RUDB
20	0	
21	0	
22	1	UNITS CONSUMPTION/UNIT USER
23	34	SOURCE NAME
24	0	
25	0	

DATA BLOCK NUMBER 11 - AIRBASE TIME HISTORY (NOT CURRENTLY USED)

WORD	FORMAT CODE	DESCRIPTION
1		CARD SEQUENCE NUMBER
2		NOT USED
3		NOT USED
4	12	AIRBASE NAME
5	0	
6	0	
7	1	PERSONNEL TYPE
8	-1	NUMBER OF POINTS
-	1	POINTS

DATA BLOCK NUMBER 12 - AIRBASE EVENT

WORD	FORMAT CODE	DESCRIPTION
1		CARD SEQUENCE NUMBER
2		NOT USED
3		NOT USED
4	9	EVENT NAME
5	0	
6	0	
7	12	AIRBASE NAME
8	0	
9	0	
10	1	TIME
11	4	CREW RATIO
12	4	ALERT RATIO
13	1	HRS/CREW/WEEK

DATA BLOCK NUMBER 13 - CCTS BLOCK

WORD	FORMAT CODE	DESCRIPTION
1		CARD SEQUENCE NUMBER
2		NOT USED
3		NOT USED
4	22	AIRBASE EVENT NAME
5	0	
6	0	
7	16	COURSE NAME
8	0	
9	0	
10	1	PERSONNEL TYPE
11	4	RATIO
12	0	A B NUMBER
13	0	TIME

DATA BLOCK NUMBER 14 - PMT GROUP

WORD	FORMAT CODE	DESCRIPTION
1		CARD SEQUENCE NUMBER
2		NOT USED
3		NOT USED
4	22	AIRBASE EVENT NAME
5	0	
6	0	
7	1	PERIOD
8	1	NUMBER OF PMT COURSES
9	0	AB NUMBER
10	0	TIME
11	0	PMT NUMBER

DATA BLOCK NUMBER 15 - PMT RECORD

WORD	FORMAT CODE	DESCRIPTION
1		CARD SEQUENCE NUMBER
2		NOT USED
3		NOT USED
4	22	AIRBASE EVENT NAME - COPIED FROM PMT GROUP CARD
5	0	
6	0	
7	16	COURSE NAME
8	0	
9	0	
10	1	PERSONNEL TYPE
11	4	RATIO
12	1	TIME LOST
13	0	A B NUMBER
14	0	TIME
15	0	PMT NUMBER

Section 1.9

COMMON VARIABLE CROSS REFERENCE TABLE

The table on the following pages shows how each subroutine uses each common variable. The subroutine names are printed across the top of the table, and the variable names down the left side.

CROSS REFERENCE SUMMARY C********** PHASE1 **********

SYMBOL	TYPE	USAGE SUMMARY											
		MAIN	*BLOCK	TBL	TBL3	TBL4	TBL5	PTYPE	TBL6	TBL7	TBL8	TBL9	TBL10
IBLKNO	I												
ID1	I												
ID2	I												
IEND	I	C	D C		C	C	C		C	C	C	C	C
IFILE	I	A F CE	CE		F CE	F CE	F CE		F CE	F CE	F CE	F CE	F CE
IFMT	I												
INAMES	I												
IPLOT	I												
IRNG1	I												
IRNG2	I												
ISTRT	I	C	D C		C	C	C		C	C	C	C	C
ITBLS	I												
MAXDR	I	F C	D C		C	C	C		C	C	C	C	C
MAXFLE	I	C	D C		C	C	C		C	C	C	C	C
NBLKS	I												
NEXTAD	I	FSC	D C		C	C	C		C	C	C	C	C
NNAMES	I												
NRECS	I	F C	D C		C	C	C		C	C	C	C	C
NTBLS	I												
N1	I												
N2	I									FS			

CROSS REFERENCE SUMMARY C********** PHASE1 **********

SYMBOL	TYPE	USAGE SUMMARY											
		TBL2	TBL12	TBL13	TBL14	ADDREC	GETREC	TRNSFR	FIXABE	OUTPUT	WRITE	IPLOT	PLOTX
IBLKNO	I											A S	
ID1	I												
ID2	I												
IEND	I	C	C	C	C	FSC	C		C	C			
IFILE	I	F CE	F CE	F CE	F CE	SCE	F CE		FSCE	FSCE		A F CE	
IFMT	I												
INAMES	I												
IPLOT	I												
IRNG1	I												
IRNG2	I												
ISTRT	I	C	C	C	F C	SC	F C		F C	C		F C	
ITBLS	I									A F C			
MAXADR	I	C	C	C	C	F C	C		C	C		F C	
MAXFLE	I	C	C	C	C	F C	C		C	C		C	
NBLKS	I												
NEXTAD	I	C	C	C	C	FSC	C		C	C		F C	
NNAMES	I												
NRECS	I	C	C	C	C	FSC	C		C	F C		C	
NTBLS	I									C			
N1	I											FS	
N2	I											FS	

CROSS REFERENCE SUMMARY C********** PHASE1 **********

SYMBOL	TYPE	USAGE SUMMARY											
		PLOTB	ARROW	ITABLE	NAME1	NAME2	REPLC1	REPLC2	PROCE1	PROCE2	LOOKUP	SORT	ISORT
IBLKNO	I	A F											
ID1	I			F C	F C	F C							
ID2	I			F C	F C	F C							
IEND	I				C		C	C	C	C			C
IFILE	I				FSCE		FSCE	FSCE	FSCE	A FSCE			FSCE
IFMT	I			F C	F C	F C							
INAMES	I												
IPLOT	I												
IRNG1	I												
IRNG2	I												
ISTRT	I				C	A S	C	C	C	C			FSC
ITBLS	I			A C									
MAXADR	I				C		C	C	C	C			C
MAXFLE	I				C		C	C	C	C			C
NBLKS	I			F C	F C	F C							
NEXTAD	I				C		C	C	C	C			C
NNAMES	I												
NRECS	I				C		C	C	F C	F C			F C
NTBLS	I			C									
N1	I							FS			FS		
N2	I												

CROSS REFERENCE SUMMARY C********** PHASE1 **********

SYMBOL	TYPE	USAGE SUMMARY									
		READTB	READC	PRINTC	TEST	STORE	RPT	INPUT	SHIFTR	ENDCOR	FIXPRO
IBLKNO	I	SC			C			F C			
ID1	I	SC									
ID2	I	SC									
IEND	I					C		C		F C	C
IFILE	I					A SCE		A SCE		FSCE	SCE
IFMT	I	SC									
INAMES	I	SC			F C			A C			
IPLOT	I							A S			
IRNG1	I	SC	C	C	F C			C			
IRNG2	I	SC	C	C	F C			C			
ISTRT	I					C		C		C	C
ITBLS	I	SC									
MAXADR	I					C		C		C	C
MAXFLE	I					C		C		C	C
NBLKS	I	FSC									
NEXTAD	I					C		C		C	C
NNAMES	I	FSC			C			A C			
NRECS	I					C		F C		F C	C
NTBLS	I	FSC									
N1	I	SC	F C	F C	F C			F C	A F		
N2	I	SC	F C	F C	F C			F C	A F		

CROSS REFERENCE SUMMARY C********** PHASE1 **********

SYMBOL	TYPE	USAGE SUMMARY									
		READTB	READC	PRINTC	TEST	STORE	RPT	INPUT	SHIFTR	ENDCOR	FIXPRO
IBLKND	I	SC			C			F C			
ID1	I	SC									
ID2	I	SC									
IEND	I					C		C		F C	C
IFILE	I					A SCE		A SCE		FSCE	SCE
IFMT	I	SC									
INAMES	I	SC			F C			A C			
IPLOT	I							A S			
IRNG1	I	SC	C	C	F C			C			
IRNG2	I	SC	C	C	F C			C			
ISTRT	I					C		C		C	C
ITBLS	I	SC									
MAXADR	I					C		C		C	C
MAXFLE	I					C		C		C	C
NBLKS	I	FSC									
NEXTAD	I					C		C		C	C
NNAMES	I	FSC			C			A C			
NRECS	I					C		F C		F C	C
NTBLS	I	FSC									
N1	I	SC	F C	F C	F C			F C	A F		
N2	I	SC	F C	F C	F C			F C	A F		

CROSS REFERENCE USAGE CODES

A ARGUMENT

THE SYMBOL IS A VARIABLE OR FUNCTION NAME WHICH APPEARS IN AN ARGUMENT LIST OF A CALL, SUBROUTINE, FUNCTION, OR ENTRY STATEMENT.

D DATA INITIALIZATION

THE SYMBOL IS A VARIABLE WHICH IS INITIALIZED IN A DATA OR TYPE SPECIFICATION STATEMENT SUCH AS A COMPLEX SPECIFICATION STATEMENT.

F FETCH A VALUE

THE SYMBOL IS A:

1. VARIABLE WHOSE MOST RECENTLY ASSIGNED VALUE IS ACCESSED BUT NOT CHANGED.
2. FUNCTION NAME OR ARGUMENT OF A FUNCTION WHICH APPEARS ON THE RIGHT SIDE OF AN EQUAL SIGN IN AN ASSIGNMENT STATEMENT OR APPEARS IN AN IF STATEMENT TEST.
3. DUMMY ARGUMENT IN A STATEMENT FUNCTION DEFINITION.

S STORE A VALUE

THE SYMBOL IS A:

1. VARIABLE WHOSE VALUE IS REPLACED BY ANOTHER VALUE.
2. FUNCTION NAME WHICH APPEARS ON THE LEFT SIDE OF AN EQUAL SIGN IN AN ASSIGNMENT STATEMENT.
3. NAME OF A STATEMENT FUNCTION IN THE DEFINITION OF THAT FUNCTION.

C COMMON

THE SYMBOL IS A VARIABLE WHICH APPEARS IN A COMMON STATEMENT OR IS THE NAME OF A LABELED COMMON BLOCK.

E EQUIVALENCE

THE SYMBOL IS A VARIABLE WHICH APPEARS IN AN EQUIVALENCE STATEMENT.

T TYPE SPECIFICATION

THE SYMBOL IS A VARIABLE WHICH APPEARS IN A :

1. TYPE SPECIFICATION STATEMENT AND IS NOT INITIALIZED IN THAT STATEMENT.
2. DIMENSION OR EXTERNAL STATEMENT.

N ENTRY POINT

THE SYMBOL IS AN ENTRY POINT DEFINED BY AN ENTRY STATEMENT IN A SUBROUTINE OR FUNCTION.

X EXTERNAL REFERENCE

THE SYMBOL IS A SUBROUTINE OR ENTRY NAME WHICH APPEARS IN A CALL STATEMENT.

Section 1.10

INITIALIZATION FILE

This file is read by subroutine READTB from FORTRAN logical unit 9. It is a formatted file that contains card images, and is used to initialize the following common blocks: ICNAME, TABLES, DD1N, and DBD. Normally, any changes to the values on this file would be accompanied with program modifications.

Four tables are contained on this file, one to initialize each common block. The contents of each of these tables are summarized below. For a detailed description of the values on this file, refer to the descriptions of the common blocks that they initialize. A listing of this file will be provided with the program listings.

TABLE 1 (Initializes common ICNAME)
This table contains the card names, which are used to identify the input cards, and the internal block numbers for the data contained on those cards.

TABLE 2 (Initializes common TABLES)
This table contains the function names to be coded on the input cards.

TABLE 3 (Initializes common DDIN)
This table contains a description of each input card. This includes the number of character fields on the card, the number of numeric fields, and the range of acceptable values for each numeric field.

TABLE 4 (Initializes common DBD)
This table contains a description of the internal data blocks used to store the inputs. This description is used by the program to locate and replace character name references with the proper integer code.

Section 1.11

OUTPUT FILE DESCRIPTION

The following tables show the contents of the output file from TRAM phase 1. This is an unformatted file that is written onto FORTRAN logical unit 10 for passage to phase 2. The first table summarizes the records that are contained on the file, and their order. Other tables follow, which give a detailed description of those records that contain more than one item.

```
**********************************************************************
*                                                                    *
*    U N I T   T E N   F I L E   D E S C R I P T I O N               *
*                                                                    *
**********************************************************************
*                                                                    *
*    THIS UNFORMATTED (BINARY) FILE CONTAINS THE FOLLOWING RECORDS   *
*                                                                    *
*                                                                    *
*  - NUMBER OF AIR BASES                                             *
*  - AIR BASE NAMES                                                  *
*  - NUMBER OF COURSES                                               *
*  - COURSE NAMES                                                    *
*  - NUMBER OF GENERATING FUNCTIONS                                  *
*  - GENERATING FUNCTION NAMES                                       *
*  - NUMBER OF PROCESSING BLOCKS                                     *
*  - PROCESSING BLOCK NAMES                                          *
*  - NUMBER OF PROCESSING BLOCKS                                     *
*  - PROCESSING BLOCK NUMBERS                                        *
*  - NUMBER OF RESOURCES                                             *
*  - RESOURCE NAMES                                                  *
*  - NUMBER OF RESOURCE UTILIZATION BLOCKS                           *
*  - RESOURCE UTILIZATION BLOCK NAMES                                *
*  - NUMBER OF RESOURCE UTILIZATION DESCRIPTION BLOCKS               *
*  - RESOURCE UTILIZATION DESCRIPTION BLOCK NAMES                    *
*  - NUMBER OF RESOURCE UTILIZATION GROUPING FUNCTIONS               *
*  - RESOURCE UTILIZATION GROUPING FUNCTION NAMES                    *
*  - NUMBER OF RESOURCE UTILIZATION TIMING FUNCTIONS                 *
*  - RESOURCE UTILIZATION TIMING FUNCTION NAMES                      *
*  - NUMBER OF SOURCES                                               *
*  - SOURCE NAMES                                                    *
*  - NUMBER OF TASK BLOCKS                                           *
*  - TASK BLOCK NAMES                                                *
*  - NUMBER OF TASK FUNCTIONS                                        *
*  - TASK FUNCTION NAMES                                             *
*                                                                    *
*                  CONTINUED ON NEXT PAGE                            *
*                                                                    *
**********************************************************************
```

```
*****************************************************************************
*                                                                           *
*     UNIT TEN FILE DESCRIPTION - CONTINUED                                 *
*                                                                           *
*****************************************************************************
*   - NUMBER OF COURSE RECORDS                                              *
*   - COURSE RECORDS                                                        *
*   - NUMBER OF PROCESSING BLOCK RECORDS                                    *
*   - PROCESSING BLOCK RECORDS                                              *
*   - NUMBER OF TASK BLOCK RECORDS                                          *
*   - TASK BLOCK RECORDS                                                    *
*   - NUMBER OF RESOURCE UTILIZATION BLOCK RECORDS                          *
*   - RESOURCE UTILIZATION BLOCK RECORDS                                    *
*   - NUMBER OF RESOURCE UTILIZATION DESCRIPTION BLOCK RECORDS              *
*   - RESOURCE UTILIZATION DESCRIPTION BLOCK RECORDS                        *
*   - NUMBER OF AIR BASE INVENTORY RECORDS                                  *
*   - AIR BASE INVENTORY RECORDS (SORTED BY AIR BASE NUMBER)                *
*   - NUMBER OF TIME HISTORY RECORDS                                        *
*   - TIME HISTORY RECORDS (SORTED BY AIR BASE NUMBER)                      *
*   - NUMBER OF AIR BASE EVENT RECORDS                                      *
*   - AIR BASE EVENT RECORDS (SORTED BY AIR BASE NUMBER AND TIME)           *
*   - NUMBER OF CCTS RECORDS                                                *
*   - CCTS RECORDS (SORTED BY AIR BASE NUMBER AND TIME)                     *
*   - NUMBER OF PMT GROUP RECORDS                                           *
*   - PMT GROUP RECORDS (SORTED BY AIR BASE NUMBER AND TIME)                *
*   - NUMBER OF PMT COURSE RECORDS                                          *
*   - PMT COURSE RECORDS (SORTED BY AIR BASE NUMBER, TIME, AND              *
*     PMT GROUP NUMBER)                                                     *
*   - NUMBER OF AIR CRAFT DELIVERY RECORDS                                  *
*   - AIR CRAFT DELIVERY RECORDS (SORTED BY AIR BASE NUMBER AND TIME)       *
*   - NUMBER OF SOURCE RECORDS                                              *
*   - SOURCE RECORDS (SORTED BY SOURCE NUMBER)                              *
*   - NUMBER OF RESOURCE RECORDS                                            *
*   - RESOURCE RECORDS (SORTED BY RESOURCE NUMBER)                          *
*                                                                           *
*****************************************************************************
```

COURSE RECORDS

WORD	DESCRIPTION
1	COURSE TYPE
2	PERSONNEL TYPE
3	PRIORITY
4	MAXIMUM CLASS SIZE
5	CLASS PERIOD
6	EARLIEST GRADUATION DATE

PROCESSING BLOCK RECORDS

WORD	DESCRIPTION
1	DURATION
2	PRIORITY
3	COURSE NUMBER TO WHICH THIS BLOCK BELONGS
4	SYNCHRONIZE-CORRELATE BLOCK NUMBER
5	NUMBER OF TRANSFERS (UP TO 5)
6	PROCESSING BLOCK NUMBER
7	PRIORITY
8	RATIO
.	.
.	.
.	.
21	NUMBER OF TASKS (UP TO 5)
22	TASK BLOCK NUMBER
.	.
.	.
.	.
26	TASK BLOCK NUMBER

TASK BLOCK RECORDS

WORD	DESCRIPTION
1	TASK FUNCTION NUMBER
2	TASK TYPE
3	RESOURCE UTILIZATION BLOCK NUMBER
4	NUMBER OF PARAMETERS (UP TO 5)
5	PARAMETER 1
.	.
.	.
.	.
9	PARAMETER 5

RESOURCE UTILIZATION BLOCK RECORDS

WORD	DESCRIPTION
1	NUMBER OF RESOURCE UTILIZATION DESCRIPTION BLOCKS (UP TO 6)
2	RESOURCE UTILIZATION DESCRIPTION BLOCK NUMBER
.	.
.	.
.	.
7	RESOURCE UTILIZATION DESCRIPTION BLOCK NUMBER

RESOURCE UTILIZATION DESCRIPTION BLOCK RECORDS

WORD	DESCRIPTION
1	RESOURCE NUMBER
2	RESOURCE UTILIZATION GROUPING FUNCTION NUMBER
3	RESOURCE UTILIZATION TIMING FUNCTION NUMBER
4	SECONDARY RESOURCE UTILIZATION BLOCK NUMBER
5	ALTERNATE RESOURCE UTILIZATION DESCRIPTION BLOCK NUMBER
6	UNITS OF CONSUMPTION PER UNIT USER

AIR BASE INVENTORY RECORDS

WORD	DESCRIPTION
1	INITIAL INVENTORY OF AIR CRAFT
2	INITIAL INVENTORY OF PILOTS
3	INITIAL INVENTORY OF COPILOTS
4	INITIAL INVENTORY OF CSO
5	INITIAL INVENTORY OF DSO

TIME HISTORY RECORDS

WORD	DESCRIPTION
1	AIR BASE NUMBER
2	PERSONNEL TYPE
3	NUMBER OF POINTS (UP TO 20)
4	POINT 1
.	.
.	.
.	.
23	POINT 20

AIR BASE EVENT RECORDS

WORD	DESCRIPTION
1	AIR BASE NUMBER
2	TIME
3	CREW RATIO
4	ALERT RATIO
5	HOURS PER CREW PER WEEK

C C T S R E C O R D S

WORD	DESCRIPTION
1	AIR BASE NUMBER
2	TIME
3	COURSE NUMBER
4	PERSONNEL TYPE
5	RATIO

PMT GROUP RECORD

WORD	DESCRIPTION
1	AIR BASE NUMBER
2	TIME
3	PMT NUMBER
4	PERIOD

P M T C O U R S E R E C O R D S

WORD	DESCRIPTION
1	AIR BASE NUMBER
2	TIME
3	PMT NUMBER
4	COURSE NUMBER
5	PERSONNEL TYPE
6	RATIO
7	TIME LOST

AIR CRAFT DELIVERY RECORDS

WORD	DESCRIPTION
1	AIR BASE NUMBER
2	TIME
3	QUANTITY

SOURCE RECORDS

WORD	DESCRIPTION
1	SOURCE NUMBER
2	START TIME
3	END TIME
4	GENERATING FUNCTION NUMBER
5	NUMBER OF PARAMETERS (UP TO 5)
6	PARAMETER 1
.	.
.	.
.	.
10	PARAMETER 5

RESOURCE RECORDS

WORD	DESCRIPTION
1	RESOURCE NUMBER
2	START TIME
3	END TIME
4	GENERATING FUNCTION NUMBER
5	NUMBER OF PARAMETERS (UP TO 5)
6	PARAMETER 1
.	.
.	.
.	.
10	PARAMETER 5

Section 1.12

PHASE 1 ERROR MESSAGES

ABOVE CARD IS OUT OF SEQUENCE

A card which requires a header card to precede it, was encountered before the header card. (From INPUT)

ERROR AT CARD NUMBER XX, BLOCK NUMBER SYNCHRONIZED TO IS INVALID - YY

A processing block card specifies a synchronize or correlate reference to another block number which does not exist in the specified course. The card sequence number of the error is given by XX, and the invalid block number is given by YY. (From PROCB2)

ERROR AT CARD NUMBER XX, INVALID TRANSFER BLOCK NUMBER - YY

The processing block specified by card number XX specifies a transfer from a processing block which was never defined within that course. The invalid block number is given by YY. (From PROCB2)

ERROR IN SUBROUTINE IPLOT - INSUFFICIENT STORAGE AVAILABLE TO DO BLOCK DIAGRAM PLOT

The quantity of inputs was great enough so that there is not enough storage left for the plot routines work areas. The program will continue, but no plot will be produced. (From IPLOT)

ERROR IN SUBROUTINE PLOTB - BLOCK NUMBER XX WAS ENCOUNTERED BEFORE ANY BLOCK SPECIFYING A TRANSFER FROM IT

The processing blocks are out of sequence. The position of each processing block is specified as an offset from the block to the right of it (toward graduation). Therefore, each time a processing block is specified, another block must have already specified a transfer from it. (From PLOTB).

ERROR IN SUBROUTINE PLOTB - INSUFFICIENT WORKING STORAGE AVAILABLE - FLOW ARROWS WILL BE OMITTED

The course is structured so that many processing blocks specify transfers from block numbers which are not defined. This message is printed when the plot routine runs out of room to store the references until they are defined. Usually the processing blocks can be specified in a different order to reduce the number of such references, but if no , the program will have to be recompiled to make storage available. (From PLOTB)

ERROR ON CARD NUMBER XX, BLOCK NUMBER YY HAS BEEN PREVIOUSLY DEFINED

Two processing blocks with the same number have been defined within the same course. (From PROCB1)

ERROR ON CARD NUMBER XX, DATA BLOCK NAME PREVIOUSLY DEFINED - YY

Card number XX attempts to define a data block with the name YY, but the same name has already been used for another block. (From NAME1)

ERROR ON CARD NUMBER XX, INVALID REFERENCE - YY

The card has referenced another data block which was never defined. The undefined block name or processing block number is given by YY. (From REPLC1, REPLC2)

INSUFFICIENT STORAGE AVAILABLE FOR INPUTS

The amount of input data is greater than the amount the program can store. The program will have to be re-compiled with more storage made available to it. (From INPUT)

INSUFFICIENT STORAGE AVAILABLE TO CONSTRUCT BLOCK NAME TABLE

The quantity of input data is large enough so that there is not enough storage available to do the cross referencing of data block names. The program will have to be re-compiled to make more storage available. (From NAME1, MAIN)

INVALID CARD NAME ON ABOVE CARD

This message appears in the input card listing. The card printed immediately above the message has a card name which is not recognized by the program (card name field is columns 1-10.) (From INPUT)

INVALID VALUE IN FIELD NUMBER XX

The card printed immediately above this error message contains a numeric value which is outside the range allowed for that value. The field number XX, refers to the field number marking at the top of the input card listing. (From TEST)

RESOURCE NAME MUST NOT BE BLANK

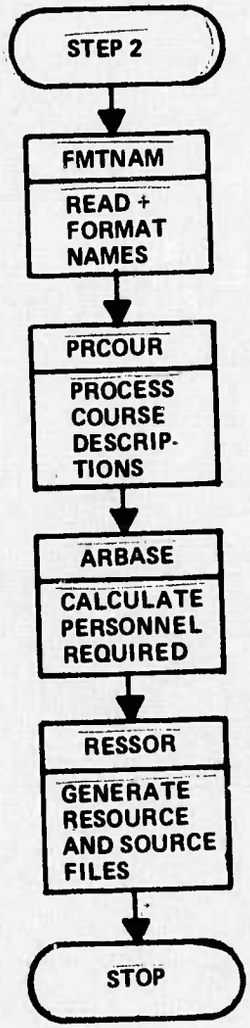
The RUDB card which is printed above this error message does not have a resource name specified. (From INPUT)

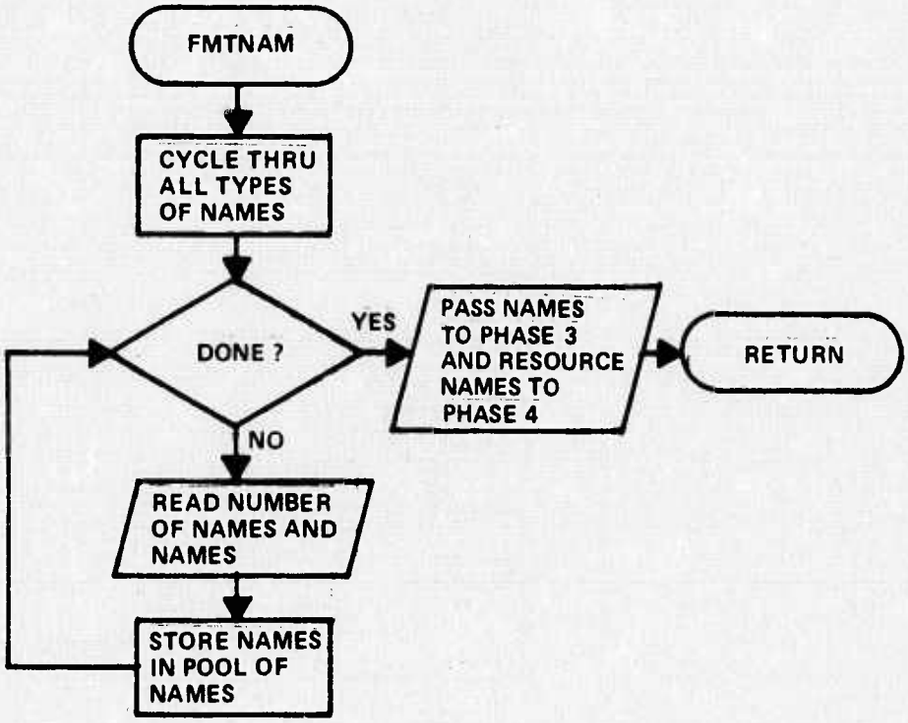
Section 2.0
TRAM PHASE 2

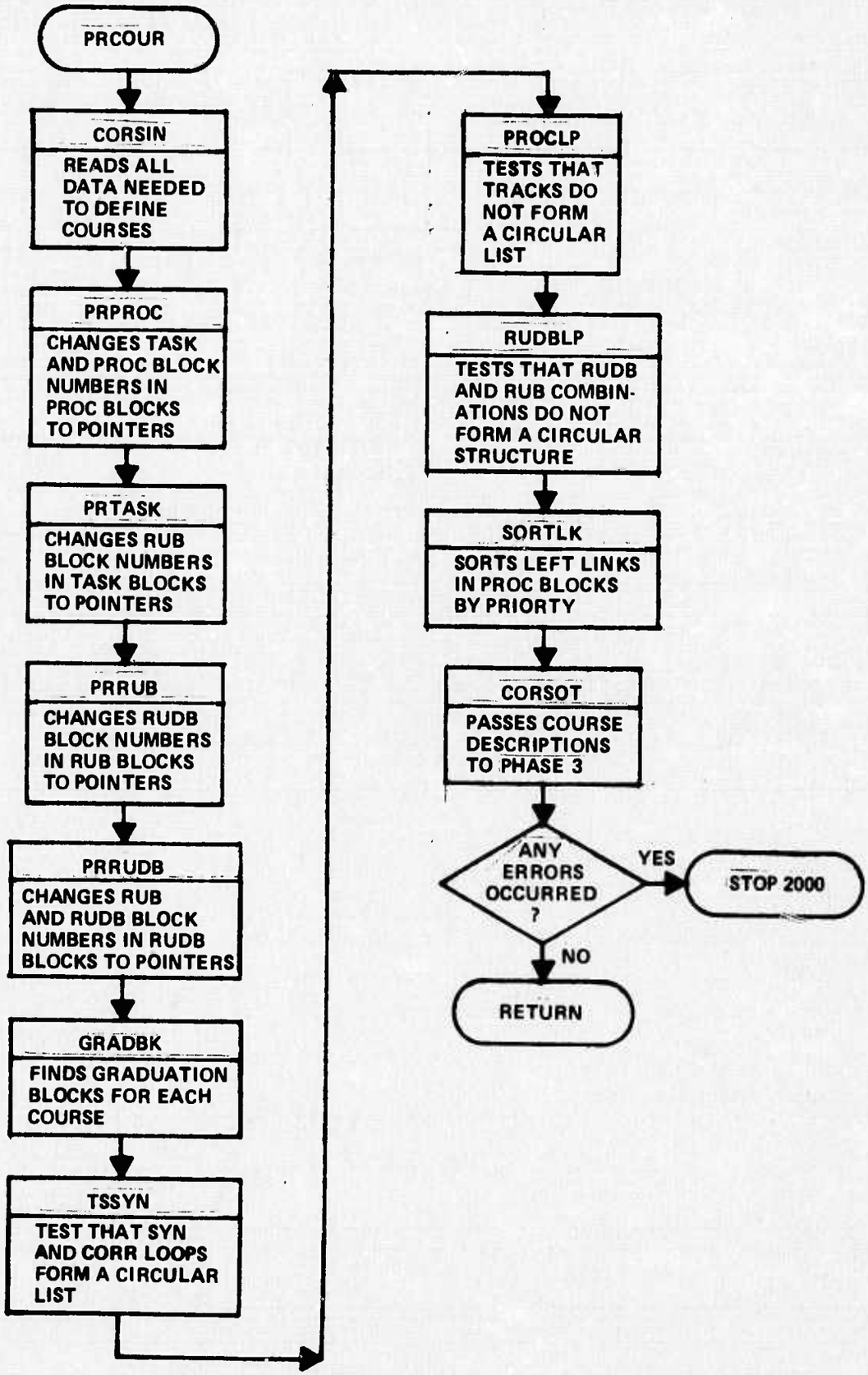
This section provides flowcharts, record formats, common block description, subroutine description and a symbol cross reference for Phase 2. This information is intended to supplement the description included in Technical Memorandum SAT-5, TRAM User's Manual with which the reader is assumed to be familiar.

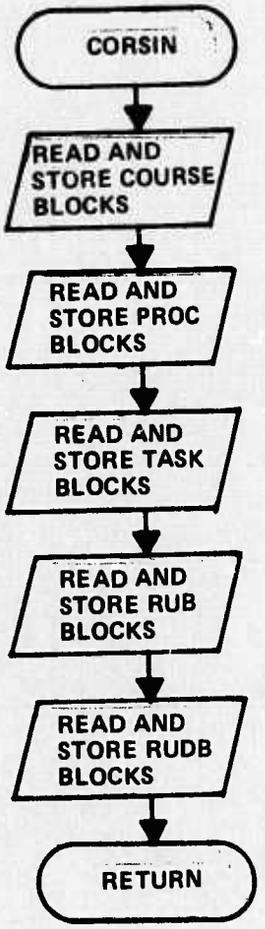
Section 2.1

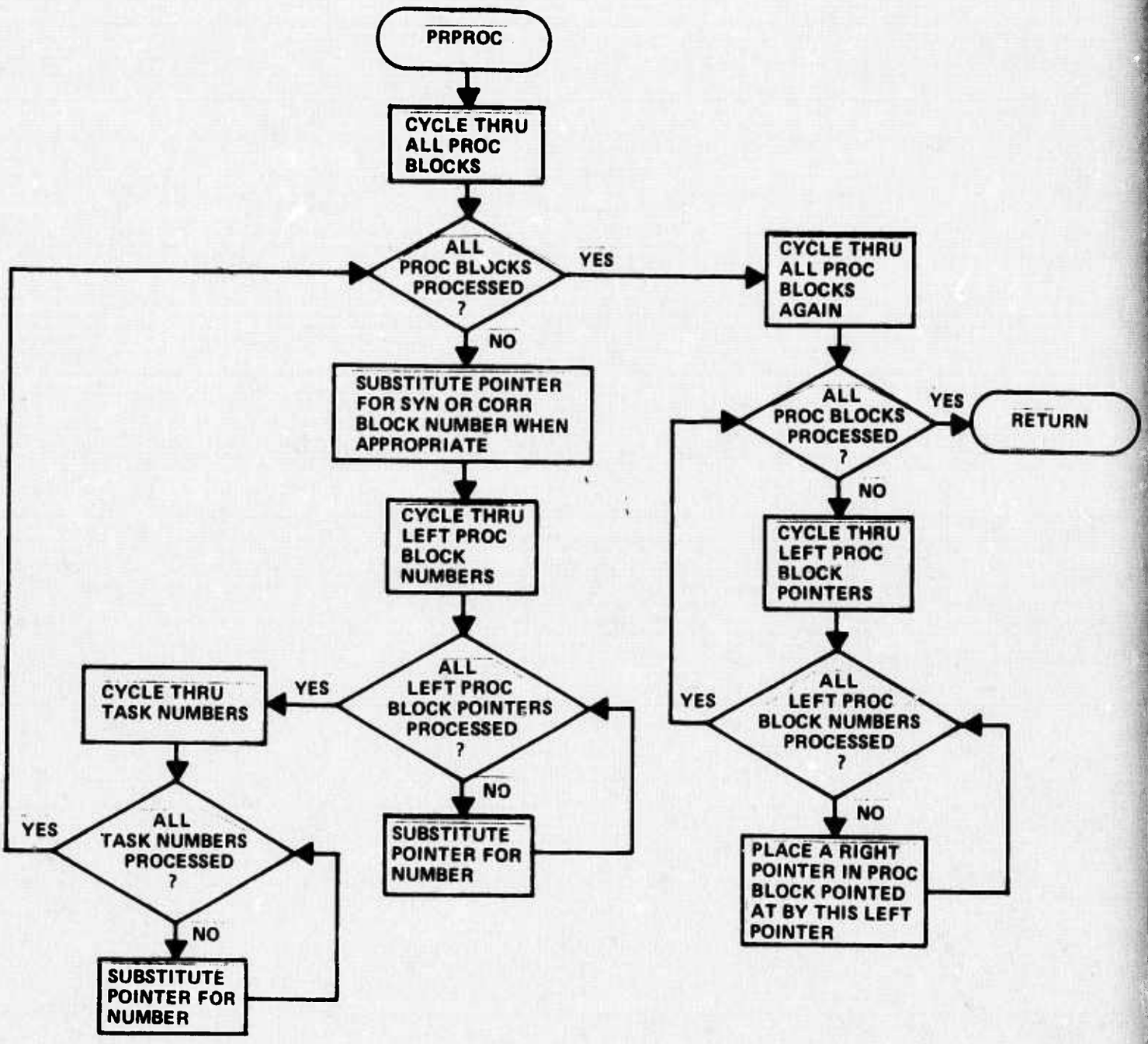
FLOWCHARTS

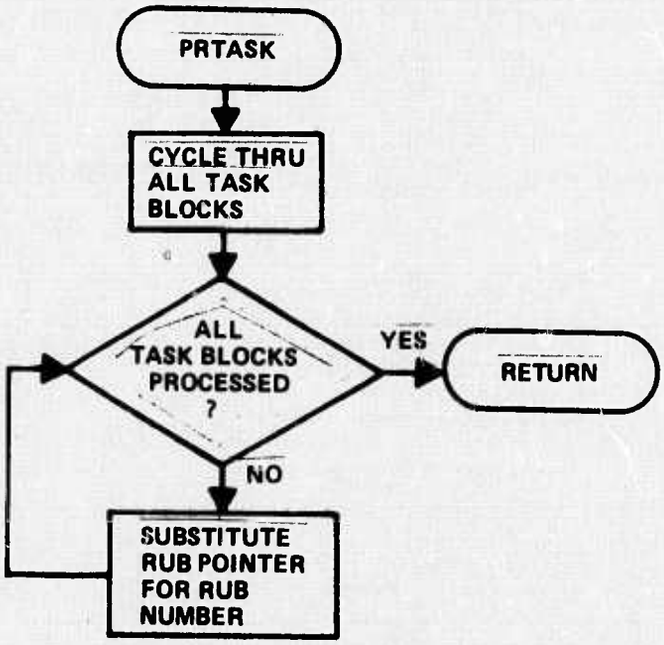

STEP 2
FMTNAM
READ + FORMAT NAMES
PRCOUR
PROCESS COURSE DESCRIP-TIONS
ARBASE
CALCULATE PERSONNEL REQUIRED
RESSOR
GENERATE RESOURCE AND SOURCE FILES
STOP

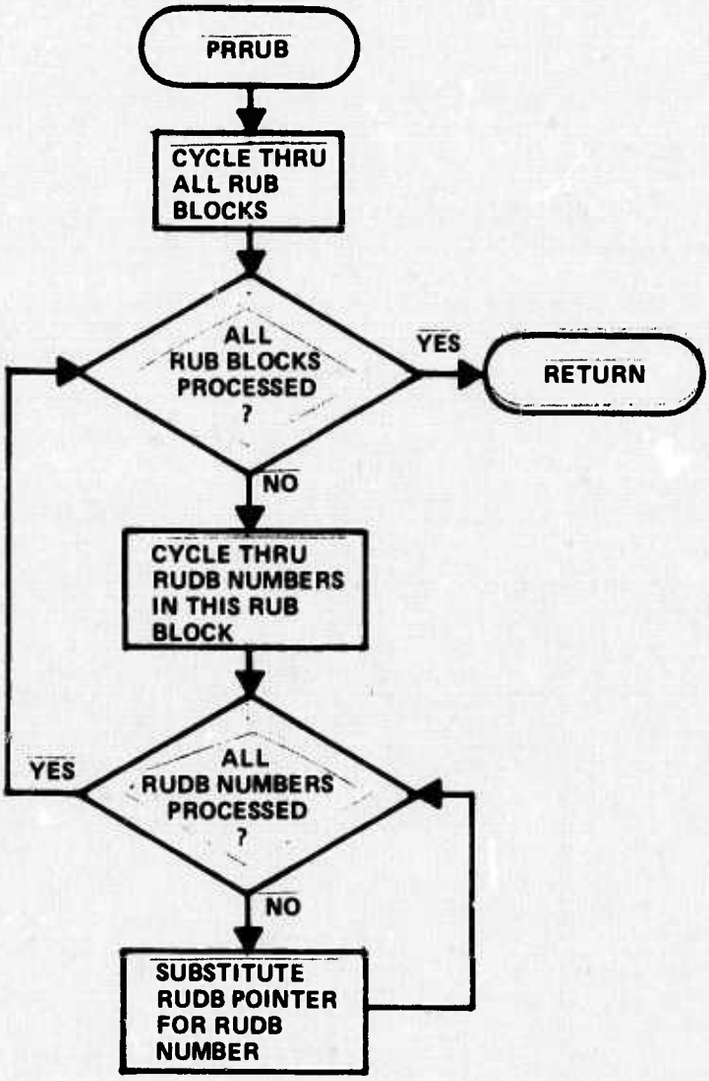

FMTNAM
CYCLE THRU ALL TYPES OF NAMES
DONE ?
YES
PASS NAMES TO PHASE 3 AND RESOURCE NAMES TO PHASE 4
RETURN
NO
READ NUMBER OF NAMES AND NAMES
STORE NAMES IN POOL OF NAMES

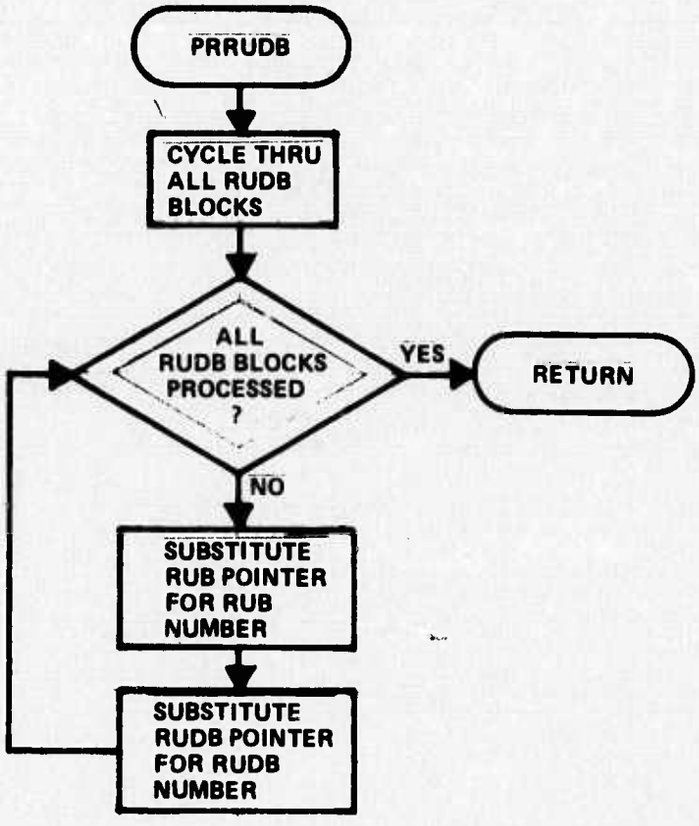

PRCOUR
CORSIN
READS ALL DATA NEEDED TO DEFINE COURSES
PRPROC
CHANGES TASK AND PROC BLOCK NUMBERS IN PROC BLOCKS TO POINTERS
PRTASK
CHANGES RUB BLOCK NUMBERS IN TASK BLOCKS TO POINTERS
PRRUB
CHANGES RUDB BLOCK NUMBERS IN RUB BLOCKS TO POINTERS
PRRUDB
CHANGES RUB AND RUDB BLOCK NUMBERS IN RUDB BLOCKS TO POINTERS
GRADBK
FINDS GRADUATION BLOCKS FOR EACH COURSE
TSSYN
TEST THAT SYN AND CORR LOOPS FORM A CIRCULAR LIST
PROCLP
TESTS THAT TRACKS DO NOT FORM A CIRCULAR LIST
RUDBLP
TESTS THAT RUDB AND RUB COMBIN-ATIONS DO NOT FORM A CIRCULAR STRUCTURE
SORTLK
SORTS LEFT LINKS IN PROC BLOCKS BY PRIORTY
CORSOT
PASSES COURSE DESCRIPTIONS TO PHASE 3
ANY ERRORS OCCURRED ?
YES
STOP 2000
NO
RETURN

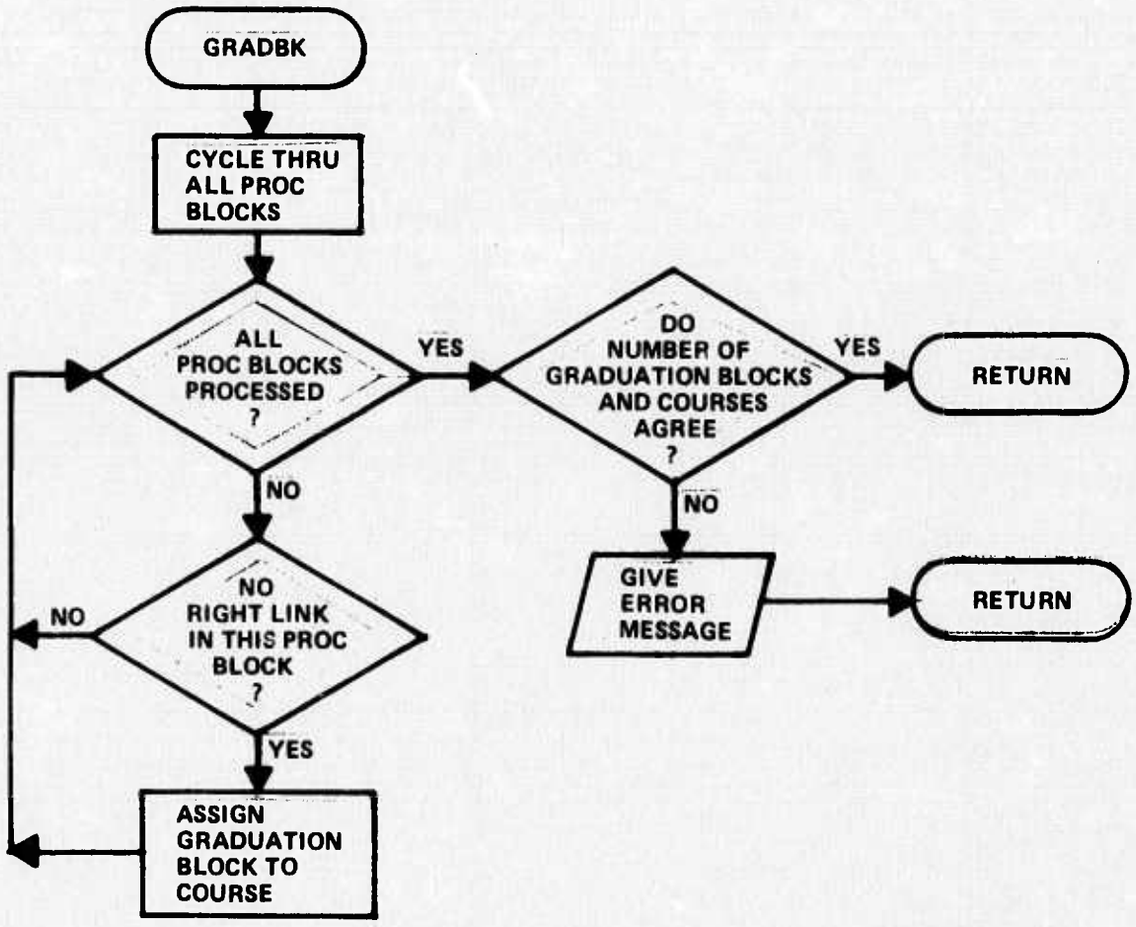

CORSIN
READ AND STORE COURSE BLOCKS
READ AND STORE PROC BLOCKS
READ AND STORE TASK BLOCKS
READ AND STORE RUB BLOCKS
READ AND STORE RUDB BLOCKS
RETURN

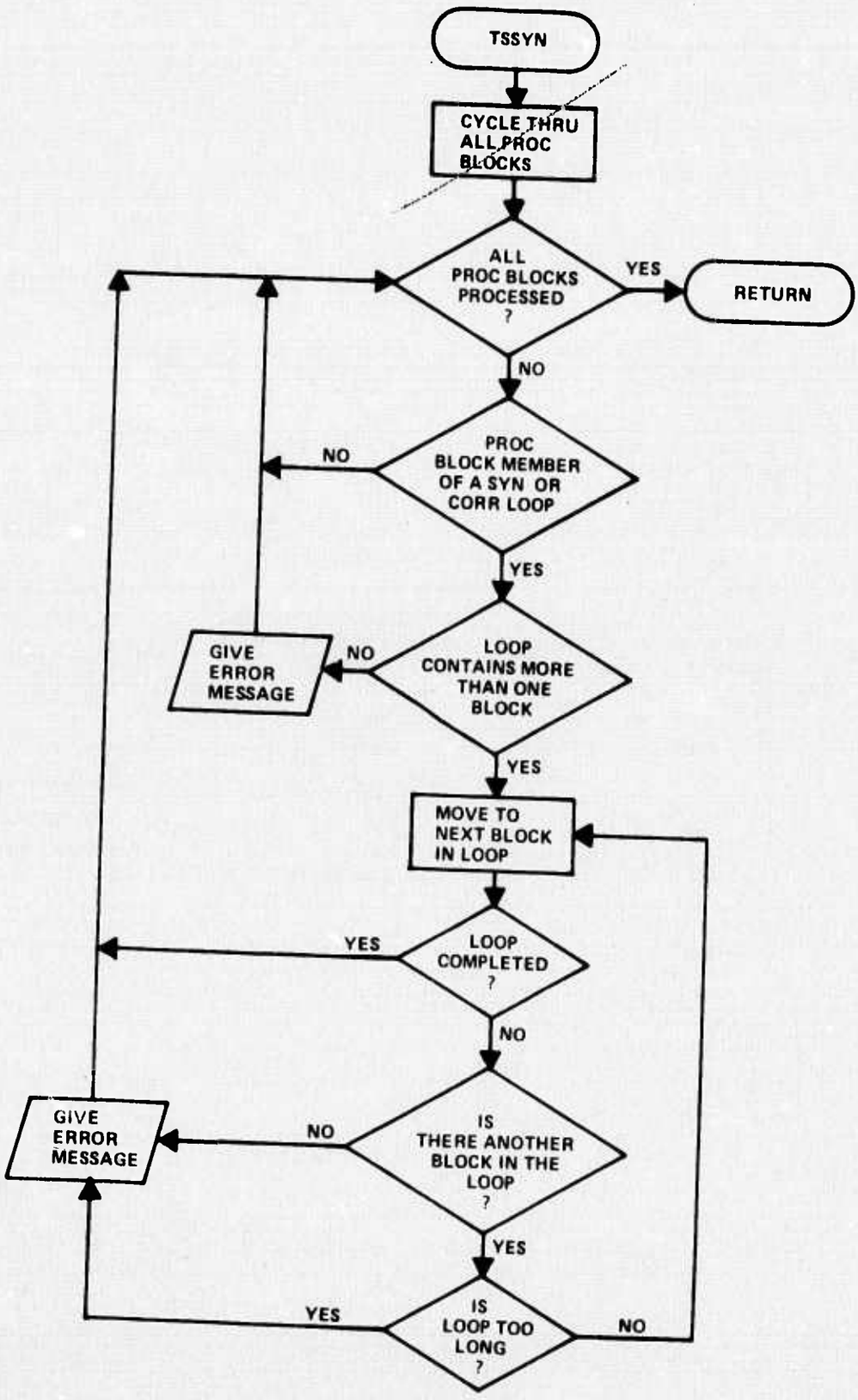

PRPROC
CYCLE THRU ALL PROC BLOCKS
ALL PROC BLOCKS PROCESSED ?
YES
NO
SUBSTITUTE POINTER FOR SYN OR CORR BLOCK NUMBER WHEN APPROPRIATE
CYCLE THRU LEFT PROC BLOCK NUMBERS
ALL LEFT PROC BLOCK POINTERS PROCESSED ?
YES
CYCLE THRU TASK NUMBERS
ALL TASK NUMBERS PROCESSED ?
YES
NO
SUBSTITUTE POINTER FOR NUMBER
NO
SUBSTITUTE POINTER FOR NUMBER
CYCLE THRU ALL PROC BLOCKS AGAIN
ALL PROC BLOCKS PROCESSED ?
YES
RETURN
NO
CYCLE THRU LEFT PROC BLOCK POINTERS
ALL LEFT PROC BLOCK NUMBERS PROCESSED ?
YES
NO
PLACE A RIGHT POINTER IN PROC BLOCK POINTED AT BY THIS LEFT POINTER

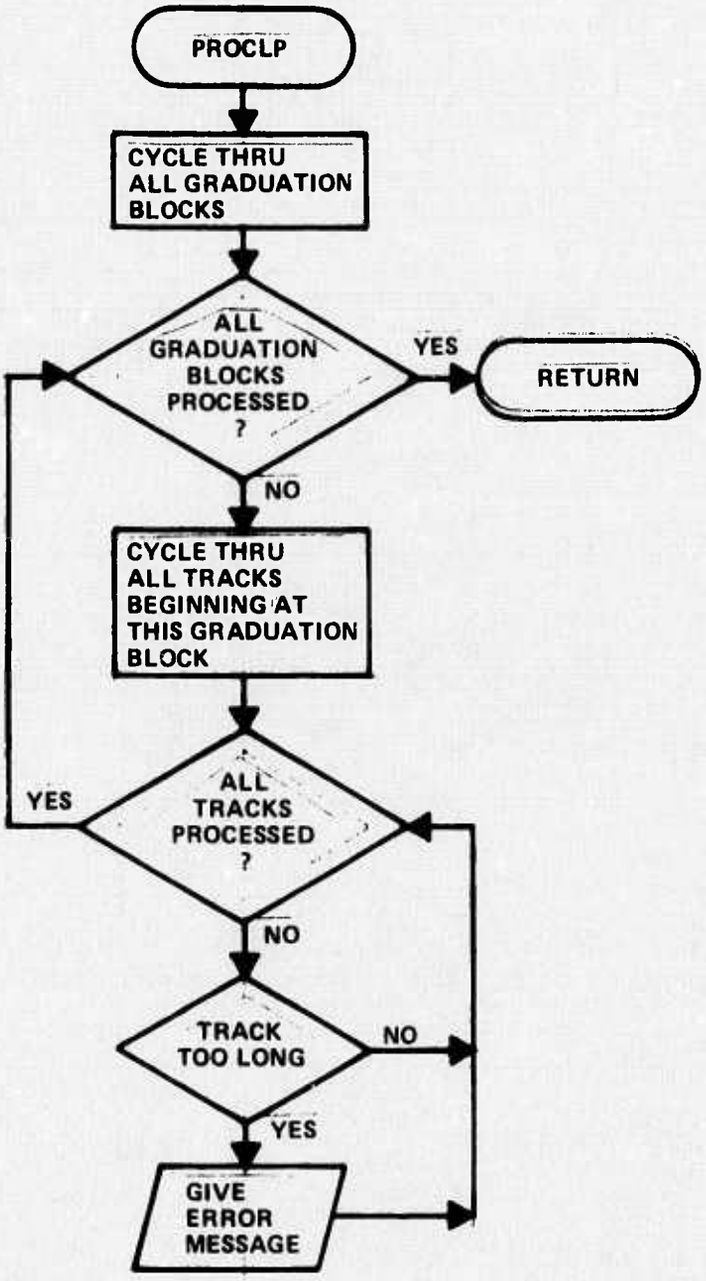

PRTASK
CYCLE THRU ALL TASK BLOCKS
ALL TASK BLOCKS PROCESSED ?
YES
RETURN
NO
SUBSTITUTE RUB POINTER FOR RUB NUMBER

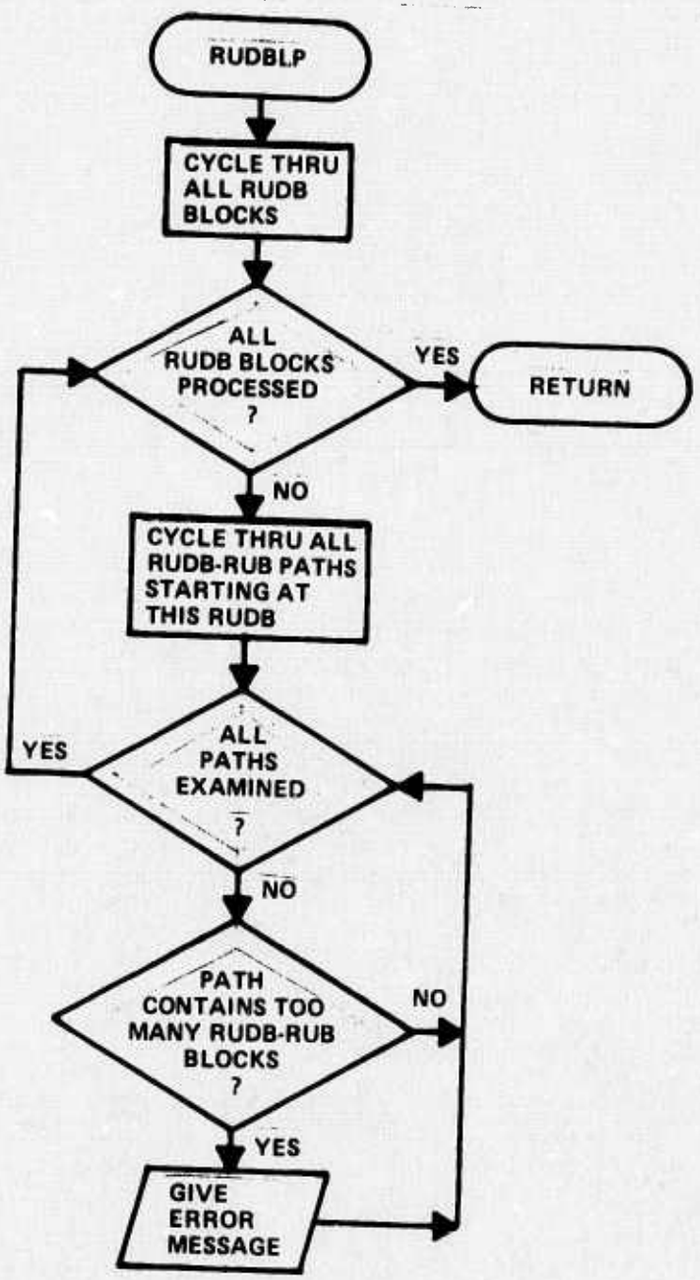

PRRUB
CYCLE THRU ALL RUB BLOCKS
ALL RUB BLOCKS PROCESSED ?
YES
RETURN
NO
CYCLE THRU RUDB NUMBERS IN THIS RUB BLOCK
ALL RUDB NUMBERS PROCESSED ?
YES
NO
SUBSTITUTE RUDB POINTER FOR RUDB NUMBER

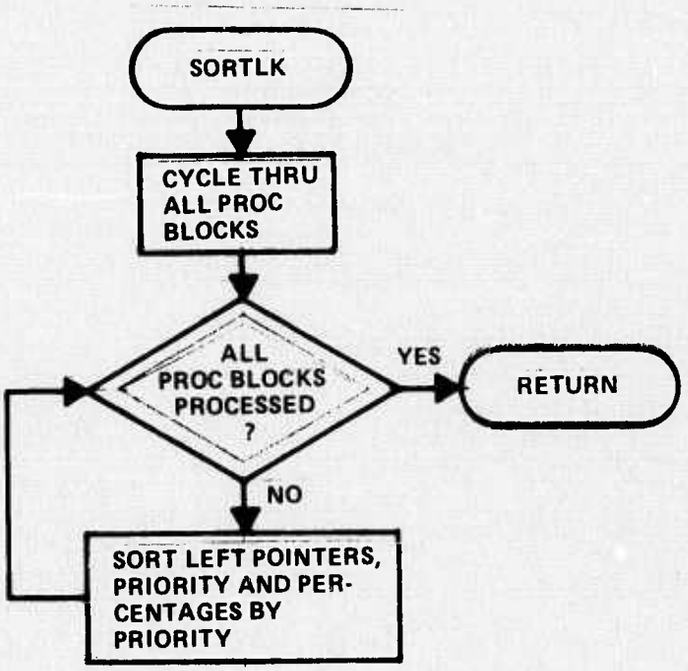

PRRUDB
CYCLE THRU ALL RUDB BLOCKS
ALL RUDB BLOCKS PROCESSED ?
YES
RETURN
NO
SUBSTITUTE RUB POINTER FOR RUB NUMBER
SUBSTITUTE RUDB POINTER FOR RUDB NUMBER

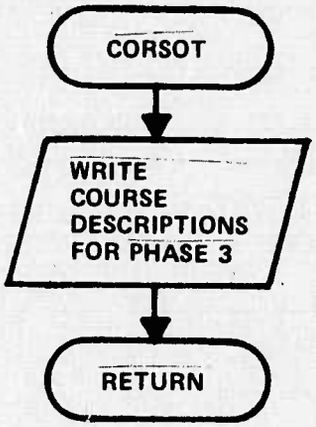

GRADBK
CYCLE THRU ALL PROC BLOCKS
ALL PROC BLOCKS PROCESSED ?
YES
DO NUMBER OF GRADUATION BLOCKS AND COURSES AGREE ?
YES
RETURN
NO
NO
GIVE ERROR MESSAGE
RETURN
NO RIGHT LINK IN THIS PROC BLOCK ?
NO
YES
ASSIGN GRADUATION BLOCK TO COURSE

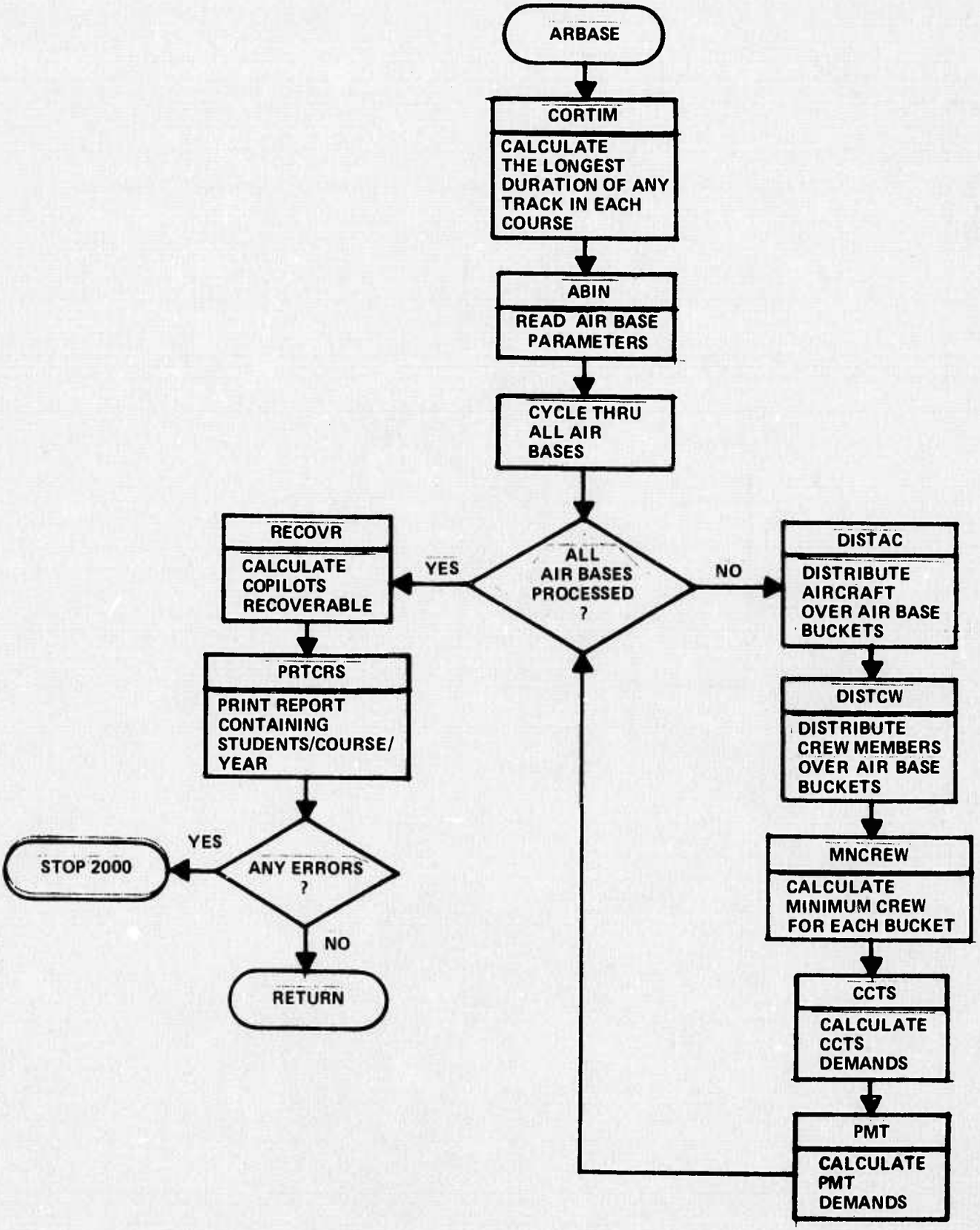

TSSYN
CYCLE THRU ALL PROC BLOCKS
ALL PROC BLOCKS PROCESSED ?
YES
RETURN
NO
PROC BLOCK MEMBER OF A SYN OR CORR LOOP
NO
YES
GIVE ERROR MESSAGE
NO
LOOP CONTAINS MORE THAN ONE BLOCK
YES
MOVE TO NEXT BLOCK IN LOOP
YES
LOOP COMPLETED ?
NO
GIVE ERROR MESSAGE
NO
IS THERE ANOTHER BLOCK IN THE LOOP ?
YES
YES
IS LOOP TOO LONG ?
NO

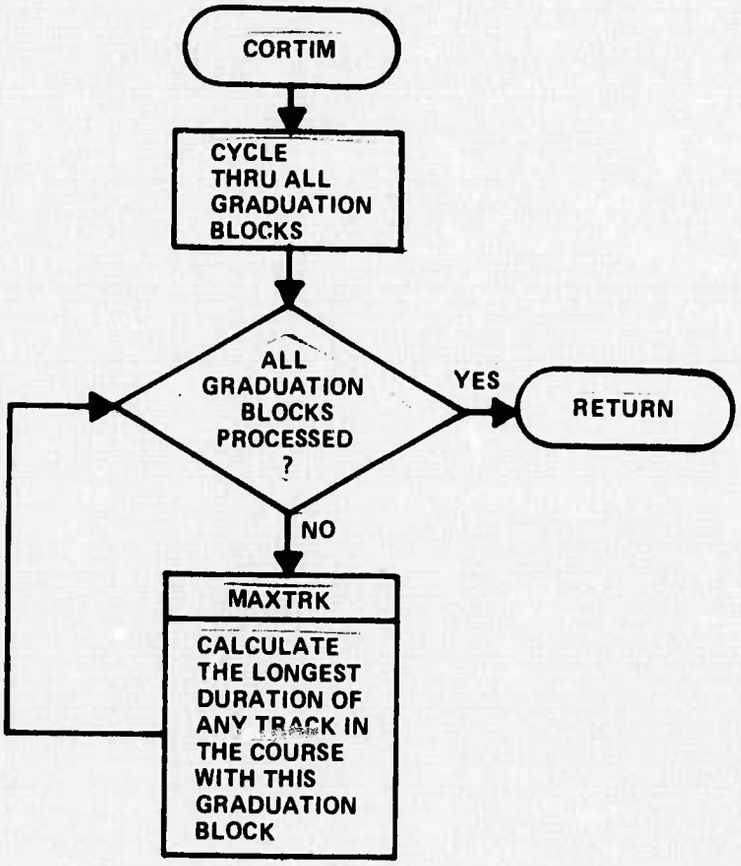

PROCLP
CYCLE THRU ALL GRADUATION BLOCKS
ALL GRADUATION BLOCKS PROCESSED ?
YES
RETURN
NO
CYCLE THRU ALL TRACKS BEGINNING AT THIS GRADUATION BLOCK
ALL TRACKS PROCESSED ?
YES
NO
TRACK TOO LONG
NO
YES
GIVE ERROR MESSAGE

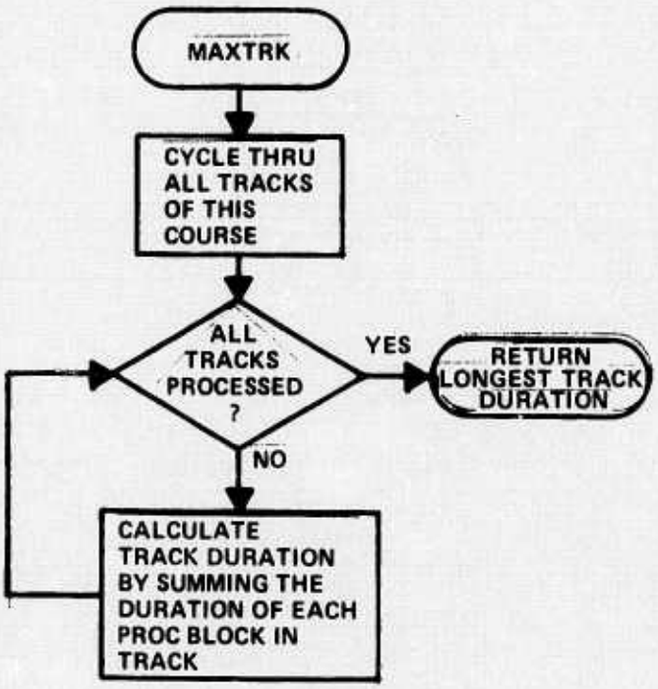

RUDBLP
CYCLE THRU ALL RUDB BLOCKS
ALL RUDB BLOCKS PROCESSED ?
YES
RETURN
NO
CYCLE THRU ALL RUDB-RUB PATHS STARTING AT THIS RUDB
ALL PATHS EXAMINED ?
YES
NO
PATH CONTAINS TOO MANY RUDB-RUB BLOCKS ?
NO
YES
GIVE ERROR MESSAGE

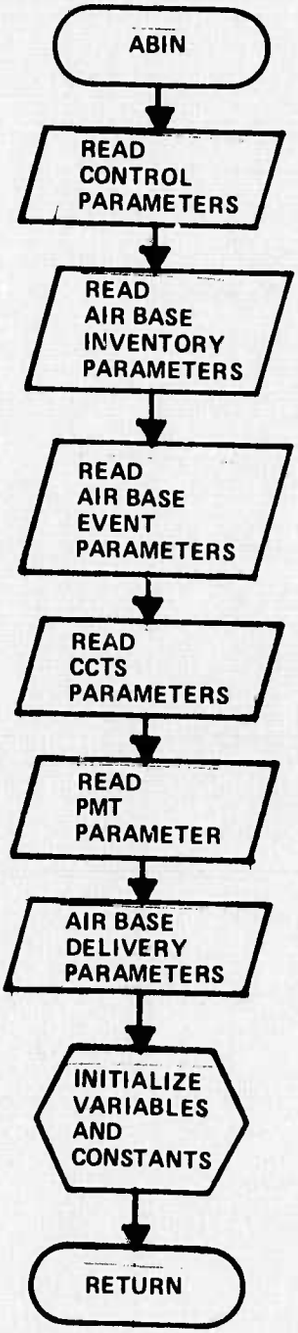

SORTLK
CYCLE THRU ALL PROC BLOCKS
ALL PROC BLOCKS PROCESSED ?
YES
RETURN
NO
SORT LEFT POINTERS, PRIORITY AND PER-CENTAGES BY PRIORITY

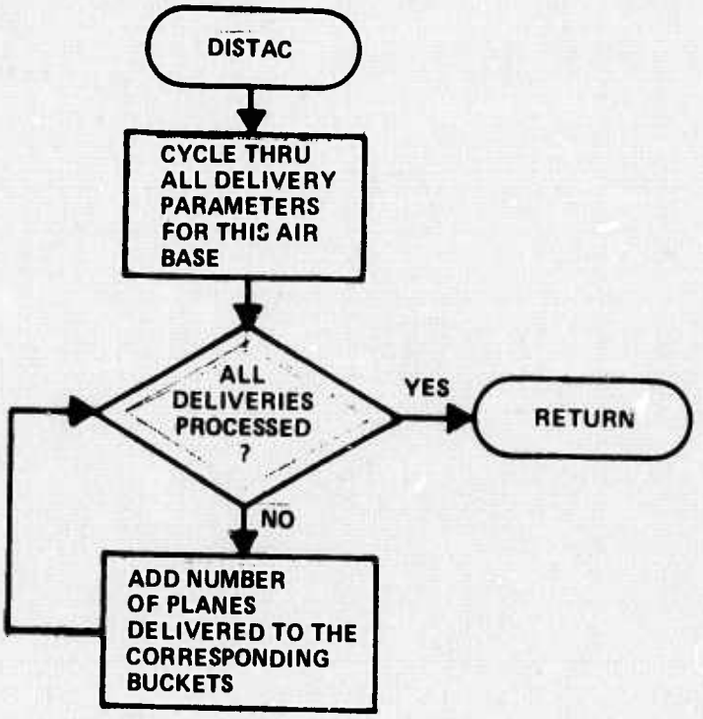

CORSOT
WRITE
COURSE
DESCRIPTIONS
FOR PHASE 3
RETURN

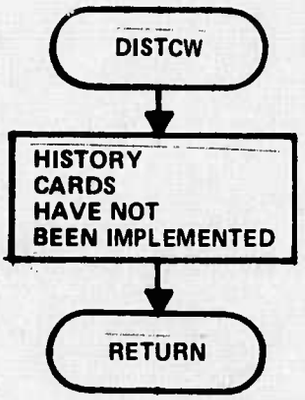

ARBASE
CORTIM
CALCULATE THE LONGEST DURATION OF ANY TRACK IN EACH COURSE
ABIN
READ AIR BASE PARAMETERS
CYCLE THRU ALL AIR BASES
ALL AIR BASES PROCESSED ?
YES
NO
RECOVR
CALCULATE COPILOTS RECOVERABLE
PRTCRS
PRINT REPORT CONTAINING STUDENTS/COURSE/ YEAR
ANY ERRORS ?
YES
STOP 2000
NO
RETURN
DISTAC
DISTRIBUTE AIRCRAFT OVER AIR BASE BUCKETS
DISTCW
DISTRIBUTE CREW MEMBERS OVER AIR BASE BUCKETS
MNCREW
CALCULATE MINIMUM CREW FOR EACH BUCKET
CCTS
CALCULATE CCTS DEMANDS
PMT
CALCULATE PMT DEMANDS

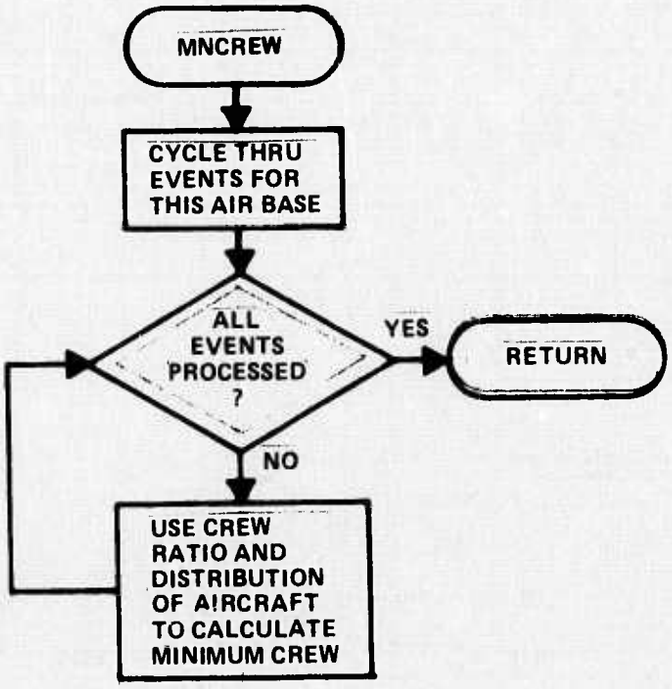

CORTIM
CYCLE THRU ALL GRADUATION BLOCKS
ALL GRADUATION BLOCKS PROCESSED ?
YES
RETURN
NO
MAXTRK
CALCULATE THE LONGEST DURATION OF ANY TRACK IN THE COURSE WITH THIS GRADUATION BLOCK

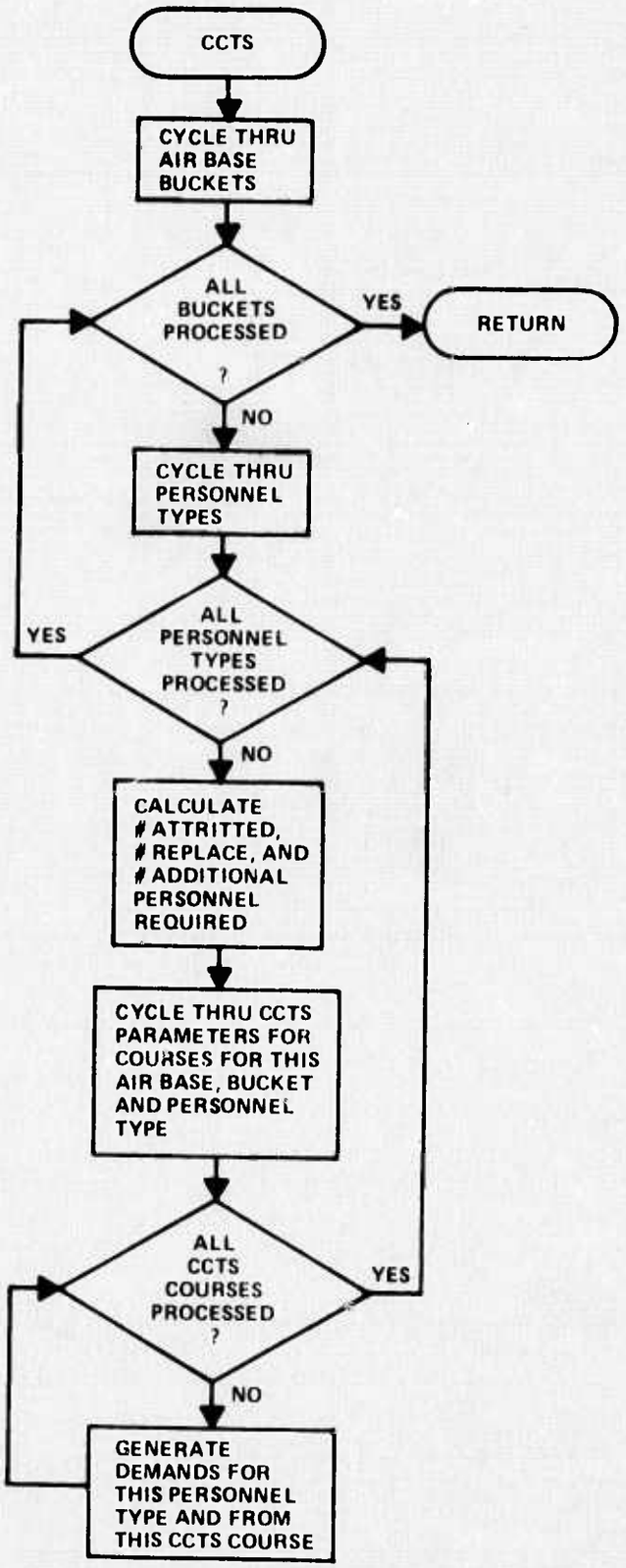

MAXTRK
CYCLE THRU ALL TRACKS OF THIS COURSE
ALL TRACKS PROCESSED ?
YES
RETURN LONGEST TRACK DURATION
NO
CALCULATE TRACK DURATION BY SUMMING THE DURATION OF EACH PROC BLOCK IN TRACK

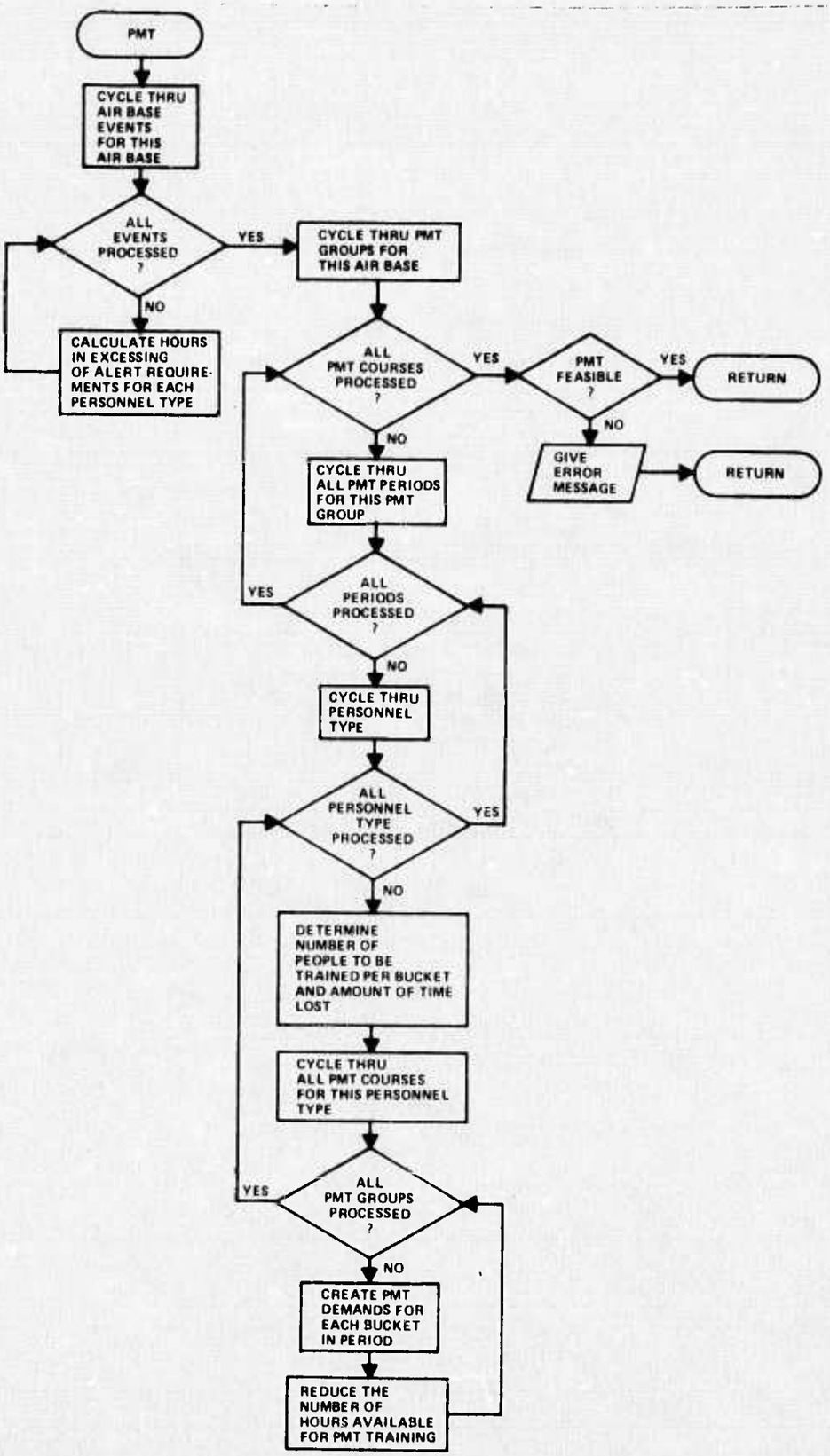

ABIN
READ CONTROL PARAMETERS
READ AIR BASE INVENTORY PARAMETERS
READ AIR BASE EVENT PARAMETERS
READ CCTS PARAMETERS
READ PMT PARAMETER
AIR BASE DELIVERY PARAMETERS
INITIALIZE VARIABLES AND CONSTANTS
RETURN

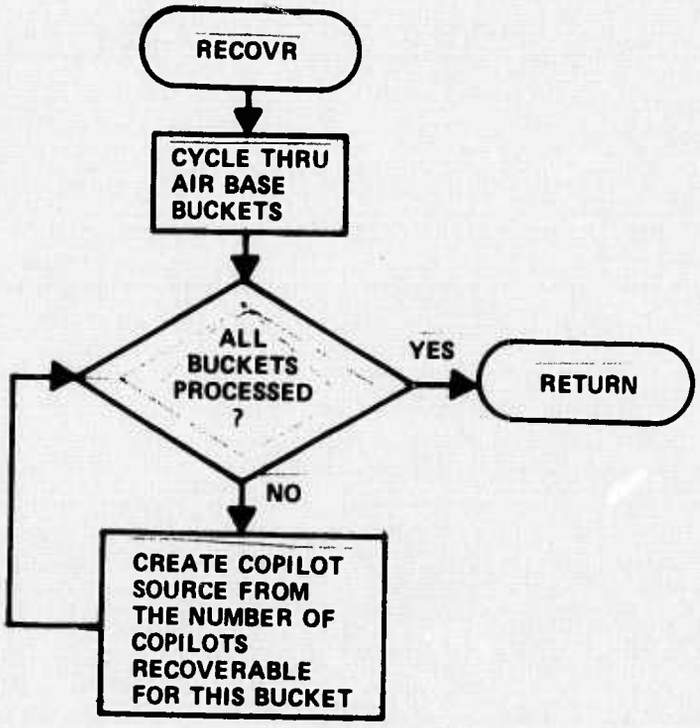

DISTAC
CYCLE THRU ALL DELIVERY PARAMETERS FOR THIS AIR BASE
ALL DELIVERIES PROCESSED ?
YES
RETURN
NO
ADD NUMBER OF PLANES DELIVERED TO THE CORRESPONDING BUCKETS

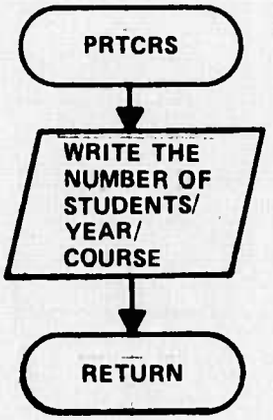

DISTCW
HISTORY
CARDS
HAVE NOT
BEEN IMPLEMENTED
RETURN

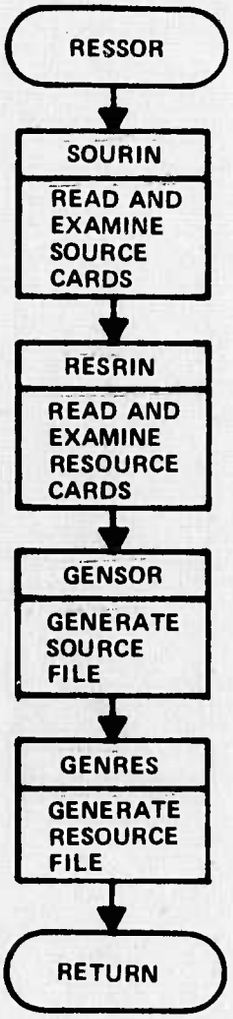

MNCREW
CYCLE THRU EVENTS FOR THIS AIR BASE
ALL EVENTS PROCESSED ?
YES
RETURN
NO
USE CREW RATIO AND DISTRIBUTION OF AIRCRAFT TO CALCULATE MINIMUM CREW

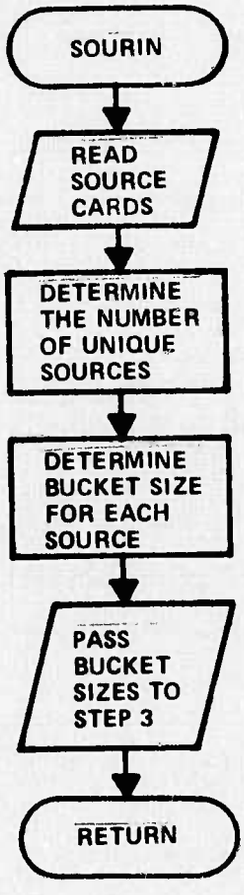

CCTS
CYCLE THRU AIR BASE BUCKETS
ALL BUCKETS PROCESSED ?
YES
RETURN
NO
CYCLE THRU PERSONNEL TYPES
ALL PERSONNEL TYPES PROCESSED ?
YES
NO
CALCULATE # ATTRITTED, # REPLACE, AND # ADDITIONAL PERSONNEL REQUIRED
CYCLE THRU CCTS PARAMETERS FOR COURSES FOR THIS AIR BASE, BUCKET AND PERSONNEL TYPE
ALL CCTS COURSES PROCESSED ?
YES
NO
GENERATE DEMANDS FOR THIS PERSONNEL TYPE AND FROM THIS CCTS COURSE

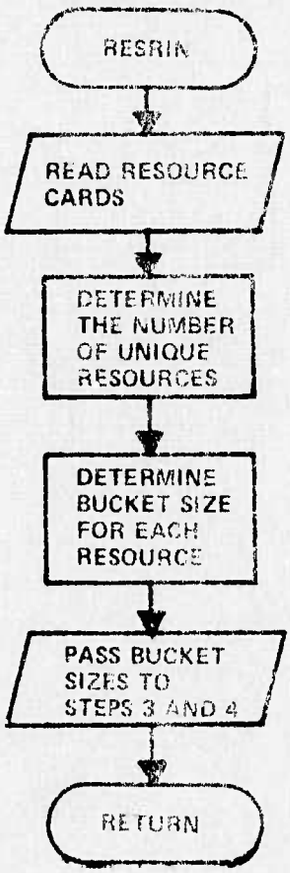

PMT
CYCLE THRU AIR BASE EVENTS FOR THIS AIR BASE
ALL EVENTS PROCESSED ?
YES
NO
CALCULATE HOURS IN EXCESSING OF ALERT REQUIREMENTS FOR EACH PERSONNEL TYPE
CYCLE THRU PMT GROUPS FOR THIS AIR BASE
ALL PMT COURSES PROCESSED ?
YES
PMT FEASIBLE ?
YES
RETURN
NO
GIVE ERROR MESSAGE
RETURN
NO
CYCLE THRU ALL PMT PERIODS FOR THIS PMT GROUP
ALL PERIODS PROCESSED ?
YES
NO
CYCLE THRU PERSONNEL TYPE
ALL PERSONNEL TYPE PROCESSED ?
YES
NO
DETERMINE NUMBER OF PEOPLE TO BE TRAINED PER BUCKET AND AMOUNT OF TIME LOST
CYCLE THRU ALL PMT COURSES FOR THIS PERSONNEL TYPE
ALL PMT GROUPS PROCESSED ?
YES
NO
CREATE PMT DEMANDS FOR EACH BUCKET IN PERIOD
REDUCE THE NUMBER OF HOURS AVAILABLE FOR PMT TRAINING

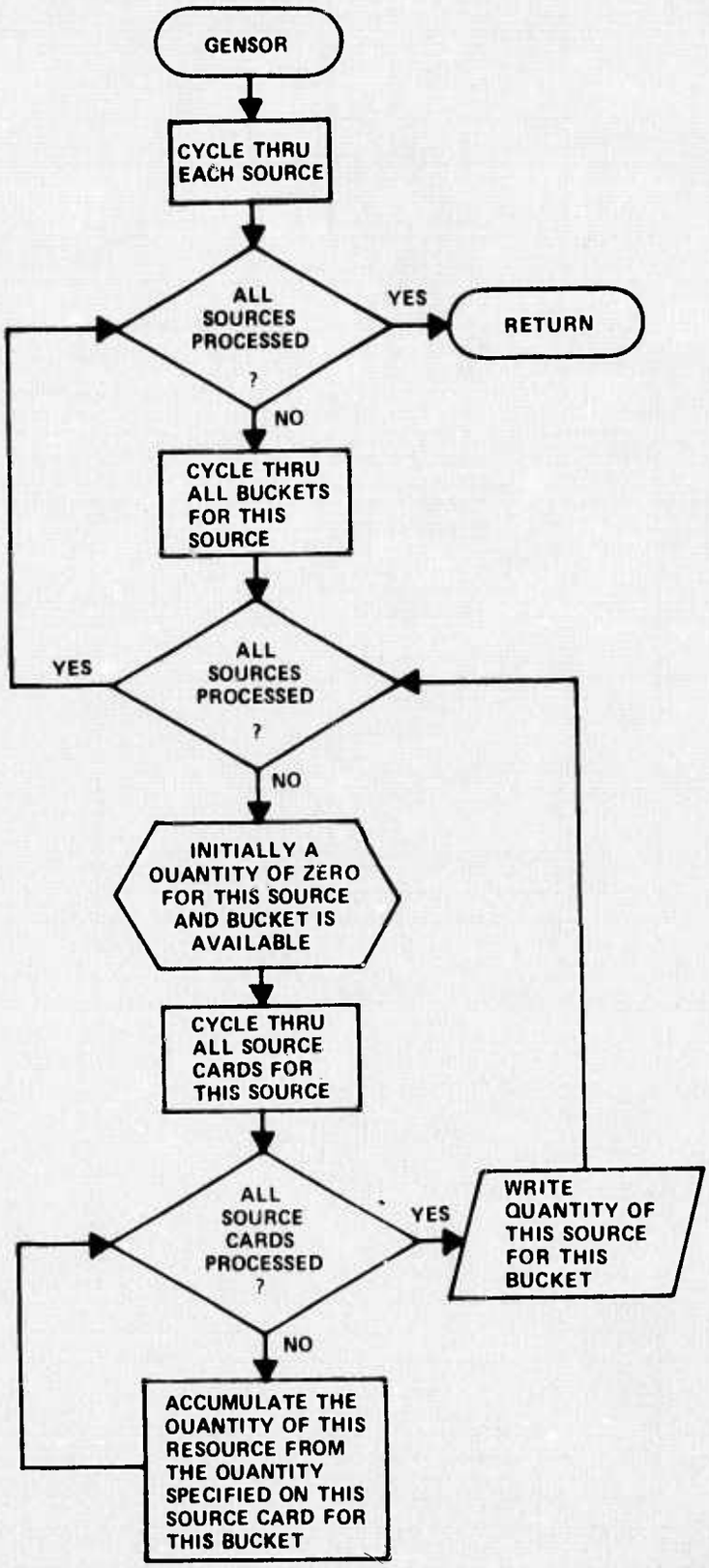

RECOVR
CYCLE THRU AIR BASE BUCKETS
ALL BUCKETS PROCESSED ?
YES
RETURN
NO
CREATE COPILOT SOURCE FROM THE NUMBER OF COPILOTS RECOVERABLE FOR THIS BUCKET

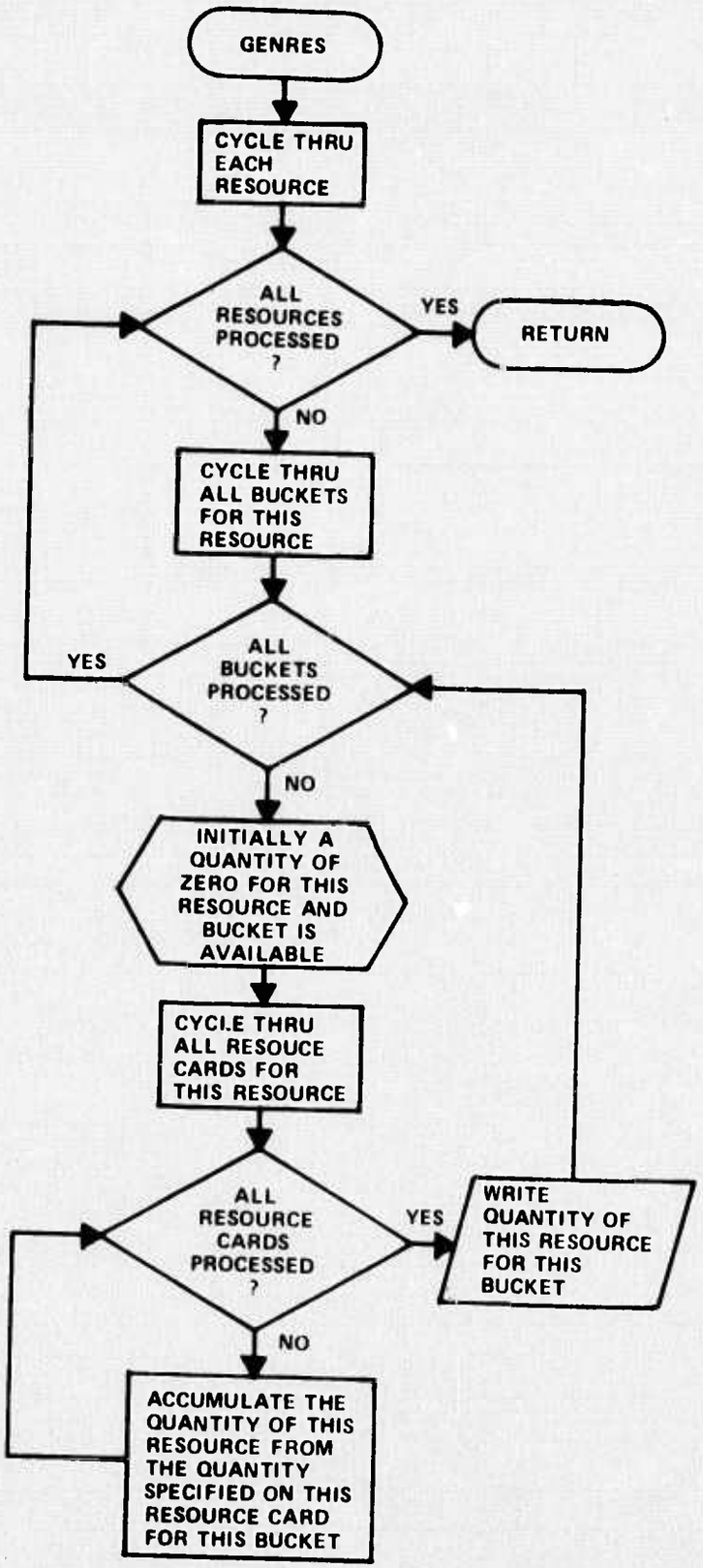

PRTCRS
WRITE THE NUMBER OF STUDENTS/ YEAR/ COURSE
RETURN

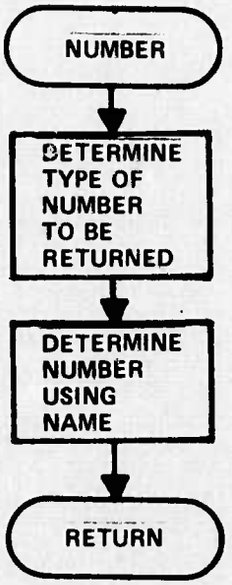

RESSOR
SOURIN
READ AND EXAMINE SOURCE CARDS
RESRIN
READ AND EXAMINE RESOURCE CARDS
GENSOR
GENERATE SOURCE FILE
GENRES
GENERATE RESOURCE FILE
RETURN

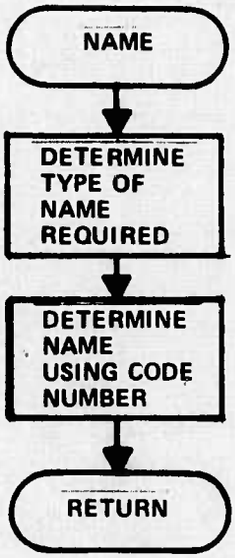

SOURIN
READ SOURCE CARDS
DETERMINE THE NUMBER OF UNIQUE SOURCES
DETERMINE BUCKET SIZE FOR EACH SOURCE
PASS BUCKET SIZES TO STEP 3
RETURN


RESRIN
READ RESOURCE CARDS
DETERMINE THE NUMBER OF UNIQUE RESOURCES
DETERMINE BUCKET SIZE FOR EACH RESOURCE
PASS BUCKET SIZES TO STEPS 3 AND 4
RETURN


GENSOR
CYCLE THRU EACH SOURCE
ALL SOURCES PROCESSED ?
YES
RETURN
NO
CYCLE THRU ALL BUCKETS FOR THIS SOURCE
ALL SOURCES PROCESSED ?
YES
NO
INITIALLY A QUANTITY OF ZERO FOR THIS SOURCE AND BUCKET IS AVAILABLE
CYCLE THRU ALL SOURCE CARDS FOR THIS SOURCE
ALL SOURCE CARDS PROCESSED ?
YES
WRITE QUANTITY OF THIS SOURCE FOR THIS BUCKET
NO
ACCUMULATE THE QUANTITY OF THIS RESOURCE FROM THE QUANTITY SPECIFIED ON THIS SOURCE CARD FOR THIS BUCKET


GENRES
CYCLE THRU EACH RESOURCE
ALL RESOURCES PROCESSED ?
YES
RETURN
NO
CYCLE THRU ALL BUCKETS FOR THIS RESOURCE
ALL BUCKETS PROCESSED ?
YES
NO
INITIALLY A QUANTITY OF ZERO FOR THIS RESOURCE AND BUCKET IS AVAILABLE
CYCLE THRU ALL RESOUCE CARDS FOR THIS RESOURCE
ALL RESOURCE CARDS PROCESSED ?
YES
WRITE QUANTITY OF THIS RESOURCE FOR THIS BUCKET
NO
ACCUMULATE THE QUANTITY OF THIS RESOURCE FROM THE QUANTITY SPECIFIED ON THIS RESOURCE CARD FOR THIS BUCKET


NUMBER
DETERMINE TYPE OF NUMBER TO BE RETURNED
DETERMINE NUMBER USING NAME
RETURN


NAME
DETERMINE TYPE OF NAME REQUIRED
DETERMINE NAME USING CODE NUMBER
RETURN

Section 2.2

DESCRIPTIONS OF RECORDS AND VARIABLES USED IN COMMONS

FIGURE C.1

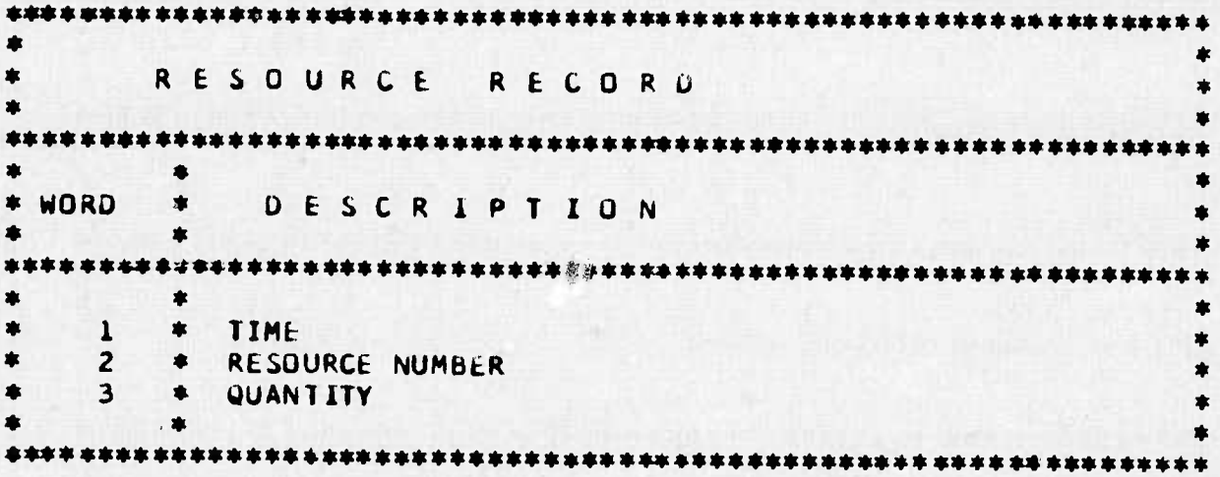
DEMAND RECORD

WORD	DESCRIPTION
1	TIME
2	QUANTITY
3	TYPE OF PERSONNEL 1-PILOTS 2-COPILOTS 3-OSOS 4-DSOS
4	COURSE NUMBER
5	DEMAND NUMBER = AIR BASE NUMBER * 1000 + BUCKET NO.
6	DEMAND TYPE 1-CCTS BECAUSE OF DELIVERIES 2-CCTS BECAUSE OF ATTRITION 3-PMT

FIGURE C.2

SOURCE RECORD	
WORD	DESCRIPTION
1	TIME
2	SOURCE NUMBER
3	QUANTITY

FIGURE C.3



RESOURCE RECORD

WORD	DESCRIPTION
1	TIME
2	RESOURCE NUMBER
3	QUANTITY

FIGURE D.1

COMMON BLOCK - NAM

VARIABLE	DESCRIPTION
ITYPE(I)	TYPE OF NAME
IFIRST(I)	INDEX TO WHERE FIRST NAME OF TYPE I IS LOCATED
NUM(I)	NUMBER OF NAMES OF TYPE I
NAMES(I,J)	POOL OF NAMES
IUNIT	UNIT NAMES ARE READ ON
JUNIT	UNIT NAMES ARE WRITTEN ONTO
MAXNUM	MAXIMUM NUMBER OF NAMES
NTYPE	NUMBER OF NAME TYPES

FIGURE D.2

COMMON BLOCK - DUMMY (COURSES)

VARIABLE	DESCRIPTION
NCOURS	NUMBER OF COURSES
MXCOUR	MAXIMUM NUMBER OF COURSES
IGRAD(I)	GRADUATION BLOCK FOR COURSE I
ICTYPE(I)	TYPE OF COURSE I
IPTYPE(I)	PERSONNEL TYPE FOR COURSE I
IPRIOR(I)	PRIORTY OF COURSE I
MXSIZE(I)	MAXIMUM SIZE OF COURSE I
IPEROD(I)	PERIOD OF COURSE I
IEGRAD(I)	EARLIEST GRADUATION DATE FOR COURSE I
IBLOCK(I)	LOCATION OF FIRST PROC, TASK, RUB, AND RUDB BLOCK
NBLOCK(I)	NUMBER OF PROC, TASK, RUB, AND RUDB BLOCKS
LBKIN(I)	LENGTH OF EACH BLOCK TYPE AS READ FROM STEP1
LBKOUT(I)	LENGTH OF EACH BLOCK TYPE AS PASSED TO STEP3
IAVAIL	POINTS TO NEXT AVAILABLE WORD IN STORAGE POOL
NWORDS	NUMBER OF WORDS REMAINING IN STORAGE POOL
IWORDS(I)	POOL OF STORAGE FOR BLOCKS
ERROR	TRUE IFF AN ERROR OCCURRED

FIGURE D.3

COMMON BLOCK - DUMMY (AIR BASES)

VARIABLE	DESCRIPTION
MAB	MAXIMUM NUMBER OF AIR BASES
MABH	MAXIMUM NUMBER OF HISTORY CARDS
MABE	MAXIMUM NUMBER OF AIR BASE EVENTS
MABC	MAXIMUM NUMBER OF CCTS COURSES
MABP	MAXIMUM NUMBER OF PMT GROUPS
MABPC	MAXIMUM NUMBER OF PMT COURSES
MABD	MAXIMUM NUMBER OF DELIVERY CARDS
MBUCKT	MAXIMUM NUMBER OF AIR BASE BUCKETS
PPATTR	% PILOTS ATTRITION PER BUCKET
CPATTR	% COPILOTS ATTRITION PER BUCKET
OPATTR	% OSOS ATTRITION PER BUCKET
DPATTR	% DSOS ATTRITION PER BUCKET
IPATTD	PILOTS ATTRITION DELAY TIME
ICATTD	COPILOTS ATTRITION DELAY TIME
IOATTD	OSOS ATTRITION DELAY TIME
IDATTD	DSOS ATTRITION DELAY TIME
PCRECY	% COPILOTS RECOVERABLE
ICUYR	CALENDAR UNITS PER YEAR
IBUCKT	CALENDAR UNITS PER BUCKET
WKSBKT	WEEKS PER BUCKET
HRSCU	HOURS PER CALENDAR UNIT
HRBUCK	HOURS PER BUCKET
MXBUCK	BUCKET ASSOCIATED WITH MAXIMUM SIMULATION TIME
NAB	NUMBER OF AIR BASES
INVAC(I)	INITIAL AIR CRAFT INVENTORY FOR AIR BASE I
INVP(I)	INITIAL PILOT INVENTORY FOR AIR BASE I
INVC(I)	INITIAL COPILOT INVENTORY FOR AIR BASE I
INVO(I)	INITIAL OSO INVENTORY FOR AIR BASE I
INVD(I)	INITIAL DSO INVENTORY FOR AIR BASE I
NABH	NUMBER OF AIR BASE HISTORY CARDS
NABE	NUMBER OF AIR BASE EVENTS
IABE1(I)	INDEX OF FIRST AIR BASE EVENT FOR AIR BASE I
IABEN(I)	NUMBER OF AIR BASE EVENTS FOR AIR BASE I
IDATEE(I)	DATE OF AIR BASE EVENT (IN BUCKETS)
CREWR(I)	CREW RATIO FOR AIR BASE EVENT
ALERTR(I)	ALERT RATIO FOR AIR BASE EVENT
HRCRBK(I)	HOURS/CREW/BUCKET FOR AIR BASE EVENT
NABC	NUMBER OF CCTS COURSES
IABC1(I)	INDEX OF FIRST CCTS FOR AIR BASE I
IABCN(I)	NUMBER OF CCTS FOR AIR BASE I
IDATEC(I)	DATE OF CCTS (IN BUCKETS)
ICOURC(I)	COURSE NUMBER
IPERC(I)	PERSONNEL TYPE
PCC(I)	PER CENTAGE OF PEOPLE TO COME FROM THIS COURSE

FIGURE D.3 (CONTINUED)

```
*****************************************************************
*                                                               *
*          C O M M O N   B L O C K  -  D U M M Y (AIR BASES)     *
*                                                               *
*****************************************************************
*            *                                                  *
* VARIABLE   *   D E S C R I P T I O N                          *
*            *                                                  *
*****************************************************************
*            *                                                  *
* NABP       * NUMBER OF PMT GROUPS                             *
* IABP1(I)   * INDEX OF FIRST PMT GROUP FOR AIR BASE I          *
* IABPN(I)   * NUMBER OF FIRST PMT GROUP FOR AIR BASE I         *
* IDATEP(I)  * DATE OF PMT GROUP (IN BUCKETS)                   *
* IPMT(I)    * PMT NUMBER                                       *
* IPEROD(I)  * PMT PERIOD                                       *
* NABPC      * NUMBER OF PMT COURSES                            *
* IABPC1(I)  * INDEX OF FIRST PMT COURSES FOR AIR BASE I        *
* IABPCN(I)  * NUMBER OF PMT COURSES FOR AIR BASE I             *
* IDATPC(I)  * DATE OF PMT COURSE (IN BUCKETS)                  *
* JPMT(I)    * NUMBER OF PMT FOR PMT COURSE                     *
* ICOUPC(I)  * COURSE NUMBER                                    *
* IPERTP(I)  * PERSONNEL TYPE FOR PMT COURSE                    *
* PCPC(I)    * PER CENT OF PERSONNEL TO GO TO THIS PMT COURSE   *
* ITL(I)     * TIME DELAY DUE TO TRAVEL FOR PMT COURSE          *
* NABD       * NUMBER OF AIR CRAFT DELIVERIES                   *
* IABD1(I)   * INDEX OF FIRST DELIVERY FOR AIR BASE I           *
* IABDN(I)   * NUMBER OF DELIVERY CARDS FOR AIR BASE I          *
* IDATED(I)  * DATE OF DELIVERY                                 *
* IQANTD(I)  * QUANTITY DELIVERIED                              *
* P(I)       * NUMBER OF PILOTS FOR BUCKET I                    *
* C(I)       * NUMBER OF COPILOTS FOR BUCKET I                  *
* O(I)       * NUMBER OF OSOS FOR BUCKET I                      *
* D(I)       * NUMBER OF DSOS FOR BUCKET I                      *
* IAC(I)     * NUMBER OF AIR CRAFT FOR BUCKET I                 *
* CREW(I)    * MINIMUM NUMBER OF CREWS FOR BUCKET I             *
* PH(I)      * PILOT HOURS AVAILABLE FOR PMT FOR BUCKET I       *
* CH(I)      * COPILOT HOURS AVAILABLE FOR PMT FOR BUCKET I     *
* OH(I)      * OSO HOURS AVAILABLE FOR PMT FOR BUCKET I         *
* DH(I)      * DSO HOURS AVAILABLE FOR PMT FOR BUCKET I         *
* CRECY(I)   * COPILOTS RECOVERABLE FOR BUCKET I                *
* IAB        * NUMBER OF AIR BASE BEING PROCESSED               *
* ERROR      * TRUE IFF ERROR OCCURRED                          *
* NOPRNT     * TRUE IFF OPTION REPORT IS NOT TO BE PRINTED      *
* STUDS(I,J) * # OF STUDENTS SENT TO COURSE J DURING YEAR I     *
* NCORS      * TOTAL NUMBER OF COURSES                          *
* NYEARS     * NUMBER OF YEARS OF SIMULATION TIME               *
*            *                                                  *
*****************************************************************
```

FIGURE D.4

COMMON BLOCK - CONTRL (STEP2)

VARIABLE	DESCRIPTION
MXTIME	MAXIMUM SIMULATION TIME

FIGURE D.5

COMMON BLOCK - RECVRY

VARIABLE	DESCRIPTION
ICRECT	# CALENDAR UNITS COPILOTS ARE AVAILABLE
ICBUCK	# OF BUCKETS RECOVERED COPILOTS ARE AVAILABLE

FIGURE D.6

COMMON BLOCK - MAXLEN	
VARIABLE	DESCRIPTION
MAXTIM(1)	DURATION OF LONGEST TRACK IN COURSE 1

FIGURE D.7

COMMON BLOCK - RESURS

VARIABLE	DESCRIPTION
IRES1(I)	INDEX TO FIRST RESOURCE CARD FOR RESOURCE I
NRES(I)	NUMBER OF RESOURCE CARDS FOR RESOURCE I
IFUNC(I)	GENERATING FUNCTION
IT1(I)	BEGINNING OF RESOURCE AVAILABLITY
ITN(I)	END OF RESOURCE AVAILABLITY
NPARM(I)	NUMBER OF PARAMETERS
IPARM1(I)	PARAMETER1
IPARM2(I)	PARAMETER2
IPARM3(I)	PARAMETER3
IPARM4(I)	PARAMETER4
IPARM5(I)	PARAMETER5
LBUCKT(I)	BUCKET SIZE
NRESR	TOTAL NUMBER OF RESOURCES
MXRES	MAXIMUM NUMBER OF RESOURCES
MXRESC	MAXIMUM NUMBER OF RESOURCE CARDS
ERROR	TRUE IFF AN ERROR OCCURRED

FIGURE D.8

COMMON BLOCK - SOURCE

VARIABLE	DESCRIPTION
ISOR1(I)	INDEX TO FIRST SOURCE CARD FOR SOURCE I
NSOR(I)	NUMBER OF SOURCE CARDS FOR SOURCE I
IFUNC(I)	GENERATING FUNCTION
IT1(I)	BEGINNING OF SOURCE AVAILABLITY
ITN(I)	END OF SOURCE AVAILABILITY
NPARM(I)	NUMBER OF PARAMETERS
IPARM1(I)	PARAMETER1
IPARM2(I)	PARAMETER2
IPARM3(I)	PARAMETER3
IPARM4(I)	PARAMETER4
IPARM5(I)	PARAMETER5
LBUCKT(I)	BUCKET SIZE
NSOUR	TOTAL NUMBER OF SOURCES
MXSOR	MAXIMUM NUMBER OF SOURCES
MXSORC	MAXIMUM NUMBER OF SOURCE CARDS
ERROR	TRUE IFF AN ERROR OCCURRED

FIGURE D.9

COMMON BLOCK - CONTRL (STEP3)

VARIABLE	DESCRIPTION
ICLOCK	SIMULATION TIME WHEN CLOCK WAS LAST CALLED

FIGURE D.10

COMMON BLOCK - RES

VARIABLE	DESCRIPTION
NRES	NUMBER OF RESOURCES
IBUCKT(I)	RESOURCE BUCKET SIZES

FIGURE D.11

COMMON BLOCK - RSOURC

VARIABLE	DESCRIPTION
IAVAIL	POINTS TO FIRST AVAILABLE CELL
NAVAIL	NUMBER OF AVAILABLE CELLS
MAVAIL	MINIMUM OF CELLS TO BE RESERVED FOR FUTURE ADDS
ITIME(I)	TIME IN CELL I
IQUANT(I)	QUANTITY IN CELL I
LINK(I)	LINK IN CELL I
IFIRST(I)	POINTS TO BEGINNING OF LIST FOR RESOURCE I
ILAST(I)	POINTS TO END OF LIST FOR RESOURCE I
ITIMEL(I)	EARLIEST TIME IN CORE FOR RESOURCE I
ITIMEH(I)	LATEST TIME IN CORE FOR RESOURCE I

FIGURE D.12

COMMON BLOCK - SOR

VARIABLE	DESCRIPTION
NSOR	NUMBER OF SOURCES
IBUCKT(I)	SOURCE BUCKET SIZES
ICU(I)	LENGTH OF TIME SOURCE IS AVAILABLE (CU)

FIGURE D.13

COMMON BLOCK - SOURSE

VARIABLE	DESCRIPTION
IAVAIL	POINTS TO FIRST AVAILABLE CELL
NAVAIL	NUMBER OF AVAILABLE CELLS
MAVAIL	MINIMUM OF CELLS TO BE RESERVED FOR FUTURE ADDS
ITIME(I)	TIME IN CELL I
IQUANT(I)	QUANTITY IN CELL I
LINK(I)	LINK IN CELL I
IFIRST(I)	POINTS TO BEGINNING OF LIST FOR SOURCE I
ILAST(I)	POINTS TO END OF LIST FOR SOURCE I
ITIMEL(I)	EARLIEST TIME IN CORE FOR SOURCE I
ITIMEH(I)	LATEST TIME IN CORE FOR SOURCE I

FIGURE D.14

COMMON BLOCK - CBLK

VARIABLE	DESCRIPTION
NCOURS	NUMBER OF COURSES
IGRAD(I)	GRADUATION BLOCK FOR COURSE I
ICTYPE(I)	TYPE OF COURSE I
IPTYPE(I)	PERSONNEL TYPE FOR COURSE I
IPRIOR(I)	PRIORTY OF COURSE I
MXSIZE(I)	MAXIMUM SIZE OF COURSE I
IPEROD(I)	PERIOD OF COURSE I
IEGRAD(I)	EARLIEST GRADUATION DATE FOR COURSE I

FIGURE D.15

COMMON BLOCK - BLKS

VARIABLE	DESCRIPTION
IBLOCK(I)	LOCATION OF FIRST PROC, TASK, RUB, AND RUDB BLOCK
NBLOCK(I)	NUMBER OF PROC, TASK, RUB, AND RUDB BLOCKS
LBLOCK(I)	LENGTH OF PROC, TASK, RUB, AND RUDB BLOCKS
IWORD(I)	POOL OF STORAGE CONTAINING ALL BLOCKS

FIGURE D.16

COMMON BLOCK - STACK

VARIABLE	DESCRIPTION
NSTACK	NUMBER OF ITEMS IN STACK
MSTACK	MAXIMUM NUMBER OF ITEMS A STACK HOLDS
ISTACK	STACK
JSTACK	STACK

Section 2.3

DESCRIPTIONS OF ROUTINES

```
C*********************************  ABIN  *********************************
C*                                                                        *
C*                            SUBROUTINE ABIN                             *
C*                                                                        *
C*     PURPOSE                                                            *
C*         READ AIR BASE PARAMETERS AND INITIALIZES VARIABLES.            *
C*                                                                        *
C*     AUTHOR/PROGRAMMER                                                  *
C*         JOHN R. MENIG                                                  *
C*         CALSPAN CORPORATION                                            *
C*         2 MAY 1975                                                     *
C*                                                                        *
C************************************************************************
```

```
C*********************************  ARBASE  *********************************
C*                                                                           *
C*                            SUBROUTINE ARBASE                              *
C*                                                                           *
C*     PURPOSE                                                               *
C*         CONTROLS THE FLOW BETWEEN SUBROUTINES THAT PROCESS                *
C*         AIR BASE INFORMATION.                                             *
C*                                                                           *
C*     SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                          *
C*         CORTIM - CALCULATES DURATION OF LONGEST TRACK IN EACH COURSE      *
C*         MAIN   - READS ALL AIR BASE PARAMETERS                            *
C*         DISTAC - CALCULATES DISTRIBUTION OF AIR CRAFT                     *
C*         DISTCW - CALCULATES DISTRIBUTION OF CREW MEMBERS                  *
C*         MNCREW - DETERMINES MINIMUM CREW                                  *
C*         CCTS   - CALCULATES GRADUATION REQUIREMENTS                       *
C*         PMT    - CALCULATES PMT COURSE DEMANDS                            *
C*         RECOVR - GENERATES SOURCE OF RECOVERABLE COPILOTS                 *
C*         PRTCRS - PRINTS REPORT CONTAINING STUDENTS/COURSE/YEAR            *
C*                                                                           *
C*     AUTHOR/PROGRAMMER                                                     *
C*         JOHN R. MENIG                                                     *
C*         CALSPAN CORPORATION                                               *
C*         5 MAY 1975                                                        *
C*                                                                           *
C***************************************************************************
```

```
C*********************************  BLKNAM  *********************************
C*                                                                           *
C*                              BLOCK DATA                                   *
C*                                                                           *
C*     PURPOSE                                                               *
C*          INITIALIZES VARIABLE NEEDED WHEN INPUTTING NAMES.                *
C*                                                                           *
C*     AUTHOR/PROGRAMMER                                                     *
C*          JOHN R. MENIG                                                    *
C*          CALSPAN CORPORATION                                              *
C*          22 APRIL 1975                                                    *
C*                                                                           *
C***************************************************************************
```

```
C********************************  BLKIN  ********************************
C*                                                                        *
C*                            SUBROUTINE BLKIN                            *
C*                                                                        *
C*     PURPOSE                                                            *
C*         READS THE BLOCKS NEEDED TO DEFINE COURSES.                     *
C*                                                                        *
C*     AUTHOR/PROGRAMMER                                                  *
C*         JOHN R. MENIG                                                  *
C*         CALSPAN CORPORATION                                            *
C*         24 APRIL 1975                                                  *
C*                                                                        *
C************************************************************************
```

```
C********************************  BLOCK  ********************************
C*                                                                        *
C*                              SUBROUTINE BLOCK                          *
C*                                                                        *
C*     PURPOSE                                                            *
C*         RETURNS THE CONTENTS OF A BLOCK                                *
C*                                                                        *
C*     CALLING SEQUENCE                                                   *
C*         CALL BLOCK(IADDR,IARRAY)                                       *
C*                                                                        *
C*     DESCRIPTION OF PARAMETERS                                          *
C*                                                                        *
C*                     * EXPLICIT INPUT *                                 *
C*         IADDR - POINTS AT BLOCK WHOS CONTENTS IS DESIRED.              *
C*                                                                        *
C*                     * EXPLICIT OUTPUT *                                *
C*         IARRAY - CONTENTS OF BLOCK ARE PLACED IN THIS ARRAY.           *
C*                                                                        *
C*                                                                        *
C*     AUTHOR/PROGRAMMER                                                  *
C*         JOHN R. MENIG                                                  *
C*         CALSPAN CORPORATION                                            *
C*         24 APRIL 1975                                                  *
C*                                                                        *
C************************************************************************
```

```
C*********************************** CCTS ***********************************
C*                                                                          *
C*                            SUBROUTINE CCTS                               *
C*                                                                          *
C*    PURPOSE                                                               *
C*        DETERMINES DEMANDS DUE TO DELIVERY OF AIR CRAFT AND               *
C*        ATTRITION.                                                        *
C*                                                                          *
C*    SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                          *
C*        NAME   - FINDS THE ALPHANUMERIC NAME OF AIR BASE                  *
C*                                                                          *
C*    AUTHOR/PROGRAMMER                                                     *
C*        JOHN R. MENIG                                                     *
C*        CALSPAN CORPORATION                                               *
C*        30 APRIL 1975                                                     *
C*                                                                          *
C****************************************************************************
```

```
C********************************  CLOCK  ********************************
C*                                                                        *
C*                            SUBROUTINE CLOCK                            *
C*                                                                        *
C*     PURPOSE                                                            *
C*         UPDATES CLOCK TIME AND UPDATES SOURCE AND RESOURCE TABLES       *
C*                                                                        *
C*     CALLING SEQUENCE                                                   *
C*         CALL CLOCK(ITIME)                                              *
C*                                                                        *
C*     DESCRIPTION OF PARAMETERS                                          *
C*                                                                        *
C*                     * EXPLICIT INPUT *                                 *
C*         ITIME - TIME TO BE ASSIGNED TO CLOCK                           *
C*                                                                        *
C*     SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                       *
C*         RDNAME - INPUTS NAME TABLES                                    *
C*         BLKIN  - INPUTS SOURCES                                        *
C*         INTRES - INITIALIZES RESOURCE TABLES                           *
C*         INTSOR - INITIALIZES SOURCE TABLES                             *
C*         UPDRES - UPDATES RESOURCE TABLES                               *
C*         UPDSOR - UPDATES SOURCE TABLES                                 *
C*                                                                        *
C*     AUTHOR/PROGRAMMER                                                  *
C*         JOHN R. MENIG                                                  *
C*         CALSPAN CORPORATION                                            *
C*         28 APRIL 1975                                                  *
C*                                                                        *
C************************************************************************
```

```
C*********************************  CORSIN **********************************
C*                                                                           *
C*                              SUBROUTINE CORSIN                            *
C*                                                                           *
C*     PURPOSE                                                               *
C*         READS ALL BLOCKS NEEDED TO DEFINE COURSES                         *
C*                                                                           *
C*     AUTHOR/PROGRAMMER                                                     *
C*         JOHN R. MENIG                                                     *
C*         CALSPAN CORPORATION                                               *
C*         22 APRIL 1975                                                     *
C*                                                                           *
C***************************************************************************
```

```
C********************************** CORSOT **********************************
C*                                                                          *
C*                            SUBROUTINE CORSOT                             *
C*                                                                          *
C*     PURPOSE                                                              *
C*         WRITE THE BLOCKS NEEDED TO DEFINE COURSES FOR STEPS.             *
C*                                                                          *
C*     AUTHOR/PROGRAMMER                                                    *
C*         JOHN R. MENIG                                                    *
C*         CALSPAN CORPORATION                                              *
C*         24 APRIL 1975                                                    *
C*                                                                          *
C****************************************************************************
```

```
C********************************  CORTIM  ********************************
C*                                                                        *
C*                            SUBROUTINE CORTIM                           *
C*                                                                        *
C*     PURPOSE                                                            *
C*         CALCULATES THE DURATION OF THE LONGEST TRACK IN EACH COURSE.   *
C*                                                                        *
C*     SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                       *
C*         MAXTRK - CALCULATES THE DURATION OF THE LONGEST TRACK          *
C*                  IN A PARTICULAR COURSE                                *
C*                                                                        *
C*     AUTHOR/PROGRAMMER                                                  *
C*         JOHN R. MENIG                                                  *
C*         CALSPAN CORPORATION                                            *
C*         6 MAY 1975                                                     *
C*                                                                        *
C************************************************************************
```

```
C********************************** DISTAC ********************************
C*                                                                        *
C*                          SUBROUTINE DISTAC                             *
C*                                                                        *
C*    PURPOSE                                                             *
C*        DETERMINE THE DISTRIBUTION OF AIR CRAFT FROM THE                *
C*        INITIAL INVENTORIES AND DELIVERIES FOR A GIVEN AIR BASE.        *
C*                                                                        *
C*    AUTHOR/PROGRAMMER                                                   *
C*        JOHN R. MENIG                                                   *
C*        CALSPAN CORPORATION                                             *
C*        30 APRIL 1975                                                   *
C*                                                                        *
C**************************************************************************
```

```
C*********************************  DISTCW  ******************************
C*                                                                        *
C*                          SUBROUTINE DISTCW                             *
C*                                                                        *
C*    PURPOSE                                                             *
C*         DETERMINE THE INITIAL DISTRIBUTION OF CREWS FOR A GIVEN       *
C*         AIR BASE FROM TIME HISTORY CARDS                               *
C*                                                                        *
C*    AUTHOR/PROGRAMMER                                                   *
C*         JOHN R. MENIG                                                  *
C*         CALSPAN CORPORATION                                            *
C*         1 MAY 1975                                                     *
C*                                                                        *
C**************************************************************************
```

```
C********************************** FMTNAM *********************************
C*                                                                         *
C*                          SUBROUTINE FMTNAM                              *
C*                                                                         *
C*    PURPOSE                                                              *
C*        READS NAMES IN STEP2 AND WRITES OUT FOR STEP3.                   *
C*                                                                         *
C*    AUTHOR/PROGRAMMER                                                    *
C*        JOHN R. MENIG                                                    *
C*        CALSPAN CORPORATION                                              *
C*        22 APRIL 1975                                                    *
C*                                                                         *
C***************************************************************************
```

```
C**********************************  GENSOR  ********************************
C*                                                                           *
C*                              SUBROUTINE GENSOR                            *
C*                                                                           *
C*     PURPOSE                                                               *
C*         APPLIES GENERATING FUNCTION TO SOURCES                            *
C*                                                                           *
C*     AUTHOR/PROGRAMMER                                                     *
C*         JOHN R. MENIG                                                     *
C*         CALSPAN CORPORATION                                               *
C*         28 APRIL 1975                                                     *
C*                                                                           *
C***************************************************************************
```

```
C********************************  GENRES  ********************************
C*                                                                        *
C*                            SUBROUTINE GENRES                           *
C*                                                                        *
C*     PURPOSE                                                            *
C*         APPLIES GENERATING FUNCTION TO RESOURCES.                      *
C*                                                                        *
C*     AUTHOR/PROGRAMMER                                                  *
C*         JOHN R. MENIG                                                  *
C*         CALSPAN CORPORATION                                            *
C*         28 APRIL 1975                                                  *
C*                                                                        *
C************************************************************************
```

```
C********************************  GETRES  ********************************
C*                                                                        *
C*                            SUBROUTINE GETRES                           *
C*                                                                        *
C*     PURPOSE                                                            *
C*         READS QUANTITY OF A GIVEN RESOURCE FOR A GIVEN PERIOD.         *
C*                                                                        *
C*     CALLING SEQUENCE                                                   *
C*         CALL GETRES(IRES,IT1IN,IT2IN,IT1OUT,IT2OUT,IARRAY)             *
C*                                                                        *
C*     DESCRIPTION OF PARAMETERS                                          *
C*                                                                        *
C*                      * EXPLICIT INPUT *                                *
C*         IRES    - RESOURCE NUMBER                                      *
C*         IT1IN   - BEGINNING OF TIME INTERVAL REQUESTED                 *
C*         IT2IN   - END OF TIME INTERVAL REQUESTED                       *
C*                                                                        *
C*                      * EXPLICIT OUTPUT *                               *
C*         IT1OUT  - BEGINNING OF TIME INTERVAL RETURNED                  *
C*         IT2OUT  - END OF TIME INTERVAL RETURNED                        *
C*         IARRAY  - ARRAY OF QUANTITIES RETURNED                         *
C*                                                                        *
C*                                                                        *
C*     AUTHOR/PROGRAMMER                                                  *
C*         JOHN R. MENIG                                                  *
C*         CALSPAN CORPORATION                                            *
C*         28 APRIL 1975                                                  *
C*                                                                        *
C************************************************************************
```

```
C********************************  GETSOR  ********************************
C*                                                                        *
C*                          SUBROUTINE GETSOR                             *
C*                                                                        *
C*     PURPOSE                                                            *
C*         READS QUANTITY OF A GIVEN SOURCE FOR A GIVEN PERIOD.           *
C*                                                                        *
C*     CALLING SEQUENCE                                                   *
C*         CALL GETSOR(ISOR,IT1IN,IT2IN,IT1OUT,IT2OUT,IARRAY)             *
C*                                                                        *
C*     DESCRIPTION OF PARAMETERS                                          *
C*                                                                        *
C*                      * EXPLICIT INPUT *                                *
C*         ISOR   - SOURCE NUMBER                                         *
C*         IT1IN  - BEGINNING OF TIME INTERVAL REQUESTED                  *
C*         IT2IN  - END OF TIME INTERVAL REQUESTED                        *
C*                                                                        *
C*                      * EXPLICIT OUTPUT *                               *
C*         IT1OUT - BEGINNING OF TIME INTERVAL RETURNED                   *
C*         IT2OUT - END OF TIME INTERVAL RETURNED                         *
C*         IARRAY - ARRAY OF QUANTITIES RETURNED                          *
C*                                                                        *
C*     AUTHOR/PROGRAMMER                                                  *
C*         JOHN R. MENIG                                                  *
C*         CALSPAN CORPORATION                                            *
C*         28 APRIL 1975                                                  *
C*                                                                        *
C************************************************************************
```

```
C********************************  GRADBK  ********************************
C*                                                                        *
C*                            SUBROUTINE GRADBK                           *
C*                                                                        *
C*     PURPOSE                                                            *
C*         ASSIGNS PROC BLOCKS WITHOUT RIGHT POINTERS AS GRADUATION       *
C*         BLOCKS FOR EACH COURSE.                                        *
C*                                                                        *
C*     AUTHOR/PROGRAMMER                                                  *
C*         JOHN R. MENIG                                                  *
C*         CALSPAN CORPORATION                                            *
C*         24 APRIL 1975                                                  *
C*                                                                        *
C************************************************************************
```

```
C********************************  INTRES  ********************************
C*                                                                        *
C*                              SUBROUTINE INTRES                         *
C*                                                                        *
C*     PURPOSE                                                            *
C*         INITIALIZE RESOURCE TABLES                                     *
C*                                                                        *
C*     AUTHOR/PROGRAMMER                                                  *
C*         JOHN R. MENIG                                                  *
C*         CALSPAN CORPORATION                                            *
C*         28 APRIL 1975                                                  *
C*                                                                        *
C************************************************************************
```

```
C********************************  INTSOR  ******************************
C*                                                                       *
C*                            SUBROUTINE INTSOR                          *
C*                                                                       *
C*     PURPOSE                                                           *
C*         INITIALIZE SOURCE TABLES                                      *
C*                                                                       *
C*     AUTHOR/PROGRAMMER                                                 *
C*         JOHN R. MENIG                                                 *
C*         CALSPAN CORPORATION                                           *
C*         28 APRIL 1975                                                 *
C*                                                                       *
C***********************************************************************
```

```
C**********************************  MAXTRK  ********************************
C*                                                                           *
C*                              FUNCTION MAXTRK                              *
C*                                                                           *
C*     PURPOSE                                                               *
C*         CALCULATES THE DURATION OF THE LONGEST TRACK IN A COURSE          *
C*                                                                           *
C*     CALLING SEQUENCE                                                      *
C*         MAXTRK(IPTR)                                                      *
C*                                                                           *
C*     DESCRIPTION OF PARAMETERS                                             *
C*                                                                           *
C*                      * EXPLICIT INPUT *                                   *
C*         IPTR    - POINTS AT GRADUATION PROC BLOCK                         *
C*                                                                           *
C*     AUTHOR/PROGRAMMER                                                     *
C*         JOHN R. MENIG                                                     *
C*         CALSPAN CORPORATION                                               *
C*         24 APRIL 1979                                                     *
C*                                                                           *
C***************************************************************************
```

```
C********************************* MNCREW *********************************
C*                                                                        *
C*                         SUBROUTINE MNCREW                              *
C*                                                                        *
C*    PURPOSE                                                             *
C*         DETERMINES MINIMUM CREW DISTRIBUTION TO BE MAINTAINED          *
C*         FOR A GIVEN AIR BASE.                                          *
C*                                                                        *
C*    AUTHOR/PROGRAMMER                                                   *
C*         JOHN R. MENIG                                                  *
C*         CALSPAN CORPORATION                                            *
C*         30 APRIL 1975                                                  *
C*                                                                        *
C**************************************************************************
```

```
C*********************************  NAME  *********************************
C*                                                                        *
C*                              SUBROUTINE NAME                           *
C*     PURPOSE                                                            *
C*         RETURN A NAME FOR CODE NUMBER.                                 *
C*                                                                        *
C*     CALLING SEQUENCE                                                   *
C*         CALL NAME(IAPRV,NUMBER,INAME)                                  *
C*                                                                        *
C*     DESCRIPTION OF PARAMETERS                                          *
C*                                                                        *
C*                    * EXPLICIT INPUT *                                  *
C*         IAPRV - ALPHANUMERIC NAME OF THE TYPE OF NAME BEING LOOKED UP  *
C*         NUMBER - CODE NUMBER OF NAME BEING LOOKED UP                   *
C*                                                                        *
C*                    * EXPLICIT OUTPUT *                                 *
C*         INAME - ALPHANUMERIC NAME BEING RETURNED                       *
C*                                                                        *
C*     AUTHOR/PROGRAMMER                                                  *
C*         JOHN R. MENIG                                                  *
C*         CALSPAN CORPORATION                                            *
C*         22 APRIL 1975                                                  *
C*                                                                        *
C************************************************************************
```

```
C********************************  NUMBER  ********************************
C*                                                                        *
C*                              SUBROUTINE NUMBER                         *
C*                                                                        *
C*     PURPOSE                                                            *
C*         RETURNS A CODE NUMBER FOR A NAME.                              *
C*                                                                        *
C*     CALLING SEQUENCE                                                   *
C*         CALL NUMBER(IAPRV,NUMB,NAME)                                   *
C*                                                                        *
C*     DESCRIPTION OF PARAMETERS                                          *
C*                                                                        *
C*                    * EXPLICIT INPUT *                                  *
C*         IAPRV - ALPHANUMERIC NAME OF THE TYPE OF CODE BEING LOOKED UP  *
C*         NAME - ALPHANUMERIC NAME BEING LOOKED UP                       *
C*                                                                        *
C*                    * EXPLICIT OUTPUT *                                 *
C*         NUMB   - CODE NUMBER RETURNED                                  *
C*                                                                        *
C*     AUTHOR/PROGRAMMER                                                  *
C*         JOHN R. MENIG                                                  *
C*         CALSPAN CORPORATION                                            *
C*         22 APRIL 1975                                                  *
C*                                                                        *
C************************************************************************
```

```
C********************************  PMT  **********************************
C*                                                                        *
C*                            SUBROUTINE PMT                              *
C*                                                                        *
C*     PURPOSE                                                            *
C*         CREATES PMT DEMANDS AND DETERMINES WHETHER PMT IS FEASIBLE     *
C*                                                                        *
C*     AUTHOR/PROGRAMMER                                                  *
C*         JOHN R. MENIG                                                  *
C*         CALSPAN CORPORATION                                            *
C*         2 MAY 1975                                                     *
C*                                                                        *
C************************************************************************
```

```
C********************************  PRCOUR  ********************************
C*                                                                        *
C*                            SUBROUTINE PRCOUR                           *
C*                                                                        *
C*     PURPOSE                                                            *
C*         CONTROLS THE FOLLOW BETWEEN PROGRAMS THAT INPUT, REFORMAT,     *
C*         EXAMINE, AND OUTPUT BLOCKS THAT DEFINE COURSES.                *
C*                                                                        *
C*     SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                       *
C*         CORSIN - READS ALL BLOCKS NEEDED TO DEFINE COURSES.            *
C*         PRPROC - CHANGES PROC AND TASK BLOCK NUMBERS INTO POINTERS IN  *
C*                  PROC BLOCKS.                                          *
C*         PRTASK - CHANGES RUB NUMBERS INTO POINTERS IN TASK BLOCKS.     *
C*         PRRUB  - CHANGES RUDB NUMBERS INTO POINTERS IN RUB BLOCKS.     *
C*         PRRUDB - CHANGES RUB AND RUDB NUMBERS INTO POINTER IN RUDB     *
C*                  BLOCKS                                                *
C*         GRADBK - FINDS GRADUATION BLOCKS FOR EACH COURSE               *
C*         TSSYN  - TEST THAT THE SYNRONIZED PROC BLOCKS FOR A            *
C*                  CIRCULAR LIST.                                        *
C*         PROCLP - TEST THAT PROC BLOCKS TERMINATE                       *
C*         RUDBLP - TEST RUB AND RUDB COMBINATIONS                        *
C*         SORTLK - IN PROC BLOCKS SORTS LEFT LINKS BY PRIORTY            *
C*         CORSOT - WRITES ALL BLOCKS NEEDED TO DEFINE COURSE IN STEP3.   *
C*                                                                        *
C*     AUTHOR/PROGRAMMER                                                  *
C*         JOHN R. MENIG                                                  *
C*         CALSPAN CORPORATION                                            *
C*         24 APRIL 1975                                                  *
C*                                                                        *
C************************************************************************
```

```
C********************************  PROCLP  ********************************
C*                                                                        *
C*                            SUBROUTINE PROCLP                           *
C*                                                                        *
C*     PURPOSE                                                            *
C*         TEST THAT EACH TRACK IN A COURSE IS SHORTER THAN A             *
C*         PREDETERMINED MAXIMUM LENGTH.                                  *
C*                                                                        *
C*     AUTHOR/PROGRAMMER                                                  *
C*         JOHN R. MENIG                                                  *
C*         CALSPAN CORPORATION                                            *
C*         24 APRIL 1975                                                  *
C*                                                                        *
C************************************************************************
```

```
C********************************  PRPROC  ********************************
C*                                                                        *
C*                            SUBROUTINE PRPROC                           *
C*                                                                        *
C*     PURPOSE                                                            *
C*         SUBSTITUTES POINTERS FOR PROC BLOCK NUMBERS AND TASK NUMBERS;  *
C*         SUPPLIES RIGHT PROC BLOCK POINTERS IN PROC BLOCKS.             *
C*                                                                        *
C*     AUTHOR/PROGRAMMER                                                  *
C*         JOHN R. MENIG                                                  *
C*         CALSPAN CORPORATION                                            *
C*         23 APRIL 1975                                                  *
C*                                                                        *
C************************************************************************
```

```
C********************************  PRRUB  ********************************
C*                                                                        *
C*                            SUBROUTINE PRRUB                            *
C*                                                                        *
C*     PURPOSE                                                            *
C*         SUBSTITUTES POINTERS FOR RUDB NUMBERS IN RUB BLOCKS.           *
C*                                                                        *
C*     AUTHOR/PROGRAMMER                                                  *
C*         JOHN R. MENIG                                                  *
C*         CALSPAN CORPORATION                                            *
C*         23 APRIL 1975                                                  *
C*                                                                        *
C************************************************************************
```

```
C********************************  PRRUDB  ********************************
C*                                                                        *
C*                              SUBROUTINE PRRUDB                         *
C*                                                                        *
C*                                                                        *
C*     PURPOSE                                                            *
C*         SUBSTITUTES POINTERS FOR RUB AND RUDB NUMBERS IN RUDB BLOCKS.  *
C*                                                                        *
C*     AUTHOR/PROGRAMMER                                                  *
C*         JOHN R. MENIG                                                  *
C*         CALSPAN CORPORATION                                            *
C*         23 APRIL 1975                                                  *
C*                                                                        *
C************************************************************************
```

```
C**********************************  PRTASK ***********************************
C*                                                                            *
C*                          SUBROUTINE PRTASK                                 *
C*                                                                            *
C*    PURPOSE                                                                 *
C*        SUBSTITUTES POINTERS FOR RUB NUMBERS IN TASK BLOCKS.                *
C*                                                                            *
C*    AUTHOR/PROGRAMMER                                                       *
C*        JOHN R. MENIG                                                       *
C*        CALSPAN CORPORATION                                                 *
C*        23 APRIL 1975                                                       *
C*                                                                            *
C******************************************************************************
```

```
C*********************************** PRTCRS ************************************
C*                                                                             *
C*                           SUBROUTINE PRTCRS                                 *
C*                                                                             *
C*    PURPOSE                                                                  *
C*        PRINTS THE NUMBER OF STUDENTS/COURSE/YEAR                            *
C*                                                                             *
C*    SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                             *
C*        NAME    - FINDS THE ALPHANUMERIC NAME OF COURSES                     *
C*                                                                             *
C*    AUTHOR/PROGRAMMER                                                        *
C*        JOHN R. MENIG                                                        *
C*        CALSPAN CORPORATION                                                  *
C*        22 MAY 1975                                                          *
C*                                                                             *
C*******************************************************************************
```

```
C********************************  PUTRES  ********************************
C*                                                                        *
C*                            SUBROUTINE PUTRES                           *
C*                                                                        *
C*    PURPOSE                                                             *
C*        WRITES QUANTITY OF A GIVEN RESOURCE FOR A GIVEN PERIOD          *
C*                                                                        *
C*    CALLING SEQUENCE                                                    *
C*        CALL PUTRES(IRES,IT1,IT2,IARRAY)                                *
C*                                                                        *
C*    DESCRIPTION OF PARAMETERS                                           *
C*                                                                        *
C*                    * EXPLICIT INPUT *                                  *
C*        IRES    - RESOURCE NUMBER                                       *
C*        IT1     - BEGINNING OF INTERVAL                                 *
C*        IT2     - END OF INTERVAL                                       *
C*                                                                        *
C*    AUTHOR/PROGRAMMER                                                   *
C*        JOHN R. MENIG                                                   *
C*        CALSPAN CORPORATION                                             *
C*        29 APRIL 1975                                                   *
C*                                                                        *
C************************************************************************
```

```
C********************************  PUTSOR  ******************************
C*                                                                       *
C*                          SUBROUTINE PUTSOR                            *
C*                                                                       *
C*     PURPOSE                                                           *
C*         WRITES QUANTITY OF A GIVEN SOURCE FOR A GIVEN PERIOD.         *
C*                                                                       *
C*     CALLING SEQUENCE                                                  *
C*         CALL PUTSOR(ISOR,IT1,IT2,IARRAY)                              *
C*                                                                       *
C*     DESCRIPTION OF PARAMETERS                                         *
C*                                                                       *
C*                      * EXPLICIT INPUT *                               *
C*         ISOR    - SOURCE NUMBER                                       *
C*         IT1     - BEGINNING OF INTERVAL                               *
C*         IT2     - END OF INTERVAL                                     *
C*                                                                       *
C*     AUTHOR/PROGRAMMER                                                 *
C*         JOHN R. MENIG                                                 *
C*         CALSPAN CORPORATION                                           *
C*         29 APRIL 1975                                                 *
C*                                                                       *
C***********************************************************************
```

```
C********************************  RDNAME  ********************************
C*                                                                        *
C*                          SUBROUTINE RDNAME                             *
C*                                                                        *
C*     PURPOSE                                                            *
C*         READS NAMES IN STEP3                                           *
C*                                                                        *
C*     AUTHOR/PROGRAMMER                                                  *
C*         JOHN R. MENIG                                                  *
C*         CALSPAN CORPORATION                                            *
C*         22 APRIL 1975                                                  *
C*                                                                        *
C************************************************************************
```

```
C*********************************  RECOVR  *********************************
C*                                                                          *
C*                              SUBROUTINE RECOVR                           *
C*                                                                          *
C*     PURPOSE                                                              *
C*         CREATE COPILOT SOURCES                                           *
C*                                                                          *
C*     AUTHOR/PROGRAMMER                                                    *
C*         JOHN R. MENIG                                                    *
C*         CALSPAN CORPORATION                                              *
C*         2 MAY 1975                                                       *
C*                                                                          *
C**************************************************************************
```

```
C********************************  RESRIN  ********************************
C*                                                                        *
C*                            SUBROUTINE RESRIN                           *
C*                                                                        *
C*     PURPOSE                                                            *
C*         READ RESOURCES, TEST RESOURCES FOR ERRORS, AND DETERMINE       *
C*         BUCKET SIZES.                                                  *
C*                                                                        *
C*     AUTHOR/PROGRAMMER                                                  *
C*         JOHN R. MENIG                                                  *
C*         CALSPAN CORPORATION                                            *
C*         25 APRIL 1975                                                  *
C*                                                                        *
C************************************************************************
```

```
C********************************  RESSOR  ********************************
C*                                                                        *
C*                          SUBROUTINE RESSOR                             *
C*                                                                        *
C*     PURPOSE                                                            *
C*         CONTROLS FLOW BETWEEN ROUTINES THAT PROCESS RESOURCES AND      *
C*         SOURCES IN STEP2.                                              *
C*                                                                        *
C*     SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                       *
C*         GENRES - GENERATES RESOURCES FROM RESOURCE CARDS               *
C*         GENSOR - GENERATES SOURCES FROM SOURCE CARDS                   *
C*         RESRIN - READS RESOURCE CARDS                                  *
C*         SOURIN - READS SOURCE CARDS                                    *
C*                                                                        *
C*     AUTHOR/PROGRAMMER                                                  *
C*         JOHN R. MENIG                                                  *
C*         CALSPAN CORPORATION                                            *
C*         28 APRIL 1975                                                  *
C*                                                                        *
C************************************************************************
```

```
C********************************* RUDBLP *******************************
C*                                                                      *
C*                        SUBROUTINE RUDBLP                             *
C*                                                                      *
C*    PURPOSE                                                           *
C*         TEST THAT THE DEPTH OF RUDB AND RUB COMBINATIONS ARE LESS    *
C*         THAN A PREDETERMINED MAXIMUM                                 *
C*                                                                      *
C*    AUTHOR/PROGRAMMER                                                 *
C*         JOHN R. MENIG                                                *
C*         CALSPAN CORPORATION                                          *
C*         25 APRIL 1975                                                *
C*                                                                      *
C************************************************************************
```

```
C**********************************  SORTLK  ********************************
C*                                                                           *
C*                              SUBROUTINE SORTLK                            *
C*                                                                           *
C*     PURPOSE                                                               *
C*         SORTS LEFT LINKS BY ASCENDING PRIORTIES                           *
C*                                                                           *
C*     AUTHOR/PROGRAMMER                                                     *
C*         JOHN R. MENIG                                                     *
C*         CALSPAN CORPORATION                                               *
C*         15 MAY 1975                                                       *
C*                                                                           *
C***************************************************************************
```

```
C**********************************  SOURIN  ******************************
C*                                                                        *
C*                              SUBROUTINE SOURIN                         *
C*                                                                        *
C*     PURPOSE                                                            *
C*         READS SOURCES, TESTS SOURCES FOR ERRORS, AND DETERMINES        *
C*         BUCKET SIZES.                                                  *
C*                                                                        *
C*     AUTHOR/PROGRAMMER                                                  *
C*         JOHN R. MENIG                                                  *
C*         CALSPAN CORPORATION                                            *
C*         25 APRIL 1975                                                  *
C*                                                                        *
C************************************************************************
```

```
C********************************** STEP2 **********************************
C*                                                                         *
C*                          MAIN PROGRAM STEP2                             *
C*                                                                         *
C*     PURPOSE                                                             *
C*         CALLS ROUTINES TO INPUT NAMES, RECONSTRUCT COURSE BLOCKS,       *
C*         CALCULATE AIR BASE DEMANDS, GENERATE RESOURCES, AND             *
C*         GENERATE SOURCES.                                               *
C*                                                                         *
C*     SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                        *
C*         FMTNAM - INPUTS NAMES                                           *
C*         PRCOUR - RECONSTRUCTS COURSES                                   *
C*         ARBASE - CALCULATES AIR BASE DEMANDS                            *
C*         RESSOR - GENERATES RESOURCES AND SOURCES                        *
C*                                                                         *
C*     AUTHOR/PROGRAMMER                                                   *
C*         JOHN R. MENIG                                                   *
C*         CALSPAN CORPORATION                                             *
C*         6 MAY 1975                                                      *
C*                                                                         *
C*************************************************************************
```

```
C********************************  TSSYN  ********************************
C*                                                                        *
C*                            SUBROUTINE TSSYN                            *
C*                                                                        *
C*     PURPOSE                                                            *
C*         TESTS THAT PROC BLOCKS THAT ARE SYNCHRONIZED FORM A CIRCULAR   *
C*         LIST CONTAINING MORE THAN ONE BLOCK BUT LESS THAN A            *
C*         PREDETERMINED MAXIMUM NUMBER OF BLOCKS.                        *
C*                                                                        *
C*     AUTHOR/PROGRAMMER                                                  *
C*         JOHN R. MENIG                                                  *
C*         CALSPAN CORPORATION                                            *
C*         23 APRIL 1975                                                  *
C*                                                                        *
C************************************************************************
```

```
C********************************  UPDRES  ********************************
C*                                                                        *
C*                              SUBROUTINE UPDRES                         *
C*                                                                        *
C*    PURPOSE                                                             *
C*        UPDATES RESOURCE LISTS WHEN CLOCK TIME HAS CHANGED              *
C*                                                                        *
C*    AUTHOR/PROGRAMMER                                                   *
C*        JOHN R. MENIG                                                   *
C*        CALSPAN CORPORATION                                             *
C*        28 APRIL 1975                                                   *
C*                                                                        *
C************************************************************************
```

```
C********************************** UPDSOR ******************************
C*                                                                      *
C*                          SUBROUTINE UPDSOR                           *
C*                                                                      *
C*   PURPOSE                                                            *
C*       UPDATES SORCE LISTS WHEN CLOCK TIME HAS CHANGED                *
C*                                                                      *
C*   AUTHOR/PROGRAMMER                                                  *
C*       JOHN R. MENIG                                                  *
C*       CALSPAN CORPORATION                                            *
C*       28 APRIL 1975                                                  *
C*                                                                      *
C************************************************************************
```

Section 2.4

CROSS REFERENCE TABLES FOR ROUTINES AND VARIABLES USED IN COMMONS

CROSS REFERENCE USAGE CODES

A **ARGUMENT**

THE SYMBOL IS A VARIABLE OR FUNCTION NAME WHICH APPEARS IN AN ARGUMENT LIST OF A CALL, SUBROUTINE, FUNCTION, OR ENTRY STATEMENT.

D **DATA INITIALIZATION**

THE SYMBOL IS A VARIABLE WHICH IS INITIALIZED IN A DATA OR TYPE SPECIFICATION STATEMENT SUCH AS A COMPLEX SPECIFICATION STATEMENT.

F **FETCH A VALUE**

THE SYMBOL IS A:

1. VARIABLE WHOSE MOST RECENTLY ASSIGNED VALUE IS ACCESSED BUT NOT CHANGED.
2. FUNCTION NAME OR ARGUMENT OF A FUNCTION WHICH APPEARS ON THE RIGHT SIDE OF AN EQUAL SIGN IN AN ASSIGNMENT STATEMENT OR APPEARS IN AN IF STATEMENT TEST.
3. DUMMY ARGUMENT IN A STATEMENT FUNCTION DEFINITION.

S **STORE A VALUE**

THE SYMBOL IS A:

1. VARIABLE WHOSE VALUE IS REPLACED BY ANOTHER VALUE.
2. FUNCTION NAME WHICH APPEARS ON THE LEFT SIDE OF AN EQUAL SIGN IN AN ASSIGNMENT STATEMENT.
3. NAME OF A STATEMENT FUNCTION IN THE DEFINITION OF THAT FUNCTION.

C **COMMON**

THE SYMBOL IS A VARIABLE WHICH APPEARS IN A COMMON STATEMENT OR IS THE NAME OF A LABELED COMMON BLOCK.

E **EQUIVALENCE**

THE SYMBOL IS A VARIABLE WHICH APPEARS IN AN EQUIVALENCE STATEMENT.

T **TYPE SPECIFICATION**

THE SYMBOL IS A VARIABLE WHICH APPEARS IN A :

1. TYPE SPECIFICATION STATEMENT AND IS NOT INITIALIZED IN THAT STATEMENT.
2. DIMENSION OR EXTERNAL STATEMENT.

N **ENTRY POINT**

THE SYMBOL IS AN ENTRY POINT DEFINED BY AN ENTRY STATEMENT IN A SUBROUTINE OR FUNCTION.

X **EXTERNAL REFERENCE**

THE SYMBOL IS A SUBROUTINE OR ENTRY NAME WHICH APPEARS IN A CALL STATEMENT.

CROSS REFERENCE SUMMARY ********** STEP2 **********

SYMBOL	TYPE	USAGE SUMMARY											
		MAIN	PRCOUR	CURSIN	PRPROC	PRTASK	PRROUB	PRROUBB	GRADBK	TSSYN	PROCLP	ROUBLP	SORTLK
ALERTR	R												
C	R												
CH	R												
CONTRL	CB												
CPATTR	R												
CRECY	R												
CREW	R												
CREWR	R												
D	R												
DH	R												
DPATTR	R												
DUMMY	CB		C	C	C	C	C	C	C	C	C	C	C
ERROR	L		FSC T	C T	SC T	C T	C T	C T	SC T	SC T	SC T	SC T	C T
HRBUCK	R												
HRCRBK	R												
HRSCU	R												
IAB	I												
IABCN	I												
IABC1	I												
IABDN	I												
IABD1	I												
IABEN	I												
IABE1	I												
IABPCN	I												
IABPC1	I												
IABPN	I												
IABP1	I												

CROSS REFERENCE SUMMARY ********** STEP2 **********

SYMBOL	TYPE	USAGE SUMMARY											
		CURSOR	ARBASE	ARIN	CCTS	PMT	RECOVR	DISTAC	DISTCW	MNCREW	CURTIM	MAXTRK	PRTCRS
ALERTR	R		C	SC	C	F C	C	C	C	C			C
C	R		C	C	FSC	F C	C	C	SC	C			C
CH	R		C	C	C	FSC	C	C	C	C			C
CONTRL	CB			C									
CPATTR	R		C	FSC	F C	C	C	C	C	C			C
CRECY	R		C	SC	FSC	C	F C	C	C	C			C
CREW	R		C	C	F C	F C	C	C	C	SC			C
CREWR	R		C	SC	C	C	C	C	C	F C			C
D	R		C	C	FSC	F C	C	C	SC	C			C
DH	R		C	C	C	FSC	C	C	C	C			C
DPATTR	R		C	FSC	F C	C	C	C	C	C			C
DUMMY	CB	C	C	C	C	C	C	C	C	C	C	C	C
ERROR	L	C T	FSC T	SC T	SC T	SC T	C T	C T	C T	SC T	C T	C T	C T
HRBUCK	R		C	SC	C	F C	C	C	C	C			C
HRCRBK	R		C	SC	C	F C	C	C	C	C			C
HRSCU	R		C	FSC	C	F C	C	C	C	C			C
IAB	I		FSC	FSC	A F C	F C	C	F C	C	F C			C
IABCN	I		C	FSC	F C	C	C	C	C	C			C
IABC1	I		C	SC	F C	C	C	C	C	C			C
IABDN	I		C	FSC	C	C	C	F C	C	C			C
IABD1	I		C	SC	C	C	C	F C	C	C			C
IAPEN	I		C	FSC	C	F C	C	C	C	F C			C
IABE1	I		C	SC	C	F C	C	C	C	F C			C
IABPCN	I		C	FSC	C	F C	C	C	C	C			C
IABPC1	I		C	SC	C	F C	C	C	C	C			C
IABPN	I		C	FSC	C	F C	C	C	C	C			C
IABP1	I		C	SC	C	F C	C	C	C	C			C

CROSS REFERENCE SUMMARY ********** STEP2 **********

SYMBOL	TYPE	USAGE SUMMARY								
		FMTNAM	*BLOCK	NAME	NUMBER	GENRES	GENSOR	RESRIN	RESSOR	SOURIN
ALERTR	R									
C	R									
CH	R									
CONTRL	CB					C	C			
CPATTR	R									
CRECY	R									
CREW	R									
CREWR	R									
D	R									
DH	R									
DPATTR	R									
DUMMY	CB									
ERROR	L					C T	C T	SC T		SC T
HRBUCK	R									
HRCRBK	R									
HRSCU	R									
IAB	I									
IABCN	I									
IABC1	I									
IABDN	I									
IABD1	I									
IABEN	I									
IABE1	I									
IABPCN	I									
IABPC1	I									
IABPN	I									
IABP1	I									

CROSS REFERENCE SUMMARY ********** STEP2 **********

SYMBOL	TYPE	USAGE SUMMARY											
		MAIN	PRCOUR	CORSIN	PRPROC	PRTASK	PRRUB	PRROOB	CRAUBK	ISSYN	PROCLP	RUBBLP	SORTLK
IAC	I												
IAVAIL	I		C	FSC	C	C	C	C	C	C	C	C	C
IBLOCK	I		C	SC	CE	CE	CE	CE	CE	CE	C	CE	CE
IBUCKT	I												
ICATTD	I												
ICBUCK	I												
ICOUPC	I												
ICOURC	I												
ICRECT	I												
ICTYPE	I		C	SC	C	C	C	C	C	C	C	C	C
ICUYR	I												
IDATEC	I												
IDATED	I												
IDATEE	I												
IDATEP	I												
IDATPC	I												
IDATTD	I												
IEGRAD	I		C	SC	C	C	C	C	C	C	C	C	C
IFIRST	I			FS									
IFUNC	I												
IGRAD	I		C	C	C	C	C	C	SC	C	F C	C	C
ILAST	I												
INVAC	I												
INVC	I												
INVD	I												
INVO	I												
INVP	I												

CROSS REFERENCE SUMMARY ********** STEP2 **********

SYMBOL	TYPE	USAGE SUMMARY											
		CORSOT	ARBASE	ABIN	CCIS	PMT	RECOVR	DISTAC	DISTCW	MNCREW	CORTIM	MAXTRK	PRICRS
IAC	I		C	C	F C	C	C	FSC	C	F C			C
IAVAIL	I	C									C	C	
IBLOCK	I	F C									C	C	
IBUCKT	I		C	FSC	F C	F C	F C	C	C	C			C
ICATTD	I		C	FSC	F C	C	C	C	C	C			C
ICBUCK	I			SC									
ICOUPC	I		C	FSC	C	F C	C	C	C	C			C
ICOURC	I		C	FSC	F C	C	C	C	C	C			C
ICRECT	I			FSC									
ICTYPE	I	F C									C	C	
ICUYR	I		C	FSC	F C	F C	F C	C	C	C			C
IDATEC	I		C	SC	F C	C	C	C	C	C			C
IDATED	I		C	SC	C	C	C	F C	C	C			C
IDATEE	I		C	SC	C	F C	C	C	C	F C			C
IDATEP	I		C	SC	C	F C	C	C	C	C			C
IDATPC	I		C	SC	C	F C	C	C	C	C			C
IDATTD	I		C	FSC	F C	C	C	C	C	C			C
IEGRAD	I	F C									C	C	
IFIRST	I					FS		FS		FS			
IFUNC	I												
IGRAD	I	F C									F C	C	
ILAST	I					FS	FS	FS		FS			
INVAC	I		C	SC	C	C	C	F C	C	C			C
INVC	I		C	SC	F C	C	C	C	C	C			C
INVD	I		C	SC	F C	C	C	C	C	C			C
INVO	I		C	SC	C	C	C	C	C	C			C
INVP	I		C	SC	F C	C	C	C	C	C			C

CROSS REFERENCE SUMMARY ********** STEP2 **********

SYMBOL	TYPE	USAGE SUMMARY								
		FMTNAM	*BLOCK	NAME	NUMBER	GENRES	GENSCR	RESRIN	RESSCR	SOURIN
IAC	I									
IAVAIL	I									
IBLOCK	I									
IBUCKT	I									
ICATTD	I									
ICBUCK	I									F C
ICOUPC	I									
ICOURC	I									
ICRECT	I									F C
ICTYPE	I									
ICUYR	I									
IDATEC	I									
IDATED	I									
IDATEE	I									
IDATEP	I									
IDATPC	I									
IDATTD	I									
IEGRAD	I									
IFIRST	I	FSC	C	F C	F C					
IFUNC	I					C	C	FSC		FSC
IGRAD	I									
ILAST	I									
INVAC	I									
INVC	I									
INVD	I									
INVU	I									
INVP	I									

CROSS REFERENCE SUMMARY ********** STEP2 **********

SYMBOL	TYPE	USAGE SUMMARY											
		MAIN	PRCOUR	CURSIN	PRPROC	PRTASK	PRRJB	PRRUDB	GRADBK	TSSYN	PROCLP	RUDBLP	SCRTLK
IDATTD	I												
IPARM1	I												
IPARM2	I												
IPARM3	I												
IPARM4	I												
IPARM5	I												
IPATTD	I												
IPERC	I												
IPEROD	I		C	SC	C	C	C	C	C	C	C	C	C
IPERTP	I												
IPMT	I												
IPRIOR	I		C	SC	C	C	C	C	C	C	C	C	C
IPTYPE	I		C	SC	C	C	C	C	C	C	C	C	C
IQANTD	I												
IRES1	I												
ISOR1	I												
ISTACK	I										FSC	FSC	
ITIME	I												
ITIMEH	I												
ITIMEL	I												
ITL	I												
ITN	I												
ITYPE	I												
ITI	I												
IUNIT	I			EFS									
IWORD	I		C	SC	FSC	FSC	FSC	FSC	F C	F C	F C	F C	FSC
JPMT	I												

CROSS REFERENCE SUMMARY ********** STEP2 **********

SYMBOL	TYPE	USAGE SUMMARY											
		CURSOT	ARBASE	ABIN	CCTS	PMT	RECOVR	DISTAC	DISTCW	MNCREW	CORTIM	MAXTRK	PRTCRS
IDATTD	I		C	FSC	F C	C	C	C	C	C			C
IPARM1	I												
IPARM2	I												
IPARM3	I												
IPARM4	I												
IPARM5	I												
IPATTD	I		C	FSC	F C	C	C	C	C	C			C
IPERC	I		C	SC	F C	C	C	C	C	C			C
IPEROD	I	F C	C	SC	C	F C	C	C	C	C	C	C	C
IPERTP	I		C	SC	C	F C	C	C	C	C			C
IPMT	I		C	SC	C	F C	C	C	C	C			C
IPRIOR	I	F C									C	C	
IPTYPE	I	F C									C	C	
IQANTD	I		C	SC	C	C	C	F C	C	C			C
IRES1	I												
ISOR1	I												
ISTACK	I											FSC	
ITIME	I				FS		FS						
ITIMEH	I												
ITIMEL	I												
ITL	I		C	SC	C	F C	C	C	C	C			C
ITN	I												
ITYPE	I												
IT1	I												
IUNIT	I	DF		DF	DF	DF	DF						
IWORD	I	F C									C	F C	
JPMT	I		C	SC	C	F C	C	C	C	C			C

CROSS REFERENCE SUMMARY ********** STEP2 **********

SYMBOL	TYPE	USAGE SUMMARY								
		FMTNAM	*BLOCK	NAME	NUMBER	GENRES	GENSUR	RESRIN	RESSUR	SOURIN
IDATTD	I									
IPARM1	I					F C	F C	SC		SC
IPARM2	I					F C	F C	FSC		FSC
IPARM3	I					C	C	SC		SC
IPARM4	I					C	C	SC		SC
IPARM5	I					C	C	SC		SC
IPATTD	I									
IPERC	I									
IPEROD	I									
IPERTP	I									
IPMT	I									
IPRIOR	I									
IPTYPE	I									
IQANTD	I									
IRES1	I					F C		SC		
ISOR1	I						F C			SC
ISTACK	I									
ITIME	I									
ITIMEH	I					FS	FS			
ITIMEL	I					FS	FS			
ITL	I									
ITN	I					F C	F C	SC		SC
ITYPE	I	F C	D C	F C	F C					
ITI	I					F C	F C	SC		SC
IUNIT	I	F C	D C	C	C	DF	DF	DF		DF
IWORD	I									
JPMT	I									

CROSS REFERENCE SUMMARY ********** STEP2 **********

SYMBOL	TYPE	USAGE SUMMARY											
		MAIN	PRCOUR	CORSIN	PRPROC	PRTASK	PRRUE	PRRUDB	GRADBK	TSSYN	PROCLP	RUDBLP	SORTLK
JSTACK	I										FSC	FSC	
JUNIT	I												
LBKIN	I		C	FSC	C	C	C	C	C	C	C	C	C
LBKOUT	I		C	FSC	CE	CE	CE	CE	CE	CE	C	CE	CE
LBUCKT	I												
MAB	I												
MABC	I												
MABD	I												
MABE	I												
MABH	I												
MABP	I												
MABPC	I												
MAXLEN	CB												
MAXNUM	I												
MAXTIM	I												
MAXTRK	I												
MBUCKT	I												
MSTACK	I										FSC	FSC	
MXBUCK	I												
MXCOUR	I		C	FSC	C	C	C	C	C	C	C	C	C
MXRES	I												
MXRESC	I												
MXSIZE	I		C	SC	C	C	C	C	C	C	C	C	C
MXSUR	I												
MXSORC	I												
MXTIME	I												
NAB	I												

CROSS REFERENCE SUMMARY ********** STEP2 **********

SYMBOL	TYPE	USAGE SUMMARY												
		CORSUT	AREASE	ABIN	CCTS	PMT	RECOVR	DISTAC	DISTCW	MNCREW	CORTIM	MAXTRK	PRTCRS
JSTACK	I												
JUNIT	I											FSC	
LBKIN	I	C											
LBKOUT	I	F C									C	C	
LBUCKT	I										C	C	
MAB	I		C	F C	C	C	C	C	C	C			
MABC	I		C	FSC	C	C	C	C	C	C			C
MABD	I		C	FSC	C	C	C	C	C	C			C
MABE	I		C	FSC	C	C	C	C	C	C			C
MABH	I		C	SC	C	C	C	C	C	C			C
MABP	I		C	FSC	C	C	C	C	C	C			C
MABPC	I		C	FSC	C	C	C	C	C	C			C
MAXLEN	CB				C	C							
MAXNUM	I										C		
MAXTIM	I				C	F C							
MAXTRK	I										SC		
MBUCKT	I		C	FSC	C	C	C	C	C	C	F	FS	
MSTACK	I												C
MXBUCK	I		C	FSC	F C	F C	F C	F C	F C	F C		SC	
MXCOUR	I	C											C
MXRES	I										C	C	
MXRESC	I												
MXSIZE	I	F C											
MXSOR	I										C	C	
MXSORC	I												
MXTIML	I			FSC									
NAB	I		F C	FSC	F C	C	C	C	C	C			C

CROSS REFERENCE SUMMARY ********** STEP2 **********

SYMBOL	TYPE	USAGE SUMMARY								
		FMTNAM	*BLOCK	NAME	NUMBER	GENRES	GENSUR	RESRIN	RESSCR	SOURIN
JSTACK	I									
JUNIT	I	F C	D C	C	C			DF		DF
LBKIN	I									
LBKOUT	I									
LBUCKT	I					F C	F C	FSC		FSC
MAB	I									
MABC	I									
MABD	I									
MABE	I									
MABH	I									
MABP	I									
MABPC	I									
MAXLEN	CB									
MAXNUM	I	F C	D C	C	C					
MAXTIM	I									
MAXTRK	I									
MBUCKT	I									
MSTACK	I									
MXBUCK	I									
MXCOUR	I									
MXRES	I					C		FSC		
MXRESC	I					C		FSC		
MXSIZE	I									
MXSOR	I						C			FSC
MXSORC	I						C			FSC
MXTIME	I					F C	F C			
NAB	I									

CROSS REFERENCE SUMMARY ********** STEP2 **********

SYMBOL	TYPE	USAGE SUMMARY											
		MAIN	PRCOUR	CORSIN	PRPROC	PRTASK	PRRUB	PRRUBB	GRADBK	TSSYN	PRBCLP	RUBBLP	SUBTLK
NABC	I												
NABD	I												
NABE	I												
NABH	I												
NABP	I												
NABPC	I												
NAM	CB												
NAME	I												
NAMES	I												
NBLOCK	I		C	SC	CE	CE	CE	CE	CE	CE	C	CE	CE
NCORS	I												
NCOURS	I		C	FSC	C	C	C	C	F C	C	F C	C	C
NOPRNT	L												
NPARM	I												
NRES	I												
NRESR	I												
NSOR	I												
NSOUR	I												
NSTACK	I												
NTYPE	I										FSC	FSC	
NUM	I												
NUMBER	I												
NWORDS	I		C	FSC	C	C	C	C	C	C	C	C	C
NYEARS	I												
O	R												
OH	R												
OPATTR	R												

CROSS REFERENCE SUMMARY ********** STEP2 **********

SYMBOL	TYPE	USAGE SUMMARY											
		CURSOT	ARBASE	ABIN	CCTS	PMT	RECOVR	DISTAC	DISTCW	MNCREW	CORTIM	MAXTSK	PRTCRS
NABC	I		C	FSC	C	C	C	C	C	C			C
NABD	I		C	FSC	C	C	C	C	C	C			C
NABE	I		C	FSC	C	C	C	C	C	C			C
NABH	I		C	FSC	C	C	C	C	C	C			C
NABP	I		C	FSC	C	C	C	C	C	C			C
NABPC	I		C	FSC	C	C	C	C	C	C			C
NAM	C6												
NAME	I												
NAMES	I												
NBLOCK	I	F C									C	C	
NCORS	I		C	FSC	C	C	C	C	C	C			F C
NCOURS	I	F C				FS					F C	C	
NOPRNT	L		C T	FSC T	F C T	C T	F C T	C T	C T	C T			F C T
NPARM	I												
NRES	I												
NRESR	I												
NSOR	I												
NSOUR	I												
NSTACK	I											FSC	
NTYPE	I												
NUM	I												
NUMBER	I												
NWORDS	I	C									C	C	
NYEARS	I		C	FSC	C	C	F C	C	C	C			F C
O	R		C	C	FSC	F C	C	C	SC	C			C
OH	R		C	C	C	FSC	C	C	C	C			C
OPATTR	R		C	FSC	F C	C	C	C	C	C			C

CROSS REFERENCE SUMMARY ********** STEP2 **********

SYMBOL	TYPE	USAGE SUMMARY								
		FMINAM	*BLOCK	NAME	NUMBER	GENRES	GENSOR	RESRIN	RESSOR	SOURIN
NABC	I									
NABD	I									
NABE	I									
NABH	I									
NABP	I									
NABPC	I									
NAM	CB	C	C	C	C					
NAME	I				A F T					
NAMES	I	FSC	C	F C	F C					
NBLOCK	I									
NCORS	I									
NCOURS	I									
NOPRNT	L									
NPARM	I					C	C	FSC		FSC
NRES	I					F C		FSC		
NRESR	I					F C		FSC		
NSOR	I						F C			FSC
NSOUR	I						F C			FSC
NSTACK	I									
NTYPE	I	F C	D C	F C	F C					
NUM	I	FSC	C	F C	F C					
NUMBER	I			A F						
NWORDS	I									
NYEARS	I									
O	R									
OH	R									
OPATTR	R									

CROSS REFERENCE SUMMARY ********** STEP2 **********

SYMBOL	TYPE	USAGE SUMMARY											
		MAIN	PRCOUR	CURSIN	PRPROC	PRTASK	PRRUB	PRRUDB	GRABBK	TSSYN	PRCELP	RUDBLP	SORTLK
P	R												
PCC	R												
PCPC	R												
PCRECV	R												
PH	R												
PPATTR	R												
RECVRY	CB												
RESURS	CB												
SOURCE	CB												
STACK	CB										C	C	
STUDS	R												
WKSBKT	R												

CROSS REFERENCE SUMMARY ********** STEP2 **********

SYMBOL	TYPE	USAGE SUMMARY											
		CURSOR	ARBASE	ABIN	CCTS	PMT	RECOVR	DISTAC	DISTCW	MNCREW	CURTIM	MAXTRK	PRTCRS
P	R		C	C	FSC	F C	C	C	SC	C			C
PCC	R		C	SC	F C	C	C	C	C	C			C
PCPC	R		C	SC	C	F C	C	C	C	C			C
PCREGY	R		C	FSC	C	C	F C	C	C	C			C
PM	R		C	C	C	FSC	C	C	C	C			C
PPATTR	R		C	FSC	F C	C	C	C	C	C			C
RECVRY	CB			C									
RESURS	CB												
SOURCE	CB												
STACK	CB											C	
STUDS	R		C	SC	FSC	FSC	C	C	C	C			F C
WKSBKT	R		C	FSC	C	C	C	C	C	C			C

CROSS REFERENCE SUMMARY ********** STEP2 **********

SYMBOL	TYPE	USAGE SUMMARY								
		FMTNAM	*BLOCK	NAME	NUMBER	GENRES	GENSCR	RESRIN	RESSCR	SOURIN
P	R									
PCC	R									
PCPC	R									
PCRECV	R									
PM	R									
PPATTR	R									
RECVRY	CB									C
RESURS	CB					C		C		
SOURCE	CB						C			C
STACK	CB									
STUDS	R									
WKSBKT	R									

SUBROUTINE CROSS REFERENCE SUMMARY ********** STEP2 **********

ROUTINE OR ENTRY	USAGE SUMMARY											
	MAIN	PRCOUR	CORSIN	PRPROC	PRTASK	PRRUB	PRRUDB	GRADBK	TSSYN	PROCLP	RUDELP	SORTLK
ABIN												
ARBASE	X											
CCTS												
CORSIN		X										
CORSOT		X										
CORTIM												
DISTAC												
DISTCW												
FMTNAM	X											
GENRES												
GENSOR												
GRADBK		X										
MNCREW												
NAME												
PMT												
PRCOUR	X											
PROCLP		X										
PRPROC		X										
PRRUB		X										
PRRUDB		X										
PRTASK		X										
PRTCRS												
RECOVR												
RESSOR	X											
RUDELP		X										
SORTLK		X										
SOURIN												

SUBROUTINE CROSS REFERENCE SUMMARY ********** STEP2 **********

ROUTINE OR ENTRY — USAGE SUMMARY

	CORSOT	ARBASE	ABIN	CCTS	PMT	RECOVR	DISTAC	DISTCW	MNCREW	CORTIM	MAXTRK	PRTCRS
ABIN		X										
ARBASE												
CCTS		X										
CORSIN												
CORSOT												
CORTIM		X										
DISTAC		X										
DISTCW		X										
FMTNAM												
GENRES												
GENSOR												
GRADBK												
MNCREW		X										
NAME				X								X
PMT		X										
PRCOUR												
PROCLP												
PRPROC												
PRRUB												
PRRUDB												
PRTASK												
PRTCRS		X										
RECOVR		X										
RESSOR												
RUDBLP												
SORTLK												
SOURIN												

SUBROUTINE CROSS REFERENCE SUMMARY ********** STEP2 **********

ROUTINE OR ENTRY | USAGE SUMMARY

	FMTNAM	*BLOCK	NAME	NUMBER	GENRES	GENSOR	RESRIN	RESSOR	SOURIN
ABIN									
ARBASE									
CCTS									
CORSIN									
CORSOT									
CORTIM									
DISTAC									
DISTCW									
FMTNAM									
GENRES								X	
GENSOR								X	
GRADBK									
MNCREW									
NAME									
PMT									
PRCOUR									
PRDCLP									
PRPROC									
PRRUB									
PRRUDB									
PRTASK									
PRTCRS									
RECOVR									
RESSOR									
RUDBLP									
SORTLK									
SOURIN								X	

SUBROUTINE CROSS REFERENCE SUMMARY ********** STEP2 **********

ROUTINE OR ENTRY — USAGE SUMMARY

	MAIN	PRCOUR	CORSIN	PRPROC	PRTASK	PRRUB	PRRUDB	GRADER	TSSYN	PRICLP	RUBCLP	SORTLK
TSSYN		X										

SUBROUTINE CROSS REFERENCE SUMMARY ********** STEP2 **********

ROUTINE OR ENTRY

USAGE SUMMARY

	CORSOT	ARBASE	ABIN	CCTS	PMT	RECOVR	DISTAC	DISTCW	MNCREW	CCRTIM	MAXTRK	PRTCRS
TSSYN												

SUBROUTINE CROSS REFERENCE SUMMARY ********** STEP2 **********

ROUTINE OR ENTRY — USAGE SUMMARY

	FMTNAM	*BLOCK	NAME	NUMBER	GENRES	GENSOR	RESRIN	RESSOR	SOURIN
TSSYN									

Section 3.0

TRAM PHASE 3

3.1 Introduction

The purpose of this section is to supplement the data in Technical Memorandum SAT-5, TRAM User's Guide with respect to Phase 3 of TRAM. This Programmer's Guide consists of a description of the data management system used in Phase 3, a listing of the input and output data sets, subroutine description and flow diagrams, cross reference tables and block descriptions.

In addition to the description of the data management system, the reader should note the capability for varying the dimensions of Phase 3 as described in Section 7.

3.1.1 Data Management

Because of the dynamic data flow in the Phase 3 TRAM Program, the standard FORTRAN array and indexing structures are inadequate in terms of core utilization and computational efficiency.

Most of the information used by the program is grouped into blocks of data that are organized using singly linked lists. The formats of the different blocks used are presented in Section 3.7. This method makes it possible to add and delete blocks to the lists without a need for periodic reorganization.

The procblocs, task blocks, resource utilization blocks (RUBs) and resource utilization description blocks (RUDBs) share a common pool of storage in common BLKS and are accessed directly by their addresses. Subroutine BLOCK is used to copy any of these blocks into local storage.

3.2 Description Of Inputs

The inputs consist of a limited number of cards described in SAT-5, TRAM User's Guide and the following data sets:

Training Demand Records

Training demand records (Figure 3.1) are written out by the Phase 2 TRAM program on either tape or disk. They are 6 words long and written without using a format statement.

Before use in Phase 3 of TRAM, the training demand records are sorted on time in decreasing order.

Resource Inventories

The resource inventory records (Figure 3.2) are written out by the Phase 2 TRAM program on either disk or tape. They are 3 words long and written without using a format statement.

The resource records are sorted in decreasing order by time.

Trainee Inventories

The source records (Figure 3.3) describe the trainee inventories. These records are written by the Phase 2 TRAM program on either disk or tape. They are 3 words long and are written without using a format statement.

The source records are sorted in decreasing order by time.

Description Of Training Program

The Training Program (also referred to as courses) is described by means of Procblocs, Task Blocks, Resource Utilization Blocks and Resource Utilization Description Blocks. The detailed formats of these data blocks are given in Section 3.7.

These blocks are read into core from FORTRAN Unit 20 when the CLOCK subroutine is invoked for the first time. The addresses of the first procbloc for each course (the Graduation Block) are stored in array IADPB1 in common CBLK. Each procbloc points to the procbloc(s) lying to the left and right of it and to the tasks associated with it. Task blocks point to RUBs and RUBs

Figure 3.1

```
*****************************************************************
*                                                               *
*    T R A I N I N G   D E M A N D   R E C O R D                *
*                                                               *
*****************************************************************
*         *                                                     *
* WORD    *    D E S C R I P T I O N                            *
*         *                                                     *
*****************************************************************
*         *                                                     *
*    1    *TIME                                                *
*    2    *QUANTITY (FLOATING POINT NUMBER OF TRAINEES).       *
*    3    * TYPE OF PERSONNEL. 1- PILOTS                       *
*         *                    2- COPILOTS                      *
*         *                    3- OSOS                          *
*         *                    4- DSOS                          *
*    4    *COURSE NUMBER                                       *
*    5    *DEMAND NUMBER = AIR BASE NUMBER * 1000 + BUCKET NO. *
*    6    *DEMAND TYPE.   1-CCTS BECAUSE OF DELIVERIES.        *
*         *                2-CCTS BECAUSE OF ATTRITION.        *
*         *                3-PMP                               *
*         *                                                    *
*****************************************************************
```

Figure 3.2

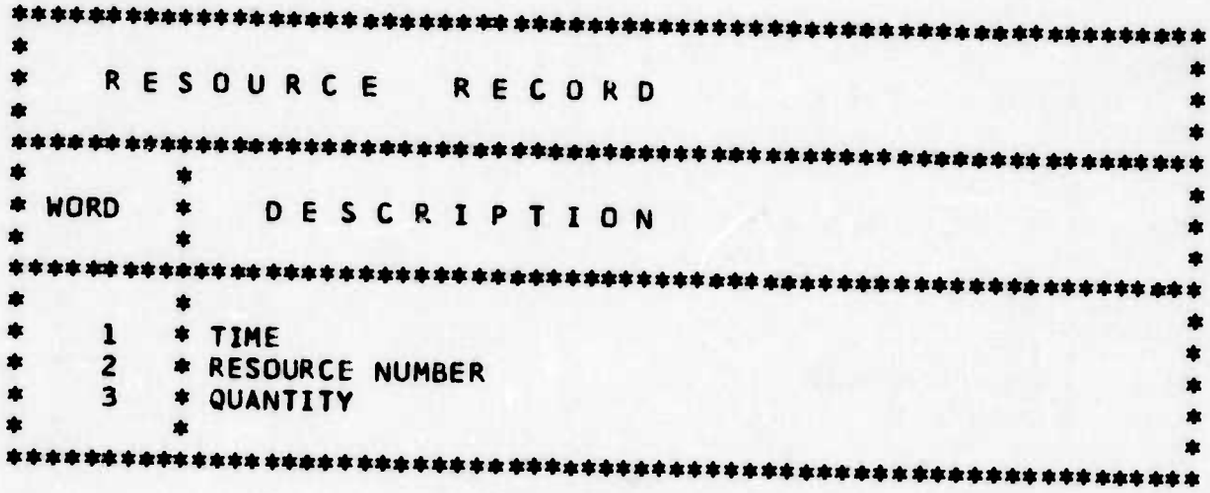

RESOURCE RECORD
WORD
DESCRIPTION
1
TIME
2
RESOURCE NUMBER
3
QUANTITY

Figure 3.3

SOURCE RECORD	
WORD	DESCRIPTION
1	TIME
2	SOURCE NUMBER
3	QUANTITY

in turn point to the RUDBs. This linked structure permits quick access (using subroutine BLOCK) to information required for performing the different functions of the program (i.e., Class Transfer Tasks, Resource Utilization Tasks, etc.)

Class blocks, stored in common CLASSB, are created for each new class of students entering a course at the graduation block and for every time that an existing class is split among different tracks. Class blocks are deleted from the list whenever a procbloc without a left branch is executed. Subroutine NEWCLS creates class blocks and subroutine REMCLS deletes them.

Predetermined transfer blocks, stored in common PTBC, are created by subroutine FRMPTB when a source allocation task (SCATSA) is executed. The pointer to the first PTB is placed in the class block. After a PTB is used to control a class transfer at a node, it is deleted and the space it used is released by subroutine REMPTB. The pointer in the class block is updated to point to the next PTB.

Look-up and updates of resource and source inventories are done by using subroutines GETRES, PUTRES, GETSOR and PUTSOR. Resource and source inventories are stored on tape or disk. When subroutine clock is called for the first time, the buffers allocated to the inventories are filled with data starting at the simulation clock time and extending as far back as space permits. Every time that the subroutine clock is called, inventory records for times greater than the simulation clock time are written out on tape or disk, and the core thus made available is used to read in resource and source inventories for an earlier time.

3.3 Description Of Outputs

The outputs of the Phase 3 TRAM program consist of:

1. Echo of inputs.
2. Resource inventories remaining after training demands have been satisfied.
3. Trainee (Source) inventories remaining after training demands have been satisfied.
4. Lag records.
5. Source allocation records.
6. Warning and error and normal end messages.

Items 2-5 are described below. Items 1 and 6 are described in detail in SAT-5.

Resource Inventories

The output resource inventory records are identical in form to the input resource inventory records (Figure 3.2).

The input inventory minus the output inventory for any given time interval is the amount of the resource consumed during that time to satisfy the training requirements.

Source Inventories

The output source inventory records are identical in form to the input source inventory records (Figure 3.3).

The input inventory minus the output inventory for any time interval is the number of trainees from that particular source actually assigned to the training program during that time interval.

Lag Records

The lag records (Figure 3.4) are written out on tape or disk by the Phase 3 TRAM program whenever a class has to be lagged.

Note - Processing in TRAM 3 is done in reverse time order (i.e. last PROCBLOC of a course is done first, first PROCBLOC is done last.) Thus when a class is lagged, the net effect is to force something to occur at an earlier date.

Figure 3.4

LAG RECORD

WORD	DESCRIPTION
1	1
2	CLASS ADRESS
3	CURRENT CLASS TIME (TIME AT WHICH LAG STARTS).
4	COURSE NUMBER
5	PROCBLOCK NUMBER
6	TASK NUMBER
7	0
8	0
9	DURATION OF CURRENT PROCBLOCK.
10	LAG DURATION
11	LAG REASON. 1- RESOURCE ALLOCATION FAILURE. 6- SYNCHRONIZATION FAILURE. 7- CORRELATION FAILURE.
12	ID. OF SCARCE RESOURCE. (APPLICABLE ONLY IF WORD 11 IS A 1)
13	UNIQUE CLASS NUMBER.

Source Allocation Records

The source allocation records (Figure 3.5) are written out on tape or disk by the Phase 3 TRAM program each time a class of students is matriculated in a course.

A potential discrepancy can arise between the matriculation date established by subroutine SCATSA and the actual matriculation date.

SCATSA assigns classes to sources on the basis of track priorities, allocation proportions and availability of trainees. Once the assignments are made, the classes will follow the established tracks. However, if lags occur due to resource unavailability or synchronization or correlation failure, a class may reach the matriculation block at an earlier time than predicted by SCATSA.

The source allocation records are written when the class reaches the matriculation procbloc and the 'GETSOURCE' task is executed.

The large time interval used for trainee inventories should serve to minimize this possible problem.

Figure 3.5

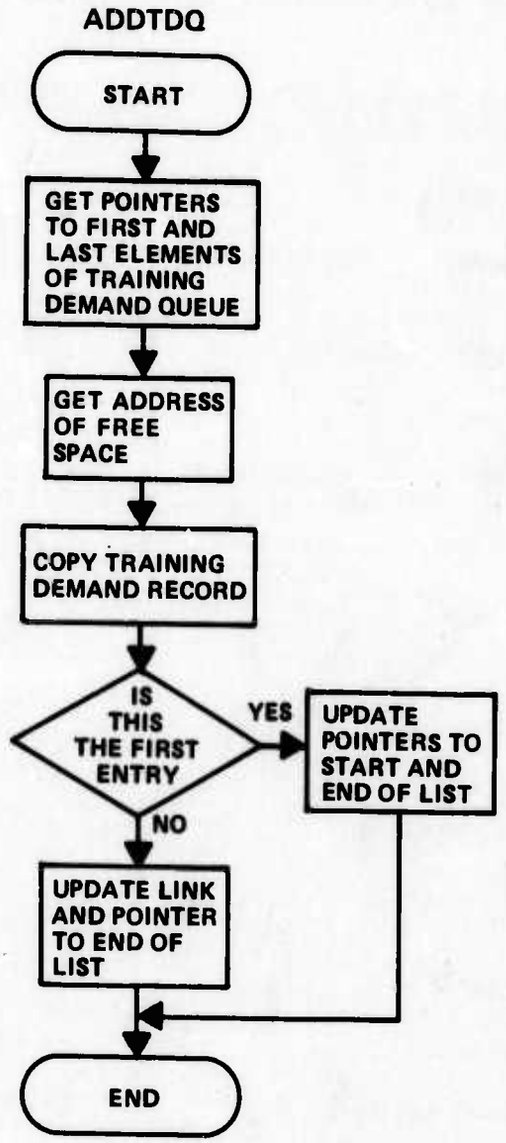
SOURCE ALLOCATION RECORD.

WORD	DESCRIPTION
1	2
2	CLASS ADRESS
3	CURRENT CLASS TIME (NOT INCLUDING DURATION OF PROCBLOCK).
4	COURSE NUMBER
5	PROCBLOCK NUMBER.
6	TASK NUMBER.
7	SOURCE NUMBER.
8	NUMBER OF TRAINEES.
9	DURATION OF CURRENT PROCBLOCK.
10	GRADUATION DATE.
11	0
12	0
13	UNIQUE CLASS NUMBER

3.4 Subprogram Descriptions

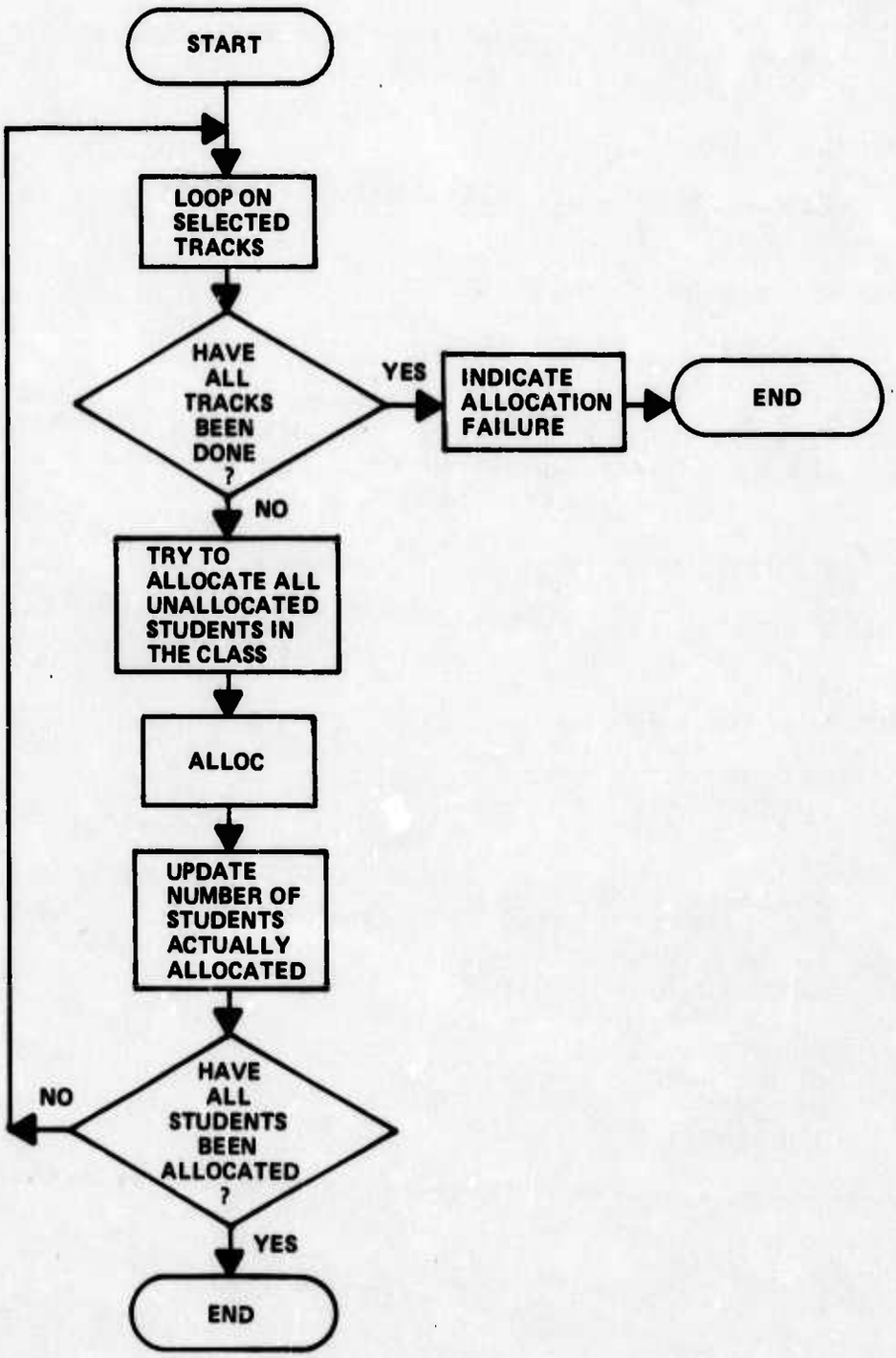
This section contains the descriptions of the individual subroutines that comprise Phase 3 of the TRAM program. The description for each subprogram consists of a statement of the purpose of the routine, the calling sequence, a description of its parameters (if any), the method used, a list of the subprograms required and the name of the programmer. A high level flowchart, which shows the logical decision points and the processing accomplished, is also included for most subprograms.

```
CC*****************************  ADDTDQ  *********************************
CC*                                                                       *
CC*    PURPOSE                                                            *
CC*        UTILITY ROUTINE FOR STORING TRAINING DEMAND INFORMATION        *
CC*        IN A LINKED LIST.                                              *
CC*                                                                       *
CC*    CALLING SEQUENCE                                                   *
CC*                                                                       *
CC*        CALL ADDTDQ(NCORSE,NUMT,IDATE,IDGRAD,ITTYPE,IDTYPE)            *
CC*                                                                       *
CC*    DESCRIPTION OF PARAMETERS                                          *
CC*                                                                       *
CC*        NCORSE          NUMBER OF COURSE TO WHICH THESE TRAINEES       *
CC*                        SHOULD BE SENT.                                *
CC*        NUMT            NUMBER OF TRAINEES IN THIS TRAINING            *
CC*                        DEMAND RECORD.                                 *
CC*                        NOTE.- VALUE IS A FLOATING POINT NUMBER.       *
CC*        IDATE           TRAINING DEMAND DATE.                          *
CC*        IDGRAD          GRADUATION ID. GENERATED BY STEP 2. NOT USED.  *
CC*        ITTYPE          TRAINEE TYPE.  1.- PILOTS                      *
CC*                                       2.- COPILOTS                    *
CC*                                       3.- OSO                         *
CC*                                       4.- DSO                         *
CC*        IDTYPE          TRAINING DEMAND TYPE.  1.- CCTS-DELIVERY.      *
CC*                                               2.- CCTS-ATTRITION.     *
CC*                                               3.- PMT                 *
CC*                                                                       *
CC*                                                                       *
CC*    PROGRAMMER                                                         *
CC*        GEORGE GAIDASZ                                                 *
CC*        CALSPAN                                                        *
CC*        MAY 1975                                                       *
CC*                                                                       *
CC***************************************************************************
```


ADDTDQ
START
GET POINTERS TO FIRST AND LAST ELEMENTS OF TRAINING DEMAND QUEUE
GET ADDRESS OF FREE SPACE
COPY TRAINING DEMAND RECORD
IS THIS THE FIRST ENTRY
YES
UPDATE POINTERS TO START AND END OF LIST
NO
UPDATE LINK AND POINTER TO END OF LIST
END

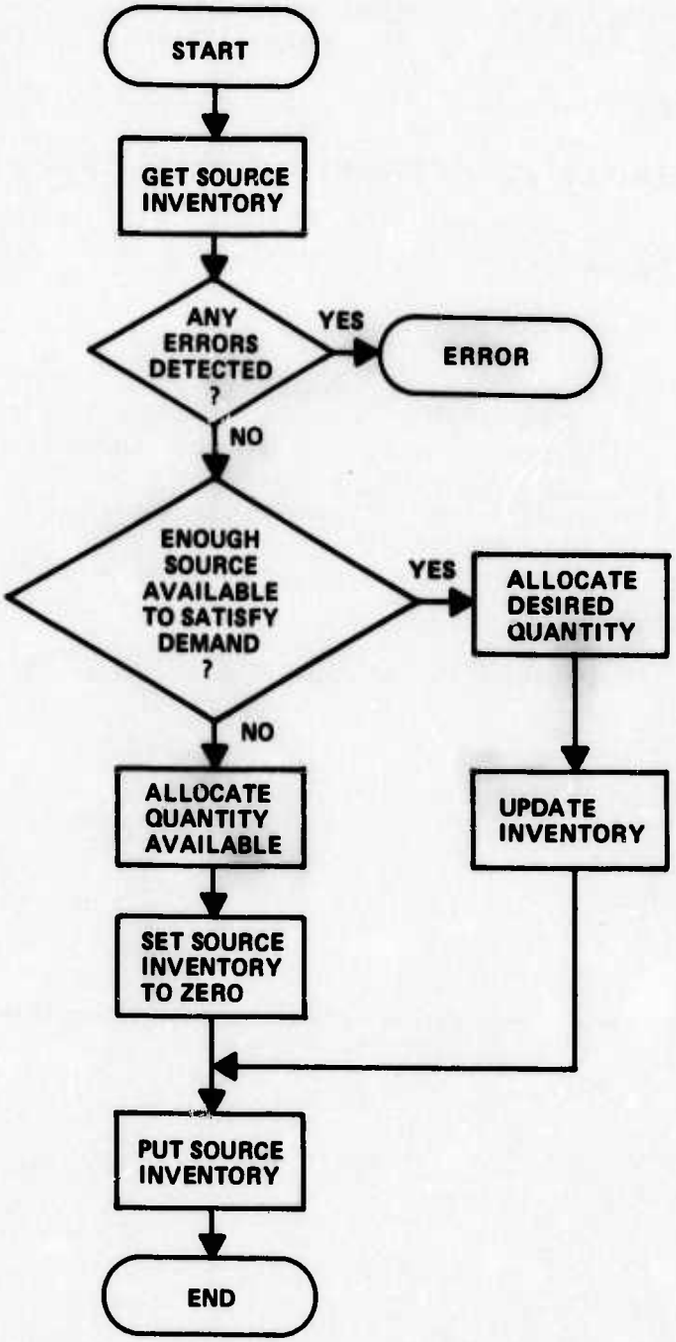
```
CC******************************** ALLOCA **********************************
CC*                                                                         *
CC*   PURPOSE                                                               *
CC*       TO SELECT FROM A SET OF EQUAL PRIORITY TRACKS THE NUMBER          *
CC*       OF TRAINEES THAT HAVE NOT BEEN ALLOCATED YET.                     *
CC*                                                                         *
CC*   CALLING SEQUENCE                                                      *
CC*                                                                         *
CC*       CALL ALLOCA(N,LIST,ICURRT,NUMSTD,  NASGND )                       *
CC*                                                                         *
CC*                                                                         *
CC*   DESCRIPTION OF PARAMETERS                                             *
CC*                                                                         *
CC*       * INPUT *                                                         *
CC*                                                                         *
CC*       N              NUMBER OF ELEMENTS IN LIST.                        *
CC*       LIST()         POINTERS TO TRACKS OF EQUAL PRIORITY TO            *
CC*                      WHICH WE WISH TO ASSIGN THIS CLASS.                *
CC*       ICURRT         CURRENT SIMULATION TIME.                           *
CC*       NUMSTD         NUMBER OF STUDENTS IN THE CLASS BEING              *
CC*                      PROCESSED.                                         *
CC*                                                                         *
CC*       * I / O *                                                         *
CC*                                                                         *
CC*       NASGND         NUMBER OF STUDENTS ALLOCATED SO FAR.               *
CC*                                                                         *
CC*   SUBROUTINES USED                                                      *
CC*                                                                         *
CC*       ALLOC                                                             *
CC*                                                                         *
CC*   PROGRAMMER                                                            *
CC*       G. GAIDASZ                                                        *
CC*       CALSPAN                                                           *
CC*       AUG 1975                                                          *
CC*                                                                         *
CC***************************************************************************
```

ALLOCA


START
LOOP ON SELECTED TRACKS
HAVE ALL TRACKS BEEN DONE ?
YES
INDICATE ALLOCATION FAILURE
END
NO
TRY TO ALLOCATE ALL UNALLOCATED STUDENTS IN THE CLASS
ALLOC
UPDATE NUMBER OF STUDENTS ACTUALLY ALLOCATED
HAVE ALL STUDENTS BEEN ALLOCATED ?
NO
YES
END

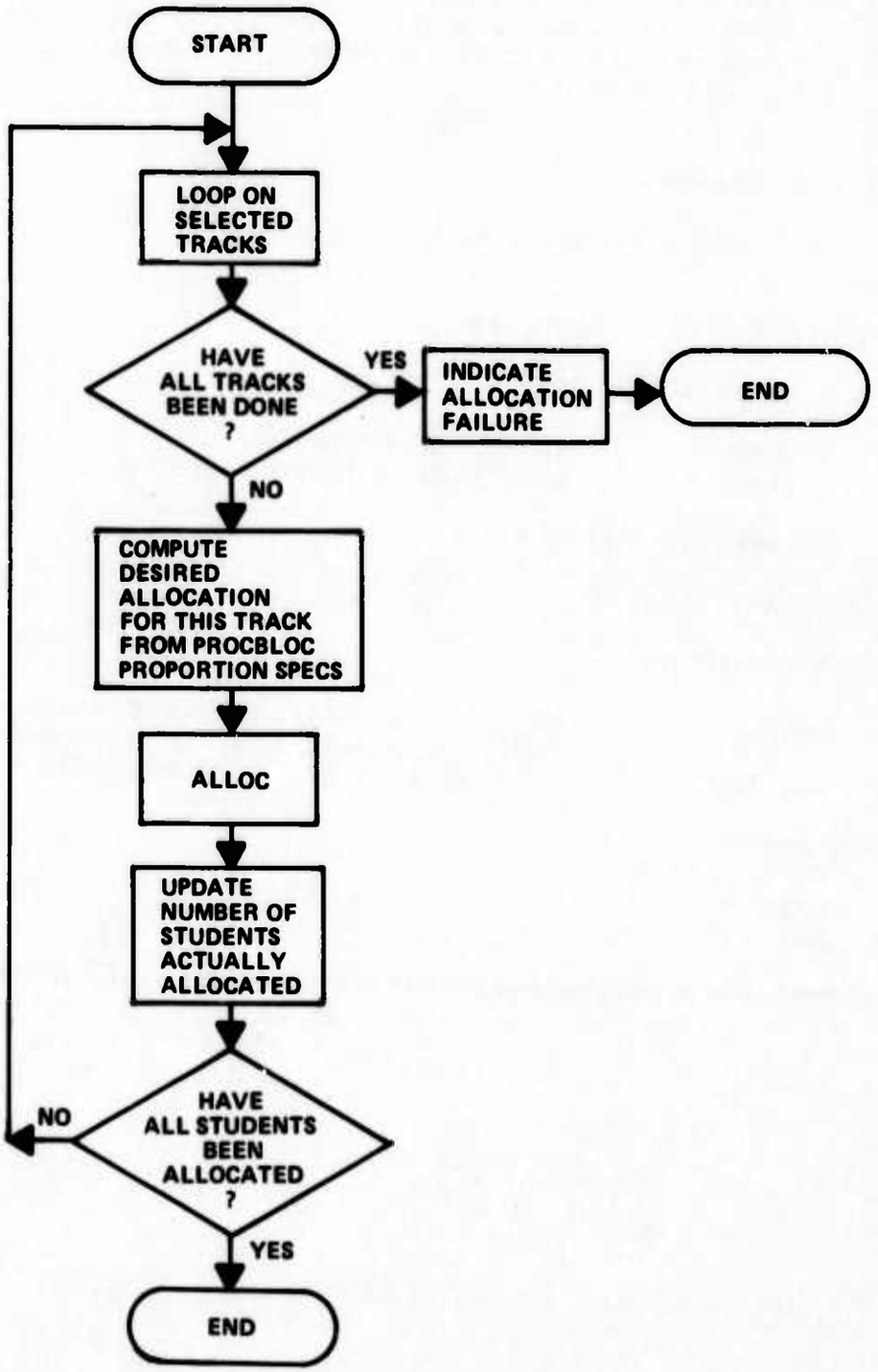
```
CC********************************* ALLOC **********************************
CC*                                                                        *
CC*   PURPOSE                                                              *
CC*       ALLOCATE MINIMUM OF DESIRED AND AVAILABLE NUMBER OF              *
CC*       STUDENTS TO A GIVEN SOURCE AT A SPECIFIC PERIOD IN TIME.         *
CC*                                                                        *
CC*   CALLING SEQUENCE                                                     *
CC*                                                                        *
CC*       CALL ALLOC(NSORCE,IGSTME,NSTUDS,NSTUDA)                          *
CC*                                                                        *
CC*                                                                        *
CC*   DESCRIPTION OF PARAMETERS                                            *
CC*                                                                        *
CC*       * INPUT *                                                        *
CC*                                                                        *
CC*       NSORCE          NUMBER OF SOURCE                                 *
CC*       IGSTME          TIME AT WHICH SOURCE IS REQUIRED.                *
CC*       NSTUDS          NUMBER OF STUDENTS WE WOULD LIKE TO              *
CC*                       MATRICULATE.                                     *
CC*                                                                        *
CC*       * OUTPUT *                                                       *
CC*                                                                        *
CC*       NSTUDA          NUMBER OF STUDENTS ACTUALLY ASSIGNED TO SOURCE   *
CC*                                                                        *
CC*                                                                        *
CC*   SUBROUTINES USED                                                     *
CC*                                                                        *
CC*       GETSOR                                                           *
CC*       PUTSOR                                                           *
CC*                                                                        *
CC*   REMARKS                                                              *
CC*       A SINGLE ELEMENT OF THE SOURCE INVENTORY IS LOOKED UP.           *
CC*       THE CELL SIZE (TIME PERIOD) FOR SOURCE INVENTORIES IS            *
CC*       LARGE COMPARED TO COURSE DURATION, SO THAT A PROXIMITY           *
CC*       SEARCH WOULD BE INAPPROPRIATE.                                   *
CC*                                                                        *
CC*   PROGRAMMER                                                           *
CC*       G. GAIDASZ                                                       *
CC*       CALSPAN                                                          *
CC*       AUG 1975                                                         *
CC*                                                                        *
CC**************************************************************************
```

ALLOC


START
GET SOURCE INVENTORY
ANY ERRORS DETECTED ?
YES
ERROR
NO
ENOUGH SOURCE AVAILABLE TO SATISFY DEMAND ?
YES
ALLOCATE DESIRED QUANTITY
NO
ALLOCATE QUANTITY AVAILABLE
UPDATE INVENTORY
SET SOURCE INVENTORY TO ZERO
PUT SOURCE INVENTORY
END

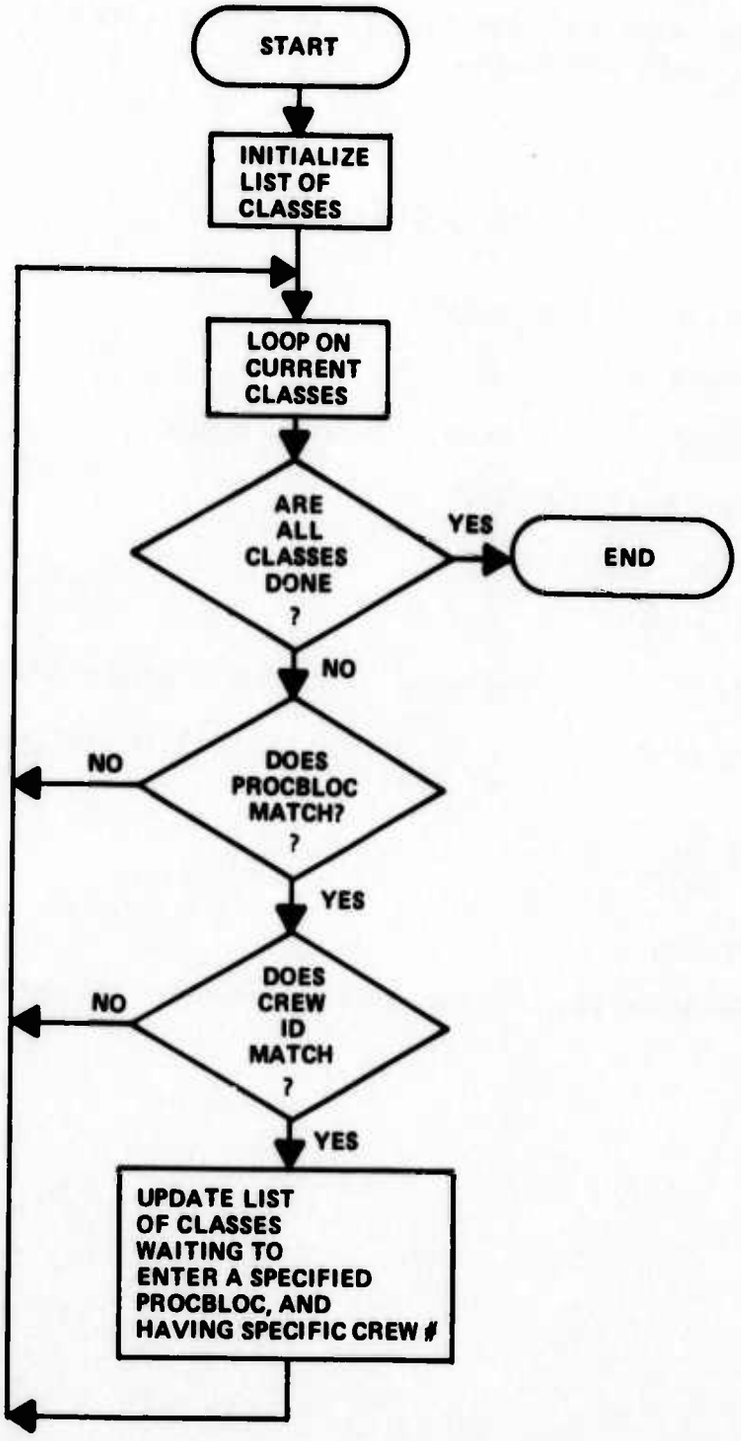
```
CC******************************* ALLOCD *********************************
CC*                                                                      *
CC*   PURPOSE                                                            *
CC*       TO SELECT FROM A SET OF EQUAL PRIORITY TRACKS. THE NUMBER      *
CC*       OF TRAINEES SPECIFIED BY THE TRANSFER PROPORTIONS.             *
CC*                                                                      *
CC*   CALLING SEQUENCE                                                   *
CC*                                                                      *
CC*       CALL ALLOCD(N,LIST,ICURRT,NUMSTD,SUMPCT,  NASGND )             *
CC*
CC*                                                                      *
CC*   DESCRIPTION OF PARAMETERS                                          *
CC*                                                                      *
CC*       * INPUT *                                                      *
CC*                                                                      *
CC*       N                NUMBER OF ELEMENTS IN LIST.                   *
CC*       LIST()           POINTERS TO TRACKS OF EQUAL PRIORITY TO       *
CC*                        WHICH WE WISH TO ASSIGN THIS CLASS.           *
CC*       ICURRT           CURRENT SIMULATION TIME.                      *
CC*       NUMSTD           NUMBER OF STUDENTS IN THE CLASS BEING         *
CC*                        PROCESSED.                                    *
CC*       SUMPCT           SUMMATION OF PER CENTAGES - USED TO NORMALIZE *
CC*                                                                      *
CC*       * I / O *                                                      *
CC*       NASGND           NUMBER OF STUDENTS ALLOCATED TO SOURCES       *
CC*                                                                      *
CC*   SUBROUTINES USED                                                   *
CC*                                                                      *
CC*       ALLOC                                                          *
CC*                                                                      *
CC*   PROGRAMMER                                                         *
CC*       G. GAIDASZ                                                     *
CC*       CALSPAN                                                        *
CC*       AUG 1975                                                       *
CC*                                                                      *
CC************************************************************************
```

ALLOCD

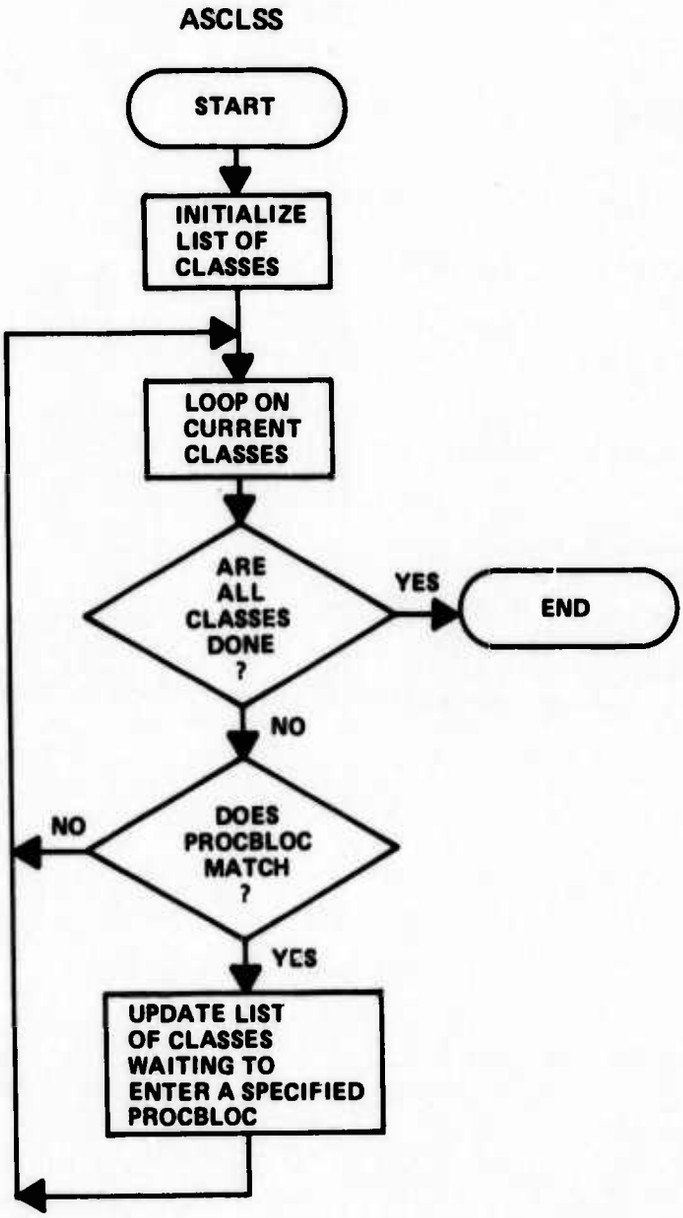

START
LOOP ON SELECTED TRACKS
HAVE ALL TRACKS BEEN DONE ?
YES
INDICATE ALLOCATION FAILURE
END
NO
COMPUTE DESIRED ALLOCATION FOR THIS TRACK FROM PROCBLOC PROPORTION SPECS
ALLOC
UPDATE NUMBER OF STUDENTS ACTUALLY ALLOCATED
HAVE ALL STUDENTS BEEN ALLOCATED ?
NO
YES
END

```
CC********************************* ASCLS ************************************
CC*                                                                          *
CC*    PURPOSE                                                               *
CC*        CREATE A LIST OF ALL CLASSES WITH THE SAME GRADUATION             *
CC*        ID NUMBER WAITING TO ENTER A SPECIFIED PROCBLOC.                   *
CC*        LIST CONTAINS POINTERS TO ARRAYS OF CURRENT CLASSES.              *
CC*        NOT CLASS ADRESSES.                                               *
CC*                                                                          *
CC*                                                                          *
CC*    CALLING SEQUENCE                                                      *
CC*                                                                          *
CC*        CALL ASCLS(IPROCB,IDGRAD,NCLS,IACLS)                              *
CC*                                                                          *
CC*                                                                          *
CC*    DESCRIPTION OF PARAMETERS                                             *
CC*                                                                          *
CC*        * INPUT *                                                         *
CC*                                                                          *
CC*        IPROCB          ADRESS OF PROCBLOCK                               *
CC*        IDGRAD          CREW NUMBER (GRADUATION ID).                      *
CC*                                                                          *
CC*        * IMPLICIT INPUT *                                                *
CC*                                                                          *
CC*        COMMON CCLS                                                       *
CC*                                                                          *
CC*        * OUTPUT *                                                        *
CC*                                                                          *
CC*        NCLS            NO. OF CLASSES FOUND THAT MATCH THE               *
CC*                        PROCBLOC NUMBER AND THE GRADUATION ID.            *
CC*        IACLS()         LIST OF POINTERS TO CLASSES IN COMMON CCLS.       *
CC*                                                                          *
CC*    PROGRAMMER                                                            *
CC*        G. GAIDASZ                                                        *
CC*        CALSPAN                                                           *
CC*        MAY 1975                                                          *
CC*                                                                          *
CC****************************************************************************
```

ASCLS


START
INITIALIZE LIST OF CLASSES
LOOP ON CURRENT CLASSES
ARE ALL CLASSES DONE ?
YES
END
NO
DOES PROCBLOC MATCH? ?
NO
YES
DOES CREW ID MATCH ?
NO
YES
UPDATE LIST OF CLASSES WAITING TO ENTER A SPECIFIED PROCBLOC, AND HAVING SPECIFIC CREW #

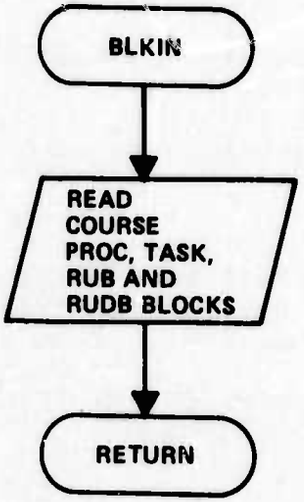
```
CC********************************* ASCLSS ***********************************
CC*                                                                           *
CC*    PURPOSE                                                                *
CC*        CREATE A LIST OF ALL CLASSES WAITING TO ENTER A SPECIFID            *
CC*        PROCBLOC.                                                          *
CC*        LIST CONTAINS POINTERS TO ARRAYS OF CURRENT CLASSES.               *
CC*        NOT CLASS ADRESSES.                                                *
CC*                                                                           *
CC*                                                                           *
CC*    CALLING SEQUENCE                                                       *
CC*                                                                           *
CC*        CALL ASCLSS(IPROCB,NCLS,IACLS)                                     *
CC*                                                                           *
CC*                                                                           *
CC*    DESCRIPTION OF PARAMETERS                                              *
CC*                                                                           *
CC*        * INPUT *                                                          *
CC*                                                                           *
CC*        IPROCB          ADRESS OF PROCBLOCK                                *
CC*                                                                           *
CC*        * IMPLICIT INPUT *                                                 *
CC*                                                                           *
CC*        COMMON CCLS                                                        *
CC*                                                                           *
CC*        * OUTPUT *                                                         *
CC*                                                                           *
CC*        NCLS            NUMBER OF CLASSES ASSOCIATED WITH PROCBLOC         *
CC*                        AT IPROCB                                          *
CC*        IACLS()         LIST OF CLASSES ASSOCIATED WITH PROCBLOC           *
CC*                        AT IPROCB                                          *
CC*                                                                           *
CC*    PROGRAMMER                                                             *
CC*        G. GAIDASZ                                                         *
CC*        CALSPAN                                                            *
CC*        MAY 1975                                                           *
CC*                                                                           *
CC*****************************************************************************
```


ASCLSS
START
INITIALIZE LIST OF CLASSES
LOOP ON CURRENT CLASSES
ARE ALL CLASSES DONE ?
YES
END
NO
DOES PROCBLOC MATCH ?
NO
YES
UPDATE LIST OF CLASSES WAITING TO ENTER A SPECIFIED PROCBLOC

```
C********************************  BLOCK  ********************************
C*                                                                        *
C*                            SUBROUTINE BLOCK                            *
C*                                                                        *
C*     PURPOSE                                                            *
C*         RETURNS THE CONTENTS OF A BLOCK                                *
C*                                                                        *
C*     CALLING SEQUENCE                                                   *
C*         CALL BLOCK(IADDR,IARRAY)                                       *
C*                                                                        *
C*     DESCRIPTION OF PARAMETERS                                          *
C*                                                                        *
C*                      * EXPLICIT INPUT *                                *
C*         IADDR - POINTS AT BLOCK WHOS CONTENTS IS DESIRED.              *
C*                                                                        *
C*                      * EXPLICIT OUTPUT *                               *
C*         IARRAY - CONTENTS OF BLOCK ARE PLACED IN THIS ARRAY.           *
C*                                                                        *
C*                                                                        *
C*     AUTHOR/PROGRAMMER                                                  *
C*         JOHN R. MENIG                                                  *
C*         CALSPAN CORPORATION                                            *
C*         24 APRIL 1975                                                  *
C*                                                                        *
C************************************************************************
```

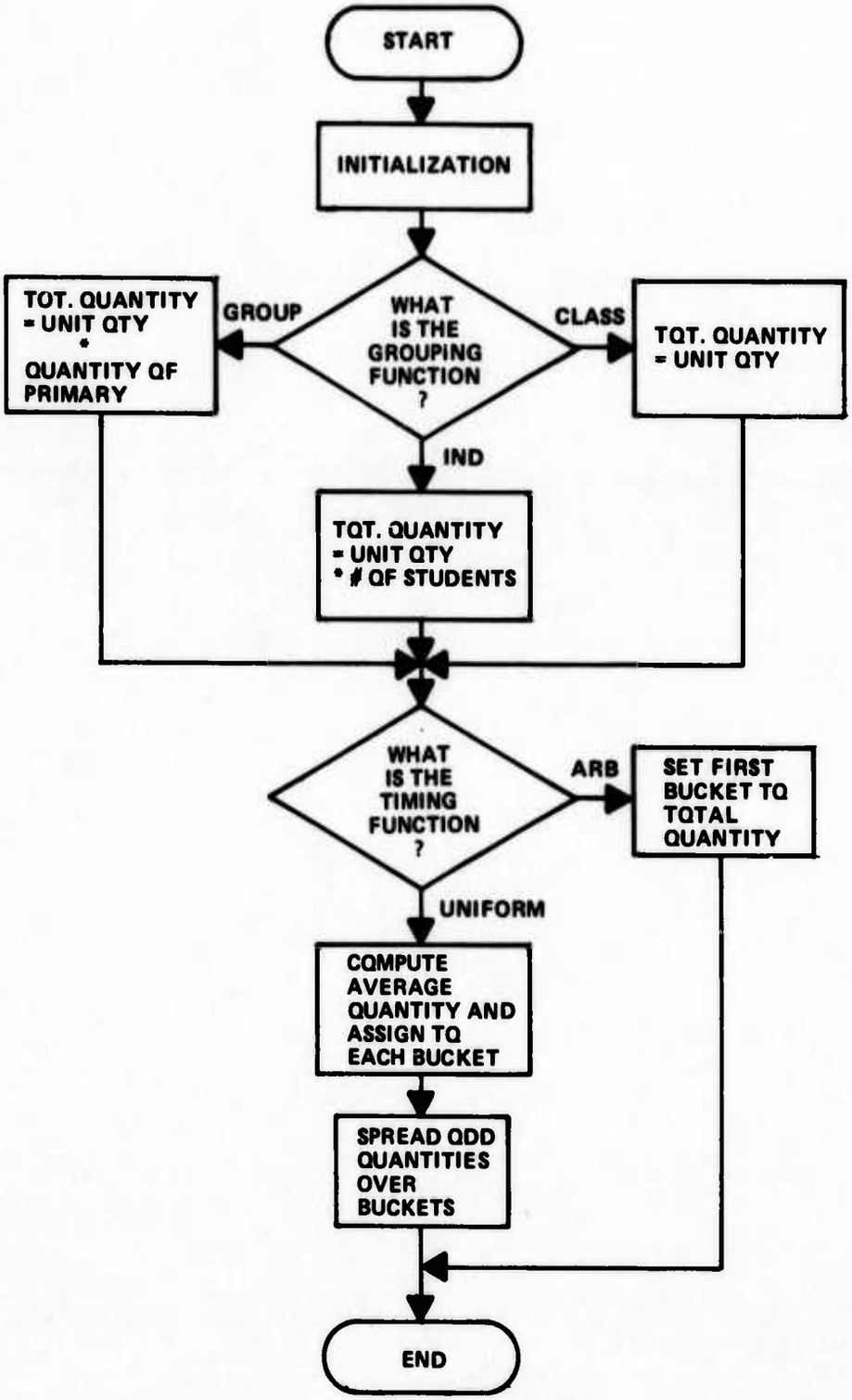
```
C********************************** BLKNAM **********************************
C*                                                                          *
C*                              BLOCK DATA                                  *
C*                                                                          *
C*     PURPOSE                                                              *
C*         INITIALIZES VARIABLE NEEDED WHEN INPUTTING NAMES.                *
C*                                                                          *
C*     AUTHOR/PROGRAMMER                                                    *
C*         JOHN R. MENIG                                                    *
C*         CALSPAN CORPORATION                                              *
C*         22 APRIL 1975                                                    *
C*                                                                          *
C**************************************************************************
```

```
C***********************************  BLKIN  ********************************
C*                                                                          *
C*                              SUBROUTINE BLKIN                            *
C*                                                                          *
C*    PURPOSE                                                               *
C*        READS THE BLOCKS NEEDED TO DEFINE COURSES.                        *
C*                                                                          *
C*    AUTHOR/PROGRAMMER                                                     *
C*        JOHN R. MENIG                                                     *
C*        CALSPAN CORPORATION                                               *
C*        24 APRIL 1975                                                     *
C*                                                                          *
C****************************************************************************
```


BLKIN
READ
COURSE
PROC, TASK,
RUB AND
RUDB BLOCKS
RETURN

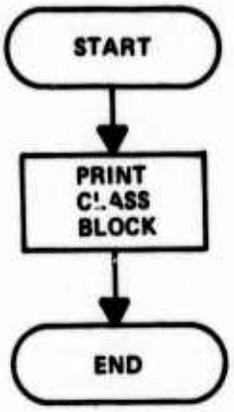
```
CC********************************* CALQ ************************************
CC*                                                                         *
CC*    PURPOSE                                                              *
CC*        TO CALCULATE THE QUANTITY OF RESOURCE REQUIRED BY A CLASS        *
CC*        DOING A TASK AS A FUNCTION OF TIME.                              *
CC*                                                                         *
CC*    CALLING SEQUENCE                                                     *
CC*                                                                         *
CC*        CALL CALQ(NSTUDS,NRUTF,NRUGF,IQTYU,IQTYP,NBI,                    *
CC*       1          NBO,IQTY,ITOTQ)                                       *
CC*                                                                         *
CC*    DESCRIPTION OF PARAMETERS                                            *
CC*                                                                         *
CC*        * INPUT *                                                        *
CC*                                                                         *
CC*        NSTUDS          NUMBER OF STUDENTS IN THE CLASS                  *
CC*        NRUTF           NUMBER OF THE RESOURCE UTILIZATION TIMING        *
CC*                        FUNCTION.   2- ARBITRARY                         *
CC*                                    3- UNIFORM                           *
CC*        NRUGF           NUMBER OF THE RESOURCE UTILIZATION GROUPING      *
CC*                        FUNCTION.   1- CLASS                             *
CC*                                    2- QTY OF PRIMARY CONSUMED.          *
CC*                                    3- INDIVIDUAL.                       *
CC*        IQTYU           UNITS OF CONSUMPTION PER UNIT USER.              *
CC*        IQTYP           QUANTITY OF PRIMARY CONSUMED                     *
CC*        NBI             NUMBER OF BUCKETS FROM WHICH RESOURCE            *
CC*                        CAN BE EXTRACTED.                                *
CC*                                                                         *
CC*        * OUTPUT *                                                       *
CC*                                                                         *
CC*        NBO             NUMBER OF BUCKETS OVER WHICH RESOURCE            *
CC*                        CONSUMPTION WILL BE SPREAD.                      *
CC*    IQTY()              ARRAY CONTAINING THE AMOUNTS OF THE              *
CC*                        CONTEMPLATED RESOURCE CONSUMPTION.               *
CC*                        (IN REVERSED TIME SEQUENCE).                     *
CC*        ITOTQ           TOTAL QUANTITY OF PLANNED RESOURCE               *
CC*                        UTILIZATION.                                     *
CC*                                                                         *
CC*    PROGRAMMER                                                           *
CC*        GEORGE GAIDASZ                                                   *
CC*        CALSPAN                                                          *
CC*        MAY 1975                                                         *
CC*                                                                         *
CC***************************************************************************
```

CALQ


START
INITIALIZATION
WHAT IS THE GROUPING FUNCTION ?
GROUP
TOT. QUANTITY = UNIT QTY * QUANTITY QF PRIMARY
CLASS
TQT. QUANTITY = UNIT QTY
IND
TQT. QUANTITY = UNIT QTY * # QF STUDENTS
WHAT IS THE TIMING FUNCTION ?
ARB
SET FIRST BUCKET TQ TQTAL QUANTITY
UNIFORM
CQMPUTE AVERAGE QUANTITY AND ASSIGN TQ EACH BUCKET
SPREAD QDD QUANTITIES OVER BUCKETS
END

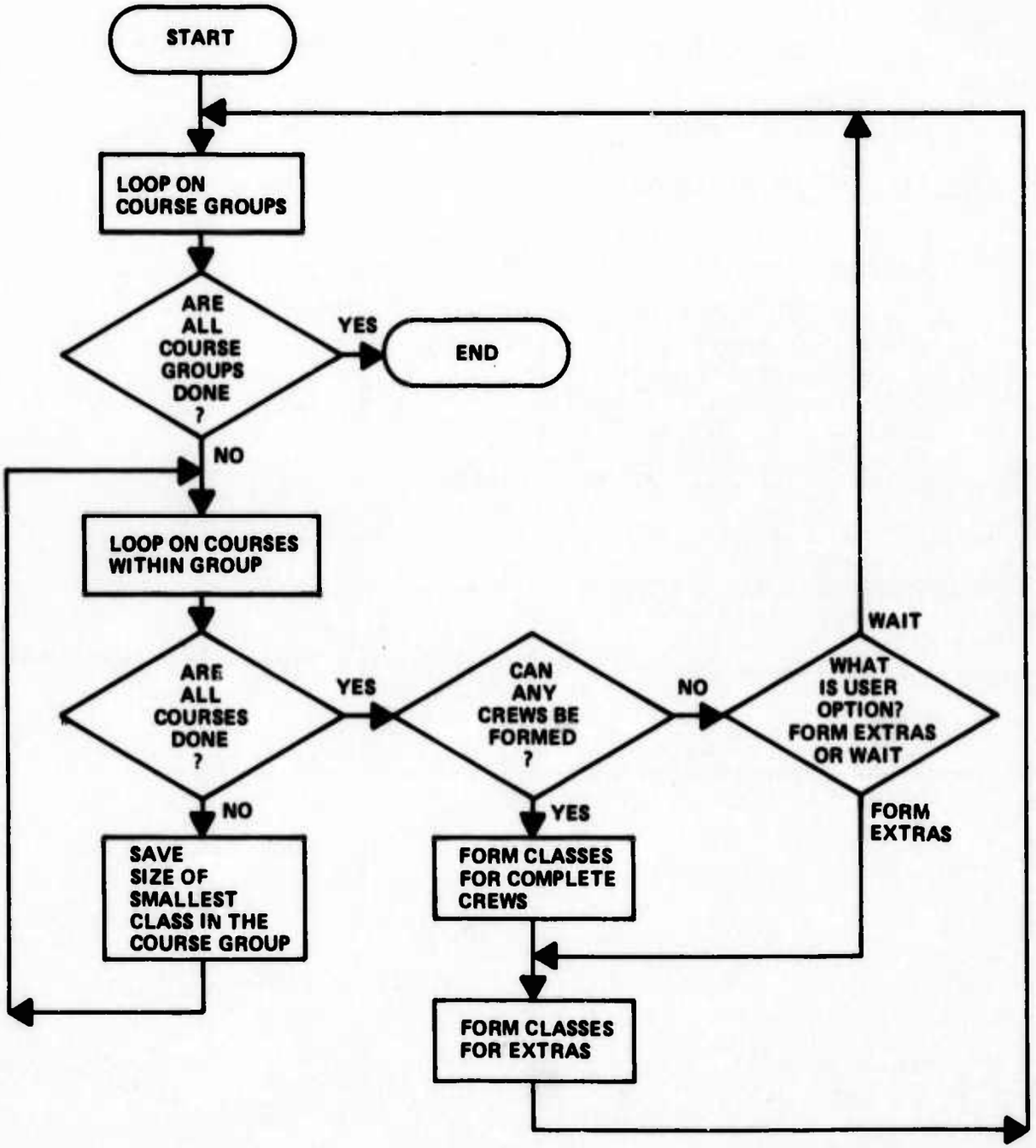
```
CC********************************* CBLOCK ************************************
CC*                                                                            *
CC*    PURPOSE                                                                 *
CC*        TO PRINT A CLASS BLOCK                                              *
CC*                                                                            *
CC*    PROGRAMMER                                                              *
CC*                                                                            *
CC*    CALLING SEQUENCE                                                        *
CC*                                                                            *
CC*        CALL CBLOCK(IADRS,IBLOCK)                                           *
CC*                                                                            *
CC*                                                                            *
CC*    DESCRIPTION OF PARAMETERS                                               *
CC*                                                                            *
CC*        IADRS           ADRESS OF CLASS BLOCK.                              *
CC*        IBLOCK          FIRST WORD OF CLASS BLOCK                           *
CC*                                                                            *
CC*        G. GAIDASZ                                                          *
CC*        CALSPAN                                                             *
CC*        MAY 1975                                                            *
CC*                                                                            *
CC********************************************************************************
```

CBLOCK

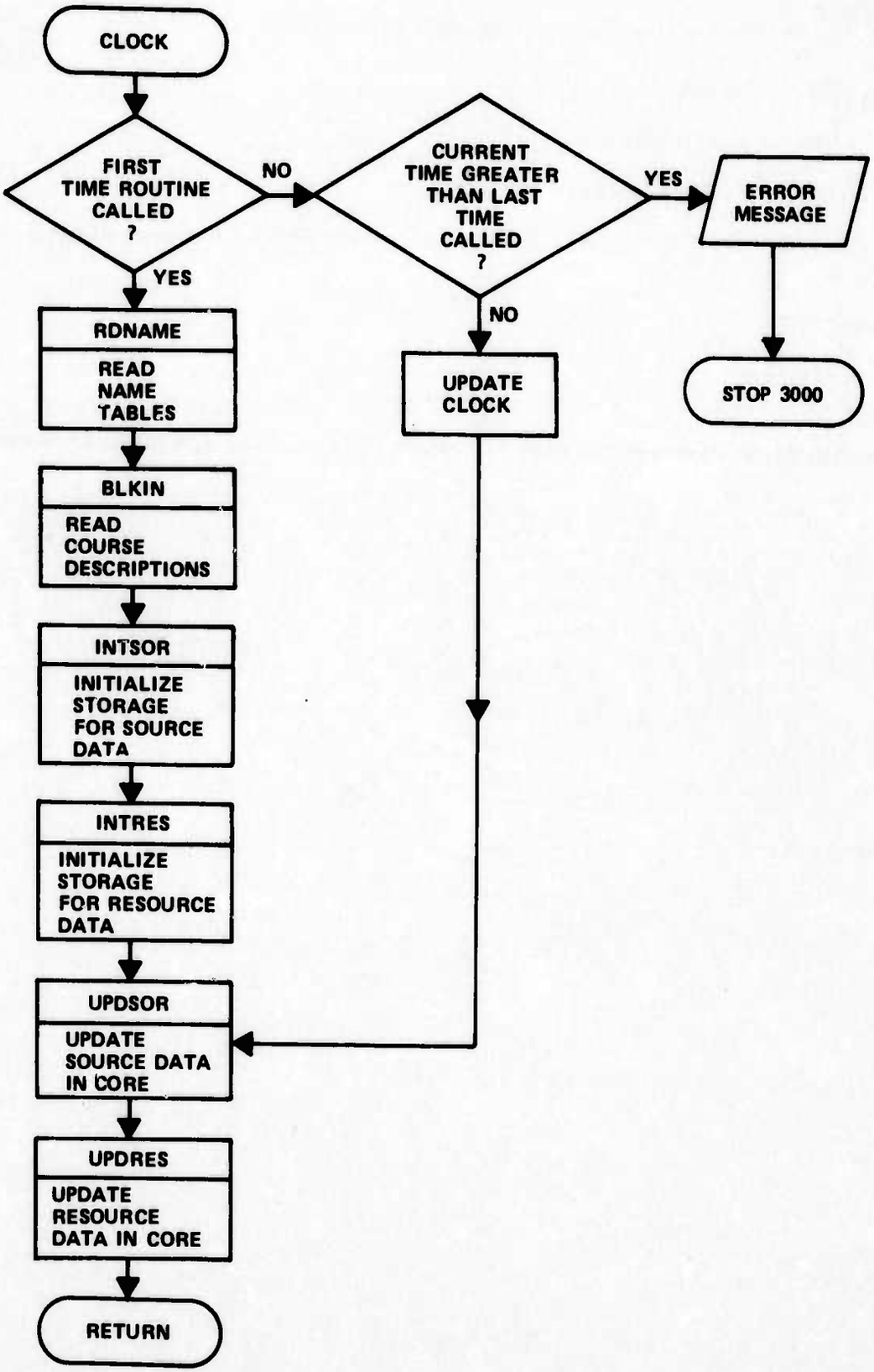


```
CC********************************* CLASCG ***********************************
CC*                                                                           *
CC*   PURPOSE                                                                 *
CC*       TO FORM CLASSES FOR CREWS AND EXTRAS.                               *
CC*       (THIS ROUTINE IS A COMPANION TO GRADF AND ASSUMES THAT              *
CC*        CREWS CAN BE FORMED WITHOUT REGARD TO THE DESTINATION              *
CC*        AIR BASE OF THE INDIVIDUAL CREW MEMBERS).                          *
CC*                                                                           *
CC*                                                                           *
CC*   CALLING SEQUENCE                                                        *
CC*                                                                           *
CC*       CALL CLASCG                                                         *
CC*                                                                           *
CC*   REMARKS                                                                 *
CC*       THIS ROUTINE LOOPS THRU ALL THE COURSES IN EACH COURSE GROUP        *
CC*       AND FINDS THE SMALLEST DEMAND.                                      *
CC*       IF THE DEMAND IS SUFFICIENT THEN CREW GROUPS ARE FORMED.            *
CC*       THE SIZE OF THE CREW IS EQUAL TO THE INTEGERIZED VALUE OF           *
CC*       THE SMALLEST DEMAND. EXTRAS CLASSES ARE FORMED FROM THE             *
CC*       REMAINING DEMANDS.                                                  *
CC*       IF THE SMALLEST DEMAND IS LESS THAN ONE THEN THE PROGRAM            *
CC*       EITHER CREATES EXTRAS CLASSES (IOPTCG EQ 0) OR SAVES THE            *
CC*       DEMANDS FOR THE NEXT GRADUATION.                                    *
CC*                                                                           *
CC*   SUBROUTINES USED                                                        *
CC*       MLTCLS                                                              *
CC*                                                                           *
CC*   PROGRAMMER                                                              *
CC*       G. GAIDASZ                                                          *
CC*       CALSPAN                                                             *
CC*       MAY 1975                                                            *
CC*                                                                           *
CC***************************************************************************
```

CLASCG

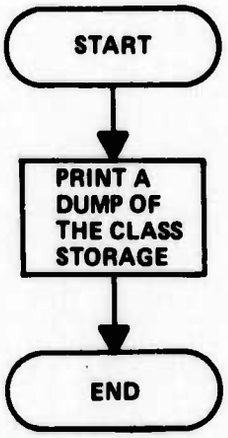

START
LOOP ON COURSE GROUPS
ARE ALL COURSE GROUPS DONE ?
YES
END
NO
LOOP ON COURSES WITHIN GROUP
ARE ALL COURSES DONE ?
YES
CAN ANY CREWS BE FORMED ?
NO
WHAT IS USER OPTION? FORM EXTRAS OR WAIT
WAIT
FORM EXTRAS
NO
SAVE SIZE OF SMALLEST CLASS IN THE COURSE GROUP
YES
FORM CLASSES FOR COMPLETE CREWS
FORM CLASSES FOR EXTRAS

```
C********************************  CLOCK  ********************************
C*                                                                        *
C*                            SUBROUTINE CLOCK                            *
C*                                                                        *
C*     PURPOSE                                                            *
C*         UPDATES CLOCK TIME AND UPDATES SOURCE AND RESOURCE TABLES       *
C*                                                                        *
C*     CALLING SEQUENCE                                                   *
C*         CALL CLOCK(ITIME)                                              *
C*                                                                        *
C*     DESCRIPTION OF PARAMETERS                                          *
C*                                                                        *
C*                    * EXPLICIT INPUT *                                  *
C*         ITIME - TIME TO BE ASSIGNED TO CLOCK                           *
C*                                                                        *
C*     SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                       *
C*         RDNAME - INPUTS NAME TABLES                                    *
C*         BLKIN  - INPUTS SOURCES                                        *
C*         INTRES - INITIALIZES RESOURCE TABLES                           *
C*         INTSOR - INITIALIZES SOURCE TABLES                             *
C*         UPDRES - UPDATES RESOURCE TABLES                               *
C*         UPDSOR - UPDATES SOURCE TABLES                                 *
C*                                                                        *
C*     AUTHOR/PROGRAMMER                                                  *
C*         JOHN R. MENIG                                                  *
C*         CALSPAN CORPORATION                                            *
C*         28 APRIL 1975                                                  *
C*                                                                        *
C************************************************************************
```


CLOCK
FIRST TIME ROUTINE CALLED ?
NO
CURRENT TIME GREATER THAN LAST TIME CALLED ?
YES
ERROR MESSAGE
STOP 3000
YES
NO
RDNAME
READ NAME TABLES
UPDATE CLOCK
BLKIN
READ COURSE DESCRIPTIONS
INTSOR
INITIALIZE STORAGE FOR SOURCE DATA
INTRES
INITIALIZE STORAGE FOR RESOURCE DATA
UPDSOR
UPDATE SOURCE DATA IN CORE
UPDRES
UPDATE RESOURCE DATA IN CORE
RETURN

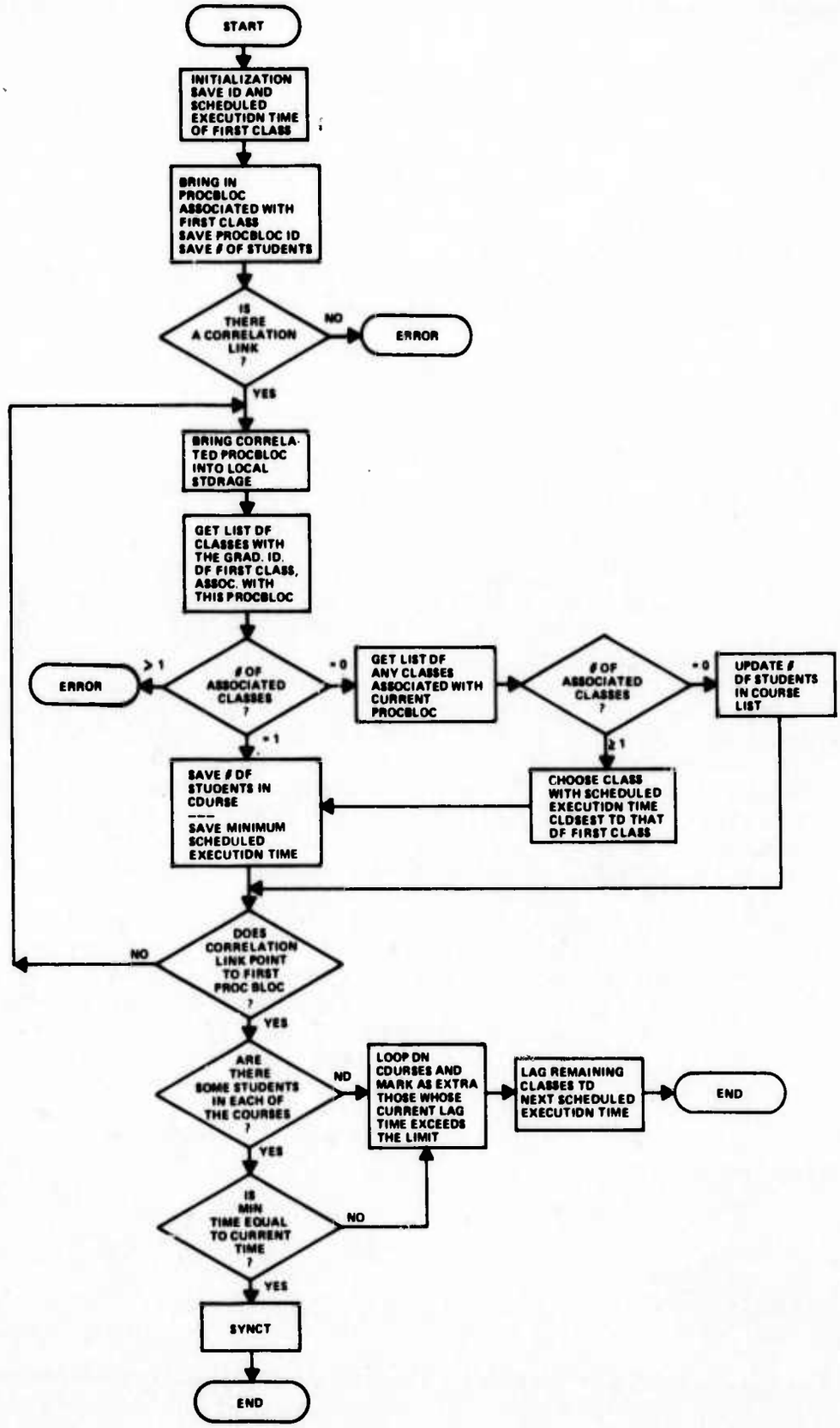
```
CC********************************* CLSDMP ***********************************
CC*                                                                           *
CC*    PURPOSE                                                                *
CC*        TO PRINT A DUMP OF THE CLASS STORAGE.                              *
CC*                                                                           *
CC*    CALLING SEQUENCE                                                       *
CC*                                                                           *
CC*        CALL CLSDMP(IADRS)                                                 *
CC*                                                                           *
CC*    DESCRIPTION OF PARAMETERS                                              *
CC*                                                                           *
CC*        IADRS           ADRESS OF CLASS AT WHICH TROUBLE OCCURRED.         *
CC*                                                                           *
CC*                                                                           *
CC*    PROGRAMMER                                                             *
CC*        G. GAIDASZ                                                         *
CC*        CALSPAN                                                            *
CC*        MAY 1975                                                           *
CC*                                                                           *
CC*****************************************************************************
```

CLSDMP



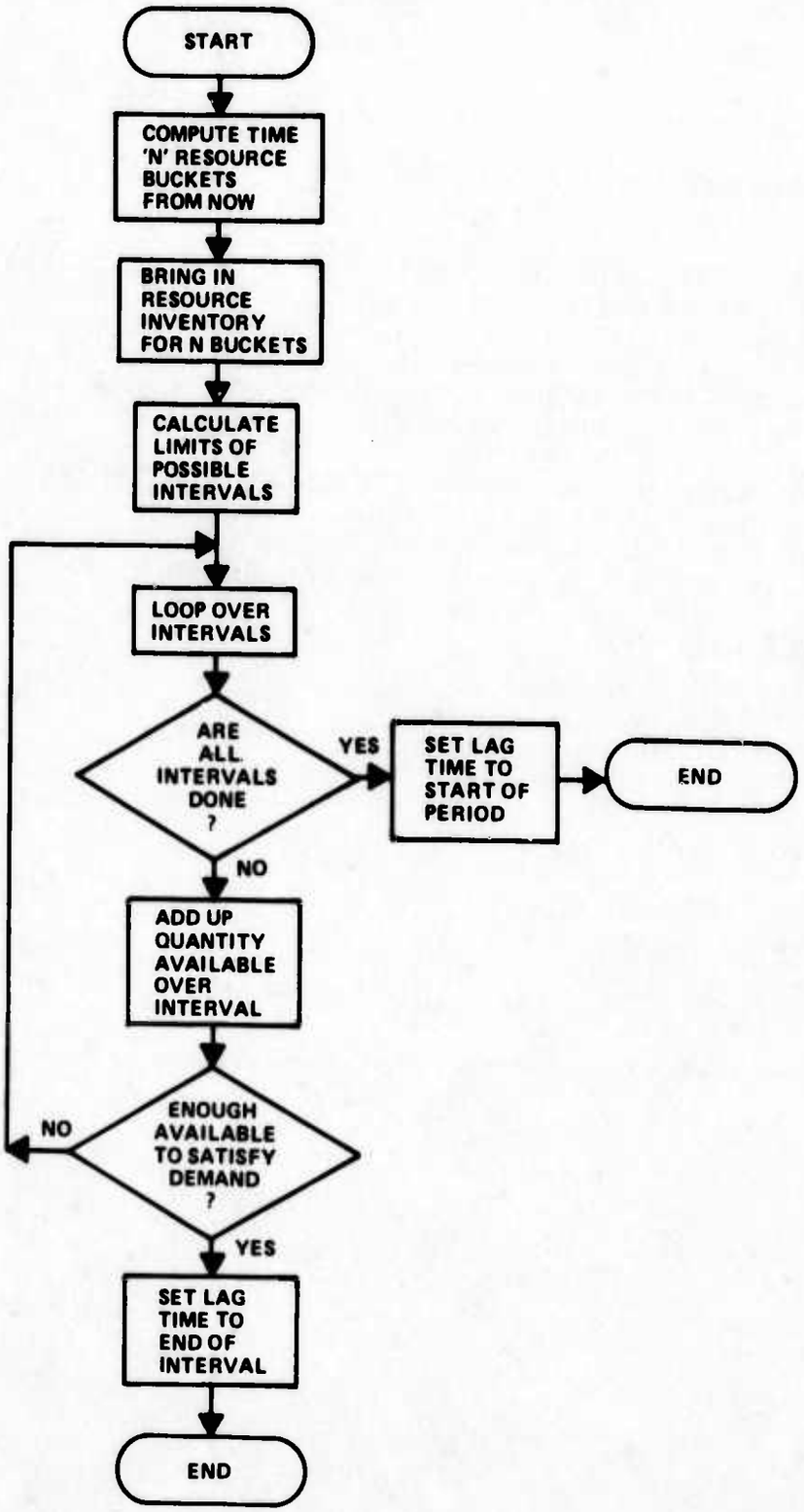
```
CC********************************* CORR ************************************
CC*                                                                          *
CC*    PURPOSE                                                               *
CC*        TO CORRELATE THE EXECUTION OF A NUMBER OF PROCBLOCS.              *
CC*                                                                          *
CC*    CALLING SEQUENCE                                                      *
CC*                                                                          *
CC*        CALL CORR(MINTME)                                                 *
CC*                                                                          *
CC*    DESCRIPTION OF PARAMETERS                                             *
CC*                                                                          *
CC*        * OUTPUT *                                                        *
CC*                                                                          *
CC*        MINTME          TIME TO WHICH CLASSES WILL BE LAGGED IF           *
CC*                        CORRELATION IS IMPOSSIBLE AT THIS TIME.           *
CC*                                                                          *
CC*        * IMPLICIT OUTPUT *                                               *
CC*                                                                          *
CC*        IEXTRA          IS SET TO 1, IF EXTRA TASKS ARE TO BE             *
CC*                        EXECUTED.                                         *
CC*        IFAIL           IS SET TO 1 IF CORRELATION CANNOT BE              *
CC*                        ACCOMPLISHED                                      *
CC*        NOCLS           NUMBER OF CLASSES TO BE SYNCHRONIZED              *
CC*                        IN EXECUTION OR LAGGED.                           *
CC*        INDXC()         LIST OF CLASSES TO BE SYNCHRONIZED IN             *
CC*                        EXECUTION OR LAGGED.                              *
CC*                                                                          *
CC*                                                                          *
CC*    REMARKS                                                               *
CC*                                                                          *
CC*        CORRELATION MEANS THAT SOME STUDENTS ARE PRESENT IN EACH ONE      *
CC*        OF THE COURSES LINKED BY THE CORRELATION SPECIFICATION.           *
CC*        IF CORRELATION CANNOT BE ACHIEVED THE CLASSES ARE LAGGED          *
CC*        UP TO A MAXIMUM TIME MAXLAG. ONCE A CLASS HAS BEEN LAGGED         *
CC*        FOR MAXLAG TIME, IT WILL EXECUTE THE EXTRAS TASKS IF IT           *
CC*        CANNOT BE CORRELATED IMMEDIATELY.                                 *
CC*                                                                          *
CC*    SUBROUTINES USED                                                      *
CC*        CLSDMP                                                            *
CC*        PBLOCK                                                            *
CC*        ASCLS                                                             *
CC*        SYNCT                                                             *
CC*        BLOCK                                                             *
CC*        ASCLSS                                                            *
CC*                                                                          *
CC*                                                                          *
CC*    PROGRAMMER                                                            *
CC*        G. GAIDASZ                                                        *
CC*        CALSPAN                                                           *
CC*        MAY 1975                                                          *
CC*                                                                          *
CC****************************************************************************
```

CORR


START
INITIALIZATION SAVE ID AND SCHEDULED EXECUTION TIME OF FIRST CLASS
BRING IN PROCBLOC ASSOCIATED WITH FIRST CLASS SAVE PROCBLOC ID SAVE # OF STUDENTS
IS THERE A CORRELATION LINK ?
NO
ERROR
YES
BRING CORRELATED PROCBLOC INTO LOCAL STORAGE
GET LIST OF CLASSES WITH THE GRAD. ID. OF FIRST CLASS, ASSOC. WITH THIS PROCBLOC
OF ASSOCIATED CLASSES ?
> 1
ERROR
= 0
GET LIST OF ANY CLASSES ASSOCIATED WITH CURRENT PROCBLOC
OF ASSOCIATED CLASSES ?
= 0
UPDATE # OF STUDENTS IN COURSE LIST
= 1
SAVE # OF STUDENTS IN CDURSE
SAVE MINIMUM SCHEDULED EXECUTION TIME
≥ 1
CHOOSE CLASS WITH SCHEDULED EXECUTION TIME CLOSEST TO THAT OF FIRST CLASS
DOES CORRELATION LINK POINT TO FIRST PROC BLOC ?
NO
YES
ARE THERE SOME STUDENTS IN EACH OF THE COURSES ?
NO
LOOP ON CDURSES AND MARK AS EXTRA THOSE WHOSE CURRENT LAG TIME EXCEEDS THE LIMIT
LAG REMAINING CLASSES TO NEXT SCHEDULED EXECUTION TIME
END
YES
IS MIN TIME EQUAL TO CURRENT TIME ?
NO
YES
SYNCT
END

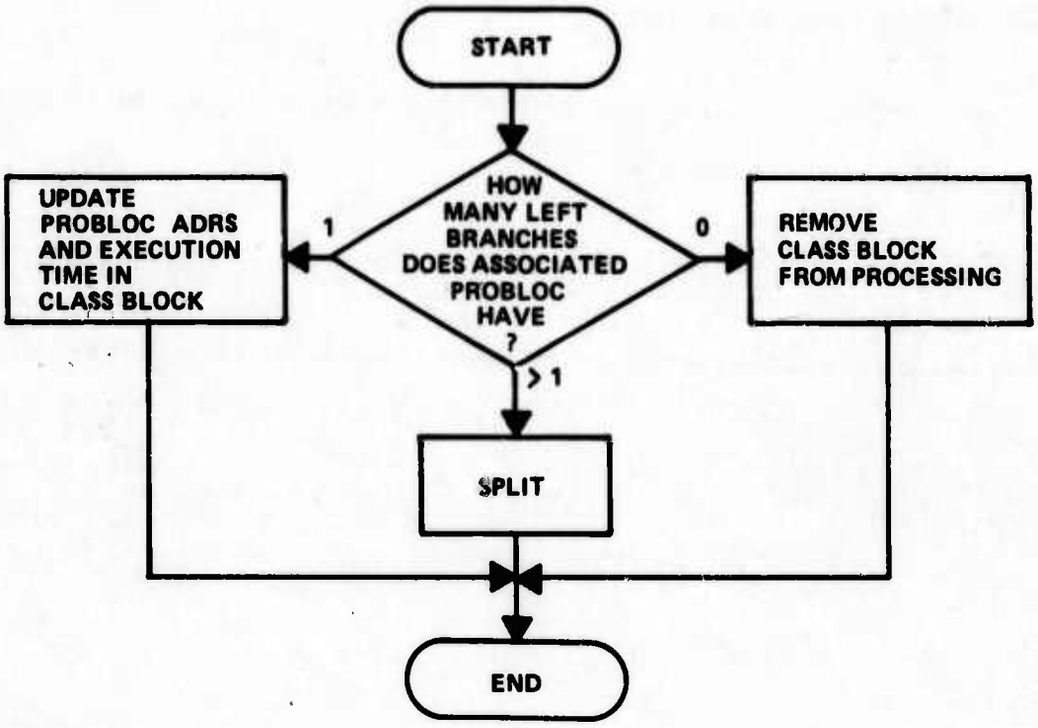
```
CC********************************* DETLAG *********************************
CC*                                                                        *
CC*    PURPOSE                                                             *
CC*        DETERMINE HOW LONG A TIME LAG IS NECESSARY TO REACH A           *
CC*        PERIOD IN TIME WHEN A SPECIFIED RESOURCE IS AVAILABLE.          *
CC*                                                                        *
CC*    CALLING SEQUENCE                                                    *
CC*                                                                        *
CC*        CALL DETLAG(IRES,NEEDQ,LAGTME                                   *
CC*    DESCRIPTION OF PARAMETERS                                           *
CC*        IRES            NUMBER OF THE RESOURCE FOR WHICH THE            *
CC*                        DEMAND COULD NOT BE SATISFIED AT THIS           *
CC*                        TIME                                            *
CC*        NEEDQ           QUANTITY OF RESOURCE NEEDED.                    *
CC*        LAGTME          TIME TO WHICH CLASS(ES) SHOULD BE LAGGED.       *
CC*                                                                        *
CC*    REMARKS                                                             *
CC*        WHEN A DEMAND FOR RESOURCES CAN NOT BE SATISFIED DURING         *
CC*        THE ACTIVE TIME INTERVAL, THREE PROCESSING OPTIONS ARE          *
CC*        AVAILABLE:                                                      *
CC*                  1. STOP THE RUN.                                      *
CC*                  2. INDICATE THE SHORTAGE AND CONTINUE.                *
CC*                  3. LAG THE CLASS TO A TIME PERIOD WHEN THE            *
CC*                     RESOURCES NEEDED ARE AVAILABLE.                    *
CC*        THIS ROUTINE TRIES TO DETERMINE THE LATEST TIME WHEN A          *
CC*        RESOURCE IS AVAILABLE.                                          *
CC*        DETLAG BRINGS IN A FIXED NUMBER OF BUCKETS OF THE INVENTORY     *
CC*        OF THE SCARCE RESOURCE INTO LOCAL STORAGE.  THIS INVENTORY      *
CC*        IS EXAMINED IN GROUPS OF BUCKETS CORRESPONDING TO THE           *
CC*        PROCBLOC INTERVAL.  IF ANY PERIOD WITHIN THE TIME INTERVAL      *
CC*        CONSIDERED HAS ENOUGH RESOURCE AVAILABLE TO SATISFY THE         *
CC*        DEMAND, THE CLASS (OR CLASSES) ARE LAGGED TO THE END-TIME       *
CC*        OF THAT PERIOD. OTHERWISE THE CLASSES ARE LAGGED TO THE         *
CC*        START OF THE 'LOOK-BACK' PERIOD.                                *
CC*        NOTES.- THE LOOK-BACK IS DONE FOR ONE CLASS-RESOURCE            *
CC*                COMBINATION, WITHOUT MEMORY OF OTHER RESOURCE USERS.    *
CC*                THEREFORE, WHEN THE CLASS TRIES TO USE THE RESOURCE     *
CC*                AT THE LAGGED TIME, THERE MAY NOT BE ENOUGH RESOURCE    *
CC*                LEFT BECAUSE ANOTHER CLASS HAS USED IT UP.              *
CC*                ALSO, THE CLASS MAY RUN OUT OF SOME OTHER RESOURCE      *
CC*        DURING THE LAGGED TIME.                                         *
CC*                                                                        *
CC*                                                                        *
CC*    SUBROUTINES USED                                                    *
CC*        GETRES                                                          *
CC*                                                                        *
CC*    PROGRAMMER                                                          *
CC*        G. GAIDASZ                                                      *
CC*        CALSPAN                                                         *
CC*        AUG 1975                                                        *
CC*                                                                        *
CC**************************************************************************
```

DETLAG


START
COMPUTE TIME 'N' RESOURCE BUCKETS FROM NOW
BRING IN RESOURCE INVENTORY FOR N BUCKETS
CALCULATE LIMITS OF POSSIBLE INTERVALS
LOOP OVER INTERVALS
ARE ALL INTERVALS DONE ?
YES
SET LAG TIME TO START OF PERIOD
END
NO
ADD UP QUANTITY AVAILABLE OVER INTERVAL
ENOUGH AVAILABLE TO SATISFY DEMAND ?
NO
YES
SET LAG TIME TO END OF INTERVAL
END

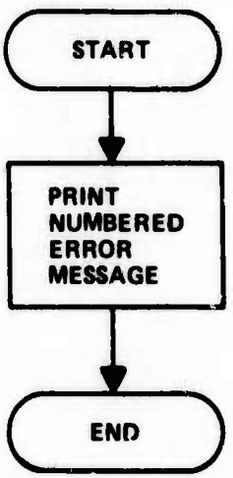
```
C********************************* DTRNSF ***********************************
CC*                                                                          *
CC*   PURPOSE                                                                *
CC*       TRANSFER A CLASS FROM ONE PROCBLOC TO THE NEXT PROCBLOC.           *
CC*                                                                          *
CC*                                                                          *
CC*                                                                          *
CC*   CALLING SEQUENCE                                                       *
CC*                                                                          *
CC*       CALL DTRNSF                                                        *
CC*                                                                          *
CC*   REMARKS                                                                *
CC*       WHEN A CLASS ENTERS DTRNSF IT MEANS THAT ALL TASKS FOR             *
CC*       THE ACTIVE PROCBLOC HAVE BEEN SUCCESSFULLY COMPLETED.              *
CC*       THE CLASS PRIORITY IS RESTORED TO EQUAL THE COURSE                 *
CC*       PRIORITY, AND THE NEXT-BREAK TIME IS UPDATED IF APPROPRIATE.       *
CC*       IF THE PROCBLOC IN WHICH THE CLASS IS LOCATED HAS ONLY             *
CC*       ONE LEFT BRANCH THEN THE CLASS PARAMETERS ARE UPDATED IN           *
CC*       PLACE.                                                             *
CC*       IF THE PROCBLOC HAS NO BRANCHES,THEN THE CLASSBLOCK IS             *
CC*       REMOVED FROM STORAGE BY ROUTINE REMCLS                             *
CC*       IF THE PROCBLOC HAS MORE THAN ONE BRANCH THEN SUBROUTINE           *
CC*       SPLIT IS INVOKED TO EFFECT THE TRANSFER.                           *
CC*                                                                          *
CC*   SUBROUTINES USED                                                       *
CC*       BLOCK                                                              *
CC*       PBLOCK                                                             *
CC*       SPLIT                                                              *
CC*       PUTCLS                                                             *
CC*       CBLOCK                                                             *
CC*       REMCLS                                                             *
CC*                                                                          *
CC*                                                                          *
CC*   PROGRAMMER                                                             *
CC*       GEORGE GAIDASZ                                                     *
CC*       CALSPAN                                                            *
CC*       MAY 1975                                                           *
CC*                                                                          *
CC****************************************************************************
```

DTRNSF


START
HOW MANY LEFT BRANCHES DOES ASSOCIATED PROBLOC HAVE ?
1
0
> 1
UPDATE PROBLOC ADRS AND EXECUTION TIME IN CLASS BLOCK
REMOVE CLASS BLOCK FROM PROCESSING
SPLIT
END

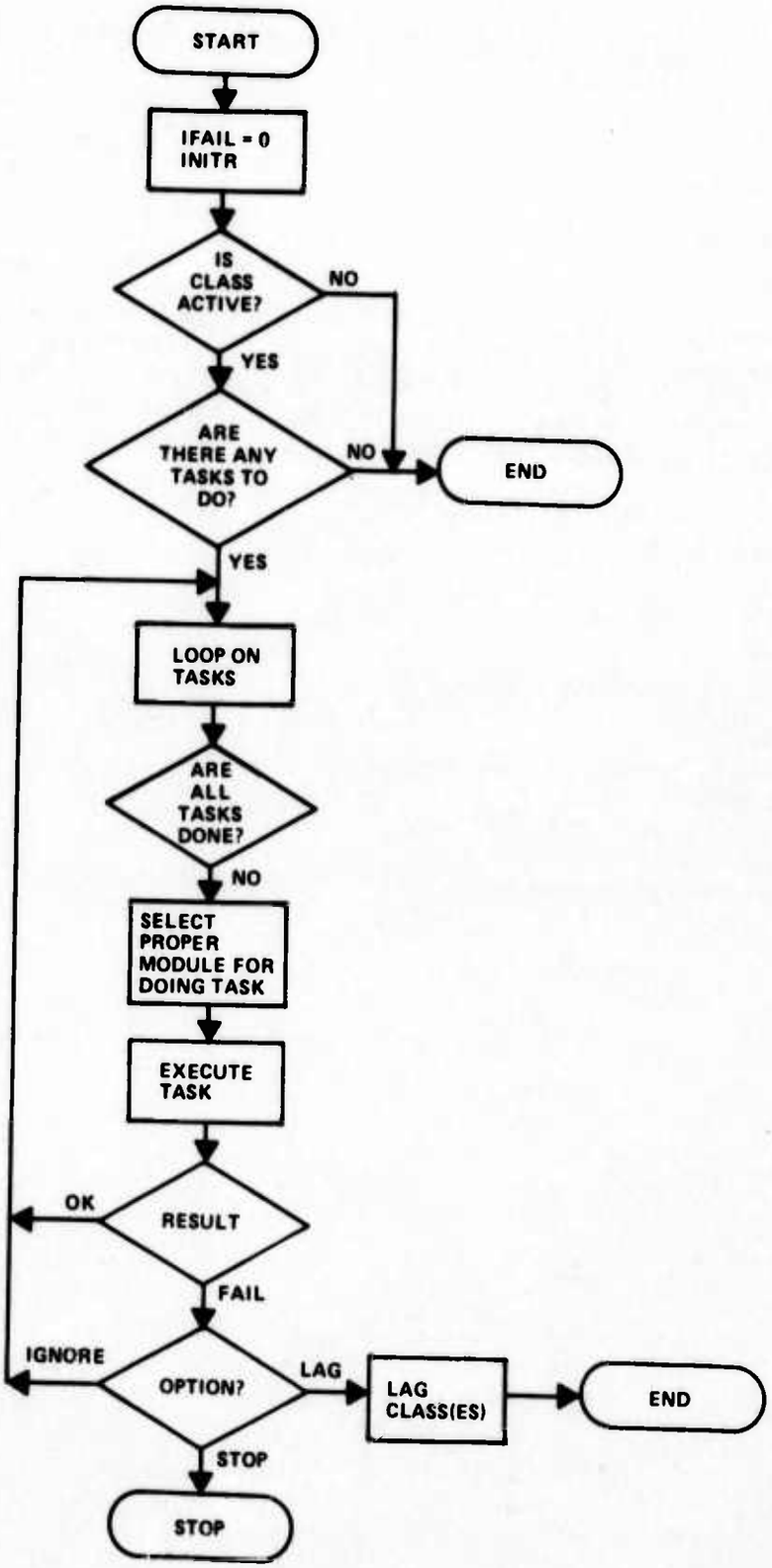
```
CC********************************* ERROR ************************************
CC*    PURPOSE                                                                *
CC*        TO PRINT ERROR MESSAGES.                                           *
CC*                                                                           *
CC*    CALLING SEQUENCE                                                       *
CC*                                                                           *
CC*        CALL ERROR(N,NAME)                                                 *
CC*                                                                           *
CC*    DESCRIPTION OF PARAMETERS                                              *
CC*                                                                           *
CC*        N               ERROR NUMBER                                       *
CC*        NAME(2)         NAME OF SUBROUTINE IN WHICH ERROR OCCURRED.        *
CC*                                                                           *
CC*    PROGRAMMER                                                             *
CC*        G. GAIDASZ                                                         *
CC*        CALSPAN                                                            *
CC*        AUG 1975                                                           *
CC*                                                                           *
CC*                                                                           *
CC*****************************************************************************
```

ERROR



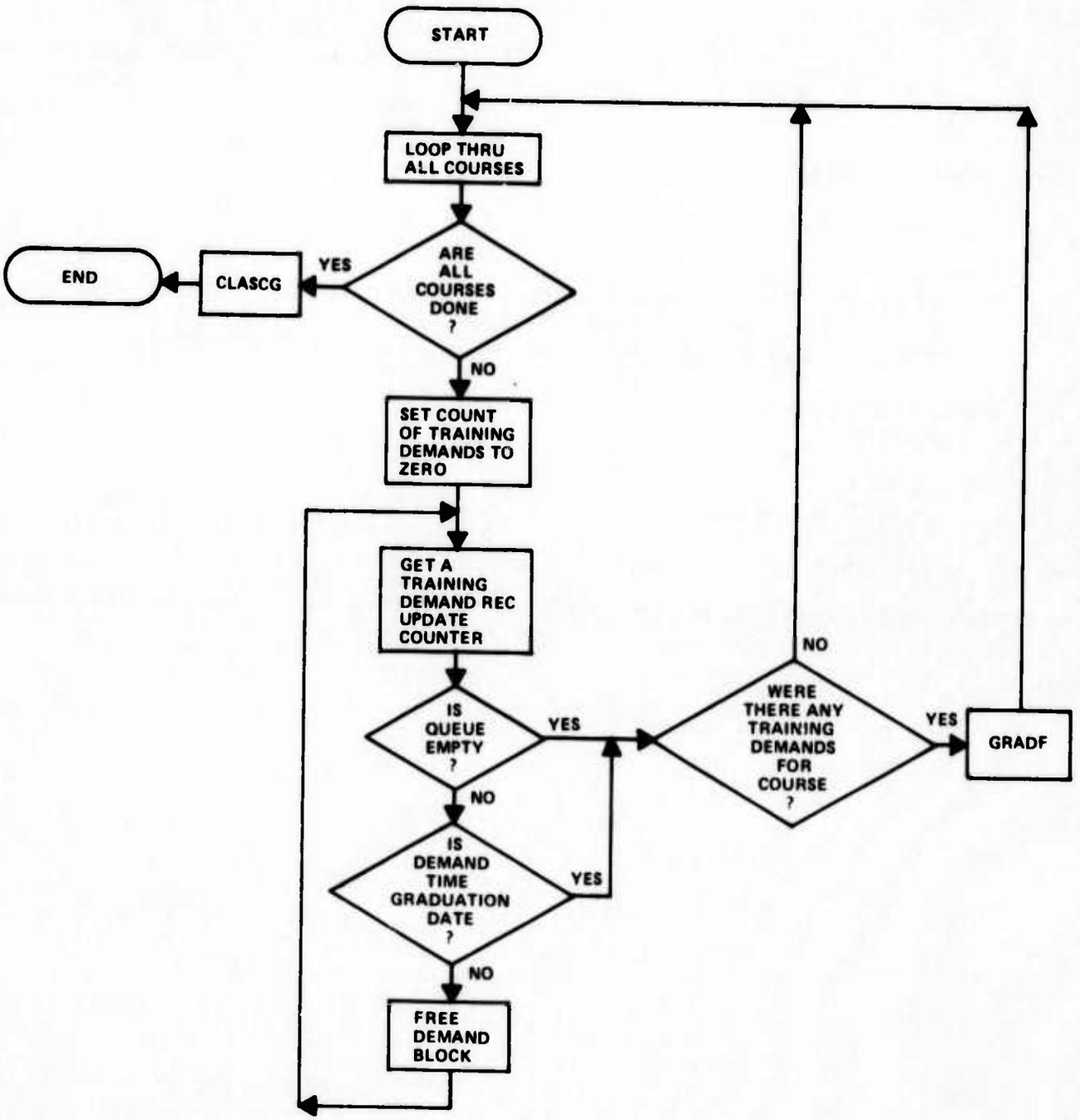
```
CC********************************* EXECT ************************************
CC*                                                                           *
CC*    PURPOSE                                                                *
CC*        TO EXECUTE THE TASKS DESCRIBED IN THE TASK LIST.                   *
CC*                                                                           *
CC*                                                                           *
CC*    CALLING SEQUENCE                                                       *
CC*                                                                           *
CC*        CALL EXECT                                                         *
CC*                                                                           *
CC*    REMARKS                                                                *
CC*                                                                           *
CC*        THIS ROUTINE CONTROLS THE EXECUTIONS OF THE TASKS WITHIN           *
CC*        PROCBLOCS BY CLASSES. AFTER INITIALIZATION, EXECT INVOKES          *
CC*        SUBROUTINE LSTASK TO ARRANGE THE TASKS IN PROPER ORDER             *
CC*        AND SUPPLY THE NECESSARY PROGRAM SUPPLIED TASKS (I.E. UPDATE,      *
CC*        DTRNSF). THEN EXECT LOOPS THRU THE TASKS AND INVOKES THE           *
CC*        PROPER ROUTINES TO PERFORM THE TASK. NOTE THAT SYNC AND            *
CC*        CORR CHANGE THE LIST OF TASKS SO THAT THE LOOP MUST BE             *
CC*        RESTARTED.                                                         *
CC*        IF A TASK FAILS THREE OPTIONS ARE AVAILABLE TO THE USER.           *
CC*        THE OPTIONS ARE STOP,IGNORE OR LAG THE CLASSES.                    *
CC*                                                                           *
CC*    SUBROUTINES USED                                                       *
CC*        CORR                                                               *
CC*        DTRNSF                                                             *
CC*        RESUSE                                                             *
CC*        INITR                                                              *
CC*        GETCLS                                                             *
CC*        SCATSA                                                             *
CC*        SYNC                                                               *
CC*        PLIST                                                              *
CC*        TBLOCK                                                             *
CC*        LAG                                                                *
CC*        BLOCK                                                              *
CC*        CBLOCK                                                             *
CC*        UPDATE                                                             *
CC*                                                                           *
CC*    PROGRAMMER                                                             *
CC*        GEORGE GAIDASZ                                                     *
CC*        CALSPAN                                                            *
CC*        MAY 1975                                                           *
CC*                                                                           *
CC*******************************************************************************
```

EXECT


START
IFAIL = 0
INITR
IS CLASS ACTIVE?
NO
YES
ARE THERE ANY TASKS TO DO?
NO
END
YES
LOOP ON TASKS
ARE ALL TASKS DONE?
NO
SELECT PROPER MODULE FOR DOING TASK
EXECUTE TASK
OK
RESULT
FAIL
IGNORE
OPTION?
LAG
LAG CLASS(ES)
END
STOP
STOP

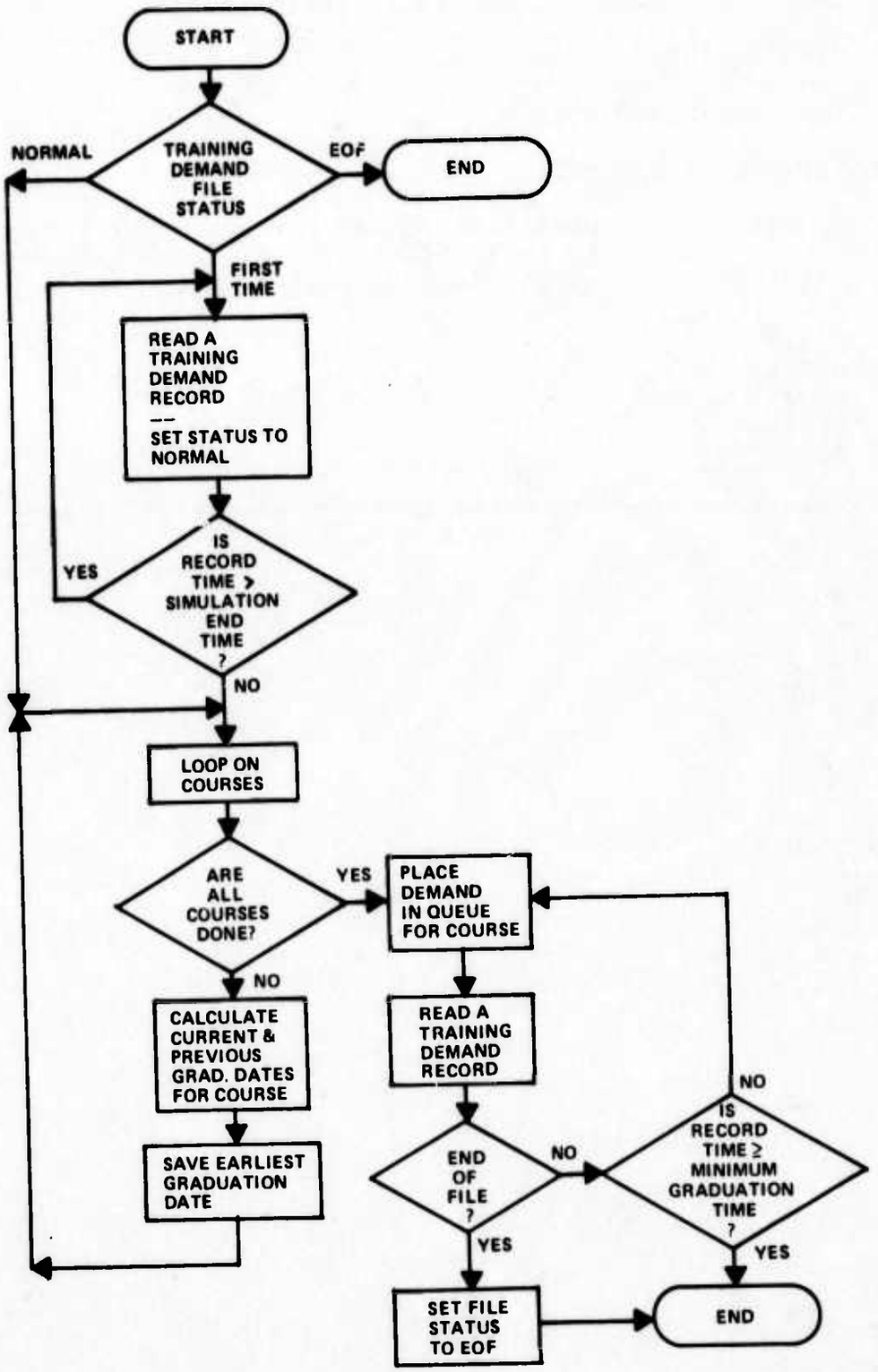
```
CC********************************* FORMC ***********************************
CC*                                                                          *
CC*    PURPOSE                                                               *
CC*        CREATE CLASS BLOCKS FROM THE TRAINING DEMAND INFORMATION          *
CC*        STORED BY 'FORMQ'.                                                *
CC*                                                                          *
CC*                                                                          *
CC*    CALLING SEQUENCE                                                      *
CC*                                                                          *
CC*        CALL FORMC                                                        *
CC*                                                                          *
CC*    REMARKS                                                               *
CC*        THIS ROUTINE EXTRACTS FROM THE TRAINING DEMAND QUEUE              *
CC*        THE RECORDS NECESSARY TO COMPUTE THE GRADUATION                   *
CC*        REQUIREMENTS FOR EACH COURSE. THE STORAGE OCCUPIED BY             *
CC*        THE TRAINING DEMANDS IS RETURNED TO FREE SPACE.                   *
CC*        SUBROUTINES GRADF AND CLASCG ARE USED TO FORM THE                 *
CC*        CLASSES                                                           *
CC*                                                                          *
CC*    SUBROUTINES USED                                                      *
CC*        CLASCG                                                            *
CC*        FRETDB                                                            *
CC*        GETTDB                                                            *
CC*        GRADF                                                             *
CC*                                                                          *
CC*    PROGRAMMER                                                            *
CC*        GEORGE GAIDASZ                                                    *
CC*        CALSPAN                                                           *
CC*        MAY 1975                                                          *
CC*                                                                          *
CC****************************************************************************
```

FORMC


START
LOOP THRU ALL COURSES
ARE ALL COURSES DONE ?
YES
CLASCG
END
NO
SET COUNT OF TRAINING DEMANDS TO ZERO
GET A TRAINING DEMAND REC UPDATE COUNTER
IS QUEUE EMPTY ?
YES
NO
WERE THERE ANY TRAINING DEMANDS FOR COURSE ?
NO
YES
GRADF
IS DEMAND TIME GRADUATION DATE ?
YES
NO
FREE DEMAND BLOCK

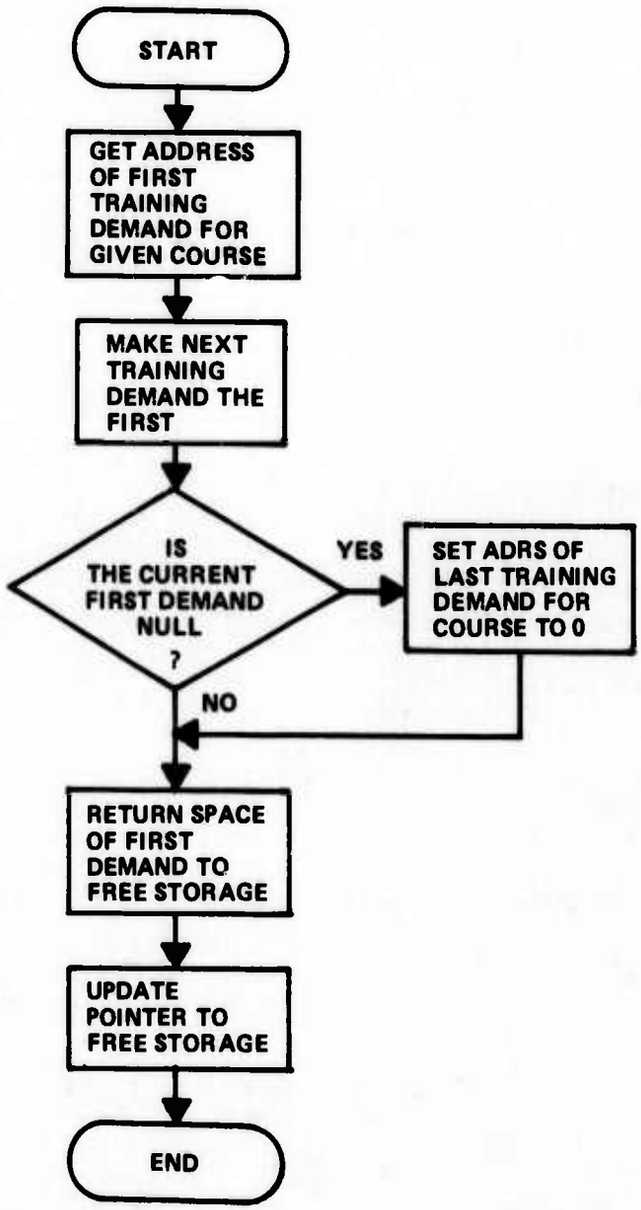
```
CC********************************* FORMQ ***********************************
CC*                                                                          *
CC*   PURPOSE                                                                *
CC*        READ IN TRAINING-DEMAND RECORDS GENERATED BY TRAM2 FOR            *
CC*        A PERIOD OF TIME TO MEET CURRENT GRADUATION SCHEDULES             *
CC*        FOR ALL COURSES AND FORM INDIVIDUAL TRAINING DEMAND QUEUES        *
CC*        FOR EACH COURSE                                                   *
CC*                                                                          *
CC*                                                                          *
CC*   CALLING SEQUENCE                                                       *
CC*                                                                          *
CC*        CALL FORMQ                                                        *
CC*                                                                          *
CC*   REMARKS                                                                *
CC*        TRAINING DEMAND RECORDS ARE READ ONLY TO THE TIME OF THE          *
CC*        LATEST GRADUATION AMONG THE COURSES.                              *
CC*        THE RECORDS ARE STORED IN A ONE-DIMENSIONAL LINKED LIST.          *
CC*                                                                          *
CC*   SUBROUTINES USED                                                       *
CC*        ADDTDQ                                                            *
CC*                                                                          *
CC*   PROGRAMMER                                                             *
CC*        GEORGE GAIDASZ                                                    *
CC*        CALSPAN                                                           *
CC*        MAY 1975                                                          *
CC*                                                                          *
CC****************************************************************************
```

FORMQ


START
TRAINING DEMAND FILE STATUS
NORMAL
EOF
END
FIRST TIME
READ A TRAINING DEMAND RECORD
--
SET STATUS TO NORMAL
IS RECORD TIME > SIMULATION END TIME ?
YES
NO
LOOP ON COURSES
ARE ALL COURSES DONE?
YES
NO
PLACE DEMAND IN QUEUE FOR COURSE
CALCULATE CURRENT & PREVIOUS GRAD. DATES FOR COURSE
SAVE EARLIEST GRADUATION DATE
READ A TRAINING DEMAND RECORD
END OF FILE ?
NO
YES
IS RECORD TIME ≥ MINIMUM GRADUATION TIME ?
NO
YES
SET FILE STATUS TO EOF
END

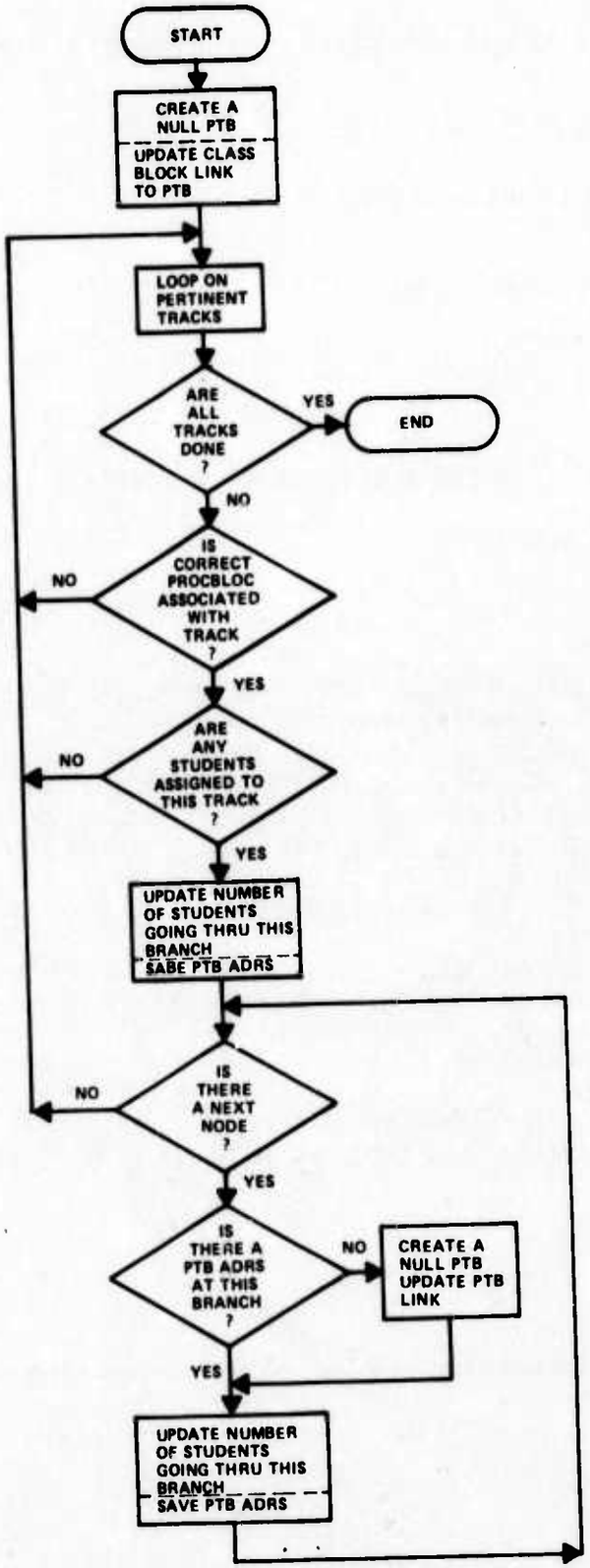
```
CC********************************* FRETDB ***********************************
CC*                                                                           *
CC*   PURPOSE                                                                 *
CC*       UTILITY ROUTINE FOR FREEING STORAGE NO LONGER USED BY               *
CC*       TRAINING DEMAND RECORDS IN A LINKED LIST.                           *
CC*                                                                           *
CC*   CALLING SEQUENCE                                                        *
CC*                                                                           *
CC*       CALL FRETDB(NCORSE)                                                 *
CC*                                                                           *
CC*   DESCRIPTION OF PARAMETERS                                               *
CC*                                                                           *
CC*       NCORSE          NUMBER OF COURSE FOR WHICH THE CORE OCCUPIED       *
CC*                       BY THE FIRST TRAINING DEMAND RECORD WILL           *
CC*                       BE RETURNED TO FREE SPACE.                         *
CC*                                                                           *
CC*                                                                           *
CC*   PROGRAMMER                                                              *
CC*       GEORGE GAIDASZ                                                      *
CC*       CALSPAN                                                             *
CC*       MAY 1975                                                            *
CC*                                                                           *
CC*****************************************************************************
```

FRETDB

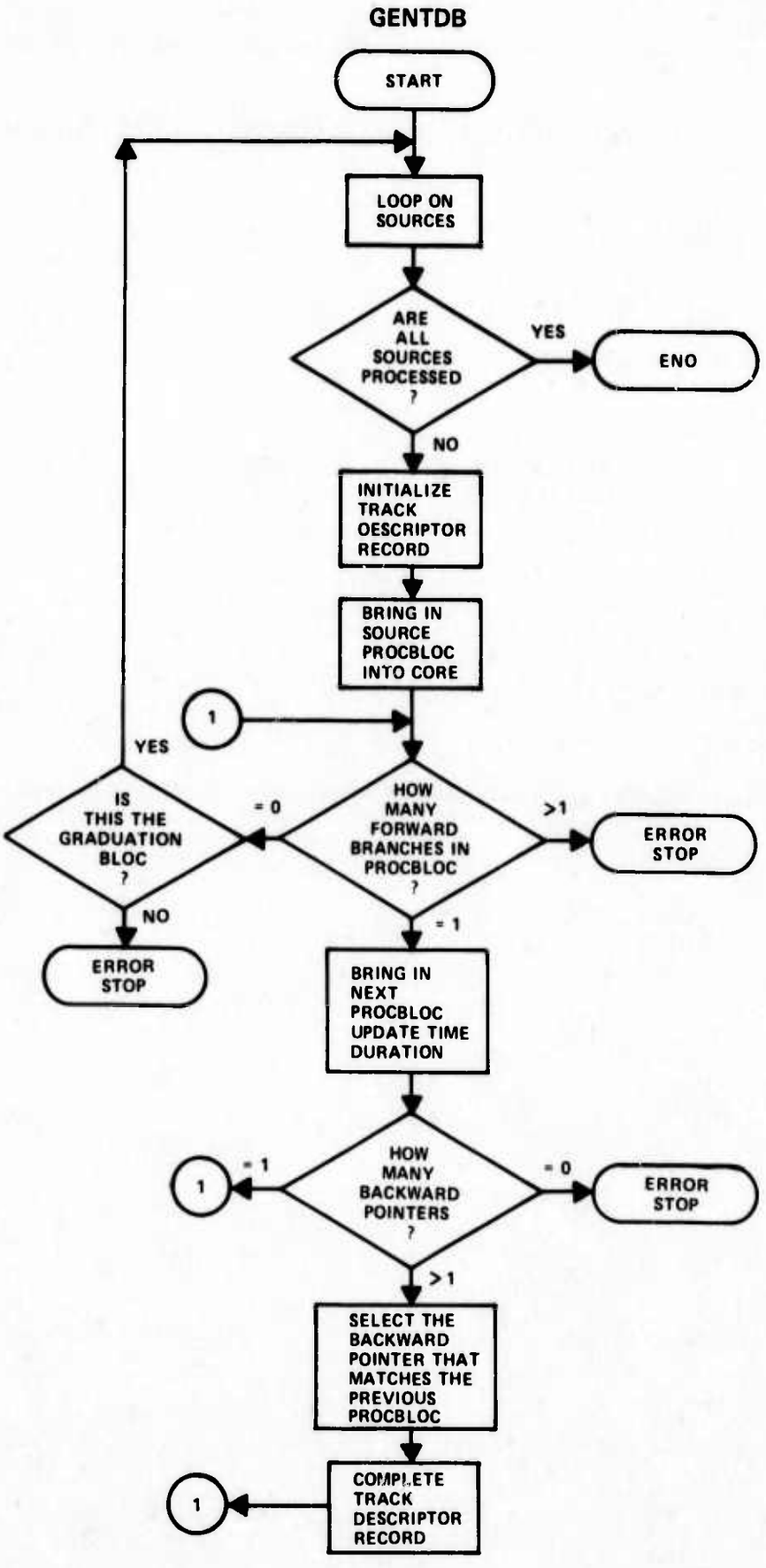

START
GET ADDRESS OF FIRST TRAINING DEMAND FOR GIVEN COURSE
MAKE NEXT TRAINING DEMAND THE FIRST
IS THE CURRENT FIRST DEMAND NULL ?
YES
SET ADRS OF LAST TRAINING DEMAND FOR COURSE TO 0
NO
RETURN SPACE OF FIRST DEMAND TO FREE STORAGE
UPDATE POINTER TO FREE STORAGE
END

```
CC********************************* FRMPTB *********************************
CC*                                                                         *
CC*   PURPOSE                                                               *
CC*       TO CREATE THE PREDETERMINED TRANSFER BLOCKS FOR A CLASS.          *
CC*                                                                         *
CC*                                                                         *
CC*   CALLING SEQUENCE                                                      *
CC*                                                                         *
CC*       CALL FRMPTB(L1,L2)                                                *
CC*                                                                         *
CC*   DESCRIPTION OF PARAMETERS                                             *
CC*                                                                         *
CC*       * INPUT *                                                         *
CC*                                                                         *
CC*       L1              POINTER TO FIRST TDB FOR COURSE.                  *
CC*       L2              POINTER TO LAST TDB FOR COURSE.                   *
CC*                                                                         *
CC*   SUBROUTINES USED                                                      *
CC*                                                                         *
CC*       PUTPTB                                                            *
CC*                                                                         *
CC*   REMARKS                                                               *
CC*       PROCESSING IN THIS ROUTINE CONSISTS OF CREATING A PTB             *
CC*       FOR THE PROCBLOC FROM WHICH SCATSA WAS CALLED.                    *
CC*       THIS PTB INDICATES HOW MANY STUDENTS WILL BE GOING THRU           *
CC*       EACH BACKWARD BRANCH.  THE NODE CHAINS FROM THE TRACK             *
CC*       DESCRIPTOR BLOCKS ARE FOLLOWED FOR EACH BRANCH, AND               *
CC*       PTBS ARE CREATE FOR EACH NODE IN THE TRACKS LEADING TO            *
CC*       THE SELECTED SOURCES.                                             *
CC*                                                                         *
CC*   PROGRAMMER                                                            *
CC*       G. GAIDASZ                                                        *
CC*       CALSPAN                                                           *
CC*       AUG 1975                                                          *
CC*                                                                         *
CC*************************************************************************
```

FRMPTB

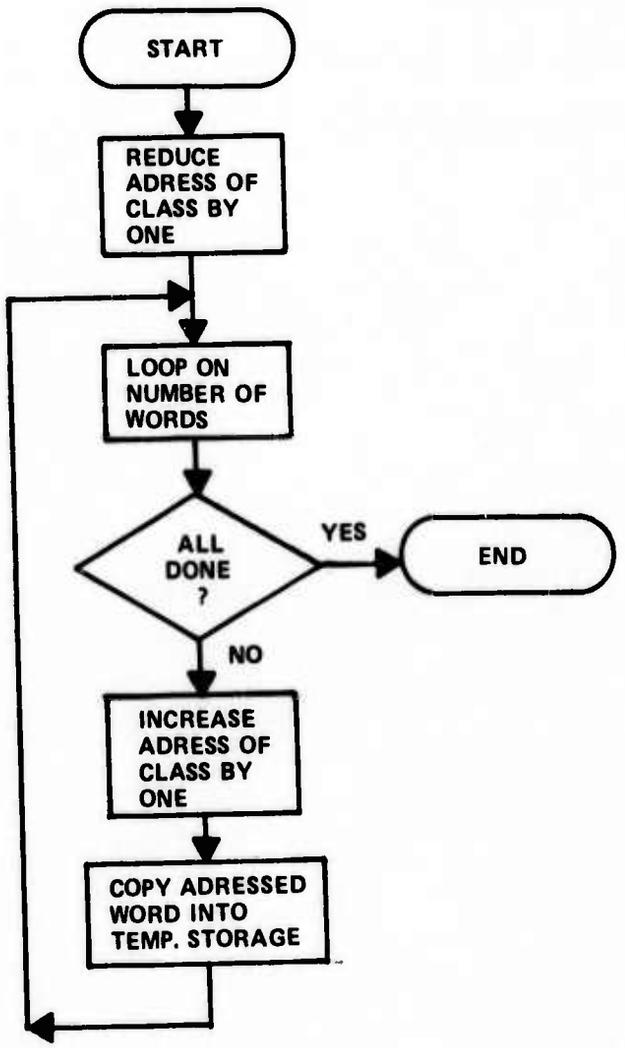

START
CREATE A NULL PTB
UPDATE CLASS BLOCK LINK TO PTB
LOOP ON PERTINENT TRACKS
ARE ALL TRACKS DONE ?
YES
END
NO
IS CORRECT PROCBLOC ASSOCIATED WITH TRACK ?
NO
YES
ARE ANY STUDENTS ASSIGNED TO THIS TRACK ?
NO
YES
UPDATE NUMBER OF STUDENTS GOING THRU THIS BRANCH
SABE PTB ADRS
IS THERE A NEXT NODE ?
NO
YES
IS THERE A PTB ADRS AT THIS BRANCH ?
NO
CREATE A NULL PTB UPDATE PTB LINK
YES
UPDATE NUMBER OF STUDENTS GOING THRU THIS BRANCH
SAVE PTB ADRS

```
CC********************************* GENTDB ***********************************
CC*                                                                           *
CC*    PURPOSE                                                                *
CC*        TO GENERATE A SET OF TRACK DESCRIPTOR BLOCKS FOR EACH              *
CC*        COURSE.                                                            *
CC*                                                                           *
CC*    CALLING SEQUENCE                                                       *
CC*                                                                           *
CC*        CALL GENTDB(ISRCE1,IDUMP )                                         *
CC*                                                                           *
CC*                                                                           *
CC*    DESCRIPTION OF PARAMETERS                                              *
CC*                                                                           *
CC*        * INPUT *                                                          *
CC*                                                                           *
CC*        ISRCE1          POINTER TO FIRST SOURCE FOR THIS COURSE.           *
CC*                        (NOSRCS POINTS TO THE LAST SOURCE).                *
CC*        IDUMP           DIAGNOSTIC DUMP SWITCH. (1-PRINT DIAGS.)           *
CC*                                                                           *
CC*    SUBROUTINES CALLED                                                     *
CC*        BLOCK                                                              *
CC*        PBLOCK                                                             *
CC*                                                                           *
CC*    REMARKS                                                                *
CC*        GENTDB IS CALLED ONCE FOR EACH COURSE. ISRCE1 POINTS TO THE        *
CC*        FIRST SOURCE FOR THE COURSE, NOSRCS IN COMMON SORDSC POINTS        *
CC*        TO THE LAST SOURCE FOR THE COURSE. THE ROUTINE STARTS AT           *
CC*        EACH SOURCE AND USING THE FORWARD POINTERS STEPS THRU THE          *
CC*        PROCBLOCS UNTIL A NODE IS FOUND.(PROCBLOC WITH MORE THAN           *
CC*        ONE BACKWARD POINTER). CUMULATIVE TIME OF THE PROCBLOCS,           *
CC*        FROM THE SOURCE TO THE NODE (INCLUSIVE) IS CALCULATED              *
CC*        AS ARE THE CUMULATIVE PRIORITIES AND PERCENTAGES (PRESENT          *
CC*        ONLY AT NODES).                                                    *
CC*        A DESCRIPTION OF EACH NODE OF EVERY TRACK IS STORED IN THE         *
CC*        ARRAYS OF COMMON RLTDBC.  EACH TRACK DESCRIPTOR BLOCK              *
CC*        POINTS TO THE PRECEEDING NODE OF THE SAME TRACK.                   *
CC*        VARIABLE NSRCE POINTS TO THE SOURCE DESCRIPTION IN COMMON          *
CC*        BLOCK SORDSC.                                                      *
CC*          NOTE.- TRACK DESCRIPTOR BLOCKS ARE CREATED ONLY FOR              *
CC*                 COURSES THAT CONTAIN MORE THAN 1 TRACK.                   *
CC*                                                                           *
CC*    PROGRAMMER                                                             *
CC*        G. GAIDASZ                                                         *
CC*        CALSPAN                                                            *
CC*        AUG 1975                                                           *
CC*                                                                           *
CC*****************************************************************************
```


GENTDB
START
LOOP ON SOURCES
ARE ALL SOURCES PROCESSED ?
YES
ENO
NO
INITIALIZE TRACK OESCRIPTOR RECORD
BRING IN SOURCE PROCBLOC INTO CORE
1
HOW MANY FORWARD BRANCHES IN PROCBLOC ?
>1
ERROR STOP
= 0
IS THIS THE GRADUATION BLOC ?
YES
NO
ERROR STOP
= 1
BRING IN NEXT PROCBLOC UPDATE TIME DURATION
HOW MANY BACKWARD POINTERS ?
= 1
1
= 0
ERROR STOP
>1
SELECT THE BACKWARD POINTER THAT MATCHES THE PREVIOUS PROCBLOC
COMPLETE TRACK DESCRIPTOR RECORD
1

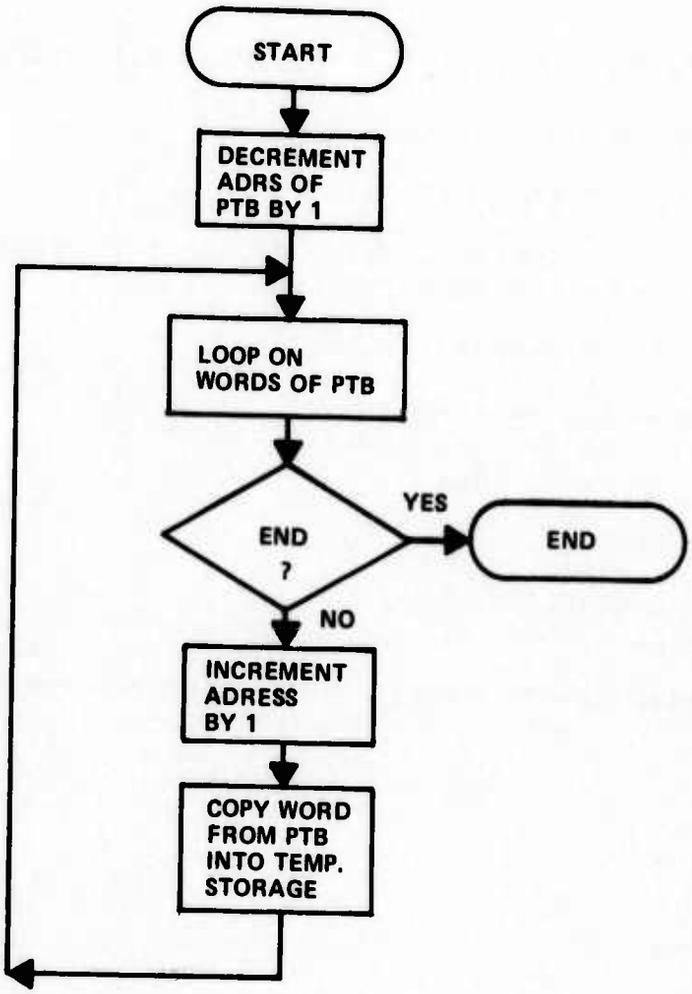
```
CC********************************* GETCLS ***********************************
CC*                                                                           *
CC*    PURPOSE                                                                *
CC*        TO MOVE A VARIABLE NUMBER OF WORDS FROM A CLASS BLOCK              *
CC*        INTO LOCAL STORAGE                                                 *
CC*                                                                           *
CC*                                                                           *
CC*    CALLING SEQUENCE                                                       *
CC*                                                                           *
CC*        CALL GETCLS(INDEX,IA,N)                                            *
CC*                                                                           *
CC*    DESCRIPTION OF PARAMETERS                                              *
CC*                                                                           *
CC*        * INPUT *                                                          *
CC*                                                                           *
CC*        INDEX           ADRESS OF THE CLASS BLOCK                          *
CC*        N               NUMBER OF WORDS TO BE MOVED TO LOCAL STORAGE       *
CC*                                                                           *
CC*        * OUTPUT *                                                         *
CC*                                                                           *
CC*        IA()            N WORDS OF CLASS BLOCK                             *
CC*                                                                           *
CC*    PROGRAMMER                                                             *
CC*        GEORGE GAIDASZ                                                     *
CC*        CALSPAN                                                            *
CC*        MAY 1975                                                           *
CC*                                                                           *
CC*************************************************************************** *
```

GETCLS

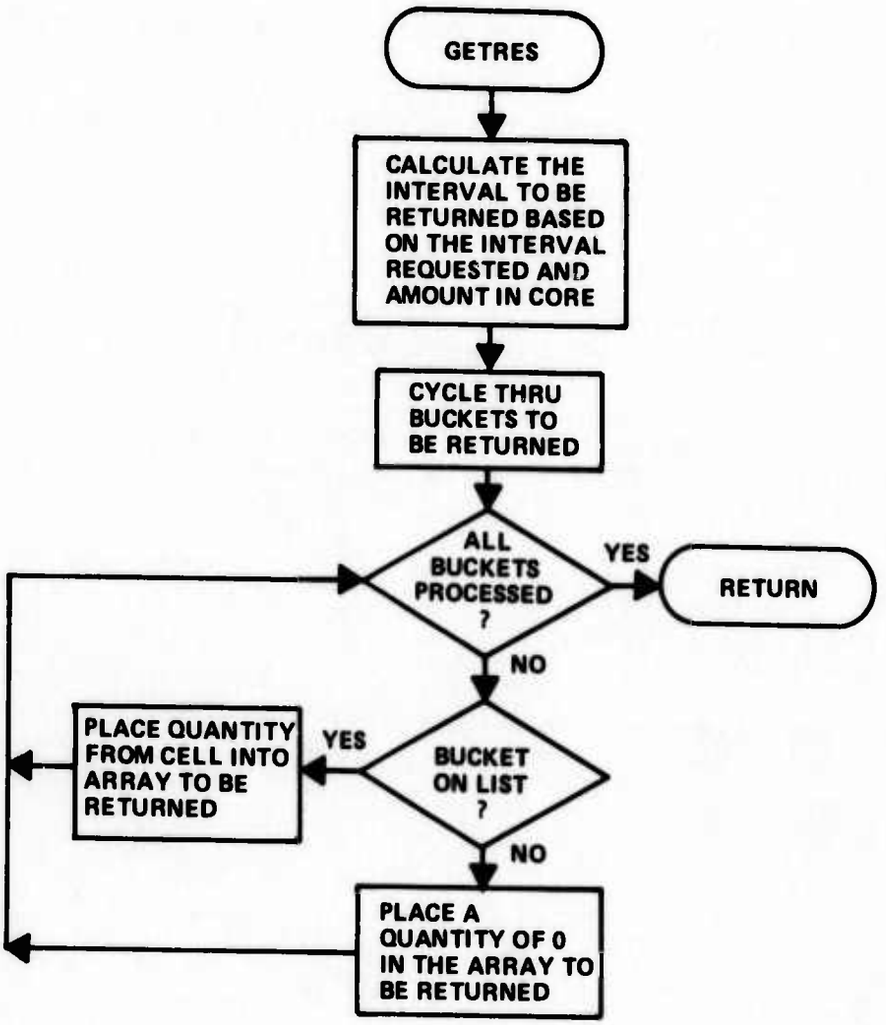

START
REDUCE ADRESS OF CLASS BY ONE
LOOP ON NUMBER OF WORDS
ALL DONE ?
YES
END
NO
INCREASE ADRESS OF CLASS BY ONE
COPY ADRESSED WORD INTO TEMP. STORAGE

```
CC********************************* GETPTB ***********************************
CC*
CC*    PURPOSE                                                                *
CC*        TO BRING IN A PREDETERMINED TRANSFER BLOCK INTO LOCAL              *
CC*        STORAGE.                                                           *
CC*                                                                           *
CC*                                                                           *
CC*    CALLING SEQUENCE                                                       *
CC*                                                                           *
CC*        CALL GETPTB(IADRS,IA)                                              *
CC*                                                                           *
CC*    DESCRIPTION OF PARAMETERS                                              *
CC*                                                                           *
CC*        * INPUT *                                                          *
CC*                                                                           *
CC*        IADRS              ADRESS OF PTB                                   *
CC*                                                                           *
CC*        * OUTPUT *                                                         *
CC*                                                                           *
CC*        IA()               TEN WORDS OF PTB                                *
CC*                                                                           *
CC*    PROGRAMMER                                                             *
CC*        G. GAIDASZ                                                         *
CC*        CALSPAN                                                            *
CC*        MAY 1975                                                           *
CC*                                                                           *
CC*****************************************************************************
```

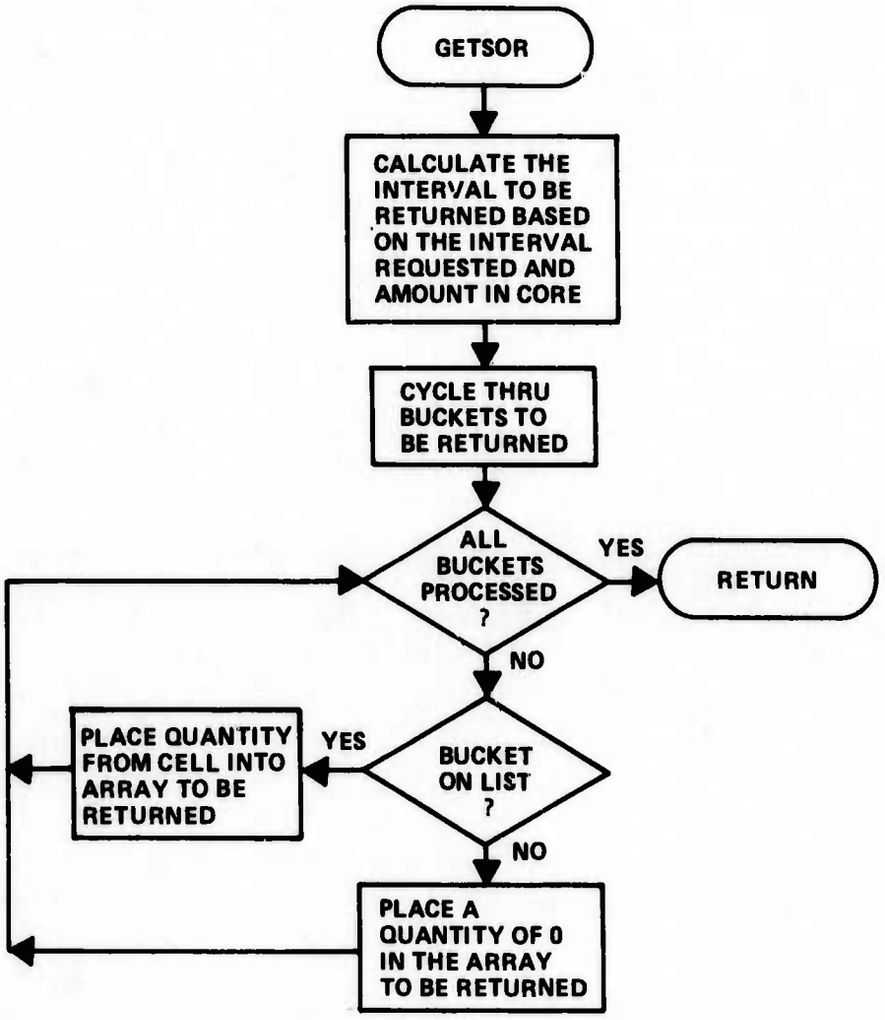
GETPTB


START
DECREMENT ADRS OF PTB BY 1
LOOP ON WORDS OF PTB
END ?
YES
END
NO
INCREMENT ADRESS BY 1
COPY WORD FROM PTB INTO TEMP. STORAGE

```
C********************************  GETRES  ********************************
C*                                                                        *
C*                            SUBROUTINE GETRES                           *
C*                                                                        *
C*     PURPOSE                                                            *
C*         READS QUANTITY OF A GIVEN RESOURCE FOR A GIVEN PERIOD.         *
C*                                                                        *
C*     CALLING SEQUENCE                                                   *
C*         CALL GETRES(IRES,IT1IN,IT2IN,IT1OUT,IT2OUT,IARRAY)             *
C*                                                                        *
C*     DESCRIPTION OF PARAMETERS                                          *
C*                                                                        *
C*                      * EXPLICIT INPUT *                                *
C*         IRES   - RESOURCE NUMBER                                       *
C*         IT1IN  - BEGINNING OF TIME INTERVAL REQUESTED                  *
C*         IT2IN  - END OF TIME INTERVAL REQUESTED                        *
C*                                                                        *
C*                      * EXPLICIT OUTPUT *                               *
C*         IT1OUT - BEGINNING OF TIME INTERVAL RETURNED                   *
C*         IT2OUT - END OF TIME INTERVAL RETURNED                         *
C*         IARRAY - ARRAY OF QUANTITIES RETURNED                          *
C*                                                                        *
C*                                                                        *
C*     AUTHOR/PROGRAMMER                                                  *
C*         JOHN R. MENIG                                                  *
C*         CALSPAN CORPORATION                                            *
C*         28 APRIL 1975                                                  *
C*                                                                        *
C************************************************************************
```

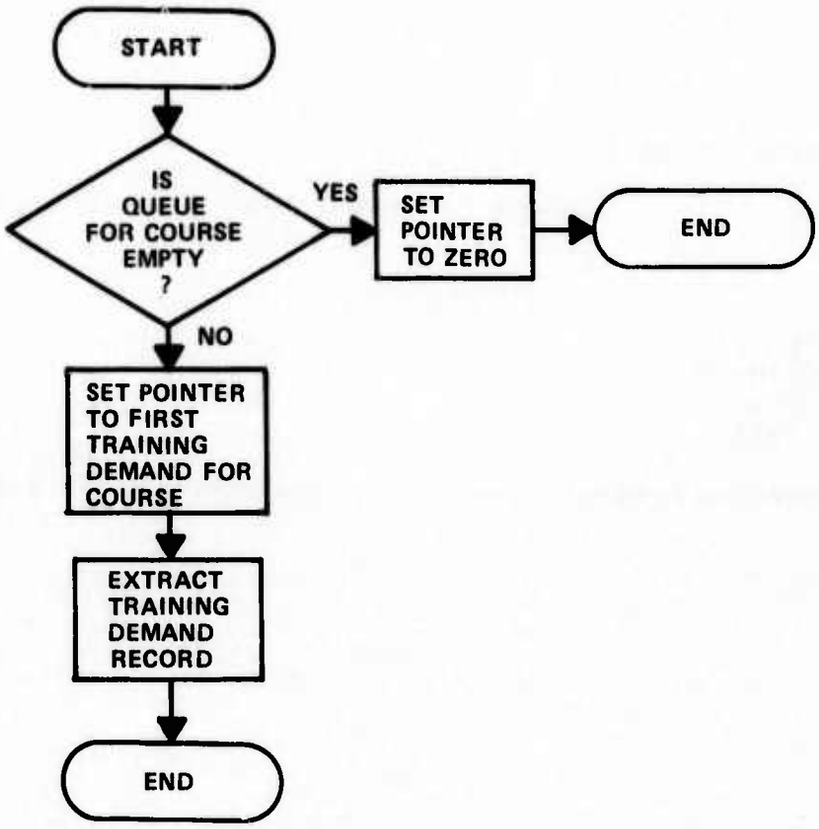

GETRES
CALCULATE THE INTERVAL TO BE RETURNED BASED ON THE INTERVAL REQUESTED AND AMOUNT IN CORE
CYCLE THRU BUCKETS TO BE RETURNED
ALL BUCKETS PROCESSED ?
YES
RETURN
NO
BUCKET ON LIST ?
YES
PLACE QUANTITY FROM CELL INTO ARRAY TO BE RETURNED
NO
PLACE A QUANTITY OF 0 IN THE ARRAY TO BE RETURNED

```
C********************************  GETSOR  ********************************
C*                                                                        *
C*                            SUBROUTINE GETSOR                           *
C*                                                                        *
C*     PURPOSE                                                            *
C*         READS QUANTITY OF A GIVEN SOURCE FOR A GIVEN PERIOD.           *
C*                                                                        *
C*     CALLING SEQUENCE                                                   *
C*         CALL GETSOR(ISOR,IT1IN,IT2IN,IT1OUT,IT2OUT,IARRAY)             *
C*                                                                        *
C*     DESCRIPTION OF PARAMETERS                                          *
C*                                                                        *
C*                      * EXPLICIT INPUT *                                *
C*         ISOR    - SOURCE NUMBER                                        *
C*         IT1IN   - BEGINNING OF TIME INTERVAL REQUESTED                 *
C*         IT2IN   - END OF TIME INTERVAL REQUESTED                       *
C*                                                                        *
C*                      * EXPLICIT OUTPUT *                               *
C*         IT1OUT  - BEGINNING OF TIME INTERVAL RETURNED                  *
C*         IT2OUT  - END OF TIME INTERVAL RETURNED                        *
C*         IARRAY  - ARRAY OF QUANTITIES RETURNED                         *
C*                                                                        *
C*     AUTHOR/PROGRAMMER                                                  *
C*         JOHN R. MENIG                                                  *
C*         CALSPAN CORPORATION                                            *
C*         28 APRIL 1975                                                  *
C*                                                                        *
C************************************************************************
```


GETSOR
CALCULATE THE INTERVAL TO BE RETURNED BASED ON THE INTERVAL REQUESTED AND AMOUNT IN CORE
CYCLE THRU BUCKETS TO BE RETURNED
ALL BUCKETS PROCESSED ?
YES
RETURN
NO
BUCKET ON LIST ?
YES
PLACE QUANTITY FROM CELL INTO ARRAY TO BE RETURNED
NO
PLACE A QUANTITY OF 0 IN THE ARRAY TO BE RETURNED

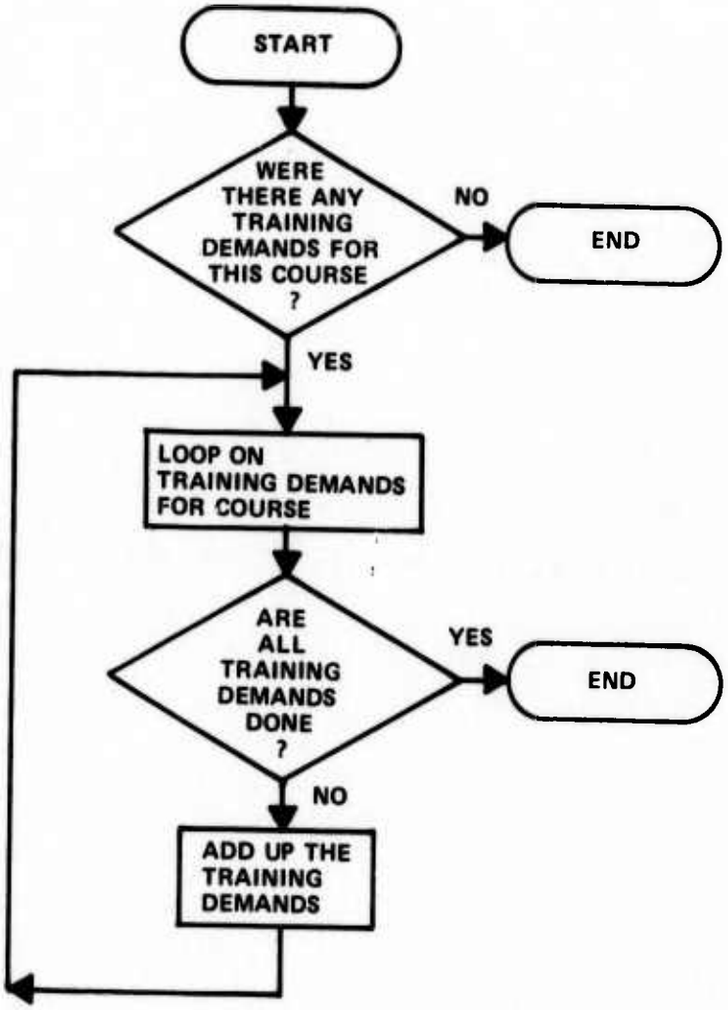
```
CC********************************* GETTDB *********************************
CC*                                                                          *
CC*    PURPOSE                                                               *
CC*        UTILITY ROUTINE TO ACCESS TRAINING DEMAND INFORMATION             *
CC*        STORED IN A LINKED LIST.                                          *
CC*                                                                          *
CC*    CALLING SEQUENCE                                                      *
CC*                                                                          *
CC*        CALL GETTDB(NCORSE,IPOINT,NUMT,IDATE,IDGRAD,ITTYPE,IDTYPE)        *
CC*                                                                          *
CC*    DESCRIPTION OF PARAMETERS                                             *
CC*                                                                          *
CC*        * INPUT *                                                         *
CC*                                                                          *
CC*        NCORSE          COURSE NUMBER FOR WHICH NEXT AVAILABLE            *
CC*                        TRAINING DEMAND IS REQUIRED.                      *
CC*                                                                          *
CC*        * OUTPUT *                                                        *
CC*                                                                          *
CC*        IPOINT          ADRESS OF NEXT AVAILABLE TRAINING DEMAND          *
CC*                        RECORD.  0 IF NONE REMAIN.                        *
CC*        NUMT            NUMBER OF STUDENTS.(FLOATING POINT VALUE)         *
CC*        IDATE           DEMAND DATE                                       *
CC*        IDGRAD          GRADUATION ID. (SET TO ZERO IN ADDTDQ)            *
CC*        ITTYPE          TRAINEE TYPE (PILOT,COPILOT,OSO,DSO).             *
CC*        IDTYPE          REASON FOR DEMAD. (CCTS DUE TO DELIVERY,          *
CC*                         CCTS DUE TO ATTRITION,PMT).                      *
CC*                                                                          *
CC*                                                                          *
CC*    PROGRAMMER                                                            *
CC*        GEORGE GAIDASZ                                                    *
CC*        CALSPAN                                                           *
CC*        MAY 1975                                                          *
CC*                                                                          *
CC****************************************************************************
```

GETTDB


START
IS QUEUE FOR COURSE EMPTY ?
YES
SET POINTER TO ZERO
END
NO
SET POINTER TO FIRST TRAINING DEMAND FOR COURSE
EXTRACT TRAINING DEMAND RECORD
END

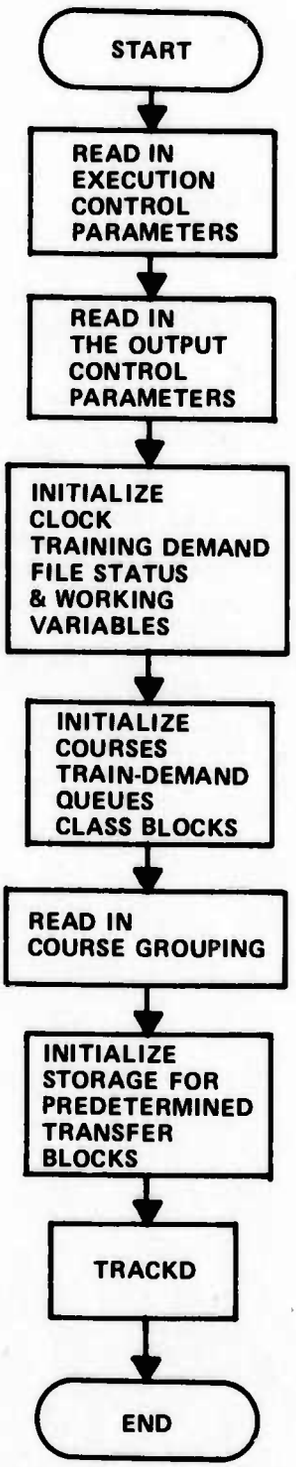
```
CC********************************* GRADF ************************************
CC*                                                                           *
CC*    PURPOSE                                                                *
CC*        TO ACCUMULATE THE TRAINING DEMANDS FOR A COURSE.                   *
CC*                                                                           *
CC*    REMARKS                                                                *
CC*        THIS ROUTINE IS USED ONLY WHEN CREWS CAN BE FORMED                 *
CC*        WITHOUT REGARD TO THE DESTINATION AIR BASE.                        *
CC*                                                                           *
CC*    CALLING SEQUENCE                                                       *
CC*                                                                           *
CC*        CALL GRADF(NCORSE)                                                 *
CC*                                                                           *
CC*    DESCRIPTION OF PARAMETERS                                              *
CC*                                                                           *
CC*        NCORSE          NUMBER OF COURSE FOR WHICH TRAINING DEMAND         *
CC*                        RECORDS ARE TO BE ACCUMULATED.                     *
CC*                                                                           *
CC*                                                                           *
CC*    PROGRAMMER                                                             *
CC*        G. GAIDASZ                                                         *
CC*        CALSPAN                                                            *
CC*        MAY 1975                                                           *
CC*                                                                           *
CC*******************************************************************************
```

GRADF


START
WERE THERE ANY TRAINING DEMANDS FOR THIS COURSE ?
NO
END
YES
LOOP ON TRAINING DEMANDS FOR COURSE
ARE ALL TRAINING DEMANDS DONE ?
YES
END
NO
ADD UP THE TRAINING DEMANDS

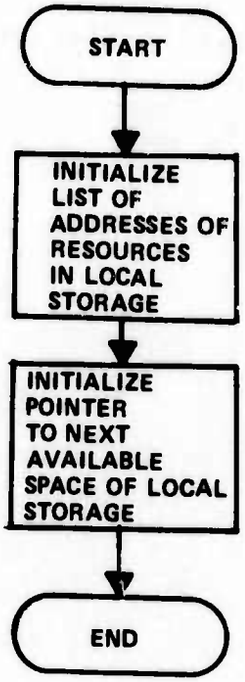
```
CC******************************** INIT ************************************
CC*                                                                       *
CC*   PURPOSE                                                             *
CC*       1. READ IN EXECUTION AND OUTPUT CONTROL PARAMETERS.             *
C*        2. INITIALIZE WORKING STORAGE AND POINTERS.                     *
CC*       3. CREATE TRACK DESCRIPTOR RECORDS                              *
CC*                                                                       *
CC*                                                                       *
CC*   CALLING SEQUENCE                                                    *
CC*                                                                       *
CC*       CALL INIT                                                       *
CC*                                                                       *
CC*   REMARKS                                                             *
CC*       THE ROUTINE MUST BE PROCESSED BY THE VARY PROGRAM BEFORE        *
CC*       COMPILATION BECAUSE IT CONTAINS VARIABLES THAT DEFINE THE       *
CC*       SIZE OF THE ARRAYS.                                             *
CC*                                                                       *
CC*   SUBROUTINES USED                                                    *
CC*       TRACKD                                                          *
CC*                                                                       *
CC*   PROGRAMMER                                                          *
CC*       GEORGE GAIDASZ                                                  *
CC*       CALSPAN                                                         *
CC*       MAY 1975                                                        *
CC*                                                                       *
CC***************************************************************************
```

INIT

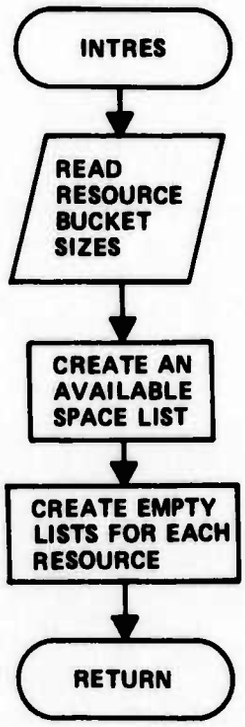

START
READ IN EXECUTION CONTROL PARAMETERS
READ IN THE OUTPUT CONTROL PARAMETERS
INITIALIZE CLOCK TRAINING DEMAND FILE STATUS & WORKING VARIABLES
INITIALIZE COURSES TRAIN-DEMAND QUEUES CLASS BLOCKS
READ IN COURSE GROUPING
INITIALIZE STORAGE FOR PREDETERMINED TRANSFER BLOCKS
TRACKD
END

```
CC********************************* INITR ***********************************
CC*                                                                          *
CC*    PURPOSE                                                               *
CC*        INITIALIZE WORKING STORAGE FOR TENTATIVE RESOURE ALLOCATION        *
CC*        CALCULATIONS.                                                     *
CC*                                                                          *
CC*                                                                          *
CC*    CALLING SEQUENCE                                                      *
CC*                                                                          *
CC*        CALL INITR                                                        *
CC*                                                                          *
CC*    PROGRAMMER                                                            *
CC*        G. GAIDASZ                                                        *
CC*        CALSPAN                                                           *
CC*        MAY 1975                                                          *
CC*                                                                          *
CC*****************************************************************************
```

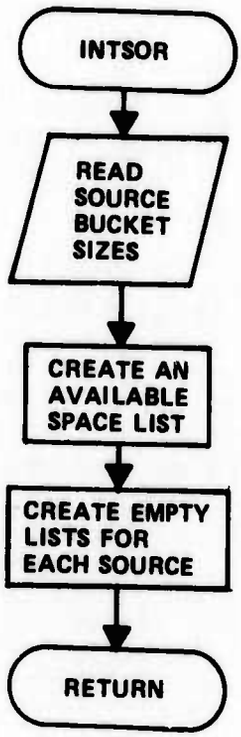
INITR


START
INITIALIZE LIST OF ADDRESSES OF RESOURCES IN LOCAL STORAGE
INITIALIZE POINTER TO NEXT AVAILABLE SPACE OF LOCAL STORAGE
END

```
C*******************************  INTRES  ****************************
C*                                                                   *
C*                            SUBROUTINE INTRES                      *
C*                                                                   *
C*    PURPOSE                                                        *
C*        INITIALIZE RESOURCE TABLES                                 *
C*                                                                   *
C*    AUTHOR/PROGRAMMER                                              *
C*        JOHN R. MENIG                                              *
C*        CALSPAN CORPORATION                                        *
C*        28 APRIL 1975                                              *
C*                                                                   *
C*********************************************************************
```

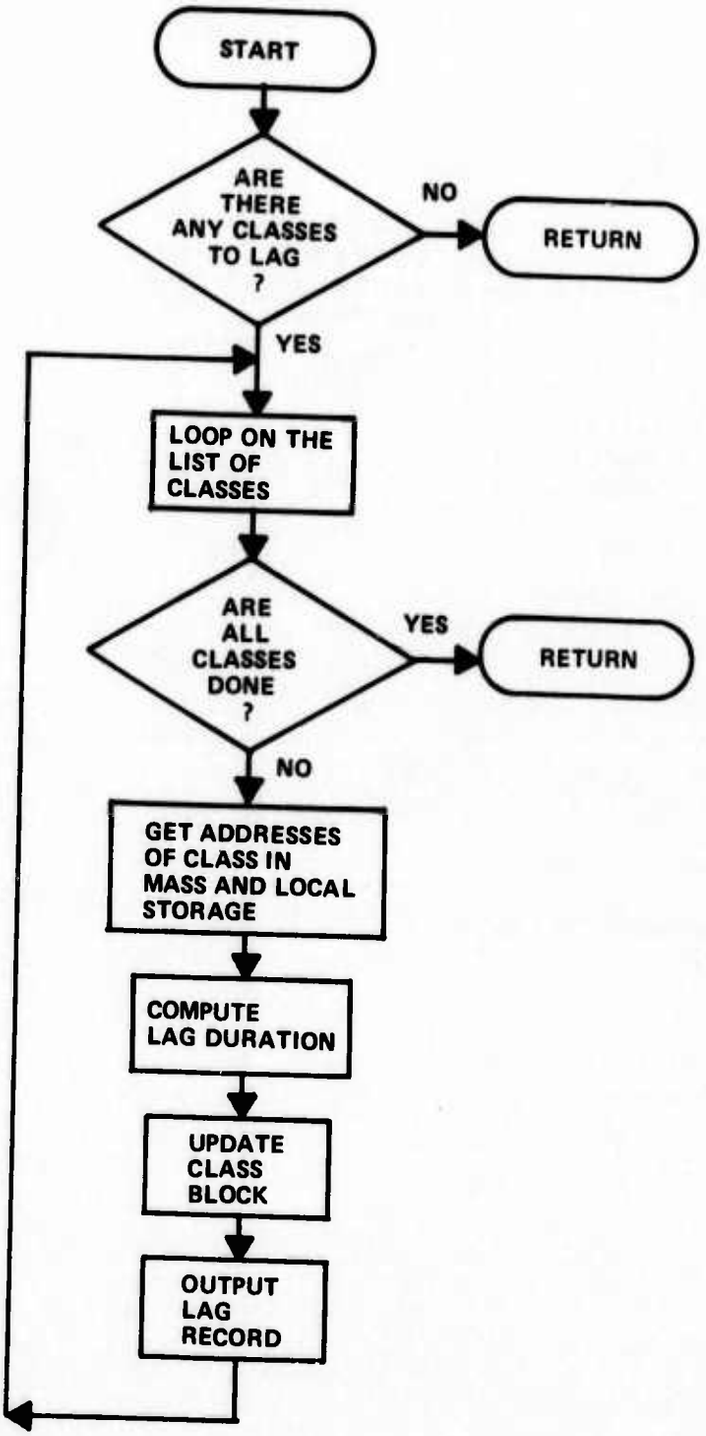

INTRES
READ RESOURCE BUCKET SIZES
CREATE AN AVAILABLE SPACE LIST
CREATE EMPTY LISTS FOR EACH RESOURCE
RETURN

```
C********************************  INTSOR  ********************************
C*                                                                        *
C*                            SUBROUTINE INTSOR                           *
C*                                                                        *
C*     PURPOSE                                                            *
C*         INITIALIZE SOURCE TABLES                                       *
C*                                                                        *
C*     AUTHOR/PROGRAMMER                                                  *
C*         JOHN R. MENIG                                                  *
C*         CALSPAN CORPORATION                                            *
C*         28 APRIL 1975                                                  *
C*                                                                        *
C************************************************************************
```


INTSOR
READ SOURCE BUCKET SIZES
CREATE AN AVAILABLE SPACE LIST
CREATE EMPTY LISTS FOR EACH SOURCE
RETURN

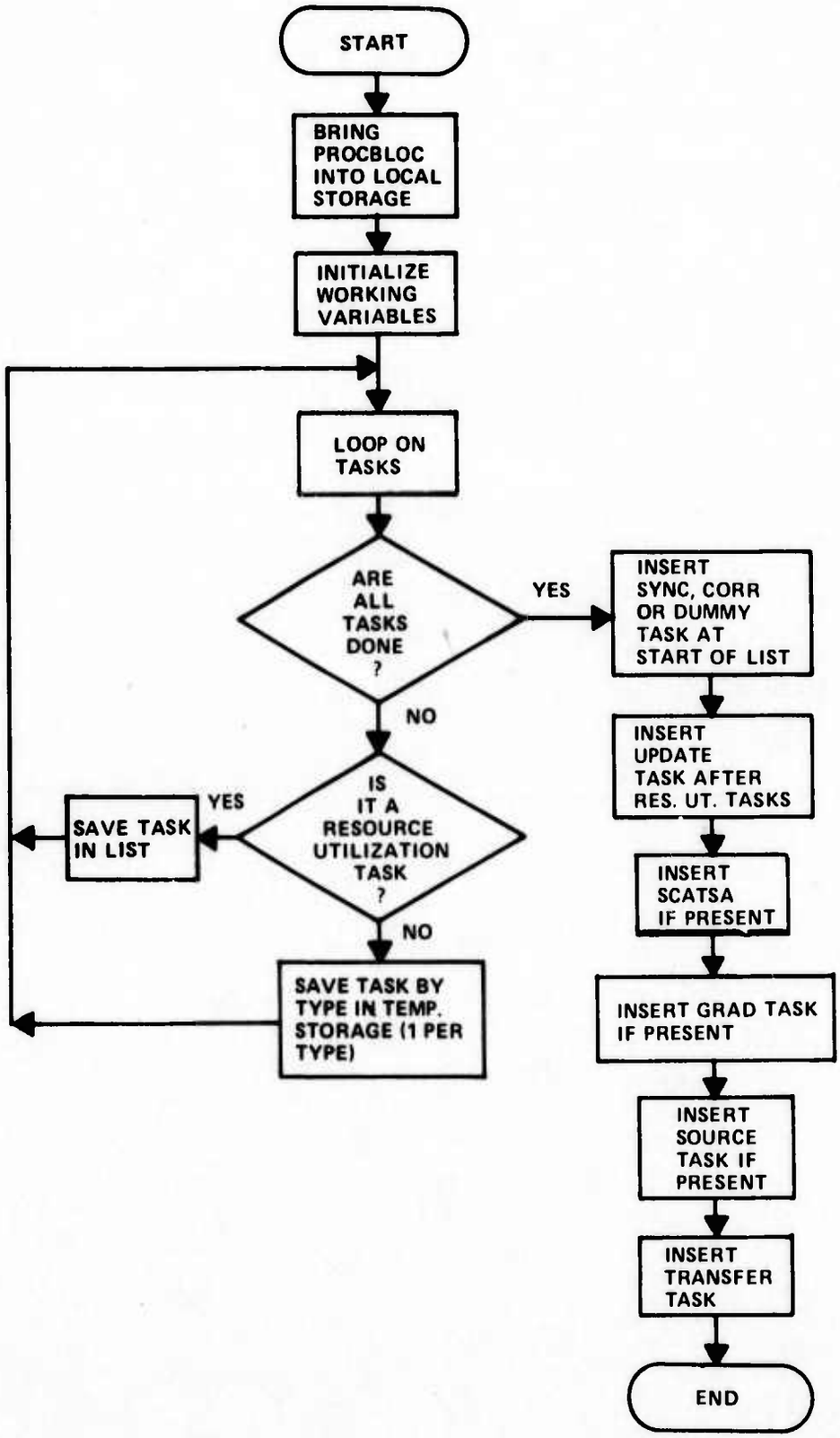
```
CC******************************** LAG ************************************
CC*                                                                       *
CC*    PURPOSE                                                            *
CC*        TO DELAY PROCESSING OF A SET OF CLASSES UNTIL A SPECIFIED       *
CC*        TIME.                                                          *
CC*                                                                       *
CC*                                                                       *
CC*    CALLING SEQUENCE                                                   *
CC*                                                                       *
CC*        CALL LAG(NOCLS,INDXC,ITIME,ITFNCT,ITASKA,IPBDUR,IDFRES)        *
CC*                                                                       *
CC*    DESCRIPTION OF PARAMETERS                                          *
CC*                                                                       *
CC*        NOCLS           NUMBER OF CLASSES TO BE LAGGED.                *
CC*        INDXC()         LIST OF CLASSES TO BE LAGGED.                  *
CC*        ITIME           TIME TO WHICH CLASSES WILL BE LAGGED           *
CC*        ITFNCT          FUNCTION OF THE TASK THAT CAUSED THE LAG.      *
CC*        ITASKA          ADRESS OF THE TASK THAT CAUSED THE LAG.        *
CC*        IPBDUR          DURATION OF THE PROCBLOC.                      *
CC*        IDFRES          NUMBER OF THE RESOURCE CAUSING THE LAG.        *
CC*                        (0 IF LAG IS DUE TO SYNC OR CORR)              *
CC*                                                                       *
CC*    SUBROUTINES USED                                                   *
CC*        BLOCK                                                          *
CC*                                                                       *
CC*    PROGRAMMER                                                         *
CC*        G.GAIDASZ                                                      *
CC*        CALSPAN                                                        *
CC*        MAY 1975                                                       *
CC*                                                                       *
CC***************************************************************************
```

LAG


START
ARE THERE ANY CLASSES TO LAG ?
NO
RETURN
YES
LOOP ON THE LIST OF CLASSES
ARE ALL CLASSES DONE ?
YES
RETURN
NO
GET ADDRESSES OF CLASS IN MASS AND LOCAL STORAGE
COMPUTE LAG DURATION
UPDATE CLASS BLOCK
OUTPUT LAG RECORD

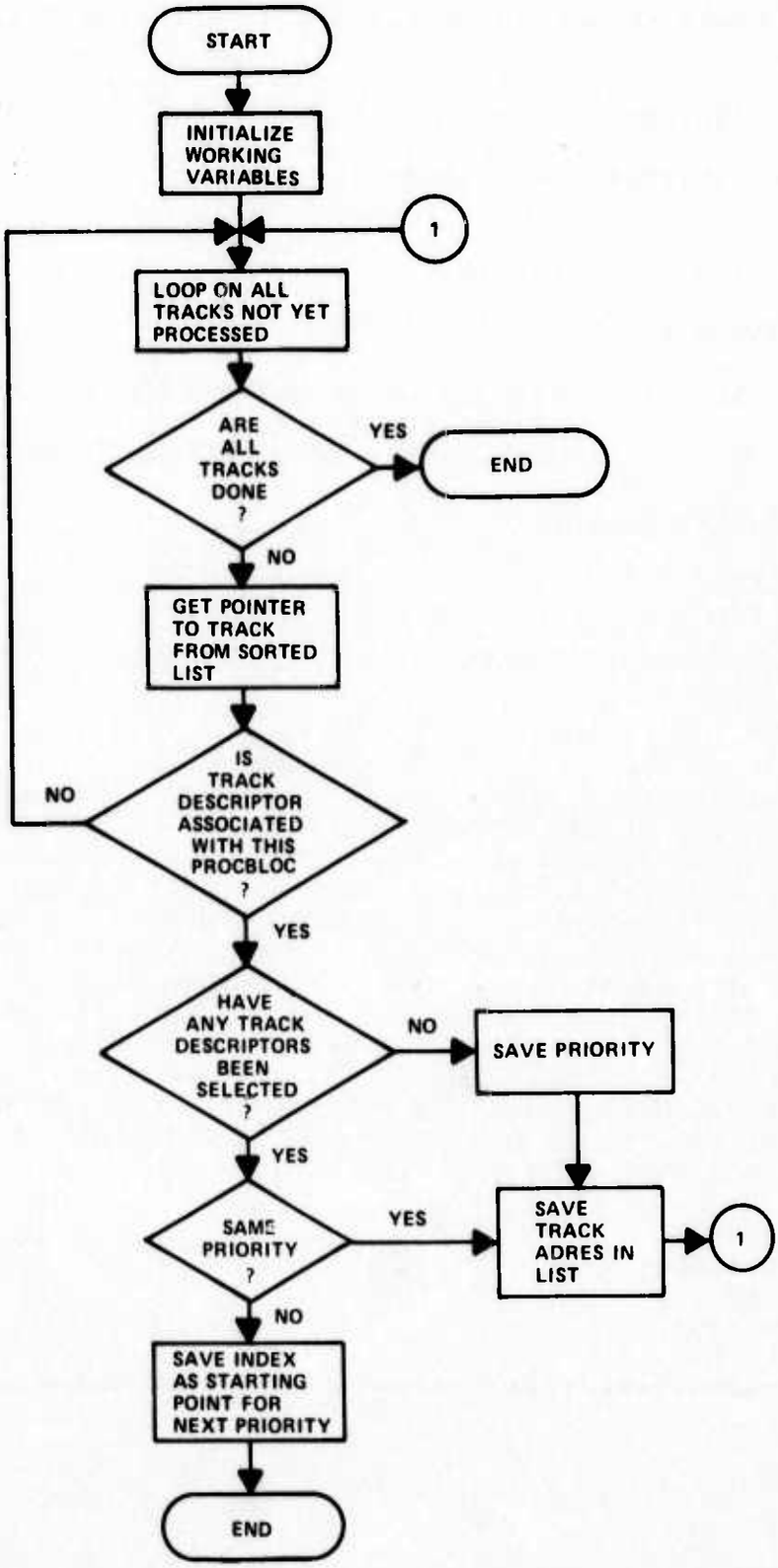
```
CC********************************* LSTASK ***********************************
CC*                                                                           *
CC*    PURPOSE                                                                *
CC*        TO CREATE A SEQUENTIAL LIST OF THE TASKS IN A PROCBLOC.            *
CC*        SYNCHRONIZING TASKS ARE PLACED AT THE BEGINNING OF THE             *
CC*        LIST.                                                              *
CC*                                                                           *
CC*                                                                           *
CC*    CALLING SEQUENCE                                                       *
CC*                                                                           *
CC*        CALL LSTASK                                                        *
CC*                                                                           *
CC*    REMARKS                                                                *
CC*        ONLY 1 OF EACH TYPE OF NON-RESOURCE UTILIZATION TASKS              *
CC*        ARE USED. THE TASKS ARE ARRANGED IN THE FOLLOWING ORDER:           *
CC*         1. SYNCHRONIZATION OR CORRELATION TASKS.                          *
CC*         2. RESOURCE UTILIZATION TASKS.                                    *
CC*         3. UPDATE TASK. (PROVIDED BY PROGRAM).                            *
CC*         4. SOURCE ALLOCATION. (SCATSA)                                    *
CC*         5. GRADUATION.                                                    *
CC*         6. GET SOURCE TASK.                                               *
CC*         7. TRANSFER TASK. (PROVIDED BY PROGRAM).                          *
CC*                                                                           *
CC*    SUBROUTINES USED                                                       *
CC*        BLOCK                                                              *
CC*        PLIST                                                              *
CC*        PBLOCK                                                             *
CC*        CBLOCK                                                             *
CC*        TBLOCK                                                             *
CC*                                                                           *
CC*    PROGRAMMER                                                             *
CC*        GEORGE GAIDASZ                                                     *
CC*        CALSPAN                                                            *
CC*        MAY 1975                                                           *
CC*                                                                           *
CC***************************************************************************
```

LSTASK

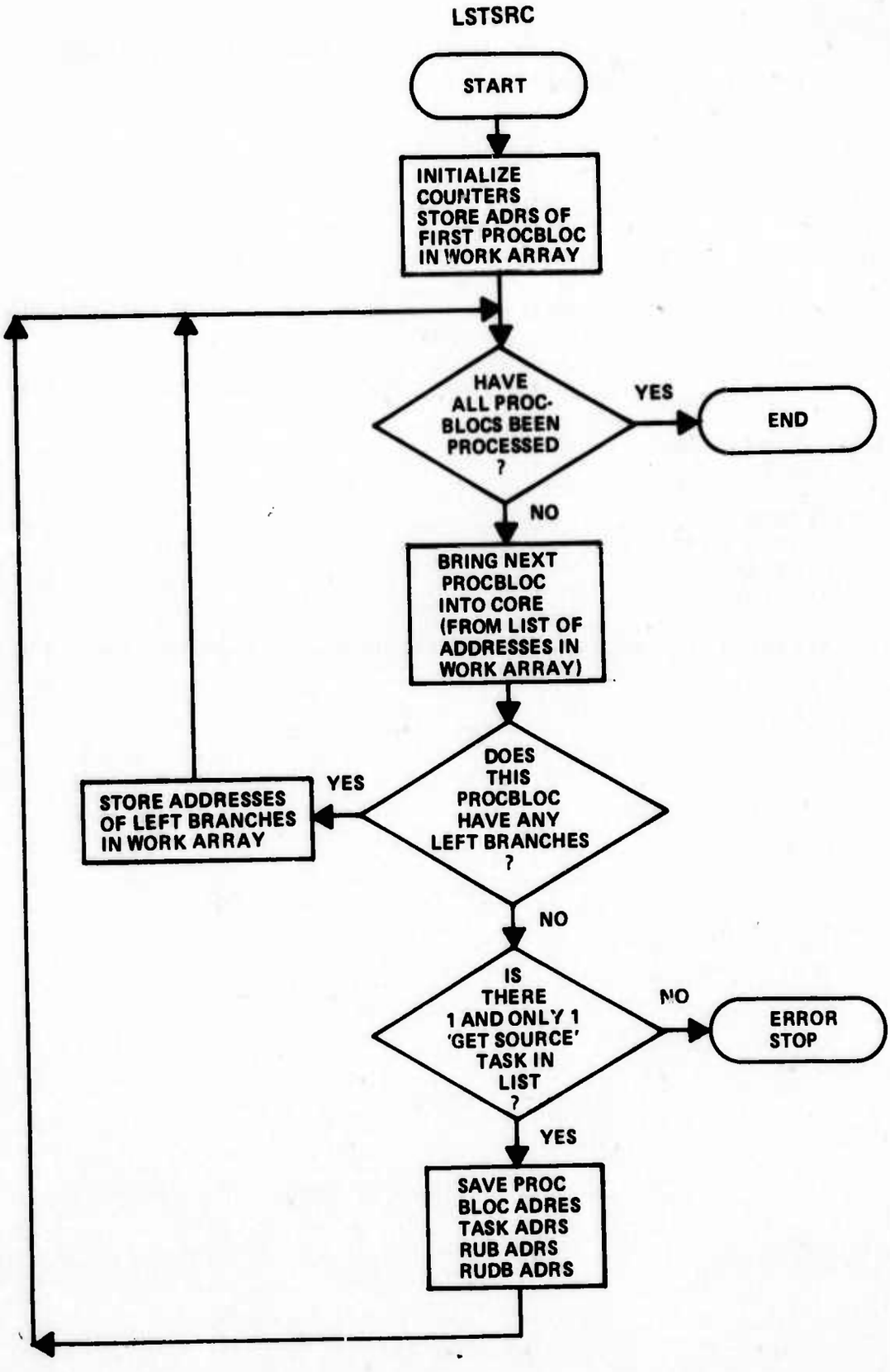

START
BRING PROCBLOC INTO LOCAL STORAGE
INITIALIZE WORKING VARIABLES
LOOP ON TASKS
ARE ALL TASKS DONE ?
YES
INSERT SYNC, CORR OR DUMMY TASK AT START OF LIST
NO
INSERT UPDATE TASK AFTER RES. UT. TASKS
IS IT A RESOURCE UTILIZATION TASK ?
YES
SAVE TASK IN LIST
NO
INSERT SCATSA IF PRESENT
SAVE TASK BY TYPE IN TEMP. STORAGE (1 PER TYPE)
INSERT GRAD TASK IF PRESENT
INSERT SOURCE TASK IF PRESENT
INSERT TRANSFER TASK
END

```
CC********************************* LSTRAK ***********************************
CC*                                                                           *
CC*   PURPOSE                                                                 *
CC*       GET A LIST OF TRACK DESCRIPTOR BLOCKS WITH EQUAL PRIORITIES         *
CC*       AND ASSOCIATED WITH THE SPECIFIED PROCBLOC.                         *
CC*                                                                           *
CC*   CALLING SEQUENCE                                                        *
CC*                                                                           *
CC*       CALL LSTRAK(L1,L2,NPROCB,   N,LIST )                                *
CC*                                                                           *
CC*   DESCRIPTION OF PARAMETERS                                               *
CC*                                                                           *
CC*       * INPUT *                                                           *
CC*                                                                           *
CC*       L1              POINTER TO INDEX OF FIRST TDB FOR COURSE.           *
CC*       L2              POINTER TO INDEX OF LAST TDB FOR COURSE.            *
CC*       NPROCB          ADRESS OF PROCBLOC THAT THE CLASS IS IN.            *
CC*                                                                           *
CC*       * OUTPUT *                                                          *
CC*                                                                           *
CC*       N               NUMBER OF ELEMENTS IN LIST                          *
CC*       LIST()          INDICES OF TRACK DESCRIPTOR BLOCKS THAT             *
CC*                       HAVE EQUAL PRIORITIES.                              *
CC*                                                                           *
CC*   PROGRAMMER                                                              *
CC*       G. GAIDASZ                                                          *
CC*       CALSPAN                                                             *
CC*       AUG 1975                                                            *
CC*                                                                           *
CC*****************************************************************************
```

LSTRAK

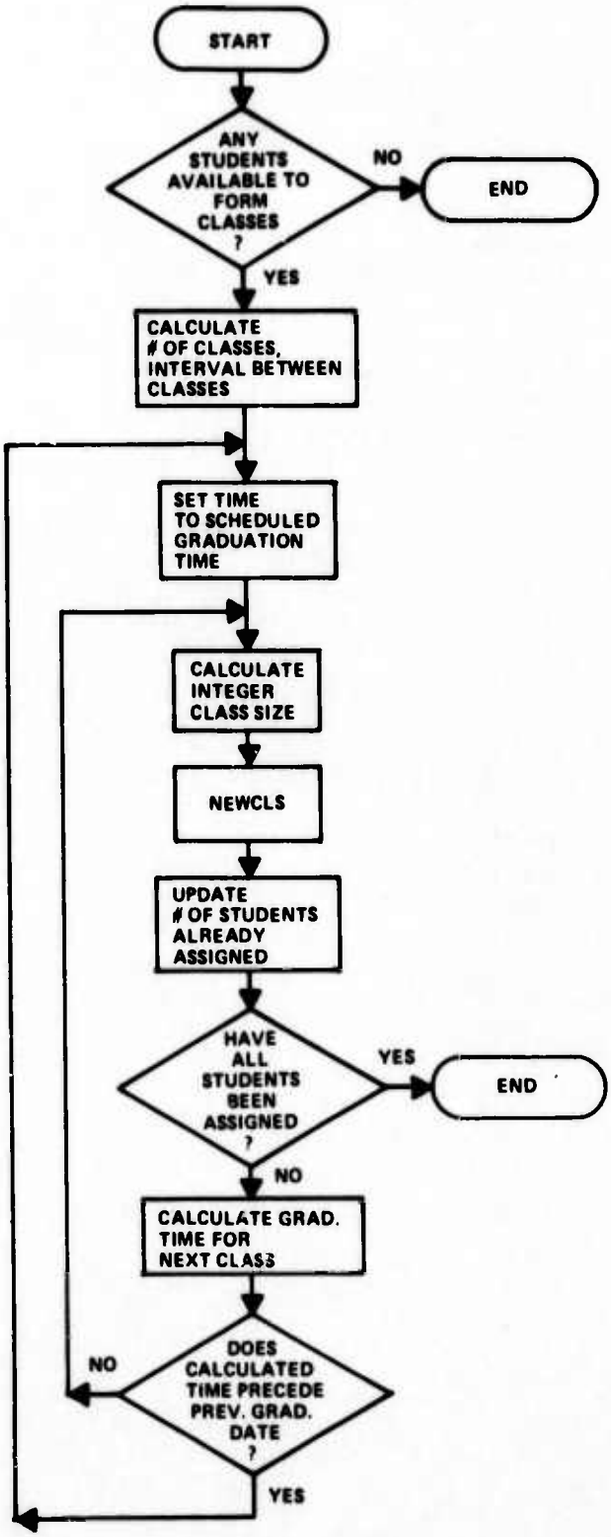

START
INITIALIZE WORKING VARIABLES
1
LOOP ON ALL TRACKS NOT YET PROCESSED
ARE ALL TRACKS DONE ?
YES
END
NO
GET POINTER TO TRACK FROM SORTED LIST
IS TRACK DESCRIPTOR ASSOCIATED WITH THIS PROCBLOC ?
NO
YES
HAVE ANY TRACK DESCRIPTORS BEEN SELECTED ?
NO
SAVE PRIORITY
YES
SAME PRIORITY ?
YES
SAVE TRACK ADRES IN LIST
1
NO
SAVE INDEX AS STARTING POINT FOR NEXT PRIORITY
END

```
CC********************************* LSTSRC ***********************************
CC*                                                                           *
CC*    PURPOSE                                                                *
CC*        TO GENERATE A LIST OF ALL THE SOURCES FOR A COURSE.                *
CC*                                                                           *
CC*                                                                           *
CC*    CALLING SEQUENCE                                                       *
CC*                                                                           *
CC*        CALL SRTSRC(IADPB1,IDUMP )                                         *
CC*                                                                           *
CC*                                                                           *
CC*    DESCRIPTION OF PARAMETERS                                              *
CC*                                                                           *
CC*        * INPUT *                                                          *
CC*                                                                           *
CC*        IADPB1          ADRESS OF GRADUATION BLOCK FOR COURSE              *
CC*                        BEING PROCESSED.                                   *
CC*        IDUMP           DIAGNOSTIC DUMP SWITCH. (1-PRINT DIAGS.)           *
CC*                                                                           *
CC*    SUBROUTINES CALLED                                                     *
CC*                                                                           *
CC*        BLOCK                                                              *
CC*        PBLOCK                                                             *
CC*        TBLOCK                                                             *
CC*        WRUB                                                               *
CC*        WRUDB                                                              *
CC*                                                                           *
CC*    REMARKS                                                                *
CC*        THIS ROUTINE STARTS AT THE RIGHTMOST (GRADUATION) PROCBLOC         *
CC*        OF A COURSE AND STEPS BACK THRU THE PROCBLOCKS (USING THE          *
CC*        BACKWARD POINTERS) UNTIL A PROCBLOC IS REACHED THAT DOES           *
CC*        NOT HAVE ANY BACKWARD POINTERS.  THIS PROCBLOC IS ASSUMED          *
CC*        TO BE THE SOURCE BLOCK AND IS CHECKED TO MAKE SURE IT HAS          *
CC*        ONE AND ONLY ONE GETSOURCE TASK ASSOCIATED WITH IT. A              *
CC*        FURTHER CHECK IS THEN MADE TO ASSURE THAT ONLY ONE RUDB            *
CC*        IS DEFINED FOR THE SOURCE AND HAS NO ALTERNATES OR SECONDARY       *
CC*        RUBS.  IF ALL CONDITIONS ARE SATISFIED, THE ADRESSES OF THE        *
CC*        SOURCE PROCBLOC,TASK,RUB AND RUDB AND THE SOURCE NUMBER            *
CC*        ARE SAVED IN ARRAYS IN THE COMMON BLOCK SORDSC.                    *
CC*        THIS PROCESS IS REPEATED UNTIL ALL THE SOURCES IN THE              *
CC*        COURSE HAVE BEEN IDENTIFIED.                                       *
CC*                                                                           *
CC*    PROGRAMMER                                                             *
CC*        G.GAIDASZ                                                          *
CC*        CALSPAN                                                            *
CC*        AUG 1975                                                           *
CC*                                                                           *
CC***************************************************************************
```

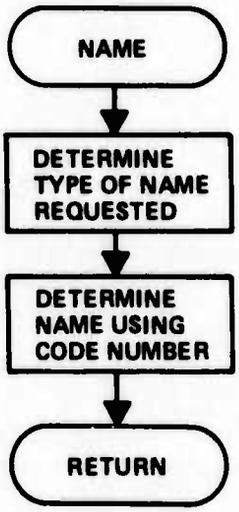

LSTSRC
START
INITIALIZE COUNTERS STORE ADRS OF FIRST PROCBLOC IN WORK ARRAY
HAVE ALL PROC-BLOCS BEEN PROCESSED ?
YES
END
NO
BRING NEXT PROCBLOC INTO CORE (FROM LIST OF ADDRESSES IN WORK ARRAY)
DOES THIS PROCBLOC HAVE ANY LEFT BRANCHES ?
YES
STORE ADDRESSES OF LEFT BRANCHES IN WORK ARRAY
NO
IS THERE 1 AND ONLY 1 'GET SOURCE' TASK IN LIST ?
NO
ERROR STOP
YES
SAVE PROC BLOC ADRES TASK ADRS RUB ADRS RUDB ADRS

```
CC********************************* MLTCLS ***********************************
CC*                                                                           *
CC*    PURPOSE                                                                *
CC*        FORM MULTIPLE CLASSES FROM THE ACCUMULATED TRAINING                *
CC*        DEMANDS ON A COURSE                                                *
CC*                                                                           *
CC*                                                                           *
CC*    CALLING SEQUENCE                                                       *
CC*                                                                           *
CC*        CALL MLTCLS(ITOTD,NCORSE,IGRID)                                    *
CC*                                                                           *
CC*    DESCRIPTION OF PARAMETERS                                              *
CC*                                                                           *
CC*        ITOTD           NUMBER OF STUDENTS TO BE ASSIGNED TO CLASSES.      *
CC*        NCORSE          COURSE NUMBER                                      *
CC*        IGRID           GRADUATION ID. COUNTER.                            *
CC*                        (IF IGRID=-1, CLASS IS AN EXTRAS CLASS)            *
CC*                                                                           *
CC*    SUBROUTINES USED                                                       *
CC*        NEWCLS                                                             *
CC*                                                                           *
CC*    PROGRAMMER                                                             *
CC*        GEORGE GAIDASZ                                                     *
CC*        CALSPAN                                                            *
CC*        MAY 1975                                                           *
CC*                                                                           *
CC*****************************************************************************
```

MLTCLS

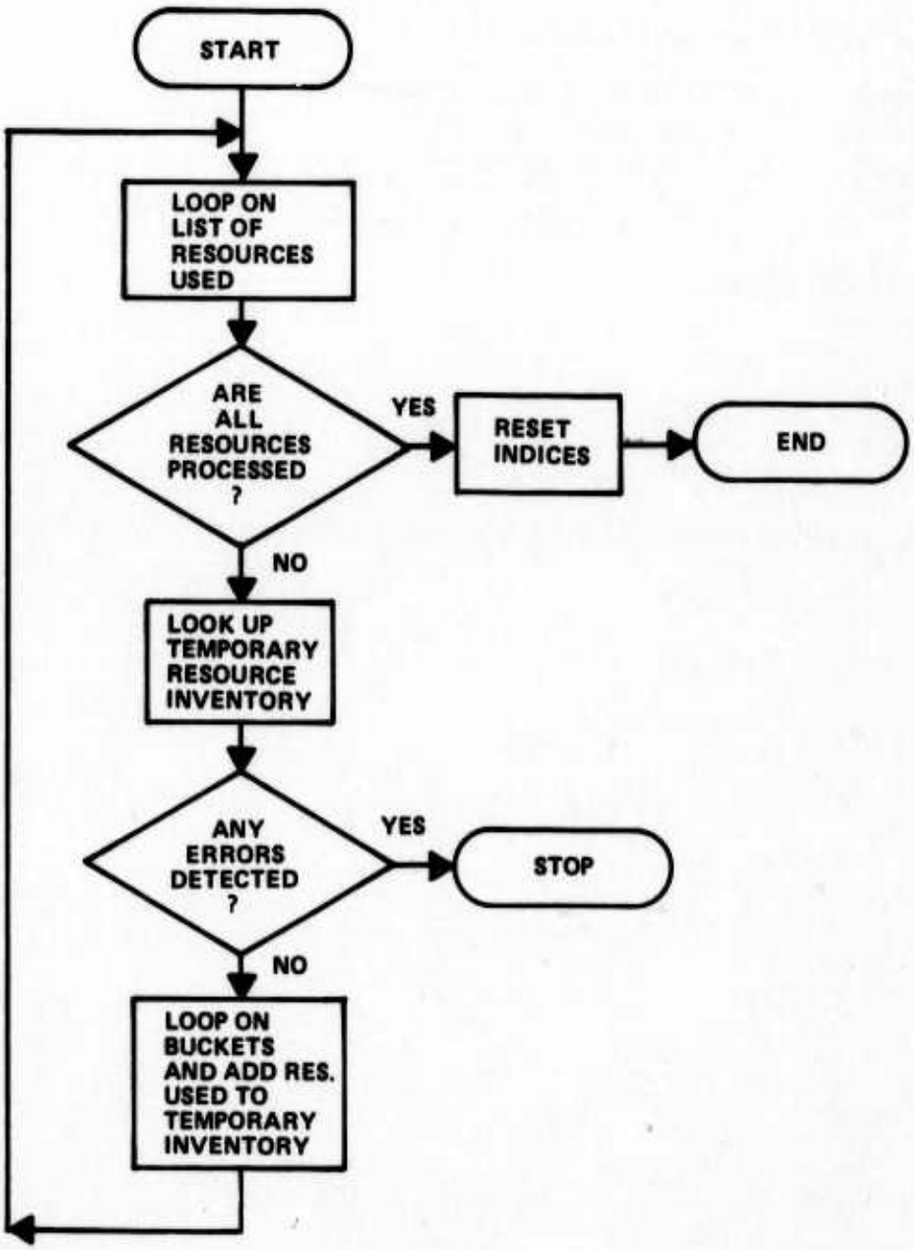

START
ANY STUDENTS AVAILABLE TO FORM CLASSES ?
NO
END
YES
CALCULATE # OF CLASSES, INTERVAL BETWEEN CLASSES
SET TIME TO SCHEDULED GRADUATION TIME
CALCULATE INTEGER CLASS SIZE
NEWCLS
UPDATE # OF STUDENTS ALREADY ASSIGNED
HAVE ALL STUDENTS BEEN ASSIGNED ?
YES
END
NO
CALCULATE GRAD. TIME FOR NEXT CLASS
DOES CALCULATED TIME PRECEDE PREV. GRAD. DATE ?
NO
YES

```
C********************************  NAME  ********************************
C*                                                                      *
C*                              SUBROUTINE NAME                         *
C*     PURPOSE                                                          *
C*         RETURN A NAME FOR CODE NUMBER.                               *
C*                                                                      *
C*     CALLING SEQUENCE                                                 *
C*         CALL NAME(IAPRV,NUMBER,INAME)                                *
C*                                                                      *
C*     DESCRIPTION OF PARAMETERS                                        *
C*                                                                      *
C*                    * EXPLICIT INPUT *                                *
C*         IAPRV - ALPHANUMERIC NAME OF THE TYPE OF NAME BEING LOOKED UP*
C*                 'AB'    - AIR BASE NAME                              *
C*                 'C'     - COURSE NAME                                *
C*                 'GF'    - GRADUATION FUNCTION NAME                   *
C*                 'PB'    - PROC BLOCK NAME                            *
C*                 'PBNU'  - PROC BLOCK NUMBER                          *
C*                 'R'     - RESOURCE NAME                              *
C*                 'RUB'   - RUB NAME                                   *
C*                 'RUDB'  - RUDB NAME                                  *
C*                 'RUGF'  - RESOURCE UTILIZATION FUNCTION NAME         *
C*                 'RUTF'  - RESOURCE UTILIZATION TIMING FUNCTION       *
C*                 'S'     - SOURCE NAME                                *
C*                 'TB'    - TASK BLOCK NAME                            *
C*                 'TF'    - TASK FUNCTION NAME                         *
C*         NUMBER - CODE NUMBER OF NAME BEING LOOKED UP                 *
C*                                                                      *
C*                    * EXPLICIT OUTPUT *                               *
C*         INAME - ALPHANUMERIC NAME BEING RETURNED                     *
C*                                                                      *
C*     AUTHOR/PROGRAMMER                                                *
C*         JOHN R. MENIG                                                *
C*         CALSPAN CORPORATION                                          *
C*         22 APRIL 1975                                                *
C*                                                                      *
C************************************************************************
```


NAME
DETERMINE TYPE OF NAME REQUESTED
DETERMINE NAME USING CODE NUMBER
RETURN

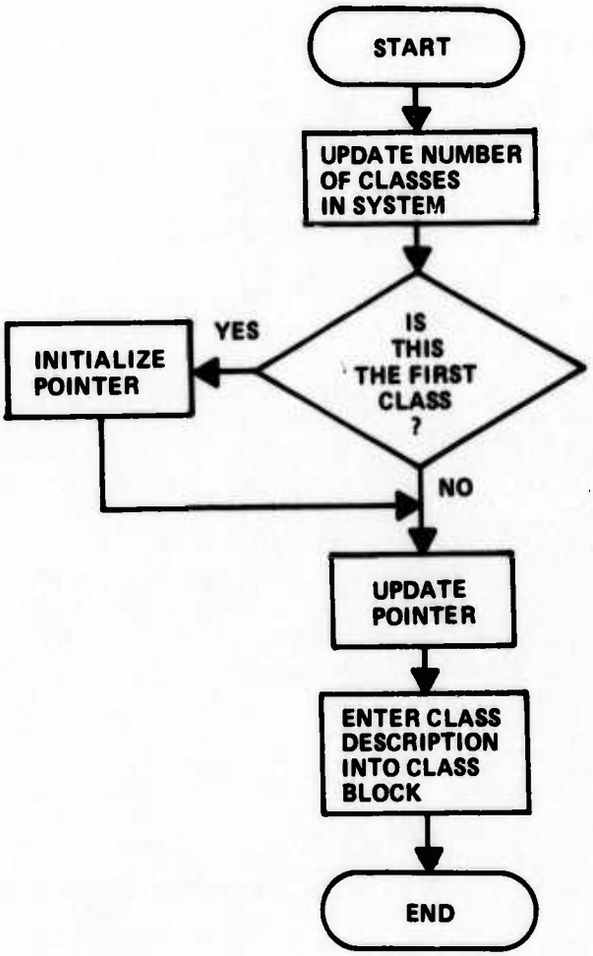
```
CC********************************* NEGUSE **********************************
CC*                                                                           *
CC*   PURPOSE                                                                 *
CC*       TO NEGATE TEMPORARY UPDATES OF RESOURCE INVENTORIES.                *
CC*       (WHEN A PRIMARY IS SATISFIED BUT A SECONDARY CANNOT                 *
CC*        BE SATISFIED).                                                     *
CC*                                                                           *
CC*   CALLING SEQUENCE                                                        *
CC*                                                                           *
CC*       CALL NEGUSE                                                         *
CC*                                                                           *
CC*   DESCRIPTION OF PARAMETERS                                               *
CC*       AS DESCRIBED IN SVRUS1 AND SVRUS2                                   *
CC*                                                                           *
CC*   PROGRAMMER                                                              *
CC*       G. GAIDASZ                                                          *
CC*       CALSPAN                                                             *
CC*       AUG 1975                                                            *
CC*                                                                           *
CC*****************************************************************************
```

NEGUSE

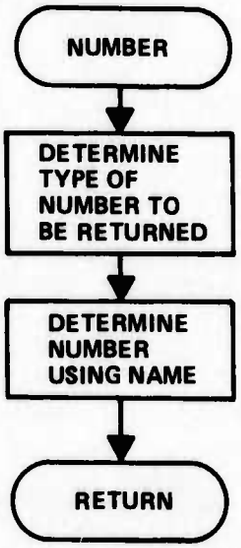

START
LOOP ON LIST OF RESOURCES USED
ARE ALL RESOURCES PROCESSED ?
YES
RESET INDICES
END
NO
LOOK UP TEMPORARY RESOURCE INVENTORY
ANY ERRORS DETECTED ?
YES
STOP
NO
LOOP ON BUCKETS AND ADD RES. USED TO TEMPORARY INVENTORY

```
CC********************************* NEWCLS ***********************************
CC*                                                                           *
CC*    PURPOSE                                                                *
CC*        TO GENERATE A CLASS BLOCK.                                         *
CC*                                                                           *
CC*                                                                           *
CC*    CALLING SEQUENCE                                                       *
CC*                                                                           *
CC*        CALL NEWCLS(NSTDS,NCORSE,IGDTE,IGRID)                              *
CC*                                                                           *
CC*    DESCRIPTION OF PARAMETERS                                              *
CC*                                                                           *
CC*        NSTDS           NUMBER OF STUDENTS IN CLASS.                       *
CC*        NCORSE          COURSE NUMBER                                      *
CC*        IGDTE           GRADUATION DATE                                    *
CC*        IGRID           GRADUATION ID COUNTER                              *
CC*                        (IF IGRID=-1,CLASS IS AN EXTRAS CLASS)             *
CC*                                                                           *
CC*    SUBROUTINES USED                                                       *
CC*        CLSDMP                                                             *
CC*                                                                           *
CC*    PROGRAMMER                                                             *
CC*        GEORGE GAIDASZ                                                     *
CC*        CALSPAN                                                            *
CC*        MAY 1975                                                           *
CC*                                                                           *
CC*****************************************************************************
```

NEWCLS

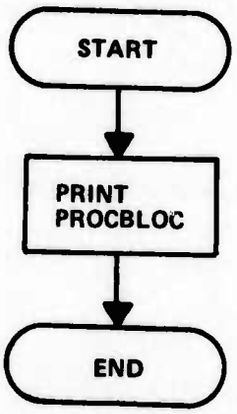

START
UPDATE NUMBER OF CLASSES IN SYSTEM
IS THIS THE FIRST CLASS ?
YES
INITIALIZE POINTER
NO
UPDATE POINTER
ENTER CLASS DESCRIPTION INTO CLASS BLOCK
END

```
C*********************************  NUMBER  ********************************
C*                                                                          *
C*                              SUBROUTINE NUMBER                           *
C*                                                                          *
C*     PURPOSE                                                              *
C*         RETURNS A CODE NUMBER FOR A NAME.                                *
C*                                                                          *
C*     CALLING SEQUENCE                                                     *
C*         CALL NUMBER(IAPRV,NUMB,NAME)                                     *
C*                                                                          *
C*     DESCRIPTION OF PARAMETERS                                            *
C*                                                                          *
C*                       * EXPLICIT INPUT *                                 *
C*         IAPRV - ALPHANUMERIC NAME OF THE TYPE OF CODE BEING LOOKED UP    *
C*                 'AB'    - AIR BASE NAME                                  *
C*                 'C'     - COURSE NAME                                    *
C*                 'GF'    - GRADUATION FUNCTION NAME                       *
C*                 'PB'    - PROC BLOCK NAME                                *
C*                 'PBNO'  - PROC BLOCK NUMBER                              *
C*                 'R'     - RESOURCE NAME                                  *
C*                 'RUB'   - RUB NAME                                       *
C*                 'RUDB'  - RUDB NAME                                      *
C*                 'RUGF'  - RESOURCE UTILIZATION FUNCTION NAME             *
C*                 'RUTF'  - RESOURCE UTILIZATION TIMING FUNCTION           *
C*                 'S'     - SOURCE NAME                                    *
C*                 'TB'    - TASK BLOCK NAME                                *
C*                 'TF'    - TASK FUNCTION NAME                             *
C*         NAME - ALPHANUMERIC NAME BEING LOOKED UP                         *
C*                                                                          *
C*                       * EXPLICIT OUTPUT *                                *
C*         NUMB   - CODE NUMBER RETURNED                                    *
C*                                                                          *
C*     AUTHOR/PROGRAMMER                                                    *
C*         JOHN R. MENIG                                                    *
C*         CALSPAN CORPORATION                                              *
C*         22 APRIL 1975                                                    *
C*                                                                          *
C**************************************************************************
```


NUMBER
DETERMINE TYPE OF NUMBER TO BE RETURNED
DETERMINE NUMBER USING NAME
RETURN

```
CC********************************* PBLOCK ***************************************
CC*                                                                               *
CC*    PURPOSE                                                                    *
CC*        TO PRINT A PROCBLOCK.                                                  *
CC*                                                                               *
CC*                                                                               *
CC*    CALLING SEQUENCE                                                           *
CC*                                                                               *
CC*        CALL PBLOCK(IADRS,IBLOCK)                                              *
CC*                                                                               *
CC*                                                                               *
CC*    DESCRIPTION OF PARAMETERS                                                  *
CC*                                                                               *
CC*        IADRS           ADRESS OF PROCBLOCK                                    *
CC*        IBLOCK          FIRST WORD OF PROCBLOC                                 *
CC*                                                                               *
CC*    PROGRAMMER                                                                 *
CC*        G. GAIDASZ                                                             *
CC*        CALSPAN                                                                *
CC*        MAY 1975                                                               *
CC*                                                                               *
CC*******************************************************************************
```

PBLOCK

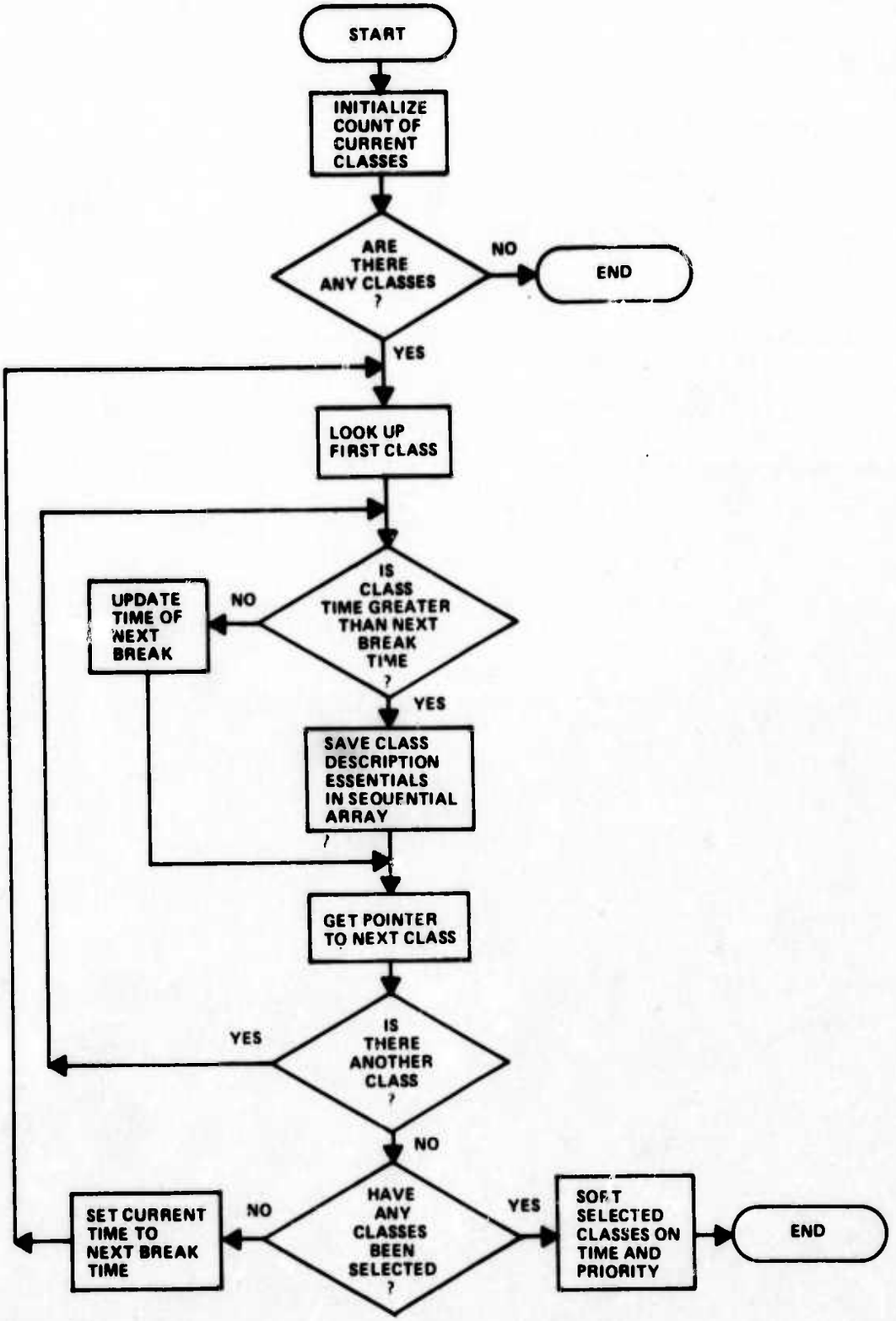


```
CC********************************* PLIST ************************************
CC*                                                                          *
CC*    PURPOSE                                                               *
CC*        TO PRINT THE LIST OF TASKS.                                       *
CC*                                                                          *
CC*                                                                          *
CC*    CALLING SEQUENCE                                                      *
CC*                                                                          *
CC*        CALL PLIST                                                        *
CC*                                                                          *
CC*    PROGRAMMER                                                            *
CC*        G. GAIDASZ                                                        *
CC*        CALSPAN                                                           *
CC*        MAY 1975                                                          *
CC*                                                                          *
CC****************************************************************************
```

PLIST

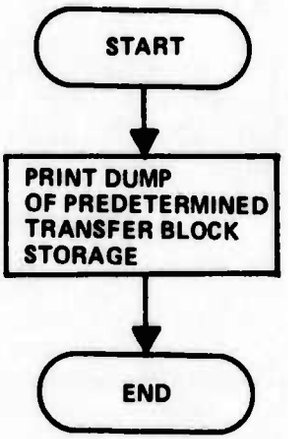
```
CC********************************* PREPC ***********************************
CC*
CC*    PURPOSE                                                               *
CC*        SELECT CURRENTLY ACTIVE CLASSES AND SORT IN ORDER BY              *
CC*        TIME AND PRIORITY.                                                *
CC*                                                                          *
CC*                                                                          *
CC*    CALLING SEQUENCE                                                      *
CC*                                                                          *
CC*        CALL PREPC                                                        *
CC*                                                                          *
CC*                                                                          *
CC*    SUBROUTINES USED                                                      *
CC*        CLSDMP                                                            *
CC*        SRTCTP                                                            *
CC*                                                                          *
CC*    PROGRAMMER                                                            *
CC*        GEORGE GAIDASZ                                                    *
CC*        CALSPAN                                                           *
CC*        MAY 1975                                                          *
CC*                                                                          *
CC*************************************************************************
```

PREPC


START
INITIALIZE COUNT OF CURRENT CLASSES
ARE THERE ANY CLASSES ?
NO
END
YES
LOOK UP FIRST CLASS
IS CLASS TIME GREATER THAN NEXT BREAK TIME ?
NO
UPDATE TIME OF NEXT BREAK
YES
SAVE CLASS DESCRIPTION ESSENTIALS IN SEQUENTIAL ARRAY
GET POINTER TO NEXT CLASS
IS THERE ANOTHER CLASS ?
YES
NO
HAVE ANY CLASSES BEEN SELECTED ?
NO
SET CURRENT TIME TO NEXT BREAK TIME
YES
SORT SELECTED CLASSES ON TIME AND PRIORITY
END

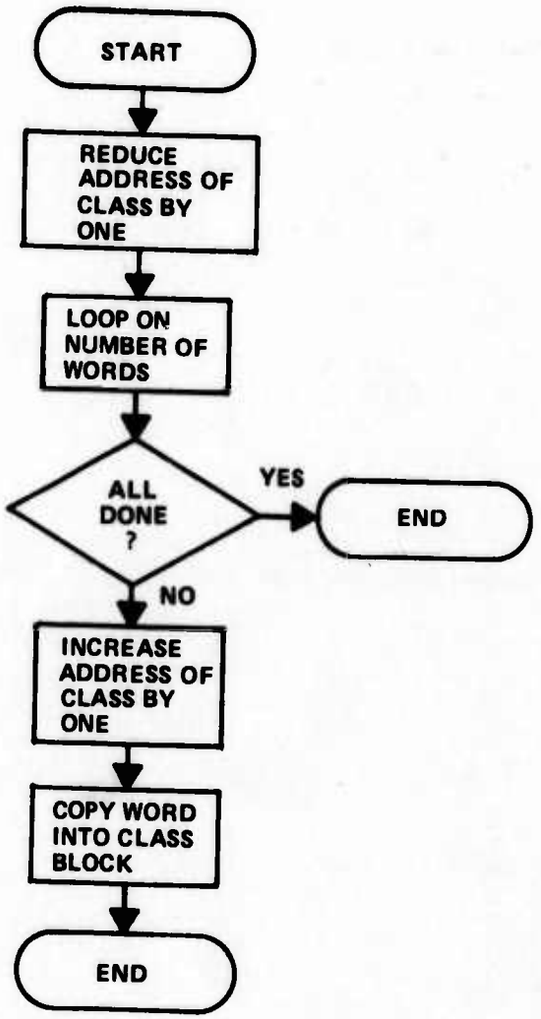
```
CC********************************* PTBDMP ***********************************
CC*                                                                           *
CC*    PURPOSE                                                                *
CC*        TO PRINT A DUMP OF THE PREDETERMINED TRANSFER BLOCKS               *
CC*        STORAGE.                                                           *
CC*                                                                           *
CC*                                                                           *
CC*    CALLING SEQUENCE                                                       *
CC*                                                                           *
CC*        CALL PTBDMP(IADRS)                                                 *
CC*                                                                           *
CC*    DESCRIPTION OF PARAMETERS                                              *
CC*                                                                           *
CC*        IADRS           ADRESS OF BAD PTB                                  *
CC*                                                                           *
CC*    PROGRAMMER                                                             *
CC*        G. GAIDASZ                                                         *
CC*        CALSPAN                                                            *
CC*        MAY 1975                                                           *
CC*                                                                           *
CC*************************************************************************** 
```

PTBDMP


START
PRINT DUMP OF PREDETERMINED TRANSFER BLOCK STORAGE
END

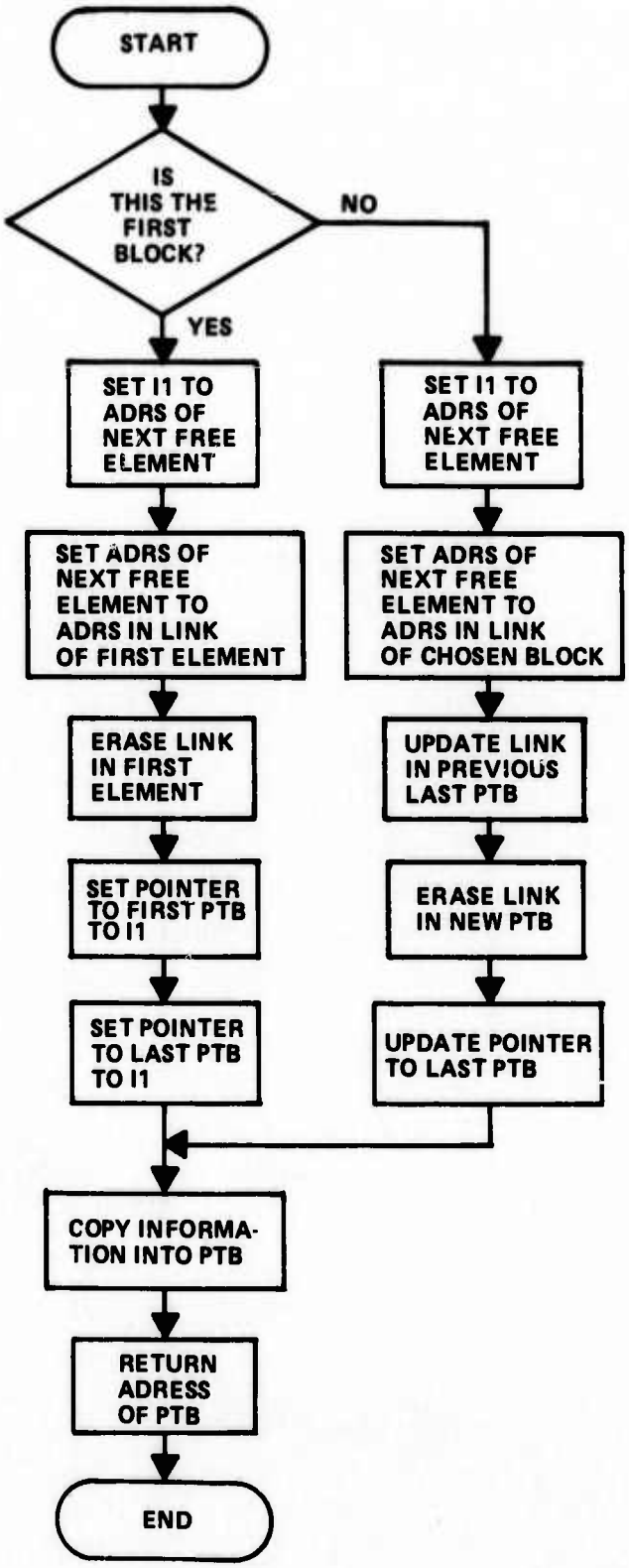
```
CC********************************* PUTCLS ***********************************
CC*                                                                           *
CC*    PURPOSE                                                                *
CC*        TO REPLACE THE CONTENT OF A CLASS BLOCK IN LINKED STORAGE.          *
CC*                                                                           *
CC*                                                                           *
CC*    CALLING SEQUENCE                                                       *
CC*                                                                           *
CC*        CALL PUTCLS(INDEX,IA,N)                                            *
CC*                                                                           *
CC*    DESCRIPTION OF PARAMETERS                                              *
CC*                                                                           *
CC*        INDEX           ADRESS OF CLASS BLOCK IN MASS STORAGE.             *
CC*        IA()            LOCAL STORAGE FOR CLASS BLOCK.                     *
CC*        N               NUMBER OF WORDS IN PROCBLOC TO BE WRITTEN          *
CC*                        IN MASS STORAGE.                                   *
CC*                                                                           *
CC*    PROGRAMMER                                                             *
CC*        G. GAIDASZ                                                         *
CC*        CALSPAN                                                            *
CC*        MAY 1975                                                           *
CC*                                                                           *
CC***************************************************************************
```

PUTCLS

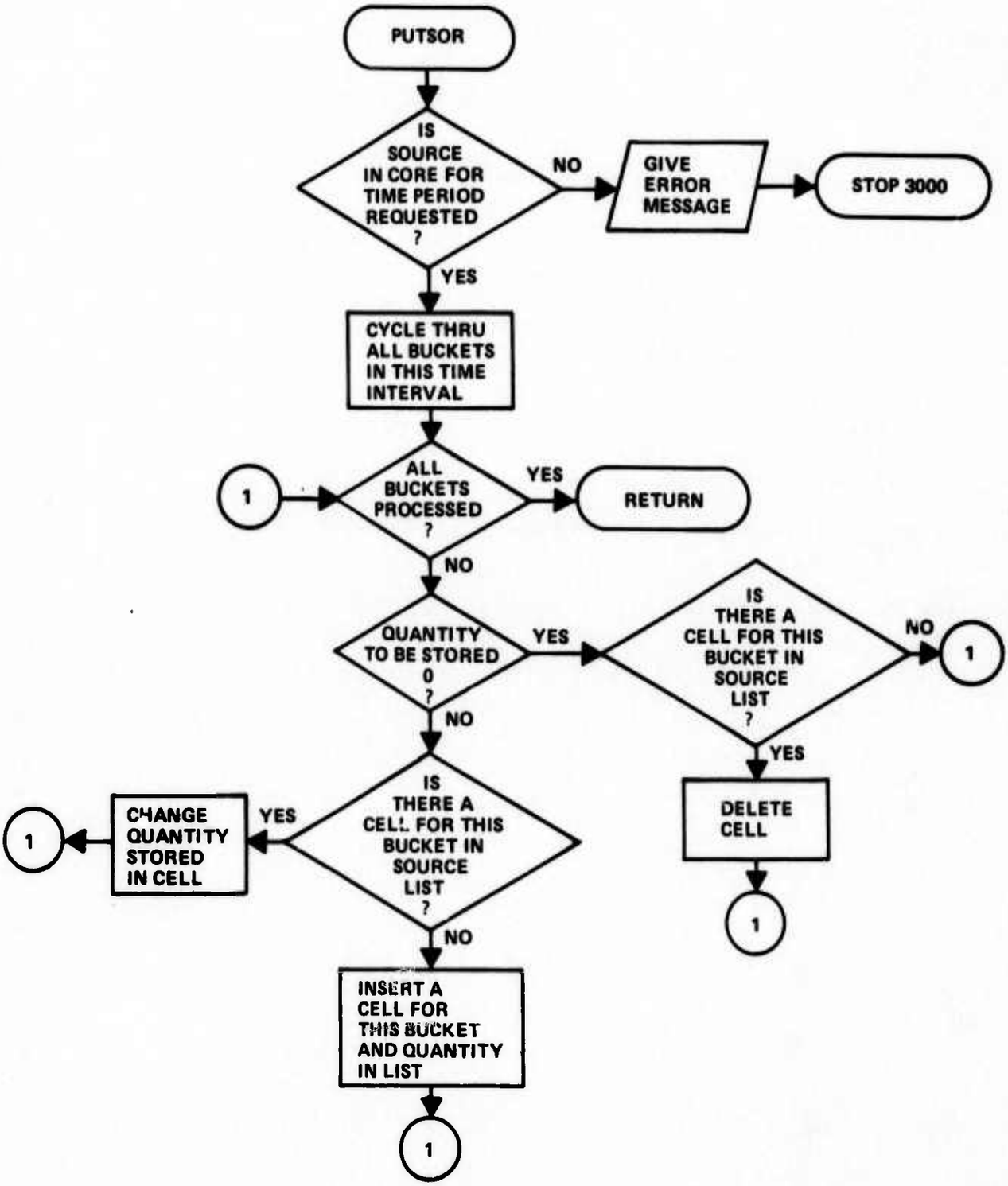

START
REDUCE ADDRESS OF CLASS BY ONE
LOOP ON NUMBER OF WORDS
ALL DONE ?
YES
END
NO
INCREASE ADDRESS OF CLASS BY ONE
COPY WORD INTO CLASS BLOCK
END

```
CC********************************* PUTPTB ***********************************
CC*                                                                           *
CC*    PURPOSE                                                                *
CC*        TO CREATE A PREDETERMINED TRANSFER BLOCK.                          *
CC*                                                                           *
CC*                                                                           *
CC*    CALLING SEQUENCE                                                       *
CC*                                                                           *
CC*        CALL PUTPTB(IPROP,NXT,IBLKN)                                       *
CC*                                                                           *
CC*    DESCRIPTION OF PARAMETERS                                              *
CC*                                                                           *
CC*        * INPUT *                                                          *
CC*                                                                           *
CC*        IPROP()          NUMBER OF STUDENTS TO BE SENT ALONG EACH ONE      *
CC*                         OF THE 5 BRANCHES OF THE PROCBLOC.                *
CC*        NXT()            ADRESS OF THE NEXT PTB ALONG THE TRACK.           *
CC*                                                                           *
CC*        * OUTPUT *                                                         *
CC*                                                                           *
CC*        IBLKN            ADRESS WHERE PTB WAS STORED.                      *
CC*                                                                           *
CC*    PROGRAMMER                                                             *
CC*        G. GAIDASZ                                                         *
CC*        CALSPAN                                                            *
CC*        MAY 1975                                                           *
CC*                                                                           *
CC*****************************************************************************
```

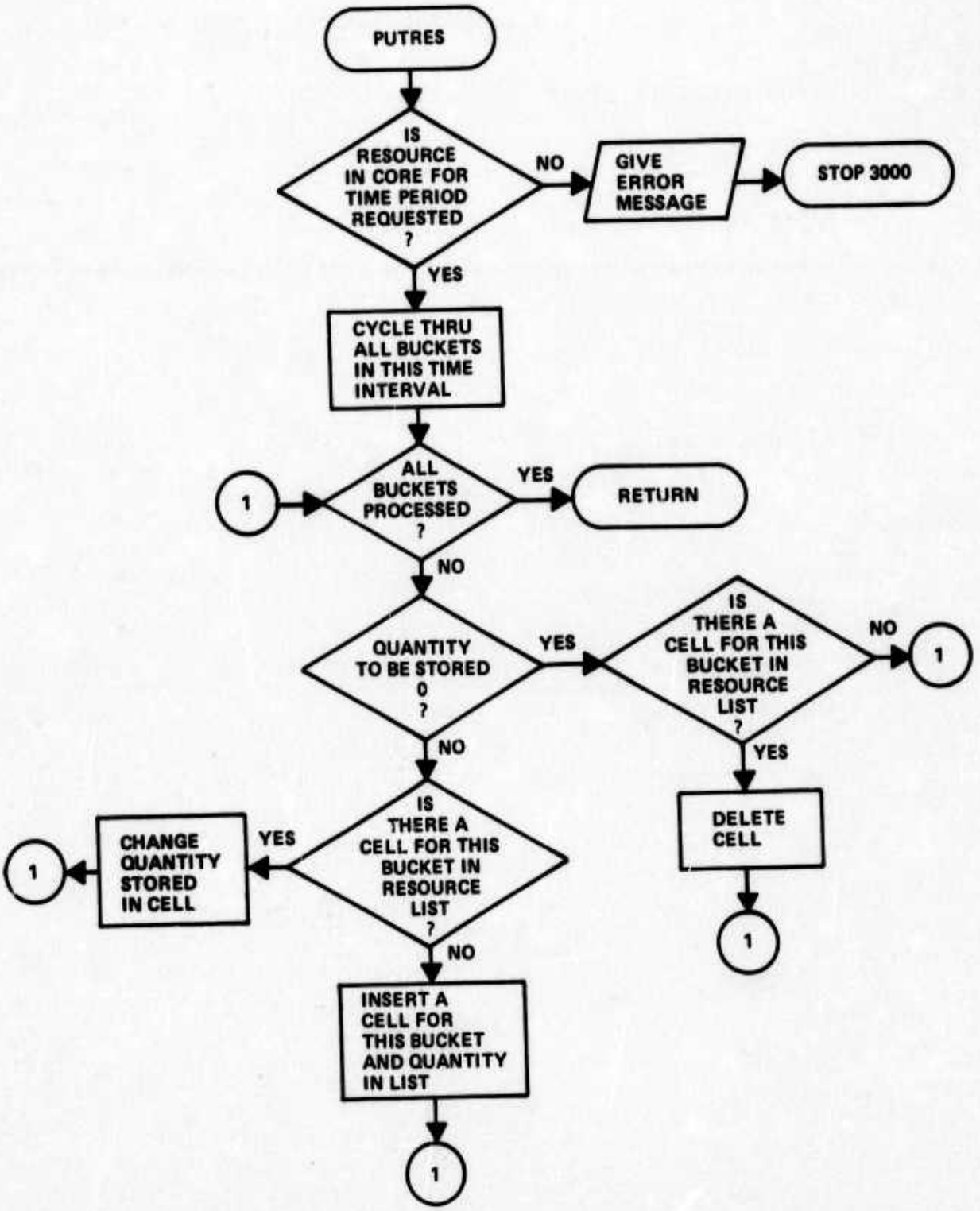
PUTPTB


START
IS THIS THE FIRST BLOCK?
NO
YES
SET I1 TO ADRS OF NEXT FREE ELEMENT
SET I1 TO ADRS OF NEXT FREE ELEMENT
SET ADRS OF NEXT FREE ELEMENT TO ADRS IN LINK OF FIRST ELEMENT
SET ADRS OF NEXT FREE ELEMENT TO ADRS IN LINK OF CHOSEN BLOCK
ERASE LINK IN FIRST ELEMENT
UPDATE LINK IN PREVIOUS LAST PTB
SET POINTER TO FIRST PTB TO I1
ERASE LINK IN NEW PTB
SET POINTER TO LAST PTB TO I1
UPDATE POINTER TO LAST PTB
COPY INFORMATION INTO PTB
RETURN ADRESS OF PTB
END

```
C********************************  PUTSOR  ********************************
C*                                                                        *
C*                            SUBROUTINE PUTSOR                           *
C*                                                                        *
C*     PURPOSE                                                            *
C*         WRITES QUANTITY OF A GIVEN SOURCE FOR A GIVEN PERIOD.          *
C*                                                                        *
C*     CALLING SEQUENCE                                                   *
C*         CALL PUTSOR(ISOR,IT1,IT2,IAPPAY)                               *
C*                                                                        *
C*     DESCRIPTION OF PARAMETERS                                          *
C*                                                                        *
C*                      * EXPLICIT INPUT *                                *
C*         ISOR    - SOURCE NUMBER                                        *
C*         IT1     - BEGINNING OF INTERVAL                                *
C*         IT2     - END OF INTERVAL                                      *
C*                                                                        *
C*     AUTHOR/PROGRAMMER                                                  *
C*         JOHN R. MENIG                                                  *
C*         CALSPAN CORPORATION                                            *
C*         29 APRIL 1975                                                  *
C*                                                                        *
C************************************************************************
```


PUTSOR
IS SOURCE IN CORE FOR TIME PERIOD REQUESTED ?
NO
GIVE ERROR MESSAGE
STOP 3000
YES
CYCLE THRU ALL BUCKETS IN THIS TIME INTERVAL
1
ALL BUCKETS PROCESSED ?
YES
RETURN
NO
QUANTITY TO BE STORED 0 ?
YES
IS THERE A CELL FOR THIS BUCKET IN SOURCE LIST ?
NO
1
YES
DELETE CELL
1
NO
IS THERE A CELL FOR THIS BUCKET IN SOURCE LIST ?
YES
CHANGE QUANTITY STORED IN CELL
1
NO
INSERT A CELL FOR THIS BUCKET AND QUANTITY IN LIST
1

```
C********************************* PUTRES *********************************
C*                                                                        *
C*                          SUBROUTINE PUTRES                             *
C*                                                                        *
C*    PURPOSE                                                             *
C*        WRITES QUANTITY OF A GIVEN RESOURCE FOR A GIVEN PERIOD          *
C*                                                                        *
C*    CALLING SEQUENCE                                                    *
C*        CALL PUTRES(IRES,IT1,IT2,IARRAY)                                *
C*                                                                        *
C*    DESCRIPTION OF PARAMETERS                                           *
C*                                                                        *
C*                   * EXPLICIT INPUT *                                   *
C*        IRES    - RESOURCE NUMBER                                       *
C*        IT1     - BEGINNING OF INTERVAL                                 *
C*        IT2     - END OF INTERVAL                                       *
C*                                                                        *
C*    AUTHOR/PROGRAMMER                                                   *
C*        JOHN R. MENIC                                                   *
C*        CALSPAN CORPORATION                                             *
C*        29 APRIL 1975                                                   *
C*                                                                        *
C**************************************************************************
```

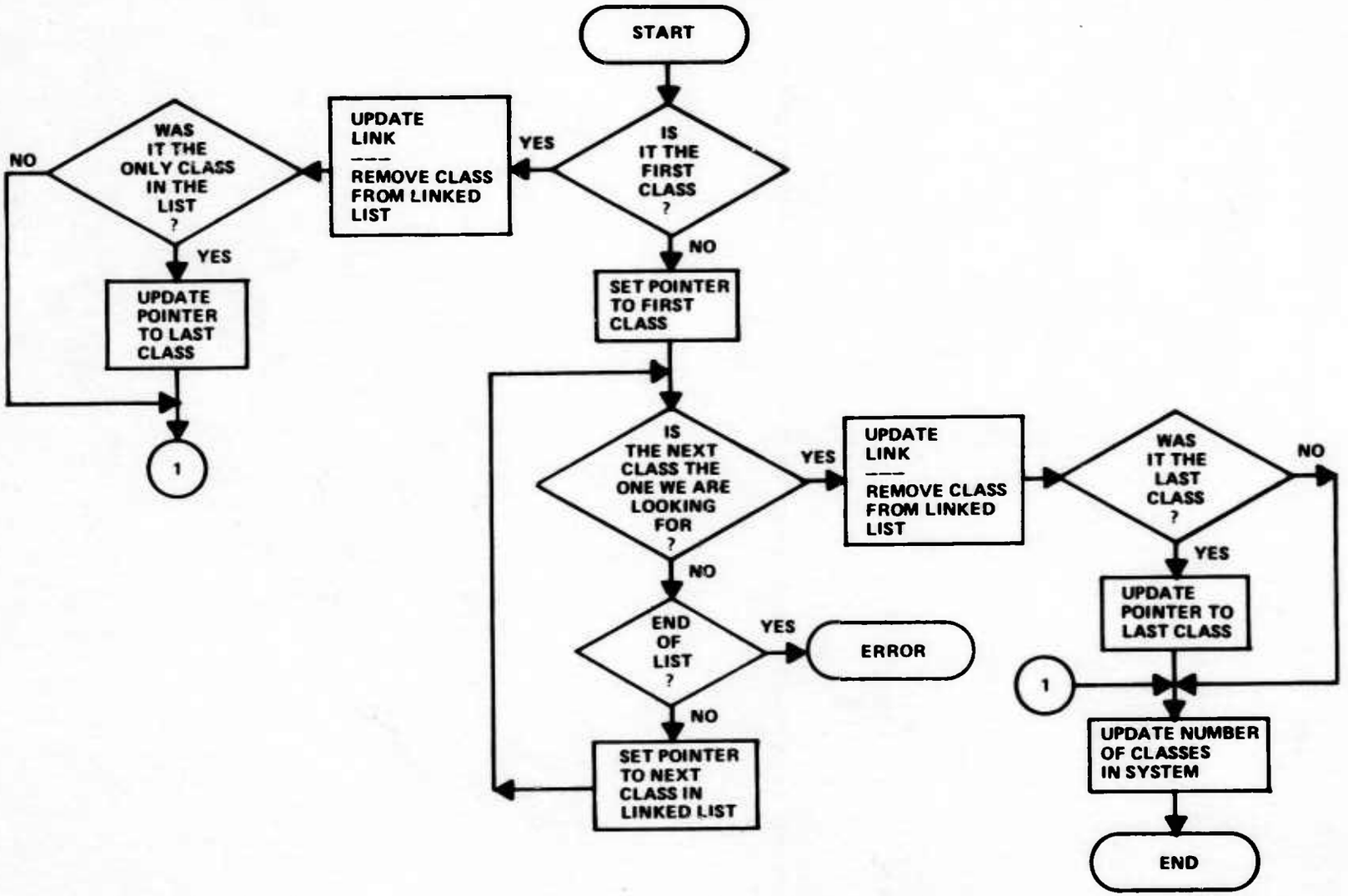

PUTRES
IS RESOURCE IN CORE FOR TIME PERIOD REQUESTED ?
NO
GIVE ERROR MESSAGE
STOP 3000
YES
CYCLE THRU ALL BUCKETS IN THIS TIME INTERVAL
1
ALL BUCKETS PROCESSED ?
YES
RETURN
NO
QUANTITY TO BE STORED 0 ?
YES
IS THERE A CELL FOR THIS BUCKET IN RESOURCE LIST ?
NO
1
YES
DELETE CELL
1
NO
IS THERE A CELL FOR THIS BUCKET IN RESOURCE LIST ?
YES
CHANGE QUANTITY STORED IN CELL
1
NO
INSERT A CELL FOR THIS BUCKET AND QUANTITY IN LIST
1

```
C**********************************  RDNAME  **********************************
C*                                                                             *
C*                              SUBROUTINE RDNAME                              *
C*                                                                             *
C*     PURPOSE                                                                 *
C*         READS NAMES IN STEP3                                                *
C*                                                                             *
C*     AUTHOR/PROGRAMMER                                                       *
C*         JOHN R. MENIG                                                       *
C*         CALSPAN CORPORATION                                                 *
C*         22 APRIL 1975                                                       *
C*                                                                             *
C*******************************************************************************
```


RDNAME
READ
NAME
TABLES
RETURN

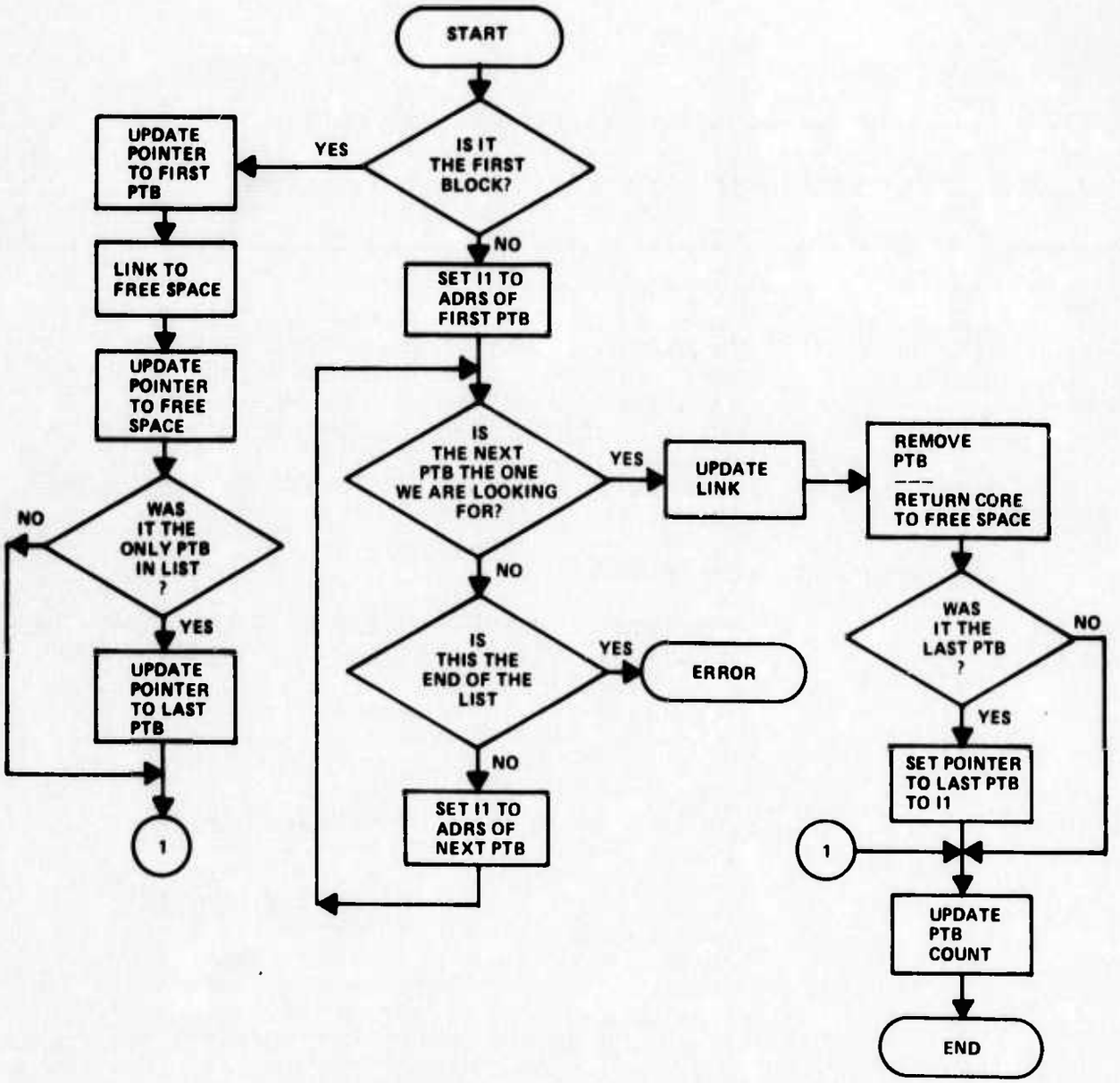
```
CC********************************* REMCLS ***********************************
CC*                                                                           *
CC*    PURPOSE                                                                *
CC*        TO FREE THE STORAGE SPACE OCCUPIED BY A CLASS BLOCK.               *
CC*                                                                           *
CC*                                                                           *
CC*    CALLING SEQUENCE                                                       *
CC*                                                                           *
CC*        CALL REMCLS(IADRS)                                                 *
CC*                                                                           *
CC*    DESCRIPTION OF PARAMETERS                                              *
CC*                                                                           *
CC*        IADRS           ADRESS OF CLASS TO BE REMOVED FROM STORAGE.        *
CC*                                                                           *
CC*    SUBROUTINES USED                                                       *
CC*        CLSDMP                                                             *
CC*                                                                           *
CC*    PROGRAMMER                                                             *
CC*        G.GAIDASZ                                                          *
CC*        CALSPAN                                                            *
CC*        MAY 1975                                                           *
CC*                                                                           *
CC*****************************************************************************
```

REMCLS


START
IS IT THE FIRST CLASS ?
YES
UPDATE LINK
REMOVE CLASS FROM LINKED LIST
NO
WAS IT THE ONLY CLASS IN THE LIST ?
NO
YES
UPDATE POINTER TO LAST CLASS
1
NO
SET POINTER TO FIRST CLASS
IS THE NEXT CLASS THE ONE WE ARE LOOKING FOR ?
YES
UPDATE LINK
REMOVE CLASS FROM LINKED LIST
WAS IT THE LAST CLASS ?
NO
YES
UPDATE POINTER TO LAST CLASS
NO
END OF LIST ?
YES
ERROR
NO
SET POINTER TO NEXT CLASS IN LINKED LIST
1
UPDATE NUMBER OF CLASSES IN SYSTEM
END

```
CC********************************* REMPTB ************************************
CC*                                                                           *
CC*    PURPOSE                                                                *
CC*        TO FREE THE STORAGE OCCUPIED BY A PREDETERMINED TRANSFER           *
CC*        BLOCK.                                                             *
CC*                                                                           *
CC*                                                                           *
CC*    CALLING SEQUENCE                                                       *
CC*                                                                           *
CC*        CALL REMPTB(IADRS)                                                 *
CC*                                                                           *
CC*    DESCRIPTION OF PARAMETERS                                              *
CC*                                                                           *
CC*        IADRS           ADRESS OF PTB TO BE REMOVED FROM STORAGE.          *
CC*                                                                           *
CC*    SUBROUTINES USED                                                       *
CC*        PTBDMP                                                             *
CC*                                                                           *
CC*    PROGRAMMER                                                             *
CC*        G. GAIDASZ                                                         *
CC*        CALSPAN                                                            *
CC*        MAY 1975                                                           *
CC*                                                                           *
CC*****************************************************************************
```

REMPTB

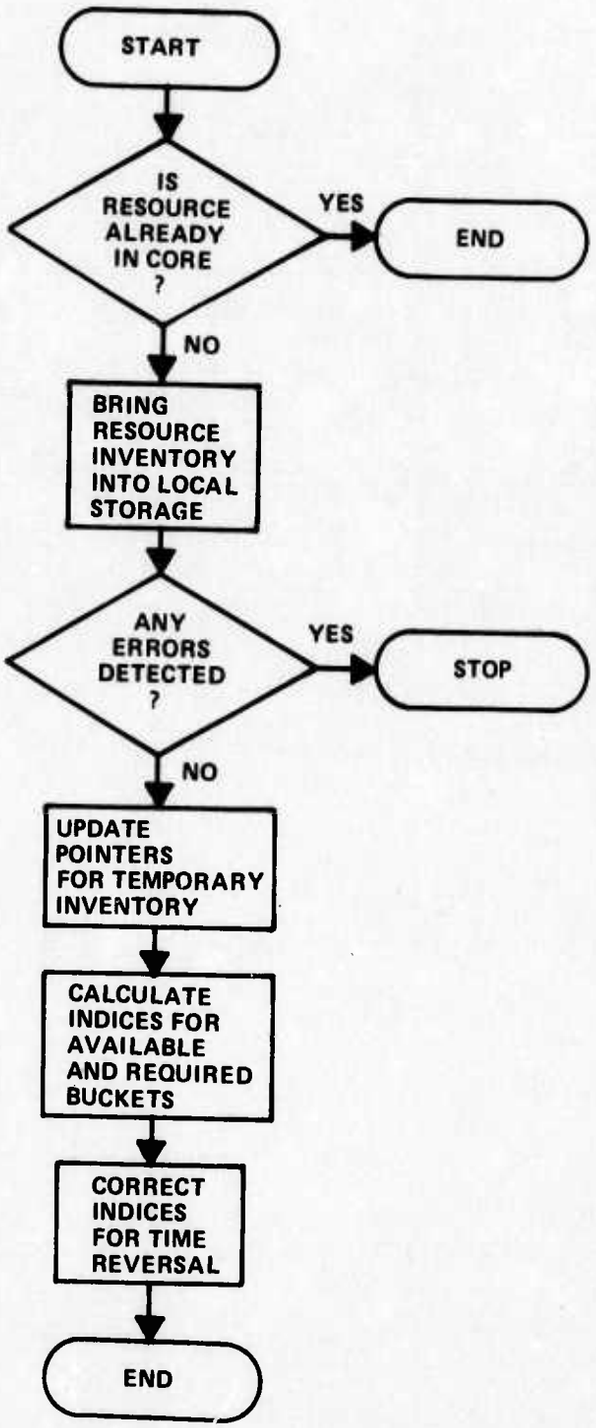

START
IS IT THE FIRST BLOCK?
YES
NO
UPDATE POINTER TO FIRST PTB
LINK TO FREE SPACE
UPDATE POINTER TO FREE SPACE
WAS IT THE ONLY PTB IN LIST ?
NO
YES
UPDATE POINTER TO LAST PTB
1
SET I1 TO ADRS OF FIRST PTB
IS THE NEXT PTB THE ONE WE ARE LOOKING FOR?
YES
UPDATE LINK
NO
IS THIS THE END OF THE LIST
YES
ERROR
NO
SET I1 TO ADRS OF NEXT PTB
REMOVE PTB

RETURN CORE TO FREE SPACE
WAS IT THE LAST PTB ?
NO
YES
SET POINTER TO LAST PTB TO I1
1
UPDATE PTB COUNT
END

```
CC********************************* RESINV *********************************
CC*
CC*    PURPOSE                                                              *
CC*        BRING RESOURCE INVENTORY INTO LOCAL STORAGE.                      *
CC*                                                                         *
CC*                                                                         *
CC*    CALLING SEQUENCE                                                     *
CC*                                                                         *
CC*        CALL RESINV(IRESNO,LITIM1,LITIM2,ITIME1,ITIME2)                  *
CC*                                                                         *
CC*    DESCRIPTION OF PARAMETERS                                            *
CC*                                                                         *
CC*        * INPUT *                                                        *
CC*                                                                         *
CC*        IRESNO          RESOURCE NUMBER.                                 *
CC*        LITIM1          LOWER LIMIT OF TIME FOR WHICH THIS RESOURCE      *
CC*                        IS NEEDED BY ANY OF THE CURRENT TASKS.           *
CC*        LITIM2          UPPER LIMIT OF TIME FOR WHICH THIS RESOURCE      *
CC*                        IS NEEDED BY ANY OF THE CURRENT TASKS.           *
CC*        ITIME1          LOWER LIMIT OF TIME FOR WHICH THIS RESOURCE      *
CC*                        IS NEEDED BY ACTIVE TASK                         *
CC*        ITIME2          UPPER LIMIT OF TIME FOR WHICH THIS RESOURCE      *
CC*                        IS NEEDED BY ACTIVE TASK.                        *
CC*                                                                         *
CC*        * OUTPUTS VIA COMMON RES *                                       *
CC*                                                                         *
CC*        IT1()           THEORETICAL BUCKET NUMBER OF BUCKET CORRES-      *
CC*                        PONDING TO LITIM1.(ASSUMING RES. INVENTORY       *
CC*                        STARTS AT TIME=1).                               *
CC*        IT2()           THEORLTICAL BUCKET NUMBER OF BUCKET              *
CC*                        CORRESPONDING TO LITIM2.                         *
CC*        IA1             THEORETICAL BUCKET NUMBER OF BUCKET              *
CC*                        CORRESPONDING TO ITIME1.                         *
CC*        IA2             THEORETICAL BUCKET NUMBER OF BUCKET              *
CC*                        CORRESPONDING TO ITIME2.                         *
CC*        INDX1           POINTER TO ELEMENT IN ARRAY INVRES THAT          *
CC*                        CORRESPONDS TO THE 'HIGH-TIME' BUCKET            *
CC*                        OF THE DESIRED RES. INVENTORY.                   *
CC*        INDX2           POINTER TO ELEMENT IN ARRAY INVRES THAT          *
CC*                        CORRESPONDS TO THE 'LOW-TIME' BUCKET             *
CC*                        OF THE DESIRED RES.INVENTORY.                    *
CC*        NB1             NUMBER OF RESOURCE BUCKETS REQUIRED TO           *
CC*                        COVER THE ACTIVE PROCBLOC.                       *
CC*                                                                         *
CC*    SUBROUTINES USED                                                     *
CC*        GETRES                                                           *
CC*                                                                         *
CC*                                                                         *
CC***                                                                       *
                          CONTINUED                                       ***
```

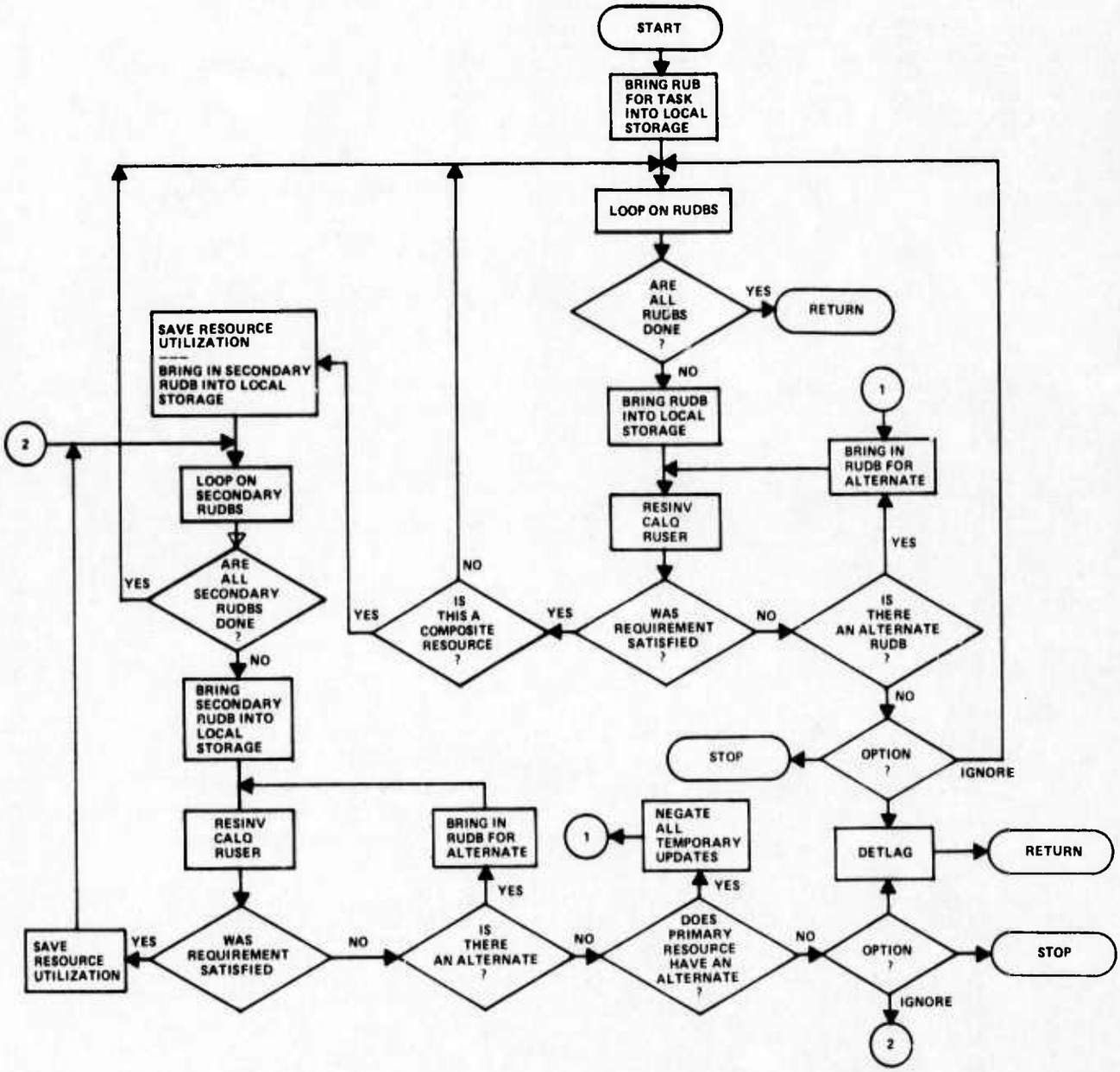
```
CC***                    RESINV - CONTINUED                          ***
CC*                                                                   *
CC*                                                                   *
CC*   REMARKS                                                         *
CC*       A LIST OF TASKS WHICH MUST BE EXECUTED SIMULTANEOUSLY       *
CC*       IS CREATED BY EITHER LSTASK OR SYNCT. EXECT PROCESSES       *
CC*       THE TASKS IN THE LIST ONE AT A TIME. IN THE CASE OF         *
CC*       RESOURCE UTILIZATION TASKS, EITHER ALL OR NONE GET DONE.    *
CC*       FOR THIS REASON THE INVENTORIES OF THE RESOURCES REQUIRED   *
CC*       ARE PLACED IN A TEMPORARY STORAGE AREA UNTIL THE DECISION   *
CC*       TO MAKE A PERMANENT UPDATE CAN BE MADE.  WHEN THE LIST OF   *
CC*       TASKS IS CREATED THE MAXIMUM TIME EXTENT OF THE TASKS IS    *
CC*       SAVED IN ORDER TO ASSURE THAT THE RESOURCE INVENTORY        *
CC*       BROUGHT INTO LOCAL STORAGE INCLUDES ALL THE TIME PERIODS    *
CC*       THAT MAY BE REQUIRED.                                       *
CC*       SUBROUTINE RESINV CHECKS TO SEE WHETHER THE RESOURCE BEING  *
CC*       PROCESSED IS ALREADY IN LOCAL STORAGE, AND IF NOT CALL      *
CC*       SUB. GETRES TO FETCH IT.  THEN IT CALCULATES THE POINTERS   *
CC*       TO THE BUCKETS REQUIRED BY THE CURRENT TASK,TAKING INTO     *
CC*       CONSIDERATION THE TIME-ORDER REVERSAL OF THE WORKING        *
CC*       INVENTORY ARRAY                                             *
CC*                                                                   *
CC*   PROGRAMMER                                                      *
CC*       G. GAIDASZ                                                  *
CC*       CALSPAN                                                     *
CC*       MAY 1975                                                    *
CC*                                                                   *
CC*********************************************************************
```

RESINV


START
IS RESOURCE ALREADY IN CORE ?
YES
END
NO
BRING RESOURCE INVENTORY INTO LOCAL STORAGE
ANY ERRORS DETECTED ?
YES
STOP
NO
UPDATE POINTERS FOR TEMPORARY INVENTORY
CALCULATE INDICES FOR AVAILABLE AND REQUIRED BUCKETS
CORRECT INDICES FOR TIME REVERSAL
END

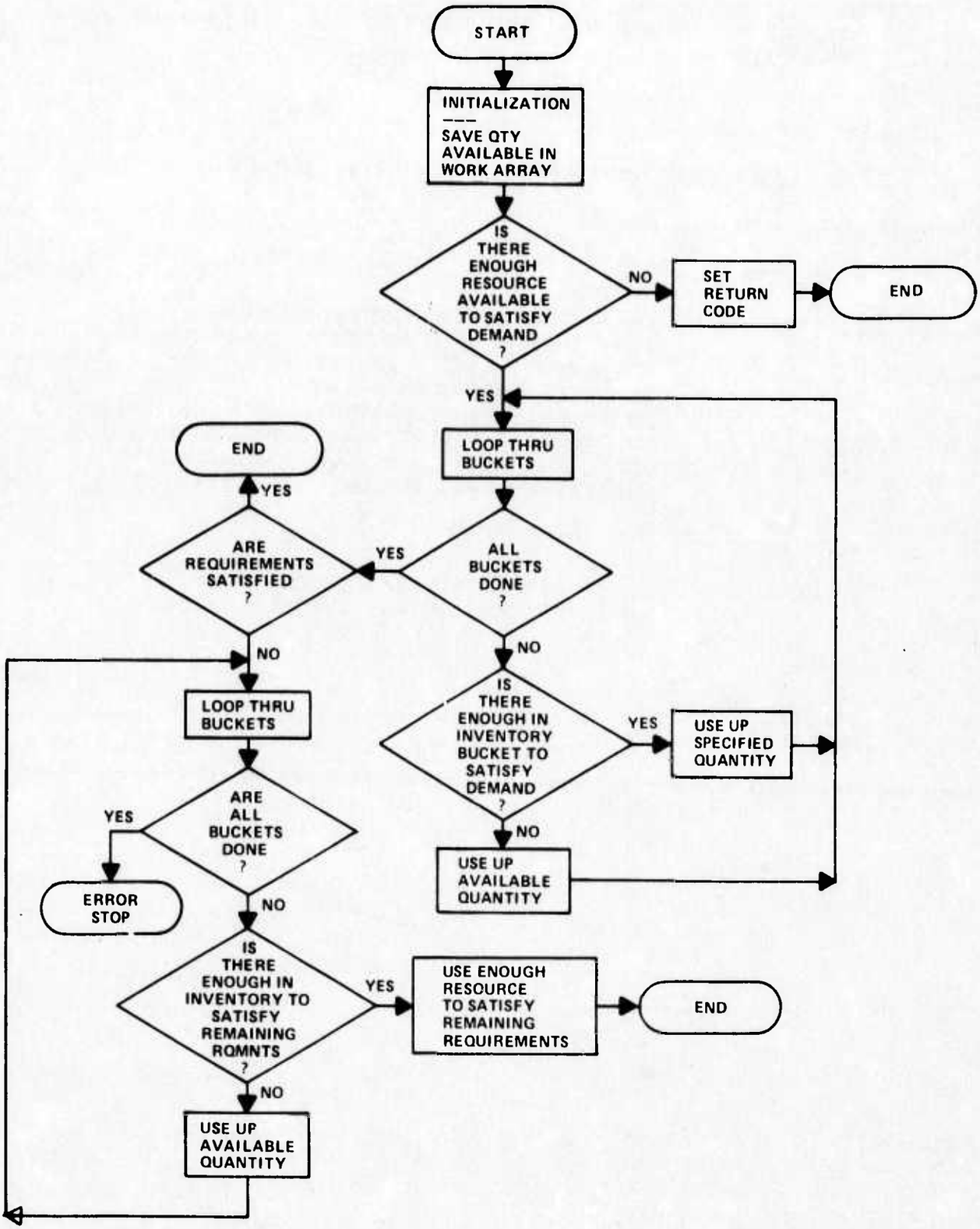
```
CC********************************* RESUSE **********************************
CC*                                                                          *
CC*    PURPOSE                                                               *
CC*        TO CALCULATE THE RESOURCES USED BY A CLASS PERFORMING A           *
CC*        TASK.                                                             *
CC*                                                                          *
CC*    CALLING SEQUENCE                                                      *
CC*        CALL RESUSE(IFRES,LAGTME)                                         *
CC*                                                                          *
CC*    DESCRIPTION OF PARAMETERS                                             *
CC*                                                                          *
CC*        * OUTPUTS *                                                       *
CC*        IFRES           NUMBER OF RESOURCE CAUSING ALLOCATION             *
CC*                        FAILURE.                                          *
CC*        LAGTME          TIME TO WHICH CLASS(ES) MUST BE LAGGED.           *
CC*                                                                          *
CC*          THE ABOVE PARAMETERS HAVE MEANING ONLY IF 'IFAIL'               *
CC*          IN COMMON ECB IS NOT ZERO                                       *
CC*                                                                          *
CC*    SUBROUTINES CALLED                                                    *
CC*        RESINV                                                            *
CC*        CALQ                                                              *
CC*        RUSER                                                             *
CC*        SVRUSE                                                            *
CC*        NEGUSE                                                            *
CC*        UPDATE                                                            *
CC*        DETLAG                                                            *
CC*        BLOCK                                                             *
CC*        WRUB                                                              *
CC*        WRUDB                                                             *
CC*                                                                          *
CC*    REMARKS                                                               *
CC*        RESOURCE UTILIZATION BY A CLASS PERFORMING A TASK  IS             *
CC*        DEFINED BY THE RESOURCE UTILIZATION BLOCK (RUB)                   *
CC*        ASSOCIATED WITH THE TASK.  THE RUB CONTAINS A LIST OF             *
CC*        POINTERS TO RESOURCE UTILIZATION DESCRIPTION BLOCKS (RUDES).      *
CC*        EACH RUDB DEFINES THE RESOURCE INVOLVED, WHETHER RESOURCE         *
CC*        CONSUMPTION IS DONE BY INDIVIDUALS, BY THE CLASS OR IS A          *
CC*        FUNCTION OF THE UTILIZATION OF THE PRIMARY RESOURCE.              *
CC*        THE RUDB ALSO DESCRIBES HOW THE RESOURCE IS CONSUMED AS           *
CC*        A FUNCTION OF TIME (ARBITRARY OR UNIFORM) AND WHETHER             *
CC*        SECONDARY AND/OR ALTERNATE RESOURCES EXIST.                       *
CC*        THE CURRENT CODE PERMITS ONE LEVEL OF SECONDARY RESOURCES.        *
CC*        BOTH PRIMARY AND SECONDARY RESOURCES ARE ALLOWED TO HAVE          *
CC*        ANY NUMBER OF ALTERNATE RESOURCES.                                *
CC*        WHEN A DEMAND FOR A RESOURCE CANNOT BE SATISFIED AND              *
CC*        ALTERNATE RESOURCES DO NOT EXIST,THREE USER SELECTED              *
CC*        OPTIONS CAN BE EXERCIZED: 1.- STOP THE RUN, 2.- CONTINUE          *
CC*        THE RUN AFTER INDICATING THE RESOURCE SHORTAGE. 3.- LAG           *
CC*        THE CLASS TO A PERIOD IN TIME WHEN THE MISSING OR SCARCE          *
CC*        RESOURCE IS AVAILABLE.                                            *
CC*                                                                          *
CC*    PROGRAMMER                                                            *
CC*        G. GAIDASZ                                                        *
CC*        CALSPAN                                                           *
CC*        AUG 1975                                                          *
CC****************************************************************************
```

RESUSE

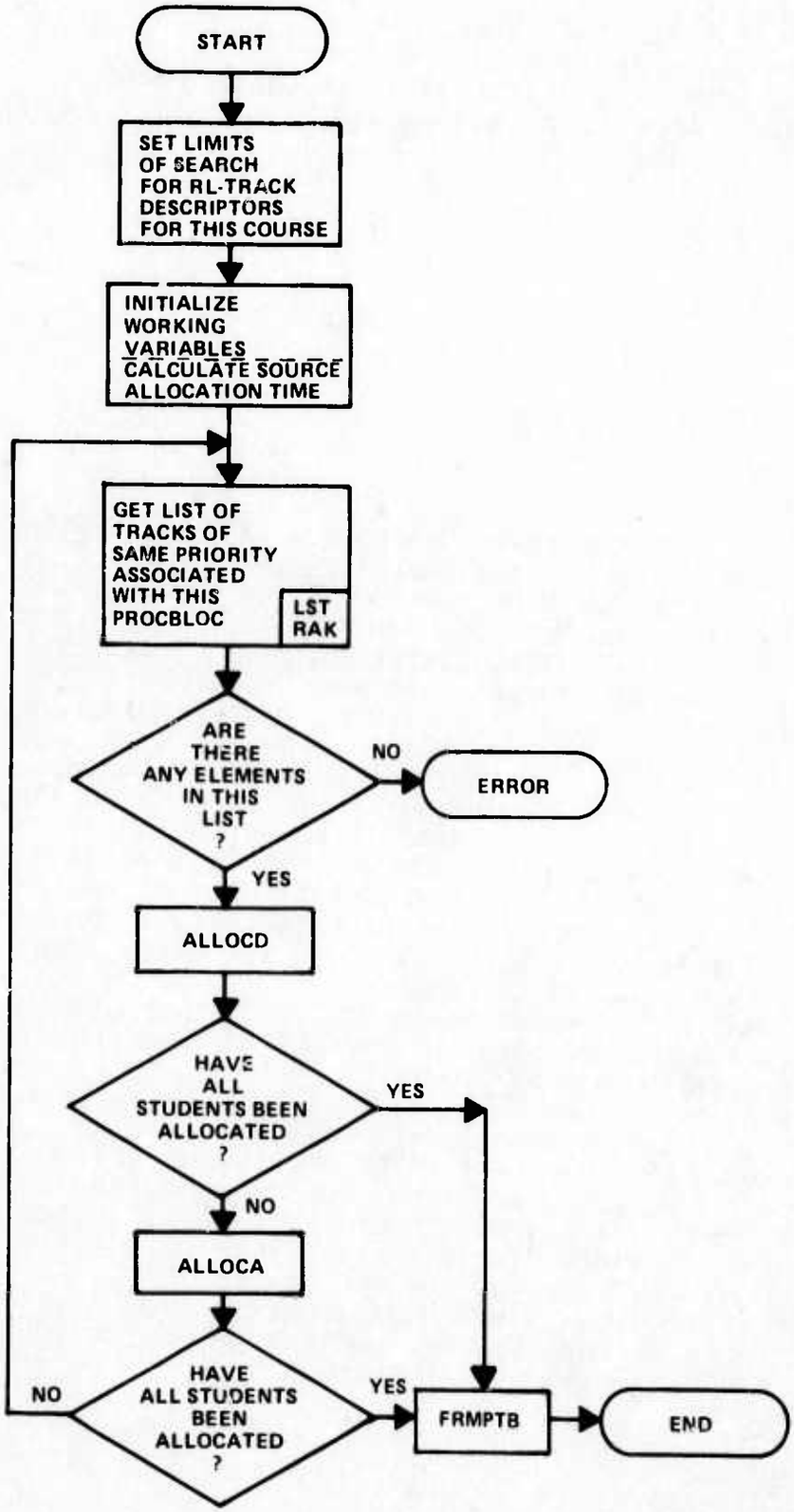

START
BRING RUB FOR TASK INTO LOCAL STORAGE
LOOP ON RUDBS
ARE ALL RUDBS DONE ?
YES
RETURN
NO
BRING RUDB INTO LOCAL STORAGE
RESINV CALQ RUSER
WAS REQUIREMENT SATISFIED ?
NO
IS THERE AN ALTERNATE RUDB ?
YES
BRING IN RUDB FOR ALTERNATE
1
NO
OPTION ?
STOP
IGNORE
DETLAG
RETURN
YES
IS THIS A COMPOSITE RESOURCE ?
YES
NO
SAVE RESOURCE UTILIZATION
BRING IN SECONDARY RUDB INTO LOCAL STORAGE
2
LOOP ON SECONDARY RUDBS
ARE ALL SECONDARY RUDBS DONE ?
YES
NO
BRING SECONDARY RUDB INTO LOCAL STORAGE
RESINV CALQ RUSER
WAS REQUIREMENT SATISFIED ?
YES
SAVE RESOURCE UTILIZATION
NO
IS THERE AN ALTERNATE ?
YES
BRING IN RUDB FOR ALTERNATE
NO
DOES PRIMARY RESOURCE HAVE AN ALTERNATE ?
YES
NEGATE ALL TEMPORARY UPDATES
1
NO
OPTION ?
STOP
IGNORE
2

```
C******************************** RUSER ***********************************
CC*                                                                       *
CC*   PURPOSE                                                             *
CC*       ALLOCATE RESOURCES FROM INVENTORY TO MEET CALCULATED            *
CC*       CONSUMPTION.                                                    *
CC*                                                                       *
CC*                                                                       *
CC*   CALLING SEQUENCE                                                    *
CC*                                                                       *
CC*       CALL RUSER(IQTY,NB,INVRES,I1,I2,ITOTQ, ICODE)                   *
CC*                                                                       *
CC*   DESCRIPTION OF PARAMETERS                                           *
CC*                                                                       *
CC*       * INPUT *                                                       *
CC*                                                                       *
CC*       IQTY()          ARRAY CONTAINING THE RESOURCE QUANTITIES.       *
CC*                       THAT SHOULD BE CONSUMED IN EACH BUCKET.         *
CC*       NB              NUMBER OF ENTRIES IN IQTY.                      *
CC*       INVRES()        RESOURCE INVENTORY ARRAY.                       *
CC*       I1              INDEX OF FIRST PERTINENT ENTRY IN INVRES.       *
CC*       I2              INDEX OF LAST PERTINENT ENTRY IN INVRES.        *
CC*       ITOTQ           TOTAL QUANTITY OF RESOURCE REQUIRED TO          *
CC*                       SATISFY CURRENT DEMAND.                         *
CC*                                                                       *
CC*       * OUTPUT *                                                      *
CC*                                                                       *
CC*       ICODE           IF 0, ALLOCATION WAS SUCCESSFULL.               *
CC*                       IF 1, ALLOCATION WAS UNSUCCESSFULL.             *
CC*                                                                       *
CC*   PROGRAMMER                                                          *
CC*       GEORGE GAIDASZ                                                  *
CC*       CALSPAN                                                         *
CC*       MAY 1975                                                        *
CC*                                                                       *
CC***************************************************************************
```

RUSER

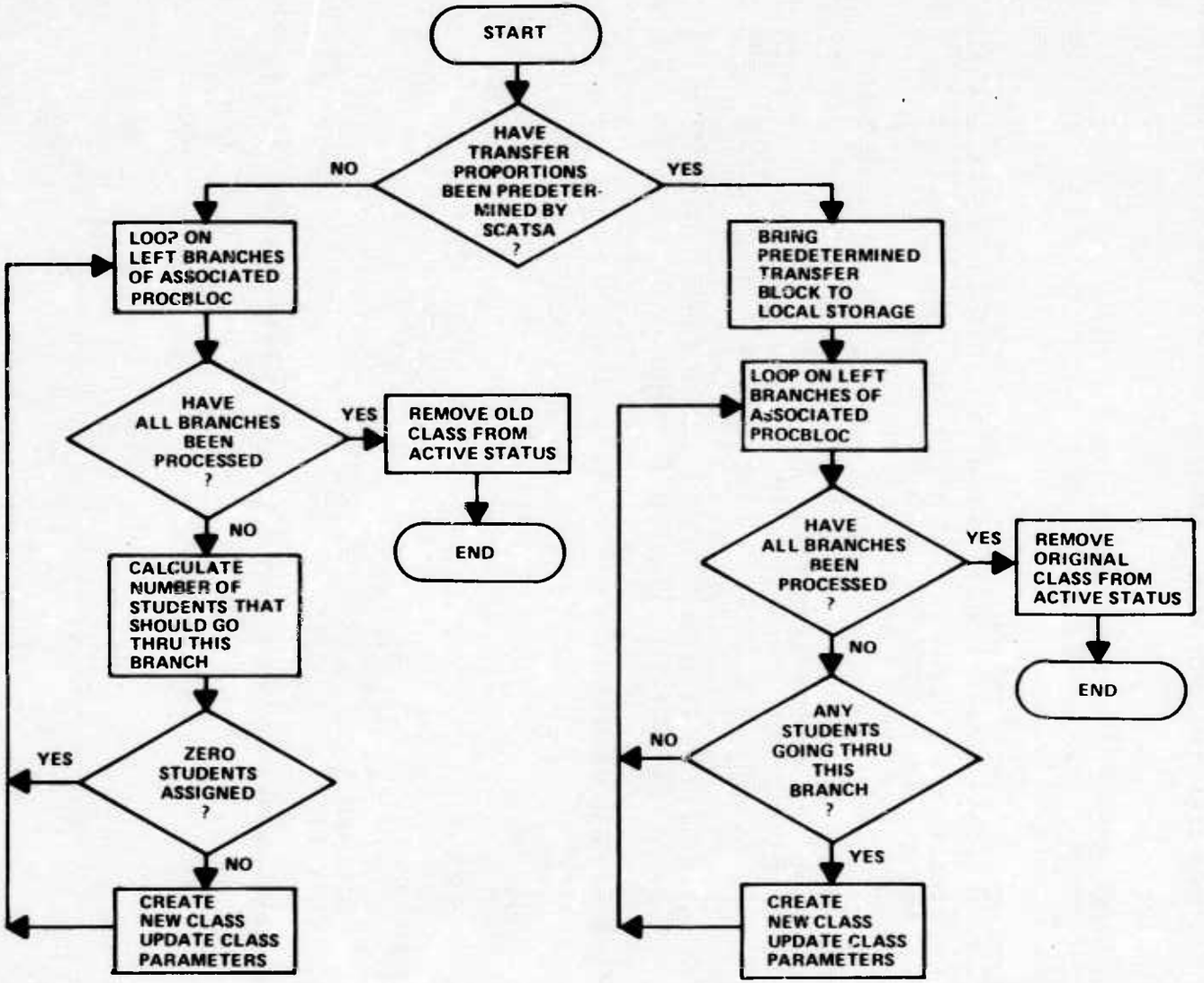

START
INITIALIZATION
SAVE QTY AVAILABLE IN WORK ARRAY
IS THERE ENOUGH RESOURCE AVAILABLE TO SATISFY DEMAND ?
NO
SET RETURN CODE
END
YES
LOOP THRU BUCKETS
ALL BUCKETS DONE ?
YES
ARE REQUIREMENTS SATISFIED ?
YES
END
NO
IS THERE ENOUGH IN INVENTORY BUCKET TO SATISFY DEMAND ?
YES
USE UP SPECIFIED QUANTITY
NO
USE UP AVAILABLE QUANTITY
NO
LOOP THRU BUCKETS
ARE ALL BUCKETS DONE ?
YES
ERROR STOP
NO
IS THERE ENOUGH IN INVENTORY TO SATISFY REMAINING RQMNTS ?
YES
USE ENOUGH RESOURCE TO SATISFY REMAINING REQUIREMENTS
END
NO
USE UP AVAILABLE QUANTITY

```
CC********************************* SCATSA *********************************
CC*                                                                        *
CC*   PURPOSE                                                              *
CC*       TO SELECT THE TRAINEE SOURCES FOR A CLASS.                       *
CC*       SELECTION IS BASED UPON.                                         *
CC*          1. ESTIMATED DURATION OF COURSE.                              *
CC*          2. SOURCE AVAILABILITY AT REQUIRED TIME.                      *
CC*          3. TRANSFER PERCENTAGES AND PRIORITIES SPECIFIED              *
CC*             FOR THE COURSE.                                            *
CC*                                                                        *
CC*   CALLING SEQUENCE                                                     *
CC*       CALL SCATSA                                                      *
CC*                                                                        *
CC*   SUBROUTINES USED                                                     *
CC*       LSTRAK                                                           *
CC*       ALLOCD                                                           *
CC*       ALLOCA                                                           *
CC*       FRMPTB                                                           *
CC*       PUTCLS                                                           *
CC*                                                                        *
CC*   REMARKS                                                              *
CC*       SCATSA USES THE TRACK DESCRIPTOR BLOCKS CREATED BY TRACKD        *
CC*       TO LOOK UP SOURCE AVAILABILITY FOR THE TRACKS OF THE COURSE.     *
CC*       THE TRACK DESCRIPTOR BLOCKS FOR EACH COURSE ARE SORTED           *
CC*       IN DESCENDING ORDER OF CUMULATIVE PRIORITY BY TRACKD.            *
CC*       IN SCATSA SUBROUTINE LSTRAK IS USED TO EXTRACT THE POINTERS      *
CC*       TO A GROUP OF SOURCES THAT HAVE EQUAL PRIORITY.                  *
CC*       SUBROUTINE ALLOCD IS THEN USED TO TRY TO ALLOCATE THE            *
CC*       PROPER NUMBER OF TRAINEES TO EACH TRACK AS SPECIFIED             *
CC*       BY THE TRANSFER PROPORTIONS SPECIFIED FOR THE COURSE.            *
CC*       IF ALL TRAINEES IN THE CLASS HAVE BEEN ALLOCATED BY              *
CC*       TRACKD, SUBROUTINE FRMPTB IS INVOKED.                            *
CC*       IF THE DESIRED PROPORTIONING COULD NOT BE SATISFIED BY           *
CC*       ALLOCD THEN SUBROUTINE ALLOCA IS CALLED.  ALLOCA LOOPS           *
CC*       ON THE SAME PRIORITY TRACKS AS ALLOCD, BUT IT ALLOCATES          *
CC*       AS MANY STUDENTS AS POSSIBLE TO THE TRACKS THAT HAVE ANY         *
CC*       REMAINING SOURCE INVENTORY.                                      *
CC*       IF THE CLASS CANNOT BE ALLOCATED TO THE SOURCES OF THIS          *
CC*       PRIORITY GROUP, THEN THE PROCESS IS REPEATED USING THE           *
CC*       SET OF NEXT LOWER PRIORITY TRACKS.                               *
CC*       AFTER ALL TRAINEES HAVE BEEN ALLOCATED TO THEIR RESPECTIVE       *
CC*       SOURCES, SUBROUTINE FRMPTB IS INVOKED.                           *
CC*       THE PURPOSE OF FRMPTB IS TO CREATE THE PREDETERMINED             *
CC*       TRANSFER BLOCKS (PTBS) FOR THE CLASS BEING PROCESSED.            *
CC*       THE PTBS FORM A TREE STRUCTURE THAT ORIGINATES AT THE            *
CC*       PROCBLOC FROM WHICH SCATSA WAS INVOKED AND HAS A LINKED          *
CC*       ELEMENT FOR EACH NODE OF THE TRACKS TO THE LEFT OF IT.           *
CC*       THE PTB INDICATES HOW MANY STUDENTS SHOULD TAKE EACH ONE         *
CC*       OF THE FIVE POSSIBLE BRANCHES AT EACH NODE AND A POINTER         *
CC*       TO THE NEXT NODE (IF ANY) ALONG EACH ONE OF THE FIVE             *
CC*       BRANCHES.                                                        *
CC*                                                                        *
CC*   PROGRAMMER                                                           *
CC*       G. GAIDASZ                                                       *
CC*       CALSPAN                                                          *
CC*       AUG 1975                                                         *
CC************************************************************************
```


START
SET LIMITS OF SEARCH FOR RL-TRACK DESCRIPTORS FOR THIS COURSE
INITIALIZE WORKING VARIABLES
CALCULATE SOURCE ALLOCATION TIME
GET LIST OF TRACKS OF SAME PRIORITY ASSOCIATED WITH THIS PROCBLOC
LST RAK
ARE THERE ANY ELEMENTS IN THIS LIST ?
NO
ERROR
YES
ALLOCD
HAVE ALL STUDENTS BEEN ALLOCATED ?
YES
NO
ALLOCA
HAVE ALL STUDENTS BEEN ALLOCATED ?
NO
YES
FRMPTB
END

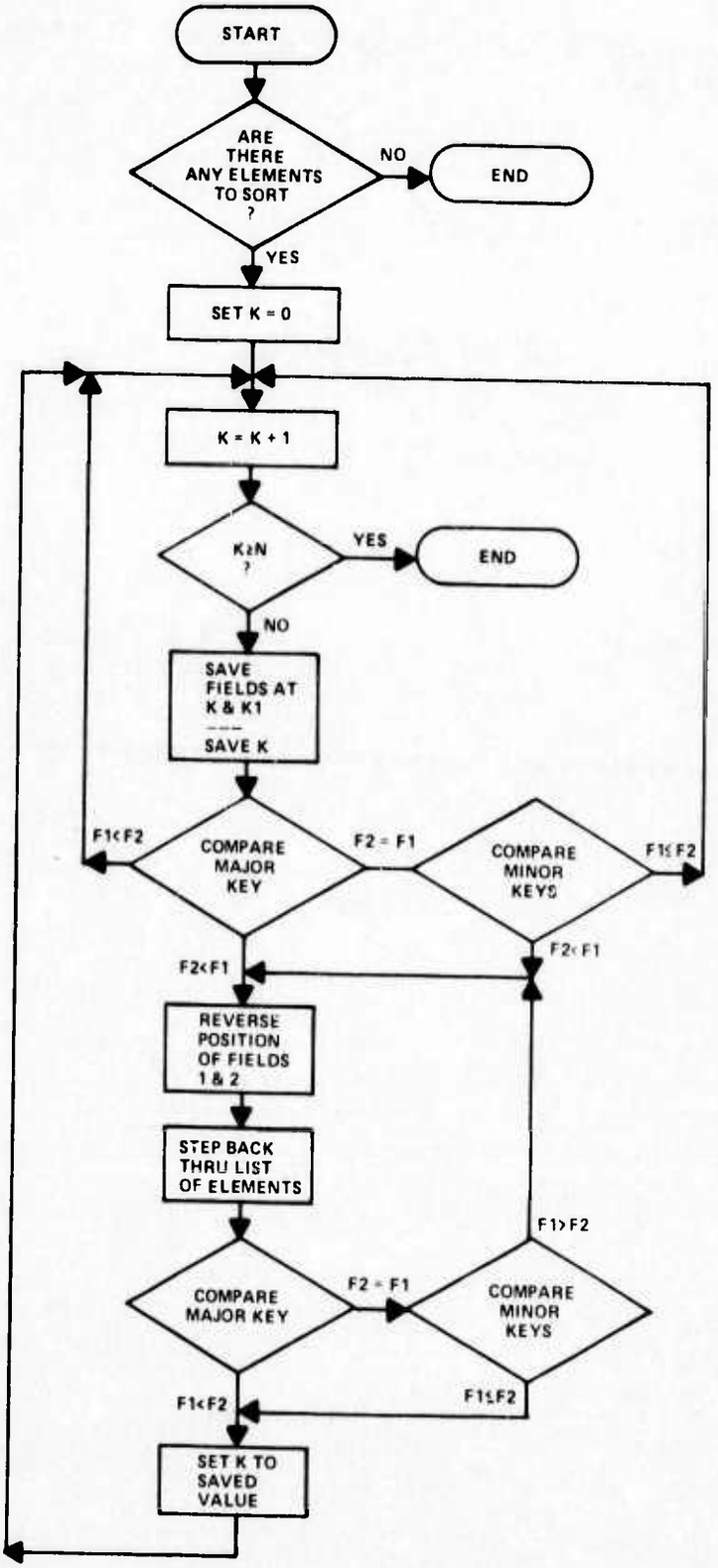
```
CC********************************* SPLIT ***********************************
CC*                                                                         *
CC*   PURPOSE                                                               *
CC*       TO SPLIT A CLASS INTO MULTIPLE CLASSES.                           *
CC*       IF SUB. SCATSA HAS BEEN ALREADY EXECUTED FOR THIS CLASS           *
CC*       THEN THE PREDETERMINED TRANSFER PROPORTIONS WILL BE USED,         *
CC*       OTHERWISE THE PROCBLOC TRANSFER PROPORTIONS WILL BE USED.         *
CC*                                                                         *
CC*                                                                         *
CC*   CALLING SEQUENCE                                                      *
CC*                                                                         *
CC*       CALL SPLIT                                                        *
CC*                                                                         *
CC*   REMARKS                                                               *
CC*       IF SCATSA HAS NOT BEEN EXECUTED FOR THIS TRACK, SPLIT             *
CC*       CALCULATES THE NUMBER OF STUDENTS THAT SHOULD BE SENT             *
CC*       ALONG EACH BRANCH FROM THE PROPORTIONS SPECIFIED FOR              *
CC*       EACH LEFT BRANCH OF THE ACTIVE PROCBLOC.                          *
CC*       IF SCATSA HAS BEEN EXECUTED FOR THIS TRACK THEN THE               *
CC*       NUMBER OF STUDENTS TO BE SENT ALONG EACH BRANCH IS TAKEN          *
CC*       FROM THE APPROPRIATE PTB.                                         *
CC*       AFTER THE CLASS HAS BEEN SPLIT INTO THE DESIRED PROPORTIONS,      *
CC*       NEW CLASSES ARE CREATED FROM EACH OF THE NEW GROUPS AND           *
CC*       THE OLD CLASS IS RELEASED. THE UNIQUE CLASS NUMBER IS             *
CC*       ASSIGNED TO EACH OF THE NEW CLASSES AND THE CORRECT PTB           *
CC*       ADRESS IS ENTERED. IF APPROPRIATE                                 *
CC*                                                                         *
CC*   SUBROUTINES USED                                                      *
CC*       CBLOCK                                                            *
CC*       REMCLS                                                            *
CC*       GETPTB                                                            *
CC*       WPTB                                                              *
CC*       NEWCLS                                                            *
CC*                                                                         *
CC*   PROGRAMMER                                                            *
CC*       GEORGE GAIDASZ                                                    *
CC*       CALSPAN                                                           *
CC*       MAY 1975                                                          *
CC*                                                                         *
CC***************************************************************************
```

SPLIT


START
HAVE TRANSFER PROPORTIONS BEEN PREDETER-MINED BY SCATSA ?
NO
YES
LOOP ON LEFT BRANCHES OF ASSOCIATED PROCBLOC
HAVE ALL BRANCHES BEEN PROCESSED ?
YES
REMOVE OLD CLASS FROM ACTIVE STATUS
END
NO
CALCULATE NUMBER OF STUDENTS THAT SHOULD GO THRU THIS BRANCH
ZERO STUDENTS ASSIGNED ?
YES
NO
CREATE NEW CLASS UPDATE CLASS PARAMETERS
BRING PREDETERMINED TRANSFER BLOCK TO LOCAL STORAGE
LOOP ON LEFT BRANCHES OF ASSOCIATED PROCBLOC
HAVE ALL BRANCHES BEEN PROCESSED ?
YES
REMOVE ORIGINAL CLASS FROM ACTIVE STATUS
END
NO
ANY STUDENTS GOING THRU THIS BRANCH ?
NO
YES
CREATE NEW CLASS UPDATE CLASS PARAMETERS

```
CC********************************* SRTCTP ***********************************
CC*                                                                           *
CC*    PURPOSE                                                                *
CC*        UTILITY ROUTINE TO SORT CLASSES IN ORDER BY GRADUATION             *
CC*        DATE AND PRIORITY.                                                 *
CC*                                                                           *
CC*                                                                           *
CC*    CALLING SEQUENCE                                                       *
CC*                                                                           *
CC*        CALL SRTCTP(IT1,IT2,N,IA)                                          *
CC*                                                                           *
CC*    DESCRIPTION OF PARAMETERS                                              *
CC*                                                                           *
CC*        IT1()           ARRAY OF MAJOR KEYS.                               *
CC*        IT2()           ARRAY OF MINOR KEYS.                               *
CC*        N               NUMBER OF ELEMENTS TO BE SORTED.                   *
CC*        IA()            ARRAY OF POSITION POINTERS TO SORTED RECORDS.      *
CC*                                                                           *
CC*    REMARKS                                                                *
CC*        METHOD IS AN INDEX BUBBLE SORT.                                    *
CC*                                                                           *
CC*    PROGRAMMER                                                             *
CC*        GEORGE GAIDASZ                                                     *
CC*        CALSPAN                                                            *
CC*        MAY 1975                                                           *
CC*                                                                           *
CC*****************************************************************************
```

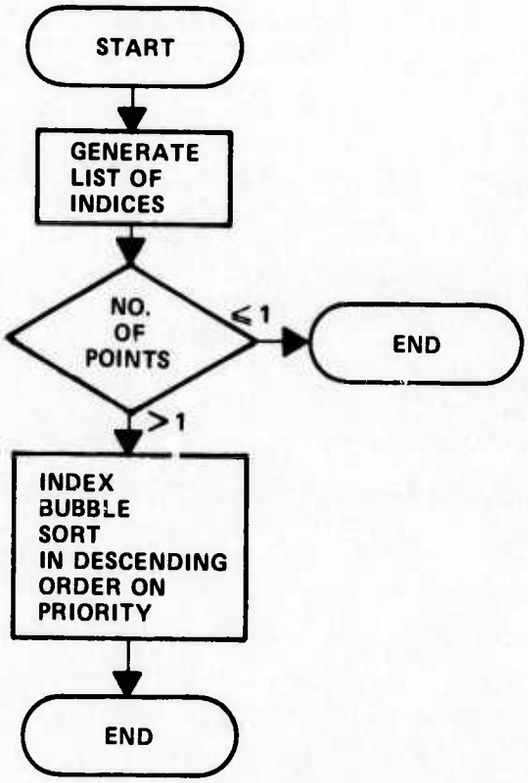
SRTCTP


START
ARE THERE ANY ELEMENTS TO SORT ?
NO
END
YES
SET K = 0
K = K + 1
K≥N ?
YES
END
NO
SAVE FIELDS AT K & K1

SAVE K
F1<F2
COMPARE MAJOR KEY
F2 = F1
COMPARE MINOR KEYS
F1≤F2
F2<F1
F2<F1
REVERSE POSITION OF FIELDS 1 & 2
STEP BACK THRU LIST OF ELEMENTS
F1>F2
COMPARE MAJOR KEY
F2 = F1
COMPARE MINOR KEYS
F1<F2
F1≤F2
SET K TO SAVED VALUE

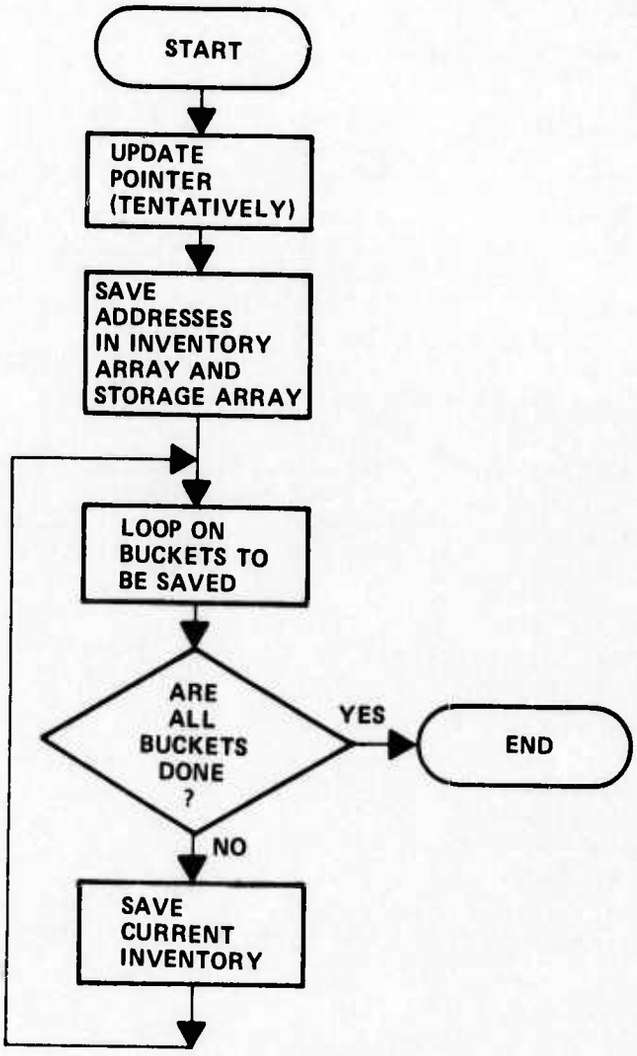
```
CC********************************* SRTTDB ***********************************
CC*                                                                           *
CC*    PURPOSE                                                                *
CC*        TO DO AN INDEX SORT ON THE TRACK DESCRIPTOR BLOCKS FOR             *
CC*        A COURSE. THE SORT IS IN DESCENDING ORDER ON PRIORITY.             *
CC*                                                                           *
CC*    CALLING SEQUENCE                                                       *
CC*                                                                           *
CC*        CALL SRTTDB(I1,I2,CUMPTY,ITDBST)                                   *
CC*                                                                           *
CC*    DESCRIPTION OF PARAMETERS                                              *
CC*                                                                           *
CC*        * INPUT *                                                          *
CC*                                                                           *
CC*        I1              POINTER TO FIRST ELEMENT TO BE SORTED.             *
CC*        I2              POINTER TO LAST ELEMENT TO BE SORTED.              *
CC*        CUMPTY()        SORT FIELD.                                        *
CC*        * I/O *                                                            *
CC*                                                                           *
CC*        ITDBST()        INDEX OF SORTED ELEMENTS                           *
CC*                                                                           *
CC*    REMARKS                                                                *
CC*        METHOD IS A INDEX BUBBLE SORT.                                     *
CC*                                                                           *
CC*    PROGRAMMER                                                             *
CC*        G. GAIDASZ                                                         *
CC*        CALSPAN                                                            *
CC*        AUG 1975                                                           *
CC*                                                                           *
CC*******************************************************************************
```

SRTTDB


START
GENERATE LIST OF INDICES
NO. OF POINTS
≤1
END
>1
INDEX BUBBLE SORT IN DESCENDING ORDER ON PRIORITY
END

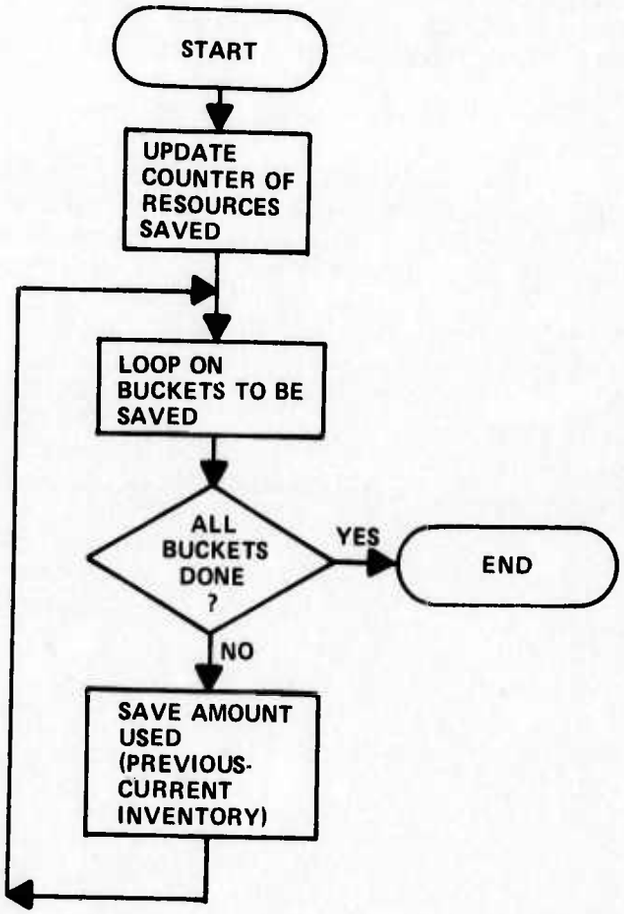
```
CC********************************* SVRUS1 ***********************************
CC*                                                                           *
CC*   PURPOSE                                                                 *
CC*       SAVE PERTINENT INVENTORY OF THE RESOURCE BEING PROCESSED.           *
CC*                                                                           *
CC*   CALLING SEQUENCE                                                        *
CC*                                                                           *
CC*       CALL SVRUS1                                                         *
CC*                                                                           *
CC*   DESCRIPTION OF PARAMETERS.                                              *
CC*                                                                           *
CC*       * IMPLICIT INPUT VIA COMMON *                                       *
CC*                                                                           *
CC*       INDX1           POINTER TO ELEMENT IN ARRAY INVRES THAT             *
CC*                       CORRESPONDS TO THE FIRST BUCKET THAT MAY            *
CC*                       BE USED BY THE CURRENT CLASS.                       *
CC*       INDX2           POINTER TO ELEMENT IN ARRAY INVRES THAT             *
CC*                       CORRESPONDS TO THE LAST BUCKET THAT MAY             *
CC*                       BE USED BY THE CURRENT CLASS.                       *
CC*       NSAVE           NUMBER OF RESOURCE INVENTORIES SAVED UP             *
CC*                       TO NOW.                                             *
CC*   ISAVE               TOTAL NUMBER OF BUCKETS SAVED UP TO NOW.            *
CC*       * IMPLICIT OUTPUT VIA COMMON *                                      *
CC*                                                                           *
CC*       IADI1()         SAVED VALUE OF INDX1                                *
CC*       IADI2()         SAVED VALUE OF INDX2                                *
CC*       IADS1()         POINTER TO FIRST ELEMENT SAVED IN IAUSED.           *
CC*       IAUSED()        SAVED RESOURCE INVENTORIES.                         *
CC*                                                                           *
CC*   REMARKS                                                                 *
CC*       THIS ROUTINE SAVES THE PERTINENT RESOURCE INVENTORY BEFORE          *
CC*       THE CURRENT UPDATES ARE MADE. SVRUS2 IS LATER CALLED IF             *
CC*       NECESSARY TO CALCULATE THE ACTUAL CONSUMPTION.                      *
CC*                                                                           *
CC*   PROGRAMMER                                                              *
CC*       G.GAIDASZ                                                           *
CC*       AUG 1975                                                            *
CC*       CALSPAN                                                             *
CC*                                                                           *
CC*****************************************************************************
```

SVRUS1


START
UPDATE POINTER (TENTATIVELY)
SAVE ADDRESSES IN INVENTORY ARRAY AND STORAGE ARRAY
LOOP ON BUCKETS TO BE SAVED
ARE ALL BUCKETS DONE ?
YES
END
NO
SAVE CURRENT INVENTORY

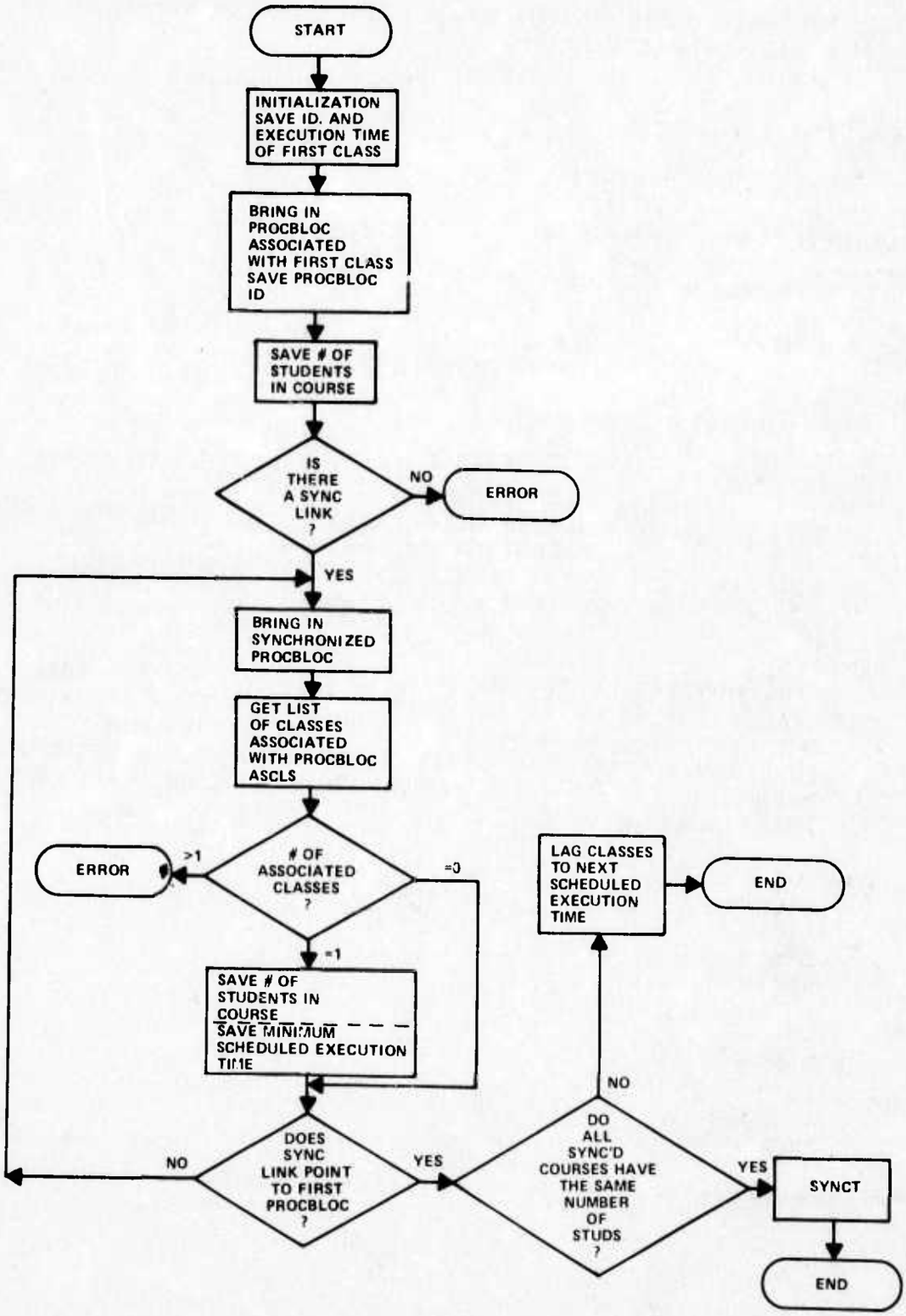
```
CC********************************* SVRUS2 *********************************
CC*                                                                         *
CC*   PURPOSE                                                               *
CC*       CALCULATE ACTUAL USAGE OF CURRENT RESOURCE BY SUBTRACTING          *
CC*       CURRENT INVENTORY FROM PREVIOUS INVENTORY.                        *
CC*                                                                         *
CC*   CALLING SEQUENCE                                                      *
CC*                                                                         *
CC*       CALL SVRUS2                                                       *
CC*                                                                         *
CC*   DESCRIPTION OF PARAMETERS.                                            *
CC*       SAME AS IN SVRUS1, EXCEPT THAT IAUSED() IS UPDATED TO             *
CC*       INDICATE CONSUMPTION BY SUBTRACTING THE CURRENT INVENTORY         *
CC*       FROM IT                                                           *
CC*                                                                         *
CC*   REMARKS                                                               *
CC*       SVRUS2 IS ONLY INVOKED FOR SATISFIED PRIMARY COMPOSITE            *
CC*       RESOURCES AND THEIR ASSOCIATED SECONDARIES. RESTORATION           *
CC*       OF OTHER RESOURCES (IN CASE OF RESOURCE ALLOCATION                *
CC*       FAILURE) IS HANDLED BY NOT CALLING UPDATE.                        *
CC*                                                                         *
CC*   PROGRAMMER                                                            *
CC*       G. GAIDASZ                                                        *
CC*       CALSPAN                                                           *
CC*       AUG 1975                                                          *
CC*                                                                         *
CC***************************************************************************
```

SVRUS2

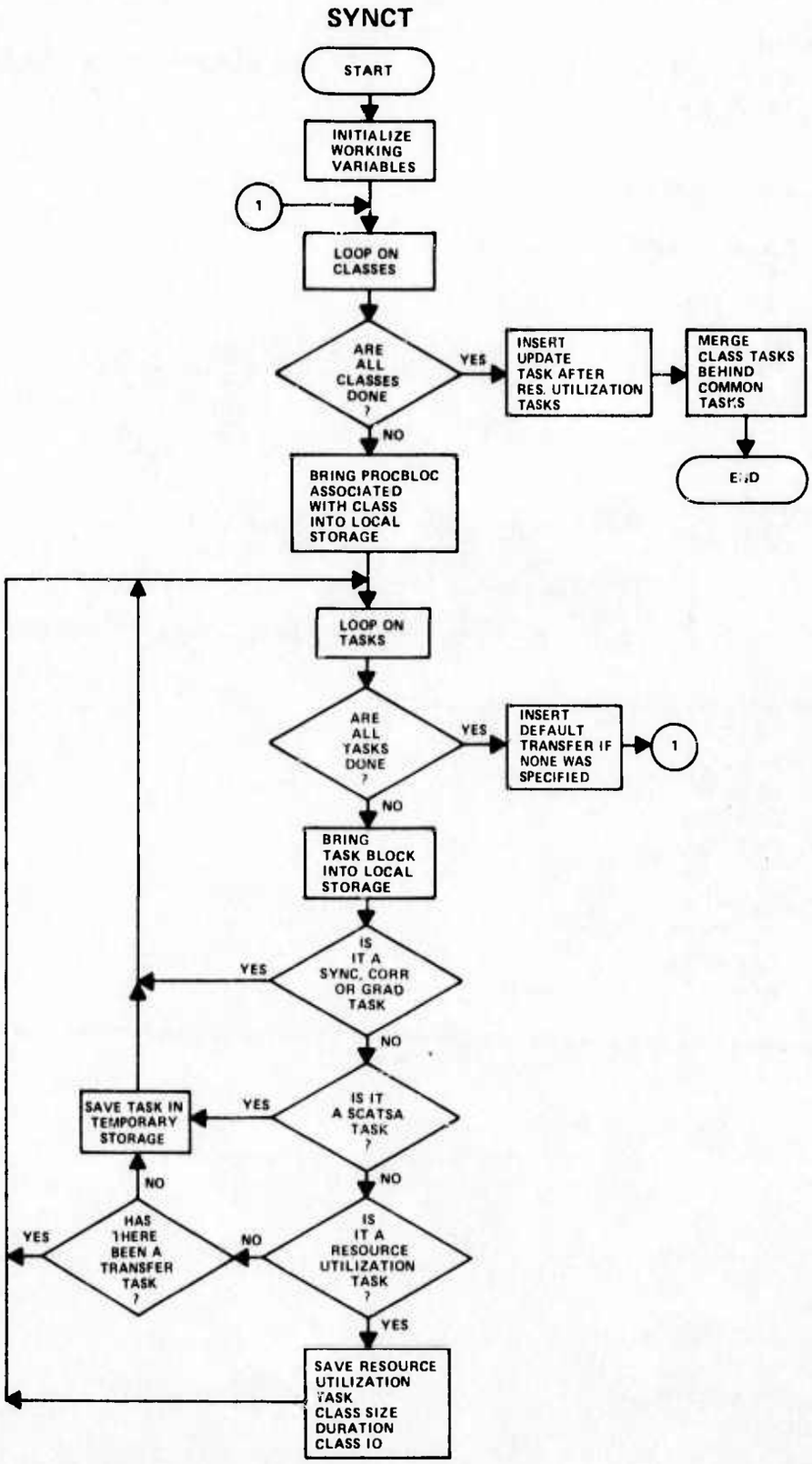

START
UPDATE COUNTER OF RESOURCES SAVED
LOOP ON BUCKETS TO BE SAVED
ALL BUCKETS DONE ?
YES
END
NO
SAVE AMOUNT USED (PREVIOUS-CURRENT INVENTORY)

```
CC********************************* SYNC ************************************
CC*                                                                         *
CC*    PURPOSE                                                              *
CC*        TO FORCE SIMULTANEOUS PROCESSING (SYNCHRONIZATION) OF            *
CC*        A LIST OF PROCBLOCS.                                             *
CC*                                                                         *
CC*                                                                         *
CC*    CALLING SEQUENCE                                                     *
CC*                                                                         *
CC*        CALL SYNC(MINTME)                                                *
CC*                                                                         *
CC*    DESCRIPTION OF PARAMETERS                                            *
CC*                                                                         *
CC*        * OUTPUT *                                                       *
CC*                                                                         *
CC*        MINTME          TIME TO WHICH CLASSES WILL BE LAGGED IF          *
CC*                        SYNCHRONIZATION IS IMPOSSIBLE AT THIS TIME.      *
CC*                                                                         *
CC*        * IMPLICIT OUTPUT *                                              *
CC*                                                                         *
CC*        IFAIL           IS SET TO 1 IF SYNCHRONIZATION CANNOT BE         *
CC*                        ACCOMPLISHED.                                    *
CC*        NOCLS           NUMBER OF CLASSES TO BE SYNCHRONIZED IN          *
CC*                        EXECUTION OR LAGGED.                             *
CC*        INDXC()         LIST OF CLASSES TO BE SYNCHRONIZED IN            *
CC*                        EXECUTION OR LAGGED.                             *
CC*                                                                         *
CC*    REMARKS                                                              *
CC*        SYNCHRONIZATION REQUIRES THAT CLASSES WITH THE SAME              *
CC*        GRADUATION ID BE IN THE CORRECT PROCBLOC(S) OF EACH OF           *
CC*        THE COURSES LINKED BY THE SYNCHRONIZATION LOOP.                  *
CC*        IF CLASSES HAVE BEEN SPLIT THEN THE NUMBER OF STUDENTS           *
CC*        (WITH THE SAME GRADUATION ID) IN EACH COURSE (SUMMED OVER        *
CC*        THE TRACKS) MUST AGREE.                                          *
CC*                                                                         *
CC*    SUBROUTINES USED                                                     *
CC*        PBLOCK                                                           *
CC*        ASCLS                                                            *
CC*        SYNCT                                                            *
CC*        BLOCK                                                            *
CC*        CLSDMP                                                           *
CC*                                                                         *
CC*    PROGRAMMER                                                           *
CC*        GEORGE GAIDASZ                                                   *
CC*        CALSPAN                                                          *
CC*        MAY 1975                                                         *
CC*                                                                         *
CC*************************************************************************
```

SYNC

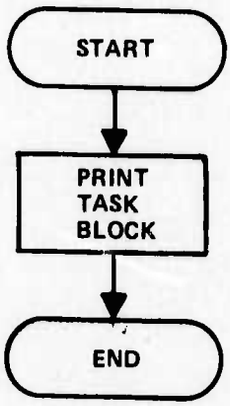

START
INITIALIZATION SAVE ID. AND EXECUTION TIME OF FIRST CLASS
BRING IN PROCBLOC ASSOCIATED WITH FIRST CLASS SAVE PROCBLOC ID
SAVE # OF STUDENTS IN COURSE
IS THERE A SYNC LINK ?
NO
ERROR
YES
BRING IN SYNCHRONIZED PROCBLOC
GET LIST OF CLASSES ASSOCIATED WITH PROCBLOC ASCLS
OF ASSOCIATED CLASSES ?
>1
ERROR
=0
=1
SAVE # OF STUDENTS IN COURSE
SAVE MINIMUM SCHEDULED EXECUTION TIME
DOES SYNC LINK POINT TO FIRST PROCBLOC ?
NO
YES
DO ALL SYNC'D COURSES HAVE THE SAME NUMBER OF STUDS ?
NO
YES
LAG CLASSES TO NEXT SCHEDULED EXECUTION TIME
END
SYNCT
END

```
CC********************************* SYNCT ***********************************
CC*                                                                          *
CC*    PURPOSE                                                               *
CC*        TO PLACE ALL TASKS THAT MUST BE PERFORMED SIMULTANEOUSLY          *
CC*        IN A LIST.                                                        *
CC*                                                                          *
CC*                                                                          *
CC*    CALLING SEQUENCE                                                      *
CC*                                                                          *
CC*        CALL SYNCT(NOCLS,INDXC)                                           *
CC*                                                                          *
CC*    DESCRIPTION OF PARAMETERS                                             *
CC*                                                                          *
CC*        NOCLS           NUMBER OF CLASSES IN INDXC.                       *
CC*        INDXC()         LIST OF POINTERS TO CLASSES IN THE                *
CC*                        CURRENT CLASSES ARRAYS, WHOSE TASKS ARE           *
CC*                        TO BE SYNCHRONIZED.                               *
CC*                                                                          *
CC*    REMARKS                                                               *
CC*        THE TASKS ARE ARRANGED IN THE FOLLOWING ORDER:                    *
CC*             1. RESOURCE UTILIZATION TASKS.                               *
CC*             2. UPDATE TASK. (PROVIDED BY PROGRAM)                        *
CC*             3. OTHER TASKS.                                              *
CC*             4. TRANSFER TASKS (PROVIDED BY PROGRAM).                     *
CC*                                                                          *
CC*    SUBROUTINES USED                                                      *
CC*        PLIST                                                             *
CC*        PBLOCK                                                            *
CC*        BLOCK                                                             *
CC*        GETCLS                                                            *
CC*        TBLOCK                                                            *
CC*                                                                          *
CC*    PROGRAMMER                                                            *
CC*        G. GAIDASZ                                                        *
CC*        CALSPAN                                                           *
CC*        MAY 1975                                                          *
CC*                                                                          *
CC****************************************************************************
```


SYNCT
START
INITIALIZE WORKING VARIABLES
1
LOOP ON CLASSES
ARE ALL CLASSES DONE ?
YES
INSERT UPDATE TASK AFTER RES. UTILIZATION TASKS
MERGE CLASS TASKS BEHIND COMMON TASKS
END
NO
BRING PROCBLOC ASSOCIATED WITH CLASS INTO LOCAL STORAGE
LOOP ON TASKS
ARE ALL TASKS DONE ?
YES
INSERT DEFAULT TRANSFER IF NONE WAS SPECIFIED
1
NO
BRING TASK BLOCK INTO LOCAL STORAGE
IS IT A SYNC, CORR OR GRAD TASK
YES
NO
IS IT A SCATSA TASK ?
YES
SAVE TASK IN TEMPORARY STORAGE
NO
HAS THERE BEEN A TRANSFER TASK ?
YES
NO
IS IT A RESOURCE UTILIZATION TASK ?
NO
YES
SAVE RESOURCE UTILIZATION TASK
CLASS SIZE
DURATION
CLASS IO

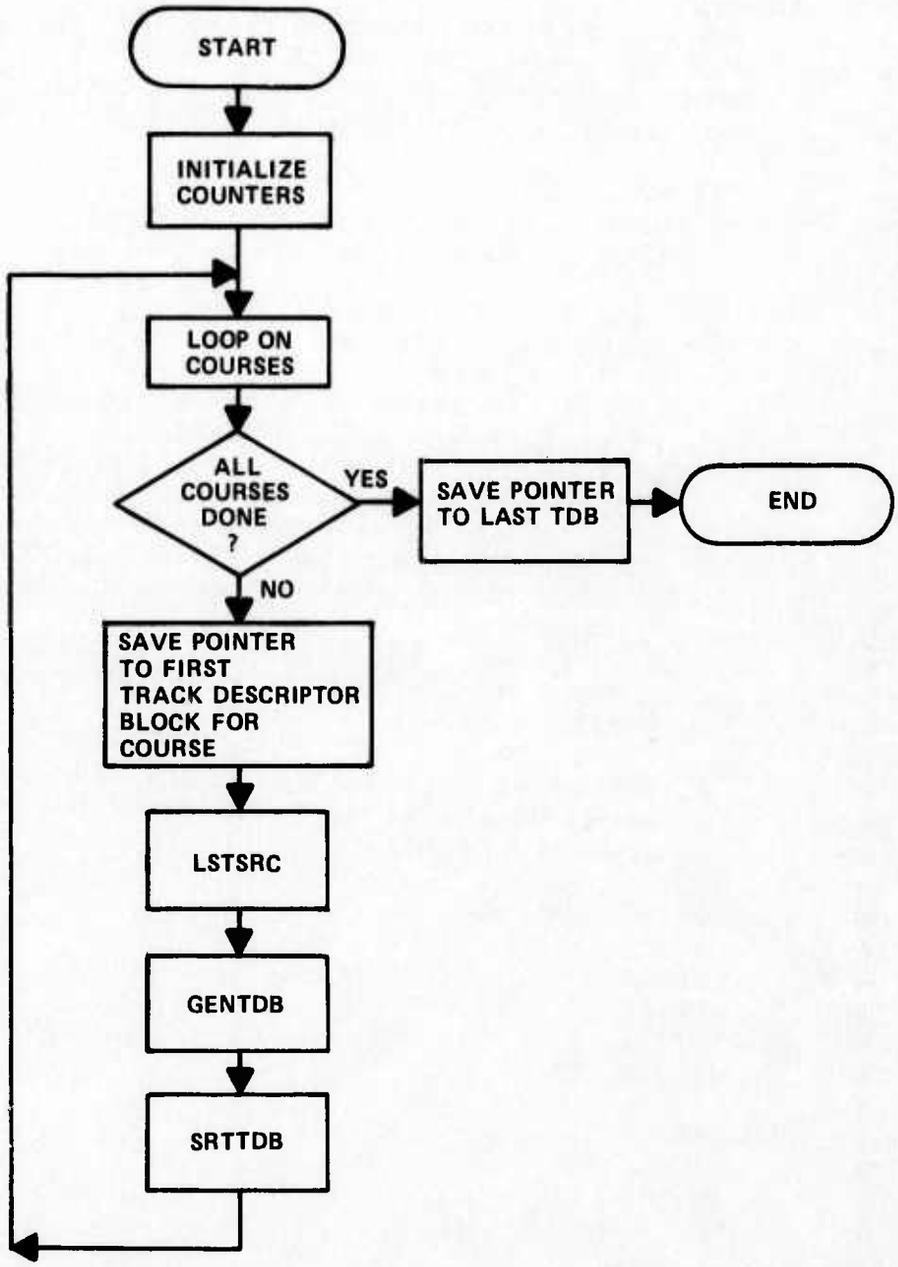
```
CC********************************* TBLOCK ***********************************
CC*                                                                           *
CC*    PURPOSE                                                                *
CC*        TO PRINT A TASK BLOCK                                              *
CC*                                                                           *
CC*                                                                           *
CC*    CALLING SEQUENCE                                                       *
CC*                                                                           *
CC*        CALL TBLOCK(IADRS,IBLOCK)                                          *
CC*                                                                           *
CC*    DESCRIPTION OF PARAMETERS                                              *
CC*                                                                           *
CC*        IADRS           ADRESS OF TASK BLOCK.                              *
CC*        IBLOCK          FIRST WORD OF TASK BLOCK.                          *
CC*                                                                           *
CC*    PROGRAMMER                                                             *
CC*        G. GAIDASZ                                                         *
CC*        CALSPAN                                                            *
CC*        MAY 1975                                                           *
CC*                                                                           *
CC*************************************************************************** 
```

TBLOCK



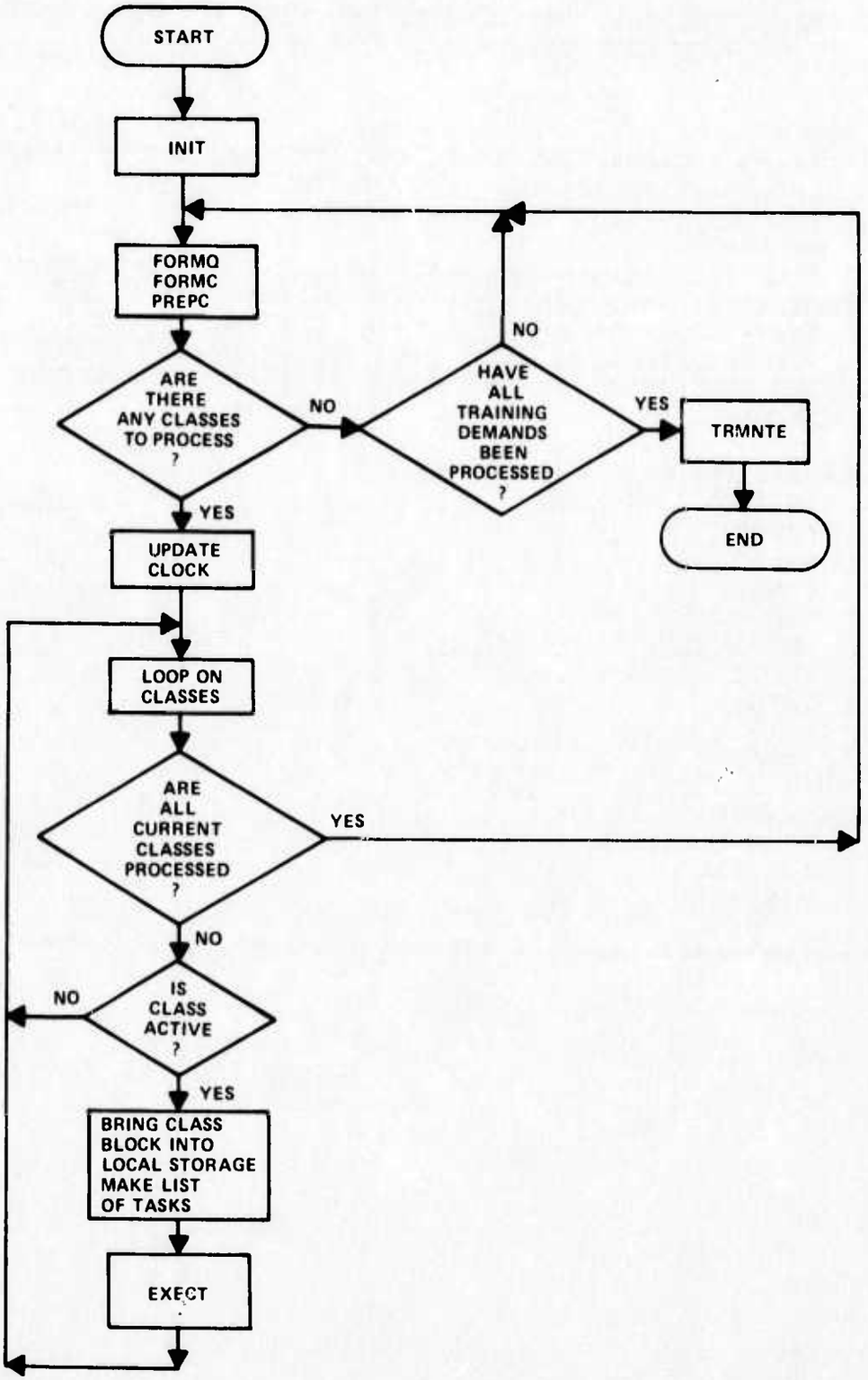
```
CC********************************* TRACKD ***********************************
CC*                                                                           *
CC*    PURPOSE                                                                *
CC*        TO CREATE THE TRACK DESCRIPTOR BLOCKS FOR EACH COURSE.             *
CC*                                                                           *
CC*    CALLING SEQUENCE                                                       *
CC*                                                                           *
CC*        CALL TRACKD                                                        *
CC*                                                                           *
CC*    REMARKS                                                                *
CC*        THE CREATION OF THE TRACK DESCRIPTOR BLOCKS, WHICH ARE             *
CC*        USED BY SUBROUTINE SCATSA TO CHOOSE TRAINEE SOURCES                *
CC*        ACCORDING TO THE PRIORITY AND PROPORTIONS SPECIFIED IN             *
CC*        THE COURSE DESCRIPTION, IS ACCOMPLISHED IN THREE STEPS.            *
CC*                                                                           *
CC*         1. A RIGHT TO LEFT SCAN IS DONE OF THE PROCBLOCS IN               *
CC*            EACH COURSE.  THE RESULT OF THIS OPERATION IS A                *
CC*            LIST OF SOURCES FOR EACH COURSE.                               *
CC*                                                                           *
CC*         2. EACH SOURCE PRODUCED BY STEP 1 SERVES AS A STARTING            *
CC*            POINT FOR A LEFT TO RIGHT SCAN OF THE TRACK DEFINED            *
CC*            BY THE SOURCE.                                                 *
CC*            AS THE PROCBLOCS OF A TRACK ARE PROCESSED A COUNT              *
CC*            IS KEPT OF THE TOTAL DURATION OF THE TRACK.                    *
CC*            PROPORTIONS SPECIFIED ALONG THE TRACK ARE MULTIPLIED           *
CC*            TOGETHER TO PRODUCE THE RESULTING PROPORTION AT EACH           *
CC*            NODE (PROCBLOC WITH MORE THAN ONE LEFT BRANCH). THE            *
CC*            PRIORITY OF EACH TRACK IS CALCULATED BY ADDING THE             *
CC*            CURRENT PRIORITY TO THE PREVIOUS PRIORITY DIVIDED BY           *
CC*            A HUNDRED.                                                     *
CC*            A TRACK DESCRIPTOR BLOCK IS CREATED FOR EACH NODE              *
CC*            ALONG A TRACK. EACH NODE POINTS TO THE NODE THAT               *
CC*            PRECEDES IT.                                                   *
CC*                                                                           *
CC*         3. THE FINAL STEP (SRTTDB) IS A LINK SORT IN DECREASING           *
CC*            ORDER BY PRIORITY OF THE TRACK DESCRIPTOR BLOCKS               *
CC*            FOR EACH COURSE.                                               *
CC*                                                                           *
CC*    SUBROUTINES CALLED                                                     *
CC*                                                                           *
CC*        LSTSRC                                                             *
CC*        GENTDB                                                             *
CC*        SRTTDB                                                             *
CC*        WRLTDB                                                             *
CC*                                                                           *
CC*    PROGRAMMER                                                             *
CC*        G. GAIDASZ                                                         *
CC*        CALSPAN                                                            *
CC*        AUG 1975                                                           *
CC*                                                                           *
CC***************************************************************************
```

TRACKD


START
INITIALIZE COUNTERS
LOOP ON COURSES
ALL COURSES DONE ?
YES
SAVE POINTER TO LAST TDB
END
NO
SAVE POINTER TO FIRST TRACK DESCRIPTOR BLOCK FOR COURSE
LSTSRC
GENTDB
SRTTDB

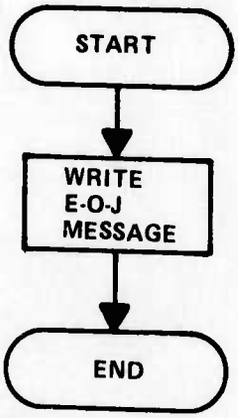
```
CC********************************* TRAM3 ***********************************
CC*
CC*   PURPOSE                                                                *
CC*        PROVIDE OVER-ALL CONTROL LOGIC FOR THE CALCULATION OF             *
CC*        RESOURCES USED BY 'CLASSES' OF STUDENTS GOING THROUGH             *
CC*        USER DEFINED COURSES.                                             *
CC*                                                                          *
CC*                                                                          *
CC*   REMARKS                                                                *
CC*        TRAM3 PROVIDES THE BASIC CYCLING LOOP OF THE PROGRAM.             *
CC*        AFTER INITIALIZATION IS DONE, THE PROGRAM READS TRAINING          *
CC*        DEMANDS TO CALCULATE THE NUMBER OF TRAINEES THAT SHOULD           *
CC*        BE GRADUATED.                                                     *
CC*        FROM THE TRAINING DEMANDS CLASSES ARE STORED IN MASS              *
CC*        STORAGE. SUBROUTINE PREPC IS USED TO SELECT THE CLASSES           *
CC*        THAT SHOULD BE ACTIVE FOR THE CURRENT SIMULATION TIME.            *
CC*        THE PROGRAM THEN LOOPS OVER THESE ACTIVE CLASSES,SELECTING        *
CC*        AND EXECUTING THE TASKS SPECIFIED BY THE PERTINENT                *
CC*        PROCBLOCS.                                                        *
CC*                                                                          *
CC*   SUBROUTINES USED                                                       *
CC*        INIT                                                              *
CC*        FORMQ                                                             *
CC*        PREPC                                                             *
CC*        TRMNTE                                                            *
CC*        CLOCK                                                             *
CC*        CBLOCK                                                            *
CC*        EXECT                                                             *
CC*        GETCLS                                                            *
CC*        LSTASK                                                            *
CC*        FORMC                                                             *
CC*                                                                          *
CC*   PROGRAMMER                                                             *
CC*        GEORGE GAIDASZ                                                    *
CC*        CALSPAN                                                           *
CC*        MAY 1975                                                          *
CC*                                                                          *
CC****************************************************************************
```

TRAM3


START
INIT
FORMQ
FORMC
PREPC
ARE THERE ANY CLASSES TO PROCESS ?
NO
HAVE ALL TRAINING DEMANDS BEEN PROCESSED ?
NO
YES
TRMNTE
END
YES
UPDATE CLOCK
LOOP ON CLASSES
ARE ALL CURRENT CLASSES PROCESSED ?
YES
NO
IS CLASS ACTIVE ?
NO
YES
BRING CLASS BLOCK INTO LOCAL STORAGE MAKE LIST OF TASKS
EXECT

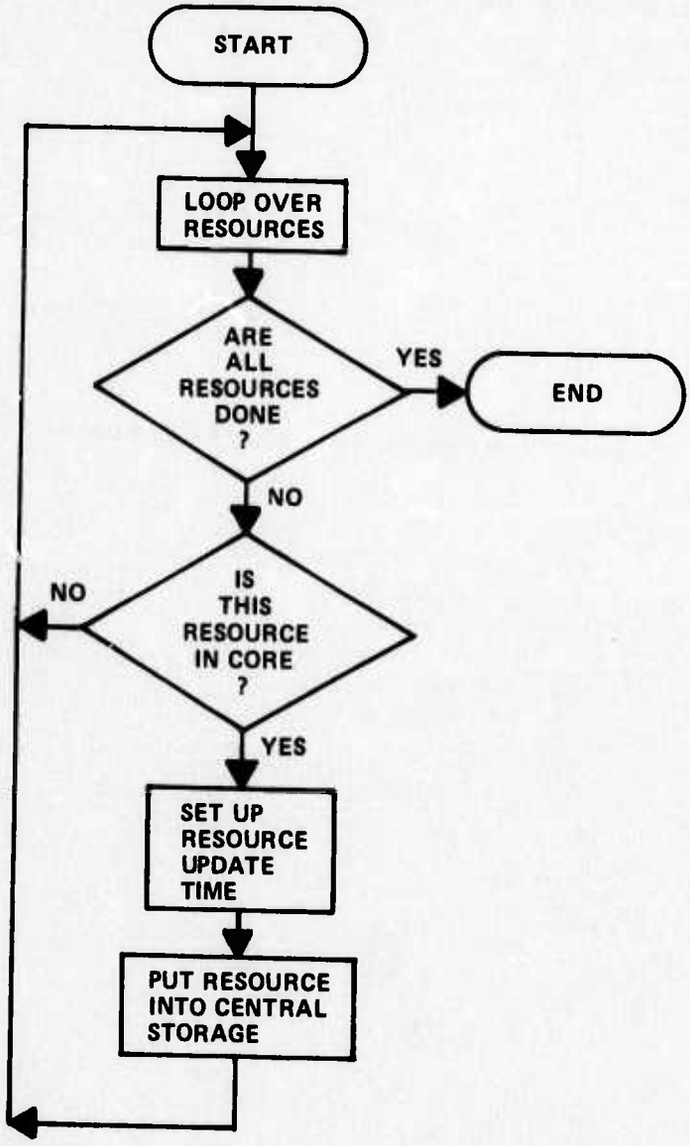
```
CC********************************* TRMNTE ************************************
CC*                                                                           *
CC*    PURPOSE                                                                *
CC*        INDICATE TERMINATION OF TRAM-3 EXECUTION.                          *
CC*                                                                           *
CC*    CALLING SEQUENCE                                                       *
CC*                                                                           *
CC*        CALL TRMNTE                                                        *
CC*                                                                           *
CC*    PROGRAMMER                                                             *
CC*        G.GAIDASZ                                                          *
CC*        CALSPAN                                                            *
CC*        MAY 1975                                                           *
CC*                                                                           *
CC*****************************************************************************
```

TRMNTE

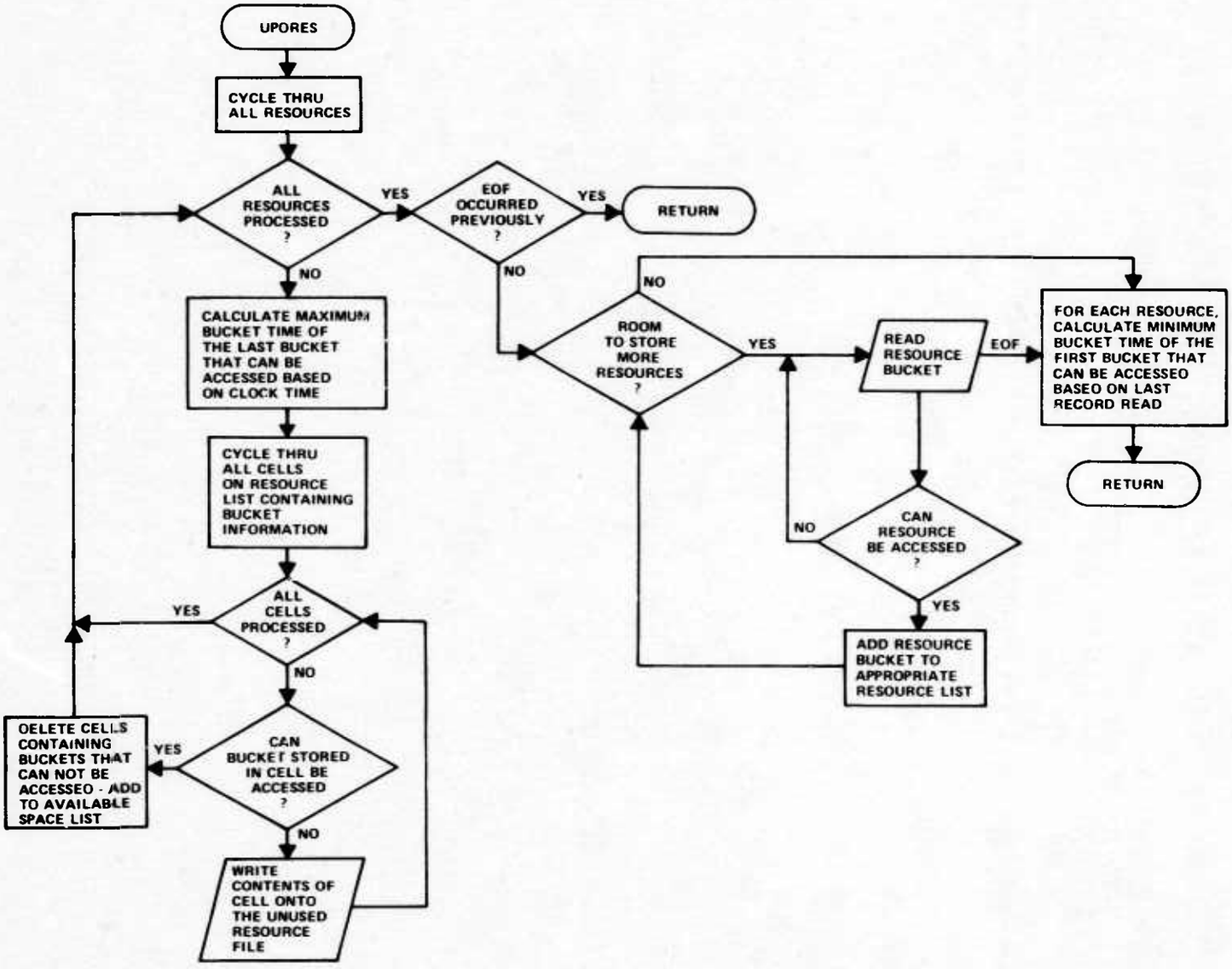


```
CC********************************* UPDATE ***********************************
CC*                                                                           *
CC*   PURPOSE                                                                 *
CC*       UPDATE RESOURCE INVENTORIES TO REFLECT THE CONSUMPTION               *
CC*       BY THE CURRENT TASK OR GROUP OF SYNCHRONIZED TASKS.                 *
CC*                                                                           *
CC*   CALLING SEQUENCE                                                        *
CC*                                                                           *
CC*       CALL UPDATE                                                         *
CC*                                                                           *
CC*   SUBROUTINES USED                                                        *
CC*       PUTRES                                                              *
CC*                                                                           *
CC*   PROGRAMMER                                                              *
CC*       G. GAIDASZ                                                          *
CC*       CALSPAN                                                             *
CC*       AUG 1975                                                            *
CC*                                                                           *
CC*************************************************************************
```

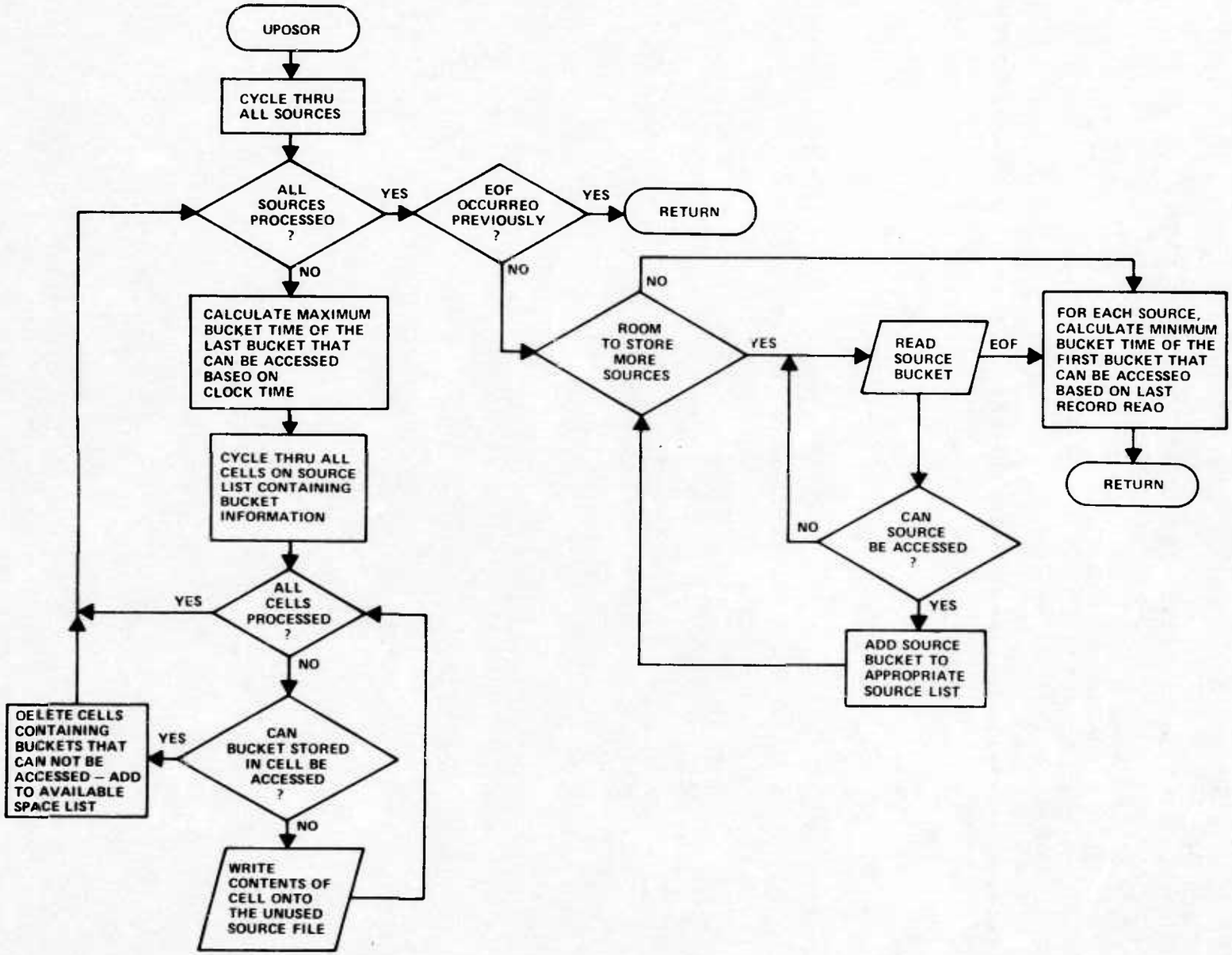
UPDATE


START
LOOP OVER RESOURCES
ARE ALL RESOURCES DONE ?
YES
END
NO
IS THIS RESOURCE IN CORE ?
NO
YES
SET UP RESOURCE UPDATE TIME
PUT RESOURCE INTO CENTRAL STORAGE

```
C********************************  UPDRES  ********************************
C*                                                                        *
C*                            SUBROUTINE UPDRES                           *
C*                                                                        *
C*     PURPOSE                                                            *
C*         UPDATES RESOURCE LISTS WHEN CLOCK TIME HAS CHANGED             *
C*                                                                        *
C*     AUTHOR/PROGRAMMER                                                  *
C*         JOHN R. MENIG                                                  *
C*         CALSPAN CORPORATION                                            *
C*         28 APRIL 1975                                                  *
C*                                                                        *
C************************************************************************
```

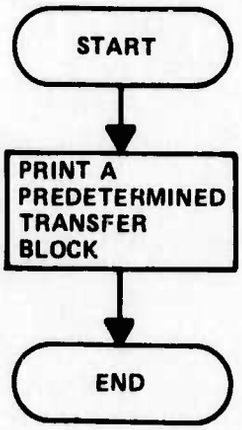

UPORES
CYCLE THRU ALL RESOURCES
ALL RESOURCES PROCESSED ?
YES
EOF OCCURRED PREVIOUSLY ?
YES
RETURN
NO
NO
CALCULATE MAXIMUM BUCKET TIME OF THE LAST BUCKET THAT CAN BE ACCESSED BASED ON CLOCK TIME
ROOM TO STORE MORE RESOURCES ?
YES
READ RESOURCE BUCKET
EOF
FOR EACH RESOURCE, CALCULATE MINIMUM BUCKET TIME OF THE FIRST BUCKET THAT CAN BE ACCESSED BASED ON LAST RECORD READ
RETURN
CYCLE THRU ALL CELLS ON RESOURCE LIST CONTAINING BUCKET INFORMATION
CAN RESOURCE BE ACCESSED ?
NO
YES
ALL CELLS PROCESSED ?
YES
NO
ADD RESOURCE BUCKET TO APPROPRIATE RESOURCE LIST
DELETE CELLS CONTAINING BUCKETS THAT CAN NOT BE ACCESSED - ADD TO AVAILABLE SPACE LIST
YES
CAN BUCKET STORED IN CELL BE ACCESSED ?
NO
WRITE CONTENTS OF CELL ONTO THE UNUSED RESOURCE FILE

```
C********************************  UPDSOR  ********************************
C*                                                                        *
C*                            SUBROUTINE UPDSOR                           *
C*                                                                        *
C*     PURPOSE                                                            *
C*         UPDATES SURCE LISTS WHEN CLOCK TIME HAS CHANGED                *
C*                                                                        *
C*     AUTHOR/PROGRAMMER                                                  *
C*         JOHN R. MENIG                                                  *
C*         CALSPAN CORPORATION                                            *
C*         28 APRIL 1975                                                  *
C*                                                                        *
C************************************************************************
```

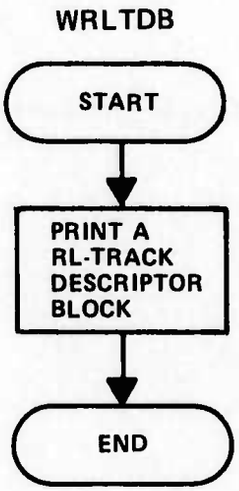

UPOSOR
CYCLE THRU ALL SOURCES
ALL SOURCES PROCESSEO ?
YES
EOF OCCURREO PREVIOUSLY ?
YES
RETURN
NO
NO
CALCULATE MAXIMUM BUCKET TIME OF THE LAST BUCKET THAT CAN BE ACCESSED BASEO ON CLOCK TIME
ROOM TO STORE MORE SOURCES
YES
READ SOURCE BUCKET
EOF
FOR EACH SOURCE, CALCULATE MINIMUM BUCKET TIME OF THE FIRST BUCKET THAT CAN BE ACCESSEO BASED ON LAST RECORD REAO
RETURN
CYCLE THRU ALL CELLS ON SOURCE LIST CONTAINING BUCKET INFORMATION
NO
CAN SOURCE BE ACCESSED ?
YES
ADD SOURCE BUCKET TO APPROPRIATE SOURCE LIST
ALL CELLS PROCESSED ?
YES
NO
OELETE CELLS CONTAINING BUCKETS THAT CAN NOT BE ACCESSED – ADD TO AVAILABLE SPACE LIST
YES
CAN BUCKET STORED IN CELL BE ACCESSED ?
NO
WRITE CONTENTS OF CELL ONTO THE UNUSED SOURCE FILE

```
CC********************************* WPTB ***********************************
CC*                                                                         *
CC*    PURPOSE                                                              *
CC*        TO PRINT A PREDETERMINED TRANSFER BLOCK.                         *
CC*                                                                         *
CC*                                                                         *
CC*    CALLING SEQUENCE                                                     *
CC*                                                                         *
CC*        CALL WPTB(IC,IP,N,NXT)                                           *
CC*                                                                         *
CC*    DESCRIPTION OF PARAMETERS                                            *
CC*                                                                         *
CC*        IC              ADRESS OF CLASS ASSOCIATED WITH PTB.             *
CC*        IP              ADRESS OF PROCBLOC ASSOCIATED WITH PTB.          *
CC*        N()             NUMBER OF STUDENTS TO BE SENT ALONG EACH         *
CC*                        OF THE 5 BRANCHES OF THE PTB.                    *
CC*        NXT()           ADRESSES OF THE NEXT PTBS ALONG EACH OF          *
CC*                        THE 5 BRANCHES.                                  *
CC*                                                                         *
CC*    PROGRAMMER                                                           *
CC*        G. GAIDASZ                                                       *
CC*        CALSPAN                                                          *
CC*        MAY 1975                                                         *
CC*                                                                         *
CC***************************************************************************
```

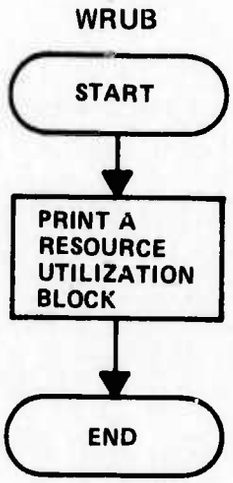
WPTB



```
CC********************************* WRLTDB ***********************************
CC*
CC*    PURPOSE                                                                 *
CC*        TO PRINT A RL-TRACK DESCRIPTOR BLOCK.                               *
CC*                                                                            *
CC*                                                                            *
CC*    CALLING SEQUENCE                                                        *
CC*                                                                            *
CC*        CALL WRLTDB(I)                                                      *
CC*                                                                            *
CC*    DESCRIPTION OF PARAMETERS                                               *
CC*                                                                            *
CC*        I               INDEX OF TRACK DESCRIPTOR BLOCK TO BE PRINTED       *
CC*                                                                            *
CC*    PROGRAMMER                                                              *
CC*        G. GAIDASZ                                                          *
CC*        CALSPAN                                                             *
CC*        MAY 1975                                                            *
CC*                                                                            *
CC*******************************************************************************
```

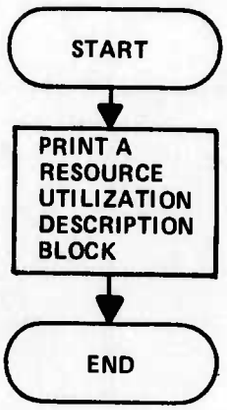

WRLTDB
START
PRINT A
RL-TRACK
DESCRIPTOR
BLOCK
END

```
CC********************************* WRUB ************************************
CC*                                                                         *
CC*   PURPOSE                                                               *
CC*       TO PRINT A RESOURCE UTILIZATION BLOCK                             *
CC*                                                                         *
CC*                                                                         *
CC*   CALLING SEQUENCE                                                      *
CC*                                                                         *
CC*       CALL WRUB(IADRS,IBLOCK)                                           *
CC*                                                                         *
CC*   DESCRIPTION OF PARAMETERS                                             *
CC*                                                                         *
CC*       IADRS           ADRESS OF RUB.                                    *
CC*       IBLOCK()        FIRST WORD OF RUB.                                *
CC*                                                                         *
CC*   PROGRAMMER                                                            *
CC*       G. GAIDASZ                                                        *
CC*       CALSPAN                                                           *
CC*       MAY 1975                                                          *
CC*                                                                         *
CC***************************************************************************
```


WRUB
START
PRINT A RESOURCE UTILIZATION BLOCK
END

```
CC********************************* WRUDB ***********************************
CC*                                                                           *
CC*    PURPOSE                                                                *
CC*        TO PRINT A RESOURCE UTILIZATION DESCRIPTION BLOCK.                 *
CC*                                                                           *
CC*                                                                           *
CC*    CALLING SEQUENCE                                                       *
CC*                                                                           *
CC*        CALL WRUDB(IADRS,IBLOCK)                                           *
CC*                                                                           *
CC*    DESCRIPTION OF PARAMETERS                                              *
CC*                                                                           *
CC*        IADRS           ADRESS OF RUDB.                                    *
CC*        IBLOCK          FIRST WORD OF RUDB.                                *
CC*                                                                           *
CC*                                                                           *
CC*    PROGRAMMER                                                             *
CC*        G. GAIDASZ                                                         *
CC*        CALSPAN                                                            *
CC*        MAY 1975                                                           *
CC*                                                                           *
CC*****************************************************************************
```

WRUDB



3.5 Cross Reference Table

In the table on the following pages, the column headings show the subroutine names that do the calling, and the row heading give the names of the subroutines called.

SUBROUTINE CROSS REFERENCE SUMMARY C********** TRAM3 **********

ROUTINE OR ENTRY — USAGE SUMMARY

	MAIN	SRTCTP	SRTTDB	SVRUS1	SVRUS2	SYNC	SYNCT	TBLOCK	TRACKD	TRMNTE	UPDATE	WPTB
ADDTDQ												
ALLOC												
ALLOCA												
ALLOCD												
ASCLS						X						
ASCLSS												
CALQ												
CBLOCK	X											
CLASCG												
CLSDMP						X						
CORR												
DETLAG												
DTRNSF												
ERROR	X			X		X		X				
EXECT	X											
FORMC	X											
FORMQ	X											
FRETDB												
FRMPTB												
GENTDB									X			
GETCLS	X						X					
GETPTB												
GETTDB												
GRADF												
INIT	X											
INITR												
LAG												

SUBROUTINE CROSS REFERENCE SUMMARY C********** TRAM3 **********

ROUTINE OR ENTRY	USAGE SUMMARY												
	WRLTDB	WRUB	WRUDB	ADDTDQ	ALLOC	ALLOCA	ALLOCD	ASCLS	ASCLSS	CALQ	CBLOCK	CLASCG	
ADDTDQ													
ALLOC						x	X						
ALLOCA													
ALLOCD													
ASCLS													
ASCLSS													
CALQ													
CBLOCK													
CLASCG													
CLSDMP													
CORR													
DETLAG													
DTRNSF													
ERROR		x	x	x	x	x	x			x			
EXECT													
FORMC													
FORMQ													
FRETDB													
FRMPTB													
GENTDB													
GETCLS													
GETPTB													
GETTDB													
GRADF													
INIT													
INITR													
LAG													

SUBROUTINE CROSS REFERENCE SUMMARY C********** TRAM3 **********

ROUTINE OR ENTRY	USAGE SUMMARY											
	CLSDMP	CORR	DETLAG	DTRNSF	ERROR	EXECT	FORMC	FORMQ	FRETDB	FRMPTB	GENTDB	GETCLS
ADDTDQ								X				
ALLOC												
ALLOCA												
ALLOCD												
ASCLS		X										
ASCLSS		X										
CALQ												
CBLOCK				X		X						
CLASCG							X					
CLSDMP		X										
CORR						X						
DETLAG												
DTRNSF						X						
ERROR		X	X	X		X	X			X	X	
EXECT												
FORMC												
FORMQ												
FRETDB							X					
FRMPTB												
GENTDB												
GETCLS						X						
GETPTB												
GETTDB							X					
GRADE							X					
INIT												
INITR						X						
LAG						X						

SUBROUTINE CROSS REFERENCE SUMMARY C********** TRAM3 **********

ROUTINE OR ENTRY — USAGE SUMMARY

	GETPTB	GETTDB	GRADF	INITR	LAG	LSTASK	LSTRAK	LSTSRC	MLTCLS	NEGUSE	NEWCLS	PBLOCK
ADDTDQ												
ALLOC												
ALLOCA												
ALLOCD												
ASCLS												
ASCLSS												
CALQ												
CBLOCK						X						
CLASCG												
CLSDMP											X	
CORR												
DETLAG												
DTRNSF												
ERROR						X		X			X	X
EXECT												
FORMC												
FORMQ												
FRETDB												
FRMPTB												
GENTDB												
GETCLS												
GETPTB												
GETTDB												
GRADF												
INIT												
INITR												
LAG												

SUBROUTINE CROSS REFERENCE SUMMARY C********** TRAM3 **********

ROUTINE OR ENTRY — USAGE SUMMARY

	PLIST	PREPC	PTBDMP	PUTCLS	PUTPTB	REMCLS	REMPTB	RESINV	RESUSE	RUSER	SCATSA	SPLIT
ADDTDQ												
ALLOC												
ALLOCA											X	
ALLOCD											X	
ASCLS												
ASCLSS												
CALQ									X			
CBLOCK												X
CLASCG												
CLSDMP		X				X						
CORR												
DETLAG									X			
DTRNSF												
ERROR		X				X	X	X	X	X	X	X
EXECT												
FORMC												
FORMQ												
FRETDB												
FRMPTB											X	
GENTDB												
GETCLS												
GETPTB												
GETTDB												X
GRADF												
INIT												
INITR												
LAG												

SUBROUTINE CROSS REFERENCE SUMMARY C****************************** TRAM3 ******************************

ROUTINE OR ENTRY	USAGE SUMMARY
	INIT
ADDTDQ	
ALLOC	
ALLOCA	
ALLOCD	
ASCLS	
ASCLSS	
CALQ	
CBLOCK	
CLASCG	
CLSDMP	
CORR	
DETLAG	
DTRNSF	
ERROR	X
EXECT	
FORMC	
FORMQ	
FRETDB	
FRMPTB	
GENTDB	
GETCLS	
GETPTB	
GETTDB	
GRADF	
INIT	
INITR	
LAG	

SUBROUTINE CROSS REFERENCE SUMMARY C********** TRAM3 **********

ROUTINE OR ENTRY	USAGE SUMMARY											
	MAIN	SRTCTP	SRTTDB	SVRUS1	SVRUS2	SYNC	SYNCT	TBLOCK	TRACKD	TRMNTE	UPDATE	WPTE
LSTASK	X											
LSTRAK												
LSTSRC									X			
MLTCLS												
NEGUSE												
NEWCLS												
PBLOCK						X	X					
PLIST							X					
PREPC	X											
PTBDMP												
PUTCLS												
PUTPTB												
REMCLS												
RESINV												
RESUSE												
RUSER												
SCATSA												
SPLIT												
SRTCTP												
SRTTDB									X			
SVRUS1												
SVRUS2												
SYNC												
SYNCT						X						
TBLOCK							X					
TRACKD												
TRMNTE	X											

SUBROUTINE CROSS REFERENCE SUMMARY C****************************** TRAM3 **********************************

ROUTINE OR ENTRY	USAGE SUMMARY												
	WRLTDB	WRUB	WRUDB	ADDTDQ	ALLOC	ALLOCA	ALLOCD	ASCLS	ASCLSS	CALQ	CBLOCK	CLASCG
LSTASK												
LSTRAK												
LSTSRC												
MLTCLS												X
NEGUSE												
NEWCLS												
PBLOCK												
PLIST												
PREPC												
PTBDMP												
PUTCLS												
PUTPTB												
REMCLS												
RESINV												
RESUSE												
RUSER												
SCATSA												
SPLIT												
SRTCTP												
SRTTDB												
SVRUS1												
SVRUS2												
SYNC												
SYNCT												
TBLOCK												
TRACKD												
TRMNTE												

SUBROUTINE CROSS REFERENCE SUMMARY C********** TRAM3 **********

ROUTINE OR ENTRY	USAGE SUMMARY											
	CLSDMP	CORR	DETLAG	DTRNSF	ERROR	EXECT	FORMC	FORMQ	FRETDB	FRMPTB	GENTDB	GETCLS
LSTASK												
LSTRAK												
LSTSRC												
MLTCLS												
NEGUSE												
NEWCLS												
PBLOCK		X		X							X	
PLIST						X						
PREPC												
PTBDMP												
PUTCLS				X								
PUTPTB										X		
REMCLS				X								
RESINV												
RESUSE						X						
RUSER												
SCATSA						X						
SPLIT				X								
SRTCTP												
SRTTDB												
SVRUS1												
SVRUS2												
SYNC						X						
SYNCT		X										
TBLOCK						X						
TRACKD												
TRMNTE												

SUBROUTINE CROSS REFERENCE SUMMARY C********** TRAM3 **********

ROUTINE OR ENTRY	USAGE SUMMARY											
	GETPTB	GETTDB	GRADF	INITR	LAG	LSTASK	LSTRAK	LSTSRC	MLTCLS	NEGUSE	NEWCLS	PBLOCK
LSTASK												
LSTRAK												
LSTSRC												
MLTCLS												
NEGUSE												
NEWCLS									X			
PBLOCK						X		X				
PLIST						X						
PREPC												
PTBDMP												
PUTCLS												
PUTPTB												
REMCLS												
RESINV												
RESUSE												
RUSER												
SCATSA												
SPLIT												
SRTCTP												
SRTTDB												
SVRUS1												
SVRUS2												
SYNC												
SYNCT												
TBLOCK						X		X				
TRACKD												
TRMNTE												

SUBROUTINE CROSS REFERENCE SUMMARY C********** TRAM3 **********

ROUTINE OR ENTRY	USAGE SUMMARY											
	PLIST	PREPC	PTBDMP	PUTCLS	PUTPTB	REMCLS	REMPTB	RESINV	RESUSE	RUSER	SCATSA	SPLIT
LSTASK												
LSTRAK											X	
LSTSRC												
MLTCLS												
NEGUSE									X			
NEWCLS												X
PBLOCK												
PLIST												
PREPC												
PTBDMP							X					
PUTCLS											X	
PUTPTB												
REMCLS												X
RESINV									X			
RESUSE												
RUSER									X			
SCATSA												
SPLIT												
SRTCTP		X										
SRTTDB												
SVRUS1									X			
SVRUS2									X			
SYNC												
SYNCT												
TBLOCK									X			
TRACKD												
TRMNTE												

SUBROUTINE CROSS REFERENCE SUMMARY C****************************** TRAM3 ********************************

ROUTINE OR ENTRY	USAGE SUMMARY
	INIT
LSTASK	
LSTRAK	
LSTSRC	
MLTCLS	
NEGUSE	
NEWCLS	
PBLOCK	
PLIST	
PREPC	
PTBDMP	
PUTCLS	
PUTPTB	
REMCLS	
RESINV	
RESUSE	
RUSER	
SCATSA	
SPLIT	
SRTCTP	
SRTTDB	
SVRUS1	
SVRUS2	
SYNC	
SYNCT	
TBLOCK	
TRACKD	X
TRMNTE	

SUBROUTINE CROSS REFERENCE SUMMARY C********** TRAM3 **********

ROUTINE OR ENTRY — USAGE SUMMARY

	MAIN	SRTCTP	SRTTDB	SVRUS1	SVRUS2	SYNC	SYNCT	TBLOCK	TRACKD	TRMNTE	UPDATE	WPTB
UPDATE												
WPTB												
WRLTDB									X			
WRUB												
WRUDB												

SUBROUTINE CROSS REFERENCE SUMMARY C****************************** TRAM3 ******************************

ROUTINE OR ENTRY — USAGE SUMMARY

	WRLTDB	WRUB	WRUDB	ADDTDQ	ALLOC	ALLOCA	ALLOCD	ASCLS	ASCLSS	CALQ	CBLOCK	CLASCG
UPDATE												
WPTB												
WRLTDB												
WRUB												
WRUDB												

SUBROUTINE CROSS REFERENCE SUMMARY C********** TRAM3 **********

ROUTINE OR ENTRY — USAGE SUMMARY

	CLSDMP	CORR	DETLAG	DTRNSF	ERROR	EXECT	FORMC	FORMQ	FRETDB	FRMPTB	GENTDB	GETCLS
UPDATE						X						
WPTB												
WRLTDB												
WRUB												
WRUDB												

SUBROUTINE CROSS REFERENCE SUMMARY C********** TRAM3 **********

ROUTINE OR ENTRY — USAGE SUMMARY

	GETPTB	GETTDB	GRADF	INITR	LAG	LSTASK	LSTRAK	LSTSRC	MLTCLS	NEGUSE	NEWCLS	PBLOCK
UPDATE												
WPTB												
WRLTDB												
WRUB								X				
WRUDB								X				

SUBROUTINE CROSS REFERENCE SUMMARY C********** TRAM3 **********

ROUTINE OR ENTRY — USAGE SUMMARY

	PLIST	PREPC	PTBDMP	PUTCLS	PUTPTB	REMCLS	REMPTB	RESINV	RESUSE	RUSER	SCATSA	SPLIT
UPDATE												
WPTB												X
WRLTDB												
WRUB									X			
WRUDB									X			

SUBROUTINE CROSS REFERENCE SUMMARY C********** TRAM3 **********

ROUTINE OR ENTRY | USAGE SUMMARY

	INIT
UPDATE	
WPTB	
WRLTDB	
WRUB	
WRUDB	

SUBROUTINE CROSS-REFERENCE SUMMARY

ROUTINE OR ENTRY	USAGE SUMMARY											
	RDNAME	*BLOCK	NAME	NUMBER	CLOCK	BLKIN	BLOCK	INTRES	INTSOR	UPDRES	UPDSOR	GETRES
BLKIN					X							
INTRES					X							
INTSOR					X							
RDNAME					X							
UPDRES					X							
UPDSOR					X							

SUBROUTINE CROSS REFERENCE SUMMARY

ROUTINE
OR ENTRY

USAGE SUMMARY

	GETSOR	PUTRES	PUTSOR
BLKIN			
INTRES			
INTSOR			
RDNAME			
UPDRES			
UPDSOR			

3.6 Common Variable Definitions

The tables on the following pages define the meaning of each variable contained in each of the common blocks used by this program.

```
*****************************************************************
*                                                               *
*   R O U T I N E S   C O N T R O L L E D   B Y                 *
*                                                               *
*     I F L O W   A N D   I D U M P                             *
*                                                               *
*****************************************************************
*                                                               *
*     NOTE.- IFLOW CONTROLS THE PRINTING OF SUBROUTINE FLOW     *
*                MESSAGES IN KEY ROUTINES.                      *
*                IF IFLOW=1, MESSAGE IS PRINTED AT ENTRY        *
*                           TO SUBROUTINE.                      *
*                IF IFLOW=0, MESSAGES ARE NOT PRINTED.          *
*                                                               *
*            IDUMP CONTROLS THE PRINTING OF DIAGNOSTIC MESSAGES *
*                DURING THE EXECUTION OF KEY ROUTINES.          *
*                IF IDUMP=1, DIAGNOSTIC MESSAGES ARE PRINTED.   *
*                IF IDUMP=0, MESSAGES ARE NOT PRINTED.          *
*                                                               *
*****************************************************************
*        *                                                      *
* WORD   *    R O U T I N E S   A F F E C T E D                 *
*        *                                                      *
*****************************************************************
*        *                                                      *
*    1   *    FORMQ                                             *
*    2   *    ADDTDQ                                            *
*    3   *    FORMC                                             *
*    5   *    NEWCLS                                            *
*    6   *    MLTCLS                                            *
*    7   *    PREPC                                             *
*    8   *    LSTASK                                            *
*    9   *    LSTSRC,GENTDB,TRACKD                              *
*   10   *    DTRNSF                                            *
*   11   *    SPLIT                                             *
*   13   *    EXECT                                             *
*   14   *    SYNCT                                             *
*   15   *    SYNC                                              *
*   16   *    CORR                                              *
*   17   *    MERGE                                             *
*   18   *    SCATSA                                            *
*   19   *    RESUSE                                            *
*   20   *    GRADF                                             *
*   21   *    CLASCG                                            *
*   23   *    RUSER                                             *
*   24   *    CALQ                                              *
*   25   *    RESINV                                            *
*   26   *    FRMPTB                                            *
*   28   *    FNDPTB                                            *
*   45   *    MAIN                                              *
*   46   *    TRACKD                                            *
*   50   *    MAIN                                              *
*        *                                                      *
*****************************************************************
```

```
*****************************************************************
*                                                               *
*          C O M M O N   B L O C K  -  BLKS                     *
*                                                               *
*****************************************************************
*             *                                                 *
*  VARIABLE   *      D E S C R I P T I O N                      *
*             *                                                 *
*****************************************************************
*             *                                                 *
* IBLOCK(4)   * IBLOCK(1) - ADRESS OF FIRST PROCBLOCK           *
*             * IBLOCK(2) - ADRESS OF FIRST TASK BLOCK.         *
*             * IBLOCK(3) - ADRESS OF FIRST RESOURCE            *
*             *             UTILIZATION BLOCK. (RUB)            *
*             * IBLOCK(4) - ADRESS OF FIRST RESOURCE            *
*             *             UTILIZATION DESCRIPTION             *
*             *             BLOCK (RUDB)                        *
* NBLOCK(4)   * NBLOCK(1) - NUMBER OF PROCBLOCKS.               *
*             * NBLOCK(2) - NUMBER OF TASK BLOCKS.              *
*             * NBLOCK(3) - NUMBER OF RUBS.                     *
*             * NBLOCK(4) - NUMBER OF RUDBS.                    *
* LBLOCK(4)   * LBLOCK(1) - LENGTH OF PROCBLOCK - 34.           *
*             * LBLOCK(2) - LENGTH OF TASK BLOCK - 11.          *
*             * LBLOCK(3) - LENGTH OF RUB - 9.                  *
*             * LBLOCK(4) - LENGTH OF RUDB - 8                  *
* IWORD( )    * POOL OF STORAGE.                                *
*             *                                                 *
*****************************************************************
```

COMMON BLOCK - CBLK

VARIABLE	DESCRIPTION
NCOURS	NUMBER OF COURSES IN CURRENT RUN.
IADPB1(I)	ADRESS OF GRADUATION PROCBLOC FOR COURSE I.
ICTYPE(I)	COURSE TYPE. 1-CCTS 2-PMT
IPTYPE(I)	PERSONNEL TYPE. 1-PILOTS 2-COPILOTS 3-OSO 4-DSO
ICPRTY(I)	COURSE PRIORITY.
MAXCLS(I)	MAXIMUM CLASS SIZE.
IGINTR(I)	TIME INTERVAL BETWEEN GRADUATIONS.
ITGRD1(I)	TIME OF EARLIEST GRADUATION PERMITTED
ICGRAD(I)	TIME OF CURRENT (LATEST) GRADUATION.
IPGRAD(I)	TIME OF PREVIOUS (SMALLER TIME) GRADUATION.
NDXTD1(I)	POINTER TO FIRST ELEMENT IN TRAINING DEMAND QUEUE (COMMON CTDQ) FOR COURSE I.
NDXTDL(I)	POINTER TO LAST ELEMENT IN TRAINING DEMAND QUEUE (COMMON CTDQ) FOR COURSE I.
NDXND1(I)	ADRESS OF FIRST NODE FOR COURSE. (NOT USED).
FRCTN(I)	NUMBER OF STUDENTS ACCUMULATED FROM TRAINING DEMANDS QUEUE THAT MUST BE PLACED IN CLASSES.

NOTE.- INDEX I REFERS TO COURSE NUMBER.

COMMON BLOCK - CCLS

VARIABLE	DESCRIPTION
NACLS	NUMBER OF CLASSES CURRENTLY ACTIVE.
IADRC(I)	ADRESS OF CLASS I.
ICTME(I)	TIME FOR PROCESSING CLASS I.
ICPRT(I)	PRIORITY OF CLASS I.
IACTVE(I)	CLASS STATUS. 0-ACTIVE. 1-INACTIVE.
NOPB(I)	ADRESS OF PROCBLOC ASSOCIATED WITH CLASS I.
IGID(I)	CREW IDENTIFICATION NUMBER.
ISORT( )	SORTED LIST OF INDICES FOR ACTIVE CLASSES. SORT IS ON TIME AND PRIORITY IN DESCENDING ORDER. (ISORT(1) CONTAINS INDEX OF CLASS WITH HIGHEST SCHEDULED EXECUTION TIME AND HIGHEST PRIORITY.)
IDUNER(I)	UNIQUE CLASS NUMBER ASSIGNED BY STEP 3 OF TRAM.
LAGC(I)	DURATION OF CURRENT LAG FOR CLASS I.

COMMON BLOCK - CLASSB

VARIABLE	DESCRIPTION
IFRSTC	POINTER TO FIRST ELEMENT IN LINKED LIST.
ILASTC	POINTER TO LAST ELEMENT IN LINKED LIST.
NXTFRE	POINTER TO NEXT UNUSED LOCATION.
LIMITC	DIMENSION LIMIT.
ICBSZE	NUMBER OF WORDS IN A CLASS BLOCK.
ICBSZ1	= ICBSZE - 1
ICLASS( )	LINKED LIST STORAGE AREA FOR CLASS BLOCKS. SEE DESCRIPTION OF CLASS BLOCKS (FIG 8.1) FOR DEFINITION OF PARAMETERS.

COMMON BLOCK - CLSB

VARIABLE	DESCRIPTION
NDXCLS	ADRESS OF CURRENTLY ACTIVE CLASS.
NUMCRS	COURSE NUMBER.
NOSTDS	NUMBER OF STUDENTS.
IPRTYC	CLASS PRIORITY.
ICLSTM	TIME OF NEXT SCHEDULED EVENT FOR CLASS.
NPROCB	ADRESS OF PROCBLOC FOR CLASS.
ISTATS	CLASS STATUS. 0-ACTIVE. 1-INACTIVE.
IPREDT	ADRESS OF NEXT PREDETERMINED TRANSFER BLOCK FOR CLASS.
IDGRAD	CREW IDENTIFICATION NUMBER.
NUMGRD	ADRESS OF GRADUATION PROCBLOC.
IDTEGR	GRADUATION DATE.
IC	POINTER TO CLASS IN LIST OF CURRENT CLASSES.
IDIDR	UNIQUE CLASS NUMBER.
LAGT	DURATION OF CURRENT LAG (IN C.U.S)
LRSON	REASON FOR CURRENT LAG. 1-RESOURCE MISSING. 6-SYNCHRONIZATION FAILURE 7-CORRELATION FAILURE.
ICLSAD	ADRESS OF CLASS IN MASS STORAGE.
ICRSPY	COURSE PRIORITY.
ISORCN	SOURCE NUMBER FOR CLASS.
LAGTOT	TOTAL TIME CLASS HAS BEEN LAGGED.

COMMON BLOCK - CLST

VARIABLE	DESCRIPTION
INDXC(I)	POINTERS TO CLASSES (IN COMMON CCLS) THAT ARE CURRENTLY IN PROCBLOCS LINKED TOGETHER BY A SYNCHRONIZATION OR CORRELATION LOOP.
IACLS(I)	WORK AREA. POINTERS TO CLASSES ASSOCIATED WITH A SPECIFIC PROCBLOCK.
IPBLK(I)	WORK AREA. COURSE NUMBER OF ITH COURSE IN SYNC. LOOP.
NSTUDS(I)	WORK AREA. NUMBER OF STUDENTS IN ITH COURSE OF SYNCH. LOOP.
NOCLS	NUMBER OF CLASSES IN INDXC.

COMMON BLOCK - CONTRL

VARIABLE	DESCRIPTION
ICLK	CLOCK TIME AT WHICH LAST UPDATE OF SOURCES AND RESOURCES WAS DONE.

COMMON BLOCK - CRSGRP

VARIABLE	DESCRIPTION
NCGRPS	NUMBER OF COURSE GROUPS.
IUPTCG	NOT USED.
NUMCRU	NEXT AVAILABLE CREW NUMBER - 1.
NCING(I)	NUMBER OF COURSES IN GROUP I.
ICING(J,I)	NUMBER OF JTH COURSE IN GROUP I.

COMMON BLOCK - CTDQ

VARIABLE	DESCRIPTION
I1FREE	POINTER TO NEXT AVAILABLE LOCATION
LIMIT1	DIMENSION LIMIT FOR ARRAY ICORE.
ICORE( )	LINKED LIST STORAGE FOR TRAINING DEMANDS (SEE FIGURE 8.2 FOR DESCRIPTION OF TRAINING DEMAND BLOCKS)

COMMON BLOCK - ECB

VARIABLE	DESCRIPTION
ITIMES	START TIME OF SIMULATION.
ITIMEE	END TIME OF SIMULATION.
ITIMEC	CURRENT TIME OF SIMULATION.
NXTBRK	TIME OF NEXT SCHEDULED EVENT.
MINGRD	TIME OF EARLIEST CURRENT GRADUATION.
ITEVNT	TIME OF LATEST PREVIOUS GRADUATION.
NCRSES	NUMBER OF COURSES.
NCLSES	TOTAL NUMBER OF CLASSES CURRENTLY IN SYSTEM.
IDRS	DEMAND RECORD STATUS. 1- FIRST TIME 2- NORMAL 3- E.O.F.
NOTDRS	NUMBER OF TRAINING DEMAND RECORDS READ.
ITRNRU	FORTRAN UNIT NUMBER FOR READING TRAINING DEMAND RECORDS.
ITRANW	NOT USED
IFAIL	IF =0,TASK EXECUTION SUCCEEDED. IF =1,TASK EXECUTION FAILED.
KEOF	NOT USED
IFAIL1	NOT USED
IFAIL2	NOT USED
IOPTF	PROCESSING OPTION IN CASE OF RESOURCE ALLOCATION FAILURE. 0- STOP 1- IGNORE AND CONTINUE 2- LAG
IOPTF1	NOT USED.
IOPTF2	NOT USED
MAXLAG	MAXIMUM LENGTH OF TIME A CLASS CAN BE LAGGED BEFORE IT STARTS EXECUTING THE EXTRAS TASKS IF IT CANNOT BE CORRELATED IMMEDIATELY.
IEXTRA	IF SET TO 1 (BY CORR) INDICATES THAT THE EXTRAS TASKS SHOULD BE EXECUTED.
IFLOW(50)	SWITCHES TO CONTROL PRINTING OF PROGRAM FLOW INFORMATION. 0-NO PRINT, 1-PRINT. (SEE TABLE 7.1 FOR DETAILS)
IDUMP(50)	SWITCHES TO CONTROL PRINTING OF DIAGNOSTICS DURING PROGRAM EXECUTION. 0-NO PRINT, 1-PRINT. (SEE TABLE 7.1 FOR DETAILS)
ICORSE( )	NOT USED.

```
*****************************************************************
*                                                               *
*            C O M M O N   B L O C K  -  PB                     *
*                                                               *
*****************************************************************
*              *                                                *
*  VARIABLE    *      D E S C R I P T I O N                     *
*              *                                                *
*****************************************************************
*              *                                                *
* IPROCB       * PROCBLOCK NUMBER.                              *
* IBTYPE       * 1                                              *
* IDURAT       * DURATION OF PROCBLOCK. (IN CALENDAR UNITS)     *
* IPRTY        * PRIORITY OF PROCBLOCK.                         *
* ISYNCT       * COURSE NUMBER.                                 *
* IDSYNB       * ADRESS OF NEXT PROCBLOCK IN SYNCHRONIZATION    *
*              * OR CORRELATION LOOP. 0 IF PROCBLOC IS NOT      *
*              * SYNCHRONIZED OR CORRELATED WITH ANY OTHER      *
*              * PROCBLOCKS.                                    *
* NLBRNC       * NUMBER OF LEFT BRANCHES IN PROCBLOCK.          *
* LBRNCH(1,I)* ADRESS OF NEXT PROCBLOCK ALONG BRANCH I.         *
* LBRNCH(2,I)* TRANSFER PRIORITY OF ITH BRANCH.                 *
* LBRNCH(3,I)* TRANSFER PROPORTION ALONG BRANCH I.              *
* NTASKS       * NUMBER OF TASKS.                               *
* ITASK(J)     * ADRESS OF JTH TASK.                            *
* NRBRNC       * NUMBER OF RIGHT BRANCHES IN PROCBLOCK.         *
* IRBRNC(K)    * ADRESS OF NEXT PROCBLOCK ALONG THE KTH BRANCH. *
*              * (IN A LEFT TO RIGHT DIRECTION)                 *
*              *                                                *
*****************************************************************
```

COMMON BLOCK - PTB

VARIABLE	DESCRIPTION
PROP(5)	PROPORTIONS FOR 5 LEFT BRANCHES OF PROCBLOC.
NEXTPT(5)	ADRESSES OF NEXT PTBS ALONG EACH OF THE 5 BRANCHES.
IPROP(10)	FIRST 10 WORDS OF ACTIVE PTB. IPROP(1-5) CONTAIN THE NUMBER OF STUDENTS TO BE SENT ALONG EACH BRANCH. IPROP(6-10) CONTAIN THE ADRESSES OF THE NEXT PTBS ALONG EACH OF THE FIVE BRANCHES.

COMMON BLOCK - PTBC

VARIABLE	DESCRIPTION
I1PTB	POINTER TO FIRST PREDETERMINED TRANSFER BLOCK.
ILPTB	POINTER TO LAST PREDETERMINED TRANSFER BLOCK.
NXTFPT	POINTER TO NEXT AVAILABLE LOCATION FOR STORING PTBS.
LIMPTB	DIMENSION LIMIT FOR PTB STORAGE ARRAY.
ISZEPT	SIZE OF PTB RECORD (11)
ISZ1PT	= ISZEPT - 1 = 10
ICORPT( )	LINKED LIST STORAGE AREA FOR PTBS (FOR DETAILED DESCRIPTION OF PREDETERMINED TRANSFER BLOCK SEE COMMON BLOCK PTB).

COMMON BLOCK - RES

VARIABLE	DESCRIPTION
NRESCR	NUMBER OF RESOURCES CURRENTLY IN LOCAL STORAGE.
IBUCKT(I)	BUCKET SIZE FOR RESOURCE I.
INCORE(I)	IF =0 RESOURCE I IS NOT IN LOCAL STORAGE. =1 RESOURCE I IS IN LOCAL STORAGE
LOTIM1(I)	START TIME FOR LOCAL INVENTORY OF RESOURCE I.
LOTIM2(I)	END TIME FOR LOCAL INVENTORY OF RESOURCE I.
NBUCKT(I)	NUMBER OF BUCKETS OF RESOURCE I IN LOCAL STORAGE.
IT1(I)	BUCKET NUMBER CORRESPONDING TO LITIM1.(ASSUMES RES. INVENTORY STARTS AT TIME=1)
IT2(I)	BUCKET NUMBER CORRESPONDING TO LITIM2. (FOR ITH RESOURCE)
NXT	NEXT AVAILABLE LOCATION IN ARRAY INVRES.
LIMNXT	DIMENSION LIMIT FOR ARRAY INVRES.
IA1	THEORETICAL NUMBER OF BUCKET CORRESPONDING TO ITIME1. (WORK VARIABLE FOR CURR. RESOURCE)
IA2	THEORETICAL NUMBER OF BUCKET CORRESPONDING TO ITIME2. (WORK VARIABLE FOR CURRENT RESOURCE).
INDX1	POINTER TO ELEMENT IN ARRAY INVRES THAT CORRESPONDS TO THE 'HIGH-TIME' BUCKET OF THE DESIRED RES. INVENTORY.
INDX2	POINTER TO ELEMENT IN ARRAY INVRES THAT CORRESPONDS TO THE 'LOW-TIME' BUCKET OF THE DESIRED RESOURCE INVENTORY.
NBI	NUMBER OF RESOURCE BUCKETS REQUIRED TO COVER THE ACTIVE PROCBLOC.
LIMRES	DIMENSION LIMIT FOR ARRAY INVRES.
INVRES( )	TEMPORARY STORAGE AREA FOR INVENTORIES OF CURRENTLY ACTIVE RESOURCES.
LIMNS	DIMENSION LIMIT FOR ARRAYS IADI1,IADI2 AND IADS1.
LIMIS	DIMENSION LIMIT FOR ARRAY IAUSED.
NSAVE	NUMBER OF RESOURCES WHOSE CONSUMPTION HAS BEEN STORED IN ARRAY IAUSED.
ISAVE	NUMBER OF BUCKETS USED TO STORE TEMPORARY UPDATE OF RESOURCE UTILIZATION.
IADI1(J)	SAVED VALUE OF INDX1. (POINTER TO 'HIGH-TIME' BUCKET IN INVRES).
IADI2(J)	SAVED VALUE OF INDX2. (POINTER TO 'LOW-TIME' BUCKET IN INVRES).
IADS1(J)	POINTER TO FIRST ELEMENT SAVED IN IAUSED. (CORRESPONDS TO IADI1) NOTE.- J VARIES FROM 1 TO NSAVE.
IAUSED(K)	SAVED RESOURCE INVENTORIES. NOTE.- K VARIES FROM I TO ISAVE.

```
*****************************************************************
*                                                               *
*          C O M M O N   B L O C K  -  RLTDBC                   *
*                                                               *
*****************************************************************
*            *                                                  *
*  VARIABLE  *      D E S C R I P T I O N                       *
*            *                                                  *
*****************************************************************
*            *                                                  *
* NTDBRL     * NUMBER OF RIGHT-TO-LEFT TRACK DESCRIPTOR         *
*            * BLOCKS.                                          *
* ITRK1(J)   * POINTER TO FIRST TRACK DESCRIPTOR BLOCK          *
*            * FOR COURSE J. (NOTE.-A DUMMY ENTRY IS            *
*            * MADE FOR THE LAST+1 COURSE)                      *
* NXTNDA(I)  * POINTER TO NEXT NODE (TDB) ALONG THIS            *
*            * TRACK. (IN A RIGHT TO LEFT DIRECTION).           *
* ITDURT(I)  * TIME DURATION BETWEEN SOURCE AND NODE I.         *
*            * (INCLUDING THE DURATION OF THE NODE PROCBLOC).   *
* CUMPCT(I)  * CUMULATIVE TRANSFER PROPORTION FROM SOURCE       *
*            * TO CURRENT NODE. OBTAINED BY MULTIPLYING         *
*            * THE SPECIFIED PROPORTIONS ALONG THE TRACK)       *
* CUMPTY(I)  * CUMULATIVE PRIORITY OF TRACK AT THIS NODE.       *
*            * (=CURRENT PRIORITY + PREVIOUS PRIORITY / 100.,   *
*            * APPLIED RECURSIVELY.)                            *
* NLFTB(I)   * NUMBER OF LEFT BRANCH IN PROCBLOC.               *
* NSRCE(I)   * POINTER TO SOURCE DESCRIPTION. (COMMON SORDSC)   *
* NUMBLK(I)  * NUMBER OF PROCBLOC ASSOCIATED WITH THIS NODE.    *
* ITDBST( )  * LIST OF SORTED POINTERS TO TDBS.                 *
*            * (SORT IS IN DESCENDING ORDER ON PRIORITY BY      *
*            * COURSE).                                         *
* NUMSTA(I)  * NUMBER OF STUDENTS ASSIGNED TO THIS NODE.        *
*            * (CALCULATED FOR EACH CLASS BY SCATSA).           *
*            *                                                  *
*****************************************************************
```

COMMON BLOCK - RUB

VARIABLE	DESCRIPTION
IBLOCN	RUB NUMBER (PRIMARY)
IBLKT	3
NRUDBS	NUMBER OF RUDBS USED BY PRIMARY RUB.
IARUDB(I)	ADRESS OF ITH RUDB. (PRIMARY)
JBLOCN	NUMBER OF SECONDARY RUB.
JBLKT	3
MRUDBS	NUMBER OF RUDBS USED BY SECONDARY RUB.
JARUDB(I)	ADRESS OF ITH SECONDARY RUDB.

COMMON BLOCK - RUDB

VARIABLE	DESCRIPTION
INTBN	NUMBER OF CURRENT PRIMARY RUDB.
IBTYPE	4
IRESNO	NUMBER OF RESOURCE DESCRIBED BY RUDB.
IRUGF	NUMBER OF RESOURCE UTILIZATION GROUPING FUNCTION. 1.- CLASS. 3.- INDIVIDUAL.
IRUTF	NUMBER OF RESOURCE UTILIZATION TIMING FUNCTION. 2.- UNIFORM 3.- ARBITRARY.
NXTRUB	ADRESS OF SECONDARY RUB.
IALTR	ADRESS OF ALTERNATE RUDB.
ICONSU	UNITS OF CONSUMPTION PER UNIT USER.
JNTBN	NUMBER OF CURRENT SECONDARY RUDB.
JBTYPE	4
JRESNO	NUMBER OF RESOURCE DESCRIBED BY RUDB.
JRUGF	NUMBER OF RESOURCE UTILIZATION GROUPING FUNCTION. 1.- CLASS 2.- QUANTITY OF PRIMARY RESOURCE CONSUMED. 3.- INDIVIDUAL
JRUTF	NUMBER OF RESOURCE UTILIZATION TIMING FUNCTION. 2.- UNIFORM 3.- ARBITRARY.
MXTRUB	NOT USED
JALTR	ADRESS OF ALTERNATE RUDB.
JCONSU	UNITS OF CONSUMPTION PER UNIT USER.

COMMON BLOCK - SORDSC

VARIABLE	DESCRIPTION
NOSRCS	NUMBER OF SOURCES (AS DEFINED BY COURSE TRACKS)
ISRCPB(I)	ADRESS OF PROCBLOC (AT SOURCE).
ISTASK(I)	ADRESS OF GETSOURCE TASK.
ISRRUB(I)	ADRESS OF RUB.
ISRUDB(I)	ADRESS OF RUDB.
ISORNN(I)	SOURCE NUMBER.
	NOTE.- I LOOPS OVER ALL TRACKS.

```
*****************************************************************
*                                                               *
*          C O M M O N   B L O C K  -  TB                       *
*                                                               *
*****************************************************************
*             *                                                 *
*  VARIABLE   *      D E S C R I P T I O N                      *
*             *                                                 *
*****************************************************************
*             *                                                 *
* IBLKN       * NUMBER OF TASK BLOCK.                           *
* IBLKT1      * 2                                               *
* ITSKFN      * TASK FUNCTION NUMBER.                           *
* ITSKPT      * TASK TYPE.                                      *
* IARUB       * ADRESS OF ASSOCIATED RUB.                       *
* NPARMS      * NUMBER OF PARAMETERS ASSOCIATED WITH TASK.      *
* IPARM(I)    * ITH PARAMETER                                   *
* ITIME1      * START TIME FOR THIS TASK                        *
* ITIME2      * END TIME FOR THIS TASK.                         *
* LITIM1      * EARLIEST START TIME FOR ALL TASKS IN THE        *
*             * CURRENTLY ACTIVE TASK LIST.                     *
* LITIM2      * LATEST START TIME FOR ALL TASKS IN THE          *
*             * CURRENTLY ACTIVE TASK LIST.                     *
* ICLSZE      * CLASS SIZE ASSOCIATED WITH THIS TASK.           *
*             *                                                 *
*****************************************************************
```

COMMON BLOCK - TDR

VARIABLE	DESCRIPTION
ITDATE	TIME OF TRAINING DEMAND
STUDNO	NUMBER OF STUDENTS DEMANDED.
ITTYPE	TRAINEE TYPE. 1-PILOT 2-COPILOT 3-OSO 4-DSO
ICRSN	COURSE NUMBER.
IDGRAD	NOT USED. (GRADUATION ID GENERATED BY STEP 2).
IDTYPE	DEMAND TYPE. 1- CCTS DUE TO DELIVERIES. 2- CCTS DUE TO ATTRITION. 3- PMT

COMMON BLOCK - TLIST

VARIABLE	DESCRIPTION
NSYNCT	NUMBER OF SYNC TASKS IN LIST.
NTSKS	NUMBER OF TASKS IN LIST.
IDSTSK(I)	TASK ADRESS.
ICLSID(I)	POINTER TO CLASS IN LIST OF CURRENT CLASSES.
ICOMID(I)	IF =0, THEN TASK I IS A CLASS TASK. IF =1, THEN TASK I IS A COMMON TASK.
KTIME1(I)	START TIME FOR TASK I.
KTIME2(I)	END TIME FOR TASK I. (TIMES ARE ONLY APPLICABLE TO RESOURCE UTILIZATION TASKS)
KLASZE(I)	CLASS SIZE TO BE USED FOR TASK I.
LTIME1	MINIMUM OF KTIME1 ENTRIES.
LTIME2	MAXIMUM OF KTIME2 ENTRIES.

COMMON BLOCK - WORKB

VARIABLE	DESCRIPTION
IPBLOC(34)	WORK AREA FOR STORING A PROCBLOC. (SEE FIG 8.3 FOR DETAILED DESCRIPTION OF PROCBLOC).
IWTASK(12)	WORK AREA FOR STORING A TASK BLOCK. (SEE FIG 8.4 FOR DETAILED DESCRIPTION OF TASK BLOCK).
IADRSB( )	NOT USED.

```
*****************************************************************
*                                                               *
*          C O M M O N   B L O C K  - WRKA                      *
*                                                               *
*****************************************************************
*            *                                                  *
*  VARIABLE  *      D E S C R I P T I O N                       *
*            *                                                  *
*****************************************************************
*            *                                                  *
* NUMTR      * NUMBER OF CURRENT TRAINING DEMANDS FOR           *
*            * COURSE IN PROCESS.                               *
* JDATE(I)   * TIME OF ITH TRAINING DEMAND.                     *
* STUDSN(I)  * NUMBER OF STUDENTS IN ITH TRAINING DEMAND.       *
* JID(I)     * NOT USED.(CREW # GENERATED BY STEP 2)            *
* JTTYPE(I)  * TRAINEE TYPE.  1-PILOTS                          *
*            *                2-COPILOTS                        *
*            *                3-OSO                             *
*            *                4-DSO                             *
* JDTYPE(I)  * DEMAND TYPE. 1-CCTS DUE TO DELIVERY.             *
*            *               2-CCTS DUE TO ATTRITION            *
*            *               3-PMT                              *
*            *               4-ROUND OFF GENERATED BY PROGRAM   *
* LIMTR      * DIMENSION LIMIT FOR TRAINING DEMANDS FOR         *
*            * ONE COURSE.                                      *
*            *                                                  *
*****************************************************************
```

3.7 Internal Data Block Description

The tables on the following pages define the contents of each of the data blocks used by the Phase 3 TRAM program.

CLASS BLOCK

WORD	DESCRIPTION
1	COURSE NUMBER.
2	NUMBER OF STUDENTS IN CLASS.
3	CLASS PRIORITY.
4	TIME OF NEXT SCHEDULED EVENT FOR CLASS.
5	ADRESS OF NEXT ACTIVE PROCBLOC FOR CLASS.
6	CLASS STATUS. 0-ACTIVE. 1-INACTIVE.
7	ADRESS OF NEXT PREDETERMINED TRANSFER BLOCK FOR CLASS.
8	CREW IDENTIFICATION NUMBER.
9	ADRESS OF GRADUATION PROCBLOC.
10	GRADUATION DATE.
11	POINTER TO CLASS IN LIST OF CURRENT CLASSES.
12	UNIQUE CLASS NUMBER.
13	DURATION OF CURRENT LAG.
14	REASON FOR CURRENT LAG. 1-RESOURCE MISSING. 6-SYNC. FAILURE. 7-CORR. FAILURE.
15	ADRESS OF CLASS IN MASS STORAGE.
16	COURSE PRIORITY.
17	SOURCE NUMBER FOR CLASS. (NOT USED).
18	TOTAL TIME CLASS HAS BEEN LAGGED.
30	LINK TO NEXT CLASS BLOCK.

TRAINING DEMAND BLOCK

WORD	DESCRIPTION
1	NUMBER OF STUDENTS.
2	DEMAND TIME
3	0
4	TRAINEE TYPE
5	DEMAND TYPE
6	POINTER TO NEXT DEMAND FOR COURSE.

NOTE.- NDXTD1(I) IN COMMON CBLK CONTAINS A POINTER TO THE FIRST TRAINING DEMAND FOR THE ITH COURSE.
NDXTDL(I) IN COMMON CBLK CONTAINS A POINTER TO THE LAST TRAINING DEMAND FOR THE ITH COURSE.

PROCESSING BLOCK

WORD	DESCRIPTION
1	INTERNAL BLOCK NUMBER.
2	BLOCK TYPE. (1-PROCBLOC)
3	DURATION.
4	BLOCK PRIORITY
5	SYNCHRONIZATION TYPE.
6	NUMBER OF PROCBLOC SYNCHRONIZED WITH.
7	NUMBER OF LEFT BRANCHES.
8	LEFT BRANCH POINTER 1
9	PRIORITY 1
10	PERCENTAGE 1
11	LEFT BRANCH POINTER 2
12	PRIORITY 2
13	PERCENTAGE 2
14	LEFT BRANCH POINTER 3
15	PRIORITY 3
16	PERCENTAGE 3
17	LEFT BRANCH POINTER 4
18	PRIORITY 4
19	PERCENTAGE 4
20	LEFT BRANCH POINTER 5
21	PRIORITY 5
22	PERCENTAGE 5
23	NUMBER OF TASKS
24	POINTER TO TASK 1
25	POINTER TO TASK 2
26	POINTER TO TASK 3
27	POINTER TO TASK 4
28	POINTER TO TASK 5
29	NUMBER OF RIGHT BRANCHES
30	RIGHT BRANCH POINTER 1
31	RIGHT BRANCH POINTER 2
32	RIGHT BRANCH POINTER 3
33	RIGHT BRANCH POINTER 4
34	RIGHT BRANCH POINTER 5

TASK BLOCK

WORD	DESCRIPTION
1	INTERNAL BLOCK NUMBER.
2	BLOCK TYPE. (2-TASK BLOCK)
3	TASK FUNCTION NUMBER. (NUMBER OF ROUTINE INVOKED)
4	TASK TYPE. 1-NORMAL 2-EXTRAS
5	POINTER TO RESOURCE UTILIZATION BLOCK.
6	NUMBER OF PARAMETERS
7	PARAMETER 1
8	PARAMETER 2
9	PARAMETER 3
10	PARAMETER 4
11	PARAMETER 5

RESOURCE UTILIZATION BLOCK

WORD	DESCRIPTION
1	INTERNAL BLOCK NUMBER.
2	BLOCK TYPE. (3-RUB)
3	NUMBER OF RESOURCE UTILIZATION DESCRIPTION BLOCKS.
4	POINTER TO RUDB 1
5	POINTER TO RUDB 2
.	
9	POINTER TO RUDB 6

RESOURCE UTILIZATION DESCRIPTION BLOCK

WORD	DESCRIPTION
1	INTERNAL BLOCK NUMBER
2	BLOCK TYPE. (4-RUDB)
3	RESOURCE NUMBER
4	RESOURCE UTILIZATION GROUPING FUNCTION NUMBER.
5	RESOURCE UTILIZATION TIMING FUNCTION NUMBER.
6	POINTER TO NEXT RUB. (FOR COMPOSITE RESOURCES)
7	POINTER TO ALTERNATE RUDB.
8	UNITS OF CONSUMPTION / UNIT USER.

3.8 Common Variable Cross Reference Table

The tables on the following pages show how each subroutine uses each common variable. The subroutine names are printed across the top of the table, and the variable names down the left side.

CROSS REFERENCE USAGE CODES

A **ARGUMENT**

THE SYMBOL IS A VARIABLE OR FUNCTION NAME WHICH APPEARS IN AN ARGUMENT LIST OF A CALL, SUBROUTINE, FUNCTION, OR ENTRY STATEMENT.

D **DATA INITIALIZATION**

THE SYMBOL IS A VARIABLE WHICH IS INITIALIZED IN A DATA OR TYPE SPECIFICATION STATEMENT SUCH AS A COMPLEX SPECIFICATION STATEMENT.

F **FETCH A VALUE**

THE SYMBOL IS A:

1. VARIABLE WHOSE MOST RECENTLY ASSIGNED VALUE IS ACCESSED BUT NOT CHANGED.
2. FUNCTION NAME OR ARGUMENT OF A FUNCTION WHICH APPEARS ON THE RIGHT SIDE OF AN EQUAL SIGN IN AN ASSIGNMENT STATEMENT OR APPEARS IN AN IF STATEMENT TEST.
3. DUMMY ARGUMENT IN A STATEMENT FUNCTION DEFINITION.

S **STORE A VALUE**

THE SYMBOL IS A:

1. VARIABLE WHOSE VALUE IS REPLACED BY ANOTHER VALUE.
2. FUNCTION NAME WHICH APPEARS ON THE LEFT SIDE OF AN EQUAL SIGN IN AN ASSIGNMENT STATEMENT.
3. NAME OF A STATEMENT FUNCTION IN THE DEFINITION OF THAT FUNCTION.

C **COMMON**

THE SYMBOL IS A VARIABLE WHICH APPEARS IN A COMMON STATEMENT OR IS THE NAME OF A LABELED COMMON BLOCK.

E **EQUIVALENCE**

THE SYMBOL IS A VARIABLE WHICH APPEARS IN AN EQUIVALENCE STATEMENT.

T **TYPE SPECIFICATION**

THE SYMBOL IS A VARIABLE WHICH APPEARS IN A :

1. TYPE SPECIFICATION STATEMENT AND IS NOT INITIALIZED IN THAT STATEMENT.
2. DIMENSION OR EXTERNAL STATEMENT.

N **ENTRY POINT**

THE SYMBOL IS AN ENTRY POINT DEFINED BY AN ENTRY STATEMENT IN A SUBROUTINE OR FUNCTION.

X **EXTERNAL REFERENCE**

THE SYMBOL IS A SUBROUTINE OR ENTRY NAME WHICH APPEARS IN A CALL STATEMENT.

CROSS REFERENCE SUMMARY C********** TRAM3 **********

SYMBOL	TYPE	USAGE SUMMARY											
		MAIN	SRTCTP	SRTTDB	SVRUS1	SVRUS2	SYNC	SYNCT	TBLOCK	TRACKD	TRMNTE	UPDATE	WPTB
CBLK	CB	C					C			C			
CCLS	CB	C					C	C					
CLASSB	CB	C					C						
CLSB	CB	C					C						
CRSGRP	CB												
CTDQ	CB												
CUMPCT	R									F C			
CUMPTY	R			A F T						A F C			
ECB	CB	C					C	C		C			
FRCTN	R	C					C			C			
IACTVE	I	F C					C	SC					
IADI1	I				SC	C						C	
IADI2	I				SC	C						C	
IADPB1	I	C					C			A C			
IADRC	I	F C					F C	F C					
IADRSB	I												
IADS1	I				SC	C						C	
IALTR	I												
IARUB	I							C					
IARUDB	I												
IAUSED	I				SC	FSC						C	
IA1	I				C	C						C	
IA2	I				C	C						C	
IBLKN	I							A C					
IBLKT	I												
IBLKT1	I							C					
IBLOCK	I								A F T				

CROSS REFERENCE SUMMARY C********** TRAM3 **********

SYMBOL	TYPE	USAGE SUMMARY												
		WRLTDB	WRUB	WRUDB	ADDTDB	ALLOC	ALLOCA	ALLOCD	ASCLS	ASCLSS	CALC	CBLOCK	CLASSG	
CBLK	CB				C								C	
CCLS	CB								C	C				
CLASSB	CB													
CLSB	CB													
CRSGRP	CB												C	
CTDQ	CB				C									
CUMPCT	R	F C					C	F C						
CUMPTY	R	F C					C	C						
ECB	CB				C						C		C	
FRCTN	R				C								FSC	
IACTVE	I								C	C				
IADI1	I													
IADI2	I													
IADPB1	I				C								C	
IADRC	I								C	C				
IADRSB	I													
IADS1	I													
IALTR	I													
IARUB	I													
IARUDB	I													
IAUSED	I													
IA1	I													
IA2	I													
IBLKN	I													
IBLKT	I													
IBLKT1	I													
IBLOCK	I		A F T	A F T								A F T		

CROSS REFERENCE SUMMARY C********** TRAM3 **********

SYMBOL	TYPE	USAGE SUMMARY											
		CLSDMP	CORR	DETLAG	DTRNSF	ERROR	EXECT	FORMC	FORMQ	FRETDB	FRMPTB	GENTDB	GETCLS
CBLK	CB				C			C	C	C			
CCLS	CB		C				C						
CLASSB	CB	C	C										C
CLSB	CB		C		C		C				C		
CRSGRP	CB												
CTDQ	CB							C		C			
CUMPCT	R										C	FSC	
CUMPTY	R										C	FSC	
ECB	CB		C	C	C		C	C	C				
FRCTN	R				C			FSC	C	C			
IACTVE	I		C				C						
IADI1	I			C									
IADI2	I			C									
IADPB1	I				C			C	C	C			
IADRC	I		F C				F C						
IADRSB	I				C								
IADS1	I			C									
IALTR	I												
IARUB	I						A C						
IARUDB	I												
IAUSED	I			C									
IA1	I			F C									
IA2	I			F C									
IBLKN	I						A F C						
IBLKT	I												
IBLKT1	I						C						
IBLOCK	I												

CROSS REFERENCE SUMMARY C******************************** TRAM3 ********************************

SYMBOL	TYPE	USAGE SUMMARY												
		GETPTB	GETTDB	GRADF	INITR	LAG	LSTASK	LSTRAK	LSTSRC	MLTCLS	NEGUSE	NEWCLS	PBLOCK	
CBLK	CB		C	C						C		C		
CCLS	CB					C	C							
CLASSB	CB					C						C		
CLSB	CB						C							
CRSGRP	CB								C					
CTDQ	CB		C											
CUMPCT	R							C						
CUMPTY	R							F C						
ECB	CB			C			C			C		C		
FRCTN	R		C	FSC						C		C		
IACTVE	I					C	C							
IADI1	I				C						F C			
IADI2	I				C						F C			
IADPB1	I		C	C					A F	C		F C		
IADRC	I					F C	C							
IADRSB	I								A FS T					
IADS1	I				C						F C			
IALTR	I													
IARUB	I						C							
IARUDB	I													
IAUSED	I				C						F C			
IA1	I				C						C			
IA2	I				C						C			
IBLKN	I						A C							
IBLKT	I													
IBLKT1	I						C							
IBLOCK	I												A F	T

CROSS REFERENCE SUMMARY C********** TRAM3 **********

SYMBOL	TYPE	USAGE SUMMARY												
		PLIST	PREPC	PTBDMP	PUTCLS	PUTPTB	REMCLS	REMPTB	RESINV	RESUSE	RUSER	SCATSA	SPLIT	
CBLK	CB													
CCLS	CB		C											
CLASSB	CB		C		C		C						C	
CLSB	CB											C	C	
CRSGRP	CB													
CTDQ	CB													
CUMPCT	R											F C		
CUMPTY	R											C		
ECB	CB		C				C		C	C	C		C	
FRCTN	R													
IACTVE	I		FSC											
IADI1	I								C	C				
IADI2	I								C	C				
IADPB1	I													
IADRC	I		FSC											
IADRSB	I													
IADS1	I								C	C				
IALTR	I									F C				
IARUB	I									A C				
IARUDB	I									A SC				
IAUSED	I								C	C				
IA1	I								FSC	C				
IA2	I								FSC	C				
IBLKN	I					A S				A C				
IBLKT	I									C				
IBLKT1	I									C				
IBLOCK	I													

CROSS REFERENCE SUMMARY C****************************** TRAM3 **********************************

SYMBOL	TYPE	USAGE SUMMARY
		INIT
CBLK	CB	C
CCLS	CB	C
CLASSB	CB	C
CLSB	CB	
CRSGRP	CB	C
CTOQ	CB	C
CUMPCT	R	
CUMPTY	R	
ECB	CB	C
FRCTN	R	SC
IACTVE	I	SC
IADI1	I	C
IADI2	I	C
IADPB1	I	C
IADRC	I	SC
IADRSB	I	
IADS1	I	C
IALTR	I	
IARUB	I	
IARUDB	I	
IAUSED	I	C
IA1	I	C
IA2	I	C
IBLKN	I	
IBLKT	I	
IBLKT1	I	
IBLOCK	I	

CROSS REFERENCE SUMMARY C********** TRAM3 **********

SYMBOL	TYPE	USAGE SUMMARY											
		MAIN	SRTCTP	SRTTDB	SVRUS1	SVRUS2	SYNC	SYNCT	TBLOCK	TRACKD	TRMNTE	UPDATE	WPTB
IBLOCN	I												
IBTYPE	I						C	C					
IBUCKT	I				C	C						C	
IC	I	SC					F C						A F
ICBSZE	I	C					C						
ICBSZ1	I	F C					C						
ICGRAD	I	F C					C			C			
ICING	I												
ICLASS	I	A FSC					F C						
ICLSAD	I	SC					C						
ICLSID	I							SC					
ICLSTM	I	C					F C						
ICLSZE	I							C					
ICOMID	I							SC					
ICONSU	I												
ICORE	I												
ICORPT	I												
ICORSE	I	C					C	C		C			
ICPRT	I	F C					C	C					
ICPRTY	I	C					C			C			
ICRSN	I												
ICRSPY	I	C					C						
ICTME	I	F C					F C	F C					
ICTYPE	I	C					C			C			
IDGRAD	I	C					A C						
IDIDR	I	C					C						
IDONER	I	F C					C	C					

CROSS REFERENCE SUMMARY C********** TRAM3 **********

SYMBOL	TYPE	USAGE SUMMARY												
		WRLTDB	WRUB	WRUDB	ADDTDQ	ALLOC	ALLOCA	ALLOCD	ASCLS	ASCLSS	CALQ	CBLOCK	CLASCG	
IBLOCN	I													
IBTYPE	I													
IBUCKT	I													
IC	I													
ICBSZE	I													
ICBSZI	I													
ICGRAD	I				C								C	
ICING	I												F C	
ICLASS	I													
ICLSAD	I													
ICLSID	I													
ICLSTM	I													
ICLSZE	I													
ICOMID	I													
ICONSU	I													
ICORE	I				FSC									
ICORPT	I													
ICORSE	I				C						C		C	
ICPRT	I								C	C				
ICPRTY	I				C								C	
ICRSN	I													
ICRSPY	I													
ICTME	I								C	C				
ICTYPE	I				C								C	
IDGRAD	I				A F				A F					
IDIDR	I													
IDONER	I								C	C				

CROSS REFERENCE SUMMARY C********** TRAM3 **********

SYMBOL	TYPE	USAGE SUMMARY											
		CLSDMP	CORR	DETLAG	DTRNSF	ERROR	EXECT	FORMC	FORMQ	FRETDB	FRMPTB	GENTDB	GETCLS
IBLOCN	I												
IBTYPE	I		C		C		C						
IBUCKT	I			F C									
IC	I		F C		SC		F C		A FS		C		
ICBSZE	I	F C	C										C
ICBSZI	I	F C	C										C
ICGRAD	I				C			FSC	FSC	C			
ICING	I												
ICLASS	I	F C	F C										F C
ICLSAD	I		C		C		C				C		
ICLSID	I						F C						
ICLSTM	I		F C		FSC		F C				C		
ICLSZE	I						SC						
ICOMID	I						C						
ICONSU	I												
ICORE	I							C		FSC			
ICORPT	I										FSC		
ICORSE	I		C	C	C		C	C	C				
ICPRT	I		C				C						
ICPRTY	I				C			C	C	C			
ICRSN	I								A FSC				
ICRSPY	I		C		F C		C				C		
ICTME	I		F C				C						
ICTYPE	I				C			C	C	C			
IDGRAD	I	A	C		C		F C		A FSC		C		
IDIDR	I		C		C		F C				C		
IDDNER	I		C				L						

CROSS REFERENCE SUMMARY C********** TRAM3 **********

SYMBOL	TYPE	USAGE SUMMARY											
		GETPTB	GETTDB	GRADF	INITR	LAG	LSTASK	LSTRAK	LSTSRC	MLTCLS	NEGUSE	NEWCLS	PBLOCK
IBLOCN	I												
IBTYPE	I						C						
IBUCKT	I				C						C		
IC	I						F C						
ICBSZE	I					C						F C	
ICBSZ1	I					C						F C	
ICGRAD	I		C	C						F C		C	
ICING	I								CE				
ICLASS	I					A FSC						FSC	
ICLSAD	I						C						
ICLSID	I						SC						
ICLSTM	I						F C						
ICLSZE	I						C						
ICOMID	I						SC						
ICONSU	I												
ICORE	I		F C										
ICORPT	I	F C											
ICORSE	I			C			C			C		C	
ICPRT	I					C	C						
ICPRTY	I		C	C						C		F C	
ICRSN	I												
ICRSPY	I						C						
ICTME	I					C	C						
ICTYPE	I		C	C						C		C	
IDGRAD	I		A S				C						
IDIDR	I						C						
IDONER	I					C	C						

CROSS REFERENCE SUMMARY C********** TRAM3 **********

SYMBOL	TYPE	USAGE SUMMARY											
		PLIST	PREPC	PTBDMP	PUTCLS	PUTPTB	REMCLS	REMPTB	RESINV	RESUSE	RUSER	SCATSA	SPLIT
IBLOCN	I									A C			
IBTYPE	I									C			C
IBUCKT	I								F C	C			
IC	I											C	C
ICBSZE	I		C		C		C						C
ICBSZ1	I		F C		C		F C						C
ICGRAD	I												
ICING	I												
ICLASS	I		F C		SC		FSC						A SC
ICLSAD	I											C	C
ICLSID	I	F C											
ICLSTM	I											A F C	F C
ICLSZE	I									A F C			
ICOMID	I	F C											
ICONSU	I									A C			
ICORE	I												
ICORPT	I			F C		FSC		FSC					
ICORSE	I		C				C		C	C	C		C
ICPRT	I		A FSC										
ICPRTY	I												
ICRSN	I												
ICRSPY	I											C	C
ICTME	I		A FSC										
ICTYPE	I												
IDGRAD	I											C	A FSC
IDIDR	I											C	F C
IDONER	I		FSC										

CROSS REFERENCE SUMMARY C********** TRAM3 **********

SYMBOL	TYPE	USAGE SUMMARY INIT
IBLOCN	I	
IBTYPE	I	
IBUCKT	I	C
IC	I	
ICBSZE	I	FSC
ICBSZ1	I	FSC
ICGRAD	I	C
ICING	I	SC
ICLASS	I	SC
ICLSAD	I	
ICLSID	I	
ICLSTM	I	
ICLSZE	I	
ICOMID	I	
ICONSU	I	
ICORE	I	SC
ICORPT	I	SC
ICORSE	I	C
ICPRT	I	SC
ICPRTY	I	C
ICRSN	I	
ICRSPY	I	
ICTME	I	SC
ICTYPE	I	C
IDGRAD	I	
IDIDR	I	
IDONER	I	C

CROSS REFERENCE SUMMARY C********** TRAM3 **********

SYMBOL	TYPE	USAGE SUMMARY											
		MAIN	SRTCTP	SRTTDB	SVRUS1	SVRUS2	SYNC	SYNCT	TBLOCK	TRACKD	TRMNTE	UPDATE	WPTB
IDRS	I	F C					C	C		C			
IDSTSK	I							SC					
IDSYNB	I						F C	C					
IDTEGR	I	C					C						
IDTYPE	I												
IDUMP	I	F C					F C	F C		A F C			
IDURAT	I						C	F C					
IEXTRA	I	C					C	C		C			
IFAIL	I	C					SC	C		C			
IFAIL1	I	C					C	C		C			
IFAIL2	I	C					C	C		C			
IFLOW	I	C					F C	F C		F C			
IFRSTC	I	F C					C						
IGID	I	F C					C	C					
IGINTR	I	C					C			C			
ILASTC	I	C					C						
ILPTB	I												
INCORE	I				C	C						FSC	
INDX1	I				F C	F C						C	
INDX2	I				F C	F C						C	
INTBN	I												
INVRES	I				F C	F C						A C	
IOPTCG	I												
IOPTF	I	C					C	C		C			
IOPTF1	I	C					C	C		C			
IOPTF2	I	C					C	C		C			
IPARM	I							C					

CROSS REFERENCE SUMMARY C******************************** TRAM3 **********************************

SYMBOL	TYPE	USAGE SUMMARY											
		WRLTDB	WRUB	WRUDB	ADDTDQ	ALLOC	ALLOCA	ALLOCD	ASCLS	ASCLSS	CALQ	CBLOCK	CLASCG
IDRS	I				C						C		C
IDSTSK	I												
IDSYNB	I												
IDTEGR	I												
IDTYPE	I				A F								
IDUMP	I				F C						F C		C
IDURAT	I												
IEXTRA	I				C						C		C
IFAIL	I				C						C		C
IFAIL1	I				C						C		C
IFAIL2	I				C						C		C
IFLOW	I				F C						F C		F C
IFRSTC	I												
IGID	I								F C	C			
IGINTR	I				C								C
ILASTC	I												
ILPTB	I												
INCORE	I												
INDX1	I												
INDX2	I												
INTBN	I												
INVRES	I												
IOPTCG	I												C
IOPTF	I				C						C		C
IOPTF1	I				C						C		C
IOPTF2	I				C						C		C
IPARM	I												

CROSS REFERENCE SUMMARY C****************************** TRAM3 ********************************

SYMBOL	TYPE	USAGE SUMMARY											
		CLSDMP	CORR	DETLAG	DTRNSF	ERROR	EXECT	FORMC	FORMQ	FRETDB	FRMPTB	GENTDB	GETCLS
IDRS	I		C	C	C		C	F C	FSC				
IDSTSK	I						A F C						
IDSYNB	I		F C		C		C						
IDTEGR	I		C		C		F C				C		
IDTYPE	I								A FSC				
IDUMP	I		F C	C	F C		F C	F C	F C			A F	
IDURAT	I		C		F C		C						
IEXTRA	I		SC	C	C		FSC	C	C				
IFAIL	I		SC	C	C		FSC	C	C				
IFAIL1	I		C	C	C		C	C	C				
IFAIL2	I		C	C	C		C	C	C				
IFLOW	I		F C	C	F C		F C	F C	F C				
IFRSTC	I	F C	C										C
IGID	I		C				C						
IGINTR	I				C			F C	F C	C			
ILASTC	I	F C	C										C
ILPTB	I										C		
INCORE	I			C									
INDX1	I			C									
INDX2	I			C									
INTBN	I												
INVRES	I			A FSC									
IOPTCG	I												
IOPTF	I		C	C	C		F C	C	C				
IOPTF1	I		C	C	C		C	C	C				
IOPTF2	I		C	C	C		F C	C	C				
IPARM	I						C						

CROSS REFERENCE SUMMARY C********** TRAM3 **********

SYMBOL	TYPE	USAGE SUMMARY											
		GETPTB	GETTDB	GRADF	INITR	LAG	LSTASK	LSTRAK	LSTSRC	MLTCLS	NEGUSE	NEWCLS	PBLOCK
IDRS	I			C			C			C		C	
IDSTSK	I						FSC						
IDSYNB	I						C						
IDTEGR	I						C						
IDTYPE	I		A S										
IDUMP	I			F C			F C		A F	F C		F C	
IDURAT	I						F C						
IEXTRA	I			C			C			C		C	
IFAIL	I			C			C			C		C	
IFAIL1	I			C			C			C		C	
IFAIL2	I			C			C			C		C	
IFLOW	I			C			F C			F C		F C	
IFRSTC	I					C						FSC	
IGID	I					C	C						
IGINTR	I		C	C						F C		C	
ILASTC	I					C						FSC	
ILPTB	I	C											
INCORE	I				SC						C		
INDX1	I				C						C		
INDX2	I				C						C		
INTBN	I												
INVRES	I				C						FSC		
IOPTCG	I								C				
IOPTF	I			C			C			C		C	
IOPTF1	I			C			C			C		C	
IOPTF2	I			C			C			C		C	
IPARM	I						C						

CROSS REFERENCE SUMMARY C********** TRAM3 **********

SYMBOL	TYPE	USAGE SUMMARY											
		PLIST	PREPC	PTBDMP	PUTCLS	PUTPTB	REMCLS	REMPTB	RESINV	RESUSE	RUSER	SCATSA	SPLIT
IDRS	I		C				C		C	C	C		C
IDSTSK	I	F C											
IDSYNB	I												C
IDTEGR	I											C	A F C
IDTYPE	I												
IDUMP	I		F C				C		F C	F C	F C		F C
IDURAT	I												F C
IEXTRA	I		C				C		C	C	C		C
IFAIL	I		C				C		C	SC	C		C
IFAIL1	I		C				C		C	C	C		C
IFAIL2	I		C				C		C	C	C		C
IFLDW	I		F C				C		F C	F C	F C		F C
IFRSTC	I		F C		C		FSC						C
IGID	I		FSC										
IGINTR	I												
ILASTC	I		C		C		SC						A F C
ILPTB	I			F C		FSC		SC					
INCORE	I								FSC	C			
INDX1	I								FSC	A C			
INDX2	I								FSC	A C			
INTBN	I									A C			
INVRES	I								A F C	A C	A FS T		
IOPTCG	I												
IOPTF	I		C				C		C	F C	C		C
IOPTF1	I		C				C		C	C	C		C
IOPTF2	I		C				C		C	C	C		C
IPARM	I									C			

CROSS REFERENCE SUMMARY C********** TRAM3 **********

SYMBOL	TYPE	USAGE SUMMARY
		INIT
IDRS	I	SC
IDSTSK	I	
IDSYNB	I	
IDTEGR	I	
IDTYPE	I	
IDUMP	I	SC
IDURAT	I	
IEXTRA	I	C
IFAIL	I	C
IFAIL1	I	C
IFAIL2	I	C
IFLOW	I	SC
IFRSTC	I	SC
IGID	I	C
IGINTR	I	C
ILASTC	I	SC
ILPTB	I	SC
INCORE	I	C
INDX1	I	C
INDX2	I	C
INTBN	I	
INVRES	I	C
IOPTCG	I	SC
IOPTF	I	FSC
IOPTF1	I	FSC
IOPTF2	I	FSC
IPARM	I	

CROSS REFERENCE SUMMARY C********** TRAM3 **********

SYMBOL	TYPE	USAGE SUMMARY											
		MAIN	SRTCTP	SRTTDB	SVRUS1	SVRUS2	SYNC	SYNCT	TBLOCK	TRACKD	TRMNTE	UPDATE	WPTB
IPBLOC	I												
IPGRAD	I	F C					C			C			
IPREDT	I	C					C						
IPROCB	I						A F C	A C					
IPROP	I												
IPRTY	I						C	C					
IPRTYC	I	C					C						
IPTYPE	I	C					C			C			
IRBRNC	I						C	C					
IRESNO	I												
IRUGF	I												
IRUTF	I												
ISAVE	I				F C	FSC							
ISORCN	I	C										C	
ISORNN	I						C						
ISORT	I	F C								C			
ISRCPB	I						C	C					
ISRRUB	I									C			
ISRUDB	I									C			
ISTASK	I									C			
ISTATS	I	C								C			
ISYNCT	I						C						
ISZEPT	I						F C	C					
ISZ1PT	I												
ITASK	I												
ITDATE	I						C	A F C					
ITDBST	I			A F S T									
										A F C			

CROSS REFERENCE SUMMARY C********** TRAM3 **********

SYMBOL	TYPE	USAGE SUMMARY												
		WRLTDB	WRUB	WRUDB	ADDTDQ	ALLOC	ALLOCA	ALLOCD	ASCLS	ASCLSS	CALQ	CBLOCK	CLASCG	
IPBLOC	I													
IPGRAD	I				C								C	
IPREDT	I													
IPROCB	I								A F	A F				
IPROP	I													
IPRTY	I													
IPRTYC	I													
IPTYPE	I				C								C	
IRBRNC	I													
IRESNO	I													
IRUGF	I													
IRUTF	I													
ISAVE	I													
ISORCN	I													
ISORNN	I						F C		F C					
ISORT	I								C	C				
ISRCPB	I						C		C					
ISRRUB	I						C		C					
ISRUDB	I						C		C					
ISTASK	I						C		C					
ISTATS	I													
ISYNCT	I													
ISZEPT	I													
ISZ1PT	I													
ITASK	I													
ITDATE	I													
ITDBST	I	F C					C		C					

CROSS REFERENCE SUMMARY C********** TRAM3 **********

SYMBOL	TYPE	USAGE SUMMARY											
		CLSDMP	CORR	DETLAG	DTRNSF	ERROR	EXFCT	FORMC	FORMQ	FRETDB	FRMPTB	GENTDB	GETCLS
IPBLOC	I				A F C							A F T	
IPGRAD	I				C			FSC	FSC	C			
IPREDT	I		C		C		C				SC		
IPROCB	I		A F C		A C		F C						
IPROP	I												
IPRTY	I		C		C		C						
IPRTYC	I		C		SC		C				C		
IPTYPE	I				C			C	A C	C			
IRBRNC	I		C		C		C						
IRESNO	I												
IRUGF	I												
IRUTF	I												
ISAVE	I			FSC									
ISORCN	I		C		C		C				C		
ISORNN	I						C					C	
ISORT	I		C				C						
ISRCPB	I						C					A F C	
ISRRUB	I						C					C	
ISRUDB	I						C					C	
ISTASK	I						C					C	
ISTATS	I		C		C		F C				C		
ISYNCT	I		F C		C		C						
ISZEPT	I										C		
ISZ1PT	I										C		
ITASK	I		C		C		C						
ITDATE	I								A FSC				
ITDBST	I										F C	FSC	

CROSS REFERENCE SUMMARY C******************************** TRAM3 **********************************

SYMBOL	TYPE	USAGE SUMMARY												
		GETPTB	GETTDB	GRADF	INITR	LAG	LSTASK	LSTRAK	LSTSRC	MLTCLS	NEGUSE	NEWCLS	PBLOCK	
IPBLOC	I								A F ET					
IPGRAD	I		C	C						F C		C		
IPREDT	I						C							
IPROCB	I						A C							
IPROP	I													
IPRTY	I						C							
IPRTYC	I						C							
IPTYPE	I		C	C						C		C		
IRBRNC	I						C							
IRESND	I													
IRUGF	I													
IRUTF	I													
ISAVE	I				C						SC			
ISORCN	I						C							
ISORNN	I								F SC					
ISORT	I					C	C							
ISRCPB	I								F SC					
ISRRUB	I								F SC					
ISRUDB	I								F SC					
ISTASK	I						FS		F SC					
ISTATS	I						C							
ISYNCT	I						C							
ISZEPT	I	C												
ISZ1PT	I	C												
ITASK	I						A F C							
ITDATE	I													
ITDBST	I							F C						

CROSS REFERENCE SUMMARY C********** TRAM3 **********

SYMBOL	TYPE	USAGE SUMMARY											
		PLIST	PREPC	PTBDMP	PUTCLS	PUTPTB	REMCLS	REMPTB	RESINV	RESUSE	RUSER	SCATSA	SPLIT
IPBLOC	I												
IPGRAD	I												
IPREDT	I											C	A F C
IPROCB	I												C
IPROP	I					A F T							A F C
IPRTY	I												C
IPRTYC	I											C	F C
IPTYPE	I												
IRBRNC	I												C
IRESNO	I								A F	A F C			
IRUGF	I									A C			
IRUTF	I									A C			
ISAVE	I								C	SC			
ISORCN	I											C	F C
ISORNN	I											C	
ISORT	I		A FSC										
ISRCPB	I											C	
ISRRUB	I											C	
ISRUDB	I											C	
ISTASK	I											C	
ISTATS	I											C	FSC
ISYNCT	I												C
ISZEPT	I			F C		C		C					
ISZ1PT	I			F C		F C		F C					
ITASK	I												C
ITDATE	I												
ITDBST	I											C	

CROSS REFERENCE SUMMARY C********** TRAM3 **********

SYMBOL	TYPE	USAGE SUMMARY
		INIT
IPBLOC	I	
IPGRAD	I	C
IPREDT	I	
IPROCB	I	
IPROP	I	
IPRTY	I	
IPRTYC	I	
IPTYPE	I	C
IRBRNC	I	
IRESNO	I	
IRUGF	I	
IRUTF	I	
ISAVE	I	C
ISORCN	I	
ISORNN	I	
ISORT	I	C
ISRCPB	I	
ISRRUB	I	
ISRUDB	I	
ISTASK	I	
ISTATS	I	
ISYNCT	I	
ISZEPT	I	FSC
ISZ1PT	I	FSC
ITASK	I	
ITDATE	I	
ITDBST	I	

CROSS REFERENCE SUMMARY C********** TRAM3 **********

SYMBOL	TYPE	USAGE SUMMARY											
		MAIN	SRTCTP	SRTTDB	SVRUSI	SVRUS2	SYNC	SYNCT	TBLOCK	TRACKD	TRMNTE	UPDATE	WPTB
ITDURT	I									F C			
ITEVNT	I	F C					C	C		C			
ITGRDI	I	C					C			C			
ITIMEC	I	A FSC					C	C		C			
ITIMEE	I	C					C	C		C			
ITIMES	I	C					C	C		C			
ITIME1	I							C					
ITIME2	I							C					
ITRANW	I	C					C	C		C			
ITRK1	I									SC			
ITRNRU	I	C					C	C		C			
ITSKFN	I							F C					
ITSKTP	I							C					
ITTYPE	I												
ITI	I		A F T		C	C						C	
IT2	I		A F T		C	C						C	
IWTASK	I												
I1FREE	I												
I1PTB	I												
JALTR	I												
JARUDB	I												
JBLKT	I												
JBLOCN	I												
JBTYPE	I												
JCONSU	I												
JDATE	I												
JDTYPE	I												

CROSS REFERENCE SUMMARY C****************************** TRAM3 ********************************

SYMBOL	TYPE	USAGE SUMMARY											
		WRLTDB	WRUB	WRUDB	ADDTDQ	ALLOC	ALLOCA	ALLOCD	ASCLS	ASCLSS	CALQ	CBLOCK	CLASCG
ITDURT	I	F C					F C	F C					
ITEVNT	I				C						C		C
ITGRD1	I				C								C
ITIMEC	I				C						C		C
ITIMEE	I				C						C		C
ITIMES	I				C						C		C
ITIME1	I					A F							
ITIME2	I					A F							
ITRANW	I				C						C		C
ITRK1	I	C					C	C					
ITRNRU	I				C						C		C
ITSKFN	I												
ITSKTP	I												
ITTYPE	I				A F								
IT1	I												
IT2	I												
IWTASK	I												
I1FREE	I				FSC								
IIPTB	I												
JALTR	I												
JARUDB	I												
JBLKT	I												
JBLDCN	I												
JBTYPE	I												
JCONSU	I												
JDATE	I												
JDTYPE	I												

CROSS REFERENCE SUMMARY C********** TRAM3 **********

SYMBOL	TYPE	USAGE SUMMARY											
		CLSDMP	CORR	DETLAG	DTRNSF	ERROR	EXECT	FORMC	FORMQ	FRETDB	FRMPTB	GENTDB	GETCLS
ITDURT	I										C	FSC	
ITEVNT	I		C	C	C		C	FSC	FSC				
ITGRD1	I				C			C	F C	C			
ITIMEC	I		C	A F C	C		C	C	F C				
ITIMEE	I		C	C	C		C	C	F C				
ITIMES	I		C	C	C		C	C	F C				
ITIME1	I						SC						
ITIME2	I						SC						
ITRANW	I		C	C	C		C	C	C				
ITRK1	I										C	C	
ITRNRU	I		C	C	C		C	C	F C				
ITSKFN	I						F C						
ITSKTP	I						F C						
ITTYPE	I								A FSC				
IT1	I			C									
IT2	I			C									
IWTASK	I				C								
I1FREE	I							C		FSC			
I1PTB	I										C		
JALTR	I												
JARUDB	I												
JBLKT	I												
JBLOCN	I												
JBTYPE	I												
JCONSU	I												
JDATE	I							A F C					
JDTYPE	I							A F C					

CROSS REFERENCE SUMMARY C********** TRAM3 **********

SYMBOL	TYPE	USAGE SUMMARY												
		GETPTB	GETTDB	GRADF	INITR	LAG	LSTASK	LSTRAK	LSTSRC	MLTCLS	NEGUSE	NEWCLS	PBLOCK	
ITDURT	I							C						
ITEVNT	I			C			C			C		C		
ITGRD1	I		C	C						C		C		
ITIMEC	I			C			C			C		C		
ITIMEE	I			C			C			C		C		
ITIMES	I			C			C			C		C		
ITIME1	I						C							
ITIME2	I						C							
ITRANW	I			C			C			C		C		
ITRK1	I							C						
ITRNRU	I			C			C			C		C		
ITSKFN	I						F C							
ITSKTP	I						C							
ITTYPE	I		A S											
IT1	I				C						C			
IT2	I				C						C			
IWTASK	I								A F T					
I1FREE	I		C											
I1PTB	I	C												
JALTR	I													
JARUDB	I													
JBLKT	I													
JBLOCN	I													
JBTYPE	I													
JCONSU	I													
JDATE	I			C										
JDTYPE	I			C										

CROSS REFERENCE SUMMARY C******************************** TRAM3 ********************************

SYMBOL	TYPE	USAGE SUMMARY											
		PLIST	PREPC	PTBDMP	PUTCLS	PUTPTB	REMCLS	REMPTB	RESINV	RESUSE	RUSER	SCATSA	SPLIT
ITDURT	I											C	
ITEVNT	I		C				C		C	C	C		C
ITGRD1	I												
ITIMEC	I		FSC				C		C	F C	C		C
ITIMEE	I		C				C		C	C	C		C
ITIMES	I		C				C		C	C	C		C
ITIME1	I								A F	A F C			
ITIME2	I								A F	A F C			
ITRANW	I		C				C		C	C	C		C
ITRK1	I											F C	
ITRNRU	I		C				C		C	C	C		C
ITSKFN	I									C			
ITSKTP	I									C			
ITTYPE	I												
IT1	I								FSC	C			
IT2	I								FSC	C			
IWTASK	I												
I1FREE	I												
I1PTB	I			F C		SC		FSC					
JALTR	I									F C			
JARUDB	I									A SC			
JBLKT	I									C			
JBLOCN	I									A C			
JBTYPE	I									C			
JCONSU	I									A C			
JDATE	I												
JDTYPE	I												

CROSS REFERENCE SUMMARY C********** TRAM3 **********

SYMBOL	TYPE	USAGE SUMMARY
		INIT
ITDURT	I	
ITEVNT	I	C
ITGRD1	I	C
ITIMEC	I	SC
ITIMEE	I	A FSC
ITIMES	I	FSC
ITIME1	I	
ITIME2	I	
ITRANW	I	FSC
ITRK1	I	
ITRNRU	I	FSC
ITSKFN	I	
ITSKTP	I	
ITTYPE	I	
IT1	I	C
IT2	I	C
IWTASK	I	
I1FREE	I	SC
I1PTB	I	SC
JALTR	I	
JARUDB	I	
JBLKT	I	
JBLOCN	I	
JBTYPE	I	
JCONSU	I	
JDATE	I	C
JDTYPE	I	C

CROSS REFERENCE SUMMARY C********** TRAM3 **********

SYMBOL	TYPE	USAGE SUMMARY											
		MAIN	SRTCTP	SRTTDB	SVRUS1	SVRUS2	SYNC	SYNCT	TBLOCK	TRACKD	TRMNTE	UPDATE	WPTB
JID	I												
JNTBN	I												
JRESNO	I												
JRUGF	I												
JRUTF	I												
JTTYPE	I												
KEOF	I	C					C	C		C			
KLASZE	I							SC					
KTIME1	I							FSC					
KTIME2	I							FSC					
LAGC	I	F C					C	C					
LAGT	I	C					C						
LAGTOT	I	C					C						
LBRNCH	I						C	C					
LIMIS	I				F C	C						C	
LIMITC	I	C					C						
LIMIT1	I												
LIMNS	I				F C	C						C	
LIMNXT	I				C	C						C	
LIMPTB	I												
LIMRES	I				C	C						C	
LIMTR	I												
LITIM1	I							C					
LITIM2	I							C					
LOTIM1	I				C	C						A C	
LOTIM2	I				C	C						A C	
LRSON	I	C					C						

CROSS REFERENCE SUMMARY C********** TRAM3 **********

USAGE SUMMARY

SYMBOL	TYPE	WRLTDB	WRUB	WRUDB	ADDTDQ	ALLOC	ALLOCA	ALLOCD	ASCLS	ASCLSS	CALQ	CBLOCK	CLASCG
JID	I												
JNTBN	I												
JRESNO	I												
JRUGF	I												
JRUTF	I												
JTTYPE	I												
KEOF	I				C						C		C
KLASZE	I												
KTIME1	I												
KTIME2	I												
LAGC	I								C	C			
LAGT	I												
LAGTOT	I												
LBRNCH	I												
LIMIS	I												
LIMITC	I												
LIMITI	I				F C								
LIMNS	I												
LIMNXT	I												
LIMPTB	I												
LIMRES	I												
LIMTR	I												
LITIM1	I												
LITIM2	I												
LOTIM1	I												
LOTIM2	I												
LRSON	I												

CROSS REFERENCE SUMMARY C******************************** TRAM3 **********************************

SYMBOL	TYPE	USAGE SUMMARY											
		CLSDMP	CORR	DETLAG	DTRNSF	ERROR	EXECT	FORMC	FORMQ	FRETDB	FRMPTB	GENTDB	GETCLS
JID	I							A F C					
JNTBN	I												
JRESNO	I												
JRUGF	I												
JRUTF	I												
JTTYPE	I							A F C					
KEOF	I		C	C	C		C	C	C				
KLASZE	I						F C						
KTIME1	I						F C						
KTIME2	I						F C						
LAGC	I		C				C						
LAGT	I		C		C		C				C		
LAGTOT	I		C		C		C				C		
LBRNCH	I		C		A F C		C						
LIMIS	I			C									
LIMITC	I	F C	C										C
LIMIT1	I							C		C			
LIMNS	I			C									
LIMNXT	I			F C									
LIMPTB	I										C		
LIMRES	I			C									
LIMTR	I							F C					
LITIM1	I						SC						
LITIM2	I						SC						
LOTIM1	I			C									
LOTIM2	I			C									
LRSON	I		C		C		C				C		

CROSS REFERENCE SUMMARY C********** TRAM3 **********

SYMBOL	TYPE	USAGE SUMMARY											
		GETPTB	GETTDB	GRADF	INITR	LAG	LSTASK	LSTRAK	LSTSRC	MLTCLS	NEGUSE	NEWCLS	PBLOCK
JID	I			C									
JNTBN	I												
JRESNO	I												
JRUGF	I												
JRUTF	I												
JTTYPE	I			C									
KEOF	I			C			C			C		C	
KLASZE	I						SC						
KTIMEI	I						FSC						
KTIME2	I						FSC						
LAGC	I					C	C						
LAGT	I						C						
LAGTOT	I						C						
LBRNCH	I						C						
LIMIS	I				C						C		
LIMITC	I					C						F C	
LIMIT1	I		C										
LIMNS	I				C						C		
LIMNXT	I				C						C		
LIMPTB	I	C											
LIMRES	I				F C						C		
LIMTR	I			C									
LITIM1	I						C						
LITIM2	I						C						
LOTIMI	I				C						C		
LOTIM2	I				C						C		
LRSON	I						C						

CROSS REFERENCE SUMMARY C********** TRAM3 **********

SYMBOL	TYPE	USAGE SUMMARY											
		PLIST	PREPC	PTBDMP	PUTCLS	PUTPTB	REMCLS	REMPTB	RESINV	RESUSE	RUSER	SCATSA	SPLIT
JID	I												
JNTBN	I									A C			
JRESNO	I									A F C			
JRUGF	I									A C			
JRUTF	I									A C			
JTTYPE	I												
KEOF	I		C				C		C	C	C		C
KLASZE	I	F C											
KTIME1	I	F C											
KTIME2	I	F C											
LAGC	I		FSC										
LAGT	I											C	L
LAGTOT	I											C	F C
LBRNCH	I												F C
LIMIS	I								C	C			
LIMITC	I		C		C		C						C
LIMIT1	I												
LIMNS	I								C	C			
LIMNXT	I								F C	C			
LIMPTB	I			F C		C		C					
LIMRES	I								C	C			
LIMTR	I												
LITIM1	I								A F	A F C			
LITIM2	I								A F	A F C			
LOTIM1	I								A F C	C			
LOTIM2	I								A F C	C			
LRSON	I											C	C

CROSS REFERENCE SUMMARY C****************************** TRAN3 **********************************

SYMBOL	TYPE	USAGE SUMMARY INIT
JID	I	C
JNTBN	I	
JRESNO	I	
JRUGF	I	
JRUTF	I	
JTTYPE	I	C
KEOF	I	C
KLASZE	I	
KTIME1	I	
KTIME2	I	
LAGC	I	C
LAGT	I	
LAGTOT	I	
LBRNCH	I	
LIMIS	I	SC
LIMITC	I	FSC
LIMIT1	I	FSC
LIMNS	I	SC
LIMNXT	I	SC
LIMPTB	I	FSC
LIMRES	I	SC
LIMTR	I	SC
LITIM1	I	
LITIM2	I	
LOTIM1	I	C
LOTIM2	I	C
LRSON	I	

CROSS REFERENCE SUMMARY C****************************** TRAM3 ********************************

SYMBOL	TYPE	USAGE SUMMARY											
		MAIN	SRTCTP	SRTTDB	SVRUS1	SVRUS2	SYNC	SYNCT	TBLOCK	TRACKD	TRMNTE	UPDATE	WPTB
LTIME1	I							FSC					
LTIME2	I							FSC					
MAXCLS	I	C					F C			C			
MAXLAG	I	C					C	C		C			
MINGRD	I	F C					C	C		C			
MRUDBS	I												
MXTRUB	I												
NACLS	I	F C					C	C					
NBI	I				C	C						C	
NBUCKT	I				C	C						C	
NCGRPS	I												
NCING	I												
NCLSES	I	F C					C	C		C			
NCOURS	I	C					C			C			
NCRSES	I	F C					C	C		F C			
NDXCLS	I	A FSC					F C						
NDXND1	I	C					C			C			
NDXTDL	I	C					C			C			
NDXTD1	I	C					C			C			
NEXTPT	I												
NLBRNC	I						C	C					
NLFTB	I									F C			
NOPB	I	F C					C	F C					
NOSRCS	I									FSC			
NOSTDS	I	C					F C						
NOTDRS	I	C					C	C		C			
NPARMS	I							C					

CROSS REFERENCE SUMMARY C********** TRAM3 **********

SYMBOL	TYPE	USAGE SUMMARY											
		WRLTDB	WRUB	WRUDB	ADDTDQ	ALLOC	ALLOCA	ALLOCD	ASCLS	ASCLSS	CALQ	CBLOCK	CLASCG
LTIME1	I												
LTIME2	I												F C
MAXCLS	I				C						C		C
MAXLAG	I				C						C		C
MINGRD	I				C								
MRUDBS	I												
MXTRUB	I												
NACLS	I								F C	F C			
NBI	I										A F		
NBUCKT	I												
NCGRPS	I												F C
NCING	I												F C
NCLSES	I				C						C		C
NCOURS	I				F C								C
NCRSES	I				C						C		C
NDXCLS	I												
NDXNDI	I				C								C
NDXTDL	I				FSC								C
NDXTD1	I				FSC								C
NEXTPT	I												
NLBRNC	I												
NLFTB	I	F C					C	C					
NOPB	I								F C	F C			
NOSRCS	I						C	C					
NOSTDS	I												
NOTDRS	I				C						C		C
NPARMS	I												

CROSS REFERENCE SUMMARY C********** TRAM3 **********

SYMBOL	TYPE	USAGE SUMMARY											
		CLSDMP	CORR	DETLAG	DTRNSF	ERROR	EXECT	FORMC	FORMQ	FRETDB	FRMPTB	GENTDB	GETCLS
LTIME1	I						F C						
LTIME2	I						F C						
MAXCLS	I				C			C	C	C			
MAXLAG	I		F C	C	C		C	C	C				
MINGRD	I		C	C	C		C	FSC	A FSC				
MRUDBS	I												
MXTRUB	I												
NACLS	I		C				C						
NBI	I			C									
NBUCKT	I			C									
NCGRPS	I												
NCING	I												
NCLSES	I		C	C	C		C	C	C				
NCOURS	I				C			C	C	C			
NCRSES	I		C	C	C		C	F C	F C				
NDXCLS	I		F C		A C		A FSC				C		
NDXND1	I				C			C	C	C			
NDXTDL	I				C			C	C	SC			
NDXTD1	I				C			C	C	FSC			
NEXTPT	I												
NLBRNC	I		C		F C		C						
NLFTB	I										F C	FSC	
NOPB	I		C				C						
NOSRCS	I						C					F C	
NOSTDS	I		F C		C		F C				C		
NOTDRS	I		C	C	C		C	C	FSC				
NPARMS	I						C						

CROSS REFERENCE SUMMARY C********** TRAM3 **********

SYMBOL	TYPE	USAGE SUMMARY	GETPTB	GETTDB	GRADF	INITR	LAG	LSTASK	LSTRAK	LSTSRC	MLTCLS	NEGUSE	NEWCLS	PBLOCK
LTIME1	I							SC						
LTIME2	I							SC						
MAXCLS	I			C	C									
MAXLAG	I										F C		C	
MINGRD	I				C			C			C		C	
MRUDBS	I				C			C			C		C	
MXTRUB	I													
NACLS	I						C	C						
NBI	I					C								
NBUCKT	I					C						C		
NCGRPS	I											C		
NCING	I									C				
NCLSES	I				C					CE				
NCOURS	I			C	C			C			C		FSC	
NCRSES	I				C						C		C	
NDXCLS	I							C			C		C	
NDXND1	I			C	C			A F C						
NDXTDL	I			C	C						C		C	
NDXTD1	I			F C	C						C		C	
NEXTPT	I										C		C	
NLBRNC	I													
NLFTB	I							C						
NOPB	I								C					
NOSRCS	I						C	C						
NOSTDS	I									FSC				
NOTDRS	I							F C						
NPARMS	I				C			C			C		C	
								C						

CROSS REFERENCE SUMMARY C******************************** TRAM3 ********************************

SYMBOL	TYPE	USAGE SUMMARY												
		PLIST	PREPC	PTBDMP	PUTCLS	PUTPTB	REMCLS	REMPTB	RESINV	RESUSE	RUSER	SCATSA	SPLIT	
LTIME1	I	F C												
LTIME2	I	F C												
MAXCLS	I													
MAXLAG	I		C				C		C	C	C		C	
MINGRD	I		C				C		C	C	C		C	
MRUDBS	I									F C				
MXTRUB	I									C				
NACLS	I		A FSC											
NBI	I								FSC	A C				
NBUCKT	I								SC	C				
NCGRPS	I													
NCING	I													
NCLSES	I		F C				FSC		C	C	C		C	
NCOURS	I													
NCRSES	I		C				C		C	C	C		C	
NDXCLS	I											A F C	A C	
NDXND1	I													
NDXTDL	I													
NDXTD1	I													
NEXTPT	I												F C	
NLBRNC	I												F C	
NLFTB	I											C		
NOPB	I		FSC											
NOSRCS	I											C		
NOSTDS	I											A F C	F C	
NOTDRS	I		C				C		C	C	C		C	
NPARMS	I									C				

CROSS REFERENCE SUMMARY C********** TRAM3 **********

SYMBOL	TYPE	USAGE SUMMARY INIT
LTIME1	I	
LTIME2	I	
MAXCLS	I	C
MAXLAG	I	FSC
MINGRD	I	SC
MRUDBS	I	
MXTRUB	I	
NACLS	I	SC
NBI	I	C
NBUCKT	I	C
NCGRPS	I	FSC
NCING	I	SC
NCLSES	I	SC
NCOURS	I	F C
NCRSES	I	SC
NDXCLS	I	
NDXND1	I	SC
NDXTDL	I	SC
NDXTD1	I	SC
NEXTPT	I	
NLBRNC	I	
NLFTB	I	
NDPB	I	C
NOSRCS	I	
NOSTDS	I	
NOTDRS	I	SC
NPARMS	I	

CROSS REFERENCE SUMMARY C********** TRAM3 **********

SYMBOL	TYPE	USAGE SUMMARY											
		MAIN	SRTCTP	SRTTDB	SVRUS1	SVRUS2	SYNC	SYNCT	TBLOCK	TRACKD	TRMNTE	UPDATE	WPTB
NPROCB	I	C					A F C						
NRBRNC	I						C	C					
NRESCR	I				C	C						F C	
NRUDBS	I												
NSAVE	I				F C	FSC						C	
NSRCE	I									F C			
NSYNCT	I							SC					
NTASKS	I						C	F C					
NTDBRL	I									A FSC			
NTSKS	I							FSC					
NUMBLK	I									F C			
NUMCRS	I	A C					C						
NUMCRU	I												
NUMGRD	I	C					C						
NUMSTA	I									C			
NUMTR	I												
NXT	I				C	C						SC	A F T
NXTBRK	I	FSC					F C	C		C			
NXTFPT	I												
NXTFRE	I	C					C						
NXTNDA	I									F C			
NXTRUB	I												
PB	CB						C	C					
PROP	R												
PTB	CB												
PTBC	CB												
RES	CB				C	C						C	

CROSS REFERENCE SUMMARY C********** TRAM3 **********

SYMBOL	TYPE	USAGE SUMMARY												
		WRLTDB	WRUB	WRUDB	ADDTDQ	ALLOC	ALLOCA	ALLOCD	ASCLS	ASCLSS	CALQ	CBLOCK	CLASCG	
NPROCB	I													
NRBRNC	I													
NRESCR	I													
NRUDBS	I													
NSAVE	I													
NSRCE	I	F C					F C	F C						
NSYNCT	I													
NTASKS	I													
NTDBRL	I	C					C	C						
NTSKS	I													
NUMBLK	I	F C					C	C						
NUMCRS	I													
NUMCRU	I													
NUMGRD	I												A FSC	
NUMSTA	I	C					FSC	FSC						
NUMTR	I													
NXT	I													
NXTBRK	I				C						C		C	
NXTFPT	I													
NXTFRE	I													
NXTNDA	I	F C					C	C						
NXTRUB	I													
PB	CB													
PROP	R													
PTB	CB													
PTBC	CB													
RES	CB													

CROSS REFERENCE SUMMARY C********** TRAM3 **********

SYMBOL	TYPE	USAGE SUMMARY											
		CLSDMP	CORR	DETLAG	DTRNSF	ERROR	EXECT	FORMC	FORMQ	FRETDB	FRMPTB	GENTDB	GETCLS
NPROCB	I		A F C		A SC		A C				F C		
NRBRNC	I		C		C		C						
NRESCR	I			C									
NRUDBS	I												
NSAVE	I			C									
NSRCE	I												
NSYNCT	I										C	FSC	
NTASKS	I		C		C		C						
NTDBRL	I												
NTSKS	I										C	FSC	
NUMBLK	I						F C						
NUMCRS	I		C		A C		A F C				F C	FSC	
NUMCRU	I										C		
NUMGRD	I		C		C		C						
NUMSTA	I										C		
NUMTR	I										F C	C	
NXT	I			A F C				A FSC					
NXTBRK	I		F C	C	FSC		C	C	C				
NXTFPT	I												
NXTFRE	I	F C	C								C		
NXTNDA	I												C
NXTRUB	I										F C	FSC	
PB	CB		C		C		C						
PROP	R												
PTB	CB												
PTBC	CB												
RES	CB			C							C		

CROSS REFERENCE SUMMARY C******************************** TRAM3 **********************************

SYMBOL	TYPE	USAGE SUMMARY											
		GETPTB	GETTDB	GRADF	INITR	LAG	LSTASK	LSTRAK	LSTSRC	MLTCLS	NEGUSE	NEWCLS	PBLOCK
NPROCB	I						A F C	A F					
NRBRNC	I						C						
NRESCR	I				C						C		
NRUDBS	I												
NSAVE	I				C						FSC		
NSRCE	I							C					
NSYNCT	I						SC						
NTASKS	I						F C						
NTDBRL	I							C					
NTSKS	I						FSC		FS				
NUMBLK	I							F C					
NUMCRS	I						A C						
NUMCRU	I								C				
NUMGRD	I						C						
NUMSTA	I							C					
NUMTR	I			F C									
NXT	I				SC						C		
NXTBRK	I			C			C			C		C	
NXTFPT	I	C											
NXTFRE	I					C						FSC	
NXTNDA	I							C					
NXTRUB	I												
PB	CB						C						
PROP	R												
PTB	CB												
PTBC	CB	C											
RES	CB				C						C		

CROSS REFERENCE SUMMARY C********** TRAM3 **********

SYMBOL	TYPE	USAGE SUMMARY											
		PLIST	PREPC	PTBDMP	PUTCLS	PUTPTB	REMCLS	REMPTB	RESINV	RESUSE	RUSER	SCATSA	SPLIT
NPROCB	I											A C	A F C
NRBRNC	I												C
NRESCR	I								C	C			
NRUDBS	I									F C			
NSAVE	I								C	SC			
NSRCE	I											C	
NSYNCT	I	F C											
NTASKS	I												C
NTDBRL	I											C	
NTSKS	I	F C											
NUMBLK	I											C	
NUMCRS	I											A F C	A F C
NUMCRU	I												
NUMGRD	I											C	F C
NUMSTA	I											SC	
NUMTR	I												
NXT	I					A F T			A FSC	C			
NXTBRK	I		FSC				C		C	C	C		C
NXTFPT	I			F C		FSC		FSC					
NXTFRE	I		C		C		FSC						C
NXTNDA	I											C	
NXTRUB	I									A F C			
PB	CB												C
PROP	R												F C
PTB	CB												C
PTBC	CB			C		C		C					
RES	CB								C	C			

CROSS REFERENCE SUMMARY C******************************** TRAM3 **********************************

SYMBOL	TYPE	USAGE SUMMARY: INIT
NPROCB	I	
NRBRNC	I	
NRESCR	I	C
NRUDBS	I	
NSAVE	I	C
NSRCE	I	
NSYNCT	I	
NTASKS	I	
NTDBRL	I	
NTSKS	I	
NUMBLK	I	
NUMCRS	I	
NUMCRU	I	SC
NUMGRD	I	
NUMSTA	I	
NUMTR	I	C
NXT	I	C
NXTBRK	I	SC
NXTFPT	I	SC
NXTFRE	I	SC
NXTNDA	I	
NXTRUB	I	
PB	CB	
PROP	R	
PTB	CB	
PTBC	CB	C
RES	CB	C

CROSS REFERENCE SUMMARY C********** TRAM3 **********

SYMBOL	TYPE	USAGE SUMMARY											
		MAIN	SRTCTP	SRTTDB	SVRUS1	SVRUS2	SYNC	SYNCT	TBLOCK	TRACKD	TRMNTE	UPDATE	WPTB
RLTDBC	CB									C			
RUB	CB												
RUDB	CB												
SORDSC	CB									C			
STUDNO	R												
STUDSN	R												
TB	CB							C					
TDR	CB												
TLIST	CB							C					
WORKB	CB												
WRKA	CB												

CROSS REFERENCE SUMMARY C********** TRAM3 **********

SYMBOL	TYPE	USAGE SUMMARY											
		WRLTDB	WRUB	WRUDB	ADDTDQ	ALLOC	ALLOCA	ALLOCD	ASCLS	ASCLSS	CALQ	CBLOCK	CLASCG
RLTDBC	CB	C					C	C					
RUB	CB												
RUDB	CB												
SORDSC	CB						C	C					
STUDNO	R												
STUDSN	R												
TB	CB												
TDR	CB												
TLIST	CB												
WORKB	CB												
WRKA	CB												

CROSS REFERENCE SUMMARY C********** TRAM3 **********

SYMBOL	TYPE	USAGE SUMMARY											
		CLSDMP	CORR	DETLAG	DTRNSF	ERROR	EXECT	FORMC	FORMQ	FRETDB	FRMPTB	GENTDB	GETCLS
RLTDBC	CB										C	C	
RUB	CB												
RUDB	CB												
SORDSC	CB						C					C	
STUDNO	R								A F S C				
STUDSN	R							A F C					
TB	CB						C						
TDR	CB								C				
TLIST	CB						C						
WORKB	CB				C								
WRKA	CB							C					

CROSS REFERENCE SUMMARY C********** TRAM3 **********

SYMBOL	TYPE	USAGE SUMMARY											
		GETPTB	GETTDB	GRADF	INITR	LAG	LSTASK	LSTRAK	LSTSRC	MLTCLS	NEGUSE	NEWCLS	PBLOCK
RLTDBC	CB							C					
RUB	CB												
RUDB	CB												
SORDSC	CB								C				
STUDNO	R												
STUDSN	R			F C									
TB	CB						C						
TDR	CB												
TLIST	CB						C						
WORKB	CB												
WRKA	CB			C									

CROSS REFERENCE SUMMARY C********** TRAM3 **********

SYMBOL	TYPE	USAGE SUMMARY											
		PLIST	PREPC	PTBDMP	PUTCLS	PUTPTB	REMCLS	REMPTB	RESINV	RESUSE	RUSER	SCATSA	SPLIT
RLTDBC	CB												
RUB	CB											C	
RUDB	CB									C			
SORDSC	CB									C			
STUDNO	R											C	
STUDSN	R												
TB	CB												
TDR	CB									C			
TLIST	CB	C											
WORKB	CB												
WRKA	CB												

CROSS REFERENCE SUMMARY

SYMBOL	TYPE	USAGE SUMMARY											
		RDNAME	*BLOCK	NAME	NUMBER	CLOCK	BLKIN	BLOCK	INTRES	INTSOR	UPDRES	UPDSOR	GETRES
BLKS	CB						C	C					
CBLK	CB						C	C					
CONTRL	CB					C							
IAVAIL	I										C	C	
IBLOCK	I								SC	SC	FSC	FSC	C
IBUCKT	I						SC	C					
ICTYPE	I								SC	SC	F C	F C	F C
ICU	I						SC	C					
IEGRAD	I									SC		C	
IFIRST	I	SC	C	F C	F C		SC	C					
IGRAD	I								SC	SC	FSC	FSC	F C
ILAST	I						SC	C					
IPEROD	I								SC	SC	FSC	FSC	C
IPRIOR	I						SC	C					
IPTYPE	I						SC	C					
IQUANT	I						SC	C					
ITIME	I								C	C	FSC	FSC	F C
ITIMEH	I					A F			C	C	FSC	FSC	F C
ITIMEL	I								C	C	FSC	FSC	F C
ITYPE	I	SC	D C	F C	F C				C	C	FSC	FSC	F C
IT1	I												
IUNIT	I	C	D C	C	C		DF		DF	DF	DF	DF	
IWORD	I						SC	F C					
JUNIT	I	F C	D C	C	C						DF	DF	
LBLOCK	I						SC	F C					
LINK	I								SC	SC	FSC	FSC	F C
MAVAIL	I								SC	SC	F C	F C	C

CROSS REFERENCE SUMMARY

SYMBOL	TYPE	USAGE SUMMARY		
		GETSOR	PUTRES	PUTSOR
BLKS	CB			
CBLK	CB			
CONTRL	CB			
IAVAIL	I	C	FSC	FSC
IBLOCK	I			
IBUCKT	I	F C	F C	F C
ICTYPE	I			
ICU	I	C		C
IEGRAD	I			
IFIRST	I	F C	FSC	FSC
IGRAD	I			
ILAST	I	C	FSC	FSC
IPEROD	I			
IPRIOR	I			
IPTYPE	I			
IQUANT	I	F C	SC	SC
ITIME	I	F C	FSC	FSC
ITIMEH	I	F C	F C	F C
ITIMEL	I	F C	F C	F C
ITYPE	I			
IT1	I		A F	A F
IUNIT	I			
IWORD	I			
JUNIT	I			
LBLOCK	I			
LINK	I	F C	FSC	FSC
MAVAIL	I	C	C	C

CROSS REFERENCE SUMMARY C********** TRAM3 **********:

SYMBOL	TYPE	INIT	USAGE SUMMARY
RLTDBC	CB		
RUB	CB		
RUDB	CB		
SORDSC	CB		
STUDNO	R		
STUDSN	R	C	
TB	CB		
TDR	CB		
TLIST	CB		
WORKB	CB		
WRKA	CB	C	

CROSS REFERENCE SUMMARY

SYMBOL	TYPE	USAGE SUMMARY											
		RDNAME	*BLOCK	NAME	NUMBER	CLOCK	BLKIN	BLOCK	INTRES	INTSOR	UPDRES	UPDSOR	GETRES
MAXNUM	I	SC	D C	C	C								
MXSIZE	I						SC	C					
NAM	CB	C	C	C	C								
NAME	I				A F T								
NAMES	I	SC	C	F C	F C								
NAVAIL	I								FSC	FSC	FSC	FSC	C
NBLOCK	I						SC	C					
NCOURS	I						SC	C					
NRES	I								FSC		F C		C
NSOR	I									FSC		F C	
NTYPE	I	SC	D C	F C	F C								
NUM	I	SC	C	F C	F C								
NUMBER	I			A F									
RES	CB								C		C		C
RSOURC	CB								C		C		C
SOR	CB									C		C	
SOURSE	CB									C		C	

CROSS REFERENCE SUMMARY

USAGE SUMMARY

SYMBOL	TYPE	GETSOR	PUTRES	PUTSOR
MAXNUM	I			
MXSIZE	I			
NAM	CB			
NAME	I			
NAMES	I			
NAVAIL	I	C	FSC	FSC
NBLOCK	I			
NCOURS	I			
NRES	I		C	
NSOR	I	C		C
NTYPE	I			
NUM	I			
NUMBER	I			
RES	CB		C	
RSOURC	CB		C	
SOR	CB	C		C
SOURSE	CB	C		C

Section 4.0
PHASE 4 PROGRAMMER'S GUIDE

Section 4.1
INTRODUCTION

The purpose of Phase 4 is to report the resource usage of the training system and to compute the associated costs.

This manual is intended to aid the programmer in the operation and modification of the computer program. It is assumed that the reader of this manual is already familiar with the contents of Technical Memorandum SAT-5, TRAM User's Guide.

Section 4.2

PROGRAM DESCRIPTION

The first processing performed by phase 4 is to read the card inputs and print them. The primary resources defined by the card inputs are then matched with the primary resources passed from phase 2 via file 24. The bucket sizes from that file complete the primary resource specifications from the card inputs. There must be a one to one correspondence between the resources from phase 2 and for those for phase 4. The secondary resources defined for phase 4 are completely independent of the other TRAM job steps.

The program then starts reading the use records from unit 40. The data from these records are stored in two separate common areas. One is for the periodic report, and the other is for the yearly report. Also, a plot bucket record is written to unit 51 for each primary resource that is to be plotted. The contents of these records will be discussed later. The program continues reading and processing the use records until the time for the next report, or the end of the run is reached.

The periodic report is produced at the specified frequency. This report consists of a printout of the information stored in the periodic report common variables. After the report is printed, the common area is cleared out for the next report. Note that this report is completely independent of the yearly report, and can be produced at any specified frequency.

The yearly report not only summarizes the resource usage, but also includes the costs associated with that usage. These costs are computed at the end of each year and stored for the final cost summary. A separate yearly report is printed for primary and secondary resources. At this time, RGU plot data are stored for those resources that are to be plotted. In addition, a plot bucket record is written for secondary resources (the bucket size for all secondary resources is one year.)

When the end of the run is reached, a final periodic and yearly report are printed, even if these reports would not normally be due at this time. The final cost summary is then printed. This report shows the costs that were incurred in each category for each year. They are shown in both current dollar

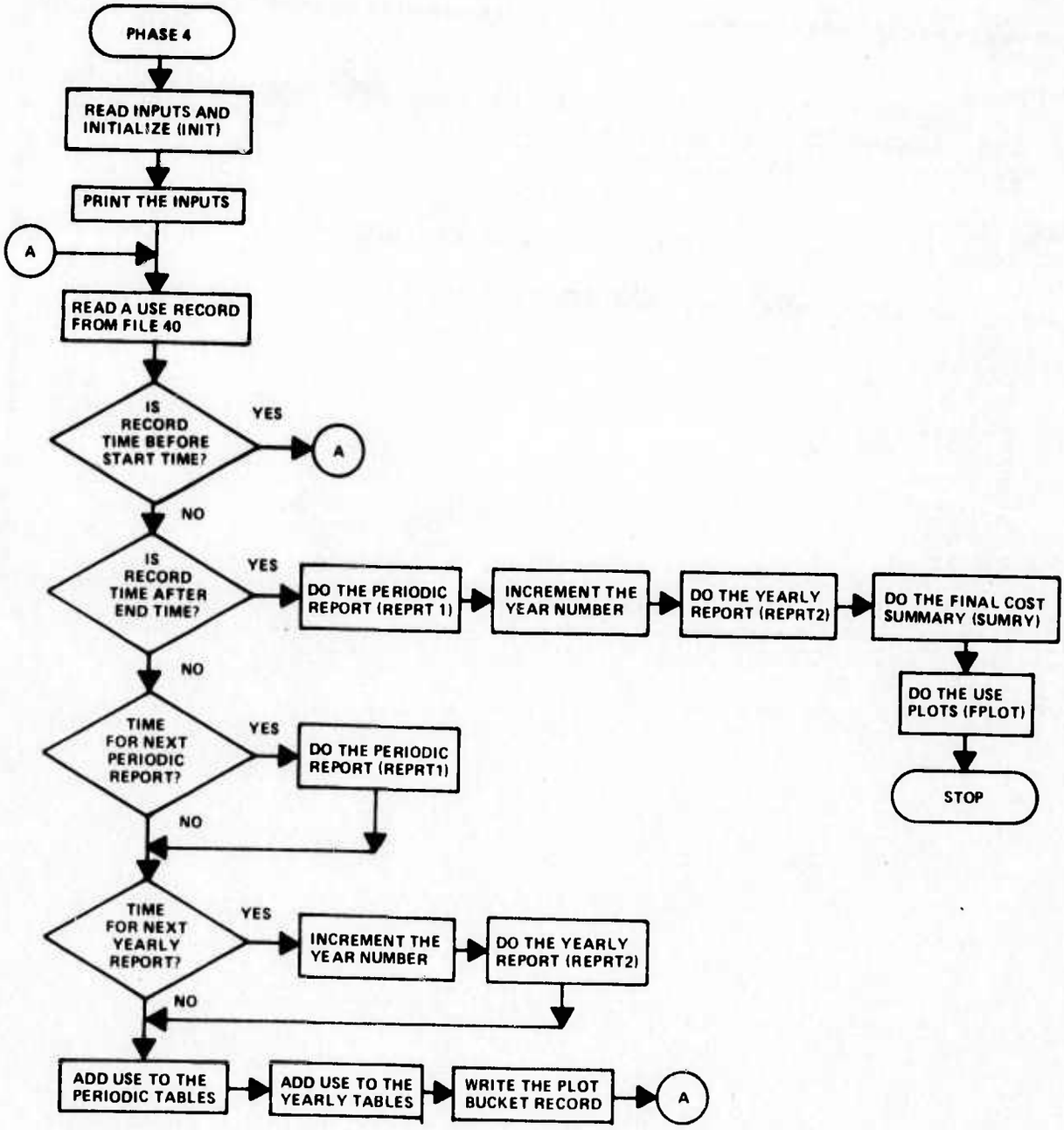
values and in inflated values. If RDT&E costs have been incurred in years prior to the start of the run, they will be shown in year zero and negative years.

The final processing that is done is to produce the use plots. The data for these plots have been stored throughout the run. RGU data, which consists of time, number of RGUs on hand, and actual use available, have been stored in common /RGU/. The two temporary files contain the rest of the required information. These are the plot bucket files that were referred to earlier. Their records contain the time, use, and maximum use available for the resources. The data contained on these files are retrieved and combined with the RGU data to produce the plots. Note that for secondary resources, the maximum use available is the same as the actual use available, since there is no maximum use restriction on secondary resources.

Section 4.3
SUBPROGRAM DESCRIPTIONS

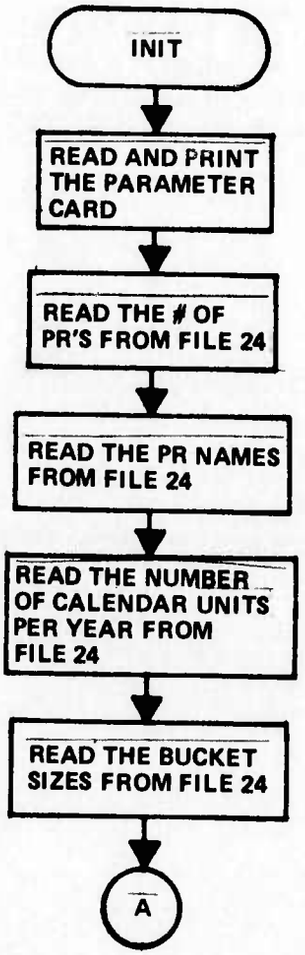
This section contains the descriptions of the individual subprograms that comprise phase 4 of the TRAM program. The description for each subprogram consists of a statement of the purpose of the routine, the calling sequence, a description of its parameters, the method used, and a list of the subprograms required. A high level flowchart, which shows the logical decision points and the processing accomplished, is also included for each of the major subprograms.

```
CC*****************************  PHASE 4  ******************************
CC*                                                                     *
CC*    PURPOSE                                                          *
CC*        TO REPORT THE TIME HISTORY OF TRAINING RESOURCE USAGE WHICH  *
CC*        WAS PASSED FROM PHASE 3, AND COMPUTE THE COSTS ASSOCIATED    *
CC*        WITH THE TRAINING SYSTEM                                     *
CC*                                                                     *
CC*    REFERENCES                                                       *
CC*        TRAM USERS GUIDE AND TRAM PROGRAMMERS GUIDE                  *
CC*                                                                     *
CC*    SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                     *
CC*        INIT                                                         *
CC*        PRINT1                                                       *
CC*        PRINT2                                                       *
CC*        PRINT3                                                       *
CC*        REPRT1                                                       *
CC*        REPRT2                                                       *
CC*        WPLOTB                                                       *
CC*        SUMRY                                                        *
CC*        FPLOT                                                        *
CC*                                                                     *
CC*********************************************************************
```

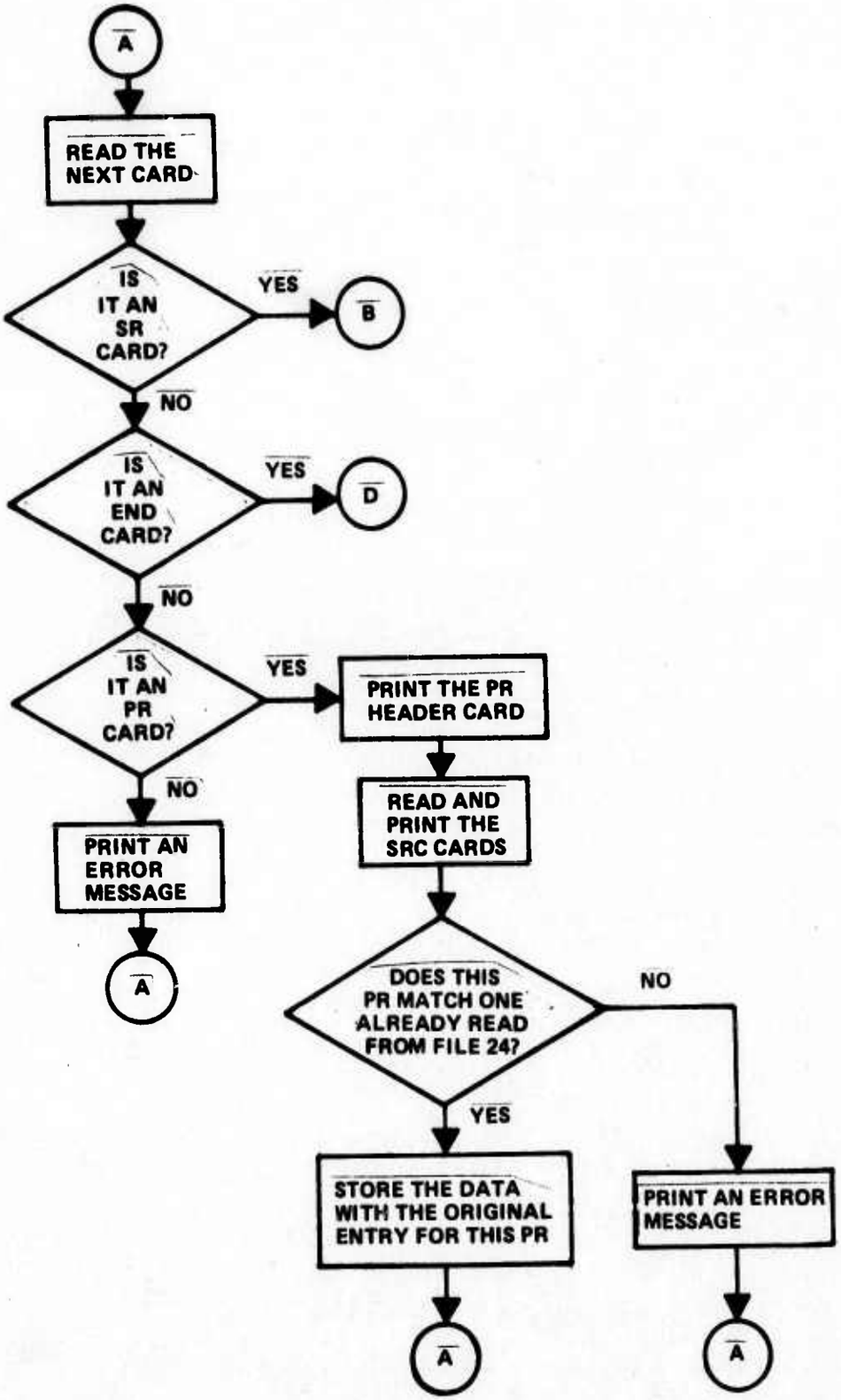


PHASE 4 MAIN PROGRAM

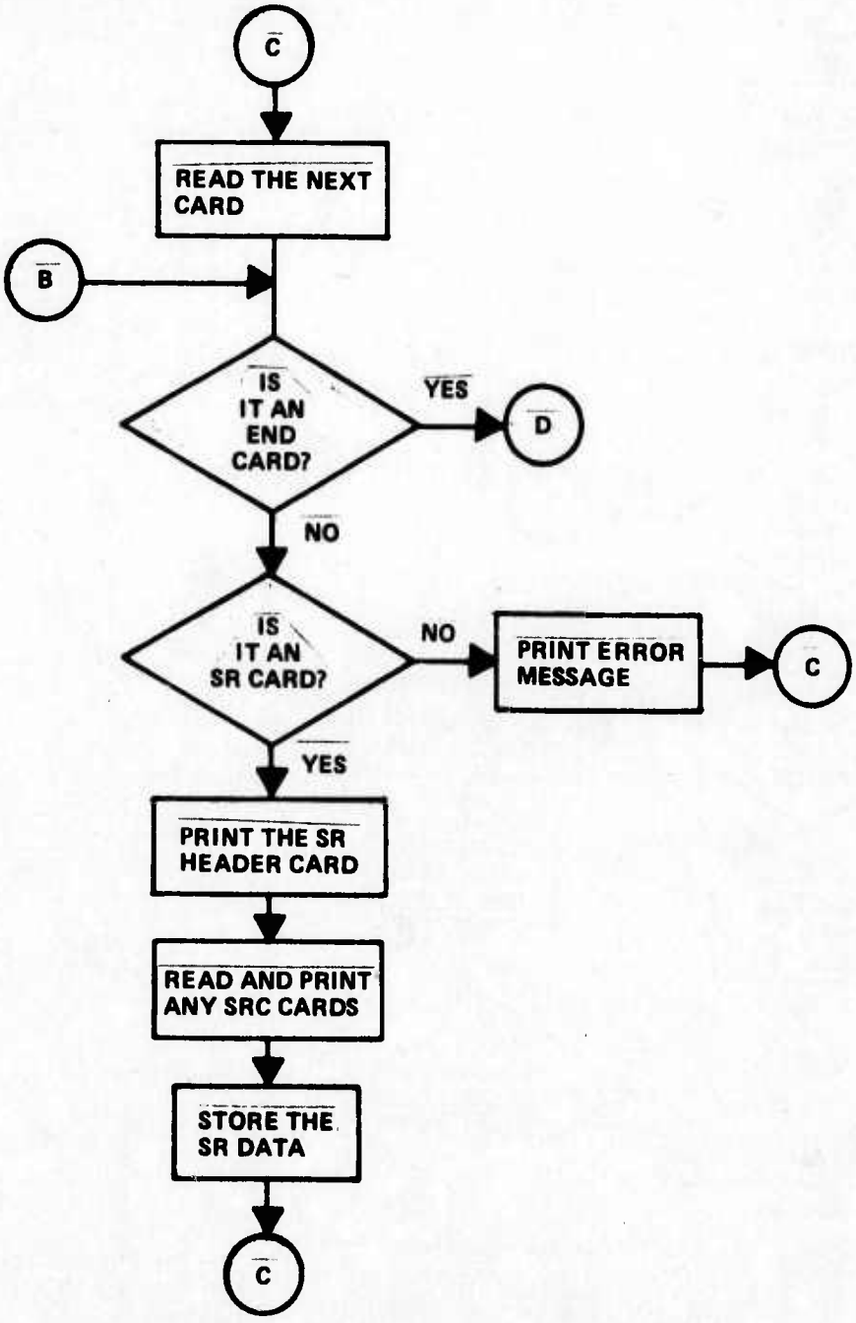
```
CC****************************** INIT ************************************
CC*                                                                      *
CC*                           SUBROUTINE INIT                            *
CC*                                                                      *
CC*   PURPOSE                                                            *
CC*      TO INITIALIZE STEP 4 OF TRAM. THIS INVOLVES THE FOLLOWING:      *
CC*      1 READ PARAMETERS CARD                                          *
CC*      2 READ PRIMARY RESOURCE DEFINITIONS PASSED FROM STEP 3          *
CC*      3 READ PRIMARY AND SECONDARY RESOURCE DATA FROM CARDS           *
CC*      4 SET RESOURCE USEAGE COUNTS AND COST SUMMARIES TO ZERO         *
CC*      5 SET UP TIME OF FIRST PEROIDIC AND YEARLY REPORTS              *
CC*                                                                      *
CC*   CALLING SEQUENCE                                                   *
CC*      CALL  INIT                                                      *
CC*                                                                      *
CC*   DESCRIPTION OF PARAMETERS                                          *
CC*      NONE                                                            *
CC*                                                                      *
CC*   SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                       *
CC*      CLEAR                                                           *
CC*      LOOKUP                                                          *
CC*      LOOK2                                                           *
CC*                                                                      *
CC************************************************************************
```



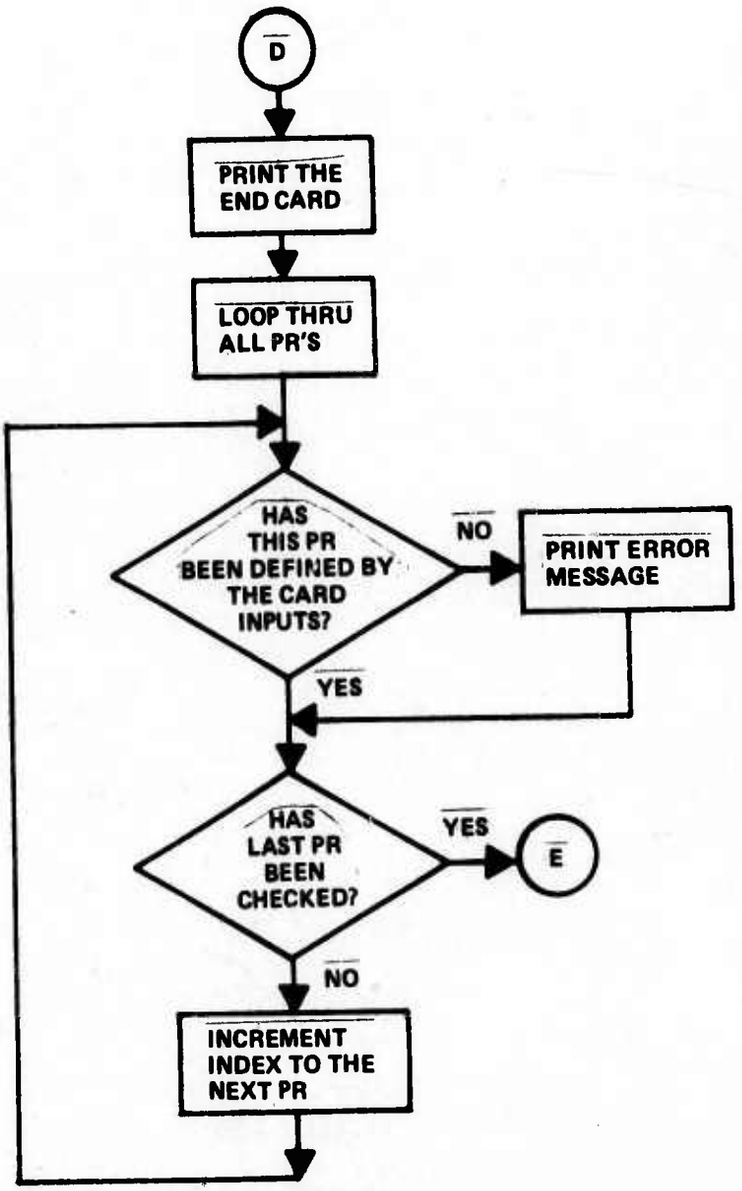
SUBROUTINE INIT



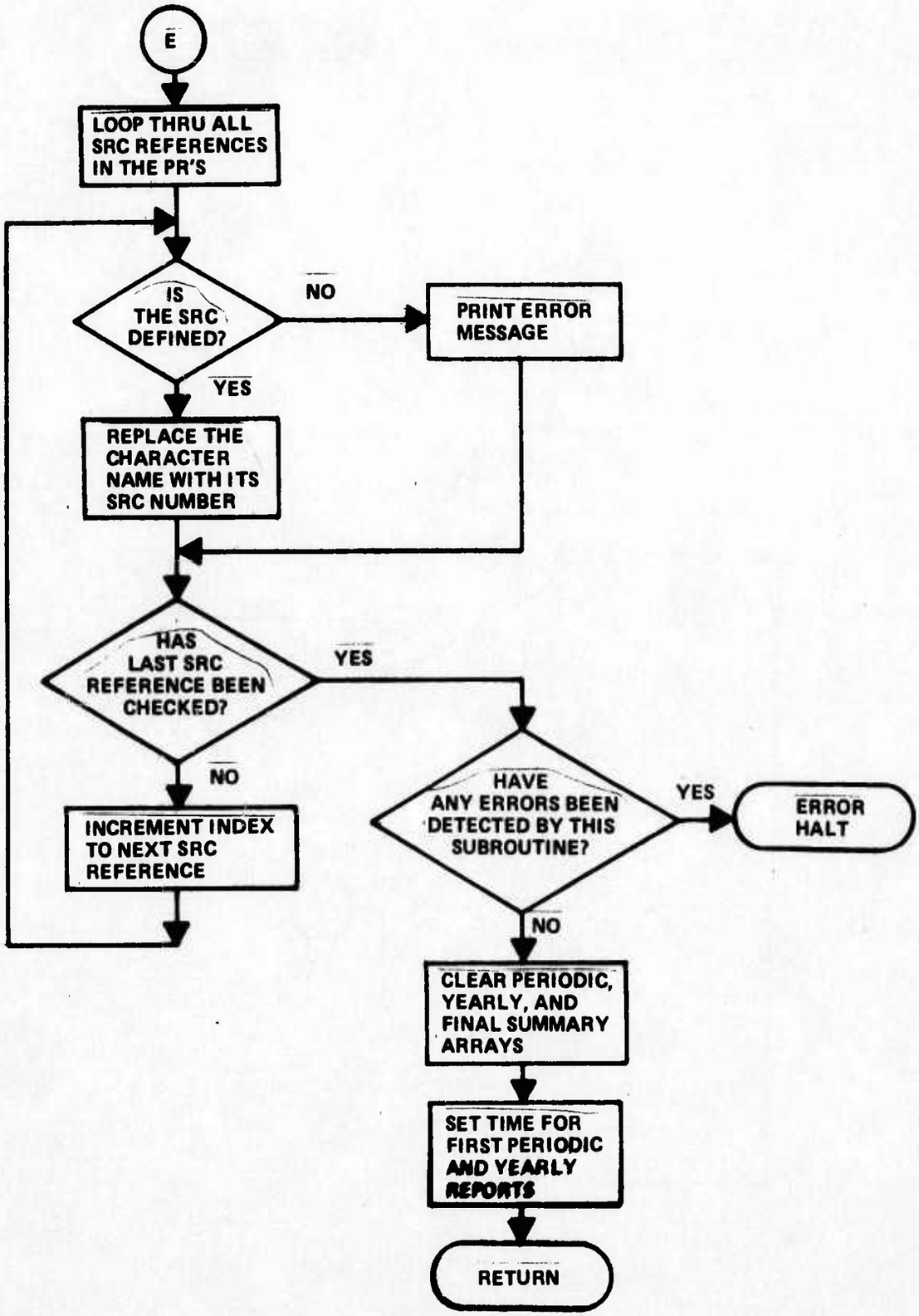
SUBROUTINE INIT -- CONTINUED



SUBROUTINE INIT – CONTINUED



SUBROUTINE INIT – CONTINUED



SUBROUTINE INIT – CONTINUED

```
CC*****************************  CLEAR  **********************************
CC*                                                                       *
CC*                          SUBROUTINE CLEAR                             *
CC*                                                                       *
CC*    PURPOSE                                                            *
CC*       TO CLEAR AN ARRAY TO ZERO                                       *
CC*                                                                       *
CC*    CALLING SEQUENCE                                                   *
CC*       CALL  CLEAR (IARRAY, NWDS)                                      *
CC*                                                                       *
CC*    DESCRIPTION OF PARAMETERS                                          *
CC*       IARRAY - ARRAY TO BE CLEARED                                    *
CC*       NWDS   - NUMBER OF ELEMENTS IN IARRAY TO BE CLEARED             *
CC*                                                                       *
CC*    SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                       *
CC*       NONE                                                            *
CC*                                                                       *
CC***************************************************************************
```

```
CC*****************************  BLOCKD  *********************************
CC*                                                                       *
CC*                            BLOCK DATA                                 *
CC*                                                                       *
CC*   PURPOSE                                                             *
CC*      TO INITIALIZE COMMON AREAS FOR TRAM STEP 4                       *
CC*                                                                       *
CC*************************************************************************
```

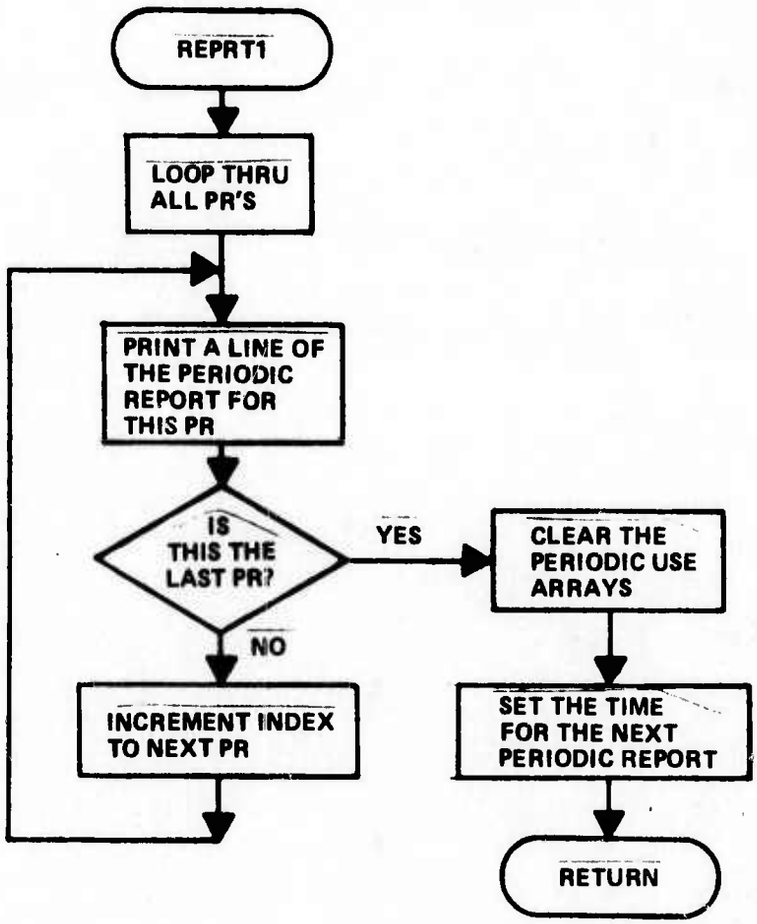
```
CC*****************************  LOOK2  *********************************
CC*                                                                       *
CC*                          SUBROUTINE LOOK2                             *
CC*                                                                       *
CC*    PURPOSE                                                            *
CC*       TO LOOK UP A VALUE IN A TABLE AND RETURN ITS POSITION.  THE     *
CC*       TABLE CONSISTS OF THOSE ELEMENTS IN A TWO DIMENSIONAL ARRAY     *
CC*       WHICH HAVE A CERTAIN FIXED FIRST SUBSCRIPT.                     *
CC*                                                                       *
CC*    CALLING SEQUENCE                                                   *
CC*       CALL  LOOK2  (IVAL, IARRAY, N1, N2, N1FIX, ICODE, INDEX)        *
CC*                                                                       *
CC*    DESCRIPTION OF PARAMETERS                                          *
CC*       INPUT                                                           *
CC*        IVAL   - VALUE TO BE SEARCHED FOR                              *
CC*        IARRAY - TABLE OF VALUES                                       *
CC*        N1     - DIMENSION OF FIRST SUBSCRIPT OF IARRAY                *
CC*        N2     - DIMENSION OF SECOND SUBSCRIPT OF IARRAY               *
CC*        N1FIX  - FIRST SUBSCRIPT OF VALUES IN IARRAY TO BE SEARCHED    *
CC*        ICODE  - DATA TYPE                                             *
CC*                   1    INTEGER                                        *
CC*                   2    CHARACTER                                      *
CC*       OUTPUT                                                          *
CC*        INDEX  - POSITION (SECOND SUBSCRIPT) OF THE VALUE IN THE       *
CC*                 TABLE   (ZERO IF NOT FOUND)                           *
CC*                                                                       *
CC*    SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                       *
CC*       NONE                                                            *
CC*                                                                       *
CC***********************************************************************
```

```
CC*****************************  PRINT1  ********************************
CC*                                                                      *
CC*                          SUBROUTINE PRINT1                           *
CC*                                                                      *
CC*                                                                      *
CC*    PURPOSE                                                           *
CC*       TO PRINT THE INPUT PARAMETERS FOR TRAM STEP 4                  *
CC*                                                                      *
CC*    CALLING SEQUENCE                                                  *
CC*       CALL  PRINT1                                                   *
CC*                                                                      *
CC*    DESCRIPTION OF PARAMETERS                                         *
CC*       NONE                                                           *
CC*                                                                      *
CC*    SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                      *
CC*       NONE                                                           *
CC*                                                                      *
CC************************************************************************
```

```
CC******************************  PRINT2  ********************************
CC*                                                                      *
CC*                          SUBROUTINE PRINT2                           *
CC*                                                                      *
CC*   PURPOSE                                                            *
CC*   .  TO PRINT A TABLE OF THE PRIMARY RESOURCE DEFINITIONS            *
CC*                                                                      *
CC*   CALLING SEQUENCE                                                   *
CC*      CALL  PRINT2                                                    *
CC*                                                                      *
CC*   DESCRIPTION OF PARAMETERS                                          *
CC*      NONE                                                            *
CC*                                                                      *
CC*   SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                       *
CC*      NONE                                                            *
CC*                                                                      *
CC************************************************************************
```

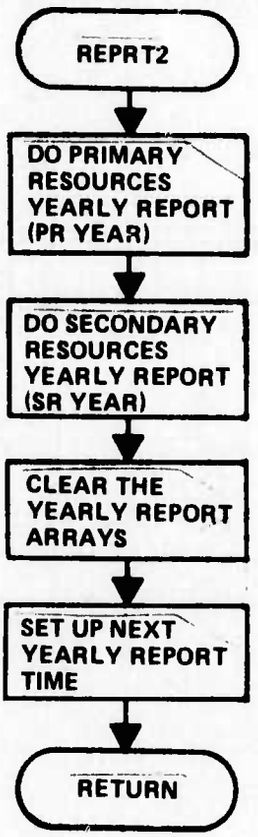
```
CC****************************** PRINT3 *******************************
CC*                                                                    *
CC*                       SUBROUTINE PRINT3                            *
CC*                                                                    *
CC*   PURPOSE                                                          *
CC*      TO PRINT A TABLE OF THE SECONDARY RESOURCE DEFINITIONS        *
CC*                                                                    *
CC*   CALLING SEQUENCE                                                 *
CC*      CALL  PRINT3                                                  *
CC*                                                                    *
CC*   DESCRIPTION OF PARAMETERS                                        *
CC*      NONE                                                          *
CC*                                                                    *
CC**********************************************************************
```

```
CC*****************************  REPRT1  *********************************
CC*                                                                       *
CC*                          SUBROUTINE REPRT1                            *
CC*                                                                       *
CC*    PURPOSE                                                            *
CC*       TO PRINT THE PERIODIC REPORT                                    *
CC*                                                                       *
CC*    CALLING SEQUENCE                                                   *
CC*       CALL  REPRT1                                                    *
CC*                                                                       *
CC*    DESCRIPTION OF PARAMETERS                                          *
CC*       NONE                                                            *
CC*                                                                       *
CC*    SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                       *
CC*       CLEAR                                                           *
CC*                                                                       *
CC*************************************************************************
```



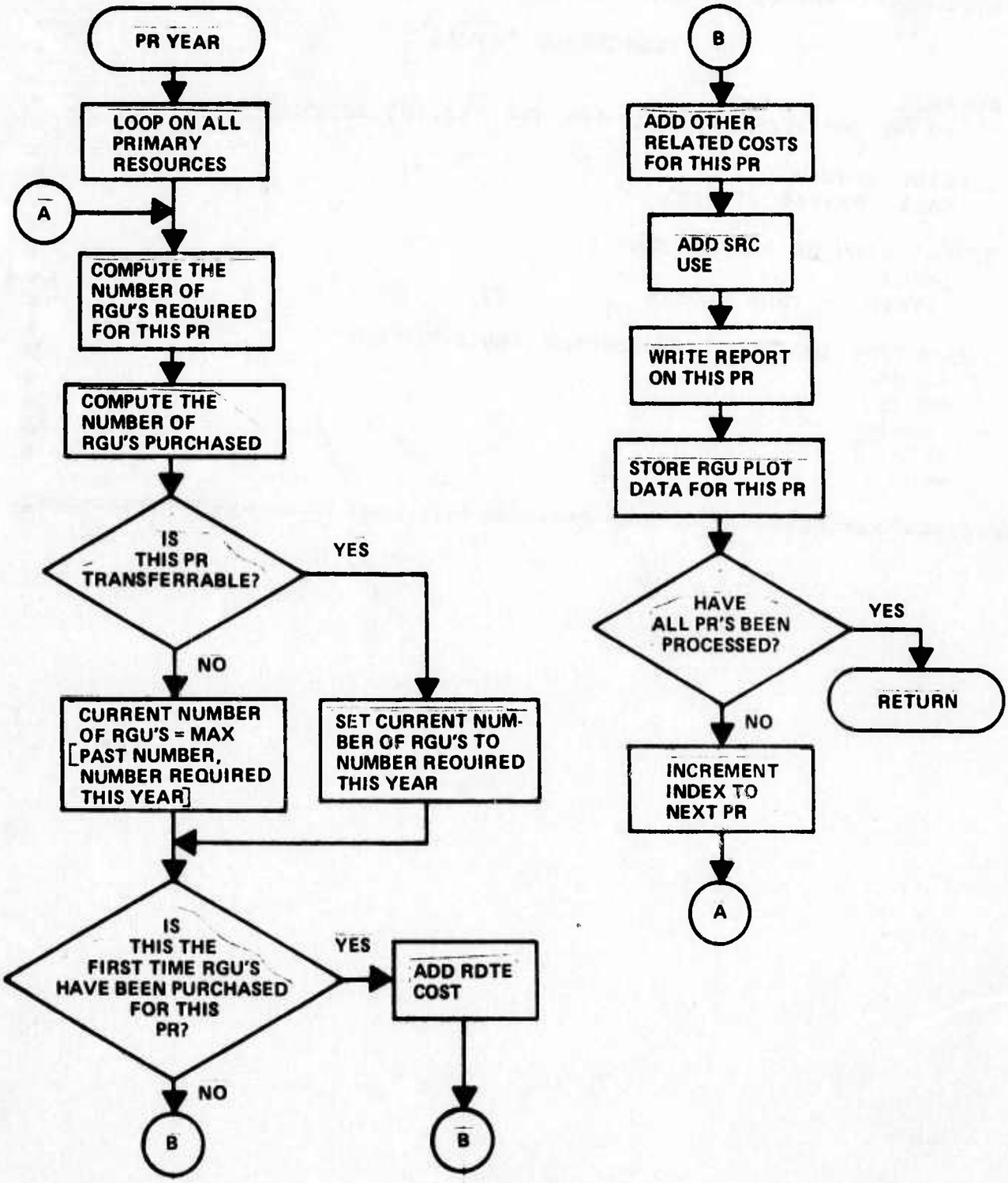
SUBROUTINE REPRT1

```
CC******************************** REPRT2 ***********************************
CC*                                                                         *
CC*                         SUBROUTINE REPRT2                              *
CC*                                                                         *
CC*   PURPOSE                                                               *
CC*      TO COMPUTE THE COSTS INCURRED BY THE RESOURCE USEAGE DURING        *
CC*      THE YEAR AND TO PRINT THE YEARLY SUMMARY REPORT                    *
CC*                                                                         *
CC*   CALLING SEQUENCE                                                      *
CC*      CALL  REPRT2 (IYEAR)                                               *
CC*                                                                         *
CC*   DESCRIPTION OF PARAMETERS                                             *
CC*      INPUT                                                              *
CC*       IYEAR  - YEAR NUMBER OF THIS REPORT                               *
CC*                                                                         *
CC*   SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                          *
CC*      CLEAR                                                              *
CC*      PRYEAR                                                             *
CC*      SRYEAR                                                             *
CC*                                                                         *
CC***************************************************************************
```



SUBROUTINE REPRT2

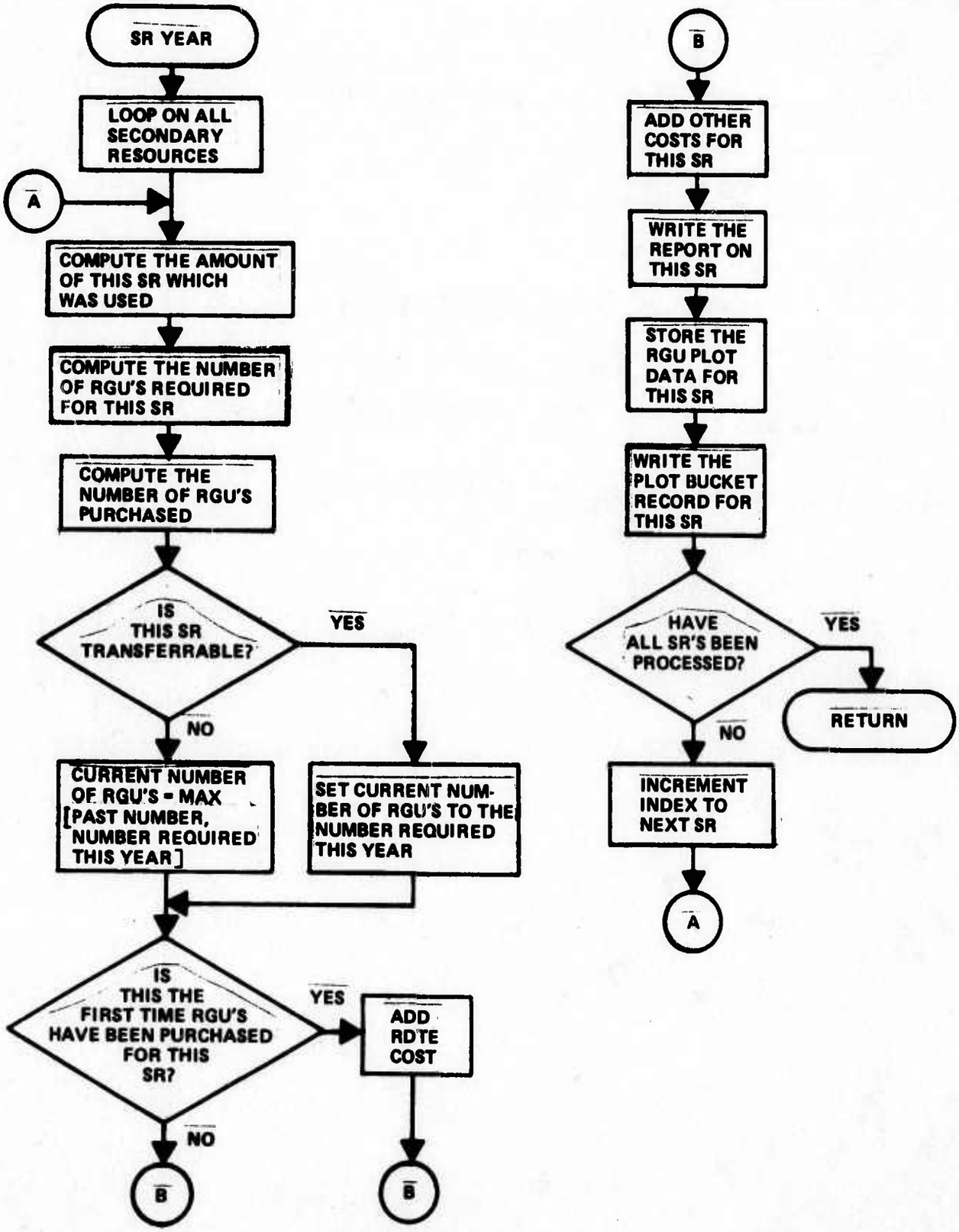
```
CC****************************** PRYEAR *********************************
CC*                                                                      *
CC*                          SUBROUTINE PRYEAR                           *
CC*                                                                      *
CC*   PURPOSE                                                            *
CC*      TO DO THE YEARLY REPORT FOR THE PRIMARY RESOURCES               *
CC*                                                                      *
CC*   CALLING SEQUENCE                                                   *
CC*      CALL  PRYEAR (IYEAR)                                            *
CC*                                                                      *
CC*   DESCRIPTION OF PARAMETERS                                          *
CC*      INPUT                                                           *
CC*       IYEAR  - YEAR NUMBER                                           *
CC*                                                                      *
CC*   SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                       *
CC*      IICOST                                                          *
CC*      RGCOST                                                          *
CC*      PRINT4                                                          *
CC*      RDTE                                                            *
CC*      WRGU                                                            *
CC*                                                                      *
CC************************************************************************
```



SUBROUTINE PRYEAR

```
CC********************************   PRINT4   **********************************
CC*                                                                            *
CC*                           SUBROUTINE PRINT4                                *
CC*                                                                            *
CC*   PURPOSE                                                                  *
CC*      TO PRINT THE PRIMARY RESOURCE YEARLY REPORT FOR SUBROUTINE            *
CC*      PRYEAR                                                                *
CC*                                                                            *
CC*   CALLING SEQUENCE                                                         *
CC*      CALL  PRINT4 (I,IYEAR,IVAL)                                           *
CC*                                                                            *
CC*   DESCRIPTION OF PARAMETERS                                                *
CC*      INPUT                                                                 *
CC*       I       - NUMBER OF THE PRIMARY RESOURCE WHICH THIS CALL IS          *
CC*                 FOR, OR ZERO TO INITIALIZE A NEW REPORT                    *
CC*       IYEAR   - YEAR NUMBER                                                *
CC*       IVAL    - ARRAY OF VALUES FOR THE PRIMARY RESOURCE                   *
CC*                                                                            *
CC*   SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                             *
CC*      NONE                                                                  *
CC*                                                                            *
CC******************************************************************************
```

```
CC*****************************  SRYEAR  ********************************
CC*                                                                       *
CC*                          SUBROUTINE SRYEAR                            *
CC*                                                                       *
CC*   PURPOSE                                                             *
CC*      TO DO THE YEARLY REPORT FOR THE SECONDARY RESOURCES              *
CC*                                                                       *
CC*   CALLING SEQUENCE                                                    *
CC*      CALL  SRYEAR (IYEAR)                                             *
CC*                                                                       *
CC*   DESCRIPTION OF PARAMETERS                                           *
CC*      INPUT                                                            *
CC*       IYEAR  - YEAR NUMBER                                            *
CC*                                                                       *
CC*   SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                        *
CC*      IICOST                                                           *
CC*      RGCOST                                                           *
CC*      PRINT5                                                           *
CC*      RDTE                                                             *
CC*      WRGU                                                             *
CC*      WPLOTB                                                           *
CC*                                                                       *
CC***********************************************************************
```



SUBROUTINE SR YEAR

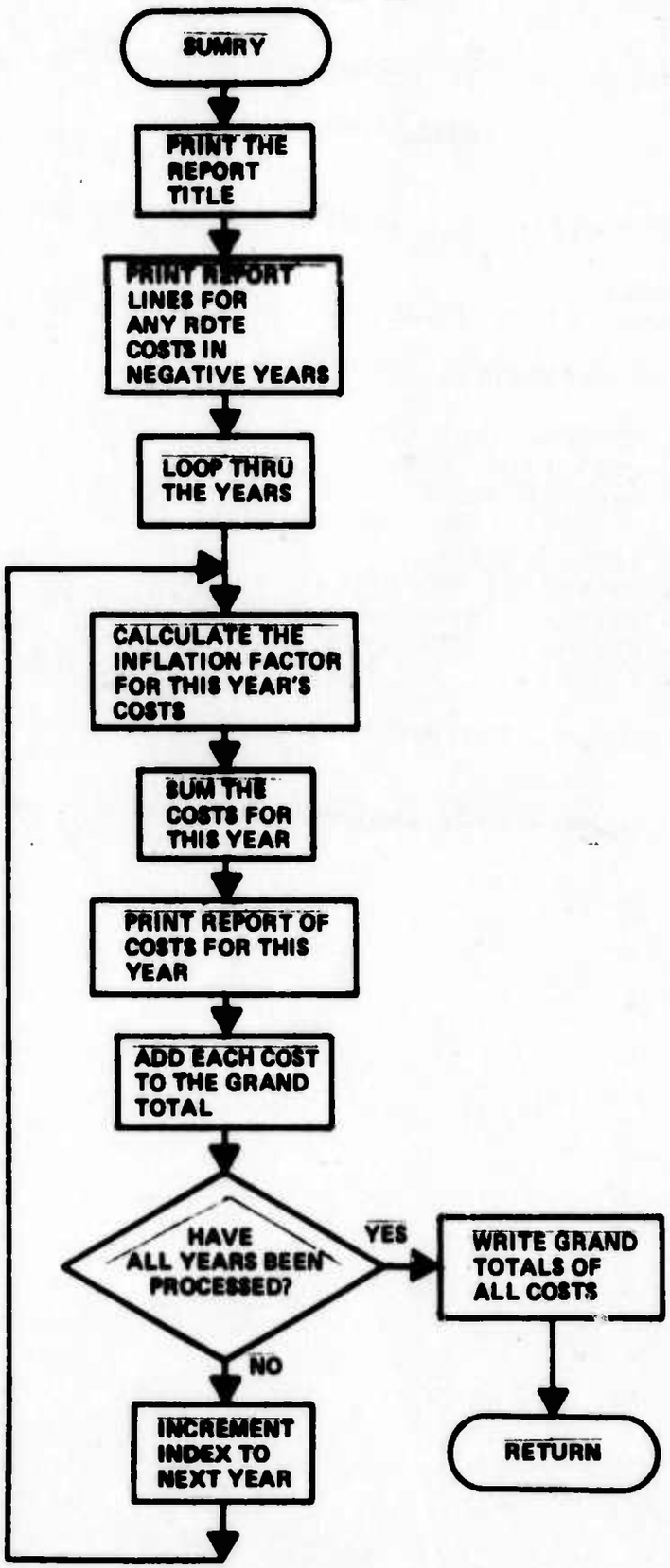
```
CC*****************************  PRINT5  *********************************
CC*                                                                       *
CC*                            SUBROUTINE PRINT5                          *
CC*                                                                       *
CC*    PURPOSE                                                            *
CC*       TO PRINT THE SECONDARY RESOURCE YEARLY REPORT FOR SUBROUTINE     *
CC*       SRYEAR                                                          *
CC*                                                                       *
CC*    CALLING SEQUENCE                                                   *
CC*       CALL  PRINT5 (I,IYEAR,IVAL)                                     *
CC*                                                                       *
CC*    DESCRIPTION OF PARAMETERS                                          *
CC*       INPUT                                                           *
CC*        I       - NUMBER OF THE SECONDARY RESOURCE WHICH THIS CALL IS   *
CC*                  FOR, OR ZERO TO INITIALIZE A NEW REPORT              *
CC*        IYEAR   - YEAR NUMBER                                          *
CC*        IVAL    - ARRAY OF VALUES FOR THE SECONDARY RESOURCE           *
CC*                                                                       *
CC*    SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                       *
CC*       NONE                                                            *
CC*                                                                       *
CC***************************************************************************
```

```
CC*****************************  RDTE  **********************************
CC*                                                                     *
CC*                          SUBROUTINE RDTE                            *
CC*                                                                     *
CC*   PURPOSE                                                           *
CC*      TO ADD THE RDTE COST TO THE COST SUMMARY.  RDTE COST IS        *
CC*      SPREAD OUT OVER THE N YEARS PREECEDING THE CURRENT YEAR        *
CC*                                                                     *
CC*   CALLING SEQUENCE                                                  *
CC*      CALL  RDTE (IYEAR, ICOST, N)                                   *
CC*                                                                     *
CC*   DESCRIPTION OF PARAMETERS                                         *
CC*      INPUT                                                          *
CC*        IYEAR  - YEAR NUMBER OF THE CURRENT YEAR                     *
CC*        ICOST  - RDTE COST TO BE SPREAD OVER N YEARS                 *
CC*        N      - NUMBER OF YEARS OVER WHICH ICOST IS TO BE INCURRED  *
CC*                                                                     *
CC*   SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                      *
CC*        NONE                                                         *
CC*                                                                     *
CC***********************************************************************
```

```
CC******************************  IICOST  ******************************
CC*                                                                    *
CC*                        SUBROUTINE IICOST                           *
CC*                                                                    *
CC*   PURPOSE                                                          *
CC*      TO COMPUTE THE COST ASSOCIATED WITH THE PURCHASE OF RESOURCE  *
CC*      GENERATOR UNITS                                               *
CC*                                                                    *
CC*   CALLING SEQUENCE                                                 *
CC*      CALL  IICOST (II, NRGUP, NRGUH, ICOST)                        *
CC*                                                                    *
CC*   DESCRIPTION OF PARAMETERS                                        *
CC*      INPUT                                                         *
CC*       II     - INITIAL INVESTMENT COST PER RGU                     *
CC*       NRGUP  - NUMBER OF RGUS PURCHASED                            *
CC*       NRGUH  - NUMBER OF RGUS ALREADY ON HAND                      *
CC*      OUTPUT                                                        *
CC*       ICOST  - INITIAL INVESTMENT COST                             *
CC*                                                                    *
CC*   METHOD                                                           *
CC*      SUBROUTINE RGCOST IS CALLED TO COMPUTE THE COST AS FOLLOWS    *
CC*       1 IF II .LT. 0                                               *
CC*         COST = NRGUP * IABS(II)                                    *
CC*       2 IF II .GT. 0                                               *
CC*         COST = C2 - C1                                             *
CC*         C2   = N * II * RL ** LOG2(N)                              *
CC*         C1   = NRGUH * II * RL ** LOG2(NRGUH)                      *
CC*         N    = NRGUH + NRGUP                                       *
CC*         RL =  LEARNING RATE FROM PARAMETER CARD                    *
CC*                                                                    *
CC*   SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                      *
CC*      RGCOST                                                        *
CC*                                                                    *
CC**********************************************************************
```

```
CC******************************  RGCOST  ****************************
CC*                                                                  *
CC*                          SUBROUTINE RGCOST                       *
CC*                                                                  *
CC*   PURPOSE                                                        *
CC*      TO COMPUTE THE COST ASSOCIATED WITH HAVING RESOURCE         *
CC*      GENERATOR UNITS ON HAND                                     *
CC*                                                                  *
CC*   CALLING SEQUENCE                                               *
CC*      CALL  RGCOST (II, NRGU, ICOST)                              *
CC*                                                                  *
CC*   DESCRIPTION OF PARAMETERS                                      *
CC*       INPUT                                                      *
CC*        II     - COST PER RGU (NEGATIVE TO PREVENT LEARNING RATE  *
CC*                 FROM BEING APPLIED)                              *
CC*        NRGU   - NUMBER OF RESOURCE GENERATOR UNITS               *
CC*       OUTPUT                                                     *
CC*        ICOST  - COST                                             *
CC*                                                                  *
CC*   METHOD                                                         *
CC*       IF II .LT. 0                                               *
CC*             COST = NRGU * IABS(II)                               *
CC*       IF II .GT. 0                                               *
CC*             COST = NRGU * II * RL ** LOG2(NRGU)                  *
CC*             RL = LEARNING RATE FROM PARAMETER CARD               *
CC*                                                                  *
CC*   SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                   *
CC*       NONE                                                       *
CC*                                                                  *
CC********************************************************************
```

```
CC****************************** SUMRY *********************************
CC*                                                                    *
CC*                        SUBROUTINE SUMRY                            *
CC*                                                                    *
CC*   PURPOSE                                                          *
CC*      TO PRINT THE FINAL COST SUMMARY REPORT                        *
CC*                                                                    *
CC*   CALLING SEQUENCE                                                 *
CC*      CALL  SUMRY (NYEARS)                                          *
CC*                                                                    *
CC*   DESCRIPTION OF PARAMETERS                                        *
CC*      INPUT                                                         *
CC*       NYEARS - NUMBER OF YEARS BEING SUMARIZED                     *
CC*                                                                    *
CC*   SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                     *
CC*      PRINT6                                                        *
CC*                                                                    *
CC**********************************************************************
```



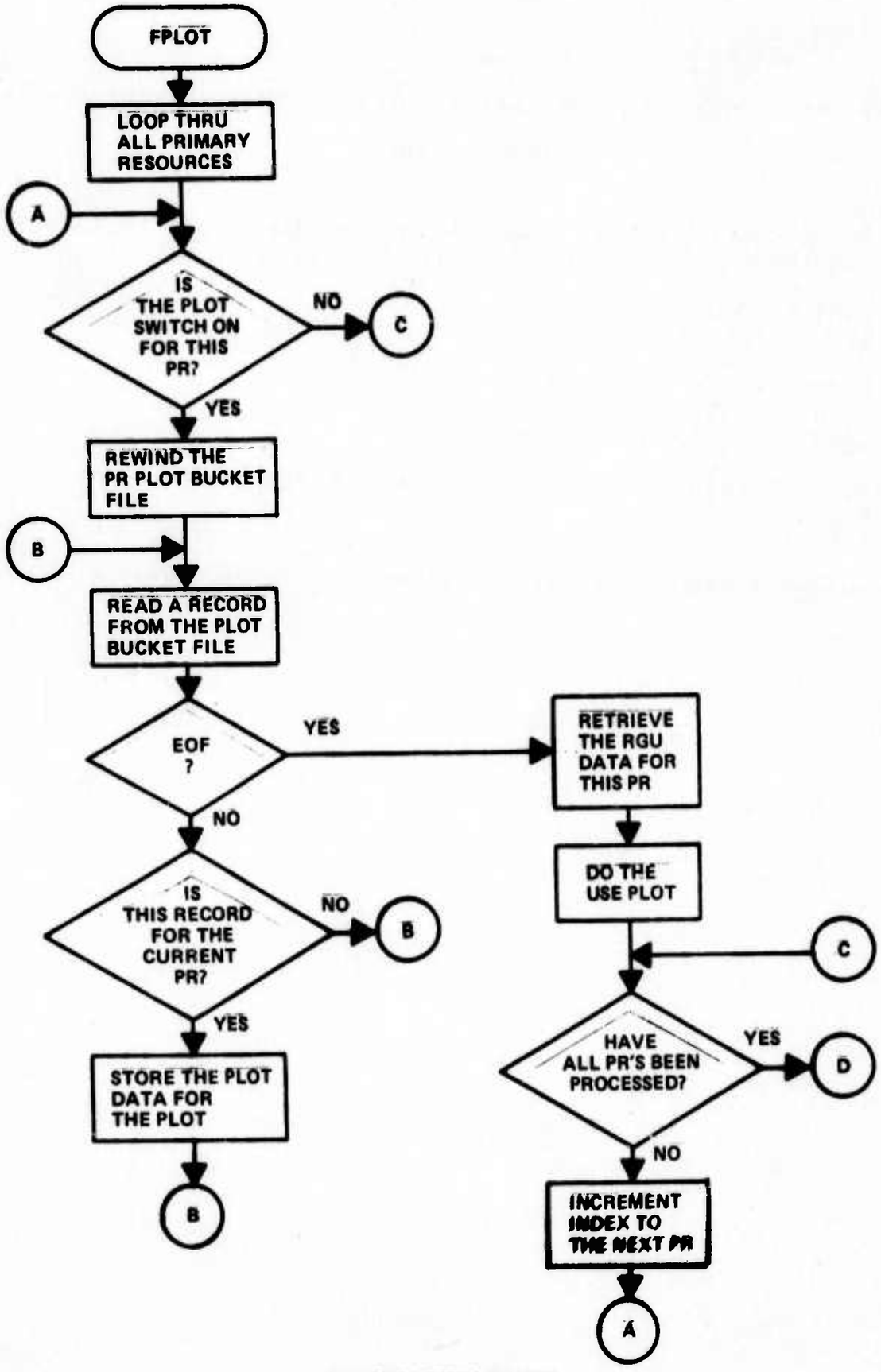
SUBROUTINE SUMRY

```
CC*****************************  PRINT6  *********************************
CC*                                                                       *
CC*                          SUBROUTINE PRINT6                            *
CC*                                                                       *
CC*    PURPOSE                                                            *
CC*       TO PRINT THE FINAL COST SUMMARY REPORT FOR SUBROUTINE SUMRY     *
CC*                                                                       *
CC*    CALLING SEQUENCE                                                   *
CC*       CALL  PRINT6  (ISW, IYEAR, IRTDE, II, IRI, IOM)                 *
CC*                                                                       *
CC*    DESCRIPTION OF PARAMETERS                                          *
CC*       INPUT                                                           *
CC*        ISW    - CONTROL VARIABLE                                      *
CC*                   LESS THAN ZERO TO INITIALIZE THE REPORT             *
CC*                   ZERO TO PRINT FINAL TOTALS                          *
CC*                   GREATER THAN ZERO TO PRINT SUMMARY FOR A SINGLE YEAR*
CC*        IYEAR  - YEAR NUMBER                                           *
CC*        IRTDE  - RTDE COST FOR THE YEAR                                *
CC*        II     - INITIAL INVESTMENT COST FOR THE YEAR                  *
CC*        IRI    - RECURING INVESTMENT COST FOR THE YEAR                 *
CC*        IOM    - OPERATIONS AND MAINTENANCE COST FOR THE YEAR          *
CC*                                                                       *
CC*    SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                       *
CC*       NONE                                                            *
CC*                                                                       *
CC***************************************************************************
```

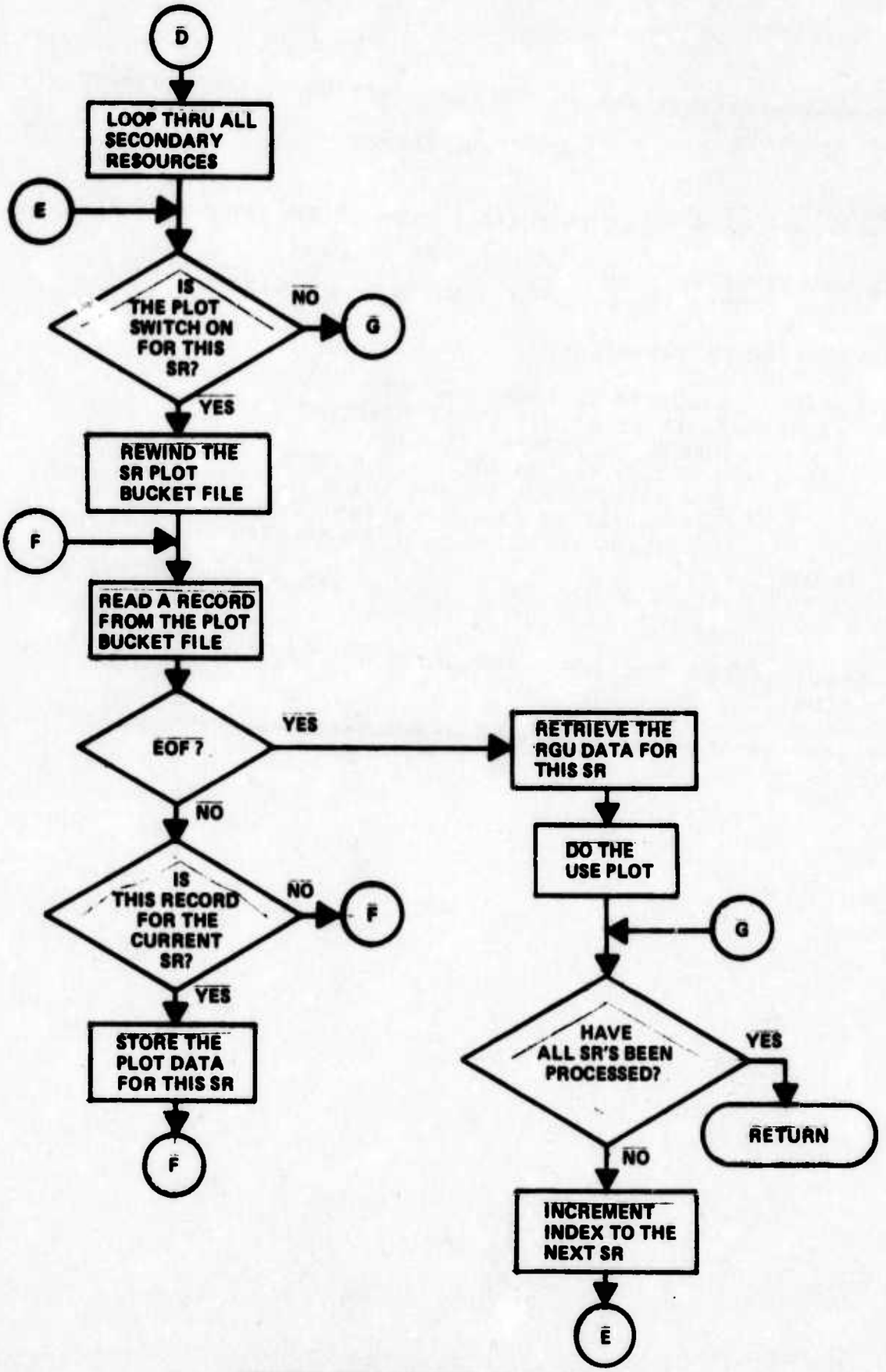
```
CC*****************************  WRGU  ***********************************
CC*                                                                       *
CC*                          SUBROUTINE WRGU                              *
CC*                                                                       *
CC*    PURPOSE                                                            *
CC*       TU STORE THE RGU PLOT DATA IN COMMON /RGU/                      *
CC*                                                                       *
CC*    CALLING SEQUENCE                                                   *
CC*       CALL  WRGU (IRES,IYEAR,NRGU,IAA)                                *
CC*                                                                       *
CC*    DESCRIPTION OF PARAMETERS                                          *
CC*       INPUT                                                           *
CC*        IRES  -  PRIMARY RESOURCE NUMBER, OR THE NEGATIVE OF THE       *
CC*                 SECONDARY RESOURCE NUMBER                             *
CC*        IYEAR -  YEAR NUMBER                                           *
CC*        NRGU  -  NUMBER OF RESOURCE GENERATING UNITS ON HAND           *
CC*        IAA   -  ACTUAL NUMBER OF USE UNITS AVAILABLE                  *
CC*                                                                       *
CC*    SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                       *
CC*       NONE                                                            *
CC*                                                                       *
CC***********************************************************************
```

```
CC*****************************  WPLOTB  *********************************
CC*                                                                       *
CC*                          SUBROUTINE WPLOTB                            *
CC*                                                                       *
CC*   PURPOSE                                                             *
CC*      TO WRITE OUT A PLOT BUCKET RECORD TO THE PRIMARY RESOURCE        *
CC*      FILE OR TO THE SECONDARY RESOURCE FILE                           *
CC*                                                                       *
CC*   CALLING SEQUENCE                                                    *
CC*      CALL  WPLOTB (IRES, ITIME, IUSE, IMA)                            *
CC*                                                                       *
CC*   DESCRIPTION OF PARAMETERS                                           *
CC*      INPUT                                                            *
CC*       IRES  -  PRIMARY RESOURCE NUMBER, OR THE NEGATIVE OF THE        *
CC*                SECONDARY RESOURCE NUMBER                              *
CC*       ITIME -  BUCKET END TIME IN CALENDAR UNITS                      *
CC*       IUSE  -  NUMBER OF UNITS OF THE RESOURCE USED DURING THE        *
CC*                BUCKET                                                 *
CC*       IMA   -  MAXIMUM NUMBER OF USE UNITS AVAILABLE FOR THE          *
CC*                RESOURCE DURING THE BUCKET                             *
CC*                                                                       *
CC*   SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                        *
CC*      NONE                                                             *
CC*                                                                       *
CC*************************************************************************
```

```
CC*****************************  FPLOT  *********************************
CC*                                                                      *
CC*                          SUBROUTINE FPLOT                            *
CC*                                                                      *
CC*    PURPOSE                                                           *
CC*       TO RETRIEVE THE PLOT DATA FOR EACH RESOURCE THAT IS TO BE      *
CC*       PLOTTED AND CALL SUBROUTINE PLOTU TO DO THE PLOTS              *
CC*                                                                      *
CC*    CALLING SEQUENCE                                                  *
CC*       CALL  FPLOT (IYEAR)                                            *
CC*                                                                      *
CC*    DESCRIPTION OF PARAMETERS                                         *
CC*       INPUT                                                          *
CC*        IYEAR  -  NUMBER OF YEARS IN THE RUN                          *
CC*                                                                      *
CC*    SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                      *
CC*       PLOTU                                                          *
CC*       EFPLOT                                                         *
CC*                                                                      *
CC**************************************************************************
```



SUBROUTINE FPLOT



SUBROUTINE FPLOT – CONTINUED

```
CC*****************************  LOOKUP  *********************************
CC*                                                                       *
CC*                          SUBROUTINE LOOKUP                            *
CC*                                                                       *
CC*    PURPOSE                                                            *
CC*       TO LOOK UP A VALUE IN A TABLE AND RETURN ITS POSITION           *
CC*                                                                       *
CC*    CALLING SEQUENCE                                                   *
CC*       CALL  LOOKUP (IVAL, IARRAY, N, ICODE, INDEX)                    *
CC*                                                                       *
CC*    DESCRIPTION OF PARAMETERS                                          *
CC*       INPUT                                                           *
CC*        IVAL   - VALUE TO BE SEARCHED FOR                              *
CC*        IARRAY- TABLE OF VALUES TO BE SEARCHED FOR                     *
CC*        N      - NUMBER OF ENTRIES IN IARRAY                           *
CC*        ICODE  - 1 - DATA VALUES OCCUPY ONE WORD                       *
CC*                 2 - DATA VALUES OCCUPY THREE WORDS, USED FOR IC       *
CC*                     CHARACTER FIELDS ON IBM COMPUTER                  *
CC*                     (REQUIRES  IVAL(3), IARRAY(3,N)  )                *
CC*       OUTPUT                                                          *
CC*        INDEX  - INDEX OF THE VALUE IN THE TABLE, ZERO IF THE VALUE    *
CC*                 IS NOT FOUND                                          *
CC*                                                                       *
CC*    SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                       *
CC*       NONE                                                            *
CC*                                                                       *
CC*************************************************************************
```

```
CC*****************************  PLOTU  **********************************
CC*                                                                       *
CC*                          SUBROUTINE PLOTU                             *
CC*                                                                       *
CC*    PURPOSE                                                            *
CC*       TO PLOT THE RESOURCE USE PLOTS                                  *
CC*                                                                       *
CC*    CALLING SEQUENCE                                                   *
CC*       CALL  PLOTU (XMA,USE,TIME1,NPTS1,AA,RGUS,TIME2,NPTS2,NAME)      *
CC*                                                                       *
CC*    DESCRIPTION OF PARAMETERS                                          *
CC*        XMA     - MAXIMUM USE AVAILABLE PER BUCKET ARRAY               *
CC*        USE     - USE PER BUCKET ARRAY                                 *
CC*        TIME1   - END   TIME OF BUCKET FOR EACH VALUE OF XMA AND USE   *
CC*        NPTS1   - NUMBER OF ELEMENTS IN XMA, USE, AND TIME1 ARRAYS     *
CC*        AA      - ACTUAL USE AVAILABLE PER YEAR ARRAY                  *
CC*        RGUS    - NUMBER OF RGUS ARRAY                                 *
CC*        TIME2   - YEAR NUMBER ASSOCIATED WITH EACH AA AND RGUS VALUE   *
CC*        NPTS2   - NUMBER OF ELEMENTS IN AA, RGUS, AND TIME2 ARRAYS     *
CC*        NAME    - TEN CHARACTER NAME OF RESOURCE                       *
CC*                                                                       *
CC*        EACH OF THE DATA ARRAYS (XMA,USE,TIME1,AA,RGUS,TIME2) HAVE     *
CC*        AS THEIR FIRST POINT, THE VALUE FOR THE BEGINNING OF THE       *
CC*        FIRST BUCKET.  THE REST OF THE VALUES ARE FOR THE END OF EACH  *
CC*        BUCKET.  THEREFORE, THE NUMBER OF POINTS EQUALS THE NUMBER     *
CC*        OF BUCKETS PLUS ONE.                                           *
CC*                                                                       *
CC*    SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                       *
CC*       SCALE1                                                          *
CC*       SCALE2                                                          *
CC*       STEPFN                                                          *
CC*       MAXMIN                                                          *
CC*       LABELX                                                          *
CC*       PLOT                                                            *
CC*       SYMBOL                                                          *
CC*       AXIS                                                            *
CC*                                                                       *
CC***************************************************************************
```

```
CC*****************************  MAXMIN  *********************************
CC*                                                                       *
CC*                          SUBROUTINE MAXMIN                            *
CC*                                                                       *
CC*    PURPOSE                                                            *
CC*       TO FIND THE MAXIMUM AND MINIMUM VALUE IN AN ARRAY               *
CC*                                                                       *
CC*    CALLING SEQUENCE                                                   *
CC*       CALL  MAXMIN (XARRAY, NPTS, XMIN, XMAX)                         *
CC*                                                                       *
CC*    DESCRIPTION OF PARAMETERS                                          *
CC*       INPUT                                                           *
CC*        XARRAY - ARRAY OF VALUES                                       *
CC*        NPTS   - NUMBER OF VALUES                                      *
CC*       OUTPUT                                                          *
CC*        XMIN   - MINIMUM VALUE IN XARRAY                               *
CC*        XMAX   - MAXIMUM VALUE IN XARRAY                               *
CC*                                                                       *
CC*    SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                       *
CC*       NONE                                                            *
CC*                                                                       *
CC***********************************************************************
```

```
CC******************************  SCALE1  *******************************
CC*                                                                    *
CC*                       SUBROUTINE SCALE1                            *
CC*                                                                    *
CC*   PURPOSE                                                          *
CC*      TO COMPUTE THE SCALE FACTORS FOR AN ARRAY OF VALUES, BASED    *
CC*      ON THE PLOT DIMENSIONS.  THIS IS AN ISOLATION ROUTINE TO      *
CC*      PROVIDE COMPATIBILITY BETWEEN THE CALSPAN SCALE SUBROUTINE    *
CC*      AND THE STANDARD CALCOMP SCALE SUBROUTINE.                    *
CC*                                                                    *
CC*   CALLING SEQUENCE                                                 *
CC*      CALL  SCALE1  (XARRAY, NPTS, SIZE, XMIN, DX)                  *
CC*                                                                    *
CC*   DESCRIPTION OF PARAMETERS                                        *
CC*      INPUT                                                         *
CC*       XARRAY - ARRAY OF VALUES FOR WHICH A SCALE IS TO BE COMPUTED *
CC*       NPTS   - NUMBER OF ELEMENTS IN XARRAY                        *
CC*       SIZE   - LENGTH IN FLOATING POINT INCHES AVAILABLE FOR       *
CC*                PLOTTING THE ARRAY                                  *
CC*      OUTPUT                                                        *
CC*       XMIN   - VALUE OF FIRST ANNOTATION ON THE AXIS               *
CC*       DX     - SCALE FACTOR  (NUMBER OF UNITS PER INCH OF PLOT)    *
CC*                                                                    *
CC*   SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                     *
CC*      MAXMIN                                                        *
CC*      SCALE                                                         *
CC*                                                                    *
CC**********************************************************************
```

```
CC******************************  SCALE2  ********************************
CC*                                                                      *
CC*                         SUBROUTINE SCALE2                            *
CC*                                                                      *
CC*   PURPOSE                                                            *
CC*      TO CONVERT AN ARRAY OF VALUES INTO PLOTTER INCHES               *
CC*                                                                      *
CC*   CALLING SEQUENCE                                                   *
CC*      CALL  SCALE2 (XARRAY, NPTS, XMIN, DX)                           *
CC*                                                                      *
CC*   DESCRIPTION OF PARAMETERS                                          *
CC*      INPUT-OUTPUT                                                    *
CC*       XARRAY - ARRAY OF VALUES TO BE CONVERTED                       *
CC*      INPUT                                                           *
CC*       NPTS   - NUMBER OF ELEMENTS IN XARRAY                          *
CC*       XMIN   - MINIMUM VALUE ON PLOT AXIS                            *
CC*       DX     - PLOT AXIS INCREMENT (UNITS PER INCH)                  *
CC*                                                                      *
CC*   SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                       *
CC*      NONE                                                            *
CC*                                                                      *
CC************************************************************************
```

```
CC*******************************  STEPFN  *********************************
CC*                                                                         *
CC*                          SUBROUTINE STEPFN                              *
CC*                                                                         *
CC*    PURPOSE                                                              *
CC*       TO PLOT A STEP FUNCTION                                           *
CC*                                                                         *
CC*    CALLING SEQUENCE                                                     *
CC*       CALL  STEPFN  (XARRAY, YARRAY, NPTS)                              *
CC*                                                                         *
CC*    DESCRIPTION OF PARAMETERS                                            *
CC*      INPUT                                                              *
CC*       XARRAY - X VALUES OF THE POINTS DEFINING THE STEP FUNCTION        *
CC*                (IN PLOTTER INCHES)                                      *
CC*       YARRAY - Y VALUES OF THE POINTS DEFINING THE STEP FUNCTION        *
CC*                (IN PLOTTER INCHES)                                      *
CC*       NPTS   - NUMBER OF ELEMENTS IN XARRAY AND YARRAY                  *
CC*                                                                         *
CC*    SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                         *
CC*       PLOT                                                              *
CC*                                                                         *
CC***************************************************************************
```

```
CC****************************** LABELX *******************************
CC*                                                                   *
CC*                        SUBROUTINE LABELX                          *
CC*                                                                   *
CC*   PURPOSE                                                         *
CC*      TO LABEL A LINE DRAWN BY SUBROUTINE STEPFN.  THE X POSITION  *
CC*      OF THE LABEL IS SPECIFIED, AND THE Y POSITION IS COMPUTED    *
CC*      SO THAT IT WILL BE ON THE LINE.                              *
CC*                                                                   *
CC*   CALLING SEQUENCE                                                *
CC*      CALL  LABELX (X, Y, NPTS, XL, LBL, NC, CHRSZE)               *
CC*                                                                   *
CC*   DESCRIPTION OF PARAMETERS                                       *
CC*      INPUT                                                        *
CC*        X      - X COORDINATES                                     *
CC*        Y      - Y COORDINATES                                     *
CC*        NPTS   - NUMBER OF ELEMENTS IN X AND Y                     *
CC*        XL     - X POSITION OF LABEL                               *
CC*        LBL    - LABEL                                             *
CC*        NC     - NUMBER OF CHARACTERS IN LABEL                     *
CC*        CHRSZE- CHARACTER SIZE                                     *
CC*                                                                   *
CC*   SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                    *
CC*      SYMBOL                                                       *
CC*                                                                   *
CC*********************************************************************
```

Section 4.4

SUBROUTINE CROSS REFERENCE TABLE

In the table on the following pages, the column headings show the subroutine names that do the calling, and the row headings give the subroutine names that are called.

CROSS REFERENCE USAGE CODES

A ARGUMENT

THE SYMBOL IS A VARIABLE OR FUNCTION NAME WHICH APPEARS IN AN ARGUMENT LIST OF A CALL, SUBROUTINE, FUNCTION, OR ENTRY STATEMENT.

D DATA INITIALIZATION

THE SYMBOL IS A VARIABLE WHICH IS INITIALIZED IN A DATA OR TYPE SPECIFICATION STATEMENT SUCH AS A COMPLEX SPECIFICATION STATEMENT.

F FETCH A VALUE

THE SYMBOL IS A:

1. VARIABLE WHOSE MOST RECENTLY ASSIGNED VALUE IS ACCESSED BUT NOT CHANGED.
2. FUNCTION NAME OR ARGUMENT OF A FUNCTION WHICH APPEARS ON THE RIGHT SIDE OF AN EQUAL SIGN IN AN ASSIGNMENT STATEMENT OR APPEARS IN AN IF STATEMENT TEST.
3. DUMMY ARGUMENT IN A STATEMENT FUNCTION DEFINITION.

S STORE A VALUE

THE SYMBOL IS A:

1. VARIABLE WHOSE VALUE IS REPLACED BY ANOTHER VALUE.
2. FUNCTION NAME WHICH APPEARS ON THE LEFT SIDE OF AN EQUAL SIGN IN AN ASSIGNMENT STATEMENT.
3. NAME OF A STATEMENT FUNCTION IN THE DEFINITION OF THAT FUNCTION.

C COMMON

THE SYMBOL IS A VARIABLE WHICH APPEARS IN A COMMON STATEMENT OR IS THE NAME OF A LABELED COMMON BLOCK.

E EQUIVALENCE

THE SYMBOL IS A VARIABLE WHICH APPEARS IN AN EQUIVALENCE STATEMENT.

T TYPE SPECIFICATION

THE SYMBOL IS A VARIABLE WHICH APPEARS IN A :

1. TYPE SPECIFICATION STATEMENT AND IS NOT INITIALIZED IN THAT STATEMENT.
2. DIMENSION OR EXTERNAL STATEMENT.

N ENTRY POINT

THE SYMBOL IS AN ENTRY POINT DEFINED BY AN ENTRY STATEMENT IN A SUBROUTINE OR FUNCTION.

X EXTERNAL REFERENCE

THE SYMBOL IS A SUBROUTINE OR ENTRY NAME WHICH APPEARS IN A CALL STATEMENT.

CROSS REFERENCE SUMMARY C********** PHASE 4 **********

SYMBOL	TYPE	USAGE SUMMARY												
		MAIN	INIT	CLEAR	*BLOCK	LOOK2	PRINT1	PRINT2	PRINT3	REPRT1	REPRT2	PRYEAR	PRINT4
IAA1	I												
IAA2	I												
ICUS	I	C	FSC				F C			C	F C		
IEND	I	F C	FSC				F C			C	C		
IPERD	I	C	FSC				F C			F C	C		
IRDTE	I	C	C		D C			C	C	C	C	C	C
ISTART	I	F C	FSC				F C			F C	C		
KFINAL	I	C	A C		C			C	C	C	C	FSC	C
KPR	I	F C	A FSC		C			F C	C	F C	C	A FSC	F C
KPRP	I	FSC	A C		C			C	C	A F C	C	C	C
KPRY	I	FSC	A C		C			C	C	C	A C	F C	C
KSR	I	C	SC		C			C	F C	C	C	C	C
KSRC	I	C	A SC		C			F C	F C	C	C	C	C
KSRCL	I	C	A FSC		C			F C	C	C	C	F C	C
KSRCY	I	C	A C		C			C	C	C	A C	FSC	C
MPR	I	C	F C		D C			C	C	C	A C	C	C
MRDTE	I	C	C		D C			C	C	C	C	C	C
MSR	I	C	F C		D C			C	C	C	C	C	C
MSRC	I	C	A F C		D C			C	C	C	A C	C	C
MSRCL	I	C	F C		D C			C	C	C	C	C	C
MYEAR	I	C	A C		D C			C	C	C	C	C	C
NEXTP	I	FSC	SC				C			FSC	C		
NEXTY	I	F C	SC				C			C	FSC		
NPR	I	C	A FSC		D C			F C	C	A F C	C	F C	C
NRGU1	I												
NRGU2	I												
NSR	I	C	FSC		D C			C	F C	C	C	C	C

CROSS REFERENCE SUMMARY C********** PHASE 4 **********

USAGE SUMMARY

SYMBOL	TYPE	SRYEAR	PRINT5	RDTE	IICOST	SUMRY	PRINT6	WRGU	WPLOTB	FPLOT	LOOKUP	PLOTU	MAXMIN
IAA1	I							SC		F C			
IAA2	I							SC		F C			
ICUS	I	C			C		C			F C		F C	
IEND	I	C			C		C			C		C	
IPERD	I	C			C		C			C		C	
IRDTE	I	C	C	FSC		A F C				C			
ISTART	I	C			C		C			C		F C	
KFINAL	I	FSC	C	FSC		A C				C			
KPR	I	C	C	C		C				A F C			
KPRP	I	C	C	C		C				C			
KPRY	I	C	C	C		C				C			
KSR	I	A FSC	F C	C		C				A F C			
KSRC	I	C	C	C		C				C			
KSRCL	I	C	C	C		C				C			
KSRCY	I	F C	C	C		C				C			
MPR	I	C	C	C		C				C			
MRDTE	I	C	C	F C		F C				C			
MSR	I	C	C	C		C				C			
MSRC	I	C	C	C		C				C			
MSRCL	I	C	C	C		C				C			
MYEAR	I	C	C	C		C				C			
NEXTP	I	C			C		C			C		C	
NEXTY	I	F C			C		C			C		C	
NPR	I	C	C	C		C				F C			
NRGU1	I							SC		F C			
NRGU2	I							SC		F C			
NSR	I	F C	C	C		C				F C			

CROSS REFERENCE SUMMARY C********** PHASE 4 **********

SYMBOL	TYPE	USAGE SUMMARY			
		SCALE1	SCALE2	STEPFN	LABELX
IAA1	I				
IAA2	I				
ICUS	I				
IEND	I				
IPERD	I				
IRDTE	I				
ISTART	I				
KFINAL	I				
KPR	I				
KPRP	I				
KPRY	I				
KSR	I				
KSRC	I				
KSRCL	I				
KSRCY	I				
MPR	I				
MRDTE	I				
MSR	I				
MSRC	I				
MSRCL	I				
MYEAR	I				
NEXTP	I				
NEXTY	I				
NPR	I				
NRGU1	I				
NRGU2	I				
NSR	I				

CROSS REFERENCE SUMMARY C********** PHASE 4 **********

SYMBOL	TYPE	USAGE SUMMARY											
		MAIN	INIT	CLEAR	*BLOCK	LOOK2	PRINT1	PRINT2	PRINT3	REPRT1	REPRT2	PRYEAR	PRINT4
NSRC	I	C	A FSC		D C			C	C	C	C	C	C
NSRCL	I	C	FSC		D C			C	C	C	C	C	C
NYEAR	I	C	C		D C			C	C	C	C	C	C
RATE	R	FSC	FSC				F C			C	C		

CROSS REFERENCE SUMMARY C********** PHASE 4 **********

SYMBOL	TYPE	USAGE SUMMARY											
		SRYEAR	PRINT5	RDTE	IICOST	SUMRY	PRINT6	WRGU	WPLOTB	FPLOT	LOOKUP	PLOTU	MAXMIN
NSRC	I	C	C	C		C				C			
NSRCL	I	C	C	C		C				C			
NYEAR	I	C	C	C		C				C			
RATE	R	C			C		F C			C		C	

CROSS REFERENCE SUMMARY C********** PHASE 4 **********

SYMBOL	TYPE	USAGE SUMMARY			
		SCALE1	SCALE2	STEPFN	LABELX
NSRC	I				
NSRCL	I				
NYEAR	I				
RATE	R				

Section 4.5

COMMON VARIABLE DEFINITIONS

The tables on the following pages define the meaning of each variable contained in each of the common blocks used by this program.

```
*****************************************************************************
*                                                                           *
*                        COMMON /RESRCE/ - PART 1                           *
*                          PRIMARY RESOURCE DATA                            *
*                                                                           *
*****************************************************************************
*           *                                                               *
* VARIABLE *   DESCRIPTION                                                  *
*           *                                                               *
*****************************************************************************
*           *                                                               *
* KPR(18,J)* PRIMARY RESOURCE DATA  (18 WORDS PER PR, SECOND SUBSCRIPT      *
*           * IS INDEXED BY PR NUMBER)                                      *
*           *                                                               *
*           *****************************************************************
*           *     *                                                         *
*           *WORD *  CONTENTS                                              *
*           *     *                                                         *
*           *****************************************************************
*           *     *                                                         *
*           *  1  * POINTER TO FIRST SRC USED BY THIS PR                    *
*           *     * (SUBSCRIPT IN KSRCL ARRAY)                              *
*           *  2  * POINTER TO LAST SRC USED BY THIS PR                     *
*           *     * (SUBSCRIPT IN KSRCL ARRAY)                              *
*           *     * OR ZERO IF NO SRC IS USED                               *
*           *  3  * NUMBER OF USE UNITS WHICH AN RGU FOR THIS PR CAN        *
*           *     * PRODUCE PER YEAR                                        *
*           *  4  * RDTE COST (DOLLARS)                                     *
*           *  5  * RDTE PERIOD (YEARS)                                     *
*           *  6  * INITIAL INVESTMENT COST PER RGU (DOLLARS)               *
*           *  7  * RECURRING INVESTMENT COST PER RGU (DOLLARS)             *
*           *  8  * RECURRING INVESTMENT COST PER YEAR (DOLLARS)            *
*           *  9  * OPERATIONS AND MAINTENANCE COST PER RGU (DOLLARS)       *
*           * 10  * OPERATIONS AND MAINTENANCE COST PER UNIT OF USE (DOLLARS)*
*           * 11  * PLOT SWITCH                                            *
*           * 12  * TRANSFERRABLE SWITCH                                   *
*           * 13  * BUCKET SIZE  (CUS)                                     *
*           * 14  * FIRST TIME USE SWITCH                                  *
*           * 15  * CURRENT NUMBER OF RGUS REQUIRED FOR THIS PR            *
*           * 16  * PR NAME  (FIRST 4 CHARACTERS)                          *
*           * 17  * PR NAME  (SECOND 4 CHARACTERS)                         *
*           * 18  * PR NAME  (LAST 2 CHARACTERS)                           *
*           *     *                                                         *
*           *****************************************************************
* NPR       * NUMBER OF PRIMARY RESOURCES IN THE KPR ARRAY                  *
* MPR       * MAXIMUM NUMBER OF PRIMARY RESOURCES WHICH CAN BE DEFINED      *
*           * (DIMENSION OF SECOND SUBSCRIPT OF KPR ARRAY)                  *
*           *                                                               *
*****************************************************************************
```

```
*****************************************************************************
*                                                                           *
*                        COMMON /RESRCE/ - PART 2                           *
*                   SECONDARY RESOURCE COMPONENT USAGE LIST                 *
*                                                                           *
*****************************************************************************
*           *                                                               *
* VARIABLE *    DESCRIPTION                                                 *
*           *                                                               *
*****************************************************************************
*           *                                                               *
*KSRCL(5,J)* SRC USAGE DATA FOR PRIMARY RESOURCES  (5 WORDS PER SRC, EACH    *
*           * PR DEFINITION GIVES THE J INDEX FOR THE FIRST AND LAST SRC    *
*           * WHICH IT USES)                                                *
*           *                                                               *
*           *************************************************************** *
*           *       *                                                       *
*           * WORD *  CONTENTS                                             *
*           *       *                                                       *
*           *************************************************************** *
*           *       *                                                       *
*           *    1  * UNITS OF USE PER RGU FOR THE PR                       *
*           *    2  * UNITS OF USE PER UNIT OF PR USE                       *
*           *    3  * POINTER TO SRC NAME IN KSRC ARRAY                     *
*           *       * (INITIALLY CONTAINS FIRST 4 CHARACTERS OF SRC NAME)   *
*           *    4  * SECOND 4 CHARACTERS OF SRC NAME                       *
*           *    5  * LAST TWO CHARACTERS OF SRC NAME                       *
*           *       *                                                       *
*           *************************************************************** *
*           *                                                               *
*NSRCL      * NUMBER OF ENTRIES IN KSRCL ARRAY                              *
*MSRCL      * MAXIMUM NUMBER OF ENTRIES WHICH CAN BE STORED IN THE KSRCL ARRAY *
*           * (DIMENSION OF SECOND SUBSCRIPT)                               *
*           *                                                               *
*****************************************************************************
```

```
*****************************************************************************
*                                                                           *
*                          COMMON /RESRCE/ - PART 3                         *
*                          SECONDARY RESOURCE DATA                          *
*                                                                           *
*****************************************************************************
*           *                                                               *
* VARIABLE *   DESCRIPTION                                                  *
*           *                                                               *
*****************************************************************************
*           *                                                               *
* KSR(17,J)* SECONDARY RESOURCE DATA  (17 WORDS PER SR, SECOND SUBSCRIPT IS  *
*           * INDEXED BY SR NUMBER)                                         *
*           *                                                               *
*           *************************************************************** *
*           *      *                                                        *
*           * WORD *  CONTENTS                                             *
*           *      *                                                        *
*           *************************************************************** *
*           *      *                                                        *
*           *   1  * POINTER TO FIRST COMPONENT OF THIS SR                  *
*           *      * (SUBSCRIPT IN KSRC ARRAY)                              *
*           *   2  * POINTER TO LAST COMPONENT OF THIS SR                   *
*           *      * (SUBSCRIPT IN KSRC ARRAY)                              *
*           *   3  * NUMBER OF USE UNITS WHICH AN RGU FOR THIS SR CAN       *
*           *      * PRODUCE PER YEAR                                       *
*           *   4  * RDTE COST (DOLLARS)                                    *
*           *   5  * RDTE PERIOD (YEARS)                                    *
*           *   6  * INITIAL INVESTMENT COST PER RGU (DOLLARS)              *
*           *   7  * RECURRING INVESTMENT COST PER RGU (DOLLARS)            *
*           *   8  * RECURRING INVESTMENT COST PER YEAR (DOLLARS)           *
*           *   9  * OPERATIONS AND MAINTENANCE COST PER RGU (DOLLARS)      *
*           *  10  * OPERATIONS AND MAINTENANCE COST PER UNIT OF USE (DOLLARS)*
*           *  11  * PLOT SWITCH                                           *
*           *  12  * TRANSFERRABLE SWITCH                                  *
*           *  13  * FIRST TIME USE SWITCH                                 *
*           *  14  * CURRENT NUMBER OF RGUS REQUIRED FOR THIS SR           *
*           *  15  * SR NAME - FIRST FOUR CHARACTERS                       *
*           *  16  * SR NAME - SECOND FOUR CHARACTERS                      *
*           *  17  * SR NAME - LAST TWO CAHRACTERS                         *
*           *      *                                                        *
*           *************************************************************** *
* NSR       * NUMBER OF SECONDARY RESOURCES IN THE KSR ARRAY                *
* MSR       * MAXIMUM NUMBER OF SECONDARY RESOURCES WHICH CAN BE DEFINED    *
*           * (DIMENSION OF SECOND SUBSCRIPT OF KSR ARRAY)                  *
*           *                                                               *
*****************************************************************************
```

COMMON /RESRCE/ - PART 4
SECONDARY RESOURCE COMPONENTS

VARIABLE	DESCRIPTION
KSRC(3,J)	SECONDARY RESOURCE COMPONENT NAMES (3 WORDS PER 10 CHARACTER NAME)
NSRC	NUMBER OF SRC NAMES IN THE KSRC ARRAY
MSRC	MAXIMUM NUMBER OF SRCS WHICH CAN BE DEFINED (DIMENSION OF SECOND SUBSCRIPT OF KSRC ARRAY

```
*****************************************************************************
*                                                                           *
*                        COMMON /RESRCE/ - PART 5                           *
*                         RESOURCE USAGE TABLES                             *
*                                                                           *
*****************************************************************************
*            *                                                              *
* VARIABLE   *  DESCRIPTION                                                 *
*            *                                                              *
*****************************************************************************
*            *                                                              *
* KPRP(3,J)  * PR USE DATA FOR PERIODIC REPORT                              *
*            * (SECOND SUBSCRIPT MUST BE DIMENSIONED AT THE MAXIMUM NUMBER  *
*            * OF PRIMARY RESOURCES ALLOWED, WHICH IS GIVEN BY VARIABLE MPR)*
*            *                                                              *
*            * 1    PEAK USE PER BUCKET                                    *
*            * 2    NUMBER OF BUCKETS DURING WHICH THIS RESOURCE WAS USED  *
*            * 3    TOTAL USE                                              *
*            *                                                              *
* KPRY(3,J)  * PR USE DATA FOR YEARLY REPORT                                *
*            * (J DIMENSION MUST BE THE SAME AS THAT OF KRPR ARRAY)         *
*            *                                                              *
*            * 1    PEAK USE PER BUCKET                                    *
*            * 2    NUMBER OF BUCKETS DURING WHICH THIS RESOURCE WAS USED  *
*            * 3    TOTAL USE                                              *
*            *                                                              *
* KSRCY(K)   * SRC USE DATA FOR THE YEARLY REPORT                           *
*            * (MUST BE DIMENSIONED AT THE MAXIMUM NUMBER OF SECONDARY      *
*            * RESOURCE COMPONENTS ALLOWED, WHICH IS GIVEN BY VARIABLE MSRC)*
*            *                                                              *
*            * EACH ELEMENT CONTAINS THE TOTAL USE FOR THAT SRC DURING THE  *
*            * YEAR                                                         *
*            *                                                              *
*****************************************************************************
```

COMMON /RESRCE/ - PART 6
FINAL COST CUMMARY

VARIABLE	DESCRIPTION
KFINAL(4,J)	TOTAL COST FOR EACH CATEGORY IN EACH YEAR 1 RDTE COST 2 INITIAL INVESTMENT COST 3 RECURRING INVESTMENT COST 4 OPERATIONS AND MAINTENANCE COST
NYEAR	NUMBER OF YEARS FOR WHICH COST DATA HAS BEEN STORED IN THE KFINAL ARRAY
MYEAR	MAXIMUM NUMBER OF YEARS ALLOWED (DIMENSION OF SECOND SUBSCRIPT OF KFINAL)
IRDTE(K)	RDTE COST TABLE FOR NEGATIVE YEARS IRDTE(1) WOULD CONTAIN THE RDTE COST FOR YEAR ZERO IRDTE(2) WOULD CONTAIN THE RDTE COST FOR YEAR -1
MRDTE	DIMENSION OF IRDTE ARRAY

```
*****************************************************************************
*                                                                           *
*                          COMMON /PARMS/                                   *
*                                                                           *
*****************************************************************************
*          *                                                                *
* VARIABLE *   DESCRIPTION                                                  *
*          *                                                                *
*****************************************************************************
*          *                                                                *
* ISTART   * START TIME FOR PHASE 4 TO START GENERATING REPORTS             *
* IEND     * END TIME FOR PHASE 4 REPORTS                                   *
* IPERD    * TIME INTERVAL BETWEEN PERIODIC REPORTS                         *
* RATE     * INFLATION RATE (RATIO - .1 = 10 PERCENT)                       *
* ICUS     * NUMBER OF CALENDAR UNITS PER YEAR                              *
* NEXTP    * TIME OF NEXT PERIODIC REPORT                                   *
* NEXTY    * TIME OF NEXT YEARLY REPORT                                     *
*          *                                                                *
*****************************************************************************
```

```
*****************************************************************************
*                                                                           *
*                          COMMON /RGU/                                     *
*                  COMMON TO HOLD RGU PLOT DATA                             *
*                                                                           *
*****************************************************************************
*              *                                                            *
* VARIABLE     *   DESCRIPTION                                              *
*              *                                                            *
*****************************************************************************
*              *                                                            *
* NRGU1(I,J)   * NUMBER OF RGUS ON HAND FOR EACH PRIMARY RESOURCE DURING    *
*              * EACH YEAR                                                  *
* IAA1(I,J)    * ACTUAL USE AVAILABLE FOR EACH PRIMARY RESOURCE DURING      *
*              * EACH YEAR                                                  *
* NRGU2(I,J)   * NUMBER OF RGUS ON HAND FOR EACH SECONDARY RESOURCE DURING  *
*              * EACH YEAR                                                  *
* IAA2(I,J)    * ACTUAL USE AVAILABLE FOR EACH SECONDARY RESOURCE DURING    *
*              * EACH YEAR                                                  *
*              *                                                            *
*              *  FOR ALL OF THE ABOVE ARRAYS                               *
*              *     I SUBSCRIPT IS INDEXED ON YEAR NUMBER                  *
*              *     J SUBSCRIPT IS INDEXED ON RESOURCE NUMBER              *
*              *                                                            *
*****************************************************************************
```

Section 4.6

COMMON VARIABLE CROSS REFERENCE TABLE

The table on the following pages shows how each subroutine uses each common variable. The subroutine names are printed across the top of the table, and the variable names down the left side.

SUBROUTINE CROSS REFERENCE SUMMARY C********** PHASE 4 **********

ROUTINE OR ENTRY	USAGE SUMMARY											
	MAIN	INIT	CLEAR	*BLOCK	LOOK2	PRINT1	PRINT2	PRINT3	REPRT1	REPRT2	PRYEAR	PRINT4
CLEAR		X							X	X		
FPLOT	X											
IICOST											X	
INIT	X											
LABELX												
LOOKUP		X										
LOOK2		X										
MAXMIN												
PLOTU												
PRINT1	X											
PRINT2	X											
PRINT3	X											
PRINT4											X	
PRINT5												
PRINT6												
PRYEAR										X		
RDTE											X	
REPRTI	X											
REPRT2	X											
SCALE1												
SCALE2												
SRYEAR										X		
STEPFN												
SUMRY	X											
WPLOTB	X											
WRGU											X	

SUBROUTINE CROSS REFERENCE SUMMARY C********** PHASE 4 **********

ROUTINE OR ENTRY — USAGE SUMMARY

	SRYEAR	PRINT5	RDTE	IICOST	SUMRY	PRINT6	WRGU	WPLOTB	FPLOT	LOOKUP	PLOTU	MAXMIN
CLEAR												
FPLOT												
IICOST	X											
INIT												
LABELX											X	
LOOKUP												
LOOK2												
MAXMIN											X	
PLOTU									X			
PRINT1												
PRINT2												
PRINT3												
PRINT4												
PRINT5	X											
PRINT6					X							
PRYEAR												
RDTE	X											
REPRT1												
REPRT2												
SCALE1											X	
SCALE2											X	
SRYEAR												
STEPFN											X	
SUMRY												
WPLOTB	X											
WRGU	X											

SUBROUTINE CROSS REFERENCE SUMMARY C********** PHASE 4 **********

ROUTINE OR ENTRY — USAGE SUMMARY

	SCALE1	SCALE2	STEPFN	LABELX
CLEAR				
FPLOT				
IICOST				
INIT				
LABELX				
LOOKUP				
LOOK2				
MAXMIN	X			
PLOTU				
PRINT1				
PRINT2				
PRINT3				
PRINT4				
PRINT5				
PRINT6				
PRYEAR				
RDTE				
REPRT1				
REPRT2				
SCALE1				
SCALE2				
SRYEAR				
STEPFN				
SUMRY				
WPLOTB				
WRGU				

Section 4.7

TEMPORARY FILES

Two temporary files are created for the purposes of sorting data for plotting. The following figures describe the records on these files.

FILE 51 DESCRIPTION
PRIMARY RESOURCE PLOT BUCKET FILE

THIS UNFORMATTED (BINARY) FILE CONTAINS RECORDS OF THE FOLLOWING FORMAT

WORD	CONTENTS
1	PRIMARY RESOURCE NUMBER
2	BUCKET END TIME (CUS)
3	NUMBER OF UNITS OF THE RESOURCE USED DURING THIS BUCKET
4	MAXIMUM NUMBER OF UNITS OF THE RESOURCE AVAILABLE DURING THIS BUCKET

FILE 52 DESCRIPTION
SECONDARY RESOURCE PLOT BUCKET FILE

THIS UNFORMATTED (BINARY) FILE CONTAINS RECORDS OF THE FOLLOWING FORMAT

WORD	CONTENTS
1	SECONDARY RESOURCE NUMBER
2	END TIME OF THIS YEAR IN CALENDAR UNITS
3	NUMBER OF UNITS OF THE RESOURCE USED DURING THIS YEAR
4	MAXIMUM NUMBER OF UNITS OF THE RESOURCE AVAILABLE DURING THIS YEAR (NOTE - THIS IS THE SAME AS ACTUAL AVAILABLE FOR SR)

Section 5.0

PHASE 5 PROGRAMMER'S GUIDE

INTRODUCTION

The purpose of Phase 5 of TRAM is to report on the usage of trainees and on the time lags that occur in the training system.

This manual is intended to aid the programmer in the operation and modification of the computer program. It is assumed that the reader of this manual is already familiar with the contents of Technical Memorandum SAT-5, TRAM User's Guide.

Section 5.2

PROGRAM DESCRIPTION

Phase 5 reads the time ordered records from the source/lag file and stores a summary of these events in two separate areas, one for the periodic reports, and the other for the yearly reports. These reports are produced at the specified intervals from this stored information. When the end time that was specified on the parameter card is reached, the program outputs a set of final reports to cover the period from the last yearly report to the end of the run.

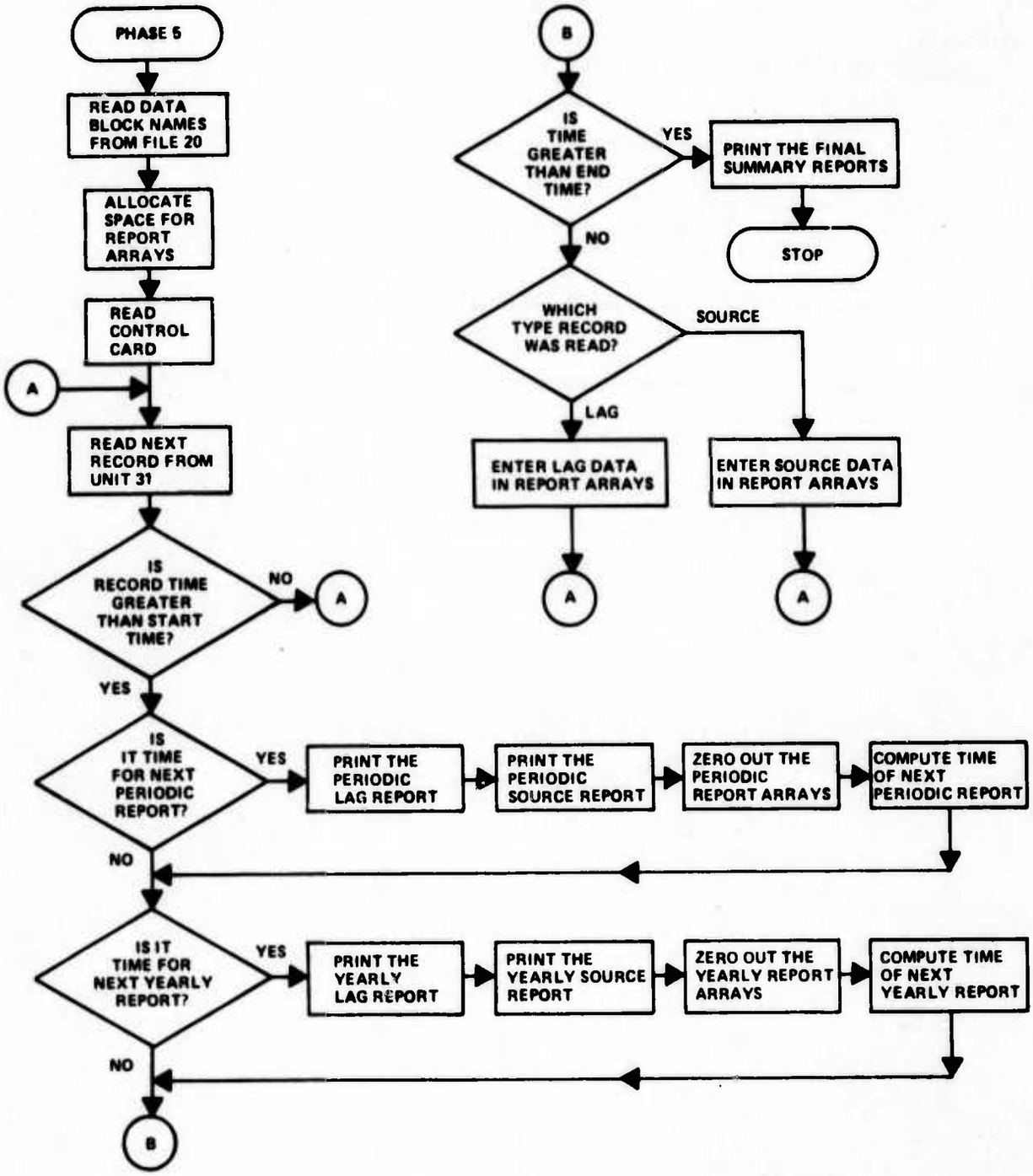
Section 5.3

SUBPROGRAM DESCRIPTIONS

This section contains the descriptions of the individual subprogram's that comprise phase 5 of the TRAM program. The description for each subprogram consists of a statement of the purpose of the routine, the calling sequence, a description of its parameters, the method used, and a list of the subprograms required. A high level flowchart, which shows the logical decision points and the processing accomplished, is also included for each of the major subprograms.

Two subroutines (RDNAME and NAME) are not shown here, but are documented in the phase 3 programmers' guide.

```
CC***************************** PHASE5 ********************************
CC*                                                                    *
CC*                       SUBROUTINE PHASE5                            *
CC*                                                                    *
CC*   PURPOSE                                                          *
CC*      TO OUTPUT THE LAG REPORTS AND THE SOURCE REPORTS FROM THE     *
CC*      RESULTS OF PHASE3.                                            *
CC*                                                                    *
CC*   SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                     *
CC*      RDNAME                                                        *
CC*      CLEAR                                                         *
CC*      REPRT1                                                        *
CC*      REPRT2                                                        *
CC*                                                                    *
CC**********************************************************************
```



PHASE 5 MAIN PROGRAM

```
CC*****************************  CLEAR  ***********************************
CC*                                                                       *
CC*                         SUBROUTINE CLEAR                              *
CC*                                                                       *
CC*   PURPOSE                                                             *
CC*      TO CLEAR AN ARRAY TO ZERO                                        *
CC*                                                                       *
CC*   CALLING SEQUENCE                                                    *
CC*      CALL  CLEAR (IARRAY, NWDS)                                       *
CC*                                                                       *
CC*   DESCRIPTION OF PARAMETERS                                           *
CC*      IARRAY - ARRAY TO BE CLEARED                                     *
CC*      NWDS   - NUMBER OF ELEMENTS IN IARRAY TO BE CLEARED              *
CC*                                                                       *
CC*   SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                        *
CC*      NONE                                                             *
CC*                                                                       *
CC*************************************************************************
```

```
CC*****************************  REPRT1  *********************************
CC*                                                                       *
CC*                          SUBROUTINE REPRT1                            *
CC*                                                                       *
CC*    PURPOSE                                                            *
CC*        TO PRINT THE LAG REPORT                                        *
CC*                                                                       *
CC*    CALLING SEQUENCE                                                   *
CC*        CALL  REPRT1 (ICODE, ISTRT, IEND)                              *
CC*                                                                       *
CC*    DESCRIPTION OF PARAMETERS                                          *
CC*       INPUT                                                           *
CC*        ICODE - INDICATES REPORT TYPE                                  *
CC*                1  PERIODIC                                            *
CC*                2  YEARLY                                              *
CC*                3  FINAL SUMMARY                                       *
CC*        ISTRT - START TIME OF THE REPORT                               *
CC*        IEND  - END TIME OF THE REPORT                                 *
CC*                                                                       *
CC*    SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                       *
CC*        NAME                                                           *
CC*                                                                       *
CC***************************************************************************
```

```
CC******************************* REPRT2 **********************************
CC*                                                                       *
CC*                          SUBROUTINE REPRT2                            *
CC*                                                                       *
CC*   PURPOSE                                                             *
CC*        TO PRINT THE SOURCE REPORT                                     *
CC*                                                                       *
CC*   CALLING SEQUENCE                                                    *
CC*        CALL  REPRT2 (ICODE,ISTRT,IEND)                                *
CC*                                                                       *
CC*   DESCRIPTION OF PARAMETERS                                           *
CC*       INPUT                                                           *
CC*        ICODE - INDICATES REPORT TYPE                                  *
CC*                1  PERIODIC                                            *
CC*                2  YEARLY                                              *
CC*                3  FINAL SUMMARY                                       *
CC*        ISTRT - START TIME OF THE REPORT                               *
CC*        IEND  - END TIME OF THE REPORT                                 *
CC*                                                                       *
CC*   SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                        *
CC*        NAME                                                           *
CC*                                                                       *
CC*************************************************************************
```

Section 5.4

SUBROUTINE CROSS REFERENCE TABLE

In the table on the following page, the column headings show the names of the subroutines that do the calling, and the row headings give the names of the subroutines that are called.

SUBROUTINE CROSS REFERENCE SUMMARY C********** PHASE5 **********

ROUTINE OR ENTRY — USAGE SUMMARY

	MAIN	*BLOCK	CLEAR	REPRT1	REPRT2
CLEAR	X				
REPRT1	X				
REPRT2	X				

Section 5.5
COMMON VARIABLE DEFINITIONS

The tables on the following pages define the meaning of each variable contained in each of the common blocks used by this program.

```
*****************************************************************************
*                                                                           *
*    COMMON /LAG/  -  DATA FOR LAG REPORTS                                  *
*                                                                           *
*****************************************************************************
*           *                                                               *
* VARIABLE *   DESCRIPTION                                                  *
*           *                                                               *
*****************************************************************************
*           *                                                               *
* IPL1      * BASE POINTER TO LAG DATA FOR COURSES                          *
* NL1       * NUMBER OF COURSES                                             *
* IPL2      * BASE POINTER TO LAG DATA FOR PROCESSING BLOCKS                *
* NL2       * NUMBER OF PROCESSING BLOCKS                                   *
* IPL3      * BASE POINTER TO LAG DATA FOR TASKS                            *
* NL3       * NUMBER OF TASKS                                               *
*           *                                                               *
* ILAG(I,4)* LAG DATA - 4 WORDS PER ENTRY                                   *
*           *                                                               *
*           *************************************************************** *
*           *      *                                                        *
*           * WORD *  CONTENTS                                             *
*           *      *                                                        *
*           *************************************************************** *
*           *      *                                                        *
*           *   1  * TOTAL LAG TIME DURING THIS PERIOD                      *
*           *   2  * TOTAL LAG TIME TO DATE (FOR PERIODIC REPORT)           *
*           *   3  * TOTAL LAG TIME DURING THIS YEAR                        *
*           *   4  * TOTAL LAG TIME TO DATE (FOR YEARLY REPORT)             *
*           *      *                                                        *
*           *************************************************************** *
*           *                                                               *
* MLAG      * MAXIMUM NUMBER OF ENTRIES WHICH CAN BE STORED IN THE ILAG ARRAY *
*           * (DIMENSION OF FIRST SUBSCRIPT)                                *
*           *                                                               *
*****************************************************************************
```

```
*****************************************************************************
*                                                                           *
*     COMMON /SOURCE/  -  DATA FOR SOURCE REPORTS                           *
*                                                                           *
*****************************************************************************
*            *                                                              *
* VARIABLE *    DESCRIPTION                                                 *
*            *                                                              *
*****************************************************************************
*            *                                                              *
* IPS1       * BASE POINTER TO SOURCE DATA FOR COURSES                      *
* NS1        * NUMBER OF COURSES                                            *
* IPS2       * BASE POINTER TO SOURCE DATA FOR SOURCES                      *
* NS2        * NUMBER OF SOURCES                                            *
*            *                                                              *
*ISRCE(I,8)* SOURCE DATA - 8 WORDS PER ENTRY                                *
*            *                                                              *
*            ********************************************************************
*            *       *                                                      *
*            * WORD *  CONTENTS                                            *
*            *       *                                                      *
*            ********************************************************************
*            *       *                                                      *
*            *    1  * NUMBER OF TRAINEES USED DURING THIS PERIOD           *
*            *    2  * TOTAL TRAINING TIME FOR TRAINEES USED DURING THIS PERIOD  *
*            *    3  * TOTAL NUMBER OF TRAINEES USED TO DATE                *
*            *       * (FOR PERIODIC REPORT)                                *
*            *    4  * TOTAL TRAINING TIME TO DATE (FOR PERIODIC REPORT)     *
*            *    5  * NUMBER OF TRAINEES USED DURING THIS YEAR             *
*            *    6  * TOTAL TRAINING TIME FOR TRAINEES USED DURING THIS YEAR    *
*            *    7  * TOTAL NUMBER OF TRAINEES USED TO DATE                *
*            *       * (FOR YEARLY REPORT)                                  *
*            *    8  * TOTAL TRAINING TIME TO DATE (FOR YEARLY REPORT)      *
*            *       *                                                      *
*            ********************************************************************
*            *                                                              *
* MSRCE      * MAXIMUM NUMBER OF ENTRIES WHICH CAN BE STORED IN ISRCE ARRAY  *
*            * (DIMENSION OF FIRST SUBSCRIPT)                               *
*            *                                                              *
*****************************************************************************
```

Section 5.6
COMMON VARIABLE CROSS REFERENCE TABLE

The table on the following pages shows how each subroutine uses each common variable. The subroutine names are printed across the top of the table, and the variable names down the left side.

CROSS REFERENCE USAGE CODES

A **ARGUMENT**

THE SYMBOL IS A VARIABLE OR FUNCTION NAME WHICH APPEARS IN AN ARGUMENT LIST OF A CALL, SUBROUTINE, FUNCTION, OR ENTRY STATEMENT.

D **DATA INITIALIZATION**

THE SYMBOL IS A VARIABLE WHICH IS INITIALIZED IN A DATA OR TYPE SPECIFICATION STATEMENT SUCH AS A COMPLEX SPECIFICATION STATEMENT.

F **FETCH A VALUE**

THE SYMBOL IS A:

1. VARIABLE WHOSE MOST RECENTLY ASSIGNED VALUE IS ACCESSED BUT NOT CHANGED.
2. FUNCTION NAME OR ARGUMENT OF A FUNCTION WHICH APPEARS ON THE RIGHT SIDE OF AN EQUAL SIGN IN AN ASSIGNMENT STATEMENT OR APPEARS IN AN IF STATEMENT TEST.
3. DUMMY ARGUMENT IN A STATEMENT FUNCTION DEFINITION.

S **STORE A VALUE**

THE SYMBOL IS A:

1. VARIABLE WHOSE VALUE IS REPLACED BY ANOTHER VALUE.
2. FUNCTION NAME WHICH APPEARS ON THE LEFT SIDE OF AN EQUAL SIGN IN AN ASSIGNMENT STATEMENT.
3. NAME OF A STATEMENT FUNCTION IN THE DEFINITION OF THAT FUNCTION.

C **COMMON**

THE SYMBOL IS A VARIABLE WHICH APPEARS IN A COMMON STATEMENT OR IS THE NAME OF A LABELED COMMON BLOCK.

E **EQUIVALENCE**

THE SYMBOL IS A VARIABLE WHICH APPEARS IN AN EQUIVALENCE STATEMENT.

T **TYPE SPECIFICATION**

THE SYMBOL IS A VARIABLE WHICH APPEARS IN A :

1. TYPE SPECIFICATION STATEMENT AND IS NOT INITIALIZED IN THAT STATEMENT.
2. DIMENSION OR EXTERNAL STATEMENT.

N **ENTRY POINT**

THE SYMBOL IS AN ENTRY POINT DEFINED BY AN ENTRY STATEMENT IN A SUBROUTINE OR FUNCTION.

X **EXTERNAL REFERENCE**

THE SYMBOL IS A SUBROUTINE OR ENTRY NAME WHICH APPEARS IN A CALL STATEMENT.

CROSS REFERENCE SUMMARY C********** PHASE5 **********

SYMBOL	TYPE	USAGE SUMMARY				
		MAIN	*BLOCK	CLEAR	REPRT1	REPRT2
ILAG	I	A FSC	D C		F C	
IPL1	I	FSC	C		F C	
IPL2	I	FSC	C		F C	
IPL3	I	FSC	C		F C	
IPS1	I	FSC	C			F C
IPS2	I	FSC	C			F C
ISRCE	I	A FSC	D C			F C
MLAG	I	A F C	D C		C	
MSRCE	I	A F C	D C			C
NL1	I	FSC	C		F C	
NL2	I	FSC	C		F C	
NL3	I	FSC	C		F C	
NS1	I	FSC	C			F C
NS2	I	FSC	C			F C

Section 6.0

MERGE PROGRAM PROGRAMMER'S GUIDE

INTRODUCTION

The purpose of this program is to merge the original resources file from Phase 2 and the unused resources file from Phase 3 into a single resource use file for input to Phase 4.

This manual is intended to aid the programmer in the operation and modification of the computer program.

Section 6.2

PROGRAM DESCRIPTION

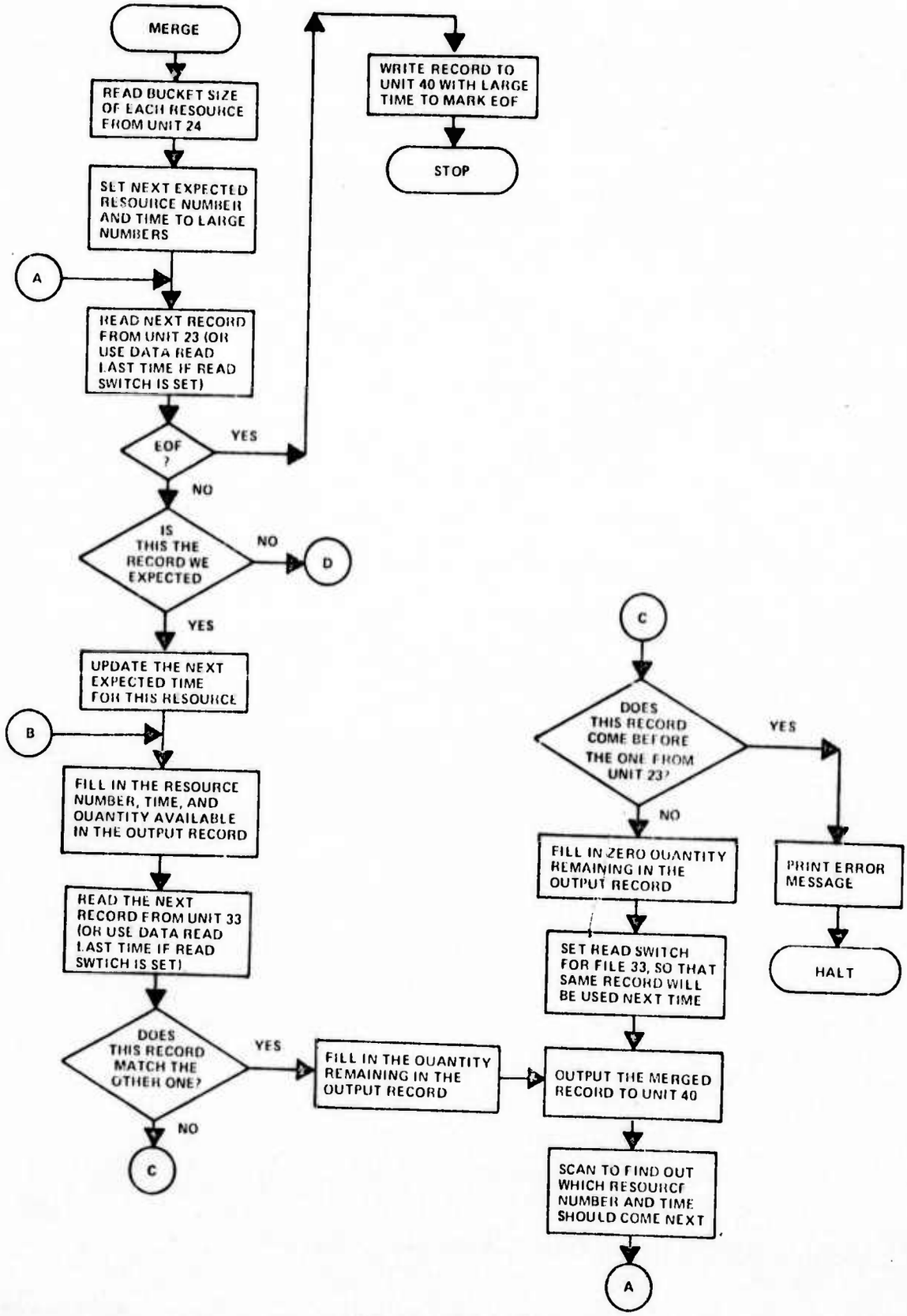
The merge program reads matched pairs of records from units 23 and 33, and outputs single records containing the data from the original pair. The records on unit 23 contain the quantity of the resource available during the bucket, and the records on unit 33 contain the quantity remaining at the end of the bucket. Both of these files are sorted by time and resource number, which are used as keys to the merge operation.

The program keeps track of the time at which the next record should be encountered for each resource, based on its bucket size (obtained from unit 24.) This enables any missing records on unit 23 to be detected. A missing record on this file indicates that the resource is no longer available. When this occurs, the program writes a record to the output file with both the quantity available and the quantity remaining set to zero. If the resource becomes available again later, the merge program will continue processing it. A missing record on unit 33 indicates that all of the resource has been used, so the quantity remaining is set to zero and a record is written to the output file.

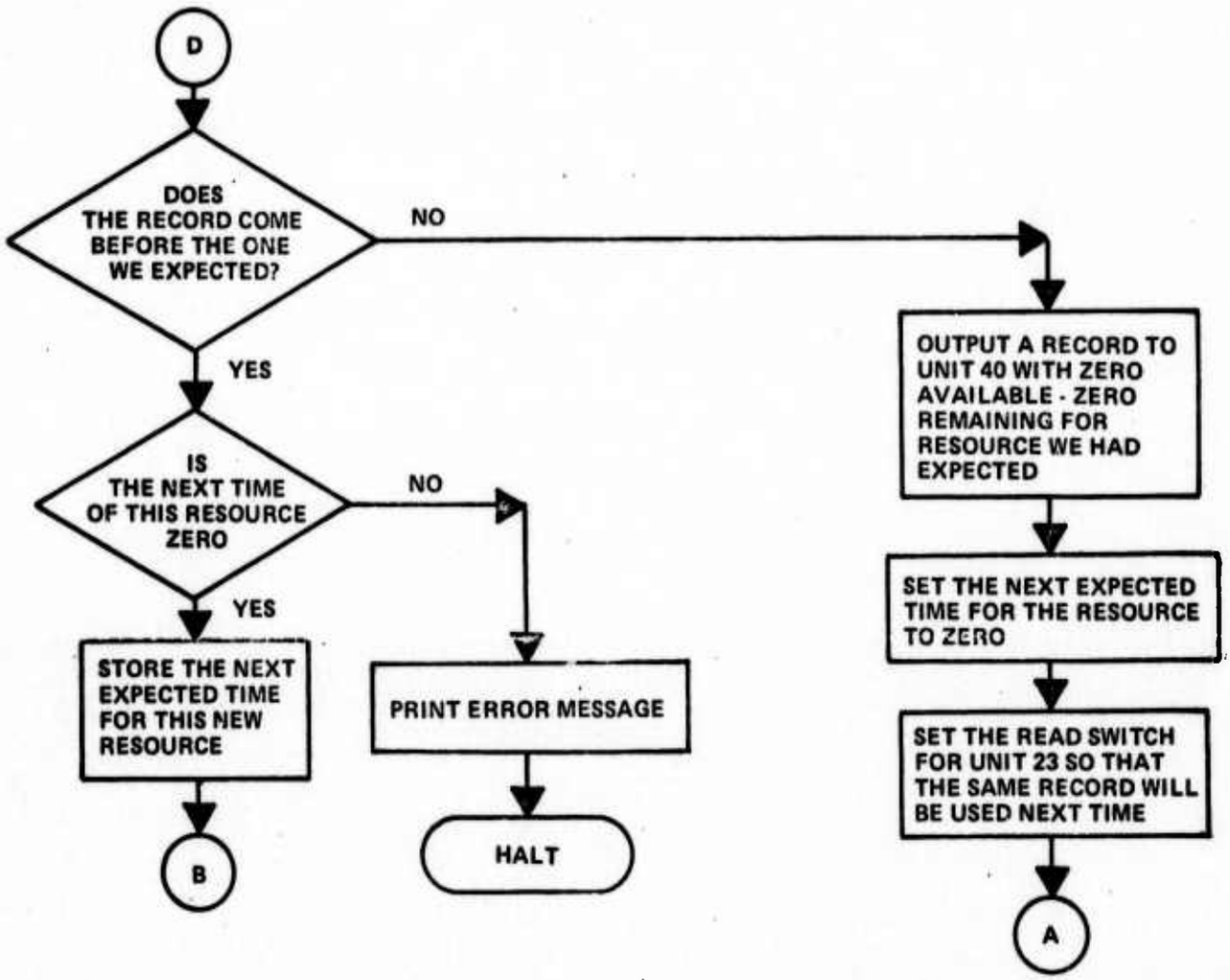
This merge operation continues until an end of file is encountered on unit 23. An extra record is then written to the output file to signal the end of file to phase 4. This record has all fields set to zero except for the bucket time, which is filled in with a large number.

The merge program consists of a main program, which does not require any subroutines or common blocks. The documentary prologue from this program is shown on the next page, and a high level flowchart is included in the pages following that.

```
CC******************************  MERGE  ********************************
CC*                                                                     *
CC*                           MERGE PROGRAM                             *
CC*                                                                     *
CC*   PURPOSE                                                           *
CC*      TO READ THE RESOURCE QUANTITY AVAILABLE FILE FROM TRAM STEP2   *
CC*      AND THE RESOURCE QUANTITY REMAINING FILE FROM TRAM STEP 3,     *
CC*      AND TO MERGE THEM INTO A SINGLE RESOURCE USE FILE FOR INPUT    *
CC*      TO TRAM STEP 4.                                                *
CC*                                                                     *
CC*   INPUT FILES                                                       *
CC*     1 TRANSFERRED PRIMARY RESOURCES FILE (TPR) - FROM TRAM STEP 2   *
CC*       ON FORTRAN LOGICAL UNIT 24                                    *
CC*       RECORD 1  - NUMBER OF RESOURCES                               *
CC*              2  - RESOURCE NAMES                                    *
CC*              3  - NUMBER OF CALENDAR UNITS PER YEAR                 *
CC*              4  - RESOURCE BUCKET SIZES                             *
CC*                                                                     *
CC*     2 RESOURCE QUANTITY AVAILABLE FILE - FROM TRAM STEP 2           *
CC*       ON FORTRAN LOGICAL UNIT 23                                    *
CC*       EACH RECORD CONTAINS THE FOLLOWING                            *
CC*           1  TIME                                                   *
CC*           2  RESOURCE NUMBER                                        *
CC*           3  QUANTITY AVAILABLE                                     *
CC*       - THESE RECORDS HAVE BEEN SORTED ON TIME AND RESOURCE NUMBER  *
CC*       - RECORDS WILL NOT BE PRESENT FOR TIMES WHEN THE RESOURCE     *
CC*         IS NOT AVAILABLE                                            *
CC*                                                                     *
CC*     3 RESOURCE QUANTITY REMAINING FILE - FROM TRAM STEP 3           *
CC*       ON FORTRAN LOGICAL UNIT 33                                    *
CC*       EACH RECORD CONTAINS THE FOLLOWING                            *
CC*           1  TIME                                                   *
CC*           2  RESOURCE NUMBER                                        *
CC*           3  QUANTITY REMAINING                                     *
CC*       - THESE RECORDS HAVE BEEN SORTED ON TIME AND RESOURCE NUMBER  *
CC*       - RECORDS WILL NOT BE PRESENT FOR TIMES WHEN ALL PRESENT      *
CC*         UNITS OF THE RESOURCE HAVE BEEN USED                        *
CC*                                                                     *
CC*   OUTPUT FILE                                                       *
CC*       RESOURCE USE FILE                                             *
CC*       ON FORTRAN LOGICAL UNIT 40                                    *
CC*       EACH RECORD CONTAINS THE FOLLOWING                            *
CC*           1  TIME                                                   *
CC*           2  RESOURCE NUMBER                                        *
CC*           3  MAXIMUM QUANTITY AVAILABLE IN THIS BUCKET              *
CC*           4  QUANTITY REMAINING AT THE END OF THIS BUCKET           *
CC*                                                                     *
CC*   SUBROUTINE AND FUNCTION SUBPROGRAMS REQUIRED                      *
CC*       NONE                                                          *
CC*                                                                     *
CC***********************************************************************
```



MERGE PROGRAM



MERGE PROGRAM – CONTINUED

Section 6.3

DESCRIPTION OF INPUTS

The only inputs to the merge program are these binary files passed from the previous TRAM job steps:

23 (original resources file from phase 2)

24 (resource information from phase 2)

33 (unused resources file from phase 3)

A description of each of these files is contained in the programmers guide for the phase which creates it.

Section 6.4

DESCRIPTION OF OUTPUTS

The main output of this program is the binary file written to unit 40 for passage to phase 4. The contents of this file are described in the program's prologue, which is shown in section 2. The only other outputs are the printed error messages, or the "MERGE COMPLETED" message, which is printed to indicate that no errors were detected.

Section 7.0

TROLIE PROGRAMMER'S GUIDE

7.1 Introduction

This guide is intended to supplement the user's guide for TROLIE in Technical Memorandum SAT-5, TRAM User's Guide. TROLIE consists of five parts. The INPUT subroutine reads inputs, documents the inputs and writes the resource name records in Unit 2. The MAIN program computes the resource use and writes the resource use records on Unit 1. Subroutines TAB and WTAB are table writers. TAB has an extra argument for writing column headings. BLOCK DATA clears arrays and introduces some literal data.

7.2 Subroutines

The section which follows contains descriptions of the subprograms, commons and output data sets.

Subroutine INPUT

The inputs are read in accordance with Table 1. As each major set of cards are read, output is created to document their values. Individual deliveries are not documented. A program error stop will occur if array sizes are exceeded (label 100), if a delivery is attempted to an undefined air base (label 100), or it there are an insufficient number of input cards (label 101). Input also writes the resource names record on unit 2 for use in Phase 4 of TRAM.

Subroutine BLOCK DATA

BLOCK DATA contains names for printout purposes and clears arrays used in MAIN. The arrays cleared by BLOCK DATA must be cleared because initial zeros are assumed.

Subroutine WTAB(NDATA, NCOLS, NLINES, COLLAB, LINLAB, TOPLAB, ISHIFT, KD, NAMES)

and

Subroutine TAB(NDATA, NCOLS, NLINES, COLLAB, LINLAB, TOPLAB, ISHIFT, KD)

Arguments are:

NDATA	a two-dimensional array to be printed out
NCOLS	number of columns
NLINES	number of lines

COLLAB	column label
LINLAB	row label
TOPLAB	overall label
ISHIFT	index offset for rows
KD	first dimension of NDATA
NAMES	list of column headings

WTAB and TAB write tables 50 lines long by 10 columns wide with a row index. WTAB has column headings, TAB has only indices.

MAIN Program

Most of the computation is performed in the MAIN program. MAIN consists of a number of sections identifying the loops over time using the index IY (for year index).

- Loop on 100 This loop computes the training demands
- Loop on 300 This loop writes the results of the 100 loop
- Loop on 200 This loop computes the PMT demands
- Loop on 340 This loop writes the results of the 200 loop
- Loop on 400 This loop selects the source for the CCTS demands

The resource and track use reports are then written.

- Loop on 600 This loop computes the resource use and writes the resource use records in the proper order for Phase 4 of TRAM on Unit 1.

The final step is a listing of the resources used and the generation of the end of file record.

7.3 NOTES

In the loop on Table 100, NNCPY (IY + 1) contains the number of crews currently in the system. On the next pass through the loop, this is used to compute the number of new crews required that year.

The resource use date (IDTCU) is 2 calendar units less than the end of the year. Normally the number of calendar units per year is 1500 so this should not present a problem.

7.4 COMMONS

The contents of the commons are indicated in Tables 7.1, 7.2 and 7.3.

Table 7.1

Common REALS -
Real Data Initialized by INPUT and BLOCK DATA

Variable	Definition	Defined
AR	Attention Ratio	Input
CR	Crew Ratio	Input
PUPR	Copilot Upgrade Ratio	Input
ANAME (5)	'PLTS'	Block Data
	'CPLT'	Block Data
	'OSO '	Block Data
	'DSO '	Block Data
	'XTRA'	Block Data
RESNAM(3,80)	Resource Names (3 words each)	Input

Table 7.2

Common ICS -
Integer Constants (All defined in INPUT)

NY	Number of Years
NYO	Date of Year 1
NB	Number of Bases
NS	Number of Sources
NT	Number of Tracks
NR	Number of Resources
IDELAY	Attrition Delay
NCU	Number of Calendar Units/Year
ITAPE	Data Set Flag

Table 7.3

Common INTAR -

Integer Arrays

Except for IDT and ISTAB, all names are of the form XXXPYY where XXX is arbitrary, P per "per" and YY is one or two suffix letters which indicate the dependencies as follows:

B	Air Bases
P	Position
S	Source
R	Resource
T	Tracks
Y	Years

Variable	Definition	Defined
NACPBY	No. of aircraft per base year year	Main
NADPBY	No. of deliveries per base each year	Input
NACPY	No. of aircraft in system each year	Main
NADPY	No. of deliveries each year	Input
NCPBY	No. of crews at each base each year	Main
NCPY	No. of crews in system each year	Main
NNCPY	No. of new crews trained each year	Main
NRCPY	No. of replacement crews trained each year	Main
NTTDPY	No. of total trainee demands each year	Main
NXCPY	No. of extra pairs each year	Main
ILTID	Lower PMT track list index for each base	Input
IUTID	Upper PMT track list index for each base	Input
IDT	Track index list	Input
NTPTY	No. of trainees in each track each year	Main
NPPY	No. of preps trained each year	Main
ISTAB	Source for each CCTS track	Input
NSPSY	No. of trainees available from each source each year	Input
IUSPSY	No. of trainees drawn from each source each year	Main
INSPTY	No. of unit trainees in each track each year	Main
IRUPRY	Amount of each resources used each year	Main
IRCPRT	Amount of each resources used by a unit trainee in each track.	Input

7.5 REPORTS

Sample outputs are contained in the programmer's guide. The reports are:

1. Parameters - The first 2 cards
2. Air Base List - Base names, indices, and PMT track lists
3. Delivery List - Years by bases
4. CCTS Track List - Sources index for each CCTS track
5. Source Availability - Trainees available years by sources
6. Resource Use Data - Resources used by unit trainees - tracks by resources
7. CCTS Summary - Yearly A/C deliveries, total A/C deployment, new crews, replacement crews, total crews in the system, pilot upgrades, total full crew training, and extras pairs training
8. Detailed Base Delivery List
9. PMT Track Trainees - Number of PMT unit trainees per track, years by track
10. Source Use Matrix - Use of trainees from each source, years by source
11. Track Use - Trainees taught by years and track
12. Resource Use - Resources used, years by resource.

7.6 DATA SET OUTPUT

Two files are produced.

FORTRAN Unit 1 contains resource use records. The records must be sorted by date and resources number. Each logical record contains:

- Date in CUs
- Resource number
- Resource originally available
- Resource remaining

The resource originally available is nominally 99999 units. A final record with the time 999999 is produced as an end of file record.

FORTRAN Unit 2 is the resource name file. It contains:

Record	
1	Number of resources
2	Resource names
3	Number of calendar units per year
4	Bucket size for each resource (=NCU for TROLIE)