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AN APT POST PROCESSOR
FOR POSITIONING MACHINES

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ABSTRACT

The APT Post Processor for Positioning Machines is a generalized post processor that produces command tapes for numerically controlled positioning machines. It provides a basic framework that allows easy implementation of new machines.

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An APT Post Processor for Positioning Machines

1. Description

The APT Post Processor for Positioning Machines is intended to be a generalized post processor. This post processor provides a basic framework that allows new machines to be added without altering the framework or the machines that have previously been implemented. Features peculiar to a given machine may be taken care of by adding new subroutines and/or by adding new branches to existing subroutines. Section 2.1 of the Appendix makes note of the subroutines generally affected by the addition of new machines.

The flow of the post processor is controlled by subroutine POSITN. POSITN calls subroutine READER which reads the CLTAPE. POSITN then calls other subroutines to process the CLTAPE data. Different branches are made in POSITN according to the type of CLTAPE record that is read. After a record has been processed, READER is called to obtain the next record from the CLTAPE. A cross reference list of the subroutines that comprise the Positioning Post Processor appears in Section 2.2 of the Appendix. Descriptions of all of the subroutines are in Section 2.3 of the Appendix. A flow chart of FEDRAT is included in Section 2.4 because the routine contains a large number of machine dependent branches.

Data to be output is loaded into the PREBU array in floating point representation. Each of the machine's registers is assigned a particular element of PREBU. Prior to output, the floating point number in each element of PREBU is converted to BCD as specified by the corresponding element of the FORMAT array and placed into the appropriate element of BUFFER. If word address is desired, the BCD letters are obtained from the WORDS array, which is ordered like PREBU and FORMAT, and placed in the appropriate elements of BUFFER. A description of the BUFFER, FORMAT, and WORDS arrays is given in Section 2.5 of the Appendix.

When adding a machine to the Positioning Post Processor, there are two options pertaining to when the output from non-motion CLTAPE records is obtained. The output may either be put out in a block by itself, or it may be held for merging with the next motion block. In the case for which the non-motion output is in a block by itself, PREBU is loaded with the proper values and subroutines CARD and PRINT are called to prepare the punched output and to print the information, respectively. When a value is to be held for merging with the next motion block, the appropriate variable is loaded with the value and the corresponding flag is set to indicate that there is a value being held for later output. A list of variable names with definitions is in Section 2.6 of the Appendix.

When coordinate data is to be put out, POSITN calls subroutine DATA which prepares the calculated points for output as a motion record. To do this, DATA calls subroutine COMPUT which calculates the desired coordinate data and then returns to DATA which then calls subroutine SETUP. SETUP calls STAU_{xx} to load any values being held for output in the next motion block into the appropriate elements of PREBU. SETUP then loads the coordinate data into the proper PREBU elements. After SETUP completes its function, control is returned to DATA where the coordinate data is rounded to the particular machine accuracy and held as the previous point. DATA then returns to POSITN which calls subroutines CARD and PRINT to put out the information in PREBU. Descriptions of the above routines are included in Section 2.3 of the Appendix.

Tables of the options presently available in the Positioning Post Processor are available in Section 2.5 of the Appendix. The IDUM array contains the fixed point values and the OPTAB array contains the floating point values. Some elements in each array are used as variable storage locations rather than options. The options and the variables are all initialized to preset values in subroutine INIT. If a particular machine requires that an option have another value, the option may be set to the desired value in MACH_{xx}.

Included in Section 2.7 of the Appendix is a dictionary of post processor words now available on the Positioning Post Processor. Program listings of all the subroutines are provided in Section 2.8 of the Appendix.

This positioning post processor is designed to operate with the APT III System; however, it is non-standard in that the subroutine XPOST in chain 400 of the standard system must be altered so that the machines called for in the machine statements will be recognized. Subroutine DISPAT in chain 400 must also be altered to place the machine number in MTABLE(6). The MTABLE array is included in the common package of the positioning post processor. If the machine statement format MACHIN/machine name, machine number is used, the version of subroutine DISPAT listed in Section 2.9 of the Appendix will properly load the machine number in MTABLE(6).

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APPENDIX

2.1 Subroutines Affected by Addition of New Machines

The following subroutines are usually altered when a new machine is added to the Positioning Postprocessor.

Subroutine	Change
INIT	A call to <u>MACHXX</u> must be added.
MESSAG	Machine information for the heading must be added.
PREINT(LL)	Tape leader and trailer information must be added. (LL = 0, leader; LL = 1, trailer)
PRINT	Machine heading information must be added.
PRTON	Machine heading information must be added for the on-line message.
SETUP	A call to <u>STAUXX</u> must be added, if registers other than n, g, x, y, and z are needed.

New subroutines generally needed are:

MACHXX
STAUXX

NOTE: Other new subroutines may be required by any one machine, but the two mentioned above will be needed for most cases.

The following routines have a branch on the machine number and may be changed to suit the specifications peculiar to the machine. However, there may not be any need to alter these routines, while others not mentioned may need to be altered.

AUXFUN	OPSTOP
CARD	PREFUN
COOLNT	REWIND
DISPLY	SPINDL
END	SPLCOD
FEDCOD	STOP
FEDRAT	TOOLN
LOADTL	

2.2 List of Subroutines

I. POSITN (Control Program)

- A. AUXFUN
 - 1. CARD
 - 2. PRINT
- B. CARD
 - 1. CONBCD
 - 2. PUNCHA
 - a. PUNCH
 - b. PUNIDS
 - 3. SEQNO(2)
- C. CLRSRF
- D. COOLNT
 - 1. CARD
 - 2. COMENT
 - a. COMT1
 - 3. PRINT
- E. DATA
 - 1. COMPUT
 - a. COMENT
 - 2. SETUP
 - a. STAUXX
 - b. PERROR
- F. DELAY
 - 1. CARD
 - 2. PRINT
- G. DESPAT
 - 1. DISPAT
- H. DISPLY
 - 1. CARD
 - 2. COMENT
 - a. COMT1
 - 3. PRINT
- I. END
 - 1. CARD
 - 2. ENDMA4
 - a. CONBCD
 - b. PRINT
 - c. PUNCHA
 - 3. ENDMA6
 - a. PUNCHA
 - 4. PRINT
 - 5. PUNCHA
- J. FEDRAT
 - 1. CARD
 - 2. COMENT
 - 3. FEDC1
 - a. COMENT
 - b. FEDCOD
 - c. PERROR

K. FINAL
1. DESPAT
2. PREINT
3. PRTON

L. INIT
1. INIT1
2. MACH~~xx~~
3. PERROR

M. INSERT
1. MESSAG
2. PUNCHA

N. LEADER
1. CONBCD
2. MESSAG
3. PUNCHA

O. LOADTL
1. CARD
2. PRINT

P. MESSAG

Q. OPSTOP
1. CARD
2. PRINT

R. OPTION

S. PDUMP

T. PERROR
1. FINAL
2. PDUMP

U. PREFUN
1. CARD
2. PRINT

V. PREINT
1. PARNEW
2. PARNOM
3. PUNCHA
4. PUNIDN
5. PUNSEQ
6. SWAP

W. PRINT
1. CONBCD

X. RAPID

Y. READER

Z. REWIND
1. CARD
2. PRINT

AA. ROTABL
1. CARD
2. COMENT
3. DATA
4. PRINT

BB. SEQNO(N)
1. COMENT
2. PUNCHA
CC. SPINDL
1. CARD
2. COMENT
3. PRINT
4. SPINCL
a. COMENT
b. PERROR
c. SPLCOD
DD. STOP
1. CARD
2. PRINT
EE. TOOLN
1. CARD
2. PRINT
FF. TRANS
1. COMENT

2.3 Descriptions of Subroutines

Subroutine AUXFUN

Purpose

To output or obtain for later output the auxiliary function number as given by the APT source statement "AUXFUN".

Input

CALL AUXFUN

Output

A block of tape and corresponding listing is produced containing the m-code only, except that the sequence number, if in the format of the machine, will be included or a parameter and a flag are set for output with next motion.

Method

For machines that output this command with the next motion, the parameter OPTAB (25) is set to the value following the slash in a AUXFUN/_____ statement. The flag IDUM (24) is set so that the parameter will be picked up.

For machines that output immediately, the proper PREBU register is loaded and CARD is called to punch the record. PRINT is called to list the record.

Subroutine CARD

Purpose

To output a block of punched tape

Input

CALL CARD

Output

A block of punched tape is produced.

Method

The buffer area BUFFER is first blanked out, then a representation of punched tape output is built up. Each register (PREBU) is tested for having a value to be punched. Those registers having no value to be punched will have "BITS" in the appropriate element of PREBU. If the value is not already BCD, CONBCD is called to convert to BCD per corresponding format in FORMAT table. The BCD representation is then placed in the appropriate location in BUFFER. If word address is desired, the alphabetic label for each register is taken from WORDS and placed in the appropriate location in BUFFER. A branch on machine is made to place tabs in the appropriate places in BUFFER. PUNCHA is called to punch per EIA standard code the BCD information in BUFFER.

Subroutine CLRSRF

Purpose

To turn the "CLRSRF" flag on and to store the normal distance to the clearance plane from the origin in OPTAB(27)

Input

CALL CLRSRF

Output

The normal distance from the origin to the clearance plane is taken from TAPSTO(10) and stored in OPTAB(27). It is then put out in the next motion block.

Method

The "CLRSRF" flag, IDUM(34), is turned on and the contents of TAPSTO(10) are stored in OPTAB(27).

Subroutine COMENT

Purpose

To write out the information received from COMT1 and to increment the line counter for the number of lines output

Input

CALL COMENT

Output

The message received from COMT1 is printed.

Subroutine COMPUT

Purpose

To compute increments of motion

Input

CALL COMPUT

Output

The coordinate points for the next motion block are placed in PRESTX, PRESTY, and PRESTZ.

Method

Coordinates from the CLTAPE record just read are placed into PRESTX, PRESTY, and PRESTZ. Increments of motion from the previous position are computed for x and y, and for z if the machine has three axes. These increments are respectively OPTAB(2), OPTAB(3), and OPTAB(4). If an increment exceeds the limit for a particular machine, a warning message is printed. If the machine has a special code for producing long motions in parts, the exceeding increment is halved and the CLTAPE record indexes are set to pick up the same coordinates again.

Subroutine COMT1

Purpose

To provide the error messages required by certain of the subroutines

Input

CALL COMT1

Output

Subroutine COMENT is provided with the message to be output.

Subroutine COOLNT

Purpose

To set up the coolant condition flag as specified by the APT source statement "COOLNT" or to output the appropriate coolant condition code

Input

CALL COOLNT

Output

The flag NCOOL is set indicating that the code for turning coolant on or off is to be punched and the parameter KOOL is set to represent flood (1), mist (2), or off (0) condition; or a block of tape and corresponding listing is produced containing the coolant code only, except that the sequence number, if in the format of the machine, will be included.

Subroutine DATA

Purpose

To handle the loading of the registers

Input

CALL DATA

Output

The PREBU array will contain any values to be punched.

Method

COMPUT is called to determine the present coordinate values and the increments of motion. SETUP is called to load the coordinates, and any values being held for a motion block, into the PREBU array. Upon return from SETUP, the previous coordinates are rounded to agree with the values put into the punched tape.

Subroutine DELAY

Purpose

To cause the tool to dwell for the number of counts designated in the "DELAY" statement

Input

CALL DELAY

Output

Either a block of tape is punched for each count designated in the "DELAY" statement or the counter on m-codes in hold is incremented, depending on the machine. The DELAY flag is turned on in the latter case.

Method

The number of counts to be held is taken from TAPSTO(4) and stored in the variable "IN" used for the limit in the loop that outputs the m-codes.

Subroutine DISPLY

Purpose

To output or obtain for later output the display number as given by the APT source statement "DISPLY"

Input

CALL DISPLY

Output

A block of punched tape and corresponding listing is produced or parameters and flags are set for output with next motion.

Method

For machines that output this command with the next motion, parameters are set to the values following the slash in a DISPLY/--- statement. Flags are set so that these parameters will be picked up.

For machines that output immediately, the proper registers are loaded and CARD is called to punch the record. PRINT is called to list the record.

Subroutine END

Purpose

To produce appropriate output block for the APT source statement
"END"

Input

CALL END

Output

Any special end codes will be punched and anything remaining in the punch buffer will be punched.

Method

If special codes are required for an END statement, a call is made to ENDMA_x to output them. A call is made to PUNCHA to punch out any information remaining in the punch buffer.

Subroutine ENDMAxPurpose

To produce a block of punched tape containing special end codes appropriate for the machine

Input

CALL ENDMAx

Output

The special end codes will be punched along with any information remaining in the punch buffers.

Method

The required codes are stored in buffer locations and then subroutine PUNCHA is called to punch the information.

Subroutine FEDC1

Purpose

To search the feed rate table to find a value corresponding to the specified value from the APT source statement "FEDRAT"

Input

CALL FEDC1

Output

The applicable element number of the feed rate table is placed in NFEEDC.

Method

The feedrate table (FEDTAB) is searched for the closest value that is not bigger than the specified feed rate value. FEDTAB is arranged as F(I,J) with J being the index of feedrate values and I the index for range. F(1,1), F(2,1), F(1,2), F(2,2), F(1,3), F(2,3), ..., F(1,n), F(2,n) for example is the order of elements for two ranges and n speeds per range. NFEEDC is set equal to the element number of FEDTAB at which the desired feed rate value is located and a call is made to FEDCOD to obtain the corresponding feed rate code.

Error Checks

Feed rate table search fails -- Error number 2

Subroutine FEDCOD

Purpose

To determine the code corresponding to a value from the feed rate table

Input

CALL FEDCOD. NFEEDC will contain the element number of the feed rate table.

Output

Feed rate code will be in NFEEDC.

Method

The feed rate codes for some machines correspond to the value of NFEEDC as determined by FEDC1. For machines where the codes do not correspond, the appropriate code is either determined by a formula or obtained from a table. When a machine having feed rate codes is added, its table of codes or its code determination procedure is added to this routine.

Subroutine FEDRAT

Purpose

To obtain values from the APT source statement "FEDRAT", and output or hold for later output the appropriate feed rate code.

Input

CALL FEDRAT

Output

Feed rate value will be in FEDIPR, range will be in OPTAB(6), and FEDFLG will be set to indicate that a feed rate code is to be picked up, or a block of tape containing the proper feed rate code will be produced along with the corresponding listing.

Method

If IPR is specified the value of feed rate goes into FEDIPR, if IPM is specified, the value goes into FEDIPM. Any range specified is placed in OPTAB(6) and the flag FEDFLG is set so that the feed rate code will be picked up. The feed rate code is obtained either here, or by a call to FEDC1, and placed in NFEEDC.

Subroutine FINAL

Purpose

To punch tape trailer, tally tape footage, and return control to Section 4 control program

Input

CALL FINAL

Output

BCD identification is punched into tape. The length of tape used is printed on line.

Method

PREINT is called to punch trailer. Tape footage is computed and PRTON is called to print on line the tape footage. Control is returned to DESPAT, the main Section 4 control program.

Subroutine INIT

Purpose

To initialize the program's flags, indexes, parameters, and buffer storages

Input

CALL INIT

Output

The postprocessor program is prepared to process the CLTAPE.

Method

INIT1 is called to initialize common. Upon return from INIT1, the FORMAT and PREBU arrays are filled with bits and the WORDS array is filled with blanks. Feed rate and spindle ranges are initialized to one. The sequence counter increment is set to one. A call is made to the appropriate MACHxx.

Error Checks

Machine number is greater than 15 - Error number 5

Subroutine INIT1

Purpose

To initialize common storage

Input

CALL INIT1.

Output

Common from BITS to ZCAM will be zeroes except that PRESTX, PRESTY, PRESTZ, PREVX, PREVY, and PREVZ will be all bits.

Subroutine INSERT

Purpose

To produce a block of punched tape containing the hand-coded block given in the APT source statement INSERT

Input

CALL INSERT

Output

A block of punched tape containing the hand-coded block given in the APT source statement INSERT is produced.

Subroutine LEADER

Purpose

To put out the number of inches of leader specified in the "LEADER" statement

Input

CALL LEADER

Output

The number of inches of leader designated in the "LEADER" statement are punched into the output tape.

Subroutine LOADTL

Purpose

To output the codes necessary to load the tool specified by the "LOADTL" statement

Input

CALL LOADTL

Output

The tool length will be in OPTAB(28). A block of tape is punched containing the m-code for a tool change and, if appropriate for the machine involved, the tool and sequence numbers. If required by the machine, a movement to the clearance plane is provided in the block of tape.

Method

If there are four words per record in the "LOADTL" statement, the fourth word is assumed to be the tool number and the information is output. If there are more than four words in the record associated with the "LOADTL" statement, then the tool length from TAPSTO(10) is stored in OPTAB(28) and the tool number from TAPSTO(8) and the m-code are output.

Subroutine MACH xxPurpose

To establish the machine's options, tables, and flags

Input

CALL MACH xx

Output

Tables, flags, and options will be loaded with desired values.

Method

The FORMAT, WORDS, SPNTAB, and FEDTAB arrays are loaded with desired information, and OPTAB and IDUM elements are loaded if required. In addition, any standard initial codes may be set up here and punched by calling PUNCHA.

Subroutine MESSAG

Purpose

To print the BCD information from the APT source statement "MESSAG"

Input

CALL MESSAG

Output

The message provided in the MESSAG statement is printed.

Subroutine OPSTOP

Purpose

To provide a planned operator stop

Input

CALL OPSTOP

Output

A block of tape containing the "OPSTOP" m-code is punched.

Subroutine PERROR

Purpose

To print out error number when an unrecoverable error is detected

Input

CALL PERROR

Output

Error number is printed and a core dump may be given.

Method

The appropriate error number is printed, and if OPTAB.(23) is zero, a core dump is printed. FINAL is then called to terminate the postprocessor.

Subroutine POSITN

Purpose

To provide a main control program for the positioning post-processors

Input

CALL POSITN

Output

A complete CLTAPE is processed and output is prepared for the printer and punched paper tape.

Method

The program initializes all necessary parameters and sets up all required tables. The CLTAPE is read by subroutine READER, and branches are made to major subroutines according to the type of CLTAPE record. Control then returns to READER to obtain another CLTAPE record. For coordinate data records, this subroutine processes one set of coordinates at a time and writes out the results before going on to the next set of coordinates.

Error Checks

CLTAPE read Failure - Error No. 1

Limitations and Restrictions

None

Subroutine PREFUN

Purpose

To output, or prepare for later output, the predefined function number as given by the APT source statement "PREFUN"

Input

CALL PREFUN

Output

OPTAB (5) will contain the specified g code and the flag IDUM (16) will be set to pick up the g code at next motion, or a block of punched tape and corresponding listing will be produced containing the g code.

Subroutine PREINT

Purpose

PREINT punches a leading or trailing identification on paper tape and also punches an end of block (\$) mark preceding data

Input

CALL PREINT(0) for leader or CALL PREINT(1) for trailer.

Output

The routine punches a 90 character I.D. consisting of 24 characters identifying the machine and 66 characters as found in PARTNO. The routine also outputs a (\$) punch after the leader.

Method

Each machine has a 24 character BCD identification associated with it. These 24 characters and the 66 characters picked up from PARTNO constitute the tape I.D. PARTNO has been stored by the Section 400 "DESPAT" routine in COMMON storage. The PARTNO I.D. is picked up from common and stored along with the machine identification and punched by the routine PARNOM.

Error Check

None

Limitations

The Section 400 "DESPAT" routine in use by Union Carbide is non-standard. The standard Section 400 will not save PARTNO information.

Subroutine PRINT

Purpose

To list the BCD representation of the information punched into the tape

Input

CALL PRINT

Output

A listing corresponding to the block of information that has been punched into tape is made.

Method

At the top of each page of output, the machine identification and a heading labeling the registers is written. For each entry, the BCD representation of the punched output is written as located in BUFFER except that decimal points are included in coordinates by an appropriate call to CONBCD which converts the coordinate value in PREBU. Before return, the PREBU array is filled with bits.

Subroutine PRTON

Purpose

To print on line the length of tape punched and the name of the machine being processed.

Input

CALL PRTON

Output

The on-line message is printed.

Subroutine RAPID

Purpose

To set the flag that indicates that feed rate is to be at rapid speed

Input

CALL RAPID

Output

The rapid flag IDUM (20) will be set to indicate rapid feed rate.

Subroutine REWIND

Purpose

To produce the appropriate output block for the APT source statement "REWIND"

Input

CALL REWIND

Output

A block of tape is punched containing only the m-code for a tape rewind except that the sequence number, if in the format of the machine, will be included. A listing is made of the sequence number and rewind code.

Method

A branch on machine is made to set up the rewind code in PREBU. CARD is called to output the code. PRINT is called to list the code.

Subroutine ROTABL

Purpose

To produce the appropriate output block for the APT source statement "ROTABL"

Input

CALL ROTABL

Output

A block of punched tape and the corresponding listing is produced.

Method

The statement ROTABL/--- is interpreted, and the desired position of the rotary table, if included, or the degrees to rotate if ATANGL is specified is placed into OPTAB (21). If a value is placed in OPTAB (21), the flag IDUM (18) is set to pick up rotary table movement. If RPM is specified, the code for the specified value is determined and placed in OPTAB (24) and the flag IDUM (19) is set to pick up the RPM code. The flag IDUM (15) is set so that COMPUT will be skipped, and DATA is called to load the registers for which there are values being held. CARD is called to output these registers. PRINT is called to list the BCD representation of the punched output.

Subroutine SEQNO

Purpose

To output the stop rewind code or to setup parameters so that the proper sequence number is produced as requested in the APT source statement "SEQNO"

Input

CALL SEQNO

Output

The stop rewind code is punched or the sequence counter (SEQCTR) and the sequence counter increment (OPTAB(22)) are set.

Method

For a SEQNO/START statement PUNCHA is called to punch a stop rewind code. For a SEQNO/k, INCR, n statement the value n, if specified, is placed in OPTAB (22) as the sequence counter increment. If n is not specified, the value one is assigned. The value k is reduced by OPTAB (22) and placed in SEQCTR so that when incremented by OPTAB (22) prior to next output, the value k will be the sequence number.

Subroutine SETUP

Purpose

To load the registers

Input

CALL SETUP

Output

PREBU registers will contain appropriate values.

Method

SETUP first loads the sequence counter register, then if the motion is linear, SETUP loads the X, Y, Z registers with their present values. If it is rotary motion, a call to STAUXX is made to load the appropriate registers. In either case, STAUXX is called to load appropriate registers with the values being held for a motion record.

Error Checks

Machine number is greater than 15 - Error number 5

Subroutine SPINC1

Purpose

To search the spindle table to find a value corresponding to the specified value from the APT source statement "SPINDL"

Input

CALL SPINC1

Output

The applicable element number of the spindle table is placed in NSPIN.

Method

The spindle table (SPNTAB) is searched for the closest value that is not bigger than the specified spindle speed. SPNTAB is arranged as S(I,J) with J being the index of spindle speed values and I the index for range. NSPIN is set equal to the element number of SPNTAB at which the desired spindle value is located.

Error Checks

Spindle speed table search fails - Error number 3

Subroutine SPINDL

Purpose

To obtain values from the APT source statement "SPINDL"

Input

CALL SPINDL

Output

The spindle speed value will be in RPM, the range will be in OPTAB(7), and SPIFLG will be set to indicate either that a spindle speed code is to be picked up, or that a block of tape containing the proper spindle speed code will be produced along with corresponding listings.

Method

If RPM is specified, the spindle speed specified goes into RPM. If SFM is specified, RADIUS must also be specified; RPM will be computed using the SFM value and the RADIUS value and will go into RPM. The flag SPIFLG is set so that the spindle speed code will be picked up. If the machine has multiple ranges, any specified range is placed in OPTAB(7). SPINCL is called to obtain code.

Subroutine SPLCOD

Purpose

To determine the code corresponding to a value from the spindle speed table

Input

CALL SPLCOD. NSPIN will contain element number of spindle speed table.

Output

NSPIN will contain spindle speed code.

Method

The spindle codes for some machines correspond to the value of NSPIN as determined by SPINC1. For machines where the codes do not correspond, the appropriate code is determined by a formula or obtained from a table.

Subroutine STAUX xPurpose

To load the registers for auxiliary function values

Input

CALL STAUX x

Output

The PREBU registers will contain appropriate values. Flags will be cleared.

Method

Flags are tested for those registers applicable to the particular machine for which the routine is written to see if there are values to be picked up. These values are placed in the appropriate PREBU register and the flags are cleared.

Subroutine STOP

Purpose

To produce the appropriate output block and program conditions for the APT source statement "STOP"

Input

CALL STOP

Output

Any special stop codes will be punched and flags for values being held will be cleared.

Method

Any flags set for picking up register values are cleared. If the particular machine requires a special code, it is set up in PREBU, CARD is called to output the code, and PRINT is called to list the code.

Subroutine TOOLN

Purpose

To output, or obtain for later output, the tool number as specified by the APT source statement "TOOLNO"

Input

CALL TOOLN

Output

The TOOLNO will be in OPTAB(19) and the flag IDUM(17) will be set.

Method

In a TOOLNO/m,n statement, if n is zero or not specified, the value m is placed in OPTAB(19) and IDUM(17) is set so that the tool number value will be picked up. If n is non-zero, the tool number value is placed in the appropriate element of PREBU, CARD is called to output the tool number, and PRINT is called to list the tool number.

Subroutine TRANS

Purpose

To store the values of x, y, and z as given by the APT source statement "TRANS" into the translation vector that is used to translate the coordinate data

Input

CALL TRANS

Output

TRANSX, TRANSY, and TRANSZ contain the given values of x, y, and z. The flag NTRANS is set so that the translation will be applied in SETUP.

2.4

2.4 SUBROUTINE FEDRAT

2.5 Description of Tables

FORMAT TABLE

Different machine tools require different output format specifications. Some machines have an f or s register while others do not; some machines require 5 digits for a given register, while others need 6 digits. It is the function of the FORMAT table to handle these variations.

The FORMAT table is an ordered table of 14 locations; each location represents a machine register, and the number assigned to each location specifies the required punch format for values of that register. The assigned numbers are two-digit floating point integers. The first digit of the floating point integer represents the total number of digits to be punched for the specified register, and the second digit indicates the number of digits to the right of the decimal point. If the floating point integer has a minus value, then the sign of the value also will be punched. Thus, the value -54.0, in the FORMAT table, means that the specified register must have a total of 5 digits punched, four digits being to the right of the decimal point, and one digit to the left of the decimal point, and also that the sign must be punched. The integer 20.0 means that a total of two digits must be punched; two to the left and none to the right of the decimal point, and that there should be no sign.

WORDS TABLE

WORDS	BCD CONTENTS
1)	N
2)	G
3)	X
4)	Y
5)	Z
6)	B
7)	
8)	F
9)	E
10)	S
11)	R
12)	T
13)	
14)	M

BUFFER STORAGE

The BCD images for punched output are set up in common storage in the parameter table BUFFER. The following list shows the format of BUFFER.

BUFFER

- 1) Blank
- 2) BCD N or blanks
- 3) Value of N (PREBU(1)) or blanks
- 4) Tab or blanks
- 5) BCD G or blanks
- 6) Value of G (PREBU(2)) or blanks
- 7) Tab or blanks
- 8) BCD X or blanks
- 9)-10) Value of X (PREBU(3)) or blanks
- 11) Tab or blanks
- 12) BCD Y or blanks
- 13)-14) Value of Y (PREBU(4)) or blanks
- 15) Tab or blanks
- 16) BCD Z or blanks
- 17)-18) Value of Z (PREBU(5)) or blanks
- 19) Tab or blanks
- 20) BCD B or blanks
- 21) Value of B (PREBU(6)) or blanks
- 22) Tab or blanks
- 23) Blanks
- 24) Blanks
- 25) Blanks
- 26) BCD F or blanks
- 27) Value of F (PREBU(8)) or blanks
- 28) Tab or blanks
- 29) BCD E or blanks
- 30) Value of E (PREBU(9)) or blanks
- 31) Tab or blanks
- 32) BCD S or blanks
- 33) Value of S (PREBU(10)) or blanks
- 34) Tab or blanks
- 35) BCD R or blanks
- 36) Value of R (PREBU(11)) or blanks
- 37) Tab or blanks
- 38) BCD T or blanks
- 39) Value of T (PREBU(12)) or blanks
- 40) Tab or blanks
- 41) Blanks

BUFFER

- 42) Blanks
- 43) Blanks
- 44) BCD M or blanks
- 45) Value of M (PREBU(14)) or blanks
- 46) Carriage return (E.O.B)

The subroutine CARD takes the values stored in PREBU(I), where $I = 1 - 14$, and sets up the BUFFER as shown in the previous table with the assistance of the subroutine CONBCD. When a complete line of BUFFER is set up the subroutine PUNCHA is called which actually punches the card in EIA standard format.

OPTION TABLE (Fixed Point)

IDUM

- 1) Is N BCD or Float (1 = BCD; 0 = Float)
- 2) Is G BCD or Float
- 3) Is X BCD or Float
- 4) Is Y BCD or Float
- 5) Is Z BCD or Float
- 6) Is B BCD or Float
- 7) Not assigned
- 8) Is F BCD or Float
- 9) Is E BCD or Float
- 10) Is S BCD or Float
- 11) Is R BCD or Float
- 12) Is T BCD or Float
- 13) Not assigned
- 14) Is M BCD or Float
- 15) Do we skip COMPUT (1 = Skip; 0 = Do not skip)
- 16) PREFUN flag
- 17) TOOLNO flag
- 18) ROTABL angle flag
- 19) ROTABL Speed flag
- 20) RAPID flag
- 21) Is Coolant to be by self (1 = yes, 0 = no)
- 22) Is Feed Rate to be by self (1 = yes, 0 = no)
- 23) Is Spindle to be by self (1 = yes, 0 = no)
- 24) AUXFUN Flag
- 25) Do we delete repeated coordinates (0 = yes, 1 = no)
- 26) Flag for testing if first data point
- 27) Do we delete trailing tabs (0 = yes, 1 = no)
- 28) Feedrate mode to assume if not specified (0 = IPR, 1 = IPM)
- 29) Seqno flag (1 = ON; 2 = OFF; 3 = ON, INCR, N; 4 = k; 5 = k, INCR, N)
- 30) Counter on m codes being held for motion block
- 31) Flag for spindle code being held for motion block
- 32) Code for spindle condition
- 33) Delay flag
- 34) CLRSRF flag

OPTION TABLE (Floating Point)

OPTAB

- 1) Are word addresses to be punched (0 = yes; 1 = no)
- 2) DELTAX
- 3) DELTAY
- 4) DELTAZ
- 5) G Code value
- 6) Feedrate range (= 1 initially)
- 7) Spindle range (= 1 initially)
- 8) Type of motion output (0 = absolute; 1 = incremental)
- 9) Option Feedrate
- 10) Option RPM
- 11) Number of ranges in Spindle table
- 12) Number of speeds in each Spindle range
- 13) Number of ranges in Feedrate table
- 14) Number of speeds in each Feedrate range
- 15) Number of axes
- 16) Maximum Delta X movement
- 17) Maximum Delta Y movement
- 18) Maximum Delta Z movement
- 19) Value of tool number from TOOLNO command
- 20) Are tabs to be punched (0 = yes; 1 = no)
- 21) Rotary table angle
- 22) Sequence counter increment
- 23) Dump flag (0 = dump; 1 = do not dump)
- 24) Rotary table speed code
- 25) AUXFUN Value
- 26) Spindle RPM
- 27) CLRSRF distance from origin
- 28) Tool length from LOADTL statement - initialized to zero
- 29) Constant value to subtract from z-coordinate

2.6

PARAMETER DEFINITIONS

BITS	Octal - 377777777777
BUFFER(50)	Buffer for storing the parameters for punched output
COMSTO(13)	Buffer for storing a comment for printout
CTRDLY	Sequence counter delay(1 = on; 0 = off)
CTRFLG	1 = Use previous sequence number 0 = Increment sequence number
FEDFLG	Feedrate Flag
FEDIPM	Feedrate value in IPM
FEDIPR	Feedrate value in IPR
FEDTAB(50)	Feedrate values in table form
FORMAT(14)	Array whose elements indicate the number of digits each related quantity must have for punched tape output
INTAP(20)	Tape storage for fixed point integers read from CLTAPE
IND2	INTAP(2)/1000
IND3	INTAP(3)
KOMENT	Comment Flag
KOOL	Coolant Code
KX, KY, KZ	Index indicator for selecting the X, Y, and Z values from TAPSTO
LINCTR	Line counter for printing

NAXIS	Number of axes (2 or 3)
NCOOL	Coolant Flag
NFEEDC	Feedrate Code
NPRINT	0 = Print heading; 1 = Do not print heading
NSPIN	Spindle Code
NTEST	Number of data words processed so far from a CLTAPE record
NTOOL1	Tool Change Flag
NTOOL2	Tool Proceed Flag
NTRANS	Axis translation in effect (0 = no; 1 = yes)
NWPR	Number of words per record from CLTAPE
NZCAM	Z CAM FLAG (0 = off; 1 = on)
OPTAB(50)	Option Table
PREBU(14)	Preliminary buffer setup of a line (record) of output
PRESTX) PRESTY) PRESTZ)	Present Path point
PREVX) PREVY) PREVZ)	Previous Path point
RADIUS	Radius used in SPINDLE calculation
RPM	Revolutions per minute
SEQCTR	Sequence counter
SFM	Surface feet per minute

SPIFLG	Spindle Flag
SPNTAB(100)	Spindle speed values in table form
TAPSTO(250)	Floating point storage of CLTAPE data
TOOLNO	Tool number value from DISPLY command
TRANSX) TRANSY) TRANSZ)	Axis translation values
ZCAM	Z cam value

2.7

POST PROCESSOR WORDS

The following auxiliary functions may be used by some or all of the positioning machines.

- A. AUXFUN/n
This instruction outputs the auxiliary function (M Code) specified by n.
- B. CLRSRF/(symbolic name of a previously defined surface)
CLRSRF/(definition of a surface)
This instruction establishes a clearance for tool retraction.
- C. COOLNT/(ON or OFF)
- D. DELAY/n,
/n, REV
n: Time in seconds of no motion.
n, REV: n is the number of revolutions of no motion.
- E. DISPLY/n,Z
This instruction is used to call for a tool change. The "Z" component of the instruction is used for the Heald only. This indicates depth cam selection with the use of digits 0-9. The "n" can be any number between 1 and 99 except for the Heald. For the Heald, "n" can be either the digit 1 or 2. The digit 1 indicates drilling operation; the digit 2 indicates a tapping operation.
- F. FEDRAT/f, IPR, RANGE, HIGH
IPM MEDIUM
LOW
n
f: Desired value of feedrate¹.
IPM): Dimensions of feedrate value; inches per minute or inches per revolution.
IPR): Dimensions of feedrate value; inches per minute or inches per revolution.
RANGE: Specifies that the next following word sets the range to 1(Low), 2(MEDIUM), 3(HIGH), or range number n. (modal)
- G. LOADTL/n
This instruction loads the tool defined into the proper holder; n may be either a tool number or the symbolic name of a previously defined tool.
- H. OPSTOP
This instruction provides a planned operator stop.
- I. PREFUN/n
This instruction outputs the predefined function (G code) specified by n.
- J. RAPID
Specifies rapid feedrate; outputs rapid code in next motion block.
- K. REWIND
This instruction outputs rewind code in block by itself.

- L. ROTABL/m, RPM, n
m: Desired position of rotary table
RPM: Revolutions per minute
n: Desired RPM
- M. SEQNO/START
This command puts an end-of-record code in the control tape.
SEQNO/k, INCR,n
The sequence number starts at k and is incremented by n for each succeeding block. If n is not specified, it is assumed to be 1.
SEQNO/n
The sequence number n is inserted for the next block only. The succeeding block will be numbered by the previously existing SEQNO option.
SEQNO/OPER
The letter "O" code is put in a block by itself.
- N. SPINDL/s, RPM, CLW, RANGE, LOW, RADIUS, r
SFM, CCLW
n
MEDIUM
HIGH
- a: Desired value of spindle speed².
RPM): Dimensions of spindle speed value; revolutions per minute or
SFM) surface feet per minute.
RADIUS: The next following word (r) sets the radius for computing RPM.
RANGE: Specifies that the next following word sets the range to 1 (LOW), 2(MEDIUM), 3(HIGH), or range number n. (modal)
- O. STOP
This instruction clears any code in hold and outputs stop code in block by itself.
- P. TOOLNO/m
This instruction generates code for selecting tool number specified by m.
- Q. TRANS/X,Y,Z
This instruction can be used to translate cutter coordinates (usually into the first quadrant). "X" indicates the numerical value of translation along the X-axis and "Y" for the Y-axis. "Z" indicates the numerical translation along the Z-axis. This instruction is ignored for incremental machines.
- R. MACHIN/_____, _____
1. MACHIN/GIDLWS, TABLE, 1
2. MACHIN/DVLEIG, JIGMIL, 1
3. MACHIN/FOSDIK, JIGBOR, 1
4. MACHIN/HEALD, DRILL, 1
5. MACHIN/LAHR, DRILL, 1
6. MACHIN/AMERCN, TABLE, 1
7. MACHIN/KNIGHT, JIGBOR, 1
8. MACHIN/BURG, DRILL, 1
9. MACHIN/GIDLWS, DRILL, 1

10. MACHIN/LUCAS, BORMIL, 2
11. MACHIN/GIDLWS, DRILL, 2
12. MACHIN/PRATTW, DRILL, 1
13. MACHIN/KRNTR, MHCNT, SERISE
14. MACHIN/GIDLWS, BORMIL, 6INCH

In addition to the above words, the following words are also used:

1. END
2. FINI
3. PARTNO or TAPENO

¹ If f is not exactly available from the feed rate table, the next lowest table value is used. If f is outside the limits of the table for the specified range, the limit nearest f is used.

² If s is not exactly available from the spindle speed table, the next lowest table value is used. If s is outside the limits of the table for the specified range, the limit nearest s is used.

2.8

*	FAP			
	PZE	0,0,460		
	TSX	\$POSITN		
	MZE	LAST		
LAST	BES	6940		
	END			
*	FAP			
	COUNT	50		40501100
*	CONNECTOR	PROGRAM	LOCATES SECTION 0 ROUTINES FOR THIS SECTION	40501200
	ENTRY	TAPERD		40501300
	ENTRY	TAPEWT		40501400
	ENTRY	TAPEOP		40501500
	ENTRY	TAPECH		40501600
	ENTRY	SEARCH		40501700
	ENTRY	BUFFTP		40501800
	ENTRY	CARDPN		40501900
	ENTRY	PRCNTL		40502000
	ENTRY	LBSRCH		40502100
	ENTRY	DYNDMP		40502200
	ENTRY	DUMP		40502300
	ENTRY	PDUMP		40502400
	ENTRY	(STH)		40502500
	ENTRY	(FIL)		40502600
	ENTRY	(TSH)		40502700
	ENTRY	(RTN)		40502800
	ENTRY	SIN		40502900
	ENTRY	COS		40503000
	ENTRY	SQRT		40503100
	ENTRY	ATAN		40503200
	ENTRY	(STHM)		40503300
	ENTRY	(TSHM)		40503400
	ENTRY	REDPRT		40503500
	ENTRY	CARDRD		40503600
	ENTRY	SPECNP		40503700
	ENTRY	(SPH)		40503702
FIRST	EQU	100	FORTTRAN LOADING POINT	40503800
TAPERD	TRA*	FIRST+1	TRANSFER TO SECTION 0	40503900
TAPEWT	TRA*	FIRST+2	ROUTINES VIA THE	40504000
TAPEOP	TRA*	FIRST+3	SECTION 0 MAIN PROGRAM	40504100
TAPECH	TRA*	FIRST+4	TRANSFER VECTOR LIST	40504200
SEARCH	TRA*	FIRST+5		40504300
BUFFTP	TRA*	FIRST+6		40504400
CARDPN	TRA*	FIRST+7		40504500
PRCNTL	TRA*	FIRST+8		40504600
LBSRCH	TRA*	FIRST+9		40504700
DYNDMP	TRA*	FIRST+10		40504800
DUMP	TRA*	FIRST+11		40504900
PDUMP	TRA*	FIRST+12		40505000
(STH)	TRA*	FIRST+13		40505100
(FIL)	TRA*	FIRST+14		40505200
(TSH)	TRA*	FIRST+15		40505300
(RTN)	TRA*	FIRST+16		40505400
SIN	TRA*	FIRST+17		40505500
COS	TRA*	FIRST+18		40505600
SQRT	TRA*	FIRST+19		40505700
ATAN	TRA*	FIRST+20		40505800
(STHM)	TRA*	FIRST+21		40505900
(TSHM)	TRA*	FIRST+22		40506000
REDPRT	TRA*	FIRST+23		40506100

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CARDRD TRA*   FIRST+24                                40506200
SPECN  TRA*   FIRST+25                                40506300
(SPH)  TRA*   FIRST+26
      END                                             40506400
*      FAP
      COUNT 12                                         40506600
* SECTION 4 CONNECTOR PROGRAM                         40506700
* THIS PROGRAM PROVIDES ENTRY TO SECTION 4 ROUTINES FROM 40506800
* POST PROCESSOR LINKS                               40506900
      ENTRY DESPAT                                     40507000
* FIRST IS FIRST CELL WHICH IS LOADED WITH PROGRAMS   40507300
* BY THE FORTRAN LOADER                               40507400
      FIRST EQU 100          FORTRAN LOADING POINT (DECIMAL) 40507500
      SPACE EQU 5700+4      SPACER SIZE OF SECTION 4 MAIN PROGRAM 40507600
      DESPAT TRA* FIRST+SPACE
      END                                             40507700
*      FORTRAN
*      LIST
* LABEL
C1000      AUXFUN
      SUBROUTINE AUXFUN
C*****
C
C... SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
      DIMENSION SYSTEM (1700)
C
      EQUIVALENCE (SYSTEM(1700),KOM (1700),KFLAGS(1692),TAPETB(1622))
C
      EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1 POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CROTAP(11),
2 CORTAP( 9),
3 TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4 FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
      EQUIVALENCE (KFLAGS( 70),
1 K0 ( 60),F0 ( 60),K1 ( 59),K2 ( 58),K3 ( 57),
2 K4 ( 56),K5 ( 55),K6 ( 54),K7 ( 53),K8 ( 52),
3 K9 ( 51),
4 KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5 IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6 ICLPRT( 35),INDEXX( 34),IPLOTR( 33), NOPLOT( 31),
7 KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8 LOCMAC( 25),LENSPC( 24),
9 IPOSTP( 20),NUMPST( 19))
C
      EQUIVALENCE (KOM ( 8),KAPTIO(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
      COMMON SYSTEM
C
      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C...*****
C COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO,
1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3,
2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC, NPRINT,
3NODAT,NSPIN,NTEST,NTOOL1,NTOOL2,NTRANS,NWPR,NZCAN,OPTAB,

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20130101
20130105
20130111
20130113

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4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN,      20130117
5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY,          20130123
6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM                                       20130125
  DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13),    20130201
1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100),  20130205
2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50)                           20130209

C
  N=MTABLE(6)
  IF(NWPR-4)1,6,6
  6 IF(N-15)2,2,1
  2 GO TO (1,1,1,1,1,1,1,1,3,1,4,1,1,13,9,1),N                      47490101
13 IF(TAPSTO(4)-75.)10,9,10                                           45720602
  9 OPTAB(25)=TAPSTO(4)                                               45720603
  GO TO 8                                                              45720604
10 SEQCTR=SEQCTR+OPTAB(22)                                             45720605
  PREBU(1)=SEQCTR                                                     45720606
  GO TO 5                                                              45720607
  3 SEQCTR=SEQCTR+OPTAB(22)
B  PREBU(1)=6060000000000
  5 PREBU(14)=TAPSTO(4)
  CALL CARD
  CALL PRINT
  1 RETURN
  4 AUXSAV=OPTAB(25)
  OPTAB(25)=TAPSTO(4)
  IF(OPTAB(25)-AUXSAV)8,7,8
  7 IF(OPTAB(25)-18.)8,1,8
  8 IDUM(30)=IDUM(30)+1                                               47490102
  IDUM(24)=IDUM(30)                                                  47490103
  GO TO 1
  END
*   FORTRAN
*   LIST
*LABEL
C1100      CARD
          SUBROUTINE CARD                                           20130101
C*****
C
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
  DIMENSION SYSTEM (1700)
C
  EQUIVALENCE (SYSTEM(1700),KOM (1700),KFLAGS(1692),TAPETB(1622))
C
  EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1  POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2  CORTAP( 9),
3  TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4  FORTIN( 4),INTAPE( 3),IDUTAP( 2),PUNTAP( 1))
C
  EQUIVALENCE (KFLAGS( 70),
1  K0 ( 60),F0 ( 60),K1 ( 59),K2 ( 58),K3 ( 57),
2  K4 ( 56),K5 ( 55),K6 ( 54),K7 ( 53),K8 ( 52),
3  K9 ( 51),
4  KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5  IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6  ICLPRT( 35),INDEXX( 34),IPLOTR( 33), NOPLOT( 31),
7  KOYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8  LOCMAC( 25),LENSPC( 24),

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          9 IPOSTP( 20),NUMPST( 19))
C
      EQUIVALENCE (KOM      (8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
      COMMON SYSTEM
C
      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C...*****
C  COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO, 20130101
      1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3, 20130105
      2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC,      NPRINT, 20130111
      3NODAT,NSPIN,NTEST,NTOOL1,NTOOL2,NTRANS,NWPR,NZCAM,OPTAB, 20130113
      4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN, 20130117
      5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY, 20130123
      6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM 20130125
      DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13), 20130201
      1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100), 20130205
      2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50) 20130209
C
C      BB=606060606060
C      BT=546060606060
C      IF(OPTAB(20))18,19,18
18  BT=BB
19  NT=MTABLE(6)
      DO 65 J=1,50
65  BUFFER(J)=BB
      DO 50 MM=1,14
      IF(PREBU(MM)-BITS)35,50,35
35  IF(FORMAT(MM)-BITS)25,17,25
25  AA=FORMAT(MM)/10.0
      N2=AA+.001
      B=N2
      E=ABS(FORMAT(MM)-(B*10.0))
      N1=E+.001
17  GO TO(1,2,3,4,5,6,7,8,9,10,11,12,13,14),MM
1  N3=3
      GO TO 15
2  N3=6
      GO TO 15
3  N3=9
      GO TO 15
4  N3=13
      GO TO 15
5  N3=17
      GO TO 15
6  N3=21
      GO TO 15
7  N3=24
      GO TO 15
8  N3=27
      GO TO 15
9  N3=30
      GO TO 15
10 N3=33
      GO TO 15
11 N3=36

```

```

      GO TO 15
12  N3=39
      GO TO 15
13  N3=42
      GO TO 15
14  N3=45
15  IF (IDUM(MM)-1)16,40,16
40  BUFFER(N3)=PREBU(MM)
      GO TO 50
16  CALL CONBCD(PREBU(MM),BUFFER(N3),N2,N1)
      IF(OPTAB(1)-1.0)20,50,20
20  BUFFER(N3-1)=WORDS(MM)
50  CONTINUE
45  IF(NT-15)46,46,54
46  GO TO (51,53,52,51,52,55,55,56,57,58,59,70,80,67,55),NT
80  BUFFER(19)=BT
      GO TO 52
70  BUFFER(7)=BT
      BUFFER(11)=BT
      GO TO 55
59  BUFFER(3)=BB
      GO TO 62
53  BUFFER(2)=BB
      GO TO 52
67  BUFFER(23)=BT
      GO TO 68
58  BUFFER(37)=BT
      BUFFER(22)=BT
68  BUFFER(19)=BT
      BUFFER(31)=BT
      BUFFER(37)=BT
56  BUFFER(40)=BT
      GO TO 51
57  BUFFER(31)=BT
      GO TO 51
51  BUFFER(7) =BT
52  BUFFER(4) =BT
      BUFFER(28)=BT
62  BUFFER(11)=BT
      BUFFER(15)=BT
      IF(NT-9)61,55,61
61  BUFFER(34)=BT
B 55  BUFFER(46)=536060606060
      IF (IDUM(27))60,71,60
71  DO 72 I=2,14
      K=16-I
      IF(PREBU(K)-BITS)60,100,60
100 GO TO (54,73,74,75,76,77,78,79,81,82,83,84,85,86),I
73  N3=43
      GO TO 72
74  N3=40
      GO TO 72
75  N3=37
      GO TO 72
76  N3=34
      GO TO 72
77  N3=31
      GO TO 72
78  N3=28

```

4
45720122
45720123

47490107
47490108
47490109
47490110
47490111

```

      GO TO 72
79 N3=25
      GO TO 72
81 IF(NT-14)87,88,87
88 N3=23
      GO TO 72
87 N3=22
      GO TO 72
82 N3=19
      GO TO 72
83 N3=15
      GO TO 72
84 N3=11
      GO TO 72
85 N3=7
      GO TO 72
86 N3=4
72 BUFFER(N3)=88
60 IF(IDUM(29)-2)98,97,98
B 97 BUFFER(2)=606060606060
B 98 BUFFER(3)=606060606060
98 N=-276
      K=0
      J=0
      CALL PUNCHA (N,BUFFER,J,K)
54 IF(IDUM(29)-4)101,99,101
99 CALL SEQNO(2)
101 RETURN
      END
*      FORTRAN
*      LIST
*LABEL
      SUBROUTINE CLRSRF
C*****
C
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
      DIMENSION SYSTEM (1700)
C
      EQUIVALENCE (SYSTEM(1700),KOM (1700),KFLAGS(1692),TAPETB(1622))
C
      EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1 POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2 CORTAP( 9),
3 TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4 FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
      EQUIVALENCE (KFLAGS( 70),
1 K0 ( 60),F0 ( 60),K1 ( 59),K2 ( 58),K3 ( 57),
2 K4 ( 56),K5 ( 55),K6 ( 54),K7 ( 53),K8 ( 52),
3 K9 ( 51),
4 KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5 IWAVER( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6 ICLPRT( 35),INDEXX( 34),IPLOTR( 33), NOPLOT( 31),
7 KDNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8 LOCMAC( 25),LENSPC( 24),
9 IPOSTP( 20),NUMPST( 19))
C
      EQUIVALENCE (KOM ( 8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))

```

47490113
47490114
47490115
47490116

```

C
COMMON SYSTEM
C
  DIMENSION KFLAGS(1), IPOSTP(1), KOM(1)
C
C...*****
C  COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
  COMMON MACH, NLOOP, NLOOP1, PNOFLG, MTABLE, NID, BITS, BUFFER, COMSTO, 20130101
  1CTRDLY, CTRFLG, FEDFLG, FEDIPR, FEDTAB, FORMAT, GGL, INTAP, IND2, IND3, 20130105
  2KOMENT, KOOL, KX, KY, KZ, LINCTR, NAXIS, NCOOL, NFEEDC, NPRINT, 20130111
  3NODAT, NSPIN, NTEST, NTOOL1, NTOOL2, NTRANS, NWPR, NZCAM, OPTAB, 20130113
  4PREBU, PRESTX, PRESTY, PRESTZ, PREVX, PREVY, PREVZ, RADIUS, RETURN, 20130117
  5RPM, SEQCTR, SFM, SPIFLG, SPNTAB, TAPSTO, TOOLNO, TRANSX, TRANSY, 20130123
  6TRANSZ, WORDS, BUFPR, IDUM, ZCAM 20130125
  DIMENSION MACH(12), PNOFLG(14), MTABLE(10), BUFFER(50), COMSTO(13), 20130201
  1FEDTAB(50), FORMAT(14), INTAP(20), OPTAB(50), PREBU(14), SPNTAB(100), 20130205
  2TAPSTO(250), WORDS(14), BUFPR(20), IDUM(50) 20130209
  IDUM(34)=1
  OPTAB(27)=TAPSTO(10)
  RETURN
  END
*   FORTRAN
*   LIST
*LABEL
C1200  COMENT
  SUBROUTINE COMENT 20130101
C*****
C
C... SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
  DIMENSION SYSTEM(1700)
C
  EQUIVALENCE (SYSTEM(1700), KOM (1700), KFLAGS(1692), TAPETB(1622))
C
  EQUIVALENCE (TAPETB(18), PROTAP(18), CANTAP(17), CLTAPE(16),
1 POCTAP(15), PLOTAP(14), SRFTAP(13), LIBTAP(12), CRDTAP(11),
2 CORTAP( 9),
3 TAPES1( 8), TAPES2( 7), TAPES3( 6), TAPES4( 5),
4 FORTIN( 4), INTAPE( 3), IOUTAP( 2), PUNTAP( 1))
C
  EQUIVALENCE (KFLAGS( 70),
1 K0 ( 60), F0 ( 60), K1 ( 59), K2 ( 58), K3 ( 57),
2 K4 ( 56), K5 ( 55), K6 ( 54), K7 ( 53), K8 ( 52),
3 K9 ( 51),
4 KFLAG0( 46), KFLAG1( 45), KFLAG2( 44), KFLAG3( 43), KFLAG4( 42),
5 IWAVEN( 40), IPTNLY( 39), NOPOST( 38), INVERT( 37), KAUTOP( 36),
6 ICLPRT( 35), INDEXX( 34), IPLOTR( 33), NOPLT( 31),
7 KDYNFG( 30), LOCJPT( 29), LOCBE( 28), KSECIN( 27), NCLREC( 26),
8 LOCMAC( 25), LENSPEC( 24),
9 IPOSTP( 20), NUMPST( 19))
C
  EQUIVALENCE (KOM ( 8), KAPTID(1), KAPTID(2), KAPTTR(3), KAPTCN(4))
C
COMMON SYSTEM
C
  DIMENSION KFLAGS(1), IPOSTP(1), KOM(1)
C
C...*****

```



```

C   COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO, 20130101
1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3, 20130105
2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC, NPRINT, 20130111
3NODAT,NSPIN,NTEST,NTOOL1,NTOOL2,NTRANS,NWPR,NZCAM,OPTAB, 20130113
4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN, 20130117
5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY, 20130123
6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM 20130125
DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13), 20130201
1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100), 20130205
2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50) 20130209
C
CALL COMT1 20130103
WRITE OUTPUT TAPE 6,101,(COMSTO(J),J=1,13) 20130105
LINCTR=LINCTR+1
RETURN 20130107
101 FORMAT (5X13A6) 20130109
END 20130111
*
*   FORTRAN
*   LIST
*LABEL
C1300 COMPUT
SUBROUTINE COMPUT 20130101
C*****
C
C... SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
DIMENSION SYSTEM (1700)
C
EQUIVALENCE (SYSTEM(1700),KOM (1700),KFLAGS(1692),TAPETB(1622))
C
EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1 POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2 CORTAP( 9),
3 TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4 FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
EQUIVALENCE (KFLAGS( 70),
1 K0 ( 60),F0 ( 60),K1 ( 59),K2 ( 58),K3 ( 57),
2 K4 ( 56),K5 ( 55),K6 ( 54),K7 ( 53),K8 ( 52),
3 K9 ( 51),
4 KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5 IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6 ICLPRT( 35),INDEXX( 34),IPLOTR( 33), NOPL0T( 31),
7 KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8 LOCMAC( 25),LENSPC( 24),
9 IPOSTP( 20),NUMPST( 19))
C
EQUIVALENCE (KOM (8),KAPTIO(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
COMMON SYSTEM
C
DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C...*****
C   COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO, 20130101

```

```

1CTROLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3, 20130105
2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC, NPRINT, 20130111
3NODAT,NSPIN,NTEST,NTOL1,NTOL2,NTRANS,NWPR,NZCAM,OPTAB, 20130113
4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN, 20130117
5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY, 20130123
6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM 20130125
  DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13), 20130201
1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100), 20130205
2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50) 20130209

```

C

```

  NT=MTABLE(6)
  DELMAX=0 20130102
  IF(IDUM(15)) 12,13,12
12 IDUM(15)=0
  GO TO 3
13 IF(PREVX-BITS)5,1,5 20130103
  1 IF(PREY-BITS)5,2,5 20130105
  2 PRESTX=TAPSTO(KX) 20130107
  PRESTY=TAPSTO(KY) 20130109
  PRESTZ=TAPSTO(KZ) + OPTAB(28) - OPTAB(29)
  OPTAB(2)=PRESTX
  OPTAB(3)=PRESTY
  OPTAB(4)=PRESTZ
  3 RETURN 20130113
  5 PRESTX=TAPSTO(KX) 20130115
  PRESTY=TAPSTO(KY) 20130117
  PRESTZ=TAPSTO(KZ) + OPTAB(28) - OPTAB(29)
  OPTAB(2)=PRESTX-PREVX
  OPTAB(3)=PRESTY-PREY
  OPTAB(4)=PRESTZ-PREVZ
10 IF((ABSF(OPTAB(2)))-OPTAB(16))15,15,11
11 DELMAX=1 20130303
  IF(NT-1)15,14,15
14 OPTAB(2)=OPTAB(2)/2.0
  PRESTX=PREVX+OPTAB(2)
15 IF((ABSF(OPTAB(3)))-OPTAB(17))25,25,20
20 DELMAX=1 20130311
  IF(NT-1)25,21,25
21 OPTAB(3)=OPTAB(3)/2.0
  PRESTY=PREY+OPTAB(3)
25 IF(OPTAB(15)-2.0)35,35,26 20130317
26 IF((ABSF(OPTAB(4)))-OPTAB(18))35,35,30
30 DELMAX=1 20130321
  IF(NT-1)35,31,35
31 OPTAB(4)=OPTAB(4)/2.0
  PRESTZ=PREVZ+OPTAB(4)
35 IF(DELMAX)3,3,32
32 IF(NT-1)37,36,37
36 NTEST=NTEST-3 20130403
  KX=KX-3 20130405
  KY=KY-3 20130407
  KZ=KZ-3 20130409
  CTRFLG=1.0 20130410
37 KOMENT=13
  CALL COMENT 20130413
  GO TO 3 20130415
  END
*1400 COMT1
  ENTRY COMT1

```

NOTAPS EQU	18	NUMBER OF TAPES
NOFLGS EQU	70	NUMBER OF FLAGS IN FLAG AREA
BUFNUM EQU	4	NUMBER OF BUFFERS
NOBLKS EQU	4	NO. OF BLOCKS ALLOWED TAPEWT CALL SEQ.
BUFSIZ EQU	400	SIZE OF ONE BUFFER BLOCK

SYSTEM COMMON	8
KFLAGS COMMON	NOFLGS
TAPETB COMMON	NOTAPS
BUFTBL COMMON	BUFNUM
BUFER1 COMMON	BUFSIZ
BUFER2 COMMON	BUFSIZ
BUFER3 COMMON	BUFSIZ
BUFER4 COMMON	BUFSIZ

KOM EQU	SYSTEM
---------	--------

KAPTIO EQU	KOM-7
------------	-------

KAPTIO EQU	KOM-6
------------	-------

KAPTTR EQU	KOM-5
------------	-------

KAPTCN EQU	KOM-4
------------	-------

K0 EQU	KFLAGS-10
--------	-----------

K1 EQU	KFLAGS-11
--------	-----------

K2 EQU	KFLAGS-12
--------	-----------

K3 EQU	KFLAGS-13
--------	-----------

K4 EQU	KFLAGS-14
--------	-----------

K5 EQU	KFLAGS-15
--------	-----------

K6 EQU	KFLAGS-16
--------	-----------

K7 EQU	KFLAGS-17
--------	-----------

K8 EQU	KFLAGS-18
--------	-----------

K9 EQU	KFLAGS-19
--------	-----------

KFLAG0 EQU	KFLAGS-24
------------	-----------

KFLAG1 EQU	KFLAGS-25
------------	-----------

KFLAG2 EQU	KFLAGS-26
------------	-----------

KFLAG3 EQU	KFLAGS-27
------------	-----------

KFLAG4 EQU	KFLAGS-28
------------	-----------

IWAVEN EQU	KFLAGS-30
------------	-----------

IPTNLY EQU	KFLAGS-31
------------	-----------

NOPOST EQU	KFLAGS-32
------------	-----------

INVERT EQU	KFLAGS-33
------------	-----------

KAUTOP EQU	KFLAGS-34
------------	-----------

ICLPRT EQU	KFLAGS-35
------------	-----------

INDEXX EQU	KFLAGS-36
------------	-----------

IPLOTR EQU	KFLAGS-37
------------	-----------

NOPL0T EQU	KFLAGS-39
------------	-----------

KDYNFG EQU	KFLAGS-40
------------	-----------

LOCJPT EQU	KFLAGS-41
------------	-----------

LOCBEG EQU	KFLAGS-42
------------	-----------

KSECIN EQU	KFLAGS-43
------------	-----------

NCLREC EQU	KFLAGS-44
------------	-----------

LOCMAC EQU	KFLAGS-45
------------	-----------

LENSPC EQU	KFLAGS-46
------------	-----------

IPOSTP EQU	KFLAGS-50
------------	-----------

NUMPOT EQU	KFLAGS-51
------------	-----------

PROTAP EQU	TAPETB
------------	--------

CANTAP EQU	TAPETB-1
------------	----------

CLTAPE EQU	TAPETB-2
------------	----------

POCTAP EQU	TAPETB-3
------------	----------

PLOTAP EQU	TAPETB-4
------------	----------

SRFTAP EQU	TAPETB-5
------------	----------

LIBTAP EQU	TAPETB-6
------------	----------

IDENTIFICATION OF LAST LIBTAP RECORD

APT I-O COMMAND

TRANSFER TO LAST SECTION READ FROM LIBTAP

CONTINUATION FLAG

KFLAGS(11)

KFLAGS(31)

CRDTAP	EQU	TAPETB-7
CORTAP	EQU	TAPETB-9
TAPES1	EQU	TAPETB-10
TAPES2	EQU	TAPETB-11
TAPES3	EQU	TAPETB-12
TAPES4	EQU	TAPETB-13
FORTIN	EQU	TAPETB-14
INTAPE	EQU	TAPETB-15
IOUTAP	EQU	TAPETB-16
PUNTAP	EQU	TAPETB-17

*

MACH	COMMON	12
NLOOP	COMMON	1
NLOOP1	COMMON	1
PNOFLG	COMMON	14
MTABLE	COMMON	10
NID	COMMON	1
BITS	COMMON	1
BUFFER	COMMON	50
COMSTO	COMMON	13
CTRDLY	COMMON	1
CTRFLG	COMMON	1
FEDFLG	COMMON	1
FEDIPR	COMMON	1
FEDTAB	COMMON	50
FORMAT	COMMON	14
GGL	COMMON	1
INTAP	COMMON	20
IND2	COMMON	1
IND3	COMMON	1
KOMENT	COMMON	1
KOOL	COMMON	1
KX	COMMON	1
KY	COMMON	1
KZ	COMMON	1
LINCTR	COMMON	1
NAXIS	COMMON	1
NCOOL	COMMON	1
NFEEDC	COMMON	1
NPRINT	COMMON	1
NODAT	COMMON	1
NSPIN	COMMON	1
NTEST	COMMON	1
NTOOL1	COMMON	1
NTOOL2	COMMON	1
NTRANS	COMMON	1
NWPR	COMMON	1
NZCAM	COMMON	1
OPTAB	COMMON	50
PREBU	COMMON	14
PRESTX	COMMON	1
PRESTY	COMMON	1
PRESTZ	COMMON	1
PREVX	COMMON	1
PREVY	COMMON	1
PREVZ	COMMON	1
RADIUS	COMMON	1
RETURN	COMMON	1

```

RPM      COMMON  1
SEQCTR   COMMON  1
SFM      COMMON  1
SPIFLG   COMMON  1
SPNTAB   COMMON 100
TAPSTO   COMMON 250
TOOLNO   COMMON  1
TRANSX   COMMON  1
TRANSY   COMMON  1
TRANSZ   COMMON  1
WORDS    COMMON 14
BUFPR    COMMON 20
IDUM     COMMON 50
ZCAM     COMMON  1

```

```

*
*

```

```

COMT1  SXA      COMTX,1
      SXA      COMTX+1,2
      SXA      COMTX+2,4
      CLA      KOMENT
      ARS      18
      XCA
      PXD      0,0
      MPY      I13A
      XCA
      ADD      LOCCOM
      STA      LOCOM
      AXT      0,2
      AXT      13,1
LUCOM  CLA      0,1
      STO      COMST0,2
      TXI      *+1,2,1
      TIX      *-3,1,1
COMTX  AXT      0,1
      AXT      0,2
      AXT      0,4
      TRA      1,4
I13A   PZE      13
LOCCOM PZE      COMT

```

```

*

```

```

* ADD 13 WORD BCD COMENTS IN ORDER OF
* NUMBER ASSIGNED IN CALLING SUBROUTINE

```

```

*

```

```

COMT  BCI      7,AUX. FUNCTION -TRANS-WRONG, NO
      BCI      6,TRANSLATIUN WAS MADE
COMT2 BCI      7,AUX. FUNCTION -DISPLY- WRONG,
      BCI      6,COMMAND IGNORED
COMT3 BCI      7,NWPR IN FEEDRATE TO SMALL,
      BCI      6,OPTION FEEDRATE ASSUMED
COMT4 BCI      7,FEEDRATE NOT IN IPR MODE,
      BCI      6,OPTION FEEDRATE ASSUMED
COMT5 BCI      7,MINIMUM FEEDRATE CODE ASSUMED
      BCI      6,
COMT6 BCI      7,MAXIMUM FEEDRATE CODE ASSUMED
      BCI      6,
COMT7 BCI      7,SPINDLE FORMAT WRONG, OPTION RPM
      BCI      6,ASSUMED
COMT8 BCI      7,RADIUS FOR SFM NOT FOUND,
      BCI      6,PREVIOUS RADIUS USED

```

```

COMT9 BCI      7,MINIMUM SPINDLE CODE ASSUMED
      BCI      6,
COMT10 BCI     7,MAXIMUM SPINDLE CODE ASSUMED
      BCI      6,
COMT11 BCI     7,NWPR ERROR IN COOLANT,
      BCI      6,NO ACTION TAKEN
COMP12 BCI     7,COOLANT ERROR, NO ACTION TAKEN
      BCI      6,
COMP13 BCI     7,DELTA MOVEMENT EXCEEDS MACHINE LIMIT.
      BCI      6,
COMP14 BCI     7, NWPR IN SEQNO IS INCORRECT,
      BCI      6,SEQUENCE NUMBER IGNORED.
COMT15 BCI     7,CONFLICT IN ROTARY SPEED CODES
      BCI      6,RAPID CODE IGNORED
      END
      FAP

```

```

*
*LABEL
*      FORTRAN
*      LIST

```

```

*LABEL
C1500      COOLNT
          SUBROUTINE COOLNT

```

20130101

```

C*****
C

```

```

C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C

```

```

      DIMENSION SYSTEM (1700)
C

```

```

      EQUIVALENCE (SYSTEM(1700),KOM (1700),KFLAGS(1692),TAPETB(1622))
C

```

```

      EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),

```

```

1  POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),

```

```

2  CORTAP( 9),

```

```

3  TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),

```

```

4  FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C

```

```

      EQUIVALENCE (KFLAGS( 70),

```

```

1  K0 ( 60),F0 ( 60),K1 ( 59),K2 ( 58),K3 ( 57),

```

```

2  K4 ( 56),K5 ( 55),K6 ( 54),K7 ( 53),K8 ( 52),

```

```

3  K9 ( 51),

```

```

4  KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),

```

```

5  IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),

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6  ICLPRT( 35),INDEXX( 34),IPLPTR( 33),      NOPLOT( 31),

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7  KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),

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8  LOCMAC( 25),LENSPC( 24),

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9  IPOSTP( 20),NUMPST( 19))
C

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      EQUIVALENCE (KOM ( 8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C

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```

      COMMON SYSTEM
C

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      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C

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C...*****
C

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COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C

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      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO,
1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3,
2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC,      NPRINT,

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20130101

20130105

20130111

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3NODAT, NSPIN, NTEST, NTOOL1, NTOOL2, NTRANS, NWPR, NZCAM, OPTAB,      20130113
4PREBU , PRESTX, PRESTY, PRESTZ, PREVX, PREVY, PREVZ, RADIUS, RETURN,  20130117
5RPM, SEQCTR, SFM, SPIFLG, SPNTAB, TAPSTO, TOOLNO, TRANSX, TRANSY,    20130123
6TRANSZ, WORDS, BUFPR, IDUM, ZCAM                                     20130125
  DIMENSION MACH(12), PNOFLG(14), MTABLE(10), BUFFER(50), COMSTO(13),  20130201
1FEDTAB(50), FORMAT(14), INTAP(20), OPTAB(50), PREBU (14), SPNTAB(100), 20130205
2TAPSTO(250), WORDS(14), BUFPR(20), IDUM(50)                          20130209

C
  N=MTABLE(6)                                                         45721006
  IF(NWPR-4)1,5,5                                                    20130103
1  KOMENT=11                                                           20130105
  CALL KOMENT                                                         20130107
2  RETURN                                                             20130109
5  IF(INTAP(4)-71)10,20,6
6  IF(INTAP(4)-72)2,30,7
7  IF(INTAP(4)-89)10,20,8
8  IF(INTAP(4)-91)21,20,10
21 IF(N-13)20,22,22
22 KOOL=2
  GO TO 31
10 KOMENT=12
  CALL KOMENT
  GO TO 2
20 KOOL=1
  GO TO 31
30 KOOL=0
31 IDUM(30)=IDUM(30)+1
  NCOOL=IDUM(30)
  IF(IDUM(21))40,2,40
40 GO TO (2,2,2,42,2,2,2,41,2,42,2,2,42,2,2),N
41 SEQCTR=SEQCTR+OPTAB(22)
B  PREBU(1)=606000000000
  GO TO 43
42 SEQCTR=SEQCTR+OPTAB(22)
  PREBU(1)=SEQCTR
43 NCOOL=0
  PREBU(14)=9-KOOL
  CALL CARD
  CALL PRINT
  GO TO 2
  END
*  FORTRAN
*  LIST
* LABEL
  4  FURTIN( 4), INTAPE( 3), IOUTAP( 2), PUNTAP( 1)
C1600  DATA
  SUBROUTINE DATA
C*****
C
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
  DIMENSION  SYSTEM (1700)
C
  EQUIVALENCE (SYSTEM(1700),KOM (1700),KFLAGS(1692),TAPETB(1622))
C
  EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1  POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRUTAP(11),
2  CORTAP( 9),
3  TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),

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C      EQUIVALENCE (KFLAGS( 70),
1      K0      ( 60),F0      ( 60),K1      ( 59),K2      ( 58),K3      ( 57),
2      K4      ( 56),K5      ( 55),K6      ( 54),K7      ( 53),K8      ( 52),
3      K9      ( 51),
4      KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5      IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6      ICLPRT( 35),INDEXX( 34),IPLOTR( 33),          NOPLOT( 31),
7      KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8      LOCMAC( 25),LENSPC( 24),
9      IPOSTP( 20),NUMPST( 19))

C      EQUIVALENCE (KOM      (8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))

C      COMMON SYSTEM

C      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)

C.....*****
C      COMMON AND DIMENSION-POSITIONING POST-PROCESSORS

C      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO,      20130101
1      CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3,      20130105
2      KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC,          NPRINT,      20130111
3      NODAT,NSPIN,NTEST,NT0OL1,NT0OL2,NTRANS,NWPR,NZCAM,OPTAB,      20130113
4      PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN,      20130117
5      SRPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY,      20130123
6      TRANSZ,WORDS,BUFPRT,IDUM,ZCAM                                20130125
      DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13),      20130201
1      FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100),      20130205
2      TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50)                        20130209

C
30      CALL COMPUT                                                    20130103
40      SEQCTR=SEQCTR+OPTAB(22)
      IF(CTRFLG)1,2,1                                                    20130107
1      CTRDLY=1.0                                                        20130109
      CTRFLG=0.0                                                        20130110
      GO TO 5                                                            20130111
2      IF(CTRDLY)3,5,3                                                  20130113
3      SEQCTR=SEQCTR-OPTAB(22)                                          20130115
      CTRDLY=0.0                                                        20130116
      GO TO 5                                                            20130117
5      CALL SETUP                                                        20130119
      IF(PREBU(3)-BITS)6,7,6
7      IF(PREVX-BITS)11,6,11
6      N=FORMAT(3)/10.0+SIGNF(.001,FORMAT(3))
      A1=N
      N=ABSF(FORMAT(3)-(A1*10.0))+.001
      A1=INTF(PRESTX*(10.**N)+SIGNF(.5,PRESTX))
      PREVX=A1/(10.**N)
11     IF(PREBU(4)-BITS)8,9,8
9      IF(PREY-BITS)12,8,12
8      N=FORMAT(4)/10.0+SIGNF(.001,FORMAT(4))
      A1=N
      N=ABSF(FORMAT(4)-(A1*10.0))+.001
      A1=INTF(PRETY*(10.**N)+SIGNF(.5,PRETY))
      PREVY=A1/(10.**N)
12     IF(PREBU(5)-BITS)10,20,10
20     IF(OPTAB(15)-2.0)15,15,14

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14 IF(PREVZ-BITS)13,10,13
10 N=FORMAT(5)/10.0+SIGNF(.001,FORMAT(5))
   A1=N
   N=ABSF(FORMAT(5)-(A1*10.0))+.001
   A1=INTF(PRESTZ*(10.**N)+SIGNF(.5,PRESTZ))
   PREVZ=A1/(10.**N)
13 RETURN
15 PREVZ=PRESTZ
   GO TO 13
   END
*   LIST
*   LABEL
C1650   DELAY
      SUBROUTINE DELAY
C*****
C
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
      DIMENSION  SYSTEM (1700)
C
      EQUIVALENCE (SYSTEM(1700),KOM (1700),KFLAGS(1692),TAPETB(1622))
C
      EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1  POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2  CORTAP( 9),
3  TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4  FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
      EQUIVALENCE (KFLAGS( 70),
1  K0 ( 60),F0 ( 60),K1 ( 59),K2 ( 58),K3 ( 57),
2  K4 ( 56),K5 ( 55),K6 ( 54),K7 ( 53),K8 ( 52),
3  K9 ( 51),
4  KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5  IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6  ICLPRT( 35),INDEXX( 34),IPLOTR( 33), NOPLOT( 31),
7  KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8  LOCMAC( 25),LENSPC( 24),
9  IPOSTP( 20),NUMPST( 19))
C
      EQUIVALENCE (KOM ( 8),KAPTID(1),KAPTID(2),KAPTTR(3),KAPTCN(4))
C
      COMMON SYSTEM
C
      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C*****
C...  COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO,
1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3,
2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC, NPRINT,
3NODAT,NSPIN,NTEST,NTOOL1,NTOOL2,NTRANS,NWPR,NZCAM,OPTAB,
4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN,
5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY,
6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM
      DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13),
1FEDTAB(50),FURMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100),
2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50)

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45720706
45720705

20130101
20130105
20130111
20130113
20130117
20130123
20130125
20130201
20130205
20130209

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      N=MTABLE(6)
      IF(N-15)2,2,1
2    GO TO (1,1,1,1,1,1,1,1,1,1,1,1,1,10,4,1),N
4    IDUM(33)=1
      IDUM(30)=IDUM(30)+1
      GO TO 1
10   IN=TAPSTO(4)+.5
      SEQCTR=SEQCTR+OPTAB(22)
      PREBU(1)=SEQCTR
      DO 50 I=1,IN
      PREBU(14)=77.
      CALL CARD
50   CALL PRINT
      1 RETURN
      END
*     FORTRAN
*     LIST
*LABEL
C1700      DISPLY
          SUBROUTINE DISPLY
C*****
C
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
      DIMENSION SYSTEM (1700)
C
      EQUIVALENCE (SYSTEM(1700),KOM (1700),KFLAGS(1692),TAPETB(1622))
C
      EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1    POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2    CORTAP( 9),
3    TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4    FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
      EQUIVALENCE (KFLAGS( 70),
1    K0 ( 60),F0 ( 60),K1 ( 59),K2 ( 58),K3 ( 57),
2    K4 ( 56),K5 ( 55),K6 ( 54),K7 ( 53),K8 ( 52),
3    K9 ( 51),
4    KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5    IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6    ICLPRT( 35),INDEXX( 34),IPLOTR( 33), NOPLOT( 31),
7    KOYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8    LOCMAC( 25),LENSPC( 24),
9    IPOSTP( 20),NUMPST( 19))
C
      EQUIVALENCE (KOM (8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
      COMMON SYSTEM
C
      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C*****
C... *****
C  COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO,
1    ICTRLDY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3,
2    KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC, NPRINT,
3    NODAT,NSPIN,NTEST,NT0OL1,NT0OL2,NTRANS,NWPR,NZCAM,OPTAB,
4    PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN,

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45720707
45720708
47490123
47490124
47490125
474901
45720710
45720712
45720713
45720711
45720714
45720715
45720716
45720717
45720718

20130101

20130101
20130105
20130111
20130113
20130117

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SRPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY,      20130123
6TRANSZ,WORDS,BUFPR,IDUM,ZCAM      20130125
DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13),  20130201
1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100), 20130205
2TAPSTO(250),WORDS(14),BUFPR(20),IDUM(50)      20130209

C
  IF(NWPR-4)1,4,3      20130103
1 KOMENT=2      20130105
  CALL COMENT      20130107
2 RETURN      20130109
3 ZCAM=TAPSTO(5)      20130111
  NZCAM=1      20130113
4 TOOLNO=TAPSTO(4)      20130115
  NTOOL1=1      20130117
  NTOOL2=1      20130119
  NT=MTABLE(6)
  IF(NT-15)5,5,2
5 GO TO (2,2,2,2,2,2,2,2,6,7,2,2,2,2,2),NT
6 OPTAB(5)=0.
  GO TO 2
7 SEQCTR=SEQCTR+OPTAB(22)
  PREBU(1)=SEQCTR
B  PREBU(12)=606360606060
  NTOOL1=0
  NTOOL2=0
  CALL CARD
  CALL PRINT
  GO TO 2
  END      20130121
*      20130123
*      LIST
*LABEL
C1800      END
      SUBROUTINE END      20130101
C*****
C
C... SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
  DIMENSION SYSTEM (1700)
C
  EQUIVALENCE (SYSTEM(1700),KOM (1700),KFLAGS(1692),TAPETB(1622))
C
  EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1 POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2 CORTAP(9),
3 TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4 FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
  EQUIVALENCE (KFLAGS( 70),
1 K0 ( 60),F0 ( 60),K1 ( 59),K2 ( 58),K3 ( 57),
2 K4 ( 56),K5 ( 55),K6 ( 54),K7 ( 53),K8 ( 52),
3 K9 ( 51),
4 KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5 IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6 ICLPR( 35),INDEXX( 34),IPLOTR( 33), NOPLO( 31),
7 KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8 LOCMAC( 25),LENSPC( 24),
9 IPOSTP( 20),NUPST( 19))
C

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      EQUIVALENCE (KOM      (8),KAPTID(1),KAPTID(2),KAPTTR(3),KAPTCN(4))
C
      COMMON SYSTEM
C
      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C...*****
C      COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO,      20130101
      1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3,      20130105
      2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC,      NPRINT,      20130111
      3NODAT,NSPIN,NTEST,NT00L1,NT00L2,NTRANS,NWPR,NZCAM,OPTAB,      20130113
      4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN,      20130117
      5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY,      20130123
      6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM      20130125
      DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13),      20130201
      1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100),      20130205
      2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50)      20130209
C
      N=MTABLE(6)      20130103
      IF (N-15)5,5,1
      5 GO TO (20,20,20,4,20,6,6,10,20,10,20,20,10,20,20),N      45720613
      4 CALL ENDMA4      20130107
      GO TO 20      20130108
      6 CALL ENDMA6
      GO TO 20
      10 PREBU(14) = 2.
      CALL CARD
      CALL PRINT
      20 NN=-276      20130109
      J=1      20130111
      K=0      20130113
      CALL PUNCHA (NN,BUFFER,J,K)      20130115
      1 RETURN      20130117
      END      20130119
*      FORTRAN
*      LIST
*LABEL
C1900      ENDMA4
      SUBROUTINE ENDMA4      20130101
C*****
C
C... SYSTEM COMMON, DIMENSION, AND EQUIVALENCE STATEMENTS
C
      DIMENSION SYSTEM (1700)
C
      EQUIVALENCE (SYSTEM(1700),KOM      (1700),KFLAGS(1692),TAPETB(1622))
C
      EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
      1 POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
      2 CORTAP( 9),
      3 TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
      4 FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
      EQUIVALENCE (KFLAGS( 70),
      1 K0      ( 60),F0      ( 60),K1      ( 59),K2      ( 58),K3      ( 57),
      2 K4      ( 56),K5      ( 55),K6      ( 54),K7      ( 53),K8      ( 52),
      3 K9      ( 51),

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4  KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5  IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6  ICLPRT( 35),INDEXX( 34),IPLOTR( 33),          NOPLOT( 31),
7  KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8  LOCMAC( 25),LENSPC( 24),
9  IPOSTP( 20),NUMPST( 19))

C      EQUIVALENCE (KOM      (8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
C      COMMON SYSTEM
C
C      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C...*****
C      COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
C      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO,      20130101
1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3,      20130105
2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC,          NPRINT,      20130111
3NODAT,NSPIN,NTEST,NTOOL1,NTOOL2,NTRANS,NWPR,NZCAM,OPTAB,      20130113
4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN,      20130117
5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY,      20130123
6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM      20130125
C      DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13),      20130201
1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100),      20130205
2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50)      20130209

C
C      PREBU (1)=SEQCTR+1.0
C      PREBU (2)=4.0
C      PREBU (8)=0.0
C      PREBU (10)=0.0
C      PREBU(14)=0.0
C      I=3
C      J=0      20130113
C      CALL CONBCD (PREBU (1),BUFFER( 3),I,J)      20130115

B      BUFFER(6)=606060606004
B      BUFFER(27)=606060606000
B      BUFFER(33)=606060600000
B      BUFFER(45)=606060600000
B      BUFFER (5)=276060606060
B      BUFFER(26)=266060606060
B      BUFFER(32)=626060606060
B      BUFFER(44)=446060606060
C      N=-276
C      J=0      20130205
C      K=0      20130207
C      CALL PUNCHA (N,BUFFER,J,K)      20130209
C      CALL PRINT      20130211
C      RETURN      20130213
C      END      20130215

*      FORTRAN
*      LIST
*LABEL
C2000      ENDMA6
SUBROUTINE ENDMA6
C*****
C
C... SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C

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20130101

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C... SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
  DIMENSION SYSTEM (1700)
C
  EQUIVALENCE (SYSTEM(1700),KOM (1700),KFLAGS(1692),TAPETB(1622))
C
  EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1 POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2 CORTAP( 9),
3 TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4 FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
  EQUIVALENCE (KFLAGS( 70),
1 K0 ( 60),F0 ( 60),K1 ( 59),K2 ( 58),K3 ( 57),
2 K4 ( 56),K5 ( 55),K6 ( 54),K7 ( 53),K8 ( 52),
3 K9 ( 51),
4 KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5 IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6 ICLPRT( 35),INDEXX( 34),IPLOTR( 33), NOPL0T( 31),
7 KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8 LOCMAC( 25),LENSPC( 24),
9 IPOSTP( 20),NUMPST( 19))
C
  EQUIVALENCE (KOM ( 8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
  COMMON SYSTEM
C
  DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C...*****
C COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
  COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO, 20130101
1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3, 20130105
2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC, NPRINT, 20130111
3NODAT,NSPIN,NTEST,NT0OL1,NT0OL2,NTRANS,NWPR,NZCAM,OPTAB, 20130113
4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN, 20130117
5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY, 20130123
6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM 20130125
  DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13), 20130201
1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100), 20130205
2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50) 20130209
C
  IF(FEDIPR)30,31,30
30 I=OPTAB(6)
  IF(FEDIPR-FEDTAB(I))1,1,5
  1 KOMENT=5 20130105
  NFEEDC=I
  2 CALL COMENT 20130109
  GO TO 21
  3 RETURN 20130111
31 NFEEDC=0
  GO TO 3
  5 I=OPTAB(14)*OPTAB(13)-OPTAB(13)+OPTAB(6)+.1
  IF(FEDIPR-FEDTAB(I))10,7,6
  7 NFEEDC=I
  GO TO 21
  6 KOMENT=6 20130117
  NFEEDC=I 20130119

```

```

      GO TO 21
10  K=OPTAB(6)
      L=OPTAB(13)
      DO15 J=K,I,L
      IF(FEDIPR-FEDTAB(J))20,15,15
15  CONTINUE
16  ERROR=2.0
      CALL PERROR (ERROR)
20  NFEEDC=J-L
21  CALL FEDCOD
      GO TO 3
      END
*      FORTRAN
*      LIST
*LABEL
C2200      FEDCOD
      SUBROUTINE FEDCOD
C*****
C
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
      DIMENSION  SYSTEM (1700)
C
      EQUIVALENCE (SYSTEM(1700),KOM  (1700),KFLAGS(1692),TAPETB(1622))
C
      EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1  POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2  CORTAP( 9),
3  TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4  FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
      EQUIVALENCE  (KFLAGS( 70),
1  K0      ( 60),F0      ( 60),K1      ( 59),K2      ( 58),K3      ( 57),
2  K4      ( 56),K5      ( 55),K6      ( 54),K7      ( 53),K8      ( 52),
3  K9      ( 51),
4  KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5  IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6  ICLPRT( 35),INDEXX( 34),IPLOTR( 33),      NOPLOT( 31),
7  KDYNFG( 30),LOCJPT( 29),LOCREG( 28),KSECIN( 27),NCLREC( 26),
8  LOCMAC( 25),LENSPC( 24),
9  IPOSTP( 20),NUMPST( 19))
C
      EQUIVALENCE (KOM  (8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
      COMMON SYSTEM
C
      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C...*****
C  COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO,
1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3,
2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC,      NPRINT,
3NODAT,NSPIN,NTEST,NT0OL1,NT0OL2,NTRANS,NWPR,NZCAM,OPTAB,
4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN,
5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY,
6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM
      DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13),

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20130203

20130205

20130207

20130213

20130215

20130101

20130105

20130111

20130113

20130117

20130123

20130125

20130201

1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100), 20130205
 2TAPSTO(250),WORDS(14),BUFPR(20),IDUM(50) 20130209

C

```

    DIMENSION IFCODE(50)
    NT =MTABLE(6)
    N=NFEEDC
    IF(NT-15)2,2,1
1  RETURN
2  GO TO(1,1,1,1,1,1,1,8,9,10,1,1,1,14,1),NT
8  NFEEDC=N/2
    IF(NFEEDC-7)1,1,16
16 NFEEDC=NFEEDC+2
    GO TO 1
9  IFCODE(1) =110
    IFCODE(2) =114
    IFCODE(3) =116
    IFCODE(4) =120
    IFCODE(5) =128
    IFCODE(6) =136
    IFCODE(7) =141
    IFCODE(8) =152
    IFCODE(9) =181
    IFCODE(10)=210
    IFCODE(11)=212
    IFCODE(12)=215
    IFCODE(13)=220
    IFCODE(14)=226
    IFCODE(15)=230
    IFCODE(16)=238
20 NFEEDC=IFCODE(N)
    GO TO 1
10 IF(N)11,1,11
11 NFEEDC=(N-1)/3 + 1
    GO TO 1
14 IFCODE(1)=03
    IFCODE(2)=05
    IFCODE(3)=06
    IFCODE(4)=08
    IFCODE(5)=10
    IFCODE(6)=12
    IFCODE(7)=13
    IFCODE(8)=15
    IFCODE(9)=17
    IFCODE(10)=19
    IFCODE(11)=20
    IFCODE(12)=22
    IFCODE(13)=24
    IFCODE(14)=25
    IFCODE(15)=27
    IFCODE(16)=29
    IFCODE(17)=31
    IFCODE(18)=32
    IFCODE(19)=34
    IFCODE(20)=36
    IFCODE(21)=37
    IFCODE(22)=39
    IFCODE(23)=41
    IFCODE(24)=43
    IFCODE(25)=44

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IFCODE(26)=46
IFCODE(27)=48
IFCODE(28)=49
IFCODE(29)=51
IFCODE(30)=53
IFCODE(31)=54
IFCODE(32)=56
GO TO 20
END
*   FORTRAN
*   LIST
*LABEL
C2300   FEDRAT
        SUBROUTINE FEDRAT
C*****
C...   SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
C       DIMENSION SYSTEM (1700)
C
C       EQUIVALENCE (SYSTEM(1700),KOM   (1700),KFLAGS(1692),TAPETB(1622))
C
C       EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1  POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2  CORTAP( 9),
3  TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4  FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
C       EQUIVALENCE (KFLAGS( 70),
1  K0   ( 60),F0   ( 60),K1   ( 59),K2   ( 58),K3   ( 57),
2  K4   ( 56),K5   ( 55),K6   ( 54),K7   ( 53),K8   ( 52),
3  K9   ( 51),
4  KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5  IWAVER( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6  ICLPRT( 35),INDEXX( 34),IPLOTR( 33),      NOPLOR( 31),
7  KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8  LOCMAC( 25),LENSPC( 24),
9  IPOSTP( 20),NUMPST( 19))
C
C       EQUIVALENCE (KOM   (8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
C       COMMON SYSTEM
C
C       DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C...*****
C   COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
C       COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO,
1CTROLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3,
2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC,      NPRINT,
3NODAT,NSPIN,NTEST,NTOOL1,NTOOL2,NTRANS,NWPR,NZCAM,OPTAB,
4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN,
5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY,
6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM
7DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13),
8FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100),
9TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50)

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20130101

20130101
20130105
20130111
20130113
20130117
20130123
20130125
20130201
20130205
20130209

N=MTABLE(6)	20130121
IF(NWPR-4)1,70,5	
1 KOMENT=3	20130105
21 CALL KOMENT	20130107
2 FEDIPR=OPTAB(9)	20130109
GO TO 10	20130111
70 IF(IDUM(28))7,7,14	
5 IF(INTAP(5)-74)6,7,13	
13 KOMENT=4	
GO TO 21	
6 IF(INTAP(5)-73)13,14,13	
14 IF(N-8)40,15,40	45721109
40 IF(N-13)13,15,15	47490201
15 FEDIPM=TAPSTO(4)	
FEDFLG=1.0	
GO TO 9	
27 IF(N-13)42,43,36	
43 IF(FEDIPM-10.)50,45,45	
50 IF(FEDIPM-1.)51,44,44	
51 FEDIPM=1.	
KOMENT=5	
CALL KOMENT	
44 NFEEDC=400.+FEDIPM*10.	45721114
GO TO 19	
45 IF(FEDIPM-70.)46,46,47	45721116
47 FEDIPM=70.	45721117
KOMENT=6	
CALL KOMENT	
46 NFEEDC=500.+FEDIPM	45721118
GO TO 19	
42 NFEEDC=FEDIPM*2.0+.0001	45721112
IF(NFEEDC-99)19,19,18	
18 NFEEDC=99	
KOMENT=6	
CALL KOMENT	
19 FEDFLG=1.0	
GO TO 30	
7 FEDIPR=TAPSTO(4)	20130119
10 FEDFLG=1.0	20130120
IF(N-15)11,11,20	
11 GO TO (20,12,12,12,20,20,20,16,12,12,20,20,16,16,20),N	47490203
16 FEDIPM=OPTAB(26)*FEDIPR	
IF(N-13)52,72,9	47490204
52 IF(FEDIPM-.5)29,9,9	
72 IF(FEDIPM-1.)73,9,9	
73 FEDIPM=1.	
GO TO 9	
29 FEDIPM=.5	
9 IF(NWPR-7)17,3,3	
3 IF(INTAP(6)-145)17,4,17	
4 IF(INTAP(7)-61)26,23,22	
22 IF(INTAP(7)-62)26,24,28	
28 IF(INTAP(7)-63)26,25,26	
23 TAPSTO(7)=2.	
GO TO 26	
24 TAPSTO(7)=3.	
GO TO 26	
25 TAPSTO(7)=1.	
26 IF(TAPSTO(7)-OPTAB(13)-.1)8,17,17	

```

      8 OPTAB(6)=TAPSTO(7)
     17 IF(OPTAB(6)-1.1)27,36,36
     36 FEDIPR=FEDIPM
     12 CALL FEDC1
     30 IF(IDUM(22))31,20,31
     31 FEDFLG=0.
        L=8
        SEQCTR=SEQCTR+OPTAB(22)
        GO TO (20,34,34,34,20,20,20,32,33,34,20,20,34,20,20),N
B  32 PREBU(1)=606000000000
        GO TO 35
     33 L=L+1
     34 PREBU(1)=SEQCTR
     35 PREBU(L)=NFEEDC
        CALL CARD
        CALL PRINT
        GO TO 20
     20 RETURN
        END
*      FORTRAN
*      LIST
*LABEL
C2400      FINAL
          SUBROUTINE FINAL
C*****
C
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
      DIMENSION SYSTEM (1700)
C
      EQUIVALENCE (SYSTEM(1700),KOM (1700),KFLAGS(1692),TAPETB(1622))
C
      EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1  POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CROTAP(11),
2  CORTAP( 9),
3  TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4  FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
      EQUIVALENCE (KFLAGS( 70),
1  K0 ( 60),F0 ( 60),K1 ( 59),K2 ( 58),K3 ( 57),
2  K4 ( 56),K5 ( 55),K6 ( 54),K7 ( 53),K8 ( 52),
3  K9 ( 51),
4  KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5  IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6  ICLPRT( 35),INDEXX( 34),IPLOTR( 33), NOPLOT( 31),
7  KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8  LOCMAC( 25),LENSPC( 24),
9  IPOSTP( 20),NUMPST( 19))
C
      EQUIVALENCE (KOM (8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
      COMMON SYSTEM
C
      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C...*****
C  COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO,

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20130201

45721121

20130205

20130207

20130101

20130101

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1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3, 20130105
2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC, NPRINT, 20130111
3NODAT,NSPIN,NTEST,NT00L1,NT00L2,NTRANS,NWPR,NZCAM,OPTAB, 20130113
4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN, 20130117
5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY, 20130123
6TRANSZ,WORDS,BUFPR, IDUM,ZCAM 20130125
    DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13), 20130201
1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100), 20130205
2TAPSTO(250),WORDS(14),BUFPR(20),IDUM(50) 20130209
C
    DIMENSION AA(12) 20130102
    CALL PREINT(1)
    N=MTABLE(6)
    CABCTR=KFLAGS(50)
    CABON=CABCTR*.6+12.0
    JCAB=CABON
    CALL PRTON(N,JCAB)
    KFLAGS(39)=KFLAGS(39)+JCAB
    KFLAGS(50)=0
    CALL DESPAT 20130115
    RETURN 20130117
    END 20130119
*
*   FORTRAN
*   LIST
*LABEL
C2500      INIT
          SUBROUTINE INIT 20130101
C*****
C
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
    DIMENSION  SYSTEM (1700)
C
    EQUIVALENCE (SYSTEM(1700),KOM   (1700),KFLAGS(1692),TAPETB(1622))
C
    EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1  POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2  CORTAP( 9),
3  TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4  FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
    EQUIVALENCE  (KFLAGS( 70),
1  K0   ( 60),F0   ( 60),K1   ( 59),K2   ( 58),K3   ( 57),
2  K4   ( 56),K5   ( 55),K6   ( 54),K7   ( 53),K8   ( 52),
3  K9   ( 51),
4  KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5  IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6  ICLPRT( 35),INDEXX( 34),IPLOTR( 33),          NOPLOT( 31),
7  KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8  LOCMAC( 25),LENSPC( 24),
9  IPOSTP( 20),NUMPST( 19))
C
    EQUIVALENCE (KOM   (8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
    COMMON SYSTEM
C
    DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C...*****

```

C COMMON AND DIMENSION-POSITIONING POST-PROCESSORS

```

C
COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO, 20130101
1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3, 20130105
2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC, NPRINT, 20130111
3NODAT,NSPIN,NTEST,NTOOL1,NTOOL2,NTRANS,NWPR,NZCAM,OPTAB, 20130113
4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN, 20130117
5SRPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY, 20130123
6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM 20130125
DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13), 20130201
1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100), 20130205
2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50) 20130209

C
CALL INIT1 20130103
DO 30 I=1,14
WORDS(I)=60606060606060
FORMAT(I)=BITS
30 PREBU(I)=BITS
OPTAB(6)=1.0
OPTAB(7)=1.0
OPTAB(22)=1.0
OPTAB(23)=BITS
IDUM(29)=1
N=MTABLE(6) 20130105
IF(N-15)18,18,19
18 GO TO (1,2,3,4,5,6,7,8,9,10,11,12,13,14,15),N
1 CALL MACH01 20130109
GO TO 20 20130111
2 CALL MACH02 20130113
GO TO 20 20130115
3 CALL MACH03 20130117
GO TO 20 20130119
4 CALL MACH04 20130121
GO TO 20 20130123
5 CALL MACH05
GO TO 20
6 CALL MACH06
GO TO 20
7 CALL MACH06
GO TO 20
8 CALL MACH08
GO TO 20
9 CALL MACH09
GO TO 20
10 CALL MACH10
GO TO 20
11 CALL MACH11
GO TO 20
12 CALL MACH12
GO TO 20
13 CALL MACH13 45720118
GO TO 20 45720119
14 CALL MACH14 47490206
GO TO 20
15 GO TO 20
19 ERROR=5.0
CALL PERROR(ERROR)
20 RETURN 20130124
END 20130125

```

```

*      FAP
*LABEL
*2600      INIT1
          ENTRY  INIT1
NOTAPS EQU    18      NUMBER OF TAPES
NOFLGS EQU    70      NUMBER OF FLAGS IN FLAG AREA
BUFNUM EQU     4      NUMBER OF BUFFERS
NOBLKS EQU     4      NO. OF BLOCKS ALLOWED TAPEWT CALL SEQ.
BUFSIZ EQU    400     SIZE OF ONE BUFFER BLOCK
*****
SYSTEM COMMON 8
KFLAGS COMMON NOFLGS
TAPETB COMMON NOTAPS
BUFTBL COMMON BUFNUM
BUFER1 COMMON BUFSIZ
BUFER2 COMMON BUFSIZ
BUFER3 COMMON BUFSIZ
BUFER4 COMMON BUFSIZ
KOM EQU       SYSTEM
KAPTID EQU    KOM-7   IDENTIFICATION OF LAST LIBTAP RECORD
KAPTIO EQU    KOM-6   APT I-O COMMAND
KAPTTR EQU    KOM-5   TRANSFER TO LAST SECTION READ FROM LIBTA
KAPTCN EQU    KOM-4   CONTINUATION FLAG
K0 EQU       KFLAGS-10
K1 EQU       KFLAGS-11
K2 EQU       KFLAGS-12
K3 EQU       KFLAGS-13
K4 EQU       KFLAGS-14
K5 EQU       KFLAGS-15
K6 EQU       KFLAGS-16
K7 EQU       KFLAGS-17
K8 EQU       KFLAGS-18
K9 EQU       KFLAGS-19
KFLAG0 EQU    KFLAGS-24
KFLAG1 EQU    KFLAGS-25
KFLAG2 EQU    KFLAGS-26
KFLAG3 EQU    KFLAGS-27
KFLAG4 EQU    KFLAGS-28
IWAVEN EQU    KFLAGS-30  KFLAGS(31)
IPTNLY EQU    KFLAGS-31
NOPOST EQU    KFLAGS-32
INVERT EQU    KFLAGS-33
KAUTOP EQU    KFLAGS-34
ICLPRT EQU    KFLAGS-35
INDEXX EQU    KFLAGS-36
IPLOTR EQU    KFLAGS-37
NOPL0T EQU    KFLAGS-39
K0YNFG EQU    KFLAGS-40
LOCJPT EQU    KFLAGS-41
LOCBEG EQU    KFLAGS-42
KSECIN EQU    KFLAGS-43
NCLREC EQU    KFLAGS-44
LOCMAC EQU    KFLAGS-45
LENSPC EQU    KFLAGS-46
IPOSTP EQU    KFLAGS-50
NUMPOT EQU    KFLAGS-51
PROTAP EQU    TAPETB
CANTAP EQU    TAPETB-1
CLTAPE EQU    TAPETB-2

```

POCTAP	EQU	TAPETB-3
PLOTAP	EQU	TAPETB-4
SRFTAP	EQU	TAPETB-5
LIBTAP	EQU	TAPETB-6
CRDTAP	EQU	TAPETB-7
CORTAP	EQU	TAPETB-9
TAPES1	EQU	TAPETB-10
TAPES2	EQU	TAPETB-11
TAPES3	EQU	TAPETB-12
TAPES4	EQU	TAPETB-13
FORTIN	EQU	TAPETB-14
INTAPE	EQU	TAPETB-15
IOUTAP	EQU	TAPETB-16
PUNTAP	EQU	TAPETB-17

*

MACH	COMMON	12
NLOOP	COMMON	1
NLOOP1	COMMON	1
PNOFLG	COMMON	14
MTABLE	COMMON	10
NID	COMMON	1
BITS	COMMON	1
BUFFER	COMMON	50
COMSTO	COMMON	13
CTRDLY	COMMON	1
CTRFLG	COMMON	1
FEDFLG	COMMON	1
FEDI PR	COMMON	1
FEDTAB	COMMON	50
FORMAT	COMMON	14
GGL	COMMON	1
INTAP	COMMON	20
IND2	COMMON	1
IND3	COMMON	1
KOMENT	COMMON	1
KOOL	COMMON	1
KX	COMMON	1
KY	COMMON	1
KZ	COMMON	1
LINCTR	COMMON	1
NAXIS	COMMON	1
NCOOL	COMMON	1
NFEEDC	COMMON	1
NPRINT	COMMON	1
NODAT	COMMON	1
NSPIN	COMMON	1
NTEST	COMMON	1
NTOOL1	COMMON	1
NTOOL2	COMMON	1
NTRANS	COMMON	1
NWPR	COMMON	1
NZCAM	COMMON	1
OPTAB	COMMON	50
PREBU	COMMON	14
PRESTX	COMMON	1
PRESTY	COMMON	1
PRESTZ	COMMON	1
PREVX	COMMON	1


```

PREVY  COMMON  1
PREVZ  COMMON  1
RADIUS COMMON  1
RETURN COMMON  1
RPM     COMMON  1
SEQCTR  COMMON  1
SFM     COMMON  1
SPIFLG  COMMON  1
SPNTAB  COMMON 100
TAPSTO  COMMON 250
TOOLNO  COMMON  1
TRANSX  COMMON  1
TRANSY  COMMON  1
TRANSZ  COMMON  1
WORDS   COMMON 14
BUFPRF  COMMON 20
IDUM    COMMON 50
ZCAM    COMMON  1
*
*
  INIT1 SXA      EXIT,1
        SXA      EXIT+1,2
        SXA      EXIT+2,4
        AXT      0,1
        STZ      BITS,1
        TXI      *+1,1,1
        TXL      *-2,1,BITS-ZCAM
        CLA      B1
        STO      BITS
        STO      PRESTX
        STO      PRESTY
        STO      PRESTZ
        STO      PREVX
        STO      PREVY
        STO      PREVZ
  EXIT  AXT      0,1
        AXT      0,2
        AXT      0,4
        TRA      1,4
  B1    OCT      777777777777
        END
*      FORTRAN
*      LIST
*LABEL
C2700      INSERT
          SUBROUTINE INSERT
C*****
C
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
          DIMENSION  SYSTEM (1700)
C
          EQUIVALENCE (SYSTEM(1700),KOM (1700),KFLAGS(1692),TAPETB(1622))
C
          EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1  POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2  CORTAP( 9),
3  TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4  FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))

```

```

C
EQUIVALENCE (KFLAGS( 70),
1 K0 ( 60),F0 ( 60),K1 ( 59),K2 ( 58),K3 ( 57),
2 K4 ( 56),K5 ( 55),K6 ( 54),K7 ( 53),K8 ( 52),
3 K9 ( 51),
4 KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5 IWAVER( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6 ICLPRT( 35),INDEXX( 34),IPLOTR( 33), NOPLT( 31),
7 KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8 LOCMAC( 25),LENSPC( 24),
9 IPOSTP( 20),NUMPST( 19))

C
EQUIVALENCE (KOM (8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))

C
COMMON SYSTEM

C
DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)

C
C...*****
C COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO, 20130101
1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3, 20130105
2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC, NPRINT, 20130111
3NODAT,NSPIN,NTEST,NTOOL1,NTOOL2,NTRANS,NWPR,NZCAM,OPTAB, 20130113
4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN, 20130117
5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY, 20130123
6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM 20130125
DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13), 20130201
1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100), 20130205
2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50) 20130209

C
CALL PUNCHA(-66,TAPSTO(4),0,0)
CALL MESSAG
RETURN
END

*
* FORTRAN
* LIST
C2730 LEADER
SUBROUTINE LEADER
C*****
C
C... SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
DIMENSION SYSTEM (1700)

C
EQUIVALENCE (SYSTEM(1700),KOM (1700),KFLAGS(1692),TAPETB(1622))

C
EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1 POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2 CORTAP( 9),
3 TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4 FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))

C
EQUIVALENCE (KFLAGS( 70),
1 K0 ( 60),F0 ( 60),K1 ( 59),K2 ( 58),K3 ( 57),
2 K4 ( 56),K5 ( 55),K6 ( 54),K7 ( 53),K8 ( 52),
3 K9 ( 51),
4 KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),

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```

5  IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6  ICLPRT( 35),INDEXX( 34),IPLOTR( 33),          NOPLOT( 31),
7  KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8  LOCMAC( 25),LENSPC( 24),
9  IPOSTP( 20),NUMPST( 19))

C      EQUIVALENCE (KOM      (8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
C      COMMON SYSTEM
C
C      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C.....*****
C      COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
C      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO,      20130101
1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3,      20130105
2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC,      NPRINT,      20130111
3NODAT,NSPIN,NTEST,NT00L1,NT00L2,NTRANS,NWPR,NZCAM,OPTAB,      20130113
4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN,      20130117
5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY,      20130123
6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM      20130125
C      DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13),      20130201
1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100),      20130205
2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50)      20130209

C
10 INCH=TAPSTO(4)/0.1+ .5
CALL CONBCD(TAPSTO(4),TAPSTO(6),4,-2)
A      TAPSTO(4)=604325212425
B      TAPSTO(5)=516160606060
DO 12 K=7,14
B 12 TAPSTO(K)=606060606060
CALL MESSAG
DO15 IK=1,50
B 15 BUFFER(IK)=606060606060
16 JA=0
KA=1
IF(INCH-300)20,20,25
20 NA=-INCH
NOMO=0
GO TO 30
25 NA=-300
INCH=INCH-300
NOMO=1
30 CALL PUNCHA (NA,BUFFER,JA,KA)
IF(NOMO)11,11,16
11 RETURN
END
*      LIST
*      LABEL
C2760      LOADTL
SUBROUTINE LOADTL
C.....*****
C
C... SYSTEM COMMON, DIMENSION, AND EQUIVALENCE+STATEMENTS
C
C      DIMENSION SYSTEM (1700)
C
C      EQUIVALENCE (SYSTEM(1700),KOM      (1700),KFLAGS(1692),TAPETB(1622))

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45720721

```

C      EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1      POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2      CORTAP( 9),
3      TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4      FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))

C      EQUIVALENCE (KFLAGS( 70),
1      K0      ( 60),F0      ( 60),K1      ( 59),K2      ( 58),K3      ( 57),
2      K4      ( 56),K5      ( 55),K6      ( 54),K7      ( 53),K8      ( 52),
3      K9      ( 51),
4      KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5      IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6      ICLPRT( 35),INDEXX( 34),IPLOTR( 33),      NOPLOT( 31),
7      KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8      LOCMAC( 25),LENSPC( 24),
9      IPOSTP( 20),NUMPST( 19))

C      EQUIVALENCE (KOM      (8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))

C      COMMON SYSTEM

C      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)

C      C...*****
C      COMMON AND DIMENSION-POSITIONING POST-PROCESSORS

C      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO,
1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3,
2KMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC,      NPRINT,
3NODAT,NSPIN,NTEST,NT0OL1,NT0OL2,NTRANS,NWPR,NZCAM,OPTAB,
4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN,
5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY,
6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM
7      DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13),
1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100),
2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50)

C      N=MTABLE(6)
IF(N-15)2,2,1
2 GO TO (1,1,1,1,1,1,1,1,1,1,1,1,10,30,1),N
10 SEQCTR=SEQCTR+OPTAB(22)
IF(PREVZ-13.9985)21,20,20
21 PREVZ=13.999
20 PREBU(1)=SEQCTR
PREBU(5)=PREVZ
PREBU(14)=6.
PREBU(8)=599.
FEDFLG=1.
30 IF(NWPR-4) 1,31,32
31 NT = 4
GO TO 34
32 NT = 8
OPTAB(28) = TAPSTO(10)
34 IF(N-13)9,33,9
9 SEQCTR=SEQCTR+OPTAB(22)
PREBU(1)=SEQCTR
PREBU(14)=6.
PREBU(12)=TAPSTO(N)

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20130101
20130105
20130111
20130113
20130117
20130123
20130125
20130201
20130205
20130209

45720722
45720723
45720725

45720802

```

33 CALL CARD
CALL PRINT
1 RETURN
END
*      FORTRAN
*      LIST
*LABEL
C2800      MACH01
SUBROUTINE MACH01
C
C      MACHIN/GIDLWS, TABLE, 1
C
C*****
C... SYSTEM COMMON, DIMENSION, AND EQUIVALENCES+STATEMENTS
C
C      DIMENSION SYSTEM (1700)
C
C      EQUIVALENCE (SYSTEM(1700), KOM (1700), KFLAGS(1692), TAPETB(1622))
C
C      EQUIVALENCE (TAPETB(18), PROTAP(18), CANTAP(17), CLTAPE(16),
1 POCTAP(15), PLOTAP(14), SRFTAP(13), LBTAP(12), CRDTAP(11),
2 CORTAP( 9),
3 TAPES1( 8), TAPES2( 7), TAPES3( 6), TAPES4( 5),
4 FORTIN( 4), INTAPE( 3), IOUTAP( 2), PUNTAP( 1))
C
C      EQUIVALENCE (KFLAGS( 70),
1 K0 ( 60), F0 ( 60), K1 ( 59), K2 ( 58), K3 ( 57),
2 K4 ( 56), K5 ( 55), K6 ( 54), K7 ( 53), K8 ( 52),
3 K9 ( 51),
4 KFLAG0( 46), KFLAG1( 45), KFLAG2( 44), KFLAG3( 43), KFLAG4( 42),
5 IWAVEN( 40), IPTNLY( 39), NOPOST( 38), INVERT( 37), KAUTOP( 36),
6 ICLPRT( 35), INDEXX( 34), IPLOTR( 33), NOPLT( 31),
7 KDYNFG( 30), LOCJPT( 29), LOCBEG( 28), KSECIN( 27), NCLREC( 26),
8 LOCMAC( 25), LENSPP( 24),
9 IPOSTP( 20), NUMPST( 19))
C
C      EQUIVALENCE (KOM ( 8), KAPTID(1), KAPTIO(2), KAPTTR(3), KAPTCN(4))
C
C      COMMON SYSTEM
C
C      DIMENSION KFLAGS(1), IPOSTP(1), KOM(1)
C
C...*****
C COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
C      COMMON MACH, NLOOP, NLOOP1, PNOFLG, MTABLE, NID, BITS, BUFFER, COMSTO,
1CTRDLY, CTRFLG, FEDFLG, FEDIPR, FEDTAB, FORMAT, GGL, INTAP, IND2, IND3,
2KOMENT, KOOL, KX, KY, KZ, LINCTR, NAXIS, NCOOL, NFEEDC, NPRINT,
3NODAT, NSPIN, NTEST, NTOOL1, NTOOL2, NTRANS, NWPR, NZCAM, OPTAB,
4PREBU, PRESTX, PRESTY, PRESTZ, PREVX, PREVY, PREVZ, RADIUS, RETURN,
5RPM, SEQCTR, SFM, SPIFLG, SPNTAB, TAPSTO, TOOLNO, TRANSX, TRANSY,
6TRANSZ, WORDS, BUFPR, IDUM, ZCAM
7DIMENSION MACH(12), PNOFLG(14), MTABLE(10), BUFFER(50), COMSTO(13),
8FEDTAB(50), FORMAT(14), INTAP(20), OPTAB(50), PREBU (14), SPNTAB(100),
9TAPSTO(250), WORDS(14), BUFPR(20), IDUM(50)
C
C      FORMAT(1)=30.0
C      FORMAT(2)=20.0

```

45720804
45720805
45720806

20130101

20130101
20130105
20130111
20130113
20130117
20130123
20130125
20130201
20130205
20130209
20130103
20130105

```

      FORMAT(3)=-53.0
      FORMAT(4)=-53.0
      FORMAT(14)=20.0
B     WORDS(1 )=606060604560
B     WORDS(2 )=606060606027
B     WORDS(3 )=606067606060
B     WORDS(4 )=606070606060
B     WORDS(14)=606060606044
      OPTAB(1)=1.0
      OPTAB(15)=2.0
      OPTAB(16)=47.0
      OPTAB(17)=30.0
      NAXIS=OPTAB(15)
      RETURN
      END
*     FORTRAN
*     LIST
* LABEL
C2900      MACH02
          SUBROUTINE MACH02
C
C     MACHIN/DVLIEG,JIGBOR,1
C
C*****
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
C     DIMENSION  SYSTEM (1700)
C
C     EQUIVALENCE (SYSTEM(1700),KOM   (1700),KFLAGS(1692),TAPETB(1622))
C
C     EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1    POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2    CORTAP( 9),
3    TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4    FORTIN( 4),INTAPE( 3),IDUTAP( 2),PUNTAP( 1))
C
C     EQUIVALENCE (KFLAGS( 70),
1    K0   ( 60),F0   ( 60),K1   ( 59),K2   ( 58),K3   ( 57),
2    K4   ( 56),K5   ( 55),K6   ( 54),K7   ( 53),K8   ( 52),
3    K9   ( 51),
4    KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5    IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6    ICLPRT( 35),INDEXX( 34),IPLOTR( 33),      NOPLOT( 31),
7    KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8    LOCMAC( 25),LENSPC( 24),
9    IPOSTP( 20),NUMPST( 19))
C
C     EQUIVALENCE (KOM   (8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
C     COMMON SYSTEM
C
C     DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C...*****
C     COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
C     COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO,
1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3,

```

20130107

20130109

20130117

20130121

20130125

20130126

20130127

20130101

20130101

20130105

	2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC,NPRINT,	20130111
	3NODAT,NSPIN,NTEST,NTOL1,NTOL2,NTRANS,NWPR,NZCAM,OPTAB,	20130113
	4PREBU,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN,	20130117
	5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY,	20130123
	6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM	20130125
	DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13),	20130201
	1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100),	20130205
	2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50)	20130209
C		
	FORMAT(1)=30.0	20130103
	FORMAT(3)=-64.0	20130105
	FORMAT(4)=-64.0	20130107
	FORMAT(5)=-64.0	20130109
	FORMAT(8)=10.0	
	FORMAT(10)=20.0	
B	WORDS(1)=606060604560	
B	WORDS(3)=606760606060	
B	WORDS(4)=607060606060	
B	WORDS(5)=607160606060	
B	WORDS(8)=606060606026	
B	WORDS(10)=606060606062	
B	WORDS(14)=604460606060	
	OPTAB(9)=.002	20130123
	OPTAB(10)=21.0	20130125
	OPTAB(11)=1.0	20130201
	OPTAB(12)=16.0	20130203
	OPTAB(13)=1.0	20130205
	OPTAB(14)=8.0	20130207
	OPTAB(15)=2.0	20130209
	NAXIS=OPTAB(15)	20130211
	OPTAB(16)=70.0	20130213
	OPTAB(17)=56.0	20130215
	IDUM(14)=1.0	
	SPNTAB(1)=21.0	20130219
	SPNTAB(2)=27.0	20130221
	SPNTAB(3)=35.0	20130223
	SPNTAB(4)=45.0	20130225
	SPNTAB(5)=58.0	20130301
	SPNTAB(6)=76.0	20130303
	SPNTAB(7)=98.0	20130305
	SPNTAB(8)=127.0	20130307
	SPNTAB(9)=165.0	20130309
	SPNTAB(10)=215.0	20130311
	SPNTAB(11)=275.0	20130313
	SPNTAB(12)=355.0	20130315
	SPNTAB(13)=470.0	20130317
	SPNTAB(14)=605.0	20130319
	SPNTAB(15)=775.0	20130321
	SPNTAB(16)=1000.0	20130323
	FEDTAB(1)=.002	20130401
	FEDTAB(2)=.003	20130403
	FEDTAB(3)=.004	20130405
	FEDTAB(4)=.006	20130407
	FEDTAB(5)=.008	20130409
	FEDTAB(6)=.012	20130411
	FEDTAB(7)=.017	20130413
	FEDTAB(8)=.024	20130415
	RETURN	20130417
	END	20130419

```

*      FORTRAN
*      LIST
*LABEL
C3000      MACH03
          SUBROUTINE MACH03
C
C      MACHIN/FOSDIK,JIGBOR,1
C
C*****
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
C      DIMENSION  SYSTEM (1700)
C
C      EQUIVALENCE (SYSTEM(1700),KOM  (1700),KFLAGS(1692),TAPETB(1622))
C
C      EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1  POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2  CORTAP( 9),
3  TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4  FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
C      EQUIVALENCE (KFLAGS( 70),
1  K0  ( 60),F0  ( 60),K1  ( 59),K2  ( 58),K3  ( 57),
2  K4  ( 56),K5  ( 55),K6  ( 54),K7  ( 53),K8  ( 52),
3  K9  ( 51),
4  KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5  IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6  ICLPRT( 35),INDEXX( 34),IPLOTR( 33),      NOPLOT( 31),
7  KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8  LOCMAC( 25),LENSPC( 24),
9  IPOSTP( 20),NUMPST( 19))
C
C      EQUIVALENCE (KOM  (8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
C      COMMON SYSTEM
C
C      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C...*****
C  COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
C      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO,
1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3,
2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC,      NPRINT,
3NODAT,NSPIN,NTEST,NTOOL1,NTOOL2,NTRANS,NWPR,NZCAM,OPTAB,
4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN,
5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY,
6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM
7      DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13),
8      1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100),
9      2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50)
C
C      FORMAT(1)=30.0
C      FORMAT(3)=-64.0
C      FORMAT(4)=-64.0
C      FORMAT(8)=10.0
C      FORMAT(10)=20.0
B      WORDS(1 )=606060604560

```

20130101

20130101

20130105

20130111

20130113

20130117

20130123

20130125

20130201

20130205

20130209

20130103

20130105

20130107


```

      B      WORDS(3 )=606760606060
      B      WORDS(4 )=607060606060
      B      WORDS(8 )=606060606026
      B      WORDS(10)=606060606062
      B      WORDS(14)=604460606060
      OPTAB(9)=.0005
      OPTAB(10)=30.0
      OPTAB(11)=1.0
      OPTAB(12)=16.0
      OPTAB(13)=1.0
      OPTAB(14)=8.0
      OPTAB(15)=2.0
      NAXIS=OPTAB(15)
      OPTAB(16)=50.0
      OPTAB(17)=30.0
      IDUM(14)=1.0
      SPNTAB(1)=30.0
      SPNTAB(2)=45.0
      SPNTAB(3)=60.0
      SPNTAB(4)=90.0
      SPNTAB(5)=120.0
      SPNTAB(6)=150.0
      SPNTAB(7)=180.0
      SPNTAB(8)=220.0
      SPNTAB(9)=240.0
      SPNTAB(10)=300.0
      SPNTAB(11)=360.0
      SPNTAB(12)=450.0
      SPNTAB(13)=600.0
      SPNTAB(14)=900.0
      SPNTAB(15)=1200.0
      SPNTAB(16)=1800.0
      FEDTAB(1)=.0005
      FEDTAB(2)=.0008
      FEDTAB(3)=.0012
      FEDTAB(4)=.0019
      FEDTAB(5)=.0028
      FEDTAB(6)=.0040
      FEDTAB(7)=.0070
      FEDTAB(8)=.01
      RETURN
      END
*      FORTRAN
*      LIST
* LABEL
C3100      MACH04
          SUBROUTINE MACH04
C
C      MACHIN/HEALD,DRILL,1
C
C*****
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
C      DIMENSION  SYSTEM (1700)
C
C      EQUIVALENCE (SYSTEM(1700),KOM  (1700),KFLAGS(1692),TAPETB(1622))
C
C      EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),

```

20130119
20130121
20130123
20130125
20130201
20130203
20130205
20130207
20130209
20130211

20130215
20130217
20130219
20130221
20130223
20130225
20130301
20130303
20130305
20130307
20130309
20130311
20130313
20130315
20130317
20130319
20130321
20130323
20130325
20130401
20130403
20130405
20130407
20130409
20130411
20130413

20130101

```

1 POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2   CORTAP( 9),
3 TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4 FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))

```

C

```

EQUIVALENCE (KFLAGS( 70),
1 K0 ( 60),F0 ( 60),K1 ( 59),K2 ( 58),K3 ( 57),
2 K4 ( 56),K5 ( 55),K6 ( 54),K7 ( 53),K8 ( 52),
3 K9 ( 51),
4 KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5 IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6 ICLPRT( 35),INDEXX( 34),IPLPTR( 33), NOPLT( 31),
7 KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8 LOCMAC( 25),LENSPC( 24),
9 IPOSTP( 20),NUMPST( 19))

```

C

```

EQUIVALENCE (KOM (8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))

```

C

```

COMMON SYSTEM

```

C

```

DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)

```

C

```

C...*****

```

```

C COMMON AND DIMENSION-POSITIONING POST-PROCESSORS

```

C

```

COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO, 20130101
1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3, 20130105
2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC, NPRINT, 20130111
3NODAT,NSPIN,NTEST,NTOL1,NTOL2,NTRANS,NWPR,NZCAM,OPTAB, 20130113
4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN, 20130117
5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY, 20130123
6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM 20130125
DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13), 20130201
1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100), 20130205
2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50) 20130209

```

C

```

FORMAT(1)=30.0 20130103
FORMAT(2)=10.0 20130105
FORMAT(3)=-53.0 20130107
FORMAT(4)=-53.0 20130109
FORMAT(8)=10.0
FORMAT(10)=20.0
FORMAT(14)=20.0

```

```

B WORDS(1 )=606060604560

```

```

B WORDS(2 )=606060606027

```

```

B WORDS(3 )=606067606060

```

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B WORDS(4 )=606070606060

```

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B WORDS(8 )=606060606026

```

```

B WORDS(10)=606060606062

```

```

B WORDS(14)=606060606044

```

```

OPTAB(9)=.002 20130117

```

```

OPTAB(10)=30.0 20130119

```

```

OPTAB(11)=1.0 20130121

```

```

OPTAB(12)=16.0 20130123

```

```

OPTAB(13)=1.0 20130201

```

```

OPTAB(14)=8.0 20130203

```

```

OPTAB(15)=2.0 20130205

```

```

NAXIS=OPTAB(15) 20130207

```

```

OPTAB(16)=48.0 20130209

```

```

OPTAB(17)=25.0
SPNTAB(1)=30.0
SPNTAB(2)=40.0
SPNTAB(3)=52.0
SPNTAB(4)=68.0
SPNTAB(5)=90.0
SPNTAB(6)=108.0
SPNTAB(7)=155.0
SPNTAB(8)=203.0
SPNTAB(9)=266.0
SPNTAB(10)=350.0
SPNTAB(11)=460.0
SPNTAB(12)=605.0
SPNTAB(13)=794.0
SPNTAB(14)=1044.0
SPNTAB(15)=1370.0
SPNTAB(16)=1800.0
FEDTAB(1)=.002
FEDTAB(2)=.003
FEDTAB(3)=.0045
FEDTAB(4)=.0065
FEDTAB(5)=.0095
FEDTAB(6)=.014
FEDTAB(7)=.021
FEDTAB(8)=.03
RETURN
END
*      FORTRAN
*      LIST
*LABEL
C3200      MACH05
          SUBROUTINE MACH05
C
C      MACHIN/LAHR,DRILL,1
C
C*****
C
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
C      DIMENSION  SYSTEM (1700)
C
C      EQUIVALENCE (SYSTEM(1700),KOM    (1700),KFLAGS(1692),TAPETB(1622))
C
C      EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1  POCTAP(15),PLOTP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2      CORTAP( 9),
3  TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4  FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
C      EQUIVALENCE  (KFLAGS( 70),
1  K0    ( 60),F0    ( 60),K1    ( 59),K2    ( 58),K3    ( 57),
2  K4    ( 56),K5    ( 55),K6    ( 54),K7    ( 53),K8    ( 52),
3  K9    ( 51),
4  KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5  IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6  ICLPRT( 35),INDEXX( 34),IPLOTR( 33),      NOPL0T( 31),
7  KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8  LOCMAC( 25),LENSPC( 24),
9  IPOSTP( 20),NUMPST( 19))
20130211
20130213
20130215
20130217
20130219
20130221
20130223
20130301
20130303
20130305
20130307
20130309
20130311
20130313
20130315
20130317
20130319
20130321
20130323
20130325
20130401
20130403
20130405
20130407
20130409
20130411
20130413

```

```

C      EQUIVALENCE (KOM      (8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
C      COMMON SYSTEM
C
C      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C.....*****
C      COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
C      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO,      20130101
C      1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3,      20130105
C      2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC,      NPRINT,      20130111
C      3NODAT,NSPIN,NTEST,NT00L1,NT00L2,NTRANS,NWPR,NZCAM,OPTAB,      20130113
C      4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN,      20130117
C      5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY,      20130123
C      6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM      20130125
C      DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13),      20130201
C      1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100),      20130205
C      2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50)      20130209
C
C
C      FORMAT(1)=30.0
C      FORMAT(3)=64.0
C      FORMAT(4)=64.0
B      WORDS(1 )=606060604560
B      WORDS(3 )=606760606060
B      WORDS(4 )=607060606060
C
C      OPTAB(15)=2.0
C      OPTAB(16)=50.0
C      OPTAB(17)=50.0
C      NAXIS=2.0
C      RETURN
C      END
C      *      FORTRAN
C      *      LIST
C      *LABEL
C3300      MACH06
C      SUBROUTINE MACH06
C
C      MACHIN/AMERCN,TABLE,1
C      MACHIN/KNIGHT,JIGBOR,1
C
C.....*****
C
C..... SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
C      DIMENSION SYSTEM (1700)
C
C      EQUIVALENCE (SYSTEM(1700),KOM      (1700),KFLAGS(1692),TAPETB(1622))
C
C      EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
C      1 POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
C      2 CORTAP( 9),
C      3 TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
C      4 FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
C      EQUIVALENCE (KFLAGS( 70),

```

```

1  K0    ( 60),F0    ( 60),K1    ( 59),K2    ( 58),K3    ( 57),
2  K4    ( 56),K5    ( 55),K6    ( 54),K7    ( 53),K8    ( 52),
3  K9    ( 51),
4  KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5  IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6  ICLPRT( 35),INDEXX( 34),IPLOTR( 33),      NOPLOT( 31),
7  KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8  LOCMAC( 25),LENSPC( 24),
9  IPOSTP( 20),NUMPST( 19))

C      EQUIVALENCE (KOM    (8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
C      COMMON SYSTEM
C
C      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C...*****
C      COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO, 20130101
      1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3, 20130105
      2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC,      NPRINT, 20130111
      3NODAT,NSPIN,NTEST,NT00L1,NT00L2,NTRANS,NWPR,NZCAM,OPTAB, 20130113
      4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN, 20130117
      5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY, 20130123
      6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM 20130125
      DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13), 20130201
      1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100), 20130205
      2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50) 20130209

C
      DIMENSION HELP(4)
      FORMAT(3)=64.0
      FORMAT(4)=64.0
      FORMAT(14)=64.0
B      WORDS(3 )=606760606060
B      WORDS(4 )=607060606060
B      WORDS(14)=606044606060
C
      OPTAB(1)=1.0
      OPTAB(15)=2.0
      OPTAB(16)=50.0
      OPTAB(17)=50.0
      OPTAB(20)=1.0
      IDUM(25)=1
      NAXIS=2
      DO2 J=1,3
B      2  HELP(J)=000000000000
B      HELP(4)=536060606060
      DO5 M=1,3
      N=-24
      J=0
      K=0
B      5  CALL PUNCHA (N,HELP,J,K)
      HELP(3)=040000000000
      CALL PUNCHA (N,HELP,J,K)
      NT00L1=0
      RETURN
      END
*      FORTRAN

```

```

*      LIST
*LABEL
C3400      MACH08
           SUBROUTINE MACH08
C
C      MACHIN/BURG,DRILL,1
C
C*****
C
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
C      DIMENSION  SYSTEM (1700)
C
C      EQUIVALENCE (SYSTEM(1700),KOM   (1700),KFLAGS(1692),TAPETB(1622))
C
C      EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1  POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2  CORTAP( 9),
3  TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4  FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
C      EQUIVALENCE (KFLAGS( 70),
1  K0   ( 60),F0   ( 60),K1   ( 59),K2   ( 58),K3   ( 57),
2  K4   ( 56),K5   ( 55),K6   ( 54),K7   ( 53),K8   ( 52),
3  K9   ( 51),
4  KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5  IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6  ICLPRT( 35),INDEXX( 34),IPLOTR( 33),      NOPLOT( 31),
7  KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8  LOCMAC( 25),LENSPC( 24),
9  IPOSTP( 20),NUMPST( 19))
C
C      EQUIVALENCE (KOM   (8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
C      COMMON SYSTEM
C
C      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C...*****
C      COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
C      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO,      20130101
1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3,      20130105
2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC,      NPRINT,      20130111
3NODAT,NSPIN,NTEST,NT0OL1,NT0OL2,NTRANS,NWPR,NZCAM,OPTAB,      20130113
4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN,      20130117
5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY,      20130123
6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM      20130125
      DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13),      20130201
1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100),      20130205
2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50)      20130209
C
C      FORMAT(2) =20.0
C      FORMAT(3) =-53.0
C      FORMAT(4) =-53.0
C      FORMAT(8) =20.0
C      FORMAT(10)=20.0
C      FORMAT(12)=20.0
C      FORMAT(14)=20.0

```

```

B      WORDS(2) =606060606027
B      WORDS(3) =606067606060
B      WORDS(4) =606070606060
B      WORDS(8) =606060606026
B      WORDS(10)=606060606062
B      WORDS(12)=606060606063
B      WORDS(14)=606060606044
      OPTAB(8) =1.0
      OPTAB(9) =.00025
      OPTAB(10)=180.
      OPTAB(11)=2.0
      OPTAB(12)=8.0
      OPTAB(13)=2.0
      OPTAB(14)=15.0
      OPTAB(15)=2.0
      NAXIS=OPTAB(15)
      OPTAB(16)=39.0
      OPTAB(17)=39.0
      OPTAB(20)=1.
      IDUM(1)=1
      IDUM(21)=1
      FEDTAB( 2)= 2.0
      FEDTAB( 4)= 2.5
      FEDTAB( 6)= 3.1
      FEDTAB( 8)= 3.8
      FEDTAB(10)= 4.7
      FEDTAB(12)= 5.8
      FEDTAB(14)= 7.3
      FEDTAB(16)= 9.0
      FEDTAB(18)=11.0
      FEDTAB(20)=14.0
      FEDTAB(22)=17.0
      FEDTAB(24)=21.0
      FEDTAB(26)=26.0
      FEDTAB(28)=32.0
      FEDTAB(30)=40.0
      SPNTAB(1) =100.0
      SPNTAB(2) =180.0
      SPNTAB(3) =160.0
      SPNTAB(4) =270.0
      SPNTAB(5) =200.0
      SPNTAB(6) =360.0
      SPNTAB(7) =320.0
      SPNTAB(8) =540.0
      SPNTAB(9) =390.0
      SPNTAB(10)=665.0
      SPNTAB(11)=590.0
      SPNTAB(12)=1000.0
      SPNTAB(13)=780.0
      SPNTAB(14)=1330.0
      SPNTAB(15)=1180.0
      SPNTAB(16)=2000.0
      RETURN
      END
*      FORTRAN
*      LIST
*LABEL
C3500      MACH09
          SUBROUTINE MACH09

```

```

C
C      MACHIN/GIDLWS,DRILL,1
C
C*****
C
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
C      DIMENSION  SYSTEM (1700)
C
C      EQUIVALENCE (SYSTEM(1700),KOM   (1700),KFLAGS(1692),TAPETB(1622))
C
C      EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1  POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CROTAP(11),
2      CORTAP( 9),
3  TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4  FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
C      EQUIVALENCE  (KFLAGS( 70),
1  K0   ( 60),F0   ( 60),K1   ( 59),K2   ( 58),K3   ( 57),
2  K4   ( 56),K5   ( 55),K6   ( 54),K7   ( 53),K8   ( 52),
3  K9   ( 51),
4  KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5  IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6  ICLPRT( 35),INDEXX( 34),IPLOTR( 33),      NOPLOTR( 31),
7  KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREG( 26),
8  LOCMAC( 25),LENSPC( 24),
9  IPOSTP( 20),NUMPST( 19))
C
C      EQUIVALENCE (KOM   (8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
C      COMMON SYSTEM
C
C      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C...*****
C      COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
C      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO,      20130101
1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3,      20130105
2KUMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC,      NPRINT,      20130111
3NODAT,NSPIN,NTEST,NTOOL1,NTOOL2,NTRANS,NWPR,NZCAM,OPTAB,      20130113
4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN,      20130117
5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY,      20130123
6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM      20130125
      DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13),      20130201
1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100),      20130205
2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50)      20130209
C
C      FORMAT(1) =30.0
C      FORMAT(2) =20.0
C      FORMAT(3) =-53.0
C      FORMAT(4) =-53.0
C      FORMAT(8) =20.0
C      FORMAT(9) =30.0
C      FORMAT(10)=30.0
B      WORDS(1) =606060604560
B      WORDS(2) =606060606027
B      WORDS(3) =606067606060
B      WORDS(4) =606070606060

```



```

B      WORDS(8) =606060606063
B      WORDS(9) =606060602660
B      WORDS(10)=606060606260
      OPTAB(1)=1.0
      OPTAB(9) =.001
      OPTAB(10)=30.0
      OPTAB(11)=1.0
      OPTAB(12)=16.
      OPTAB(13)=1.0
      OPTAB(14)=16.0
      OPTAB(15)=2.0
      NAXIS=OPTAB(15)
      OPTAB(16)=42.0
      OPTAB(17)=32.0
      FEDTAB(1) =.001
      FEDTAB(2) =.0014
      FEDTAB(3) =.0016
      FEDTAB(4) =.0020
      FEDTAB(5) =.0028
      FEDTAB(6) =.0036
      FEDTAB(7) =.0041
      FEDTAB(8) =.0052
      FEDTAB(9) =.0081
      FEDTAB(10)=.010
      FEDTAB(11)=.012
      FEDTAB(12)=.015
      FEDTAB(13)=.020
      FEDTAB(14)=.026
      FEDTAB(15)=.030
      FEDTAB(16)=.038
      SPNTAB(1) =30.0
      SPNTAB(2) =39.0
      SPNTAB(3) =50.0
      SPNTAB(4) =66.0
      SPNTAB(5) =85.0
      SPNTAB(6) =110.0
      SPNTAB(7) =143.0
      SPNTAB(8) =187.0
      SPNTAB(9) =242.0
      SPNTAB(10)=315.0
      SPNTAB(11)=408.0
      SPNTAB(12)=530.0
      SPNTAB(13)=686.0
      SPNTAB(14)=890.0
      SPNTAB(15)=1155.0
      SPNTAB(16)=1500.0
B      ABC=606054000053
      N=-6
      J=0
      K=0
      CALL PUNCHA(N,ABC,J,K)
      RETURN
      END
*      FORTRAN
*      LIST
*LABEL
C3600      MACH10
      SUBROUTINE MACH10
C

```

```

C   MACHIN/LUCAS,BORMIL,2
C
C*****
C... SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
C   DIMENSION SYSTEM (1700)
C
C   EQUIVALENCE (SYSTEM(1700),KOM (1700),KFLAGS(1692),TAPETB(1622))
C
C   EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1  POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2  CORTAP( 9),
3  TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4  FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
C   EQUIVALENCE (KFLAGS( 70),
1  K0 ( 60),F0 ( 60),K1 ( 59),K2 ( 58),K3 ( 57),
2  K4 ( 56),K5 ( 55),K6 ( 54),K7 ( 53),K8 ( 52),
3  K9 ( 51),
4  KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5  IWAVER( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6  ICLPRT( 35),INDEXX( 34),IPLOTR( 33), NOPLOT( 31),
7  KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8  LOCMAC( 25),LENSPC( 24),
9  IPOSTP( 20),NUMPST( 19))
C
C   EQUIVALENCE (KOM ( 8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
C   COMMON SYSTEM
C
C   DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C...*****
C   COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
C   COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO, 20130101
1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3, 20130105
2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC, NPRINT, 20130111
3NODAT,NSPIN,NTEST,NTOOL1,NTOOL2,NTRANS,NWPR,NZCAM,OPTAB, 20130113
4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN, 20130117
5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY, 20130123
6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM 20130125
C   DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13), 20130201
1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100), 20130205
2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50) 20130209
C
C   FORMAT(1)=30.0
C   FORMAT(2)=20.0
C   FORMAT(3)=-64.0
C   FORMAT(4)=-64.0
C   FORMAT(5)=-64.0
C   FORMAT(6)=63.0
C   FORMAT(8)=20.0
C   FORMAT(9)=10.0
C   FORMAT(10)=20.0
C   FORMAT(14)=20.0
B   WORDS(1) =606060604560
B   WORDS(2) =606060606027

```

```

B      WORDS(3) =606067606060
B      WORDS(4) =606070606060
B      WORDS(5) =606071606060
B      WORDS(6) =606022606060
B      WORDS(8) =606060606026
B      WORDS(9) =606060606025
B      WORDS(10)=606060606062
B      WORDS(11)=605160606060
B      WORDS(12)=606360606060
B      WORDS(14)=606060606044
      IDUM(11)=1
      IDUM(12)=1
      IDUM(21)=1
      IDUM(22)=1
      IDUM(23)=1
      OPTAB(9) =.0001
      OPTAB(10)=9.0
      OPTAB(11)=1.0
      OPTAB(12)=26.0
      OPTAB(13)=3.0
      OPTAB(14)=14.0
      OPTAB(15)=3.0
      NAXIS=OPTAB(15)
      OPTAB(16)=98.0
      OPTAB(17)=98.0
      OPTAB(18)=98.0
      OPTAB(20)=1.0
      FEDTAB(1) =.003
      FEDTAB(2) =.0006
      FEDTAB(3) =.0001
      FEDTAB(4) =.005
      FEDTAB(5) =.0009
      FEDTAB(6) =.0002
      FEDTAB(7) =.008
      FEDTAB(8) =.0014
      FEDTAB(9) =.0003
      FEDTAB(10)=.011
      FEDTAB(11)=.0019
      FEDTAB(12)=.0004
      FEDTAB(13)=.017
      FEDTAB(14)=.003
      FEDTAB(15)=.0006
      FEDTAB(16)=.027
      FEDTAB(17)=.0046
      FEDTAB(18)=.001
      FEDTAB(19)=.044
      FEDTAB(20)=.0074
      FEDTAB(21)=.0016
      FEDTAB(22)=.067
      FEDTAB(23)=.0114
      FEDTAB(24)=.0025
      FEDTAB(25)=.110
      FEDTAB(26)=.019
      FEDTAB(27)=.004
      FEDTAB(28)=.170
      FEDTAB(29)=.029
      FEDTAB(30)=.006
      FEDTAB(31)=.266
      FEDTAB(32)=.045

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```

FEDTAB(33)=.010
FEDTAB(34)=.429
FEDTAB(35)=.073
FEDTAB(36)=.016
FEDTAB(37)=.664
FEDTAB(38)=.112
FEDTAB(39)=.025
FEDTAB(40)=1.038
FEDTAB(41)=.176
FEDTAB(42)=.037
SPNTAB(1) =9.0
SPNTAB(2) =11.0
SPNTAB(3) =13.0
SPNTAB(4) =16.0
SPNTAB(5) =20.0
SPNTAB(6) =24.0
SPNTAB(7) =30.0
SPNTAB(8) =36.0
SPNTAB(9) =44.0
SPNTAB(10)=52.0
SPNTAB(11)=64.0
SPNTAB(12)=77.0
SPNTAB(13)=97.0
SPNTAB(14)=117.0
SPNTAB(15)=142.0
SPNTAB(16)=174.0
SPNTAB(17)=212.0
SPNTAB(18)=258.0
SPNTAB(19)=304.0
SPNTAB(20)=369.0
SPNTAB(21)=461.0
SPNTAB(22)=560.0
SPNTAB(23)=680.0
SPNTAB(24)=833.0
SPNTAB(25)=1000.0
SPNTAB(26)=1200.0
RETURN
END

```

```

*   FORTRAN
*   LIST

```

```
*LABEL
```

```

C3700      MACH11
          SUBROUTINE MACH11

```

```
C*****
```

```
C
```

```
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
```

```
C
```

```
          DIMENSION  SYSTEM (1700)
```

```
C
```

```
          EQUIVALENCE (SYSTEM(1700),KOM  (1700),KFLAGS(1692),TAPETB(1622))
```

```
C
```

```
          EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
```

```
1  POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
```

```
2  CORTAP( 9),
```

```
3  TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
```

```
4  FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
```

```
C
```

```
          EQUIVALENCE (KFLAGS( 70),
```

```
1  K0  ( 60),FO  ( 60),K1  ( 59),K2  ( 58),K3  ( 57),
```

```

2  K4      ( 56),K5      ( 55),K6      ( 54),K7      ( 53),K8      ( 52),
3  K9      ( 51),
4  KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5  IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6  ICLPRT( 35),INDEXX( 34),IPLOTR( 33),          NOPLLOT( 31),
7  KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8  LOCMAC( 25),LENSPC( 24),
9  IPOSTP( 20),NUMPST( 19))

C
EQUIVALENCE (KOM      (8),KAPTIO(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))

C
COMMON SYSTEM

C
DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)

C
C...*****
C  COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO, 20130101
1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3, 20130105
2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC,          NPRINT, 20130111
3NODAT,NSPIN,NTEST,NTOOL1,NTOOL2,NTRANS,NWPR,NZCAM,OPTAB, 20130113
4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN, 20130117
5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY, 20130123
6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM 20130125
DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13), 20130201
1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100), 20130205
2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50) 20130209

C
FORMAT(3)=-53.0
FORMAT(4)=-53.0
FORMAT(8)=20.0
B  WORDS(3)=606067606060
B  WORDS(4)=606070606060
B  WORDS(8)=606060606044
OPTAB(15)=2.
NAXIS=OPTAB(15)
OPTAB(16)=98.
OPTAB(17)=98.
OPTAB(20)=1.0
IDUM(1)=1
RETURN
END
*  FORTRAN
*  LIST
*LABEL
C3700      MACH12
SUBROUTINE MACH12
C*****
C
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENCES+STATEMENTS
C
DIMENSION SYSTEM (1700)

C
EQUIVALENCE (SYSTEM(1700),KOM      (1700),KFLAGS(1692),TAPETB(1622))

C
EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1  POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2  CORTAP( 9),

```

```

3  TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4  FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
  EQUIVALENCE (KFLAGS( 70),
1  K0    ( 60),FO    ( 60),K1    ( 59),K2    ( 58),K3    ( 57),
2  K4    ( 56),K5    ( 55),K6    ( 54),K7    ( 53),K8    ( 52),
3  K9    ( 51),
4  KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5  IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6  ICLPRT( 35),INDEXX( 34),IPLOTR( 33),      NOPLOT( 31),
7  KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8  LOCMAC( 25),LENSPC( 24),
9  IPOSTP( 20),NUMPST( 19))
C
  EQUIVALENCE (KOM    ( 8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
  COMMON SYSTEM
C
  DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C...*****
C  COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
  COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO, 20130101
1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3, 20130105
2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC,      NPRINT, 20130111
3NODAT,NSPIN,NTEST,NT00L1,NT00L2,NTRANS,NWPR,NZCAM,OPTAB, 20130113
4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN, 20130117
5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY, 20130123
6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM 20130125
  DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13), 20130201
1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100), 20130205
2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50) 20130209
C
  FORMAT(2)=30.0
  FORMAT(3)=-53.0
  FORMAT(4)=-53.0
B  WORDS(1)=606323606060
B  WORDS(2)=606060604560
B  WORDS(3)=606067606060
B  WORDS(4)=606070606060
  OPTAB(1)=1.0
  OPTAB(15)=2.0
  NAXIS=OPTAB(15)
  OPTAB(16)=30.0
  OPTAB(17)=30.0
  IDUM(1)=1
  RETURN
  END
*  FORTRAN
*  LIST
*LABEL
C3800      MACH13
          SUBROUTINE MACH13
C*****
C
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
  DIMENSION SYSTEM (1700)

```

```

C      EQUIVALENCE (SYSTEM(1700),KOM      (1700),KFLAGS(1692),TAPETB(1622))
C
C      EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1  POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2  CORTAP( 9),
3  TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4  FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
C      EQUIVALENCE (KFLAGS( 70),
1  K0      ( 60),F0      ( 60),K1      ( 59),K2      ( 58),K3      ( 57),
2  K4      ( 56),K5      ( 55),K6      ( 54),K7      ( 53),K8      ( 52),
3  K9      ( 51),
4  KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5  IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6  ICLPRT( 35),INDEXX( 34),IPLOTR( 33),      NOPL0T( 31),
7  KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8  LOCMAC( 25),LENSPC( 24),
9  IPOSTP( 20),NUMPST( 19))
C
C      EQUIVALENCE (KOM      (8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
C      COMMON SYSTEM
C
C      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C.....*****
C      COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
C      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO,      20130101
1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3,      20130105
2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC,      NPRINT,      20130111
3NODAT,NSPIN,NTEST,NT0OL1,NT0OL2,NTRANS,NWPR,NZCAM,OPTAB,      20130113
4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN,      20130117
5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY,      20130123
6TRANSZ,WORDS,BUFPR,T,IDUM,ZCAM      20130125
DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13),      20130201
1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100),      20130205
2TAPSTO(250),WORDS(14),BUFPR,T(20),IDUM(50)      20130209
C
C      FORMAT(1)=30.0      45720319
C      FORMAT(3)=-53.0      45720320
C      FORMAT(4)=-53.0      45720321
C      FORMAT(5)=-53.0      45720322
C      FORMAT(8)=30.0      45720323
C      FORMAT(10)=20.0      45720324
C      FORMAT(14)=20.0      45720325
B      WORDS(1)=606060604560      45720401
B      WORDS(3)=606067606060      45720402
B      WORDS(4)=606070606060      45720403
B      WORDS(5)=606071606060      45720404
B      WORDS(8)=606060606026      45720405
B      WORDS(10)=606060606062      45720406
B      WORDS(14)=606060606044      45720407
C      OPTAB(8)=0.      45720409
C      OPTAB(9)=70
C      OPTAB(11)=1.      45720410
C      OPTAB(12)=32.      45720411
C      OPTAB(15)=3.      45720412

```

```

NAXIS=OPTAB(15)
OPTAB(16)=99.
OPTAB(17)=99.
OPTAB(18)=99.
OPTAB(20)=0.
OPTAB(29)=9.0
IDUM(21)=1
IDUM(23)=1
IDUM(28)=1
SPNTAB(1)=100
SPNTAB(2)=111
SPNTAB(3)=125
SPNTAB(4)=138
SPNTAB(5)=153
SPNTAB(6)=169
SPNTAB(7)=190
SPNTAB(8)=210
SPNTAB(9)=253
SPNTAB(10)=279
SPNTAB(11)=315
SPNTAB(12)=347
SPNTAB(13)=385
SPNTAB(14)=423
SPNTAB(15)=478
SPNTAB(16)=528
SPNTAB(17)=564
SPNTAB(18)=620
SPNTAB(19)=700
SPNTAB(20)=772
SPNTAB(21)=857
SPNTAB(22)=944
SPNTAB(23)=1064
SPNTAB(24)=1178
SPNTAB(25)=1420
SPNTAB(26)=1562
SPNTAB(27)=1764
SPNTAB(28)=1942
SPNTAB(29)=2160
SPNTAB(30)=2378
SPNTAB(31)=2682
SPNTAB(32)=2970
RETURN
END
*      FORTRAN
*      LIST
*LABEL
      SUBROUTINE MACH14
C*****
C
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
      DIMENSION  SYSTEM (1700)
C
      EQUIVALENCE (SYSTEM(1700),KOM   (1700),KFLAGS(1692),TAPETB(1622))
C
      EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1  POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2  CORTAP( 9),
3  TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),

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45720413

45720414

45720415

45720417

45720418

45720419

45720420

45720421

45720422

45720423

45720424

45720425

45720501

45720502

45720503

45720504

45720505

45720506

45720507

45720508

45720509

45720510

45720511

45720512

45720513

45720514

45720515

45720516

45720517

45720518

45720519

45720520

45720521

45720522

45720523

45720524


```

4  FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))

C
EQUIVALENCE (KFLAGS( 70),
1  K0      ( 60),F0      ( 60),K1      ( 59),K2      ( 58),K3      ( 57),
2  K4      ( 56),K5      ( 55),K6      ( 54),K7      ( 53),K8      ( 52),
3  K9      ( 51),
4  KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5  IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6  ICLPRT( 35),INDEXX( 34),IPLOTR( 33),          NOPLLOT( 31),
7  KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8  LOCMAC( 25),LENSPC( 24),
9  IPOSTP( 20),NUMPST( 19))

C
EQUIVALENCE (KOM      (8),KAPTIO(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))

C
COMMON SYSTEM

C
DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)

C
C...*****
C  COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO,
1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3,
2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC,      NPRINT,
3NODAT,NSPIN,NTEST,NTOOL1,NTOOL2,NTRANS,NWPR,NZCAM,OPTAB,
4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN,
5SRPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY,
6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM
20130101
20130105
20130111
20130113
20130117
20130123
20130125
20130201
20130205
20130209
DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13),
1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100),
2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50)

C
FORMAT(1)=30.0
47490101
FORMAT(2)=20.0
47490102
FORMAT(3)=-74.0
FORMAT(4)=-74.0
FORMAT(5)=-64.0
FORMAT(6)=-64.0
FORMAT(8)=20.0
47490107
FORMAT(9)=20.0
47490108
FORMAT(10)=20.0
47490109
FORMAT(12)=20.0
47490110
FORMAT(14)=20.0
47490111
B  WORDS(1)=606060604560
47490112
B  WORDS(2)=606060606027
47490113
B  WORDS(3)=606067606060
47490114
B  WORDS(4)=606070606060
47490115
B  WORDS(5)=606066606060
47490116
B  WORDS(6)=606051606060
47490117
B  WORDS(8)=606060606026
47490118
B  WORDS(9)=606060606025
47490119
B  WORDS(10)=606060606062
47490120
B  WORDS(12)=606060606041
47490121
B  WORDS(14)=606060606044
47490122
IDUM(28)=1
47490125
OPTAB(9)=.002
OPTAB(10)=0.
OPTAB(11)=2.
47490201

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OPTAB(12)=27.	47490202
OPTAB(13)=1.	47490203
OPTAB(14)=32.	47490204
OPTAB(15)=3.	47490205
OPTAB(16)=132.	
OPTAB(17)=132.	
OPTAB(18)=64.	
OPTAB(20)=0.	47490206
NAXIS=OPTAB(15)	47490207
SPNTAB(1)=0.0	47490208
SPNTAB(2)=508.	47490209
SPNTAB(3)=5.6	47490210
SPNTAB(4)=585.	47490211
SPNTAB(5)=6.5	47490212
SPNTAB(6)=673.	47490213
SPNTAB(7)=7.4	47490214
SPNTAB(8)=773.	47490215
SPNTAB(9)=8.5	47490216
SPNTAB(10)=888.	47490217
SPNTAB(11)=9.8	47490218
SPNTAB(12)=1020.	47490219
SPNTAB(13)=13.	47490220
SPNTAB(14)=1020.	47490221
SPNTAB(15)=15.	47490222
SPNTAB(16)=1020.	47490223
SPNTAB(17)=17.3	47490224
SPNTAB(18)=1020.	47490225
SPNTAB(19)=19.9	47490301
SPNTAB(20)=1020.	47490302
SPNTAB(21)=26.4	47490303
SPNTAB(22)=1020.	47490304
SPNTAB(23)=30.4	47490305
SPNTAB(24)=1020.	47490306
SPNTAB(25)=35.	47490307
SPNTAB(26)=1020.	47490308
SPNTAB(27)=40.3	47490309
SPNTAB(28)=1020.	47490310
SPNTAB(29)=53.5	47490311
SPNTAB(30)=1020.	47490312
SPNTAB(31)=61.5	47490313
SPNTAB(32)=1020.	47490314
SPNTAB(33)=70.8	47490315
SPNTAB(34)=1020.	47490316
SPNTAB(35)=81.5	47490317
SPNTAB(36)=1020.	47490318
SPNTAB(37)=93.7	47490319
SPNTAB(38)=1020.	47490320
SPNTAB(39)=124.	47490321
SPNTAB(40)=1020.	47490322
SPNTAB(41)=143.	47490323
SPNTAB(42)=1020.	47490324
SPNTAB(43)=165.	47490325
SPNTAB(44)=1020.	47490401
SPNTAB(45)=190.	47490402
SPNTAB(46)=1020.	47490403
SPNTAB(47)=252.	47490404
SPNTAB(48)=1020.	47490405
SPNTAB(49)=290.	47490406
SPNTAB(50)=1020.	47490407

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SPNTAB(51)=334.
SPNTAB(52)=1020.
SPNTAB(53)=384.
SPNTAB(54)=1020.
FEDTAB(1)=.012
FEDTAB(2)=.016
FEDTAB(3)=.021
FEDTAB(4)=.029
FEDTAB(5)=.039
FEDTAB(6)=.054
FEDTAB(7)=.070
FEDTAB(8)=.096
FEDTAB(9)=.130
FEDTAB(10)=.180
FEDTAB(11)=.230
FEDTAB(12)=.320
FEDTAB(13)=.420
FEDTAB(14)=.570
FEDTAB(15)=.750
FEDTAB(16)=1.000
FEDTAB(17)=1.4
FEDTAB(18)=1.9
FEDTAB(19)=2.5
FEDTAB(20)=3.4
FEDTAB(21)=4.5
FEDTAB(22)=6.2
FEDTAB(23)=8.1
FEDTAB(24)=11.
FEDTAB(25)=15.
FEDTAB(26)=20.
FEDTAB(27)=27.
FEDTAB(28)=36.
FEDTAB(29)=49.
FEDTAB(30)=67.
FEDTAB(31)=87.
FEDTAB(32)=120.
RETURN
END
*      FORTRAN
*      LIST
*LABEL
C4100 MESSAG
      SUBROUTINE MESSAG
C*****
C
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENCES+STATEMENTS
C
      DIMENSION  SYSTEM (1700)
C
      EQUIVALENCE (SYSTEM(1700),KOM   (1700),KFLAGS(1692),TAPETB(1622))
C
      EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1  POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2  CORTAP( 9),
3  TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4  FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
      EQUIVALENCE (KFLAGS( 70),
1  KO   ( 60),FO   ( 60),K1   ( 59),K2   ( 58),K3   ( 57),

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47490408
47490409
47490410
47490411
47490412
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47490415
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47490419
47490420
47490421
47490422
47490423
47490424
47490425
47490501
47490502
47490503
47490504
47490505
47490506
47490507
47490508
47490509
47490510
47490511
47490512
47490513
47490514
47490515
47490516
47490517
47490518
47490519
47490520

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45720810
45720809

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2 K4 ( 56),K5 ( 55),K6 ( 54),K7 ( 53),K8 ( 52),
3 K9 ( 51),
4 KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5 IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6 ICLPRT( 35),INDEXX( 34),IPLOTR( 33), NOPLOT( 31),
7 KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8 LOCMAC( 25),LENSPC( 24),
9 IPOSTP( 20),NUMPST( 19))

C
EQUIVALENCE (KOM (8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))

C
COMMON SYSTEM

C
DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)

C
C...*****
C COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO, 20130101
1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3, 20130105
2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC, NPRINT, 20130111
3NODAT,NSPIN,NTEST,NT0OL1,NT0OL2,NTRANS,NWPR,NZCAM,OPTAB, 20130113
4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN, 20130117
5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY, 20130123
6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM 20130125
DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13), 20130201
1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100), 20130205
2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50) 20130209

C
C 20130102
C
KL=MTABLE(6)
BB=606060606060
IF(NPRINT)30,20,30
20 NPRINT = 1
BUFPRT(1) =WORDS(1)
BUFPRT(2) =WORDS(2)
BUFPRT(3) =BB
BUFPRT(4) =WORDS(3)
BUFPRT(5) =BB
BUFPRT(6) =WORDS(4)
BUFPRT(7) =BB
BUFPRT(8) =WORDS(5)
BUFPRT(9) =BB
BUFPRT(10)=WORDS(6)
BUFPRT(11)=WORDS(8)
BUFPRT(12)=WORDS(9)
BUFPRT(13)=WORDS(10)
BUFPRT(14)=WORDS(11)
BUFPRT(15)=WORDS(12)
BUFPRT(16)=WORDS(14)
WRITE OUTPUT TAPE 6,100
K=14
DO 1001 J=40,50
K=K-1
1001 OPTAB(J)=PNOFLG(K)
WRITE OUTPUT TAPE 6,121,(OPTAB(J),J=40,50)
GO TO (1,2,3,4,5,6,7,8,9,10,24,12,13,14,11),KL 47490208
1 WRITE OUTPUT TAPE 6,101
16 WRITE OUTPUT TAPE 6,116,(BUFPRT(1),BUFPRT(2),BUFPRT(3),BUFPRT(4),

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18BUFPR(5),BUFPR(6),BUFPR(7),BUFPR(8),BUFPR(11),BUFPR(13),
2BUFPR(16))
GO TO 11
2 WRITE OUTPUT TAPE 6,102
GO TO 16
3 WRITE OUTPUT TAPE 6,103
GO TO 16
4 WRITE OUTPUT TAPE 6,104
GO TO 16
5 WRITE OUTPUT TAPE 6,105
GO TO 16
6 WRITE OUTPUT TAPE 6,106
17 WRITE OUTPUT TAPE 6,117,(          BUFPR(2),BUFPR(3),BUFPR(4),
18BUFPR(5),BUFPR(6),BUFPR(7),BUFPR(8),BUFPR(11),BUFPR(13),
2BUFPR(15),BUFPR(16))
GO TO 11
7 WRITE OUTPUT TAPE 6,107
GO TO 17
8 WRITE OUTPUT TAPE 6,108
GO TO 17
9 WRITE OUTPUT TAPE 6,109
23 WRITE OUTPUT TAPE 6,120,(BUFPR(I),I=1,16)
GO TO 11
10 WRITE OUTPUT TAPE 6,110
GO TO 23
24 WRITE OUTPUT TAPE 6,109
GO TO 17
12 WRITE OUTPUT TAPE 6,112
GO TO 23
13 WRITE OUTPUT TAPE 6,113
GO TO 16
14 WRITE OUTPUT TAPE 6,114
GO TO 23
11 LINCTR=0
30 IF(LINCTR-45)18,20,20
18 LINCTR=LINCTR+1
WRITE OUTPUT TAPE 6,1000,(TAPSTU(J),J=4,14)
1000 FORMAT(2X,11A6)
100 FORMAT(1H1)
101 FORMAT(26H G. + L. POSITIONING TABLE///)
102 FORMAT(17H DEVLIEG JIG MILL///)
103 FORMAT(28H FOSDICK POSITIONING MACHINE///)
104 FORMAT(18H HEALD - HEALDRILL///)
105 FORMAT(13H LAHR - DRILL///)
106 FORMAT(17H AMERICAN - DRILL///)
107 FORMAT(17H KNIGHT JIG BORER///)
108 FORMAT(13H BURG - DRILL///)
109 FORMAT(14H G. + L. DRILL///)
110 FORMAT(18H LUCAS BORING MILL///)
112 FORMAT(20 H PRATT-WHITNEY DRILL///)
113 FORMAT(13H KRNTN-MCHCNT///)
114 FORMAT(15H G. + L. BORMIL///)
116 FORMAT(11A6///)
117 FORMAT(6H N ,11A6///)
118 FORMAT(16A6)
119 FORMAT(1X,I5,11A6)
120 FORMAT(16A6///)
121 FORMAT(1H ,11A6,53X)
RETURN

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45720107
45720108
47490209
47490210

45720110
47490211

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      END
      LIST
      LABEL
      SUBROUTINE OPSTOP
C3850      OPSTOP
C*****
C
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
C      DIMENSION  SYSTEM (1700)
C
C      EQUIVALENCE (SYSTEM(1700),KOM  (1700),KFLAGS(1692),TAPETB(1622))
C
C      EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1  POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2  CORTAP( 9),
3  TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4  FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
C      EQUIVALENCE (KFLAGS( 70),
1  K0  ( 60),F0  ( 60),K1  ( 59),K2  ( 58),K3  ( 57),
2  K4  ( 56),K5  ( 55),K6  ( 54),K7  ( 53),K8  ( 52),
3  K9  ( 51),
4  KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5  IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6  ICLPRT( 35),INDEXX( 34),IPLOTR( 33),      NOPLOT( 31),
7  KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8  LOCMAC( 25),LENSPC( 24),
9  IPOSTP( 20),NUMPST( 19))
C
C      EQUIVALENCE (KOM  (8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
C      COMMON SYSTEM
C      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C...*****
C  COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
C      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO,
1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3,
2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC,      NPRINT,
3NODAT,NSPIN,NTEST,NTOOL1,NTOOL2,NTRANS,NWPR,NZCAM,OPTAB,
4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN,
5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY,
6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM
7      DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13),
8      IFEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100),
9      2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50)
C
C      N=MTABLE(6)
C      IF(N-15)2,2,1
2  GO TO (1,1,1,1,1,1,1,1,1,1,1,1,10,10,1),N
10 PREBU(14)=1.
      SEQCTR=SEQCTR+OPTAB(22)
      PREBU(1)=SEQCTR
      CALL CARD
      CALL PRINT
1  RETURN

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45720616
45720617

20130101
20130105
20130111
20130113
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20130123
20130125
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20130209

45720618
45720619
47490213
45720621
45720622
45720623
45720624
45720625
45720701

45720702

```

      END
*      FORTRAN
*      LIST
*LABEL
      SUBROUTINE OPTION
C*****
C
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENCES+STATEMENTS
C
      DIMENSION  SYSTEM (1700)
C
      EQUIVALENCE (SYSTEM(1700),KOM  (1700),KFLAGS(1692),TAPETB(1622))
C
      EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1  POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2  CORTAP( 9),
3  TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4  FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
      EQUIVALENCE (KFLAGS( 70),
1  K0  ( 60),F0  ( 60),K1  ( 59),K2  ( 58),K3  ( 57),
2  K4  ( 56),K5  ( 55),K6  ( 54),K7  ( 53),K8  ( 52),
3  K9  ( 51),
4  KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5  IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6  ICLPRT( 35),INDEXX( 34),IPLOTR( 33),      NOPL0T( 31),
7  KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8  LOCMAC( 25),LENSPC( 24),
9  IPOSTP( 20),NUMPST( 19))
C
      EQUIVALENCE (KOM  ( 8),KAPTIO(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
      COMMON SYSTEM
C
      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C... *****
C  COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO, 20130101
1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3, 20130105
2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC,      NPRINT, 20130111
3NODAT,NSPIN,NTEST,NT0OL1,NT0OL2,NTRANS,NWPR,NZCAM,OPTAB, 20130113
4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN, 20130117
5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY, 20130123
6TRANSZ,WURUS,BUFPRT,IDUM,ZCAM 20130125
      DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13), 20130201
1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100), 20130205
2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50) 20130209
C
      N=4
1  MN=TAPSTO(N)
      IF(MN-100) 10,10,20
10  OPTAB(MN)=TAPSTO(N+1)
      GO TO 15
20  IDUM(MN-100)=TAPSTO(N+1)
15  N=N+2
      IF(N-NWPR) 1,2,2
2  RETURN

```

```

      END
*      FORTRAN
*      LIST
*LABEL
C3900      PERROR
          SUBROUTINE PERROR (ERROR)
C*****
C
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
      DIMENSION SYSTEM (1700)
C
      EQUIVALENCE (SYSTEM(1700),KOM (1700),KFLAGS(1692),TAPETB(1622))
C
      EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1  POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2  CORTAP( 9),
3  TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4  FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
      EQUIVALENCE (KFLAGS( 70),
1  K0 ( 60),F0 ( 60),K1 ( 59),K2 ( 58),K3 ( 57),
2  K4 ( 56),K5 ( 55),K6 ( 54),K7 ( 53),K8 ( 52),
3  K9 ( 51),
4  KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5  IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6  ICLPRT( 35),INDEXX( 34),IPLOTR( 33), NOPLOT( 31),
7  KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8  LOCMAC( 25),LENSPC( 24),
9  IPOSTP( 20),NUMPST( 19))
C
      EQUIVALENCE (KOM ( 8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
      COMMON SYSTEM
C
      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C...*****
C  COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO,
1CTROLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3,
2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC, NPRINT,
3NODAT,NSPIN,NTEST,NT0OL1,NT0OL2,NTRANS,NWPR,NZCAM,OPTAB,
4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN,
5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY,
6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM
      DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13),
1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100),
2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50)
C
      NA=6
      WRITE OUTPUT TAPE NA,100,ERROR
100  FORMAT(40X,8HERROR = F2.0,///)
      IF(OPTAB(23))2,1,2
1  CALL PDUMP
2  CALL FINAL
      RETURN
      END

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20130101

20130101

20130105

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20130117

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20130125

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20130209

20130103

20130105

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20130113

20130115


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* FORTRAN
* LIST
* LABEL
C4000          POSITN
          SUBROUTINE POSITN
C*****
C
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
C          DIMENSION  SYSTEM (1700)
C
C          EQUIVALENCE (SYSTEM(1700),KOM   (1700),KFLAGS(1692),TAPETB(1622))
C
C          EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1  POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2  CORTAP( 9),
3  TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4  FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
C          EQUIVALENCE (KFLAGS( 70),
1  K0   ( 60),F0   ( 60),K1   ( 59),K2   ( 58),K3   ( 57),
2  K4   ( 56),K5   ( 55),K6   ( 54),K7   ( 53),K8   ( 52),
3  K9   ( 51),
4  KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5  IWAVER( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6  ICLPRT( 35),INDEXX( 34),IPLPTR( 33),          NOPLT( 31),
7  K0YNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8  LOCMAC( 25),LENSPC( 24),
9  IPOSTP( 20),NUMPST( 19))
C
C          EQUIVALENCE (KOM   (8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
C          COMMON SYSTEM
C
C          DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C...*****
C  COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
C          COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO,
1CTROLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3,
2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC,          NPRINT,
3NODAT,NSPIN,NTEST,NTOOL1,NTOOL2,NTRANS,NWPR,NZCAM,OPTAB,
4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN,
5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY,
6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM
7DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13),
1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100),
2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50)
C
C
C          MAIN CONTROL OF POSITIONING POSTPROCESSORS
C
C          KFLAGS(50)=0
C          CALL PREINT(0)
C          CALL INIT
C          KL=MTABLE(6)
1  CALL READER
  IF(RETURN)3,6,4

```

C		20130113
C	ERROR RETURN	20130114
C		20130115
	3 ERROR=1.0	20130117
	2 CALL PERROR (ERROR)	
C		20130121
C	END OF FILE RETURN	20130122
C		20130124
	4 CALL TAPEOP (CLTAPE,3,RETURN)	20130201
	GO TO 11	20130203
C		20130205
C	END OF RECORD RETURN	20130206
C		20130207
	6 N=IDUM(29)	
	GO TO(53,51,55,51,51),N	
53	SEQCTR=FLOATF(INTAP(1))-OPTAB(22)	
	GO TO 51	
55	SEQCTR=INTAP(1)	
51	IND2=INTAP(2)/1000	
	IF(IND2-16)5,5,1	20130211
	5 GO TO (1,10,1,1,30,1,1,1,1,1,1,1,1,1,4,1,1),IND2	20130213
C		20130215
C	AUXILIARY FUNCTIONS	20130216
C		20130217
	10 IF(INTAP(3)-1)1,11,7	
	11 CALL END	20130221
	CALL FINAL	20130223
	CALL PDUMP	
	CALL DESPAT	20130225
	7 IF(INTAP(3)-3)8,38,9	45720817
	8 CALL STOP	
	GO TO 1	
	38 CALL OPSTOP	45720818
	GO TO 1	45720819
	9 IF(INTAP(3)-5)1,12,15	
	12 CALL RAPID	
	GO TO 1	
	15 IF(INTAP(3)-1000)1,1,16	20130301
	16 IND3=INTAP(3)-1000	20130303
	IF(IND3-61)13,1,1	
	13 GO TO (1,1,1,1,1,1,25,1,1,18,39,	45720820
	1 1,1,36,1,1,1,1,1,23,1,	
	2 19,26,1,1,27,28,1,1,1,20,	
	3 21,1,1,1,1,1,22,1,1,1,	
	4 1,1,1,24,1,29,1,33,1,1,	
	5 34,1,1,1,37,1,46,1,1,1),IND3	
	18 CALL FEDRAT	20130313
	GO TO 1	20130315
	19 CALL DISPLY	20130317
	GO TO 1	20130319
	20 CALL COOLNT	20130321
	GO TO 1	20130323
	21 CALL SPINDL	20130401
	GO TO 1	20130403
	22 CALL TRANS	20130405
	GO TO 1	20130407
	23 CALL SEQNO(1)	
	GO TO 1	
	24 CALL MESSAG	45720813

```

      GO TO 1
37 CALL LOADTL                                45720815
      GO TO 1                                45720816
39 CALL DELAY                                45720821
      GO TO 1                                45720822
25 CALL REWIND
      GO TO 1
26 CALL AUXFUN
      GO TO 1
27 CALL TOOLN
      GO TO 1
28 CALL ROTABL
      GO TO 1
29 CALL INSERT
      GO TO 1
33 CALL PREFUN
      GO TO 1
34 CALL OPTION
      GO TO 1
36 CALL LEADER
      GO TO 1
46 CALL CLRSRF
      GO TO 1
30 IF (INTAP(3)-2) 1,1,31                    20130501
31 IF (INTAP(3)-4) 32,50,32
50 INTAP(3)=5
   TAPSTO(6)=TAPSTO(6)+PREVX
   TAPSTO(7)=TAPSTO(7)+PREVY
   TAPSTO(8)=TAPSTO(8)+PREVZ
32 KX=6                                       20130505
   NTEST=5                                   20130506
   KY=7                                     20130507
   KZ=8                                     20130509
35 CALL DATA                                20130511
   IF (NTEST) 1,41,41
41 IF (KL-13) 42,43,42                       45721101
43 DO 44 I=3,5                               45721102
44 PREBU(I)=BITS                             45721103
      GO TO 45                               45721104
42 CALL CARD                                45721105
   CALL PRINT                               20130515
45 NTEST=NTEST+3                             45721106
   IF (NTEST-NWPR) 40,1,1                   20130519
40 KX=KX+3                                   20130521
   KY=KY+3                                   20130523
   KZ=KZ+3                                   20130524
      GO TO 35                               20130525
   END                                       20130526
*      FORTRAN
*      LIST
* LABEL
C4200      PREFUN
          SUBROUTINE PREFUN
C*****
C
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
          DIMENSION  SYSTEM (1700)
C

```

```

EQUIVALENCE (SYSTEM(1700),KOM (1700),KFLAGS(1692),TAPETB(1622))
C
EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1 POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2 CORTAP( 9),
3 TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4 FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
EQUIVALENCE (KFLAGS( 70),
1 K0 ( 60),F0 ( 60),K1 ( 59),K2 ( 58),K3 ( 57),
2 K4 ( 56),K5 ( 55),K6 ( 54),K7 ( 53),K8 ( 52),
3 K9 ( 51),
4 KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5 IWAVER( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6 ICLPRT( 35),INDEXX( 34),IPLOTR( 33), NOPLT( 31),
7 KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8 LOCMAC( 25),LENSPC( 24),
9 IPOSTP( 20),NUMPST( 19))
C
EQUIVALENCE (KOM ( 8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
COMMON SYSTEM
C
DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C.....*****
C COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO, 20130101
1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3, 20130105
2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC, NPRINT, 20130111
3NODAT,NSPIN,NTEST,NTOOL1,NTOOL2,NTRANS,NWPR,NZCAM,OPTAB, 20130113
4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN, 20130117
5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY, 20130123
6TRANSZ,WORDS,BUFPR, IDUM,ZCAM 20130125
DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13), 20130201
1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100), 20130205
2TAPSTO(250),WORDS(14),BUFPR(20),IDUM(50) 20130209
C
N=MTABLE(6)
IF(N-15)2,2,1
2 GO TO(1,1,1,1,1,1,1,1,3,3,3,1,1,1,3,1),N
3 IF(NWPR-4)1,4,4
4 IF(IDUM(16)-1)11,10,11
10 IFLAG=1
PRESAV=OPTAB(5)
11 IDUM(16)=1
OPTAB(5)=TAPSTO(4)
IF(N-8)1,5,1
5 IF(IFLAG-1)13,12,13
12 OPTAB(5)=PRESAV
GO TO 7
13 L=OPTAB(5)+.1
IF(L-6)6,1,6
6 IF(L-80)7,1,7
7 SEQCTR=SEQCTR+OPTAB(22)
B PREBU(1)=606000000000
IDUM(16)=0
PREBU(2)=OPTAB(5)

```

```

      CALL CARD
      CALL PRINT
      IF(IFLAG-1)1,14,1
14  IFLAG=0
      GO TO 11
1   RETURN
      END
*     FORTRAN
*     LIST
* LABEL
C4300      PREINT
          SUBROUTINE PREINT(LL)
C*****
C
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
      DIMENSION  SYSTEM (1700)
C
      EQUIVALENCE (SYSTEM(1700),KOM    (1700),KFLAGS(1692),TAPETB(1622))
C
      EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1  POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2  CORTAP( 9),
3  TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4  FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
      EQUIVALENCE (KFLAGS( 70),
1  K0    ( 60),F0    ( 60),K1    ( 59),K2    ( 58),K3    ( 57),
2  K4    ( 56),K5    ( 55),K6    ( 54),K7    ( 53),K8    ( 52),
3  K9    ( 51),
4  KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5  IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6  ICLPRT( 35),INDEXX( 34),IPLOTR( 33),      NOPLOT( 31),
7  KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8  LOCMAC( 25),LENSPC( 24),
9  IPOSTP( 20),NUMPST( 19))
C
      EQUIVALENCE (KOM    (8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
      COMMON SYSTEM
C
      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C...*****
C  COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO, 20130101
1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3, 20130105
2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC,      NPRINT, 20130111
3NODAT,NSPIN,NTEST,NTOOL1,NTOOL2,NTRANS,NWPR,NZCAM,OPTAB, 20130113
4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN, 20130117
5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY, 20130123
6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM 20130125
      DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13), 20130201
1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100), 20130205
2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50) 20130209
C
      DIMENSION AA(15),ABC(10)
      DIMENSION AG(12)

```

```

NN=MTABLE(6)
IF(LL) 301,300,301
B 300 AE=606060606060
      DO 799 J7=1,12
      799 AG(J7)=AE
B      AG(9)=606044000053
B      AG(10)=606044000053
B      AG(11)=440000757575
      N=-72
      J=0
      K=1
      CALL PUNCHA(N,AG,J,K)
      N=-6
      CALL PUNCHA(N,AG(10),J,K)
      N=-12
      CALL PUNCHA(N,AG(11),J,K)
301 IF(NN-15)15,15,35
      15 GO TO (1,2,3,4,5,6,7,8,9,10,11,12,13,14,35),NN
B      1 AA(1)=273124436662
B      AA(2)=736063212243
B      AA(3)=257360016060
B      AA(4)=606060606060
      GO TO 25
B      2 AA(1)=246543312527
B      AA(2)=736041312744
B      AA(3)=314373600160
B      AA(4)=606060606060
      GO TO 25
B      3 AA(1)=264662243142
B      AA(2)=736041312722
B      AA(3)=465173600160
B      AA(4)=606060606060
      GO TO 25
B      4 AA(1)=302521432473
B      AA(2)=602451314343
B      AA(3)=736001606060
B      AA(4)=606060606060
      GO TO 25
B      5 AA(1)=432151305173
B      AA(2)=602451314343
B      AA(3)=736001606060
B      AA(4)=606060606060
      GO TO 25
B      6 AA(1)=214425512345
B      AA(2)=736063212243
B      AA(3)=257360016060
B      AA(4)=606060606060
      GO TO 25
B      7 AA(1)=424531273063
B      AA(2)=736041312722
B      AA(3)=465173600160
B      AA(4)=606060606060
      GO TO 25
B      8 AA(1)=602264512773
B      AA(2)=245131434373
B      AA(3)=600160606060
B      AA(4)=606060606060
      GO TO 25
B      9 AA(1)=273124436662

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20130113

20130117

20130121

20130125

```

      B      AA(2)=736024513143
      B      AA(3)=437360016060
      B      AA(4)=606060606060
      GO TO 25
      B 10  AA(1)=436423216273
      B      AA(2)=602246514431
      B      AA(3)=437360026060
      B      AA(4)=606060606060
      GO TO 25
      B 11  AA(1)=273124436662
      B      AA(2)=736024513143
      B      AA(3)=437360026060
      B      AA(4)=606060606060
      GO TO 25
      B 12  AA(1)=475121636366
      B      AA(2)=736024513143
      B      AA(3)=437360016060
      B      AA(4)=606060606060
      GO TO 25
      B 13  AA(1)=425145635173
      B      AA(2)=604423302345
      B      AA(3)=637360622551
      B      AA(4)=316225606060
      GO TO 25
      B 14  AA(1)=273124436662
      B      AA(2)=736022465144
      B      AA(3)=314373600631
      B      AA(4)=452330606060
      GO TO 25
      25 K=14
      DO 30 J=5,15
      K=K-1
      30 AA(J)=PNOFLG(K)
      PNOFLG(14)=AA(1)
      GOTO(26,26,26,26,27,26,26,27,27,26,27,27,27,27,27),NN
      26 N=+90
      CALL SWAP(AA)
      CALL PARNEW(N,AA(15))
      GO TO 331
      27 N=-90
      CALL PARNOM (N,AA)
      331 C=BITS
      CALL PUNIDN(C)
      B=7.0
      CALL PUNSEQ(B)
      IF(LL) 35,31,35
      31 M=-60
      DO33 L=1,9
      B 33 ABC(L)=131313131313
      GO TO (36,36,36,36,36,36,36,39,36,36,36,36,36,36,36),NN
      B 39 ABC(10)=131313133453
      GO TO 37
      B 36 ABC(10)=131313131353
      37 J=0
      K=1
      34 CALL PUNCHA(M,ABC,J,K)
      35 RETURN
      END
      *      FORTRAN

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45720101
 45720102
 45720103
 45720104
 47490216
 47490217
 47490218
 47490219
 47490220
 20130201
 20130205
 20130207
 20130211
 20130213
 20130215

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*      LIST
*LABEL
C4400      PRINT
          SUBROUTINE PRINT
                                                    20130101
*
*****
C
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENCES+STATEMENTS
C
      DIMENSION SYSTEM (1700)
C
      EQUIVALENCE (SYSTEM(1700),KOM (1700),KFLAGS(1692),TAPETB(1622))
C
      EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1  POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2  CORTAP( 9),
3  TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4  FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
      EQUIVALENCE (KFLAGS( 70),
1  K0 ( 60),F0 ( 60),K1 ( 59),K2 ( 58),K3 ( 57),
2  K4 ( 56),K5 ( 55),K6 ( 54),K7 ( 53),K8 ( 52),
3  K9 ( 51),
4  KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5  IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6  ICLPRT( 35),INDEXX( 34),IPLOTR( 33), NOPLOT( 31),
7  KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8  LOCMAC( 25),LENSPC( 24),
9  IPOSTP( 20),NUMPST( 19))
C
      EQUIVALENCE (KOM ( 8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
      COMMON SYSTEM
C
      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C...*****
C  COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO, 20130101
1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3, 20130105
2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC, NPRINT, 20130111
3NODAT,NSPIN,NTEST,NT0OL1,NT0OL2,NTRANS,NWPR,NZCAM,OPTAB, 20130113
4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN, 20130117
5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY, 20130123
6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM 20130125
      DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13), 20130201
1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100), 20130205
2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50) 20130209
C
      KL=MTABLE(6)
B      BB=606060606060
      IF(NPRINT)30,20,30
20  NPRINT = 1
      BUFPRT(1) =WORDS(1)
      BUFPRT(2) =WORDS(2)
      BUFPRT(3) =BB
      BUFPRT(4) =WORDS(3)
      BUFPRT(5) =BB

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      BUFPR1(6) =WORDS(4)
      BUFPR1(7) =88
      BUFPR1(8) =WORDS(5)
      BUFPR1(9) =88
      BUFPR1(10)=WORDS(6)
      BUFPR1(11)=WORDS(8)
      BUFPR1(12)=WORDS(9)
      BUFPR1(13)=WORDS(10)
      BUFPR1(14)=WORDS(11)
      BUFPR1(15)=WORDS(12)
      BUFPR1(16)=WORDS(14)
      WRITE OUTPUT TAPE 6,100
      K=14
      DO 1000 J=40,50
      K=K-1
1000 OPTAB(J)=PNOFLG(K)
      WRITE OUTPUT TAPE 6,121,(OPTAB(J),J=40,50)
      GO TO (1,2,3,4,5,6,7,8,9,10,24,12,13,14,11),KL
      1 WRITE OUTPUT TAPE 6,101
      16 WRITE OUTPUT TAPE 6,116,(BUFPR1(1),BUFPR1(2),BUFPR1(3),BUFPR1(4),
      1BUFPR1(5),BUFPR1(6),BUFPR1(7),BUFPR1(8),BUFPR1(11),BUFPR1(13),
      2BUFPR1(16))
      GO TO 11
      2 WRITE OUTPUT TAPE 6,102
      GO TO 16
      3 WRITE OUTPUT TAPE 6,103
      GO TO 16
      4 WRITE OUTPUT TAPE 6,104
      GO TO 16
      5 WRITE OUTPUT TAPE 6,105
      GO TO 16
      6 WRITE OUTPUT TAPE 6,106
      17 WRITE OUTPUT TAPE 6,117,(      BUFPR1(2),BUFPR1(3),BUFPR1(4),
      1BUFPR1(5),BUFPR1(6),BUFPR1(7),BUFPR1(8),BUFPR1(11),BUFPR1(13),
      2BUFPR1(15),BUFPR1(16))
      GO TO 11
      7 WRITE OUTPUT TAPE 6,107
      GO TO 17
      8 WRITE OUTPUT TAPE 6,108
      GO TO 17
      9 WRITE OUTPUT TAPE 6,109
      23 WRITE OUTPUT TAPE 6,120,(BUFPR1(I),I=1,16)
      GO TO 11
      10 WRITE OUTPUT TAPE 6,110
      GO TO 23
      24 WRITE OUTPUT TAPE 6,109
      GO TO 17
      12 WRITE OUTPUT TAPE 6,112
      GO TO 23
      13 WRITE OUTPUT TAPE 6,113
      GO TO 16
      14 WRITE OUTPUT TAPE 6,114
      GO TO 23
      11 LINCTR=0
      30 IF(LINCTR-45)18,20,20
      18 LINCTR=LINCTR+1
      DO 19 N=1,20
      19 BUFPR1(N)=88
      BUFPR1(1) =BUFFER(3)

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47490301

45720107
45720108
47490302
47490303

```

      BUFPR1(2) =BUFFER(6)
      BUFPR1(11)=BUFFER(27)
      BUFPR1(12)=BUFFER(30)
      BUFPR1(13)=BUFFER(33)
      BUFPR1(14)=BUFFER(36)
      BUFPR1(15)=BUFFER(39)
      BUFPR1(16)=BUFFER(45)
      N3=3
      DO 21 I=3,6
        IF(PREBU(I)-BITS)22,21,22
22    AA=FORMAT(I)/10.0
        N2=AA+.001
        B=N2
        E=ABS(FORMAT(I)-(B*10.0))+.001
        N1=-E
        CALL CONBCD (PREBU(I),BUFPR1(N3),N2,N1)
21    N3=N3+2
        GO TO (41,41,41,41,41,42,42,42,43,43,42,43,41,43,50),KL
41    WRITE OUTPUT TAPE 6,118,(BUFPR1(1),BUFPR1(2),BUFPR1(3),BUFPR1(4),
      1BUFPR1(5),BUFPR1(6),BUFPR1(7),BUFPR1(8),BUFPR1(11),BUFPR1(13),
      2BUFPR1(16))
        GO TO 50
43    WRITE OUTPUT TAPE 6,118,(BUFPR1(I),I=1,16)
        GO TO 50
42    IBOB=SEQCTR
        WRITE OUTPUT TAPE 6,119,(      IBOB,BUFPR1(2),BUFPR1(3),BUFPR1(4),
      1BUFPR1(5),BUFPR1(6),BUFPR1(7),BUFPR1(8),BUFPR1(11),BUFPR1(13),
      2BUFPR1(15),BUFPR1(16))
50    DO 51 I=1,14
51    PREBU(I)=BITS
        RETURN
100   FORMAT(1H1)
101   FORMAT(26H G. + L. POSITIONING TABLE///)
102   FORMAT(17H DEVLIEG JIG MILL///)
103   FORMAT(28H FOSDICK POSITIONING MACHINE///)
104   FORMAT(18H HEALD - HEALDRILL///)
105   FORMAT(13H LAHR - DRILL///)
106   FORMAT(17H AMERICAN - DRILL///)
107   FORMAT(17H KNIGHT JIG BORER///)
108   FORMAT(13H BURG - DRILL///)
109   FORMAT(14H G. + L. DRILL///)
110   FORMAT(18H LUCAS BORING MILL///)
112   FORMAT(20 H PRATT-WHITNEY DRILL///)
113   FORMAT(13H KRNTN-MCHCNT///)
114   FORMAT(15H G. + L. BORMIL///)
116   FORMAT(11A6///)
117   FORMAT(6H N ,11A6///)
118   FORMAT(16A6)
119   FORMAT(1X,15,11A6)
120   FORMAT(16A6///)
121   FORMAT(1H ,11A6,53X)
      END
*     FORTRAN
*     LIST
      SUBROUTINE PRINTA
C
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
      DIMENSION SYSTEM (1700)

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47490305

45720110
47490304

60009300
60009400
60009500
60009600

```

C      EQUIVALENCE (SYSTEM(1700),KOM      (1700),KFLAGS(1692),TAPETB(1622)) 60009700
C      EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16), 60009800
1      POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11), 60009900
2      CORTAP( 9), 60010000
3      TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5), 60010100
4      FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1)) 60010200
C      EQUIVALENCE (KFLAGS( 70), 60010300
1      K0      ( 60),FO      ( 60),K1      ( 59),K2      ( 58),K3      ( 57), 60010400
2      K4      ( 56),K5      ( 55),K6      ( 54),K7      ( 53),K8      ( 52), 60010500
3      K9      ( 51), 60010600
4      KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42), 60010700
5      IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36), 60010800
6      ICLPRT( 35),INDEXX( 34),IPLOTR( 33), 60010900
7      KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26), 60011000
8      LOCMAC( 25),LENSPC( 24), 60011100
9      IPOSTP( 20),NUMPST( 19)) 60011200
C      EQUIVALENCE (KOM      ( 8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4)) 60011300
C      COMMON SYSTEM 60011400
C      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1) 60011500
C      ***** 60011600
C... ***** 60011700
      KFLAGS(50)=KFLAGS(50)+1 60011800
      RETURN 60011900
      END 60012000
*      FAP 60012100
*LABEL 60012200
*4500      PRTON
      ENTRY      PRTON
      PRTON      CLA*      1,4
      STO      N
      ARS      18
      XCA
      PXD      0,0
      MPY      N6
      XCA
      ADD      ADR
      STA      DO
      SXA      8,4
      CLA*      2,4
      STO      BB
      AXT      0,4
      DO      CLA      0,4
      STO      PRT+5,4
      TXI      *+1,4,1
      TXL      DO,4,5
      CALL      (SPH),PRT
      CALL      (FIL)
      LFTM
      CALL      (SPH),ACC
      LDQ      BB
      STR
      CALL      (FIL)
      LFTM

```

```

      LXA      8,4
      TRA      3,4
      B        PZE      0
      BB       PZE      0
      N        PZE      0
      ACC      BCI      6,(19H LENGTH OF TAPE IS 15,6H FEET)
      N6       OCT      6
      ADR      PZE      E1-1
      PRT      BSS      6
      E1       BCI      6,(30HOPUNCHED TAPE FOR G.L.      )
      E2       BCI      6,(30HOPUNCHED TAPE FOR DEVLIEG   )
      E3       BCI      6,(30HOPUNCHED TAPE FOR FOSDICK    )
      E4       BCI      6,(30HOPUNCHED TAPE FOR HEALD      )
      E5       BCI      6,(30HOPUNCHED TAPE FOR LAHR       )
      E6       BCI      6,(30HOPUNCHED TAPE FOR AMERICAN   )
      E7       BCI      6,(30HOPUNCHED TAPE FOR KNIGHT     )
      E8       BCI      6,(30HOPUNCHED TAPE FOR BURG       )
      E9       BCI      6,(30HOPUNCHED TAPE FOR G.L. DRILL  )
      E10      BCI      6,(30HOPUNCHED TAPE FOR LUCAS      )
      E11      BCI      6,(30HOPUNCHED TAPE FOR G.L. DRILL  )
      E12      BCI      6,(30HOPUNCHED TAPE FOR PRATTW DRILL)
      E13      BCI      6,(30HOPUNCHED TAPE FOR KRNR       )
      E14      BCI      6,(30HOPUNCHED TAPE FOR G.L. BORMIL )
      BSS      6
      END
*      FORTRAN
*      LIST
*LABEL
C4600      RAPID
          SUBROUTINE RAPID
C*****
C
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
          DIMENSION SYSTEM (1700)
C
          EQUIVALENCE (SYSTEM(1700),KOM (1700),KFLAGS(1692),TAPETB(1622))
C
          EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1  POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2  CORTAP( 9),
3  TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4  FORTIN( 4),INTAPE( 3),IGUTAP( 2),PUNTAP( 1))
C
          EQUIVALENCE (KFLAGS( 70),
1  K0 ( 60),F0 ( 60),K1 ( 59),K2 ( 58),K3 ( 57),
2  K4 ( 56),K5 ( 55),K6 ( 54),K7 ( 53),K8 ( 52),
3  K9 ( 51),
4  KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5  IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6  ICLPRT( 35),INDEXX( 34),IPLOTR( 33), NOPILOT( 31),
7  KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8  LOCMAC( 25),LENSPC( 24),
9  IPOSTP( 20),NUPST( 19))
C
          EQUIVALENCE (KOM ( 8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
          COMMON SYSTEM
C

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      DIMENSION KFLAGS(1), IPOSTP(1), KOM(1)
C
C.....*****
C  COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
      COMMON MACH, NLOOP, NLOOP1, PNOFLG, MTABLE, NID, BITS, BUFFER, COMSTO, 20130101
      1CTRDLY, CTRFLG, FEDFLG, FEDIPR, FEDTAB, FORMAT, GGL, INTAP, IND2, IND3, 20130105
      2KOMENT, KOOL, KX, KY, KZ, LINCTR, NAXIS, NCOOL, NFEEDC, NPRINT, 20130111
      3NODAT, NSPIN, NTEST, NTOOL1, NTOOL2, NTRANS, NWPR, NZCAM, OPTAB, 20130113
      4PREBU, PRETX, PRETY, PRETZ, PREVX, PREVY, PREVZ, RADIUS, RETURN, 20130117
      5RPM, SEQCTR, SFM, SPIFLG, SPNTAB, TAPSTO, TOOLNO, TRANSX, TRANSY, 20130123
      6TRANSZ, WORDS, BUFPR, IDUM, ZCAM 20130125
      DIMENSION MACH(12), PNOFLG(14), MTABLE(10), BUFFER(50), COMSTO(13), 20130201
      1FEDTAB(50), FORMAT(14), INTAP(20), OPTAB(50), PREBU (14), SPNTAB(100), 20130205
      2TAPSTO(250), WORDS(14), BUFPR(20), IDUM(50) 20130209
C
      10 IDUM(20)=1 45721016
      FEDFLG=0.
      30 RETURN 45721023
      END
* FAP
*READERCO 60846600
      ENTRY READER 60889100
* SUBROUTINE READER 60846700
* READS RECORD FROM CLTAPE WRITTEN BY APT III 60846800
* 60846900
* SYSTEM COMMON, DIMENSION, AND EQUIVALENCE STATEMENTS FOR FAP 60847000
NOTAPS EQU 18 NUMBER OF TAPES
NOFLGS EQU 70 NUMBER OF FLAGS IN FLAG AREA
BUFNUM EQU 4 NUMBER OF BUFFERS
NOBLKS EQU 4 NO. OF BLOCKS ALLOWED TAPEWT CALL SEQ.
BUFSIZ EQU 400 SIZE OF ONE BUFFER BLOCK
*****
SYSTEM COMMON 8
KFLAGS COMMON NOFLGS
TAPETB COMMON NOTAPS
BUFTBL COMMON BUFNUM
BUFER1 COMMON BUFSIZ
BUFER2 COMMON BUFSIZ
BUFER3 COMMON BUFSIZ
BUFER4 COMMON BUFSIZ
KOM EQU SYSTEM
KAPTID EQU KOM-7 IDENTIFICATION OF LAST LIBTAP RECORD
KAPTIO EQU KOM-6 APT I-O COMMAND
KAPTR EQU KOM-5 TRANSFER TO LAST SECTION READ FROM LIBTAP
KAPTCN EQU KOM-4 CONTINUATION FLAG
      K0 EQU KFLAGS-10 KFLAGS(11)
      K1 EQU KFLAGS-11
      K2 EQU KFLAGS-12
      K3 EQU KFLAGS-13
      K4 EQU KFLAGS-14
      K5 EQU KFLAGS-15
      K6 EQU KFLAGS-16
      K7 EQU KFLAGS-17
      K8 EQU KFLAGS-18
      K9 EQU KFLAGS-19
KFLAG0 EQU KFLAGS-24
KFLAG1 EQU KFLAGS-25
KFLAG2 EQU KFLAGS-26

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KFLAG3 EQU	KFLAGS-27	
KFLAG4 EQU	KFLAGS-28	
IWAVEN EQU	KFLAGS-30	KFLAGS(31)
IPTNLY EQU	KFLAGS-31	
NOPOST EQU	KFLAGS-32	
INVERT EQU	KFLAGS-33	
KAUTOP EQU	KFLAGS-34	
ICLPRT EQU	KFLAGS-35	
INDEXX EQU	KFLAGS-36	
IPLOTR EQU	KFLAGS-37	
NOPL0T EQU	KFLAGS-39	
KDYNFG EQU	KFLAGS-40	
LOCJPT EQU	KFLAGS-41	
LOCBEG EQU	KFLAGS-42	
KSECIN EQU	KFLAGS-43	
NCLREC EQU	KFLAGS-44	
LOCMAC EQU	KFLAGS-45	
LENSPC EQU	KFLAGS-46	
IPOSTP EQU	KFLAGS-50	
NUMPOT EQU	KFLAGS-51	
PROTAP EQU	TAPETB	
CANTAP EQU	TAPETB-1	
CLTAPE EQU	TAPETB-2	
POCTAP EQU	TAPETB-3	
PLOTAP EQU	TAPETB-4	
SRFTAP EQU	TAPETB-5	
LIBTAP EQU	TAPETB-6	
CRDTAP EQU	TAPETB-7	
CORTAP EQU	TAPETB-9	
TAPES1 EQU	TAPETB-10	
TAPES2 EQU	TAPETB-11	
TAPES3 EQU	TAPETB-12	
TAPES4 EQU	TAPETB-13	
FORTIN EQU	TAPETB-14	
INTAPE EQU	TAPETB-15	
IOUTAP EQU	TAPETB-16	
PUNTAP EQU	TAPETB-17	

*

MACH	COMMON	12
NLOOP	COMMON	1
NLOOP1	COMMON	1
PN0FLG	COMMON	14
MTABLE	COMMON	10
NID	COMMON	1
BITS	COMMON	1
BUFFER	COMMON	50
COMSTO	COMMON	13
CTRDLY	COMMON	1
CTRFLG	COMMON	1
FEDFLG	COMMON	1
FEDIPR	COMMON	1
FEDTAB	COMMON	50
FORMAT	COMMON	14
GGL	COMMON	1
INTAP	COMMON	20
IND2	COMMON	1
IND3	COMMON	1
KOMENT	COMMON	1

KOOL COMMON 1
 KX COMMON 1
 KY COMMON 1
 KZ COMMON 1
 LINCTR COMMON 1
 NAXIS COMMON 1
 NCOOL COMMON 1
 NFEEDC COMMON 1
 NPRINT COMMON 1
 NODAT COMMON 1
 NSPIN COMMON 1
 NTEST COMMON 1
 NTOOL1 COMMON 1
 NTOOL2 COMMON 1
 NTRANS COMMON 1
 NWPR COMMON 1
 NZCAM COMMON 1
 OPTAB COMMON 50
 PREBU COMMON 14
 PRESTX COMMON 1
 PRESTY COMMON 1
 PRESTZ COMMON 1
 PREVX COMMON 1
 PREVY COMMON 1
 PREVZ COMMON 1
 RADIUS COMMON 1
 RETURN COMMON 1
 RPM COMMON 1
 SEQCTR COMMON 1
 SFM COMMON 1
 SPIFLG COMMON 1
 SPNTAB COMMON 100
 TAPSTO COMMON 250
 TOOLNO COMMON 1
 TRANSX COMMON 1
 TRANSY COMMON 1
 TRANSZ COMMON 1
 WORDS COMMON 14
 BUFPR COMMON 20
 IDUM COMMON 50
 ZCAM COMMON 1

*

*

*

*

*

*

*

READER SXA READX,1
 SXA READX+1,2
 SXA READX+2,4

*

CALL TAPERD,CLTAPE,IRETN,NWPR,NBLKS,TAPSTO,WRDS
 CLA IRETN
 TZF EOF
 TMI READOK
 CLS ONE
 STO RETURN
 TRA READOK+1

60889000
 60889200
 60889300
 60889400
 60889500
 60889600
 60889700
 60889800
 60889900
 60890000
 60890100
 60890200
 60890300
 60890400
 60890500
 60890600

```

READOK STZ      RETURN                                60890700
      AXT      20,1                                60890800
      CLA      TAPSTO+1,1                          60890900
      STO      INTAP+1,1                          60891000
      TIX      *-2,1,1                            60891100
READX  AXT      --,1                                60891200
      AXT      --,2                                60891300
      AXT      --,4                                60891400
      TRA      1,4                                60891500
EOF    CLA      ONE                                60891600
      STO      RETURN                              60891700
      TRA      READX                              60891800
*                                           60891900
IRETN  PZE                                           60892000
NBLKS  PZE      0,0,1                              60892100
WRDS   PZE                                           60892200
ONE    DEC      1.0                                60892300
      END                                           60892400
*
*   FORTRAN
*   LIST
*
* LABEL
C4800      REWIND
          SUBROUTINE REWIND
C*****
C
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
      DIMENSION SYSTEM (1700)
C
      EQUIVALENCE (SYSTEM(1700),KOM (1700),KFLAGS(1692),TAPETB(1622))
C
      EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1  POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2  CORTAP( 9),
3  TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4  FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
      EQUIVALENCE (KFLAGS( 70),
1  K0 ( 60),F0 ( 60),K1 ( 59),K2 ( 58),K3 ( 57),
2  K4 ( 56),K5 ( 55),K6 ( 54),K7 ( 53),K8 ( 52),
3  K9 ( 51),
4  KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5  IWAVER( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6  ICLPRT( 35),INDEXX( 34),IPLOTR( 33),      NOPLT( 31),
7  KOYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8  LOCMAC( 25),LENSPC( 24),
9  IPOSTP( 20),NUMPST( 19))
C
      EQUIVALENCE (KOM ( 8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
      COMMON SYSTEM
C
      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C... *****
C  COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO,
1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3,
20130101
20130105

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2KMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC,      NPRINT,      20130111
3NODAT,NSPIN,NTEST,NTOL1,NTOL2,NTRANS,NWPR,NZCAM,OPTAB,      20130113
4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN,      20130117
5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY,      20130123
6TRANSZ,WORDS,BUFPR, IDUM,ZCAM      20130125
    DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13),      20130201
1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100),      20130205
2TAPSTO(250),WORDS(14),BUFPR(20),IDUM(50)      20130209

C
    N=MTABLE(6)
    IF(N-15)2,2,1
2 GO TO (1,1,1,1,1,1,1,3,1,1,1,1,5,5,1),N
3 SEQCTR=SEQCTR+OPTAB(22)
B PREBU(1)=606000000000
  PREBU(14)=29.
4 CALL CARD
  CALL PRINT
1 RETURN
5 SEQCTR=SEQCTR+OPTAB(22)
  PREBU(1)=SEQCTR
  PREBU(14)=2.
  GO TO 4
END
* FORTRAN
* LIST
* LABEL
C4900 ROTABL
    SUBROUTINE ROTABL
C*****
C
C... SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
    DIMENSION SYSTEM (1700)
C
    EQUIVALENCE (SYSTEM(1700),KOM (1700),KFLAGS(1692),TAPETB(1622))
C
    EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1 POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2 CORTAP( 9),
3 TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4 FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
    EQUIVALENCE (KFLAGS( 70),
1 K0 ( 60),F0 ( 60),K1 ( 59),K2 ( 58),K3 ( 57),
2 K4 ( 56),K5 ( 55),K6 ( 54),K7 ( 53),K8 ( 52),
3 K9 ( 51),
4 KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5 IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6 ICLPRT( 35),INDEXX( 34),IPLOTR( 33), NOPLT( 31),
7 KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8 LOCMAC( 25),LENSPC( 24),
9 IPOSTP( 20),NUMPST( 19))
C
    EQUIVALENCE (KOM ( 8),KAPTIO(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
    COMMON SYSTEM
C
    DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C

```

C...*****

C COMMON AND DIMENSION-POSITIONING POST-PROCESSORS

C

COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO,	20130101
1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3,	20130105
2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC,NPRINT,	20130111
3NODAT,NSPIN,NTEST,NTOL1,NTOL2,NTRANS,NWPR,NZCAM,OPTAB,	20130113
4PREBU,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN,	20130117
5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY,	20130123
6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM	20130125
DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13),	20130201
1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU(14),SPNTAB(100),	20130205
2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50)	20130209

C

DIMENSION SPEED(10)	
N=MTABLE(6)	
IF(N-10)1,10,27	
27 IF(N-13)1,28,1	
10 IF(NWPR-4)1,2,3	
2 IF(INTAP(4)-1)6,1,6	
6 OPTAB(21)=TAPSTO(4)	
GO TO 4	
3 IF(NWPR-6)5,8,8	
5 IF(INTAP(4)-1)9,7,9	
7 OPTAB(21)=TAPSTO(5)	
GO TO 4	
9 IF(INTAP(4)-78)30,11,6	45720917
30 IF(INTAP(4)-66)6,29,6	
28 IF(NWPR-5)29,35,29	
29 WRITE OUTPUT TAPE 6,34	
34 FORMAT(27H ROTABL STATEMENT INCORRECT)	
GO TO 1	
35 IF(INTAP(4)-66)29,33,29	
33 IANGL=TAPSTO(5)+45.	45720920
IANGL=IANGL/90	45720921
IF(PREVZ-13.9985)71,70,70	
71 PREVZ=13.999	
70 PREBU(1)=SEQCTR	
PREBU(5)=PREVZ	
SEQCTR=SEQCTR+OPTAB(22)	45720923
PREBU(1)=SEQCTR	45720924
DO 32 I=1,IANGL	45720922
PREBU(14)=78.	45720925
CALL CARD	45721001
32 CALL PRINT	45721002
GO TO 1	45721003
11 OPTAB(24)=TAPSTO(5)	
GO TO 20	
8 IF(INTAP(4)-1)12,13,12	
12 IF(INTAP(4)-78)15,11,15	
15 OPTAB(21)=TAPSTO(4)	
IF(INTAP(5)-78)4,14,4	
4 IDUM(18)=1	
25 IDUM(15)=1	
CALL DATA	
CALL CARD	
CALL PRINT	
1 RETURN	
14 OPTAB(24)=TAPSTO(6)	

```

      IDUM(18)=1
      GO TO 20
13  OPTAB(21)=TAPSTO(5)
      IF(INTAP(6)-78)4,16,4
16  IF(NWPR-7)4,17,17
17  OPTAB(24)=TAPSTO(7)
      IDUM(18)=1
      GO TO 20
20  IDUM(19)=1
      L=OPTAB(25)+.1
      IF(L-18)24,26,24
26  OPTAB(25)=0.
      IDUM(24)=0
      KOMENT=15
      CALL COMENT
24  SPEED(1)=.03
      SPEED(2)=.045
      SPEED(3)=.067
      SPEED(4)=.100
      SPEED(5)=.150
      SPEED(6)=.225
      SPEED(7)=.340
      SPEED(8)=.5
      SPEED(9)=1.0
      DO 21 I=1,9
      IF(OPTAB(24)-SPEED(I))22,21,21
21  CONTINUE
      I=9
      GO TO 23
22  I=I-1
23  OPTAB(24)=I
      GO TO 25
      END
*      FORTRAN
*      LIST
*LABEL
C5000      SEQNO
          SUBROUTINE SEQNO(M)
C*****
C
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
          DIMENSION  SYSTEM (1700)
C
          EQUIVALENCE (SYSTEM(1700),KOM   (1700),KFLAGS(1692),TAPETB(1622))
C
          EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1  POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2  CORTAP( 9),
3  TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4  FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
          EQUIVALENCE (KFLAGS( 70),
1  K0   ( 60),F0   ( 60),K1   ( 59),K2   ( 58),K3   ( 57),
2  K4   ( 56),K5   ( 55),K6   ( 54),K7   ( 53),K8   ( 52),
3  K9   ( 51),
4  KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5  IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6  ICLPRT( 35),INDEXX( 34),IPLOTR( 33),      NOPLOT( 31),

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7 KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8 LOCMAC( 25),LENSPC( 24),
9 IPOSTP( 20),NUMPST( 19))

C      EQUIVALENCE (KOM      (8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
C      COMMON SYSTEM
C
C      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C.....*****
C      COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
C      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO,      20130101
1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3,      20130105
2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC,      NPRINT,      20130111
3NODAT,NSPIN,NTEST,NTOOL1,NTOOL2,NTRANS,NWPR,NZCAM,OPTAB,      20130113
4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN,      20130117
5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY,      20130123
6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM      20130125
C      DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13),      20130201
1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100),      20130205
2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50)      20130209

C
C      IF(M-1)3,4,3
4 IF(NWPR-4)1,5,7
5 IF(INTAP(4)-57)8,20,8
8 IF(INTAP(4)-71)9,11,9
9 IF(INTAP(4)-72)30,13,30
30 IF(INTAP(4)-230)12,31,12
7 IF(NWPR-5)1,14,6
14 OPTAB(22)=1.
GO TO 15
6 OPTAB(22)=TAPSTO(6)
15 IF(INTAP(5)-66)1,16,1
16 IF(INTAP(4)-71)17,18,17
17 IDUM(29)=5
SEQCTR=TAPSTO( 4)-OPTAB(22)
GO TO 2
12 SEQSAV=SEQCTR
SEQCTR=TAPSTO(4)-OPTAB(22)
IDUMSV=IDUM(29)
IDUM(29)=4
GO TO 2
11 IDUM(29)=1
GO TO 2
13 IDUM(29)=2
GO TO 2
18 IDUM(29)=3
GO TO 2
3 SEQCTR=SEQSAV
IDUM(29)=IDUMSV
2 RETURN
B 20 ABC=345360606060
CALL PUNCHA(-2,ABC,0,0)
GO TO 2
1 KOMENT=14
CALL COMENT
GO TO 2

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47490309
47490310

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B 31 A=465360606060                                47490311
      CALL PUNCHA(-6,A,0,0)                          47490312
      GO TO 2                                          47490313
      END
*      FORTRAN
*      LIST
*LABEL
C5100      SETUP
          SUBROUTINE SETUP                                20130101
C*****
C
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
      DIMENSION  SYSTEM (1700)
C
      EQUIVALENCE (SYSTEM(1700),KOM  (1700),KFLAGS(1692),TAPETB(1622))
C
      EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1  POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2  CORTAP( 9),
3  TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4  FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
      EQUIVALENCE  (KFLAGS( 70),
1  K0      ( 60),F0      ( 60),K1      ( 59),K2      ( 58),K3      ( 57),
2  K4      ( 56),K5      ( 55),K6      ( 54),K7      ( 53),K8      ( 52),
3  K9      ( 51),
4  KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5  IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6  ICLPRT( 35),INDEXX( 34),IPLOTR( 33),          NOPL0T( 31),
7  KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8  LOCMAC( 25),LENSPC( 24),
9  IPOSTP( 20),NUMPST( 19))
C
      EQUIVALENCE (KOM  (8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
      COMMON SYSTEM
C
      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C...*****
C  COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO,  20130101
1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3,    20130105
2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC,          NPRINT,    20130111
3NODAT,NSPIN,NTEST,NT0OL1,NT0OL2,NTRANS,NWPR,NZCAM,OPTAB,      20130113
4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN,    20130117
5SRPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY,      20130123
6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM                                20130125
      DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13),  20130201
1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100),  20130205
2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50)                    20130209
C
      N=MTABLE(6)
      IF (IDUM(18)-1)27,8,27
27 IF (OPTAB(8)-1.0)2,1,2
1 IF (INTAP(3)-3)41,40,41
41 PRESX=OPTAB(2)

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PRESY=OPTAB(3)
PRESZ=OPTAB(4)
GO TO 3
40 NTEST=-NTEST
SEQCTR=SEQCTR-OPTAB(22)
GO TO 10
2 PRESX=PRESTX
PRESY=PRESTY
PRESZ = PRESTZ
3 PREBU (3)=PRESX
PREBU (4)=PRESY
IF(OPTAB(15)-2.0)5,5,4
4 PREBU (5)=PRESZ
5 IF(OPTAB(8)-1.0)26,30,26
26 IF(NTRANS)30,30,6
6 PREBU(3)=TRANSX+PREBU(3)
PREBU(4)=TRANSY+PREBU(4)
IF(OPTAB(15)-2.0)30,30,7
7 PREBU(5)=TRANSZ+PREBU(5)
30 IF(IDUM(25)-1)31,8,31
31 IF(IDUM(26))37,38,37
37 DO 36 J=2,4
IF(J-4)33,32,32
32 IF(OPTAB(15)-2.0)36,36,33
33 N1=FORMAT(J+1)/10.+SIGNF(.001,FORMAT(J+1))
A1=N1
N1=ABSF(FORMAT(J+1)-(A1*10.))+.001
A1=.5/(10.**N1) +.000001
IF(ABSF(OPTAB(J))-A1)35,35,36
35 PREBU(J+1)=BITS
36 CONTINUE
GO TO 8
38 IDUM(26)=1
IF(N-13)8,70,8
70 IF(FEDFLG)71,71,8
71 FEDFLG=1.
NFEEDC=570
8 PREBU (1)=SEQCTR
IF(N-15)9,9,25
9 GO TO (11,12,13,14,10,16,17,18,19,20,10,22,23,24,10),N
10 RETURN
25 ERROR=5.0
CALL PERROR (ERROR)
GO TO 10
11 CALL STAU1
GO TO 10
12 CALL STAU2
GO TO 10
13 CALL STAU2
GO TO 10
14 CALL STAU4
GO TO 10
16 CALL STAU6
GO TO 10
17 CALL STAU6
GO TO 10
18 CALL STAU8
GO TO 10
19 CALL STAU9

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20130113

47490315
20130123
20130201

20130205
20130207
20130209
20130211
20130213
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20130217
20130219
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      GO TO 10
20 CALL STAU10
      GO TO 10
22 CALL STAU12
      GO TO 10
23 CALL STAU13
      GO TO 10
24 CALL STAU14
      GO TO 10
      END
*      FORTRAN
*      LIST
*LABEL
C5200      SPINC1
      SUBROUTINE SPINC1
C*****
C
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
      DIMENSION  SYSTEM (1700)
C
      EQUIVALENCE (SYSTEM(1700),KOM  (1700),KFLAGS(1692),TAPETB(1622))
C
      EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1  POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2  CORTAP( 9),
3  TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4  FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
      EQUIVALENCE (KFLAGS( 70),
1  K0  ( 60),F0  ( 60),K1  ( 59),K2  ( 58),K3  ( 57),
2  K4  ( 56),K5  ( 55),K6  ( 54),K7  ( 53),K8  ( 52),
3  K9  ( 51),
4  KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5  IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6  ICLPRT( 35),INDEXX( 34),IPLOTR( 33),      NOPL0T( 31),
7  KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECI( 27),NCLREC( 26),
8  LOCMAC( 25),LENSPC( 24),
9  IPOSTP( 20),NUMPST( 19))
C
      EQUIVALENCE (KOM  (8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
      COMMON SYSTEM
C
      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C...*****
C  COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO,
1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3,
2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC,      NPRINT,
3NODAT,NSPIN,NTEST,NT00L1,NT00L2,NTRANS,NWPR,NZCAM,OPTAB,
4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN,
5SRPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY,
6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM
      DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13),
1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100),
2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50)

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45720114
45720115
47490316
47490317

20130101

20130101
20130105
20130111
20130113
20130117
20130123
20130125
20130201
20130205
20130209

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C      IF(RPM)30,31,30
30 I=OPTAB(7)
   IF(RPM-SPNTAB(I))1,5,5
1  KOMENT=9
   NSPIN=I
2  CALL COMENT
   GO TO 24
3  RETURN
31 NSPIN=0
   OPTAB(26)=0.
   IF(MTABLE(6)-10)3,25,3
5  I=OPTAB(12)*OPTAB(11)-OPTAB(11)+OPTAB(7)+.1
6  IF(RPM-SPNTAB(I))10,4,7
7  KOMENT=10
   CALL COMENT
4  NSPIN=I
   GO TO 24
10 K=OPTAB(7)
   L=OPTAB(11)
   DO15 J=K,I,L
   IF(RPM-SPNTAB(J))20,15,15
15 CONTINUE
   ERROR=3.0
   CALL PERROR (ERROR)
20 NSPIN=J-L
24 OPTAB(26)=SPNTAB(NSPIN)
25 CALL SPLCOD
   GO TO 3
   END
*      -- FORTRAN
*      LIST
*LABEL
C5300      SPINDL
          SUBROUTINE SPINDL
C*****
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C      DIMENSION  SYSTEM (1700)
C      EQUIVALENCE (SYSTEM(1700),KOM (1700),KFLAGS(1692),TAPETB(1622))
C      EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1  POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2  CORTAP( 9),
3  TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4  FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C      EQUIVALENCE (KFLAGS( 70),
1  K0 ( 60),FO ( 60),K1 ( 59),K2 ( 58),K3 ( 57),
2  K4 ( 56),K5 ( 55),K6 ( 54),K7 ( 53),K8 ( 52),
3  K9 ( 51),
4  KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5  IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6  ICLPRT( 35),INDEXX( 34),IPLOTR( 33), NOPLO( 31),
7  KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8  LOCMAC( 25),LENSPC( 24),
9  IPOSTP( 20),NUMPST( 19))

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20130105

20130109

20130111

20130117

20130119

20130203

20130205

20130207

20130213

20130215

20130101


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C      EQUIVALENCE (KOM      (8),KAPTID(1),KAPTID(2),KAPTTR(3),KAPTCN(4))
C
C      COMMON SYSTEM
C
C      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C.....*****
C      COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
C      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO,      20130101
1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3,      20130105
2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC,      NPRINT,      20130111
3NODAT,NSPIN,NTEST,NT0OL1,NT0OL2,NTRANS,NWPR,NZCAM,OPTAB,      20130113
4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN,      20130117
5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY,      20130123
6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM      20130125
DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13),
1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100),      20130205
2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50)      20130209
C
C      IDUM(30)=IDUM(30)+1      47490319
C      IDUM(31)=IDUM(30)      47490320
C      IDUM(32)=3      47490321
C      K=MTABLE(6)      20130205
C      IF(NWPR-5)100,5,50      45720903
100 IF(K-13)1,101,101      47490322
101 IF(INTAP(4)-72)1,102,1      45720905
102 IDUM(32)=5      47490323
C      GO TO 107
C      1 KOMENT=7      20130105
C      CALL COMENT      20130107
C      2 RPM=OPTAB(10)      20130109
C      GO TO 20      20130111
C      5 IF(INTAP(5)-78)1,10,6      20130113
C      6 IF(INTAP(5)-115)1,7,1
C      7 IF(RADIUS)1,1,8      20130117
C      8 KOMENT=8      20130119
C      CALL COMENT      20130121
C      GO TO 60      20130123
10 RPM=TAPSTO(4)      20130201
20 SPIFLG=1.
C      IF(K-15)11,11,30
11 GO TO (30,22,22,22,30,30,30,33,22,22,30,30,12,12,12),K      47490401
12 IF(INTAP(6)-60)104,120,121      47490402
104 IF(INTAP(6)-59)121,105,121      47490403
105 IDUM(32)=4      47490324
C      GO TO 120      47490404
120 L=7      47490405
C      GO TO 13      47490406
121 L=6      47490407
C      GO TO 13      47490408
13 IF(INTAP(L)-145)21,14,21      47490409
14 IF(INTAP(L+1)-61)19,17,16      47490410
16 IF(INTAP(L+1)-63)18,26,19      47490411
17 TAPSTO(L+1)=2.      47490412
C      GO TO 19
18 TAPSTO(L+1)=3.      47490413
C      GO TO 19

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26 TAPSTO(L+1)=1. 47490414
19 IF(TAPSTO(L+1)-OPTAB(11))15,15,22 47490415
15 OPTAB(7)=TAPSTO(L+1) 47490416
   GO TO 22
21 IF(NWPR-(L+3))22,23,23 47490417
23 IF(INTAP(L+2)-145)22,24,22 47490418
24 IF(INTAP(L+3)-61)29,28,27 47490419
27 IF(INTAP(L+3)-63)31,32,29 47490420
28 TAPSTO(L+3)=2. 47490421
   GO TO 29
31 TAPSTO(L+3)=3. 47490422
   GO TO 29
32 TAPSTO(L+3)=1. 47490423
29 IF(TAPSTO(L+3)-OPTAB(11))25,25,22 47490424
25 OPTAB(7)=TAPSTO(L+3) 47490425
22 CALL SPINC1 20130209
   IF(IDUM(23))34,30,34
34 SPIFLG=0.
   PREBU(10)=NSPIN
107 SEQCTR=SEQCTR+OPTAB(22)
   GO TO (30,36,36,36,30,30,30,35,36,36,30,30,106,30,30),K 45720913
B 35 PREBU(1)=606000000000
   GO TO 37
106 PREBU(14)=IDUM(32) 47490325
36 PREBU(1)=SEQCTR
37 CALL CARD
   CALL PRINT
   GO TO 30
30 RETURN 20130211
33 N=OPTAB(19)+.1 20130213
   OPTAB(7)=XMODF(N,2)+1
   GO TO 22
50 IF(INTAP(5)-115)5,51,1
51 SFM=TAPSTO(4) 20130217
   IF(INTAP(6)-23)52,55,52 20130219
52 IF(INTAP(8)-23)53,56,53 20130221
53 IF(INTAP(10)-23)7,57,7 20130223
55 RADIUS=TAPSTO(7) 20130301
   GO TO 60 20130303
56 RADIUS=TAPSTO(9) 20130305
   GO TO 60 20130307
57 RADIUS=TAPSTO(11) 20130309
   GO TO 60 20130311
60 RPM=(SFM*6.0)/(3.14159*RADIUS) 20130313
   GO TO 20 20130315
   END 20130317
*   FORTRAN
*   LIST
*LABEL
C5400   SPLCOD
      SUBROUTINE SPLCOD
C*****
C
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
C      DIMENSION  SYSTEM (1700)
C
C      EQUIVALENCE (SYSTEM(1700),KOM (1700),KFLAGS(1692),TAPETB(1622))
C

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      EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1  POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2  CORTAP( 9),
3  TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4  FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))

C
      EQUIVALENCE (KFLAGS( 70),
1  K0      ( 60),FO      ( 60),K1      ( 59),K2      ( 58),K3      ( 57),
2  K4      ( 56),K5      ( 55),K6      ( 54),K7      ( 53),K8      ( 52),
3  K9      ( 51),
4  KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5  IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6  ICLPRT( 35),INDEXX( 34),IPLOTR( 33),      NOPL0T( 31),
7  KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8  LOCMAC( 25),LENSPC( 24),
9  IPOSTP( 20),NUMPST( 19))

C
      EQUIVALENCE (KOM      (8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))

C
      COMMON SYSTEM

C
      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)

C
C...*****
C  COMMON AND DIMENSION-POSITIONING POST-PROCESSORS

C
      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO,      20130101
1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3,      20130105
2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC,      NPRINT,      20130111
3NODAT,NSPIN,NTEST,NT0OL1,NT0OL2,NTRANS,NWPR,NZCAM,OPTAB,      20130113
4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN,      20130117
5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY,      20130123
6TRANSZ,WORDS,BUFPR, IDUM,ZCAM      20130125
      DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13),      20130201
1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100),      20130205
2TAPSTO(250),WORDS(14),BUFPR(20),IDUM(50)      20130209

C
      DIMENSION ISCODE(50)
      NT=MTABLE(6)
      N=NSPIN
      IF(NT-15)2,2,1
1  RETURN
2  GO TO (1,1,3,1,1,1,1,8,9,10,1,1,13,14,1),NT
3  ISCODE(1)=10
      ISCODE(2)=20
      ISCODE(3)=19
      ISCODE(4)=29
      ISCODE(5)=30
      ISCODE(6)=40
      ISCODE(7)=50
      ISCODE(8)=60
      ISCODE(9)=39
      ISCODE(10)=49
      ISCODE(11)=59
      ISCODE(12)=69
      ISCODE(13)=70
      ISCODE(14)=80
      ISCODE(15)=79
      ISCODE(16)=89

```

47490501

4 NSPIN=ISCODE(N).

GO TO 1

8 ISCODE(1)=0

ISCODE(2)=0

ISCODE(3)=1

ISCODE(4)=1

ISCODE(5)=2

ISCODE(6)=2

ISCODE(7)=3

ISCODE(8)=3

ISCODE(9)=4

ISCODE(10)=4

ISCODE(11)=5

ISCODE(12)=5

ISCODE(13)=6

ISCODE(14)=6

ISCODE(15)=7

ISCODE(16)=7

GO TO 4

9 ISCODE(1)=530

ISCODE(2)=539

ISCODE(3)=550

ISCODE(4)=566

ISCODE(5)=585

ISCODE(6)=611

ISCODE(7)=614

ISCODE(8)=619

ISCODE(9)=624

ISCODE(10)=632

ISCODE(11)=641

ISCODE(12)=653

ISCODE(13)=669

ISCODE(14)=689

ISCODE(15)=712

ISCODE(16)=715

GO TO 4

13 ISCODE(1)=1

ISCODE(2)=2

ISCODE(3)=3

ISCODE(4)=4

ISCODE(5)=5

ISCODE(6)=6

ISCODE(7)=7

ISCODE(8)=8

ISCODE(9)=9

ISCODE(10)=10

ISCODE(11)=11

ISCODE(12)=12

ISCODE(13)=13

ISCODE(14)=14

ISCODE(15)=15

ISCODE(16)=16

ISCODE(17)=17

ISCODE(18)=18

ISCODE(19)=19

ISCODE(20)=20

ISCODE(21)=21

ISCODE(22)=22

ISCODE(23)=23

45720210

45720211

45720212

45720213

45720214

45720215

45720216

45720217

45720218

45720219

45720220

45720221

45720222

45720223

45720224

45720225

45720301

45720302

45720303

45720304

45720305

45720306

45720307

ISCODE(24)=24	45720308
ISCODE(25)=25	45720309
ISCODE(26)=26	45720310
ISCODE(27)=27	45720311
ISCODE(28)=28	45720312
ISCODE(29)=29	45720313
ISCODE(30)=30	45720314
ISCODE(31)=31	45720315
ISCODE(32)=32	45720316
GO TO 4	
14 ISCODE(1)=00	47490502
ISCODE(2)=37	47490503
ISCODE(3)=11	47490504
ISCODE(4)=38	47490505
ISCODE(5)=12	47490506
ISCODE(6)=39	47490507
ISCODE(7)=13	47490508
ISCODE(8)=40	47490509
ISCODE(9)=14	47490510
ISCODE(10)=41	47490511
ISCODE(11)=15	47490512
ISCODE(12)=42	47490513
ISCODE(13)=16	47490514
ISCODE(14)=42	47490515
ISCODE(15)=17	47490516
ISCODE(16)=42	47490517
ISCODE(17)=18	47490518
ISCODE(18)=42	47490519
ISCODE(19)=19	47490520
ISCODE(20)=42	47490521
ISCODE(21)=20	47490522
ISCODE(22)=42	47490523
ISCODE(23)=21	47490524
ISCODE(24)=42	47490525
ISCODE(25)=22	47490601
ISCODE(26)=42	47490602
ISCODE(27)=23	47490603
ISCODE(28)=42	47490604
ISCODE(29)=24	47490605
ISCODE(30)=42	47490606
ISCODE(31)=25	47490607
ISCODE(32)=42	47490608
ISCODE(33)=26	47490609
ISCODE(34)=42	47490610
ISCODE(35)=27	47490611
ISCODE(36)=42	47490612
ISCODE(37)=28	47490613
ISCODE(38)=42	47490614
ISCODE(39)=29	47490615
ISCODE(40)=42	47490616
ISCODE(41)=30	47490617
ISCODE(42)=42	47490618
ISCODE(43)=31	47490619
ISCODE(44)=42	47490620
ISCODE(45)=32	47490621
ISCODE(46)=42	47490622
ISCODE(47)=33	47490623
ISCODE(48)=42	47490624
ISCODE(49)=34	47490625

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        ISCODE(50)=42
        ISCODE(51)=35
        ISCODE(52)=42
        ISCODE(53)=36
        ISCODE(54)=42
        GO TO 4
10 IF(N)16,17,16
17 NSPIN=30
   GO TO 1
16 IF(N-9)22,22,18
18 IF(N-18)19,19,20
19 NSPIN=N+1
   OPTAB(6)=2.0
   GO TO 1
20 IF(N-26)21,21,1
21 NSPIN=N+3
   OPTAB(6)=3.0
   GO TO 1
22 OPTAB(6)=1.0
   GO TO 1
   END
*      FORTRAN
*      LIST
*LABEL
C5500      STAX1
          SUBROUTINE STAX1
C*****
C
C... SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
C      DIMENSION SYSTEM (1700)
C
C      EQUIVALENCE (SYSTEM(1700),KOM (1700),KFLAGS(1692),TAPETB(1622))
C
C      EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1 POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2 CORTAP( 9),
3 TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4 FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
C      EQUIVALENCE (KFLAGS( 70),
1 K0 ( 60),FO ( 60),K1 ( 59),K2 ( 58),K3 ( 57),
2 K4 ( 56),K5 ( 55),K6 ( 54),K7 ( 53),K8 ( 52),
3 K9 ( 51),
4 KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5 IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6 ICLPRT( 35),INDEXX( 34),IPLOTR( 33), NOPLOT( 31),
7 KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSEGIN( 27),NCLREC( 26),
8 LOCMAC( 25),LENSPC( 24),
9 IPOSTP( 20),NUMPST( 19))
C
C      EQUIVALENCE (KOM (8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
C      COMMON SYSTEM
C
C      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C...*****
C COMMON AND DIMENSION-POSITIONING POST-PROCESSORS

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47490701
47490702
47490703
47490704
47490705

20130101

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C      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO,      20130101
1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3,          20130105
2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC,      NPRINT,          20130111
3NODAT,NSPIN,NTEST,NTOOL1,NTOOL2,NTRANS,NWPR,NZCAM,OPTAB,                20130113
4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN,          20130117
5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY,            20130123
6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM                                         20130125
      DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13),    20130201
1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100),    20130205
2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50)                             20130209

C
      IF(CTRDLY)1,2,1
1  GGL=1.0                                                                20130105
      PREBU (2)=70.0
      GO TO 5
2  IF(GGL)5,5,3
3  GGL=0.0                                                                20130111
      PREBU (2)=0.0
5  IF(NTOOL1)6,10,6
6  PREBU(14)=TOOLNO
      NTOOL1=0                                                            20130121
      NTOOL2=0                                                            20130123
10 RETURN                                                                20130124
      END                                                                20130125
*      FORTRAN
*      LIST
* LABEL
C5600      STAU2
      SUBROUTINE STAU2                                                  20130101
C*****
C
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
      DIMENSION  SYSTEM (1700)
C
      EQUIVALENCE (SYSTEM(1700),KOM   (1700),KFLAGS(1692),TAPETB(1622))
C
      EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1  POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2  CORTAP( 9),
3  TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4  FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
      EQUIVALENCE  (KFLAGS( 70),
1  K0   ( 60),F0   ( 60),K1   ( 59),K2   ( 58),K3   ( 57),
2  K4   ( 56),K5   ( 55),K6   ( 54),K7   ( 53),K8   ( 52),
3  K9   ( 51),
4  KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5  IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6  ICLPRT( 35),INDEXX( 34),IPLOTR( 33),      NOPLT( 31),
7  KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8  LOCMAC( 25),LENSPC( 24),
9  IPOSTP( 20),NUMPST( 19))
C
      EQUIVALENCE (KOM   (8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
      COMMON SYSTEM
C

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      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C...*****
C  COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO,
      1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3,
      2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC,      NPRINT,
      3NODAT,NSPIN,NTEST,NTOOL1,NTOOL2,NTRANS,NWPR,NZCAM,OPTAB,
      4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN,
      5SRPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY,
      6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM
      20130101
      DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13),
      1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100),
      2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50)
      20130105
      20130111
      20130113
      20130117
      20130123
      20130125
      20130201
      20130205
      20130209
C
      IF(FEDFLG)5,5,1
      20130103
      1 PREBU (8)=NFEEDC
      FEDFLG=0.0
      20130107
      5 IF(SPIFLG)10,10,6
      20130109
      6 PREBU(10)=NSPIN
      SPIFLG=0.0
      20130113
      10 IF(NTOOL1)12,12,11
      20130115
      B 11 PREBU(14)=606360606060
      NTOOL1=0.0
      20130119
      NTOOL2=0.0
      20130121
      GO TO 20
      20130123
      B 12 PREBU(14)=604760606060
      GO TO 20
      20130203
      20 RETURN
      20130205
      END
      20130207
      *   FORTRAN
      *   LIST
      *LABEL
      C5700      STAU4
      SUBROUTINE STAU4
      20130101
C*****
C
C... SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
      DIMENSION SYSTEM (1700)
C
      EQUIVALENCE (SYSTEM(1700),KOM (1700),KFLAGS(1692),TAPETB(1622))
C
      EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
      1 POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
      2      CORTAP( 9),
      3 TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
      4 FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
      EQUIVALENCE (KFLAGS( 70),
      1 K0 ( 60),F0 ( 60),K1 ( 59),K2 ( 58),K3 ( 57),
      2 K4 ( 56),K5 ( 55),K6 ( 54),K7 ( 53),K8 ( 52),
      3 K9 ( 51),
      4 KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
      5 IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
      6 ICLPRT( 35),INDEXX( 34),IPLOTR( 33),      NOPLOT( 31),
      7 KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
      8 LOCMAC( 25),LENSPC( 24),

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      9 IPOSTP( 20),NUMPST( 19))
C
      EQUIVALENCE (KOM      (8),KAPTIO(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
      COMMON SYSTEM
C
      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C...*****
C  COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO,
      1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3,
      2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC,      NPRINT,
      3NODAT,NSPIN,NTEST,NTOOL1,NTOOL2,NTRANS,NWPR,NZCAM,OPTAB,
      4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN,
      5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY,
      6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM
      DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13),
      1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100),
      2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50)
C
      IF(NTOOL1)1,5,1
      1 IF(TOOLNO-1.0)5,2,3
      2 PREBU (2)=1.0
      GO TO 4
      3 PREBU (2)=3.0
      4 NTOOL1=0
      GO TO 10
      5 IF(NTOOL2)6,10,6
      6 IF(TOOLNO-1.0)10,7,8
      7 PREBU (2)=0.0
      GO TO 9
      8 PREBU (2)=2.0
      9 NTOOL2=0
      10 IF(NZCAM)11,20,11
      11 GO TO 15
      13 CALL PERROR (ERROR)
      15 IF(KOOL-1)16,17,19
      16 TEMP=0.0
      GO TO 18
      17 TEMP=10.0
      18 PREBU(14)=TEMP+ZCAM
      GO TO 28
      19 ERROR=7.0
      GO TO 13
      20 IF(NCOOL)11,30,11
      28 NZCAM=0
      NCOOL=0
      30 IF(FEDFLG)40,40,31
      31 PREBU (8)=NFEEDC
      FEDFLG=0.0
      40 IF(SPIFLG)50,50,41
      41 PREBU(10)=NSPIN
      SPIFLG=0.0
      50 RETURN
      END
*   FORTRAN
*   LIST

```

```

*LABEL
C5800      STAUX6
          SUBROUTINE STAUX6
C*****
C
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
          DIMENSION SYSTEM (1700)
C
          EQUIVALENCE (SYSTEM(1700),KOM (1700),KFLAGS(1692),TAPETB(1622))
C
          EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1  POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2  CORTAP( 9),
3  TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4  FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
          EQUIVALENCE (KFLAGS( 70),
1  K0 ( 60),F0 ( 60),K1 ( 59),K2 ( 58),K3 ( 57),
2  K4 ( 56),K5 ( 55),K6 ( 54),K7 ( 53),K8 ( 52),
3  K9 ( 51),
4  KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5  IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6  ICLPRT( 35),INDEXX( 34),IPLPTR( 33),      NOPLT( 31),
7  KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8  LOCMAC( 25),LENSPC( 24),
9  IPOSTP( 20),NUMPST( 19))
C
          EQUIVALENCE (KOM ( 8),KAPTID(1),KAPTID(2),KAPTTR(3),KAPTCN(4))
C
          COMMON SYSTEM
C
          DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C...*****
C  COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
          COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO,      20130101
1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3,          20130105
2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC,      NPRINT,          20130111
3NODAT,NSPIN,NTEST,NTOOL1,NTOOL2,NTRANS,NWPR,NZCAM,OPTAB,          20130113
4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN,          20130117
5SRPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY,          20130123
6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM          20130125
          DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13),
1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100), 20130201
2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50)          20130209
C
          PREBU(1)=BITS
          IF(NTOOL1-1)1,2,3
1  PREBU(14)=0.0
5  NTOOL1=0
          RETURN
2  PREBU(14)=10.0
          GO TO 5
3  PREBU(14)=40.0
          GO TO 5
          END
*  FORTRAN

```

```

*      LIST
*LABEL
C5900      STAUX8
          SUBROUTINE STAUX8
C*****
C
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
          DIMENSION  SYSTEM (1700)
C
          EQUIVALENCE (SYSTEM(1700),KOM      (1700),KFLAGS(1692),TAPETB(1622))
C
          EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1  POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRODTAP(11),
2  CORTAP( 9),
3  TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4  FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
          EQUIVALENCE (KFLAGS( 70),
1  K0      ( 60),F0      ( 60),K1      ( 59),K2      ( 58),K3      ( 57),
2  K4      ( 56),K5      ( 55),K6      ( 54),K7      ( 53),K8      ( 52),
3  K9      ( 51),
4  KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5  IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6  ICLPRT( 35),INDEXX( 34),IPLOTR( 33),          NOPLOT( 31),
7  KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8  LUCMAC( 25),LENSPC( 24),
9  IPOSTP( 20),Numpst( 19))
C
          EQUIVALENCE (KOM      (8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
          COMMON SYSTEM
C
          DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C...*****
C  COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
          COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO, 20130101
1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3, 20130105
2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC,          NPRINT, 20130111
3NODAT,NSPIN,NTEST,NTOOL1,NTOOL2,NTRANS,NWPR,NZCAM,OPTAB, 20130113
4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN, 20130117
5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY, 20130123
6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM 20130125
          DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13), 20130201
1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100), 20130205
2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50) 20130209
C
          IF(FEDFLG)5,5,1
1  PREBU(8)=NFEEDC
          FEDFLG=0.0
          5  IF(SPIFLG)10,10,6
          6  PRFRU(10)=NSPIN
          SPIFLG=0.0
B 10  PREBU(1)=606000000000
          IF(NCOOL)11,12,11
          11 PREBU(14)=9-KOOL
          NCOOL=0

```

```

12 IF(IDUM(16))13,14,13
13 IDUM(16)=0
   PREBU(2)=OPTAB(5)
14 IF(IDUM(17))15,16,15
15 IDUM(17)=0
   PREBU(12)=OPTAB(19)
16 RETURN
   END
*      FORTRAN
*      LIST
*LABEL
C6000      STAU9
          SUBROUTINE STAU9
C*****
C
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
      DIMENSION  SYSTEM (1700)
C
      EQUIVALENCE (SYSTEM(1700),KOM  (1700),KFLAGS(1692),TAPETB(1622))
C
      EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1  POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2  CORTAP( 9),
3  TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4  FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
      EQUIVALENCE  (KFLAGS( 70),
1  K0   ( 60),F0   ( 60),K1   ( 59),K2   ( 58),K3   ( 57),
2  K4   ( 56),K5   ( 55),K6   ( 54),K7   ( 53),K8   ( 52),
3  K9   ( 51),
4  KFLAG( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5  IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6  ICLPRT( 35),INDEXX( 34),IPLOTR( 33),      NOPLOT( 31),
7  KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8  LOCMAC( 25),LENSPC( 24),
9  IPOSTP( 20),NUMPST( 19))
C
      EQUIVALENCE (KOM  (8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
      COMMON SYSTEM
C
      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C...*****
C  COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO,
1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3,
2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC,      NPRINT,
3NODAT,NSPIN,NTEST,NT0OL1,NT0OL2,NTRANS,NWPR,NZCAM,OPTAB,
4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN,
5RPM,SEQCTR,SFM,SIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY,
6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM
      DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13),
1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100),
2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50)
C
      IF(FEDFLG)5,5,1

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20130101
20130105
20130111
20130113
20130117
20130123
20130125
20130201
20130205
20130209

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1 PREBU(9)=NFEEDC
  FEDFLG=0.0
5 IF(SPIFLG)10,10,6
6 PREBU(10)=NSPIN
  SPIFLG=0.0
10 PREBU(2)=OPTAB(5)
4 IF(NTOOL1)7,8,7
7 PREBU(8)=TOOLNO
  NTOOL1=0
  NTOOL2=0
8 RETURN
  END
*   FORTRAN
*   LIST
*LABEL
C6100      STAU10
          SUBROUTINE STAU10
C*****
C
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
      DIMENSION  SYSTEM (1700)
C
      EQUIVALENCE (SYSTEM(1700),KOM    (1700),KFLAGS(1692),TAPETB(1622))
C
      EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1  POCTAP(15),PLOTAP(14),SKFTAP(13),LIBTAP(12),CRDTAP(11),
2  CORTAP( 9),
3  TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4  FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
      EQUIVALENCE  (KFLAGS( 70),
1  K0    ( 60),F0    ( 60),K1    ( 59),K2    ( 58),K3    ( 57),
2  K4    ( 56),K5    ( 55),K6    ( 54),K7    ( 53),K8    ( 52),
3  K9    ( 51),
4  KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5  IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6  ICLPRT( 35),INDEXX( 34),IPLOTR( 33),          NOPL0T( 31),
7  KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8  LOCMAC( 25),LENSPC( 24),
9  IPOSTP( 20),NUMPST( 19))
C
      EQUIVALENCE (KOM    (8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
      COMMON SYSTEM
C
      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C...*****
C  COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO,
1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3,
2KUMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC,      NPRINT,
3NODAT,NSPIN,NTEST,NT0OL1,NT0OL2,NTRANS,NWPR,NZCAM,OPTAB,
4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN,
5SRPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY,
6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM
      DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13),

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20130101
20130105
20130111
20130113
20130117
20130123
20130125
20130201

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1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100), 20130205
2TAPSTO(250),WORDS(14),BUFPR(20),IDUM(50) 20130209

C
  IF(FEDFLG)5,5,1
1 PREBU(8)=NFEEDC
  FEDFLG=0.0
5 IF(SPIFLG)10,10,6
6 PREBU(10)=NSPIN
  SPIFLG=0.0
10 IF(NCOOL)11,12,11
11 PREBU(14)=9-KOOL
  NCOOL=0
12 IF(IDUM(16))13, 3,13
13 IDUM(16)=0
  PREBU(2)=OPTAB(5)
3 IF(IDUM(20))4,7,4
B 4 PREBU(11)=605160606060
  IDUM(20)=0
7 IF(IDUM(18))8,9,8
8 IDUM(18)=0
  PREBU(6)=OPTAB(21)
9 IF(IDUM(19))15,16,15
15 IDUM(19)=0
  PREBU(9)=OPTAB(24)
16 IF(IDUM(24))17,18,17
17 IDUM(24)=0
  PREBU(14)=OPTAB(25)
18 RETURN
  END
*      FORTRAN
*      LIST
*LABEL
C6200      STAU12
          SUBROUTINE STAU12
C*****
C
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
          DIMENSION  SYSTEM (1700)
C
          EQUIVALENCE (SYSTEM(1700),KOM (1700),KFLAGS(1692),TAPETB(1622))
C
          EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1 POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2 CORTAP( 9),
3 TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4 FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
          EQUIVALENCE (KFLAGS( 70),
1 K0 ( 60),F0 ( 60),K1 ( 59),K2 ( 58),K3 ( 57),
2 K4 ( 56),K5 ( 55),K6 ( 54),K7 ( 53),K8 ( 52),
3 K9 ( 51),
4 KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5 IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6 ICLPRT( 35),INDEXX( 34),IPLOTR( 33), NOPLOT( 31),
7 KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8 LOCMAC( 25),LENSPC( 24),
9 IPOSTP( 20),NUMPST( 19))
C

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      EQUIVALENCE (KOM      (8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
      COMMON SYSTEM
C
      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C... *****
C  COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,8ITS,BUFFER,COMSTO, 20130101
      1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3, 20130105
      2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC,  NPRINT, 20130111
      3NODAT,NSPIN,NTEST,NTOOL1,NTOOL2,NTRANS,NWPR,NZCAM,OPTAB, 20130113
      4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN, 20130117
      5RPM,SEQCTR,SFM,SIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY, 20130123
      6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM 20130125
      DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13), 20130201
      1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100), 20130205
      2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50) 20130209
C
      PREBU(2)=PREBU(1)
B      PREBU(1)=606060606060
      IF(NTOOL1)1,2,1
B      1 PREBU(1)=606323606060
      NTOOL1=0
      NTOOL2=0
      2 RETURN
      END
*      FORTRAN
*      LIST
*LABEL
C6300      STAU13
      SUBROUTINE STAU13
C*****
C
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
      DIMENSION  SYSTEM (1700)
C
      EQUIVALENCE (SYSTEM(1700),KOM      (1700),KFLAGS(1692),TAPETB(1622))
C
      EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1  POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2  CORTAP( 9),
3  TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4  FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
      EQUIVALENCE (KFLAGS( 70),
1  K0      ( 60),F0      ( 60),K1      ( 59),K2      ( 58),K3      ( 57),
2  K4      ( 56),K5      ( 55),K6      ( 54),K7      ( 53),K8      ( 52),
3  K9      ( 51),
4  KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5  IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6  ICLPRT( 35),INDEXX( 34),IPLOTR( 33),  NOPLOT( 31),
7  KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8  LOCMAC( 25),LENSPC( 24),
9  IPOSTP( 20),NUMPST( 19))
C
      EQUIVALENCE (KOM      (8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))

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C      COMMON SYSTEM
C
C      DIMENSION KFLAGS(1), IPOSTP(1), KOM(1)
C
C... *****
C      COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
C      COMMON MACH, NLOOP, NLOOP1, PNOFLG, MTABLE, NID, BITS, BUFFER, COMSTO, 20130101
1CTRDLY, CTRFLG, FEDFLG, FEDIPR, FEDTAB, FORMAT, GGL, INTAP, IND2, IND3, 20130105
2KOMENT, KOOL, KX, KY, KZ, LINCTR, NAXIS, NCOOL, NFEEDC, NPRINT, 20130111
3NODAT, NSPIN, NTEST, NTOOL1, NTOOL2, NTRANS, NWPR, NZCAM, OPTAB, 20130113
4PREBU, PRESTX, PRESTY, PRESTZ, PREVX, PREVY, PREVZ, RADIUS, RETURN, 20130117
5RPM, SEQCTR, SFM, SPIFLG, SPNTAB, TAPSTO, TOOLNO, TRANSX, TRANSY, 20130123
6TRANSZ, WORDS, BUFPR, IDUM, ZCAM 20130125
C      DIMENSION MACH(12), PNOFLG(14), MTABLE(10), BUFFER(50), COMSTO(13), 20130201
1FEDTAB(50), FORMAT(14), INTAP(20), OPTAB(50), PREBU(14), SPNTAB(100), 20130205
2TAPSTO(250), WORDS(14), BUFPR(20), IDUM(50) 20130209
C
C      DIMENSION PRESAV(3) 45721201
IF( IDUM(20)) 21, 20, 21
21 PREBU(8)=599.
20 IF(FEDFLG) 17, 17, 18
18 PREBU(8)=NFEEDC
17 IF( IDUM(24)) 1, 2, 1
1 PREBU(14)=OPTAB(25) 45721203
2 DO 11 I=1, 3 45721204
PRESAV(I)=PREBU(I+2) 45721205
11 PREBU(I+2)=BITS 45721206
DO 10 I=3, 5 45721207
PREBU(I)=PRESAV(I-2) 45721208
IF(PREBU(I)-BITS) 3, 10, 3 45721209
3 IDUM(24)=0 45721210
IDUM(20)=0
FEDFLG=0.0
CALL CARD 45721211
CALL PRINT 45721212
10 CONTINUE 45721213
DO 12 I=1, 3 45721214
12 PREBU(I+2)=PRESAV(I) 45721215
RETURN 45721216
END 45721217
*      FORTRAN
*      LIST
* LABEL
SUBROUTINE STAU14
C*****
C
C... SYSTEM COMMON, DIMENSION, AND EQUIVALENCES+STATEMENTS
C
C      DIMENSION SYSTEM (1700)
C
C      EQUIVALENCE (SYSTEM(1700), KOM (1700), KFLAGS(1692), TAPETB(1622))
C
C      EQUIVALENCE (TAPETB(18), PROTAP(18), CANTAP(17), CLTAPE(16),
1 POCTAP(15), PLOTAP(14), SRFTAP(13), LIBTAP(12), CRDTAP(11),
2 CORTAP( 9),
3 TAPES1( 8), TAPES2( 7), TAPES3( 6), TAPES4( 5),
4 FORTIN( 4), INTAPE( 3), IOUTAP( 2), PUNTAP( 1))

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C
EQUIVALENCE (KFLAGS( 70),
1 K0 ( 60),F0 ( 60),K1 ( 59),K2 ( 58),K3 ( 57),
2 K4 ( 56),K5 ( 55),K6 ( 54),K7 ( 53),K8 ( 52),
3 K9 ( 51),
4 KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5 IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6 ICLPRT( 35),INDEXX( 34),IPLOTR( 33), NOPLOT( 31),
7 KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8 LOCMAC( 25),LENSPC( 24),
9 IPOSTP( 20),NUMPST( 19))

C
EQUIVALENCE (KOM (8),KAPTID(1),KAPTID(2),KAPTTR(3),KAPTCN(4))

C
COMMON SYSTEM

C
DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)

C
C...*****
C COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO, 20130101
1CTROLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3, 20130105
2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC, NPRINT, 20130111
3NODAT,NSPIN,NTEST,NT00L1,NT00L2,NTRANS,NWPR,NZCAM,OPTAB, 20130113
4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN, 20130117
5SRPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY, 20130123
6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM 20130125
DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13),
1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100), 20130205
2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50) 20130209

C
DIMENSION SAVIT(3)
N=IDUM(30)-1
M=IDUM(30)
IF(M-1)16,5,6
6 IF(IDUM(33))28,28,29
29 IDUM(33)=M
28 DO 7 I=1,N
IF(NCOOL-I)8,9,8
9 PREBU(14)=9-KOOL
NCOOL=0
GO TO 10
8 IF(IDUM(31)-I)11,12,11
12 IDUM(31)=0
IF(IDUM(32)-ISAVE)15,7,15
15 PREBU(14)=IDUM(32)
ISAVE=IDUM(32)
GO TO 10
11 IF(IDUM(24)-I)7,14,7
14 PREBU(14)=OPTAB(25)
IDUM(24)=0
10 DO 13 I=1,3
SAVIT(I)=PREBU(I+2)
13 PREBU(I+2)=BITS
CALL CARD
CALL PRINT
PREBU(1)=SEQCTR
DO 26 I=1,3

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26 PREBU(I+2)=SAVIT(I)
7 CONTINUE
5 IF(NCOOL-M)17,18,17
18 PREBU(14)=9-KOOL
   NCOOL=0
   GO TO 16
17 IF(IDUM(31)-M)19,20,19
20 IF(IDUM(32)-ISAVE)21,16,21
21 PREBU(14)=IDUM(32)
   IDUM(31)=0
   ISAVE=IDUM(32)
   GO TO 16
19 IF(IDUM(24)-M)16,23,16
23 PREBU(14)=OPTAB(25)
   IDUM(24)=0
16 IF(IDUM(33))32,27,32
32 IF(PREBU(14)-BITS)30,31,30
30 DO 50 I=1,3
   SAVIT(I)=PREBU(I+2)
50 PREBU(I+2)=BITS
   CALL CARD
   CALL PRINT
   PREBU(1)=SEQCTR
   DO 51 I=1,3
51 PREBU(I+2)=SAVIT(I)
31 PREBU(14)=12.
   IDUM(33)=0
27 IDUM(30)=0
   IF(IDUM(34))24,25,24
24 PREBU(6)=OPTAB(27)
   IDUM(34)=0
25 IF(IDUM(16))1,2,1
1 IDUM(16)=0
   PREBU(2)=OPTAB(5)
2 IF(FEDFLG)3,4,3
3 PREBU(8)=NFEEDC
   FEDFLG=0.
4 IF(SPIFLG)33,34,33
33 PREBU(10)=NSPIN
   SPIFLG=0.
34 RETURN
   END
*      FORTRAN
*      LIST
*LABEL
C6200      STOP
      SUBROUTINE STOP
C*****
C
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
C      DIMENSION  SYSTEM (1700)
C
C      EQUIVALENCE (SYSTEM(1700),KOM  (1700),KFLAGS(1692),TAPETB(1622))
C
C      EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1  POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2  CORTAP( 9),
3  TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),

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47490710
47490711
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47490806
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47490602
47490604
47490605
47490606
47490813

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4  FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
  EQUIVALENCE (KFLAGS( 70),
1  K0      ( 60),FO      ( 60),K1      ( 59),K2      ( 58),K3      ( 57),
2  K4      ( 56),K5      ( 55),K6      ( 54),K7      ( 53),K8      ( 52),
3  K9      ( 51),
4  KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5  IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6  ICLPRT( 35),INDEXX( 34),IPLOTR( 33),      NOPLOT( 31),
7  KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8  LOCMAC( 25),LENSPC( 24),
9  IPOSTP( 20),NUMPST( 19))
C
  EQUIVALENCE (KOM      (8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
  COMMON SYSTEM
C
  DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C...*****
C  COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
  COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO, 20130101
1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3, 20130105
2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC,      NPRINT, 20130111
3NODAT,NSPIN,NTEST,NTOOL1,NTOOL2,NTRANS,NWPR,NZCAM,OPTAB, 20130113
4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN, 20130117
5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY, 20130123
6TRANSZ,WORDS,BUFPRT,IDUM,ZCAM 20130125
  DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13), 20130201
1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100), 20130205
2TAPSTO(250),WORDS(14),BUFPRT(20),IDUM(50) 20130209
C
  FEDFLG =0.
  NCOOL  =0
  NTOOL1 =0
  NTOOL2 =0
  SPIFLG =0.
  IDUM(16)=0
  IDUM(17)=0
  IDUM(18)=0
  IDUM(19)=0
  IDUM(20)=0
  IDUM(24)=0
  N=MTABLE(6)
  IF(N-15)2,2,1
2 GO TO(1,1,1,1,1,1,1,8,9,10,11,1,10,10,1),N
8 SEQCTR=SEQCTR+OPTAB(22)
B  PREBU(1)=606000000000
  PREBU(14)=12.
  GO TO 20
9  PREBU(2)=0.
  OPTAB(5)=0.
21 SEQCTR=SEQCTR+OPTAB(22)
  PREBU(1)=SEQCTR
  GO TO 20
10 PREBU(14)=0.
  GO TO 21
11 PREBU(8)=0.

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      GO TO 21
20 CALL CARD
   CALL PRINT
   RETURN
END
*      FORTRAN
*      LIST
*LABEL
C6300      TOOLN
          SUBROUTINE TOOLN
C*****
C
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
C      DIMENSION  SYSTEM (1700)
C
C      EQUIVALENCE (SYSTEM(1700),KOM  (1700),KFLAGS(1692),TAPETB(1622))
C
C      EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1  POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2  CORTAP( 9),
3  TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4  FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
C      EQUIVALENCE (KFLAGS( 70),
1  K0      ( 60),F0      ( 60),K1      ( 59),K2      ( 58),K3      ( 57),
2  K4      ( 56),K5      ( 55),K6      ( 54),K7      ( 53),K8      ( 52),
3  K9      ( 51),
4  KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5  IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6  ICLPRT( 35),INDEXX( 34),IPLOTR( 33),          NOPLT( 31),
7  KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8  LOCMAC( 25),LENSPC( 24),
9  IPOSTP( 20),NUMPST( 19))
C
C      EQUIVALENCE (KOM  (8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
C      COMMON SYSTEM
C
C      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C...*****
C  COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
C      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO,      20130101
1CTRDLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3,      20130105
2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC,          NPRINT,      20130111
3NODAT,NSPIN,NTEST,NT0OL1,NT0OL2,NTRANS,NWPR,NZCAM,OPTAB,      20130113
4PREBU ,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN,      20130117
5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY,      20130123
6TRANSZ,WORDS,BUFprt,IDUM,ZCAM      20130125
C      DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13),
1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100),      20130201
2TAPSTO(250),WORDS(14),BUFprt(20),IDUM(50)      20130209
C
C      N=MTABLE(6)
C      IF(N-8)1,2,1
1  RETURN
2  FLAG=0.

```

```

      IF(NWPR-4)1,4,3
      3 FLAG=TAPSTO(5)
      4 OPTAB(19)=TAPSTO(4)
      IF(FLAG)6,5,6
      5 IDUM(17)=1
      GO TO 1
      6 SEQCTR=SEQCTR+OPTAB(22)
B     PREBU(1)=606000000000
      PREBU(12)=OPTAB(19)
      8 CALL CARD
      CALL PRINT
      GO TO 1
      END
*     FORTRAN
*     LIST
*LABEL
C6400      TRANS
          SUBROUTINE TRANS
C*****
C
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENC5+STATEMENTS
C
      DIMENSION SYSTEM (1700)
C
      EQUIVALENCE (SYSTEM(1700),KOM (1700),KFLAGS(1692),TAPETB(1622))
C
      EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1     POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2     CORTAP( 9),
3     TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4     FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
      EQUIVALENCE (KFLAGS( 70),
1     K0 ( 60),F0 ( 60),K1 ( 59),K2 ( 58),K3 ( 57),
2     K4 ( 56),K5 ( 55),K6 ( 54),K7 ( 53),K8 ( 52),
3     K9 ( 51),
4     KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5     IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6     ICLPRT( 35),INDEXX( 34),IPLOTR( 33),      NOPLOT( 31),
7     KOYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8     LOCMAC( 25),LENSPC( 24),
9     IPOSTP( 20),NUMPST( 19))
C
      EQUIVALENCE (KOM ( 8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
      COMMON SYSTEM
C
      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C...*****
C     COMMON AND DIMENSION-POSITIONING POST-PROCESSORS
C
      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,BITS,BUFFER,COMSTO,
1CTROLY,CTRFLG,FEDFLG,FEDIPR,FEDTAB,FORMAT,GGL,INTAP,IND2,IND3,
2KOMENT,KOOL,KX,KY,KZ,LINCTR,NAXIS,NCOOL,NFEEDC,      NPRINT,
3NODAT,NSPIN,NTEST,NT0OL1,NT0OL2,NTRANS,NWPR,NZCAM,OPTAB,
4PREBU,PRESTX,PRESTY,PRESTZ,PREVX,PREVY,PREVZ,RADIUS,RETURN,
5RPM,SEQCTR,SFM,SPIFLG,SPNTAB,TAPSTO,TOOLNO,TRANSX,TRANSY,
6TRANSZ,WORDS,BUFPR, IDUM,ZCAM

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20130101

20130101
20130105
20130111
20130113
20130117
20130123
20130125

	DIMENSION MACH(12),PNOFLG(14),MTABLE(10),BUFFER(50),COMSTO(13),	20130201
	1FEDTAB(50),FORMAT(14),INTAP(20),OPTAB(50),PREBU (14),SPNTAB(100),	20130205
	2TAPSTO(250),WORDS(14),BUFPR(20),IDUM(50)	20130209
C		
C		20130103
C	ROUTINE STORES VALUES OF AXIS TRANSLATION	20130104
C		20130105
	IF(NWPR-5)1,5,4	20130107
	1 KOMENT=1	20130109
	CALL COMENT	20130111
	3 RETURN	20130113
	4 TRANSZ=TAPSTO(6)	20130115
	5 TRANSX=TAPSTO(4)	20130117
	TRANSY=TAPSTO(5)	20130119
	NTRANS=1	20130121
	GO TO 3	20130123
	END	20130125
*	FAP	
	ENTRY SWAP	
SWAP	SXA BACK,4	
	SXA BACK+1,2	
	SXA BACK+2,1	
	AXT 5,2	
	AXT 21,1	
	CAL 1,4	
	AXT 22,4	
	STA LOOP	
	STA RESET	
LOOP	CAL **,1	
	AXT 5,2	
	LGR 6	
	RQL 12	
	TIX LOOP+2,2,1	
	LGR 6	
	RQL 6	
	XCL	
RESET	SLW **,1	
	TXI **+1,1,-1	
	TIX LOOP,4,1	
BACK	AXT **,4	
	AXT **,2	
	AXT **,1	
	TRA 2,4	
	END	
*	FORTRAN	
*	LIST	
*	FAP	
*LABEL		
*PARNEW		
*	PART NO. PUNCH TAPE ROUTINE FOR NUMERICAL CONTROL	61658200
	ENTRY PARNEW	
	BCI 1,PARNEW	
*	USE - CALL PARNEW (N,A) OR	61658600
*	CALL PARNEM (N,A) WHERE -	61658700
*	** A - IS THE BCD ARRAY WHOSE CHARACTERS WILL BE	61658800
*	PUNCHED ON TAPE IN 5X5 MATRIX. FOR	61658900
*	PARNOM THE PARITY WILL BE ODD - EVEN	61659000
*	FOR PARNEM.	61659100
*	* IF N IS NEGATIVE, THE ARRAY /A/ WILL	61659200

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*          BE CONSIDERED TO BE STORED BACKWARDS IN          61659300
*          CORE - OTHERWISE FORWARD IN CORE.                61659400
*          ** N - IS THE NUMBER OF CHARACTERS TO BE          61659500
*          PROCESSED IN ARRAY /A/. IF A $ SHOULD             61659600
*          BE ENCOUNTERED, PROCESSING WILL STOP.             61659700
*          THIS ROUTINE SHOULD BE USED TO LABEL A PUNCHED TAPE. 61659800
PARNEW CLA      SO          61659900
      LDQ      SO+1          61660000
      STQ      ST1           61660400
      STQ      ST2           61660500
      SXA      EX,4           61660600
      SXA      EX+1,2         61660700
      SXA      EX+2,1         61660800
      SXA      F3             61660900
      CLA*     $PUNIDS        GET ID          61661000
      STO      CARDN+1        61661100
      CLA*     $PUNNOM        GET SEQ. NO.    61661200
      UFA      =HCH0000       61661300
      SUB      =HCH0000       61661400
      STO      CARDN          61661500
      CLA      2,4            61661600
      STA      LOAD+1         61661700
      SXA      LOAD           61661800
      CLA*     1,4            SET UP CHAR. COUNT 61661900
      PDX      0,2            61662000
      TXI      **1,2,1        61662100
      AXT      1,1            61662200
      TMI      **2            61662300
      AXC      1,1            SET UP STORAGE DIR 61662400
      SXD      LOAD+2,1       61662500
      AXT      24,4           61662600
      STZ      TAP+24,4       61662700
      TIX      *-1,4,1        61662800
      CLA      CS             61662900
      STA      TS             61663000
PAR3  TSX      LOAD,4         61663100
      TNX      PAR1,2,1       61663200
      LDQ      JOE            61663300
      PXD      6              61663400
      LGL      6              61663500
      STQ      JOE            61663600
      CAS      =43            IS IT $        61663700
      TRA      **2            61663800
      TRA      PAR1           YES            61663900
      LXA      TAB1,4         SEARCH TABLE 61664000
      CAS      TAB1,4         61664100
      TRA      **2            61664200
      TRA      PAR5           FOUND          61664300
      TIX      *-3,4,1        61664400
PAR4  TIX      PAR3+1,1,1     61664500
      TXL      PAR3           61664600
PAR5  PXA      0,4            61664700
      SXA      F5,1           61664800
      ALS      1              DOUBLE         61664900
      PAX      0,1            61665000
F3    AXT      0,4            61665100
ST1   CLA      **,1          61665200
      STO      TAP,4          61665300
ST2   CLA      **,1          61665400

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F5	STO	TAP+1,4		61665500
	AXT	0,1		61665600
	TXI	**+1,4,-2		61665700
	SXA	F3,4		61665800
	TXH	**+3,4,-24		61665900
	TSX	PUNC,4	OUTPUT CARD	61666000
	SXA	F3		61666100
TS	TRA	**		61666200
PAR1	CLA	CS1	FILL REST OF CARD	61666300
	STA	TS	AND EXIT	61666400
PAR1A	LXA	F3,4	CARD FULL	61666500
	TXL	EX,4,0	YES	61666600
	LXA	TAB1,4		61666700
	TRA	PAR5		61666800
EX	AXT	0,4		61666900
	AXT	0,2		61667000
	AXT	0,1		61667100
	TRA	3,4		61667200
JOE				61667300
BOTROW	EQU	7		61667400
TAP	BSS	24		61667500
CARDN	BSS	2		61667600
LOAD	AXT	0,1		61667700
	LDQ	**+1		61667800
	TXI	**+1,1,**		61667900
	SXA	LOAD,1		61668000
	STQ	JOE		61668100
	AXT	6,1		61668200
	TRA	1,4		61668300
PUNC	SXA	PUNC1,4		61668400
	TSX	\$PUNCH2,4		61668500
	PZE	0,6		61668600
	TXH	CARDN,6,2		61668700
	TXH	TAP,2,24		61668800
	CLA	CARDN		61668900
	ADD	=1		61669000
	STO	CARDN		61669100
	ADD	=HCH0000		61669200
	FAD	=HCH0000		61669300
	STO*	\$PUNNOM		61669400
	AXT	24,4		61669500
	STZ	TAP+24,4		61669600
	FIX	*-1,4,1		61669700
PUNC1	AXT	0,4		61669800
	TRA	1,4		61669900
SO	CLA	TAB0,1		61670000
	CLA	TAB0+1,1		61670100
SE	CLA	TABE,1		61670200
	CLA	TABE+1,1		61670300
CS		PAR4		61670400
CS1		PAR1A		61670500
TA	OCT	60,0,1,2	012	61670600
	OCT	3,4,5,6	3456	61670700
	OCT	7,10,11,13	789=	61670800
	OCT	20,21,22,23	+ABC	61670900
	OCT	24,25,26,27	DEFG	61671000
	OCT	30,31,33,34	HI.)	61671100
	OCT	40,41,42,43	-JKL	61671200
	OCT	44,45,46,47	MNOP	61671300

	OCT	50,51,53,54	QR\$*	61671400
	OCT	61,62,63,64	/STU	61671500
	OCT	65,66,67,70	VWXY	61671600
	OCT	71,73,74	Z,I	61671700
TAB1	PZE	TAB1-TA		61671800
	REM	TABLE FOR ODD PARITY		61671900
ZA	EQU	9-BOTROW		61672000
Z	EQU	ZA*2		61672100
	VFD	12/128*Z,12/128*Z,12/128*Z		BL61672200
	VFD	12/128*Z,12/128*Z,12/128*Z		BL61672300
	VFD	12/62*Z,12/193*Z,12/193*Z		61672400
	VFD	12/193*Z,12/62*Z,12/128*Z		61672500
	VFD	12/N1,12/N1,12/127*Z		1
	VFD	12/2*Z,12/N1,12/N1		1
	VFD	12/70*Z,12/73*Z,12/81*Z		2
	VFD	12/97*Z,12/194*Z,12/N1		2
	VFD	12/179*Z,12/205*Z,12/73*Z		3
	VFD	12/193*Z,12/161*Z,12/N1		3
	VFD	12/16*Z,12/127*Z,12/146*Z		4
	VFD	12/148*Z,12/152*Z,12/N1		4
	VFD	12/185*Z,12/69*Z,12/69*Z		5
	VFD	12/69*Z,12/167*Z,12/N1		5
	VFD	12/176*Z,12/73*Z,12/73*Z		6
	VFD	12/194*Z,12/188*Z,12/N1		6
	VFD	12/131*Z,12/133*Z,12/121*Z		7
	VFD	12/Z,12/Z,12/N1		7
	VFD	12/182*Z,12/73*Z,12/73*Z		861674000
	VFD	12/73*Z,12/182*Z,12/N1		861674100
	VFD	12/158*Z,12/161*Z,12/73*Z		9
	VFD	12/73*Z,12/134*Z,12/N1		9
	VFD	12/162*Z,12/162*Z,12/162*Z		=61674400
	VFD	12/162*Z,12/162*Z,12/N1		=61674500
	VFD	12/8*Z,12/8*Z,12/62*Z		+61674600
	VFD	12/8*Z,12/8*Z,12/N1		+61674700
	VFD	12/254*Z,12/145*Z,12/145*Z		A61674800
	VFD	12/145*Z,12/254*Z,12/N1		A61674900
	VFD	12/182*Z,12/73*Z,12/73*Z		B
	VFD	12/73*Z,12/127*Z,12/N1		B
	VFD	12/162*Z,12/193*Z,12/193*Z		C
	VFD	12/193*Z,12/62*Z,12/N1		C
	VFD	12/62*Z,12/193*Z,12/193*Z		D
	VFD	12/193*Z,12/127*Z,12/N1		D
	VFD	12/193*Z,12/73*Z,12/73*Z		E
	VFD	12/73*Z,12/127*Z,12/N1		E
	VFD	12/Z,12/137*Z,12/137*Z		F
	VFD	12/137*Z,12/127*Z,12/N1		F
	VFD	12/121*Z,12/73*Z,12/193*Z		G
	VFD	12/193*Z,12/62*Z,12/N1		G
	VFD	12/127*Z,12/8*Z,12/8*Z		H61676200
	VFD	12/8*Z,12/127*Z,12/N1		H61676300
	VFD	12/N1,12/193*Z,12/127*Z		I61676400
	VFD	12/193*Z,12/N1,12/N1		I61676500
	VFD	12/N1,12/N1,12/224*Z		.61676600
	VFD	12/224*Z,12/N1,12/N1		.61676700
	VFD	12/N1,12/28*Z,12/162*Z		)
	VFD	12/193*Z,12/193*Z,12/N1		)
	VFD	12/8*Z,12/8*Z,12/8*Z		-61677000
	VFD	12/8*Z,12/8*Z,12/N1		-61677100
	VFD	12/N1,12/191*Z,12/64*Z		J

VFD	12/64*Z,12/32*Z,12/N1	J
VFD	12/193*Z,12/162*Z,12/148*Z	K
VFD	12/8*Z,12/127*Z,12/N1	K
VFD	12/64*Z,12/64*Z,12/64*Z	L
VFD	12/64*Z,12/127*Z,12/N1	L
VFD	12/127*Z,12/2*Z,12/140*Z	61677800
VFD	12/2*Z,12/127*Z,12/N1	61677900
VFD	12/127*Z,12/8*Z,12/4*Z	N
VFD	12/2*Z,12/127*Z,12/N1	N
VFD	12/62*Z,12/193*Z,12/69*Z	061678200
VFD	12/67*Z,12/62*Z,12/N1	061678300
VFD	12/134*Z,12/137*Z,12/137*Z	P
VFD	12/137*Z,12/127*Z,12/N1	P
VFD	12/94*Z,12/161*Z,12/81*Z	Q
VFD	12/193*Z,12/62*Z,12/N1	Q
VFD	12/70*Z,12/41*Z,12/25*Z	R
VFD	12/137*Z,12/127*Z,12/N1	R
VFD	12/49*Z,12/73*Z,12/127*Z	\$
VFD	12/73*Z,12/70*Z,12/N1	\$
VFD	12/8*Z,12/42*Z,12/28*Z	*61679200
VFD	12/42*Z,12/8*Z,12/N1	*61679300
VFD	12/2*Z,12/4*Z,12/8*Z	/
VFD	12/16*Z,12/32*Z,12/N1	/
VFD	12/49*Z,12/73*Z,12/73*Z	S
VFD	12/73*Z,12/70*Z,12/N1	S
VFD	12/Z,12/Z,12/127*Z	T61679800
VFD	12/Z,12/Z,12/N1	T61679900
VFD	12/191*Z,12/64*Z,12/64*Z	U61680000
VFD	12/64*Z,12/191*Z,12/N1	U61680100
VFD	12/143*Z,12/176*Z,12/64*Z	V61680200
VFD	12/176*Z,12/143*Z,12/N1	V61680300
VFD	12/191*Z,12/64*Z,12/188*Z	W61680400
VFD	12/64*Z,12/191*Z,12/N1	W61680500
VFD	12/227*Z,12/148*Z,12/8*Z	X61680600
VFD	12/148*Z,12/227*Z,12/N1	X61680700
VFD	12/7*Z,12/8*Z,12/112*Z	Y61680800
VFD	12/8*Z,12/7*Z,12/N1	Y61680900
VFD	12/67*Z,12/69*Z,12/73*Z	Z
VFD	12/81*Z,12/97*Z,12/N1	Z
VFD	12/N1,12/176*Z,12/208*Z	,
VFD	12/N1,12/N1,12/N1	,
VFD	12/N1,12/193*Z,12/193*Z	)
VFD	12/162*Z,12/28*Z,12/N1	)
TABO	BSS	0
K1	EQU	192*Z
N1	EQU	128*Z
REM	TABLE FOR EVEN PARITY	
VFD	12/K1,12/K1,12/K1	61681600
VFD	12/K1,12/K1,12/K1	61681700
VFD	12/190*Z,12/65*Z,12/65*Z	61681800
VFD	12/65*Z,12/190*Z,12/K1	61681900
VFD	12/K1,12/130*Z,12/255*Z	BL61682000
VFD	12/K1,12/K1,12/K1	BL61682100
VFD	12/66*Z,12/225*Z,12/209*Z	61682200
VFD	12/201*Z,12/198*Z,12/K1	61682300
VFD	12/33*Z,12/65*Z,12/201*Z	161682400
VFD	12/77*Z,12/51*Z,12/K1	161682500
VFD	12/24*Z,12/20*Z,12/18*Z	261682600
VFD	12/255*Z,12/144*Z,12/K1	261682700
		361682800
		361682900
		461683000
		461683100

VFD	12/39*Z,12/197*Z,12/197*Z	561683200
VFD	12/197*Z,12/57*Z,12/K1	561683300
VFD	12/60*Z,12/66*Z,12/201*Z	661683400
VFD	12/201*Z,12/48*Z,12/K1	661683500
VFD	12/129*Z,12/129*Z,12/249*Z	761683600
VFD	12/5*Z,12/3*Z,12/K1	761683700
VFD	12/54*Z,12/201*Z,12/201*Z	861683800
VFD	12/201*Z,12/54*Z,12/K1	861683900
VFD	12/6*Z,12/201*Z,12/201*Z	961684000
VFD	12/33*Z,12/30*Z,12/K1	961684100
VFD	12/34*Z,12/34*Z,12/34*Z	=61684200
VFD	12/34*Z,12/34*Z,12/K1	=61684300
VFD	12/136*Z,12/136*Z,12/190*Z	+61684400
VFD	12/136*Z,12/136*Z,12/K1	+61684500
VFD	12/126*Z,12/17*Z,12/17*Z	A61684600
VFD	12/17*Z,12/126*Z,12/K1	A61684700
VFD	12/255*Z,12/201*Z,12/201*Z	B61684800
VFD	12/201*Z,12/54*Z,12/K1	B61684900
VFD	12/190*Z,12/65*Z,12/65*Z	C61685000
VFD	12/65*Z,12/34*Z,12/K1	C61685100
VFD	12/255*Z,12/65*Z,12/65*Z	61685200
VFD	12/65*Z,12/190*Z,12/K1	D61685300
VFD	12/255*Z,12/201*Z,12/201*Z	61685400
VFD	12/201*Z,12/65*Z,12/K1	E61685500
VFD	12/255*Z,12/9*Z,12/9*Z	F61685600
VFD	12/9*Z,12/129*Z,12/K1	F61685700
VFD	12/190*Z,12/65*Z,12/65*Z	G61685800
VFD	12/201*Z,12/249*Z,12/K1	G61685900
VFD	12/255*Z,12/136*Z,12/136*Z	H61686000
VFD	12/136*Z,12/255*Z,12/K1	H61686100
VFD	12/K1,12/65*Z,12/255*Z	I61686200
VFD	12/65*Z,12/K1,12/K1	I61686300
VFD	12/K1,12/K1,12/96*Z	.61686400
VFD	12/96*Z,12/K1,12/K1	.61686500
VFD	12/K1,12/65*Z,12/65*Z	I61686600
VFD	12/34*Z,12/156*Z,12/K1	I61686700
VFD	12/136*Z,12/136*Z,12/136*Z	-61686800
VFD	12/136*Z,12/136*Z,12/K1	-61686900
VFD	12/160*Z,12/K1,12/K1	J61687000
VFD	12/63*Z,12/K1,12/K1	J61687100
VFD	12/255*Z,12/136*Z,12/20*Z	K61687200
VFD	12/34*Z,12/65*Z,12/K1	K61687300
VFD	12/255*Z,12/K1,12/K1	L61687400
VFD	12/K1,12/K1,12/K1	L61687500
VFD	12/255*Z,12/130*Z,12/12*Z	61687600
VFD	12/130*Z,12/255*Z,12/K1	61687700
VFD	12/255*Z,12/130*Z,12/132*Z	N61687800
VFD	12/136*Z,12/255*Z,12/K1	N61687900
VFD	12/190*Z,12/65*Z,12/197*Z	O61688000
VFD	12/195*Z,12/190*Z,12/K1	O61688100
VFD	12/255*Z,12/9*Z,12/9*Z	P61688200
VFD	12/9*Z,12/6*Z,12/K1	P61688300
VFD	12/190*Z,12/65*Z,12/209*Z	Q61688400
VFD	12/33*Z,12/222*Z,12/K1	Q61688500
VFD	12/255*Z,12/9*Z,12/153*Z	R61688600
VFD	12/169*Z,12/198*Z,12/K1	R61688700
VFD	12/198*Z,12/201*Z,12/255*Z	\$61688800
VFD	12/201*Z,12/177*Z,12/K1	\$61688900
VFD	12/136*Z,12/170*Z,12/156*Z	*61689000

VFD	12/170*Z,12/136*Z,12/K1	*61689100
VFD	12/160*Z,12/144*Z,12/136*Z	/61689200
VFD	12/132*Z,12/130*Z,12/K1	/61689300
VFD	12/198*Z,12/201*Z,12/201*Z	S61689400
VFD	12/201*Z,12/177*Z,12/K1	S61689500
VFD	12/129*Z,12/129*Z,12/255*Z	T61689600
VFD	12/129*Z,12/129*Z,12/K1	T61689700
VFD	12/63*Z,12/K1,12/K1	U61689800
VFD	12/K1,12/63*Z,12/K1	U61689900
VFD	12/15*Z,12/48*Z,12/K1	V61690000
VFD	12/48*Z,12/15*Z,12/K1	V61690100
VFD	12/63*Z,12/K1,12/60*Z	W61690200
VFD	12/K1,12/63*Z,12/K1	W61690300
VFD	12/99*Z,12/20*Z,12/136*Z	X61690400
VFD	12/20*Z,12/99*Z,12/K1	X61690500
VFD	12/135*Z,12/136*Z,12/240*Z	61690600
VFD	12/136*Z,12/135*Z,12/K1	Y61690700
VFD	12/225*Z,12/209*Z,12/201*Z	Z61690800
VFD	12/197*Z,12/195*Z,12/K1	Z61690900
VFD	12/K1,12/K1,12/80*Z	,61691000
VFD	12/48*Z,12/K1,12/K1	,61691100
VFD	12/K1,12/156*Z,12/34*Z	61691200
VFD	12/65*Z,12/65*Z,12/K1	(61691300
TABE	BSS	0
	END	61691400
*	FAP	61691500
*	LIST	
	ENTRY	KARKNT
KARKNT	TRA	3,4
	END	
*	FAP	
*	LIST	
*	CONBCD	ROUTINE 2 WORD FLEXIBLE FORMAT BCD CONVERSION.
	ENTRY	CONBCD
	BCI	1,CONBCD
*	USE	CALL CONBCD (A,B,I,J) WHERE -
*	A -	IS THE FLOATING POINT NUMBER TO BE CONVERTED.
*	B -	BCD ARRAY TO STORE CONVERTED RESULTS.
*	I -	IS THE FIELD LENGTH OF BCD NUMBER.
*		IF I IS NEGATIVE, THEN INCLUSION SIGN OF A IS
*		DESIRED. THE PROGRAM WILL INCREASE THE FIELD
*		LENGTH BY ONE CHARACTER IN THIS CASE.
*	J -	DEFINES THE NUMBER OF FRACTIONAL DIGITS
*		THAT A SHOULD HAVE. IF J IS NEGATIVE, THEN
*		A DECIMAL POINT IS TO BE INSERTED.
*		IN THIS CASE THE FIELD LENGTH (I) WILL BE
*		INCREASED BY ONE.
*		IF YOU WISH TO BLANK OUT TRAILING ZEROES, ADD 100
*		TO THE MAGNITUDE OF J.
*	NOTE -	THE ADJUSTED I VALUE CANNOT EXCEED 12 AND
*		I CANNOT BE ZERO.
*		J WILL NOT BE ALLOWED TO EXCEED 8 IN VALUE.
CONBCD	SXA	EX,4
	SXA	EX+1,2
	SXA	EX+2,1
	AXT	0,1
	AXT	8,2
	STZ	PFLAG+8,2
	TIX	*-1,2,1
		61409600
		61409700
		61409800
		61409900
		61410000
		61410100
		61410200
		61410300
		61410400
		61410500
		61410600
		61410700
		61410800
		61410900
		61411000
		61411100
		61411200
		61411300
		61411400
		61411500
		61411600
		61411700
		61411800
		61411900
		61412000
		61412100
		61412200

CAL	BIBA		61412300
STP	BIBB		61412400
CLA	BIBC		61412500
STO	BIBCD		61412600
CLA	2,4	B	61412700
STA	CON5+2		61412800
SUB	=1		61412900
STA	CON7		61413000
CLA*	3,4	I	61413100
SLW	I		61413200
TZE	ERR1	I=0	61413300
LDQ*	1,4		61413400
TPL	*+7		61413500
ACL	ONE		61413600
SLW	I		61413700
CLA	=16		61413800
TQP	*+2		61413900
ADD	=16		61414000
STO	SFLAG	SET SIGN	61414100
XCL			61414200
STO	A		61414300
CLA*	4,4		61414400
SLW	J		61414500
CLA	J		61414600
SUB	=100B17		61414700
TMI	*+6		61414800
SLW	J		61414900
CLA	BIBA		61415000
STP	BIBB		61415100
CLA	NOP		61415200
STO	BIBCD		61415300
CLA*	4,4		61415400
TPL	*+5		61415500
CLA	I	DEC. POINT DESIRED.	61415600
ADD	ONE		61415700
STO	I		61415800
SLW	PFLAG	SET FLAG	61415900
CLA	J		61416000
SUB	8V		61416100
TMI	*+3		61416200
CLA	8V	J IS TOO LARGE SET	61416300
STO	J	IT TO 8.	61416400
CLA	J		
STO	NODEC		
CLA	12V		61416500
SUB	I		61416600
TMI	ERR1	ADJUSTED I IS LARGER 12.	61416700
CLA	A		61416800
LXD	J,2	LXA FOR 7090	61416900
TZE	CON1-1		
FAD	TAB5,2	ROUND	61417100
UFA	=HCH0000		61417200
FAD	=HCH0000		61417300
SLW	Q1	INTEGRAL A	61417400
CLA	A		61417500
UFA	=HCH0000		61417600
FAD	=HCH0000		61417700
STO	Q3		61417800
CLA	A	CONVERT FRACTION	61417900

	FSB	Q3		61418000
	SSP			61418100
	XCA			61418200
	FMP	TAB2,2		61418300
	FAD	=.5		61418400
	STO	Q2	Q2=(A-Q1)*10**J+.5	61418500
	UFA	=HCH0000		61418600
	SUB	=HCH0000		61418700
	TSX	BIBCD,4		61418800
	TXH	**2,2,6		61418900
	ANA	TAB3,2		61419000
	SLW	BB2		61419100
	TXL	CON1,2,5		
	XCA			61419300
	TSX	BIBCD,4		61419400
	TXI	**1,2,-6		61419500
	ANA	TAB3,2		61419600
	SLW	BB1		61419700
	TXI	**1,1,1		61419800
CON1	CLA	J		61419900
	STO	CC		61420000
	NZT	PFLAG	DEC. POINT WANTED	61420100
	TRA	CON3	NO	61420200
	TXL	**2,2,5		
	TXI	**1,2,-6		61420400
	CAL	TAB1,2		61420500
	ORS	BB2,1		61420600
	CLA	CC		61420700
	ADD	ONE		61420800
	STO	CC		61420900
CON3	CLA	I		61421000
	SUB	CC		61421100
	ZET	SFLAG		61421200
	SUB	ONE		61421300
	PDX	0,2	PAX FOR-90	61421400
	TXL	**2,2,6		61421500
	TXI	**1,2,-6		61421600
	CLA	Q1	CONVERT INTEGRAL PART	61421700
	UFA	=HCH0000		61421800
	SUB	=HCH0000		61421900
	TSX	BIBCD,4		61422000
	ANA	TAB3,2		61422100
	XCL			61422200
	PXD			61422300
	LXD	CC,4	LXA FOR 7090	61422400
	TXL	**3,4,0		61422500
	LGL	6	MERGE INTEGRAL	61422600
	TXI	*-2,4,-1	PART	61422700
	ORS	BB1	WITH	61422800
	XCL		FRACTION	61422900
	ORS	BB2		61423000
	NZT	SFLAG	SIGN WANTED	61423100
	TRA	CON4	NO	61423200
	LXD	I,4	LXA FOR 7090F	61423300
	TXI	**1,4,-1		61423400
	PXD			61423500
	LDQ	SFLAG		61423600
	LGL	6		61423700
	TIX	*-1,4,1		61423800

	ORS	BB1		61423900
	XCL			61424000
	ORS	BB2		61424100
CON4	AXT	1,1	FILL IN WITH BLANKS	61424200
	CLA	12V		61424300
	SUB	I		61424400
	TZE	CON5		61424500
	PDX	0,2	PAX FOR 7090F	61424600
	SUB	6V		61424700
	TZE	CON6		61424800
	TXL	**3,2,6		61424900
	TXI	**1,2,-6		61425000
	AXT	0,1		61425100
	CAL	TAB4,2		61425200
	ORS	BB2,1		61425300
CON5	CLA	BB2		61425400
	TXH	**3,1,0		61425500
	STO	**		61425600
	TXL	EX		61425700
CON7	STO	**		61425800
	CLA	BB1		61425900
	TRA	CON7-2		61426000
EX	AXT	0,4	EXIT	61426100
	AXT	0,2		61426200
	AXT	0,1		61426300
	TRA	5,4		61426400
CON6	AXT	0,1		61426500
	TRA	CON5		61426600
ERR1	CAL	=6B17		61426700
	TSX	\$(STH),4		61426800
	TSX	CON8		61426900
	LDQ	I		61427000
	STR			61427100
	TSX	\$(FIL),4		61427200
	TSX	\$PERROR,4		61427300
CON8	BCI	6,(26H ERROR - NO. OF DIGITS IS 16)		61427400
BIBCD	TZE	1,4		61427500
	SXA	BIB,4		61427600
	XCA			61427700
	AXT	0,4		61427800
	STZ	Q3		61427900
	PXD			61428000
	DVP	=10		61428100
BIBB	TXL	**7		
	TNZ	Q3+2		61428300
	CLA	NODEC		
	TZE	Q3+2		
	SUB	ONE		
	STO	NODEC		
	CAL	=48		61428400
	ALS	0,4		61428500
	ORS	Q3		61428600
	TXI	**1,4,-6		61428700
	TXH	BIBB-2,4,-36		61428800
	CAL	Q3		61428900
BIB	AXT	0,4		61429000
	TRA	1,4		61429100
Q3	BSS	2		61429200
	STO	*-1		61429300

CAL	BIBA	61429400
STP	8188	61429500
CLA	Q3+1	61429600
BIBA TXL	8188	61429700
DEC	100000000.,10000000.,1000000.	61429800
DEC	100000.,10000.,1000.,100.,10.	61429900
TAB2 BSS	0	61430000
BCI	2,.000000.0000	61430100
OCT	33000000,330000,3300	61430200
TAB1 OCT	33	61430300
OCT	777777777777,7777777777	61430400
OCT	77777777,777777,7777,77	61430500
TAB3 DEC	0	61430600
BCI	1, 0	61430700
BCI	1, 00	61430800
BCI	1, 000	61430900
BCI	1, 0000	61431000
BCI	1, 00000	61431100
TAB4 DEC	0	61431200
PFLAG		61431300
SFLAG		61431400
BB1		61431500
BB2		61431600
Q1		61431700
Q2		61431800
A		61431900
CC		61432000
ONE DEC	1817	61432100
12V DEC	12817	61432200
8V DEC	8817	61432300
6V DEC	6817	61432400
J		61432500
I		61432600
DEC	.5E-8,.5E-7,.5E-6	61432700
DEC	.5E-5,.5E-4,.5E-3,.5E-2	61432800
DEC	.5E-1	61432900
TAB5 DEC	.5	61433000
NOP NOP		61433100
BIBC TZE	1,4	61433200
NODEC PZE		
END		61433300
* FAP		
* LIST		
*PARNEM00		61658100
* PART NO. PUNCH TAPE ROUTINE FOR NUMERICAL CONTROL		61658200
ENTRY PARNOM		61658300
ENTRY PARNEM		61658400
BCI 1,PARNOM		61658500
* USE - CALL PARNOM (N,A) OR		61658600
* CALL PARNEM (N,A) WHERE -		61658700
* ** A - IS THE BCD ARRAY WHOSE CHARACTERS WILL BE		61658800
* PUNCHED ON TAPE IN 5X5 MATRIX. FOR		61658900
* PARNOM THE PARITY WILL BE ODD - EVEN		61659000
* FOR PARNEM.		61659100
* * IF N IS NEGATIVE, THE ARRAY /A/ WILL		61659200
* BE CONSIDERED TO BE STORED BACKWARDS IN		61659300
* CORE - OTHERWISE FORWARD IN CORE.		61659400
* ** N - IS THE NUMBER OF CHARACTERS TO BE		61659500
* PROCESSED IN ARRAY /A/. IF A \$ SHOULD		61659600

*		BE ENCOUNTERED, PROCESSING WILL STOP.	61659700
*		THIS ROUTINE SHOULD BE USED TO LABEL A PUNCHED TAPE.	61659800
PARNOM	CLA	SO	61659900
	LDQ	SO+1	61660000
	TXL	PARNEM+2	61660100
PARNEM	CLA	SE	61660200
	LDQ	SE+1	61660300
	STO	ST1	61660400
	STQ	ST2	61660500
	SXA	EX,4	61660600
	SXA	EX+1,2	61660700
	SXA	EX+2,1	61660800
	SXA	F3	61660900
	CLA*	\$PUNIDS	61661000
	STO	CARDN+1	61661100
	CLA*	\$PUNNOM	61661200
	UFA	=HCH0000	61661300
	SUB	=HCH0000	61661400
	STO	CARDN	61661500
	CLA	2,4	61661600
	STA	LOAD+1	61661700
	SXA	LOAD	61661800
	CLA*	1,4	61661900
	PDX	0,2	61662000
	TXI	*+1,2,1	61662100
	AXT	1,1	61662200
	TMI	*+2	61662300
	AXC	1,1	61662400
	SXD	LOAD+2,1	61662500
	AXT	24,4	61662600
	STZ	TAP+24,4	61662700
	TIX	*-1,4,1	61662800
	CLA	CS	61662900
	STA	TS	61663000
PAR3	TSX	LOAD,4	61663100
	TNX	PAR1,2,1	61663200
	LDQ	JOE	61663300
	PXD		61663400
	LGL	6	61663500
	STQ	JOE	61663600
	CAS	=43	61663700
	TRA	*+2	61663800
	TRA	PAR1	61663900
	LXA	TAB1,4	61664000
	CAS	TAB1,4	61664100
	TRA	*+2	61664200
	TRA	PAR5	61664300
	TIX	*-3,4,1	61664400
PAR4	TIX	PAR3+1,1,1	61664500
	TXL	PAR3	61664600
PAR5	PXA	0,4	61664700
	SXA	F5,1	61664800
	ALS	1	61664900
	PAX	0,1	61665000
F3	AXT	0,4	61665100
ST1	CLA	**1	61665200
	STO	TAP,4	61665300
ST2	CLA	**1	61665400
	STO	TAP+1,4	61665500

F5	AXT	0,1		61665600
	TXI	**1,4,-2		61665700
	SXA	F3,4		61665800
	TXH	**3,4,-24		61665900
	TSX	PUNC,4	OUTPUT CARD	61666000
	SXA	F3		61666100
TS	TRA	**		61666200
PAR1	CLA	CS1	FILL REST OF CARD	61666300
	STA	TS	AND EXIT	61666400
PAR1A	LXA	F3,4	CARD FULL	61666500
	TXL	EX,4,0	YES	61666600
	LXA	TAB1,4		61666700
	TRA	PAR5		61666800
EX	AXT	0,4		61666900
	AXT	0,2		61667000
	AXT	0,1		61667100
	TRA	3,4		61667200
JOE				61667300
BOTROW	EQU	7		61667400
TAP	BSS	24		61667500
CARDN	BSS	2		61667600
LOAD	AXT	0,1		61667700
	LDQ	**1		61667800
	TXI	**1,1,**		61667900
	SXA	LOAD,1		61668000
	STQ	JOE		61668100
	AXT	6,1		61668200
	TRA	1,4		61668300
PUNC	SXA	PUNC1,4		61668400
	TSX	\$PUNCH2,4		61668500
	PZE	0,6		61668600
	TXH	CARDN,6,2		61668700
	TXH	TAP,2,24		61668800
	CLA	CARDN		61668900
	ADD	=1		61669000
	STO	CARDN		61669100
	ADD	=HCH0000		61669200
	FAD	=HCH0000		61669300
	STO*	\$PUNNOM		61669400
	AXT	24,4		61669500
	STZ	TAP+24,4		61669600
	TIK	*-1,4,1		61669700
PUNC1	AXT	0,4		61669800
	TRA	1,4		61669900
SO	CLA	TAB0,1		61670000
	CLA	TAB0+1,1		61670100
SE	CLA	TABE,1		61670200
	CLA	TABE+1,1		61670300
CS		PAR4		61670400
CS1		PAR1A		61670500
TA	OCT	60,0,1,2	012	61670600
	OCT	3,4,5,6	3456	61670700
	OCT	7,10,11,13	789=	61670800
	OCT	20,21,22,23	+ABC	61670900
	OCT	24,25,26,27	DEFG	61671000
	OCT	30,31,33,34	HI.)	61671100
	OCT	40,41,42,43	-JKL	61671200
	OCT	44,45,46,47	MNOP	61671300
	OCT	50,51,53,54	QR\$*	61671400

	OCT	61,62,63,64	/STU	61671500
	OCT	65,66,67,70	VWXY	61671600
	OCT	71,73,74	Z,I	61671700
TAB1	PZE	TAB1-TA		61671800
	REM	TABLE FOR ODD PARITY		61671900
ZA	EQU	9-BOTROW		61672000
Z	EQU	ZA*2		61672100
	VFD	12/128*Z,12/128*Z,12/128*Z		BL61672200
	VFD	12/128*Z,12/128*Z,12/128*Z		BL61672300
	VFD	12/62*Z,12/193*Z,12/193*Z		61672400
	VFD	12/193*Z,12/62*Z,12/128*Z		61672500
	VFD	12/N1,12/2*Z,12/127*Z		161672600
	VFD	12/N1,12/N1,12/N1		161672700
	VFD	12/194*Z,12/97*Z,12/81*Z		261672800
	VFD	12/73*Z,12/70*Z,12/N1		261672900
	VFD	12/161*Z,12/193*Z,12/73*Z		361673000
	VFD	12/205*Z,12/179*Z,12/N1		361673100
	VFD	12/152*Z,12/148*Z,12/146*Z		461673200
	VFD	12/127*Z,12/16*Z,12/N1		461673300
	VFD	12/167*Z,12/69*Z,12/69*Z		561673400
	VFD	12/69*Z,12/185*Z,12/N1		561673500
	VFD	12/188*Z,12/194*Z,12/73*Z		661673600
	VFD	12/73*Z,12/176*Z,12/N1		661673700
	VFD	12/Z,12/Z,12/121*Z		761673800
	VFD	12/133*Z,12/131*Z,12/N1		761673900
	VFD	12/182*Z,12/73*Z,12/73*Z		861674000
	VFD	12/73*Z,12/182*Z,12/N1		861674100
	VFD	12/134*Z,12/73*Z,12/73*Z		961674200
	VFD	12/161*Z,12/158*Z,12/N1		961674300
	VFD	12/162*Z,12/162*Z,12/162*Z		=61674400
	VFD	12/162*Z,12/162*Z,12/N1		=61674500
	VFD	12/8*Z,12/8*Z,12/62*Z		+61674600
	VFD	12/8*Z,12/8*Z,12/N1		+61674700
	VFD	12/254*Z,12/145*Z,12/145*Z		A61674800
	VFD	12/145*Z,12/254*Z,12/N1		A61674900
	VFD	12/127*Z,12/73*Z,12/73*Z		B61675000
	VFD	12/73*Z,12/182*Z,12/N1		B61675100
	VFD	12/62*Z,12/193*Z,12/193*Z		C61675200
	VFD	12/193*Z,12/162*Z,12/N1		C61675300
	VFD	12/127*Z,12/193*Z,12/193*Z		D61675400
	VFD	12/193*Z,12/62*Z,12/N1		D61675500
	VFD	12/127*Z,12/73*Z,12/73*Z		E61675600
	VFD	12/73*Z,12/193*Z,12/N1		E61675700
	VFD	12/127*Z,12/137*Z,12/137*Z		F61675800
	VFD	12/137*Z,12/Z,12/N1		F61675900
	VFD	12/62*Z,12/193*Z,12/193*Z		G61676000
	VFD	12/73*Z,12/121*Z,12/N1		G61676100
	VFD	12/127*Z,12/8*Z,12/8*Z		H61676200
	VFD	12/8*Z,12/127*Z,12/N1		H61676300
	VFD	12/N1,12/193*Z,12/127*Z		I61676400
	VFD	12/193*Z,12/N1,12/N1		I61676500
	VFD	12/N1,12/N1,12/224*Z		.61676600
	VFD	12/224*Z,12/N1,12/N1		.61676700
	VFD	12/N1,12/193*Z,12/193*Z		161676800
	VFD	12/162*Z,12/28*Z,12/N1		61676900
	VFD	12/8*Z,12/8*Z,12/8*Z		-61677000
	VFD	12/8*Z,12/8*Z,12/N1		-61677100
	VFD	12/32*Z,12/64*Z,12/64*Z		J61677200
	VFD	12/191*Z,12/N1,12/N1		J61677300

VFD	12/127*Z,12/8*Z,12/148*Z	K61677400
VFD	12/162*Z,12/193*Z,12/N1	K61677500
VFD	12/127*Z,12/64*Z,12/64*Z	L61677600
VFD	12/64*Z,12/64*Z,12/N1	L61677700
VFD	12/127*Z,12/2*Z,12/140*Z	61677800
VFD	12/2*Z,12/127*Z,12/N1	61677900
VFD	12/127*Z,12/2*Z,12/4*Z	N61678000
VFD	12/8*Z,12/127*Z,12/N1	N61678100
VFD	12/62*Z,12/193*Z,12/69*Z	O61678200
VFD	12/67*Z,12/62*Z,12/N1	O61678300
VFD	12/127*Z,12/137*Z,12/137*Z	P61678400
VFD	12/137*Z,12/134*Z,12/N1	P61678500
VFD	12/62*Z,12/193*Z,12/81*Z	Q61678600
VFD	12/161*Z,12/94*Z,12/N1	Q61678700
VFD	12/127*Z,12/137*Z,12/25*Z	R61678800
VFD	12/41*Z,12/70*Z,12/N1	R61678900
VFD	12/70*Z,12/73*Z,12/127*Z	\$61679000
VFD	12/73*Z,12/49*Z,12/N1	\$61679100
VFD	12/8*Z,12/42*Z,12/28*Z	*61679200
VFD	12/42*Z,12/8*Z,12/N1	*61679300
VFD	12/32*Z,12/16*Z,12/8*Z	/61679400
VFD	12/4*Z,12/2*Z,12/N1	/61679500
VFD	12/70*Z,12/73*Z,12/73*Z	S61679600
VFD	12/73*Z,12/49*Z,12/N1	S61679700
VFD	12/Z,12/Z,12/127*Z	T61679800
VFD	12/Z,12/Z,12/N1	T61679900
VFD	12/191*Z,12/64*Z,12/64*Z	U61680000
VFD	12/64*Z,12/191*Z,12/N1	U61680100
VFD	12/143*Z,12/176*Z,12/64*Z	V61680200
VFD	12/176*Z,12/143*Z,12/N1	V61680300
VFD	12/191*Z,12/64*Z,12/188*Z	W61680400
VFD	12/64*Z,12/191*Z,12/N1	W61680500
VFD	12/227*Z,12/148*Z,12/8*Z	X61680600
VFD	12/148*Z,12/227*Z,12/N1	X61680700
VFD	12/7*Z,12/8*Z,12/112*Z	Y61680800
VFD	12/8*Z,12/7*Z,12/N1	Y61680900
VFD	12/97*Z,12/81*Z,12/73*Z	Z61681000
VFD	12/69*Z,12/67*Z,12/N1	Z61681100
VFD	12/N1,12/N1,12/208*Z	,61681200
VFD	12/176*Z,12/N1,12/N1	,61681300
VFD	12/N1,12/28*Z,12/162*Z	61681400
VFD	12/193*Z,12/193*Z,12/N1	(61681500
TABO	BSS	0
K1	EQU	192*Z
N1	EQU	128*Z
REM	TABLE FOR EVEN PARITY	
VFD	12/K1,12/K1,12/K1	BL61682000
VFD	12/K1,12/K1,12/K1	BL61682100
VFD	12/190*Z,12/65*Z,12/65*Z	61682200
VFD	12/65*Z,12/190*Z,12/K1	61682300
VFD	12/K1,12/130*Z,12/255*Z	161682400
VFD	12/K1,12/K1,12/K1	161682500
VFD	12/66*Z,12/225*Z,12/209*Z	261682600
VFD	12/201*Z,12/198*Z,12/K1	261682700
VFD	12/33*Z,12/65*Z,12/201*Z	361682800
VFD	12/77*Z,12/51*Z,12/K1	361682900
VFD	12/24*Z,12/20*Z,12/18*Z	461683000
VFD	12/255*Z,12/144*Z,12/K1	461683100
VFD	12/39*Z,12/197*Z,12/197*Z	561683200

VFD	12/197*Z,12/57*Z,12/K1	561683300
VFD	12/60*Z,12/66*Z,12/201*Z	661683400
VFD	12/201*Z,12/48*Z,12/K1	661683500
VFD	12/129*Z,12/129*Z,12/249*Z	761683600
VFD	12/5*Z,12/3*Z,12/K1	761683700
VFD	12/54*Z,12/201*Z,12/201*Z	861683800
VFD	12/201*Z,12/54*Z,12/K1	861683900
VFD	12/6*Z,12/201*Z,12/201*Z	961684000
VFD	12/33*Z,12/30*Z,12/K1	961684100
VFD	12/34*Z,12/34*Z,12/34*Z	=61684200
VFD	12/34*Z,12/34*Z,12/K1	=61684300
VFD	12/136*Z,12/136*Z,12/190*Z	+61684400
VFD	12/136*Z,12/136*Z,12/K1	+61684500
VFD	12/126*Z,12/17*Z,12/17*Z	A61684600
VFD	12/17*Z,12/126*Z,12/K1	A61684700
VFD	12/255*Z,12/201*Z,12/201*Z	B61684800
VFD	12/201*Z,12/54*Z,12/K1	B61684900
VFD	12/190*Z,12/65*Z,12/65*Z	C61685000
VFD	12/65*Z,12/34*Z,12/K1	C61685100
VFD	12/255*Z,12/65*Z,12/65*Z	61685200
VFD	12/65*Z,12/190*Z,12/K1	D61685300
VFD	12/255*Z,12/201*Z,12/201*Z	61685400
VFD	12/201*Z,12/65*Z,12/K1	E61685500
VFD	12/255*Z,12/9*Z,12/9*Z	F61685600
VFD	12/9*Z,12/129*Z,12/K1	F61685700
VFD	12/190*Z,12/65*Z,12/65*Z	G61685800
VFD	12/201*Z,12/249*Z,12/K1	G61685900
VFD	12/255*Z,12/136*Z,12/136*Z	H61686000
VFD	12/136*Z,12/255*Z,12/K1	H61686100
VFD	12/K1,12/65*Z,12/255*Z	I61686200
VFD	12/65*Z,12/K1,12/K1	I61686300
VFD	12/K1,12/K1,12/96*Z	.61686400
VFD	12/96*Z,12/K1,12/K1	.61686500
VFD	12/K1,12/65*Z,12/65*Z	161686600
VFD	12/34*Z,12/156*Z,12/K1	161686700
VFD	12/136*Z,12/136*Z,12/136*Z	-61686800
VFD	12/136*Z,12/136*Z,12/K1	-61686900
VFD	12/160*Z,12/K1,12/K1	J61687000
VFD	12/63*Z,12/K1,12/K1	J61687100
VFD	12/255*Z,12/136*Z,12/20*Z	K61687200
VFD	12/34*Z,12/65*Z,12/K1	K61687300
VFD	12/255*Z,12/K1,12/K1	L61687400
VFD	12/K1,12/K1,12/K1	L61687500
VFD	12/255*Z,12/130*Z,12/12*Z	61687600
VFD	12/130*Z,12/255*Z,12/K1	61687700
VFD	12/255*Z,12/130*Z,12/132*Z	N61687800
VFD	12/136*Z,12/255*Z,12/K1	N61687900
VFD	12/190*Z,12/65*Z,12/197*Z	O61688000
VFD	12/195*Z,12/190*Z,12/K1	O61688100
VFD	12/255*Z,12/9*Z,12/9*Z	P61688200
VFD	12/9*Z,12/6*Z,12/K1	P61688300
VFD	12/190*Z,12/65*Z,12/209*Z	Q61688400
VFD	12/33*Z,12/222*Z,12/K1	Q61688500
VFD	12/255*Z,12/9*Z,12/153*Z	R61688600
VFD	12/169*Z,12/198*Z,12/K1	R61688700
VFD	12/198*Z,12/201*Z,12/255*Z	\$61688800
VFD	12/201*Z,12/177*Z,12/K1	\$61688900
VFD	12/136*Z,12/170*Z,12/156*Z	*61689000
VFD	12/170*Z,12/136*Z,12/K1	*61689100

VFD	12/160*Z,12/144*Z,12/136*Z	/61689200
VFD	12/132*Z,12/130*Z,12/K1	/61689300
VFD	12/198*Z,12/201*Z,12/201*Z	S61689400
VFD	12/201*Z,12/177*Z,12/K1	S61689500
VFD	12/129*Z,12/129*Z,12/255*Z	T61689600
VFD	12/129*Z,12/129*Z,12/K1	T61689700
VFD	12/63*Z,12/K1,12/K1	U61689800
VFD	12/K1,12/63*Z,12/K1	U61689900
VFD	12/15*Z,12/48*Z,12/K1	V61690000
VFD	12/48*Z,12/15*Z,12/K1	V61690100
VFD	12/63*Z,12/K1,12/60*Z	W61690200
VFD	12/K1,12/63*Z,12/K1	W61690300
VFD	12/99*Z,12/20*Z,12/136*Z	X61690400
VFD	12/20*Z,12/99*Z,12/K1	X61690500
VFD	12/135*Z,12/136*Z,12/240*Z	61690600
VFD	12/136*Z,12/135*Z,12/K1	Y61690700
VFD	12/225*Z,12/209*Z,12/201*Z	Z61690800
VFD	12/197*Z,12/195*Z,12/K1	Z61690900
VFD	12/K1,12/K1,12/80*Z	,61691000
VFD	12/48*Z,12/K1,12/K1	,61691100
VFD	12/K1,12/156*Z,12/34*Z	61691200
VFD	12/65*Z,12/65*Z,12/K1	61691300
TABE	BSS	0
	END	61691400
*	FAP	61691500
*	LIST	
*PUNCH	00	
	ENTRY PUNCH2	61749800
	ENTRY PUNCH3	61749900
* IF APT II CARDPN CALLING SEQUENCE		61750000
* USE PUNCH2 AND IT WILL CALL		61750100
* APT III CARDPN CORRECTLY		61750200
* IF APT III CARPN CALLING SEQUENCE		61750300
* USE PUNCH 3		61750400
*		61750500
* IF MODE OF CARD PUNCHING IS		61750600
* SET IN CALLING SEQUENCE (M).		61750700
* BCD +1 (FORTRAN ARRAY) -1 (FAP ARRAY)		61750800
* COL +2 (FORTRAN ARRAY) -2 (FAP ARRAY)		61750900
* ROW +3 (FORTRAN ARRAY) -3 (FAP ARRAY)		61751000
*		61751100
* APT III CALLING SEQUENCE FOR		61751200
* CARD PUNCHING		61751300
*		61751400
* CALL CARDPN (A,N,M,I,D)		61751500
*		61751600
		61751700
PUNCH3	SXA EX,1	SAVE
	SXA EX+1,2	INDEX
	SXA EX+2,4	REGISTERS
	CLA TRA64	SET RETURN
	STO EX+3	
	CLA 1,4	A (ORIGIN)
	STO CSCP+1	
	CLA 2,4	N (NUM. OF WORDS)
	STO CSCP+2	
	CLA 3,4	M (MODE)
	STO CSCP+3	
	CLA 4,4	I (SEQ NO.)
	STO CSCP+4	

	CLA	5,4	D (BCD ID)	61753100
	STO	CSCP+5		61753200
	TRA	CSCP		61753300
PUNCH2	SXA	EX,1	SAVE	61753400
	SXA	EX+1,2	INDEX	61753500
	SXA	EX+2,4	REGISTERS	61753600
	STZ	M		61753700
	CLA	1,4	PZE OR MZE	61753800
	TPL	**3	PZE=COL OR ROW	61753900
	CLS	II1	MZE=BCD	61754000
	STO	M		61754100
	CLA	2,4	IS SEQ NO USED	61754200
	ANA	MK7	PRESERVE TAG	61754300
	SUB	MK6	IF TAG=6 THEN	61754400
	TNZ	NOSQ	SEQ NO. USED	61754500
	CLA	TRA44	SET TRA, SEQ	61754600
	STO	EX+3	NO. WAS USED	61754700
	CLA	2,4	LOC. OF SEQ NO.	61754800
	STA	**3	IN ADDRESS. SEQ	61754900
	ADD	II1	NO.+1 IS BCD	61755000
	STA	**3	WORD IDENTIFICATION	61755100
	CLA	**	STORE SEQ NO	61755200
	STO	I		61755300
	CLA	**		61755400
	STO	D		61755500
	CLA	I3		61755600
	STA	ORIGN		61755700
	TRA	ORIGN		61755800
NOSQ	CLA	TRA34	SET TRA, SEQ	61755900
	STO	EX+3	NO. NOT USED	61756000
	CLA	I2		61756100
	STA	**1		61756200
ORIGN	CLA	3,4	ADDRESS WAS MODIFIED	61756300
	STA	AL	ORIGIN	61756400
	STO	N	NUM. OF WORDS	61756500
	ANA	MK7	PRESERVE TAG	61756600
	SUB	MK1		61756700
	TNZ	COL	2 IN TAG=COL OR BCD	61756800
	CLS	II3	1 IN TAG=ROW	61756900
	STO	M		61757000
	TRA	SUCS		61757100
COL	CLA	M	BCD = -1	61757200
	TNZ	SUCS		61757300
	CLS	II2		61757300
	STO	M		61757300
SUCS	AXT	5,1		61757600
	CLA	DL+1,1	LOAD ADDRESSES	61757700
	STO	CSCP+6,1	INTO CALLING	61757800
	TIX	*-2,1,1	SEQUENCE OF CARDPN	61757900
	TRA	CSCP		61758000
CSCP	TSX	\$CARDPN,4		61758100
	TSX	0,0,0	A (ORIGIN)	61758200
	TSX	0,0,0	N (NO. OF WORDS)	61758300
	TSX	0,0,0	M (MODE)	61758400
	TSX	0,0,0	I (SEQ. NO.)	61758500
	TSX	0,0,0	D (BCD ID)	61758600
EX	AXT	**1		61758700
	AXT	**2		61758800
	AXT	**4		61758900

	TRA	4,4	ADDRESS WAS MODIFIED	61759000
N	PZE			61759100
M	PZE			61759200
I	PZE			61759300
D	PZE			61759400
AL	PZE			61759500
NL	PZE	N		61759600
ML	PZE	M		61759700
IL	PZE	I		61759800
DL	PZE	D		61759900
MK7	OCT	000000700000		61760000
MK6	OCT	000000600000		61760100
MK1	OCT	000000100000		61760200
TRA64	TRA	6,4		61760300
TRA44	TRA	4,4		61760400
TRA34	TRA	3,4		61760500
I1	PZE	1,0,1		61760600
I2	PZE	2,0,2		61760700
I3	PZE	3,0,3		61760800
I11	PZE	0,0,1		61760801
I12	PZE	0,0,2		61760802
I13	PZE	0,0,3		61760803
	END			61760900
*	FAP			
*	LIST			
*	PUNCHA00			61761000
	ENTRY	PUNCHA		61761200
*	PUNCHA	- GENERATE PUNCH TAPE FOR BCD FORMATS.		61761100
	BCI	1,PUNCHA		61761300
*	USE	- CALL PUNCHA (N,A,J,K) WHERE -		61761400
*	** A	- IS THE BCD ARRAY WHOSE CHARACTERS WILL		61761500
*		BE CONVERTED TO THE PUNCH TAPE FORMAT.		61761600
*		/A/ IS ASSUMED TO BE STORED FORWARD IN		61761700
*	*	CORE IF N IS POSITIVE - OTHERWISE IT		61761800
*		WILL BE ASSUMED BACKWARDS IN CORE.		61761900
*	** N	- IS THE NUMBER OF CHARACTERS CONTAINED IN		61762000
*		/A/ TO BE CONVERTED. THIS COUNT WILL BE		61762100
*		OVERRULED IF A \$ IS ENCOUNTERED.		61762200
*	** J	- FLAG. IF J=0 ON ENTRY INTO PROGRAM,		61762300
*		PROCESS CHAR. IN /A/. ON FIRST ENTRY		61762400
*		GO GET ID AND SEQUENCE NO. FROM PUNION		61762500
*		AND PUNSEQ.		61762600
*		IF J=1, FILL UP PRESENT		61762700
*		CARD WITH CODE DELETES AND OUTPUT CARD. IN		61762800
*		ADDITION PUT OUT A BLANK CARD.		61762900
*		IF J=2, PROCESS AS J=0 WITHOUT EOB AT END		61763000
*		IF J=3, PROCESS FIRST CHARACTER (DEFINED BY		61763100
*		K) N-TIMES AND DO NOT PUT EOB AT END.		61763200
*		IF J IS LESS THAN ZERO, PUT OUT A BLANK CARD.		61763300
*		THUS, IF J IS NOT ZERO, SET UP A FIRST ENTRY		61763400
*		CONDITION AND DO NOT PROCESS CHAR. FROM /A/.		61763500
*	** K	- IF K IS SPECIFIED, AND IS NON-ZERO, DO NOT		61763600
*		IGNORE BLANK CHARACTERS IN /A/.		61763700
*		IF K=0 OR IS NOT SPECIFIED, IGNORE		61763800
*		BLANK CHAR. IN /A/.		61763900
PUNCHA	SXA	EX,4		61764000
	SXA	EX+1,2		61764100
	SXA	EX+2,1		61764200
	SXA	LOAD		61764300

BOTROW	EQU	7		61764400
	CLA	4,4	K	61764500
	ANA	TSX		61764600
	SUB	TSX		61764700
	TZE	PN1	K EXISTS	61764800
	AXT	4,2		61764900
	SXD	BLFL		61765000
	SXD	FL1F		61765100
PN2	SXA	EX+3,2		61765200
	CLA*	3,4	J	61765300
	TZE	PN3	NORMAL PROCESS	61765400
	TMI	PN4		61765500
	SUB	=1B17		61765600
	TNZ	PN3		61765700
	LXA	COLC,2	END CODE	61765800
	TXL	PN4,2,0		61765900
	CLA	=0177	PUT IN CODE DELETES	61766000
	TSX	MERGE,4	1	61766100
	TRA	*-4		61766200
PN4	TSX	PUNC,4	DUMP A BLANK CARD	61766300
	STZ	PUNDF	SET UP FIRST ENTRY	61766400
EX	AXT	0,4	EXIT	61766500
	AXT	0,2		61766600
	AXT	0,1		61766700
	TRA	** ,4		61766800
PN3	CLA	2,4		61766900
	STA	LOAD+1		61767000
	CLA*	1,4	N	61767100
	PDX	0,2		61767200
	TXI	*+1,2,1		61767300
	AXT	1,1		61767400
	TMI	*+2	A IS STORED BACKWARDS	61767500
	AXC	1,1		61767600
	SXD	LOAD+2,1		61767700
	ZET	PUNDF	IS IT FIRST ENTRY	61767800
	TRA	P5N		61767900
	CLA*	\$PUNIDS	SET UP	61768000
	STO	CARDN+1		61768100
	CLA*	\$PUNNOM	SEQUENCE NO	61768200
	UFA	=HCH0000		61768300
	SUB	=HCH0000		61768400
	STO	CARDN		61768500
	SXA	COLC		61768600
	CLA	=1		61768700
	STO	PUNDF		61768800
	CLA	=0200	STOP CODE IN COL. 1	61768900
	TSX	MERGE,4		61769000
	TRA	P5N		61769100
PN5	TSX	LOAD,4		61769200
	TNX	PN8,2,1	CHECK CHARACTER COUNT	61769300
	LDQ	JOE		61769400
	PXD			61769500
	LGL	6		61769600
	STQ	JOE		61769700
	LXD	BLFL,4	DO WE INCLUDE BLANKS	61769800
	TXH	*+4,4,0	YES	61769900
	CAS	=48	NO	61770000
	TRA	*+2		61770100
	TRA	PN7	IGNORE	61770200

	CAS	=43	IS IT \$	61770300
	TRA	*+2		61770400
	TRA	PN8	YES EXIT	61770500
	LXA	TAB1,4		61770600
	CAS	TAB1,4		61770700
	TRA	*+2		61770800
	TRA	PN6		61770900
	TIX	*-3,4,1		61771000
ERR	STO	PUNDF		61771100
	CAL	=6B17		61771200
	TSX	\$(STH),4		61771300
	TSX	FOR		61771400
	LDQ	PUNDF		61771500
	STR			61771600
	TSX	\$(FIL),4		61771700
	TSX	\$PERROR,4		61771800
FOR	BCI	7,(33H THE FOLLOWING ILLEGAL CHARACTER ,012,		61771900
	BCI	5,26H DOES NOT EXIST IN PUNCHA.)		61772000
PN7	TIX	PN5+1,1,1		61772100
	TXL	PN5		61772200
PN6	CLA	TAB2,4		61772300
	TSX	MERGE,4		61772400
	TRA	PN7		61772500
PN8	LXD	FL1F,4		61772600
	TXH	EX,4,0		61772700
	CLA	=0200	PUT IN EOB CODE	61772800
	TSX	MERGE,4		61772900
	TXL	EX		61773000
JOE				61773100
CARDN	BSS	2		61773200
TAP	BSS	24		61773300
T1				61773400
LOAD	AXT	0,1	BRING IN NEXT WORD	61773500
	LDQ	** ,1		61773600
	TXI	**+1,1,**		61773700
	SXA	LOAD,1		61773800
	STQ	JOE		61773900
	AXT	6,1		61774000
	TRA	1,4		61774100
PUNC	SXA	PUNC1,4	PUT OUT A CARD	61774200
	TSX	\$PUNCH2,4		61774300
	PZE	0,6		61774400
	TXH	CARDN,6,2		61774500
	TXH	TAP,2,24		61774600
	CLA	CARDN	UPDATE SEQ. NO.	61774700
	ADD	=1		61774800
	STO	CARDN		61774900
	ADD	=HCH0000		61775000
	FAD	=HCH0000		61775100
	STO*	\$PUNNOM		61775200
	CALL	PRINTA		
	AXT	24,4	CLEAR TAP AREA	61775300
	STZ	TAP+24,4		61775400
	TIX	*-1,4,1		61775500
	SXA	COLC		61775600
PUNC1	AXT	0,4		61775700
	TRA	1,4		61775800
MERGE	ALS	9-BOTROW		61775900
	STO	T1		61776000

	SXA	EXI,2		61776100
	SXA	EXI+1,4		61776200
COLC	AXT	0,4	COL. COUNT IN X4	61776300
	TXH	M2,4,71	CHECK COUNT	61776400
	TXI	*+1,4,1	CARD NOT FULL	61776500
	SXA	COLC,4	INDEX COUNT	61776600
	TXH	*+4,4,1		61776700
	SXA	M3		61776800
	AXT	-24,4		61776900
	SXA	M4,4		61777000
M3	AXT	0,4	WORD INDEX	61777100
M4	AXT	-24,2	SHIFT COUNT INDEX	61777200
M5	ALS	0,2		61777300
	ORS	TAP,4		61777400
	TXL	M6,2,0	IS PUNCH WORD FULL	61777500
	TXI	*+1,2,12	NO - INDEX SHIFT	61777600
	SXA	M4,2		61777700
M7	LXA	COLC,4	IS CARD FULL	61777800
	TXH	M8,4,71	YES	61777900
EXI	AXT	0,2	EXIT	61778000
	AXT	0,4		61778100
	TRA	1,4		61778200
M8	TSX	PUNC,4	PUNCH OUT CARD	61778300
	TXL	EXI		61778400
M6	AXT	-24,2	WORD FULL	61778500
	SXA	M4,2		61778600
	TXI	*+1,4,-1	INDEX WORD	61778700
	SXA	M3,4		61778800
	TXL	M7		61778900
M2	TSX	PUNC,4	CARD FULL	61779000
	CLA	T1		61779100
	TXL	COLC	GO PROCESS	61779200
ZERO				61779300
PUNDF				61779400
TA	OCT	0,1,2,3	0-3	61779500
	OCT	4,5,6,7	4-7	61779600
	OCT	10,11,13,20	89=+	61779700
	OCT	21,22,23,24	ABCD	61779800
	OCT	25,26,27,30	EFGH	61779900
	OCT	31,33,34,40	I.)-	61780000
	OCT	41,42,43,44	JKLM	61780100
	OCT	45,46,47,50	NOPQ	61780200
	OCT	51,53,54,60	R\$*	61780300
	OCT	61,62,63,64,65	/STUV	61780400
	OCT	66,67,70,71	WXYZ	61780500
	OCT	73,74	,I	61780600
TAB1	PZE	TAB1-TA		61780700
	REM	TABLE 2		61780800
	OCT	40,1,2,23	0-3	61780900
	OCT	4,25,26,7	4-7	61781000
	OCT	10,31,177,160	89=+	61781100
	OCT	141,142,163,144	ABCD	61781200
	OCT	165,166,147,150	EFGH	61781300
	OCT	171,153,13,100	I.)-	61781400
	OCT	121,122,103,124	JKLM	61781500
	OCT	105,106,127,130	NOPQ	61781600
	OCT	111,200,76,20	R\$*	61781700
	OCT	61,62,43,64,45	/STUV	61781800
	OCT	46,67,70,51	WXYZ	61781900

	OCT	73,52	,1	61782000
TAB2	BSS	0		61782100
TSX	TSX			61782200
PN1	AXT	5,2		61782300
	CLA*	4,4		61782400
	TZE	PN2-2	IGNORE BLANKS	61782500
	SXD	BLFL,2		61782600
BLFL	TXL	PN2		61782700
P5N	LXA	EX,4		61782800
	CLA*	3,4		61782900
	TZE	PN5	J=0	61783000
	SUB	=2B17		61783100
	TNZ	**4	J=3	61783200
	CLA	=2B17	NO EOB DESIRED	61783300
	STD	FL1F	J=2	61783400
FL1F	TXL	PN5		61783500
	SUB	=1B17	1 CHARACTER N TIMES	61783600
	TNZ	ERR1	WITHOUT EOB.	61783700
P6N	TSX	LOAD,4		61783800
	TNX	EX,2,1		61783900
	LDQ	JOE		61784000
	PXD			61784100
	LGL	6		61784200
	STQ	JOE		61784300
	LXD	BLFL,4		61784400
	TXH	**4,4,0		61784500
	CAS	=48		61784600
	TRA	**2		61784700
	TRA	P7N		61784800
	LXA	TAB1,4		61784900
	CAS	TAB1,4		61785000
	TRA	**2		61785100
	TRA	**3		61785200
	TIX	*-3,4,1		61785300
	TRA	ERR		61785400
	CLA	TAB2,4		61785500
	STO	JOE		61785600
	LXA	EX,4		61785700
	CLA*	1,4		61785800
	PDX	0,2		61785900
	CLA	JOE		61786000
	TSX	MERGE,4		61786100
	TIX	*-2,2,1		61786200
	TXL	EX		61786300
P7N	TIX	P6N+1,1,1		61786400
	TRA	P6N		61786500
ERR1	LAC	EX,4		61786600
	SXD	PUNDF		61786700
	CAL	=6B17		61786800
	TSX	\$(STH),4		61786900
	TSX FOR1			61787000
	LDQ	PUNDF		61787100
	STR			61787200
	TSX	\$(FIL),4		61787300
	TSX	\$EXIT,4		61787400
FOR1	BCI	7,(45H BAD CALLING SEQUENCE FOR PUNCHA AT LO		61787500
	BCI	2,CATION 012)		61787600
	END			61787700
*	FAP			

*	LIST		
*	PUNCH CARD ID AND SEQUENCE NO. ROUTINE		61842300
	ENTRY PUNION		61842400
	ENTRY PUNSEQ		61842500
	ENTRY PUNNUM		61842600
	ENTRY PUNNOM		61842700
	ENTRY PUNIDS		61842800
*	PROGRAMMER USES - PUNION - TO SET UP ID		61842900
*	PROGRAMS USES - PUNIDS - INDIR. TO GET ID		61843000
*	PROGRAMMER USES - PUNSEQ - TO SET UP SEQ. NO.		61843100
*	PROGRAMS UPDATES - PUNNOM - INDIR.		61843200
*	PROGRAMMER INTEROGATES - PUNNUM - TO GET SEQ. NO.		61843300
PUNION	CLA*	1,4	61843400
	SUB	BITS	61843410
	TZE	P1	61843420
	CLA*	1,4	61843430
	TRA	P2	61843440
P1	CLA	BLANKS	61843450
P2	STO	PUNIDS	61843460
	TRA	2,4	61843600
PUNIDS	BSS	1	61843700
PUNNOM	BSS	1	61843800
PUNSEQ	CLA*	1,4	61843900
	STO	PUNNOM	61844000
	TRA	2,4	61844100
PUNNUM	CLA	PUNNOM	61844200
	STO*	1,4	61844300
	TRA	2,4	61844400
BITS	OCT	-377777777777	61844410
BLANKS	BCI	1,	61844420
	END		618445009977
00007760 LINES OF PRINT. U1.			

2.9

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*      LIST
*      FORTRAN
C4005      DISPAT
SUBROUTINE DISPAT
C...      SYSTEM COMMON, DIMENSION, AND EQUIVALENCES+STATEMENTS
C
      DIMENSION SYSTEM (1700)
C
      EQUIVALENCE (SYSTEM(1700),KOM (1700),KFLAGS(1692),TAPETB(1622))
C
      EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),
1 POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),
2 CORTAP( 9),
3 TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5),
4 FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1))
C
      EQUIVALENCE (KFLAGS( 70),
1 K0 ( 60),F0 ( 60),K1 ( 59),K2 ( 58),K3 ( 57),
2 K4 ( 56),K5 ( 55),K6 ( 54),K7 ( 53),K8 ( 52),
3 K9 ( 51),
4 KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42),
5 IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36),
6 ICLPRT( 35),INDEXX( 34),IPLPTR( 33), NOPLT( 31),
7 KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8 LOCMAC( 25),LENSPC( 24),
9 IPOSTP( 20),NUMPST( 19))
C
      EQUIVALENCE (KOM ( 8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
      COMMON SYSTEM
C
      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C...*****
C
      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID
      DIMENSION MACH(12),PNOFLG(14),MTABLE(10)
C
      INITIALIZE POST PROCESSOR INDEX
      IF (LP) 50,10,50
10 IPOSTP(1) # K1
C
      ARE WE FINISHED
C
50 IF (NUMPST) 500,500,100
C
      NO
C
      DECREMENT THE COUNTERS
C
100 NUMPST # NUMPST-K1
      IPOSTP(1) # IPOSTP(1)+K2
C
      FIND POST PROCESSOR NAME IN TABLE
C
150 LP#XPOSTF(0)
      K#IPOSTP(1)
      MTABLE(6)#IPOSTP(K+1)
      MTABLE(6)#PNOFLG(20)
200 DO 300 I#1,22
210 IF (KOM(LP)-IPOSTP(K)) 220,400,220

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40050020
40050030
40050040
40050050
40050060
40050070
40050080
40050090
40050100
40050110
40050120
40050130
40050140
40050150
40050160
40050170
40050180
40050190
40050200
40050210
40050220
40050230
40050240
40050250
40050260
40050270
40050280
40050290
40050300
40050310
40050320
40050330
40050340
40050350
40050351
40050352
40050353
40050354
40050360
40050370
40050380
40050390
40050400
40050410
40050420
40050430
40050440
40050450
40050460
40050470
40050480
40050490
40050500
40050510
40050520

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220	LP#LP+K2	40050530
C		40050540
C	KEEP LOOKING	40050550
C		40050560
300	CONTINUE	40050570
350	WRITE OUTPUT TAPE IOUTAP,900,IPOSTP(K)	40050580
	GO TO 50	40050590
C		40050600
C	OBTAIN APT ID FOR SECTION ON THE LIBRARY TAPE	40050610
C		40050620
400	J#LP+1	40050630
	IF (KOM(J)) 450,350,450	40050640
450	CALL LBSRCH (KOM(J))	40050650
490	RETURN	40050660
C		40050670
C	REWIND LIBTAP AND DISCONTINUE BUFFERING ON CLTAPE (REWIND)	40050680
C		40050690
500	CALL TAPEOP (LIBTAP,1,J)	40050700
	CALL BUFFTP (CLTAPE,3)	40050710
	CALL PRCNTL	40050720
	GO TO 490	40050730
900	FORMAT (42H POST PROCESSOR NOT AVAILABLE ON LIBTAP A6)	40050740
	END	40050750