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COMPUTING TECHNOLOGY CENTER

MASTER

UNION CARBIDE DUAL-HEAD
INSPECTION POST PROCESSOR

UNION CARBIDE CORPORATION

NUCLEAR DIVISION

POST OFFICE BOX P, OAK RIDGE, TENNESSEE 37830

**UNION
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Operating the

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UNION CARBIDE DUAL-HEAD
INSPECTION POST PROCESSOR

W. V. Schellinger

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UNION CARBIDE DUAL-HEAD
INSPECTION POST PROCESSOR

ABSTRACT

The Union Carbide Dual-Head Inspection Post Processor is a special purpose post processor that produces command tapes and/or listings for numerically controlled inspection machines with more than one inspection gage. It has a foundation which allows similar types of inspection machines to be added with a minimum amount of effort.

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1. Description

The Union Carbide Dual-Head Inspection Post Processor is designed as a special purpose post processor. However, it can be readily expanded to include processing for similar type machines. This procedure is described in Section 2.1 of the Appendix.

The logic of this post processor varies from the normal in that a two-phase process is utilized. The function of the first phase is to gather data from each measuring head. The flow of this phase is much the same as a standard post processor. The control program EXECT calls the Input element (READER) to obtain one logical CLTAPE record. EXECT then examines the record and calls either an auxiliary or motion element module depending upon the record type which is encountered.

During this phase pertinent data are gathered when a TMARK/n (n indicates which reading) requests a reading. These data are stored according to the mode of operation in effect at the time a reading is requested. The mode is established by the use of a HEAD/INNER or HEAD/OUTER where the minor word denotes which head. The flow is repetitive until Phase I is terminated when EXECT encounters an END or FINI statement.

Phase II processes the assembled data to produce the machine's control tape and/or control listing. A transfer to COPROC or PROCES is made depending upon the machine being processed. A complete cross-reference table of subroutines is given in Section 2.2 of the Appendix. Section 2.5 gives a description of each major word accepted by the post processor.

Output data are loaded into the BUFP array as real numbers from the assembled data in ARAYIN and OUTRAY. These arrays accumulate data from up to 250 TMARK's prior to writing them on an intermediate tape. A separate tape is used for each array. If a control tape is required, each element of BUFP is transformed into BCD information and stored in BUFFER according to the format specified in the corresponding element of the FORMAT array. If word address is required, the letter associated

with each BUFP register is held in the corresponding position of the WORDS array.

A list of all tables and their functions is given in Section 2.4 of the Appendix. Included are a description and definition of all major words accepted by the post processor. Since most major words execute some special logic, a separate module was written to handle each. This enables the user to expand the post processor easily by adding the module to execute the logic associated with the new word or by expanding an existing module.

This post processor was designed to operate within the APT III System; however, it is nonstandard 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 store the PARTNO information into PNOFLG and the machine number in MTABLE(6). The MTABLE and PNOFLG arrays are included in the common package of the Inspection Post Processor. If the machine statement format MACHIN/machine name, machine number is used, the version of subroutine DISPAT listed in Section 218 of the Appendix will properly load the machine number in MTABLE(6).

Section 3. presents three part programs which utilize the various capabilities of the post processor.

2. Appendix

2.1. Subroutines Affected by Addition of New Machines

In the event that the user desires to add a new machine to be controlled by this post processor, the following changes are necessary:

1. XPOST must be altered to establish a unique machine number within the post processor.
2. A MACHxx must be written to establish the desired configuration to best simulate the machine tool control unit relationship.
3. PREINT must have tape leader and trailer information established for each machine's control tape.
4. PRTON must have the machine heading information added.
5. PRTTIT must have the machine heading and output heading information established.

The following routines have a branch on the machine number and may be changed to allow the proper logic to be executed for the new machine:

END
EXECT
FINI
OUTTAP
PROCES

2.2. Alphabetic Listing and Cross Reference of Inspection Subroutines

<u>Name</u>	<u>Flow Chart Page</u>	<u>Listing Page</u>	<u>Calls</u>
ABEAR	108	47	None
AGFND	109	48	None
AUXOUT	110	48	INSERT, LEADER, REWIND
CONBCD	None	52	ERREX
COPROC	111	49	ABEAR, AUXOUT, MATCH, PTAPE, PUNCHB, SEQOUT, TEST
DATE	114	56	None
DESPAT	None	None	None
END	115	57	COPROC, DESPAT, ERREX, PREINT, PROCES, PUNCHB
ERREX	116	58	DESPAT, PDUMP
EXECT	117	59	END, ERREX, FINI, FROM, HEAD, INIT, INSERT, LEADER, MACH05, MESSAG, OPSTOP, OPTION, POSTIN, POSTN, RADSET, READER, REWIND, SEQNO, STOP, STORPT, TAPEOF, TLSET, TMARK, TOOLNO, TURRET
FINI	118	61	COPROC, DESPAT, ERREX, PREINT, PROCES, PUNCHB
FROM*	None	63	None
HEAD	119	63	ERREX
INIT	120	64	None
INSERT*	None	64	None

* Denotes subroutine is inoperative.

LEADER	121	67	PUNCHB
MACH05	122	68	None
MATCH	123	69	ERREX
MESSAG*	None	70	None
OPSTOP*	None	71	None
OPTION	124	70	ERREX
OUTTAP	125	71	PRTTIT
PARNEM	None	73	None
POSTIN	126	79	None
POSTN	127	79	None
PREINT	128	80	DATE, PARNOM, PRTON, PUNCHA, PUNCHB, PUNSEQ, TAPEOP
PRINTA	129	82	None
PROCES	130	83	AGFND, MATCH, OUTTAP, SEQOUT, TEST
PRTON	None	86	None
PRTTIT	135	86	None
PTAPE	136	88	CONBCD, PRTTIT, PUNCHB
PUNCHA	None	90	ERREX, PRINTA, PUNCH2
PUNCH2, PUNCH3	None	94	None
PUNIDN	None	98	None
RADSET	138	99	None
READER	139	100	TAPERD
REWIND	140	102	OUTTAP, SEQOUT
SEQNO	141	103	None

* Denotes subroutine is inoperative.

STORPT	142	104	None
TEST	143	105	None
TMARK	144	106	ERREX, TAPEWT
TOOLNO*	None	107	None
TURRET	None	107	None

* Denotes subroutine is inoperative.

2.3. Descriptions of Subroutines

Subroutine ABEAR

Purpose

To calculate the angle that the drive surface normals make with the positive X-axis

Input

CALL ABEAR (MDS, IWVS, ICT, IDX)

where:

MDS = Flag to signal the number of times the routine has been called

IWVS = Flag to indicate which head(s) is being used

ICT = Indicates column of OUTRAY (L,M) in which the I, J, K information is stored

IDX = Indicates column of ARAYIN (L,M) in which the I, J, K information is stored

Output

The calculated angles in degrees are stored in the proper BUFP registers and control passed back to the calling program.

Method

The angles are calculated by using the I, J, K information in the following formulas:

$$\text{THETA} = \text{ATAN} (J/I) \text{ where } I \neq 0; \text{ or}$$

$$\text{THETA} = 90^\circ \text{ where } I \leq 10^{-7}$$

The angles passed are the complement of those calculated.

Subroutine AGFND

Purpose

To convert any angle given in radians to its corresponding number of degrees, minutes, and seconds

Input

CALL AGFND (ANGL, IDEG, IMIN, ISEC)
where:

ANGL = Angle in radians to be converted
IDEG = Number of degrees in ANGL
IMIN = Number of minutes in ANGL
ISEC = Number of seconds in ANGL

Output

The number of degrees, minutes, and seconds of the given angle are returned as part of the calling arguments as defined above.

Method

The given angle is converted from radians to degrees, minutes, and seconds (the angle is rounded to the nearest five seconds).

Subroutine AUXOUT

Purpose

To allow an auxiliary function to be processed

Input

CALL AUXOUT(K,L)

- K = Flag to indicate which mode was in command when statement originally occurred. (1 = inner, 2 = outer)
- L = The position in the desired array containing the flag to indicate which auxiliary command is wanted

Output

An appropriate call is generated to process the correct command.

Method

A number which is the sum of the powers of 2 is examined as to which powers when combined produce the sum. For each power there is a unique auxiliary command associated with it. Once the largest is found, the sum is reduced by that amount, and a call is generated. Upon return, the sum is reduced by that amount, and the process is repeated until the sum is zero.

Subroutine COPROC

Purpose

To process the gathered data for the Pratt-Whitney 6-Coordinate machine for production of the punched tape.

Input

CALL COPROC

Output

A punched tape to run the machine, as well as a listing of the information which appears on the punched tape, is produced.

Method

The routine processes the information which was stored from reading the CLTAPE. It calculates the angle the drive surface normal makes with the positive X-axis for both heads. This angle, the X, Y coordinates of each head, and a slide sequence indicator for each head are stored in the BUFP array for output.

Subroutine DATE

Purpose

To pick up the date to be punched into the leader and trailer of the control tape

Input

CALL DATE(A)
where:

A = First of two locations in which the date will be returned.

Output

The date is loaded in BCD form into the argument.

Method

Obtains the date from an absolute address in core and stores it into appropriate positions.

Subroutine END

Purpose

To produce the appropriate block of information for an END statement and to signal the processor to process the data which have accumulated in the program prior to the command

Input

CALL END

Output

The appropriate END codes are placed on the control tape, if any, after all the processing has been completed.

Method

Calls appropriate processing routine according to machine requirements to make a listing only or a listing and a punched tape. Special codes are loaded into appropriate BUFP register, and routines are called which output this information.

Error Checks

Tests are made to see if information stored is in a valid form to be processed; if not, a routine is called to signal that an error has occurred.

Subroutine ERREX

Purpose

To post any and all errors encountered during processing and transfer control back to the control program for CHAIN 400

Input

CALL ERREX (M)

where:

M = Number to signify which error has occurred

Output

A message is printed to signify which error has occurred.

Subroutine EXECT

Purpose

Control program for this post processor

Input

CALL EXECT

Output

Magnetic tapes are prepared for the printed output and punched tape.

Method

The program initializes all parameters and sets all tables. Subroutine READER then reads the CLTAPE, and transfer is made according to the type of CLTAPE record. Control then returns to READER to obtain another record. All records are read until an END or FINI statement is encountered, and at this time, all stored data are processed either by PROCES or COPROC.

Subroutine FINI

Purpose

To process pertinent information and produce a control tape if the machine requires such, print accumulated footage, and transfer control to the Section 400 control routine

Input

CALL FINI

Output

Control tape with BCD leader and trailer information is punched, accumulated footage is printed on-line, and printed output corresponding to information on the punched tape is produced.

Method

Calls COPROC or PROCES according to whether the machine does or does not require punched tape. These routines process and produce tape and/or listing. PREINT produces the BCD leader and trailer, if required, and PRTON gives the accumulated tape footage.

Subroutine HEAD

Purpose

To set proper inspection mode (i.e. inner or outer)

Input

CALL HEAD

Output

The following flags are set to indicate which mode of operation is in effect:

IDUM(5) = 1, IDUM(6) = 0 indicates outer
IDUM(5) = 0, IDUM(6) = 1 indicates inner

Method

Examines HEAD command for the minor words INNER or OUTER and sets flags appropriately

Error Checks

All other modifiers not acceptable

Subroutine LEADER

Purpose

To generate the number of output blocks necessary to produce t inches of blank tape where t is defined by the command LEADER/ t

Input

CALL LEADER(M)

Output

If $M = 1$, the amount of leader to be produced is stored as well as a pointer indicating when this should be punched.

If $M = 2$, the amount of blank tape for this specification is punched at this time.

Method

A temporary array is first loaded with proper number of inches to be produced. The second phase outputs blocks of blank tape at a rate of 5 feet per punch. The amount is then decremented by 5 feet until the final amount is less than or equal to 5 feet. This amount is punched. This will occur the first time if t is less than or equal to 60.

Subroutine MACHxxPurpose

To establish the particular options, tables, and formats to best fit this machine tool, control-unit combination

Input

CALL MACHxx

Output

The preparatory and miscellaneous codes are established for this machine tool. The format of the control tape, if any is required, is established.

Subroutine MATCH

Purpose

To examine recorded data to see if both inner and outer readings were taken for a particular TMARK/n

Input

CALL MATCH(L,M,N,IW)

where:

L = Fixed position in the array which is in command
M = Return variable set
 M = 1 indicates no match found
 M = 0 indicates match found
N = Position in tested array in which a match was found
IW = Flag indicating the manner of testing the arrays
 1 = ARAYIN i.e. INNER VS. OUTER
 2 = OUTRAY i.e. OUTER VS. INNER

Output

M and N are set.

Method

The fixed position of the active array is compared to position one of each column of the passive array until an exact match is found or the array is exhausted.

Subroutine MESSAG

Purpose

. To print BCD information from the APT command MESSAG

Input

CALL MESSAG

Output

Up to 66 BCD characters are saved to be printed in the output listing.

Subroutine OPTION

Purpose

To alter option number n from its initialized value to the value of t , where n and t are defined by the statement `OPTION/n,t`.
(Each couplet is processed independently, and any number of couplets may be included in the statement.)

Input

`CALL OPTION`

Output

The desired option is set to the specified value.

Subroutine OUTTAP

Purpose

To output the desired listing for the particular machine in use (handles either Sheffield Manual Rotary Contour Gage or Horizontally Opposed Head Gage)

Input

CALL OUTTAP

Output

The instructions by which an operator can control the specified machine are listed.

Method

Depending on which machine is being used, a transfer is made to write appropriate headings, and print corresponding values on the output listing.

Subroutine POSTIN

Purpose

To zero out input buffers prior to reading each CLTAPE record

Input

CALL POSTIN

Output

TAPST0 and INTAP are zeroed.

Subroutine POSTN

Purpose

To set up slide movement sequence numbers as specified in POSTN command

Input

CALL POSTN

Output

NUMOFI and NUMOFJ arrays indicate points at which the slide sequence for a particular head will change. SEQIN and SEQOT contain the slide sequence corresponding to each change.

Method

The mode of operation as determined and an appropriate indicator are stored in NUMOFI or NUMOFJ. The command is interrogated for XAXIS or YAXIS, and the sequence number is stored according to which is found:

XAXIS = 1
YAXIS = 2

Subroutine PREINT

Purpose

To punch leading and trailing identification on the control tape;
also to produce (\$) in front of data

Input

CALL PREINT

Output

Ninety characters of BCD identification are punched as leader or
trailer. The output includes PARTNO, machine, and date.

Method

Various arrays are set up with the characters for each machine.
Characters are stored in PNOFLG by Section 400 DESPAT in COMMON
storage. These are punched by PARNOM.

Note

Union Carbide Corporation, Nuclear Division, has modified Section 400
DESPAT to store the PARTNO statement. A standard system will not
operate in this manner.

Subroutine PROCES

Purpose

To process the gathered CLDATA points of interest and calculate the desired results for the machines, Sheffield Manual Rotary Contour Gage and Sheffield Horizontally Opposed Head Gage

Input

CALL PROCES

Output

The wall-thickness; cosine correction factors for the inside and outside head, as well as the position of the heads at the point of inspection

Method

The array which contains the information for the outer head is used as the initial guide. An attempt is made to find a corresponding TMARK/n for the inner head. If found, the wall thickness of the part at this juncture is calculated. A cosine correction factor based on the angle the drive surface normal makes with a line which connects the head centers is then calculated. This information, along with the position of each head, is listed, and the process is repeated until the outer array has been exhausted. The inner array is then tested for any information which has not been used by the first pass. These are noted as errors. When all have been processed, a return is made to the calling program.

Subroutine PRTTIT

Purpose

To print PARTNO, machine, and heading for each page of output

Input

CALL PRTTIT

Output

PARTNO, machine, and appropriate headings are printed at the top of a new page of output.

Subroutine PTAPE

Purpose

To produce control tapes when requested

Input

CALL PTAPE

Output

The control tape image is placed on an auxiliary tape according to the tape format specified.

Method

The BUFP array is processed and converted into format specified for each register in the particular machine. Both word address and tabs are added, if requested, and either PUNCHA or PUNCHB is called to punch the image of the control tape requested.

Subroutine RADSET

Purpose

To store the radius of the inspection heads being used

Input

CALL RADSET

Output

RADIN and RADOUT contain the desired radius.

Subroutine READER

Purpose

To read one logical CLTAPE record

Input

CALL READER

Output

TAPSTO array contains logical CLTAPE record, NWPR contains number of words in this particular record, INTAP array contains TAPSTO (1-20), the variable RETURN is set as follows:

- 1 indicates End of File read.
- 0 indicates a valid read of the CLTAPE.
- 1 indicates error in read of the CLTAPE.

Method

TAPERD is called to read CLTAPE.

Subroutine REWIND

Purpose

To produce appropriate output block for APT command REWIND

Input

CALL REWIND(M)

where:

M is a dummy argument (at the present time).

Output

Information is set up to output a REWIND code at time requested.

Subroutine STORPT

Purpose

To store X, Y, Z coordinates of the head at a particular TMARK/N along with the I, J, K vector of the drive surface normal at this point

Input

CALL STORPT(K)

where:

K = position in the TAPSTO array in which to find the beginning of the desired information

Output

The coordinates are stored.

Subroutine TEST

Purpose

To determine if a new page for the output listing has been requested

Input

CALL TEST (IAG, JDX, ICT)

where:

IAG = Flag to indicate how many times program has been entered;
IDX = Position of inner array to be tested;
ICT = Position of outer array to be tested.

Output

General purpose flag IDUM(25) is set "on" if the new page was requested.

Subroutine TMARK

Purpose

To save the data when a reading has been requested by a TMARK/I command

Input

CALL TMARK

Output

Pertinent data which include:

- 1) TMARK number,
- 2) Present X coordinate,
- 3) Present Y coordinate,
- 4) Present Z coordinate,
- 5) Present I value of drive surface normal,
- 6) Present J value of drive surface normal,
- 7) Present K value of drive surface normal.

This information is stored according to mode of operation when reading was requested.

If OUTER, then use the OUTRAY array.

If INNER, then use the ARAYIN array.

2.4. Variable Dictionary

ARRAYIN (8,250)* = An array in COMMON used to collect pertinent data while in the HEAD/INNER mode. It contains information as follows:

- (1,I) = TMARK number where reading taken
- (2,I) = X coordinate of point at reading
- (3,I) = Y coordinate of point at reading
- (4,I) = Z coordinate of point at reading
- (5,I) = I component vector of D. S. normal
- (6,I) = J component vector of D. S. normal
- (7,I) = K component vector of D. S. normal
- (8,I) = sum of power of 2 to indicate some auxiliary information between this and last TMARK.

BITS A location in COMMON containing 777777777777₈.

BLANKS A location in COMMON consisting of 606060606060₈.

BUFFER(100) An array in COMMON which contains the converted register values in BCD form prior to being punched.

BUFP(26) An array in COMMON used as the initial output array.

CCFIN The cosine correction factor for the Inner Head.

CCFOT Cosine correction factor for the Outer Head.

FORMAT(26) An array in COMMON which contains Format specifications for corresponding registers in the BUFP array.

I The index which indicates how many TMARK/n commands have been encountered while in the OUTER mode. At I=250 information is written on an auxiliary scratch tape, and I is reset to 0.

* Dimensions, in parentheses.

IDEG	The number of degrees in the angle a line through the heads and the positive X-axis makes (for the MACHIN/SHEFLD, INSP, ROCOGM).
IMEN	The number of minutes in the angle a line through the heads and the positive X-axis would make (for the MACHIN/SHEFLD, INSP, ROCOGM).
ISEC	The number of seconds in the angle a line through the heads and the positive X-axis would make (for the MACHIN/SHEFLD, INSP, ROCOGM).
INTAP(20)	An array in COMMON used as a temporary location of a portion of each logical CLTAPE record as it is read and processed.
J	The index which indicates how many TMARK/n commands have been encountered while in the INNER mode. At J=250 information is written on a scratch tape, and J is reset to 0.
NWPR	The number of words read for the logical CLTAPE record being processed.
PREVSI	The I component of the previous drive surface normal.
PREVSJ	The J component of the previous drive surface normal.
PREVSK	The K component of the previous drive surface normal.
PREVSX	The X coordinate of the previous cut vector.
PREVSY	The Y coordinate of the previous cut vector.
PREVSZ	The Z coordinate of the previous cut vector.
RADIN	The radius of the inside inspection head.
RADOUT	The radius of the outside inspection head.
RAD	Not used.
RETURN	Location used to indicate the result of the CLTAPE read.
RIN	Contains inside gage radial distance for MACHIN/SHEFLD, INSP, ROCOGM.

ROUT	Contains outside gage radial distance for MACHIN/ SHEFLD, INSP, ROCOGM.
SEQINC	Not used.
SEQCTR	Not used.
TAPSTO(250)	The input buffer into which one logical record <2275 words is read.
WORDS(20)	An array which contains the word address of the corresponding position in the BUFP array.
OUTRAY(8,250)	Collects data for HEAD/OUTER. (See ARAYIN)
XIN	Inside ball center coordinate for the MACHIN/HORHDS, INSP, 1.
XOUT	Outside ball center coordinate for the MACHIN/ HORHDS, INSP, 1.
YIN	The ball center height at a particular TMARK for MACHIN/HORHDS, INSP, 1.
NUM	The position number specified by n in the TMARK/n. that has been processed.
WALL	Gage tip wall thickness of the part.

2.5. Post Processor Words

- A. HEAD/(INNER or OUTER)
Used to specify which gage is being programmed.
- B. LEADER/n
This instruction indicates that n inches of blank tape are to be output in the control tape.
- C. MESSAG
This instruction allows up to 66 BCD characters to be merged into the output listing at the desired time.
- D. OPTION/n,t
This instruction allows this option to be under part programmer control to set option n to value t. Any number of couplets may appear in a statement.
- E. POSTN/XAXIS,YAXIS
This instruction sets up a slide movement sequence (the minor words indicate which axis to move first).
- F. REWIND
This instruction outputs a rewind code in a block by itself.
- G. SEQNO/START
This instruction outputs a special punch in a block by itself.
- H. TMARK/n
This instruction indicates the reading n should be recorded.

In addition to the above the following words are recognized:

- 1. END
- 2. STOP
- 3. FINI

2.6. Option Table

OPTAB

- 1-3) Not used.
- 4) Counter for number of lines printed on a page.
- 5-13) Not used.
- 14) Indicates whether or not a core dump is wanted when an error occurs that causes a call to subroutine ERREX?
1 = no (standard); 0 = yes.
- 15) Not used.
- 16) Number of lines to print on a page (initialized to 45).
- 17-29) Not used.
- 30) Number of copies of the output (initialized to 1).
- 31) Are repeated coordinates output? 0 = no (standard); 1 = yes.
- 32-34) Not used.
- 35) Is punch tape wanted? 0 = yes (standard); 1 = no.

2.7

Program Listing of Subroutines

*FAP			UC000010
	PZE	0,0,424	UC000020
	TSX	\$EXEC	UC000030
	MZE	LAST	UC000040
LAST	BES	6940	UC000050
	END		UC000060
*	FAP		UC000070
	COUNT	50	UC000080
* CONNECTOR	PROGRAM	LOCATES SECTION 0 ROUTINES FOR THIS SECTION	UC000090
	ENTRY	TAPERD	UC000100
	ENTRY	TAPEWT	UC000110
	ENTRY	TAPFDP	UC000120
	ENTRY	TAPECH	UC000130
	ENTRY	SEARCH	UC000140
	ENTRY	BUFFTP	UC000150
	ENTRY	CARDPN	UC000160
	ENTRY	PRCNTL	UC000170
	ENTRY	LBSRCH	UC000180
	ENTRY	DYNDMP	UC000190
	ENTRY	DUMP	UC000200
	ENTRY	PDUMP	UC000210
	ENTRY	(STH)	UC000220
	ENTRY	(FIL)	UC000230
	ENTRY	(TSH)	UC000240
	ENTRY	(RTN)	UC000250
	ENTRY	SIN	UC000260
	ENTRY	COS	UC000270
	ENTRY	SQRT	UC000280
	ENTRY	ATAN	UC000290
	ENTRY	(STHM)	UC000300
	ENTRY	(TSHM)	UC000310
	ENTRY	REDPRT	UC000320
	ENTRY	CARDRD	UC000330
	ENTRY	SPECN	UC000340
	ENTRY	(SPH)	UC000350
FIRST	EQU	100	UC000360
TAPERD	TRA*	FIRST+1	UC000370
TAPEWT	TRA*	FIRST+2	UC000380
TAPFDP	TRA*	FIRST+3	UC000390
TAPECH	TRA*	FIRST+4	UC000400
SEARCH	TRA*	FIRST+5	UC000410
BUFFTP	TRA*	FIRST+6	UC000420
CARDPN	TRA*	FIRST+7	UC000430
PRCNTL	TRA*	FIRST+8	UC000440
LBSRCH	TRA*	FIRST+9	UC000450
DYNDMP	TRA*	FIRST+10	UC000460
DUMP	TRA*	FIRST+11	UC000470
PDUMP	TRA*	FIRST+12	UC000480
(STH)	TRA*	FIRST+13	UC000490
(FIL)	TRA*	FIRST+14	UC000500
(TSH)	TRA*	FIRST+15	UC000510
(RTN)	TRA*	FIRST+16	UC000520
SIN	TRA*	FIRST+17	UC000530
COS	TRA*	FIRST+18	UC000540
SQRT	TRA*	FIRST+19	UC000550
ATAN	TRA*	FIRST+20	UC000560
(STHM)	TRA*	FIRST+21	UC000570
(TSHM)	TRA*	FIRST+22	UC000580
REDPRT	TRA*	FIRST+23	UC000590

FORTRAN LOADING POINT
 TRANSFER TO SECTION 0
 ROUTINES VIA THE
 SECTION 0 MAIN PROGRAM
 TRANSFER VECTOR LIST

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CARDRD TRA*      FIRST+24      UC000600
SPECN  TRA*      FIRST+25      UC000610
(SPH)  TRA*      FIRST+26      UC000620
      END          UC000630
C          UC000010
C          UC000020
C-----UC000030
C          UC000040
C          UC000050
      SUBROUTINE ABEAR(MDS,IWVS,ICT,IDX) UC000060
C*****UC000070
C          UC000080
C.....SYSTEM COMMON, DIMENSION, AND EQUIVALENCE STATEMENTS UC000090
C          UC000100
      DIMENSION SYSTEM (1700) UC000110
C          UC000120
      EQUIVALENCE (SYSTEM(1700),KOM (1700),KFLAGS(1692),TAPETB(1622)) UC000130
C          UC000140
      EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16), UC000150
1 POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11), UC000160
2 CORTAP( 9), UC000170
3 TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5), UC000180
4 FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1)) UC000190
C          UC000200
      EQUIVALENCE (KFLAGS( 70), UC000210
1 K0 ( 60),FC ( 60),K1 ( 59),K2 ( 58),K3 ( 57), UC000220
2 K4 ( 56),K5 ( 55),K6 ( 54),K7 ( 53),K8 ( 52), UC000230
3 K9 ( 51), UC000240
4 KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42), UC000250
5 IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36), UC000260
6 ICLPRT( 35),INDEXX( 34),IPLQTR( 33), NOPLQTR( 31), UC000270
7 KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26), UC000280
8 LOCMAC( 25),LENSPC( 24), UC000290
9 IPOSTP( 20),NUMPST( 19)) UC000300
C          UC000310
      EQUIVALENCE (KOM ( 8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTGN(4)) UC000320
C          UC000330
      COMMON SYSTEM UC000340
C          UC000350
      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1) UC000360
C          UC000370
C.....***** UC000380
C          UC000390
C***** COMMON FOR THE MULTI-HEAD INSPECTION POSTPROCESSOR ***** UC000400
C          UC000410
      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,ADUM, UC000420
1 ARAYIN,BITS,BLANKS,BUFFER,BUFP,CCFIN,CCFOT, UC000430
2 FORMAT,IDEG,IDUM,IMIN,INTAP,I,ISEC,J,NUM,NWPR, UC000440
3 OPTAB,OUTRAY,PREVSI,PREVSJ,PREVSK,PREVSX, UC000450
4 PREVSZ,PREVSZ,RADIN,RADOUT,RAD,RETURN, UC000460
5 RIN,ROUT,SEQCTR,SEQINC,TAPSTC,WALL,WORDS, UC000470
6 XIN,XOUT,YIN UC000480
      DIMENSION MACH(12),PNOFLG(14),MTABLE(10),ADUM(50), UC000490
1 BUFFER(100),BUFP(26),FORMAT(26),IDUM(50),INTAP(20), UC000500
2 OPTAB(100),TAPSTC(250),WORDS(26) UC000510
      DIMENSION ARAYIN(8,250),OUTRAY(8,250) UC000520
      IF(MDS-1)80,10,80 UC000530
10 GOTO(20,50,20),IWVS UC000540
20 IF(ABS(OUTRAY(5,ICT))-0.0000001)40,40,30 UC000550

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30 BUFP(5)=ATANF(OUTRAY(6,ICT)/OUTRAY(5,ICT))*57.2957795      UC000560
   BUFP(5)=90.0-BUFP(5)                                         UC000570
   GOTO(80,80,50),IWVS                                          UC000580
40 BUFP(5)=SIGNF(90.0, OUTRAY(5,ICT))                          UC000590
   BUFP(5)=90.0-BUFP(5)                                         UC000600
   GOTO(80,80,50),IWVS                                          UC000610
50 IF(ABSF(ARRAYIN(5,IDX))-0.0000001) 70,70,60                UC000620
60 BUFP(9)=ATANF(ARRAYIN(6,IDX)/ARRAYIN(5,IDX))*57.2957795    UC000630
   BUFP(9)=90.0-BUFP(9)                                         UC000640
   GOTO80                                                        UC000650
70 BUFP(9)=SIGNF(90.0,ARRAYIN(6,IDX))                          UC000660
   BUFP(9)=90.0+BUFP(9)                                         UC000670
80 RETURN                                                       UC000680
   END                                                         UC000690
C                                                                UC000010
C                                                                UC000020
C-----UC000030
C                                                                UC000040
C                                                                UC000050
C                                                                UC000060
   SUBROUTINE AGFND(ANGL, IDEG, IMIN, ISEC)
   DIV=57.29578
   IF(ANGL)10,20,20
10 ANGL=ANGL+6.28319
20 FIRST=ANGL*DIV+.5/3600.
   IDEG=FIRST
   SECND=IDEG
   THIRD=ABSF(FIRST-SECND)
   FOURTH=THIRD*60.0
   IMIN=FOURTH
   FIFTH=IMIN
   SIXTH=ABSF(FOURTH-FIFTH)
   SEVTH=SIXTH*60.0
   FND=MODF(SEVTH,5.0)
   SEVTH=SEVTH-FND
   IF(FND-2.5)40,40,30
30 SEVTH=SEVTH+5.0
40 SEVTH=SEVTH+.001
   ISEC=SEVTH
   IF(ISEC-60)70,50,50
50 ISEC=0
   IMIN=IMIN+1
   IF(IMIN-60)70,60,60
60 IMIN=0
   IDEG=IDEG+1
70 RETURN
   END
C                                                                UC000010
C                                                                UC000020
C-----UC000030
C                                                                UC000040
C                                                                UC000050
C                                                                UC000060
   SUBROUTINE AUXDUI(K,L)
C*****
C
C.....SYSTEM COMMON, DIMENSION, AND EQUIVALENCE STATEMENTS
C
   DIMENSION SYSTEM (1700)
C
   EQUIVALENCE (SYSTEM(1700),KDM (1700),KFLAGS(1692),TAPETB(1622)) UC000130

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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),IPLCTR( 33),      NOPLQT( 31),
7      KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECI( 27),NCLREC( 26),
8      LOCMAC( 25),LENSPC( 24),
9      IPOSTP( 20),NUMPST( 19))
C
C      EQUIVALENCE (KOM      (8),KAPTIO(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))
C
C      COMMON SYSTEM
C
C      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C.....*****
C***** COMMON FOR THE MULTI-HEAD INSPECTION POSTPROCESSOR *****
C
C      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,ADUM,
1      ARAYIN,BITS,BLANKS,BUFFER,BUFP,CCFIN,CCFOT,
2      FORMAT,IDEG,IDUM,IMIN,INTAP,I,ISEC,J,NUM,NWPR,
3      OPTAB,OUTRAY,PREVSI,PREVSJ,PREVSK,PREVSX,
4      PREVSZ,PREVSZ,RADIN,RADCUT,RAD,RETURN,
5      RIN,ROUT,SEQCTR,SEQINC,TAPSTO,WALL,WORDS,
6      XIN,XOUT,YIN
C      DIMENSION MACH(12),PNOFLG(14),MTABLE(10),ADUM(50),
1      BUFFER(100),BUFP(26),FORMAT(26),IDUM(50),INTAP(20),
2      OPTAB(100),TAPSTO(250),WORDS(26)
C      DIMENSION ARAYIN(8,250),OUTRAY(8,250)
C
C      AUXOUT- THE FUNCTION OF THIS ROUTINE IS TO
C      CALL THE APPROPRIATE AUXILIARY FUNCTION
C      ROUTINE TO PRODUCE THE DESIRED
C      OUTPUT BLOCK.
C
C      K=K
C      WHICH ARRAY HAS THE DESIRED INFORMATION
C      GOTO(10,20),K
C..... ARAYIN HAS THE DESIRED INFORMATION
10  MMM=ARAYIN(8,L)+.001
C      GOTO30
C      OUTRAY HAS THE DESIRED INFORMATION
20  MMM=OUTRAY(8,L)+.001
30  ITRY=3
C      DO110 KMAC=1,3
C      ITRY=ITRY-1
C      DETERMINE LARGEST POWER OF 2 IN SUM AND
C      TRANSFER ACCORDINGLY UNTIL SUM = 0.
C      IF(MMM-2**ITRY)110,40,40

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40	MMM=MMM-2**ITRY	UC000730
	GOTO(50,60,100),KMAC	UC000740
50	CALL INSERT(2)	UC000750
	GOTO110	UC000760
60	CALL LEADER(2)	UC000770
70	GO TO(80,90),K	UC000780
80	ARAYIN(8,L)=BITS	UC000790
	GO TO 110	UC000800
90	OUTRAY(8,L)=BITS	UC000810
	GO TO 110	UC000820
100	CALL REWIND(2)	UC000830
	GO TO 70	UC000840
110	CONTINUE	UC000850
	RETURN	UC000860
	END	UC000870

C-----

*	FAP	UC000010
*	LIST	UC000020
*	CONBCD ROUTINE 2 WORD FLEXIBLE FORMAT BCD CONVERSION.	UC000030
	ENTRY CONBCD	UC000040
	BCI 1,CONBCD	UC000050
*	USE CALL CONBCD (A,B,I,J) WHERE -	UC000060
*	A - IS THE FLOATING POINT NUMBER TO BE CONVERTED.	UC000070
*	B - BCD ARRAY TO STORE CONVERTED RESULTS.	UC000080
*	I - IS THE FIELD LENGTH OF BCD NUMBER.	UC000090
*	IF I IS NEGATIVE, THEN INCLUSION SIGN OF A IS	UC000100
*	DESIRED. THE PROGRAM WILL INCREASE THE FIELD	UC000110
*	LENGTH BY ONE CHARACTER IN THIS CASE.	UC000120
*	J - DEFINES THE NUMBER OF FRACTIONAL DIGITS	UC000130
*	THAT A SHOULD HAVE. IF J IS NEGATIVE, THEN	UC000140
*	A DECIMAL POINT IS TO BE INSERTED.	UC000150
*	IN THIS CASE THE FIELD LENGTH (I) WILL BE	UC000160
*	INCREASED BY ONE.	UC000170
*	IF YOU WISH TO BLANK OUT TRAILING ZEROES, ADD 100	UC000180
*	TO THE MAGNITUDE OF J.	UC000190
*	NOTE - THE ADJUSTED I VALUE CANNOT EXCEED 12 AND	UC000200
*	I CANNOT BE ZERO.	UC000210
*	J WILL NOT BE ALLOWED TO EXCEED 8 IN VALUE.	UC000220
CONBCD	SXA EX,4	UC000230
	SXA EX+1,2	UC000240
	SXA EX+2,1	UC000250
	AXT 0,1	UC000260
	AXT 8,2	UC000270
	STZ PFLAG+8,2	UC000280
	TIX *-1,2,1	UC000290
	CAL BIBA	UC000300
	STP B1B8	UC000310
	CLA DI0C	UC000320
	STO B1BCD	UC000330
	CLA 2,4	UC000340
	STA CUN5+2	UC000350
	SUB =1	UC000360
	STA CON7	UC000370
	CLA* 3,4	UC000380
	SLW I	UC000390

TZE	ERR1	I=0	UC000400
LDQ*	1,4		UC000410
TPL	*+7		UC000420
ACL	ONE		UC000430
SLW	I		UC000440
CLA	=16		UC000450
TQP	*+2		UC000460
ADD	=16		UC000470
STO	SFLAG	SET SIGN	UC000480
XCL			UC000490
STO	A		UC000500
CLA*	4,4		UC000510
SLW	J		UC000520
CLA	J		UC000530
SUB	=100817		UC000540
TMI	*+6		UC000550
SLW	J		UC000560
CLA	BIBA		UC000570
STP	BIBB		UC000580
CLA	NOP		UC000590
STO	BIBCD		UC000600
CLA*	4,4		UC000610
TPL	*+5		UC000620
CLA	I	DEC. POINT DESIRED.	UC000630
ADD	ONE		UC000640
STO	I		UC000650
SLW	PFLAG	SET FLAG	UC000660
CLA	J		UC000670
SUB	8V		UC000680
TMI	*+3		UC000690
CLA	8V	J IS TOO LARGE SET	UC000700
STO	J	IT TO 8.	UC000710
CLA	J		UC000720
STO	NODEC		UC000730
CLA	12V		UC000740
SUB	I		UC000750
TMI	ERR1	ADJUSTED I IS LARGER 12.	UC000760
CLA	A		UC000770
LXD	J,2	LXA FOR 7090	UC000780
TZE	CON1-1		UC000790
FAD	TAB5,2	ROUND	UC000800
UFA	=HCH0000		UC000810
FAD	=HCH0000		UC000820
SLW	Q1	INTEGRAL A	UC000830
CLA	A		UC000840
UFA	=HCH0000		UC000850
FAD	=HCH0000		UC000860
STO	Q3		UC000870
CLA	A	CONVERT FRACTION	UC000880
FSB	Q3		UC000890
SSP			UC000900
XCA			UC000910
FMP	TAB2,2		UC000920
FAD	=.5		UC000930
STO	Q2	$Q2 = (A - Q1) * 10 ** J + .5$	UC000940
UFA	=HCH0000		UC000950
SUB	=HCH0000		UC000960
TSX	BIBCD,4		UC000970
TXH	*+2,2,6		UC000980

	ANA	TAB3,2		UC000990
	SLW	BB2		UC001000
	TXL	CON1,2,5		UC001010
	XCA			UC001020
	TSX	BIBCD,4		UC001030
	TXI	*+1,2,-6		UC001040
	ANA	TAB3,2		UC001050
	SLW	BB1		UC001060
	TXI	*+1,1,1		UC001070
CON1	CLA	J		UC001080
	STO	CC		UC001090
	NZT	SFLAG	DEC. POINT WANTED	UC001100
	TRA	CON3	NO	UC001110
	TXL	*+2,2,5		UC001120
	TXI	*+1,2,-6		UC001130
	CAL	TAB1,2		UC001140
	ORS	BB2,1		UC001150
	CLA	CC		UC001160
	ADD	ONE		UC001170
	STO	CC		UC001180
CON3	CLA	I		UC001190
	SUB	CC		UC001200
	ZET	SFLAG		UC001210
	SUB	ONE		UC001220
	PDX	0,2	PAX FOR-90	UC001230
	TXL	*+2,2,6		UC001240
	TXI	*+1,2,-6		UC001250
	CLA	Q1	CONVERT INTEGRAL PART	UC001260
	UFA	=HCH0000		UC001270
	SUB	=HCH0000		UC001280
	TSX	BIBCD,4		UC001290
	ANA	TAB3,2		UC001300
	XCL			UC001310
	PXD			UC001320
	LXD	CC,4	LXA FOR 7090	UC001330
	TXL	*+3,4,0		UC001340
	LGL	6	MERGE INTEGRAL	UC001350
	TXI	*-2,4,-1	PART	UC001360
	QRS	BB1	WITH	UC001370
	XCL		FRACTION	UC001380
	QRS	BB2		UC001390
	NZT	SFLAG	SIGN WANTED	UC001400
	TRA	CON4	NO	UC001410
	LXD	I,4	LXA FOR 7090F	UC001420
	TXI	*+1,4,-1		UC001430
	PXD			UC001440
	LDQ	SFLAG		UC001450
	LGL	6		UC001460
	TIK	*-1,4,1		UC001470
	QRS	BB1		UC001480
	XCL			UC001490
	QRS	BB2		UC001500
CON4	AXT	1,1	FILL IN WITH BLANKS	UC001510
	CLA	12V		UC001520
	SUB	I		UC001530
	TZE	CON5		UC001540
	PDX	0,2	PAX FOR 7090F	UC001550
	SUB	5V		UC001560
	TZE	CON6		UC001570

	TXL	++3,2,6		UC001580
	TXI	++1,2,-6		UC001590
	AXT	0,1		UC001600
	CAL	TAB4,2		UC001610
	ORS	BB2,1		UC001620
CON5	CLA	BB2		UC001630
	TXH	++3,1,0		UC001640
	STO	**		UC001650
	TXL	EX		UC001660
CON7	STO	**		UC001670
	CLA	BB1		UC001680
	TRA	CON7-2		UC001690
EX	AXT	0,4	EXIT	UC001700
	AXT	0,2		UC001710
	AXT	0,1		UC001720
	TRA	5,4		UC001730
CON6	AXT	0,1		UC001740
	TRA	CON5		UC001750
ERR1	TSX	\$ERREX,4		UC001760
	PZE	=24B17		UC001770
	TRA	EX		UC001780
BIBCD	TZE	1,4		UC001790
	SXA	BIB,4		UC001800
	XCA			UC001810
	AXT	0,4		UC001820
	STZ	Q3		UC001830
	PXD			UC001840
	DVP	=10		UC001850
BIBB	TXL	++7		UC001860
	TNZ	Q3+2		UC001870
	CLA	NODEC		UC001880
	TZE	Q3+2		UC001890
	SUB	ONE		UC001900
	STO	NODEC		UC001910
	CAL	=48		UC001920
	ALS	0,4		UC001930
	ORS	Q3		UC001940
	TXI	++1,4,-6		UC001950
	TXH	BIBB-2,4,-36		UC001960
	CAL	Q3		UC001970
BIB	AXT	0,4		UC001980
	TRA	1,4		UC001990
Q3	BSS	2		UC002000
	STO	*-1		UC002010
	CAL	BIBA		UC002020
	STP	BIBB		UC002030
	CLA	Q3+1		UC002040
BIBA	TXL	BIBB		UC002050
	DEC	100000000.,10000000.,1000000.		UC002060
	DEC	100000.,10000.,1000.,100.,10.		UC002070
TAB2	BSS	0		UC002080
	BCI	2,.,000000.0000		UC002090
	OCT	330000000,330000,3300		UC002100
TAB1	OCT	33		UC002110
	OCT	777777777777,7777777777		UC002120
	OCT	77777777,777777,7777,77		UC002130
TAB3	DEC	0		UC002140
	BCI	1, 0		UC002150
	BCI	1, 00		UC002160

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      BCI      1,    000
      BCI      1,   0000
      BCI      1,  00000
TAB4  DEC      0
PFLAG
SFLAG
BB1
BB2
Q1
Q2
A
CC
ONE  DEC      1817
12V  DEC      12817
8V   DEC      9817
6V   DEC      6817
J
I
      DEC      .5E-8,.5E-7,.5E-6
      DEC      .5E-5,.5E-4,.5E-3,.5E-2
      DEC      .5E-1
TAB5  DEC      .5
NOP   NOP
BIBC  TZE      1,4
NODEC PZE
      END
C
C
C-----
C
C
C
*      LIST
      SUBROUTINE COPROC
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),CRUTAP(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),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),      NOPLCT( 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))

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UC002170
UC002180
UC002190
UC002200
UC002210
UC002220
UC002230
UC002240
UC002250
UC002260
UC002270
UC002280
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UC002420
UC000010
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UC000060
UC000070
UC000080
UC000090
UC000100
UC000110
UC000120
UC000130
UC000140
UC000150
UC000160
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UC000190
UC000200
UC000210
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UC000230
UC000240
UC000250
UC000260
UC000270
UC000280
UC000290
UC000300
UC000310
UC000320
UC000330

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C                                     UC000340
COMMON SYSTEM                                     UC000350
C                                     UC000360
DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)           UC000370
C                                     UC000380
C...*****                               UC000390
C                                     UC000400
C***** COMMON FOR THE MULTI-HEAD INSPECTION POSTPROCESSOR *****UC000410
C                                     UC000420
COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,ADUM, UC000430
1 ARAYIN,BITS,BLANKS,BUFFER,BUFP,CCFIN,CCFOT, UC000440
2 FORMAT,IDEG,IDUM,IMIN,INTAP,I,ISEC,J,NUM,NWPR, UC000450
3 OPTAB,OUTRAY,PREVSI,PREVSJ,PREVSK,PREVSX, UC000460
4 PREVSZ,PREVSZ,RADIN,RADCUT,RAD,RETURN, UC000470
5 RIN,ROUT,SEQCTR,SEQINC,TAPSTO,WALL,WORDS, UC000480
6 XIN,XOUT,YIN UC000490
DIMENSION MACH(12),PNOFLG(14),MTABLE(10),ADUM(50), UC000500
1 BUFFER(100),BUFP(26),FORMAT(26),IDUM(50),INTAP(20), UC000510
2 OPTAB(100),TAPSTO(250),WORDS(26) UC000520
DIMENSION ARAYIN(8,250),OUTRAY(8,250) UC000530
COMMON SEQOT,SEQIN,NUMOFI,NUMOFJ UC000540
DIMENSION SEQOT(10),SEQIN(10),NUMOFI(10),NUMOFJ(10) UC000550
DIMENSION SAVES(2) UC000560
C                                     UC000570
C COPROC- THE FUNCTION OF THIS ROUTINE TO UC000580
C PROCESS THE STORED INFORMATION FOR THE UC000590
C MACHIN/PRATTW, INSP, 6COORD UC000600
C                                     UC000610
NOW=0 UC000620
C DETERMINE THE NUMBER OF LISTINGS DESIRED UC000630
NUMTMS=OPTAB(30)+.001 UC000640
SAV35=OPTAB(35) UC000650
C INITIALIZE THE COUNTER FOR THIS PASS UC000660
10 NOW=NOW+1 UC000670
MDO=1 UC000680
MDS=1 UC000690
IDUM(25)=1 UC000700
DO220 ICT=1,I UC000710
IF(IDUM(45)-ICT)40,20,40 UC000720
B 20 ABC=765360606060 UC000730
C WAS PUNCH TAPE WANTED UC000740
IF(OPTAB(35))40,30,40 UC000750
30 CALL PUNCHB(-6,ABC,2,0) UC000760
40 CALL MATCH(ICT,IXX,IDX,1) UC000770
KCT=ICT UC000780
KDX=IDX UC000790
C HAVE ANY AUXILIARY FUNCTIONS BEEN PROCESSED UC000800
C BETWEEN THIS AND PREVIOUS TMARK. UC000810
IF(OUTRAY(8,KCT)-BITS)70,50,70 UC000820
C WAS THERE A MATCH FOR TMARK UC000830
50 IF(IXX)60,60,90 UC000840
60 IF(ARAYIN(8,KDX)-BITS)80,90,80 UC000850
70 CALL AUXOUT(2,KCT) UC000860
GOTO50 UC000870
80 CALL AUXOUT(1,KDX) UC000880
C HAS A SEQNO/START BEEN GIVEN PRIOR TO THIS TMARK UC000890
90 IF(IDUM(46)-IDX)120,100,120 UC000900
B 100 ABC=765360606060 UC000910
C WAS PUNCH TAPE WANTED UC000920

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	IF(OPTAB(35))120,110,120	UC000930
110	CALL PUNCHB(-6,ABC,2,0)	UC000940
C	HAS SLIDE SEQUENCE OF EITHER GAGE BEEN	UC000950
C	ALTERED	UC000960
120	IF(NUMOFI(MDD)-ICT)130,140,130	UC000970
130	IF(NUMOFJ(MDS)-IDX)160,150,160	UC000980
140	BUFP(2)=SEQOT(MDD)	UC000990
	MDD=MDD+1	UC001000
	GOTO 130	UC001010
150	BUFP(6)=SEQIN(MDS)	UC001020
	MDS=MDS+1	UC001030
C	BEGIN PROCESSING THE OUTER GAGE INFORMATION	UC001040
C	CALCULATE POSITION NUMBER, X, Y COORDINATES OF THE	UC001050
C	OUTSIDE POINT OF CONTACT, DRIVE SURFACE NORMAL	UC001060
C	ANGLES FOR OUTSIDE AND INSIDE, X, Y COORDINATES	UC001070
C	FOR INSIDE POINT OF CONTACT	UC001080
C	CALCULATE ONLY POSITION NUMBER, X, Y COORDINATES	UC001090
C	OF OUTSIDE POINT OF CONTACT, AND DRIVE SURFACE	UC001100
C	NORMAL ANGLE FOR CORRESPONDING POINT.	UC001110
160	BUFP(1)=ABSF(OUTRAY(1,ICT))	UC001120
	BUFP(3)=OUTRAY(2,ICT)	UC001130
	BUFP(4)=OUTRAY(3,ICT)	UC001140
	IF(IXX) 170,170,180	UC001150
170	CALL TEST(1,IDX,ICT)	UC001160
	BUFP(7)=ARAYIN(2,IDX)	UC001170
	BUFP(8)=ARAYIN(3,IDX)	UC001180
	IDUM(10)=0	UC001190
	KBA=3	UC001200
	GOTO190	UC001210
180	CALL TEST(2,IDX,ICT)	UC001220
	KBA=1	UC001230
	IDUM(10)=1	UC001240
190	DO210IP=1,2	UC001250
	CALL ABEAR(IP,KBA,ICT,IDX)	UC001260
	JUNK=IP-1	UC001270
	IF(BUFP(4*JUNK+2)-SAVES(IP))200,210,200	UC001280
200	SAVES(IP)=BUFP(4*JUNK+2)	UC001290
210	CONTINUE	UC001300
	CALL SEQOUT	UC001310
	CALL PTAPE	UC001320
220	ICT=ICT	UC001330
	IKT=I+1	UC001340
	JKT=J+1	UC001350
	IF(OUTRAY(8,IKT)-BITS)230,240,230	UC001360
230	CALL AUXOUT(2,IKT)	UC001370
240	IF(ARAYIN(8,JKT)-BITS)250,260,250	UC001380
250	CALL AUXOUT(1,JKT)	UC001390
260	CONTINUE	UC001400
C	REPEAT ABOVE STEPS FOR THE INSIDE GAGE	UC001410
C	BUT ONLY PROCESS WHEN NO MATCH IS FOUND	UC001420
	DO370K=1,J	UC001430
	IF(IDUM(46)-K)290,270,290	UC001440
B 270	ABC=765360606060	UC001450
C	WAS PUNCHED TAPE WANTED	UC001460
	IF(OPTAB(35))290,290,290	UC001470
280	CALL PUNCHB(-6,ABC,2,0)	UC001480
290	CALL MATCH(K,IXX,JDX,2)	UC001490
	IDX=JDX	UC001500
	IF(IXX)370,370,300	UC001510

300 IF(ARRAYIN(8,K)-BITS) 310,320,310	UC001520
310 CALL AUXOUT(1,K)	UC001530
320 BUFP(7)=ARRAYIN(2,K)	UC001540
BUFP(8)=ARRAYIN(3,K)	UC001550
IF(NUMOFJ(MDS)-K) 340,330,340	UC001560
330 BUFP(6)=SEQIN(MDS)	UC001570
MDS=MDS+1	UC001580
340 BUFP(1)=ABSF(ARRAYIN(1,K))	UC001590
CALL TEST(3,IDX,K)	UC001600
CALL ABEAR(1,KBA,IDX,K)	UC001610
KBA=2	UC001620
IF(BUFP(6)-SAVES(2)) 350,360,350	UC001630
350 SAVES(2)=BUFP(6)	UC001640
360 CALL SEQOUT	UC001650
IDUM(10)=1	UC001660
CALL PTAPE	UC001670
370 K=5	UC001680
OPTAB(35)=1.	UC001690
C HAVE ALL LISTINGS BEEN GIVEN	UC001700
IF(NOW-NUMTMS) 10,380,380	UC001710
380 OPTAB(35)=SAV35	UC001720
RETURN	UC001730
END	UC001740

C-----

* FAP	UC000001
ENTRY DATE	UC0000020
DATE CLA 1,4	UC0000030
STA FIRST	UC0000040
SUB =1	UC0000050
STA SECND	UC0000060
PXD	UC0000070
LDQ 08	UC0000080
LGL 6	UC0000090
TNZ *+2	UC0000100
ADD BLNK	UC0000110
LGL 6	UC0000120
FIRST STA **	UC0000130
PXD	UC0000140
LGL 12	UC0000150
ALS 6	UC0000160
LGL 12	UC0000170
ACL SLSHS	UC0000180
SECND SLW **	UC0000190
TRA 2,4	UC0000200
SLSHS OCT 6100000610000	UC0000210
BLNK OCT 60	UC0000220
END	UC0000230

C-----

* FAP	UC000001
COUNT 12	UC0000020
* SECTION 4 CONNECTOR PROGRAM	UC0000030

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* THIS PROGRAM PROVIDES ENTRY TO SECTION 4 ROUTINES FROM          UC000040
* POST PROCESSOR LINKS                                           UC000050
  ENTRY DESPAT                                                    UC000060
* FIRST IS FIRST CELL WHICH IS LOADED WITH PROGRAMS             UC000070
* BY THE FORTRAN LOADER                                          UC000080
  FIRST EQU 100          FORTRAN LOADING POINT (DECIMAL)         UC000090
  SPACE EQU 5700+4       SPACER SIZE OF SECTION 4 MAIN PROGRAM   UC000100
DESPAT TRA* FIRST+SPACE                                          UC000110
  END                                                            UC000120
C                                                                UC000010
C                                                                UC000020
C-----C-----C-----C-----C-----C-----C-----C----- UC000030
C                                                                UC000040
C                                                                UC000050
C                                                                UC000060
  SUBROUTINE END                                                  UC000070
C*****C*****C*****C*****C*****C*****C*****C*****C***** UC000080
C                                                                UC000090
C.....SYSTEM COMMON, DIMENSION, AND EQUIVALENCE STATEMENTS     UC000100
C                                                                UC000110
  DIMENSION SYSTEM (1700)                                         UC000120
C                                                                UC000130
  EQUIVALENCE (SYSTEM(1700),KOM (1700),KFLAGS(1692),TAPETB(1622)) UC000140
C                                                                UC000150
  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                                                                UC000200
  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),IPLCTR( 33),
7 K0YNFG( 30),LOCJPT( 29),LUCBEG( 28),KSECIN( 27),NCLREC( 26),
8 LOCMAC( 25),LENSPC( 24),
9 IPOSTP( 20),NUMPST( 19))
C                                                                UC000300
  EQUIVALENCE (KOM ( 8),KAPTIO(1),KAPTIO(2),KAPTTR(3),KAPTCN(4)) UC000310
C                                                                UC000320
  COMMON SYSTEM                                                    UC000330
C                                                                UC000340
  DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)                            UC000350
C                                                                UC000360
C.....C.....C.....C.....C.....C.....C.....C.....C..... UC000370
C                                                                UC000380
C*****C*****C*****C*****C*****C*****C*****C*****C***** UC000390
C***** COMMON FOR THE MULTI-HEAD INSPECTION POSTPROCESSOR ***** UC000400
C                                                                UC000410
  COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,ADUM,
1 ARAYIN,BITS,BLANKS,BUFFER,BUFP,CCFIN,CCFOT,
2 FORMAT,IDEG,IDUM,IMIN,INTAP,I,ISEC,J,NUM,NWPR,
3 OPTAB,OUTRAY,PREVSI,PREVSJ,PREVSK,PREVSX,
4 PREVSZ,PREVSZ,RADIN,RADOUT,RAD,RETURN,
5 RIN,ROUT,SEQCTR,SEQINC,TAPSTO,WALL,WORDS,
6 XIN,XOUT,YIN
  DIMENSION MACH(12),PNOFLG(14),MTABLE(10),ADUM(50),
1 BUFFER(100),BUFP(26),FORMAT(26),IDUM(50),INTAP(20),

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      2      OPTAB(100),TAPSTO(250),WORDS(26)
      DIMENSION ARAYIN(8,250),OUTRAY(8,250)
C
C      END TO PRODUCE THE DESIRED TAPE OR LISTING
C      IF THE PROPER CONDITIONS ARE SATISFIED.
C
C      TEST FLAG FOR PROCESSING
      IF(IDUM(2)-1) 10,20,10
10  CALL ERREX(3)
      IDUM(3)=1
      GOTD90
20  CALL PREINT
30  MDS=MTABLE(6)
      GOTD(40,40,40,40,50),MDS
40  CALL PROCES
      GOTD60
50  CALL COPROC
60  IDUM(3)=1
      IDUM(4)=1
C      WAS PUNCH TAPE WANTED
      IF(OPTAB(35))90,70,90
C      CLEAR THE OUTPUT BUFFER
70  DO 80 MKJ=1,12
80  BUFFER(MKJ)=BLANKS
      CALL PUNCHB(-72,BUFFER,1,0)
90  IDUM(40)=1
      CALL PREINT
      CALL DESPAT
      RETURN
      END
C
C
C-----
C
C      SUBROUTINE ERREX(M)
C*****
C.....SYSTEM COMMON, DIMENSION, AND EQUIVALENCE STATEMENTS
C
C      DIMENSION SYSTEM (1700)
C
C      EQUIVALENCE (SYSTEM(1700),KDM (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), NOPLCT( 31),
7  KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8  LOCMAC( 25),LENSPC( 24),

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UC000510
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UC000260
UC000270
UC000280
UC000290

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C      9 IPOSTP( 20),NUMPST( 19)) UC000300
C      EQUIVALENCE (KOM      (8),KAPTID(1),KAPTID(2),KAPTTR(3),KAPTCN(4)) UC000310
C      COMMON SYSTEM UC000320
C      UC000330
C      UC000340
C      UC000350
C      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1) UC000360
C      UC000370
C      C..... UC000380
C      UC000390
C***** COMMON FOR THE MULTI-HEAD INSPECTION POSTPROCESSOR ***** UC000400
C      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,ADUM, UC000410
C      UC000420
C      1 ARAYIN,BITS,BLANKS,BUFFER,BUFP,CCFIN,CCFOT, UC000430
C      2 FORMAT,IDEG,IDUM,IMIN,INTAP,I,ISEC,J,NUM,NWPR, UC000440
C      3 OPTAB,OUTRAY,PREVSI,PREVSJ,PREVSK,PREVSX, UC000450
C      4 PREVSZ,PREVSZ,RADIN,RACUT,RAD,RETURN, UC000460
C      5 RIN,ROUT,SEQCTR,SEQINC,TAPSTO,WALL,WORDS, UC000470
C      6 XIN,XOUT,YIN UC000480
C      DIMENSION MACH(12),PNOFLG(14),MTABLE(10),ADUM(50), UC000490
C      1 BUFFER(100),BUFP(26),FORMAT(26),IDUM(50),INTAP(20), UC000500
C      2 OPTAB(100),TAPSTO(250),WORDS(26) UC000510
C      DIMENSION ARAYIN(8,250),OUTRAY(8,250) UC000520
C      UC000530
C      ERREX- THE FUNCTION OF THIS ROUTINE UC000540
C      IS TO PROVIDE ERROR COMMENTS, UC000550
C      OCTAL DUMPS, AND TERMINATION OF UC000560
C      POST PROCESSING WHEN REQUESTED. UC000570
C      UC000580
C      ROUTINE TO PROVIDE ERROR COMMENTS AND EXIT UC000590
C      M=M UC000600
C      GO TO(10,30,50,70,90,110,140),M UC000610
C      10 WRITE OUTPUT TAPE6,20 UC000620
C      20 FORMAT(1H0,39HERROR HAS OCCURRED WHILE READING CLTAPE) UC000630
C      GOTO110 UC000640
C      30 WRITE OUTPUT TAPE6,40 UC000650
C      40 FORMAT(1H0,38HTAPES WERE NOT REWOUND STOP PROCESSING) UC000660
C      GOTO110 UC000670
C      50 WRITE OUTPUT TAPE6,60 UC000680
C      60 FORMAT(1H0,26HNO TMARKS WERE ENCOUNTERED) UC000690
C      GOTO110 UC000700
C      70 WRITE OUTPUT TAPE6,80 UC000710
C      80 FORMAT(1H0,21HIMPROPER HEAD COMMAND) UC000720
C      GOTO110 UC000730
C      90 WRITE OUTPUT TAPE6,100 UC000740
C      100 FORMAT(1H0,20HTAPE WRITE NOT VALID) UC000750
C      110 IF(OPTAB(14))130,120,130 UC000760
C      120 CALL PDUMP UC000770
C      130 CALL DESPAT UC000780
C      GOTO150 UC000790
C      140 WRITE OUTPUT TAPE6,150 UC000800
C      150 FORMAT(53H NEITHER HEAD/OUTER NOR HEAD/INNER HAS BEEN SPECIFIED) UC000810
C      GO TO 110 UC000820
C      160 RETURN UC000830
C      END UC000840
C      UC000010
C      UC000020
C----- UC000030
C      UC000040

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C                                UC000050
      SUBROUTINE EXECT                                UC000060
C*****                                UC000070
C                                UC000080
C.....SYSTEM COMMON, DIMENSION, AND EQUIVALENCE STATEMENTS UC000090
C                                UC000100
      DIMENSION SYSTEM (1700)                        UC000110
C                                UC000120
      EQUIVALENCE (SYSTEM(1700),KOM (1700),KFLAGS(1692),TAPETB(1622)) UC000130
C                                UC000140
      EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16), UC000150
1 POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11), UC000160
2 CORTAP( 9), UC000170
3 TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5), UC000180
4 FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1)) UC000190
C                                UC000200
      EQUIVALENCE (KFLAGS( 70), UC000210
1 K0 ( 60),FO ( 60),K1 ( 59),K2 ( 58),K3 ( 57), UC000220
2 K4 ( 56),K5 ( 55),K6 ( 54),K7 ( 53),K8 ( 52), UC000230
3 K9 ( 51), UC000240
4 KFLAGO( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42), UC000250
5 IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36), UC000260
6 ICLPRT( 35),INDEXX( 34),IPLCTR( 33), NOPLCT( 31), UC000270
7 KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26), UC000280
8 LOCMAC( 25),LENSPC( 24), UC000290
9 IPOSTP( 20),NUMPST( 19)) UC000300
C                                UC000310
      EQUIVALENCE (KOM ( 8),KAPTIO(1),KAPTIO(2),KAPTTR(3),KAPTCN(4)) UC000320
C                                UC000330
      COMMON SYSTEM UC000340
C                                UC000350
      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1) UC000360
C                                UC000370
C.....***** UC000380
C                                UC000390
C***** COMMON FOR THE MULTI-HEAD INSPECTION POSTPROCESSOR *****UC000400
C                                UC000410
      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,ADUM, UC000420
1 ARAYIN,BITS,BLANKS,BUFFER,BUFP,CCFIN,CCFOT, UC000430
2 FORMAT,IDEG,IDUM,IMIN,INTAP,I,ISEC,J,NUM,NWPR, UC000440
3 OPTAB,OUTRAY,PREVSI,PREVSJ,PREVSK,PREVSX, UC000450
4 PREVSZ,PREVSZ,RADIN,RADCUT,RAD,RETURN, UC000460
5 RIN,ROUT,SEQCTR,SEQINC,TAPSTO,WALL,WORDS, UC000470
6 XIN,XOUT,YIN UC000480
      DIMENSION MACH(12),PNOFLG(14),MTABLE(10),ADUM(50), UC000490
1 BUFFER(100),BUFP(26),FORMAT(26),IDUM(50),INTAP(20), UC000500
2 OPTAB(100),TAPSTO(250),WORDS(26) UC000510
      DIMENSION ARAYIN(8,250),OUTRAY(8,250) UC000520
C                                UC000530
C                                UC000540
      EXECT- THE CONTROL ELEMENT OF THE POST PROCESSOR UC000550
C                                UC000560
      READS ONE LOGICAL RECORD, DETERMINES UC000570
C                                UC000580
      TYPE, AND TRANSFERS ACCORDINGLY. UC000590
C                                UC000600
      CALL INIT UC000610
      RADIN=.078125 UC000620
      RADOUT=.078125 UC000630
      MONO=MTABLE(6)
      GOTO(20,20,20,20,10),MONO
10 CALL MACH05

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20	CALL POSTIN	UC000640
	CALL READER	UC000650
	IF(RETURN) 30,50,40	UC000660
C	ERROR RETURN	UC000670
30	ERROR=1.0	UC000680
	GOTO 370	UC000690
C	END OF FILE RETURN	UC000700
40	GOTO 380	UC000710
C	END OF RECORD SEQUENCE	UC000720
C	STORE RECORD SEQUENCE INTEGER	UC000730
50	TEMP=INTAP(1)	UC000740
	IF(SEQINC) 60,70,70	UC000750
60	SEQCTR=BITS	UC000760
	GOTO 80	UC000770
70	SEQCTR=TEMP+SEQINC	UC000780
80	IND1=INTAP(2)/1000	UC000790
	IF(IND1-14) 90,90,20	UC000800
90	GOTO(20,100,20,20,300,330,20,20,350,	UC000810
1	20,20,20,20,390),IND1	UC000820
C.....	2000 RECORD PROCESSED HERE	UC000830
100	IF(INTAP(3)-1000) 110,160,160	UC000840
110	IF(INTAP(3)-17) 120,20,20	UC000850
120	IND2=INTAP(3)	UC000860
	GO TO(130,140,150,20,20,20,20,20,20,	UC000870
1	20,20,20,20,20,20,20),IND2	UC000880
130	CALL END	UC000890
	GOTO 20	UC000900
140	CALL STOP	UC000910
	GOTO 20	UC000920
150	CALL OPSTOP	UC000930
	GOTO 20	UC000940
160	IND3=INTAP(3)-1000	UC000950
	IF(IND3-83) 170,170,20	UC000960
170	GO TO(20,180,20,20,190,200,20,20,20,20,	UC000970
1	20,20,210,20,20,20,20,20,220,20,	UC000980
2	20,20,20,230,240,20,20,20,20,20,	UC000990
3	20,20,250,260,20,20,20,20,20,20,	UC001000
4	20,20,20,270,20,280,20,20,20,20,	UC001010
5	290,20,20,20,20,20,20,20,20,20,	UC001020
6	20,20,20,20,20,20,20,20,20,20,	UC001030
7	20,20,20,20,20,20,20,20,20,20,	UC001040
8	20,20,20),IND3	UC001050
180	CALL HEAD	UC001060
	GOTO 20	UC001070
190	CALL TMARK	UC001080
	GOTO 20	UC001090
200	CALL REWIND(1)	UC001100
	GOTO 20	UC001110
210	CALL LEADER(1)	UC001120
	GOTO 20	UC001130
220	CALL SEQNO	UC001140
	GOTO 20	UC001150
230	CALL POSTN	UC001160
	GOTO 20	UC001170
240	CALL TOOLNO	UC001180
	GOTO 20	UC001190
250	CALL TURRET	UC001200
	GOTO 20	UC001210
260	CALL TLSET	UC001220

.GOTO 20	UC001230
270 CALL MESSAG	UC001240
GOTO 20	UC001250
280 CALL INSERT(1)	UC001260
GOTO 20	UC001270
290 CALL OPTION	UC001280
GOTO20	UC001290
C 5000 RECORD PROCESSED HERE	UC001300
300 IND4=INTAP(3)	UC001310
GOTO(20,20,310,320,320),IND4	UC001320
310 CALL FROM	UC001330
320 NRCDS=(NWPR-5)/6	UC001340
INCR=NRCDS*6	UC001350
CALL STORPT(INCR)	UC001360
GOTO 20	UC001370
330 IF(INTAP(3)-6) 20,340,20	UC001380
340 CALL RADSET	UC001390
GOTO20	UC001400
C.....9000 RECORD, CHECK FOR MULTI-AXIS	UC001410
350 IF(INTAP(3)-2)20,360,20	UC001420
C YES,SET PROCESSING FLAG ON	UC001430
360 IDUM(2)=1	UC001440
GOTO20	UC001450
370 CALL ERREX(1)	UC001460
GOTO 400	UC001470
380 CALL ERREX(2)	UC001480
GOTO 400	UC001490
390 CALL TAPEOP(CLTAPE,3,IXX)	UC001500
CALL FINI	UC001510
400 RETURN	UC001520
END	UC001530
C	UC000010
C	UC000020
C-----	UC000030
C	UC000040
C	UC000050
SUBROUTINE FINI	UC000060
C*****	UC000070
C	UC000080
C.....SYSTEM COMMON, DIMENSION, AND EQUIVALENCE STATEMENTS	UC000090
C	UC000100
DIMENSION SYSTEM (1700)	UC000110
C	UC000120
EQUIVALENCE (SYSTEM(1700),KOM (1700),KFLAGS(1692),TAPETB(1622))	UC000130
C	UC000140
EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),	UC000150
1 POCTAP(15),PLDTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),	UC000160
2 CORTAP(9),	UC000170
3 TAPES1(6),TAPES2(7),TAPES3(6),TAPES4(5),	UC000180
4 FORTIN(4),INTAPE(3),IDUTAP(2),PUNTAP(1))	UC000190
C	UC000200
EQUIVALENCE (KFLAGS(70),	UC000210
1 K0 (60),F0 (60),K1 (59),K2 (58),K3 (57),	UC000220
2 K4 (56),K5 (55),K6 (54),K7 (53),K8 (52),	UC000230
3 K9 (51),	UC000240
4 KFLAG0(46),KFLAG1(45),KFLAG2(44),KFLAG3(43),KFLAG4(42),	UC000250
5 IWAVER(40),IPTNLY(39),NOPOST(38),INVERT(37),KAUTOP(36),	UC000260
6 ICLPRT(35),INDEXX(34),IPLCTR(33), NOPLQT(31),	UC000270
7 KDYNFG(30),LOCJPT(29),LOCBEG(28),KSECIN(27),NCLREC(26),	UC000280

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      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 FOR THE MULTI-HEAD INSPECTION POSTPROCESSOR *****
C
      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,ADUM,
1      ARAYIN,BITS,BLANKS,BUFFER,BUFP,CCFIN,CCFOT,
2      FORMAT,IDEG,IDUM,IMIN,INTAP,I,ISEC,J,NUM,NWPR,
3      OPTAB,OUTRAY,PREVSI,PREVSJ,PREVSK,PREVSX,
4      PREVSZ,RADIN,RADCUT,RAD,RETURN,
5      RIN,ROUT,SEQCTR,SEQINC,TAPSTO,WALL,WORDS,
5      XIN,XOUT,YIN
      DIMENSION MACH(12),PNOFLG(14),MTABLE(10),ADUM(50),
1      BUFFER(100),BUFP(26),FORMAT(26),IDUM(50),INTAP(20),
2      OPTAB(100),TAPSTO(250),WORDS(26)
      DIMENSION ARAYIN(8,250),OUTRAY(8,250)
C
C      FINI- TO PROCESS THE DATA WHEN APPROPRIATE
C      CONDITIONS ARE MET AND TRANSFER CONTROL
C      BACK TO SECTION 4 ROUTINE DISPAT.
C
C      TEST TO SEE IF THE INFORMATION WAS PROCESSED BY END
      IF(IDUM(3)-1)10,110,10
10  IF(IDUM(2)-1)20,30,20
20  CALL ERREX(3)
      GOTO110
C
C      NO CALL ERROR ROUTINE
30  CALL PREINT
40  MDS=MTABLE(6)
C
C      TRANSFER ON MACHINE
      GOTO(50,50,50,50,60),MDS
C
C      ALL OTHERS
50  CALL PROCES
      GOTO70
C
C      MACHIN/PRATTW, INSP, 6COORD
60  CALL COPROC
70  IDUM(4)=1
C
C      WAS PUNCH TAPE WANTED
      IF(OPTAB(35))100,80,100
C
C      CLEAR THE OUTPUT BUFFER
80  DO 90 MKJ=1,100
90  BUFFER(MKJ)=BLANKS
      CALL PUNCHR(-72,BUFFER,1,0)
100 IDUM(40)=1
      CALL PREINT
C
C      RETURN TO SECTION 4.
110 CALL DESPAT
120 RETURN
      END
C
C

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UC000290
UC000300
UC000310
UC000320
UC000330
UC000340
UC000350
UC000360
UC000370
UC000380
UC000390
UC000400
UC000410
UC000420
UC000430
UC000440
UC000450
UC000460
UC000470
UC000480
UC000490
UC000500
UC000510
UC000520
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UC000570
UC000580
UC000590
UC000600
UC000610
UC000620
UC000630
UC000640
UC000650
UC000660
UC000670
UC000680
UC000690
UC000700
UC000710
UC000720
UC000730
UC000740
UC000750
UC000760
UC000770
UC000780
UC000790
UC000800
UC000810
UC000820
UC000830
UC000840
UC000850
UC000010
UC000020

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C----- UC000030
C UC000040
C UC000050
* LIST UC000060
SUBROUTINE FROM UC000070
RETURN UC000080
END UC000090
C UC000000
C UC000005
C----- UC000010
C UC000015
C UC000020
SUBROUTINE HEAD UC000025
C***** UC000030
C UC000035
C.....SYSTEM COMMON, DIMENSION, AND EQUIVALENCE STATEMENTS UC000040
C UC000045
DIMENSION SYSTEM (1700) UC000050
C UC000055
EQUIVALENCE (SYSTEM(1700),KOM (1700),KFLAGS(1692),TAPETB(1622)) UC000060
C UC000065
EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16), UC000070
1 POCTAP(15),PLDTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11), UC000075
2 CORTAP( 9), UC000080
3 TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5), UC000085
4 FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1)) UC000090
C UC000095
EQUIVALENCE (KFLAGS( 70), UC000100
1 K0 ( 60),FO ( 60),K1 ( 59),K2 ( 58),K3 ( 57), UC000105
2 K4 ( 56),K5 ( 55),K6 ( 54),K7 ( 53),K8 ( 52), UC000110
3 K9 ( 51), UC000115
4 KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42), UC000120
5 IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36), UC000125
6 ICLPRT( 35),INDEXX( 34),IPLOTR( 33), NOPLOT( 31), UC000130
7 KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26), UC000135
8 LOCMAG( 25),LENSPC( 24), UC000140
9 IPOSTP( 20),NUMPST( 19)) UC000145
C UC000150
EQUIVALENCE (KOM ( 8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4)) UC000155
C UC000160
COMMON SYSTEM UC000165
C UC000170
DIMENSION KFLAGS(1),IPOSTP(1),KOM(1) UC000175
C UC000180
C..... UC000185
C UC000190
C***** COMMON FOR THE MULTI-HEAD INSPECTION POSTPROCESSOR ***** UC000195
C UC000200
COMMON MACH,NLOOP,NLOOPi,PNOFLG,MTABLE,NID,ADUM, UC000205
1 ARAYIN,BITS,RLANKS,BUFFER,BUFP,CCFIN,CCFOT, UC000210
2 FORMAT,IDEG,IDUM,IMIN,INTAP,I,ISEC,J,NUM,NWPR, UC000215
3 OPTAB,OUTRAY,PREVSI,PREVSJ,PREVSK,PREVSX, UC000220
4 PREVSZ,RADIN,RADOUT,RAD,RETURN, UC000225
5 RIN,ROUT,SEQCTR,SEQINC,TAPSTO,WALL,WORDS, UC000230
6 XIN,XOUT,YIN UC000235
DIMENSION MACH(12),PNOFLG(14),MTABLE(10),ADUM(50), UC000240
1 BUFFER(100),BUFP(26),FORMAT(26),IDUM(50),INTAP(20), UC000245
2 OPTAB(100),TAPSTO(250),WORDS(26) UC000250
DIMENSION ARAYIN(8,250),OUTRAY(8,250) UC000255

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C                                     UC000260
C   HEAD- THE FUNCTION OF THIS ROUTINE IS TO          UC000265
C   ESTABLISH THE MODE OF OPERATION BY              UC000270
C   SETTING FLAGS TO INDICATE HEAD/INNER            UC000275
C   OR HEAD/OUTER                                    UC000280
C                                                     UC000285
C   IF(INTAP(4)-236) 100,105,100                    UC000290
100 IF(INTAP(4)-235) 115,110,115                    UC000295
C   HEAD/OUTER HAS OCCURRED,SET OUT FLAG ON         UC000300
105 IDUM(5)=1                                         UC000305
    IDUM(6)=0                                         UC000310
    GOTO 120                                          UC000315
C   HEAD/INNER HAS OCCURRED ,SET IN FLAG ON          UC000320
110 IDUM(5)=0                                         UC000325
    IDUM(6)=1                                         UC000330
    GOTO 120                                          UC000335
C   NEITHER OUTTER OR INNER HAS OCCURED SET ERROR FLAG=4 UC000340
115 CALL ERREX(4)                                     UC000345
120 RETURN                                           UC000350
    END                                              UC000355

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C-----
*      FAP                                           UC000001
    ENTRY  ERREX                                     UC000020
ERREX  TRA  2,4                                     UC000030
    END                                             UC000040
*      FAP                                           UC000050
    ENTRY  INIT                                     UC000060
*                                                    UC000070
*   SYSTEM COMMON, DIMENSION, AND EQUIVALENCE STATEMENTS FOR FAP UC000080
NOTAPS EQU  18          NUMBER OF TAPES             UC000090
NOFLGS EQU  70          NUMBER OF FLAGS IN FLAG AREA UC000100
BUFNUM EQU   4          NUMBER OF BUFFERS           UC000110
NOBLKS EQU   4          NO. OF BLOCKS ALLOWED TAPEWT CALL SEC. UC000120
BUFSIZ EQU  400        SIZE OF ONE BUFFER BLOCK     UC000130
*****
SYSTEM COMMON  8                                           UC000140
KFLAGS COMMON NOFLGS                                     UC000150
TAPETB COMMON NOTAPS                                     UC000160
BUFTBL COMMON BUFNUM                                     UC000170
BUFER1 COMMON BUFSIZ                                     UC000180
BUFER2 COMMON BUFSIZ                                     UC000190
BUFER3 COMMON BUFSIZ                                     UC000200
BUFER4 COMMON BUFSIZ                                     UC000210
KOM EQU      SYSTEM                                       UC000220
KAPTID EQU   KOM-7          IDENTIFICATION OF LAST LIBTAP RECORD UC000230
KAPTIO EQU   KOM-6          APT I-O COMMAND             UC000240
KAPTTR EQU   KOM-5          TRANSFER TO LAST SECTION READ FROM LIBTAP UC000250
KAPTCN EQU   KOM-4          CONTINUATION FLAG            UC000260
K0 EQU      KFLAGS-10      KFLAGS(11)                 UC000270
K1 EQU      KFLAGS-11      UC000280
K2 EQU      KFLAGS-12      UC000290
K3 EQU      KFLAGS-13      UC000300
K4 EQU      KFLAGS-14      UC000310
K5 EQU      KFLAGS-15      UC000320
K6 EQU      KFLAGS-16      UC000330
UC000340

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K7	EQU	KFLAGS-17	UC000350
K8	EQU	KFLAGS-18	UC000360
K9	EQU	KFLAGS-19	UC000370
KFLAG0	EQU	KFLAGS-24	UC000380
KFLAG1	EQU	KFLAGS-25	UC000390
KFLAG2	EQU	KFLAGS-26	UC000400
KFLAG3	EQU	KFLAGS-27	UC000410
KFLAG4	EQU	KFLAGS-28	UC000420
IWAVEN	EQU	KFLAGS-30	UC000430
IPTNLY	EQU	KFLAGS-31	UC000440
NDPOST	EQU	KFLAGS-32	UC000450
INVERT	EQU	KFLAGS-33	UC000460
KAUTOP	EQU	KFLAGS-34	UC000470
ICLPRT	EQU	KFLAGS-35	UC000480
INDEXX	EQU	KFLAGS-36	UC000490
IPLOTR	EQU	KFLAGS-37	UC000500
NDPLOT	EQU	KFLAGS-39	UC000510
KDYNFG	EQU	KFLAGS-40	UC000520
LOCJPT	EQU	KFLAGS-41	UC000530
LOCBEG	EQU	KFLAGS-42	UC000540
KSECIN	EQU	KFLAGS-43	UC000550
NCLREC	EQU	KFLAGS-44	UC000560
LOCMAC	EQU	KFLAGS-45	UC000570
LENSPC	EQU	KFLAGS-46	UC000580
IPOSTP	EQU	KFLAGS-50	UC000590
NUMPST	EQU	KFLAGS-51	UC000600
PROTAP	EQU	TAPETB	UC000610
CANTAP	EQU	TAPETB-1	UC000620
CLTAPE	EQU	TAPETB-2	UC000630
POCTAP	EQU	TAPETB-3	UC000640
PLOTAP	EQU	TAPETB-4	UC000650
SRFTAP	EQU	TAPETB-5	UC000660
LIBTAP	EQU	TAPETB-6	UC000670
CRDTAP	EQU	TAPETB-7	UC000680
CORTAP	EQU	TAPETB-9	UC000690
TAPES1	EQU	TAPETB-10	UC000700
TAPES2	EQU	TAPETB-11	UC000710
TAPES3	EQU	TAPETB-12	UC000720
TAPES4	EQU	TAPETB-13	UC000730
FORTIN	EQU	TAPETB-14	UC000740
INTAPE	EQU	TAPETB-15	UC000750
IOUTAP	EQU	TAPETB-16	UC000760
PUNTAP	EQU	TAPETB-17	UC000770
*****			UC000780
*			UC000790
*			UC000800
MACH	COMMON	12	UC000810
NLOOP	COMMON	1	UC000820
NLOOP1	COMMON	1	UC000830
PNOFLG	COMMON	14	UC000840
MTABLE	COMMON	10	UC000850
NID	COMMON	1	UC000860
ADUM	COMMON	50	UC000870
ARAYIN	COMMON	2000	UC000880
BITS	COMMON	1	UC000890
BLANKS	COMMON	1	UC000900
BUFFER	COMMON	100	UC000910
BUFP	COMMON	26	UC000920
CCFIN	COMMON	1	UC000930

CCFOT	COMMON	1		UC000940
FORMAT	COMMON	26		UC000950
IDEG	COMMON	1		UC000960
IDUM	COMMON	50		UC000970
IMIN	COMMON	1		UC000980
INTAP	COMMON	20		UC000990
I	COMMON	1		UC001000
ISEC	COMMON	1		UC001010
J	COMMON	1		UC001020
NUM	COMMON	1		UC001030
NWPR	COMMON	1		UC001040
OPTAB	COMMON	100		UC001050
OUTRAY	COMMON	2000		UC001060
PREVSI	COMMON	1		UC001070
PREVSJ	COMMON	1		UC001080
PREVSK	COMMON	1		UC001090
PREVSX	COMMON	1		UC001100
PREVSY	COMMON	1		UC001110
PREVSZ	COMMON	1		UC001120
RADIN	COMMON	1		UC001130
RADOUT	COMMON	1		UC001140
RAD	COMMON	1		UC001150
RETURN	COMMON	1		UC001160
RIN	COMMON	1		UC001170
ROUT	COMMON	1		UC001180
SEQCTR	COMMON	1		UC001190
SEQINC	COMMON	1		UC001200
TAPSTO	COMMON	250		UC001210
WALL	COMMON	1		UC001220
WORDS	COMMON	26		UC001230
XIN	COMMON	1		UC001240
XOUT	COMMON	1		UC001250
YIN	COMMON	1		UC001260
INIT	SXA	EX,4		UC001270
	SXA	EX+1,2		UC001280
	SXA	EX+2,1		UC001290
	STZ	KFLAGS-49		UC001300
	AXT	0,1		UC001310
	STZ	ADUM,1		UC001320
	TXI	*+1,1,1		UC001330
	TXL	*-2,1,ADUM-YIN		UC001340
	CLA	BB		UC001350
	STO	BITS		UC001360
	AXT	0,1		UC001370
	CLA	BITS		UC001380
	STO	ARRAYIN,1		UC001390
	STO	OUTRAY,1		UC001400
	TXI	*+1,1,1		UC001410
	TXL	*-2,1,2000		UC001420
	CLA	BLKS		UC001430
	STO	BLANKS		UC001440
	CLA	F45	INITIALIZE 45	UC001450
	STO	OPTAB-15	LINES PER PAGE	UC001460
	AXT	0,1		UC001470
	CLA	BITS		UC001480
	STO	BUFP,1		UC001490
	TXI	*+1,1,1		UC001500
	TXL	*-2,1,26		UC001510
	CLA	FONE	INITIALIZE OPTAB(14) TO 1. TO PREVENT	UC001520

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      STO      OPTAB-13      GETTING A DUMP IF AN ERROR OCCURS      UC001530
EX      AXT      0,4      UC001540
      AXT      0,2      UC001550
      AXT      0,1      UC001560
      TRA      1,4      UC001570
FONE    DEC      1.0      UC001580
F45     DEC      45.      UC001590
BB      OCT      7777777777777777 UC001600
      BLKS OCT      606060606060C UC001610
      END      UC001620
C      UC000010
C      UC000020
C----- UC000030
C      UC000040
C      UC000050
      SUBROUTINE INSERT(ML) UC000060
C..... DUMMY SUBROUTINE UC000070
      RETURN UC000080
      END UC000090
C      UC000010
C      UC000020
C----- UC000030
C      UC000040
C      UC000050
      SUBROUTINE LEADER(M) UC000060
C***** UC000070
C      UC000080
C..... SYSTEM COMMON, DIMENSION, AND EQUIVALENCE STATEMENTS UC000090
C      UC000100
      DIMENSION SYSTEM (1700) UC000110
C      UC000120
      EQUIVALENCE (SYSTEM(1700),KOM (1700),KFLAGS(1692),TAPETB(1622)) UC000130
C      UC000140
      EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16), UC000150
1 POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11), UC000160
2 CURTAP( 9), UC000170
3 TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5), UC000180
4 FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1)) UC000190
C      UC000200
      EQUIVALENCE (KFLAGS( 70), UC000210
1 KO ( 60),FO ( 60),K1 ( 59),K2 ( 58),K3 ( 57), UC000220
2 K4 ( 56),K5 ( 55),K6 ( 54),K7 ( 53),K8 ( 52), UC000230
3 K9 ( 51), UC000240
4 KFLAGO( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42), UC000250
5 IWAVER( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36), UC000260
6 ICLPRT( 35),INDEXX( 34),IPLOTR( 33), NOPLOT( 31), UC000270
7 KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26), UC000280
8 LOCMAC( 25),LENSPC( 24), UC000290
9 IPOSTP( 20),NUMPST( 19)) UC000300
C      UC000310
      EQUIVALENCE (KOM ( 8),KAPTID(1),KAPTID(2),KAPTTR(3),KAPTCN(4)) UC000320
C      UC000330
      COMMON SYSTEM UC000340
C      UC000350
      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1) UC000360
C      UC000370
C..... UC000380
C      UC000390
C***** COMMON FOR THE MULTI-HEAD INSPECTION POSTPROCESSOR *****UC000400

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C	COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,ADUM,	UC000410
	1 ARAYIN,BITS,BLANKS,BUFFER,BUFP,CCFIN,CCFOT,	UC000420
	2 FORMAT,IDEG,IDUM,IMIN,INTAP,I,ISEC,J,NUM,NWPR,	UC000430
	3 OPTAB,OUTRAY,PREVSI,PREVSJ,PREVSK,PREVSX,	UC000440
	4 PREVSZ,RADIN,RADOUT,RAD,RETURN,	UC000450
	5 RIN,ROUT,SEQCTR,SEQINC,TAPSTO,WALL,WORDS,	UC000460
	6 XIN,XOUT,YIN	UC000470
	DIMENSION MACH(12),PNOFLG(14),MTABLE(10),ADUM(50),	UC000480
	1 BUFFER(100),BUFP(26),FORMAT(26),IDUM(50),INTAP(20),	UC000490
	2 OPTAB(100),TAPSTO(250),WORDS(26)	UC000500
	DIMENSION ARAYIN(8,250),OUTRAY(8,250)	UC000510
	DIMENSION FOOT(10)	UC000520
C		UC000530
C	LEADER- THE FUNCTION OF THIS ROUTINE IS	UC000540
C	TO PROVIDE N FEET OF BLANK TAPE	UC000550
C	AS SPECIFIED BY THE PART PROGRAMMER IN A	UC000560
C	LEADER/N COMMAND.	UC000570
C		UC000580
C		UC000590
C	IS PUNCH TAPE WANTED	UC000600
	IF(OPTAB(35))170,10,170	UC000610
	10 M=M	UC000620
C	WAS LEADER CALLED TO STORE OR PRODUCE A	UC000630
C	DESIRED AMOUNT OF TAPE.	UC000640
	GOTO(20,120),M	UC000650
C	STORE, DETERMINE THE MODE OF OPERATION	UC000660
	20 IF(IDUM(5)-IDUM(6))30,90,90	UC000670
C	HEAD INNER	UC000680
	30 JADD1=J+1	UC000690
	IF(ARAYIN(8,JADD1)-BITS)50,40,50	UC000700
	40 ARAYIN(8,JADD1)=2.0	UC000710
	GOTO60	UC000720
	50 ARAYIN(8,JADD1)=ARAYIN(8,JADD1)+2.0	UC000730
	60 IF(TSFT-3.248)70,80,70	UC000740
	70 LIDT=0	UC000750
	80 LIDT=LIDT+1	UC000760
	TSFT=3.248	UC000770
C	STORE FOOTAGE AND INDICATE WHAT GOES WITH	UC000780
C	WHAT	UC000790
	FOOT(LIDT)=TAPSTO(4)/.1	UC000800
	JTBIRD=0	UC000810
	GOTO170	UC000820
C	HEAD/OUTER	UC000830
	90 IADD1=I+1	UC000840
	IF(OUTRAY(8,IADD1)-BITS)110,100,110	UC000850
	100 OUTRAY(8,IADD1)=2.0	UC000860
	GOTO60	UC000870
	110 OUTRAY(8,IADD1)=OUTRAY(8,IADD1)+2.0	UC000880
	GOTO60	UC000890
C	PRODUCE, DETERMINE WHICH AMOUNT TO BE	UC000900
C	PUNCHED	UC000910
	120 JTBIRD=JTBIRD+1	UC000920
	DO130 LT=1,100	UC000930
	130 BUFFER(LT)=BLANKS	UC000940
C	IS THE AMOUNT GREATER THAN 5FT	UC000950
	140 IF(FOOT(JTBIRD)-600.0)150,150,160	UC000960
C	NO, PUNCH DESIRED AMOUNT AND RETURN	UC000970
	150 IFOOT=FOOT(JTBIRD)+.5	UC000980
		UC000990

```

      CALL PUNCHB(-IFOOT,BUFFER,0,1)
      GOTO170
C     YES, PUNCH 5FT AND REDUCE AMOUNT BY 5
C     AND TRY AGAIN
      160 CALL PUNCHB(-600,BUFFER,0,1)
      FQOT(JTBIRD)=FQOT(JTBIRD)-600.0
      GOTO140
      170 RETURN
      END
C
C
C-----
C
C
C     SUBROUTINE MACH05
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),FQ ( 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      ILLPRI( 35),INDEXX( 34),IPLUIK( 33), NUPLUI( 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 FOR THE MULTI-HEAD INSPECTION POSTPROCESSOR *****
C
      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,ADUM,
1      ARAYIN,BITS,BLANKS,BUFFER,BUFP,CCFIN,CCFOT,
2      FORMAT,IDEG,IDUM,IMIN,INTAP,I,ISEC,J,NUM,NWPR,
3      OPTAB,OUTRAY,PREVSI,PREVSJ,PREVSK,PREVSX,
4      PREVSZ,PREVSZ,RADIN,RADOUT,RAD,RETURN,
5      RIN,ROUT,SEQCTR,SEQINC,TAPSTO,WALL,WORDS,
6      XIN,XOUT,YIN
      DIMENSION MACH(12),PNOFLG(14),MTABLE(10),ADUM(50),
1      BUFFER(100),BUFP(26),FORMAT(26),IDUM(50),INTAP(20),

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UC001000
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COMMON SYSTEM
C
C      DIMENSION KFLAGS(1), IPOSTP(1), KOM(1)
C.....*****
C***** COMMON FOR THE MULTI-HEAD INSPECTION POSTPROCESSOR *****
C
COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,ADUM,
1  ARAYIN,BITS,BLANKS,BUFFER,BUFP,CCFIN,CCFOT,
2  FORMAT,IDEG,IDUM,IMIN,INTAP,I,ISEC,J,NUM,NWPR,
3  OPTAB,OUTRAY,PREVSI,PREVSJ,PREVSK,PREVSX,
4  PREVSZ,PREVSZ,RADIN,RADCUT,PAD,RETURN,
5  RIN,ROUT,SEQCTR,SEQINC,TAPSTO,WALL,WORDS,
6  XIN,XOUT,YIN
DIMENSION MACH(12),PNOFLG(14),MTABLE(10),ADUM(50),
1  BUFFER(100),BUFP(26),FORMAT(26),IDUM(50),INTAP(20),
2  OPTAB(100),TAPSTO(250),WORDS(26)
DIMENSION ARAYIN(8,250),OUTRAY(8,250)
C
C      MATCH- THE FUNCTION OF THIS ROUTINE IS TO
C      DETERMINE IF LIKE TMARKS OCCURRED
C      WHILE IN THE INNER AND OUTER MODE
C      AND INDICATE RESULT TO CALLING
C      PROGRAM.
C
      IW=IW
      GOTO(10,50),IW
10  IOUT=ABSF(OUTRAY(1,L))+.001
      DO 20 KIT=1,J
      INN=ABSF(ARAYIN(1,KIT))+.001
      IF(INN-IOUT)20,20,20
20  CONTINUE
      M=1
      GOTO40
C.....MATCH HAS BEEN LOCATED, SAVE J VALUE
30  M=0
      N=KIT
40  RETURN
50  INN=ABSF(ARAYIN(1,L))+.001
      DO 60 KIT=1,I
      IOUT=ABSF(OUTRAY(1,KIT))+.001
      IF(IOUT-INN)60,20,60
60  CONTINUE
      M=1
      GOTO40
      END
C
C
C-----
C
C
C      SUBROUTINE MESSAG
C.....DUMMY SUBROUTINE
      RETURN
      END
C
C
C-----

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C
C
C      SUBROUTINE OPSTOP
C.....DUMMY SUBROUTINE
C      RETURN
C      END
C
C
C-----
C
C      SUBROUTINE OPTION
C*****
C.....SYSTEM COMMON, DIMENSION, AND EQUIVALENCE 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),FC  ( 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),IPLCTR( 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),KAPTID(2),KAPTTR(3),KAPTCN(4))
C
C      COMMON SYSTEM
C
C      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C.....*****
C***** COMMON FOR THE MULTI-HEAD INSPECTION POSTPROCESSOR *****
C
C      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,ADUM,
1  ARAYIN,BITS,BLANKS,BUFFER,BUFP,CCFIN,CCFOT,
2  FORMAT,IDEG,IDUM,IMIN,INTAP,I,ISEC,J,NUM,NWPR,
3  OPTAB,OUTRAY,PREVSI,PREVSJ,PREVSK,PREVSX,
4  PREVSJ,PREVSZ,RADIN,RADCUT,PAD,RETURN,
5  RIN,ROUT,SEQCTR,SEQINC,TAPSTG,WALL,WORDS,
6  XIN,XOUT,YIN
C      DIMENSION MACH(12),PNOFLG(14),MTABLE(10),ADUM(50),
1  BUFFFF(100),BUFP(26),FORMAT(26),IDUM(50),INTAP(20),
2  OPTAB(100),TAPSTO(250),WORDS(26)
C      DIMENSION ARAYIN(8,250),OUTRAY(8,250)
C

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C      OPTION- THE FUNCTION OF THIS ROUTINE                      UC000540
C      IS TO RESET POST PROCESSOR OPTIONS                      UC000550
C      TO REFLECT NEEDS OF PART PROGRAM                      UC000560
C      AS SPECIFIED IN THE OPTION COMMAND.                    UC000570
C                                                                UC000580
C      NW=4                                                    UC000590
C      HAVE ALL WORDS BEEN TESTED                            UC000600
C      NO, IS THIS AN ALLOWABLE OPTION                      UC000610
C      10 IF(NW-NWPR)20,20,130                                UC000620
C      20 IF(TAPSTO(NW)-100.)30,30,120                       UC000630
C      YES, HAS A NEW PAGE IN LISTIN BEEN REQUESTED          UC000640
C      30 JIB=TAPSTO(NW)                                       UC000650
C      IF(JIB-4) 110,40,110                                    UC000660
C      40 IF(TAPSTO(NW+1)-46.0) 110,50,50                    UC000670
C      YES, DETERMINE MODE AND SET FLAG                      UC000680
C      50 IF(IDUM(5)-1) 70,60,70                               UC000690
C      60 OUTRAY(1,I)=-OUTRAY(1,I)                            UC000700
C      GO TO 100                                                UC000710
C      70 IF(IDUM(6)-1) 90,80,90                               UC000720
C      80 ARAYIN(1,J)=-ARAYIN(1,J)                            UC000730
C      GO TO 100                                                UC000740
C      90 CALL ERREX (7)                                       UC000750
C      100 CONTINUE                                           UC000760
C      NO, SET APPROPRIATE OPTION, INCREMENT                 UC000770
C      COUNTER, AND GO AGAIN                                  UC000780
C      110 OPTAB(JIB)=TAPSTO(NW+1)                            UC000790
C      120 NW=NW+2                                             UC000800
C      GOTO10                                                  UC000810
C      130 RETURN                                             UC000820
C      END                                                    UC000830
C                                                                UC000010
C                                                                UC000020
C-----UC000030
C                                                                UC000040
C                                                                UC000050
C                                                                UC000060
C      SUBROUTINE OUTTAP                                       UC000070
C      *****UC000080
C      C.....SYSTEM COMMON, DIMENSION, AND EQUIVALENCE STATEMENTS UC000090
C                                                                UC000100
C      DIMENSION SYSTEM (1700)                                UC000110
C                                                                UC000120
C      EQUIVALENCE (SYSTEM(1700),KOM (1700),KFLAGS(1692),TAPETB(1622)) UC000130
C                                                                UC000140
C      EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16), UC000150
C      1 POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11), UC000160
C      2 CORTAP( 9), UC000170
C      3 TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5), UC000180
C      4 FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1)) UC000190
C                                                                UC000200
C      EQUIVALENCE (KFLAGS( 70), UC000210
C      1 K0 ( 60),FO ( 60),K1 ( 59),K2 ( 58),K3 ( 57), UC000220
C      2 K4 ( 56),K5 ( 55),K6 ( 54),K7 ( 53),K8 ( 52), UC000230
C      3 K9 ( 51), UC000240
C      4 KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42), UC000250
C      5 IWAVEN( 40),IPTNLY( 39),NOPPOST( 38),INVERT( 37),KAUTOP( 36), UC000260
C      6 ICLPRT( 35),INDEXX( 34),IPLCTR( 33), NOPLT( 31), UC000270
C      7 KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26), UC000280
C      8 LOCMAC( 25),LENSPC( 24), UC000290

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        SAVAL(2)=CCFIN
        SAVAL(3)=ROUT
        SAVAL(4)=CCFOT
        SAVAL(5)=WALL
170  FORMAT(1H ,I4,2XI3,2XI2,2XI2,3XF8.4,5XF8.4,6XF8.4,5XF8.4,5XF8.4)
        GOTO280
C      DO WE OUTPUT REPEATED COORDINATES
180  IF(OPTAB(31))260,190,260
190  IF(YIN-SAVAL(1))260,200,260
200  IF(XIN-SAVAL(2))260,210,260
210  IF(CCFIN-SAVAL(3))260,220,260
220  IF(XOUT-SAVAL(4))260,230,260
230  IF(CCFOT-SAVAL(5))260,240,260
240  IF(WALL-SAVAL(6))260,250,260
250  GO TO 330
260  WRITE OUTPUT TAPE6,270,NUM,YIN,XIN,CCFIN,XOUT,CCFOT,WALL
270  FORMAT(1H ,5XI4,3(2XF8.4),3(4XF8.4))
        SAVAL(1)=YIN
        SAVAL(2)=XIN
        SAVAL(3)=CCFIN
        SAVAL(4)=XOUT
        SAVAL(5)=CCFOT
        SAVAL(6)=WALL
C      WAS THERE A SET OF TMARKS FOR THIS
C      DATA
280  IF(IDUM(10)-1) 310,290,310
290  WRITE OUTPUT TAPE 6,300
300  FORMAT(1H ,78HTHERE WAS NO MATCH FOR THE TMARK ABOVE.  A ZERO WAS
        1RECORDED IN MISSING RADIUS)
C      INCREMENT LINE COUNT
310  ADUM(1)=ADUM(1)+1.0
        IF(ADUM(1)-OPTAB(16))330,320,320
320  ADUM(1)=0.0
330  RETURN
        END

```

C-----

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*      FAP
*PARNEM00
*      PART NO. PUNCH TAPE ROUTINE FOR NUMERICAL CONTROL
        ENTRY  PARNOM
        ENTRY  PARNEM
        BCI    1,PARNOM
*      USE -   CALL PARNOM (N,A)   OR
*              CALL PARNEM (N,A)   WHERE -
*      ** A -  IS THE BCD ARRAY WHOSE CHARACTERS WILL BE
*              PUNCHED ON TAPE IN 5X5 MATRIX. FOR
*              PARNOM THE PARITY WILL BE ODD - EVEN
*              FOR PARNEM.
*      *      IF N IS NEGATIVE, THE ARRAY /A/ WILL
*              BE CONSIDERED TO BE STORED BACKWARDS IN
*              CORE - OTHERWISE FORWARD IN CORE.
*      ** N -  IS THE NUMBER OF CHARACTERS TO BE
*              PROCESSED IN ARRAY /A/. IF A $ SHOULD
*              BE ENCOUNTERED, PROCESSING WILL STOP.
*      THIS ROUTINE SHOULD BE USED TO LABEL A PUNCHED TAPE.

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PARNOM	CLA	SO		UC000200
	LDQ	SO+1		UC000210
	TXL	PARNEM+2		UC000220
PARNEM	CLA	SE		UC000230
	LDQ	SE+1		UC000240
	STO	ST1		UC000250
	STQ	ST2		UC000260
	SXA	EX,4		UC000270
	SXA	EX+1,2		UC000280
	SXA	EX+2,1		UC000290
	SXA	F3		UC000300
	CLA*	\$PUNIDS	GET ID	UC000310
	STQ	CARDN+1		UC000320
	CLA*	\$PUNNOM	GET SEQ. NO.	UC000330
	UFA	=HCH0000		UC000340
	SUB	=HCH0000		UC000350
	STO	CARDN		UC000360
	CLA	2,4		UC000370
	STA	LOAD+1		UC000380
	SXA	LOAD		UC000390
	CLA*	1,4	SET UP CHAR. COUNT	UC000400
	PDX	0,2		UC000410
	TXI	*+1,2,1		UC000420
	AXT	1,1		UC000430
	TMI	*+2		UC000440
	AXC	1,1	SET UP STORAGE DIR	UC000450
	SXD	LOAD+2,1		UC000460
	AXT	24,4		UC000470
	STZ	TAP+24,4		UC000480
	TIX	*-1,4,1		UC000490
	CLA	CS		UC000500
	STA	TS		UC000510
PAR3	TSX	LOAD,4		UC000520
	TNX	PAR1,2,1		UC000530
	LDQ	JOE		UC000540
	PXD			UC000550
	LGL	6		UC000560
	STQ	JOE		UC000570
	CAS	=43	IS IT \$	UC000580
	TRA	*+2		UC000590
	TRA	PAR1	YES	UC000600
	LXA	TAB1,4	SEARCH TABLE	UC000610
	CAS	TAB1,4		UC000620
	TRA	*+2		UC000630
	TRA	PAR5	FOUND	UC000640
	TIX	*-3,4,1		UC000650
PAR4	TIX	PAR3+1,1,1		UC000660
	TXL	PAR3		UC000670
PAR5	PXA	0,4		UC000680
	SXA	F5,1		UC000690
	ALS	1	DOUBLE	UC000700
	PAX	0,1		UC000710
F3	AXT	0,4		UC000720
ST1	CLA	**1		UC000730
	STO	TAP,4		UC000740
ST2	CLA	**1		UC000750
	STO	TAP+1,4		UC000760
F5	AXT	0,1		UC000770
	TXI	*+1,4,-2		UC000780

	SXA	F3,4		UC000790
	TXH	*+3,4,-24		UC000800
	TSX	PUNC,4	OUTPUT CARD	UC000810
	SXA	F3		UC000820
TS	TRA	**		UC000830
PAR1	CLA	CS1	FILL REST OF CARD	UC000840
	STA	TS	AND EXIT	UC000850
PAR1A	LXA	F3,4	CARD FULL	UC000860
	TXL	EX,4,0	YES	UC000870
	LXA	TAB1,4		UC000880
	TRA	PAR5		UC000890
EX	AXT	0,4		UC000900
	AXT	0,2		UC000910
	AXT	0,1		UC000920
	TRA	3,4		UC000930
JOE				UC000940
BOTROW	EQU	7		UC000950
TAP	BSS	24		UC000960
CARDN	BSS	2		UC000970
LOAD	AXT	0,1		UC000980
	LDQ	** ,1		UC000990
	TXI	*+1,1,**		UC001000
	SXA	LOAD,1		UC001010
	STQ	JOE		UC001020
	AXT	6,1		UC001030
	TRA	1,4		UC001040
PUNC	SXA	PUNC1,4		UC001050
	TSX	\$PUNCH2,4		UC001060
	PZE	0,6		UC001070
	TXH	CARDN,6,2		UC001080
	TXH	TAP,2,24		UC001090
	CLA	CARDN		UC001100
	ADD	=1		UC001110
	STQ	CARDN		UC001120
	ADD	=HCH0000		UC001130
	FAD	=HCH0000		UC001140
	STQ*	\$PUNNOM		UC001150
	AXT	24,4		UC001160
	STZ	TAP+24,4		UC001170
	TIK	*-1,4,1		UC001180
PUNC1	AXT	0,4		UC001190
	TRA	1,4		UC001200
SO	CLA	TAB0,1		UC001210
	CLA	TAB0+1,1		UC001220
SE	CLA	TABE,1		UC001230
	CLA	TABE+1,1		UC001240
CS		PAR4		UC001250
CS1		PAR1A		UC001260
TA	OCT	60,0,1,2	012	UC001270
	OCT	3,4,5,6	3456	UC001280
	OCT	7,10,11,13	789=	UC001290
	OCT	20,21,22,23	+ABC	UC001300
	OCT	24,25,26,27	DEFG	UC001310
	OCT	30,31,33,34	HI.)	UC001320
	OCT	40,41,42,43	-JKL	UC001330
	OCT	44,45,46,47	MNOP	UC001340
	OCT	50,51,53,54	QR\$*	UC001350
	OCT	51,52,63,64	/STU	UC001360
	OCT	65,66,67,70	VWXY	UC001370

	QCT	71,73,74	Z,(	UC001380
TAB1	PZE	TAB1-TA		UC001390
	REM	TABLE FOR ODD PARITY		UC001400
ZA	EQU	9-BOTROW		UC001410
Z	EQU	ZA*2		UC001420
	VFD	12/128*Z,12/128*Z,12/128*Z		UC001430
	VFD	12/128*Z,12/128*Z,12/128*Z		UC001440
	VFD	12/62*Z,12/193*Z,12/193*Z		UC001450
	VFD	12/193*Z,12/62*Z,12/128*Z		UC001460
	VFD	12/N1,12/2*Z,12/127*Z		UC001470
	VFD	12/N1,12/N1,12/N1		UC001480
	VFD	12/194*Z,12/97*Z,12/81*Z		UC001490
	VFD	12/73*Z,12/70*Z,12/N1		UC001500
	VFD	12/161*Z,12/193*Z,12/73*Z		UC001510
	VFD	12/205*Z,12/179*Z,12/N1		UC001520
	VFD	12/152*Z,12/148*Z,12/146*Z		UC001530
	VFD	12/127*Z,12/16*Z,12/N1		UC001540
	VFD	12/167*Z,12/69*Z,12/69*Z		UC001550
	VFD	12/69*Z,12/185*Z,12/N1		UC001560
	VFD	12/188*Z,12/194*Z,12/73*Z		UC001570
	VFD	12/73*Z,12/176*Z,12/N1		UC001580
	VFD	12/Z,12/Z,12/121*Z		UC001590
	VFD	12/133*Z,12/131*Z,12/N1		UC001600
	VFD	12/182*Z,12/73*Z,12/73*Z		UC001610
	VFD	12/73*Z,12/182*Z,12/N1		UC001620
	VFD	12/134*Z,12/73*Z,12/73*Z		UC001630
	VFD	12/161*Z,12/158*Z,12/N1		UC001640
	VFD	12/162*Z,12/162*Z,12/162*Z		UC001650
	VFD	12/162*Z,12/162*Z,12/N1		UC001660
	VFD	12/8*Z,12/8*Z,12/62*Z		UC001670
	VFD	12/8*Z,12/8*Z,12/N1		UC001680
	VFD	12/254*Z,12/145*Z,12/145*Z		UC001690
	VFD	12/145*Z,12/254*Z,12/N1		UC001700
	VFD	12/127*Z,12/73*Z,12/73*Z		UC001710
	VFD	12/73*Z,12/182*Z,12/N1		UC001720
	VFD	12/62*Z,12/193*Z,12/193*Z		UC001730
	VFD	12/193*Z,12/162*Z,12/N1		UC001740
	VFD	12/127*Z,12/193*Z,12/193*Z		UC001750
	VFD	12/193*Z,12/62*Z,12/N1		UC001760
	VFD	12/127*Z,12/73*Z,12/73*Z		UC001770
	VFD	12/73*Z,12/193*Z,12/N1		UC001780
	VFD	12/127*Z,12/137*Z,12/137*Z		UC001790
	VFD	12/137*Z,12/Z,12/N1		UC001800
	VFD	12/62*Z,12/193*Z,12/193*Z		UC001810
	VFD	12/73*Z,12/121*Z,12/N1		UC001820
	VFD	12/127*Z,12/8*Z,12/8*Z		UC001830
	VFD	12/8*Z,12/127*Z,12/N1		UC001840
	VFD	12/N1,12/193*Z,12/127*Z		UC001850
	VFD	12/193*Z,12/N1,12/N1		UC001860
	VFD	12/N1,12/N1,12/224*Z		UC001870
	VFD	12/224*Z,12/N1,12/N1		UC001880
	VFD	12/N1,12/193*Z,12/193*Z		UC001890
	VFD	12/162*Z,12/28*Z,12/N1		UC001900
	VFD	12/8*Z,12/8*Z,12/N1		UC001920
	VFD	12/8*Z,12/8*Z,12/8*Z		UC001910
	VFD	12/32*Z,12/64*Z,12/64*Z		UC001930
	VFD	12/191*Z,12/N1,12/N1		UC001940
	VFD	12/127*Z,12/8*Z,12/148*Z		UC001950
	VFD	12/162*Z,12/193*Z,12/N1		UC001960

VFD	12/127*Z,12/64*Z,12/64*Z	UC001970
VFD	12/64*Z,12/64*Z,12/N1	UC001980
VFD	12/127*Z,12/2*Z,12/140*Z	UC001990
VFD	12/?*Z,12/127*Z,12/N1	UC002000
VFD	12/127*Z,12/2*Z,12/4*Z	UC002010
VFD	12/8*Z,12/127*Z,12/N1	UC002020
VFD	12/62*Z,12/193*Z,12/69*Z	UC002030
VFD	12/67*Z,12/62*Z,12/N1	UC002040
VFD	12/127*Z,12/137*Z,12/137*Z	UC002050
VFD	12/137*Z,12/134*Z,12/N1	UC002060
VFD	12/62*Z,12/193*Z,12/81*Z	UC002070
VFD	12/161*Z,12/94*Z,12/N1	UC002080
VFD	12/127*Z,12/137*Z,12/25*Z	UC002090
VFD	12/41*Z,12/70*Z,12/N1	UC002100
VFD	12/70*Z,12/73*Z,12/127*Z	UC002110
VFD	12/73*Z,12/49*Z,12/N1	UC002120
VFD	12/8*Z,12/42*Z,12/28*Z	UC002130
VFD	12/42*Z,12/8*Z,12/N1	UC002140
VFD	12/32*Z,12/16*Z,12/8*Z	UC002150
VFD	12/4*Z,12/2*Z,12/N1	UC002160
VFD	12/70*Z,12/73*Z,12/73*Z	UC002170
VFD	12/73*Z,12/49*Z,12/N1	UC002180
VFD	12/Z,12/Z,12/127*Z	UC002190
VFD	12/Z,12/Z,12/N1	UC002200
VFD	12/191*Z,12/64*Z,12/64*Z	UC002210
VFD	12/64*Z,12/191*Z,12/N1	UC002220
VFD	12/143*Z,12/176*Z,12/64*Z	UC002230
VFD	12/176*Z,12/143*Z,12/N1	UC002240
VFD	12/191*Z,12/64*Z,12/188*Z	UC002250
VFD	12/64*Z,12/191*Z,12/N1	UC002260
VFD	12/227*Z,12/148*Z,12/8*Z	UC002270
VFD	12/148*Z,12/227*Z,12/N1	UC002280
VFD	12/7*Z,12/8*Z,12/112*Z	UC002290
VFD	12/8*Z,12/7*Z,12/N1	UC002300
VFD	12/97*Z,12/81*Z,12/73*Z	UC002310
VFD	12/59*Z,12/67*Z,12/N1	UC002320
VFD	12/N1,12/N1,12/208*Z	UC002330
VFD	12/176*Z,12/N1,12/N1	UC002340
VFD	12/N1,12/28*Z,12/162*Z	UC002350
VFD	12/193*Z,12/193*Z,12/N1	UC002360
TABO	BSS	UC002370
K1	EQU	UC002380
N1	EQU	UC002390
REM	TABLE FOR EVEN PARITY	UC002400
VFD	12/K1,12/K1,12/K1	UC002410
VFD	12/K1,12/K1,12/K1	UC002420
VFD	12/190*Z,12/65*Z,12/65*Z	UC002430
VFD	12/65*Z,12/190*Z,12/K1	UC002440
VFD	12/K1,12/130*Z,12/255*Z	UC002450
VFD	12/K1,12/K1,12/K1	UC002460
VFD	12/66*Z,12/225*Z,12/209*Z	UC002470
VFD	12/201*Z,12/198*Z,12/K1	UC002480
VFD	12/33*Z,12/65*Z,12/201*Z	UC002490
VFD	12/77*Z,12/51*Z,12/K1	UC002500
VFD	12/24*Z,12/20*Z,12/18*Z	UC002510
VFD	12/255*Z,12/144*Z,12/K1	UC002520
VFD	12/39*Z,12/197*Z,12/197*Z	UC002530
VFD	12/197*Z,12/57*Z,12/K1	UC002540
VFD	12/60*Z,12/66*Z,12/201*Z	UC002550

VFD	12/201*Z,12/48*Z,12/K1	UC002560
VFD	12/129*Z,12/129*Z,12/249*Z	UC002570
VFD	12/5*Z,12/3*Z,12/K1	UC002580
VFD	12/54*Z,12/201*Z,12/201*Z	UC002590
VFD	12/201*Z,12/54*Z,12/K1	UC002600
VFD	12/6*Z,12/201*Z,12/201*Z	UC002610
VFD	12/33*Z,12/30*Z,12/K1	UC002620
VFD	12/34*Z,12/34*Z,12/34*Z	UC002630
VFD	12/34*Z,12/34*Z,12/K1	UC002640
VFD	12/136*Z,12/136*Z,12/190*Z	UC002650
VFD	12/136*Z,12/136*Z,12/K1	UC002660
VFD	12/126*Z,12/17*Z,12/17*Z	UC002670
VFD	12/17*Z,12/126*Z,12/K1	UC002680
VFD	12/255*Z,12/201*Z,12/201*Z	UC002690
VFD	12/201*Z,12/54*Z,12/K1	UC002700
VFD	12/190*Z,12/65*Z,12/65*Z	UC002710
VFD	12/65*Z,12/34*Z,12/K1	UC002720
VFD	12/255*Z,12/65*Z,12/65*Z	UC002730
VFD	12/65*Z,12/190*Z,12/K1	UC002740
VFD	12/255*Z,12/201*Z,12/201*Z	UC002750
VFD	12/201*Z,12/65*Z,12/K1	UC002760
VFD	12/255*Z,12/9*Z,12/9*Z	UC002770
VFD	12/9*Z,12/129*Z,12/K1	UC002780
VFD	12/190*Z,12/65*Z,12/65*Z	UC002790
VFD	12/201*Z,12/249*Z,12/K1	UC002800
VFD	12/255*Z,12/136*Z,12/136*Z	UC002810
VFD	12/136*Z,12/255*Z,12/K1	UC002820
VFD	12/K1,12/65*Z,12/255*Z	UC002830
VFD	12/65*Z,12/K1,12/K1	UC002840
VFD	12/K1,12/K1,12/96*Z	UC002850
VFD	12/96*Z,12/K1,12/K1	UC002860
VFD	12/K1,12/65*Z,12/65*Z	UC002870
VFD	12/34*Z,12/156*Z,12/K1	UC002880
VFD	12/136*Z,12/136*Z,12/136*Z	UC002890
VFD	12/136*Z,12/136*Z,12/K1	UC002900
VFD	12/160*Z,12/K1,12/K1	UC002910
VFD	12/63*Z,12/K1,12/K1	UC002920
VFD	12/255*Z,12/136*Z,12/20*Z	UC002930
VFD	12/34*Z,12/65*Z,12/K1	UC002940
VFD	12/255*Z,12/K1,12/K1	UC002950
VFD	12/K1,12/K1,12/K1	UC002960
VFD	12/255*Z,12/130*Z,12/12*Z	UC002970
VFD	12/130*Z,12/255*Z,12/K1	UC002980
VFD	12/255*Z,12/130*Z,12/132*Z	UC002990
VFD	12/136*Z,12/255*Z,12/K1	UC003000
VFD	12/190*Z,12/65*Z,12/197*Z	UC003010
VFD	12/195*Z,12/190*Z,12/K1	UC003020
VFD	12/255*Z,12/9*Z,12/9*Z	UC003030
VFD	12/9*Z,12/6*Z,12/K1	UC003040
VFD	12/190*Z,12/65*Z,12/209*Z	UC003050
VFD	12/33*Z,12/222*Z,12/K1	UC003060
VFD	12/253*Z,12/9*Z,12/153*Z	UC003070
VFD	12/169*Z,12/198*Z,12/K1	UC003080
VFD	12/198*Z,12/201*Z,12/255*Z	UC003090
VFD	12/201*Z,12/177*Z,12/K1	UC003100
VFD	12/136*Z,12/170*Z,12/156*Z	UC003110
VFD	12/170*Z,12/136*Z,12/K1	UC003120
VFD	12/160*Z,12/144*Z,12/136*Z	UC003130
VFD	12/132*Z,12/130*Z,12/K1	UC003140

VFD	12/198*Z,12/201*Z,12/201*Z	UC003150
VFD	12/201*Z,12/177*Z,12/K1	UC003160
VFD	12/129*Z,12/129*Z,12/255*Z	UC003170
VFD	12/129*Z,12/129*Z,12/K1	UC003180
VFD	12/63*Z,12/K1,12/K1	UC003190
VFD	12/K1,12/63*Z,12/K1	UC003200
VFD	12/15*Z,12/48*Z,12/K1	UC003210
VFD	12/48*Z,12/15*Z,12/K1	UC003220
VFD	12/63*Z,12/K1,12/60*Z	UC003230
VFD	12/K1,12/63*Z,12/K1	UC003240
VFD	12/99*Z,12/20*Z,12/136*Z	UC003250
VFD	12/20*Z,12/99*Z,12/K1	UC003260
VFD	12/135*Z,12/136*Z,12/240*Z	UC003270
VFD	12/136*Z,12/135*Z,12/K1	UC003280
VFD	12/225*Z,12/209*Z,12/201*Z	UC003290
VFD	12/197*Z,12/195*Z,12/K1	UC003300
VFD	12/K1,12/K1,12/80*Z	UC003310
VFD	12/48*Z,12/K1,12/K1	UC003320
VFD	12/K1,12/156*Z,12/34*Z	UC003330
VFD	12/65*Z,12/65*Z,12/K1	UC003340
TABE	BSS	UC003350
	END	UC003360
C		UC000010
C	-----	UC000020
C		UC000030
C		UC000040
C		UC000050
	SUBROUTINE PERROP	UC000060
	CALL DESPAT	UC000070
	RETURN	UC000080
	END	UC000090
C		UC000010
C		UC000020
C	-----	UC000030
C		UC000040
C		UC000050
	SUBROUTINE POSTIN	UC000060
	RETURN	UC000070
	END	UC000080
C		UC000010
C		UC000020
C	-----	UC000030
C		UC000040
C		UC000050
	SUBROUTINE POSTN	UC000060
C*****		UC000070
C		UC000080
C.....	SYSTEM COMMON, DIMENSION, AND EQUIVALENCE STATEMENTS	UC000090
C		UC000100
	DIMENSION SYSTEM (1700)	UC000110
C		UC000120
	EQUIVALENCE (SYSTEM(1700),KOM (1700),KFLAGS(1692),TAPETB(1622))	UC000130
C		UC000140
	EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),	UC000150
1	POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),	UC000160
2	CORTAP(9),	UC000170
3	TAPES1(8),TAPES2(7),TAPES3(6),TAPES4(5),	UC000180
4	FORTIN(4),INTAPE(3),IOUTAP(2),PUNTAP(1))	UC000190
C		UC000200


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EQUIVALENCE (KFLAGS( 70), UC000210
1 K0 ( 60),FO ( 60),K1 ( 59),K2 ( 58),K3 ( 57), UC000220
2 K4 ( 56),K5 ( 55),K6 ( 54),K7 ( 53),K8 ( 52), UC000230
3 K9 ( 51), UC000240
4 KFLAGO( 45),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42), UC000250
5 IWAVEN( 40),IPTNLY( 35),NOPOST( 38),INVERT( 37),KAUTO( 36), UC000260
6 ICLPRT( 35),INDEXX( 34),IPLCTR( 33), NOPLT( 31), UC000270
7 KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26), UC000280
8 LOCMAC( 25),LENSPC( 24), UC000290
9 IPOSTP( 20),NUMPST( 19)) UC000300
C UC000310
EQUIVALENCE (KOM (8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4)) UC000320
C UC000330
COMMON SYSTEM UC000340
C UC000350
DIMENSION KFLAGS(1),IPOSTP(1),KOM(1) UC000360
C UC000370
C...***** UC000380
C UC000390
C***** COMMON FOR THE MULTI-HEAD INSPECTION POSTPROCESSOR ***** UC000400
C UC000410
COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,ADUM, UC000420
1 ARAYIN,BITS,BLANKS,BUFFER,RUFP,CCFIN,CCFOT, UC000430
2 FORMAT,IDEQ,IDUM,IMIN,INTAP,I,ISEC,J,NUM,NWPR, UC000440
3 OPTAB,OUTRAY,PREVSI,PREVSJ,PREVSK,PREVSX, UC000450
4 PREVSZ,PREVSI,RADIN,RADCUT,RAD,RETURN, UC000460
5 RIN,RQUT,SEQCTR,SEQINC,TAPSTO,WALL,WORDS, UC000470
6 XIN,XOUT,YIN UC000480
DIMENSION MACH(12),PNOFLG(14),MTABLE(10),ADUM(50), UC000490
1 BUFFER(100),BUFP(26),FORMAT(26),IDUM(50),INTAP(20), UC000500
2 OPTAB(100),TAPSTO(250),WORDS(26) UC000510
DIMENSION ARAYIN(8,250),OUTRAY(8,250) UC000520
COMMON SEQOT,SEQIN,NUMOFI,NUMOFJ UC000530
DIMENSION SEQOT(10),SEQIN(10),NUMOFI(10),NUMOFJ(10) UC000540
C UC000550
C POSTN- THE FUNCTION OF THIS ROUTINE IS TO UC000560
C ESTABLISH THE SLIDE SEQUENCE UC000570
C AS TO WHICH AXIS MOVES FIRST FOR UC000580
C THE APPROPRIATE GAGE UC000590
C UC000600
MDS=IDUM(47) UC000610
MDD=IDUM(48) UC000620
C ARE WE PROCESSING IN THE INNER OR UC000630
C OUTER MODE. UC000640
IF(IDUM(5)-IDUM(6))10,110,20 UC000650
C INNER MODE STORE APPROPRIATE TMARK/N UC000660
10 K=1 UC000670
MDS=MDS+1 UC000680
NUMOFJ(MDS)=J+1 UC000690
GOTO30 UC000700
C OUTER MODE STORE APPROPRIATE TMARK/N UC000710
20 K=-1 UC000720
MDD=MDD+1 UC000730
NUMOFI(MDD)=I+1 UC000740
C DETERMINE IF XAXIS OR YAXIS SPECIFIED UC000750
C STORE SEQUENCE AS SPECIFIED UC000760
30 IF(INTAP(4)-84 )70,40,70 UC000770
40 IF(K)50,110,60 UC000780
50 MNN=0 UC000790

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        GOTO120
60 MNQ=0
        GOTO130
70 IF(INTAP(4)-85 )110,80,110
80 IF(K)90,110,100
90 MNN=1
        GOTO120
100 MNQ=1
        GOTO130
110 CALL ERREX(12)
120 SEQOT(MDD)=1+MNN*1
        GOTO140
130 SEQIN(MDS)=1+MNQ*1
140 IDUM(47)=MDS
        IDUM(48)=MDD
        RETURN
        END
C
C
C-----
C
C
C      SUBROUTINE PREINT
C*****
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENCE 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),IPLQTR( 33), NOPLGT( 31),
7  KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8  LOCMAC( 25),LENSPC( 24),
9  IPOSTP( 20),NUPST( 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 FOR THE MULTI-HEAD INSPECTION POSTPROCESSOR *****
C
C      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,ADUM,

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UC000800
UC000810
UC000820
UC000830
UC000840
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UC000860
UC000870
UC000880
UC000890
UC000900
UC000910
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UC000930
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UC000190
UC000200
UC000210
UC000220
UC000230
UC000240
UC000250
UC000260
UC000270
UC000280
UC000290
UC000300
UC000310
UC000320
UC000330
UC000340
UC000350
UC000360
UC000370
UC000380
UC000390
UC000400
UC000410
UC000420

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1	ARRAYIN,BITS,BLANKS,BUFFER,BUFP,CCFIN,CCFOT,	UC000430
2	FORMAT,IDEG,IDUM,IMIN,INTAP,I,ISEC,J,NUM,NWPR,	UC000440
3	OPTAB,OUTRAY,PREVSI,PREVSJ,PREVSK,PREVSX,	UC000450
4	PREVSY,PREVSZ,RADIN,RADOUT,RAD,RETURN,	UC000460
5	RIN,ROUT,SEQCTR,SEQINC,TAPSTC,WALL,WORDS,	UC000470
6	XIN,XOUT,YIN	UC000480
	DIMENSION MACH(12),PNOFLG(14),MTABLE(10),ADUM(50),	UC000490
1	BUFFER(100),BUFP(26),FORMAT(26),IDUM(50),INTAP(20),	UC000500
2	OPTAB(100),TAPSTC(250),WORDS(26)	UC000510
	DIMENSION ARRAYIN(8,250),OUTRAY(8,250)	UC000520
	DIMENSION AG(12), ABB(15), ABC(15)	UC000530
C		UC000540
C	PREINT- THE FUNCTION OF THIS ROUTINE IS	UC000550
C	TO PRODUCE LEADER OR TRAILER	UC000560
C	INFORMATION IN THE N/C TAPE	UC000570
C		UC000580
C	WAS PUNCHED TAPE WANTED	UC000590
	IF(OPTAB(35))90,10,90	UC000600
C	WAS PREINT CALLED TO PRODUCE LEADER OR TRAILER	UC000610
10	IF(IDUM(40))40,20,40	UC000620
C	LEADER,PUNCH SPECIAL CHARACTERS TO IDENTIFY LEADER	UC000630
B	20 AE=606060606060	UC000640
	DO30J7=1,12	UC000650
30	AG(J7)=AE	UC000660
B	AG(9)=606044000053	UC000670
B	AG(10)=606044000053	UC000680
B	AG(11)=440000757575	UC000690
	N=-72	UC000700
	JP=0	UC000710
	K=1	UC000720
	CALL PUNCHA(N,AG,JP,K)	UC000730
	N=-6	UC000740
	CALL PUNCHA(N,AG(10),JP,K)	UC000750
	N=-12	UC000760
	CALL PUNCHA(N,AG(11),JP,K)	UC000770
C	PUNCH MACHINE INFORMATION	UC000780
40	NN=MTABLE(6)	UC000790
	GO TO(160,160,160,160,50),NN	UC000800
B	50 ABB(1)=475121636366	UC000810
B	ABB(2)=736031456247	UC000820
B	ABB(3)=736006234646	UC000830
B	ABB(4)=512460606060	UC000840
	K=14	UC000850
C	PUNCH PARTNO INFORMATION	UC000860
	DO60I1=5,15	UC000870
	K=K-1	UC000880
60	ABB(IT)=PNOFLG(K)	UC000890
	ABB(14)=AE	UC000900
	CALL DATE(ABB(14))	UC000910
	N=-90	UC000920
	CALL PARNOM(N,ABB)	UC000930
	C=BITS	UC000940
	CALL PUNIDN(C)	UC000950
	B=7.0	UC000960
	CALL PUNSEQ(B)	UC000970
	IF(IDUM(40))100,70,100	UC000980
70	M=-60	UC000990
	DO80L=1,10	UC001000
B	80 ABC(L)=343434343434	UC001010

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      JP=0
      K=1
      CALL PUNCH8(M,ABC,JP,K)
90  IF(IDUM(40))100,160,100
100 CABCTR=KFLAGS(50)
C   CALCULATE TAPE FOOTAGE
      CABON=CABCTR*.6
      JCAB=CABON
C   WAS PUNCH TAPE WANTED
      IF(OPTAB(35))110,150,110
C   NO
110 NBCKSP=KFLAGS(50)
C   DO WE NEED TO BACKSPACE OVER ANY PUNCHED TAPE
      IF(NBCKSP)120,140,120
C   YES
120 JCAB=0
      DO 130 IBCKSP=1,NBCKSP
130  CALL TAPEOP(PUNTAP,3,IXX)
140  CALL TAPEOP(PUNTAP,2,IXX)
      CALL TAPEOP(PUNTAP,3,IXX)
150  KFLAGS(50)=0
      NN=MTABLE(6)
      CALL PRTON(NN,JCAB)
      KFLAGS(39)=KFLAGS(39)+JCAB
160  RETURN
      END
C
C
C-----
C
C
*   FORTRAN
*   LIST
*   SUBROUTINE PRINTA
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),
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),IPLGTR( 33),      NOPLDT( 31),
7  KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26),
8  LOCMAC( 25),LENSPC( 24),
9  IPDSTP( 20),NUMPST( 19))
C
      EQUIVALENCE (KOM  ( 8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4))

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UC001020
UC001030
UC001040
UC001050
UC001060
UC001070
UC001080
UC001090
UC001100
UC001110
UC001120
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UC001160
UC001170
UC001180
UC001190
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UC000240
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UC000270
UC000280
UC000290
UC000300
UC000310
UC000320
UC000330

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```

C
COMMON SYSTEM
C
DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C...*****
KFLAGS(50)=KFLAGS(50)+1
RETURN
END
C
C
C-----
C
SUBROUTINE PROCES
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),IQUTAP( 2),PUNTAP( 1))
C
EQUIVALENCE (KFLAGS( 70),
1  K0 ( 60),F0 ( 50),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),KAUTO( 36),
6  ICLPRT( 35),INDEXX( 34),IPLCTR( 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 ( 6),KAPTID(1),KAPTIC(2),KAPTTR(3),KAPTCN(4))
C
COMMON SYSTEM
C
DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C...*****
C***** COMMON FOR THE MULTI-HEAD INSPECTION POSTPROCESSOR *****
C
COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,ADUM,
1  ARAYIN,BITS,BLANKS,BUFFER,BUFP,CCFIN,CCFOT,
2  FORMAT,IDEG,IDUM,IMIN,INTAP,I,ISEC,J,NUM,NWPR,
3  OPTAB,OUTRAY,PREVSI,PREVSJ,PREVSK,PREVSX,
4  PREVSY,PREVSZ,RADIN,RACQUT,RAD,RFTURN,
5  RIN,ROUT,SEQCTR,SEQINC,TAPSTC,WALL,WORDS,
6  XIN,XOUT,YIN
DIMENSION MACH(12),PNOFLG(14),MTABLE(10),ADUM(50),
1  BUFFER(100),BUFP(26),FORMAT(26),IDUM(50),INTAP(20),

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UC000340
UC000350
UC000360
UC000370
UC000380
UC000390
UC000400
UC000410
UC000420
UC000010
UC000020
UC000030
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UC000090
UC000100
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UC000470
UC000480
UC000490
UC000500

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2      OPTAB(100),TAPSTQ(250),WORDS(26)          UC000510
      DIMENSION ARAYIN(8,250),OUTRAY(8,250)        UC000520
      NOW=0                                          UC000530
      NUMTMS=OPTAB(30)+.001                        UC000540
10     NOW=NOW+1                                    UC000550
      IDUM(25)=1                                    UC000560
      M=MTABLE(6)                                   UC000570
      GOTO(20,80,100,80,80),M                      UC000580
20     DO 50 ICT=1,I                                UC000590
      CALL MATCH(ICT,IXX,IDX,1)                     UC000600
      IDX=IDX                                         UC000610
      IF(IXX)30,30,40                                UC000620
30     IAG=1                                          UC000630
      SQRIN=(ARAYIN(2,IDX)**2+ARAYIN(3,IDX)**2+ARAYIN(4,IDX)**2) UC000640
      RIN=SQRTF(SQRIN)+RADIN                         UC000650
      SQROUT=(OUTRAY(2,ICT)**2+OUTRAY(3,ICT)**2+OUTRAY(4,ICT)**2) UC000660
      ROUT=SQRTF(SQROUT)-RADOUT                     UC000670
      WALL=ABSF(ROUT-RIN)                           UC000680
      NUM=ABSF(OUTRAY(1,ICT))+.001                  UC000690
      SQDIST=((ARAYIN(2,IDX)-OUTRAY(2,ICT))**2+
1      (ARAYIN(3,IDX)-OUTRAY(3,ICT))**2+          UC000700
2      (ARAYIN(4,IDX)-OUTRAY(4,ICT))**2)          UC000710
      DIST=SQRTF(SQDIST)                             UC000720
      CCFIN=ABSF((ARAYIN(2,IDX)-OUTRAY(2,ICT))*ARAYIN(5,IDX)+
1      (ARAYIN(3,IDX)-OUTRAY(3,ICT))*ARAYIN(6,IDX)+
2      (ARAYIN(4,IDX)-OUTRAY(4,ICT))*ARAYIN(7,IDX))/
3      DIST                                           UC000730
      CCFOT=ABSF((ARAYIN(2,IDX)-OUTRAY(2,ICT))*OUTRAY(5,ICT)+
1      (ARAYIN(3,IDX)-OUTRAY(3,ICT))*OUTRAY(6,ICT)+
2      (ARAYIN(4,IDX)-OUTRAY(4,ICT))*OUTRAY(7,ICT))/
3      DIST                                           UC000740
      ANGL=ATAN2F(OUTRAY(3,ICT),OUTRAY(2,ICT))      UC000750
      CALL AGFND(ANGL,IDEG,IMIN,ISEC)               UC000760
      IDUM(10)=0                                     UC000770
      CALL OUTTAP                                    UC000780
      CALL TEST(IAG,IDX,ICT)                         UC000790
      GOTO 50                                         UC000800
40     RIN=0.0                                       UC000810
      IAG=2                                          UC000820
      CCFIN=0.0                                     UC000830
      IDUM(10)=1                                    UC000840
      WALL=0.0                                       UC000850
      NUM=ABSF(OUTRAY(1,ICT))+.001                  UC000860
      SQROUT=(OUTRAY(2,ICT)**2+OUTRAY(3,ICT)**2+OUTRAY(4,ICT)**2) UC000870
      ROUT=SQRTF(SQROUT)-RADOUT                     UC000880
      DIST=SQRTF(SQROUT)                             UC000890
      CCFOT=ABSF(OUTRAY(2,ICT)*OUTRAY(5,ICT)+OUTRAY(3,ICT)*OUTRAY(6,ICT)+
1      OUTRAY(4,ICT)*OUTRAY(7,ICT))/DIST            UC000900
      ANGL=ATAN2F(OUTRAY(3,ICT),OUTRAY(2,ICT))      UC000910
      CALL AGFND(ANGL,IDEG,IMIN,ISEC)               UC000920
      CALL OUTTAP                                    UC000930
      CALL TEST(IAG,IDX,ICT)                         UC000940
50     CONTINUE                                     UC000950
      DO 70 K=1,J                                    UC000960
      CALL MATCH(K,IXX,IDX,2)                       UC000970
      IF(IXX)70,70,60                                UC000980
60     ROUT=0.0                                       UC000990
      IAG=3                                          UC001000
      IDUM(10)=1                                     UC001010

```

WALL=0.0	UC001100
CCFOT=0.0	UC001110
SQRIN=(ARAYIN(2,K)**2+ARAYIN(3,K)**2+ARAYIN(4,K)**2)	UC001120
NUM=ABSF(ARAYIN(1,K))+.001	UC001130
RIN=SQRTF(SQRIN)+RADIN	UC001140
DIST=SQRTF(SQRIN)	UC001150
CCFIN=ABSF(ARAYIN(2,K)*ARAYIN(5,K)+ARAYIN(3,K)*ARAYIN(6,K)+	UC001160
1 ARAYIN(4,K)*ARAYIN(7,K))/DIST	UC001170
ANGL=ATAN2F(ARAYIN(3,K),ARAYIN(2,K))	UC001180
CALL AGFND(ANGL, IDEG, IMIN, ISEC)	UC001190
CALL OUTTAP	UC001200
CALL TEST (IAG,K,IDX)	UC001210
70 CONTINUE	UC001220
80 IF(NOW-NUMTMS)10,90,90	UC001230
90 RETURN	UC001240
100 DO140 ICT=1,I	UC001250
CALL MATCH(ICT,IXX,IDX,1)	UC001260
IDX=IDX	UC001270
IF(IXX)110,110,120	UC001280
110 IAG=1	UC001290
NUM=ABSF(OUTRAY(1,ICT))	UC001300
YIN=ARAYIN(3,IDX)	UC001310
XIN=ARAYIN(2,IDX)	UC001320
XOUT=OUTRAY(2,ICT)	UC001330
WALL=ABSF(XOUT-XIN)-RADIN-RADOUT	UC001340
CCFIN=ARAYIN(5,IDX)	UC001350
CCFOT=OUTRAY(5,ICT)	UC001360
IDUM(10)=0	UC001370
GOTO130	UC001380
120 IAG=2	UC001390
NUM=ABSF(OUTRAY(1,ICT))+.001	UC001400
YIN=OUTRAY(3,ICT)	UC001410
XOUT=OUTRAY(2,ICT)	UC001420
XIN=0.0	UC001430
WALL=0.0	UC001440
CCFIN=0.0	UC001450
CCFOT=OUTRAY(5,ICT)	UC001460
IDUM(10)=1	UC001470
CALL SEQOUT	UC001480
CALL OUTTAP	UC001490
CALL TEST (IAG,ICT, IDX)	UC001500
GO TO 140	UC001510
130 CALL SEQOUT	UC001520
CALL OUTTAP	UC001530
CALL TEST (IAG,ICT, IDX)	UC001540
140 CONTINUE	UC001550
DO160 MN=1,J	UC001560
CALL MATCH(MN,IXX,IDX,2)	UC001570
IDX=IDX	UC001580
IF(IXX)160,160,150	UC001590
150 IAG=3	UC001600
NUM=ABSF(ARAYIN(1,MN))+.001	UC001610
YIN=ARAYIN(3,MN)	UC001620
XIN=ARAYIN(2,MN)	UC001630
XOUT=0.0	UC001640
WALL=0.0	UC001650
CCFOT=0.0	UC001660
CCFIN=ARAYIN(5,MN)	UC001670
IDUM(10)=1	UC001680

```

CALL SEQOUT
CALL OUTTAP
CALL TEST (IAG, IDX, ICT)
160 CONTINUE
GOTO 80
END

```

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UC001690
UC001700
UC001710
UC001720
UC001730
UC001740

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C-----

```

*      FAP
*LABEL
*4500      PRTON
PRTON  ENTRY  PRTON
        CLA*   1,4
        STO     N
        ARS    18
        XCA
        PXD     0,0
        MPY     N6
        XCA
        ADD     ADR
        STA     00
        SXA     8,4
        CLA*    2,4
        STO     BB
        AXT     0,4
DO      CLA     0,4
        STO     PRT+5,4
        TXI     *+1,4,1
        TXL     00,4,5
        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       BSS     24
E5       BCI     5,(30H PUNCHED TAPE FOR 6CO
        END
C
C
C-----
C
C
C      SUBROUTINE PRITIT
C*****

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UC000001
UC000020
UC000030
UC000040
UC000050
UC000060
UC000070
UC000080
UC000090
UC000100
UC000110
UC000120
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UC000300
UC000310
UC000320
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UC000340
UC000350
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UC000370
UC000380
UC000390
UC000400
UC000410
UC000010
UC000020
UC000030
UC000040
UC000050
UC000060
UC000070

```



```

C
C... SYSTEM COMMON, DIMENSION, AND EQUIVALENCE 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),IPLCTR( 33), NOPLCT( 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 FOR THE MULTI-HEAD INSPECTION POSTPROCESSOR *****
C
C      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,ADUM,
1 ARAYIN,BITS,BLANKS,BUFFER,BUFP,CCFIN,CCFOT,
2 FORMAT,IDEG,IDUM,IMIN,INTAP,I,ISEC,J,NUM,NWPR,
3 OPTAB,OUTRAY,PREVSI,PREVSJ,PREVSK,PREVSX,
4 PREVSZ,PREVSZ,RADIN,RADOUT,RAD,RETURN,
5 RIN,ROUT,SEQCTR,SEQINC,TAPSTO,WALL,WORDS,
6 XIN,XOUT,YIN
C      DIMENSION MACH(12),PNOFLG(14),MTABLE(10),ADUM(50),
1 BUFFER(100),BUFP(26),FORMAT(26),IDUM(50),INTAP(20),
2 OPTAB(100),TAPSTO(250),WORDS(26)
C      DIMENSION ARAYIN(8,250),OUTRAY(8,250)
C      DIMENSION SIUPRT(11)
C
C      PRITIT- THE FUNCTION OF THIS ROUTINE IS TO
C      WRITE THE CORRECT HEADINGS ON EACH
C      PAGE OF OUTPUT.
C
C      IF(IDUM(12))10,10,30
10 DO 20 ITT=4,14
K=15-ITT
20 STOPRT(K)=PNOFLG(ITT)
B STOPRT(1)=472151634546
30 M=MTABLE(6)
GO TO(40,250,60,250,80),M
40 WRITE OUTPUT TAPE 6,50

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```

C      DO WE WANT TO OUTPUT REPEATED COORDINATES          UC000680
      IF(OPTAB(31))80,60,80                                UC000690
C      NO, IS THE PRESENT POINT EQUAL TO THE LAST POINT PROCESSED UC000700
60     ICTSAV=0                                             UC000710
      DO 70 ISAV=2,9                                       UC000720
      IF(BUFP(ISAV)-SABUFP(ISAV))80,70,80                 UC000730
70     CONTINUE                                           UC000740
      GO TO 220                                           UC000750
80     DO 110 KB=1,9                                       UC000760
C      THE VARIABLE ITNDIT WAS ADDED TO CORRECT A RELATIVE CONSTANT PROBLUC000770
      ITNDIT=KB                                           UC000780
      IF(BUFP(ITNDIT)-BITS)90,110,90                     UC000790
90     FOR=FORMAT(ITNDIT)/10.0+.001                       UC000800
      IX=FOR                                              UC000810
      FT=IX                                              UC000820
      A=ABSF(FORMAT(ITNDIT)-(FT*10.0))+0.1               UC000830
      JX=A                                              UC000840
100    CALL CONBCD(BUFP(ITNDIT),BUFFER(NN),IX,JX)        UC000850
110    NN=NN+4                                           UC000860
      NB=-600                                           UC000870
C      WAS PUNCH TAPE WANTED                             UC000880
      IF(OPTAB(35))130,120,130                           UC000890
120    CALL PUNCHB(NB,BUFFER,2,0)                        UC000900
130    WRITE OUTPUT TAPE 6,140,(BUFP(KIM),KIM=1,9)      UC000910
140    FORMAT(1H ,F5.0,4XF4.0,5XF8.4,2XF8.4,2XF7.1,3XF5.0,4XF8.4,2XF8.4,
1      2XF6.1)                                           UC000930
C      DO WE OUTPUT REPEATED COORDINATES                  UC000940
      IF(OPTAB(31))170,150,170                           UC000950
C      NO, SAVE PRESENT POINT                             UC000960
150    DO 160 ISAV=2,9                                    UC000970
160    SABUFP(ISAV)=BUFP(ISAV)                          UC000980
170    IF(IDUM(10))200,200,180                          UC000990
180    WRITE OUTPUT TAPE 6,190                            UC001000
190    FORMAT(1H ,39HTHERE WAS NO MATCH FOR THE ABOVE TMARK ) UC001010
200    ADUM(1)=ADUM(1)+1.0                               UC001020
      IF(ADUM(1)-OPTAB(16))220,210,210                   UC001030
210    ADUM(1)=0.0                                        UC001040
220    RETURN                                           UC001050
      END                                              UC001060

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C-----

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*      LABEL                                             UC000001
*      FAP                                              UC000020
      COUNT      300                                     UC000030
*PUNCHA00                                             UC000040
*      PUNCHA - GENERATE PUNCH TAPE FOR BCD FORMATS.   UC000050
      ENTRY      PUNCHA                                UC000060
      BCI        1,PUNCHA                              UC000070
*      USE - CALL PUNCHA (N,A,J,K) WHERE -             UC000080
*      ** A - IS THE BCD ARRAY WHOSE CHARACTERS WILL   UC000090
*              BE CONVERTED TO THE PUNCH TAPE FORMAT. UC000100
*              /A/ IS ASSUMED TO BE STORED FORWARD IN UC000110
*              CORE IF N IS POSITIVE - OTHERWISE IT    UC000120
*              WILL BE ASSUMED BACKWARDS IN CORE.      UC000130
*      ** N - IS THE NUMBER OF CHARACTERS CONTAINED IN UC000140
*              /A/ TO BE CONVERTED.THIS COUNT WILL BE UC000150

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*          OVERRULED IF A $ IS ENCOUNTERED.
*          ** J - FLAG. IF J=0 ON ENTRY INTO PROGRAM,
*          PROCESS CHAR. IN /A/. ON FIRST ENTRY
*          GO GET ID AND SEQUENCE NO. FROM PUNIDN
*          AND PUNSEQ.
*          IF J=1, FILL UP PRESENT
*          CARD WITH SPACE CODES AND OUTPUT A CARD.
*          IF J=2, PROCESS AS J=0 WITHOUT EOB AT END
*          IF J=3, PROCESS FIRST CHARACTER (DEFINED BY
*          K) N-TIMES AND DO NOT PUT EOB AT END.
*          IF J IS LESS THAN ZERO, PUT OUT A BLANK CARD.
*          THUS, IF J IS NOT ZERO, SET UP A FIRST ENTRY
*          CONDITION AND DO NOT PROCESS CHAR. FROM /A/.
*          ** K - IF K IS SPECIFIED AND IS NON-ZERO, DO NOT
*          IGNORE BLANK CHARACTERS IN /A/.
*          IF K=0 OR IS NOT SPECIFIED, IGNORE
*          BLANK CHAR. IN /A/.
PUNCHA  SXA      EX,4
        SXA      EX+1,2
        SXA      EX+2,1
        SXA      LOAD
BOTROW  EQU      7
        CLA      4,4          K
        ANA      TSX
        SUB      TSX
        TZE      PN1          K EXISTS
        AXT      4,2
        SXD      BLFL
        SXD      FL1F
PN2     SXA      EX+3,2
        CLA*     3,4          J
        TZE      PN3          NORMAL PROCESS
        TMI      PN4
        SUB      =1817
        TNZ      PN3
        LXA      COLC,2        END CODE
        TXL      PN4A,2,0
        CLA      =020          PUT IN SPACE CODES
        TSX      MERGE,4       1
        TRA      *-4
PN4     TSX      PUNC,4        DUMP A BLANK CARD
PN4A    STZ      PUNDF         SET UP FIRST ENTRY
EX      AXT      0,4          EXIT
        AXT      0,2
        AXT      0,1
        TRA      **,4
PN3     CLA      2,4
        STA      LOAD+1
        CLA*     1,4          N
        PDX      0,2
        TXI      *+1,2,1
        AXT      1,1
        TMI      *+2          A IS STORED BACKWARDS
        AXC      1,1
        SXD      LOAD+2,1
        ZET      PUNDF         IS IT FIRST ENTRY
        TRA      P5N
        CLA*     $PUNIDS       SET UP
        STO      CARDN+1

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UC000160
UC000170
UC000180
UC000190
UC000200
UC000210
UC000220
UC000230
UC000240
UC000250
UC000260
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UC000410
UC000420
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UC000680
UC000690
UC000700
UC000710
UC000720
UC000730
UC000740

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	CLA*	\$PUNNOM	SEQUENCE NO	UC000750
	UFA	=HCH0000		UC000760
	SUB	=HCH0000		UC000770
	STD	CARDN		UC000780
	SXA	COLC		UC000790
	CLA	=1		UC000800
	STD	PUNDF		UC000810
	CLA	=0200	STOP CODE IN COL. 1	UC000820
	TSX	MERGE,4		UC000830
	TRA	P5N		UC000840
PN5	TSX	LOAD,4		UC000850
	TNX	PN8,2,1	CHECK CHARACTER COUNT	UC000860
	LDQ	JOE		UC000870
	PXD			UC000880
	LGL	6		UC000890
	STQ	JOE		UC000900
	LXD	BLFL,4	DO WE INCLUDE BLANKS	UC000910
	TXH	**+4,4,0	YES	UC000920
	CAS	=48	NO	UC000930
	TRA	**+2		UC000940
	TRA	PN7	IGNORE	UC000950
	CAS	=43	IS IT \$	UC000960
	TRA	**+2		UC000970
	TRA	PN8	YES EXIT	UC000980
	LXA	TAB1,4		UC000990
	CAS	TAB1,4		UC001000
	TRA	**+2		UC001010
	TRA	PN6		UC001020
	TIX	*-3,4,1		UC001030
ERR	STD	PUNDF		UC001040
	CAL	=6817		UC001050
	TSX	\$(STH),4		UC001060
	TSX	FOR		UC001070
	LDQ	PUNDF		UC001080
	STR			UC001090
	TSX	\$(FIL),4		UC001100
	TSX	\$PERROR,4		UC001110
FOR	BCI	7,(33H THE FOLLOWING ILLEGAL CHARACTER ,012,		UC001120
	BCI	5,26H DOES NOT EXIST IN PUNCHA.)		UC001130
PN7	TIX	PN5+1,1,1		UC001140
	TXL	PN5		UC001150
PN6	CLA	TAB2,4		UC001160
	TSX	MERGE,4		UC001170
	TRA	PN7		UC001180
PN8	LXD	FL1F,4		UC001190
	TXH	EX,4,0		UC001200
	CLA	=0200	PUT IN EOB CODE	UC001210
	TSX	MERGE,4		UC001220
	TXL	EX		UC001230
JOE				UC001240
CARDN	BSS	?		UC001250
TAP	BSS	24		UC001260
T1				UC001270
LOAD	AXT	0,1	BRING IN NEXT WORD	UC001280
	LDQ	**,1		UC001290
	TXI	**+1,1,**		UC001300
	SXA	LOAD,1		UC001310
	STQ	JOE		UC001320
	AXT	6,1		UC001330

	TRA	1,4			UC001340
PUNC	SXA	PUNC1,4	PUT OUT A CARD		UC001350
	TSX	\$PUNCH2,4			UC001360
	PZE	0,6			UC001370
	TXH	CARDN,6,2			UC001380
	TXH	TAP,2,24			UC001390
	CLA	CARDN	UPDATE SEQ. NO.		UC001400
	ADD	=1			UC001410
	STO	CARDN			UC001420
	ADD	=HCHOCGO			UC001430
	FAD	=HCHOCGO			UC001440
	STO*	\$PUNNGM			UC001450
	CALL	PRINTA			UC001460
	AXT	24,4	CLEAR TAP AREA		UC001470
	STZ	TAP+24,4			UC001480
	TIX	*-1,4,1			UC001490
	SXA	COLC			UC001500
PUNC1	AXT	0,4			UC001510
	TRA	1,4			UC001520
MERGE	ALS	9-BOTROW			UC001530
	STO	T1			UC001540
	SXA	EXI,2			UC001550
	SXA	EXI+1,4			UC001560
COLC	AXT	0,4	COL. COUNT IN X4		UC001570
	TXH	M2,4,71	CHECK COUNT		UC001580
	TXI	*+1,4,1	CARD NOT FULL		UC001590
	SXA	COLC,4	INDEX COUNT		UC001600
	TXH	*+4,4,1			UC001610
	SXA	M2			UC001620
	AXT	-24,4			UC001630
	SXA	M4,4			UC001640
M3	AXT	0,4	WORD INDEX		UC001650
M4	AXT	-24,2	SHIFT COUNT INDEX		UC001660
M5	ALS	0,2			UC001670
	ORS	TAP,4			UC001680
	TXL	M6,2,0	IS PUNCH WORD FULL		UC001690
	TXI	*+1,2,12	NO - INDEX SHIFT		UC001700
	SXA	M4,2			UC001710
M7	LXA	COLC,4	IS CARD FULL		UC001720
	TXH	M8,4,71	YES		UC001730
EXI	AXT	0,2	EXIT		UC001740
	AXT	0,4			UC001750
	TRA	1,4			UC001760
M8	TSX	PUNC,4	PUNCH OUT CARD		UC001770
	TXL	EXI			UC001780
M6	AXT	24,2	WORD FULL		UC001790
	SXA	M4,2			UC001800
	TXI	*+1,4,-1	INDEX WORD		UC001810
	SXA	M3,4			UC001820
	TXL	M7			UC001830
M2	TSX	PUNC,4	CARD FULL		UC001840
	CLA	T1			UC001850
	TXL	COLC	GO PROCESS		UC001860
ZERO					UC001870
PUNDF					UC001880
TA	OCT	0,1,2,3	0-3		UC001890
	OCT	4,5,6,7	4-7		UC001900
	OCT	10,11,13,20	89=+		UC001910
	OCT	21,22,23,24	ABCD		UC001920

	OCT	25,26,27,30	EFGH	UC001930
	OCT	31,33,34,40	I.)-	UC001940
	OCT	41,42,43,44	JKLM	UC001950
	OCT	45,46,47,50	NOPQ	UC001960
	OCT	51,53,54,60	R\$*	UC001970
	OCT	61,62,63,64,65	/STUV	UC001980
	OCT	66,67,70,71	WXYZ	UC001990
	OCT	73,74,75	, (	UC002000
TAB1	PZE	TAB1-TA		UC002010
	REM	TABLE 2		UC002020
	OCT	40,1,2,23	0-3	UC002030
	OCT	4,25,26,7	4-7	UC002040
	OCT	10,31,13,160	89=+	UC002050
	OCT	141,142,163,144	ABCD	UC002060
	OCT	165,166,147,150	EFGH	UC002070
	OCT	171,153,177,100	I.)-	UC002080
	OCT	121,122,103,124	JKLM	UC002090
	OCT	105,106,127,130	NOPQ	UC002100
	OCT	111,200,76,20	R\$*	UC002110
	OCT	61,62,43,64,45	/STUV	UC002120
	OCT	46,67,70,51	WXYZ	UC002130
	OCT	73,20,370	, (	UC002140
TAB2	BSS	0		UC002150
TSX	TSX			UC002160
PN1	AXT	5,2		UC002170
	CLA*	4,4		UC002180
	TZE	PN2-2	IGNORE BLANKS	UC002190
	SXD	BLFL,2		UC002200
BLFL	TXL	PN2		UC002210
P5N	LXA	EX,4		UC002220
	CLA*	3,4		UC002230
	TZE	PN5	J=0	UC002240
	SUB	=2B17		UC002250
	TNZ	*+4	J=3	UC002260
	CLA	=2B17	NO EOB DESIRED	UC002270
	SIU	FLIF	J=2	UC002280
FLIF	TXL	PN5		UC002290
	SUB	=1B17	1 CHARACTER N TIMES	UC002300
	TNZ	ERR1	WITHOUT EOB.	UC002310
P6N	TSX	LOAD,4		UC002320
	TNX	EX,2,1		UC002330
	LDQ	JOE		UC002340
	PXD			UC002350
	LGL	6		UC002360
	STQ	JOE		UC002370
	LXD	BLFL,4		UC002380
	TXH	*+4,4,0		UC002390
	CAS	=48		UC002400
	TRA	*+2		UC002410
	TRA	P7N		UC002420
	LXA	TAB1,4		UC002430
	CAS	TAB1,4		UC002440
	TRA	*+2		UC002450
	TRA	*+3		UC002460
	TIX	*-3,4,1		UC002470
	TRA	ERR		UC002480
	CLA	TAB2,4		UC002490
	STO	JOE		UC002500
	LXA	EX,4		UC002510

	CLA*	1,4	UC002520
	PDX	0,2	UC002530
	CLA	JCE	UC002540
	TSX	MERGE,4	UC002550
	TIK	*-2,2,1	UC002560
	TXL	EX	UC002570
P7N	TIK	P6N+1,1,1	UC002580
	TRA	P6N	UC002590
ERR1	LAC	EX,4	UC002600
	SXD	PUNDF	UC002610
	CAL	=6817	UC002620
	TSX	\$(STH),4	UC002630
	TSX FOR1		UC002640
	LDO	PUNDF	UC002650
	STR		UC002660
	TSX	\$(FIL),4	UC002670
	TSX	\$EXIT,4	UC002680
FOR1	BCI	7,(45H BAD CALLING SEQUENCE FOR PUNCHA AT LO	UC002690
	BCI	2,CATION 012)	UC002700
	END		UC002710

C-----

*	FAP		UC000001
*PUNCHBOO			UC000002
	ENTRY	PUNCHB	UC000003
*	PUNCHB	- GENERATE PUNCH TAPE FOR 610 FORMATS.	UC000004
	BCI	1,PUNCHA	UC000005
*	USE	- CALL PUNCHA (N,A,J,K) WHERE -	UC000006
*	** A	- IS THE BCD ARRAY WHOSE CHARACTERS WILL	UC000007
*		BE CONVERTED TO THE PUNCH TAPE FORMAT.	UC000008
*		/A/ IS ASSUMED TO BE STORED FORWARD IN	UC000009
*	*	CORE IF N IS POSITIVE - OTHERWISE IT	UC000010
*		WILL BE ASSUMED BACKWARDS IN CORE.	UC000011
*	** N	- IS THE NUMBER OF CHARACTERS CONTAINED IN	UC000012
*		/A/ TO BE CONVERTED. THIS COUNT WILL BE	UC000013
*		OVERRULED IF A \$ IS ENCOUNTERED.	UC000014
*	** J	- FLAG. IF J=0 ON ENTRY INTO PROGRAM,	UC000015
*		PROCESS CHAR. IN /A/. ON FIRST ENTRY	UC000016
*		GO GET ID AND SEQUENCE NO. FROM PUNIDN	UC000017
*		AND PUNSEQ.	UC000018
*		IF J=1, FILL UP PRESENT	UC000019
*		CARD WITH CODE DELETES AND OUTPUT CARD. IN	UC000020
*		ADDITION PUT OUT A BLANK CARD.	UC000021
*		IF J=2, PROCESS AS J=0 WITHOUT EOB AT END	UC000022
*		IF J=3, PROCESS FIRST CHARACTER (DEFINED BY	UC000023
*		K) N-TIMES AND DO NOT PUT EOB AT END.	UC000024
*		IF J IS LESS THAN ZERO, PUT OUT A BLANK CARD.	UC000025
*		THUS, IF J IS NOT ZERO, SET UP A FIRST ENTRY	UC000026
*		CONDITION AND DO NOT PROCESS CHAR. FROM /A/.	UC000027
*	** K	- IF K IS SPECIFIED AND IS NON-ZERO, DO NOT	UC000028
*		IGNORE BLANK CHARACTERS IN /A/.	UC000029
*		IF K=0 OR IS NOT SPECIFIED, IGNORE	UC000030
*		BLANK CHAR. IN /A/.	UC000031
PUNCHB	SXA	EX,4	UC000032
	SXA	EX+1,2	UC000033
	SXA	EX+2,1	UC000034
			UC000035
			UC000036
			UC000037
			UC000038
			UC000039

	SXA	LOAD		UC000400
BOTROW	EQU	7		UC000410
	CLA	4,4	K	UC000420
	ANA	TSX		UC000430
	SUB	TSX		UC000440
	TZE	PN1	K EXISTS	UC000450
	AXT	4,2		UC000460
	SXD	BLFL		UC000470
	SXD	FL1F		UC000480
PN2	SXA	EX+3,2		UC000490
	CLA*	3,4	J	UC000500
	TZE	PN3	NORMAL PROCESS	UC000510
	TMI	PN4		UC000520
	SUB	=1B17		UC000530
	TNZ	PN3		UC000540
	LXA	COLC,2	END CODE	UC000550
	TXL	PN4A,2,0	DONE	UC000560
	CLA	=020	PUT IN SPACE CODES	UC000570
	TSX	MERGE,4	1	UC000580
	TRA	*-4		UC000590
PN4	TSX	PUNC,4	DUMP A BLANK CARD	UC000600
PN4A	STZ	PUNDF		UC000610
EX	AXT	0,4	EXIT	UC000620
	AXT	0,2		UC000630
	AXT	0,1		UC000640
	TRA	** ,4		UC000650
PN3	CLA	2,4		UC000660
	STA	LOAD+1		UC000670
	CLA*	1,4	N	UC000680
	PDX	0,2		UC000690
	TXI	*+1,2,1		UC000700
	AXT	1,1		UC000710
	TMI	*+2	A IS STORED BACKWARDS	UC000720
	AXC	1,1		UC000730
	SXD	LOAD+2,1		UC000740
	ZET	PUNDF	IS IT FIRST ENTRY	UC000750
	TRA	P5N		UC000760
	CLA*	\$PUNIDS	SET UP	UC000770
	STO	CARDN+1		UC000780
	CLA*	\$PUNNOM	SEQUENCE NO	UC000790
	UFA	=HCH0000		UC000800
	SUB	=HCH0000		UC000810
	STO	CARDN		UC000820
	SXA	COLC		UC000830
	CLA	=1		UC000840
	STO	PUNDF		UC000850
	CLA	=0200	STOP CODE IN COL. 1	UC000860
	TSX	MERGE,4		UC000870
	TRA	P5N		UC000880
PN5	TSX	LOAD,4		UC000890
	TNX	PN8,2,1	CHECK CHARACTER COUNT	UC000900
	LDQ	JOE		UC000910
	PXD			UC000920
	LGL	5		UC000930
	STQ	JOE		UC000940
	LXD	BLFL,4	DO WE INCLUDE BLANKS	UC000950
	TXH	*+4,4,0	YES	UC000960
	CAS	=48	NO	UC000970
	TRA	*+2		UC000980

	TRA	PN7	IGNORE	UC000990
	CAS	=43	IS IT \$	UC001000
	TRA	*+2		UC001010
	TRA	PN8	YES EXIT	UC001020
	LXA	TAB1,4		UC001030
	CAS	TAB1,4		UC001040
	TRA	*+2		UC001050
	TRA	PN5		UC001060
	TIX	*-3,4,1		UC001070
ERR	STO	PUNDF		UC001080
	CAL	=6B17		UC001090
	TSX	\$(STH),4		UC001100
	TSX	FOR		UC001110
	LDQ	PUNDF		UC001120
	STR			UC001130
	TSX	\$(FIL),4		UC001140
	TSX	\$PERROR,4		UC001150
FOR	BCI	7,(33H THE FOLLOWING ILLEGAL CHARACTER ,012,		UC001160
	BCI	5,26H DOES NOT EXIST IN PUNCHA.)		UC001170
PN7	TIX	PN5+1,1,1		UC001180
	TXL	PN5		UC001190
PN6	CLA	TAB2,4		UC001200
	TSX	MERGE,4		UC001210
	TRA	PN7		UC001220
PN8	LXD	FL1F,4		UC001230
	TXH	EX,4,0		UC001240
	CLA	=0200	PUT IN EOB CODE	UC001250
	TSX	MERGE,4		UC001260
	TXL	EX		UC001270
JOE				UC001280
CARDN	BSS	2		UC001290
TAP	BSS	24		UC001300
T1				UC001310
LOAD	AXT	0,1	BRING IN NEXT WORD	UC001320
	LDQ	**,1		UC001330
	TXI	*+1,1,**		UC001340
	SXA	LOAD,1		UC001350
	STQ	JOE		UC001360
	AXT	6,1		UC001370
	TRA	1,4		UC001380
PUNC	SXA	PUNC1,4	PUT OUT A CARD	UC001390
	TSX	\$PUNCH2,4		UC001400
	PZE	0,6		UC001410
	TXH	CARDN,6,2		UC001420
	TXH	TAP,2,24		UC001430
	CLA	CARDN	UPDATE SEQ. NO.	UC001440
	ADD	=1		UC001450
	STO	CARDN		UC001460
	ADD	=HCH0000		UC001470
	FAD	=HCH0000		UC001480
	STO*	\$PUNNOM		UC001490
	CAI	PRINTA		UC001500
	AXT	24,4	CLEAR TAP AREA	UC001510
	STZ	TAP+24,4		UC001520
	TIX	*-1,4,1		UC001530
	SXA	COLC		UC001540
PUNC1	AXT	0,4		UC001550
	TRA	1,4		UC001560
MERGE	ALS	9-BOTROW		UC001570

	STO	T1		UC001580
	SXA	EXI,2		UC001590
	SXA	EXI+1,4		UC001600
COLC	AXT	0,4	COL. COUNT IN X4	UC001610
	TXH	M2,4,71	CHECK COUNT	UC001620
	TXI	*+1,4,1	CARD NOT FULL	UC001630
	SXA	COLC,4	INDEX COUNT	UC001640
	TXH	*+4,4,1		UC001650
	SXA	M3		UC001660
	AXT	-24,4		UC001670
	SXA	M4,4		UC001680
M3	AXT	0,4	WORD INDEX	UC001690
M4	AXT	-24,2	SHIFT COUNT INDEX	UC001700
M5	ALS	0,2		UC001710
	ORS	TAP,4		UC001720
	TXL	M6,2,0	IS PUNCH WORD FULL	UC001730
	TXI	*+1,2,12	NO - INDEX SHIFT	UC001740
	SXA	M4,2		UC001750
M7	LXA	COLC,4	IS CARD FULL	UC001760
	TXH	M8,4,71	YES	UC001770
EXI	AXT	0,2	EXIT	UC001780
	AXT	0,4		UC001790
	TRA	1,4		UC001800
M8	TSX	PUNC,4	PUNCH OUT CARD	UC001810
	TXL	EXI		UC001820
M6	AXT	-24,2	WORD FULL	UC001830
	SXA	M4,2		UC001840
	TXI	*+1,4,-1	INDEX WORD	UC001850
	SXA	M3,4		UC001860
	TXL	M7		UC001870
M2	TSX	PUNC,4	CARD FULL	UC001880
	CLA	T1		UC001890
	TXL	COLC	GO PROCESS	UC001900
ZERO				UC001910
PUNDF				UC001920
TA	OCT	0,1,2,3	0-3	UC001930
	OCT	4,5,6,7	4-7	UC001940
	OCT	10,11,13,20	99=+	UC001950
	OCT	21,22,23,24	ABCD	UC001960
	OCT	25,26,27,30	EFGH	UC001970
	OCT	31,33,34,40	I.)-	UC001980
	OCT	41,42,43,44	JKLM	UC001990
	OCT	45,46,47,50	NOPQ	UC002000
	OCT	51,53,54,60	R\$*	UC002010
	OCT	61,62,63,64,65	/STUV	UC002020
	OCT	66,67,70,71	WXYZ	UC002030
	OCT	73,74,75,76		UC002040
TAB1	PZE	TAB1-TA		UC002050
	REM	TABLE 2		UC002060
	OCT	255,235,271,260	0-3	UC002070
	OCT	212,241,265,274	4-7	UC002080
	OCT	214,203,247,221	89=+	UC002090
	OCT	141,142,163,144	ABCD	UC002100
	OCT	165,166,147,150	EFGH	UC002110
	OCT	171,247,200,230	I.)-	UC002120
	OCT	121,122,103,124	JKLM	UC002130
	OCT	105,106,127,130	NOPQ	UC002140
	OCT	111,221,76,200		UC002150
	OCT	61,62,43,64,45	/STUV	UC002160

	OCT	46,67,70,51	WXYZ	UC002170
	OCT	73,200,370,247		UC002180
TAB2	BSS	0		UC002190
TSX	TSX			UC002200
PN1	AXT	5,2		UC002210
	CLA*	4,4		UC002220
	TZE	PN2-2	IGNORE BLANKS	UC002230
	SXD	BLFL,2		UC002240
BLFL	TXL	PN2		UC002250
P5N	LXA	EX,4		UC002260
	CLA*	3,4		UC002270
	TZE	PN5	J=0	UC002280
	SUB	=2B17		UC002290
	TNZ	*+4	J=3	UC002300
	CLA	=2B17	NO EOB DESIRED	UC002310
	STD	FL1F	J=2	UC002320
FL1F	TXL	PN5		UC002330
	SUB	=1B17	1 CHARACTER N TIMES	UC002340
	TNZ	ERR1	WITHOUT EOB.	UC002350
P6N	TSX	LOAD,4		UC002360
	TNX	EX,2,1		UC002370
	LDQ	JOE		UC002380
	PXD			UC002390
	LGL	6		UC002400
	STQ	JOE		UC002410
	LXD	BLFL,4		UC002420
	TXH	*+4,4,0		UC002430
	CAS	=48		UC002440
	TRA	*+2		UC002450
	TRA	P7N		UC002460
	LXA	TAB1,4		UC002470
	CAS	TAB1,4		UC002480
	TRA	*+2		UC002490
	TRA	*+3		UC002500
	TIK	*-3,4,1		UC002510
	TRA	ERR		UC002520
	CLA	TAB2,4		UC002530
	STO	JOE		UC002540
	LXA	EX,4		UC002550
	CLA*	1,4		UC002560
	PDX	0,2		UC002570
	CLA	JOE		UC002580
	TSX	MERGE,4		UC002590
	TIK	*-2,2,1		UC002600
	TXL	EX		UC002610
P7N	TIK	P6N+1,1,1		UC002620
	TRA	P6N		UC002630
ERR1	LAC	EX,4		UC002640
	SXD	PUNDF		UC002650
	CAL	=6B17		UC002660
	TSX	\$(STH),4		UC002670
	TSX	FOR1		UC002680
	LDQ	PUNDF		UC002690
	STR			UC002700
	TSX	\$(FIL),4		UC002710
	TSX	\$EXIT,4		UC002720
FOR1	BCI	7,(45H BAD CALLING SEQUENCE FOR PUNCHA AT LO		UC002730
	BCI	2,CATION 012)		UC002740
	END			UC00275

C-----				UC00001
				UC000020
				UC000030
				UC000040
				UC000050
*	FAP			UC000060
*	LIST			UC000070
*PUNCH	00			UC000080
	ENTRY	PUNCH2		UC000090
	ENTRY	PUNCH3		UC000100
*	IF APT II CARDPN CALLING SEQUENCE			UC000110
*	USE PUNCH2 AND IT WILL CALL			UC000120
*	APT III CARDPN CORRECTLY			UC000130
*	IF APT III CARPN CALLING SEQUENCE			UC000140
*	USE PUNCH 3			UC000150
*				UC000160
*	IF MODE OF CARD PUNCHING IS			UC000170
*	SET IN CALLING SEQUENCE (M)			UC000180
*	BCD +1 (FORTRAN ARRAY) -1 (FAP ARRAY)			UC000190
*	COL +2 (FORTRAN ARRAY) -2 (FAP ARRAY)			UC000200
*	ROW +3 (FORTRAN ARRAY) -3 (FAP ARRAY)			UC000210
*				UC000220
*	APT III CALLING SEQUENCE FOR			UC000230
*	CARD PUNCHING			UC000240
*				UC000250
*	CALL CARDPN (A,N,M,I,D)			UC000260
*				UC000270
PUNCH3	SXA	EX,1	SAVE	UC000280
	SXA	EX+1,2	INDEX	UC000290
	SXA	EX+2,4	REGISTERS	UC000300
	CALL	PRINTA		UC000310
	LXA	EX+2,4		UC000320
	CLA	TRA64	SET RETURN	UC000330
	STO	EX+3		UC000340
	CLA	1,4	A (ORIGIN)	UC000350
	STO	CSCP+1		UC000360
	CLA	2,4	N (NUM. OF WORDS)	UC000370
	STO	CSCP+2		UC000380
	CLA	3,4	M (MODE)	UC000390
	STO	CSCP+3		UC000400
	CLA	4,4	I (SEQ NO.)	UC000410
	STO	CSCP+4		UC000420
	CLA	5,4	D (BCD ID)	UC000430
	STO	CSCP+5		UC000440
	TRA	CSCP		UC000450
PUNCH2	SXA	EX,1	SAVE	UC000460
	SXA	EX+1,2	INDEX	UC000470
	SXA	EX+2,4	REGISTERS	UC000480
	CALL	PRINTA		UC000490
	LXA	EX+2,4		UC000500
	STZ	M		UC000510
	CLA	1,4	PZE OR MZE	UC000520
	TPL	*+3	PZE=COL OR ROW	UC000530
	CLS	III	MZE=BCD	UC000540
	STO	M		UC000550
	CLA	2,4	IS SEQ NO USED	UC000560
	ANA	MK7	PRESERVE TAG	UC000570
	SUB	MK6	IF TAG=6 THEN	UC000580
	TNZ	NOSQ	SEQ NO. USED	UC000590

	CLA	TRA44	SET TRA, SEQ	UC000600
	STO	EX+3	NO. WAS USED	UC000610
	CLA	2,4	LOC. OF SEQ NO.	UC000620
	STA	**+3	IN ADDRESS. SEQ	UC000630
	ADD	I1	NO.+1 IS BCD	UC000640
	STA	**+3	WORD IDENTIFICATION	UC000650
	CLA	**	STORE SEQ NO	UC000660
	STO	I		UC000670
	CLA	**		UC000680
	STO	D		UC000690
	CLA	I3		UC000700
	STA	ORIGN		UC000710
	TRA	ORIGN		UC000720
NOSQ	CLA	TRA34	SET TRA, SEQ	UC000730
	STO	EX+3	NO. NOT USED	UC000740
	CLA	I2		UC000750
	STA	**+1		UC000760
ORIGN	CLA	3,4	ADDRESS WAS MODIFIED	UC000770
	STA	AL	ORIGIN	UC000780
	STO	N	NUM. OF WORDS	UC000790
	ANA	MK7	PRESERVE TAG	UC000800
	SUB	MK1		UC000810
	TNZ	COL	2 IN TAG=COL OR BCD	UC000820
	CLS	I13	1 IN TAG=ROW	UC000830
	STO	M		UC000840
	TRA	SUCS		UC000850
COL	CLA	M		UC000860
	TNZ	SUCS	BCD = -1	UC000870
	CLS	I12		UC000880
	STO	M		UC000890
SUCS	AXT	5,1		UC000900
	CLA	DL+1,1	LOAD ADDRESSES	UC000910
	STO	CSCP+6,1	INTO CALLING	UC000920
	TIK	*-2,1,1	SEQUENCE OF CARDPN	UC000930
	TRA	CSCP		UC000940
CSCP	TSX	\$CARDPN,4		UC000950
	TSX	0,0,0	A (ORIGIN)	UC000960
	TSX	0,0,0	N (NO. OF WORDS)	UC000970
	TSX	0,0,0	M (MODE)	UC000980
	TSX	0,0,0	I (SEQ. NO.)	UC000990
	TSX	0,0,0	D (BCD ID)	UC001000
EX	AXT	** ,1		UC001010
	AXT	** ,2		UC001020
	AXT	** ,4		UC001030
	TRA	4,4	ADDRESS WAS MODIFIED	UC001040
N	PZE			UC001050
M	PZE			UC001060
I	PZE			UC001070
D	PZE			UC001080
AL	PZE			UC001090
NL	PZE	N		UC001100
ML	PZE	M		UC001110
IL	PZE	I		UC001120
DL	PZE	D		UC001130
MK7	OCT	000000700000		UC001140
MK6	OCT	000000600000		UC001150
MK1	OCT	000000100000		UC001160
TRA64	TRA	6,4		UC001170
TRA44	TRA	4,4		UC001180

2.7

TRA34	TRA	3,4		UC001190
I1	PZE	1,0,1		UC001200
I2	PZE	2,0,2		UC001210
I3	PZE	3,0,3		UC001220
II1	PZE	0,0,1		UC001230
II2	PZE	0,0,2		UC001240
II3	PZE	0,0,3		UC001250
	END			UC001260
				UC000001
				UC000020
C-----				UC000030
				UC000040
				UC000050
*	LIST			UC000060
*	FAP			UC000070
*PUNCH 00				UC000080
	ENTRY	PUNCH2		UC000090
	ENTRY	PUNCH3		UC000100
* IF APT II CARDPN CALLING SEQUENCE				UC000110
* USE PUNCH2 AND IT WILL CALL				UC000120
* APT III CARDPN CORRECTLY				UC000130
* IF APT III CARPN CALLING SEQUENCE				UC000140
* USE PUNCH 3				UC000150
*				UC000160
* IF MODE OF CARD PUNCHING IS				UC000170
* SET IN CALLING SEQUENCE (M)				UC000180
* BCD +1 (FORTRAN ARRAY) -1 (FAP ARRAY)				UC000190
* COL +2 (FORTRAN ARRAY) -2 (FAP ARRAY)				UC000200
* ROW +3 (FORTRAN ARRAY) -3 (FAP ARRAY)				UC000210
*				UC000220
* APT III CALLING SEQUENCE FOR				UC000230
* CARD PUNCHING				UC000240
*				UC000250
* CALL CARDPN (A,N,M,I,D)				UC000260
*				UC000270
PUNCH3	SXA	EX,1	SAVE	UC000280
	SXA	EX+1,2	INDEX	UC000290
	SXA	EX+2,4	REGISTERS	UC000300
	CALL	PRINTA		UC000310
	LXA	EX+2,4		UC000320
	CLA	TRA64	SET RETURN	UC000330
	STO	EX+3		UC000340
	CLA	1,4	A (ORIGIN)	UC000350
	STO	CSCP+1		UC000360
	CLA	2,4	N (NUM. OF WORDS)	UC000370
	STO	CSCP+2		UC000380
	CLA	3,4	M (MODE)	UC000390
	STO	CSCP+3		UC000400
	CLA	4,4	I (SEQ NO.)	UC000410
	STO	CSCP+4		UC000420
	CLA	5,4	D (BCD ID)	UC000430
	STO	CSCP+5		UC000440
	TRA	CSCP		UC000450
PUNCH2	SXA	EX,1	SAVE	UC000460
	SXA	EX+1,2	INDEX	UC000470
	SXA	EX+2,4	REGISTERS	UC000480
	CALL	PRINTA		UC000490
	LXA	EX+2,4		UC000500
	STZ	M		UC000510

	CLA	1,4	PZE OR MZE	UC000520
	TPL	**3	PZE=COL OR ROW	UC000530
	CLS	III1	MZE=BCD	UC000540
	STO	M		UC000550
	CLA	2,4	IS SEQ NO USED	UC000560
	ANA	MK7	PRESERVE TAG	UC000570
	SUB	MK6	IF TAG=6 THEN	UC000580
	TNZ	NOSQ	SEQ NO. USED	UC000590
	CLA	TRA44	SET TRA, SEQ	UC000600
	STO	EX+3	NO. WAS USED	UC000610
	CLA	2,4	LOC. OF SEQ NO.	UC000620
	STA	**3	IN ADDRESS. SEQ	UC000630
	ADD	I1	NO.+1 IS BCD	UC000640
	STA	**3	WORD IDENTIFICATION	UC000650
	CLA	**	STORE SEQ NO	UC000660
	STO	I		UC000670
	CLA	**		UC000680
	STO	D		UC000690
	CLA	I3		UC000700
	STA	ORIGN		UC000710
	TRA	ORIGN		UC000720
NOSQ	CLA	TRA34	SET TRA, SEQ	UC000730
	STO	EX+3	NO. NOT USED	UC000740
	CLA	I2		UC000750
	STA	**+1		UC000760
ORIGN	CLA	3,4	ADDRESS WAS MODIFIED	UC000770
	STA	AL	ORIGIN	UC000780
	STO	N	NUM. OF WORDS	UC000790
	ANA	MK7	PRESERVE TAG	UC000800
	SUB	MK1		UC000810
	TNZ	COL	2 IN TAG=COL OR BCD	UC000820
	CLS	II3	1 IN TAG=ROW	UC000830
	STO	M		UC000840
	TRA	SUCS		UC000850
COL	CLA	M		UC000860
	TNZ	SUCS	BCD = -1	UC000870
	CLS	II2		UC000880
	STO	M		UC000890
SUCS	AXT	5,1		UC000900
	CLA	DL+1,1	LOAD ADDRESSES	UC000910
	STO	CSCP+6,1	INTO CALLING	UC000920
	TIX	*-2,1,1	SEQUENCE OF CARDPN	UC000930
	TRA	CSCP		UC000940
CSCP	TSX	\$CARDPN,4		UC000950
	TSX	0,0,0	A (ORIGIN)	UC000960
	TSX	0,0,0	N (NO. OF WORDS)	UC000970
	TSX	0,0,0	M (MODE)	UC000980
	TSX	0,0,0	I (SEQ. NO.)	UC000990
	TSX	0,0,0	D (BCD ID)	UC001000
EX	AXT	**1		UC001010
	AXT	**2		UC001020
	AXT	**4		UC001030
	TRA	4,4	ADDRESS WAS MODIFIED	UC001040
N	PZE			UC001050
M	PZE			UC001060
I	PZE			UC001070
D	PZE			UC001080
AL	PZE			UC001090
NL	PZE	N		UC001100

ML	PZE	M	UC001110
IL	PZE	I	UC001120
DL	PZE	D	UC001130
MK7	OCT	000000700000	UC001140
MK6	OCT	000000600000	UC001150
MK1	OCT	000000100000	UC001160
TRA64	TRA	6,4	UC001170
TRA44	TRA	4,4	UC001180
TRA34	TRA	3,4	UC001190
I1	PZE	1,0,1	UC001200
I2	PZE	2,0,2	UC001210
I3	PZE	3,0,3	UC001220
I11	PZE	0,0,1	UC001230
I12	PZE	0,0,2	UC001240
I13	PZE	0,0,3	UC001250
END			UC001260
			UC000001
			UC000020
C	-----		UC000030
			UC000040
			UC000050
*	FAP		UC000060
*	PUNCH CARD ID AND SEQUENCE NO. ROUTINE		UC000070
	ENTRY	PUNIDN	UC000080
	ENTRY	PUNSEQ	UC000090
	ENTRY	PUNNUM	UC000100
	ENTRY	PUNNOM	UC000110
	ENTRY	PUNIDS	UC000120
*	PROGRAMMER USES - PUNIDN - TO SET UP ID		UC000130
*	PROGRAMS USES - PUNIDS - INDIR. TO GET ID		UC000140
*	PROGRAMMER USES - PUNSEQ - TO SET UP SEQ. NO.		UC000150
*	PROGRAMS UPDATES - PUNNOM - INDIR.		UC000160
*	PROGRAMMER INTEROGATES - PUNNUM - TO GET SEQ. NO.		UC000170
PUNIDN	CLA*	1,4	UC000180
	SUB	BITS	UC000190
	T7E	P1	UC000200
	CLA*	1,4	UC000210
	TRA	P2	UC000220
P1	CLA	BLANKS	UC000230
P2	STO	PUNIDS	UC000240
	TRA	2,4	UC000250
PUNIDS	BSS	1	UC000260
PUNNOM	BSS	1	UC000270
PUNSEQ	CLA*	1,4	UC000280
	STO	PUNNOM	UC000290
	TRA	2,4	UC000300
PUNNUM	CLA	PUNNOM	UC000310
	STO*	1,4	UC000320
	TRA	2,4	UC000330
BITS	OCT	-377777777777	UC000340
BLANKS	BCI	1,	UC000350
END			UC000360
*	LIST		UC000370
C			UC000001
C			UC000020
C	-----		UC000030
C			UC000040
C			UC000050
*	LABEL		UC000060

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CRAPD                                UC000070
      SUBROUTINE RADSET                UC000080
C*****                            UC000090
C                                UC000100
C...  SYSTEM COMMON, DIMENSION, AND EQUIVALENCE STATEMENTS UC000110
C                                UC000120
      DIMENSION SYSTEM (1700)         UC000130
C                                UC000140
      EQUIVALENCE (SYSTEM(1700),KOM   UC000150
      (1700),KFLAGS(1692),TAPETB(1622)) UC000160
C                                UC000170
      EQUIVALENCE (TAPETB(18),PROTAP(19),CANTAP(17),CLTAPE(16),
1  POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11), UC000180
2  CORTAP( 9), UC000190
3  TAPES1( 8),TAPES2( 7),TAPES3( 6),TAPES4( 5), UC000200
4  FORTIN( 4),INTAPE( 3),IOUTAP( 2),PUNTAP( 1)) UC000210
C                                UC000220
      EQUIVALENCE (KFLAGS( 70), UC000230
1  K0 ( 60),FO ( 60),K1 ( 59),K2 ( 58),K3 ( 57), UC000240
2  K4 ( 56),K5 ( 55),K6 ( 54),K7 ( 53),K8 ( 52), UC000250
3  K9 ( 51), UC000260
4  KFLAG0( 46),KFLAG1( 45),KFLAG2( 44),KFLAG3( 43),KFLAG4( 42), UC000270
5  IWAVEN( 40),IPTNLY( 39),NOPOST( 38),INVERT( 37),KAUTOP( 36), UC000280
6  ICLPRT( 35),INDEXX( 34),IPLQTR( 33), NOPLQTR( 31), UC000290
7  KDYNFG( 30),LOCJPT( 29),LOCBEG( 28),KSECIN( 27),NCLREC( 26), UC000300
8  LOCMAC( 25),LENSPC( 24), UC000310
9  IPOSTP( 20),NUMPST( 19)) UC000320
C                                UC000330
      EQUIVALENCE (KOM ( 8),KAPTID(1),KAPTIO(2),KAPTTR(3),KAPTCN(4)) UC000340
C                                UC000350
      COMMON SYSTEM UC000360
C                                UC000370
      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1) UC000380
C                                UC000390
C*****                            UC000400
C                                UC000410
C***** COMMON FOR THE MULTI-HEAD INSPECTION POSTPROCESSOR ***** UC000420
C                                UC000430
      COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,ADUM, UC000440
1  ARAYIN,BITS,BLANKS,BUFFER,BUFP,CCFIN,CCFOT, UC000450
2  FORMAT,IDEG,IDUM,IMIN,INTAP,I,ISEC,J,NUM,NWPR, UC000460
3  OPTAB,OUTRAY,PREVSI,PREVSJ,PREVSK,PREVSX, UC000470
4  PREVSZ,PREVSY,RADIN,RADOUT,RAD,RETURN, UC000480
5  RIN,ROUT,SFQCTR,SFQINC,TAPSTO,WALL,WORDS, UC000490
6  XIN,XOUT,YIN UC000500
      DIMENSION MACH(12),PNOFLG(14),MTABLE(10),ADUM(50), UC000510
1  BUFEK(100),BUFP(26),FORMAT(26),IDUM(50),INTAP(20), UC000520
2  OPTAB(100),TAPSTO(250),WORDS(26) UC000530
      DIMENSION ARAYIN(8,250),OUTRAY(8,250) UC000540
C                                UC000550
C                                UC000560
C                                UC000570
C                                UC000580
C                                UC000590
10 RADIN=TAPSTO(4)/2.0 UC000600
    RADOUT=RADIN UC000610
    RETURN UC000620
    END UC000630
                                UC000001
                                UC000020

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C-----			UC000030
			UC000040
			UC000050
			UC000060
			UC000070
C-----			UC000080
			UC000090
			UC000100
*	FAP		UC000110
	ENTRY	READER	UC000120
*			UC000130
*	SYSTEM COMMON, DIMENSION, AND EQUIVALENCE STATEMENTS FOR FAP		UC000140
NOTAPS EQU	18	NUMBER OF TAPES	UC000150
NOFLGS EQU	70	NUMBER OF FLAGS IN FLAG AREA	UC000160
BUFNUM EQU	4	NUMBER OF BUFFERS	UC000170
NOBLKS EQU	4	NO. OF BLOCKS ALLOWED TAPEWT CALL SEQ.	UC000180
BUFSIZ EQU	400	SIZE OF ONE BUFFER BLOCK	UC000190
*****			UC000200
SYSTEM COMMON	8		UC000210
KFLAGS COMMON	NOFLGS		UC000220
TAPETB COMMON	NOTAPS		UC000230
BUFTBL COMMON	BUFNUM		UC000240
BUFER1 COMMON	BUFSIZ		UC000250
BUFER2 COMMON	BUFSIZ		UC000260
BUFER3 COMMON	BUFSIZ		UC000270
BUFER4 COMMON	BUFSIZ		UC000280
KOM EQU	SYSTEM		UC000290
KAPTID EQU	KOM-7	IDENTIFICATION OF LAST LIBTAP RECORD	UC000300
KAPTIO EQU	KOM-6	APT I-O COMMAND	UC000310
KAPTTR EQU	KOM-5	TRANSFER TO LAST SECTION READ FROM LIBTAP	UC000320
KAPTCN EQU	KOM-4	CONTINUATION FLAG	UC000330
K0 EQU	KFLAGS-10	KFLAGS(11)	UC000340
K1 EQU	KFLAGS-11		UC000350
K2 EQU	KFLAGS-12		UC000360
K3 EQU	KFLAGS-13		UC000370
K4 EQU	KFLAGS-14		UC000380
K5 EQU	KFLAGS-15		UC000390
K6 EQU	KFLAGS-16		UC000400
K7 EQU	KFLAGS-17		UC000410
K8 EQU	KFLAGS-18		UC000420
K9 EQU	KFLAGS-19		UC000430
KFLAG0 EQU	KFLAGS-24		UC000440
KFLAG1 EQU	KFLAGS-25		UC000450
KFLAG2 EQU	KFLAGS-26		UC000460
KFLAG3 EQU	KFLAGS-27		UC000470
KFLAG4 EQU	KFLAGS-28		UC000480
IWAVEN EQU	KFLAGS-30	KFLAGS(31)	UC000490
IPTNLY EQU	KFLAGS-31		UC000500
NOPOST EQU	KFLAGS-32		UC000510
INVERT EQU	KFLAGS-33		UC000520
KAUTOP EQU	KFLAGS-34		UC000530
ICLPRT EQU	KFLAGS-35		UC000540
INDEXX EQU	KFLAGS-36		UC000550
IPLOTR EQU	KFLAGS-37		UC000560
NOPL0T EQU	KFLAGS-39		UC000570
KDYNFG EQU	KFLAGS-40		UC000580
LOCJPT EQU	KFLAGS-41		UC000590
LOCBEG EQU	KFLAGS-42		UC000600
KSEGIN EQU	KFLAGS-43		UC000610

NCLREC EQU	KFLAGS-44	UC000620
LOCMAC EQU	KFLAGS-45	UC000630
LENSPC EQU	KFLAGS-46	UC000640
IPOSTP EQU	KFLAGS-50	UC000650
NUMPST EQU	KFLAGS-51	UC000660
PROTAP EQU	TAPETB	UC000670
CANTAP EQU	TAPETB-1	UC000680
CLTAPE EQU	TAPETB-2	UC000690
POCTAP EQU	TAPETB-3	UC000700
PLOTAP EQU	TAPETB-4	UC000710
SRFTAP EQU	TAPETB-5	UC000720
LIBTAP EQU	TAPETB-6	UC000730
CRDTAP EQU	TAPETB-7	UC000740
CORTAP EQU	TAPETB-9	UC000750
TAPES1 EQU	TAPETB-10	UC000760
TAPES2 EQU	TAPETB-11	UC000770
TAPES3 EQU	TAPETB-12	UC000780
TAPES4 EQU	TAPETB-13	UC000790
FORTIN EQU	TAPETB-14	UC000800
INTAPE EQU	TAPETB-15	UC000810
IOUTAP EQU	TAPETB-16	UC000820
PUNTAP EQU	TAPETB-17	UC000830
*****		UC000840
*		UC000850
*		UC000860
MACH COMMON	12	UC000870
NLOOP COMMON	1	UC000880
NLOOP1 COMMON	1	UC000890
PNOFLG COMMON	14	UC000900
MTABLE COMMON	10	UC000910
NID COMMON	1	UC000920
ADUM COMMON	50	UC000930
ARRAYIN COMMON	2000	UC000940
BITS COMMON	1	UC000950
BLANKS COMMON	1	UC000960
BUFFER COMMON	100	UC000970
BUFP COMMON	26	UC000980
CCFIN COMMON	1	UC000990
CCFOT COMMON	1	UC001000
FORMAT COMMON	26	UC001010
IDEG COMMON	1	UC001020
IDUM COMMON	50	UC001030
IMIN COMMON	1	UC001040
INTAP COMMON	20	UC001050
I COMMON	1	UC001060
ISEC COMMON	1	UC001070
J COMMON	1	UC001080
NUM COMMON	1	UC001090
NWPR COMMON	1	UC001100
OPTAB COMMON	100	UC001110
OUTRAY COMMON	2000	UC001120
PREVSI COMMON	1	UC001130
PREVSJ COMMON	1	UC001140
PREVSK COMMON	1	UC001150
PREVSX COMMON	1	UC001160
PREVSY COMMON	1	UC001170
PREVSZ COMMON	1	UC001180
RADIN COMMON	1	UC001190
RADOUT COMMON	1	UC001200

RAD	COMMON	1	UC001210
RETURN	COMMON	1	UC001220
RIN	COMMON	1	UC001230
ROUT	COMMON	1	UC001240
SEQCTR	COMMON	1	UC001250
SEQINC	COMMON	1	UC001260
TAPSTO	COMMON	250	UC001270
WALL	COMMON	1	UC001280
WORDS	COMMON	26	UC001290
XIN	COMMON	1	UC001300
XOUT	COMMON	1	UC001310
YIN	COMMON	1	UC001320
READER	SXA	BACK,1	UC001330
	SXA	BACK+1,2	UC001340
	SXA	BACK+2,4	UC001350
	CALL	TAPERD,CLTAPE,IRETN,NWPR,NBLKS,TAPSTO,WORD	UC001360
	CLA	IRETN	UC001370
	TZE	EOF	UC001380
	TMI	READOK	UC001390
	CLS	ONE	UC001400
	STO	RETURN	UC001410
	TRA	READOK+1	UC001420
READOK	STZ	RETURN	UC001430
	AXT	20,1	UC001440
	CLA	TAPSTO+1,1	UC001450
	STO	INTAP+1,1	UC001460
	TIX	*-2,1,1	UC001470
BACK	AXT	0,1	UC001480
	AXT	0,2	UC001490
	AXT	0,4	UC001500
	TRA	1,4	UC001510
EOF	CLA	ONE	UC001520
	STO	RETURN	UC001530
	TRA	BACK	UC001540
IRETN	PZE		UC001550
NBLKS	PZE	0,0,1	UC001560
WORD	PZE		UC001570
ONE	DEC	1.0	UC001580
	END		UC001590
C			UC000010
C			UC000020
C			UC000030
C			UC000040
C			UC000050
	SUBROUTINE REWIND(M)		UC000060
C	*****		UC000070
C			UC000080
C...	SYSTEM COMMON, DIMENSION, AND EQUIVALENCE STATEMENTS		UC000090
C			UC000100
	DIMENSION SYSTEM (1700)		UC000110
C			UC000120
	EQUIVALENCE (SYSTEM(1700),KOM (1700),KFLAGS(1692),TAPETB(1622))		UC000130
C			UC000140
	EQUIVALENCE (TAPETB(18),PROTAP(18),CANTAP(17),CLTAPE(16),		UC000150
1	POCTAP(15),PLOTAP(14),SRFTAP(13),LIBTAP(12),CRDTAP(11),		UC000160
2	CORTAP(9),		UC000170
3	TAPES1(8),TAPES2(7),TAPES3(6),TAPES4(5),		UC000180
4	FORTIN(4),INTAPE(3),IOUTAP(2),PUNTAP(1)		UC000190
C			UC000200

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      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  IWAVER( 40),IPTNLY( 39),NOPQST( 38),INVERT( 37),KAUTOP( 36),
6  ICLPRT( 35),INDEXX( 34),IPLGTR( 33),
7  KQYNFG( 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
      DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C...*****
C***** COMMON FOR THE MULTI-HEAD INSPECTION POSTPROCESSOR *****
C
      COMMON MACH,NLOOP,NLQOPI,PNOFLG,MTABLE,NID,ADUM,
1      ARAYIN,BITS,BLANKS,BUFFER,BUFP,CCFIN,CCFOT,
2      FORMAT,IDEQ,IDUM,IMIN,INTAP,I,ISEC,J,NUM,NWPR,
3      OPTAB,OUTRAY,PREVSI,PREVSJ,PREVSK,PREVSX,
4      PREVSZ,RADIN,RADOUT,RAD,RETURN,
5      RIN,ROUT,SEQCTR,SEQINC,TAPSTO,WALL,WORDS,
6      XIN,XOUT,YIN
      DIMENSION MACH(12),PNOFLG(14),MTABLE(10),ADUM(50),
1      BUFFER(100),BUFP(26),FORMAT(26),IDUM(50),INTAP(20),
2      OPTAB(100),TAPSTO(250),WORDS(26)
      DIMENSION ARAYIN(8,250),OUTRAY(8,250)
C
C      REWIND- THE FUNCTION OF THIS ROUTINE IS TO
C      SET UP OR OUTPUT A REWIND
C      M COPE OF 30 IN N/C TAPE
C
      BUFP(13)=30.0
      CALL SEQOUT
      CALL OUTTAP
      RETURN
      END
C
C-----
C
      SUBROUTINE SEQNO
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),
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
C***** COMMON FOR THE MULTI-HEAD INSPECTION POSTPROCESSOR *****
C
COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,ADUM,
1  ARAYIN,BITS,BLANKS,BUFFER,BUFP,CCFIN,CCFOT,
2  FORMAT,IDEG,IDUM,IMIN,INTAP,I,ISEC,J,NUM,NWPR,
3  OPTAB,OUTRAY,PREVSI,PREVSJ,PREVSK,PREVSX,
4  PREVSZ,PREVSZ,RADIN,RADOUT,RAD,RETURN,
5  RIN,ROUT,SEQCTR,SEQINC,TAPSTO,WALL,WRDS,
6  XIN,XOUT,YIN
1  DIMENSION MACH(12),PNOFLG(14),MTABLE(10),ADUM(50),
2  BUFFER(100),BUFP(26),FORMAT(26),IDUM(50),INTAP(20),
3  OPTAB(100),TAPSTO(250),WORDS(26)
4  DIMENSION ARAYIN(8,250),OUTRAY(8,250)
5  IF(INTAP(4)-57)50,10,50
10 IF(IDUM(5)-IDUM(6))20,30,40
C
INNER WAS SPECIFIED
20 IDUM(46)=J+1
GOTO50
30 IF(I+J)40,40,50
40 IDUM(45)=I+1
50 RETURN
END
C
C
C-----
C
SUBROUTINE SEQOUT
RETURN
END
C
C
C-----
C
SUBROUTINE STOP
RETURN

```

```

UC000180
UC000190
UC000200
UC000210
UC000220
UC000230
UC000240
UC000250
UC000260
UC000270
UC000280
UC000290
UC000300
UC000310
UC000320
UC000330
UC000340
UC000350
UC000360
UC000370
UC000380
UC000390
UC000400
UC000410
UC000420
UC000430
UC000440
UC000450
UC000460
UC000470
UC000480
UC000490
UC000500
UC000510
UC000520
UC000530
UC000540
UC000550
UC000560
UC000570
UC000580
UC000590
UC000600
UC000610
UC000610
UC000620
UC000630
UC000640
UC000650
UC000660
UC000670
UC000680
UC000690
UC000700
UC000710
UC000720
UC000730
UC000740
UC000750
UC000760
UC000770

```



```

      END
C
C
C-----
C
C
C
      SUBROUTINE STORPT(K)
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),
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),IPLCTR( 33), NOPLCT( 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 FOR THE MULTI-HEAD INSPECTION POSTPROCESSOR *****
C
      COMMON MACH,NLOOP,NLCOPI,PNOFLG,MTABLE,NID,ADUM,
1  ARAYIN,BITS,BLANKS,BUFFER,BUFP,CCFIN,CCFOT,
2  FORMAT,IDEQ,IDUM,IMIN,INTAP,I,ISEC,J,NUM,NWPR,
3  OPTAB,OUTRAY,PREVSI,PREVSJ,PREVSK,PREVSX,
4  PREVSZ,PREVSZ,RADIN,RADOUT,RAD,RETURN,
5  RIN,ROUT,SEQCTR,SEQINC,TAPSTO,WALL,WORDS,
6  XIN,XOUT,YIN
      DIMENSION MACH(12),PNOFLG(14),MTABLE(10),ADUM(50),
1  BUFFER(100),BUFP(26),FORMAT(26),IDUM(50),INTAP(20),
2  OPTAB(100),TAPSTO(250),WORDS(26)
      DIMENSION ARAYIN(8,250),OUTRAY(8,250)
C
      THIS ROUTINE STORES COORDINATES ANDI,J,KVALUES
      K=K
      PREVSX=TAPSTO(K)
      PREVSZ=TAPSTO(K+1)
      PREVSJ=TAPSTO(K+2)
      PREVSI=TAPSTO(K+3)

```

```

PREVSJ=TAPSTO(K+4)
PREVSK=TAPSTO(K+5)
RETURN
END
C
C
C-----
C
C
C
SUBROUTINE TEST (IAG,IDX,ICT)
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),FC ( 60),K1 ( 59),K2 ( 58),K3 ( 57),
2 K4 ( 56),K5 ( 55),K6 ( 54),K7 ( 53),K8 ( 52),
3 K9 ( 51),
4 KFLAG1( 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),IPLQTR( 33), NOPLGT( 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 ( 0),KAPTID(1),KAPTIO(2),KAPTTR(9),KAPTCN(4))
C
COMMON SYSTEM
C
DIMENSION KFLAGS(1),IPOSTP(1),KOM(1)
C
C...*****
C***** COMMON FOR THE MULTI-HEAD INSPECTION POSTPROCESSOR *****
C
COMMON MACH,NLOOP,NLOOP1,PNOFLG,MTABLE,NID,ADUM,
1 ARAYIN,BITS,BLANKS,BUFFER,BUFP,CCFIN,CCFOT,
2 FORMAT,IDEG,IDUM,IMIN,INTAP,I,ISEC,J,NUM,NWPR,
3 OPTAB,OUTRAY,PREVSI,PREVSJ,PREVSK,PREVSX,
4 PREVSZ,RADIN,RADCUT,RAD,RETURN,
5 RIN,ROUT,SEQCTR,SEQINC,TAPSTO,WALL,WORDS,
6 XIN,XOUT,YIN
DIMENSION MACH(12),PNOFLG(14),MTABLE(10),ADUM(50),
1 BUFFER(100),BUFP(26),FORMAT(26),IDUM(50),INTAP(20),
2 OPTAB(100),TAPSTO(250),WORDS(26)
DIMENSION ARAYIN(8,250),OUTRAY(8,250)
GO TO (10,60,90),IAG
10 IF(OUTRAY(1,ICT)-ABS(OUTRAY(1,ICT)))20,30,30
20 IDUM(25)=1

```

```

      RETURN
30 IF (ARRAYIN(1,IDX)-ABS(ARRAYIN(1,IDX)))40,50,50
40 IDUM(25)=1
50 RETURN
60 IF (OUTRAY(1,ICT)-ABS(OUTRAY(1,ICT)))70,80,80
70 IDUM(25)= 1
80 RETURN
90 IF (ARRAYIN(1,IDX)-ABS(ARRAYIN(1,IDX))) 100,110,110
100 IDUM(25)=1
110 RETURN
      END
C
C
C-----
C
C
C      SUBROUTINE TLSET
C..... DUMMY SUBROUTINE
C      RETURN
C      END
C
C
C-----
C
C
C      SUBROUTINE TMARK
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))
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),IPLCTR( 33), NOPLCT( 31),
7  KDYNFG( 30),LGCJPT( 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

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UC000560
UC000570
UC000580
UC000590
UC000600
UC000610
UC000620
UC000630
UC000640
UC000650
UC000660
UC000010
UC000020
UC000030
UC000040
UC000050
UC000060
UC000070
UC000080
UC000090
UC000010
UC000020
UC000030
UC000040
UC000050
UC000060
UC000070
UC000080
UC000090
UC000100
UC000110
UC000120
UC000130
UC000140
UC000150
UC000160
UC000170
UC000180
UC000190
UC000200
UC000210
UC000220
UC000230
UC000240
UC000250
UC000260
UC000270
UC000280
UC000290
UC000300
UC000310
UC000320
UC000330
UC000340
UC000350
UC000360
UC000370
UC000380
UC000390

C ***** COMMON FOR THE MULTI-HEAD INSCRIPTION POSTPROCESSOR *****	UC000400
C	UC000410
COMMON MACH,NLGOOP,NLOOP1,PNOFLG,MTABLE,NID,ADUM,	UC000420
1 ARAYIN,BITS,BLANKS,BUFFER,BUFP,CCFIN,CCFOT,	UC000430
2 FORMAT,IDEG,IDUM,IMIN,INTAP,I,ISEC,J,NUM,NWPR,	UC000440
3 OPTAB,OUTRAY,PREVSI,PREVSJ,PREVSK,PREVSX,	UC000450
4 PREVSZ,PREVSI,RADIN,RADCUT,RAD,RETURN,	UC000460
5 RIN,ROUT,SEQCTR,SEQINC,TAPSTO,WALL,WORDS,	UC000470
6 XIN,XOUT,YIN	UC000480
DIMENSION MACH(12),PNOFLG(14),MTABLE(10),ADUM(50),	UC000490
1 BUFFER(100),BUFP(26),FORMAT(26),IDUM(50),INTAP(20),	UC000500
2 OPTAB(100),TAPSTO(250),WORDS(26)	UC000510
DIMENSION ARAYIN(8,250),OUTRAY(8,250)	UC000520
C A READING HAS BEEN REQUESTED,STORE CORRECT POINTS	UC000530
IF(IDUM(5)-1) 10,20,10	UC000540
10 IF(IDUM(6)-1) 80,50,80	UC000550
20 I=I+1	UC000560
OUTRAY(1,I)=TAPSTO(4)	UC000570
OUTRAY(2,I)=PREVSX	UC000580
OUTRAY(3,I)=PREVSJ	UC000590
OUTRAY(4,I)=PREVSZ	UC000600
OUTRAY(5,I)=PREVSI	UC000610
OUTRAY(6,I)=PREVSJ	UC000620
OUTRAY(7,I)=PREVSK	UC000630
IF(I-250) 70,30,30	UC000640
30 I=0	UC000650
IDUM(7)=IDUM(7)+1	UC000660
CALL TAPEWT(TAPES3,IXX,OUTRAY,1550)	UC000670
IF(IXX) 70,70,40	UC000680
40 CALL ERREX(5)	UC000690
50 J=J+1	UC000700
ARAYIN(1,J)=TAPSTO(4)	UC000710
ARAYIN(2,J)=PREVSX	UC000720
ARAYIN(3,J)=PREVSJ	UC000730
ARAYIN(4,J)=PREVSZ	UC000740
ARAYIN(5,J)=PREVSI	UC000750
ARAYIN(6,J)=PREVSJ	UC000760
ARAYIN(7,J)=PREVSK	UC000770
IF(J-250) 70,60,60	UC000780
60 J=0	UC000790
IDUM(8)=IDUM(8)+1	UC000800
CALL TAPEWT(TAPES4,IXX,INARAY,1550)	UC000810
IF(IXX) 70,70,40	UC000820
70 RETURN	UC000830
80 CALL ERREX(6)	UC000840
GOTO 70	UC000850
END	UC000860
C	UC000010
C	UC000020
C-----	UC000030
C	UC000040
C	UC000050
SUBROUTINE TOOLNO	UC000060
C..... DUMMY SUBROUTINE	UC000070
RETURN	UC000080
END	UC000090
C	UC000010
C	UC000020
C-----	UC000030

C
C
SUBROUTINE TURRET
C.....DUMMY SUBROUTINE
RETURN

UC000040
UC000050
UC000060
UC000070
UC000080

2.8

Program Flow Charts

Subroutine ABEAR

Subroutine AGFND

Subroutine AUXOUT(K, L)

Subroutine COPROC

Subroutine DATE (Fap)

Subroutine END

Subroutine ERREX(m)

Subroutine EXEC

Subroutine FINI

Subroutine HEAD

Subroutine INIT(FAP)

Subroutine LEADER(M)

Subroutine MACH XX

Subroutine MATCH(L, M, N, IW)

Subroutine OPTION

Subroutine OUTTAP

Subroutine POSTIN

Subroutine POSTN

Subroutine PREINT

Subroutine PRINTA

Subroutine PROCES

Subroutine PRITIT

Subroutine PTAPE

Subroutine RADSET

Subroutine READER (FAP)

Subroutine REWIND(M)

Subroutine SEQNO

Subroutine STORPT(K)

Subroutine TEST (IAG, IDX, ICT)

Subroutine TMARK

2.9

Subroutine DISPAT

```

*      LIST
*      FORTRAN
C4005      DISPAT                                06/30/65   2065
      SUBROUTINE DISPAT
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  CURTAP( 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 MACH,NLOOP,NLOOPI,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
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	40050510
210 IF (KOM(LP)-IPOSTP(K)) 220,400,220	40050520
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

3. Sample Part Programs

3.1

Horizontally Opposed Head Gage

The parts programmer will move a "cutter" in a continuous mode along the inner and outer surfaces of the part to be inspected. The "cutter" in the case of a dual-head inspection machine is the gage head. To locate inspection points, the programmer will use interim check surfaces parallel to the X-axis during the excursion. At these check surfaces the programmer will employ a TMARK/n instruction to mark the current tool (gage) position on the CLTAPE. He must use identical "n's" in the TMARK instruction for identical check surfaces encountered in traversing the inner and outer contours of the part. The HEAD/^{INNER}_{OUTER} instruction will signal to the postprocessor which head is being moved. Figure 1 is a schematic diagram relating the orientation of the inner and outer heads, the part and the check surface.

On the Horizontally Opposed Head Gage, the gage head deflection vector (the direction in which a surface inconsistency forces the head) is horizontal. The true error in the part must be measured along the surface normal; so the deflection of the gage is not indicative of the actual error. The true error can be obtained by multiplying the gage deflection by the "cosine correction factor" which is the cosine of the angular difference between the gage head deflection vector and surface normal. The inside and outside cosine correction factors listed on page 166 are the cosines of α and β , respectively, in the schematic on page 163. Pages 164-166 show the output of a part program using the Horizontally Opposed Head Gage.

Figure 1. Horizontally Opposed Head Gage

TAPENO SAMPLE PROGRAM NO. 1	SIP FORK GAGE	0101
CHARGE#4062		0102
\$\$DWG. NO SKETCH 2		0105
\$\$X-AXIS # FACE		0107
\$\$Y-AXIS # CENTERLINE		0108
MACHIN/HORHDS,INSP,1		0113
OPTION/30,3		0114
MULTAX/2		0116
CUTTER/(5/32)		0117
CLPRNT		0118
SYN/P,POINT,L,LINE,C,CIRCLE,AA,ATANGL,PL,PARLEL,XS,XSMALL,\$		0121
XL,XLARGE,YS,YSMALL,YL,YLARGE		0122
INTOL/.000012		0123
OUTTOL/.000012		0124
IC #C/O,0,9.5		0201
PT1 #P/4,15		0203
SLI #L/PT1,AA,(90+15)		0205
LI #L/4,0,4,10		0207
LO #L/PL,LI,XL,.100		0209
SLO #L/PL,SLI,XL,.100		0211
OC #C/O,0,(9.5+.100)		0213
SC1 #C/XL,SLO,YL,OUT,OC,RADIUS,.250		0215
RESERV/H,15		0217
H(1) #L/O,15.5,10,15.5		0219
H(2) #L/O,14,14,10		0221
H(3) #L/O,12,10,12		0223
H(4) #L/O,10,10,10		0225
H(5) #L/O,8,10,8		
H(6) #L/O,7,10,7		0301
H(7) #L/O,5,10,5		0303
H(8) #L/O,3,10,3		0305
H(9) #L/O,1,10,1		0307
H(10) #L/O,.5,10,.5		0309
PMID #P/3,16		0311
HEAD/INNER		0313
FROM/PMID		0315
INDIRV/1,0,0		0317
\$\$IF PROGRAM IS DEFINED TO MMC AND		0319
\$\$A NORMAL OFFSET IS REQUIRED A THICK		0320
\$\$STATEMENT MUST BE USED AND NOT A		0321
\$\$GAGE BALL OFFSET		0322
GO/TO,LI		0324
TLRGT,GORGT/LI,ON,H(1)		0401
TMARK/1		0403
GOFWD/LI,PAST,SLI		0405
TLRGT,GOLFT/SLI,ON,H(2)		0407
TMARK/2		0409
GOFWD/SLI,ON,H(3)		0411
TMARK/3		0413
GOFWD/SLI,ON,H(4)		0415
TMARK/4		0417
GOFWD/SLI,ON,H(5)		
TMARK/5		
GOFWD/SLI,PAST,IC		0419
TLRGT,GOLFT/IC,ON,H(6)		
TMARK/6		
I#6		

	LOOPST	0501
1)	I#I+1	0503
	GOFWD/IC,ON,H(1)	0505
	TMARK/(1)	0507
	IF(I-10)1,2,2	0509
2)	LOOPND	0511
	GOTO/PMID	0513
	HEAD/OUTER	0514
	FROM/PMID	0515
	INDIRV/1,0,0	0517
	GO/PAST,LO	0519
	TLLFT,GORGT/LO,ON,H(1)	0521
	TMARK/1	0523
	GOFWD/LO,TO,SLO	0525
	GOFWD/SLO,ON,H(2)	0601
	TMARK/2	0603
	GOFWD/SLO,ON,H(3)	0605
	TMARK/3	0606
	GOFWD/SLO,ON,H(4)	0607
	TMARK/4	0609
	GOFWD/SLO,ON,H(5)	
	TMARK/5	
	GOFWD/SLO,TANTO,SC1	0611
	GOFWD/SC1,TANTO,OC	0613
	GOFWD/OC,ON,H(6)	0615
	TMARK/6	0616
	I#6	0617
	LOOPST	0619
3)	I#I+1	0621
	GOFWD/OC,ON,H(1)	0623
	TMARK/(1)	0625
	IF(I-10)3,4,4	
4)	LOOPND	0701
	GOTO/PMID	0703
	END	0705
	FINI	0709

HORIZONTALLY OPPOSED HEAD GAGE

PARTNO SAMPLE PROGRAM NO. 1 SIP FORK GAGE

POS NUM	BALL CENTER HEIGHT (Y)	INSIDE BALL CENTER (XI)	INSIDE COSINE CORR.FACTOR	OUTSIDE BALL CENTER (XO)	OUTSIDE COSINE CORR.FACTOR	GAGE TIP WALL THICKNESS
1	15.5000	3.9219	-1.0000	4.1781	1.0000	0.1000
2	12.7045	4.5342	-0.9659	4.8215	0.9659	0.1310
3	12.0000	4.7230	-0.9659	4.9883	0.9659	0.1090
4	10.0000	5.2589	-0.9659	5.5242	0.9659	0.1090
5	8.0000	5.7948	-0.9659	6.0601	0.9659	0.1090
6	7.0000	6.3065	-0.6693	6.6833	0.6906	0.2205
7	5.0000	7.9857	-0.8476	8.2865	0.8562	0.1445
8	3.0000	8.9315	-0.9480	9.2014	0.9507	0.1137
9	1.0000	9.3687	-0.9944	9.6263	0.9946	0.1014
10	0.5000	9.4086	-0.9986	9.6652	0.9987	0.1004

3.2 Sheffield Manually Operated Rotary Contour Gage

Part programming instructions will be similar to those described in Section 3.1. The interim check surfaces will be radial lines rather than lines parallel to the X-axis (see Figure 2). Pages 169-171 contain a sample part program for this machine.

Figure 2. Sheffield Manually Operated Rotary Contour Gage

TAPENO SAMPLE PROGRAM NO. 2	MANUAL ROTACOM	0101
CHARGE#4062		0102
\$\$X-AXIS # FACE		0107
\$\$Y-AXIS # CENTERLINE		0108
\$\$PROGRAM WITH CENTERLINE USED AS X-AXIS		0110
MACHIN/SHEFLD, INSP, ROCOGM		0113
OPTION/30,3		0114
MULTAX/2		0116
CUTTER/(5/32)		0117
CLPRNT		0118
SYN/P, POINT, L, LINE, C, CIRCLE, AA, ATANGL, PL, PARLEL, XS, XSMALL, \$		0121
XL, XLARGE, YS, YSMALL, YL, YLARGE		0122
INTOL/.000012		0123
OUTTOL/.000012		0124
PC	#P/0,1,0	
OC	#C/0,0,11.250	0201
IC	#CIRCLE/0,0,10.000	0203
	RESERV/R,15	0206
R(1)	#L/PC,AA,0	0208
R(2)	#L/PC,AA,10	0210
R(3)	#L/PC,AA,20	0212
R(4)	#L/PC,AA,30	0214
R(5)	#L/PC,AA,40	0216
R(6)	#L/PC,AA,50	0218
R(7)	#L/PC,AA,60	0220
R(8)	#L/PC,AA,70	0222
R(9)	#L/PC,AA,80	0224
R(10)	#L/PC,AA,90 \$\$REF. ONLY	0300
PMID	#POINT/9,-.5	0301
	HEAD/INNER	0303
	FROM/PMID	0305
	INDIRV/1,0,0	0307
	GO/TO,IC	0309
	TLLFT,GOLFT/IC,ON,R(1)	0311
	TMARK/1	0313
	I#1	0315
	LOOPST	0317
1)	I#I+1	0319
	GOFWD/IC,ON,R(1)	0321
	TMARK/(1)	0323
	IF(I-10)1,2,2	0325
2)	LOOPND	0401
	GOTO/PMID	0403
	HEAD/OUTER	0405
	FROM/PMID	0407
	INDIRV/1,0,0	0409
	THICK/-.0015	0411
	GO/PAST,OC	0413
	TLRGT,GOLFT/OC,ON,R(1)	0415
	TMARK/(1)	0417
	I#1	0419
	LOOPST	0421
3)	I#I+1	0423
	GOFWD/OC,ON,R(1)	0425
	TMARK/(1)	0501
	IF(I-10)3,4,4	0503
4)	LOOPND	0505

GOTO/PMID
END
FINI

0507
0509
0513

SHEFFIELD MANUAL ROTARY CONTOUR GAGE

PARTNO SAMPLE PROGRAM NO. 2 MANUAL ROTACOM

POS NUM	RADIAL ANGLE DEG MIN SEC			INSIDE GAGE RADIAL DISTANCE (RI)	INSIDE COSINE CORR.FACTOR	OUTSIDE GAGE RADIAL DISTANCE (RO)	OUTSIDE COSINE CORR.FACTOR	GAGE WALL THICKNESS
1	5	3	55	10.0000	0.9949	11.2485	0.9961	1.2485
2	14	59	15	10.0000	0.9951	11.2485	0.9962	1.2485
3	24	45	35	10.0000	0.9955	11.2485	0.9966	1.2485
4	34	23	5	10.0000	0.9962	11.2485	0.9971	1.2485
5	43	52	40	10.0000	0.9970	11.2485	0.9977	1.2485
6	53	15	15	10.0000	0.9979	11.2485	0.9984	1.2485
7	62	31	50	10.0000	0.9987	11.2485	0.9990	1.2485
8	71	43	50	10.0000	0.9994	11.2485	0.9995	1.2485
9	80	52	45	10.0000	0.9998	11.2485	0.9999	1.2485
10	90	0	0	10.0000	1.0000	11.2485	1.0000	1.2485

3.3 Pratt & Whitney 6-Coordinate Measuring Machine

Section 3.1 describes adequately the necessary part programming instructions, with a few notable exceptions. Since the machine control system uses surface normals as input, check surface attitude is not important. Also the order of slide movements (the slide movement sequence) must be specified on the punched tape. A POSTN/XAXIS command with HEAD/OUTER will insert a "1" in this position on the tape; a POSTN/YAXIS, a "2". This also holds true for HEAD/INNER. The normal designations are "1" for both the inner and outer heads. Options 33 and 34 determine the settings for INNER and OUTER, respectively. Figure 3 is a schematic representation of the Pratt & Whitney 6-Coordinate Measuring Machine. The output of a sample part program is presented on pages 174-176.

Figure 3. Pratt & Whitney 6-Coordinate Measuring Machine

TAPENO SAMPLE PROGRAM NO. 3 P+W SIX COORD
CHARGE#4062

MACHIN/PRATTW,INSP,6COORD
OPTION/30,1
MULTAX/2
CUTTER/0
CLPRNT
RESERV/LN,10
SYN/P,POINT,L,LINE,C,CIRCLE,AA,ATANGL,PL,PARLEL,XS,XSMALL,\$
XL,XLARGE,YS,YSMALL,YL,YLARGE
INTOL/.000012
OUTTOL/.000012

PMID #P/2,-5
PMOD #P/14.5,14.5
APRO #L/-.5,0,-.5,10
LY #L/0,0,0,10
IC #C/0,0,10.000
OC #C/0,0,11.250
PC #P/0,0
SEQNO/START
HEAD/INNER
POSTN/XAXIS
FROM/PMID
INDIRV/-1,0,0
GO/ON,APRO
TLON,GORGT/APRO,TO,IC
TLRGT,GORGT/IC,ON,LY
TMARK/1
POSTN/YAXIS
A#90
I#1
LOOPST
1) I#I+1
A#A-10
TLRGT,GORGT/IC,ON,(LN(I)#L/PC,AA,A)
TMARK/(I)
IF(I-9)1,2,2
2) LOOPEND
GODLTA/-1,0,0
TMARK/10
GOTO/PMID
TMARK/11
HEAD/OUTER
POSTN/YAXIS
FROM/PMOD
INDIRV/-1,0,0
GO/ON,APRO
THICK/-.0015
TLON,GOLFT/APRO,TO,OC
TLLFT,GOLFT/OC,ON,LY
TMARK/1
POSTN/XAXIS
A#90
I#1
LOOPST
3) I#I+1
A#A-10

```
TLLFT,GOFWD/OC,ON,LN(I)  
TMARK/(I)  
IF(I-9)3,4,4  
4) LOOPND  
GOTO/PMOD  
TMARK/10  
TMARK/11  
END  
FINI
```

PRATT + WHITNEY 6-COORDINATE MEASURING MACHINE

PARTNO SAMPLE PROGRAM NO. 3 P+W SIX COORD

POS NUM	OUTSIDE SLIDE MOVEMENT SEQUENCE	XCOORD OUTSIDE POINT OF CONTACT (XO)	YCOORD OUTSIDE POINT OF CONTACT (YO)	NORMAL ANGLE OUTSIDE	INSIDE SLIDE MOVEMENT SEQUENCE	XCOORD INSIDE POINT OF CONTACT (XI)	YCOORD INSIDE POINT OF CONTACT (YI)	NORMAL ANGLE INSIDE
1.	2.	0.0000	11.2485	0.0	1.	0.	10.0000	0.
2.	1.	1.9533	11.0776	10.0	2.	1.7365	9.8481	10.0
3.	1.	3.8472	10.5701	20.0	2.	3.4202	9.3969	20.0
4.	1.	5.6243	9.7415	30.0	2.	5.0000	8.6603	30.0
5.	1.	7.2304	8.6168	40.0	2.	6.4279	7.6605	40.0
6.	1.	8.6168	7.2304	50.0	2.	7.6605	6.4279	50.0
7.	1.	9.7415	5.6242	60.0	2.	8.6603	5.0000	60.0
8.	1.	10.5701	3.8472	70.0	2.	9.3969	3.4202	70.0
9.	1.	11.0776	1.9533	80.0	2.	9.8481	1.7365	80.0
10.	1.	14.5000	14.5000	80.0	2.	8.8481	1.7365	80.0
11.	1.	14.5000	14.5000	80.0	2.	2.0000	-5.0000	80.0