

RH70/RP04

MECHANICAL R/W TEST
MD-11-DERPK-C

EP-DERPK-C-DL-A

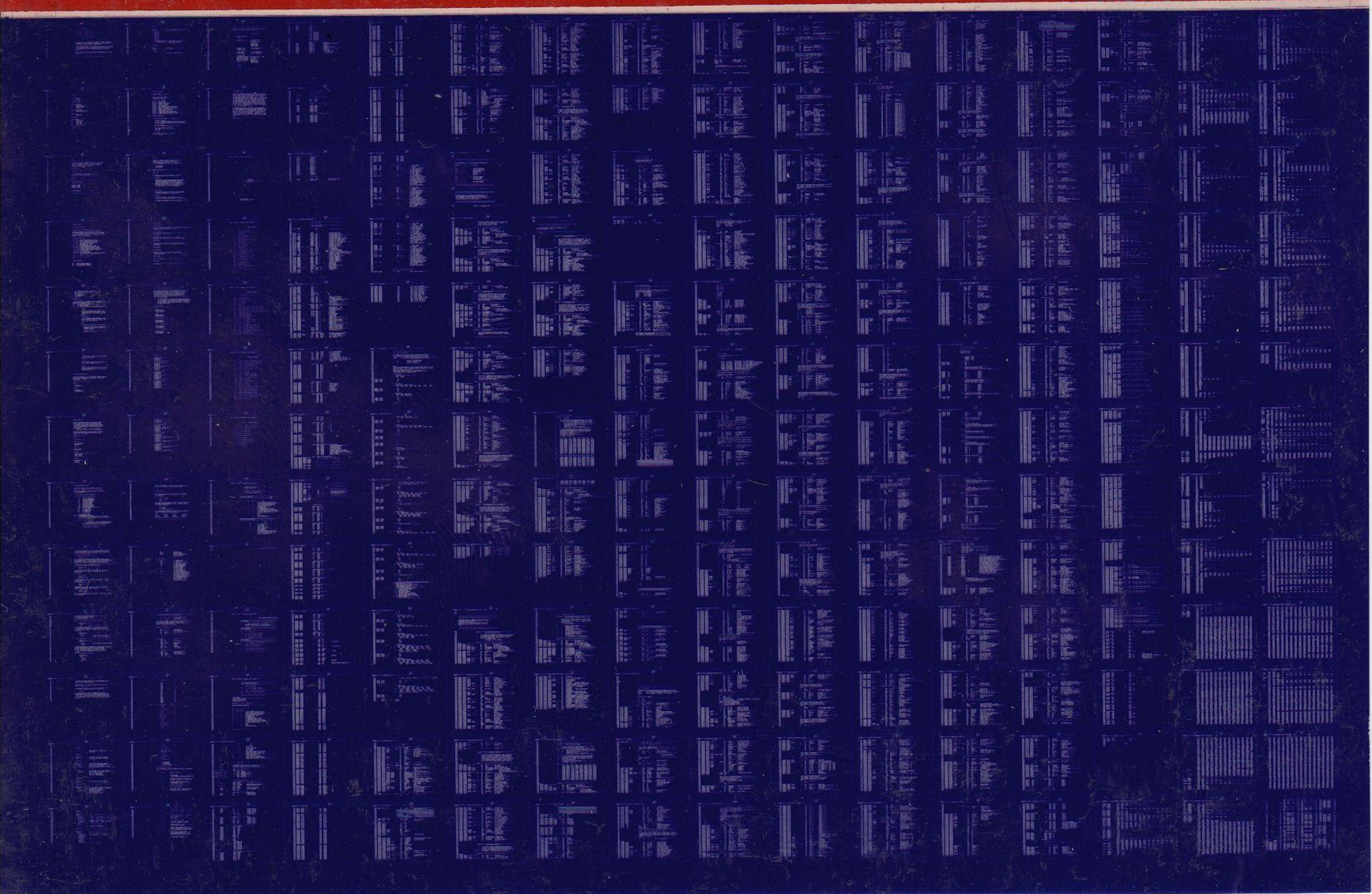
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IDENTIFICATION

PRODUCT CODE: MAINDEC-11-DEPK-C-D

PRODUCT NAME: RH70/RP04 MECHANICAL AND READ/WRITE TEST

DATE CREATED: OCTOBER 21, 1975

MAINTAINER: DIAGNOSTIC ENGINEERING

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THIS PROGRAM CONTAINS A SERIES OF TESTS THAT WILL INSURE THE DISK IS CAPABLE OF PERFORMING SEEKS, THE ACCESS TIMES ARE WITHIN TOLERANCE, THE TRACK AND SECTOR ADDRESSING CIRCUITRY OPERATES PROPERLY, AND THE DATA STORAGE AND RETRIEVAL CAPABILITIES ARE FUNCTIONAL.

REQUIREMENTS

EQUIPMENT

PDP-11 COMPUTER WITH 16K OF MEMORY, CONSOLE TELETYPE.
RH70/RP04 DISK WITH FORMATTED PACK,
AND A KW11-P CLOCK (IF TIMING TESTS ARE DESIRED).

STORAGE

THIS PROGRAM WILL LOAD IN 12K BUT REQUIRES. 16K TO RUN

PRELIMINARY PROGRAMS

MAINDEC-11-DERPS
MAINDEC-11-DERPT
MAINDEC-11-DERPU
MAINDEC-11-DERPVS

LOADING PROCEDURE

USE STANDARD PROCEDURE FOR LOADING .ABS TAPES

4. STARTING PROCEDURE
-----4.1 CONTROL SWITCH SETTINGS

THE CONTROL SWITCH SETTINGS ARE INPUT VIA THE TTY.

TO ENTER THE CONTROL SWITCH SETTING MODE PLACE SW<07>=1 BEFORE PRESSING START. THEN UPON STARTING THE PROGRAM IT WILL TYPE THE PRESENT CONTENTS OF THE CONTROL SWITCH REGISTER (C.SWR) AND WAIT FOR THE NEW SETTING TO BE INPUT. THE INPUT STRING MUST CONSIST OF A SLASH (/), 1 TO 6 OCTAL DIGITS, TWO PERIODS (...) AND A CARRIAGE RETURN.

THE C.SWR SETTINGS ARE:

C.SWR<15>=0...WRITE PACK BEFORE TESTING (TEST16)
 =1...INHIBIT WRITE PACK BEFORE TESTING (TEST16)
C.SWR<14>=0...NO STALL BETWEEN DRIVE FUNCTIONS
 =1...STALL AFTER EVERY DRIVE FUNCTION
C.SWR<13>=0...USE SPECIFIC STALL TIMES
 =1...USE RANDOM STALL TIMES
C.SWR<12>=0...NO INCREMENTING STALLS IN TEST4
 =1...PERFORM INCREMENTING STALLS IN TEST4
C.SWR<08>=0...DO IMPLIED SEEKS WITH DATA TRANSFERS
 =1...DO EXPLICIT SEEKS BEFORE DATA TRANSFERS
C.SWR<07>=0...DO READ HEADER AND DATA COMMANDS IN TESTS 0-6
 =1...DO EXPLICIT SEEK COMMANDS IN TESTS 0-6
C.SWR<06>=0...60 HZ POWER SOURCE
 =1...50 HZ POWER SOURCE
C.SWR<05>=0...ALLOW SOFTWARE TIMEOUTS(ENABLE WATCHDOG TIMER)
 =1...INHIBIT SOFTWARE TIMEOUTS(DISABLE WATCHDOG TIMER)

THE DEFAULT CONDITION OF C.SWR<15:00>=0.

REFER TO 4.4.1 FOR C.SWR SELECTION

4.2 STARTING ADDRESSES

200 NORMAL STARTING ADDRESS
204 SELECT OPERATING PARAMETERS
210 SELECT RH70/RP04 ADDRESSES
214 COMBINATION OF 204 AND 210

-
1. LOAD PROGRAM INTO MEMORY (SEE SECTION 3.)
 2. LOAD A FORMATTED PACK INTO DRIVE(S) TO BE TESTED
 3. BRING DRIVE(S) TO ONLINE STATE, WRITE ENABLED, AND LOCKED ON PORT.
 4. LOAD ADDRESS 200.
 5. SET SWITCHES (SEE SECTION 4.1 & 5.1)
 6. PRESS START.

4.4 PROGRAM ACTION

IN AN EFFORT TO ALLOW CONVERSATION WITH A PROGRAM FOR THE PURPOSE OF CONTROLLING ITS OPERATION AND PARAMETERS THE FOLLOWING CONSTRUCTIONS HAVE BEEN ADOPTED.

NOTE1: IN ALL EXAMPLES BRACKETS ARE USED FOR CLARITY AND ARE NOT TYPED BY THE USER.

NOTE2: THE CARRIAGE RETURN TYPED BY THE USER IS INDICATED BY <CR> AND WILL BE ECHOED AS A "CARRIAGE RETURN-LINE FEED."

<.><CR> PERIOD

A STATEMENT TERMINATOR: WHEN TYPED AT THE END OF A LINE (LEGAL ON ALL LINES) IT TELLS THE PARAMETER STRING INTERPRETER (PSI) THIS IS THE END OF CHANGES TO THE CURRENT PARAMETER STRING.

<..><CR> PERIOD PERIOD

AN INPUT TERMINATOR: WHEN A PERIOD IS TYPED AFTER A "STATEMENT TERMINATOR PERIOD" IT TELLS THE PSI THIS IS THE END OF ALL CHANGES (LEGAL ON ALL LINES) BEGIN EXECUTION.

<,><CR> COMMA

A CONTINUATION INDICATOR AND FIELD SEPARATOR:

- 1) THIS IS THE CONSTRUCTION USED WHEN NOT USING A PERIOD; THAT IS TO SAY THE COMMA SAYS "TERMINATE THE LINE BUT NOT THE INPUT FOR PARAMETER CHANGES".
- 2) SEPARATE MULTIPLE ENTRIES ON THE SAME TEXT STRING, I.E., A,B,C,D.

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205 (/) SLASH
206
207 A MODIFICATION INDICATOR: AT ANY GIVEN PARAMETER
208 STOP IF A SLASH IS TYPED IT SAYS "OPEN THIS
209 PARAMETER FOR CHANGES".
210
211 (↑ U) CONTROL-U
212
213 DUMP THE PRESENT INPUT STRING AND START A NEW
214 LINE. TYPED BY DEPRESSING THE "CONTROL KEY"
215 (CTRL) AND THEN STRIKING THE "U".
216
217 (\) RUBOUT
218
219 DELETE THE LAST CHARACTER FROM THE INPUT STRING.
220 TYPED BY STRIKING THE "RUBOUT" KEY. WHICH WILL
221 BE ECHOED BY A BACKSLASH (\) FOLLOWED BY THE
222 CHARACTER DELETED.
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4.4.1 CONTROL SWITCHES SELECTION

STARTING THE PROGRAM AT ANY OF THE POSSIBLE STARTING ADDRESSES
WITH SW<07>=1 WILL RESULT IN ENTERING THE "CONTROL SWITCH
SETTING" MODE. THUS, ALLOWING THE OPERATOR TO SPECIFY THE
DESIRED STATE OF "C.SWR".

4.4.1.1 CONTROL SWITCH SELECTION EXAMPLES

EXAMPLE #1

SET SW<07>=0
C.SWR=000000/400..

EXAMPLE #2

SET SW<07>=0
C.SWR=000000/220.
C.SWR=000000/220..

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4.4.2 ADDRESS SELECTION

STARTING THE PROGRAM AT 200 WILL RESULT IN AUTOMATIC
SELECT OF THE DEFAULT VALUES OF BUS ADDRESS (RHCS1),
VECTOR ADDRESS, AND PRIORITY LEVEL OF THE RH70/RP04.
IF THE DEFAULT VAULE OF THE BUS ADDRESS DOES NOT RESPOND
(TIMES OUT) TO ADDRESSING IT IS REPORTED AS AN ERROR.
AFTER THE ERROR IS REPORTED ONE OF TWO COURSES OF ACTION
WILL BE TAKEN:

1. IF THERE IS A MONITOR -- RETURN TO THE MONITOR
2. IF THERE ISN'T A MONITOR -- ASK FOR NEW ADDRESSES

STARTING THE PROGRAM AT 210 OR 214 ALLOWS THE OPERATOR
TO CHANGE THE CONTROL AND STATUS REGISTER #1 (RHCS1)
ADDRESS, THE VECTOR ADDRESS, AND THE PRIORITY LEVEL.

4.4.2.1 ADDRESS SELECTION EXAMPLES

EXAMPLE #1

RHCS1=177200/176300..

EXAMPLE #2

RHCS1=177200/176300,
RHVEC=254/260,
RHPRIO=5/6..

EXAMPLE #3

RHCS1=177200,
RHVEC=254/260..

EXAMPLE #4

RH70/RP04 FAILED TO RESPOND TO ADDRESSING
RHCS1 ERR PC
177200 XXXXXX
RHCS1=177200/176300..

EXAMPLE #5

RHCS1=177200/1776\67\6300,
RHVEC=254,
RHPRIO=5,
RHCS1=176300..

4.4.3 DRIVE AND PARAMETER SELECTION

STARTING THE PROGRAM AT 200 WILL RESULT IN AUTOMATIC
SELECTION OF THE DRIVES TO TEST AND THE TESTS TO RUN.

STARTING THE PROGRAM AT 210 OR 214 ALLOWS THE OPERATOR
TO SELECT THE DRIVE(S) TO BE TESTED, THE TESTS TO BE EXECUTED,
AND THE PARAMETERS TO USE.

4.4.3.1 DRIVE AND PARAMETER SELECTION DESCRIPTION

THE FOLLOWING IS A TABLE OF TERMS USED BY THE PSI.

"R"	REPEATS (ITERATIONS)
"FC"	FIRST CYLINDER ADDRESS
"LC"	LAST CYLINDER ADDRESS
"IC"	INCREMENT CYLINDER
"FT"	FIRST TRACK ADDRESS
"LT"	LAST TRACK ADDRESS
"IT"	INCREMENT TRACK
"FS"	FIRST SECTOR ADDRESS
"LS"	LAST SECTOR ADDRESS
"PAT"	PATTERN (USED FOR DATA TEST)
"WDX"	WORD OF PATTERN 0 WHERE X IS 1 TO 16
*"S"	ALL SEEK TESTS
*"T"	ALL TIMING TESTS
*"A"	ALL ADDRESS TESTS
*"D"	THE DATA TESTS
*"E"	THE EXERCISER

* USED BY USER AS INPUT.

NOTE1: ALL OTHERS ARE OUTPUT ONLY.

NOTE2: ALL NUMBERS WILL BE IN DECIMAL EXCEPT FOR THE PATTERN
(PAT) AND WORDS (WDX) SELECTION. "PAT" WILL BE SELECTED
BY A BIT (I.E. 001000(8)=PATTERN 9) AND "WDX" WILL BE IN OCTAL.

SPECIAL CASES OF CONTROL CHARACTERS

IF <..> IS TYPED WHILE A TEST IS OPEN FOR MODIFICATION
(</>) AND OTHER TESTS IN THE "TEST COMMAND" STRING
ARE TO BE OPENED, THEY WILL RECEIVE THE PARAMETERS OF
THE TEST THAT IS OPEN WHEN <..> IS TYPED.

<,> IS ILLEGAL AS A "TEST" LINE TERMINATOR
UNLESS A TEST IS TO BE OPENED.

ON STARTING THE PROGRAM ALL TESTS WILL RUN AGAINST ALL DRIVES
IN A WORST CASE MANNER. BUT IF THE USER DESIRES TO SELECT THE
DRIVES TO BE TESTED, THE TESTS TO BE EXECUTED, AND THE PARAMETERS
TO BE USED HE ENTERS CONVERSATION MODE BY TYPING CONTROL C (↑C).

THE PROGRAM WILL RESPOND WITH:

DRIVE(S)=

WE WILL ASSUME FOR OUR EXAMPLE THAT THE OPERATOR WISHED TO TEST
DRIVE #3 USING TESTS 2 THRU 7 AND TEST 11 AND DOES NOT DESIRE TO CHANGE
THE PARAMETERS (INITIAL CYLINDER ADDRESS, FINAL CYLINDER ADDRESS, ETC.).
THE USER WOULD TYPE "3<.>" WHICH SAYS "THIS IS THE END OF ANY
CHANGES TO THIS LINE BUT TAKE ME DEEPER FOR MORE CHANGES", AND <CR> "TAKE IT."

FOR CLARITY THE LINE WILL BE REPEATED AS IT LOOKS AFTER USER RESPONSE WITH
THE LINE BELOW IT ADDED, THE PROGRAMS RESPONSE:

DRIVE(S)=3,<CR>
TEST=

NOW THE USER INSERTS THE TEST NUMBERS HE DESIRES. IN THIS CASE
HE WANTS TESTS 2 THRU 7 AND TEST 11 SO HE TYPES 2-7<.> (TO
SEPERATE FIELD), 11<..> (END OF ANY CHANGES START EXECUTION),
<CR> (TAKE IT).

IT NOW LOOKS LIKE THIS

DRIVE(S)=3,<CR>
TEST=2-7,11..<CR>

IN OUR NEXT EXAMPLE WE WILL ASSUME THE USER WISHES TO TEST DRIVE
4 AND RUN TESTS 1 AND 3 THRU 11 WITH THE PARAMETER FOR TESTS 3
AND 10 MODIFIED.
THIS IS HOW HE WOULD RESPOND:

DRIVE(S)=4,<CR>
TEST=

THE USER NOW WILL INSERT A LINE TO GET TESTS 1 AND 3 THRU 11
BUT REMEMBER HE WISHES TO "OPEN" TESTS 3 AND 10 FOR PARAMETER
CHANGES. THE ENTIRE ENTRY IS SHOWN BELOW:

DRIVE(S)=4,<CR>
TEST=1,3/4-7,10/11.<CR>

NOTICE THIS SAYS SELECT TEST ONE, CONTINUE<.>; SELECT TEST 3, OPEN</>;
SELECT TESTS 4-7, CONTINUE<.>; SELECT TEST 10, OPEN</>; SELECT TEST
11, END OF INPUT <.>.

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THE PSI SCANS THE TEST STRING AND DETERMINES THAT TEST #1'S
PARAMETERS WILL REMAIN THE SAME BUT
TEST 3'S MUST BE CHANGED. THEREFORE, TEST
3 IS OPENED FOR CHANGE.

RESPONDS: <FOR CLARITY ENTIRE TRANSACTION REPEATED>

DRIVE(S)=4,<CR>
TEST=1,3/4-7,10/11.<CR>
TEST 3
R=X ;WHERE X IS ITERATION

AS IN THE NORMAL MANNER TYPING A </> WILL OPEN THIS LINE FOR
MODIFICATION OF THE ITERATION COUNT. ENDING THE LINE WITH A
<.> (PERIOD) WOULD TERMINATE THE CHANGES FOR THIS TEST, AND AS
IN THE EXAMPLE SHOWN USING A <,> (COMMA) WILL GET US THE NEXT
PARAMETER.

DRIVE(S)=4,<CR>
TEST=1,3/4-7,10/11,<CR>
TEST 3
R=1,<CR> ;DO NOT ALTER-BUT CONTINUE
FC=N ;WHERE N IS FIRST CYLINDER ADDRESS

THE USER DOES NOT WISH TO CHANGE "FC" SO THE FOLLOWING ACTION IS TAKEN:

DRIVE(S)=4,<CR>
TEST=1,3/4-7,10/11.<CR>
TEST 3
R=1,<CR> ;DO NOT ALTER THIS LINE BUT CONTINUE
FC=0,<CR> ;DO NOT ALTER THIS LINE BUT CONTINUE
LC=410

THE PROGRAM RESPONDS WITH THE PREVIOUSLY ASSIGNED PARAMETER FOR LAST
CYLINDER ADDRESS IN THIS CASE USING 410 AS THE EXAMPLE. THIS IS
WHAT THE USER INTENDED TO MODIFY AND IS WHY HE OPENED
TEST #3. HE WANTS TO CHANGE IT TO CYLINDER 20. THEREFORE
HE TYPES </> (OPEN LINE FOR CHANGE), "20" (THE NEW VALUE),
<.> (THIS IS THE END OF CHANGES FOR THIS DRIVE), <CR>
(TAKE IT).

THE TOTAL TRANSACTION AND RESPONSE:

DRIVE(S)=4,<CR>
TEST=1,3/4-7,10/11.<CR>
TEST 3
R= 1,<CR>
FC=0,<CR>
LC= 410/20.<CR>
TEST 10
R=1

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THE PROGRAM HAS LOADED TEST #3 WITH ITS NEW PARAMETERS. TESTS
NUMBER 4 THRU 7 WITH THEIR PREVIOUSLY ASSIGNED PARAMETERS AND IS
NOW WAITING FOR CHANGES TO TEST 10.

THE USER TYPES </> (OPEN THIS LINE FOR CHANGE), "10" (MAKE
ITERATION COUNT 10), <.> (THIS IS THE END OF CHANGES TO THIS
TEST) <CR> (TAKE IT).

THE PROGRAM NOW LOADS TEST 10 WITH THE NEW PARAMETERS, TEST 11
WITH PREVIOUSLY ASSIGNED PARAMETERS AND RESPONDS WITH:

DRIVE(S)=

SINCE THE USER DID NOT END THE CONVERSATION MODE WITH A <...>
THE PROGRAM HAS LOOPED BACK TO THE BEGINNING LOOKING FOR MORE
CHANGES. THAT IS TO SAY, AFTER THE ENTRY FOR DRIVE SELECTION A
<,><CR> WILL CAUSE THE TEST MESSAGE TO BE REPEATED AND FURTHER
CHANGES CAN BE MADE. HOWEVER, AT SOME POINT IN ORDER TO EXECUTE
THE CHANGES MADE WE MUST NOTIFY THE PROGRAM WE ARE FINISHED BY
TYPING <...>.

EXAMPLE #1

DRIVE=4.<CR>

;SELECT DRIVE #4, TERMINATE AND
;BEGIN EXECUTION USING PREVIOUSLY ASSIGNED
;PARAMETERSEXAMPLE #2
-----DRIVE=0.<CR>
TEST=1-5.<CR>;SELECT DRIVE #0 AND MAKE CHANGES " "
;RUN TEST 1 THRU 5 ONLY, USE DEFAULT
;PARAMETERS AND TERMINATE AND EXECUTE "..."EXAMPLE #3
-----DRIVE=2.<CR>
TEST=1-5,6/7/10/<CR>
TEST 6
R=1.<CR>
FC=0/10.<CR>;SELECT DRIVE #2 AND MAKE CHANGES " "
;RUN TEST 1-5 WITH DEFAULT PARAMETERS, OPEN
;TEST 6, 7 AND 10 FOR CHANGES
;LEAVE R AS IS MOVE TO NEXT PARAMETER
;SET "FC" CYLINDER ADDRESS TO 10 " " END CHANGES
;TO TEST #6TEST 7
R=1/5J.<CR>
FC=0.<CR>
LC=410/50.<CR>;50 ITERATIONS, MOVE TO NEXT PARAMETER
;DO NOT CHANGE "FC" CYLINDER ADDRESS BUT CONTINUE " "
;TEST 10 IS STILL PENDING
;AND WILL THEREFORE BE
;SET TO THE SAME PARAMETERS
;AS TEST 7 -- START EXECUTIONEXAMPLE #4
-----DRIVE=0.<CR>
TEST=S,E.<CR>;SELECT DRIVE #0 AND MAKE CHANGES
;RUN ALL SEEK TESTS AND THE EXERCISEREXAMPLE #5
-----DRIVE=1.<CR>
TEST=S/O.<CR>
TEST 0
R=10.<CR>
FC=0/10.<CR>;RUN ALL SEEK TESTS (OPEN FOR CHANGES) AND
;THE DATA TEST (WITH DEFAULT PARAMETERS).
;RUN WITH 10 ITERATIONS
;CHANGE FIRST CYLINDER ADDRESS
;AND START EXECUTION
;TESTS 1-6 WILL BE ASSIGNED THE
;SAME PARAMETERS AS TEST 0460
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546EXAMPLE #6

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DRIVE=1,<CR>
TEST=S/,<CR>
TEST 0
  R=10/100.<CR>
TEST 1
  R=100/1000.<CR>
TEST 2
  R=1/10.<CR>
  FC=0/50.<CR>
  LC=410/51.<CR>
TEST 3
  R=1.<CR>
TEST 4
  R=1..<CR>

```

;OPEN THE SEEK TESTS (TST 0-6)
;CHANGE TO 100 ITERATIONS; <.> MOVE TO NEXT TEST
;CHANGE R TO 1000 ITERATIONS; <.> MOVE TO NEXT TEST
;CHANGE R TO 10 ITERATIONS; <.> MOVE TO NEXT LINE
;CHANGE FC TO 50; <.> MOVE TO NEXT LINE
;CHANGE LC TO 51; <.> MOVE TO NEXT TEST
;<.> MOVE TO NEXT TEST
;USE TESTS 4'S PARAMETERS
;FOR TEST 5 & 6 START EXECUTION

EXAMPLE #7

```

DRIVE=1,<CR>
TEST=D/,<CR>
TEST 15
  R=1/1000,<CR>
  FC=0/10.<CR>
  LC=410/10.<CR>
  IC=64/0.<CR>
  FT=0/2.<CR>
  LT=18/2.<CR>
  IT=1.<CR>
  FS=0/4.<CR>
  LS=22/4.<CR>
  PAT=177777/400..<CR>

```

;SELECT AND OPEN THE DATA TEST
;DO 1000 ITERATION OF TEST PATTERN
;#8 ON CYLINDER 10, TRACK 2, SECTOR 4
;RUN WITH PATTERN #8

EXAMPLE #8

```

DRIVE=1,<CR>
TEST=D/<CR>
TEST 15
R=1000,<CR>
FC=10,<CR>
LC=10,<CR>
IC=0,<CR>
FT=2,<CR>
LT=2,<CR>
IT=1,<CR>
FS=4,<CR>
LS=4,<CR>
PAT=000400/401,<CR>
WD1=165555/125252,<CR>
WD2=133333/52525..<CR>
;USE THE SAME PARAMETERS AS IN EXAMPLE
;#7, BUT ALSO SPECIFY YOUR OWN DATA
;PATTERN (PAT #0).
;RUN WITH PATTERN #8 & #0 (0=OPERATOR INPUT)
;FIRST WORD OF PATTERN 0
;SECOND WORD OF PATTERN 0
;...> START EXECUTION

```

EXAMPLE #9

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DRIVE=0,1,4,
TEST=0-5/
TEST 0
R=10,
FC=0,
LC=410/1..
;TEST DRIVES 0,1, AND 4 IN SEQUENCE
;CHANGE TEST 0-5
;CHANGE LAST CYLINDER FROM 410
;TO 1 FOR TEST #0-5; START TESTING

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 DEPAC.P11

5. OPERATING PROCEDURE
-----5.1 OPERATIONAL SWITCH SETTINGS

WITH SW<15:0>=0 THE PROGRAM WILL PRINT OUT ON
ERRORS AND CONTINUE IN TEST.
THE SWITCH SETTINGS ARE:

SW<15>=1...HALT ON ERROR
SW<14>=1...LOOP ON TEST
SW<13>=1...INHIBIT ERROR TYPEOUTS
SW<11>=1...INHIBIT ITERATIONS
SW<10>=1...RING BELL ON ERROR
SW<09>=1...LOOP ON ERROR
SW<08>=1...PRINT ERROR MESSAGE ON LINE PRINTER
SW<07>=1...READ CONTROL SWITCH SETTINGS FROM TTY
SW<06>=1...INHIBIT TIME REPORTS (TESTS 7-12)
SW<05>=1...REPORT ONE ERROR PER SECTOR (TESTS 13&14)
SW<04>=1...INHIBIT WRITES (TEST 15)
SW<03>=1...INHIBIT WRITE CHECKS (TEST 15)
SW<02>=1...INHIBIT READ AND SOFTWARE COMPARES (TEST 15)
SW<01>=1...INHIBIT SOFTWARE COMPARES (TEST 15)
SW<00>=1...PERFORM READ AFTER WRITE CHECK ERROR (TEST 15)

5.2 SUBROUTINE ABSTRACTS

THE SUBROUTINE CALLS USED BY THIS PROGRAM ARE:

1. IOT (USED FOR SCOPE)
THIS CALL IS PLACED BETWEEN EACH TEST IN THE INSTRUCTION
SECTION. IT RECORDS THE STARTING ADDRESS OF EACH TEST IN
LOCATIONS "\$LPADR" AND "\$LPERR" AS IT IS BEING ENTERED.
2. EMT (USED FOR ERROR)
THIS CALL IS USED TO REPORT ALL ERRORS (REFER TO 6).
3. TRAP (USED FOR TYPE, TYPOC, TYPOS,
TYPON, TYPDS, RDCHR, RDLIN, SAVREG,
AND RESREG)
4. JSR R,ADR

THE FOLLOWING SECTION CONTAINS AN ABSTRACT
FOR EACH SUBROUTINE

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5. ERRORS

THERE ARE A NUMBER OF ERRORS THAT CAN OCCUR IN THIS PROGRAM. WHEN AN ERROR IS ENCOUNTERED THE CALL TO THE ERROR ROUTINE IS MADE AND IF SW(13) IS NOT SET AN ERROR MESSAGE PERTAINING TO THE ERROR WILL BE TYPED. EACH ERROR TYPE OUT WILL CONTAIN THE FOLLOWING:

1. AN ERROR MESSAGE
2. A DATA HEADER
3. A DATA STRING

REFER TO THE FOLLOWING SECTION FOR THE DIFFERENT ERRORS THAT CAN OCCUR.

6.1 ERROR TYPES

THE ERRORS THAT OCCUR IN THIS PROGRAM FALL INTO THREE (3) CATEGORIES DEFINED AND EXPLAINED AS FOLLOWS:

6.1.1 DRIVER ERROR

THESE ERRORS WILL BE DETECTED BY THE RM70/RP04 DRIVER. THERE ARE TWO CLASSES OF DRIVER ERRORS; THOSE THAT CAN NOT BE IDENTIFIED IN A MANNER THAT ALLOWS THE INFORMATION TO BE RETURNED TO A "DATA PARAMETER BLOCK" (DPB) AND THOSE THAT CAN. THE FIRST CLASS WILL BE REPORTED BY ERROR CALLS (EMT'S) 1-5 WITHIN THE DRIVER. THE SECOND CLASS WILL PASS THE ERROR CODES TO THE STATUS/ERROR WORD (DPB+16) OF THE PROPER DPB.

6.1.2 NON-FATAL ERROR

THESE ERRORS WILL BE DUE TO "DISK" OR "DATA" FAILURES WHICH WILL BE REPORTED AS THEY OCCUR. AFTER REPORTING THE ERROR THE PROGRAM WILL CONTINUE TESTING.

6.1.3 FATAL ERROR

THIS TYPE OF ERROR WILL BE THE RESULT OF ANY KIND OF ERROR THAT INHIBITS THE PROGRAM FROM TESTING THE DISK.

THIS ERROR WILL BE REPORTED WHEN IT OCCURS, THEN THE PROGRAM WILL ABORT THE TEST AND GO TO THE END OF PROGRAM.

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6.2 ERROR RECOVERY -----

6.2.1 PRETEST ERROR

WHEN THIS TYPE OF ERROR OCCURS IT WILL BE REPORTED. THEN DEPENDING ON HOW THE PROGRAM WAS STARTED IT WILL ASK FOR THE DRIVES AND ADDRESSES FOR TESTING OR RETURN TO MONITOR.

6.2.2 NON-FATAL ERROR

WHEN THIS TYPE OF ERROR OCCURS IT WILL BE REPORTED AND THE PROGRAM WILL CONTINUE IN TEST.

6.2.3 FATAL ERROR

WHEN THIS TYPE OF ERROR OCCURS IT WILL BE REPORTED. THE PROGRAM WILL ABORT THE TEST AND GO TO THE END OF PROGRAM.

7. RESTRICTIONS -----

BEFORE STARTING THE PROGRAM THE OPERATOR MUST INSURE THAT A FORMATTED PACK IS LOADED AND WRITE ENABLED IN THE DRIVE(S) TO BE TESTED.

8. MISCELLANEOUS -----

8.1 EXECUTION TIME -----

TO MAKE ONE PASS OF THE PROGRAM TAKES APPROXIMATELY 4 MINUTES FOR EVERY 4K OF CORE. THE RUN TIME INCREASES LINEARLY FOR EACH DRIVE TESTED.

8.2 STACK POINTER -----

STACK IS INITIALLY SET TO 1100 AND EXTENDS DOWN IN MEMORY.

8.3 COMMON TAGS -----

THE COMMON TAGS USED IN THIS PROGRAM START AT 1100 AND EXTEND UP IN MEMORY.

9.4 TIMING TESTS (TST7-TST12) PRINTOUTS

AT THE COMPLETION OF EACH OF THE TIMING TESTS THE TIME OF THE MINIMUM SEEK, MAXIMUM SEEK, AND THE AVERAGE OF ALL OF THE SEEKS PERFORMED ARE TYPED ON THE TTY. THE NUMBER OF SEEKS THAT HAD TIMES BELOW THE MINIMUM TIME ALLOWED WILL BE TYPED ON THE SAME LINE AS THE MINIMUM TIME. THE NUMBER ABOVE THE MAXIMUM WILL BE TYPED ON THE SAME LINE AS THE MAXIMUM TIME, AND THE TOTAL NUMBER OF SEEKS PERFORMED WILL BE ON THE SAME LINE AS THE AVERAGE.

NOTE: THE PROGRAM STALLS FOR 2 MILLISECONDS BETWEEN SEEK ORDERS. THIS STALL TIME IS NOT INCLUDED IN THE CALCULATED SEEK TIMES. THE 2 MILLISECOND STALL BETWEEN SEEK ORDERS IS SPECIFIED BY THE RPO4 VENDOR. THE SEEK TIMES SPECIFIED BY THE VENDOR ARE POSITIONER MOVEMENT TIMES ONLY AND ARE NOT A MEASUREMENT OF EFFECTIVE SEEK TIME.

8.4.1 TIMING TOLERANCES

1. TEST 7 -- ROTATIONAL SPEED TIMES

60 HZ
MINIMUM=16340 US
MAXIMUM=17000 US
NOMINAL=16670 US

50 HZ
MINIMUM=16250 US
MAXIMUM=17090 US
NOMINAL=16670 US

2. TEST 10 -- ONE CYLINDER SEEK TIMES

MINIMUM=3000 US
MAXIMUM=10000 US
NOMINAL=7000 US

3. TEST 11 -- AVERAGE SEEK TIMES

MINIMUM=26000 US
MAXIMUM=30000 US
NOMINAL=28000 US

4. TEST 12 -- MAXIMUM SEEK TIMES

MINIMUM=46000 US
MAXIMUM=52000 US
NOMINAL=50000 US

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EXAMPLE #1

ROTATIONAL SPEED TIMES

MIN=16670 US
MAX=16690 US
AVG=16680 US 10 SEEKS TIMED

ONE CYLINDER SEEK TIMES

** 0, 1, 2, ..., 410 **
MIN=5350 US
MAX=6920 US
AVG=5550 US 409 SEEKS TIMED
** 410, 409, 408, ..., 0 **
MIN=5140 US
MAX=5960 US
AVG=5430 US 410 SEEKS TIMED

AVERAGE SEEK TIMES

** 0 TO 136 **
MIN=27770 US
MAX=28640 US
AVG=28230 US 128 SEEKS TIMED
** 136 TO 0 **
MIN=27990 US
MAX=28550 US
AVG=28220 US 128 SEEKS TIMED

MAXIMUM SEEK TIMES

** 0 TO 410 **
MIN=49990 US
MAX=51980 US
AVG=51010 US 128 SEEKS TIMED
** 410 TO 0 **
MIN=48120 US
MAX=50650 US
AVG=49340 US 128 SEEKS TIMED

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ROTATIONAL SPEED TIMES
MIN=16670 US
MAX=16690 US
AVG=16680 US 10 SEKS TIMED

ONE CYLINDER SEEK TIMES
** 0, 1, 2,...410 **
MIN=5470 US
MAX=10940 US 3 ABOVE THE MAXIMUM OF 10000 US
AVG=5830 US 409 SEKS TIMED
** 410, 409, 408,...0 **
MIN=5040 US
MAX=5970 US
AVG=5330 US 410 SEKS TIMED

AVERAGE SEEK TIMES
** 0 TO 136 **
MIN=29730 US
MAX=31620 US 73 ABOVE THE MAXIMUM OF 30000 US
AVG=30320 US 128 SEKS TIMED
** 136 TO 0 **
MIN=28620
MAX=31230 US 128 ABOVE THE MAXIMUM OF 30000 US
AVG=30800 US 128 SEKS TIMED

MAXIMUM SEEK TIMES
** 0 TO 410 **
MIN=53510 US
MAX=54240 US 128 ABOVE THE MAXIMUM OF 52000 US
AVG=54020 US 128 SEKS TIMED
** 410 TO 0 **
MIN=52050 US
MAX=54550 US 128 ABOVE THE MAXIMUM OF 52000 US
AVG=52210 US 128 SEKS TIMED

 WITH ALL SWITCHES ON A "0" AN "END OF PASS" MESSAGE WILL BE
 TYPED AT THE COMPLETION OF TESTING A DRIVE AND THE "END OF TEST"
 TYPEOUT WILL OCCUR WHEN ALL DRIVES HAVE BEEN TESTED.

8.6 RH70/RP04 DRIVER

ALL OF THE COMMUNICATION WITH THE RH70/RP04 IS PERFORMED
 VIA A COMMON DRIVER. THIS SECTION CONTAINS THE USERS GUIDE
 FOR THE DRIVER.

8.6.1. TO INITIALIZE THE DRIVER:

JSR PC,RPINIT
 RETURN

UPON RETURN YOU MUST EXAMINE THE "DRVSTA" TABLE TO DETERMINE
 THE DRIVES THAT ARE ONLINE FOR TESTING. THE DRVSTA TABLE IS
 EIGHT BYTES; ONE BYTE PER DRIVE. THE STATE OF EACH DRIVE WILL
 BE INDICATED AS FOLLOWS:

>0 ON LINE
 =0 OFFLINE
 <0 UNSAFE OR NONEXISTENT

WITH NON-RP04 DRIVES INDICATED AS OFFLINE. AND THE DRIVE TYPE
 WILL BE INDICATED IN THE "DRVSTYP" TABLE. USING "DRVSTA" AND
 "DRVSTYP" THE FOLLOWING CAN BE DETERMINED:

ONLINE	OFFLINE	UNSAFE	NONEXISTENT
-----	-----	-----	-----
DRVSTA>0	DRVSTA=0	DRVSTA<0	DRVSTA<0
DRVSTYP=(RHDT)	DRVSTYP=(RHDT)	DRVSTYP=(RHDT)	DRVSTYP=0

THE RPINIT ROUTINE WILL DO A READIN PRESET AND WILL SET FMT22.

FOR YOU.

CALL:

JSR RO,RP04
PNTDPB
RETURN1
RETURN2;MAKE THE CALL
;ADDRESS OF DPB*
;RETURN IF QUEUE IS FULL
;RETURN IF REQUEST IS IN
;QUEUE OR THERE IS AN
;ERROR CONDITION

*DPB (DATA PARAMETER BLOCK)

PNTDPB: .BYTE 0
 .BYTE 0
 .BYTE 0
 .BYTE 0
 .WORD 0
 .WORD 0

 .BYTE 0
 .BYTE 0
 .WORD 0
 .WORD 0

 .WORD 0;(0) DRIVE NUMBER
;(1) OFFSET VALUE OR FMT22, ECT, AND HCI
;(2) COMMAND
;(3) PSEL AND A17 AND A16
;(4) WORD COUNT (MUST BE NEG.)
;(6) BUFFER ADDRESS OR
;REGISTER TABLE POINTER
;(10) SECTOR ADDRESS OR
;FIRST REG. INDEX
;(11) TRACK ADDRESS OR
;LAST REG. INDEX
;(12) CYLINDER ADDRESS
;(14) ERROR TABLE POINTER
;POINTS TO THE FIRST OF TWENTY
;LOCATIONS OF WHERE THE DRIVER
;IS TO STORE THE RH70/RP04
;REGISTERS ON AN ERROR. IF LEFT
;ZERO REGISTERS ARE NOT SAVED.
;(16) STATUS/ERROR INDICATOR
;BIT15=1=>ERROR OCCURRED
;BIT07=1=>DONE
;BIT14-BIT09 AND BIT06-BIT03
;INDICATE TYPE OF ERROR892
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TO UTILIZE THIS CAPABILITY YOU MUST SUPPLY THE "RP TIMER" ROUTINE
WITH THE ELAPSED TIME IN THE FOLLOWING MANNER:

```
MOV    #16.,-(SP)    ;16 MILLISECONDS BETWEEN
                        ;CLOCK TICKS
JSR    R0,RPTMR      ;CALL THE TIMER ROUTINE
```

IT SHOULD BE NOTED THAT YOU MUST PROVIDE THE CODE TO DRIVE THE
CLOCK. AND THE ELAPSED TIME MUST BE IN MILLISECONDS.
THE DRIVER WILL SET THE TIMEOUT TO 1 SECOND FOR ALL POSITIONING
AND DATA TRANSFER OPERATIONS AND WILL SET THE TIMEOUT TO 30
SECONDS FOR ERROR RECOVERY OPERATIONS.

8.6.4. EXAMPLE - WRITE 1000. WORDS

```
1$:    JSR    R0,RPO3    ;CALL THE DRIVER
        WRTDPB    ;DPB ADDRESS
        BR      1$      ;WAIT FOR QUEUE IF FULL
2$:    TST    WRTDPB+16  ;WAIT FOR COMMAND TO COMPLETE
        BEQ    2$
        BMI    ERROR1    ;ERROR OCCURRED
        .
        .
        .
```

```
WRTDPB: .BYTE    5        ;DRIVE #5
        .BYTE    0
        .BYTE    161     ;WRITE COMMAND
        .BYTE    0
        .WORD    -1000.   ;WORD COUNT
        .WORD    WRTBUF   ;BUFFER ADDRESS
        .BYTE    3        ;SECTOR
        .BYTE    5        ;TRACK
        .WORD    400      ;CYLINDER
        .WORD    ERRTB5   ;ERROR TABLE
        .WORD    0        ;STATUS/ERROR INDICATOR
```

ALTERNATE DPB SETUP

```
WRTDPB: .WORD    5        ;THIS SETUP ACHIEVED
        .WORD    WRITE    ;EVERYTHING THE
        .WORD    -1000.   ;ABOVE TABLE DID, BUT
        .WORD    WRTBUF   ;IN A CLEANER FORMAT
        .BYTE    3,5
        .WORD    400,ERRTB5,0
```

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MNEMONIC	INDEX
RHCS1	0
RHWC	2
RHBA	4
RHDA	6
RHCS2	10
RHDS1	12
RHER1	14
RHAS	16
RHLA	20
RHDB	22
RHMR	24
RHDT	26
RHSN	30
RHOF	32
RHCA	34
RHCC	36
RHER2	40
RHER3	42
RHEC1	44
RHEC2	46
RHBAE	50
RHCS3	52

8.6.6. COMMANDS PERFORMED BY THE DRIVER

COMMAND	CODE	COMMAND TYPE
NO OPERATION	101	N
UNLOAD	103	N
SEEK	105	P
RECALIRATE	107	P
DRIVE CLEAR	111	N
RELEASE	113	N
OFFSET	115	P
RETURN TO CENTER	117	P
READIN PRESET	121	N
PACK ACKNOWLEDGE	123	N
SEARCH	131	P

SET FORMAT	143	S
SELECT DRIVE	145	S
WRITE CHECK DATA	151	D
WRITE CHECK HEADER AND DATA	153	D
WRITE DATA	161	D
WRITE HEADER & DATA	163	D
READ DATA	171	D
READ HEADER & DATA	173	D

N = HOUSEKEEPING
P = POSITIONING
D = DATA TRANSFER
S = SPECIAL PROVIDED BY THE DRIVER

8.6.7. DPB STATUS/ERROR INDICATOR

THIS INDICATOR WILL INFORM THE USER OF THE RESULTS OF THE REQUEST.
THIS IS ACCOMPLISHED BY SETTING VARIOUS BITS OF THE INDICATOR TO
A ONE.

<u>BIT NO.</u>	<u>MEANING IF ON A "1"</u>
15	ERROR OCCURRED DONE (BIT07=0); BITS 14-10 SPECIFIES TYPE DONE (BIT07=1); BITS 06-03 SPECIFIES TYPE
14(1)	USER MADE A REQUEST FOR A FUNCTION TO BE PERFORMED ON AN OFFLINE OR UNSAFE DRIVE
13(1)	USER MADE A REQUEST FOR A FUNCTION TO BE PERFORMED ON A DRIVE THAT HAS AN UNLOAD REQUEST IN QUEUE.
12(2)	PERSISTENT UNSAFE CONDITION EXIST.
11(2)	PARITY ERROR OCCURRED
10(2)(4)	FATAL PARITY ERROR. A MASSBUS CLEAR WAS PERFORMED, ALL QUEUES WERE EMPTIED, AND ALL DRVACT'S SET TO THE IDLE STATE

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1080	9(3)(4)	SOFTWARE TIMEOUT OCCURRED ON THIS DRIVE
1081		
1082	8(4)	SOFTWARE TIMEOUT OCCURRED ON ANOTHER DRIVE
1083		
1084	7	DONE
1085		
1086	6(2)	ERROR OCCURRED DURING AN I/O OPERATION
1087		
1088	5(2)	ERROR OCCURRED DURING AN OPERATION
1089		OTHER THAN I/O.
1090		
1091	4(2)	UNSAFE CONDITION OCCURRED
1092		
1093	3(2)	DRIVE ERROR OCCURRED THAT CAUSED AN
1094		AUTOMATIC "RECALIBRATE" SEQUENCE
1095		
1096	(1) =>	REQUEST WASN'T PUT IN QUEUE. (RH70/RP04
1097		REGISTERS WERE NOT SAVED)
1098		
1099	(2) =>	REQUEST QUEUE HAS BEEN EMPTIED. THE DRIVER
1100		ISSUED A "DRIVE CLEAR" TO THE DRIVE.
1101		NOTE: ALL RH70/RP04 REGISTERS ARE SAVED
1102		AS PER DPB+14 BEFORE THE "DRIVE CLEAR".
1103		
1104	(3) =>	REQUEST QUEUE HAS BEEN EMPTIED. THE
1105		DRIVER ISSUED A MASSBUS INIT. ALL
1106		RH70/RP04 REGISTERS FOR THE DRIVE WERE
1107		SAVED AS PER DPB+14 BEFORE THE INIT.
1108		
1109	(4) =>	A "RECALIBRATE" SHOULD BE ISSUED
1110		BEFORE ANY OTHER COMMAND.
1111		

THERE ARE A FEW ERRORS THAT CAN OCCUR THAT CAN NOT BE INDICATED IN A CPB.

WHEN THIS TYPE OF ERROR IS DETECTED BY THE DRIVER IT WILL MAKE
AN ERROR CALL OF THE FORM "ERROR N", WHERE "N" IS THE ERROR
NUMBER AND THE ERROR WILL BE AN EMT INSTRUCTION.

N	TYPE	DATA AVAILABLE
----	----	-----
1	ILLEGAL SUBSYSTEM INTERPUPT OCCURRED (SC=0)	*R4= RHCS1'S ADDRESS
2	ILLEGAL DRIVE INTERRUPT OCCURRED	R1= DRIVE NUMBER R3= ATA BIT *R4= RHCS1'S ADDRESS R5= (RHAS) RPERRS =RHDS1 RPERRS+2=RHER1 RPERRS+'=RHER2 RPERRS+6=RHER3
3	MASSBUS CONTROL BUS PARITY ERROR OCCURRED(MCPE=1)	RD.ADR= ADDRESS OF REG. READ RD.WRD= WORD READ
4	CONTROL BUS PARITY ERROR OCCURRED(PAR=1)	WRT.AD= ADDRESS OF REG. WRITTEN WRT.WD= WORD WRITTEN RD.WRD= WORD READ BACK
5	ATTENTION FROM AN OFFLINE, NONEXISTENT OR PREVIOUSLY DETECT UNSAFE DRIVE OCCURRED. NOTE: COULD HAVE BEEN CAUSED BY A BIT PICK OR DROP WHEN READING RHAS.	R1= DRIVE NUMBER R3= ATA BIT *R4= RHCS1'S ADDRESS R5= (RHAS) RPERRS =RHDS1 RPERRS+2=RHER1 RPERRS+4=RHER2 RPERRS+6=RHER3
6	RESERVED	
7.	RESERVED	

* THIS IS THE ACTUAL UNIBUS ADDRESS (177200)

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9. PROGRAM DESCRIPTION

THIS PROGRAM CONTAINS SIXTEEN TESTS NUMBERED 0-17 IN OCTAL. TESTS 0-6 WILL READ THE CYLINDER, TRACK, AND SECTOR INFORMATION FROM THE HEADER, USING A "READ HEADER AND DATA" COMMAND, AND THEN CHECK THE INFORMATION FOR VALIDITY. THUS, INSURING THE SEEK OPERATION FUNCTIONS PROPERLY. TEST 7-12 WILL MEASURE THE ROTATIONAL SPEED, THE ONE CYLINDER SEEK, THE AVERAGE SEEK, AND THE MAXIMUM SEEK TIMES TO INSURE THEY ARE ALL WITHIN THE TOLERANCES ALLOWED. TEST 13 AND 14 INSURES THE SECTOR AND TRACK ADDRESSING CIRCUITRY WORKS PROPERLY. TEST 15 VERIFIES THE DATA STORAGE AND RETRIEVAL CAPABILITIES ARE FUNCTIONAL. AND TEST 16 WILL STRESS AND CHECK THE READ/WRITE AND SERVO SYSTEMS. TEST 17 IS SIMILAR TO TEST 15 EXCEPT FOR THE FOLLOWING
1) ONLY LAST TWO CYLINDERS USED. 2) ONLY EIGHT PATTERNS USED.
3) ALL OF AVAILABLE MEMORY IS USED.

THE PROGRAM WILL START BY IDENTIFYING ITSELF AND DETERMINING ALL DRIVES THAT ARE AVAILABLE FOR TESTING. THEN BEGINNING WITH THE LOWEST NUMERICAL DRIVE AND PROCEEDING IN SEQUENTIAL ORDER ALL OF THE DRIVES WILL BE TESTED. ONE PASS THROUGH THE TEST SEQUENCE (TEST 0-15) WILL BE PERFORMED ON EACH DRIVE BEFORE MOVING TO THE NEXT DRIVE IN SEQUENCE. THE DRIVE TO BE TESTED WILL BE TYPED AT THE BEGINNING OF EACH PASS, AN "END OF PASS" MESSAGE WILL BE TYPED AT THE COMPLETION OF EACH PASS, AND AN "END OF TEST" MESSAGE WILL BE TYPED AFTER TESTING ALL DRIVES.

REFER TO THE FOLLOWING SECTION FOR A DETAILED DESCRIPTION OF EACH TEST.

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DOCUMENT

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4331	DRVCAL - DRIVER (RPO4) CALL USING "DTADPB"
4431	ERINDX - FORM ERROR INDEX
4483	STALL - USED TO STALL AFTER A DRIVE FUNCTION IS COMPLETE

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4534	VERIFY - VALIDATE HEADER ON IMPLIED SEEKS
4562	SRCH00 - INITIALIZE THE DRIVE FOR THE TIMING TESTS
4605	DORTI - RETURN FROM INTERRUPT
4611	STRTMR - START THE TIMERS
4631	COUNT - THIS ROUTINE COUNTS THE ELAPSED TIME
4670	TYPTIM - TYPE TIMES
4755	INCTRK - INCREMENT TRACK NUMBER
4774	INCCYL - INCRMENT CYLINDER NUMBER
4792	FILBUF - FILL BUFFER WITH ADDRESS DATA
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4839	CKSCTR - CHECK SECTOR DATA
4933	SETBUF - SET BUFFER TO DATA PATTERN
4969	DATCMP - DATA COMPARE
5063	FILRAN - FILL DATA BUFFER WITH RANDOM PATTERN
5084	RANCK - RANDOM PATTERN BUFFER CHECK
5145	RANPAT - RANDOM PATTERN GENERATOR
5166	RANADR - RANDOM ADDRESS GENERATOR
5221	GETSWR - GET THE CONTROL SWITCH SETTINGS
5246	GETADR - GET BUS ADDRESS AND VECTOR ADDRESS
5310	GETNUM - ROUTINE TO GET A NUMBER
5369	GT.PRM - GET PARAMETERS

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DERPKC.P11

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5764	CK.CHR -- CHECK CHARACTER
5798	CK.DIG - CHECK DIGIT
5864	CK.NUM - CHECK NUMBER (OCTAL)
5913	RH11/RP04 DRIVER (REV. 0.9)
7211	ASCIZ MESSAGES
7297	ERROR HEADER (EM) MESSAGES
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7559	DATA TABLE (DT)
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MAINDEC-11-DERPK-C "MECHANICAL AND READ/WRITE TEST"
DECDOC VER 00.06 15-SEP-75 14:04 PAGE 063 COPYRIGHT (C) 1974, 1975
DIGITAL EQUIPMENT CORP.
MAYNARD, MASS. 01754

PROGRAM BY J. LACEY/C. HESS/SUB MALLICK

THIS PROGRAM WAS ASSEMBLED USING THE PDP-11 MAINDEC SYSMAC
PACKAGE (MAINDEC-11-DZQAC-A2).

13

CONTROL SWITCH SETTINGS

14

SWITCH	STATE	USE
15	0	WRITE PACK BEFORE TESTING (TEST 16)
	1	INHIBIT WRITING PACK BEFORE TESTING (TES
14	0	NO STALL BETWEEN DRIVE FUNCTIONS
	1	STALL AFTER EVERY DRIVE FUNCTION
13	0	USE SPECIFIC STALL TIME
	1	USE RANDOM STALL
12	0	NO INCREMENTING STALL IN TEST 4
	1	DO INCREMENTING STALL IN TEST 4
8	0	DO IMPLIED SEEKS WITH DATA TRANSFERS
	1	DO EXPLICIT SEEKS BEFORE DATA TRANSFERS
7	0	DO "READ HEADER AND DATA" IN TESTS 0-6
	1	DO EXPLICIT SEEKS IN TESTS 0-6
6	0	60 HZ
	1	50 HZ
5	0	RUN WATCHDOG TIMER
	1	INHIBIT WATCHDOG TIMER

35

OPERATIONAL SWITCH SETTINGS

36

SWITCH	USE
15	HALT ON ERROR
14	LOOP ON TEST
13	INHIBIT ERROR TYPEOUTS
11	INHIBIT ITERATIONS
10	BELL ON ERROR
9	LOOP ON ERROR
8	PRINT ERROR MESSAGE ON LINE PRINTER
7	READ CONTROL SWITCH SETTINGS FROM TTY
6	INHIBIT TIME REPORTS (TESTS 7-12)
5	REPORT ONE ERROR PER SECTOR (TESTS 13 &
4	INHIBIT WRITES (TEST 15)

J03

MAINDEC-11-DERPK-C "MECHANICAL AND READ/WRITE TEST"
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1487
1488

3
2

INHIBIT WRITE CHECKS (TEST 15)
INHIBIT READ AND SOFTWARE COMPARES (TEST

201

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15311
0INHIBIT SOFTWARE COMPARES (TEST 15)
PERFORM READ AFTER WRITE CHECK ERROR (TE

57

TRAP CATCHER
*****60 ALL UNUSED LOCATIONS FROM 4 - 776 CONTAIN A ".+2,HALT"
SEQUENCE TO CATCH ILLEGAL TRAPS AND INTERRUPTS
LOCATION 0 CONTAINS 0 TO CATCH IMPROPERLY LOADED VECTORS

64

STARTING ADDRESSES

66 200 = NORMAL START

68 204 = SELECT OPERATING PARAMETERS

70 210 = SELECT RH11/RP04 ADDRESSES

72 214 = COMBINATION OF 204 AND 210

76

BASIC DEFINITIONS

78 INITIAL ADDRESS OF THE STACK POINTER *** 1100 ***

89 GENERAL PURPOSE REGISTER DEFINITIONS

101 PRIORITY LEVEL DEFINITIONS

111 "SWITCH REGISTER" SWITCH DEFINITIONS

139 DATA BIT DEFINITIONS (BIT00 TO BIT15)

167.. BASIC "CPU" TRAP VECTOR ADDRESSES

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MEMORY MANAGEMENT DEFINITIONS

183 KT11 VECTOR ADDRESS

187 KT11 STATUS REGISTER ADDRESSES

194 KERNAL "I" PAGE DESCRIPTOR REGISTERS

205 KERNAL "I" PAGE ADDRESS REGISTERS

244 *****

```
%
.ENABLE ABS,AMA
.TITLE MAINDEC-11-DERPK-C "MECHANICAL AND READ/WRITE TEST"
.*COPYRIGHT (C) 1974,1975
.*DIGITAL EQUIPMENT CORP.
.*MAYNARD, MASS. 01754
.*
.*PROGRAM BY J. LACEY/C. HESS/SUB MALLICK
.*
.*THIS PROGRAM WAS ASSEMBLED USING THE PDP-11 MAINDEC SYSMAC
.*PACKAGE (MAINDEC-11-DZQAC-A2).
.*
```

.SBTTL CONTROL SWITCH SETTINGS

```
.*
.* SWITCH STATE USE
.* -----
.* 15 0 WRITE PACK BEFORE TESTING (TEST 16)
.* 1 1 INHIBIT WRITING PACK BEFORE TESTING (TEST 16)
.* 14 0 NO STALL BETWEEN DRIVE FUNCTIONS
.* 1 1 STALL AFTER EVERY DRIVE FUNCTION
.* 13 0 USE SPECIFIC STALL TIME
.* 1 1 USE RANDOM STALL
.* 12 0 NO INCREMENTING STALL IN TEST 4
.* 1 1 DO INCREMENTING STALL IN TEST 4
.* 8 0 DO IMPLIED SEEKS WITH DATA TRANSFERS
.* 1 1 DO EXPLICIT SEEKS BEFORE DATA TRANSFERS
.* 7 0 DO "READ HEADER AND DATA" IN TESTS 0-6
.* 1 1 DO EXPLICIT SEEKS IN TESTS 0-6
.* 6 0 60 HZ
.* 1 1 50 HZ
.* 5 0 RUN WATCHDOG TIMER
.* 1 INHIBIT WATCHDOG TIMER
```

.SBTTL OPERATIONAL SWITCH SETTINGS

.*

	SWITCH	USE
1588	*	
1589	*	
1590	*	
1591	*	15 HALT ON ERROR
1592	*	14 LOOP ON TEST
1593	*	13 INHIBIT ERROR TYPEOUTS
1594	*	11 INHIBIT ITERATIONS
1595	*	10 BELL ON ERROR
1596	*	9 LOOP ON ERROR
1597	*	8 PRINT ERROR MESSAGE ON LINE PRINTER
1598	*	7 READ CONTROL SWITCH SETTINGS FROM TTY
1599	*	6 INHIBIT TIME REPORTS (TESTS 7-12)
1600	*	5 REPORT ONE ERROR PER SECTOR (TESTS 13 & 14)
1601	*	4 INHIBIT WRITES (TEST 15)
1602	*	3 INHIBIT WRITE CHECKS (TEST 15)
1603	*	2 INHIBIT READ AND SOFTWARE COMPARES (TEST 15)
1604	*	1 INHIBIT SOFTWARE COMPARES (TEST 15)
1605	*	0 PERFORM READ AFTER WRITE CHECK ERROR (TEST 15)

.SBTTL TRAP CATCHER

```

1609      000000      .=0
1611      ;*ALL UNUSED LOCATIONS FROM 4 - 776 CONTAIN A ".+2,HALT"
1612      ;*SEQUENCE TO CATCH ILLEGAL TRAPS AND INTERRUPTS
1613      ;*LOCATION 0 CONTAINS 0 TO CATCH IMPROPERLY LOADED VECTORS

```

.SBTTL STARTING ADDRESSES

```

1616      000200      .=200
1617      ;*200 = NORMAL START
1618      000200 000137 004154      JMP      @#START1
1619      ;*204 = SELECT OPERATING PARAMETERS
1620      000204 000137 004244      JMP      @#START2
1621      ;*210 = SELECT RH11/RP04 ADDRESSES
1622      000210 000137 004144      JMP      @#START3
1623      ;*214 = COMBINATION OF 204 AND 210
1624      000214 000137 004234      JMP      @#START4

```

.SBTTL BASIC DEFINITIONS

```

1629      001100      ;*INITIAL ADDRESS OF THE STACK POINTER *** 1100 ***
1630      STACK= 1100
1631      .EQUIV EMT,ERROR      ;;BASIC DEFINITION OF ERROR CALL
1632      .EQUIV IOT,SCOPE      ;;BASIC DEFINITION OF SCOPE CALL
1633      177776      PS= 177776      ;;PROCESSOR STATUS WORD
1634      .EQUIV PS,PSW
1635      177774      STKLMT= 177774      ;;STACK LIMIT REGISTER
1636      177772      PIRQ= 177772      ;;PROGRAM INTERRUPT REQUEST REGISTER
1637      177570      SWR= 177570      ;;SWITCH REGISTER
1638      177570      DISPLAY=SWR

```

;*GENERAL PURPOSE REGISTER DEFINITIONS

```

1641      000000      R0= %0      ;;GENERAL REGISTER
1642      000001      R1= %1      ;;GENERAL REGISTER
1643      000002      R2= %2      ;;GENERAL REGISTER

```

1644	000003	R3=	%3	:: GENERAL REGISTER
1645	000004	R4=	%4	:: GENERAL REGISTER
1646	000005	R5=	%5	:: GENERAL REGISTER
1647	000006	R6=	%6	:: GENERAL REGISTER
1648	000007	R7=	%7	:: GENERAL REGISTER
1649		.EQUIV	R6, SP	:: STACK POINTER
1650		.EQUIV	R7, PC	:: PROGRAM COUNTER
1651		.*PRIORITY LEVEL DEFINITIONS		
1652		PRO=	0	:: PRIORITY LEVEL 0
1653	000000	PR1=	40	:: PRIORITY LEVEL 1
1654	000040	PR2=	100	:: PRIORITY LEVEL 2
1655	000100	PR3=	140	:: PRIORITY LEVEL 3
1656	000140	PR4=	200	:: PRIORITY LEVEL 4
1657	000200	PR5=	240	:: PRIORITY LEVEL 5
1658	000240	PR6=	300	:: PRIORITY LEVEL 6
1659	000300	PR7=	340	:: PRIORITY LEVEL 7
1660	000340	.*"SWITCH REGISTER" SWITCH DEFINITIONS		
1661		SW15=	100000	
1662		SW14=	40000	
1663	100000	SW13=	20000	
1664	040000	SW12=	10000	
1665	020000	SW11=	4000	
1666	010000	SW10=	2000	
1667	004000	SW09=	1000	
1668	002000	SW08=	400	
1669	001000	SW07=	200	
1670	000400	SW06=	100	
1671	000200	SW05=	40	
1672	000100	SW04=	20	
1673	000040	SW03=	10	
1674	000020	SW02=	4	
1675	000010	SW01=	2	
1676	000004	SW00=	1	
1677	000002	.EQUIV	SW09, SW9	
1678	000001	.EQUIV	SW08, SW8	
1679		.EQUIV	SW07, SW7	
1680		.EQUIV	SW06, SW6	
1681		.EQUIV	SW05, SW5	
1682		.EQUIV	SW04, SW4	
1683		.EQUIV	SW03, SW3	
1684		.EQUIV	SW02, SW2	
1685		.EQUIV	SW01, SW1	
1686		.EQUIV	SW00, SW0	
1687		.*DATA BIT DEFINITIONS (BIT00 TO BIT15)		
1688		BIT15=	100000	
1689		BIT14=	40000	
1690	100000	BIT13=	20000	
1691	040000	BIT12=	10000	
1692	020000	BIT11=	4000	
1693	010000	BIT10=	2000	
1694	004000	BIT09=	1000	
1695	002000	BIT08=	400	
1696	001000	BIT07=	200	
1697	000400			
1698	000200			
1699				


```
1731
1732      .SBTTL  MEMORY MANAGEMENT DEFINITIONS
1733
1734      ;*KT11 VECTOR ADDRESS
1735
1736      000250      MMVEC= 250
1737
1738      ;*KT11 STATUS REGISTER ADDRESSES
1739
1740      177572      SR0= 177572
1741      177574      SR1= 177574
1742      177576      SR2= 177576
1743      172516      SR3= 172516
1744
1745      ;*KERNAL "I" PAGE DESCRIPTOR REGISTERS
1746
1747      172300      KIPDR0= 172300
1748      172302      KIPDR1= 172302
1749      172304      KIPDR2= 172304
1750      172306      KIPDR3= 172306
1751      172310      KIPDR4= 172310
1752      172312      KIPDR5= 172312
1753      172314      KIPDR6= 172314
1754      172316      KIPDR7= 172316
1755
1756      ;*KERNAL "I" PAGE ADDRESS REGISTERS
1757
1758      172340      KIPAR0= 172340
1759      172342      KIPAR1= 172342
1760      172344      KIPAR2= 172344
1761      172346      KIPAR3= 172346
1762      172350      KIPAR4= 172350
1763      172352      KIPAR5= 172352
1764      172354      KIPAR6= 172354
1765      172356      KIPAR7= 172356
1766
```

004

MAINDEC-11-DERPK-C "MECHANICAL AND READ WRITE TEST"
DERPKC.P11 MEMORY MANAGEMENT DEFINITIONS

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```
1767      ;OP CODE DEFINITIONS
1768      NOOP=101
1769      UNLOAD=103
1770      SEEK=105
1771      RECAL=107
1772      DRVCLR=111
1773      RELEASE=113
1774      OFFSET=115
1775      RTC=117
1776      READIN=121
1777      PACK=123
1778      SEARCH=131
1779      WRCKD=151
1780      WRCKHD=153
1781      WRITE=161
1782      WRTHD=163
1783      READ=171
1784      READHD=173
1785      GETREG=141
1786      SETFORM=143
1787      SELDRV=145
1788
1789      ;OTHER EQUATES
1790
1791      165000      TRCKWC = -(256.*22.)
1792      177400      SCTRW = -256.
1793      010000      FMT22=10000
1794
```

```
;WORD COUNT FOR TRACK
;WORD COUNT FOR SECTOR
;FORMAT 22 BIT
```

```

1795 ;*****
1796
1797 .SBTTL COMMON TAGS
1798
1799 ;*THIS TABLE CONTAINS VARIOUS COMMON STORAGE LOCATIONS
1800 ;*USED IN THE PROGRAM.
1801
1802 000046 000046 .=46
1803 000046 015210 $ENDAD ;;LOGICAL END OF PROGRAM
1804
1805 001100 .=1100
1806
1807 001100 $CMTAG: ;;START OF COMMON TAGS
1808 001100 000000 $PASS: .WORD 0 ;;CONTAINS PASS COUNT
1809 001102 000 $STSTM: .BYTE 0 ;;CONTAINS THE TEST NUMBER
1810 001103 000 $SERFLG: .BYTE 0 ;;CONTAINS ERROR FLAG
1811 001104 000000 $SICNT: .WORD 0 ;;CONTAINS SUBTEST ITERATION COUNT
1812 001106 000000 $SLPADR: .WORD 0 ;;CONTAINS SCOPE LOOP
1813 001110 000000 $SLPERR: .WORD 0 ;;CONTAINS SCOPE RETURN FOR ERRORS
1814 001112 000000 $SERTTL: .WORD 0 ;;CONTAINS TOTAL ERRORS DETECTED
1815 001114 000 $SITEMB: .BYTE 0 ;;CONTAINS ITEM CONTROL BYTE
1816 001115 001 $SERMAX: .BYTE 1 ;;CONTAINS MAX. ERRORS PER TEST
1817 001116 000000 $ERRPC: .WORD 0 ;;CONTAINS PC OF LAST ERROR INSTRUCTION
1818 001120 000000 $SGADR: .WORD 0 ;;CONTAINS OF 'GOOD' DATA
1819 001122 000000 $SBDADR: .WORD 0 ;;CONTAINS OF 'BAD' DATA
1820 001124 000000 $SGODAT: .WORD 0 ;;CONTAINS 'GOOD' DATA
1821 001126 000000 $SBDAT: .WORD 0 ;;CONTAINS 'BAD' DATA
1822 001130 000000 000000 000000 $WORD 0,0,0 ;;RESERVED--NOT TO BE USED
1823 001136 177560 $TKS: 177560 ;;TTY KBD STATUS
1824 001140 177562 $TKB: 177562 ;;TTY KBD BUFFER
1825 001142 177564 $TPS: 177564 ;;TTY PRINTER STATUS REG.
1826 001144 177566 $TPB: 177566 ;;TTY PRINTER BUFFER REG.
1827 001146 000 $NULL: .BYTE 0 ;;CONTAINS NULL CHARACTER FOR FILLS
1828 001147 002 $FILLS: .BYTE 2 ;;CONTAINS # OF FILLER CHARACTERS REQUIRED
1829 001150 012 $FILLC: .BYTE 12 ;;INSERT FILL CHARS. AFTER A "LINE FEED"
1830 001151 000 $TPFLG: .BYTE 0 ;;"TERMINAL AVAILABLE" FLAG (BIT<07>=0=YES)
1831 001152 000000 $REGAD: .WORD 0 ;;CONTAINS THE FROM
1832 ;;WHICH ($REGO) WAS OBTAINED
1833 001154 000000 $REGO: .WORD 0 ;;CONTAINS ((REGAD)+0)
1834 001156 000000 $REG1: .WORD 0 ;;CONTAINS ((REGAD)+2)
1835 001160 000000 $REG2: .WORD 0 ;;CONTAINS ((REGAD)+4)
1836 001162 000000 $REG3: .WORD 0 ;;CONTAINS ((REGAD)+6)
1837 001164 000000 $REG4: .WORD 0 ;;CONTAINS ((REGAD)+10)
1838 001166 000000 $REG5: .WORD 0 ;;CONTAINS ((REGAD)+12)
1839 001170 000000 $TMP0: .WORD 0 ;;USER DEFINED
1840 001172 000000 $TMP1: .WORD 0 ;;USER DEFINED
1841 001174 000000 $TMP2: .WORD 0 ;;USER DEFINED
1842 001176 000000 $TIMES: 0 ;;MAX. NUMBER OF ITERATIONS
1843 001200 000000 $ESCAPE: 0 ;;ESCAPE ON ERROR
1844 001202 177607 000377 $BELL: .ASCIZ <207><377><377> ;;CODE FOR BELL
1845 001206 077 $QUES: .ASCIZ /?/ ;;QUESTION MARK
1846 001207 015 $CRLF: .ASCIZ <15> ;;CARRIAGE RETURN
1847 001210 000012 $LF: .ASCIZ <12> ;;LINE FEED
1848 001212 000000 $BUF: 0
1849 001214 000000 $TEMP1: 0
1850 001216 000000 $TEMP2: 0

```

1851	001220	000000	TEMP3:	0	
1852	001222	000000	TEMP4:	0	
1853	001224	000000	TEMP5:	0	
1854	001226	000000	TEMP6:	0	
1855	001230	000000	TEMP7:	0	
1856	001232	000000	TEMP9:	0	
1857	001234	000000	TEMP10:	0	;0=70 1=45
1858	001236	177740	LERADD:	177740	
1859	001240	177742	HERADD:	177742	
1860	001242	177744	MEMERR:	177744	
1861	001244	000001	RPT17:	1	
1862	001246	000000	C.SWR:	.WORD	0
1863	001250	000000	CNTRLC:	.WORD	0
1864	001252	000000	BUSADR:	.WORD	0
1865	001254	000000	LPTAVL:	.WORD	0
1866	001256	000000	DRVSEL:	.WORD	0
1867	001260	037777	TSTNMS:	.WORD	37777
1868	001262	000000	CLKSTA:	.WORD	0
1869					
1870	001264	000000	TICKMS:	.WORD	1016
1871	001266	040432	TICKUS:	.WORD	1016666
1872	001270	000000	BYPASS:	.WORD	0
1873	001272	000000	CHKDRV:	.WORD	0
1874	001274	000000	DRVMSK:	.WORD	0
1875	001276	000000	SVSTAT:	.WORD	0
1876					
1877	001300	000000	CYL.RD:	.WORD	0
1878	001302	000000	TRK.RD:	.WORD	0
1879	001304	000000	SEC.RD:	.WORD	0
1880	001306	000000	CYL.DS:	.WORD	0
1881	001310	000000	SEC.DS:	.WORD	0
1882	001312	000000	TRK.DS:	.WORD	0
1883	001314	000000	TIM.UP:	.WORD	0
1884	001316	000000		.WORD	0
1885	001320	000000		.WORD	0
1886	001322	000000		.WORD	0
1887	001324	000000		.WORD	0,0
1888	001330	000000		.WORD	0
1889	001332	000000	TIM.DN:	.WORD	0
1890	001334	000000		.WORD	0
1891	001336	000000		.WORD	0
1892	001340	000000		.WORD	0
1893	001342	000000		.WORD	0,0
1894	001346	000000		.WORD	0
1895	001350	000000	TIM.PT:	.WORD	0
1896	001352	000000	WCEFLG:	.WORD	0
1897	001354	000000	STALLO:	.WORD	0
1898	001356	000000	SVADR:	.WORD	0,0
1899					
1900			:CONSTANTS STORAGE		
1901	001362	176700	RH.ADR:	.WORD	176700
1902	001364	000254	RHVEC:	.WORD	254,5*32.
1903	001370	000104	PKV:	.WORD	104,106
1904	001374	172540	PKCS:	.WORD	172540
1905	001376	172542	PKB:	.WORD	172542
1906	001400	172544	PKC:	.WORD	172544

```

:CONTROL SWITCHES
:CONTROL "C" FLAG
:GET ADDRESSES FROM THE TTY FLAG (0=NO, -1=YES)
:LPT AVAILABLE STATUS (0=NO, 1=YES)
:DRIVES SELECTED FOR TESTING
:RUN TESTS 0-15
:CLOCK STATUS (0=NO CLOCK, +1=KW11-P,
:AND -1=KW11-L)
:16 MILLISECONDS PER CLOCK TICK
:16666 MICROSECONDS PER CLOCK TICK

:DRIVE UNDER TEST
:DRIVE MASK BIT
:STATUS/ERROR INDICATOR IS
:SAVED HERE ON AN ERROR
:CYLINDER READ
:TRACK READ
:SECTOR READ
:CYLINDER DESIRED
:SECTOR DESIRED
:TRACK DESIRED
:MINIMUM TIME
:NUMBER OF COUNTS BELOW MIN. LIMIT
:MAXIMUM TIME
:NUMBER OF COUNTS ABOVE MAX. LIMIT
:TOTAL TIME OF ALL SEEKS
:NUMBER OF SEEKS PERFORMED
:MINIMUM TIME
:NUMBER OF COUNTS BELOW MIN. LIMIT
:MAXIMUM TIME
:NUMBER OF COUNTS ABOVE MAX. LIMIT
:TOTAL TIME OF ALL SEEKS
:NUMBER OF SEEKS PERFORMED
:POINTS TO TABLE OF TIMES
:FATAL WRITE CHECK ERROR FLAG (TST 15)
:VARIABLE STALL (TEST 4)
:SAVE DISK ADDRESS (TST16)

:RH11/RP04 CONTROL AND STATUS REG. #1
:RH11/RP04 VECTOR AND PRIORITY
:KW11-P VECTOR ADDRESS
:KW11-P CONTROL AND STATUS REG.
:KW11-P COUNT SET BUFFER
:KW11-P COUNTER

```

G04

MAINDEC-11-DERPK-C "MECHANICAL AND READ WRITE TEST"
DERPKC.P11 COMMON TAGS

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1907 001402 000100 000102
 1908 001406 177546
 1909 001410 177564
 1910 001412 177566
 1911 001414 177514
 1912 001416 177516
 1913 001420 000012
 1914 001422 000012
 1915 001424 000031
 1916 001426 006
 1917
 1918 001427 000
 1919
 1920

LKV: .WORD 100,102
 LKS: .WORD 177546
 TPS: .WORD 177564
 TPB: .WORD 177566
 LPS: .WORD 177514
 LPB: .WORD 177516
 STALL1: .WORD 1D10
 STALL2: .WORD 1D10
 MXSTAL: .WORD 1D25
 ERR.CT: .BYTE 6
 .BYTE 0

;KW11-L VECTOR ADDRESS
 ;KW11-L STATUS REGISTER
 ;TTY PRINTER STATUS
 ;TTY PRINTER BUFFER
 ;LINE PRINTER STATUS
 ;LINE PRINTER BUFFER
 ;10 MILLISECONDS STALL (TEST 0-6)
 ;10 MILLISECONDS STALL (TEST 13-16)
 ;MAX. INCREMENTING STALL ALLOWED IN TEST 4
 ;NUMBER OF ERRORS ALLOWED IN TESTS 13-16
 ;BEFORE GOING TO THE NEXT TEST
 ;RESERVED

1921 001430 000001
 1922 001432 000002
 1923 001434 000004
 1924 001436 000010
 1925 001440 000020
 1926 001442 000040
 1927 001444 000100
 1928 001446 000200
 1929 001450 000400
 1930 001452 001000
 1931 001454 002000
 1932 001456 004000
 1933 001460 010000
 1934 001462 020000
 1935 001464 040000
 1936 001466 100000
 1937
 1938
 1939

;BIT TABLE
 BITS: .WORD BIT00
 .WORD BIT01
 .WORD BIT02
 .WORD BIT03
 .WORD BIT04
 .WORD BIT05
 .WORD BIT06
 .WORD BIT07
 .WORD BIT08
 .WORD BIT09
 .WORD BIT10
 .WORD BIT11
 .WORD BIT12
 .WORD BIT13
 .WORD BIT14
 .WORD BIT15

1940 001470 000000
 1941 001472 000000
 1942 001474 003000
 1943 001476 000000
 1944 001500 000000
 1945 001502 000000
 1946 001504 000000
 1947 001506 000000
 1948 001510 000000
 1949 001512 000000
 1950 001514 000000
 1951
 1952

;COMMON STORAGE FOR TEST PARAMETER

PRM: .WORD 0
 RPT: .WORD 0
 FC: .WORD 0
 LC: .WORD 0
 IC: .WORD 0
 FT: .WORD 0
 LT: .WORD 0
 IT: .WORD 0
 FS: .WORD 0
 LS: .WORD 0
 PAT: .WORD 0

;REPEAT COUNTS FOR ALL TESTS
 ;FIRST CYLINDER
 ;LAST CYLINDER
 ;INCREMENT CYLINDER
 ;FIRST TRACK
 ;LAST TRACK
 ;INCREMENT TRACK
 ;FIRST SECTOR
 ;LAST SECTOR
 ;PATTERN CODE

1953 001516 002116
 1954 001520 002130
 1955 001522 002152
 1956 001524 002170
 1957 001526 002206
 1958 001530 002224
 1959 001532 002242
 1960 001534 002260
 1961 001536 002272
 1962 001540 002276

;TABLE OF PARAMETER POINTERS

PRMPT: .WORD PRM0
 .WORD PRM1
 .WORD PRM2
 .WORD PRM3
 .WORD PRM4
 .WORD PRM5
 .WORD PRM6
 .WORD PRM7
 .WORD PRM10
 .WORD PRM11

1963 001542 002302
 1964 001544 002306
 1965 001546 002316
 1966 001550 002326
 1967 001552 002354

.WORD PRM12
 .WORD PRM13
 .WORD PRM14
 .WORD PRM15
 .WORD PRM16

1968
 1969
 1970 001554 077777
 1971 001556 000632
 1972 001560 000632
 1973 001562 000632
 1974 001564 000022
 1975 001566 000022
 1976 001570 000022
 1977 001572 000025
 1978 001574 000025
 1979 001576 177777

.PARAMETER UPPER LIMIT
 PRMLMT: .WORD 1D32767
 .WORD 1D410
 .WORD 1D410
 .WORD 1D410
 .WORD 1D18
 .WORD 1D18
 .WORD 1D18
 .WORD 1D21
 .WORD 1D21
 .WORD 177777

;"R"
 ;"FC"
 ;"LC"
 ;"IC"
 ;"FT"
 ;"LT"
 ;"IT"
 ;"FS"
 ;"LS"
 ;"PAT"

1980
 1981
 1982 001600 040006
 1983 001602 040010
 1984 001604 040013
 1985 001606 040016
 1986 001610 040021
 1987 001612 040024
 1988 001614 040027
 1989 001616 040032
 1990 001620 040035

.TABLE OF MESSAGE POINTERS
 PRMSG: .WORD MSG.R
 .WORD MSG.FC
 .WORD MSG.LC
 .WORD MSG.IC
 .WORD MSG.FT
 .WORD MSG.LT
 .WORD MSG.IT
 .WORD MSG.FS
 .WORD MSG.LS

1991
 1992
 1993 001622 041431
 1994 001624 041473
 1995 001626 041524
 1996 001630 041546
 1997 001632 041574
 1998 001634 041617
 1999 001636 041656
 2000 001640 041720
 2001 001642 041764
 2002 001644 042034
 2003 001646 042054

.STATUS/ERROR INDICATOR MESSAGES POINTER TABLE
 STATBL: .WORD MSGB14 ;OFFLINE OR UNSAFE DRIVE REQUESTED
 .WORD MSGB13 ;UNLOAD DRIVE REQUESTED
 .WORD MSGB12 ;PERSISTENT UNSAFE
 .WORD MSGB11 ;PARITY ERROR OCCURRED
 .WORD MSGB10 ;FATAL PARITY ERROR
 .WORD MSGB09 ;SOFTWARE TIMEOUT ON THIS DRIVE
 .WORD MSGB08 ;SOFTWARE TIMEOUT ON ANOTHER DRIVE
 .WORD MSGB06 ;ERROR OCCURRED DURING I/O OPERATION
 .WORD MSGB05 ;ERROR OCCURRED DURING NON-I/O OPERATION
 .WORD MSGB04 ;UNSAFE OCCURRED
 .WORD MSGB03 ;AUTOMATIC RECALIBRATE SEQUENCE OCCURRED

2004
 2005
 2006 001650 000225 000012 000632
 2007 001656 000000 000000
 2008 001662 000677 000144 000000
 2009 001670 000200 000000 000000
 2010 001676 000000 000000 000000
 2011 001704 000237 000001 000000
 2012 001712 000632 000001 000000
 2013 001720 000000
 2014 001722 000237 000001 000000
 2015 001730 000400 000001 000000
 2016 001736 000000
 2017 001740 000237 000001 000000
 2018 001746 000632 000001 000000

.DEFAULT VALUES OF TESTS PARAMETERS
 DFLT: .WORD 225,10.,410.,0,0 ;RECAL/SEEK (T0)
 .WORD 677,100.,0,128.,0,0,0,0 ;SEEK/SEEK (T1)
 .WORD 237,1,0,410.,1,0,0 ;INCREMENT SEEK (T2)
 .WORD 237,1,0,256.,1,0,0 ;STEPPING SEEK (T3)
 .WORD 237,1,0,410.,1,0,0 ;OSCILLATING SEEK (T4)

2019	001754	000000			
2020	001756	000237	000001	000000	.WORD 237,1,0,410.,1,0,0 ;CONVERGING/DIVERGING SEEK (T5)
2021	001764	000632	000001	000000	
2022	001772	000000			
2023	001774	000237	000001	000000	.WORD 237,1,0,410.,1,0,0 ;SERVO ADDRESSING LOGIC NOISE (T6)
2024	002002	000632	000001	000000	
2025	002010	000000			
2026	002012	000223	000001	000000	.WORD 223,1,0,0,0 ;ROTATIONAL SPEED TIMING TEST (T7)
2027	002020	000000	000000		
2028	002024	000001	000001		.WORD 1,1 ;ONE CYLINDER SEEK TIMING TEST (T10)
2029	002030	000001	000001		.WORD 1,1 ;AVERAGE SEEK TIMING TEST (T11)
2030	002034	000001	000001		.WORD 1,1 ;MAXIMUM SEEK TIMEING TEST (T12)
2031	002040	000023	000001	000000	.WORD 23,1,0,0 ;SECTOR ADDRESSING TEST (T13)
2032	002046	000000			
2033	002050	000203	000001	000000	.WORD 203,1,0,0 ;TRACK ADDRESSING TEST (T14)
2034	002056	000000			
2035	002060	001777	000001	000000	.WORD 1777,1,0,410.,64.,0,18.,1,1,0,177777 ;DATA TEST (T15)
2036	002066	000632	000100	000000	
2037	002074	000022	000001	000001	
2038	002102	000000	177777		
2039	002106	000007	047040	000000	.WORD 7,20000.,0,410. ;EXERCISER (T16)
2040	002114	000632			

;PARAMETER TABLES

;RECAL/SEEK (T0)

PRM0:	.WORD	225
RPT0:	.WORD	10.
LC0:	.WORD	410.
FT0:	.WORD	0
FS0:	.WORD	0

;SEEK/SEEK (T1)

PRM1:	.WORD	677
RPT1:	.WORD	100.
FC1:	.WORD	0
LC1:	.WORD	128.
IC1:	.WORD	0
FT1:	.WORD	0
LT1:	.WORD	0
FS1:	.WORD	0
LS1:	.WORD	0

;INCREMENT SEEK (T2)

PRM2:	.WORD	237
RPT2:	.WORD	1
FC2:	.WORD	0
LC2:	.WORD	410.
IC2:	.WORD	1
FT2:	.WORD	0
FS2:	.WORD	0

;STEPPING SEEK (T3)

PRM3:	.WORD	237
RPT3:	.WORD	1
FC3:	.WORD	0

2041		
2042		
2043		
2044		
2045	002116	000225
2046	002120	000012
2047	002122	000632
2048	002124	000000
2049	002126	000000
2050		
2051		
2052	002130	000677
2053	002132	000144
2054	002134	000000
2055	002136	000200
2056	002140	000000
2057	002142	000000
2058	002144	000000
2059	002146	000000
2060	002150	000000
2061		
2062		
2063	002152	000237
2064	002154	000001
2065	002156	000000
2066	002160	000632
2067	002162	000001
2068	002164	000000
2069	002166	000000
2070		
2071		
2072	002170	000237
2073	002172	000001
2074	002174	000000

2075	002176	000400	LC3:	.WORD	256.
2076	002200	000001	IC3:	.WORD	1
2077	002202	000000	FT3:	.WORD	0
2078	002204	000000	FS3:	.WORD	0
2079					
2080			:OSCILLATING SEEK (T4)		
2081	002206	000237	PRM4:	.WORD	237
2082	002210	000001	RPT4:	.WORD	1
2083	002212	000000	FC4:	.WORD	0
2084	002214	000632	LC4:	.WORD	410.
2085	002216	000001	IC4:	.WORD	1
2086	002220	000000	FT4:	.WORD	0
2087	002222	000000	FS4:	.WORD	0
2088					
2089			:CONVERGING/DIVERGING SEEK (T5)		
2090	002224	000237	PRM5:	.WORD	237
2091	002226	000001	RPT5:	.WORD	1
2092	002230	000000	FC5:	.WORD	0
2093	002232	000632	LC5:	.WORD	410.
2094	002234	000001	IC5:	.WORD	1
2095	002236	000000	FT5:	.WORD	0
2096	002240	000000	FS5:	.WORD	0
2097					
2098			:SERVO ADDRESSING LOGIC NOISE GENERATOR (T6)		
2099	002242	000237	PRM6:	.WORD	237
2100	002244	000001	RPT6:	.WORD	1
2101	002246	000000	FC6:	.WORD	0
2102	002250	000632	LC6:	.WORD	410.
2103	002252	000001	IC6:	.WORD	1
2104	002254	000000	FT6:	.WORD	0
2105	002256	000000	FS6:	.WORD	0
2106					
2107			:ROTATIONAL SPEED TIMING TEST (T7)		
2108	002260	000223	PRM7:	.WORD	223
2109	002262	000001	RPT7:	.WORD	1
2110	002264	000000	FC7:	.WORD	0
2111	002266	000000	FT7:	.WORD	0
2112	002270	000000	FS7:	.WORD	0
2113					
2114			:ONE CYLINDER SEEK TIMING TEST (T10)		
2115	002272	000001	PRM10:	.WORD	1
2116	002274	000001	RPT10:	.WORD	1
2117					
2118			:AVERAGE SEEK TIMING TEST (T11)		
2119	002276	000001	PRM11:	.WORD	1
2120	002300	000001	RPT11:	.WORD	1
2121					
2122			:MAXIMUM SEEK TIMING TEST (T12)		
2123	002302	000001	PRM12:	.WORD	1
2124	002304	000001	RPT12:	.WORD	1
2125					
2126			:SECTOR ADDRESSING TEST (T13)		
2127	002306	000023	PRM13:	.WORD	23
2128	002310	000001	RPT13:	.WORD	1
2129	002312	000000	FC13:	.WORD	0
2130	002314	000000	FT13:	.WORD	0

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2131					
2132					
2133	002316	000203	: TRACK ADDRESSING TEST (T14)		
2134	002320	000001	PRM14: .WORD	203	
2135	002322	000000	RPT14: .WORD	1	
2136	002324	000000	FC14: .WORD	0	
2137			FS14: .WORD	0	
2138					
2139	002326	001777	: DATA TEST (T15)		
2140	002330	000001	PRM15: .WORD	1777	
2141	002332	000000	RPT15: .WORD	1	
2142	002334	000632	FC15: .WORD	0	
2143	002336	000100	LC15: .WORD	410.	
2144	002340	000000	IC15: .WORD	64.	
2145	002342	000022	FT15: .WORD	0	
2146	002344	000001	LT15: .WORD	18.	
2147	002346	000001	IT15: .WORD	1	
2148	002350	000000	FS15: .WORD	1	
2149	002352	177777	LS15: .WORD	0	
2150			PTRN15: .WORD	177777	
2151					
2152	002354	000007	: EXERCISER (T16)		
2153	002356	047040	PRM16: .WORD	7	
2154	002360	000000	RPT16: .WORD	20000.	
2155	002362	000632	FC16: .WORD	0	
2156			LC16: .WORD	410.	
2157					
2158			: SEEK TIMING LIMITS		
2159	002364	040126	T7A: .WORD	MSG7	
2160	002366	000000	.WORD	0	
2161	002370	003142	.WORD	1634.	;(16.67-2%)*2
2162	002372	003244	.WORD	1700.	;(16.67+2%)*2
2163					
2164	002374	040126	T7B: .WORD	MSG7	
2165	002376	000000	.WORD	0	
2166	002400	003131	.WORD	1625.	;(16.67-2.5%)*2
2167	002402	003255	.WORD	1709.	;(16.67+2.5%)*2
2168					
2169	002404	040160	T10: .WORD	MSG10A	
2170	002406	040241	.WORD	MSG10B	
2171	002410	000454	.WORD	300.	;(7-4)*2
2172	002412	001750	.WORD	1000.	;(7+3)*2
2173					
2174	002414	040274	T11: .WORD	MSG11A	
2175	002416	040342	.WORD	MSG11B	
2176	002420	005050	.WORD	2600.	;(28-2)*2
2177	002422	005670	.WORD	3000.	;(28+2)*2
2178					
2179	002424	040363	T12: .WORD	MSG12A	
2180	002426	040431	.WORD	MSG12B	
2181	002430	010770	.WORD	4600.	;(50-4)*2
2182	002432	012120	.WORD	5200.	;(50+2)*2
2183					
2184	002434	002474	PAT.PT: .WORD	PAT0	: TABLE OF POINTERS WHICH POINT TO THE
2185	002436	002534	.WORD	PAT1	: PATTERNS USED BY THE DATA TEST
2186	002440	002574	.WORD	PAT2	

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MAINDEC-11-DERPK-C "MECHANICAL AND READ/WRITE TEST"
DERPKC.P11 COMMON TAGS

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2187	002442	002634	.WORD	PAT3
2188	002444	002674	.WORD	PAT4
2189	002446	002734	.WORD	PAT5
2190	002450	002774	.WORD	PAT6
2191	002452	003034	.WORD	PAT7
2192	002454	003074	.WORD	PAT8
2193	002456	003134	.WORD	PAT9
2194	002460	003174	.WORD	PAT10
2195	002462	003234	.WORD	PAT11
2196	002464	003274	.WORD	PAT12
2197	002466	003334	.WORD	PAT13
2198	002470	003374	.WORD	PAT14
2199	002472	003434	.WORD	PAT15

; PATTERNS 0 THRU 15

2203	002474	165555	PAT0: .WORD	165555	; PATTERN 0
2204	002476	133333	.WORD	133333	
2205	002500	165555	.WORD	165555	
2206	002502	133333	.WORD	133333	
2207	002504	165555	.WORD	165555	
2208	002506	133333	.WORD	133333	
2209	002510	165555	.WORD	165555	
2210	002512	133333	.WORD	133333	
2211	002514	165555	.WORD	165555	
2212	002516	133333	.WORD	133333	
2213	002520	165555	.WORD	165555	
2214	002522	133333	.WORD	133333	
2215	002524	165555	.WORD	165555	
2216	002526	133333	.WORD	133333	
2217	002530	165555	.WORD	165555	
2218	002532	133333	.WORD	133333	

2220	002534	000001	PAT1: .WORD	000001	; PATTERN 1
2221	002536	000003	.WORD	000003	
2222	002540	000007	.WORD	000007	
2223	002542	000017	.WORD	000017	
2224	002544	000037	.WORD	000037	
2225	002546	000077	.WORD	000077	
2226	002550	000177	.WORD	000177	
2227	002552	000377	.WORD	000377	
2228	002554	000777	.WORD	000777	
2229	002556	001777	.WORD	001777	
2230	002560	003777	.WORD	003777	
2231	002562	007777	.WORD	007777	
2232	002564	017777	.WORD	017777	
2233	002566	037777	.WORD	037777	
2234	002570	077777	.WORD	077777	
2235	002572	177777	.WORD	177777	

2237	002574	177776	PAT2: .WORD	177776	; PATTERN 2
2238	002576	177774	.WORD	177774	
2239	002600	177770	.WORD	177770	
2240	002602	177760	.WORD	177760	
2241	002604	177740	.WORD	177740	
2242	002606	177700	.WORD	177700	

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MAINDEC-11-DERPK-C "MECHANICAL AND READ/WRITE TEST"
DERPKC.P11 COMMON TAGS

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2243	002610	177600	.WORD	177600	
2244	002612	177400	.WORD	177400	
2245	002614	177000	.WORD	177000	
2246	002616	176000	.WORD	176000	
2247	002620	174000	.WORD	174000	
2248	002622	170000	.WORD	170000	
2249	002624	160000	.WORD	160000	
2250	002626	140000	.WORD	140000	
2251	002630	100000	.WORD	100000	
2252	002632	000000	.WORD	000000	
2253					
2254	002634	000000	PAT3: .WORD	000000	;PATTERN 3
2255	002636	000000	.WORD	000000	
2256	002640	000000	.WORD	000000	
2257	002642	177777	.WORD	177777	
2258	002644	177777	.WORD	177777	
2259	002646	177777	.WORD	177777	
2260	002650	000000	.WORD	000000	
2261	002652	000000	.WORD	000000	
2262	002654	177777	.WORD	177777	
2263	002656	177777	.WORD	177777	
2264	002660	000000	.WORD	000000	
2265	002662	177777	.WORD	177777	
2266	002664	000000	.WORD	000000	
2267	002666	177777	.WORD	177777	
2268	002670	000000	.WORD	000000	
2269	002672	177777	.WORD	177777	
2270					
2271	002674	000000	PAT4: .WORD	000000	;PATTERN 4
2272	002676	010421	.WORD	010421	
2273	002700	021042	.WORD	021042	
2274	002702	031463	.WORD	031463	
2275	002704	042104	.WORD	042104	
2276	002706	052525	.WORD	052525	
2277	002710	063146	.WORD	063146	
2278	002712	073567	.WORD	073567	
2279	002714	104210	.WORD	104210	
2280	002716	114631	.WORD	114631	
2281	002720	125252	.WORD	125252	
2282	002722	135673	.WORD	135673	
2283	002724	146314	.WORD	146314	
2284	002726	156735	.WORD	156735	
2285	002730	167356	.WORD	167356	
2286	002732	177777	.WORD	177777	
2287					
2288	002734	052525	PAT5: .WORD	052525	;PATTERN 5
2289	002736	052525	.WORD	052525	
2290	002740	052525	.WORD	052525	
2291	002742	125252	.WORD	125252	
2292	002744	125252	.WORD	125252	
2293	002746	125252	.WORD	125252	
2294	002750	052525	.WORD	052525	
2295	002752	052525	.WORD	052525	
2296	002754	125252	.WORD	125252	
2297	002756	125252	.WORD	125252	
2298	002760	052525	.WORD	052525	

2299	002762	125252	.WORD	125252	
2300	002764	052525	.WORD	052525	
2301	002766	125252	.WORD	125252	
2302	002770	052525	.WORD	052525	
2303	002772	125252	.WORD	125252	
2304					
2305	002774	007417	PAT6: .WORD	007417	;PATTERN 6
2306	002776	007417	.WORD	007417	
2307	003000	007417	.WORD	007417	
2308	003002	170360	.WORD	170360	
2309	003004	170360	.WORD	170360	
2310	003006	170360	.WORD	170360	
2311	003010	007417	.WORD	007417	
2312	003012	007417	.WORD	007417	
2313	003014	170360	.WORD	170360	
2314	003016	170360	.WORD	170360	
2315	003020	007417	.WORD	007417	
2316	003022	170360	.WORD	170360	
2317	003024	007417	.WORD	007417	
2318	003026	170360	.WORD	170360	
2319	003030	007417	.WORD	007417	
2320	003032	170360	.WORD	170360	
2321					
2322	003034	026455	PAT7: .WORD	026455	;PATTERN 7
2323	003036	026455	.WORD	026455	
2324	003040	026455	.WORD	026455	
2325	003042	151322	.WORD	151322	
2326	003044	151322	.WORD	151322	
2327	003046	151322	.WORD	151322	
2328	003050	026455	.WORD	026455	
2329	003052	026455	.WORD	026455	
2330	003054	151322	.WORD	151322	
2331	003056	151322	.WORD	151322	
2332	003060	026455	.WORD	026455	
2333	003062	151322	.WORD	151322	
2334	003064	026455	.WORD	026455	
2335	003066	151322	.WORD	151322	
2336	003070	026455	.WORD	026455	
2337	003072	151322	.WORD	151322	
2338					
2339	003074	165555	PAT8: .WORD	165555	;PATTERN 8
2340	003076	133333	.WORD	133333	
2341	003100	165555	.WORD	165555	
2342	003102	133333	.WORD	133333	
2343	003104	165555	.WORD	165555	
2344	003106	133333	.WORD	133333	
2345	003110	165555	.WORD	165555	
2346	003112	133333	.WORD	133333	
2347	003114	165555	.WORD	165555	
2348	003116	133333	.WORD	133333	
2349	003120	165555	.WORD	165555	
2350	003122	133333	.WORD	133333	
2351	003124	165555	.WORD	165555	
2352	003126	133333	.WORD	133333	
2353	003130	165555	.WORD	165555	
2354	003132	133333	.WORD	133333	

2355					
2356	003134	000001	PAT9: .WORD	000001	;PATTERN 9
2357	003136	000002	.WORD	000002	
2358	003140	000004	.WORD	000004	
2359	003142	000010	.WORD	000010	
2360	003144	000020	.WORD	000020	
2361	003146	000040	.WORD	000040	
2362	003150	000100	.WORD	000100	
2363	003152	000200	.WORD	000200	
2364	003154	000400	.WORD	000400	
2365	003156	001000	.WORD	001000	
2366	003160	002000	.WORD	002000	
2367	003162	004000	.WORD	004000	
2368	003164	010000	.WORD	010000	
2369	003166	020000	.WORD	020000	
2370	003170	040000	.WORD	040000	
2371	003172	100000	.WORD	100000	
2372					
2373	003174	177776	PAT10: .WORD	177776	;PATTERN 10
2374	003176	177775	.WORD	177775	
2375	003200	177773	.WORD	177773	
2376	003202	177767	.WORD	177767	
2377	003204	177757	.WORD	177757	
2378	003206	177737	.WORD	177737	
2379	003210	177677	.WORD	177677	
2380	003212	177577	.WORD	177577	
2381	003214	177377	.WORD	177377	
2382	003216	176777	.WORD	176777	
2383	003220	175777	.WORD	175777	
2384	003222	173777	.WORD	173777	
2385	003224	167777	.WORD	167777	
2386	003226	157777	.WORD	157777	
2387	003230	137777	.WORD	137777	
2388	003232	077777	.WORD	077777	
2389					
2390	003234	172666	PAT11: .WORD	172666	;PATTERN 11
2391	003236	155555	.WORD	155555	
2392	003240	172666	.WORD	172666	
2393	003242	155555	.WORD	155555	
2394	003244	172666	.WORD	172666	
2395	003246	155555	.WORD	155555	
2396	003250	172666	.WORD	172666	
2397	003252	155555	.WORD	155555	
2398	003254	172666	.WORD	172666	
2399	003256	155555	.WORD	155555	
2400	003260	172666	.WORD	172666	
2401	003262	155555	.WORD	155555	
2402	003264	172666	.WORD	172666	
2403	003266	155555	.WORD	155555	
2404	003270	172666	.WORD	172666	
2405	003272	155555	.WORD	155555	
2406					
2407	003274	077777	PAT12: .WORD	077777	;PATTERN 12
2408	003276	137777	.WORD	137777	
2409	003300	157777	.WORD	157777	
2410	003302	167777	.WORD	167777	

2411	003304	173777	.WORD	173777	
2412	003306	175777	.WORD	175777	
2413	003310	176777	.WORD	176777	
2414	003312	177377	.WORD	177377	
2415	003314	177577	.WORD	177577	
2416	003316	177677	.WORD	177677	
2417	003320	177737	.WORD	177737	
2418	003322	177757	.WORD	177757	
2419	003324	177767	.WORD	177767	
2420	003326	177773	.WORD	177773	
2421	003330	177775	.WORD	177775	
2422	003332	177776	.WORD	177776	
2423					
2424	003334	153333	PAT13: .WORD	153333	:PATTERN 13
2425	003336	066667	.WORD	066667	
2426	003340	153333	.WORD	153333	
2427	003342	066667	.WORD	066667	
2428	003344	153333	.WORD	153333	
2429	003346	066667	.WORD	066667	
2430	003350	153333	.WORD	153333	
2431	003352	066667	.WORD	066667	
2432	003354	153333	.WORD	153333	
2433	003356	066667	.WORD	066667	
2434	003360	153333	.WORD	153333	
2435	003362	066667	.WORD	066667	
2436	003364	153333	.WORD	153333	
2437	003366	066667	.WORD	066667	
2438	003370	153333	.WORD	153333	
2439	003372	066667	.WORD	066667	
2440					
2441	003374	000000	PAT14: .WORD	000000	:PATTERN 14
2442	003376	177777	.WORD	177777	
2443	003400	177777	.WORD	177777	
2444	003402	177777	.WORD	177777	
2445	003404	177777	.WORD	177777	
2446	003406	177777	.WORD	177777	
2447	003410	177777	.WORD	177777	
2448	003412	177777	.WORD	177777	
2449	003414	177777	.WORD	177777	
2450	003416	177777	.WORD	177777	
2451	003420	177777	.WORD	177777	
2452	003422	177777	.WORD	177777	
2453	003424	177777	.WORD	177777	
2454	003426	177777	.WORD	177777	
2455	003430	177777	.WORD	177777	
2456	003432	177777	.WORD	177777	
2457					
2458	003434	177777	PAT15: .WORD	177777	:PATTERN 15
2459	003436	000000	.WORD	000000	
2460	003440	000000	.WORD	000000	
2461	003442	000000	.WORD	000000	
2462	003444	000000	.WORD	000000	
2463	003446	000000	.WORD	000000	
2464	003450	000000	.WORD	000000	
2465	003452	000000	.WORD	000000	
2466	003454	000000	.WORD	000000	

2467	003456	000000	.WORD	000000
2468	003460	000000	.WORD	000000
2469	003462	000000	.WORD	000000
2470	003464	000000	.WORD	000000
2471	003466	000000	.WORD	000000
2472	003470	000000	.WORD	000000
2473	003472	000000	.WORD	000000

:DPB (DATA PARAMETER BLOCK)

2477	003474	000	DPB.A: .BYTE	0
2478	003475	000	.BYTE	0
2479	003476	000	.BYTE	0
2480	003477	000	.BYTE	0
2481	003500	000000	.WORD	0
2482	003502	044134	.WORD	BUFFER
2484	003504	000	.BYTE	0
2486	003505	000	.BYTE	0
2488	003506	000000	.WORD	0
2489	003510	003574	.WORD	RP.REG

(0) DRIVE NUMBER
 (1) OFFSET VALUE OR FMT22, ECT, AND HCI
 (2) COMMAND
 (3) PSEL AND A17 AND A16
 (4) WORD COUNT (MUST BE NEG.)
 (6) BUFFER ADDRESS OR
 REGISTER TABLE POINTER
 (10) SECTOR ADDRESS OR
 FIRST REG. INDEX
 (11) TRACK ADDRESS OR
 LAST REG. INDEX
 (12) CYLINDER ADDRESS
 (14) ERROR TABLE POINTER
 POINTS TO THE FIRST OF TWENTY
 LOCATIONS OF WHERE THE DRIVER
 IS TO STORE THE RH11/RP04
 REGISTERS ON AN ERROR. IF LEFT
 ZERO REGISTERS ARE NOT SAVED.
 (16) STATUS/ERROR INDICATOR
 BIT15=1=>ERROR OCCURRED
 BIT07=1=>DONE
 BIT14-BIT09 AND BIT06-BIT03
 INDICATE TYPE OF ERROR

2495	003512	000000	.WORD	0
2501	003514	000	DPB.B: .BYTE	0
2502	003515	000	.BYTE	0
2503	003516	000	.BYTE	0
2504	003517	000	.BYTE	0
2505	003520	177776	.WORD	-2
2506	003522	044134	.WORD	BUFFER
2508	003524	000	.BYTE	0
2510	003525	000	.BYTE	0
2512	003526	000000	.WORD	0
2513	003530	003574	.WORD	RP.REG
2519	003532	000000	.WORD	0

(0) DRIVE NUMBER
 (1) OFFSET VALUE OR FMT22, ECT, AND HCI
 (2) COMMAND
 (3) PSEL AND A17 AND A16
 (4) WORD COUNT (MUST BE NEG.)
 (6) BUFFER ADDRESS OR
 REGISTER TABLE POINTER
 (10) SECTOR ADDRESS OR
 FIRST REG. INDEX
 (11) TRACK ADDRESS OR
 LAST REG. INDEX
 (12) CYLINDER ADDRESS
 (14) ERROR TABLE POINTER
 POINTS TO THE FIRST OF TWENTY
 LOCATIONS OF WHERE THE DRIVER
 IS TO STORE THE RH11/RP04
 REGISTERS ON AN ERROR. IF LEFT
 ZERO REGISTERS ARE NOT SAVED.
 (16) STATUS/ERROR INDICATOR
 BIT15=1=>ERROR OCCURRED
 BIT07=1=>DONE
 BIT14-BIT09 AND BIT06-BIT03

```

;SAVE RH11/RP04 REGISTERS HERE ON ERROR

```

```

;INDICATE TYPE OF ERROR

;(0) DRIVE NUMBER
;(1) OFFSET VALUE OR FMT22, ECT, AND HCI
;(2) COMMAND
;(3) PSEL AND A17 AND A16
;(4) WORD COUNT (MUST BE NEG.)
;(6) BUFFER ADDRESS OR
REGISTER TABLE POINTER
;(10) SECTOR ADDRESS OR
FIRST REG. INDEX
;(11) TRACK ADDRESS OR
LAST REG. INDEX
;(12) CYLINDER ADDRESS
;(14) ERROR TABLE POINTER
POINTS TO THE FIRST OF TWENTY
LOCATIONS OF WHERE THE DRIVER
IS TO STORE THE RH11/RP04
REGISTERS ON AN ERROR. IF LEFT
ZERO REGISTERS ARE NOT SAVED.
;(16) STATUS/ERROR INDICATOR
BIT15=1=>ERROR OCCURRED
BIT07=1=>DONE
BIT14-BIT09 AND BIT06-BIT03
;INDICATE TYPE OF ERROR

;(0) DRIVE NUMBER
;(1) OFFSET VALUE OR FMT22, ECT, AND HCI
;(2) COMMAND
;(3) PSEL AND A17 AND A16
;(4) WORD COUNT (MUST BE NEG.)
;(6) BUFFER ADDRESS OR
REGISTER TABLE POINTER
;(10) SECTOR ADDRESS OR
FIRST REG. INDEX
;(11) TRACK ADDRESS OR
LAST REG. INDEX
;(12) CYLINDER ADDRESS
;(14) ERROR TABLE POINTER
POINTS TO THE FIRST OF TWENTY
LOCATIONS OF WHERE THE DRIVER
IS TO STORE THE RH11/RP04
REGISTERS ON AN ERROR. IF LEFT
ZERO REGISTERS ARE NOT SAVED.
;(16) STATUS/ERROR INDICATOR
BIT15=1=>ERROR OCCURRED
BIT07=1=>DONE
BIT14-BIT09 AND BIT06-BIT03
;INDICATE TYPE OF ERROR

ON ERROR

;RHCS1 (776700) CONTROL & STATUS #1
;RHWC (776702) WORD COUNT

```

2579	003600	000000	.WORD	0
2580	003602	000000	.WORD	0
2581	003604	000000	.WORD	0
2582	003606	000000	.WORD	0
2583	003610	000000	.WORD	0
2584	003612	000000	.WORD	0
2585	003614	000000	.WORD	0
2586	003616	000000	.WORD	0
2587	003620	000000	.WORD	0
2588	003622	000000	.WORD	0
2589	003624	000000	.WORD	0
2590	003626	000000	.WORD	0
2591	003630	000000	.WORD	0
2592	003632	000000	.WORD	0
2593	003634	000000	.WORD	0
2594	003636	000000	.WORD	0
2595	003640	000000	.WORD	0
2596	003642	000000	.WORD	0

;RH9A (776704)	BUS ADDRESS
;RHDA (776706)	DESIRED SECTOR/TRACK
;RHCS2 (776710)	CONTROL & STATUS #2
;RHDS1 (776712)	DISK STATUS
;RHER1 (776714)	ERROR REG. #1
;RHAS (776716)	ATTENTION SUMMARY
;RHLA (776720)	LOOK AHEAD
;RHDB (776722)	DATA BUFFER
;RHMR (776724)	MAINTAINABILITY
;RHDT (776726)	DRIVE TYPE
;RHSN (776730)	SERIAL NUMBER
;RHOF (776732)	OFFSET
;RHCA (776734)	DESIRED CYLINDER
;RHCC (776736)	CURRENT CYLINDER
;RHER2 (776740)	ERROR REG #2
;RHER3 (776742)	ERROR REG #3
;RHEC1 (776744)	ECC POSITION
;RHEC2 (776746)	ECC PATTERN

;*****

.SBTTL ERROR POINTER TABLE

;*THIS TABLE CONTAINS THE INFORMATION FOR EACH ERROR THAT CAN OCCUR.
 ;*THE INFORMATION IS OBTAINED BY USING THE INDEX NUMBER FOUND IN
 ;*LOCATION \$ITEMB. THIS NUMBER INDICATES WHICH ITEM IN THE TABLE IS PERTINENT.
 ;*NOTE1: IF \$ITEMB IS 0 THE ONLY PERTINENT DATA IS (\$ERRPC).
 ;*NOTE2: EACH ITEM IN THE TABLE CONTAINS 4 POINTERS EXPLAINED AS FOLLOWS:

;	*	EM	;;POINTS TO THE ERROR MESSAGE
;	*	DH	;;POINTS TO THE DATA HEADER
;	*	DT	;;POINTS TO THE DATA
;	*	DF	;;POINTS TO THE DATA FORMAT

\$ERRTB:

;*EM AND DH ARE ASCII MESSAGES, DT IS A STRING OF WORDS THAT POINT TO THE
 ;*DATA TO BE TYPED AND DF IS A STRING OF DATA THAT TELL HOW THE DT WORDS
 ;*ARE TO BE TYPED. IF ANY OF THE POINTERS ARE NOT NEEDED FOR A PARTICULAR
 ;*ERROR IT IS REPLACED WITH A ZERO.
 ;*EACH OF THE ITEMS BELOW REFER TO THE ERROR NUMBER AND INDICATE
 ;*THE INFORMATION THAT WILL BE TYPED WHEN THE ERROR OCCURS.
 ;*UNLESS STATED OTHER ALL NUMBERS ARE OCTAL

;* ERROR ITEM 1
 ;* ILLEGAL RH11(SC=0) INTERRUPT OCCURRED
 ;* TEST ERR PC
 ;* \$TMPD \$ERRPC

EM1
 DH1
 DT1
 DF1

;* ERROR ITEM 2
 ;* ILLEGAL RPO4 INTERRUPT OCCURRED
 ;* TEST ERR PC DRIVE RHAS RHDS RHER1 RHER2 RHER3
 ;* \$TMPD \$ERRPC \$REG1 \$REG5 RPERRS RPERRS+2 RPERRS+4 RPERRS+6

EM2
 DH2
 DT2
 DF2

;* ERROR ITEM 3
 ;* MASSBUS PARITY ERROR (MCPE=1)
 ;* TEST ERR PC ADDRESS DATA
 ;* \$TMPD \$ERRPC RD.ADR RD.WRD

EM3
 DH3
 DT3
 DF3

;* ERROR ITEM 4

2597
 2598
 2599
 2600
 2601
 2602
 2603
 2604
 2605
 2606
 2607
 2608
 2609
 2610
 2611
 2612
 2613
 2614
 2615
 2616
 2617
 2618
 2619
 2620
 2621
 2622
 2623
 2624
 2625
 2626
 2627
 2628
 2629
 2630
 2631
 2632
 2633
 2634
 2635
 2636
 2637
 2638
 2639
 2640
 2641
 2642
 2643
 2644
 2645
 2646
 2647
 2648
 2649
 2650
 2651
 2652

003644

003644 040615
 003646 042124
 003650 043364
 003652 043770

003654 040663
 003656 042143
 003660 043370
 003662 043774

003664 040723
 003666 042241
 003670 043410
 003672 044000

ERROR POINTER TABLE

2653			;	*	MASSBUS	PARITY	ERROR (PAR=1)			
2654			;	*	TEST	ERR PC	ADDRESS	GDDATA	BDDATA	
2655			;	*	\$TMPO	\$ERRPC	WRT.ADR	WRT.WD	RD.WRD	
2656										
2657	003674	040760			EM4					
2658	003676	042276			DH4					
2659	003700	043420			DT4					
2660	003702	044004			DF4					
2661										
2662			;	*	ERROR ITEM 5					
2663			;	*	OFFLINE, NONEXIS. ENT,	OR UNSAFE	DRIVE INTERRUPTED			
2664			;	*	TEST	ERR PC	DRIVE	RHAS	RHDS	RHER1
2665			;	*	\$TMPO	\$ERRPC	\$REG1	\$REG5	RPERRS	RPERRS+2
2666										
2667	003704	041014			EM5					
2668	003706	042143			DH2					
2669	003710	043370			DT2					
2670	003712	043774			DF2					
2671										
2672			;	*	ERROR ITEM 6 -- NOT USED					
2673										
2674	003714	000000			0					
2675	003716	000000			0					
2676	003720	000000			0					
2677	003722	000000			0					
2678										
2679			;	*	ERROR ITEM 7 -- NOT USED					
2680										
2681	003724	000000			0					
2682	003726	000000			0					
2683	003730	000000			0					
2684	003732	000000			0					
2685										
2686			;	*	ERROR ITEM 10					
2687			;	*	RH11/RP04 FAILED TO RESPOND TO ADDRESSING					
2688			;	*	RHCS1	ERR PC				
2689			;	*	RH.ADR	\$ERRPC				
2690										
2691	003734	041077			EM10					
2692	003736	042345			DH10					
2693	003740	043452			DT10					
2694	003742	044010			DF10					
2695										
2696			;	*	ERROR ITEM 11					
2697			;	*	DRIVE SELECTED IS NOT ONLINE					
2698			;	*	DRIVE	ERR PC				
2699			;	*	\$REG2	\$ERRPC				
2700										
2701	003744	041151			EM11					
2702	003746	042364			DH11					
2703	003750	043456			DT11					
2704	003752	044014			DF11					
2705										
2706			;	*	ERROR ITEM 12					
2707			;	*	IMPROPER HEADER DATA					
2708			;	*	TEST	ERR PC	TST PC	DRIVE	CYLNR	TRACK

```

2709      ;*      STMPD  $ERRPC $REGD  CHKDRV  CYL.DS  TRK.DS  SEC.DS
2710      ;*      GDCYL  GDTRK  GDSCTR  BDCYL  BDTRK  BDSCTR
2711      ;*      CYL.DS  TRK.DS  SEC.DS  CYL.RD  TRK.RD  SEC.RD
2712      ;*      CYLNDR, TRACK, AND SECTOR ARE DECIMAL
2713
2714      003754  041206      EM12
2715      003756  042403      DH12
2716      003760  043462      DT12
2717      003762  044020      DF12
2718
2719      ;*      ERROR ITEM 13
2720      ;*      DATA COMPARE FAILURE
2721      ;*      TEST    ERR PC  TST PC  DRIVE  CYLNDR  TRACK  SECTOR
2722      ;*      STMPD  $ERRPC $REGD  CHKDRV  CYL.DS  TRK.DS  SEC.DS
2723      ;*      GDDAT  BDDAT  WRDCNT  GDADR  BDADR
2724      ;*      $GDDAT $BDDAT $REG4  $GDADR $BDADR
2725      ;*      CYLNDR, TRACK, SECTOR, AND WRDCNT ARE DECIMAL
2726
2727      003764  041233      EM13
2728      003766  042403      DH12
2729      003770  043514      DT13
2730      003772  044030      DF13
2731
2732      ;*      ERROR ITEM 14 -- FOLLOWS #13
2733      ;*      $GDDAT $BDDAT $REG4  $GDADR $BDADR
2734
2735      003774  000000      0
2736      003776  000000      0
2737      004000  043532      DT13A
2738      004002  044040      DF14
2739
2740      ;*      ERROR ITEM 15
2741      ;*      DATA COMPARE FAILURE
2742      ;*      TEST    ERR PC  TST PC  DRIVE  CYLNDR  TRACK  SECTOR
2743      ;*      STMPD  $ERRPC $REGD  CHKDRV  CYL.DS  TRK.DS  SEC.DS
2744      ;*      GDDAT  BDDAT  WRDCNT  GDADR  BDADR
2745      ;*      $GDDAT $BDDAT $REG4  $GDADR $BDADR
2746      ;*      CYLNDR, TRACK, SECTOR, AND WRDCNT ARE DECIMAL
2747
2748      004004  041233      EM13
2749      004006  042403      DH12
2750      004010  043514      DT13
2751      004012  044030      DF13
2752
2753      ;*      ERROR ITEM 16 -- FOLLOWS #15
2754      ;*      $GDDAT $BDDAT $REG4  $GDADR $BDADR
2755
2756      004014  000000      0
2757      004016  000000      0
2758      004020  043532      DT13A
2759      004022  044040      DF14
2760
2761      ;*      ERROR ITEM 17
2762      ;*      DISK ERROR IN TIMING TEST
2763      ;*      TEST    ERR PC  DRIVE  RHCS1  RHDS  RHER1  RHER2  RHER3
2764      ;*      STMPD  $ERRPC  CHKDRV  RP.REG  RP.REG+12  RP.REG+14  RP.REG+40  RP.REG+42

```

2765			
2766	004024	041260	EM17
2767	004026	042617	DH17
2768	004030	043544	DT17
2769	004032	044044	DF17
2770			
2771			;* ERROR ITEM 20
2772			;* CLOCK (KW11-P) OVERFLOW IN TIMING TEST
2773			;* TEST ERR PC DRIVE RHCS1 RHDS RHER1 RHER2 RHER3
2774			;* STMP0 \$ERRPC CHKDRV RP.REG RP.REG+12 RP.REG+14 RP.REG+40 RP.REG+42
2775			
2776	004034	041312	EM20
2777	004036	042617	DH17
2778	004040	043544	DT17
2779	004042	044044	DF17
2780			
2781			;* ERROR ITEM 21
2782			;* DATA COMPARE FAILURE
2783			;* TEST ERR PC TST PC DRIVE CYLNDR TRACK
2784			;* STMP0 \$ERRPC \$REG0 CHKDRV CYL.DS TRK.DS
2785			;* GDDAT BDDAT WRDCNT SECTOR
2786			;* \$REG1 \$BDDAT \$REG4 \$REG1
2787			;* CYLINDER, TRACK, WRDCNT, AND SECTOR ARE DECIMAL
2788			
2789	004044	041233	EM13
2790	004046	042715	DH21
2791	004050	043564	DT21
2792	004052	044050	DF21
2793			
2794			;* ERROR ITEM 22--FOLLOWS #21
2795			;* \$REG1 \$BDDAT \$REG4 \$REG1
2796			
2797	004054	000000	0
2798	004056	000000	0
2799	004060	043600	DT21A
2800	004062	044060	DF22
2801			
2802			*****
2803			*****
2804			;* ERROR ITEMS 23-40 NOT USED
2805			;* ERROR ITEMS 41-46 WILL HAVE AN EM THAT
2806			;* VARIES DEPENDING ON THE ERROR, IT WILL BE IN THE FORM:
2807			;* RH11/RP04 ERROR (MESSAGE)
2808			;* WHERE MESSAGE WILL BE ONE OR MORE OF THE FOLLOWING:
2809			;* 1) OFFLINE OR UNSAFE DRIVE REQUESTED
2810			;* 2) UNLOADED DRIVE REQUESTED
2811			;* 3) PERSISTENT UNSAFE
2812			;* 4) PARITY ERROR OCCURRED
2813			;* 5) FATAL PARITY ERROR
2814			;* 6) SOFTWARE TIMEOUT ON THIS DRIVE
2815			;* 7) SOFTWARE TIMEOUT ON ANOTHER DRIVE
2816			;* 8) ERROR OCCURRED DURING I/O OPERATION
2817			;* 9) ERROR OCCURRED DURING NON-I/O OPERATION
2818			;* 10) UNSAFE OCCURRED
2819			;* 11) AUTOMATIC RECALIBRATE SEQUENCE OCCURRED
2820			

```

2821 004064      ITEM41:
2822
2823      ;* ERROR ITEM 41
2824      ;* RH11/RP04 ERROR (MESSAGE)
2825      ;* TEST   ERR PC  TST PC  DRIVE
2826      ;* $TMPO  $ERRPC  $REGO  CHKDRV
2827
2828 004064 041361      EM41
2829 004066 043032      DH41
2830 004070 043610      DT41
2831 004072 044064      DF41
2832
2833      ;* ERROR ITEM 42
2834      ;* RH11/RP04 ERROR (MESSAGE)
2835      ;* TEST   ERR PC  TST PC  DRIVE  RHCS1  RHCS2  RHDS
2836      ;* $TMPO  $ERRPC  $REGO  CHKDRV  RP.REG  RP.REG+10  RP.REG+12
2837
2838 004074 041361      EM41
2839 004076 043070      DH42
2840 004100 043620      DT42
2841 004102 044070      DF42
2842
2843      ;* ERROR ITEM 43
2844      ;* RH11/RP04 ERROR (MESSAGE)
2845      ;* TEST   ERR PC  TST PC  DRIVE  RHCS1  RHCS2  RHDS
2846      ;* $TMPO  $ERRPC  $REGO  CHKDRV  RP.REG  RP.REG+10  RP.REG+12
2847      ;* RHER1  RHER2  RHER3
2848      ;* RP.REG+14  RP.REG+40  RP.REG+42
2849
2850 004104 041361      EM41
2851 004106 043070      DH42
2852 004110 043636      DT43
2853 004112 044074      DF43
2854
2855      ;* ERROR ITEM 44
2856      ;* RH11/RP04 ERROR (MESSAGE)
2857      ;* TEST   ERR PC  TST PC  DRIVE  CYLNR  TRACK  SECTOR
2858      ;* $TMPO  $ERRPC  $REGO  CHKDRV  CYL.DS  TRK.DS  SEC.DS
2859      ;* RHCS1  RHCS2  RHDS  RHCC  RHCA  RHDA
2860      ;* RP.REG  RP.REG+10  RP.REG+12  RP.REG+36  RP.REG+34  RP.REG+06
2861      ;* RHER1  RHER2  RHER3
2862      ;* RP.REG+14  RP.REG+40  RP.REG+42
2863      ;* CYLNR, TRACK, AND SECTOR ARE DECIMAL
2864
2865 004114 041361      EM41
2866 004116 042403      DH12
2867 004120 043662      DT44
2868 004122 044104      DF44
2869
2870      ;* ERROR ITEM 45
2871      ;* RH11/RP04 ERROR (MESSAGE)
2872      ;* TEST   ERR PC  TST PC  DRIVE  CYLNR  TRACK  SECTOR
2873      ;* $TMPO  $ERRPC  $REGO  CHKDRV  CYL.DS  TRK.DS  SEC.DS
2874      ;* RHCS1  RHCS2  RHDS  RHCC  RHCA  RHDA
2875      ;* RP.REG  RP.REG+10  RP.REG+12  RP.REG+36  RP.REG+34  RP.REG+06
2876      ;* RHER1  RHER2  RHER3  RHWC  RHBA  RHDB

```

```

2877      ;*      RP.REG+14  RP.REG+40  RP.REG+42  RP.REG+2  RP.REG+4 RP.REG+22
2878      ;*      CYLNR,TRACK, AND SECTOR ARE DECIMAL
2879
2880      004124  041361      EM41
2881      004126  042403      DH12
2882      004130  043722      DT45
2883      004132  044120      DF45
2884
2885      ;*  ERROR ITEM 46
2886      ;*  FATAL WRITE CHECK ERROR (MESSAGE)
2887      ;*  TEST   ERR PC  TST PC  DRIVE  CYLNR  TRACK  SECTOR
2888      ;*  $TMPD  $ERRPC $REGD  CHKDRV  CYL.DS  TRK.DS  SEC.DS
2889      ;*          RHCS1  RHCS2  RHDS   RHCC   RHCA   RHDA
2890      ;*          RP.REG  RP.REG+10 RP.REG+12 RP.REG+36 RP.REG+34 RP.REG+06
2891      ;*          RHER1  RHER2  RHER3  RHCW  RHBA  RHDB
2892      ;*          RP.REG+14 RP.REG+40  RP.REG+42  RP.REG+2  RP.REG+4 RP.REG+22
2893      ;*          CYLNR,TRACK, AND SECTOR ARE DECIMAL
2894
2895      004134  041401      EM46
2896      004136  042403      DH12
2897      004140  043722      DT45
2898      004142  044120      DF45
2899
2900      000400      A16=400
2901      001000      A17=1000
2902      000114      PARE70=114

```

```

2903
2904           .SBTTL  START OF PROGRAM
2905
2906
2907 004144 012737 177777 001252 START3: MOV    #-1, @#BUSADR ;GET BUSADR FLAG
2908 004152 000402          BR      STRT1A
2909 004154 005037 001252          START1: CLR    @#BUSADR ;CLR BUSADR FLAG
2910 004160 012737 137777 001260 STRT1A: MOV    #137777, TSTNMS ;SELECT TESTS 0-15 AND 17
2911 004166 005037 001250          CLR    @#CNTRLC ;NO CONTROL "C"
2912 004172 012700 001650          MOV    #DFLT, R0 ;DEFAULT PARAMETERS POINTER
2913 004176 012701 002116          MOV    #PRMO, R1 ;TABLE POINTER
2914 004202 010102          MOV    R1, R2 ;STOP ADDRESS
2915 004204 012021          1$: MOV    (R0)+, (R1)+ ;MOVE DEFAULT PARAMETERS INTO
2916 004206 020002          CMP     R0, R2 ;RUN TIME TABLES ** DONE?
2917 004210 103775          BLO     1$ ;NO--BRANCH
2918 004212 012700 003074          MOV    #PAT8, R0 ;PATO DEFAULTS TO PATTERN 8
2919 004216 012701 002474          MOV    #PATO, R1
2920 004222 012021          2$: MOV    (R0)+, (R1)+
2921 004224 020027 003134          CMP     R0, #PAT9
2922 004230 103774          BLO     2$
2923 004232 000411          BR      START
2924 004234 012737 177777 001252 START4: MOV    #-1, @#BUSADR ;SET BUSADR FLAG
2925 004242 000402          BR      STRT2A
2926 004244 005037 001252          START2: CLR    @#BUSADR ;CLR BUSADR FLAG
2927 004250 012737 177777 001250 STRT2A: MOV    #-1, @#CNTRLC ;SET CONTROL "C" FLAG
2928 004256 000005          START: RESET
2929 004260 012737 000340 177776          MOV    #340, @#PS ;LOCK OUT ALL INTERRUPTS
2930 004266 012706 001100          MOV    #SCMTAG, R6 ;FIRST LOCATION TO BE CLEARED
2931 004272 005026          CLR     (R6)+ ;CLEAR MEMORY LOCATION
2932 004274 022706 001136          CMP     #STKS, R6 ;DONE?
2933 004300 001374          BNE     .-6 ;LOOP BACK IF NO
2934 004302 012706 001100          MOV    #STACK, SP ;SETUP THE STACK POINTER
2935 004306 012737 020470 000020          MOV    #SCOPE, @#IOTVEC ;IOT VECTOR FOR SCOPE ROUTINE
2936 004314 012737 000340 000022          MOV    #340, @#IOTVEC+2 ;LEVEL 7
2937 004322 012737 015230 000030          MOV    #ERROR, @#EMTVEC ;EMT VECTOR FOR ERROR ROUTINE
2938 004330 012737 000340 000032          MOV    #340, @#EMTVEC+2 ;LEVEL 7
2939 004336 012737 021004 000034          MOV    #TRAP, @#TRAPVEC ;TRAP VECTOR FOR TRAP CALLS
2940 004344 012737 000340 000036          MOV    #340, @#TRAPVEC+2 ;LEVEL 7
2941 004352 005037 001176          CLR     $TIMES ;INITIALIZE NUMBER OF ITERATIONS
2942 004356 005037 001200          CLR     $ESCAPE ;CLEAR THE ESCAPE ON ERROR ADDRESS
2943 004362 112737 000001 001115          MOVB   #1, $ERMAX ;ALLOW ONE ERROR PER TEST
2944 004370 012737 004370 001106          MOV    #., $LPADR ;INITIALIZE THE LOOP ADDRESS FOR SCOPE
2945 004376 012737 004376 001110          MOV    #., $LPERR ;SETUP THE ERROR LOOP ADDRESS
2946 004404 012700 001152          MOV    #REGAD, R0 ;FIRST ADDRESS
2947 004410 005020          1$: CLR    (R0)+ ;CLEAR VARIABLE STORAGE
2948 004412 022700 001202          CMP     #BELL, R0 ;DONE?
2949 004416 001374          BNE     1$ ;NO--BRANCH
2950 004420 013737 001410 001144          MOV    @#TPS, @#STPB ;SETUP THE STATUS AND BUFFER REG'S
2951 004426 013737 001412 001144          MOV    @#TPB, @#STPB ;FOR THE TYPE ROUTINE
2952 004434 063727 001250 000000          ADD     @#CNTRLC, #0 ;TYPE "ID" IF START AT 200 OR
2953 004442 103433          BCS     SRTINT ;THE 1ST START AT 204
2954 004444 104400 004452          TYPE   .+4 ;TYPE ASCIZ STRING
2955 004450 000430          BR      64$ ;GET OVER THE ASCIZ
2956          ;;.ASCIZ <15><12>/MD-11-DERPK-C "MECHANICAL & READ-WRITE" TEST/
2957 004532          64$:
2958 004532 004737 022340          SRTINT: JSR    PC, @#LP.AVL ;CHECK FOR A LINE PRINTER

```

2959	004536	004737	017734		JSR	PC, @STKINT	;TURN ON THE TTY KEYBOARD INTERRUPT
2960	004542	005037	177776		CLR	@PS	;INSURE THE PRIORITY = 0
2961					;*****		
2962					;*****		
2963					;*****		
2964					;*****		
2965					;*****		
2966					;*****		
2967					;*****		
2968					;*****		
2969					;*****		
2970	004546	004737	022026		JSR	PC, \$SIZE	
2971	004552	104400	004560		TYPE	+4	;TYPE ASCIZ STRING
2972	004556	000411			BR	64\$	;GET OVER THE ASCIZ
2973					;ASCIZ <15><12>/TOTAL MEMORY /		
2974	004602			64\$:	MOV	\$LSTBK, -(SP)	
2975	004602	013746	022334		ASR	(SP)	
2976	004606	006216			ASR	(SP)	
2977	004610	006216			ASR	(SP)	
2978	004612	006216			ASR	(SP)	
2979	004614	006216			ASR	(SP)	
2980	004616	006216			ASR	(SP)	
2981	004620	005216			INC	(SP)	
2982	004622	011637	001214		MOV	(SP), TEMP1	
2983	004626	006237	001214		ASR	TEMP1	
2984	004632	042737	100000	001214	BIC	#100000, TEMP1	
2985	004640	006237	001214		ASR	TEMP1	
2986	004644	104410			TYPDS		
2987	004646	104400	004654		TYPE	+4	;TYPE ASCIZ STRING
2988	004652	000401			BR	65\$	;GET OVER THE ASCIZ
2989					;ASCIZ /K/		
2990	004656			65\$:	JSR	PC, @GETADR	;CHECK RH11/RP04 (RHCS1) ADDRESS
2991	004656	004737	027372		JSR	PC, @GETSWR	;CO CHECK FOR CONTROL SWITCHES
2992	004662	004737	027304		JSR	PC, @RPINIT	;SETUP DRIVE STATUS
2993	004666	004737	032376		JSR	PC, @ST.CLK	;INITIALIZE THE CLOCK
2994	004672	004737	022402		MOV	#9\$, ERRVEC	
2995	004676	012737	004732	000004	TST	@LERADD	
2996	004704	005777	174326		CLR	TEMP10	
2997	004710	005037	001234		MOV	#PARITY, PARE70	
2998	004714	012737	016566	000114	MOV	#340, PARE70+2	
2999	004722	012737	000340	000116	BR	10\$	
3000	004730	000403			MOV	#-1, TEMP10	
3001	004732	012737	177777	001234	MOV	#TIMEOUT, ERRVEC	
3002	004740	012737	016426	000004	MOV	#340, ERRVEC+2	
3003	004746	012737	000340	000006	MOV	#PARITY, PARE70	
3004	004754	012737	016566	000114	TST	@CNTRL0	;CONTROL "C" START/RESTART?
3005	004762	005737	001250		BEQ	1\$	;NO--BRANCH
3006	004766	001403			JSR	PC, @GT.PRM	;YES--GET PARAMETERS
3007	004770	004737	027742		BR	4\$	
3008	004774	000416			CLR	DRVSEL	;NO DRIVES SELECTED
3009	004776	005037	001256	1\$:	CLR	RD	;DETERMINE THE DRIVES THAT
3010	005002	005000			MOV	#1, R1	;ARE AVAILABLE FOR TESTING
3011	005004	012701	000001		TSTB	DRVSTA(RD)	
3012	005010	105760	032242	2\$:	BLE	3\$	
3013	005014	003403			BISB	ATABIT(RD), @DRVSEL	
3014	005016	156037	032346	001256			

```

3015 005024 005200      35:  INC      R0
3016 005026 106301      ASLB     R1
3017 005030 001367      BNE      25
3018 005032 005037 032322  45:  CLR      2#SEEKFG      ;CLEAR SEEK FLAG
3019 005036 032737 000400 001246  BIT      2#SW08.2#C.SW  ;DO SEEK BEFORE DATA TRANSFER?
3020 005044 001002      BNE      55      ;YES--BRANCH
3021 005046 005137 032322  COM      2#SEEKFG      ;NO
3022 005052
3023 005052 104400 005060  55:  TYPE     2,+4      ;TYPE ASCIZ STRING
3024 005056 000415      BR      66$      ;GET OVER THE ASCIZ
3025
3026 005112      66$:  ;:ASCIZ      <15><12>/DRIVE(S) TO BE TESTED /
3027 005112 005037 015126  CLR      2#SENDCT      ;DETERMINE PASSES TO MAKE AND
3028 005116 005000      CLR      R0      ;THE DRIVES TO BE TESTED
3029 005120 013701 001256  MOV      2#DRVSEL,R1  ;ANY DRIVES SELECTED?
3030 005124 001010      BNE      65      ;YES--BRANCH
3031 005126 104400 005134  TYPE     2,+4      ;TYPE ASCIZ STRING
3032 005132 000403      BR      67$      ;GET OVER THE ASCIZ
3033
3034 005142      67$:  ;:ASCIZ      /NONE/
3035 005142 000137 014744  JMP      2#SEOP      ;GO TO END OF PROGRAM
3036 005146 006201      65:  ASR      R1      ;REPORT THE DRIVES TO BE TESTED
3037 005150 103013      BCC      7$
3038 005152 005237 015126  INC      2#SENDCT      ;GIVE THIS DRIVE A PASS
3039 005156 010046      MOV      R0,-(SP)  ;SAVE R0 FOR TYPEOUT
3040 005160 104404      TYP0S     ;GO TYPE--OCTAL ASCII
3041 005162 001      .BYTE     1      ;TYPE 1 DIGIT(S)
3042 005163 000      .BYTE     0      ;SUPPRESS LEADING ZEROS
3043 005164 005701      TST      R1      ;MORE DRIVES?
3044 005166 001406      BEQ      8$      ;NO--BRANCH
3045 005170 104400 005176  TYPE     2,+4      ;TYPE ASCIZ STRING
3046 005174 000401      BR      68$      ;GET OVER THE ASCIZ
3047
3048 005200      68$:  ;:ASCIZ      ", "
3049 005200 005200      7$:  INC      R0      ;FORM DRIVE NUMBER
3050 005202 000761      BR      6$
3051 005204 013737 015126 015120 8$:  MOV      2#SENDCT,2#SEOPCT
3052 005212 005737 001262  TST      2#CLKSTA      ;KW11-P AVAILABLE
3053 005216 003041      BGT      RSTART1  ;YES--BRANCH
3054 005220 032737 003600 001260  BIT      2#3600.2#TSTNMS ;NO--ANY TIMING TESTS TO BE PERFORMED?
3055 005226 001435      BEQ      RSTART1  ;NO--BRANCH
3056 005230 104400 005236  TYPE     2,+4      ;TYPE ASCIZ STRING
3057 005234 000432      BR      69$      ;GET OVER THE ASCIZ
3058
3059 005322      69$:  ;:ASCIZ      <15><12>/NO KW11-P CLOCK--TEST 7-12 WILL NOT BE PERFORMED/
3060 005322 005037 001272  RSTART1: CLR      CHKDRV      ;INIT. THE CHECK DRIVE KEY
3061 005326 012737 000001 001274  MOV      2#1,DRVMSK  ;START TO CHECK DESIRED DRIVES
3062 005334 033737 001274 001256  RSTART2: BIT      DRVMSK,DRVSEL ;IS THIS DRIVE SELECTED?
3063 005342 001006      RSTART3: BNE      DRVOK      ;YES--GO CHECK IF DRIVE IS READY FOR TESTING
3064 005344 005237 001272  RESTART: INC      CHKDRV      ;MOVE TO NEXT DRIVE NUMBER
3065 005350 106337 001274      ASLB     DRVMSK  ;POSITION THE MASK
3066 005354 103762      BCS      RSTART1  ;BRANCH IF THE DRIVE NUMBER NEEDS INITIALIZED
3067 005356 000766      BR      RSTART2
3068
3069 005360 013702 001272  DRVOK:  MOV      2#CHKDRV,R2  ;PICKUP THE DRIVE NUMBER
3070 005364 105762 032242  TSTB     DRVSTA(R2)  ;IS DESIRED DRIVE ON-LINE?

```

3071	005370	003002		BUT	15		; YES, BRANCH
3072	005372	104011		ERROR	11		; DRIVE SELECTED IS NOT ONLINE
3073	005374	000763		BR	RESTART		; NO-- RETURN
3074	005376	010237	003474	15:	MOV	R2, 2*DPB.A	; SET THE DRIVE NUMBER INTO THE DPB'S
3075	005402	010237	003514		MOV	R2, 2*DPB.B	
3076	005406	010237	003534		MOV	R2, 2*DPB.C	
3077	005412	010237	003554		MOV	R2, 2*DTADPB	
3078	005416	004737	022660		JSR	PC, 2*LDCMD	; LOAD COMMAND INTO DPB.B AND DPB.C
3079	005422	012737	014744	001270	MOV	*SEOP, 2*BYPASS	; IF ERROR GO TO END OF PROGRAM
3080	005430	112737	000020	003475	MOVB	*FMT22/1D256, 2*DPB.A+1	
3081	005436	012737	000143	003476	MOV	*SETFORM, 2*DPB.A+2	; SETFORM=COMMAND
3082	005444	004037	022724		JSR	RO, 2*CALL.A	; GO EXECUTE THE COMMAND
3083	005450	012737	000107	003476	MOV	*RECAL, 2*DPB.A+2	; RECAL=COMMAND
3084	005456	004037	022724		JSR	RO, 2*CALL.A	; GO EXECUTE THE COMMAND
3085	005462	012737	000030	003504	MOV	*RHSN, 2*DPB.A+10	; FIRST REG. INDEX
3086	005470	112737	000030	003505	MOVB	*RHSN, 2*DPB.A+11	; LAST REG. INDEX
3087	005476	012737	000141	003476	MOV	*GETREG, 2*DPB.A+2	; GETREG=COMMAND
3088	005504	004037	022724		JSR	RO, 2*CALL.A	; GO EXECUTE THE COMMAND
3089	005510	104400	005516		TYPE	+4	; TYPE ASCIZ STRING
3090	005514	000411		BR	645		; GET OVER THE ASCIZ
3091					;;.ASCIZ	<15><12><12>	/TESTING DRIVE /
3092	005540			645:	MOV	R2, -(SP)	; SAVE R2 FOR TYPEOUT
3093	005540	010246			TYPOS		; GO TYPE--OCTAL ASCII
3094	005542	104404			.BYTE	1	; TYPE 1 DIGIT(S)
3095	005544	001			.BYTE	0	; SUPPRESS LEADING ZEROS
3096	005545	000			TYPE	,MSG.SP	; TYPE SPACES
3097	005546	104400	040612		TYPE	+4	; TYPE ASCIZ STRING
3098	005552	104400	005560		BR	655	; GET OVER THE ASCIZ
3099	005556	000410			;;.ASCIZ	/SERIAL NUMBER /	
3100				655:			
3101	005600				MOV	*4, RO	; FOUR DIGITS TO TYPE
3102	005600	012700	000004		MOV	2*BUFFER, R1	; SERIAL NUMBER
3103	005604	013701	044134		CLR	R2	; ZERO
3104	005610	005002		25:	ROL	R1	; PUT THE NEXT DIGIT
3105	005612	006101			ROL	R2	; INTO R2
3106	005614	006102			ROL	R1	
3107	005616	006101			ROL	R2	
3108	005620	006102			ROL	R1	
3109	005622	006101			ROL	R2	
3110	005624	006102			ROL	R1	
3111	005626	006101			ROL	R2	
3112	005630	006102			ADD	*'0, R2	; MAKE IT ASCII
3113	005632	062702	000060		MOV	R2, (PC)+	; SAVE IT
3114	005636	010227		35:	.WORD	0	
3115	005640	000000			TYPE	35	; TYPE
3116	005642	104400	005640		DEC	RO	; ALL DIGITS TYPED?
3117	005646	005300			BGT	25	; NO -- BRANCH
3118	005650	003357			TYPE	,SCRLF	
3119	005652	104400	001207				

3120
3121
3122

.SBTTL **** TESTS ****

```

:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:
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```

*IN THE DESCRIPTIONS OF THE BELOW TESTS THE VARIABLES USED
*AND THEIR DEFAULT VALUES (UNLESS SPECIFIED OTHERWISE) ARE:

*MNEMONIC	VALUE	VARIABLE
*R	1	ITERATIONS (REPEATS)
*FC	0	FIRST CYLINDER ADDRESS
*LC	410	LAST CYLINDER ADDRESS
*IC	1	INCREMENT VALUE
*NC OF NC1	FC+IC	NEW OR MODIFIED CYLINDER ADDRESS
*NC2	LC-IC	NEW OR MODIFIED CYLINDER ADDRESS
*FT	0	FIRST TRACK ADDRESS
*LT	18	LAST TRACK ADDRESS
*IT	1	INCREMENT VALUE
*NT	FT+IT	NEW OR MODIFIED TRACK ADDRESS
*FS	0	FIRST SECTOR ADDRESS
*LS	21	LAST SECTOR ADDRESS

```

:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:
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3155
3156
3157

.SBTTL *** SEEK TESTS (0-6) ***

```

:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:
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```

*THE SEEK TESTS WILL BE EXECUTED USING IMPLIED SEEKS. THESE
*IMPLIED SEEKS WILL BE PERFORMED BY "READ HEADER AND
*DATA" COMMANDS TO TRACK "FT" SECTOR "FS" OF THE DESIRED CYLINDER.
*THE WORD COUNT WILL BE SET SUCH THAT ONLY THE CYLINDER AND
*TRACK/SECTOR WORDS OF THE HEADER ARE READ.

```

:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:/*:
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3173
3174
3175

*TEST 0 RECAL/SEEK TEST

```

645:  BIT      @#BITS+(<1*2>),TSTNMS ;DO THIS TEST?
      BNE   645                    ;YES--BRANCH
      JMP   TST2                   ;NO--GO TO THE NEXT TEST
      MOV   @#RPT1,$TIMES          ;GET THE ITERATION COUNT
      MOV   #TEST1,@#SLPADR
      MOV   #TST1,@#SLPERR        ;SETUP THE ERROR LOOP ADDRESS
      MOV   #1,@#$TSTNM            ;SET UP TEST NUMBER AND
                                   ;CLEAR THE ERROR FLAG ($ERFLG)
      MOV   $TSTNM,@#DISPLAY       ;LOAD THE TEST NUMBER INTO THE DISPLAY REGISTER
      MOVB  @#FS1,@#DPB.B+10      ;FS
      MOVB  @#LS1,@#DPB.C+10      ;LS
      MOVB  @#FT1,@#DPB.B+11      ;FT
      MOVB  @#LT1,@#DPB.C+11      ;LT
      MOV   @#FC1,@#DPB.B+12      ;FC
      MOV   @#LC1,@#DPB.C+12      ;LC

```

```

3232 006122 012737 006144 001270      MOV      #EXIT1,2#BYPASS ;GO TO EXIT1 ON ERROR
3233 006130 012706 001100      TEST1:  MOV      #STACK,SP      ;SET THE STACK POINTER
3234 006134 004037 023176      JSR      R0,2#CALL.C      ;GO EXECUTE THE COMMAND
3235 006140 004037 023032      JSR      R0,2#CALL.B      ;GO EXECUTE THE COMMAND
3236 006144 000004      EXIT1:  SCOPE      ;LOOP
3237
3238 ;*****
3239 ;*TEST 2      INCREMENT/SEEK TEST
3240
3241 ;*      THIS TEST WILL COMMAND FORWARD SEEK CYCLES TO ADVANCE THE
3242 ;*      CYLINDER ADDRESS FROM "FC" TO "LC" BY THE INCREMENT "IC".
3243 ;*      WHEN THE RESULTANT CYLINDER ADDRESS (NC) EXCEEDS
3244 ;*      "LC" REVERSE SEEK CYCLES ARE INITIATED; STARTING
3245 ;*      AT THE LAST LEGAL "NC" AND DECREMENTING BY "IC"
3246 ;*      UNTIL "NC" IS LESS THAN "FC". AT THE COMPLETION OF EACH
3247 ;*      SEEK COMMAND THE PROPER INDICATORS ARE EXAMINED TO
3248 ;*      INSURE PROPER OPERATION.
3249
3250 ;*****
3251 TST2:      BIT      2#BITS+(2*2),TSTNMS ;DO THIS TEST?
3252 006146 033737 001434 001260      BNE      64$      ;YES--BRANCH
3253 006154 001002      JMP      TST2      ;NO--GO TO THE NEXT TEST
3254 006156 000137 006330      64$:  MOV      2#RPT2,$TIMES ;GET THE ITERATION COUNT
3255 006162 013737 002154 001176      MOV      #TEST2,2#$LPADR
3256 006170 012737 006242 001106      MOV      #TST2,2#$LPERR ;SETUP THE ERROR LOOP ADDRESS
3257 006176 012737 006146 001110      MOV      #2,2#$TSTNM ;SET UP TEST NUMBER AND
3258 006204 012737 000002 001102      MOV      $TSTNM,2#DISPLAY ;CLEAR THE ERROR FLAG (SERFLG)
3259 ;*      ;LOAD THE TEST NUMBER INTO THE DISPLAY REGISTER
3260 006212 013737 001102 177570      MOV      2#FS2,2#DPB.2+10 ;FS
3261 006220 113737 002166 003524      MOV      2#FT2,2#DPB.8+11 ;FT
3262 006226 113737 002164 003525      MOV      #EXIT2,2#BYPASS ;GO TO EXIT2 ON ERROR
3263 006234 012737 006326 001270      TEST2:  MOV      #STACK,SP ;SET UP THE STACK POINTER
3264 006242 012706 001100      MOV      2#FC2,2#DPB.8+12 ;FC
3265 006246 013737 002156 003526      INCSK:  JSR      R0,2#CALL.B ;GO EXECUTE THE COMMAND
3266 006254      ADD      2#IC2,2#DPB.8+12 ;MOVE TO NEXT CYLINDER
3267 006254 004037 023032 003526      CMP      2#LC2,2#DPB.8+12 ;OUT OF CYLINDERS?
3268 006260 063737 002162 003526      BGE      INCSK ;NO--BRANCH
3269 006266 023737 002160 003526      MOV      2#LC2,2#DPB.8+12
3270 006274 002367 002150 003526      DECSK:  JSR      R0,2#CALL.B ;GO EXECUTE THE COMMAND
3271 006276 013737 002150 003526      SUB      2#IC2,2#DPB.8+12
3272 006304 004037 023032 003526      CMP      2#FC2,2#DPB.8+12
3273 006310 163737 002162 003526      BLE      DECSK
3274 006316 023737 002156 003526      EXIT2:  SCOPE ;LOOP
3275 006324 003767
3276 006326 000004
3277
3278 ;*****
3279 ;*TEST 3      STEPPING SEEK TEST
3280
3281 ;*      THIS TEST WILL COMMAND SEEK CYCLES TO CYLINDER 0,1,2,4,
3282 ;*      8,16,32,64,128, AND 256. AT THE COMPLETION OF EACH SEEK
3283 ;*      COMMAND THE PROPER INDICATORS ARE EXPLAINED TO INSURE PROPER
3284 ;*      OPERATION.
3285
3286 ;*****
3287

```

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MAINDEC-11-DERPK-C "MECHANICAL AND READ/WRITE TEST"
DERPKC.P11 T3 STEPPING SEEK TEST

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3288 005330          TST3:
3289 006330 033737 001436 001260      BIT      @#BITS+(3*2),TSTNMS ;DO THIS TEST?
3290 006336 001002          BNE      64$      ;YES--BRANCH
3291 006340 000137 006470          JMP      TST4      ;NO--GO TO THE NEXT TEST
3292 006344 013737 002172 001176 64$: MOV      @#RPT3,$TIMES ;GET THE ITERATION COUNT
3293 006352 012737 006424 001106      MOV      @#TEST3,@#SLPADR
3294 006360 012737 006230 001110      MOV      @#TST3,@#SLPERR ;SETUP THE ERROR LOOP ADDRESS
3295 006366 012737 000003 001102      MOV      @#3,@#TSTNM ;SET UP TEST NUMBER AND
3296          ;CLEAR THE ERROR FLAG ($ERFLG)
3297 006374 013737 001102 177570      MOV      $TSTNM,@#DISPLAY ;LOAD THE TEST NUMBER INTO THE DISPLAY REGISTER
3298 006402 113737 002204 003524      MOV      @#FS3,@#DPB.B+10 ;FS
3299 006410 113737 002202 003525      MOV      @#FT3,@#DPB.B+11 ;FT
3300 006416 012737 006466 001270      MOV      @#EXIT3,@#BYPASS ;GO TO BYPASS ON ERROR
3301 006424 012706 001100          TEST3: MOV      @#STACK,SP ;SET UP THE STACK
3302 006430 013737 002171 003526      MOV      @#OV,@#FC3,@#DPB.B+12 ;FC
3303 006436 004037 023032          JSR      RO,@#CALL.B ;GO EXECUTE THE COMMAND
3304 006442 013701 002200          MOV      IC3,R1 ;CYLINDER 1
3305 006446 010137 003526 1$: MOV      R1,@#DPB.B+12 ;DESIRED CYLINDER
3306 006452 004037 023032          JSR      RO,@#CALL.B ;GO EXECUTE THE COMMAND
3307 006456 006301          ASL      R1 ;MOVE TO NEXT CYLINDER
3308 006460 020137 002176          CMP      R1,@#LC3 ;DONE?
3309 006464 003770          BLE      1$ ;NO--LOOP
3310 006466 000004          EXIT3: SCOPE
3311
3312          ;*****
3313          ;*TEST 4          OSCILLATING SEEK TEST
3314
3315          ;*          THIS TEST WILL COMMAND SEEK CYCLES FROM "FC" TO "NC" AND BACK
3316          ;*          TO "FC". "NC" STARTS AT "FC" AND INCREMENTS BY "IC" UP TO CYLINDER
3317          ;*          "LC", THEN IS DECREMENTED BY "IC" BACK TO CYLINDER "FC". AT THE
3318          ;*          COMPLETION OF EVERY SEEK COMMAND THE PROPER INDICATORS ARE
3319          ;*          EXAMINED TO INSURE PROPER OPERATION.
3320
3321          ;*****
3322          TST4:
3323 006470 033737 001440 001260      BIT      @#BITS+(4*2),TSTNMS ;DO THIS TEST?
3324 006476 001002          BNE      64$      ;YES--BRANCH
3325 006500 000137 007022          JMP      TST5      ;NO--GO TO THE NEXT TEST
3326 006504 013737 002210 001176 64$: MOV      @#RPT4,$TIMES ;GET THE ITERATION COUNT
3327 006512 012737 006600 001106      MOV      @#TEST4,@#SLPADR
3328 006520 012737 006470 001110      MOV      @#TST4,@#SLPERR ;SETUP THE ERROR LOOP ADDRESS
3329 006526 012737 000004 001102      MOV      @#4,@#TSTNM ;SET UP TEST NUMBER AND
3330          ;CLEAR THE ERROR FLAG ($ERFLG)
3331 006534 013737 001102 177570      MOV      $TSTNM,@#DISPLAY ;LOAD THE TEST NUMBER INTO THE DISPLAY REGISTER
3332 006542 113737 002222 003524      MOV      @#FS4,@#DPB.B+10 ;FS
3333 006550 113737 002220 003525      MOV      @#FT4,@#DPB.B+11 ;FT
3334 006556 012737 007020 001270      MOV      @#EXIT4,@#BYPASS ;GO TO EXIT4 ON ERROR
3335 006564 005002          CLR      R2 ;CLEAR STALL SWITCH (NO STALL)
3336 006566 032737 010000 001246      BIT      @#SW12,@#C.SWR ;STALL REQUIRED?
3337 006574 001401          BEQ      TEST4 ;NO--BRANCH
3338 006576 005102          COM      R2 ;YES--SET SWITCH
3339 006600 012706 001100          TEST4: MOV      @#STACK,SP ;SET UP THE STACK POINTER
3340 006604 013701 002212          MOV      @#FC4,R1 ;SET NC TO FC
3341 006610 005037 001354          CLR      @#STALLO ;START AT ZERO IF STALLS REQUIRED
3342 006614 010137 003526 1$: MOV      R1,@#DPB.B+12 ;NC
3343 006620 004037 023032          JSR      RO,@#CALL.B ;GO EXECUTE THE COMMAND

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MAINDEC-11-DERPK-C "MECHANICAL AND READ/WRITE TEST"
DERPKC.P11 T4 OSCILLATING SEEK TEST

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3344 006624 005702 TST R2 ;STALL?
3345 006626 001403 BEQ 2$ ;NO--BRANCH
3346 006630 004037 024144 JSR RO,2$STALL ;YES--GO TO STALL ROUTINE
3347 006634 001354 .WORD STALLO ;TIME POINTER
3348 006636 013737 002212 003526 2$: MOV FC4,2$DPB.B+12 ;FC
3349 006644 004037 023032 JSR RO,2$CALL.B ;GO EXECUTE THE COMMAND
3350 006650 005702 TST R2 ;STALL?
3351 006652 001413 BEQ 3$ ;NO--BRANCH
3352 006654 004037 024144 JSR RO,2$STALL ;YES--GO TO STALL ROUTINE
3353 006660 001354 .WORD STALLO ;TIME POINTER
3354 006662 005237 001354 INC 2$STALLO ;UPDATE THE TIME
3355 006666 023737 001424 001354 CMP 2$MXSTAL,2$STALLO ;TIME TO BIG?
3356 006674 003347 BGT 1$ ;NO--BRANCH
3357 006676 005037 001354 CLR 2$STALLO ;YES--START OVER AT ZERO
3358 006702 063701 002216 3$: ADD 2$IC4,R1 ;MOVE TO NEXT CYLINDER
3359 006706 020137 002214 CMP R1,2$LC4 ;LAST CYLINDER COMPLETED?
3360 006712 003740 BLE 1$ ;NO--BRANCH
3361 006714 013701 002214 MOV 2$LC4,R1 ;SET NC TO LC
3362 006720 010137 003526 4$: MOV R1,2$DPB.B+12 ;NC
3363 006724 004037 023032 JSR RO,2$CALL.B ;GO EXECUTE THE COMMAND
3364 006730 005702 TST R2 ;STALL?
3365 006732 001403 BEQ 5$ ;NO--BRANCH
3366 006734 004037 024144 JSR RO,2$STALL ;YES--GO TO STALL ROUTINE
3367 006740 001354 .WORD STALLO ;TIME POINTER
3368 006742 013737 002214 003526 5$: MOV 2$LC4,2$DPB.B+12 ;LC
3369 006750 004037 023032 JSR RO,2$CALL.B ;GO EXECUTE THE COMMAND
3370 006754 005702 TST R2 ;STALL?
3371 006756 001413 BEQ 6$ ;NO--BRANCH
3372 006760 004037 024144 JSR RO,2$STALL ;YES--GO TO STALL ROUTINE
3373 006764 001354 .WORD STALLO ;TIME POINTER
3374 006766 005237 001354 INC 2$STALLO ;UPDATE STALL TIME
3375 006772 023737 001424 001354 CMP 2$MXSTAL,2$STALLO ;TIME TOO BIG?
3376 007000 003347 BGT 4$ ;NO--BRANCH
3377 007002 005037 001354 CLR 2$STALLO ;YES--SET STALL TIME BACK TO ZERO
3378 007006 163701 002216 6$: SUB 2$IC4,R1 ;NEXT CYLINDER
3379 007012 020137 002212 CMP R1,2$FC4 ;DONE?
3380 007016 002373 BGE 6$ ;NO--BRANCH
3381 007020 000004 EXIT4: SCOPE ;LOOP

```

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*****
;TEST 5 CONVERGING/DIVERGING SEEK TEST

```

```

;* THIS TEST WILL CAUSE THE DRIVE TO EXECUTE FORWARD AND REVERSE
;* SEEKS FROM "NC1" AND "NC2" RESPECTIVELY, "NC1" WILL BE INCREMENTED
;* BY "IC" AND "NC2" WILL BE DECREMENTED BY "IC" UNTIL "NC1" IS
;* GREATER THAN THE INITIAL VALUE OF "NC2" AND "NC2" IS
;* LESS THAN THE INITIAL VALUE OF "NC1". AT THE COMPLETION OF
;* EACH SEEK COMMAND THE PROPER INDICATORS ARE EXAMINED TO
;* INSURE PROPER OPERATION. "NC1" AND "NC2" DEFAULT TO
;* "FC" AND "LC" RESPECTIVELY.

```

```

*****

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```

3396 007022 033737 001442 001260 TST5: BIT 2$BITS+(5*2),TSTNMS ;DO THIS TEST?
3397 007022 001002 BNE 64$ ;YES--BRANCH
3398 007030 000137 007200 JMP TST6 ;NO--GO TO THE NEXT TEST

```

```

3400 007036 013737 002226 001176 64$: MOV      2#RPT5,$TIMES ;GET THE ITERATION COUNT
3401 007044 012737 007116 001106      MOV      2#TEST5,2#SLPADR
3402 007052 012737 007022 001110      MOV      2#TST5,2#SLPERR ;SETUP THE ERROR LOOP ADDRESS
3403 007060 012737 000005 001102      MOV      2#5,2#STSTNM ;SET UP TEST NUMBER AND
3404                                     ;CLEAR THE ERROR FLAG ($ERFLG)
3405 007066 013737 001102 177570      MOV      $STSTNM,2#DISPLAY ;LOAD THE TEST NUMBER INTO THE DISPLAY REGISTER
3406 007074 113737 002240 003524      MOVVB   2#FS5,2#DPB.B+10 ;FS
3407 007102 113737 002236 003525      MOVVB   2#FT5,2#DPB.B+11 ;FT
3408 007110 012737 007176 001270      MOV      2#EXIT5,2#BYPASS ;GO TO EXITS ON ERROR
3409 007116 012706 001100      TEST5: MOV    2#STACK,SP
3410 007122 013701 002230      MOV      2#FC5,R1 ;START NC1 AT FC
3411 007126 013702 002232      MOV      2#LC5,R2 ;START NC2 AT LC
3412 007132 010137 003526      1$: MOV     R1,2#DPB.B+12 ;NC1
3413 007136 004037 023032      JSR      R0,2#CALL.B ;GO EXECUTE THE COMMAND
3414 007142 010237 003526      MOV      R2,2#DPB.B+12 ;NC2
3415 007146 004037 023032      JSR      R0,2#CALL.B ;GO EXECUTE THE COMMAND
3416 007152 063701 002234      ADD      2#IC5,R1 ;NEXT NC1
3417 007156 163702 002234      SUB      2#IC5,R2 ;NEXT NC2
3418 007162 020137 002232      CMP      R1,2#LC5 ;DONE?
3419 007166 003003      BGT      EXIT5 ;YES--BRANCH
3420 007170 020237 002230      CMP      R2,2#FC5 ;?
3421 007174 002356      BGE      1$ ;NO--BRANCH
3422 007176 000004      EXIT5: SCOPE ;LOOP

```

```

*****
*TEST 6 SERVO ADDRESSING LOGIC NOISE GENERATOR

```

```

;*
;* IN THIS TEST A SEEK IS DONE TO CYL "NC" THEN A SEEK TO
;* NC+4 THEN NC+1 THEN NC+3 THEN NC+2 THEN NC+5. NOW "NC" IS UPDATED
;* BY "IC" AND THE ABOVE SEQUENCE IS REPEATED UNTIL "LC" IS
;* EXCEEDED BY ANY OF THE ABOVE VALUES. THE INITIAL VALUE OF "NC"
;* IS "FC". AT THE COMPLETION OF EACH SEEK COMMAND THE
;* PROPER INDICATORS ARE EXAMINED TO INSURE PROPER OPERATION.

```

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*****

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```

3435 007200      1ST6: BIT      2#BITS+(6*2),TSTNMS ;DO THIS TEST?
3436 007200 033737 001444 001260      BNE      64$ ;YES--BRANCH
3437 007206 001002      JMP      TST7 ;NO--GO TO THE NEXT TEST
3438 007210 000137 007422      64$: MOV     2#RPT6,$TIMES ;GET THE ITERATION COUNT
3439 007214 013737 002244 001176      MOV     2#TEST6,2#SLPADR
3440 007222 012737 007274 001106      MOV     2#TST6,2#SLPERR ;SETUP THE ERROR LOOP ADDRESS
3441 007230 012737 007200 001110      MOV     2#6,2#STSTNM ;SET UP TEST NUMBER AND
3442 007236 012737 000006 001102      MOV                                     ;CLEAR THE ERROR FLAG ($ERFLG)
3443                                     ;LOAD THE TEST NUMBER INTO THE DISPLAY REGISTER
3444 007244 013737 001102 177570      MOV     $STSTNM,2#DISPLAY
3445 007252 113737 002256 003524      MOVVB   2#FS6,2#DPB.B+10 ;FS
3446 007260 113737 002254 003525      MOVVB   2#FT6,2#DPB.B+11 ;FT
3447 007266 012737 007420 001270      MOV     2#EXIT6,2#BYPASS ;GO TO EXIT6 ON ERROR
3448 007274 012706 001100      TEST6: MOV    2#STACK,SP ;SETUP STACK
3449 007300 013701 002246      MOV      2#FC6,R1 ;PICKUP "FC"
3450 007304 013702 002250      MOV      2#LC6,R2 ;FORM LAST CYLINDER THAT
3451 007310 162702 000005      SUB      2#5,R2 ;IS AVAILABLE FOR TESTING
3452 007314 020102      1$: CMP     R1,R2 ;LAST CYLINDER
3453 007316 003040      BGT      EXIT6 ;YES--BRANCH
3454 007320 010137 003526      MOV     R1,2#DPB.B+12 ;NC
3455 007324 004037 023032      JSR      R0,2#CALL.B ;GO EXECUTE THE COMMAND

```

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MAINDEC-11-DERPK-C "MECHANICAL AND READ/WRITE TEST" MACY11 27(732) 14-OCT-76 10:36 PAGE 75
 DERPKC.P11 T6 SERVO ADDRESSING LOGIC NOISE GENERATOR

3456	007330	062737	000004	003526	ADD	#4, @DPB.B+12	;NC+4	
3457	007336	004037	023032		JSR	RD, @CALL.B		;GO EXECUTE THE COMMAND
3458	007342	162737	000003	003526	SUB	#3, @DPB.B+12	;NC+1	
3459	007350	004037	023032		JSR	RD, @CALL.B		;GO EXECUTE THE COMMAND
3460	007354	062737	000002	003526	ADD	#2, @DPB.B+12	;NC+3	
3461	007362	004037	023032		JSR	RD, @CALL.B		;GO EXECUTE THE COMMAND
3462	007366	162737	000001	003526	SUB	#1, @DPB.B+12	;NC+2	
3463	007374	004037	023032		JSR	RD, @CALL.B		;GO EXECUTE THE COMMAND
3464	007400	062737	000003	003526	ADD	#3, @DPB.B+12	;NC+5	
3465	007406	004037	023032		JSR	RD, @CALL.B		;GO EXECUTE THE COMMAND
3466	007412	063701	002252		ADD	@IC6, R1		
3467	007416	000736			BR	1\$		
3468	007420	000004			EXIT6:	SCOPE		;LOOP

```
.SBTTL *** TIMING TESTS (7-12) ***
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;
;
;

```

;*THE TIMING TESTS WILL INSURE THAT THOSE FUNCTIONS BEING
;*TIMED ARE WITHIN THE TOLERANCES SPECIFIED IN THE "RP04
;*ENGINEERING SPECIFICATIONS".
;*THE SEEK TIMING WILL BE PERFORMED USING EXPLICIT SEEK
;*OPERATIONS. AT THE COMPLETION OF EACH OF THE TIMING
;*TESTS THE MINIMUM, MAXIMUM AND AVERAGE TIMES WILL BE
;*TYPED.

```

;
;
;

```

3489                                     ;*****
3490                                     ;TEST 7      ROTATIONAL SPEED TIMING TEST
3491
3492                                     ;*          THIS TEST WILL START A SEARCH TO CYLINDER 0, TRACK 0, SECTOR
3493                                     ;*          0. AS SOON AS THE INTERRUPT OCCURS, THE GO BIT IS SET AGAIN
3494                                     ;*          AND THE OPERATION IS TIMED. THIS PROCEDURE IS REPEATED 10
3495                                     ;*          TIMES THEN THE AVERAGE TIME IS CALCULATED AND CHECKED TO
3496                                     ;*          INSURE IT IS WITHIN TOLERANCE:
3497                                     ;*          16.67 MS/REV + OR - 2% IF 60HZ
3498                                     ;*          16.67 MS/REV + OR - 2.5% IF 50HZ.
3499                                     ;*
3500
3501                                     ;*****
3502     007422    TST7:
3503     007422    033737    001446    001260        BIT       @#BITS+(7*2),TSTNMS ;DO THIS TEST?
3504     007430    001002                                BNE       64$             ;YES--BRANCH
3505     007432    000137    010142                                JMP       TST10           ;NO--GO TO THE NEXT TEST
3506     007436    013737    002262    001176    64$: MOV       @#RPT7,$TIMES   ;GET THE ITERATION COUNT
3507     007444    012737    007422    001106        MOV       #TST7,@#$LPADR  ;SETUP THE SCOPE LOOP ADDRESS
3508     007452    012737    007422    001110        MOV       #TST7,@#$LPERR  ;SETUP THE ERROR LOOP ADDRESS
3509     007460    012737    000007    001102        MOV       #7,@#$TSTNM      ;SET UP TEST NUMBER AND
3510                                           ;CLEAR THE ERROR FLAG ($ERFLG)
3511     007466    013737    001102    177570        MOV       $TSTNM,@#DISPLAY  ;LOAD THE TEST NUMBER INTO THE DISPLAY REGISTER
3512     007474    005737    001262                                TST       @#CLKSTA         ;KW11-P CLOCK?
3513     007500    003002                                BGT       1$              ;YES--START TEST
3514     007502    000137    010142                                JMP       TST10           ;NO--GO TO NEXT TEST
3515     007506    004037    024416                1$: JSR       R0,@#SRCHOO      ;DO A MASSBUS INIT & RECAL
3516     007512    000401                                BR        2$              ;RETURN HERE IF NO ERROR
3517     007514    000563                                BR        EXIT7           ;RETURN HERE IF ERROR
3518     007516    013764    002264    000034    2$: MOV       @#FC7,RHCA(R4)    ;FC
3519     007524    013746    002270                MOV       @#FS7,-(SP)      ;FS
3520     007530    113766    002266    000001        MOVB      @#FT7,1(SP)     ;FT
3521     007536    012664    000006                MOV       (SP)+,RHDA(R4)   ;LOAD FT/FS
3522     007542    012737    010064    001200        MOV       #EXIT7,$ESCAPE  ;ESCAPE TO EXIT7 ON ERROR
3523     007550    005005                                CLR       R5              ;COUNT UP
3524     007552    012703    002364                MOV       #T7A,R3         ;60HZ PARAMETERS

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3525	007556	032737	000100	001246	BIT	#SW06, @#C.SWR	:60 HZ?
3526	007564	001402			BEG	TEST7	:YES--BRANCH
3527	007566	012703	002374		MOV	#T7B, R3	:NO--50 HZ PARAMETERS
3528	007572	012706	001100		TEST7: MOV	#STACK, SP	:SETUP STACK
3529	007576	012701	000012		MOV	#D10, R1	:TIME 10 SEARCHES
3530	007602	004737	024602		JSR	PC, @#STRMR	:INITIALIZE THE TIMERS
3531	007606	012777	010014	171554	MOV	#7\$, @PKV	:SETUP VECTOR IN CASE OF OVERFLOW
3532	007614	012777	024600	022540	MOV	#D0RT1, @RPVEC	:SETUP RPO4 VECTOR
3533	007622	005077	171550		1\$: CLR	@PKB	:START COUNTING AT ZERO
3534	007626	012777	000131	171540	MOV	#131, @PKCS	:INT.EN., COUNT UP AT 100KHZ
3535	007634	012714	000131		MOV	#SEARCH, (R4)	:START A SEARCH
3536	007640	000001			WAIT		:WAIT ON INTERRUPT
3537	007642	042777	000101	171524	BIC	#101, @PKCS	:STOP THE CLOCK
3538	007650	032764	040000	000012	BIT	#BIT14, RHDS1(R4)	:ERROR?
3539	007656	001415			BEG	2\$	:NO--BRANCH
3540	007660	104416			SAVREG		:SAVE R0-R5
3541	007662	012702	003554		MOV	#DTADPB, R2	:DPB POINTER
3542	007666	004737	037044		JSR	PC, @#SVRH11	:SAVE ALL THE RH11/RPO4 REGISTERS
3543	007672	012764	000040	000010	MOV	#BIT05, RHCS2(R4)	:MASSBUS CLEAR
3544	007700	013764	003554	000010	MOV	@#DTADPB, RHCS2(R4)	:SELECT DRIVE
3545	007706	104420			RESREG		:RESTORE R0-R5
3546	007710	104017			ERROR	17	
3547	007712	005077	171460		2\$: CLR	@PKB	:START THE COUNT AT ZERO
3548	007716	012714	000131		MOV	#SEARCH, (R4)	:START A SEARCH
3549	007722	012777	000131	171444	MOV	#131, @PKCS	:START THE CLOCK
3550	007730	000001			WAIT		:WAIT ON INTERRUPT
3551	007732	042777	000101	171434	BIC	#101, @PKCS	:STOP THE CLOCK
3552	007740	032764	040000	000012	BIT	#BIT14, RHDS1(R4)	:IS "ERR=1"?
3553	007746	001415			BEG	3\$	:NO--BRANCH
3554	007750	104416			SAVREG		:SAVE R0-R5
3555	007752	012702	003554		MOV	#DTADPB, R2	:DPB POINTER
3556	007756	004737	037044		JSR	PC, @#SVRH11	:SAVE ALL THE RH11/RPO4 REGISTERS
3557	007762	012764	000040	000010	MOV	#BIT05, RHCS2(R4)	:MASSBUS CLEAR
3558	007770	013764	003554	000010	MOV	@#DTADPB, RHCS2(R4)	:SELECT DRIVE
3559	007776	104420			RESREG		:RESTORE R0-R5
3560	010000	104017			ERROR	17	:DISK ERROR OCCURRED
3561	010002	004737	024646		3\$: JSR	PC, @#COUNT	:UPDATE THE COUNT
3562	010006	005301			DEC	R1	:DONE?
3563	010010	003304			BGT	1\$	:NO--BRANCH
3564	010012	000424			BR	EXIT7	:YES--GO TO THE EXIT
3565	010014	042777	000101	171352	7\$: BIC	#101, @PKCS	:STOP THE CLOCK
3566	010022	005037	177776		CLR	@#PS	:DROP THE PRIORITY
3567	010026	012600			MOV	(SP)+, R0	:PC OF WAIT+2
3568	010030	005726			TST	(SP)+	:POP THE PS FROM THE STACK
3569	010032	104416			SAVREG		:SAVE R0-R5
3570	010034	012702	003554		MOV	#DTADPB, R2	:DPB POINTER
3571	010040	004737	037044		JSR	PC, @#SVRH11	:SAVE ALL THE RH11/RPO4 REGISTERS
3572	010044	012764	000040	000010	MOV	#BIT05, RHCS2(R4)	:MASSBUS CLEAR
3573	010052	013764	003554	000010	MOV	@#DTADPB, RHCS2(R4)	:SELECT DRIVE
3574	010060	104420			RESREG		:RESTORE R0-R5
3575	010062	104020			ERROR	20	:CLOCK OVERFLOWED
3576	010064	000004			EXIT7: SCOPE		
3577	010066	012764	000040	000010	MOV	#BIT05, RHCS2(R4)	:MASSBUS INIT.
3578	010074	013764	003554	000010	MOV	@#DTADPB, RHCS2(R4)	:SELECT DRIVE
3579	010102	004737	022402		JSR	PC, @#ST.CLK	:INITIALIZE THE CLOCK
3580	010106	012777	034766	022246	MOV	#ISR, @RPVEC	:RESTORE RH11/RPO4 INT. VECTOR

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3581 010114 032737 000100 001246      BIT      #SW06, @#C.SWR      ;60 HZ?
3582 010122 001004                      BNE      1$              ;NO -- BRANCH
3583 010124 004037 025000              JSR      RO, @#TYPTIM      ;GO TYPE THE TIMES
3584 010130 002364                      T7A                      ;POINTER
3585 010132 000403                      BR       TST10           ;GO TO NEXT TEST
3586 010134                      1$:
3587 010134 004037 025000              JSR      RO, @#TYPTIM      ;GO TYPE THE TIMES
3588 010140 002374                      T7B                      ;POINTER
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;*****
;*TEST 10      ONE CYLINDER SEEK TIMING TEST

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;*      THIS TEST WILL COMMAND FORWARD SEEK CYCLES TO ADVANCE THE
;*      CYLINDER BY ONE UNTIL THE INCREMENT IS GREATER THAN THE
;*      NUMBER OF CYLINDERS TO CYLINDER 410, THEN REVERSE SEEK
;*      CYCLES TO RETRACT THE CYLINDER BY ONE UNTIL THE INCREMENT
;*      IS GREATER THAN THE NUMBER OF CYLINDERS TO CYLINDER 0. THE
;*      TIME TO PERFORM EACH SEEK IS CHECKED TO INSURE IT DOES NOT
;*      EXCEED THE MAXIMUM TIME PERMITTED FOR A ONE CYLINDER SEEK.
;*      THE TIME MUST BE LESS THAN 10MS BUT GREATER THAN 3MS.

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;*****
TST10:

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3604 010142
3605 010142 033737 001450 001260      BIT      @#BITS+<10*2>, TSTNMS ;DO THIS TEST?
3606 010150 001002                      BNE      64$              ;YES--BRANCH
3607 010152 000137 010564              JMP      TST11           ;NO--GO TO THE NEXT TEST
3608 010156 013737 002274 001176      64$: MOV      @#RPT10, $TIMES ;GET THE ITERATION COUNT
3609 010164 012737 010142 001106      MOV      @#TST10, @#SLPADR ;SETUP THE SCOPE LOOP ADDRESS
3610 010172 012737 010142 001110      MOV      @#TST10, @#SLPERR ;SETUP THE ERROR LOOP ADDRESS
3611 010200 012737 000010 001102      MOV      @#10, @#$TSTNM ;SET UP TEST NUMBER AND
3612                                ;CLEAR THE ERROR FLAG ($ERFLG)
3613 010206 013737 001102 177570      MOV      $TSTNM, @#DISPLAY ;LOAD THE TEST NUMBER INTO THE DISPLAY REGISTER
3614 010214 005737 001262              TST      @#CLKSTA        ;KW11-P CLOCK?
3615 010220 003002                      BGT      1$              ;YES--START TEST
3616 010222 000137 010564              JMP      TST11           ;NO--GO TO NEXT TEST
3617 010226 004037 024416              1$: JSR      RO, @#SRCH00    ;DO A MASSBUS INIT. AND RECAL
3618 010232 000401                      BR       2$              ;NO ERROR RETURN
3619 010234 000534                      BR       EXIT10         ;ERROR RETURN--SCOPE LOOP CALL
3620 010236 012703 002404              2$: MOV      @#T10, R3      ;PARAMETER POINTER
3621 010242 012737 010526 001200      MOV      @#EXIT10, $ESCAPE ;ESCAPE TO EXIT10 ON ERROR
3622 010250 012706 001100      TEST10: MOV     @#STACK, SP ;SETUP STACK
3623 010254 012737 000001 003566      MOV      @#1, @#DTADPB+12 ;START WITH CYLINDER #1
3624 010262 005005                      CLR      R5              ;SET THE UP/DOWN SWITCH TO UP
3625 010264 004737 024602              JSR      PC, @#STRTMR    ;INITIALIZE THE TIMERS
3626 010270 012777 010456 171072      MOV      @#7$, @PKV     ;SETUP INCASE OF OVERFLOW
3627 010276 012777 024600 022056      MOV      @#DORT1, @RPVEC ;SET RPO4 VECTOR
3628 010304 005077 171066              1$: CLR      @PKB         ;START THE COUNTER AT ZERO
3629 010310 013764 003566 000034      MOV      @#DTADPB+12, RHCA(R4) ;LOAD DESIRED CYLINDER
3630 010316 012714 000105              MOV      @#SEEK, (R4)    ;START A SEEK
3631 010322 012777 000131 171044      MOV      @#131, @PKCS   ;START THE CLOCK
3632 010330 000001                      WAIT                     ;WAIT ON INTERRUPT
3633 010332 042777 000101 171034      BIC      @#101, @PKCS   ;STOP THE CLOCK
3634 010340 032764 040000 000012      BIT      @#BIT14, RHDS1(R4) ;ANY DISK ERRORS?
3635 010346 001415                      BEQ      2$              ;NO--BRANCH
3636 010350 104416                      SAVREG                     ;SAVE R0-R5

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3637 010352 012702 003554      MOV      #DTADPB,R2      ;DPB POINTER
3638 010356 004737 037044      JSR      PC,@SVRH11    ;SAVE ALL THE RH11/RP04 REGISTERS
3639 010362 012764 000040 000010  MOV      #BIT05,RHCS2(R4) ;MASSBUS CLEAR
3640 010370 013764 003554 000010  MOV      @#DTADPB,RHCS2(R4) ;SELECT DRIVE
3641 010376 104420      RESREG      ;RESTORE R0-R5
3642 010400 104017      ERROR      17      ;REPORT THE ERROR
3643 010402 004737 024646      JSR      PC,@#COUNT    ;COUNT THIS SEEKS TIME
3644 010406 004737 024226      JSR      PC,@#TWOMS      ;STALL FOR 2 MILLISECONDS
3645 010412 005705      TST      R5      ;UP OR DOWN?
3646 010414 001011      BNE      4$      ;DOWN--BRANCH
3647 010416 005237 003566      INC      @#DTADPB+12    ;MOVE TO NEXT CYLINDER
3648 010422 023727 003566 000632  CMP      @#DTADPB+12,@#D410 ;OUT OF CYLINDERS?
3649 010430 002725      BLT      1$      ;NO--GO DO THE NEXT SEEK
3650 010432 012705 177777      MOV      #-1,R5      ;SET UP/DOWN SWITCH TO DOWN
3651 010436 000722      BR      1$      ;GO DO THE NEXT SEEK
3652 010440 005337 003566      DEC      @#DTADPB+12    ;MOVE TO NEXT CYLINDER
3653 010444 023727 003566 000000  CMP      @#DTADPB+12,@0    ;OUT OF CYLINDERS?
3654 010452 003314      BGT      1$      ;NO--GO DO THE NEXT SEEK
3655 010454 000424      BR      EXIT10    ;GO TO THE EXIT
3656 010456 042777 000101 170710  BIC      #101,@PKCS      ;STOP THE CLOCK
3657 010464 005037 177776      CLR      @#PS      ;DROP THE PRIORITY
3658 010470 012600      MOV      (SP)+,R0    ;PC OF WAIT+2
3659 010472 005726      TST      (SP)+      ;POP THE PS FROM THE STACK
3660 010474 104416      SAVREG      ;SAVE R0-R5
3661 010476 012702 003554      MOV      #DTADPB,R2      ;DPB POINTER
3662 010502 004737 037044      JSR      PC,@SVRH11    ;SAVE ALL THE RH11/RP04 REGISTERS
3663 010506 012764 000040 000010  MOV      #BIT05,RHCS2(R4) ;MASSBUS CLEAR
3664 010514 013764 003554 000010  MOV      @#DTADPB,RHCS2(R4) ;SELECT DRIVE
3665 010522 104420      RESREG      ;RESTORE R0-R5
3666 010524 104020      ERROR      20      ;REPORT CLOCK OVERFLOW
3667 010526 000004      EXIT10: SCOPE
3668 010530 012764 000040 000010  MOV      #BIT05,RHCS2(R4) ;MASSBUS INIT.
3669 010536 013764 003554 000010  MOV      @#DTADPB,RHCS2(R4) ;SELECT DRIVE
3670 010544 004737 022402      JSR      PC,@#ST.CLK    ;INITIALIZE THE CLOCK
3671 010550 012777 034766 021604  MOV      #ISR,@RPVEC      ;RESTORE RH11/RP04 INT. VECTOR
3672 010556 004037 025000      JSR      R0,@#TYPTIM    ;GO TYPE THE TIMES
3673 010562 002404      T10      ;POINTER
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3675
3676 ;*****
3677 ;*TEST 11 AVERAGE SEEK TIMING TEST
3678
3679 ;* THIS TEST WILL COMMAND A FORWARD SEEK FROM CYLINDER 0 TO
3680 ;* CYLINDER 136, THEN A REVERSE SEEK FROM CYLINDER 136 TO
3681 ;* CYLINDER 0. BOTH SEEKS ARE TIMED AND CHECKED TO INSURE THEY
3682 ;* ARE WITHIN THE TOLERANCE ALLOWED FOR THE AVERAGE SEEK TIME.
3683 ;* THIS SEQUENCE IS REPEATED 128 TIMES (FOR A TOTAL
3684 ;* OF 256 SEEKS). THE AVERAGE SEEK TIME IS 28 MS + OR - 2MS.
3685
3686 ;*****
3687 ;*T11:
3688 010564 033737 001452 001260      BIT      @#BITS+(<11*2>),TSTNMS ;DO THIS TEST?
3689 010572 001002      BNE      64$      ;YES--BRANCH
3690 010574 000137 011264      JMP      TST12      ;NO--GO TO THE NEXT TEST
3691 010600 013737 002300 001176 64$: MOV      @#RPT11,$TIMES ;GET THE ITERATION COUNT
3692 010606 012737 010564 001106  MOV      #TST11,@#SLPADR ;SETUP THE SCOPE LOOP ADDRESS

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3693	010614	012737	010564	001110	MOV	#TST11,2#S_PERR	;SETUP THE ERROR LOOP ADDRESS
3694	010622	012737	000011	001102	MOV	#11,2#STSTIM	;SET UP TEST NUMBER AND
3695							;CLEAR THE ERROR FLAG (SEPFLG)
3696	010630	013737	001102	177570	MOV	STSTIM,2#DISPLAY	;LOAD THE TEST NUMBER INTO THE DISPLAY REGISTER
3697	010636	005737	001262		TST	2#CLKSTA	;K11-P CLOCK?
3698	010642	003002			BGT	15	;YES--START TEST
3699	010644	000137	011264		JMP	TST12	;NO--GO TO NEXT TEST
3700	010650	004037	024416		JSR	RO,2#SRCH00	;DO A MASSBUS INIT & RECAL
3701	010654	000401			BR	25	;RETURN HERE IF NO ERROR
3702	010656	000563			BR	EXIT11	;RETURN HERE ON ERROR
3703	010660	012703	002414		MOV	#T11,R3	;PARAMETER POINTER
3704	010664	012737	011226	001200	MOV	#EXIT11,\$ESCAPE	;ESCAPE TO EXIT11 ON ERROR
3705	010672	012706	001100		MOV	#STACK,SP	;SETUP STACK
3706	010676	012701	000200		MOV	#D128,R1	;REPEAT "0-136-0" 128 TIMES
3707	010702	004737	024602		JSR	PC,2#STRTMR	;INIT. THE COUNTERS
3708	010706	012777	011156	170454	MOV	#75,2#PKV	;SET UP VECTOR IN CASE OF OVERFLOW
3709	010714	012777	024600	021440	MOV	#DOATI,2#RVEC	;SETUP RPO4 VECTOR
3710	010722	005077	170450		CLR	2#PKB	;START COUNT AT ZERO
3711	010726	012764	000210	000034	MOV	#D136,RHCA(R4)	;CYLINDER=136
3712	010734	012764	000105	000000	MOV	#SEEK,RHCS1(R4)	;START A SEEK
3713	010742	012777	000131	170424	MOV	#131,2#PKCS	;START THE CLOCK
3714	010750	000001			WAIT		;WAIT ON INTERRUPT
3715	010752	042777	000101	170414	BIC	#101,2#PKCS	;STOP CLOCK
3716	010760	032764	040000	000012	BIT	#BIT14,RHDS1(R4)	;ERR=1?
3717	010766	001415			BEO	25	;NO--BRANCH
3718	010770	104416			SAVREG		;SAVE RO-R5
3719	010772	012702	003554		MOV	#DTADPB,R2	;DPB POINTER
3720	010776	004737	037044		JSR	PC,2#SVRH11	;SAVE ALL THE RH11/RPO4 REGISTERS
3721	011002	012764	000040	000010	MOV	#BIT05,RHCS2(R4)	;MASSBUS CLEAR
3722	011010	013764	003554	000010	MOV	2#DTADPB,RHCS2(R4)	;SELECT DRIVE
3723	011016	104420			RESREG		;RESTORE RO-R5
3724	011020	104017			ERROR	17	
3725	011022	005005			CLR	R5	;SET UP/DOWN SWITCH TO UP
3726	011024	004737	024646		JSR	PC,2#COUNT	;UPDATE THE COUNT
3727	011030	004737	024226		JSR	PC,2#TWOMS	;STALL FOR 2 MILLISECONDS
3728	011034	005077	170336		CLR	2#PKB	;START THE COUNT AT ZERO
3729	011040	012764	000000	000034	MOV	#0,RHCA(R4)	;CYLINDER=0
3730	011046	012764	000105	000000	MOV	#SEEK,RHCS1(R4)	;START A SEEK
3731	011054	012777	000131	170312	MOV	#131,2#PKCS	;START THE CLOCK
3732	011062	000001			WAIT		;WAIT ON INTERRUPT
3733	011064	042777	000101	170302	BIC	#101,2#PKCS	;STOP THE CLOCK
3734	011072	032764	040000	000012	BIT	#BIT14,RHDS1(R4)	;ERR=1?
3735	011100	001415			BEO	35	;NO--BRANCH
3736	011102	104416			SAVREG		;SAVE RO-R5
3737	011104	012702	003554		MOV	#DTADPB,R2	;DPB POINTER
3738	011110	004737	037044		JSR	PC,2#SVRH11	;SAVE ALL THE RH11/RPO4 REGISTERS
3739	011114	012764	000040	000010	MOV	#BIT05,RHCS2(R4)	;MASSBUS CLEAR
3740	011122	013764	003554	000010	MOV	2#DTADPB,RHCS2(R4)	;SELECT DRIVE
3741	011130	104420			RESREG		;RESTORE RO-R5
3742	011132	104017			ERROR	17	
3743	011134	012705	177777		MOV	#-1,R5	;SET UP/DOWN SWITCH TO DOWN
3744	011140	004737	024646		JSR	PC,2#COUNT	;UPDATE THE COUNT
3745	011144	004737	024226		JSR	PC,2#TWOMS	;STALL FOR 2 MILLISECONDS
3746	011150	005301			DEC	R1	;DONE?
3747	011152	003263			BGT	15	;NO--BRANCH
3748	011154	000424			BR	EXIT11	;YES--EXIT

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3749 011156 042777 000101 170210 75: B1C #101,2PKCS ;STOP THE CLOCK
3750 011164 005037 177776 CLR 2#PS ;DROP THE PRIORITY
3751 011170 012600 MOV (SP)+,R0 ;PC OF WAIT+2
3752 011172 005726 TST (SP)+ ;POP THE PS FROM THE STACK
3753 011174 104416 SAVREG ;SAVE R0-R5
3754 011176 012702 003554 MOV #DTADPB,R2 ;DPB POINTER
3755 011202 004737 037044 JSR PC,2#SVRH11 ;SAVE ALL THE RH11/RP04 REGISTERS
3756 011206 012764 000040 000010 MOV #BIT05,RHCS2(R4) ;MASSBUS CLEAR
3757 011214 013764 003554 000010 MOV 2#DTADPB,RHCS2(R4) ;SELECT DRIVE
3758 011222 104420 RESREG ;RESTORE R0-R5
3759 011224 104020 ERROR 20 ;CLOCK OVERFLOWED
3760 011226 000004 EXIT11: SCOPE
3761 011230 012764 000040 000010 MOV #BIT05,RHCS2(R4) ;MASSBUS INIT.
3762 011236 013764 003554 000010 MOV 2#DTADPB,RHCS2(R4) ;SELECT DRIVE
3763 011244 004737 022402 JSR PC,2#ST.CLK ;INITIALIZE THE CLOCK
3764 011250 012777 034766 021104 MOV #ISR,2RPVEC ;RESTORE RH11/RP04 INT. VECTOR
3765 011256 004037 025000 JSR R0,2#TYPTIM ;GO TYPE THE TIMES
3766 011262 002414 T11 ;POINTER

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;*****
;TEST 12 MAXIMUM SEEK TIMING TEST

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;* THIS TEST WILL COMMAND A FORWARD SEEK FROM CYLINDER 0 TO
;* CYLINDER 410, THEN A REVERSE SEEK FROM CYLINDER 410 TO
;* CYLINDER 0. BOTH SEEKS ARE TIMED AND CHECKED TO INSURE
;* THEY ARE WITHIN THE TOLERANCE ALLOWED FOR THE MAXIMUM SEEK
;* TIME. THIS SEQUENCE IS REPEATED 128 TIMES (FOR
;* A TOTAL OF 256 SEEKS). THE MAXIMUM SEEK TIME IS 50MS + 4MS CR - 2MS.

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;*****
;TST12:

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3779 011264 033737 001454 001260 BIT 2#BITS+(12*2),TSTNMS ;DO THIS TEST?
3780 011264 001002 BNE 645 ;YES--BRANCH
3781 011272 000137 011764 JMP TST13 ;NO--GO TO THE NEXT TEST
3782 011274 000137 011764 645: MOV 2#RPT12,STIMES ;GET THE ITERATION COUNT
3783 011300 013737 002304 001176 MOV #TST12,2#SLPADR ;SETUP THE SCOPE LOOP ADDRESS
3784 011306 012737 011264 001106 MOV #TST12,2#SLPERR ;SETUP THE ERROR LOOP ADDRESS
3785 011314 012737 011264 001110 MOV #12,2#STSTNM ;SET UP TEST NUMBER AND
3786 011322 012737 000012 001102 MOV $TSTNM,2#DISPLAY ;CLEAR THE ERROR FLAG (SERFLG)
3787 ;LOAD THE TEST NUMBER INTO THE DISPLAY REGISTER
3788 011330 013737 001102 177570 MOV 2#CLKSTA ;KW11-P CLOCK
3789 011336 005737 001262 TST 15 ;YES--START TEST
3790 011342 003002 BGT 15 ;NO--GO TO NEXT TEST
3791 011344 000137 011764 15: JSR R0,2#SRCH00 ;DO A MASSBUS INIT & RECAL
3792 011350 004037 024416 25: BR 25 ;RETURN HERE IF NO ERROR
3793 011354 000401 BR EXIT12 ;RETURN HERE ON ERROR
3794 011356 000563 002424 25: MOV #T12,R3 ;PARAMETER POINTER
3795 011360 012703 001726 001200 TEST12: MOV #EXIT12,$ESCAPE ;ESCAPE TO EXIT12 ON ERROR
3796 011364 012737 001100 MOV #STACK,$P ;SETUP STACK
3797 011372 012706 001100 MOV #10128,R1 ;REPEAT "0-410-0" 128 TIMES
3798 011376 012701 000200 JSR PC,2#STATMR ;INIT. THE TIMERS
3799 011402 004737 024602 MOV #75,2PKV ;SETUP VECTOR IN CASE OF OVERFLOW
3800 011406 012777 011656 167754 MOV #DORTI,2RPVEC ;SETUP RP04 VECTOR
3801 011414 012777 024600 020740 15: CLR 2PKB ;START COUNTING FROM ZERO
3802 011422 005077 167750 MOV #410.,RHCA(R4) ;CYLINDER=410
3803 011426 012764 000632 000034 MOV #SEEK,RHCS1(R4) ;START A SEEK
3804 011434 012764 000105 000000

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3905	011442	012777	000131	167724	MOV	#131,DPKCS	;START THE CLOCK
3906	011450	000001			WAIT		;WAIT ON INTERRUPT
3807	011452	042777	000101	167714	BIC	#01,DPKCS	;STOP THE CLOCK
3808	011460	032764	040000	000012	BIT	#BIT14,RHDS1(R4)	;ERR=1?
3809	011466	001415			BEQ	25	;NO--BRANCH
3810	011470	104416			SAVREG		;SAVE R0-R5
3811	011472	012702	003554		MOV	#DTADPB,R2	;DPB POINTER
3812	011476	004737	037044		JSR	PC,#SVRH11	;SAVE ALL THE RH11/RP04 REGISTERS
3813	011502	012764	000040	000010	MOV	#BIT05,RHCS2(R4)	;MASSBUS CLEAR
3814	011510	013764	003554	000010	MOV	#DTADPB,RHCS2(R4)	;SELECT DRIVE
3815	011516	104420			RESREG		;RESTORE R0-R5
3816	011520	104017			ERROR	17	
3817	011522	005005			CLR	R5	;SET THE UP/DOWN SWITCH TO UP
3818	011524	004737	024646		JSR	PC,#COUNT	;UP THE COUNT
3819	011530	004737	024226		JSR	PC,#TWOMS	;STALL FOR 2 MILLISECONDS
3820	011534	005077	167636		CLR	DPKB	;START COUNT AT ZERO
3821	011540	012764	000000	000034	MOV	#0,RHCA(R4)	;CYLINDER=0
3822	011546	012764	000105	000000	MOV	#SEEK,RHCS1(R4)	;START A SEEK
3823	011554	012777	000131	167612	MOV	#131,DPKCS	;START THE CLOCK
3824	011562	000001			WAIT		;WAIT ON INTERRUPT
3825	011564	042777	000101	167602	BIC	#101,DPKCS	;STOP THE CLOCK
3826	011572	032764	040000	000012	BIT	#BIT14,RHDS1(R4)	;ERR=1?
3827	011600	001415			BEQ	35	;NO--BRANCH
3828	011602	104416			SAVREG		;SAVE R0-R5
3829	011604	012702	003554		MOV	#DTADPB,R2	;DPB POINTER
3830	011610	004737	037044		JSR	PC,#SVRH11	;SAVE ALL THE RH11/RP04 REGISTERS
3831	011614	012764	000040	000010	MOV	#BIT05,RHCS2(R4)	;MASSBUS CLEAR
3832	011622	013764	003554	000010	MOV	#DTADPB,RHCS2(R4)	;SELECT DRIVE
3833	011630	104420			RESREG		;RESTORE R0-R5
3834	011632	104017			ERROR	17	;REPORT THE ERROR
3835	011634	012705	177777		MOV	#-1,R5	;SET THE UP/DOWN SWITCH TO DOWN
3836	011640	004737	024646		JSR	PC,#COUNT	;UPDATE THE COUNT
3837	011644	004737	024226		JSR	PC,#TWOMS	;STALL FOR 2 MILLISECONDS
3838	011650	005301			DEC	R1	;DONE?
3839	011652	003263			BGT	15	;NO--BRANCH
3840	011654	000424			BR	EXIT12	;YES--EXIT
3841	011656	042777	000101	167510	BIC	#101,DPKCS	;STOP THE CLOCK
3842	011664	005037	177776		CLR	#PS	;DROP THE PRIORITY
3843	011670	012600			MOV	(SP)+,R0	;PC OF WAIT+2
3844	011672	005726			TST	(SP)+	;POP THE PS FROM THE STACK
3845	011674	104416			SAVREG		;SAVE R0-R5
3846	011676	012702	003554		MOV	#DTADPB,R2	;DPB POINTER
3847	011702	004737	037044		JSR	PC,#SVRH11	;SAVE ALL THE RH11/RP04 REGISTERS
3848	011706	012764	000040	000010	MOV	#BIT05,RHCS2(R4)	;MASSBUS CLEAR
3849	011714	013764	003554	000010	MOV	#DTADPB,RHCS2(R4)	;SELECT DRIVE
3850	011722	104420			RESREG		;RESTORE R0-R5
3851	011724	104020			ERROR	20	;CLOCK OVERFLOWED
3852	011726	000004			EXIT12: SCOPE		
3853	011730	012764	000040	000010	MOV	#BIT05,RHCS2(R4)	;MASSBUS INIT.
3854	011736	013764	003554	000010	MOV	#DTADPB,RHCS2(R4)	;SELECT DRIVE
3855	011744	004737	022402		JSR	PC,#ST.CLK	;INITIALIZE THE CLOCK
3856	011750	012777	034766	020404	MOV	#ISR,DPVEC	;RESTORE RH11/RP04 INT. VECTOR
3857	011756	004037	025000		JSR	R0,#TYPTIM	;GO TYPE THE TIMES
3858	011762	002424			T12		;POINTER

.SBTTL *** ADDRESSING TESTS (13-14) ***

: * \ / * \ / * \ / * \ / * \ / * \ / * \ / * \ / * \ / * \ / * \ / * \ / * \ / * \ :
: * \ / * \ / * \ / * \ / * \ / * \ / * \ / * \ / * \ / * \ / * \ / * \ / * \ / * \ :
: * \ / * \ / * \ / * \ / * \ / * \ / * \ / * \ / * \ / * \ / * \ / * \ / * \ / * \ :

;*THE ADDRESSING TESTS INSURES PROPER OPERATION OF THE TRACK
 ;*AND SECTOR ADDRESS CIRCUITRY. BOTH ADDRESSING TESTS
 ;*WILL BE PERFORMED ON CYLINDER FC.

[illegible]

```

;*****
;*TEST 13      SECTOR ADDRESSING TEST

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; * THIS TEST WRITES DATA INTO ALL SECTORS OF TRACK "FT". THE
; * DATA WILL BE 256 WORDS OF THE SECTOR ADDRESS OF THE SECTOR
; * BEING WRITTEN. A WRITE CHECK IS PERFORMED, THE BUFFER IS
; * CLEARED (TO 177400) AND THE DATA IS READ AND COMPARED. THEN SECTOR 0
; * IS REWRITTEN AND SECTORS 0 - 21 ARE WRITE CHECKED. THEN
; * SECTOR 1 IS REWRITTEN AND SECTORS 0 - 21 ARE WRITE CHECKED.
; * THIS REWRITE AND WRITE CHECK PROCEDURE IS CONTINUED UP THROUGH
; * REWRITE SECTOR 21 AND WRITE CHECK SECTORS 0-21.

```

```

:*****
†ST13:

```

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645:  BIT      2#BITS+<13*2>,TSTNMS ;DO THIS TEST?
      BNE      64$                ;YES--BRANCH
      JMP      TST14              ;NO--GO TO THE NEXT TEST
645:  MOV      2#RPT13,$TIMES        ;GET THE ITERATION COUNT
      MOV      2#TEST13,2#$SLPADR
      MOV      2#TST13,2#$SLPERR ;SETUP THE ERROR LOOP ADDRESS
      MOV      2#13,2#$TSTNM      ;SET UP TEST NUMBER AND
                                   ;CLEAR THE ERROR FLAG ($ERFLG)
      MOV      2#$TSTNM,2#DISPLAY ;LOAD THE TEST NUMBER INTO THE DISPLAY REGISTER
      MOV      2#EXIT13,2#BYPASS
TEST13: MOV      2#STACK,$P        ;SET THE STACK POINTER
      JSR      PC,2#FILBUF         ;FILL THE BUFFER WITH SECTOR ADDRESSES
      MOV      2#WRITE,2#DTADPB+2 ;COMMAND=WRITE DATA
      MOV      2#FC13,2#DTADPB+12 ;CYLINDER
      MOVB     2#FT13,2#DTADPB+11 ;TRACK
      CLRB     2#DTADPB+10        ;SECTOR
      MOV      2#TRCKWC,2#DTADPB+4 ;WORD COUNT
      MOV      2#BUFFER,2#DTADPB+6 ;BUFFER ADDRESS
      JSR      RO,2#DRVCL         ;START A DATA TRANSFER
      MOV      2#WRCKD,2#DTADPB+2 ;COMMAND=WRITE CHECK DATA
      JSR      RO,2#DRVCL         ;START A DATA TRANSFER
      JSR      RO,2#CLRBUF        ;CLEAR BUFFER
      MOV      2#READ,2#DTADPB+2 ;COMMAND = READ
      JSR      RO,2#DRVCL         ;START A DATA TRANSFER
      JSR      RO,2#CKSCTR        ;CHECK THE SECTOR DATA READ

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3915 012156 012700 044134      MOV    #BUFFER,RO      ;BUFFER ADDRESS
3916 012162 005001              CLR    R1                ;FIRST SECTOR
3917 012164 012737 000161 003556 1$: MOV    #WRITE,2#DTADPB+2 ;COMMAND=WRITE DATA
3918 012172 012737 177400 003560      MOV    #SCTRWC,2#DTADPB+4 ;WORD COUNT
3919 012200 010037 003562              MOV    RO,2#DTADPB+6      ;BUFFER ADDRESS
3920 012204 110137 003564              MOV    R1,2#DTADPB+10     ;SECTOR
3921 012210 004037 023342              JSR    RO,2#DRVCAL      ;START A DATA TRANSFER
3922 012214 012737 000151 003556      MOV    #WRCKD,2#DTADPB+2 ;COMMAND=WRITE CHECK DATA
3923 012222 012737 165000 003560      MOV    #TRCKWC,2#DTADPB+4 ;WORD COUNT
3924 012230 012737 044134 003562      MOV    #BUFFER,2#DTADPB+6 ;BUFFER ADDRESS
3925 012236 105037 003564              CLR    2#DTADPB+10     ;SECTOR
3926 012242 004037 023342              JSR    RO,2#DRVCAL      ;START A DATA TRANSFER
3927 012246 062700 001000              ADD    #10256*2,RO      ;MOVE TO NEXT SECTOR
3928 012252 005201              INC    R1
3929 012254 022701 000026              CMP    #1022,R1      ;DONE?
3930 012260 003341              BGT    1$            ;NO--BRANCH
3931 012262 000004              EXIT13: SCOPE      ;LOOP

```

```

;*****
;*TEST 14      TRACK ADDRESSING TEST

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```

;*      THIS TEST WILL WRITE DATA IN THE FORM OF TRACK ADDRESSES
;*      IN CYLINDER "FC" SECTOR "FS" OF EVERY TRACK WITH EACH TRACK
;*      GETTING ITS OWN TRACK ADDRESS.
;*      A WRITE CHECK IS THEN PERFORMED ON EACH TRACK TO INSURE
;*      THE DATA IS VALID. THEN TRACK 0 IS REWRITTEN AND TRACK 1
;*      THROUGH TRACK 18 IS WRITE CHECKED. THEN TRACK 1 IS
;*      REWRITTEN AND TRACK 2 THROUGH TRACK 18 IS WRITE CHECKED.
;*      THIS PROCEDURE IS CONTINUED UP THROUGH REWRITING TRACK 17
;*      AND WRITE CHECKING TRACK 18.

```

```

;*****
TST14:

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3947 012264              BIT    2#BITS+(14*2),TSTNMS ;DO THIS TEST?
3948 012264 033737 001460 001260      BNE    64$          ;YES--BRANCH
3949 012272 001002              JMP    TST15          ;NO--GO TO THE NEXT TEST
3950 012274 000137 012620              MOV    2#RPT14,$TIMES ;GET THE ITERATION COUNT
3951 012300 013737 002320 001176 64$: MOV    #TEST14,2#$LPADR
3952 012306 012737 012344 001106      MOV    #TST14,2#$LPERR ;SETUP THE ERROR LOOP ADDRESS
3953 012314 012737 012264 001110      MOV    #14,2#$TSTNM    ;SET UP TEST NUMBER AND
3954 012322 012737 000014 001102              ;CLEAR THE ERROR FLAG ($ERFLG)
3955              ;LOAD THE TEST NUMBER INTO THE DISPLAY REGISTER
3956 012330 013737 001102 177570      MOV    $TSTNM,2#DISPLAY
3957 012336 012737 012616 001270      MOV    #EXIT14,2#BYPASS
3958 012344 012706 001100              MC      #STACK,SP ;SET THE STACK POINTER
3959 012350 004737 025406              JSR    PC,2#FILBUF    ;FILL THE BUFFER WITH TRACK ADDRESS
3960 012354 012737 000161 003556      MOV    #WRITE,2#DTADPB+2 ;COMMAND=WRITE DATA
3961 012362 013737 002322 003566      MOV    2#FC14,2#DTADPB+12 ;CYLINDER
3962 012370 113737 002324 003564      MOV    2#FS14,2#DTADPB+10 ;SECTOR
3963 012376 012737 177400 003560      MOV    #SCTRWC,2#DTADPB+4 ;WORD COUNT
3964 012404 012737 044134 003562      MOV    #BUFFER,2#DTADPB+6 ;BUFFER ADDRESS
3965 012412 005000              CLR    RO          ;TRACK=0
3966 012414 110037 003565 1$: MOV    RO,2#DTADPB+11 ;TRACK ADDRESS
3967 012420 004037 023342              JSR    RO,2#DRVCAL      ;START A DATA TRANSFER
3968 012424 062737 001000 003562      ADD    #10256*2,2#DTADPB+6 ;UPDATE BUFFER ADDRESS
3969 012432 005200              INC    RO          ;UPDATE TRACK NUMBER
3970 012434 022700 000023              CMP    #1019,RO      ;OUT OF TRACKS?

```

GO7

MAINDEC-11-DEPK-C "MECHANICAL AND READ/WRITE TEST"
DEPKC.P11 T14 TRACK ADDRESSING TEST

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3971	012440	003365		BGT	1\$	;NO--BRANCH
3972	012442	012737	044134 003562	MOV	#BUFFER,2#DTADPB+6	;BUFFER ADDRESS
3973	012450	005000		CLR	RO	
3974	012452	012737	000151 003556	MOV	#WRCKD,2#DTADPB+2	;COMMAND=WRITE CHECK
3975	012460	110037	003565 2\$:	MOVB	RO,2#DTADPB+11	;TRACK ADDRESS
3976	012464	004037	023342	JSR	RO,2#DRVCAL	;START A DATA TRANSFER
3977	012470	062737	001000 003562	ADD	#D256*2,2#DTADPB+6	;UPDATE BUFFER ADDRESS
3978	012476	005200		INC	RO	;UPDATE TRACK NUMBER
3979	012500	022700	000023	CMP	#D19,RO	;OUT OF TRACKS?
3980	012504	003365		BGT	2\$	;NO--BRANCH
3981	012506	005000		CLR	RO	;FIRST TRACK ADDRESS
3982	012510	110037	003565 3\$:	MOVB	RO,2#DTADPB+11	;TRACK
3983	012514	010001		MOV	RO,R1	;FORM BUFFER ADDRESS
3984	012516	012737	044134 003562	MOV	#BUFFER,2#DTADPB+6	;BUFFER ADDRESS
3985	012524	005301		DEC	R1	
3986	012526	002404		BLT	5\$	
3987	012530	062737	001000 003562	ADD	#D256*2,2#DTADPB+6	
3988	012536	000772		BR	4\$	
3989	012540	012737	000161 003556 5\$:	MOV	#WRITE,2#DTADPB+2	;COMMAND=WRITE DATA
3990	012546	004037	023342	JSR	RO,2#DRVCAL	;START A DATA TRANSFER
3991	012552	062737	001000 003562 6\$:	ADD	#D256*2,2#DTADPB+6	;UPDATE BUFFER ADDRESS
3992	012560	105237	003565	INCB	2#DTADPB+11	;MOVE TO NEXT TRACK
3993	012564	012737	000151 003556	MOV	#WRCKD,2#DTADPB+2	;COMMAND=WRITE CHECK DATA
3994	012572	004037	023342	JSR	RO,2#DRVCAL	;START A DATA TRANSFER
3995	012576	122737	000022 003565	CMPB	#D18,2#DTADPB+11	;OUT OF TRACKS?
3996	012604	003362		BGT	6\$	;NO--BRANCH
3997	012606	005200		INC	RO	;NEXT TRACK TO WRITE
3998	012610	022700	000022	CMP	#D18,RO	;OUT OF TRACKS?
3999	012614	003335		BGT	3\$	;NO--BRANCH
4000	012616	000004	EXIT14: SCOPE			

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.SBTTL *** DATA TEST (15) ***

;*TEST 15 DATA TEST

THIS TEST PERFORMS DATA STORAGE AND RETRIEVAL ON CYLINDERS
"FC" THROUGH "LC" BY THE INCREMENT "IC" USING THE DATA PATTERNS
SPECIFIED. THE FOLLOWING SEQUENCE OCCURS FOR EACH CYLINDER:

1. SET "NT" TO "FT" THEN REPEAT 2-4 UNTIL "NT" > "LT"
2. WRITE THEN WRITE CHECK "FS" THROUGH "LS" OF TRACK "NT"
3. READ THEN SOFTWARE COMPARE "FS" THROUGH "LS" OF TRACK "NT"
4. INCREMENT "NT" BY "IT"
5. REPEAT STEPS 1-4 FOR EACH DATA PATTERN
6. REPEAT STEPS 1-5 FOR "FC" THROUGH "LC" ADVANCING BY "IC"

IF A WRITE CHECK ERROR OCCURS THE ERROR IS REPORTED AND
THE TRACK IN ERROR IS REWRITTEN AND CHECKED. THIS CHECK IS
ACCOMPLISHED BY PERFORMING TWO(2) SUCCESSIVE ERROR FREE
WRITE CHECKS. IF THE CHECK FAILS THE ERROR IS REPORTED AS
FATAL AND NO READ OCCURS.

FS DEFAULTS TO 1 AND LS DEFAULTS TO 0
PAT DEFAULTS TO 177777 (ALL POSSIBLE PATTERNS)
THE POSSIBLE PATTERNS ARE:

PAT 0	PAT 1	PAT 2	PAT 3	PAT 4	PAT 5	PAT 6	PAT 7
165555	000001	177776	000000	000000	052525	007417	026455
133333	000003	177774	000000	010421	052525	007417	026455
165555	000007	177770	000000	021042	052525	007417	026455
133333	000017	177760	177777	031463	125252	170360	151322
165555	000037	177740	177777	042104	125252	170360	151322
133333	000077	177700	177777	052525	125252	170360	151322
165555	000177	177600	000000	063146	052525	007417	026455
133333	000277	177400	000000	073567	052525	007417	026455
165555	000777	177000	177777	104210	125252	170360	151322
133333	001777	176000	177777	114631	125252	170360	151322
165555	003777	174000	000000	125252	052525	007417	026455
133333	007777	170000	177777	135673	125252	170360	151322
165555	017777	160000	000000	146314	052525	007417	026455
133333	037777	140000	177777	156735	125252	170360	151322
165555	077777	100000	000000	167356	052525	007417	026455
133333	177777	000000	177777	177777	125252	170360	151322
PAT 8	PAT 9	PAT 10	PAT 11	PAT 12	PAT 13	PAT 14	PAT 15
165555	000001	177776	172666	077777	153333	000000	177777
133333	000002	177775	155555	137777	066667	177777	000000
165555	000004	177773	172666	157777	153333	177777	000000
133333	000010	177767	155555	167777	066667	177777	000000
165555	000020	177757	172666	173777	153333	177777	000000
133333	000040	177737	155555	175777	066667	177777	000000
165555	000100	177677	172666	176777	153333	177777	000000
133333	000200	177577	155555	177377	066667	177777	000000
165555	000400	177377	172666	177577	153333	177777	000000
133333	001000	176777	155555	177677	066667	177777	000000
165555	002000	175777	172666	177737	153333	177777	000000

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4057          : *      133333 004000 173777 155555 177757 066667 177777 000000
4058          : *      165555 010000 167777 172666 177767 153333 177777 000000
4059          : *      133333 020000 157777 155555 177773 066667 177777 000000
4060          : *      165555 040000 137777 172666 177775 153333 177777 000000
4061          : *      133333 100000 077777 155555 177776 066667 177777 000000
4062          : *
4063          : *
4064          : *****
4065          : ST15:
4066 012620      033737 001462 001260      BIT      @#BITS+(15*2),TSTNMS ;DO THIS TEST?
4067 012620      001002      BNE      64$      ;YES--BRANCH
4068 012630      000137 013260      JMP      TST16      ;NO--GO TO THE NEXT TEST
4069 012634      013737 002330 001176 64$:      MOV      @#RPT15,$TIMES ;GET THE ITERATION COUNT
4070 012642      012737 013004 001106      MOV      @#TEST15,@#SLPADR
4071 012650      012737 012620 001110      MOV      @#TEST15,@#SLPERR ;SETUP THE ERROR LOOP ADDRESS
4072 012656      012737 000015 001102      MOV      @#15,@#$TSTNM ;SET UP TEST NUMBER AND
4073          :          ;CLEAR THE ERROR FLAG ($ERFLG)
4074 012664      013737 001102 177570      MOV      $TSTNM,@#DISPLAY ;LOAD THE TEST NUMBER INTO THE DISPLAY REGISTER
4075 012672      005000      CLR      R0      ;CLEAR SWITCH
4076 012674      005004      CLR      R4      ;FORM WORD COUNT IN R4
4077 012676      013701 002350      MOV      @#LS15,R1
4078 012702      163701 002346      SUB      @#FS15,R1
4079 012706      002003      BGE      1$      ;BRANCH IF FS < OR = LS
4080 012710      062701 000026      ADD      @#D22,R1      ;MAKE DIFFERENCE POSITIVE
4081 012714      005100      COM      R0      ;SET SWITCH
4082 012716      062704 000400      1$:      ADD      @#D256,R4
4083 012722      005301      DEC      R1
4084 012724      002374      BGE      1$
4085 012726      005404      NEG      R4
4086 012730      010405      MOV      R4,R5      ;COPY NORMAL WORD COUNT INTO SMALL WC
4087 012732      005700      TST      R0      ;SWITCH SET?
4088 012734      001412      BEQ      3$      ;NO--BRANCH
4089 012736      005005      CLR      R5      ;FORM WORD COUNT FOR LS < FS
4090 012740      012701 000025      MOV      @#D21,R1
4091 012744      163701 002346      SUB      @#FS15,R1
4092 012750      062705 000400      2$:      ADD      @#D256,R5
4093 012754      005301      DEC      R1
4094 012756      002374      BGE      2$
4095 012760      005405      NEG      R5
4096 012762      113737 002346 003564 3$:      MOV      @#FS15,@#DTADPB+10 ;SECTOR
4097 012770      012737 044134 003562      MOV      @#BUFFER,@#DTADPB+6 ;DATA BUFFER
4098 012776      012737 013256 001270      MOV      @#EXIT15,@#BYPASS
4099 013004      005037 001352      TEST15: CLR      @#WCEFLG ;CLEAR THE WRITE CHECK ERROR FLAG
4100 013010      013701 002332      MOV      @#FC15,R1 ;PICKUP FIRST CYLINDER
4101 013014      000407      BR      2$
4102 013016      005720      1$:      TST      (R0)+ ;MOVE TO NEXT DATA PATTERN
4103 013020      022700 000040      CMP      @#D16*2,R0 ;OUT OF PATTERNS?
4104 013024      003004      BGT      3$      ;NO--BRANCH
4105 013026      004037 025356      JSR      R0,@#INCCYL ;MOVE TO NEXT CYLINDER
4106 013032      000511      BR      EXIT15 ;OUT OF CYLINDERS
4107 013034      005000      2$:      CLR      R0 ;START WITH PATTERN 0
4108 013036      036037 001430 002352 3$:      BIT      BITS(R0),@#PTRN15 ;THIS PATTERN SELECTED?
4109 013044      001764      BEQ      1$      ;NO--BRANCH
4110 013046      013702 002340      MOV      @#FT15,R2 ;FIRST TRACK
4111 013052      010137 003566      MOV      R1,@#DTADPB+12 ;CYLINDER
4112 013056      110237 003565      4$:      MOV      R2,@#DTADPB+11 ;TRACK

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4113	013062	010437	003560		MOV	R4,2#DTADPB+4	;WORD COUNT
4114	013066	022701	000632		CMP	#410.,R1	;LAST DISK CYLINDER?
4115	013072	003005			BGT	5\$	;NO--BRANCH
4116	013074	022702	000022		CMP	#18.,R2	;LAST DISK TRACK?
4117	013100	003002			BGT	5\$	;NO--BRANCH
4118	013102	010537	003560		MOV	R5,2#DTADPB+4	;SHORT WORD COUNT
4119	013106	013703	177570	5\$:	MOV	2#SWR,R3	;INHIBIT WRITE AND
4120	013112	005103			COM	R3	;WRITE CHECK?
4121	013114	032703	000030		BIT	#SW04!SW03,R3	
4122	013120	001424			BEQ	7\$	;YES--BRANCH
4123	013122	004737	026076		JSR	PC,2#SETBUF	;MOVE DATA PATTERN INTO THE BUFFER
4124	013126	032737	000020	177570	BIT	#SW04,2#SWR	;INHIBIT WRITE?
4125	013134	001005			BNE	6\$	;YES--BRANCH
4126	013136	012737	000161	003556	MOV	#WRITE,2#DTADPB+2	;COMMAND=WRITE DATA
4127	013144	004037	023342		JSR	RD,2#DRVCAL	;START A DATA TRANSFER
4128	013150	032737	000010	177570	BIT	#SW03,2#SWR	;INHIBIT WRITE CHECK?
4129	013156	001005			BNE	7\$	;YES--BRANCH
4130	013160	012737	000151	003556	MOV	#WRCKD,2#DTADPB+2	;COMMAND=WRITE CHECK DATA
4131	013166	004037	023342		JSR	RD,2#DRVCAL	;START A DATA TRANSFER
4132	013172	005737	001352		TST	2#WCEFLG	;WRITE CHECK ERROR FLAG SET?
4133	013176	001404			BEQ	8\$	;NO--BRANCH
4134	013200	032737	000001	177570	BIT	#SW00,2#SWR	;PERFORM READ AFTER FATAL "WCE"?
4135	013206	001417			BEQ	9\$	;NO--BRANCH
4136	013210	032737	000004	177570	BIT	#SW02,2#SWR	;INHIBIT READ DATA AND SOFTWARE COMPARE?
4137	013216	001013			BNE	9\$	;YES--BRANCH
4138	013220	012737	000171	003556	MOV	#READ,2#DTADPB+2	;COMMAND=READ
4139	013226	004037	023342		JSR	RD,2#DRVCAL	;START A DATA TRANSFER
4140	013232	032737	000002	177570	BIT	#SW01,2#SWR	;COMPARE THE DATA?
4141	013240	001002			BNE	9\$	;NO--BRANCH
4142	013242	004737	026206		JSR	PC,2#DATCMP	;YES--DO IT
4143	013246	004037	025326	9\$:	JSR	RD,2#INCTRK	;MOVE TO NEXT TRACK
4144	013252	000661			BR	1\$	;OUT OF TRACKS GO TO NEXT PATTERN
4145	013254	000700			BR	4\$	;LOOP
4146	013256	000004			EXIT15:	SCOPE	;SCOPE LOOP
4147							
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013260	033737	001464	001260
013266	001002		
013270	000137	013726	
013274	013737	002356	001176
013302	012737	013260	001106
013310	012737	013260	001110
013316	012737	000016	001102
013324	013737	001102	177570
013332	012737	013724	001270
013340	012737	176543	022022
013346	012737	123456	022024
013354	013737	002360	003566
013362	012737	165000	003560
013370	012737	044134	003562
013376	012737	000161	003556
013404	032737	100000	001246
013412	001022		
013414	004037	026562	
013420	005037	003564	
013424			
013424	004037	023342	
013430	105237	003565	
013434	122737	000023	003565
013442	003370		

.SBTTL *** EXERCISE TEST (16) ***

;TEST 16 RANDOM ADDRESS AND RANDOM PATTERN TEST (TST16)

;* STARTING AT "FC" AND GOING THROUGH "LC" THE DISK PACK
;* IS WRITTEN WITH A RANDOM PATTERN. THE FIRST TWO WORDS
;* OF EACH SECTOR WILL BE THE BASE OF THE RANDOM GENERATOR
;* FOR THAT SECTOR.
;* THE TEST THEN PERFORMS THE FOLLOWING SEQUENCE "R" TIMES
;* "R" DEFAULTS TO 20,000.

- 1) GENERATE A RANDOM ADDRESS
- 2) WRITE A RANDOM PATTERN AT THE ADDRESS
GENERATED IN 1.
- 3) GENERATE A RANDOM ADDRESS
- 4) READ THE SECTOR AT THE ADDRESS
GENERATED IN 3.
- 5) DO A SOFTWARE CHECK OF THE DATA READ IN 4.
- 6) DO A WRITE CHECK OF THE DATA WRITTEN IN 2
- 7) GENERATE A RANDOM ADDRESS
- 8) READ THE SECTOR AT THE ADDRESS
GENERATED IN 7.
- 9) DO A SOFTWARE CHECK OF THE DATA READ IN 8
- 10) DO A WRITE CHECK OF THE DATA WRITTEN IN 2

TST16:

BIT	2#BITS+(16*2),TSTNMS ;DO THIS TEST?
BNE	64\$;YES--BRANCH
JMP	TST17 ;NO--GO TO THE NEXT TEST
64\$: MOV	2#RPT16,\$TIMES ;GET THE ITERATION COUNT
MOV	2#TST16,2#SLPADR ;SETUP THE SCOPE LOOP ADDRESS
MOV	2#TST16,2#SLPERR ;SETUP THE ERROR LOOP ADDRESS
MOV	2#16,2#\$TSTNM ;SET UP TEST NUMBER AND
	;CLEAR THE ERROR FLAG (\$ERFLG)
	;LOAD THE TEST NUMBER INTO THE DISPLAY REGISTER
MOV	\$TSTNM,2#DISPLAY
MOV	2#EXIT16,2#BYPASS
MOV	2#176543,2#\$HINUM ;PRIME THE RANDOM NUMBER GENERATOR
MOV	2#123456,2#\$LONUM
MOV	2#FC16,2#DTADPB+12 ;CYLINDER
MOV	2#TRACKWC,2#DTADPB+4 ;WORD COUNT
MOV	2#BUFFER,2#DTADPB+6 ;BUFFER ADDRESS
MOV	2#WRITE,2#DTADPB+2 ;COMMMAND
BIT	2#SW15,2#C.SWR ;WRITE THE DISK PACK BEFORE TESTING?
BNE	3\$;NO--BRANCH
JSR	RD,2#FILRAN ;FILL DATA BUFFER WITH RANDOM DATA
1\$: CLR	2#DTADPB+10 ;SECTOR AND TRACK
2\$: JSR	RD,2#DRVCAL ;START A DATA TRANSFER
INCB	2#DTADPB+11 ;NEXT TRACK
CMPB	2#1019,2#DTADPB+11 ;TIME FOR NEXT CYLINDER
BGT	2\$;NO--BRANCH

L07

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 DERPKC.P11 T16 RANDOM ADDRESS AND RANDOM PATTERN TEST (TST16)

4209	013444	005237	003566		INC	Q#DTADPB+12
4210	013450	023737	002362	003566	CMP	Q#LC16, Q#DTADPB+12 ; OUT OF CYLINDERS?
4211	013456	002360			BGE	1\$; NO--BRANCH
4212	013460	012737	177400	003560	3\$: MOV	#SCTRWC, Q#DTADPB+4 ; WORD COUNT
4213	013466	012737	013502	001106	MOV	#TEST16, Q#SLPADR
4214	013474	012737	013502	001110	MOV	#TEST16, Q#SLPERR
4215	013502	012706	001100		TEST16: MOV	#STACK SP ; SET STACK POINTER
4216	013506	004037	027122		JSR	RO, Q#RANADR ; GENERATE A RANDOM ADDRESS
4217	013512	013737	003564	001356	MOV	Q#DTADPB+10, Q#SVADR ; SAVE THE TRACK/SECTOR
4218	013520	013737	003566	001360	MOV	Q#DTADPB+12, Q#SVADR+2 ; SAVE THE CYLINDER
4219	013526	012737	000161	003556	MOV	#WRITE, Q#DTADPB+2 ; COMMAND=WRITE DATA
4220	013534	012701	044134		MOV	#BUFFER, R1 ; BUFFER ADDRESS
4221	013540	010137	003562		MOV	R1, Q#DTADPB+6
4222	013544	004037	027066		JSR	RO, Q#RANPAT ; GENERATE RANDOM PATTERN
4223	013550	004037	023342		JSR	RO, Q#DRVCAL ; START A DATA TRANSFER
4224	013554	004037	027122		JSR	RO, Q#RANADR
4225	013560	012737	000171	003556	MOV	#READ, Q#DTADPB+2 ; COMMAND=READ DATA
4226	013566	012737	045134	003562	MOV	#BUFFER+512., Q#DTADPB+6 ; BUFFER ADDRESS
4227	013574	004037	023342		JSR	RO, Q#DRVCAL ; START A DATA TRANSFER
4228	013600	004037	026620		JSR	RO, Q#RANCK ; CHECK THE DATA
4229	013604	013737	001356	003564	MOV	Q#SVADR, Q#DTADPB+10 ; GET ADDRESS OF WHERE THE LAST
4230	013612	013737	001360	003566	MOV	Q#SVADR+2, Q#DTADPB+12 ; WRITE WAS PERFORMED
4231	013620	012737	000151	003556	MOV	#WRCKD, Q#DTADPB+2 ; COMMAND=WRITE CHECK DATA
4232	013626	012737	044134	003562	MOV	#BUFFER, Q#DTADPB+6 ; DATA BUFFER ADDRESS
4233	013634	004037	023342		JSR	RO, Q#DRVCAL ; START A DATA TRANSFER
4234	013640	004037	027122		JSR	RO, Q#RANADR ; GENERATE A RANDOM ADDRESS
4235	013644	012737	000171	003556	MOV	#READ, Q#DTADPB+2 ; COMMAND=READ
4236	013652	012737	045134	003562	MOV	#BUFFER+512., Q#DTADPB+6 ; DATA BUFFER ADDRESS
4237	013660	004037	023342		JSR	RO, Q#DRVCAL ; START A DATA TRANSFER
4238	013664	004037	026620		JSR	RO, Q#RANCK ; CHECK THE DATA
4239	013670	013737	001356	003564	MOV	Q#SVADR, Q#DTADPB+10 ; GET DISK ADDRESS OF THE
4240	013676	013737	001360	003566	MOV	Q#SVADR+2, Q#DTADPB+12 ; LAST WRITE
4241	013704	012737	000151	003556	MOV	#WRCKD, Q#DTADPB+2 ; COMMAND=WRITE CHECK DATA
4242	013712	012737	044134	003562	MOV	#BUFFER, Q#DTADPB+6 ; DATA BUFFER ADDRESS
4243	013720	004037	023342		JSR	RO, Q#DRVCAL ; START A DATA TRANSFER
4244	013724	000004			EXIT16: SCOPE	; LOOP

M07

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*** DATA TEST WITH ALL MEMORY (17) ***

.SBTTL *** DATA TEST WITH ALL MEMORY (17) ***

;*****
;*TEST 17 DATA TEST WITH ALL MEMORY

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;* THIS TEST PERFORMS DATA STORAGE AND RETRIEVAL ON CYLINDERS
;* 409 THROUGH 410 USING THE DATA PATTERNS
;* SPECIFIED. THE FOLLOWING SEQUENCE OCCURS FOR EACH CYLINDER:
;* 1. SET "NT" TO "FT" THEN REPEAT 2-4 UNTIL "NT" > "LT"
;* 2. WRITE THEN WRITE CHECK "FS" THROUGH "LS" OF TRACK "NT"
;* 3. READ THEN SOFTWARE COMPARE "FS" THROUGH "LS" OF TRACK "NT"
;* 4. INCREMENT "NT" BY "IT"
;* 5. REPEAT STEPS 1-4 FOR EACH DATA PATTERN
;* 6. REPEAT STEPS 1-5 FOR "FC" THROUGH "LC" ADVANCING BY "IC"

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;* IF A WRITE CHECK ERROR OCCURS THE ERROR IS REPORTED AND
;* THE TRACK IN ERROR IS REWRITTEN AND CHECKED. THIS CHECK IS
;* ACCOMPLISHED BY PERFORMING TWO(2) SUCCESSIVE ERROR FREE
;* WRITE CHECKS. IF THE CHECK FAILS THE ERROR IS REPORTED AS
;* FATAL AND NO READ OCCURS.
;* FS DEFAULTS TO 1 AND LS DEFAULTS TO 0
;* PAT DEFAULTS TO 177777 (ALL POSSIBLE PATTERNS)
;* THE POSSIBLE PATTERNS ARE:

```

PAT 0	PAT 1	PAT 2	PAT 3	PAT 4	PAT 5	PAT 6	PAT 7
165555	000001	177776	000000	000000	052525	007417	026455
133333	000003	177774	000000	010421	052525	007417	026455
165555	000007	177770	000000	021042	052525	007417	026455
133333	000017	177760	177777	031462	125252	170360	151322
165555	000037	177740	177777	042104	125252	170360	151322
133333	000077	177700	177777	052525	125252	170360	151322
165555	000177	177600	000000	063146	052525	007417	026455
133333	000377	177400	000000	073567	052525	007417	026455
165555	000777	177000	177777	104210	125252	170360	151322
133333	001777	176000	177777	114631	125252	170360	151322
165555	003777	174000	000000	125252	052525	007417	026455
133333	007777	170000	177777	135673	125252	170360	151322
165555	017777	160000	000000	146314	052525	007417	026455
133333	037777	140000	177777	156735	125252	170360	151322
165555	077777	100000	000000	167356	052525	007417	026455
133333	177777	000000	177777	177777	125252	170360	151322

;*****
;*TEST 17:

```

BIT      @#BITS+<17*2>,TSTNMS ;DO THIS TEST?
BNE      64$                     ;YES--BRANCH
JMP      $EOP                     ;NO--GO TO THE END OF THE PROGRAM
64$:     MOV      @#RPT17,$TIMES ;GET THE ITERATION COUNT
MOV      @#TEST17,@#SLPADR
MOV      @#TST17,@#SLPERR ;SETUP THE ERROR LOOP ADDRESS
MOV      @#17,@#$TSTNM          ;SET UP TEST NUMBER AND
                                ;CLEAR THE ERROR FLAG ($ERFLG)
MOV      $TSTNM,@#DISPLAY      ;LOAD THE TEST NUMBER INTO THE DISPLAY REGISTER
;*****

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4290 013726
4291 013726 033737 001466 001260
4292 013734 001002
4293 013736 000137 014744
4294 013742 013737 001244 001176
4295 013750 012737 014424 001106
4296 013756 012737 013726 001110
4297 013764 012737 000017 001102
4298
4299 013772 013737 001102 177570
4300

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4301 ;*****
4302 ;*****
4303 ;*****
4304 ;*****
4305 ;*****
4306 ;*****
4307 ;*****
4308 ;*****
4309 014000 032737 100000 022064 BIT #100000,SKT11
4310 014006 001002 BNE 1$
4311 014010 000137 014744 JMP $EOP
4312 014014 1$: CLR KIPAR0
4313 014014 005037 172340 MOV #200,KIPAR1
4314 014020 012737 000200 172342 MOV #400,KIPAR2
4315 014026 012737 000400 172344 MOV #600,KIPAR3
4316 014034 012737 000600 172346 MOV #1000,KIPAR4
4317 014042 012737 001000 172350 MOV #1200,KIPAR5
4318 014050 012737 001200 172352 MOV #1400,KIPAR6
4319 014056 012737 001400 172354 MOV #17600,KIPAR7
4320 014064 012737 177600 172356
4321
4322
4323 014072 012746 077406 MOV #77406,-(SP)
4324 014076 011637 172300 MOV (SP),KIPDR0
4325 014102 011637 172302 MOV (SP),KIPDR1
4326 014106 011637 172304 MOV (SP),KIPDR2
4327 014112 011637 172306 MOV (SP),KIPDR3
4328 014116 011637 172310 MOV (SP),KIPDR4
4329 014122 011637 172312 MOV (SP),KIPDR5
4330 014126 011637 172314 MOV (SP),KIPDR6
4331 014132 011637 172316 MOV (SP),KIPDR7
4332
4333
4334 014136 012737 000020 172516 MOV #20,SR3
4335 014144 012737 000001 177572 MOV #1,SRO
4336 014152 012737 044134 001212 T15.1: MOV #BUFFER,BUF
4337 014160 032737 017776 001212 BIT #17776,BUF
4338 014166 001406 BEQ 4$
4339 014170 062737 020000 001212 ADD #20000,BUF
4340 014176 042737 017776 001212 BIC #17776,BUF
4341 014204 013746 001212 4$: MOV BUF,-(SP)
4342 014210 000316 SWAB (SP)
4343 014212 006216 ASR (SP)
4344 014214 006216 ASR (SP)
4345 014216 006216 ASR (SP)
4346 014220 006216 ASR (SP)
4347 014222 006216 ASR (SP)
4348 014224 005037 001220 CLR TEMP3
4349 014230 005037 172352 CLR KIPAR5
4350 014234 062737 000200 172352 5$: ADD #200,KIPAR5
4351 014242 005237 001220 INC TEMP3
4352 014246 005316 DEC (SP)
4353 014250 001371 BNE 5$
4354 014252 005726 TST (SP)+
4355 014254 013737 172354 MOV KIPAR5,KIPAR6
4356 014262 062737 000200 172354 ADD #200,KIPAR6

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4357	014270	013737	001214	001216		MOV	TEMP1,TEMP2	
4358	014276	162737	000003	001216		SUB	#3,TEMP2	
4359	014304	012737	120000	001212	T15.2:	MOV	#120000,BUF	
4360	014312	005000				CLR	R0	;CLEAR SWITCH
4361	014314	005004				CLR	R4	;FORM WORD COUNT IN R4
4362	014316	013701	002350			MOV	#LS15,R1	
4363	014322	163701	002346			SUB	#FS15,R1	
4364	014326	002003				BGE	1\$	;BRANCH IF FS < OR = LS
4365	014330	062701	000026			ADD	#1022,R1	;MAKE DIFFERENCE POSITIVE
4366	014334	005100				COM	R0	;SET SWITCH
4367	014336	062704	000400		1\$:	ADD	#10256,R4	
4368	014342	005301				DEC	R1	
4369	014344	002374				BGE	1\$	
4370	014346	005404				NEG	R4	
4371	014350	010405				MOV	R4,R5	;COPY NORMAL WORD COUNT INTO SMALL WC
4372	014352	005700				TST	R0	;SWITCH SET?
4373	014354	001412				BEQ	3\$	;NO--BRANCH
4374	014356	005005				CLR	R5	;FORM WORD COUNT FOR LS < FS
4375	014360	012701	000025			MOV	#1021,R1	
4376	014364	163701	002346			SUB	#FS15,R1	
4377	014370	062705	000400		2\$:	ADD	#10256,R5	
4378	014374	005301				DEC	R1	
4379	014376	002374				BGE	2\$	
4380	014400	005405				NEG	R5	
4381	014402	113737	002346	003564	3\$:	MOV	#FS15,#DTADPB+10	;SECTOR
4382	014410	013737	001212	003562		MOV	BUF,#DTADPB+6	;DATA BUFFER
4383	014416	012737	014676	001270		MOV	#EXIT17,#B.PASS	
4384	014424	005037	001352		TEST17:	CLR	#WCEFLG	;CLEAR THE WRITE CHECK ERROR FLAG
4385	014430	012701	000631			MOV	#409.,R1	;PICKUP FIRST CYLINDER
4386	014434	000407				BR	2\$	
4387	014436	005720			1\$:	TST	(R0)+	;MOVE TO NEXT DATA PATTERN
4388	014440	022700	000020			CMP	#108*2,R0	;OUT OF PATTERNS?
4389	014444	003004				BGT	3\$	;NO--BRANCH
4390	014446	004037	025356			JSR	R0,#INCCYL	;MOVE TO NEXT CYLINDER
4391	014452	000511				BR	EXIT17	;OUT OF CYLINDERS
4392	014454	005000			2\$:	CLR	R0	;START WITH PATTERN 0
4393	014456	036037	001430	002352	3\$:	BIT	BITS(R0),#PTRN15	;THIS PATTERN SELECTED?
4394	014464	001764				BEQ	1\$	;NO--BRANCH
4395	014466	013702	002340			MOV	#FT15,R2	;FIRST TRACK
4396	014472	010137	003566			MOV	R1,#DTADPB+12	;CYLINDER
4397	014476	110237	003565		4\$:	MOVB	R2,#DTADPB+11	;TRACK
4398	014502	010437	003560			MOV	R4,#DTADPB+4	;WORD COUNT
4399	014506	022701	000632			CMP	#410.,R1	;LAST DISK CYLINDER?
4400	014512	003005				BGT	5\$	;NO--BRANCH
4401	014514	022702	000022			CMP	#18.,R2	;LAST DISK TRACK?
4402	014520	003002				BGT	5\$	;NO--BRANCH
4403	014522	010537	003560			MOV	R5,#DTADPB+4	;SHORT WORD COUNT
4404	014526	013703	177570		5\$:	MOV	#SWR,R3	;INHIBIT WRITE AND
4405	014532	005103				COM	R3	;WRITE CHECK?
4406	014534	032703	000030			BIT	#SW04!SW03,R3	
4407	014540	001424				BEQ	7\$	;YES--BRANCH
4408	014542	004737	026076			JSR	PC,#SETBUF	;MOVE DATA PATTERN INTO THE BUFFER
4409	014546	032737	000020	177570		BIT	#SW04,#SWR	;INHIBIT WRITE?
4410	014550	001005				BNE	6\$	;YES--BRANCH
4411	014556	012737	000161	003556		MOV	#WRITE,#DTADPB+2	;COMMAND=WRITE DATA
4412	014564	004037	023342			JSR	R0,#DRVCAL	;START A DATA TRANSFER

4413	014570	032737	000010	177570	65:	BIT	#SW03,2#SWR	:INHIBIT WRITE CHECK?
4414	014576	001005				BNE	75	:YES--BRANCH
4415	014600	012737	000151	003556		MOV	#WRCKD,2#DTA)PB+2	:COMMAND=WRITE CHECK DATA
4416	014606	004037	023342			JSR	RO,2#DRVCAL	:START A DATA TRANSFER
4417	014612	005737	001352		75:	TST	2#WCEFLG	:WRITE CHECK ERROR FLAG SET?
4418	014616	001404				BEQ	85	:NO--BRANCH
4419	014620	032737	000001	177570		BIT	#SW00,2#SWR	:PERFORM READ AFTER FATAL "WCE"?
4420	014626	001417				BEQ	95	:NO--BRANCH
4421	014630	032737	000004	177570	85:	BIT	#SW02,2#SWR	:INHIBIT READ DATA AND SOFTWARE COMPARE?
4422	014636	001013				BNE	95	:YES--BRANCH
4423	014640	012737	000171	003556		MOV	#READ,2#DTADPE+2	:COMMAND=READ
4424	014646	004037	023342			JSR	RO,2#DRVCAL	:START A DATA TRANSFER
4425	014652	032737	000002	177570		BIT	#SW01,2#SWR	:COMPARE THE DATA?
4426	014660	001002				BNE	95	:NO--BRANCH
4427	014662	004737	026206			JSR	PC,2#DATCMP	:YES--DO IT
4428	014666	004037	025326		95:	JSR	RO,2#INCTRK	:MOVE TO NEXT TRACK
4429	014672	000661				BR	15	:OUT OF TRACKS GO TO NEXT PATTERN
4430	014674	000700				BR	45	:LOOP
4431	014676	023737	001216	001220	EXIT:17:	CMP	TEMP2,TEMP3	
4432	014704	002002				BGE	15	
4433	014706	000137	014736			JMP	25	
4434	014712	005277	001220		15:	INC	TEMP3	
4435	014716	062737	000200	172352		ADD	#200,KIPAR5	
4436	014724	062737	000200	172354		ADD	#200,KIPAR6	
4437	014732	000137	014304			JMP	T15.2	
4438	014736				25:			
4439	014736	000004				SCOPE		:SCOPE LOOP
4440	014740	005037	177572			CLR	SRO	

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4452 014744
4453 014744 104400 014752
4454 014750 000410
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4456 014772
4457 014772 005737 001256
4458 014776 001434
4459 015000 104400 015006
4460 015004 000405
4461
4462 015020
4463 015020 013746 001272
4464 015024 104404
4465 015026 002
4466 015027 000
4467 015030 104400 015036
4468 015034 000412
4469
4470 015062
4471 015062 013746 001112
4472 015066 104402
4473 015070 005037 001112
4474 015074 005037 001102
4475 015100 005037 001176
4476 015104 005237 001100
4477 015110 042737 100000 001100
4478 015116 005327
4479 015120 000010
4480 015122 003036
4481 015124 012737
4482 015126 000010
4483 015130 015120
4484 015132 104400 015140
4485 015136 000407
4486
4487 015156
4488 015156 104400 015224
4489 015162 013700 000042
4490 015166 001414
4491 015170 022700 015210
4492 015174 001005
4493 015176 022760 177777 000002
4494 015204 001005
4495 015206 000005
4496 015210 004710

;*****
.SBTTL END OF PASS ROUTINE

;*INCREMENT THE PASS NUMBER ($PASS)
;*INDICATE END-OF-PROGRAM AFTER 8. PASSES THRU THE PROGRAM
;*IF THERES A MONITOR GO TO IT
;*IF THERE ISN'T JUMP TO RESTART

SEOP:
    TYPE      6,+4      ;;TYPE ASCIZ STRING
    BR        64$      ;;GET OVER THE ASCIZ
    ;;.ASCIZ      <15><12><12>/END OF PASS/

64$:
    TST       2#DRVSEL   ;ANY DRIVES SELECTED?
    BEQ       1$         ;NO--BRANCH
    TYPE      6,+4      ;;TYPE ASCIZ STRING
    BR        65$      ;;GET OVER THE ASCIZ
    ;;.ASCIZ      / ON DRIVE/

65$:
    MOV       2#CHKDRV,-(SP) ;;SAVE 2#CHKDRV FOR TYPEOUT
    TYP0C     ;;GO TYPE--OCTAL ASCII
    .BYTE     2         ;TYPE 2 DIGIT(S)
    .BYTE     0         ;SUPPRESS LEADING ZEROS
    TYPE      6,+4      ;;TYPE ASCIZ STRING
    BR        66$      ;;GET OVER THE ASCIZ
    ;;.ASCIZ      / ERRORS DETECTED=/

66$:
    MOV       2#$ERTTL,-(SP) ;;SAVE 2#$ERTTL FOR TYPEOUT
    TYP0C     ;;GO TYPE--OCTAL ASCII(ALL DIGITS)

1$:
    CLR       2#$ERTTL   ;ZERO ERROR TOTAL
    CLR       $STNM      ;ZERO THE TEST NUMBER
    CLR       $TIMES     ;ZERO THE NUMBER OF ITERATIONS
    INC       $PASS      ;INCREMENT THE PASS NUMBER
    BIC       #100000,$PASS ;;DON'T ALLOW A NEG. NUMBER
    DEC       (PC)+      ;;LOOP?

SEOPCT: .WORD      8.
    BGT       $DOAGN     ;;YES
    MOV       (PC)+,2(PC)+ ;;RESTORE COUNTER

SENDCT: .WORD      8.
    SEOPCT
    TYPE      6,+4      ;;TYPE ASCIZ STRING
    BR        64$      ;;GET OVER THE ASCIZ
    ;;.ASCIZ      <15><12>/END OF TEST/

64$:
    TYPE      $ENULL     ;TYPE NULL CHARACTER
    $GET42: MOV     2#42,R0 ;;GET MONITOR ADDRESS
    BEQ       $DOAGN     ;BRANCH IF NO MONITOR
    CMP       #SENDAD,R0 ;IS MONITOR ACT11?
    BNE       $ENDAD     ;NO--BRANCH
    CMP       #-1,2(R0)  ;YES--IS THIS THE LAST PASS?
    BNE       $DOAGN     ;NO--MAKE ANOTHER PASS
    RESET
    $ENDAD: JSR      PC,(R0) ;;CLEAR THE WORLD
    ;;GO TO MONITOR

```

E08

MAINDEC-11-DERPK-C "MECHANICAL AND READ WRITE TEST"
DERPKC.P11 END OF PASS ROUTINE

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4497	015212	000240		NOP		::SAVE ROOM
4498	015214	000240		NOP		::FOR
4499	015216	000240		NOP		::ACT11
4500	015220	000137	005344	SDOAGN: JMP	0#RESTART	::RETURN
4501	015224	377	377	000 SENUALL: .BYTE	-1,-1,0	::NULL CHARACTER STRING
4502		015230		.EVEN		

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4520 015230
4521 015230 032737 000400 177570
4522 015236 001411
4523 015240 005737 001254
4524 015244 001406
4525 015246 013737 001414 001142
4526 015254 013737 001416 001144
4527 015262 105237 001103
4528 015266 001775
4529 015270 013737 001102 177570
4530 015276 032737 002000 177570
4531 015304 001402
4532 015306 104400 001202
4533 015312 005237 001112
4534 015316 011637 001116
4535 015322 162737 000002 001116
4536 015330 117737 163562 001114
4537 015336 032737 020000 177570
4538 015344 001004
4539 015346 004737 015432
4540 015352 104400 001207
4541 015356 005737 177570
4542 015362 100001
4543 015364 000000
4544 015366 032737 001000 177570
4545 015374 001402
4546 015376 013716 001110
4547 015402 005737 001200
4548 015406 001402
4549 015410 013716 001200
4550 015414
4551 015414 013737 001410 001142
4552 015422 013737 001412 001144
4553 015430 000002
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.SBTTL *** SUBROUTINES ***
;*****
.SBTTL ERROR HANDLER ROUTINE
; *THIS ROUTINE WILL INCREMENT THE ERROR FLAG AND THE ERROR COUNT,
; *SAVE THE ERROR ITEM NUMBER AND THE ADDRESS OF THE ERROR CALL
; *AND GO TO TYPERR ON ERROR
; *THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
; *SW15=1 HALT ON ERROR
; *SW13=1 INHIBIT ERROR TYPEOUTS
; *SW10=1 BELL ON ERROR
; *SW09=1 LOOP ON ERROR
; *CALL
; * ERROR N ;;ERROR=EMT AND N=ERROR ITEM NUMBER

$ERROR:
BIT #SW08,2#SWR ;SEND ERROR MESSAGE TO TTY?
BEQ 7$ ;YES--BRANCH
TST 2#LPTAVL ;IS THERE A LINE PRINTER AVAILABLE?
BEQ 7$ ;NO--BRANCH
MOV 2#LPS,2#STPS ;YES--SETUP STATUS
MOV 2#LPB,2#STPB ;AND BUFFER REG.'S FOR LINE PRINTER
7$: INCB $ERFLG ;SET THE ERROR FLAG
BEQ 7$ ;DON'T LET THE FLAG GO TO ZERO
MOV $STNM,2#DISPLAY ;DISPLAY TEST NUMBER AND ERROR FLAG
BIT #BIT10,2#SWR ;BELL ON ERROR?
BEQ 1$ ;NO - SKIP
TYPE $BELL ;RING BELL
1$: INC $ERTTL ;COUNT THE NUMBER OF ERRORS
MOV (SP), $ERRPC ;GET ADDRESS OF ERROR INSTRUCTION
SUB #2, $ERRPC
MOVB $ERRPC, $ITEMB ;STRIP AND SAVE THE ERROR ITEM CODE
BIT #BIT13,2#SWR ;SKIP TYPEOUT IF SET
BNE 2$ ;SKIP TYPEOUTS
JSR PC,2#TYPERR ;GO TO USER ERROR ROUTINE
TYPE $CRLF
2$: TST 2#SWR ;HALT ON ERROR
BPL 3$ ;SKIP IF CONTINUE
HALT ;HALT ON ERROR!
3$: BIT #BIT09,2#SWR ;LOOP ON ERROR SWITCH SET?
BEQ 4$ ;BR IF NO
MOV $LPERR, (SP) ;FUDGE RETURN FOR LOOPING
4$: TST $ESCAPE ;CHECK FOR AN ESCAPE ADDRESS
BEQ 5$ ;BR IF NONE
MOV $ESCAPE, (SP) ;FUDGE RETURN ADDRESS FOR ESCAPE
5$: MOV 2#TPS,2#STPS ;SET STATUS AND BUFFER REG.'S
MOV 2#TPB,2#STPB ;FOR TTY
RTI ;RETURN FROM ERROR CALL

;*****
.SBTTL TYPERR - TYPE ERROR ROUTINE
; *THIS ROUTINE USES THE "ITEM CONTROL BYTE" ($ITEMB) TO DETERMINE
; *WHICH ERROR IS TO BE REPORTED, IT THEN OBTAINS, FROM THE "ERROR

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4559      ;*TABLE" ($ERRTB), AND REPORTS THE APPROPRIATE INFORMATION
4560      ;*CONCERNING THE ERROR.
4561      ;*CALL
4562      ;*      JSR      PC,2#TYPERR
4563      ;*      RETURN
4564
4565      015432 113737 001102 001170 TYPERR: MOVB 2#STSTNM,2#STMP0 ;SAVE THE TEST NUMBER
4566      015440 004037 037744      JSR      R0,2#SAVR05 ;SAVE R0-R5
4567      015444 162700 000004      SUB      #4,R0 ;FORM TEST PC
4568      015450 010037 001154      MOV      R0,2#$REG0 ;COPY R0-R5 IN $REG0-$REG5
4569      015454 010137 001156      MOV      R1,2#$REG1
4570      015460 010237 001160      MOV      R2,2#$REG2
4571      015464 010337 001162      MOV      R3,2#$REG3
4572      015470 010437 001164      MOV      R4,2#$REG4
4573      015474 010537 001166      MOV      R5,2#$REG5
4574      015500 113700 001114      MOVB 2#$ITEMB,R0 ;PICKUP ERROR ITEM NUMBER
4575      015504 010001      MOV      R0,R1 ;AND COPY IT INTO R1
4576      015506 005300      DEC      R0 ;FORM INDEX FOR ERROR TABLE
4577      015510 106300      ASLB      R0
4578      015512 106300      ASLB      R0
4579      015514 106300      ASLB      R0
4580      015516 103002      BCC      1$ ;IS ERROR > 37?
4581      015520 062700 000220      ADD      #ITEM41-$ERRTB,R0 ;YES--FORM OFFSET
4582      015524 062700 003644      1$: ADD      $ERRTB,R0 ;FORM ADDRESS
4583      015530 012037 015544      MOV      (R0)+,2$ ;GET ERROR MESSAGE (EM) POINTER
4584      015534 001447      BEQ      7$ ;BRANCH IF THERE ISN'T ONE
4585      015536 104400 001207      TYPE      ,SCRLF ;"CARRIAGE RETURN - LINE FEED"
4586      015542 104400
4587      015544 000000      2$: .WORD      0 ;"EM" POINTER GOES HERE
4588      015546 162701 000041      SUB      #41,R1 ;SPECIAL ERROR ITEM NUMBER?
4589      015552 100440      BMI      7$ ;NO--BRANCH
4590      015554 013701 001276      MOV      2#SVSTAT,R1 ;GET STATUS/ERROR INDICATOR
4591      015560 106301      ASLB      R1 ;STRIP "DONE" BIT (BIT07)
4592      015562 006301      ASL      R1 ;STRIP "ERROR" BIT (BIT15)
4593      015564 012702 001622      MOV      #STATBL,R2 ;1ST ADDRESS ON STATUS MESSAGE POINTERS
4594      015570 005003      CLR      R3 ;CARRIAGE RETURN-LINE FEED SWITCH
4595      015572 104400 015600      TYPE      ,+4 ;TYPE ASCIZ STRING
4596      015576 000402      BR      64$ ;GET OVER THE ASCIZ
4597      ;;.ASCIZ      / (/
4598      015604
4599      015604 012237 015626      64$: MOV      (R2)+,5$ ;MESSAGE POINTER
4600      015610 006301      3$: ASL      R1 ;TYPE THIS MESSAGE?
4601      015612 103013      BCC      6$ ;NO--BRANCH
4602      015614 005103      COM      R3 ;YES--TYPE A "CR" & "LF"?
4603      015616 001002      BNE      4$ ;NO--BRANCH
4604      015620 104400 001207      TYPE      ,SCRLF ;YES
4605      015624 104400      4$: TYPE
4606      015626 000000      5$: .WORD      0 ;MESSAGE POINTER GOES HERE
4607      015630 005701      TST      R1 ;MORE TO TYPE?
4608      015632 001403      BEQ      6$ ;NO--BRANCH
4609      015634 104400 040612      TYPE      ,MSG.SP ;YES--SPACES
4610      015640 000761      BR      3$ ;LOOP
4611      015642 001360      6$: BNE      3$ ;BRANCH IF NOT FINISHED
4612      015644 104400 015652      TYPE      ,+4 ;TYPE ASCIZ STRING
4613      015650 000401      BR      65$ ;GET OVER THE ASCIZ
4614      ;;.ASCIZ      //

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4615 015654 122737 000002 001114 65$: CMPB #2,SITEMB
4616 015654 001421 7$: BEQ 25$
4617 015662 122737 000010 001114 CMPB #10,SITEMB
4618 015664 001415 BEQ 25$
4619 015672 122737 000017 001114 CMPB #17,SITEMB
4620 015674 001411 BEQ 25$
4621 015702 122737 000042 001114 CMPB #42,SITEMB
4622 015704 001405 BEQ 25$
4623 015712 122737 000043 001114 CMPB #43,SITEMB
4624 015714 001401 BEQ 25$
4625 015722 000436 BR 26$
4626 015724 005737 001234 25$: TST TEMP10
4627 015726 001C33 BNE 26$
4628 015732 010446 MOV R4,-(SP)
4629 015734 013704 032360 MOV RPADR,R4
4630 015736 104400 015750 TYPE +4
4631 015742 000405 BR 66$ ;;TYPE ASCIZ STRING
4632 015746 000405 ;;GET OVER THE ASCIZ
4633 65$: ;;.ASCIZ <15><12>/RHBAE= /
4634 015762 016446 000050 MOV RHBAE(R4),-(SP)
4635 015762 104402 TYPQC
4636 015766 104400 015776 TYPE +4 ;;TYPE ASCIZ STRING
4637 015770 000406 BR 67$ ;;GET OVER THE ASCIZ
4638 015774 000406 ;;.ASCIZ / RHCS3= /
4639 67$: MOV RHCS3(R4),-(SP)
4640 016012 016446 000052 TYPQC
4641 016012 104402 MOV (SP)+,R4
4642 016016 012604 26$: MOV (R0)+,R5 ;;PICK UP DATA HEADER (DH) POINTER
4643 016020 012037 016036 BEQ 9$ ;;BRANCH IF NONE
4644 016022 001404 TYPE ,SCRLF ;;CARRIAGE RETURN-LINE FEED
4645 016026 104400 001207 TYPE
4646 016030 104400 8$: .WORD 0 ;;"DH" POINTER GOES HERE
4647 016034 000000 9$: MOV (R0)+,R1 ;;PICKUP DATA TABLE (DT) POINTER
4648 016036 012001 BEQ 20$ ;;BRANCH IF NONE
4649 016040 001500 CLR R5 ;;SET INDENT SWITCH
4650 016042 005005 MOV (R0)+,R0 ;;DATA FORMAT (DF) POINTER
4651 016044 012000 MOV (R0)+,R2 ;;NUMBER OF DH'S TO TYPE
4652 016046 012002 BEQ 17$ ;;BRANCH IF DH NUMBER IS 0
4653 016050 001471 COM R5 ;;NO INDENT
4654 016052 005105 TYPE ,SCRLF ;;CARRIAGE RETURN-LINE FEED
4655 016054 104400 001207 10$: MOVB (R0)+,R3 ;;NUMBER OF DATA WORDS TO TYPE
4656 016056 112003 MOVB (R0)+,R4 ;;AND HOW TO TYPE THEM
4657 016062 112004 11$: ROR R4 ;;OCTAL OR DECIMAL?
4658 016064 006004 BCS 12$ ;;DECIMAL--BRANCH
4659 016066 103433 MOV @R1+,-(SP) ;;SAVE @R1+ FOR TYPEOUT
4660 016070 013146
4661 016072
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4671 016074 122737 000017 001102      CMPB      #17,$STSTNM
4672 016102 001024      BNE        21$
4673 016104 122737 000013 001114      CMPB      #13,$ITEMB
4674 016112 001007      BNE        22$
4675 016114 022702 000001      CMP        #1,R2
4676 016120 001015      BNE        21$
4677 016122 022703 000001      CMP        #1,R3
4678 016126 001012      BNE        21$
4679 016130 000407      BR         23$
4680 016132 122737 000014 001114 22$:  CMPB      #14,$ITEMB
4681 016140 001005      BNE        21$
4682 016142 022703 000001      CMP        #1,R3
4683 016146 001002      BNE        21$
4684 016150 104422      23$:  TYP22
4685 016152 000404      BR         13$
4686
4687 016154 104402      21$:  TYP0C      ;GO TYPE--OCTAL ASCII(ALL DIGITS)
4688 016156 000402      BR         13$
4689 016160      12$:
4690 016160 013146      MOV        2(R1)+,-(SP)      ;;SAVE 2(R1)+ FOR TYPEOUT
4691 016162 104410      TYPDS      ;;GO TYPE--DECIMAL ASCII WITH SIGN
4692 016164 005303      13$:  DEC        R3      ;;MORE NUMBERS TO TYPE?
4693 016166 001403      BEQ        14$      ;;NO--BRANCH
4694 016170 104400 040612      TYPE      MSG.SP      ;;YES--TYPE SEPERATORS
4695 016174 000734      BR         11$      ;;LOOP
4696 016176 005302      14$:  DEC        R2      ;;MORE DH'S?
4697 016200 003421      BLE        20$      ;;NO--BRANCH
4698 016202 104400 001207      TYPE      $CRLF      ;;YES--START A NEW LINE
4699 016206 005105      COM        R5      ;;INDENT?
4700 016210 001002      BNE        15$      ;;NO--BRANCH
4701 016212 104400 040612      TYPE      MSG.SP      ;;YES--TYPE SPACES
4702 016216 012037 016224      15$:  MOV        (R0)+,16$      ;;GET NEXT DH
4703 016222 104400      TYPE      16$:  .WORD      0      ;;AND TYPE IT
4704 016224 000000      16$:  TYPE      $CRLF      ;;DH POINTER GOES HERE
4705 016226 104400 001207      TST        R5      ;;CARRIAGE RETURN-LINE FEED
4706 016232 005705      BNE        10$      ;;INDENT?
4707 016234 001312      BNE        10$      ;;NO--BRANCH
4708 016236 104400 040612      17$:  TYPE      MSG.SP      ;;YES--TYPE SPACES
4709 016242 000707      BR         10$      ;;LOOP
4710 016244 004037 037770      20$:  JSR        R0,2$GETR05      ;;RESTORE R0-R5
4711 016250 000207      RTS        PC      ;;RETURN
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4722 016252      TYPE22:
4723 016252 010046      MOV        R0,-(SP)      ;;PUSH R0 ON STACK
4724 016254 010246      MOV        R2,-(SP)      ;;PUSH R2 ON STACK
4725 016256 010346      MOV        R3,-(SP)      ;;PUSH R3 ON STACK
4726 016260 016600 000012      MOV        12(SP),R0

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4727 016264 010037 001224      MOV      R0,TEMP5
4728 016270 000300      SKAB      R0
4729 016272 042700 177420      BIC      #177420,R0
4730 016276 006200      ASR      R0
4731 016300 006200      ASR      R0
4732 016302 006200      ASR      R0
4733 016304 006200      ASR      R0
4734
4735
4736 016306 016002 172340      MOV      KIPAR0(R0),R2
4737 016312 005003      CLR      R3
4738 016314 006302      ASL      R2
4739 016316 006103      ROL      R3
4740 016320 006302      ASL      R2
4741 016322 006103      ROL      R3
4742 016324 006302      ASL      R2
4743 016326 006103      ROL      R3
4744 016330 006302      ASL      R2
4745 016332 006103      ROL      R3
4746 016334 006302      ASL      R2
4747 016336 006103      ROL      R3
4748 016340 006302      ASL      R2
4749 016342 006103      ROL      R3
4750
4751 016344 042737 160000 001224      BIC      #160000,TEMP5
4752 016352 050237 001224      BIS      R2,TEMP5
4753 016356 010337 001226      MOV      R3,TEMP6
4754 016362 012746 001224      MOV      #TEMP5,-(SP)
4755 016366 004737 021050      JSR      PC,$DB20
4756 016372 062716 000003      ADD      #3,(SP)
4757 016376 012637 016404      MOV      (SP)+,1$
4758 016402 104400      TYPE
4759 016404 000000      1$: .WORD 0
4760 016406 012603      MOV      (SP)+,R3      ;;POP STACK INTO R3
4761 016410 012602      MOV      (SP)+,R2      ;;POP STACK INTO R2
4762 016412 012600      MOV      (SP)+,R0      ;;POP STACK INTO R0
4763 016414 016666 000002 000004      MOV      2(SP),4(SP)
4764 016422 012616      MOV      (SP)+,(SP)
4765 016424 000002      RTI
4766
4767
4768
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4772
4773      ;*****
4774      ;*      THIS ROUTINE HANDLES TIME OUT TRAPS THROUGH LOC. 4
4775      ;*****
4776
4777 016426      TIEOUT:
4778 016426 104400 016434      TYPE      64$+4      ;;TYPE ASCIZ STRING
4779 016432 000433      BR      64$      ;;GET OVER THE ASCIZ
4780      ;;.ASCIZ      <15><12>/TIMEOUT OCCURED THROUGH LOCATION 4 FROM PROGRAM PC/
4781 016522      64$:
4782 016522 162716 000002      SUB      #2,(SP)      ;TYPE PC

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K08

M2INDEC-11-DERPK-C "MECHANICAL AND READ/WRITE TEST"
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TYPERR - TYPE ERROR ROUTINE

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4783 016526 104402
4784 016530 104400 016536
4785 016534 000410
4786
4787 016556
4788 016556 104402
4789 016560 013716 001106
4790 016564 000002
4791
4792
4793
4794
4795
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4802 016566
4803 016566 104400 016574
4804 016572 000417
4805
4806 016632
4807 016632 104400 016640
4808 016636 000413
4809
4810 016666
4811 016666 162716 000002
4812 016672 104402
4813 016674 104400 016702
4814 016700 000407
4815
4816 016720
4817 016720 104402
4818 016722 104400 016730
4819 016726 000421
4820
4821 016772
4822 016772 017746 162242
4823 016776 104402
4824 017000 104400 017006
4825 017004 000421
4826
4827 017050
4828 017050 017746 162162
4829 017054 104402
4830 017056 104400 017064
4831 017062 000422
4832
4833 017130
4834 017130 017746 162106
4835 017134 104402
4836 017136 013716 001106
4837 017142 000002
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        TYP0C
        TYPE      +4          ;;TYPE ASCIZ STRING
        BR        65$          ;;GET OVER THE ASCIZ
        ;;.ASCIZ  <15><12>/PSW WAS /
65$:    TYP0C
        MOV      $LPADR,(SP)    ;RETURN TO TEST
        RTI

;*****
;*      THIS ROUTINE HANDLES PARITY ERRORS
;*****
PARITY:
        TYPE      +4          ;;TYPE ASCIZ STRING
        BR        64$          ;;GET OVER THE ASCIZ
        ;;.ASCIZ  <15><12>/PARITY TRAP THRU VECTOR 114/
64$:    TYPE      +4          ;;TYPE ASCIZ STRING
        BR        65$          ;;GET OVER THE ASCIZ
        ;;.ASCIZ  <15><12>/FROM PROGRAM PC /
65$:    SUB      #2,(CP)          ;TYPE PC
        TYP0C
        TYPE      +4          ;;TYPE ASCIZ STRING
        BR        66$          ;;GET OVER THE ASCIZ
        ;;.ASCIZ  <15><12>/PSW WAS /
66$:    TYP0C
        TYPE      +4          ;;TYPE ASCIZ STRING
        BR        67$          ;;GET OVER THE ASCIZ
        ;;.ASCIZ  <15><1>/HIGH ERROR ADDRESS REGISTER /
67$:    MOV      @HERADD,-(SP)    ;TYPE HIGH ERROR
        TYP0C
        TYPE      +4          ;;TYPE ASCIZ STRING
        BR        68$          ;;GET OVER THE ASCIZ
        ;;.ASCIZ  <15><12>/LOW ERROR ADDRESS REGISTER /
68$:    MOV      @LERADD,-(SP)    ;TYPE LOW ERROR
        TYP0C
        TYPE      +4          ;;TYPE ASCIZ STRING
        BR        69$          ;;GET OVER THE ASCIZ
        ;;.ASCIZ  <15><12>/MEMORY SYSTEM ERROR REGISTER /
69$:    MOV      @MEMERR,-(SP)
        TYP0C
        MOV      $LPADR,(SP)    ;RETURN TO TEST
        RTI

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;*****
.SBTTL TYPE ROUTINE

;*ROUTINE TO TYPE ASCIZ MESSAGE. MESSAGE MUST TERMINATE WITH A 0 BYTE.
;*THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED.
;*NOTE1: $NULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER.
;*NOTE2: $FILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED.
;*NOTE3: $FILLC CONTAINS THE CHARACTER TO FILL AFTER.
;*
;*CALL:
;*1) USING A TRAP INSTRUCTION
;*    TYPE      ,MESADR      ;;MESADR IS FIRST ADDRESS OF AN ASCIZ STRING
;*OR
;*    TYPE
;*    MESADR
;*2) USING A JSR INSTRUCTION
;*    MOV      PS,-(SP)      ;;PUSH PROCESSOR STATUS WORD ON THE STACK
;*    JSR      PC,$TYPE      ;;CALL TYPE ROUTINE
;*    MESADDR      ;;FIRST ADDRESS OF MESSAGE

$TYPE:  TSTB      $TPFLG      ;;IS THERE A TERMINAL?
        BPL      1$          ;;BR IF YES
        HALT     HERE IF NO TERMINAL
        BR       3$          ;;LEAVE
1$:      MOV      RO,-(SP)      ;;SAVE RO
        MOV      @2(SP),RO      ;;GET ADDRESS OF ASCIZ STRING
2$:      MOVB     (RO)+,-(SP)    ;;PUSH CHARACTER TO BE TYPED ONTO STACK
        BNE      4$          ;;BR IF IT ISN'T THE TERMINATOR
        TST      (SP)+          ;;IF TERMINATOR POP IT OFF THE STACK
        MOV      (SP)+,RO      ;;RESTORE RO
3$:      ADD      #2,(SP)      ;;ADJUST RETURN PC
        RTI              ;;RETURN
4$:      JSR      PC,$TYPE      ;;GO TYPE THIS CHARACTER
5$:      CMPB     $FILLC,(SP)+  ;;IS IT TIME FOR FILLER CHARS.?
        BNE      2$          ;;IF NO GO GET NEXT CHAR.
        MOV      $NULL,-(SP)   ;;GET # OF FILLER CHARS. NEEDED
                                ;;AND THE NULL CHAR.
6$:      DECB     1(SP)        ;;DOES A NULL NEED TO BE TYPED?
        BLT      5$          ;;BR IF NO--GO POP THE NULL OFF OF STACK
        JSR      PC,$TYPE      ;;GO TYPE A NULL
        BR       6$          ;;LOOP
$TYPEC: TSTB      @2$PS
        BPL      $TYPEC      ;;WAIT UNTIL PRINTER IS READY

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017144 105737 001151
017150 100002
017152 000000
017154 000407
017156 010046
017160 017600 000002
017164 112046
017166 001005
017170 005726
017172 012600
017174 062716 000002
017200 000002
017202 004737 017234
017206 123726 001150
017212 001364
017214 013746 001146
017220 105366 000001
017224 002770
017226 004737 017234
017232 000772
017234 105777 161702
017240 100375

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4895 017242 116677 000002 161674      MOVB 2(SP),2$TPB      ;;LOAD CHAR TO BE TYPED INTO DATA REG.
4896 017250 000207                      RTS PC
4897                                     ;*****
4898                                     .SBTTL BINARY TO OCTAL (ASCII) AND TYPE
4899
4900
4901                                     ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 6-DIGIT
4902                                     ;*OCTAL (ASCII) NUMBER AND TYPE IT.
4903                                     ;*$TYPOS---ENTER HERE TO SETUP SUPPRESS ZEROS AND NUMBER OF DIGITS TO TYPE
4904                                     ;*CALL:
4905                                     ;*      MOV      NUM,-(SP)      ;;NUMBER TO BE TYPED
4906                                     ;*      TYPOS      ;;CALL FOR TYPEOUT
4907                                     ;*      .BYTE  N      ;;N=1 TO 6 FOR NUMBER OF DIGITS TO TYPE
4908                                     ;*      .BYTE  M      ;;M=1 OR 0
4909                                     ;*                                     ;;1=TYPE LEADING ZEROS
4910                                     ;*                                     ;;0=SUPPRESS LEADING ZEROS
4911
4912                                     ;*$TYPON---ENTER HERE TO TYPE OUT WITH THE SAME PARAMETERS AS THE LAST
4913                                     ;*$TYPOS OR $TYPOC
4914                                     ;*CALL:
4915                                     ;*      MOV      NUM,-(SP)      ;;NUMBER TO BE TYPED
4916                                     ;*      TYPON      ;;CALL FOR TYPEOUT
4917
4918                                     ;*$TYPOC---ENTER HERE FOR TYPEOUT OF A 16 BIT NUMBER
4919                                     ;*CALL:
4920                                     ;*      MOV      NUM,-(SP)      ;;NUMBER TO BE TYPED
4921                                     ;*      TYPOC      ;;CALL FOR TYPEOUT
4922
4923 017252 017646 000000      $TYPOS: MOV 2(SP),-(SP)      ;;PICKUP THE MODE
4924 017256 116637 000001 017475      MOV 1(SP),$OFILL      ;;LOAD ZERO FILL SWITCH
4925 017264 112637 017477      MOV (SP)+,$OMODE+1      ;;NUMBER OF DIGITS TO TYPE
4926 017270 062716 000002      ADD #2,(SP)      ;;ADJUST RETURN ADDRESS
4927 017274 000406          BR $TYPON
4928 017276 112737 000001 017475      $TYPOC: MOV #1,$OFILL      ;;SET THE ZERO FILL SWITCH
4929 017304 112737 000006 017477      MOV #6,$OMODE+1      ;;SET FOR SIX(6) DIGITS
4930 017312 112737 000005 017474      $TYPON: MOV #5,$OCNT      ;;SET THE ITERATION COUNT
4931 017320 010346          MOV R3,-(SP)      ;;SAVE R3
4932 017322 010446          MOV R4,-(SP)      ;;SAVE R4
4933 017324 010546          MOV R5,-(SP)      ;;SAVE R5
4934 017326 113704 017477      MOV $OMODE+1,R4      ;;GET THE NUMBER OF DIGITS TO TYPE
4935 017332 005404          NEG R4
4936 017334 062704 000006      ADD #6,R4      ;;SUBTRACT IT FOR MAX. ALLOWED
4937 017340 110437 017476      MOV R4,$OMODE      ;;SAVE IT FOR USE
4938 017344 113704 017475      MOV $OFILL,R4      ;;GET THE ZERO FILL SWITCH
4939 017350 016605 000012      MOV 12(SP),R5      ;;PICKUP THE INPUT NUMBER
4940 017354 005003          CLR R3      ;;CLEAR THE OUTPUT WORD
4941 017356 006105          1$: ROL R5      ;;ROTATE MSB INTO "C"
4942 017360 000404          BR 3$      ;;GO DO MSB
4943 017362 006105          2$: ROL R5      ;;FORM THIS DIGIT
4944 017364 006105          ROL R5
4945 017366 006105          ROL R5
4946 017370 010503          MOV R5,R3
4947 017372 006103          3$: ROL R3      ;;GET LSB OF THIS DIGIT
4948 017374 105337 017476      DECB $OMODE      ;;TYPE THIS DIGIT?
4949 017400 100016          BPL 7$      ;;BR IF NO
4950 017402 042703 177770      BIC #177770,R3      ;;GET RID OF JUNK

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4951 017406 001002      BNE      4$      ;; TEST FOR 0
4952 017410 005704      TST      R4      ;; SUPPRESS THIS 0?
4953 017412 001403      BEQ      5$      ;; BR IF YES
4954 017414 005204      4$: INC      R4      ;; DON'T SUPPRESS ANYMORE 0'S
4955 017416 052703 000060  BIS      #'0,R3  ;; MAKE THIS DIGIT ASCII
4956 017422 052703 000040  5$: BIS      #' ,R3  ;; MAKE ASCII IF NOT ALREADY
4957 017426 110337 017472  MOV      R3,8$  ;; SAVE FOR TYPING
4958 017432 104400 017472  TYPE      8$  ;; GO TYPE THIS DIGIT
4959 017436 105337 017474  7$: DECB    $OCNT  ;; COUNT BY 1
4960 017442 003347      BGT      2$      ;; BR IF MORE TO DO
4961 017444 002402      BLT      6$      ;; BR IF DONE
4962 017446 005204      INC      R4      ;; INSURE LAST DIGIT ISN'T A BLANK
4963 017450 000744      BR       2$      ;; GO DO THE LAST DIGIT
4964 017452 012605      6$: MOV      (SP)+,R5  ;; RESTORE R5
4965 017454 012604      MOV      (SP)+,R4  ;; RESTORE R4
4966 017456 012603      MOV      (SP)+,R3  ;; RESTORE R3
4967 017460 016666 000002 000004  MOV      2(SP),4(SP)  ;; SET THE STACK FOR RETURNING
4968 017466 012616      MOV      (SP)+,(SP)
4969 017470 000002      RTI      ;; RETURN
4970 017472 000      8$: .BYTE      0      ;; STORAGE FOR ASCII DIGIT
4971 017473 000      .BYTE      0      ;; TERMINATOR FOR TYPE ROUTINE
4972 017474 000      $OCNT: .BYTE      0      ;; OCTAL DIGIT COUNTER
4973 017475 000      $OFILL: .BYTE      0      ;; ZERO FILL SWITCH
4974 017476 000000      $OMODE: .WORD      0      ;; NUMBER OF DIGITS TO TYPE
4975 *****
4976
4977 .SBTTL CONVERT BINARY TO DECIMAL AND TYPE ROUTINE
4978
4979 ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 5-DIGIT
4980 ;*SIGNED DECIMAL (ASCII) NUMBER AND TYPE IT. DEPENDING ON WHETHER THE
4981 ;*NUMBER IS POSITIVE OR NEGATIVE A SPACE OR A MINUS SIGN WILL BE TYPED
4982 ;*BEFORE THE FIRST DIGIT OF THE NUMBER. LEADING ZEROS WILL ALWAYS BE
4983 ;*REPLACED WITH SPACES.
4984 ;*CALL:
4985 ;*      MOV      NUM,-(SP)      ;; PUT THE BINARY NUMBER ON THE STACK
4986 ;*      TYPDS      ;; GO TO THE ROUTINE
4987
4988 $TYPDS:
4989 017500      MOV      R0,-(SP)      ;; PUSH R0 ON STACK
4989 017500 010046      MOV      R1,-(SP)      ;; PUSH R1 ON STACK
4990 017502 010146      MOV      R2,-(SP)      ;; PUSH R2 ON STACK
4991 017504 010246      MOV      R3,-(SP)      ;; PUSH R3 ON STACK
4992 017506 010346      MOV      R5,-(SP)      ;; PUSH R5 ON STACK
4993 017510 010546      MOV      #20200,-(SP)  ;; SET BLANK SWITCH AND SIGN
4994 017512 012746 020200  MOV      20(SP),R5  ;; GET THE INPUT NUMBER
4995 017516 016605 000020  BPL      1$      ;; BR IF INPUT IS POS.
4996 017522 100004      NEG      R5      ;; MAKE THE BINARY NUMBER POS.
4997 017524 005405      MOV      #'-,1(SP)  ;; MAKE THE ASCII NUMBER NEG.
4998 017526 112766 000055 000001  1$: CLR      R0      ;; ZERO THE CONSTANTS INDEX
4999 017534 005000      MOV      #SDBLK,R3  ;; SETUP THE OUTPUT POINTER
5000 017536 012703 017714      MOV      #' ,(R3)+  ;; SET THE FIRST CHARACTER TO A BLANK
5001 017542 112723 000040  2$: CLR      R2      ;; CLEAR THE BCD NUMBER
5002 017546 005002      MOV      $DTBL(R0),R1  ;; GET THE CONSTANT
5003 017550 016001 017704  3$: SUB      R1,R5      ;; FORM THIS BCD DIGIT
5004 017554 160105      BLT      4$      ;; BR IF DONE
5005 017556 002402      INC      R2      ;; INCREASE THE BCD DIGIT BY 1
5006 017560 005202

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5007 017562 000774      BR      3$
5008 017564 060105      4$: ADD    R1,R5      ;; ADD BACK THE CONSTANT
5009 017566 005702      TST    R2          ;; CHECK IF BCD DIGIT=0
5010 017570 001002      BNE     5$          ;; FALL THROUGH IF 0
5011 017572 105716      TSTB   (SP)        ;; STILL DOING LEADING 0'S?
5012 017574 100407      BMI     7$          ;; BR IF YES
5013 017576 106316      5$: ASLB   (SP)        ;; MSD?
5014 017500 103003      BCC     6$          ;; BR IF NO
5015 017602 116663 000001 177777  MOVB  1(SP),-1(R3)  ;; YES--SET THE SIGN
5016 017610 052702 000060      6$: BIS    #'0,R2      ;; MAKE THE BCD DIGIT ASCII
5017 017614 052702 000040      7$: BIS    #' ,R2      ;; MAKE IT A SPACE IF NOT ALREADY A DIGIT
5018 017620 110223      MOVB  R2,(R3)+      ;; PUT THIS CHARACTER IN THE OUTPUT BUFFER
5019 017622 005720      TST    (R0)+      ;; JUST INCREMENTING
5020 017624 020027 000010      CMP    R0,#10      ;; CHECK THE TABLE INDEX
5021 017630 002746      BLT     2$          ;; GO DO THE NEXT DIGIT
5022 017632 003002      BGT     8$          ;; GO TO EXIT
5023 017634 010502      MOV     R5,R2      ;; GET THE LSD
5024 017636 000764      BR      6$          ;; GO CHANGE TO ASCII
5025 017640 105726      8$: TSTB   (SP)+      ;; WAS THE LSD THE FIRST NON-ZERO?
5026 017642 100003      BPL     9$          ;; BR IF NO
5027 017644 116663 177777 177776  MOVB  -1(SP),-2(R3)  ;; YES--SET THE SIGN FOR TYPING
5028 017652 105013      9$: CLRB   (R3)        ;; SET THE TERMINATOR
5029 017654 012605      MOV     (SP)+,R5      ;; POP STACK INTO R5
5030 017656 012603      MOV     (SP)+,R3      ;; POP STACK INTO R3
5031 017660 012602      MOV     (SP)+,R2      ;; POP STACK INTO R2
5032 017662 012601      MOV     (SP)+,R1      ;; POP STACK INTO R1
5033 017664 012600      MOV     (SP)+,R0      ;; POP STACK INTO R0
5034 017666 104400 017714      TYPE   $DBLK      ;; NOW TYPE THE NUMBER
5035 017672 016666 000002 000004  MOV    2(SP),4(SP)  ;; ADJUST THE STACK
5036 017700 012616      MOV     (SP)+,(SP)
5037 017702 000002      FTI
5038 017704 023420      $DTBL: 10000.
5039 017706 001750      1000.
5040 017710 000144      100.
5041 017712 000012      10.
5042 017714 000004      $DBLK: .BLKW 4
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5047 017724 000000      ;*****
5048 017726 000000      ;*****
5049 017730 000000      .SBTTL TTY INPUT ROUTINE
5050 017732 000002      STKCNT: .WORD 0      ;; NUMBER OF ITEMS IN QUEUE
5051 017734      STKGIN: .WORD 0      ;; INPUT POINTER
5052      STKGOUT: .WORD 0      ;; OUTPUT POINTER
5053      STKQSR: .BLKB 2      ;; TTY KEYBOARD QUEUE
5054      STKQEND=.
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5061 017734 005037 017724      ;*TK INITIALIZE ROUTINE
5062 017740 012737 017732 017726  ;*THIS ROUTINE WILL INITIALIZE THE TTY KEYBOARD INPUT QUEUE
5063      ;*SETUP THE INTERRUPT VECTOR AND TURN ON THE KEYBOARD INTERRUPT
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5063 017746 013737 017726 017730      MOV      $TKQIN,$TKQOUT      ;;QUEUE INTO THE INPUT & OUTPUT POINTERS.
5064 017754 012737 020004 000060      MOV      $TKSRV,$TKVEC      ;;INITIALIZE THE KEYBOARD VECTOR
5065 017762 012737 000200 000062      MOV      $200,$TKVEC+2      ;;BR" LEVEL 4
5066 017770 005777 161144              TST      $TKB              ;;CLEAR DONE FLAG
5067 017774 012777 000100 161134      MOV      $BIT06,$TKS      ;;ENABLE INTERRUPT
5068 020002 000207                    RTS      PC              ;;RETURN TO CALLER
5069
5070
5071      ;;TK SERVICE ROUTINE
5072      ;;THIS ROUTINE WILL SERVICE THE TTY KEYBOARD INTERRUPT
5073      $TKSRV: MOVB      $TKB,-(SP)      ;;PICKUP THE CHARACTER
5074 020010 042716 177600              BIC      $1C177,(SP)      ;;STRIP THE JUNK
5075 020014 021627 000003              CMP      (SP),#3      ;;IS IT A CONTROL C?
5076 020020 001006                    BNE      1$      ;;BRANCH IF NO
5077 020022 104400 020463              TYPE     $CNTLC      ;;TYPE A CONTROL-C (1C)
5078 020026 004737 017734              JSR      PC,$TKINT      ;;INIT THE KEYBOARD
5079 020032 000137 004244              JMP      START2      ;;CONTROL C RESTART
5080 020036 022737 000002 017724 1$:   CMP      $2,$TKCNT      ;;IS THE QUEUE FULL?
5081 020044 001004                    BNE      2$      ;;BRANCH IF NO
5082 020046 104400 001202              TYPE     $BELL      ;;RING THE TTY BELL
5083 020052 005726                    TST      (SP)+      ;;CLEAN CHARACTER OFF OF STACK
5084 020054 000002                    RTI      ;;RETURN
5085 020056 005237 017724 2$:         INC      $TKCNT      ;;COUNT THIS CHARACTER
5086 020062 112677 177640              MOVB     (SP)+,$TKQIN      ;;AND PUT IT IN QUEUE
5087 020066 005237 017726              INC      $TKQIN      ;;UPDATE THE POINTER
5088 020072 023727 017726 017734      CMP      $TKQIN,$TKQEND      ;;GO OFF THE END?
5089 020100 001003                    BNE      3$      ;;BRANCH IF NO
5090 020102 012737 017732 017726      MOV      $TKQSRV,$TKQIN      ;;RESET THE POINTER
5091 020110 000002                    RTI      ;;RETURN
5092      *****
5093      ;;THIS ROUTINE WILL INPUT A SINGLE CHARACTER FROM THE TTY
5094      ;;CALL:
5095      ;;      RDCHR              ;;INPUT A SINGLE CHARACTER FROM THE TTY
5096      ;;      RETURN HERE      ;;CHARACTER IS ON THE STACK
5097
5098
5099      $RDCHR: MOV      (SP),-(SP)      ;;PUSH DOWN THE PC AND
5100 020114 016666 000004 000002      MOV      4(SP),2(SP)      ;;THE PS
5101 020122 005066 000004              CLR      4(SP)      ;;GET READY FOR A CHARACTER
5102 020126 005037 177776              CLR      $PS      ;;ALLOW INTERRUPTS
5103 020132 005737 017724 1$:         TST      $TKCNT      ;;WAIT ON A CHARACTER
5104 020136 001775                    BEQ      1$
5105 020140 005337 017724              DEC      $TKCNT      ;;DECREMENT THE COUNTER
5106 020144 117766 177560 000004      MOVB     $TKQOUT,4(SP)      ;;GET ONE CHARACTER
5107 020152 005237 017730              INC      $TKQOUT      ;;UPDATE THE POINTER
5108 020156 023727 017730 017734      CMP      $TKQOUT,$TKQEND      ;;DID IT GO OFF OF THE END?
5109 020164 001003                    BNE      2$      ;;BRANCH IF NO
5110 020166 012737 017732 017730      MOV      $TKQSRV,$TKQOUT      ;;RESET THE POINTER
5111 020174 000002                    RTI      ;;RETURN
5112      *****
5113      ;;THIS ROUTINE WILL INPUT A STRING FROM THE TTY
5114      ;;CALL:
5115      ;;      RDLIN              ;;INPUT A STRING FROM THE TTY
5116      ;;      RETURN HERE      ;;ADDRESS OF FIRST CHARACTER WILL BE ON THE STACK
5117      ;;      ;;TERMINATOR WILL BE A BYTE OF ALL 0'S
5118

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5119 020176 010346 SRDLIN: MOV R3, -(SP) ;;SAVE R3
5120 020200 005046 CLR -(SP) ;;CLEAR THE RUBOUT KEY
5121 020202 012703 020437 15: MOV #TTYIN, R3 ;;GET ADDRESS
5122 020206 022703 020463 25: CMP #TTYIN+20., R3 ;;BUFFER FULL?
5123 020212 101456 45 BR IF YES ;;BR IF YES
5124 020214 104412 RDCHR ;;GO READ ONE CHARACTER FROM THE TTY
5125 020216 112613 MOVB (SP)+, (R3) ;;GET CHARACTER
5126 020220 122713 000177 CMPB #177, (R3) ;;IS IT A RUBOUT
5127 020224 001022 BNE 55 ;;BR IF NO
5128 020226 005716 TST (SP) ;;IS THIS THE FIRST RUBOUT?
5129 020230 001007 BNE 65 ;;BR IF NO
5130 020232 112737 000134 020430 MOVB #' \, 95 ;;TYPE A BACK SLASH
5131 020240 104400 020430 TYPE 95
5132 020244 012716 177777 MOV #-1, (SP) ;;SET THE RUBOUT KEY
5133 020250 005303 65: DEC R3 ;;BACKUP BY ONE
5134 020252 020327 020437 CMP R3, #TTYIN ;;STACK EMPTY?
5135 020256 103434 45 BLO 45 ;;BR IF YES
5136 020260 111337 020430 MOVB (R3), 95 ;;SETUP TO TYPEOUT THE DELETED CHAR.
5137 020264 104400 020430 TYPE 95 ;;GO TYPE
5138 020270 000746 BR 25 ;;GO READ ANOTHER CHAR.
5139 020272 005716 55: TST (SP) ;;RUBOUT KEY SET?
5140 020274 001406 BEQ 75 ;;BR IF NO
5141 020276 112737 000134 020430 MOVB #' \, 95 ;;TYPE A BACK SLASH
5142 020304 104400 020430 TYPE 95
5143 020310 005016 CLR (SP) ;;CLEAR THE RUBOUT KEY
5144 020312 122713 000025 75: CMPB #25, (R3) ;;IS CHARACTER A CTRL U?
5145 020316 001003 BNE 85 ;;BR IF NO
5146 020320 104400 020432 TYPE $CNTLU ;;TYPE A CONTROL "U"
5147 020324 000726 BR 15 ;;GO START OVER
5148 020326 122713 000012 65: CMPB #12, (R3) ;;IS CHARACTER A "LF"?
5149 020332 001011 BNE 35 ;;BRANCH IF NO
5150 020334 105013 CLR (R3) ;;CLEAR THE CHARACTER
5151 020336 104400 001207 TYPE $CRLF ;;TYPE A "CR" & "LF"
5152 020342 104400 020437 TYPE $TTYIN ;;TYPE THE INPUT STRING
5153 020346 000717 BR 25 ;;GO PICKUP ANOTHER CHARACTER
5154 020350 104400 001206 45: TYPE $QUES ;;TYPE A " "?
5155 020354 000712 BR 15 ;;CLEAR THE BUFFER AND LOOP
5156 020356 111337 020430 35: MOVB (R3), 95 ;;ECHO THE CHARACTER
5157 020362 104400 020430 TYPE 95
5158 020366 122723 000015 CMPB #15, (R3)+ ;;CHECK FOR RETURN
5159 020372 001305 BNE 25 ;;LOOP IF NOT RETURN
5160 020374 105063 177777 CLRB -1(R3) ;;CLEAR RETURN (THE 15)
5161 020400 104400 001210 TYPE $LF ;;TYPE A LINE FEED
5162 020404 005726 TST (SP)+ ;;CLEAN RUBOUT KEY FROM THE STACK
5163 020406 012603 MOV (SP)+, R3 ;;RESTORE R3
5164 020410 011646 MOV (SP), -(SP) ;;ADJUST THE STACK AND PUT ADDRESS OF THE
5165 020412 016666 000004 000002 MOV 4(SP), 2(SP) ;;FIRST ASCII CHARACTER ON IT
5166 020420 012766 020437 000004 MOV #TTYIN, 4(SP)
5167 020426 000002 RTI ;;RETURN
5168 020430 000 95: .BYTE 0 ;;STORAGE FOR ASCII CHAR. TO TYPE
5169 020431 000 .BYTE 0 ;;TERMINATOR
5170 020432 052536 005015 00J $CNTLU: .ASCIIZ /U<15><12> ;;CONTROL "U"
5171 020437 000024 $TTYIN: .BLKB 20. ;;RESERVE 20. BYTES FOR TTY INPUT
5172 020463 136 006503 000012 $CNTLC: .ASCIIZ /C<15><12> ;;CONTROL "C"
5173 *****
5174

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5175          .SBTTL  SCOPE HANDLER ROUTINE
5176
5177          ;*THIS ROUTINE CONTROLS THE LOOPING OF SUBTESTS. IT WILL INCREMENT
5178          ;*AND LOAD THE TEST NUMBER($TSTNM) INTO THE DISPLAY REG.(DISPLAY<7:0>)
5179          ;*AND LOAD THE ERROR FLAG ($ERFLG) INTO DISPLAY<15:08>
5180          ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
5181          ;*SW14=1      LOOP ON TEST
5182          ;*SW11=1      INHIBIT ITERATIONS
5183          ;*SW09=1      LOOP ON ERROR
5184          ;*CALL
5185          ;*          SCOPE          ;;SCOPE=IOT
5186
5187          $SCOPE:
5188          020470 006137 177570          ROL      @#SWR          ;;LOOP ON PRESENT TEST?
5189          020474 100476          BMI      $OVER          ;;YES IF SW14=1
5190          ;*****START OF CODE FOR THE XOR TESTER*****
5191          020476 000416          $XTSTR: BR      6$          ;IF RUNNING ON THE "XOR" TESTER CHANGE
5192          ;THIS INSTRUCTION TO A "NOP" (NOP=240)
5193          020500 013746 000004          MOV      @#ERRVEC, -(SP)          ;SAVE THE CONTENTS OF THE ERROR VECTOR
5194          020504 012737 020524 000034          MOV      @#ERRVEC          ;SET FOR TIMEOUT
5195          020512 005737 177060          TST      @#177060          ;TIME OUT ON XOR?
5196          020516 012637 000004          MOV      (SP)+, @#ERRVEC          ;RESTORE THE ERROR VECTOR
5197          020522 000450          BR      $SVLAD          ;GO TO THE NEXT TEST
5198          020524 022626          $S:      CMP      (SP)+, (SP)+          ;CLEAR THE STACK AFTER A TIME OUT
5199          020526 012637 000004          MOV      (SP)+, @#ERRVEC          ;RESTORE THE ERROR VECTOR
5200          020532 000413          BR      7$          ;LOOP ON THE PRESENT TEST
5201          020534          6$:;*****END OF CODE FOR THE XOR TESTER*****
5202          020534 105737 001103          2$:      TSTB      $ERFLG          ;HAS AN ERROR OCCURRED?
5203          020540 001421          BEQ      3$          ;BR IF NO
5204          020542 123737 001115 001103          CMPB      $ERMAX, $ERFLG          ;MAX. ERRORS FOR THIS TEST OCCURRED?
5205          020550 101015          BHI      3$          ;BR IF NO
5206          020552 032737 001000 177570          BIT      @BIT09, @#SWR          ;LOOP ON ERROR?
5207          020560 001404          BEQ      4$          ;BR IF NO
5208          020562 013737 001110 001106          7$:      MOV      $LPERR, $LPADR          ;SET LOOP ADDRESS TO LAST SCOPE
5209          020570 000440          BR      $OVER
5210          020572 105037 001103          4$:      CLRB      $ERFLG          ;ZERO THE ERROR FLAG
5211          020576 005037 001176          CLR      $TIMES          ;CLEAR THE NUMBER OF ITERATIONS TO MAKE
5212          020602 000412          BR      1$          ;ESCAPE TO THE NEXT TEST
5213          020604 032737 004000 177570          3$:      BIT      @BIT11, @#SWR          ;INHIBIT ITERATIONS?
5214          020612 001006          BNE      1$          ;BR IF YES
5215          020614 005237 001104          INC      $ICNT          ;INCREMENT ITERATION COUNT
5216          020620 023737 001176 001104          CMP      $TIMES, $ICNT          ;CHECK THE NUMBER OF ITERATIONS MADE
5217          020626 002021          BGE      $OVER          ;BR IF MORE ITERATION REQUIRED
5218          020630 012737 000001 001104          1$:      MOV      @1, $ICNT          ;REINITIALIZE THE ITERATION COUNTER
5219          020636 013737 020706 001176          MOV      $MXCNT, $TIMES          ;SET NUMBER OF ITERATIONS TO DO
5220          020644 105237 001102          $SVLAD: INCB      $TSTNM          ;COUNT TEST NUMBERS
5221          020650 011637 001106          MOV      (SP), $LPADR          ;SAVE SCOPE LOOP ADDRESS
5222          020654 011637 001110          MOV      (SP), $LPERR          ;SAVE ERROR LOOP ADDRESS
5223          020660 005037 001200          CLR      $ESCAPE          ;CLEAR THE ESCAPE FROM ERROR ADDRESS
5224          020664 112737 000001 001115          MOVB      @1, $ERMAX          ;ONLY ALLOW ONE(1) ERROR ON NEXT TEST
5225          020672 013737 001102 177570          $OVER:  MOV      $TSTNM, @#DISPLAY          ;DISPLAY TEST NUMBER
5226          020700 013716 001106          MOV      $LPADR, (SP)          ;FUDGE RETURN ADDRESS
5227          020704 000002          RTI          ;FIXES PS
5228          020706 000001          $MXCNT: 1          ;MAX. NUMBER OF ITERATIONS
5229          ;*****
5230

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5231 .SBTTL SAVE AND RESTORE RO-R5 ROUTINES
5232
5233 ;*SAVE RO-R5
5234 ;*CALL:
5235 ;* SAVREG
5236 ;*UPON RETURN FROM $SAVREG THE STACK WILL LOOK LIKE:
5237 ;*
5238 ;*TOP---(+16)
5239 ;* +2---(+18)
5240 ;* +4---R5
5241 ;* +6---R4
5242 ;* +8---R3
5243 ;* +10---R2
5244 ;* +12---R1
5245 ;* +14---R0
5246
5247 $SAVREG:
5248 020710 010046 MOV RO,-(SP) ;; PUSH RO ON STACK
5249 020712 010146 MOV R1,-(SP) ;; PUSH R1 ON STACK
5250 020714 010246 MOV R2,-(SP) ;; PUSH R2 ON STACK
5251 020716 010346 MOV R3,-(SP) ;; PUSH R3 ON STACK
5252 020720 010446 MOV R4,-(SP) ;; PUSH R4 ON STACK
5253 020722 010546 MOV R5,-(SP) ;; PUSH R5 ON STACK
5254 020724 016646 000022 MOV 22(SP),-(SP) ;; SAVE PS OF MAIN FLOW
5255 020730 016646 000022 MOV 22(SP),-(SP) ;; SAVE PC OF MAIN FLOW
5256 020734 016646 000022 MOV 22(SP),-(SP) ;; SAVE PS OF CALL
5257 020740 016646 000022 MOV 22(SP),-(SP) ;; SAVE PC OF CALL
5258 020744 000002 RTI
5259
5260 ;*RESTORE RO-R5
5261 ;*CALL:
5262 ;* RESREG
5263 $RESREG:
5264 020746 012666 000022 MOV (SP)+,22(SP) ;; RESTORE PC OF CALL
5265 020752 012666 000022 MOV (SP)+,22(SP) ;; RESTORE PS OF CALL
5266 020756 012666 000022 MOV (SP)+,22(SP) ;; RESTORE PC OF MAIN FLOW
5267 020762 012666 000022 MOV (SP)+,22(SP) ;; RESTORE PS OF MAIN FLOW
5268 020766 012605 MOV (SP)+,R5 ;; POP STACK INTO R5
5269 020770 012604 MOV (SP)+,R4 ;; POP STACK INTO R4
5270 020772 012603 MOV (SP)+,R3 ;; POP STACK INTO R3
5271 020774 012602 MOV (SP)+,R2 ;; POP STACK INTO R2
5272 020776 012601 MOV (SP)+,R1 ;; POP STACK INTO R1
5273 021000 012600 MOV (SP)+,R0 ;; POP STACK INTO R0
5274 021002 000002 RTI
5275 ;*****
5276
5277 .SBTTL TRAP DECODER
5278
5279 ;*THIS ROUTINE WILL PICKUP THE LOWER BYTE OF THE "TRAP" INSTRUCTION
5280 ;*AND USE IT TO INDEX THROUGH THE TRAP TABLE FOR THE STARTING ADDRESS
5281 ;*OF THE DESIRED ROUTINE. THEN USING THE ADDRESS OBTAINED IT WILL
5282 ;*GO TO THAT ROUTINE.
5283
5284 $TRAP: 021004 010046 MOV RO,-(SP) ;; SAVE RO
5285 021006 016600 000002 MOV 2(SP),RO ;; GET TRAP ADDRESS
5286 021012 005740 TST -(RO) ;; BACKUP BY 2

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5287 021014 111000      MOV      (R0),R0      ;;GET RIGHT BYTE OF TRAP
5288 021016 016000 021024  MOV      $TRPAD(R0),R0  ;;INDEX TO TABLE
5289 021022 000200      RTS      R0          ;;GO TO ROUTINE
5290
5291
5292      .SBTTL  TRAP TABLE
5293
5294      ;*THIS TABLE CONTAINS THE STARTING ADDRESSES OF THE ROUTINES CALLED
5295      ;*BY THE "TRAP" INSTRUCTION.
5296
5297      ;      ROUTINE
5298      ;      -----
5299      $TRPAD:
5300      $TYPE      ;;CALL=TYPE      TRAP+0(104400)  TTY TYPEOUT ROUTINE
5301      $TYPOC     ;;CALL=TYPOC     TRAP+2(104402)  TYPE OCTAL NUMBER (WITH LEADING ZEROS)
5302      $TYPOS     ;;CALL=TYPOS     TRAP+4(104404)  TYPE OCTAL NUMBER (NO LEADING ZEROS)
5303      $TYPON     ;;CALL=TYPON     TRAP+6(104406)  TYPE OCTAL NUMBER (AS PER LAST CALL)
5304      $TYPDS     ;;CALL=TYPDS     TRAP+10(104410) TYPE DECIMAL NUMBER (WITH SIGN)
5305      $RDCHR     ;;CALL=RDCHR     TRAP+12(104412) TTY TYPEIN CHARACTER ROUTINE
5306      $RDLIN     ;;CALL=RDLIN     TRAP+14(104414) TTY TYPEIN STRING ROUTINE
5307      $SAVREG    ;;CALL=SAVREG    TRAP+16(104416) SAVE R0-R5 ROUTINE
5308      $RESREG    ;;CALL=RESREG    TRAP+20(104420) RESTORE R0-R5 ROUTINE
5309      TYPE22     ;;CALL=TYPE22    TRAP+22(104422) TYPE 22 BITS
5310      ;*****
5311
5312      .SBTTL  DOUBLE LENGTH BINARY TO OCTAL ASCII CONVERT ROUTINE
5313
5314      ;*THIS ROUTINE WILL CONVERT A 32-BIT UNSIGNED BINARY NUMBER TO AN
5315      ;*UNSIGNED OCTAL ASCIIZ NUMBER.
5316      ;*CALL
5317      ;*      MOV      #PNTR, -(SP)      ;; POINTER TO LOW WORD OF BINARY NUMBER
5318      ;*      JSR      PC, 2*$DB20      ;; CALL THE ROUTINE
5319      ;*      RETURN                      ;; THE ADDRESS OF THE FIRST ASCIIZ CHAR. IS ON THE STACK
5320
5321
5322      $DB20:  SAVREG                      ;; SAVE ALL REGISTERS
5323      MOV      2(SP), R1                  ;; PICKUP THE POINTER TO LOW WORD
5324      MOV      #12, R4                   ;; DO ELEVEN CHARACTERS
5325      MOV      #12, R4                   ;; DO ELEVEN CHARACTERS
5326      MOV      #12, R4                   ;; DO ELEVEN CHARACTERS
5327      MOV      #12, R4                   ;; DO ELEVEN CHARACTERS
5328      MOV      #12, R4                   ;; DO ELEVEN CHARACTERS
5329      MOV      #12, R4                   ;; DO ELEVEN CHARACTERS
5330      MOV      #12, R4                   ;; DO ELEVEN CHARACTERS
5331      MOV      #12, R4                   ;; DO ELEVEN CHARACTERS
5332      MOV      #12, R4                   ;; DO ELEVEN CHARACTERS
5333      MOV      #12, R4                   ;; DO ELEVEN CHARACTERS
5334      MOV      #12, R4                   ;; DO ELEVEN CHARACTERS
5335      MOV      #12, R4                   ;; DO ELEVEN CHARACTERS
5336      MOV      #12, R4                   ;; DO ELEVEN CHARACTERS
5337      MOV      #12, R4                   ;; DO ELEVEN CHARACTERS
5338      MOV      #12, R4                   ;; DO ELEVEN CHARACTERS
5339      MOV      #12, R4                   ;; DO ELEVEN CHARACTERS
5340      MOV      #12, R4                   ;; DO ELEVEN CHARACTERS
5341      MOV      #12, R4                   ;; DO ELEVEN CHARACTERS
5342      MOV      #12, R4                   ;; DO ELEVEN CHARACTERS

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5343 021134 006000          ROR      R0
5344 021136 006001          ROR      R1
5345 021140 006000          ROR      R0
5346 021142 040302          BIC      R3,R2          ;;MASK OUT ALL JUNK
5347 021144 062702 000060  ADD      #'0,R2          ;;MAKE THIS CHAR. ASCII
5348 021150 000753          BR       1$             ;;GO PUT IT IN THE DATA TABLE
5349 021152 000016          $OCTVL: .BLKB 14.         ;;RESERVE DATA TABLE
5350                                     ;*****
5351                                     .SBTTL  SINGLE LENGTH BINARY TO DECIMAL ASCII ROUTINE
5352                                     ;*THIS ROUTINE WILL CONVERT A 16-BIT UNSIGNED BINARY NUMBER TO AN
5353                                     ;*UNSIGNED DECIMAL ASCII NUMBER.
5354                                     ;*CALL
5355                                     ;*      MOV      NUMBER, -(SP)          ;;PUT BINARY NUMBER ON THE STACK
5356                                     ;*      JSR      PC, @#$SB2D          ;;CALL
5357                                     ;*      RETURN          ;;ADDRESS OF THE 1ST ASCII CHAR. IS ON THE STACK
5358
5359
5360
5361
5362 021170 016637 000002 021214 $SB2D:  MOV      2(SP), 1$          ;;SAVE BINARY NUMBER
5363 021176 012746 021214          MOV      1$, -(SP)          ;;SET POINTER
5364 021202 004737 021220          JSR      PC, @#$DB2D          ;;CALL DOUBLE LENGTH CONVERT
5365 021206 012666 000002          MOV      (SP)+, 2(SP)        ;;PICKUP POINTER
5366 021212 000207          RTS      PC          ;;RETURN
5367 021214 000000 000000 1$:      .WORD 0,0
5368                                     ;*****
5369                                     .SBTTL  DOUBLE LENGTH BINARY TO DECIMAL ASCII CONVERT ROUTINE
5370                                     ;*THIS ROUTINE WILL CONVERT A 32-BIT BINARY NUMBER TO AN UNSIGNED
5371                                     ;*DECIMAL (ASCII) NUMBER. THE SIGN OF THE BINARY NUMBER MUST BE
5372                                     ;*POSITIVE.
5373                                     ;*CALL
5374                                     ;*      MOV      #PNTR, -(SP)          ;;POINTER TO LOW WORD OF BINARY NUMBER
5375                                     ;*      JSR      PC, @#$DB2D          ;;CALL
5376                                     ;*      RETURN          ;;THE FIRST ADDRESS OF ASCII
5377                                     ;*                                     ;;IS ON THE STACK
5378
5379
5380
5381
5382 021220 104416          $DB2D:  SAVREG          ;;SAVE REGISTERS
5383 021222 016602 000002          MOV      2(SP), R2          ;;PICKUP THE DATA POINTER
5384 021226 012700 021400          MOV      #$DECVL, R0          ;;GET ADDRESS OF "$DECVL" STRING
5385 021232 010066 000002          MOV      R0, 2(SP)          ;;PUT ADDRESS OF ASCII STRING ON STACK
5386 021236 012201          MOV      (R2)+, R1          ;;PICKUP THE BINARY NUMBER
5387 021240 012202          MOV      (R2)+, R2
5388 021242 012737 000012 021316  MOV      #10, 4$          ;;SET UP TO DO 10 CONVERSIONS
5389 021250 012704 021330          MOV      #STNPNR, R4          ;;ADDRESS OF TEN POWER
5390 021254 012705 021332          MOV      #STNPNR+2, R5
5391 021260 005003          1$:      CLR      R3          ;;CLEAR PARTIAL
5392 021262 161401          2$:      SUB      (R4), R1          ;;SUBTRACT TEN POWER
5393 021264 005602          SBC      R2
5394 021266 161502          SUB      (R5), R2
5395 021270 002402          BLT      3$          ;;BR IF TEN POWER TO LARGE
5396 021272 005203          INC      R3          ;;ADD 1 TO PARTIAL
5397 021274 000772          BR       2$          ;;LOOP
5398 021276 062401          3$:      ADD      (R4)+, R1          ;;RESTORE SUBTRACTED VALUE

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5399 021300 005502      AUC      R2
5400 021302 062402      ADD      (R4)+,R2
5401 021304 022525      CMP      (R5)+,(R5)+      ;; MOVE TO NEXT TEN POWER
5402 021306 052703 000060  BIS      #'0,R3      ;; CHANGE PARTIAL TO ASCII
5403 021312 110320      MOV      R3,(R0)+      ;; SAVE IT
5404 021314 005327      DEC      (PC)+      ;; DONE?
5405 021316 000000      4$:      .WORD      0
5406 021320 001357      BNE      1$      ;; BR IF NO
5407 021322 105020      CLRB      (R0)+      ;; TERMINATOR
5408 021324 104420      RESREG      ;; RESTORE REGISTERS
5409 021326 000207      RTS      PC      ;; RETURN
5410 021330 145000      $TNPWR: 145000      ;; 1.0E09
5411 021332 035632      35632
5412 021334 160400      160400      ;; 1.0E08
5413 021336 002765      2765
5414 021340 113200      113200      ;; 1.0E07
5415 021342 000230      230
5416 021344 041100      041100      ;; 1.0E06
5417 021346 000017      17
5418 021350 103240      103240      ;; 1.0E05
5419 021352 000001      1
5420 021354 023420      23420      ;; 1.0E04
5421 021356 000000      0
5422 021360 001750      1750      ;; 1.0E03
5423 021362 000000      0
5424 021364 000144      144      ;; 1.0E02
5425 021366 000000      0
5426 021370 000012      12      ;; 1.0E01
5427 021372 000000      0
5428 021374 000001      1      ;; 1.0E00
5429 021376 000000      0
5430 021400 000014      $DECVL: .BLKB 12.      ;; RESERVE STORAGE FOR ASCII STRING
5431      *****
5432      .SBTTL TYPE NUMERICAL ASCII STRING SUPPRESS LEADING ZEROS
5433      ;*THIS ROUTINE IS USED TO TYPE AN ASCII NUMBER SUPPRESSING THE
5434      ;*LEADING NUMBERS.
5435      ;*CALL
5436      ;*
5437      ;*      MOV      #NUMADR, -(SP)      ;; FIRST ADDRESS OF ASCII STRING
5438      ;*      JSR      PC, @#$SUPRS
5439
5440
5441
5442 021414 010046      $SUPRS: MOV      RO, -(SP)      ;; SAVE RO
5443 021416 016600 000004  MOV      4(SP), RO      ;; PICKUP THE POINTER
5444 021422 105710      1$:      TSTB      (RO)      ;; TERMINATOR?
5445 021424 001403      BEQ      2$      ;; BR IF YES
5446 021426 122720 000060  CMPB      #'0, (RO)+      ;; IS THIS AN ASCII "0" ?
5447 021432 001773      BEQ      1$      ;; BR IF YES
5448 021434 005300      2$:      DEC      RO      ;; BACKUP BY "1"
5449 021436 010037 021444  MOV      RO, 3$      ;; SAVE FOR TYPING
5450 021442 104400      TYPE      ;; GO TYPE
5451 021444 000000      3$:      .WORD      0      ;; ASCII POINTER GOES HERE
5452 021446 012600      MOV      (SP)+, RO      ;; RESTORE RO
5453 021450 012616      MOV      (SP)+, (SP)      ;; RESTORE THE STACK
5454 021452 000207      RTS      PC      ;; RETURN

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5455 ;*****
5456
5457 .SBTTL  INTEGER DIVIDE ROUTINE
5458
5459 ;*THIS ROUTINE WILL DIVIDE A 32-BIT TWO'S COMPLEMENT INTEGER
5460 ;*DIVIDEND BY A 16-BIT TWO'S COMPLEMENT INTEGER DIVISOR GIVING
5461 ;*A 16-BIT TWO'S COMPLEMENT INTEGER QUOTIENT AND A 16-BIT REMAINDER.
5462 ;*DIVISION WILL BE PERFORMED SO THAT THE REMAINDER IS OF THE
5463 ;*SAVE SIGN AS THE DIVIDEND.
5464 ;*CALL:
5465 ;*      MOV      LOW DIVIDEND,-(SP) ;;THE HIGH DIVIDEND MUST BE < 1/2
5466 ;*      MOV      HIGH DIVIDEND,-(SP); AS LARGE AS THE DIVISOR
5467 ;*      MOV      DIVISOR,-(SP)
5468 ;*      JSR      PC,$DIV
5469 ;*      RETURN    ;;QUOTIENT & REMAINDER ARE ON THE STACK
5470 ;*      "V"=0    IMPLIES NO ERROR
5471 ;*      "V"=1    IMPLIES ERROR OCCURRED
5472 ;*      "C"=0    DIVIDE OVERFLOW OCCURRED
5473 ;*      "C"=1    ATTEMPTED TO DIVIDE BY ZERO
5474
5475
5476 ;*      STACK    NO ERROR      OVERFLOW      DIVIDE BY ZERO
5477 ;*      -----
5478 ;*      TOP      REMAINDER    ALL ZEROS      ALL ONES
5479 ;*      +2       QUOTIENT     ALL ZEROS      ALL ONES
5480
5481 021454 013746 177776 $DIV: MOV 2*PS,-(SP) ;;SAVE THE PROCESSOR STATUS
5482 021460 042716 000017 BIC #17,{SP} ;;STRIP AWAY CONDITION CODES
5483 021464 010046 MOV R0,-(SP) ;;PUSH R0 ON STACK
5484 021466 010146 MOV R1,-(SP) ;;PUSH R1 ON STACK
5485 021470 010246 MOV R2,-(SP) ;;PUSH R2 ON STACK
5486 021472 010346 MOV R3,-(SP) ;;PUSH R3 ON STACK
5487 021474 005046 CLR -(SP) ;;SAVE A PLACE FOR SIGNS
5488 021476 012746 000021 MOV #17,-(SP) ;;SETUP THE ITERATION COUNTER
5489 021502 016601 000024 MOV 24(SP),R1 ;;PICKUP THE DIVIDEND
5490 021506 016600 000022 MOV 22(SP),R0
5491 021512 100005 BPL 1$ ;;CHECK THE SIGN
5492 021514 105366 000003 DECB 3(SP) ;;KEEP TRACK OF THE SIGN
5493 021520 005400 NEG R0 ;;AND NEGATE THE ORIGINAL
5494 021522 005401 NEG R1 ;;NUMBER
5495 021524 005600 SBC R0
5496 021526 016602 000020 1$: MOV 20(SP),R2 ;;PICKUP THE DIVISOR
5497 021532 002407 BLT 2$ ;;CHECK THE SIGN
5498 021534 003011 BGT 3$ ;;DIVISOR OF 0 IS A NO-NO
5499 021536 052766 000003 000014 BIS #3,14(SP) ;;SET "V" & "C"
5500 021544 012700 177777 MOV #-1,R0 ;;SET REMAINDER TO ALL ONES
5501 021550 000424 BR 7$ ;;EXIT
5502 021552 005266 000002 2$: INC 2(SP) ;;KEEP TRACK OF DIVISORS SIGN
5503 021556 000401 BR 4$
5504 021560 005402 3$: NEG R2 ;;NEGATE THE ORIGINAL NUMBER
5505 021562 000241 4$: CLC ;;CLEAR "C"
5506 021564 000405 BR 6$ ;;START FORMING QUOTIENT
5507 021566 006100 5$: ROL R0 ;;POSITION MSB'S
5508 021570 010003 MOV R0,R3 ;;COPY
5509 021572 060203 ADD R2,R3 ;;COMPARE DIVIDEND & DIVISOR
5510 021574 103001 BCC 6$ ;;BR IF DIVIDEND > DIVISOR

```

K09

MAINDEC-11-DERPK-C "MECHANICAL AND READ/WRITE TEST"
DERPKC.P11 INTEGER DIVIDE ROUTINE

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5511 021576 010300      MOV      R3,R0      ;:REMAINDER AFTER THIS LOOP
5512      021600 006101      6$:      ROL      R1      ;:QUOTIENT BIT ENTERS HERE
5513      021602 005316      DEC      (SP)      ;:DONE?
5514      021604 001370      BNE      5$      ;:BR IF NO
5515      021606 005701      TST      R1      ;:OVERFLOW?
5516      021610 100005      BPL      8$      ;:BR IF NO
5517      021612 052766 000002 000014      BIS      #2,14(SP) ;:SET "V" IN RETURN STATUS WORD
5518      021620 005000      CLR      R0      ;:SET REMAINDER TO ALL ZEROS
5519      021622 010001      7$:      MOV      R0,R1      ;:COPY REMAINDER INTO QUOTIENT
5520      021624 005726      8$:      TST      (SP)+      ;:CLEAR COUNTER FROM STACK
5521      021626 005716      TST      (SP)      ;:REMAINDER SIGN CORRECTION NEEDED?
5522      021630 002004      BGE      9$      ;:BR IF NO
5523      021632 005400      NEG      R0      ;:NEGATE REMAINDER
5524      021634 105066 000001      CLRB     1(SP)      ;:CLEAR SIGN
5525      021640 005316      DEC      (SP)      ;:BUT DON'T FORGET QUOTIENT
5526      021642 005726      9$:      TST      (SP)+      ;:QUOTIENT SIGN CORRECTION NEEDED?
5527      021644 001401      BEQ      10$      ;:BR IF NO
5528      021646 005401      NEG      R1      ;:NEGATE QUOTIENT
5529      021650 010166 000020      10$:     MOV      R1,20(SP) ;:RETURN QUOTIENT AND
5530      021654 010066 000016      MOV      R0,16(SP) ;:REMAINDER TO USER
5531      021660 012603      MOV      (SP)+,R3      ;:POP STACK INTO R3
5532      021662 012602      MOV      (SP)+,R2      ;:POP STACK INTO R2
5533      021664 012601      MOV      (SP)+,R1      ;:POP STACK INTO R1
5534      021666 012600      MOV      (SP)+,R0      ;:POP STACK INTO R0
5535      021670 012666 000002      MOV      (SP)+,2(SP) ;:SETUP TO RETURN CONDITION CODES
5536      021674 000002      RTI      ;:RETURN

```

;*****

.SBTTL RANDOM NUMBER GENERATOR ROUTINE

;*THIS ROUTINE IS A DOUBLE PRECISION PSEUDO RANDOM NUMBER GENERATOR
;*WITH A RANGE OF 0 TO 2(+33)-1.

;*CALL:

```

;*      JSR      PC,$RAND      ;:CALL THE ROUTINE
;*      RETURN      ;:RETURN HERE THE RANDOM
;*                  ;:NUMBER WILL BE IN
;*                  ;:$HINUM,$LONUM

```

.\$RAND:

```

5549 021676      010046      MOV      R0,-(SP)      ;:PUSH R0 ON STACK
5550 021676 010146      MOV      R1,-(SP)      ;:PUSH R1 ON STACK
5551 021700 010146      MOV      R2,-(SP)      ;:PUSH R2 ON STACK
5552 021702 010246      MOV      R3,-(SP)      ;:PUSH R3 ON STACK
5553 021704 010346      MOV      $LONUM,R0      ;:SET R0 WITH LOW
5554 021706 013700 022024      MOV      $HINUM,R1      ;:SET R1 WITH HIGH
5555 021712 013701 022022      MOV      #-7,R3      ;:SET SHIFT COUNT
5556 021716 012703 177771      CLR      R2      ;:ZERO R2
5557 021722 005002      1$:      ASL      R0      ;:SHIFT R0 LEFT AND
5558 021724 006300      ROL      R1      ;:ROTATE CARRY INTO R1 AND
5559 021726 006101      ROL      R2      ;:ROTATE CARRY INTO R2
5560 021730 006102      INC      R3      ;:CHECK FOR DONE
5561 021732 005203      BNE      1$      ;:CONTINUE SHIFT LOOP
5562 021734 001373      ADD      $LONUM,R0      ;:ADD NUMBER TO MAKE X 129
5563 021736 063700 022024      ADC      R1      ;:PROPOGATE CARRY
5564 021742 005501      ADD      $HINUM,R1      ;:ADD NUMBER TO MAKE X 129
5565 021744 063701 022022      ADC      R2      ;:PROPOGATE CARRY
5566 021750 005502

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5567 021752 062700 001057      ADD    #1057,R0      ;;ADD LOW CONSTANT
5568 021756 005501      ADC     R1          ;;PROPOGATE CARRY
5569 021760 005502      ADC     R2          ;;PROPOGATE CARRY
5570 021762 062701 047401      ADD    #47401,R1      ;;ADD HIGH CONSTANT
5571 021766 005502      ADC     R2          ;;PROPOGATE CARRY
5572 021770 062702 000006      ADD    #6,R2          ;;ADD HIGHEST CONSTART
5573 021774 060200      ADD    R2,R0          ;;REPRIME R0 WITH HIGHEST DIGIT
5574 021776 005501      ADC     R1          ;;PROPOGATE CARRY
5575 022000 010037 022024      MOV    R0,$LONUM      ;;SAVE R0
5576 022004 010137 022022      MOV    R1,$HINUM      ;;SAVE R1
5577 022010 012603      MOV    (SP)+,R3      ;;POP STACK INTO R3
5578 022012 012602      MOV    (SP)+,R2      ;;POP STACK INTO R2
5579 022014 012601      MOV    (SP)+,R1      ;;POP STACK INTO R1
5580 022016 012600      MOV    (SP)+,R0      ;;POP STACK INTO R0
5581 022020 000207      RTS     PC          ;;RETURN
5582 022022 176543      $HINUM: .WORD 176543
5583 022024 123456      $LONUM: .WORD 123456

```

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*****

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```

.SBTTL ROUTINE TO SIZE MEMORY

```

```

;*CALL:
;*      JSR      PC,$SIZE
;*      RETURN
;*$LSTAD WILL CONTAIN:
;*      WITH KT11 OPTION      -- LAST VIRTUAL ADDRESS OF THE LAST BANK
;*      WITHOUT KT11 OPTION   -- LAST ABSOLUTE ADDRESS OF AVAILABLE MEMORY
;*$LSTBK WILL CONTAIN THE LAST BANK AS A SAF
;*$KT11 IS THE MEMORY MANAGEMENT KEY
;*BIT07 = 0 DON'T USE MEMORY MANAGEMENT
;*      MUST BE SETUP BEFORE THE CALL
;*BIT15 = 0 DON'T HAVE MEMORY MANAGEMENT OPTION
;*      DETERMINED BY ROUTINE

```

```

5601 022026 010046      $SIZE: MOV    R0,-(SP)      ;;SAVE R0 ON THE STACK
5602 022030 010146      MOV    R1,-(SP)      ;;SAVE R1 ON THE STACK
5603 022032 010246      MOV    R2,-(SP)      ;;SAVE R2 ON THE STACK
5604 022034 010346      MOV    R3,-(SP)      ;;SAVE R3 ON THE STACK
5605 022036 013746 000004      MOV    @#ERRVEC,-(SP)      ;;SAVE PRESENT ERROR VECTOR PS & PC
5606 022042 013746 000006      MOV    @#ERRVEC+2,-(SP)
5607 022046 010600      MOV    SP,R0          ;;SAVE THE STACK POINTER
5608 022050 013737 177776 000006      MOV    @#PS,@#ERRVEC+2      ;;SET ERRVEC PS TO PRESENT PS
5609 022056 012701 003776      MOV    #3776,R1      ;;SETUP ADDRESS
5610 022062 105727      TSTB   (PC)+        ;;USE MEMORY MANAGEMENT?
5611 022064 000200      $KT11: .WORD 200      ;;SET TO USE MEMORY MANAGEMENT
5612 022066 100063      BPL     $SCORE      ;;BR IF NO
5613 022070 012737 022230 000004      MOV    #SKTNEX,@#ERRVEC      ;;SET FOR TIMEOUT
5614 022076 005737 177572      TST    @#SRO      ;;KT11 ARE YOU THERE?
5615 022102 052737 100000 022064      BIS    #100000,$KT11      ;;YES--SET KT11 KEY
5616 022110 012737 022336 000250      MOV    #MMER,@#MMVEC      ;;SET IN CASE OF ERROR
5617 022116 012737 000340 000252      MOV    #340,@#MMVEC+2
5618 022124 005046      CLR     -(SP)          ;;INITIALIZE FOR "PAR" LOADING
5619 022126 012702 172340      MOV    #KIPAR0,R2      ;;ADDRESS OF FIRST "PAR"
5620 022132 012703 000010      MOV    #108,R3          ;;LOAD EIGHT "PAR.'S" AND EIGHT "PDR.'S"
5621 022136 012762 077406 177740 1$: MOV    #77406,-40(R2)      ;;PDR = 4K, UP, READ/WRITE
5622 022144 011622      MOV    (SP),(R2)+      ;;LOAD "PAR"

```

```

5623 022146 062716 000200      AUD      #200,(SP)      ;;UPDATE FOR NEXT "PAR"
5624 022152 077307      SOB      R3,1$      ;;LOOP UNTIL ALL EIGHT ARE LOADED
5625 022154 012742 177600      MOV      #177600,-(R2)  ;;SETUP KIPAR7 FOR I/O
5626 022160 005042      CLR      -(R2)      ;;SETUP KIPAR6 FOR TESTING
5627 022162 012737 000020 172516  MOV      #20,2#SR3  ;;ENABLE 22 BIT MODE
5628 022170 005237 177572      INC      2#SR0      ;;TURN ON MEMORY MANAGEMENT
5629 022174 012737 022220 000004  MOV      #SKTOUT,2#ERRVEC  ;;SET FOR TIME OUT
5630 022202 005737 143776 2$:    TST      2#143776  ;;TRAP ON NON-EX-MEM
5631 022206 062712 000040      ADD      #40,(R2)      ;;MAKE A 1K STEP
5632 022212 023712 172356      CMP      2#KIPAR7,(R2)  ;;LAST ONE?
5633 022216 101371      BHI      2$      ;;NO--TRY IT
5634 022220 011202      SKTOUT: MOV      (R2),R2      ;;GET LAST BANK+1
5635 022222 005037 177572      CLR      2#SR0      ;;TURN OFF MEMORY MANAGEMENT
5636 022226 000421      BR      $SIZEX
5637 022230 042737 100000 022064  SKTNEX: BIC      #100000,$KT11  ;;KT11 NON-EXISTENT
5638 022236 012737 022266 000004  SCORE:  MOV      #SCROUT,2#ERRVEC  ;;SET FOR TIMEOUT
5639 022244 005002      CLR      R2      ;;SET UP BANK
5640 022246 062701 004000 1$:    ADD      #4000,R1      ;;INCREMENT BY 1K
5641 022252 062702 000040      ADD      #40,R2      ;;1K STEP
5642 022256 005711      TST      (R1)      ;;TRAP ON TIME OUT
5643 022260 022701 177776      CMP      #177776,R1      ;;LAST ONE
5644 022264 001370      BNE      1$      ;;NO--TRY AGAIN
5645 022266 162701 004000      SCROUT: SUB      #4000,R1
5646 022272 162702 000040      $SIZEX: SUB      #40,R2      ;;DROP BACK
5647 022276 010006      MOV      R0,$P      ;;RESTORE THE STACK
5648 022300 012637 000006      MOV      ($P)+,2#ERRVEC+2  ;;RESTORE ERROR VECTOR
5649 022304 012637 000004      MOV      ($P)+,2#ERRVEC
5650 022310 010137 022332      MOV      R1,$LSTAD      ;;LAST ADDRESS
5651 022314 010237 022334      MOV      R2,$LSTBK      ;;LAST BANK
5652 022320 012603      MOV      ($P)+,R3      ;;RESTORE R3
5653 022322 012602      MOV      ($P)+,R2      ;;RESTORE R2
5654 022324 012601      MOV      ($P)+,R1      ;;RESTORE R1
5655 022326 012600      MOV      ($P)+,R0      ;;RESTORE R0
5656 022330 000207      RTS      PC
5657 022332 000000      $LSTAD: .WORD      0      ;;CONTAINS THE LAST ADDRESS
5658 022334 000000      $LSTBK: .WORD      0      ;;CONTAINS THE LAST BANK
5659 022336 000000      MMER:    HALT
5660
5661      ;*****
5662      .SBTTL LP.AVL - LINE PRINTER AVAILABLE
5663      ;*THIS ROUTINE WILL CHECK IF THERE IS A LINE PRINTER AVAILABLE AND SET
5664      ;*"LPTAVL" TO THE PROPER STATE.
5665      ;* LPTAVL = 0 IF NO LINE PRINTER AVAILABLE
5666      ;* LPTAVL = 1 IF LINE PRINTER IS AVAILABLE
5667      ;*CALL
5668      ;*      JSR      PC,2#LP.AVL
5669      ;*      RETURN
5670
5671 022340 005037 001254      LP.AVL: CLR      2#LPTAVL      ;;START WITH NO PRINTER AVAIABLE
5672 022344 012737 022370 000004  MOV      #1$,2#ERRVEC  ;;SETUP THE TIMEOUT VECTOR
5673 022352 005037 000006      CLR      2#ERRVEC+2
5674 022356 005777 157032      TST      2#LPS      ;;IS THERE A LINE PRINTER?
5675 022362 005237 001254      INC      2#LPTAVL      ;;YES--SET AVAILABLE SWITCH
5676 022366 000401      BR      2$
5677 022370 022626 1$:    CMP      ($P)+,($P)+      ;;NO--POP STACK
5678 022372 012737 000006 000004  2$:    MOV      #ERRVEC+2,2#ERRVEC  ;;RESTORE TIMEOUT VECTOR

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5679 022400 000207          RIS      PC          ;RETURN
5680
5681          ;*****
5682          ;SBTTL ST.CLK - CLOCK STARTUP ROUTINE
5683          ;*THIS ROUTINE WILL DETERMINE IF THERE IS A CLOCK ON THE SYSTEM
5684          ;*AND IF THERE IS IT WILL SETUP THE VECTOR AND START THE CLOCK
5685          ;*"CLKSTA" WILL INDICATE THE CLOCK TYPE
5686          ;* 0= NO CLOCK
5687          ;*+1= KW11-P
5688          ;*-1= KW11-L
5689          ;*THIS ROUTINE WILL ALSO SETUP "TICKMS" (TIME
5690          ;*PER CLOCK TICK IN MILLISECONDS) AND "TICKUS"
5691          ;*(TIME PER CLOCK TICK IN MICROSECONDS) AS
5692          ;*PER SW00.
5693          ;*SW00=0 -- 60HZ
5694          ;*SW00=1 -- 50HZ
5695          ;*CALL
5696          ;*      JSR      PC, @ST.CLK
5697          ;*      RETURN
5698
5699 022402 010146          ST.CLK: MOV      R1, -(SP)          ;SAVE R1
5700 022404 012701 000006      MOV      #ERRVEC+2, R1      ;SAVE AND SETUP TIMEOUT VECTOR
5701 022410 011146          MOV      (R1), -(SP)
5702 022412 005011          CLR      (R1)          ;LEVEL 0
5703 022414 014146          MOV      -(R1), -(SP)
5704 022416 012711 022446      MOV      #1$, (R1)          ;GO TO 1$ ON TIMEOUT
5705 022422 005037 001262      CLR      CLKSTA          ;SET CLOCK STATUS TO NO CLOCK
5706 022426 005777 156742      TST      @PKCS          ;IS THERE A KW11-P?
5707 022432 012737 000001 001262      MOV      #1, CLKSTA      ;YES--SET STATUS TO KW11-P
5708 022440 004737 022550      JSR      PC, ST.PCLK      ;START THE KW11-P
5709 022444 000414          BR      3$          ;GO TO EXIT
5710 022446 022626          1$:      CMP      (SP)+, (SP)+      ;CLEAN UP THE STACK
5711 022450 012711 022474      MOV      #2$, (R1)          ;IF TIMEOUT GO TO 2$
5712 022454 005777 156726      TST      @LK$          ;IS THERE A KW11-L?
5713 022460 012737 177777 001262      MOV      #-1, CLKSTA      ;YES-- SET STATUS TO KW11-L
5714 022466 004737 022612      JSR      PC, ST.LCLK      ;START THE KW11-L
5715 022472 000401          BR      3$          ;EXIT
5716 022474 022626          2$:      CMP      (SP)+, (SP)+      ;CLEAN UP THE STACK
5717 022476 012621 3$:      MOV      (SP)+, (R1)+      ;RESTORE THE TIMEOUT VECTOR
5718 022500 012621          MOV      (SP)+, (R1)+
5719 022502 012601          MOV      (SP)+, R1          ;RESTORE R1
5720 022504 032737 000100 001246      BIT      #SW06, @C.SWR      ;50HZ OR 60HZ?
5721 022512 001407          BEQ      4$          ;BRANCH IF 60
5722 022514 012737 000020 001264      MOV      #20, @TICKMS      ;SETUP TIME PER
5723 022522 012737 047040 001266      MOV      #20000., @TICKUS      ;TICK FOR 50HZ
5724 022530 000406          BR      5$
5725 022532 012737 000016 001264 4$:      MOV      #16, @TICKMS      ;SETUP TIME PER
5726 022540 012737 040432 001266      MOV      #16666., @TICKUS      ;TICK FOR 60HZ
5727 022546 000207          5$:      RTS      PC          ;RETURN
5728
5729 022550          ST.PCLK:
5730 022550 032737 000040 001246      BIT      #SW05, @C.SWR      ;ALLOW SOFTWARE TIMEOUTS?
5731 022556 001014          BNE      1$          ;NO--BRANCH
5732 022560 012777 022646 156602      MOV      #SRVCLK, @PKV      ;SETUP THE KW11-P VECTOR
5733 022566 012777 000300 156576      MOV      #300, @PKV+2
5734 022574 012777 000001 156574      MOV      #1, @PKB          ;COUNT ONE TICK

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5735 022602 012777 000115 156564      MOV      #115,DPKCS      ;"INT.EN." COUNT DOWN, "MODE 1 (REPEAT)",
5736                                     ;"LINE FREQ", AND "RUN"
5737 022610 000207                      1$:      RTS      PC      ;RETURN
5738
5739 022612                      ST.LCLK:
5740 022612 C32737 000040 001246      BIT      #SW05,DP.C.SWR      ;ALLOW SOFTWARE TIMEOUTS?
5741 022620 001011                      1$:                      ;NO--BRANCH
5742 022622 012777 022646 156552      MOV      #SRVCLK,DLKV      ;SETUP THE KW11-L VECTOR
5743 022630 012777 000300 156546      MOV      #300,DLKV+2
5744 022636 012777 000100 156542      MOV      #100,DLKS      ;START THE KW11-L
5745 022644 000207                      1$:      RTS      PC      ;RETURN
5746
5747 022646 013746 001264      SRVCLK: MOV      DP.TICKMS,-(SP)      ;TIME PER TICK IN MILLISECONDS
5748 022652 004037 036144      JSR      RD,DP.RPTMR      ;COUNT THE ELAPSED TIME
5749 022656 000002      RTI      ;RETURN AFTER INTERRUPT
5750
5751      ;*****
5752      .SBTTL LDCMD - LOAD COMMAND
5753      ;THIS ROUTINE LOADS A READ HEADER AND DATA COMMAND OR A SEEK COMMAND
5754      ;INTO DPB.B+2 AND DPB.C+2, DEPENDING ON THE STATE OF "CONTROL SWITCH"
5755      ;BIT07.
5756      ;CALL
5757      ;*
5758      JSR      PC,DP.LCMD
5759      ;*
5760      RETURN
5760 022660 032737 000200 001246 LDCMD: BIT      #SW07,DP.C.SWR      ;DO EXPLICIT SEEKS?
5761 022666 001007                      1$:                      ;YES--BRANCH
5762 022670 012737 000173 003516      MOV      #READHD,DPB.B+2 ;NO--SET UP FOR READ HEADER AND
5763 022676 012737 000173 003536      MOV      #READHD,DPB.C+2 ;DATA COMMAND
5764 022704 000406                      BR      2$
5765 022706 012737 000105 003516      1$:      MOV      #SEEK,DPB.B+2 ;SETUP FOR SEEK COMMAND
5766 022714 012737 000105 003536      MOV      #SEEK,DPB.C+2
5767 022722 000207                      2$:      RTS      PC
5768
5769      ;*****
5770      .SBTTL CALL.A - CALL RPO4 DRIVER USING "DPB.A"
5771      ;THIS ROUTINE WILL CALL THE RPO4 DRIVER AND THEN WAIT ON THE FUNCTION
5772      ;TO COMPLETE. IF AN ERROR OCCURS IT IS REPORTED.
5773      ;CALL
5774      ;*
5775      ;FILL "DPB" WITH COMMAND INFORMATION
5776      JSR      RD,DP.CALL.A
5777      ;*
5777      RETURN
5778 022724 005037 001200      CALL.A: CLR      DP.$ESCAPE      ;NO ESCAPE ADDRESS
5779 022730 004037 032766      JSR      RD,DP.RP04      ;CALL RPO4 DRIVER
5780 022734 003474      DPB.A
5781 022736 000772      BR      CALL.A
5782 022740 005737 003512      1$:      TST      DPB.A+16      ;DONE?
5783 022744 001775                      BEQ      1$      ;NO--LOOP
5784 022746 100030                      BPL      3$      ;BRANCH IF NO ERROR
5785 022750 012737 023024 001200      MOV      #2$,DP.$ESCAPE      ;ESCAPE TO 2$ ON ERROR
5786 022756 013737 003506 001306      MOV      DPB.A+12,DP.CYL.DS ;CYLINDER
5787 022764 113737 003505 001312      MOV      DPB.A+11,DP.TRK.DS ;TRACK
5788 022772 113737 003504 001310      MOV      DPB.A+10,DP.SEC.DS ;SECTOR
5789 023000 012746 003512      MOV      DPB.A+16,-(SP) ;STATUS/ERROR INDICATOR ADDRESS
5790 023004 004737 024026      JSR      PC,DP.ERINDX ;FORM DISPATCH INDEX

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5791 023010 062607          AUD      (SP)+,PC      ;REPORT PROPER ERROR
5792 023012 104041          ERROR    41             ;
5793 023014 104042          ERROR    42             ;PARITY ERROR
5794 023016 104043          ERROR    43             ;UNSAFE ERROR
5795 023020 104044          ERROR    44             ;NON-I/O ERROR
5796 023022 104045          ERROR    45             ;I/O ERROR
5797 023024 013700 001270  2$:      MOV      2$BYPASS,RO  ;TAKE ERROR EXIT
5798 023030 000200          3$:      RTS       RO         ;RETURN
5799
5800 ;*****
5801 ;SBTTL CALL.B - CALL RPO4 DRIVER USING "DPB.B"
5802 ;*THIS ROUTINE IS THE SAME AS "CALL.A" EXCEPT FOR THE DPB USED AND IF
5803 ;*THE COMMAND IS A READ HEADER AND DATA THE HEADER (CYLINDER, TRACK,
5804 ;*AND SECTOR) READ IS CHECKED FOR VALIDITY.
5805 ;*CALL
5806 ;*      FILL DPB
5807 ;*      JSR      RO,2$CALL.B
5808 ;*      RETURN
5809
5810 023032 005037 001200  CALL.B: CLR      2$ESCAPE      ;NO ESCAPE ADDRESS
5811 023036 004037 032766          JSR      RO,2$RPO4      ;CALL RPO4 DRIVER
5812 023042 003514          DPB.B
5813 023044 000772          BR       CALL.B
5814 023046 005737 003532  1$:      TST      DPB.B+16      ;DONE?
5815 023052 001775          BEQ      1$                  ;NO--BRANCH
5816 023054 100031          BPL      3$                  ;BRANCH IF NO ERROR
5817 023056 012737 023132 001200  MOV      2$ESCAPE      ;ESCAPE TO 2$ ON ERROR
5818 023064 013737 003526 001306  MOV      2$DPB.B+12,2$CYL.DS ;CYLINDER
5819 023072 113737 003525 001312  MOV      2$DPB.B+11,2$TRK.DS ;TRACK
5820 023100 113737 003524 001310  MOV      2$DPB.B+10,2$SEC.DS ;SECTOR
5821 023106 012746 003532          MOV      2$DPB.B+16,-(SP) ;STATUS/ERROR INDICATOR ADDRESS
5822 023112 004737 024026          JSR      PC,2$ERINDX    ;FORM DISPATCH INDEX
5823 023116 062607          ADD      (SP)+,PC      ;REPORT PROPER ERROR
5824 023120 104041          ERROR    41             ;
5825 023122 104042          ERROR    42             ;PARITY ERROR
5826 023124 104043          ERROR    43             ;UNSAFE ERROR
5827 023126 104044          ERROR    44             ;NON-I/O ERROR
5828 023130 104045          ERROR    45             ;I/O ERROR
5829 023132 013700 001270  2$:      MOV      2$BYPASS,RO  ;TAKE ERROR EXIT
5830 023136 000407          BR       4$
5831 023140 123727 003516 000173  3$:      CMPB     2$DPB.B+2,2$READHD ;DOING IMPLIED SEEKS?
5832 023146 001003          BNE      4$                  ;NO--BRANCH
5833 023150 004037 024306          JSR      RO,2$VERIFY    ;YES--GO CHECK THE DATA
5834 023154 003524          DPB.B+10
5835 023156 032737 040000 001246  4$:      BIT      2$SW14,2$C.SWR  ;STALL?
5836 023164 001403          BEQ      5$                  ;NO--BRANCH
5837 023166 004037 024144          JSR      RO,2$STALL    ;YES--CALL STALL ROUTINE
5838 023172 001420          .WORD    STALL1              ;STALL TIME POINTER
5839 023174 000200          5$:      RTS       RO         ;RETURN
5840
5841 ;*****
5842 ;SBTTL CALL.C - CALL RPO4 DRIVER USING "DBP.C"
5843 ;*THIS ROUTINE IS THE SAME AS "CALL.B" EXCEPT FOR THE DPB USED.
5844 ;*CALL
5845 ;*      FILL DPB
5846 ;*      JSR      RO,2$CALL.C

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5847          ;*      RETURN
5848
5849 023176 005037 001200 CALL.C: CLR      2#SESCAPE      ;NO ESCAPE ADDRESS
5850 023202 004037 032756 JSR      RO,2#RPO4      ;CALL RPO4 DRIVER
5851 023206 003534      DPB.C
5852 023210 000772      CALL.C
5853 023212 005737 003552 1$: TST      2#DPB.C+16      ;DONE?
5854 023216 001775      BEQ      1$      ;NO--LOOP
5855 023220 100031      BPL      3$      ;YES--BRANCH IF NO ERROR
5856 023222 012737 023276 001200 MOV      2$,$ESCAPE      ;ESCAPE TO 2$ ON ERROR
5857 023230 013737 003546 001306 MOV      2#DPB.C+12,2#CYL.DS ;CYLINDER
5858 023236 113737 003545 001312 MOV      2#DPB.C+11,2#TRK.DS ;TRACK
5859 023244 113737 003544 001310 MOV      2#DPB.C+10,2#SEC.DS ;SECTOR
5860 023252 012746 003552      MOV      2#DPB.C+16,-(SP) ;STATUS/ERROR INDICATOR ADDRESS
5861 023256 004737 024026 JSR      PC,2#ERINDX      ;FORM DISPATCH INDEX
5862 023262 062607      ADD      (SP)+,PC      ;REPORT PROPER ERROR
5863 023264 104041      ERROR      41      ;
5864 023266 104042      ERROR      42      ;PARITY ERROR
5865 023270 104043      ERROR      43      ;UNSAFE ERROR
5866 023272 104044      ERROR      44      ;NON-I/O ERROR
5867 023274 104045      ERROR      45      ;I/O ERROR
5868 023276 013700 001270 2$: MOV      2#BYPASS,RO      ;TAKE ERROR EXIT
5869 023302 000400      BR      3$
5870 023304 123727 3536 000173 3$: CMP      2#DPB.C+2,2#READHD ;DOING IMPLIED SEEK?
5871 023312 001003      BNE      4$      ;NO--EXIT
5872 023314 004037 001006 JSR      RO,2#VERIFY      ;YES--CHECK THE DATA
5873 023320 003544      DPB.C+10
5874 023322 032737 040000 001246 4$: BIT      2#SW14,2#C.SWR      ;STALL?
5875 023330 001403      BEQ      5$      ;NO--BRANCH
5876 023332 004037 024144 JSR      RO,2#STALL      ;YES--CALL STALL ROUTINE
5877 023336 001420      .WORD      STALL1      ;STALL TIME POINTER
5878 023340 000200      5$: RTS      RO
5879
5880
5881 ;*****
5882 ;SBTTL DRVCAL - DRIVER (RPO4) CALL USING "DTADPB"
5883 ;THIS ROUTINE IS THE SAME AS "CALL.A" EXCEPT FOR THE DPB USED AND
5884 ;ON AN ERROR LOCATION "ERR.CT" IS EXAMINED. IF ERR.CT IS EQUAL TO
5885 ;$ERFLG EXIT IS TO THE NEXT TEST.
5886 ;CALL
5887 ;*
5888 ;*      FILL DPB
5889 ;*      JSR      RO,2#DRVCAL
5890 ;*      RETURN
5891
5891 023342 005037 001200 DRVCAL: CLR      2#SESCAPE      ;NO ESCAPE ADDRESS
5892 023346 005037 001352 CLR      2#WCEFLG      ;CLEAR WRITE CHECK ERROR FLAG
5893 023352 004037 032766 JSR      RO,2#RPO4      ;CALL RPO4 DRIVER
5894 023356 003554      DTADPB
5895 023360 000770      BR      DRVCAL
5896 023362 005737 003572 1$: TST      2#DTADPB+16      ;DONE
5897 023366 001775      BEQ      1$      ;NO--LOOP
5898 023370 100001      BPL      12$      ;YES--BRANCH IF NO ERRORS
5899 023372 000402      BR      13$
5900 023374 000137 024006 12$: JMP      10$
5901 023400      13$:
5902 023400 012737 023454 001200 MOV      2$,$ESCAPE      ;;ESCAPE TO 2$ ON ERROR

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E10

MAINDEC-11-DERPK-C "MECHANICAL AND READ/WRITE TEST" MACY11 27(732) 14-OCT-76 10:36 PAGE 122
 DERPKC.P11 DRVCL - DRIVER (RPO4) CALL USING "DTADFB"

5903	023406	013737	003566	001306	MOV	2#DTADPB+12,2#CYL.DS	:CYLINDER
5904	023414	113737	003565	001312	MOVB	2#DTADPB+11,2#TRK.DS	:TRACK
5905	023422	113737	003564	001310	MOVB	2#DTADPB+10,2#SEC.DS	:SECTOR
5906	023430	012746	003572		MOV	2#DTADPB+16,-(SP)	:STATUS/ERROR INDICATOR ADDRESS
5907	023434	004737	024026		JSR	PC,2#ERINDX	:FORM DISPATCH INDEX
5908	023440	062607			ADD	(SP)+,PC	:REPORT PROPER ERROR
5909	023442	104041			ERROR	41	
5910	023444	104042			ERROR	42	:PARITY ERROR
5911	023446	104043			ERROR	43	:UNSAFE ERROR
5912	023450	104044			ERROR	44	:NON-I/O ERROR
5913	023452	104045			ERROR	45	:I/O ERROR
5914	023454	122737	000015	001102	2\$: CMPB	8\$15,2#STSTNM	:TEST 15?
5915	023462	001137			SNE	8\$	:NO--BRANCH
5916	023464	122737	000017	001102	CMPB	8\$17,2#STSTNM	:TEST 17 ? MINE
5917	023472	001133			BNE	8\$	:NO--BRANCH
5918	023474	122737	000151	003556	CMPB	2#WRCKD,2#DTADPB+2	:DOING A WRITE CHECK?
5919	023502	001127			BNE	8\$	:NO--BRANCH
5920	023504	032737	040000	003604	BIT	8\$BIT14,2#RP.REG+10	:IS "WCE"=1?
5921	023512	001523			BEQ	8\$	:NO--BRANCH
5922	023514	032737	000020	177570	BIT	8\$SW04,2#SWR	:INHIBIT WRITES?
5923	023522	001117			BNE	8\$	:YES--BRANCH
5924	023524	112737	000161	003556	MOVB	2#WRITE,2#DTADPB+2	:SETUP FOR A WRITE
5925	023532	005037	001200		CLR	2#SESCAPE	:NO ESCAPE ADDRESS
5926	023536	004037	032766		JSR	RO,2#RPO4	:DO THE WRITE
5927	023542	003554			DTADPB		
5928	023544	000240			NOP		
5929	023546	005737	003572		3\$: TST	2#DTADPB+16	:DONE?
5930	023552	001775			BEQ	3\$	:NO--LOOP
5931	023554	100026			BPL	4\$	:YES--BRANCH IF NO ERROR
5932	023556	012737	023762	001200	MOV	8\$SESCAPE	:ESCAPE TO 8\$ ON ERROR
5933	023564	013737	003566	001306	MOV	2#DTADPB+12,2#CYL.DS	:CYLINDER
5934	023572	113737	003565	001312	MOVB	2#DTADPB+11,2#TRK.DS	:TRACK
5935	023600	113737	003564	001310	MOVB	2#DTADPB+10,2#SEC.DS	:SECTOR
5936	023606	012746	003572		MOV	2#DTADPB+16,-(SP)	:STATUS/ERROR INDICATOR ADDRESS
5937	023612	004737	024026		JSR	PC,2#ERINDX	:FORM DISPATCH INDEX
5938	023616	062607			ADD	(SP)+,PC	:REPORT PROPER ERROR
5939	023620	104041			ERROR	41	
5940	023622	104042			ERROR	42	:PARITY ERROR
5941	023624	104043			ERROR	43	:UNSAFE ERROR
5942	023626	104044			ERROR	44	:NON-I/O ERROR
5943	023630	104045			ERROR	45	:I/O ERROR
5944	023632	112737	000151	003556	4\$: MOVB	2#WRCKD,2#DTADPB+2	:COMMAND=WRITE CHECK DATA
5945	023640	004037	032766		JSR	RO,2#RPO4	:DO THE WRITE CHECK
5946	023644	003554			DTADPB		
5947	023646	000240			NOP		
5948	023650	005737	003572		5\$: TST	2#DTADPB+16	:DONE?
5949	023654	001775			BEQ	5\$	:NO--LOOP
5950	023656	100410			BMI	7\$	:YES--BRANCH IF ERROR
5951	023660	004037	032766		JSR	RO,2#RPO4	:DO A 2ND WRITE CHECK
5952	023664	003554			DTADPB		
5953	023666	000240			NOP		
5954	023670	005737	003572		6\$: TST	2#DTADPB+16	:DONE?
5955	023674	001775			BEQ	6\$	:NO--LOOP
5956	023676	100031			BPL	8\$	:YES--BRANCH IF NO ERROR
5957	023700	012737	000001	001352	7\$: MOV	8\$1,2#WCEFLG	:SET THE WRITE CHECK ERROR FLAG
5958	023706	012737	023762	001200	MOV	8\$SESCAPE	:ESCAPE TO 8\$ ON ERROR

F10

MAINDEC-11-DERPK-C "MECHANICAL AND READ/WRITE TEST" MACY11 27(732) 14-OCT-76 10:36 PAGE 123
DERPKC.P11 DRVCAL - DRIVER (RPO4) CALL USING "DTADPB"

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5959 023714 013737 003566 001306      MOV      2*DTADPB+12,2*CYL.DS ;CYLINDER
5960 023722 113737 003565 001312      MOV      2*DTADPB+11,2*TRK.DS ;TRACK
5961 023730 113737 003564 001310      MOV      2*DTADPB+10,2*SEC.DS ;SECTOR
5962 023736 012746 003572      MOV      2*DTADPB+16,-(SP) ;STATUS/ERROR INDICATOR ADDRESS
5963 023742 004737 024026      JSR      PC,2*ERINDX ;FORM DISPATCH INDEX
5964 023746 062607      ADD      (SP)+,PC ;REPORT PROPER ERROR
5965 023750 104041      ERROR    41
5966 023752 104042      ERROR    42 ;PARITY ERROR
5967 023754 104043      ERROR    43 ;UNSAFE ERROR
5968 023756 104044      ERROR    44 ;NON-I/O ERROR
5969 023760 104046      ERROR    46 ;FATAL WRITE CHECK
5970 023762 032737 001000 177570 8$:      BIT      2*SW09,2*SWR ;LOOP ON ERROR?
5971 023770 001004      BNE      9$ ;YES--BRANCH
5972 023772 123737 001426 001103      CMP      2*ERR.CT,2*SERFLG ;GO TO NEXT TEST?
5973 024000 101002      BHI      10$ ;NO--BRANCH
5974 024002 013700 001270 9$:      MOV      2*BYPASS,RO ;YES--GET EXIT ADDRESS
5975 024006 032737 040000 001246 10$:      BIT      2*SW14,2*C.SWR ;STALL?
5976 024014 001403      BEQ      11$ ;NO--BRANCH
5977 024016 004037 024144      JSR      RO,2*STALL ;YES--CALL STALL ROUTINE
5978 024022 001422      .WORD    STALL2 ;STALL TIME POINTER
5979 024024 000200      11$:      RTS      RO
5980
5981 ;*****
5982 ;SBTTL ERINDX - FORM ERROR INDEX
5983 ;THIS ROUTINE FORMS AN INDEX THAT WILL BE USED TO DISPATCH
5984 ;TO THE PROPER ERROR CALL. THE INDEX IS FORMED BY EXAMINING
5985 ;THE STATUS/ERROR INDICATOR OF THE APPLICABLE DPB.
5986 ;INDEX STATUS/ERROR
5987 ;-----
5988 ;      0 BIT14!BIT13!BIT08
5989 ;      2 BIT11!BIT10
5990 ;      4 BIT12!BIT04
5991 ;      6 BIT05!BIT03!<BIT09 & COMMAND=NON-I/O>
5992 ;      10 BIT06!<BIT09 & COMMAND=I/O>
5993 ;CALL
5994 ;      JSR      2*DPB+16,-(SP) ;ADDRESS OF STATUS/ERROR INDICATOR
5995 ;      JSR      PC,2*ERINDX ;FORM INDEX
5996 ;      RETURN ;INDEX IS ON THE STACK
5997
5998 ERINDX: 024026 010046      MOV      RO,-(SP) ;SAVE RO
5999 024030 010146      MOV      R1,-(SP) ;SAVE R1
6000 024032 016600 000006      MOV      6(SP),RO ;GET STATUS/ERROR INDICATOR POINTER
6001 024036 011037 001276      MOV      (RO),2*SVSTAT ;SAVE THE STATUS/ERROR INDICATOR
6002 024042 005001      CLR      R1 ;START INDEX AT ZERO
6003 024044 032710      BIT      (PC)+,(RO) ;FORM INDEX OF 0?
6004 024046 060400      .WORD    BIT14!BIT13!BIT08
6005 024050 001027      BNE      5$ ;YES--BRANCH
6006 024052 032710      .IT      (PC)+,(RO) ;FORM PARITY ERROR INDEX (2)?
6007 024054 006000      .WORD    BIT11!BIT10
6008 024056 001023      BNE      4$ ;YES--BRANCH
6009 024060 032710      BIT      (PC)+,(RO) ;FORM UNSAFE INDEX (4)?
6010 024062 010020      .WORD    BIT12!BIT04
6011 024064 001017      BNE      3$ ;YES--BRANCH
6012 024066 032710      BIT      (PC)+,(RO) ;FORM NON-I/O ERROR INDEX (6)?
6013 024070 000050      .WORD    BIT05!BIT03
6014 024072 001013      BNE      2$ ;YES--BRANCH

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6015	024074	032710		BIT	(PC)+,(RO)	;FORM I/O ERROR INDEX (10)?
6016	024076	000100		.WORD	BIT06	
6017	024100	001007		BNE	1\$	;YES--BRANCH
6018	024102	032710		BIT	(PC)+,(RO)	;SOFTWARE TIMEOUT?
6019	024104	001000		.WORD	BIT09	
6020	024106	001410		BEQ	5\$	;NO--FORM INDEX OF 0
6021	024110	122760	000150 177762	CMPB	#150,-16(RO)	;YES--I/O?
6022	024116	003001		BGT	2\$	;NO--BRANCH
6023	024120	005201	1\$:	INC	R1	;INDEX=10---ERROR=45 OR 46
6024	024122	005201	2\$:	INC	R1	;INDEX=6---ERROR=44
6025	024124	005201	3\$:	INC	R1	;INDEX=4---ERROR=43
6026	024126	005201	4\$:	INC	R1	;INDEX=2---ERROR=42
6027	024130	006301	5\$:	ASL	R1	;INDEX=0---ERROR=41
6028	024132	010166	000006	MOV	R1,6(SP)	;RETURN INDEX TO USER
6029	024136	012601		MOV	(SP)+,R1	;RESTORE R1
6030	024140	012600		MOV	(SP)+,RO	;RESTORE RO
6031	024142	000207		RTS	PC	;RETURN FROM CALL

 ;SMTL STALL - USED TO STALL AFTER A DRIVE FUNCTION IS COMPLETE
 ;THIS ROUTINE WILL PROVIDE A STALL IN MILLISECONDS FOR A SPECIFIC
 ;AMOUNT OF TIME IF BIT13 OF C.SWR = 0 OR A RANDOM AMOUNT OF TIME
 ;IF BIT 13 OF C.SWR = 1.
 ;*STALL1 CONTAINS SPECIFIED TIME FOR TESTS 0-6 AND STALL2
 ;*CONTAINS THE TIME FOR TESTS 13-16.
 ;*CALL

6041				JSR	RO,2*STALL	
6042				TIME POINTER		;WHERE TO FIND THE STALL TIME
6043						
6044	024144	013046		STALL: MOV	2(RO)+,-(SP)	;PICKUP STALL TIME
6045	024146	032737	020000 001246	BIT	#SW13,2*C.SWR	;USE A RANDOM TIME?
6046	024154	001406		BEQ	1\$	;NO--BRANCH
6047	024156	004737	021676	JSR	PC,2*\$RAND	;YES--FORM RANDOM NUMBER
6048	024162	013716	022024	MOV	2*\$LONUM,(SP)	;AND USE IT FOR THE STALL TIME
6049	024166	042716	177700	BIC	#1C77,(SP)	;BUT NEVER > 64 MILLISECONDS
6050	024172	005046	1\$:	CLR	-(SP)	;CLEAR TEMP. LOCATION
6051	024174	162766	000001 000002	2\$:	SUB	#1,2(SP)
6052	024202	103407		BLO	4\$	;NO--BRANCH
6053	024204	012716	000144	MOV	#1D100,(SP)	;STALL FOR ABOUT 1 MILLISECOND
6054	024210	005700	3\$:	TST	RO	;NOP TO KILL TIME
6055	024212	005366	000000	DEC	0(SP)	;COUNT
6056	024216	001374		BNE	3\$	;LOOP IF MORE COUNTS NEEDED
6057	024220	000765		BR	2\$	
6058	024222	022626	4\$:	CMP	(SP)+,(SP)+	;CLEAN OFF THE STACK
6059	024224	000200		RTS	RO	;EXIT

 ;SMTL TWOMS - STALL FOR 2 MS BETWEEN SEEKS IN TESTS 10- - 12
 ;*ROUTINE TO PROVIDE A 2 MS STALL AFTER A SEEK OPERATION IN THE SEEK TIMING
 ;*TESTS (TESTS 10, 11, & 12). THIS STALL IS SPECIFIED BY THE VENDOR (ISS)
 ;*OF THE DISK DRIVE. THIS STALL TIME IS NOT INCLUDED IN THE CALCULATED
 ;*SEEK TIMES.
 ;*CALL
 ;* JSR PC,2*TWOMS
 ;* RETURN

6060
6061
6062
6063
6064
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6067
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6071
6072 024226 013746 177776 TWOMS: MOV @#PS,-(SP) ;SAVE THE PRESENT PROCESSOR STATUS
6073 024232 012737 000240 177776 MOV @<5*32.>, @#PS ;SET THE PROCESSOR PRIORITY TO 5
6074 024240 017746 155124 MOV @PKV,-(SP) ;SAVE THE OLD CLOCK VECTOR ADDRESS
6075 024244 012777 024270 155116 MOV #15, @PKV ;SETUP NEW VECTOR ADDRESS
6076 024252 012777 000310 155116 MOV #200, @PKB ;LOAD THE CLOCK BUFFER
6077 024260 012777 000101 155106 MOV #101, @PKCS ;START THE CLOCK
6078 024266 000001 WAIT ;WAIT FOR 2 MS
6079 024270 062706 000004 1S: ADD #4, SP ;INCREMENT STACK FOR RETURN
6080 024274 012677 155070 MOV (SP)+, @PKV ;RESTORE OLD CLOCK VECTOR
6081 024300 012637 177776 MOV (SP)+, @#PS ;RESTORE THE OLD PROCESSOR STATUS
6082 024304 000207 RTS PC ;RETURN
6083
6084 ;*****
6085 ;SBTTL VERIFY - VALIDATE HEADER ON IMPLIED SEEKS
6086 ;*ROUTINE TO SOFTWARE COMPARE HEADER ON IMPLIED SEEKS
6087 ;*CALL
6088 ;* JSR RO, @#VERIFY
6089 ;* ADR POINTER ;ADDRESS OF DPB+10 (SECTOR NUMBER)
6090 ;* RETURN
6091
6092 024306 010146 VERIFY: MOV R1,-(SP) ;SAVE R1
6093 024310 012001 MOV (R0)+, R1 ;GET ADDRESS OF DPB+10
6094 024312 042737 010000 044134 BIC #FMT22, @#BUFFER ;STRIP FORMAT BIT FROM CYLINDER NUMBER
6095 024320 023761 044134 000002 CMP @#BUFFER, 2(R1) ;CYLINDER NUMBER OK?
6096 024326 001003 BNE 1S ;NO--BRANCH
6097 024330 023711 044136 CMP @#BUFFER+2, (R1) ;YES--HOW ABOUT TRACK/SECTOR?
6098 024334 001426 BEQ 3S ;BRANCH IF GOOD
6099 024336 013737 044134 001300 1S: MOV @#BUFFER, @#CYL.RD ;SAVE THE EXPECTED AND THE
6100 024344 113737 044137 001302 MOV @#BUFFER+3, @#TRK.RD ;RECEIVED CYLINDER, TRACK,
6101 024352 113737 044136 001304 MOV @#BUFFER+2, @#SEC.RD ;AND SECTOR
6102 024360 112137 001310 MOV (R1)+, @#SEC.DS
6103 024364 112137 001312 MOV (R1)+, @#TRK.DS
6104 024370 011137 001306 MOV (R1), @#CYL.DS
6105 024374 012737 024406 001200 MOV #25, $ESCAPE ;:ESCAPE TO 2$ ON ERROR
6106 024402 005740 TST -(R0) ;MAKE IT TEST PC+4
6107 024404 104012 ERROR 12 ;REPORT THE ERROR
6108 024406 013700 001270 2$: MOV @#BYPASS, RO ;TAKE ERROR EXIT
6109 024412 012601 3$: MOV (SP)+, R1 ;RESTORE R1
6110 024414 000200 RTS RO ;EXIT
6111
6112 ;*****
6113 ;SBTTL SRCH00 - INITIALIZE THE DRIVE FOR THE TIMING TESTS
6114 ;*THIS ROUTINE WILL PERFORM A "MASSBUS" INIT. FOLLOWED BY
6115 ;*A "RECALIBRATE" ON THE DRIVE UNDER TEST.
6116 ;*NOTE: THIS ROUTINE DESTROYS R1 AND R4
6117 ;*CALL
6118 ;* JSR RO, SRCH00 ;DO A MASSBUS INIT. AND RECAL
6119 ;* RETURN1 ;RETURN HERE IF NO ERROR
6120 ;* RETURN2 ;RETURN HERE ON ERROR
6121
6122 024416 005001 SRCH00: CLR R1 ;INCASE OF ERROR (TYPTIM)
6123 024420 005037 177776 CLR @#PS
6124 024424 012777 034766 005730 MOV #ISR, @RPVEC ;SETUP INTERRUPT VECTOR
6125 024432 013704 032360 MOV @#RPADR, R4 ;PICKUP ADDRESS OF RHCS1
6126 024436 012764 000040 000010 MOV #BIT05, @RHCS2(R4) ;MASSBUS INIT.

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6127 024444 005037 003564 CLR 2#DTADPB+10 ;TRACK=0: SECTOR=0
6128 024450 005037 003566 CLR 2#DTADPB+12 ;CYLINDER =0
6129 024454 012737 000107 003556 MOV #RECAL,2#DTADPB+2 ;COMMAND = RECALIBRATE
6130 024462 005037 001200 CLR 2#$ESCAPE ;NO ESCAPE ADDRESS
6131 024466 004037 032766 JSR RO,2#RPO4 ;CALL THE DRIVER
6132 024472 003554 DTADPB ;DPB POINTER
6133 024474 000440 BR 4$ ;QUEUE IS FULL
6134 024476 005737 003572 1$: TST DTADPB+16 ;WAIT ON DONE
6135 024502 001775 BEQ 1$
6136 024504 100030 BPL 3$ ;TAKE NORMAL EXIT IF NO ERROR
6137 024506 012737 024562 001200 MOV 2$,$ESCAPE ;ESCAPE TO 2$ ON ERROR
6138 024514 013737 003566 001306 MOV 2#DTADPB+12,2#CYL.DS ;CYLINDER
6139 024522 113737 003565 001312 MOVB 2#DTADPB+11,2#TRK.DS ;TRACK
6140 024530 113737 003564 001310 MOVB 2#DTADPB+10,2#SEC.DS ;SECTOR
6141 024536 012746 003572 MOV 2#DTADPB+16,-(SP) ;STATUS/ERROR INDICATOR ADDRESS
6142 024542 004737 024026 JSR PC,2#ERINDX ;FORM DISPATCH INDEX
6143 024546 062607 ADD (SP)+,PC ;REPORT PROPER ERROR
6144 024550 104041 ERROR 41 ;
6145 024552 104042 ERROR 42 ;PARITY ERROR
6146 024554 104043 ERROR 43 ;UNSAFE ERROR
6147 024556 104044 ERROR 44 ;NON-I/O ERROR
6148 024560 104045 ERROR 45 ;I/O ERROR
6149 024562 005720 2$: TST (RO)+ ;ADJUST FOR ERROR EXIT
6150 024564 000404 BR 4$ ;GO TO THE EXIT
6151 024566 005064 000006 3$: CLR RHDA(R4) ;TRACK AND SECTOR = 0
6152 024572 005064 000034 CLR RHCA(R4) ;CYLINDER = 0
6153 024576 000200 4$: RTS RO ;RETURN
6154
6155 ;*****
6156 ;SBTTL DORTI - RETURN FROM INTERRUPT
6157 ;*THIS IS AN RTI WHICH IS USED BY THE TIMING TESTS
6158
6159 024600 000002 DORTI: RTI ;RETURN FROM INTERRUPT
6160
6161 ;*****
6162 ;SBTTL STRTMR - START THE TIMERS
6163 ;*THIS ROUTINE WILL INITIALIZE THE TIMERS
6164 ;*USE Y THE "TIMING ROUTINES
6165 ;*CALL
6166 ;* JSR PC,2#STRTMR
6167 ;* RETURN
6168
6169 024602 104416 STRTMR: SAVREG ;SAVE RO-R5
6170 024604 012700 001314 MOV #TIM.UP,RO ;START AT TIM.UP (MINIMUM)
6171 024610 012701 001350 MOV #TIM.PT,R1 ;STOP AT TIM.PT
6172 024614 005020 1$: CLR (RO)+ ;CLEAR
6173 024616 020001 CMP RO,R1 ;DONE?
6174 024620 103775 BLO 1$ ;NO--BRANCH
6175 024622 012710 044134 MOV #BUFFER,(RO) ;SETUP POINTER
6176 024626 012737 077777 001314 MOV #1CBIT15,2#TIM.UP ;SET MINIMUM TIME TO MAXIMUM
6177 024634 012737 077777 001332 MOV #1CBIT15,2#TIM.DN ;POSITIVE NUMBER
6178 024642 104420 RESREG ;RESTORE RO-R5
6179 024644 000207 RTS PC ;RETURN
6180
6181 ;*****
6182 ;SBTTL COUNT - THIS ROUTINE COUNTS THE ELAPSED TIME

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6183                                     ;*THIS ROUTINE WILL ADD THE ELAPSED TIME TO THE AVERAGE COUNTER AND
6184                                     ;*MAINTAIN THE MINIMUM AND MAXIMUM TIMES.
6185                                     ;*NOTE: THIS ROUTINE DESTROYS R2
6186                                     ;*CALL
6187                                     ;*      MOV      #TP,R3          ;PARAMETER POINTER
6188                                     ;*      MOV      FLAG,R5          ;FLAG=0=COUNT UP
6189                                     ;*                                     ;FLAG=-1=COUNT DOWN
6190                                     ;*      JSR      PC,@#COUNT
6191                                     ;*      RETURN
6192
6193 024646 012702 001314 COUNT: MOV      #TIM.UP,R2      ;PICKUP THE "UP" POINTER
6194 024652 005705          TST      R5                  ;USE IT?
6195 024654 001402          BEQ      1$                  ;YES--BRANCH
6196 024656 012702 001332          MOV      #TIM.DN,R2      ;NO--PICKUP "DOWN" POINTER
6197 024662 027722 154512 1$:      CMP      @PKC,(R2)+      ;LESS THAN PREVIOUS LOW?
6198 024666 002003          BGE      2$                  ;NO--BRANCH
6199 024670 017762 154504 177776          MOV      @PKC,-2(R2) ;YES--SAVE IT
6200 024676 027763 154476 000004 2$:      CMP      @PKC,4(R3) ;LESS THAN THE LOW LIMIT?
6201 024704 002001          BGE      3$                  ;NO--BRANCH
6202 024706 005212          INC      (R2)                ;YES--COUNT IT
6203 024710 005722          TST      (R2)+              ;ADVANCE THE POINTER
6204 024712 027722 154462          CMP      @PKC,(R2)+      ;GREATER THAN PREVIOUS HIGH?
6205 024716 003403          BLE      4$                  ;NO--BRANCH
6206 024720 017762 154454 177776          MOV      @PKC,-2(R2) ;YES--SAVE IT
6207 024726 027763 154446 000006 4$:      CMP      @PKC,6(R3) ;GREATER THAN THE HIGH LIMIT?
6208 024734 003401          BLE      5$                  ;NO--BRANCH
6209 024736 005212          INC      (R2)                ;YES--COUNT IT
6210 024740 005722          TST      (R2)+              ;ADVANCE THE POINTER
6211 024742 067722 154432          ADD      @PKC,(R2)+      ;ADD THIS COUNT TO THE TOTAL
6212 024746 005522          ADC      (R2)+
6213 024750 005212          INC      (R2)
6214 024752 022737 047304 001350          CMP      #BUFFER+(4*410.),@#TIM.PT ;COUNT THIS READING
6215 024760 101406          BLOS      6$                  ;@#TIM.PT ;SAVE THIS COUNT?
6216 024762 017777 154412 154360          MOV      @PKC,@TIM.PT ;NO--BRANCH
6217 024770 062737 000002 001350          ADD      #2,@#TIM.PT ;YES--WELL SAVE IT THEN
6218 024776 000207 6$:      RTS      PC                  ;ADVANCE THE POINTER
6219                                     ;RETURN
6220                                     ;*****
6221 .SBTTL TYPTIM - TYPE TIMES
6222 ;*THIS ROUTINE IS USED TO TYPE THE MINIMUM,
6223 ;*MAXIMUM, AND AVERAGE TIMES FOR TESTS 7,10,11, AND 12.
6224 ;*IT WILL ALSO CHECK THE TIMES TO INSURE
6225 ;*THEY ARE WITHIN TOLERANCE AND IF NOT FLAG THE BAD TIMES.
6226 ;*NOTE: THIS ROUTINE DESTROYS R2-R5
6227 ;*CALL
6228 ;*      JSR      RO,@#TYPTIM      ;GO REPORT THE TIMES
6229 ;*      TABLE      ;POINT TO THE PROPER TABLE
6230 ;*      RETURN
6231 ;*
6232 ;*TABLE:MSGADR1      ;ADDRESS OF ASCIZ MESSAGE NUMBER 1
6233 ;*      MSGADR2      ;ADDRESS OF ASCIZ MESSAGE NUMBER 2
6234 ;*      MIN.ALLOWED   ;MINIMUM TIME ALLOWED
6235 ;*      MAX.ALLOWED   ;MAXIMUM TIME ALLOWED
6236
6237 025000 012002 TYPTIM: MOV      (RO)+,R2      ;PICKUP THE TABLE POINTER
6238 025002 032737 000100 177570          BIT      #SW06,@#SWR      ;INHIBIT TIME REPORTS?

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6239	025010	001145		BNE	7\$	;YES--BRANCH
6240	025012	012237	025032	MOV	(R2)+,2\$	;ADDRESS OF MESSAGE NUMBER 1
6241	025016	012205		MOV	(R2)+,R5	;ADDRESS OF MESSAGE NUMBER 2
6242	025020	012203		MOV	(R2)+,R3	;PICKUP THE LOW LIMIT
6243	025022	011202		MOV	(R2),R2	;AND THE HIGH LIMIT
6244	025024	012704	001314	MOV	*TIM.UP,R4	;PARAMETER POINTER
6245	025030	104400		1\$: TYPE		;TYPE THE MESSAGE
6246	025032	000000		2\$: .WORD	0	;ASCIZ MESSAGE POINTER GOES HERE
6247	025034	005764	000014	TST	14(R4)	;DID ANY COUNTS OCCUR?
6248	025040	001527		BEQ	6\$	;NO--BRANCH
6249	025042	104400	040452	TYPE	MSGMIN	;MIN="
6250	025046	012446		MOV	(R4)+,-(SP)	;PUT (R4)+ ON THE STACK
6251	025050	004737	021170	JSR	PC,2*SSB2D	;CHANGE (R4)+ TO DECIMAL ASCIZ
6252	025054	004737	021414	JSR	PC,2*SSUPRS	;TYPE WITHOUT LEADING ZEROS
6253	025060	104400	040477	TYPE	MSGOUS	; "0 US"
6254	025064	005724		TST	(R4)+	;ANY SEEKS BELOW THE LOW LIMIT
6255	025066	001421		BEQ	3\$	;NO--BRANCH
6256	025070	104400	040612	TYPE	MSG.SP	
6257	025074	016446	177776	MOV	-2(R4),-(SP)	;PUT -2(R4) ON THE STACK
6258	025100	004737	021170	JSR	PC,2*SSB2D	;CHANGE -2(R4) TO DECIMAL ASCIZ
6259	025104	004737	021414	JSR	PC,2*SSUPRS	;TYPE WITHOUT LEADING ZEROS
6260	025110	104400	040504	TYPE	MBELOW	; "BELOW THE MINIMUM OF"
6261	025114	010346		MOV	R3,-(SP)	;PUT R3 ON THE STACK
6262	025116	004737	021170	JSR	PC,2*SSB2D	;CHANGE R3 TO DECIMAL ASCIZ
6263	025122	004737	021414	JSR	PC,2*SSUPRS	;TYPE WITHOUT LEADING ZEROS
6264	025126	104400	040477	TYPE	MSGOUS	
6265	025132	104400	040461	3\$: TYPE	MSGMAX	; "MAX="
6266	025136	012446		MOV	(R4)+,-(SP)	;PUT (R4)+ ON THE STACK
6267	025140	004737	021170	JSR	PC,2*SSB2D	;CHANGE (R4)+ TO DECIMAL ASCIZ
6268	025144	004737	021414	JSR	PC,2*SSUPRS	;TYPE WITHOUT LEADING ZEROS
6269	025150	104400	040477	TYPE	MSGOUS	
6270	025154	005724		TST	(R4)+	;ANY SEEKS ABOVE THE HIGH LIMIT
6271	025156	001421		BEQ	4\$	;NO--BRANCH
6272	025160	104400	040612	TYPE	MSG.SP	;YES--REPORT HOW MANY
6273	025164	016446	177776	MOV	-2(R4),-(SP)	;PUT -2(R4) ON THE STACK
6274	025170	004737	021170	JSR	PC,2*SSB2D	;CHANGE -2(R4) TO DECIMAL ASCIZ
6275	025174	004737	021414	JSR	PC,2*SSUPRS	;TYPE WITHOUT LEADING ZEROS
6276	025200	104400	040533	TYPE	MABOVE	; "ABOVE THE MAXIMUM OF"
6277	025204	010246		MOV	R2,-(SP)	;PUT R2 ON THE STACK
6278	025206	004737	021170	JSR	PC,2*SSB2D	;CHANGE R2 TO DECIMAL ASCIZ
6279	025212	004737	021414	JSR	PC,2*SSUPRS	;TYPE WITHOUT LEADING ZEROS
6280	025216	104400	040477	TYPE	MSGOUS	
6281	025222	104400	040470	4\$: TYPE	MSGAVG	; "AVG="
6282	025226	012446		MOV	(R4)+,-(SP)	;FORM THE AVERAGE
6283	025230	012446		MOV	(R4)+,-(SP)	
6284	025232	012446		MOV	(R4)+,-(SP)	
6285	025234	004737	021454	JSR	PC,2*SDIV	
6286	025240	006126		ROL	(SP)+	;IS THE REMAINDER OVER HALF?
6287	025242	100001		BPL	5\$	;NO--BRANCH
6288	025244	005216		INC	(SP)	;YES--ROUND UP
6289	025246			5\$: JSR	PC,2*SSB2D	;CHANGE TO DECIMAL ASCIZ
6290	025246	004737	021170	JSR	PC,2*SSUPRS	;TYPE WITHOUT LEADING ZEROS
6291	025252	004737	021414	TYPE	MSGOUS	
6292	025256	104400	040477	TYPE	MSG.SP	
6293	025262	104400	040612	MOV	-2(R4),-(SP)	;PUT -2(R4) ON THE STACK
6294	025266	016446	177776			

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6295 025272 004737 021170      JSR    PC,0#SSB2D      ;CHANGE -2(R4) TO DECIMAL ASCII2
6296 025276 004737 021414      JSR    PC,0#SSUPRS     ;TYPE WITHOUT LEADING ZEROS
6297 025302 104400 040562      TYPE   MSGNUM        ;"SEEKS TIMED"
6298 025306 010537 025032      MOV    R5,2$        ;NEXT MESSAGE POINTER
6299 025312 001404             BEQ    7$            ;IF NONE EXIT
6300 025314 005005             CLR    R5            ;NO MORE THAN 2
6301 025316 000644             BR     1$
6302 025320 104400 040577      6$:    TYPE   MSGNON
6303 025324 000200             7$:    RTS     R0            ;EXIT
6304
6305 ;*****
6306 ;SBTTL INCTRK - INCREMENT TRACK NUMBER
6307 ;*THIS SUBROUTINE WILL INCREMENT THE TRACK
6308 ;*NUMBER (R2) BY THE AMOUNT SPECIFIED BY IT15.
6309 ;*CALL
6310 ;*
6311 ;*    JSR    R0,0#INCTRK
6312 ;*    RETURN1
6313 ;*    RETURN2
6314 ;*                                     ;TRACK NUMBER GREATER THAN LT15
6315 ;*                                     ;TRACK NUMBER INCREMENTED
6316
6314 025326 020237 002342      INCTRK: CMP    R2,0#LT15      ;LAST TRACK COMPLETED?
6315 025332 001410             BEQ    2$            ;YES--EXIT
6316 025334 063702 002344             ADD    0#IT15,R2      ;NO--UPDATE TRACK
6317 025340 020237 002342             CMP    R2,0#LT15      ;TRACK TO BIG?
6318 025344 003402             BLE    1$            ;NO--EXIT
6319 025346 013702 002342             MOV    0#LT15,R2      ;YES--SET TRACK TO LAST TRACK
6320 025352 005720             1$:    TST    (R0)+        ;ADJUST FOR RETURN 2
6321 025354 000200             2$:    RTS     R0            ;RETURN
6322
6323 ;*****
6324 ;SBTTL INCCYL - INCRMENT CYLINDER NUMBER
6325 ;*THIS SUBROUTINE WILL INCREMENT THE CYLINDER
6326 ;*NUMBER (R1) BY THE AMOUNT SPECIFIED BY IC15.
6327 ;*CALL
6328 ;*
6329 ;*    JSR    R0,0#INCCYL
6330 ;*    RETURN1
6331 ;*    RETURN2
6332 ;*                                     ;CYLINDER NUMBER GREATER THAN LC15
6333 ;*                                     ;CYLINDER NUMBER INCREMENTED
6334
6333 025356 020137 002334      INCCYL: CMP    R1,0#LC15      ;LAST CYLINDER COMPLETED?
6334 025362 001410             BEQ    2$            ;YES--EXIT
6335 025364 063701 002336             ADD    0#IC15,R1      ;NO--UPDATE CYLINDER
6336 025370 020137 002334             CMP    R1,0#LC15      ;CYLINDER TO BIG?
6337 025374 003402             BLE    1$            ;NO--EXIT
6338 025376 013701 002334             MOV    0#LC15,R1      ;YES--SET CYLINDER TO LAST CYLINDER
6339 025402 005720             1$:    TST    (R0)+        ;ADJUST FOR RETURN 2
6340 025404 000200             2$:    RTS     R0            ;RETURN
6341
6342 ;*****
6343 ;SBTTL FILBUF - FILL BUFFER WITH ADDRESS DATA
6344 ;*THIS SUBROUTINE IS USED TO FILL THE DATA BUFFER
6345 ;*WITH ADDRESSES FROM 0 TO 21 WITH EACH ADDRESS
6346 ;*BEING STORED IN 256 CONSECUTIVE LOCATIONS
6347 ;*CALL
6348 ;*    JSR    PC,0#FILBUF
6349 ;*    RETURN
6350

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6351 025406 004037 037744      FILBUF: JSR    RO, @SAVR05      ;SAVE R0-R5
6352 025412 005000              CLR    RO              ;FIRST DISK ADDRESS
6353 025414 012701 044134      MOV    #BUFFER, R1      ;START FILLING HERE
6354 025420 012702 000400      1$:  MOV    #1D256, R2      ;DO 256 WORDS
6355 025424 010021              2$:  MOV    RO, (R1)+      ;STORE
6356 025426 005302              DEC    R2              ;MORE?
6357 025430 003375              BGT    2$              ;YES--BRANCH
6358 025432 005200              INC    RO              ;NO--UPDATE DISK ADDRESS
6359 025434 022700 000026      CMP    #1D22, RO      ;DONE?
6360 025440 003367              BGT    1$              ;NO--BRANCH
6361 025442 004037 037770      JSR    RO, @GETR05      ;RESTORE R0-R5
6362 025446 000207              RTS     PC              ;RETURN
6363
6364      ;*****
6365      ;SBTTL CLRBUF - CLEAR BUFFER
6366      ;THIS ROUTINE WILL CLEAR THE BUFFER BY
6367      ;SETTING EACH WORD TO "177400".
6368      ;CALL
6369      ;*
6370      ;* JSR    RO, @CLRBUF
6371      ;* RETURN
6372
6372 025450 004037 037744      CLRBUF: JSR    RO, @SAVR15      ;SAVE R1-R5
6373 025454 012701 177400      MOV    #177400, R1      ;WORD TO FILL BUFFER WITH
6374 025460 012702 044134      MOV    #BUFFER, R2      ;FIRST ADDRESS OF BUFFER
6375 025464 012703 072134      MOV    #BUFFER+512.*22, R3 ;LAST ADDRESS+2 OF BUFFER
6376 025470 010122      1$:  MOV    R1, (R2)+      ;FILL WORDS 1, 9, ... 249, ... 5625
6377 025472 010122      MOV    R1, (R2)+      ;FILL WORDS 2, 10, ... 250, ... 5626
6378 025474 010122      MOV    R1, (R2)+      ;FILL WORDS 3, 11, ... 251, ... 5627
6379 025476 010122      MOV    R1, (R2)+      ;FILL WORDS 4, 12, ... 252, ... 5628
6380 025500 010122      MOV    R1, (R2)+      ;FILL WORDS 5, 13, ... 253, ... 5629
6381 025502 010122      MOV    R1, (R2)+      ;FILL WORDS 6, 14, ... 254, ... 5630
6382 025504 010122      MOV    R1, (R2)+      ;FILL WORDS 7, 15, ... 255, ... 5631
6383 025506 010122      MOV    R1, (R2)+      ;FILL WORDS 8, 16, ... 256, ... 5632
6384 025510 020203      CMP    R2, R3      ;DONE?
6385 025512 103766      BLO    1$              ;NO--BRANCH
6386 025514 004037 037764      JSR    RO, @GETR15      ;RESTORE R1-R5
6387 025520 000200      RTS     RO              ;RETURN FROM CALL
6388
6389      ;*****
6390      ;SBTTL CKSCTR - CHECK SECTOR DATA
6391      ;THIS ROUTINE IS USED TO CHECK THE DATA BUFFER
6392      ;FOR ADDRESSES 0 THROUGH 21 WITH EACH ADDRESS
6393      ;BEING STORED IN 256 CONSECUTIVE LOCATIONS
6394      ;CALL
6395      ;*
6396      ;* JSR    RO, @CKSCTR
6397      ;* RETURN
6398
6398 025522 004037 037744      CKSCTR: JSR    RO, @SAVR15      ;SAVE R1-R5
6399 025526 162706 000004      SUB    #4, SP      ;RESERVE TEMP. STORAGE AREA
6400 025532 005001              CLR    R1              ;FIRST SECTOR
6401 025534 012716 044134      MOV    #BUFFER, (SP)      ;FIRST ADDRESS OF DATA BUFFER
6402 025540 005066 000002      CLR    2(SP)      ;NO ERRORS
6403 025544 012702 000020      1$:  MOV    #1D16, R2      ;LOOP COUNT (16*16=256)
6404 025550 011603      MOV    (SP), R3      ;GET 1ST ADDRESS OF THIS SECTORS DATA
6405 025552
6406 025552 020123      2$:  CMP    R1, (R3)+      ;WORD 1

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6407	025554	001064			BNE	7\$		;BRANCH IF BAD
6408	025556	020123			CMP	R1,(R3)+		;WORD 2
6409	025560	001062			BNE	7\$		;BRANCH IF BAD
6410	025562	020123			CMP	R1,(R3)+		;WORD 3
6411	025564	001060			BNE	7\$		;BRANCH IF BAD
6412	025566	020123			CMP	R1,(R3)+		;WORD 4
6413	025570	001056			BNE	7\$		;BRANCH IF BAD
6414	025572	020123			CMP	R1,(R3)+		;WORD 5
6415	025574	001054			BNE	7\$		;BRANCH IF BAD
6416	025576	020123			CMP	R1,(R3)+		;WORD 6
6417	025600	001052			BNE	7\$		;BRANCH IF BAD
6418	025602	020123			CMP	R1,(R3)+		;WORD 7
6419	025604	001050			BNE	7\$		;BRANCH IF BAD
6420	025606	020123			CMP	R1,(R3)+		;WORD 8
6421	025610	001046			BNE	7\$		;BRANCH IF BAD
6422	025612	020123			CMP	R1,(R3)+		;WORD 9
6423	025614	001044			BNE	7\$		;BRANCH IF BAD
6424	025616	020123			CMP	R1,(R3)+		;WORD 10
6425	025620	001042			BNE	7\$		;BRANCH IF BAD
6426	025622	020123			CMP	R1,(R3)+		;WORD 11
6427	025624	001040			BNE	7\$		;BRANCH IF BAD
6428	025626	020123			CMP	R1,(R3)+		;WORD 12
6429	025630	001036			BNE	7\$		;BRANCH IF BAD
6430	025632	020123			CMP	R1,(R3)+		;WORD 13
6431	025634	001034			BNE	7\$		;BRANCH IF BAD
6432	025636	020123			CMP	R1,(R3)+		;WORD 14
6433	025640	001032			BNE	7\$		;BRANCH IF BAD
6434	025642	020123			CMP	R1,(R3)+		;WORD 15
6435	025644	001030			BNE	7\$		;BRANCH IF BAD
6436	025646	020123			CMP	R1,(R3)+		;WORD 16
6437	025650	001026			BNE	7\$		;BRANCH IF BAD
6438	025652	005302			DEC	R2		;FINISHED WITH THIS SECTORS DATA?
6439	025654	001336			BNE	2\$		;NO--BRANCH
6440	025656	062716	001000	3\$:	ADD	#D512,(SP)		;YES--FIRST ADDRESS OF NEXT SECTOR
6441	025662	005201			INC	R1		;MOVE TO NEXT SECTOR
6442	025664	022701	000026		CMP	#D22,R1		;DONE?
6443	025670	003325			BGT	1\$		;NO--BRANCH
6444	025672	005766	000002	4\$:	TST	2(SP)		;ERROR OCCUR?
6445	025676	001406			BEQ	6\$		;NO--BRANCH
6446	025700	123737	001426	001103	CMPB	#ERR.CT,#SERFLG		;MAX. ERROR OCCURRED?
6447	025706	101002			BHI	6\$		;NO--BRANCH
6448	025710	013700	001270	5\$:	MOV	#BYPAS ^c R0		;TAKE ERROR EXIT
6449	025714	062706	000004	6\$:	ADD	#4,SP		;FREE TEMP. AREA
6450	025720	004037	037764		JSR	R0,#GEINIS		;RESTORE R1-R5
6451	025724	000200			RTS	R0		;RETURN FROM CALL
6452	025726	010304		7\$:	MOV	R3,R4		;FORM WORD NUMBER AND
6453	025730	161604			SUB	(SP),R4		;ADDRESS TO CONTINUE FROM
6454	025732	010405			MOV	R4,R5		
6455	025734	006204			ASR	R4		;WORD NUMBER
6456	025736	042705	177740		BIC	#C37,R5		
6457	025742	001002			BNE	8\$		;BRANCH IF NOT A MULTIPLE OF 16
6458	025744	012705	000040		MOV	#40,R5		;SET TO WORD 16
6459	025750	006305		8\$:	ASL	R5		
6460	025752	062705	025552		ADD	#2\$ R5		;ADDRESS
6461	025756	016337	177776	001126	MOV	-2(R3),#BDDAT		;SAVE BAD DATA
6462	025764	005766	000002		TST	2(SP)		;FIRST ERROR?

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6463 025770 001015 BNE 105 ;NO--BRANCH
6464 025772 013737 003566 001306 MOV 2*DTADPB+12,2*CYL.DS ;CYLINDER NUMBER
6465 025000 113737 003565 001312 MOV 2*DTADPB+11,2*TRK.DS ;TRACK NUMBER
6466 026006 012737 026016 001200 MOV 2*9$,SESCAPE ;ESCAPE TO 9$ ON ERROR
6467 026014 104021 ERROR 21 ;REPORT THE ERROR
6468 026016 105166 000002 9$: COMB 2(SP) ;SET ERROR SWITCH
6469 026022 000404 BR 11$
6470 026024 10$: MOV 11$,SESCAPE ;ESCAPE TO 11$ ON ERROR
6471 026024 012737 026034 001200 ERROR 22 ;REPORT THE ERROR
6472 026032 104022 11$: BIT 2*SW09,2*SWR ;LOOP ON ERROR?
6473 026034 032737 001000 177570 BNE 5$ ;YES
6474 026042 001322 9IT 2*SW01,2*SWR ;STOP DATA COMPARE?
6475 026044 032737 000002 177570 BNE 4$ ;YES--BRANCH
6476 026052 001207 CMPB 2*ERR.CT,2*SERFLG ;MAX. ERRORS?
6477 026054 123737 001426 001103 BLOS 5$ ;YES--BRANCH
6478 026062 101712 BIT 2*SW05,2*SWR ;REPORT ONLY 1ST ERROR PER SECTOR?
6479 026064 032737 000040 177570 BNE 3$ ;YES--BRANCH
6480 026072 001271 JMP (R5)
6481 026074 000115
6482
6483 ;*****
6484 ;SBTTL SETBUF - SET BUFFER TO DATA PATTERN
6485 ;THIS ROUTINE WILL MOVE THE 16 WORDS OF THE
6486 ;DESIRED PATTERN INTO THE DATA BUFFER.
6487 ;CALL
6488 ;*
6489 ;* MOV 2*NX,RO ;PATTERN NUMBER INDEX TO RO
6490 ;* JSR PC,2*SETBUF
6491 026076 004037 037744 SETBUF: JSR RO,2*SAVR15 ;SAVE R1-R5
6492 026102 012701 044134 MOV 2*BUFFER,R1 ;FIRST ADDRESS
6493 026106 122737 000017 001102 CMPB 2*17,2*STSNM
6494 026114 001002 BNE 2$
6495 026116 013701 001212 MOV BUF,R1
6496 026122 013702 003563 2$: MOV 2*DTADPB+4,R2 ;WORD COUNT
6497 026126 016003 002434 1$: MOV PAT.PT(RO),R3 ;PICKUP PATTERN POINTER
6498 026132 012321 MOV (R3)+,(R1)+ ;MOVE WORD 1 INTO DATA BUFFER
6499 026134 012321 MOV (R3)+,(R1)+ ;MOVE WORD 2 INTO DATA BUFFER
6500 026136 012321 MOV (R3)+,(R1)+ ;MOVE WORD 3 INTO DATA BUFFER
6501 026140 012321 MOV (R3)+,(R1)+ ;MOVE WORD 4 INTO DATA BUFFER
6502 026142 012321 MOV (R3)+,(R1)+ ;MOVE WORD 5 INTO DATA BUFFER
6503 026144 012321 MOV (R3)+,(R1)+ ;MOVE WORD 6 INTO DATA BUFFER
6504 026146 012321 MOV (R3)+,(R1)+ ;MOVE WORD 7 INTO DATA BUFFER
6505 026150 012321 MOV (R3)+,(R1)+ ;MOVE WORD 8 INTO DATA BUFFER
6506 026152 012321 MOV (R3)+,(R1)+ ;MOVE WORD 9 INTO DATA BUFFER
6507 026154 012321 MOV (R3)+,(R1)+ ;MOVE WORD 10 INTO DATA BUFFER
6508 026156 012321 MOV (R3)+,(R1)+ ;MOVE WORD 11 INTO DATA BUFFER
6509 026160 012321 MOV (R3)+,(R1)+ ;MOVE WORD 12 INTO DATA BUFFER
6510 026162 012321 MOV (R3)+,(R1)+ ;MOVE WORD 13 INTO DATA BUFFER
6511 026164 012321 MOV (R3)+,(R1)+ ;MOVE WORD 14 INTO DATA BUFFER
6512 026166 012321 MOV (R3)+,(R1)+ ;MOVE WORD 15 INTO DATA BUFFER
6513 026170 012321 MOV (R3)+,(R1)+ ;MOVE WORD 16 INTO DATA BUFFER
6514 026172 062702 000020 ADD 2*1D16,R2 ;DONE?
6515 026176 001353 BNE 1$ ;NO--BRANCH
6516 026200 004037 037764 JSR RO,2*GETR15 ;YES--RESTORE R1-R5
6517 026204 000207 RTS PC ;RETURN
6518

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6519          ;*****
6520          ;SBTTL DATCMP - DATA COMPARE
6521          ;*THIS ROUTINE COMPARES A 16 WORD DATA PATTERN
6522          ;*AGAINST THE DATA BUFFER
6523          ;*CALL
6524          ;*      MOV      #NX,R0          ;PATTERN NUMBER INDEX TO R0
6525          ;*      JSR      PC, @DATCMP
6526          ;*      RETURN
6527
6528 026206 004037 037744          DATCMP: JSR      R0, @SAVR05          ;SAVE R0-R5
6529 026212 012701 044134          MOV      @BUFFER, R1          ;FIRST ADDRESS OF BUFFER
6530 026216 122737 000017 001102 CMPB     #17, STSNM
6531 026224 001002          BNE     95
6532 026226 013701 001212          MOV      BUF, R1
6533 026232 013702 003560          95:  MOV      @DATADPB+4, R2          ;WORD COUNT
6534 026236 005046          CLR      -(SP)          ;NO ERROR
6535 026240 016003 002434          15:  MOV      PAT.PT(R0), R3          ;PATTERN POINTER
6536 026244          25:
6537 026244 162321          SUB      (R3)+, (R1)+          ;CHECK WORD 1
6538 026246 001045          BNE     45          ;BRANCH IF DIFFERENT
6539 026250 162321          SUB      (R3)+, (R1)+          ;CHECK WORD 2
6540 026252 001043          BNE     45          ;BRANCH IF DIFFERENT
6541 026254 162321          SUB      (R3)+, (R1)+          ;CHECK WORD 3
6542 026256 001041          BNE     45          ;BRANCH IF DIFFERENT
6543 026260 162321          SUB      (R3)+, (R1)+          ;CHECK WORD 4
6544 026262 001037          BNE     45          ;BRANCH IF DIFFERENT
6545 026264 162321          SUB      (R3)+, (R1)+          ;CHECK WORD 5
6546 026266 001035          BNE     45          ;BRANCH IF DIFFERENT
6547 026270 162321          SUB      (R3)+, (R1)+          ;CHECK WORD 6
6548 026272 001033          BNE     45          ;BRANCH IF DIFFERENT
6549 026274 162321          SUB      (R3)+, (R1)+          ;CHECK WORD 7
6550 026276 001031          BNE     45          ;BRANCH IF DIFFERENT
6551 026300 162321          SUB      (R3)+, (R1)+          ;CHECK WORD 8
6552 026302 001027          BNE     45          ;BRANCH IF DIFFERENT
6553 026304 162321          SUB      (R3)+, (R1)+          ;CHECK WORD 9
6554 026306 001025          BNE     45          ;BRANCH IF DIFFERENT
6555 026310 162321          SUB      (R3)+, (R1)+          ;CHECK WORD 10
6556 026312 001023          BNE     45          ;BRANCH IF DIFFERENT
6557 026314 162321          SUB      (R3)+, (R1)+          ;CHECK WORD 11
6558 026316 001021          BNE     45          ;BRANCH IF DIFFERENT
6559 026320 162321          SUB      (R3)+, (R1)+          ;CHECK WORD 12
6560 026322 001017          BNE     45          ;BRANCH IF DIFFERENT
6561 026324 162321          SUB      (R3)+, (R1)+          ;CHECK WORD 13
6562 026326 001015          BNE     45          ;BRANCH IF DIFFERENT
6563 026330 162321          SUB      (R3)+, (R1)+          ;CHECK WORD 14
6564 026332 001013          BNE     45          ;BRANCH IF DIFFERENT
6565 026334 162321          SUB      (R3)+, (R1)+          ;CHECK WORD 15
6566 026336 001011          BNE     45          ;BRANCH IF DIFFERENT
6567 026340 162321          SUB      (R3)+, (R1)+          ;CHECK WORD 16
6568 026342 001007          BNE     45          ;BRANCH IF DIFFERENT
6569 026344 062702 000020          ADD      #1016, R2          ;DONE ?
6570 026350 001333          15:  BNE     15          ;NO--BRANCH
6571 026352 005726          35:  TST      (SP)+          ;YES -- CLEAN UP STACK
6572 026354 004037 037770          JSR      R0, @GETR05          ;RESTORE R0-R5
6573 026360 000207          RTS      PC
6574 026362 010104          45:  MOV      R1, R4          ;FORM THE WORD NUMBER

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6575 026364 122737 000017 001102      CMPB    #17,STSTNM
6576 026372 001403                      BEQ     10$
6577 026374 152704 044134              SUB     #BUFFER,R4
6578 026400 000402                      BR      11$
6579 026402 163704 001212              10$: SUB     BUF,R4
6580 026406                      11$:
6581 026406 006204                      ASR     R4                ;WORD NUMBER
6582 026410 010305                      MOV     R3,R5                ;FORM ADDRESS TO CONTINUE FROM
6583 026412 166005 002434              SUB     PAT.PT(R0),R5
6584 026416 006305                      ASL     R5
6585 026420 062705 026244              ADD     #2$,R5                ;ADDRESS
6586 026424 064341                      ADD     -(R3),-(R1)          ;RECONSTRUCT THE BAD WORD
6587 026426 010137 001122              MOV     R1,#$BDADR          ;SAVE THE ERROR INFORMATION
6588 026432 010337 001120              MOV     R3,#$GDADR
6589 026436 012137 001126              MOV     (R1)+,#$BDADR
6590 026442 012337 001124              MOV     (R3)+,#$GDADR
6591 026446 005716                      TST     (SP)
6592 026450 001023                      BNE     6$                ;1ST DATA COMPARE ERROR?
6593 026452 013737 003566 001306      MOV     #DTADPB+12,#CYL.DS ;CYLINDER
6594 026460 113737 003565 001312      MOV     #DTADPB+11,#TRK.DS ;TRACK
6595 026466 113737 003564 001310      MOV     #DTADPB+10,#SEC.DS ;SECTOR
6596 026474 016600 000016              MOV     16(SP),R0          ;GET TEST PC+4
6597 026500 012737 026510 001200      MOV     #5$,SESCAPE        ;ESCAPE TO 5$ ON ERROR
6598 026506 104013                      ERROR  13                ;REPORT THE ERROR
6599 026510 016600 000014              5$: MOV     14(SP),R0        ;PATTERN NUMBER INDEX
6600 026514 105116                      COMB   (SP)              ;SET THE ERROR SWITCH
6601 026516 000404                      BR      7$
6602 026520                      6$:
6603 026520 012737 026530 001200      MOV     #7$,SESCAPE        ;ESCAPE TO 7$ ON ERROR
6604 026526 104014                      ERROR  14                ;REPORT THE ERROR
6605 026530 032737 000002 177570      7$: BIT     #SW01,#SWR      ;STOP DATA COMPARE?
6606 026536 001305                      BNE     3$                ;YES--EXIT
6607 026540 123737 001426 001103      CMPB    #ERR.CT,#SERFLG    ;MAX. ERRORS?
6608 026546 101004                      BHI     8$                ;NO--BRANCH
6609 026550 013766 001270 000016      MOV     #8:PASS,16(SP)    ;YES--ERROR EXIT
6610 026556 000675                      BR      3$
6611 026560 000115              8$: JMP     (R5)                ;NO--CONTINUE AT NEXT WORD
6612
6613 ;*****
6614 ;SBTTL FILRAN - FILL DATA BUFFER WITH RANDOM PATTERN
6615 ;THIS ROUTINE WILL FILL THE DATA BUFFER (256*22 WORDS) WITH
6616 ;A RANDOM PATTERN. THE FIRST TWO WORDS OF EVERY 256 WILL
6617 ;BE THE BASE OF THE RANDOM NUMBER GENERATOR FOR THE
6618 ;NEXT 254 WORDS.
6619 ;NOTE: THIS ROUTINE DESTROYS R1 AND R2
6620 ;CALL
6621 ;*      JSR     R0,#FILRAN
6622 ;*      RETURN
6623
6624 026562 012701 044134 001102      FILRAN: MOV     #BUFFER,R1
6625 026566 122737 000017                      CMPB    #17,STSTNM
6626 026574 001002                      BNE     2$
6627 026576 013701 001212              MOV     BUF,R1
6628 026602 012702 000026              2$: MOV     #1D22,R2
6629 026606 004037 027066              1$: JSR     R0,#RANPAT
6630 026612 005302                      DEC     R2

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E11

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 DERPKC.P11 FILRAN - FILL DATA BUFFER WITH RANDOM PATTERN

6631	026614	003374		BGT	15	
6632	026616	000200		RTS	RO	
6633						
6634				;*****		
6635				;SBTTL RANCK - RANDOM PATTERN BUFFER CHECK		
6636				;*THIS ROUTINE USES THE FIRST TWO WORDS OF THE		
6637				;*READ BUFFER TO GENERATED A RANDOM PATTERN. THEN		
6638				;*THE READ BUFFER IS COMPARED TO THE PATTERN GENERATED.		
6639				;*NOTE: THIS ROUTINE DESTROYS R1-R4		
6640				;*CALL		
6641				;*		
6642				JSR	RO,2#RANCK	
6643				;*		
6644	026620	013746	022022	RANCK:	MOV	2#SHINUM,-(SP) ;SAVE THE PRESENT RANDOM NUMBER
6645	026624	013746	022024		MOV	2#SLONUM,-(SP)
6646	026630	012702	045134		MOV	#BUFFER+512.,R2 ;READ BUFFER ADDRESS
6647	026634	012701	046134		MOV	#BUFFER+1024.,R1 ;RANDOM PATTERN ADDRESS
6648	026640	122737	000017 001102		CMPB	#17,\$STSTM
6649	026646	001007			BNE	7\$
6650	026650	013702	001212		MOV	BUF,R2
6651	026654	010201			MOV	R2,R1
6652	026656	062702	001000		ADD	#512.,R2
6653	026662	062701	002000		ADD	#1024.,R1
6654	026666	010103		7\$:	MOV	R1,R3 ;COPY IT INTO R3 FOR LATER USE
6655	026670	011237	022024		MOV	(R2),2#SLONUM ;PRIME THE RANDOM NUMBER GENERATOR
6656	026674	016237	000002 022022		MOV	2(R2),2#SHINUM
6657	026702	004037	027066		JSR	RO,2#RANPAT ;GENERATE A RANDOM PATTERN
6658	026706	012637	022024		MOV	(SP)+,2#SLONUM ;RESTORE PRESENT RANDOM NUMBER
6659	026712	012637	022022		MOV	(SP)+,2#SHINUM
6660	026716	005046			CLR	-(SP) ;NO ERRORS
6661	026720	162322		1\$:	SUB	(R3)+,(R2)+ ;ARE THESE TWO WORDS DIFFERENT?
6662	026722	001452			BEQ	4\$;NO--BRANCH
6663	026724	012737	027020 001200		MOV	3\$,\$ESCAPE ;ESCAPE TO 3\$ ON ERROR
6664	026732	064342			ADD	-(R3),-(R2) ;RECREATE THE BAD WORD
6665	026734	010237	001122		MOV	R2,2#\$BDADR ;ADDRESS OF BAD DATA
6666	026740	010337	001120		MOV	R3,2#\$GDADR ;ADDRESS OF GOOD DATA
6667	026744	012237	001126		MOV	(R2)+,2#\$BDAT ;BAD DATA
6668	026750	012337	001124		MOV	(R3)+,2#\$GDAT ;GOOD DATA
6669	026754	010204			MOV	R2,R4 ;FORM WORD NUMBER (1 TO 256)
6670	026756	122737	000017 001102		CMPB	#17,\$STSTM
6671	026764	001005			BNE	9\$
6672	026766	163704	001212		SUB	BUF,R4
6673	026772	162704	001000		SUB	#512.,R4
6674	026776	000402			BR	8\$
6675	027000	162704	045134	9\$:	SUB	#BUFFER+512.,R4
6676	027004	006204		8\$:	ASR	R4
6677	027006	005716			TST	(SP) ;FIRST ERROR
6678	027010	001002			BNE	2\$;NO--BRANCH
6679	027012	105116			COMB	(SP) ;YES--SET ERROR SWITCH
6680	027014	104015			ERROR	15 ;REPORT THE ERROR
6681	027016	104016		2\$:	ERROR	16 ;REPORT THE ERROR
6682	027020	032737	001000 177570	3\$:	BIT	#SW09,2#SWR ;LOOP ON ERROR?
6683	027026	001012			BNE	5\$;YES--BRANCH
6684	027030	123737	001426 001103		CMPB	2#ERR.CT,2#SERFLG ;MAX. ERRORS OCCURRED?
6685	027036	101406			BLOS	5\$;YES--BRANCH
6686	027040	032737	000002 177570		BIT	#SW01,2#SWR ;STOP COMPARING?

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6687 027046 001002          BNE      5$          ;YES--BRANCH
6688 027050 020103          4$:      CMP      R1,R3      ;ALL DATA BEEN COMPARED?
6689 027052 101322          BHI      1$          ;NO--BRANCH
6690 027054 005726          5$:      TST      (SP)+      ;ERROR OCCUR?
6691 027056 001402          BEQ      6$          ;NO--BRANCH
6692 027060 013700 001270   MOV      2$BYPASS,R0      ;TAKE ERROR EXIT
6693 027064 000200          6$:      RTS      R0          ;EXIT
6694
6695 ;*****
6696 ;SBTTL RANPAT - RANDOM PATTERN GENERATOR
6697 ;*THIS ROUTINE FILLS A 256 WORD BUFFER WITH A RANDOM
6698 ;*PATTERN OF WHICH THE FIRST TWO WORDS ARE THE BASE
6699 ;*OF THE PATTERN.
6700 ;*CALL
6701 ;*      MOV      2$ADR,R1          ;ADDRESS OF THE BUFFER
6702 ;*      JSR      R0,2$RANPAT
6703 ;*      RETURN
6704
6705 027066 010246 000200   RANPAT: MOV      R2,-(SP)      ;SAVE R2
6706 027070 012702          MOV      2$10256/2,R2      ;GENERATE 256 WORDS
6707 027074 000402          BR      2$
6708 027076 004737 021676   1$:      JSR      PC,2$SRAND      ;GENERATE A RANDOM NUMBER
6709 027102 013721 022024   2$:      MOV      2$2LONUM,(R1)+      ;PUT LOW WORD IN BUFFER
6710 027106 013721 022022   MOV      2$2SHINUM,(R1)+      ;PUT HIGH WORD IN BUFFER
6711 027112 005302          DEC      R2          ;DONE?
6712 027114 003370          BGT      1$          ;NO--BRANCH
6713 027116 012602          MOV      (SP)+,R2      ;RESTORE R2
6714 027120 000200          RTS      R0          ;EXIT
6715
6716 ;*****
6717 ;SBTTL RANADR - RANDOM ADDRESS GENERATOR
6718 ;*THIS ROUTINE GENERATES RANDOM CYLINDER, TRACK, AND SECTOR
6719 ;*ADDRESSES AND SAVES THEM IN THE DPB (DTADPB+10 AND DTADPB+12).
6720 ;*NOTE: THIS ROUTINE DESTROYS R1-R3
6721 ;*CALL
6722 ;*      JSR      R0,2$RANADR
6723 ;*      RETURN
6724
6725 027122 004737 021676   RANADR: JSR      PC,2$SRAND      ;GENERATE A RANDOM NUMBER
6726 027126 113701 022024   MOV      2$2LONUM,R1      ;FORM SECTOR IN R1
6727 027132 113702 022025   MOV      2$2LONUM+1,R2      ;FORM TRACK IN R2
6728 027136 013703 022022   MOV      2$2SHINUM,R3      ;FORM CYLINDER IN R3
6729 027142 105701          TST      R1          ;INSURE THE SECTOR IS BETWEEN 0 AND 21
6730 027144 002403          BLT      2$
6731 027146 122701 000026   1$:      CMP      2$1022,R1
6732 027152 003003          BGT      3$
6733 027154 000241          2$:      CLC
6734 027156 106001          RORB      R1
6735 027160 000772          BR      1$
6736 027162 105702          3$:      TST      R2          ;INSURE THE TRACK IS BETWEEN 0 AND 18
6737 027164 002403          BLT      5$
6738 027166 122702 000023   4$:      CMP      2$1019,R2
6739 027172 003003          BGT      6$
6740 027174 000241          5$:      CLC
6741 027176 106002          RORB      R2
6742 027200 000772          BR      4$

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6743 027202 023703 002360 65: CMP 2#FC16,R3 ;INSURE THE CYLINDER IS BETWEEN FC AND LC
6744 027206 003413 BLE 7$
6745 027210 000241 CLC
6746 027212 006003 ROR R3
6747 027214 005503 ADC R3
6748 027216 001371 BNE 6$
6749 027220 010103 MOV R1,R3
6750 027222 000303 SWAB R3
6751 027224 060203 ADD R2,R3
6752 027226 005203 INC R3
6753 027230 003364 BGT 6$
6754 027232 005403 NEG R3
6755 027234 000762 BR 6$
6756 027236 023703 002362 75: CMP 2#LC16,R3
6757 027242 002003 BGE 8$
6758 027244 000241 CLC
6759 027246 006003 ROR R3
6760 027250 000772 BR 7$
6761 027252 023703 002360 85: CMP 2#FC16,R3
6762 027256 003403 BLE 9$
6763 027260 005203 INC R3
6764 027262 000303 SWAB R3
6765 027264 000764 BR 7$
6766 027266 110137 003564 95: MOV R1,2#DTADPB+10 ;SAVE SECTOR ADDRESS
6767 027272 110237 003565 MOV R2,2#DTADPB+11 ;SAVE TRACK ADDRESS
6768 027276 010337 003566 MOV R3,2#DTADPB+12 ;SAVE CYLINDER ADDRESS
6769 027302 000200 RTS ;RETURN

```

```

6770
6771 ;*****
6772 .SBTTL GETSWR - GET THE CONTROL SWITCH SETTINGS
6773 ;*THIS ROUTINE IS USED TO INPUT THE "CONTROL SWITCHES".
6774 ;*IF SWR<07>=1 THE PRESENT SETTING WILL BE TYPED AND THE NEW
6775 ;*SETTING IS READ AND STORED.
6776 ;*NOTE: THIS ROUTINE DESTROYS R3 AND R4
6777 ;*CALL
6778 ;*
6779 ;* JSR PC,2#GETSWR
6780 ;* RETURN ; (C.SWR)=DESIRED CONTROL SWITCHES

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6781 027304 022737 000200 177570 GETSWR: BIT 2#SW07,2#SWR ;READ CONTROL SWITCHES?
6782 027312 001426 BEC 2$ ;NO--BRANCH
6783 027314 104400 027322 TYPE +4 ;TYPE ASCIZ STRING
6784 027320 000410 BR 64$ ;GET OVER THE ASCIZ
6785 ;;.ASCIZ <15><12>/SET SWR<07>=0/
6786 027342 64$:
6787 027342 012703 040046 1$: MOV 2#MSG.CS,R3 ;"CONTROL SWITCHES="
6788 027346 013704 001246 MOV 2#C.SWR,R4 ;PRESENT CONTROL SWITCH SETTINGS
6789 027352 004037 027612 JSR R0,2#GETNUM ;GET THE NEW SWITCH SETTINGS
6790 027356 000771 BR 1$ ;COMMA
6791 027360 000770 BR 1$ ;PERIOD
6792 027362 010437 001246 MOV R4,2#C.SWR ;DOUBLE PERIOD-SAVE NEW SWITCH SETTING
6793 027366 000746 BR GETSWR ;LOOP
6794 027370 000207 2$: RTS PC ;RETURN FROM CALL

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6795
6796 ;*****
6797 .SBTTL GETADR - GET BUS ADDRESS AND VECTOR ADDRESS
6798 ;*THIS ROUTINE IS USED TO INSURE THE BUS ADDRESS

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H11

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 DERPKC.P11 GETADR - GET BUS ADDRESS AND VECTOR ADDRESS

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6799      ;*OF THE RH11/RP04 IS SETUP TO READ THE PROPER VALUE.
6800      ;*IT WILL ALSO READ THE ADDRESS FROM THE TTY IF
6801      ;*REQUIRED.
6802      ;*NOTE: THIS ROUTINE DESTROYS R0-R4
6803      ;*CALL
6804      ;*
6805      ;*      JSR      PC, @GETADR
6806      ;*      RETURN
6807
6808 027372 005737 001252      GETADR: TST      @BUSADR      ; INPUT FROM TTY REQUESTED?
6809 027376 001447              BEQ      7$              ; NO--BRANCH
6810 027400 005037 001252      CLR      @BUSADR      ; YES--CLEAR THE REQUEST FLAG
6811 027404 012700 001362      1$:  MOV      @RH.ADR, R0      ; FIRST ADDRESS
6812 027410 012703 040072      MOV      @MRHCS1, R3      ; "RHCS1="
6813 027414 011004              MOV      (R0), R4      ; PRESENT RHCS1 ADDRESS
6814 027416 004037 027612      JSR      R0, @GETNUM      ; GET NEW RHCS1
6815 027422 000402              BR      2$              ; COMMA
6816 027424 000767              BR      1$              ; PERIOD
6817 027426 000430              BR      5$              ; DOUBLE PERIOD
6818 027430 010420 040103      2$:  MOV      R4, (R0)+      ; SAVE NEW RHCS1
6819 027432 012703 040103      MOV      @MRHVEC, R3      ; "RHVEC="
6820 027436 011004              MOV      (R0), R4      ; PRESENT RH11 VECTOR ADDRESS
6821 027440 004037 027612      JSR      R0, @GETNUM      ; GET NEW RHVEC
6822 027444 000402              BR      3$              ; COMMA
6823 027446 000756              BR      1$              ; PERIOD
6824 027450 000417              BR      5$              ; DOUBLE PERIOD
6825 027452 010420 040114      3$:  MOV      R4, (R0)+      ; SAVE NEW RHVEC
6826 027454 012703 040114      MOV      @MRHPRI, R3      ; "RHPRI="
6827 027460 011004              MOV      (R0), R4      ; PRESENT RH11 PRIORITY LEVEL
6828 027462 006304              ASL      R4              ; POSITION FOR TYPEOUT
6829 027464 006304              ASL      R4
6830 027466 006304              ASL      R4
6831 027470 000304              SWAB      R4
6832 027472 004037 027612      JSR      R0, @GETNUM      ; GET NEW RHPRI
6833 027476 000402              BR      4$              ; COMMA
6834 027500 000401              BR      4$              ; PERIOD
6835 027502 000404              BR      6$              ; DOUBLE PERIOD
6836 027504 010210 040114      4$:  MOV      R2, (R0)      ; SAVE NEW RHPRI
6837 027506 000736              BR      1$              ; LOOP
6838 027510 010410 040114      5$:  MOV      R4, (R0)      ; SAVE INPUT
6839 027512 000401              BR      7$              ;
6840 027514 010210 040114      6$:  MOV      R2, (R0)      ; SAVE PRIORITY
6841 027516 013701 000004      7$:  MOV      @ERRVEC, R1      ; SAVE THE ERROR VECTOR
6842 027522 012737 027560 000004      MOV      @BS, @ERRVEC      ; SETUP FOR TRAP
6843 027530 005777 151626      TST      @RH.ADR      ; CHECK FOR RH11/RP04
6844 027534 010137 000004      MOV      R1, @ERR VEC      ; RESTORE ERROR VECTOR
6845 027540 012700 001362      MOV      @RH.ADR, R0      ; FIRST ADDRESS OF NEW PARAMETERS
6846 027544 012701 032360      MOV      @RPADR, R1      ; FIRST ADDRESS OF WHERE TO PUT THEM
6847 027550 012021              MOV      (R0)+, (R1)+      ; BUS ADDRESS
6848 027552 012021              MOV      (R0)+, (R1)+      ; VECTOR ADDRESS
6849 027554 012021              MOV      (R0)+, (R1)+      ; PRIORITY LEVEL
6850 027556 000207              RTS      PC              ; RETURN
6851 027560 010137 000004      8$:  MOV      R1, @ERRVEC      ; RESTORE ERROR VECTOR
6852 027564 022626              CMP      (SP)+, (SP)+      ; CLEAN OFF THE STACK
6853 027566 104010              ERROR      10              ; REPORT THE ERROR
6854 027570 005737 000042      TST      @42              ; IS THERE A MONITOR?

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6855	027574	001703		BEQ	1\$		;NO--GO ASK FOR ADDRESS
6856	027576	005037	001256	CLR	2\$DRVSEL		;YES--NO DRIVES SELECTED
6857	027602	005037	015120	CLR	2\$SEOPCT		;NO PASSES
6858	027606	000137	014744	JMP	2\$SEOP		;GO TO END OF PROGRAM
6859							
6860							*****
6861							.SBTTL GETNUM - ROUTINE TO GET A NUMBER
6862							;THIS ROUTINE WILL TYPE AN ASCIZ MESSAGE AND THEN
6863							;INPUT AN ASCIZ STRING AND CHANGE THE STRING TO OCTAL
6864							;IF REQUIRED.
6865							;NOTE: THIS ROUTINE DESTROYS R1
6866							;CALL
6867							
6868							
6869							
6870							
6871							
6872							
6873							
6874							
6875							
6876							
6877	027612	010337	027620	GETNUM: MOV	R3,2\$		;SAVE MESSAGE POINTER
6878	027616	104400		1\$: TYPE			;TYPE THE MESSAGE
6879	027620	000000		2\$: .WORD	0		;MESSAGE POINTER GOES HERE
6880	027622	010446		MOV	R4,-(SP)		;SAVE R4 FOR TYPEOUT
6881	027624	104402		TYPOC			;GO TYPE--OCTAL ASCII(ALL DIGITS)
6882	027626	104414		RDLIN			;READ AN ASCIZ STRING
6883	027630	012601		MOV	(SP)+,R1		;ADDRESS OF FIRST CHARACTER
6884	027632	004037	031646	JSR	RO,2\$CK.CHR		;CHECK ONE CHARACTER
6885	027636	027616		1\$			;ILLEGAL CHARACTER
6886	027640	027616		1\$			;CARRIAGE RETURN
6887	027642	027652		3\$			"/"
6888	027644	027676		7\$			"."
6889	027646	027704		8\$			"."
6890	027650	027616		1\$			;DIGIT 0-9
6891	027652			3\$:			
6892	027652	004037	032102	JSR	RO,2\$CK.NUM		;CHECK THE NUMBER
6893	027656	027616		1\$			;ILLEGAL INPUT
6894	027660	027672		6\$			;TERMINATED WITH A ","
6895	027662	027670		5\$			;TERMINATED WITH A "."
6896	027664	027666		4\$			;TERMINATED WITH A "..."
6897	027666	005720		4\$: TST	(R0)+		;DOUBLE PERIOD
6898	027670	005720		5\$: TST	(R0)+		;SINGLE PERIOD
6899	027672	010204		6\$: MOV	R2,R4		;COMMA--SAVE INPUT NUMBER
6900	027674	000414		BR	10\$		;GO TO EXIT
6901	027676	105711		7\$: TSTB	(R1)		;TERMINATOR AFTER A COMMA?
6902	027700	001346		BNE	1\$		;NO--LOOP
6903	027702	000411		BR	10\$		;YES--EXIT
6904	027704	105711		8\$: TSTB	(R1)		;TERMINATOR AFTER A PERIOD?
6905	027706	001406		BEQ	9\$		;YES--EXIT
6906	027710	122721	000056	CMPB	#'.,(R1)+		;NO--DOUBLE PERIOD?
6907	027714	001340		BNE	1\$		;NO--LOOP
6908	027716	105711		TSTB	(R1)		;YES--TERMINATOR?
6909	027720	001336		BNE	1\$		;NO--LOOP
6910	027722	005720		TST	(R0)+		;DOUBLE PERIOD

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6911 027724 005720          9$:   TST      (R0)+      ;PERIOD
6912 027726 010402          10$:  MOV      R4,R2      ;COMMA--POSITION THE
6913 027730 000302                  SWAB      R2      ;NUMBER IN CASE IT
6914 027732 006202                  ASR       R2      ;IS THE PRIORITY LEVEL
6915 027734 006202                  ASR       R2
6916 027736 006202                  ASR       R2
6917 027740 000200                  RTS        R0      ;EXIT
6918
6919 ;*****
6920 ;SBTTL GT.PRM - GET PARAMETERS
6921 ;*THIS ROUTINE IS USED TO CHANGE OR MODIFY
6922 ;*THE TEST PARAMETERS. IT GIVES THE OPERATOR
6923 ;*THE CAPABILITY OF SPECIFYING WHICH DRIVES TO TEST, WHICH
6924 ;*TESTS TO RUN AND HOW MANY TIMES TO
6925 ;*REPEAT EACH TEST
6926 027742 004037 037744 GT.PRM: JSR      R0, @SAVROS      ;SAVE R0-R5
6927 027746 005037 001256 GT.PR1: CLR      DRVSEL      ;NO DRIVE SELECTED
6928 027752 104400 027760          TYPE      +4      ;TYPE ASCIZ STRING
6929 027756 000406          BR        64$      ;GET OVER THE ASCIZ
6930 ;;;.ASCIZ      <15><12>/DRIVE(S)=/
6931 64$:
6932 027774 104414          RDLIN      ;READ TTY
6933 027776 012601          MOV      (SP)+,R1      ;ADDRESS OF ASCIZ STRING
6934 030000 004037 031646          JSR      R0, @CK.CHR      ;CHECK ONE CHARACTER
6935 030004 027746          GT.PR1      ;ILLEGAL CHARACTER
6936 030006 027746          GT.PR1      ;CARRIAGE RETURN
6937 030010 027746          GT.PR1      ;"/"
6938 030012 027746          GT.PR1      ;"."
6939 030014 027746          GT.PR1      ;","
6940 030016 030020          IS        ;DIGIT 0-9
6941 030020 005301          1$:   DEC      R1
6942 030022          2$:
6943 030022 012702 000007          MOV      #7,R2      ;UPPER LIMIT OF INPUT
6944 030026 004037 031722          JSR      R0, @CK.DIG      ;CHECK THE DIGIT(S)
6945 030032 027746          GT.PR1      ;ILLEGAL INPUT
6946 030034 027746          GT.PR1      ;INPUT TOO LARGE
6947 030036 030044          3$:   ;TERMINATED WITH A ","
6948 030040 030064          4$:   ;TERMINATED WITH A ".'"
6949 030042 030064          4$:   ;TERMINATED WITH A ".'"
6950 030044 156237 032346 001256 3$: BISB      ATABIT(R2),DRVSEL ;SET THE DRIVE SELECTED BIT
6951 030052 105741          TSTB      -(R1)      ;WAS THE LINE TERMINATED?
6952 030054 001362          BNE      2$      ;NO-GET THE NEXT DRIVE
6953 030056 005037 001260          CLR      @TSTNMS      ;DESELECT ALL TESTS
6954 030062 000406          BR        GTTST1      ;YES--SELECT TEST
6955 030064 156237 032346 001256 4$: BISB      ATABIT(R2),DRVSEL ;SET THE SELECTED DRIVE BITS
6956 030072 004037 037770          GT.PR2: JSR      R0, @GETROS      ;RESTORE R0-R5
6957 030076 000207          RTS        PC      ;EXIT
6958
6959 030100          GTTST1:
6960 030100 104400 030106          TYPE      +4      ;TYPE ASCIZ STRING
6961 030104 000403          BR        64$      ;GET OVER THE ASCIZ
6962 ;;;.ASCIZ      /TEST=/
6963 64$:
6964 030114 104414          RDLIN      ;READ AN ASCIZ STRING
6965 030116 012601          MOV      (SP)+,R1      ;POINTER TO R1
6966 030120 122711 000056          CMPB      #'.,(R1)      ;DOUBLE PERIOD?

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 MAINDEC-11-DERPK-C "MECHANICAL AND READ/WRITE TEST"
 DERPKC.P11 GT.PRM - GET PARAMETERS

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6967	030124	001007		BNE	1\$	;NO--BRANCH
6968	030126	122761	000056 000001	CMPB	#',,1(R1)	
6969	030134	001003		BNE	1\$	
6970	030136	105761	000002	TSTB	2(R1)	; "CR"?
6971	030142	001753		BEQ	GT.PR2	;YES--EXIT
6972	030144	005037	001260	1\$: CLR	TSTNMS	;NO TEST SELECTED
6973	030150	005003		CLR	R3	;NO TEST TO BE OPENED
6974	030152	005004		GTTST2: CLR	R4	;NO TEST BITS SET
6975	030154	121127	000123	CMPB	(R1), #'S	;ALL SEEK TESTS?
6976	030160	001003		BNE	1\$	;NO--BRANCH
6977	030162	012704	000177	MOV	#177,R4	;YES--SELECT TESTS 0-6
6978	030166	000512		BR	GTTST3	
6979	030170	121127	000124	1\$: CMPB	(R1), #'T	;ALL TIMING TESTS?
6980	030174	001003		BNE	2\$	;NO--BRANCH
6981	030176	012704	003600	MOV	#3600,R4	;YES--SELECT TESTS 7-12
6982	030202	000504		BR	GTTST3	
6983	030204	121127	000101	2\$: CMPB	(R1), #'A	;ALL ADDRESSING TESTS?
6984	030210	001003		BNE	3\$	;NO--BRANCH
6985	030212	012704	014000	MOV	#14000,R4	;YES--SELECT TESTS 13 & 14
6986	030216	000476		BR	GTTST3	
6987	030220	121127	000104	3\$: CMPB	(R1), #'D	;DATA TEST?
6988	030224	001003		BNE	4\$	;NO--BRANCH
6989	030226	012704	020000	MOV	#20000,R4	;YES--SELECT TEST 15
6990	030232	000470		BR	GTTST3	
6991	030234	121127	000105	4\$: CMPB	(R1), #'E	;EXERCISER TEST?
6992	030240	001003		BNE	5\$	;NO--BRANCH
6993	030242	012704	040000	MOV	#40000,R4	;YES--SELECT TEST 16
6994	030246	000462		BR	GTTST3	
6995	030250	004037	031572	5\$: JSR	RO, @CK.OCT	;OCTAL DIGIT?
6996	030254	000460		BR	GTTST4	;NO--BRANCH
6997	030256	010205		MOV	R2,R5	;YES--SAVE IT
6998	030260	005201		INC	R1	;MOVE TO NEXT CHARACTER
6999	030262	004037	031572	JSR	RO, @CK.OCT	;OCTAL DIGIT
7000	030266	000405		BR	6\$	;NO--BRANCH
7001	030270	005201		INC	R1	;MOVE TO NEXT CHARACTER
7002	030272	006305		ASL	R5	;SCALE HIGH DIGIT
7003	030274	006305		ASL	R5	
7004	030276	006305		ASL	R5	
7005	030300	060502		ADD	R5,R2	;COMBINE HIGH & LOW DIGITS
7006	030302	020227	000016	6\$: CMP	R2, #16	;LEGAL TEST NUMBER?
7007	030306	003274		BGT	GTTST1	;NO--BRANCH
7008	030310	006302		ASL	R2	
7009	030312	016204	001430	MOV	BITS(R2),R4	;SELECT TEST
7010	030316	121127	000055	CMPB	(R1), #'-	;TEST STRING?
7011	030322	001035		BNE	GTTST4	;NO--BRANCH
7012	030324	005201		INC	R1	;YES--MOVE TO NEXT CHARACTER
7013	030326	004037	031572	JSR	RO, @CK.OCT	;OCTAL DIGIT?
7014	030332	000662		BR	GTTST1	;NO--BRANCH
7015	030334	010205		MOV	R2,R5	;YES--SAVE IT
7016	030336	005201		INC	R1	;MOVE TO NEXT CHARACTER
7017	030340	004037	031572	JSR	RO, @CK.OCT	;OCTAL DIGIT?
7018	030344	000405		BR	7\$	;NO--BRANCH
7019	030346	005201		INC	R1	;YES--MOVE TO NEXT CHARACTER
7020	030350	006305		ASL	R5	;SCALE HIGH DIGIT
7021	030352	006305		ASL	R5	
7022	030354	006305		ASL	R5	

7023	030356	060502			ADD	R5,R2	;COMBINE HIGH & LOW DIGIT
7024	030360	020227	000017	7\$:	CMP	R2,#17	;LEGAL TEST NUMBER?
7025	030364	003245			BGT	GTTST1	;NO--BRANCH
7026	030366	006302			ASL	R2	
7027	030370	020462	001430		CMP	R4,BITS(R2)	;IS THE FIRST NUMBER OF THE
7028							;STRING SMALLER THAN THE LAST?
7029	030374	002241			BGE	GTTST1	;NO--BRANCH
7030	030376	056204	001430	8\$:	BIS	BITS(R2),R4	;YES--SET TEST SELECT BIT FOR SELECTED TESTS
7031	030402	005742			TST	-(R2)	;ADJUST POINTER
7032	030404	036204	001430		BIT	BITS(R2),R4	;DONE?
7033	030410	001772			BEQ	8\$	;NO--BRANCH
7034	030412	000401			BR	GTTST4	;SKIP THE INCREMENT
7035	030414	005201		GTTST3:	INC	R1	;MOVE TO NEXT CHARACTER
7036	030416	050437	001260	GTTST4:	BIS	R4,TSTNMS	;SET SELECTED TEST BITS INTO
7037							;TEST SELECT WORD
7038	030422	121127	000056		CMPB	(R1),#'	; "PERIOD"?
7039	030426	001420			BEQ	GTTST5	;YES--BRANCH
7040	030430	005704			TST	R4	;ANY TEST SELECTED THIS CYCLE?
7041	030432	001622			BEQ	GTTST1	;NO--BRANCH
7042	030434	121127	000057		CMPB	(R1),#'/	; "OPEN"?
7043	030440	001002			BNE	1\$	;NO--BRANCH
7044	030442	050403			BIS	R4,R3	;YES--SET BITS FOR TEST TO OPEN
7045	030444	000403			BR	2\$	
7046	030446	121127	000054	1\$:	CMPB	(R1),#'	; "COMMA"?
7047	030452	001212			BNE	GTTST1	;NO--BRANCH
7048	030454	005201		2\$:	INC	R1	;MOVE TO NEXT CHARACTER
7049	030456	105711			TSTB	(R1)	; "CR"?
7050	030460	001234			BNE	GTTST2	;NO--GO GET NEXT CHARACTER
7051	030462	005703			TST	R3	;ANY TESTS TO OPEN?
7052	030464	001026			BNE	OPNTST	;YES--BRANCH
7053	030466	000604			BR	GTTST1	;NO--START AGAIN
7054	030470	005201		GTTST5:	INC	R1	;MOVE TO NEXT CHARACTER
7055	030472	121127	000056		CMPB	(R1),#'	; "PERIOD"?
7056	030476	001410			BEQ	GTTST6	;YES--BRANCH
7057	030500	105711			TSTB	(R1)	; "CR"?
7058	030502	001402			BEQ	1\$	;YES--BRANCH
7059	030504	000137	030100		JMP	GTTST1	
7060	030510	005703		1\$:	TST	R3	;ANY TEST TO BE OPENED?
7061	030512	001013			BNE	OPNTST	;YES--BRANCH
7062	030514	000137	030072		JMP	GT.PR2	;NO--GO START TESTING
7063	030520	005201		GTTST6:	INC	R1	;MOVE TO NEXT CHARACTER
7064	030522	105711			TSTB	(R1)	; "CR"?
7065	030524	001402			BEQ	1\$	;YES--BRANCH
7066	030526	000137	030100		JMP	GTTST1	;NO--GO ASK FOR TEST
7067	030532	005703		1\$:	TST	R3	;ANY TEST TO BE OPENED?
7068	030534	001002			BNE	OPNTST	;YES--BRANCH
7069	030536	000137	030072		JMP	GT.PR2	;NO--GO START TESTING
7070							
7071	030542	004037	037744		OPNTST:	JSR	;OPEN THE TEST FOR CHANGES
7072	030546	005027			CLR	RO,#SAVR05	
7073	030550	000000		OPN.CT:	.WORD	0	;START WITH TEST 0
7074	030552	000412			BR	OPN.2	;COUNT STORED HERE
7075	030554	005237	030550	OPN.1:	INC	OPN.CT	;SKIP THE INCREMENT
7076	030560	022737	000016 030550		CMP	#16,OPN.CT	;MOVE TO THE NEXT TEST
7077	030566	002004			BGE	OPN.2	;TEST NUMBER TO BIG?
7078	030570	004037	037770		JSR	RO,#GETR05	;NO--OPEN THE NEXT TEST

7079	030574	000137	030100		JMP	GTTST1	;;YES--GO ASK FOR MORE TESTS
7080	030600	013705	030550	OPN.2:	MOV	OPN.CT,R5	;;SETUP TO USE THE
7081	030604	006305			ASL	R5	;;TEST NUMBER AS AN INDEX
7082	030606	036503	001430		BIT	BITS(R5),R3	;;OPEN THIS TEST?
7083	030612	001760			BEQ	OPN.1	;;NO--MOVE TO NEXT TEST
7084	030614	104400	030622		TYPE	+4	;;TYPE ASCIZ STRING
7085	030620	000404			SR	64\$	;;GET OVER THE ASCIZ
7086					;;	ASCIZ / TEST /	
7087	030632			64\$:			
7088	030632	013746	030550		MOV	OPN.CT,-(SP)	;;SAVE OPN.CT FOR TYPEOUT
7089							;;TEST NUMBER
7090	030636	104404			TYP0S		;;GO TYPE--OCTAL ASCII
7091	030640	002			.BYTE	2	;;TYPE 2 DIGIT(S)
7092	030641	000			.BYTE	0	;;SUPPRESS LEADING ZEROS
7093	030642	104400	001207		TYPE	,SCLF	;;TYPE "CR" & "LF"
7094	030646	016500	001516		MOV	PRMPT(R5),R0	;;PICKUP PARAMETER POINTER
7095	030652	011046			MOV	(R0),-(SP)	;;SAVE THE VARIABLE INDICATOR
7096	030654	012702	001470		MOV	*PRM,R2	;;FIRST ADDRESS OF TABLE
7097	030660	000405			BR	2\$	
7098	030662	006216		1\$:	ASR	(SP)	;;CHECK FOR A VARIABLE
7099	030664	103403			BCS	2\$	;;GO MOVE THIS ONE
7100	030666	001404			BEQ	OPNPRM	;;DONE
7101	030670	005722			TST	(R2)+	;;BUMP THE POINTER
7102	030672	000773			BR	1\$	
7103	030674	012022		2\$:	MOV	(R0)+,(R2)+	;;MOVE THIS VARIABLE INTO THE
7104	030676	000771			BR	1\$	;;COMMON AREA
7105	030700	013716	001470	OPNPRM:	MOV	*PRM,(SP)	;;GET THE VARIABLE INDICATOR
7106	030704	005004			CLR	R4	;;ZERO THE INDEX
7107	030706	006216		1\$:	ASR	(SP)	;;CHECK FOR A VARIABLE
7108	030710	103403			BCS	3\$	;;GO GET IT
7109	030712	001772			BEQ	OPNPRM	;;OUT OF VARIABLES
7110	030714	005724		2\$:	TST	(R4)+	;;UPDATE THE INDEX
7111	030716	000773			BR	1\$	
7112	030720	005764	001554	3\$:	TST	PRMLT(R4)	;;IS THE MAX. MAGNITUDE NEG?
7113	030724	100463			BMI	OPNPAT	;;YES--THEN IT IS THE PATTERN
7114	030726	104400	040612		TYPE	MSG.SP	;;TYPE SPACES
7115	030732	016437	001600	030742	MOV	PRMSG(R4),4\$	;;TYPE THE NAME OF THIS VARIABLE
7116	030740	104400			TYPE		
7117	030742	000000		4\$:	.WORD	0	
7118	030744	104400	040044		TYPE	MSG.EQ	;;TYPE "="
7119	030750	016446	001472		MOV	RPT(R4),-(SP)	;;PUT RPT(R4) ON THE STACK
7120	030754	004737	021170		JSR	PC,*\$S820	;;CHANGE RPT(R4) TO DECIMAL ASCIZ
7121	030760	004737	021414		JSR	PC,*\$SUPRS	;;TYPE WITHOUT LEADING ZEROS
7122	030764	104414			RDLIN		
7123	030766	012601			MOV	(SP)+,R1	;;READ AN ASCIZ STRING
7124	030770	004037	031646		JSR	R0,*CK.CHR	;;CHECK ONE CHARACTER
7125	030774	030720			3\$		;;ILLEGAL CHARACTER
7126	030776	030720			3\$		;;CARRIAGE RETURN
7127	031000	031044					;;
7128	031002	031010			5\$		;;
7129	031004	031016			6\$		;;
7130	031006	030720			3\$		;;DIGIT 0-9
7131	031010	105711		5\$:	TSTB	(R1)	;;"CR"?
7132	031012	001342			BNE	3\$	;;NO--STAY ON THIS VARIABLE
7133	031014	000737			BR	2\$	;;YES--MOVE TO NEXT VARIABLE
7134	031016	105711		6\$:	TSTB	(R1)	;;IS THERE A "CR" AFTER THE PERIOD?

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 DERPKC.P11 GT.PRM - GET PARAMETERS

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7135	031020	001002		BNE	64\$	;NO
7136	031022	000137	031432	JMP	OPN.N2	;YES--GO CLOSE THIS TEST
7137	031026	122721	000056	64\$: CMPB	*'.,(R1)+	;DOUBLE PERIOD?
7138	031032	001332		BNE	3\$	;NO--GO ASK FOR THIS VARIABLE
7139	031034	105711		TSTB	(R1)	;YES--IS A "CR" AFTER THE DOUBLE PERIOD?
7140	031036	001330		BNE	3\$	;NO--ASK FOR THIS VARIABLE AGAIN
7141	031040	000137	031450	JMP	OPN.X2	;YES--CLOSE ALL TEST
7142	031044			7\$:		
7143	031044	016402	001554	MOV	PRMLMT(R4),R2	;UPPER LIMIT OF INPUT
7144	031050	004037	031722	JSR	RO,2#CK.DIG	;CHECK THE DIGIT(S)
7145	031054	030720		3\$		;ILLEGAL INPUT
7146	031056	030720		3\$		;INPUT TO LARGE
7147	031060	031066		8\$		;TERMINATED WITH A ".,"
7148	031062	031426		OPN.N1		;TERMINATED WITH A ".,"
7149	031064	031444		OPN.X1		;TERMINATED WITH A "..."
7150	031066	010264	001472	8\$: MOV	R2,RPT(R4)	;SAVE THIS VARIABLE
7151	031072	000710		BR	2\$	;MOVE TO NEXT VARIABLE
7152	031074	104400	040612	OPNPAT: TYPE	,MSG.SP	;TYPE SPACES
7153	031100	104400	040040	TYPE	,MSG.PAT	;TYPE "PAT"
7154	031104	104400	040044	TYPE	,MSG.EQ	;TYPE "="
7155	031110	016446	001472	MOV	RPT(R4),-(5,)	;SAVE RPT(R4) FOR TYPEOUT
7156	031114	104402		TYPOC		;GO TYPE--OCTAL ASCII(ALL DIGITS)
7157	031116	104414		RDLIN		;READ ASCII STRING
7158	031120	012601		MOV	(SP)+,R1	;PICKUP POINTER
7159	031122	004037	031646	JSR	RO,2#CK.CHR	;CHECK ONE CHARACTER
7160	031126	031074		OPNPAT		;ILLEGAL CHARACTER
7161	031130	031074		OPNPAT		;CARRIAGE RETURN
7162	031132	031162		2\$		;"/"
7163	031134	030700		OPNPRM		;".,"
7164	031136	031142		1\$		;".,"
7165	031140	031074		OPNPAT		;DIGIT 0-9
7166	031142	105711		1\$: TSTB	(R1)	; "CR" AFTER THE PERIOD?
7167	031144	001532		BEG	OPN.N2	;YES--GO CLOSE THIS TEST
7168	031146	122721	000056	CMPB	*'.,(R1)+	;NO--PERIOD?
7169	031152	001350		BNE	OPNPAT	;NO--LOOP
7170	031154	105711		TSTB	(R1)	; "CR" AFTER A DOUBLE PERIOD?
7171	031156	001534		BEG	OPN.X2	;YES--GO START TESTING
7172	031160	000745		BR	OPNPAT	;NO--LOOP
7173	031162			2\$:		
7174	031162	004037	032102	JSR	RO,2#CK.NUM	;CHECK THE NUMBER
7175	031166	031074		OPNPAT		;ILLEGAL INPUT
7176	031170	031176		3\$		;TERMINATED WITH A ".,"
7177	031172	031426		OPN.N1		;TERMINATED WITH A ".,"
7178	031174	031444		OPN.X1		;TERMINATED WITH A "..."
7179	031176	010264	001472	3\$: MOV	R2,RPT(R4)	;SAVE THE INPUT NUMBER
7180	031202	006002		ROR	R2	;OPEN PATTERN 0?
7181	031204	103235		BCC	OPNPRM	;NO--START AT BEGINNING OF PARAMETER TABLE
7182	031206	004037	037744	JSR	RO,2#SAVR05	;SAVE R1-R5
7183	031212	005000		OPNWDS: CLR	RO	;START WITH WORD 0
7184	031214	012704	002474	MOV	#PATO,R4	
7185	031220			1\$:		
7186	031220	104400	031226	TYPE	+4	;TYPE ASCII STRING
7187	031224	000403		BR	64\$	;GET OVER THE ASCII
7188				;;.ASCIIZ	/ WD/	
7189	031234			64\$:		
7190	031234	010046		MOV	RO,-(SP)	;PUT RO ON THE STACK

7191	031236	004737	021170		JSR	PC,2#SSB20	:CHANGE RD TO DECIMAL ASCIZ
7192	031242	004737	021414		JSR	PC,2#SSUPRS	:TYPE WITHOUT LEADING ZEROS
7193	031246	104400	040044		TYPE	.MSG.EQ	:TYPE "="
7194	031252	011446			MOV	(R4),-(SP)	:SAVE (R4) FOR TYPEOUT
7195	031254	104402			TYPC		:GO TYPE--OCTAL ASCII(ALL DIGITS)
7196	031256	104414			RDLIN		:READ ASCII STRING
7197	031260	012601			MOV	(SP)+,R1	:PICKUP THE POINTER
7198	031262	004037	031646		JSR	RD,2#CK.CH	:CHECK ONE CHARACTER
7199	031266	031220			IS		:ILLEGAL CHARACTER
7200	031270	031220			IS		:CARRIAGE RETURN
7201	031272	031302			2S		"/"
7202	031274	031320			4S		"/"
7203	031276	031334			5S		"/"
7204	031300	031220			IS		:DIGIT 0-9
7205	031302			2S:			
7206	031302	004037	032102		JSR	RD,2#CK.NUM	:CHECK THE NUMBER
7207	031306	031220			IS		:ILLEGAL INPUT
7208	031310	031316			3S		:TERMINATED WITH A "."
7209	031312	031354			ES		:TERMINATED WITH A "."
7210	031314	031370			BS		:TERMINATED WITH A "..."
7211	031316	010214		3S:	MOV	R2,(R4)	:SAVE THE INPUT
7212	031320	005724		4S:	TST	(R4)+	:MOVE TO NEXT WORD
7213	031322	005200			INC	RD	:INCREMENT THE COUNT
7214	031324	022700	000020		CMP	#16..RD	:COUNT TO LARGE?
7215	031330	003333			BGT	IS	:NO--BRANCH
7216	031332	000727			BR	OPN.WDS	:YES--BRANCH
7217	031334	105711		5S:	TSTB	(R1)	: "CR" AFTER THE PERIOD?
7218	031336	001407			BEQ	7S	:YES--GO CLOSE THIS TEST
7219	031340	122721	000056		CMPB	#'..,(R1)+	:NO--PERIOD?
7220	031344	001325			BNE	IS	:NO--BRANCH ILLEGAL INPUT STRING
7221	031346	105711			TSTB	(R1)	: "CR" AFTER THE "PERIOD-PERIOD"?
7222	031350	001410			BEQ	9S	:YES--GO START TESTING
7223	031352	000722			BR	IS	:NO--LOOP
7224	031354	010224		6S:	MOV	R2,(R4)+	:SAVE THE INPUT
7225	031356	004737	031404	7S:	JSR	PC,2#CLSWDS	:CLOSE THE DATA PATTERN
7226	031362	004037	037770		JSR	RD,2#GETROS	:GET RD-R5
7227	031366	000421			BR	OPN.N2	:MOVE TO NEXT TEST
7228	031370	010224		8S:	MOV	R2,(R4)+	:SAVE THE INPUT
7229	031372	004737	031404	9S:	JSR	PC,2#CLSWDS	:CLOSE THE DATA PATTERN
7230	031376	000421	037770		JSR	RD,2#GETROS	:GET RD-R5
7231	031402	000422			BR	OPN.X2	:START TESTING
7232	031404	012701	002474	CLSWDS:	MOV	#PAT0,R1	:FIRST ADDRESS OF DATA PATTERN
7233	031410	005200		1S:	INC	RD	:COUNT THE LAST WORD THAT WAS STORED
7234	031412	022700	000017		CMP	#15..RD	:END OF TABLE
7235	031416	002402			BLT	2S	:YES--EXIT
7236	031420	012124			MOV	(R1)+,(R4)+	:COPY
7237	031422	000772			BR	IS	:LOOP
7238	031424	000207		2S:	RTS	PC	:RETURN
7239	031426	010264	001472	OPN.N1:	MOV	R2,RPT(R4)	:SAVE THIS VARIABLE
7240	031432	005726		OPN.N2:	TST	(SP)+	:CLEAN OFF THE STACK
7241	031434	004737	031506		JSR	PC,CLOSE	:CLOSE THIS TEST
7242	031440	000137	030554		JMP	OPN.1	:GO OPEN THE NEXT TEST
7243	031444	010264	001472	OPN.X1:	MOV	R2,RPT(R4)	:SAVE THIS VARIABLE
7244	031450	005726		OPN.X2:	TST	(SP)+	:CLEAN OFF THE STACK
7245	031452	004737	031506	1S:	JSR	PC,CLOSE	:CLOSE THIS TEST
7246	031456	005725		2S:	TST	(R5)+	:UPDATE THE INDEX

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7247 031460 020527 000034      CMP      R5,#16*2      ;INDEX TO BIG?
7248 031464 002404      BLT       3$              ;NO--BRANCH
7249 031466 004037 037770      JSR      RO,#GETR05      ;YES--RESTORE RO-R5
7250 031472 000137 030072      JMP      GT.PR2        ;GO TO EXIT
7251 031476 036503 001430      3$:      BIT      BITS(R5),R3      ;IS THIS TEST OPEN FOR CHANGE?
7252 031502 001363      BNE       1$              ;YES--GO CLOSE IT
7253 031504 000764      BR        2$              ;NO--MOVE TO NEXT TEST
7254 031506 004037 037744      CLOSE:  JSR      RO,#SAVR05      ;SAVE RO-R5
7255 031512 012700 001470      MOV      #PRM,RO      ;"FROM" ADDRESS
7256 031516 016501 001516      MOV      PRMP1(R5),R1      ;"TO" ADDRESS
7257 031522 012002      MOV      (RO)+,R2      ;"FROM" INDICATOR
7258 031524 012103      MOV      (R1)+,R3      ;"TO" INDICATOR
7259 031526 012704 000001      MOV      #1,R4        ;TEST BIT START A "RPT"
7260 031532 030402      1$:      BIT      R4,R2        ;PARAMETER TO BE MOVED?
7261 031534 001403      BEQ      2$              ;NO--BRANCH
7262 031536 030403      BIT      R4,R3        ;A PLACE TO PUT IT?
7263 031540 001404      BEQ      3$              ;NO--BRANCH
7264 031542 011011      MOV      (RO),(R1)      ;YES--MOVE "FROM" TO "TO"
7265 031544 030403      2$:      BIT      R4,R3        ;"TO" PARAMETER?
7266 031546 001401      BEQ      3$              ;NO--BRANCH
7267 031550 005721      TST      (R1)+        ;YES--UPDATE THE POINTER
7268 031552 005720      3$:      TST      (RO)+        ;UPDATE FROM POINTER
7269 031554 006304      ASL      R4          ;POSITION THE TEST BIT
7270 031556 032704 002000      BIT      #BIT10,R4      ;DONE?
7271 031562 001763      BEQ      1$              ;NO--BRANCH
7272 031564 004037 037770      JSR      RO,#GETR05      ;YES--RESTORE RO-R5
7273 031570 000207      RTS       PC          ;RETURN
7274                                     ;*****
7275 .SBTTL CK.OCT -- CHECK FOR OCTAL CHARACTER
7276 ;*THIS ROUTINE IS USED TO CHECK IF AN
7277 ;*ASCII CHARACTER IS A DIGIT BETWEEN 0 AND 7.
7278 ;*CALL
7279 ;*      MOV      #ADR,R1      ;ADDRESS OF ASCII CHARACTER
7280 ;*      JSR      RO,#CK.OCT   ;CHECK THE CHARACTER
7281 ;*      RETURN1     ;C. CHARACTER IS NOT BETWEEN 0-7
7282 ;*      RETURN2     ;CHARACTER IS IN R2 AS A
7283 ;*                  ;OCTAL DIGIT
7284
7285 031572 121127 000060      CK.OCT: CMPB     (R1),#0      ;LESS THAN ZERO?
7286 031576 103407      BLO       1$              ;YES -- BRANCH
7287 031600 121127 000067      CMPB     (R1),#7      ;GREATER THAN SEVEN?
7288 031604 101004      BHI       1$              ;YES -- BRANCH
7289 031606 111102      MOVB     (R1),R2      ;GET THE CHARACTER
7290 031610 042702 177770      BIC      #C7,R2        ;STRIP AWAY THE ASCII
7291 031614 035720      TST      (RO)+        ;ADJUST FOR RETURN
7292 031616 000200      1$:      RTS       RO          ;RETURN
7293                                     ;*****
7294 .SBTTL CK.DEC -- CHECK FOR DECIMAL CHARACTER
7295 ;*THIS ROUTINE IS USED TO CHECK AN ASCII CHARACTER
7296 ;*AND DETERMINE IF IT IS A DIGIT BETWEEN 0 AND 9.
7297 ;*CALL
7298 ;*      MOV      #ADR,R1      ;ADDRESS OF ASCII CHARACTER
7299 ;*      JSR      RO,#CK.DEC   ;CHECK THE CHARACTER
7300 ;*      RETURN1     ;NOT BETWEEN 0 AND 9
7301 ;*      RETURN2     ;BETWEEN 0 AND 9
7302

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7303                                     ;*                                     ;R2 = DIGIT
7304                                     ;*
7305 031620 121127 000060 CK.DEC: CMPB (R1),#0 ;LESS THAN ZERO?
7306 031624 103407 BLC 1$ ;YES -- BRANCH
7307 031626 121127 000071 CMPB (R1),#9 ;GREATER THAN NINE?
7308 031632 101004 BHI 1$ ;YES -- BRANCH
7309 031634 111102 MOVB (R1),R2 ;GET THE CHARACTER
7310 031636 042702 000060 BIC #0,R2 ;STRIP AWAY THE ASCII
7311 031642 005720 TST (R0)+ ;ADJUST FOR RETURN
7312 031644 000200 1$: RTS R0 ;RETURN
7313
7314 ;*****
7315 .SBTTL CK.CHR -- CHECK CHARACTER
7316 ;THIS ROUTINE WILL CHECK AN ASCII CHARACTER TO
7317 ;DETERMINE WHAT IT IS.
7318 ;CALL
7319 ;* MOV #ADR,R1 ;ADDRESS OF ASCII CHARACTER
7320 ;* JSR R0,CK.CHR ;CHECK CHARACTER
7321 ;* RETURN ADR1 ;UNKNOWN CHARACTER
7322 ;* RETURN ADR2 ;CARRIAGE RETURN * (R1)=ADR+1
7323 ;* RETURN ADR3 ;SLASH * (R1)=ADR+1
7324 ;* RETURN ADR4 ;COMMA * (R1)=ADR+1
7325 ;* RETURN ADR5 ;PERIOD * (R1)=ADR+1
7326 ;* RETURN ADR6 ;DIGIT BETWEEN 0 AND 9.
7327 ;* ;R2 = DIGIT * (R1)=ADR+1
7328 ;*
7329 CK.CHR: TSTB (R1) ;"CARRIAGE RETURN"?
7330 031650 001420 BEQ 4$ ;YES -- BRANCH
7331 031652 121127 000057 CMPB (R1),# '/' ;"SLASH"?
7332 031656 001414 BEQ 3$ ;YES -- BRANCH
7333 031660 121127 000054 CMPB (R1),# ',' ;"COMMA"?
7334 031664 001410 BEQ 2$ ;YES -- BRANCH
7335 031666 121127 000056 CMPB (R1),# '.' ;"PERIOD"?
7336 031672 001404 BEQ 1$ ;YES -- BRANCH
7337 031674 004037 031620 JSR R0,CK.DEC ;"DIGIT"?
7338 031700 000406 BR 5$ ;NO -- BRANCH
7339 031702 005720 TST (R0)+ ;DIGIT BETWEEN 0-9
7340 031704 005720 1$: TST (R0)+ ;PERIOD
7341 031706 005720 2$: TST (R0)+ ;COMMA
7342 031710 005720 3$: TST (R0)+ ;SLASH
7343 031712 005720 4$: TST (R0)+ ;CARRIAGE RETURN
7344 031714 005201 INC R1 ;MOVE POINTER TO NEXT CHARACTER
7345 031716 011000 5$: MOV (R0),R0 ;UNKNOWN CHARACTER
7346 031720 000200 RTS R0 ;RETURN
7347
7348 ;*****
7349 .SBTTL CK.DIG - CHECK DIGIT
7350 ;THIS ROUTINE CHECKS AN ASCII STRING FOR LEGAL
7351 ;CHARACTERS AND FORMS A DECIMAL VALUE BINARY NUMBER IN R2.
7352 ;CALL
7353 ;* MOV #ADR,R1 ;ADDRESS OF ASCII STRING
7354 ;* MOV #NUM,R2 ;MAX. MAGNITUDE OF INPUT NUMBER
7355 ;* JSR R0,CK.DIG ;CHECK DIGITS
7356 ;* RETURN ADR1 ;ILLEGAL CHARACTER -- R2=?
7357 ;* RETURN ADR2 ;INPUT NUMBER TOO LARGE -- R2=?
7358 ;* RETURN ADR3 ;"COMMA" -- R2 = NUMBER

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7359          : *      RETURN  ADR4      ; "PERIOD" -- R2 = NUMBER
7360          : *      RETURN  ADR5      ; "PERIOD-PERIOD" -- R2 = NUMBER
7361
7362 031722 010446          CK.DIG: MOV   R4, -(SP)      ; SAVE R4
7363 031724 010346          MOV   R3, -(SP)      ; SAVE R3
7364 031726 010246          MOV   R2, -(SP)      ; SAVE THE MAX. SIZE ON THE STACK
7365 031730 005002          CLR   R2            ; START WITH 0
7366 031732 005003          CLR   R3
7367 031734 005004          CLR   R4
7368 031736 004037 031646  JSR   R0, @CK.CHR      ; CHECK ONE CHARACTER
7369 031742 032066          BS     ; ILLEGAL CHARACTER
7370 031744 032066          BS     ; CARRIAGE RETURN
7371 031746 032066          BS     ; "/"
7372 031750 032066          BS     ; "."
7373 031752 032066          BS     ; ","
7374 031754 031756          IS     ; DIGIT 0-9
7375 031756 006303          1S:   ASL   R3          ; *2
7376 031760 010346          MOV   R3, -(SP)      ; SAVE *2
7377 031762 006303          ASL   R3          ; *4
7378 031764 006303          ASL   R3          ; *8
7379 031766 062603          ADD   (SP)+, R3      ; (*8)+(*2)=*10.
7380 031770 060203          ADD   R2, R3        ; UPDATE THE INPUT NUMBER
7381 031772 004037 031646  JSR   R0, @CK.CHR      ; CHECK ONE CHARACTER
7382 031776 032066          BS     ; ILLEGAL CHARACTER
7383 032000 032066          BS     ; CARRIAGE RETURN
7384 032002 032066          BS     ; "/"
7385 032004 032014          BS     ; "."
7386 032006 032012          BS     ; ","
7387 032010 031756          IS     ; DIGIT 0-9
7388 032012 005724          2S:   TST   (R4)+      ; "PERIOD"
7389 032014 005724          3S:   TST   (R4)+      ; "COMMA"
7390 032016 004037 031646  JSR   R0, @CK.CHR      ; CHECK ONE CHARACTER
7391 032022 032066          BS     ; ILLEGAL CHARACTER
7392 032024 032056          BS     ; CARRIAGE RETURN
7393 032026 032066          BS     ; "/"
7394 032030 032066          BS     ; "."
7395 032032 032036          BS     ; ","
7396 032034 032046          4S:   TST   (R4)+      ; DIGIT 0-9
7397 032036 005724          TSTB  (R1)          ; "PERIOD-PERIOD"
7398 032040 105711          BEQ   6S            ; "CR"?
7399 032042 001409          BR     8S          ; YES--BRANCH
7400 032044 000410          BR     8S
7401 032046 126127 177776 000054 5S:  CMPB  -2(R1), #' , ; WAS CHARACTER BEFORE THE DIGIT A COMMA?
7402 032054 001004          BNE   8S            ; NO--EXIT
7403 032056 020316          6S:   CMP   R3, (SP)    ; INPUT TO LARGE?
7404 032060 101001          BHI   7S            ; YES -- BRANCH
7405 032062 060400          ADD   R4, R0          ; ADJUST RETURN ADDRESS
7406 032064 005720          7S:   TST   (R0)+      ; NUMBER TO R2
7407 032066 010302          8S:   MOV   R3, R2      ; CLEAN MAX. SIZE OFF OF STACK
7408 032070 005726          TST   (SP)+          ; RESTORE R3
7409 032072 012603          MOV   (SP)+, R3      ; RESTORE R4
7410 032074 012604          MOV   (SP)+, R4
7411 032076 011000          MOV   (R0), R0        ; GET RETURN ADDRESS
7412 032100 000200          RTS   R0            ; RETURN
7413
7414          ; *****

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7415      .SBTTL CK.NUM - CHECK NUMBER (OCTAL)
7416      ;*THIS ROUTINE CHECKS AN ASCII STRING FOR LEGAL CHARACTERS
7417      ;*AND FORMS AN OCTAL NUMBER IN R2
7418      ;*CALL:
7419      ;*      MOV      #ADR,R1      ;ADDRESS OF ASCII STRING
7420      ;*      JSR      RD,2#CK.NUM  ;GO FORM THE NUMBER
7421      ;*      RETURN   ADR1        ;ILLEGAL CHARACTER IN THE INPUT STRING
7422      ;*      RETURN   ADR2        ;"COMMA"--R2=NUMBER
7423      ;*      RETURN   ADR3        ;"PERIOD"--R2=NUMBER
7424      ;*      RETURN   ADR4        ;"PERIOD-PERIOD"--R2=NUMBER
7425
7426      CK.NUM: MOV      R3,-(SP)    ;SAVE R3
7427      CLR      R3                ;START NUMBER AT ZERO
7428      JSR      RD,2#CK.OCT        ;OCTAL DIGIT?
7429      BR       6$                ;NO--BRANCH
7430      1$: INC      R1              ;MOVE TO NEXT CHARACTER
7431      ASL      R3                ;FOR THE OCTAL NUMBER IN R3
7432      BCS      6$                ;DON'T LET IT GET TO BIG
7433      ASL      R3
7434      BCS      6$
7435      ASL      R3
7436      BCS      6$
7437      ADD      R2,R3
7438      JSR      RD,2#CK.OCT        ;IS THIS AN OCTAL DIGIT?
7439      BR       2$                ;NO--FIND OUT WHAT IT IS
7440      BR       1$                ;YES--MAKE IT PART OF THE NUMBER
7441      2$: MOV      R3,R2          ;SAVE THE OCTAL NUMBER
7442      CLR      R3                ;START WITH ZERO INDEX
7443      JSR      RD,2#CK.CHR        ;CHECK ONE CHARACTER
7444      6$:                                     ;ILLEGAL CHARACTER
7445      6$:                                     ;CARRIAGE RETURN
7446      6$:                                     ;"/"
7447      5$:                                     ;"."
7448      3$:                                     ;"'"
7449      6$:                                     ;DIGIT 0-9
7450      3$: TST      (R3)+          ;"PERIOD"
7451      CMPB     (R1),#'.          ;"PERIOD-PERIOD"?
7452      BNE      5$                ;NO--BRANCH
7453      INC      R1                ;YES--ADVANCE THE POINTER
7454      4$: TST      (R3)+          ;"PERIOD-PERIOD"
7455      5$: TST      (R3)+          ;"COMMA"
7456      TSTB     (R1)              ;"CR"?
7457      BNE      6$                ;NO--BRANCH
7458      ADD      R3,R0              ;YES--SAVE THE OCTAL NUMBER
7459      6$: MOV      (SP)+,R3       ;RESTORE R3
7460      MOV      (R0),R0           ;PICKUP EXIT ADDRESS
7461      RTS      R0                ;RETURN

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7462 ;*****
7463
7464 .SBTTL RH11/RP04 DRIVER (REV. D.9)
7465
7466 ;*COPYRIGHT (C) 1974
7467 ;*DIGITAL EQUIPMENT CORP.
7468 ;*MAYNARD, MA 01754
7469 ;*AUTHOR: JIM LACEY
7470
7471
7472 ;*STORAGE FOR RHDS1, RHER1, RHER2, AND RHER3 ON AN ERROR "2" OR "5"
7473 ;*RPERRS = RHDS1
7474 ;*RPERRS+2 = RHER1
7475 ;*RPERRS+4 = RHER2
7476 ;*RPERRS+6 = RHER3
7477
7478 032222 000000 RPERRS: .WORD 0
7479 032224 000000 .WORD 0
7480 032226 000000 .WORD 0
7481 032230 000000 .WORD 0
7482
7483 ;*TABLE OF DRIVE ACTIVE INDICATORS (DRVACT=8 BYTES)
7484 ;*DRVACT=0 IMPLIES DRIVE IS IDLE
7485 ;*DRVACT>0 IMPLIES DRIVE IS ACTIVE WITH A COMMAND
7486 ;*DRVACT<0 IMPLIES DRIVE IS ACTIVE WITH AN ERROR RECOVERY OPERATION
7487
7488 032232 000 DRVACT: .BYTE 0 ;DRIVE 0
7489 032233 000 .BYTE 0 ;DRIVE 1
7490 032234 000 .BYTE 0 ;DRIVE 2
7491 032235 000 .BYTE 0 ;DRIVE 3
7492 032236 000 .BYTE 0 ;DRIVE 4
7493 032237 000 .BYTE 0 ;DRIVE 5
7494 032240 000 .BYTE 0 ;DRIVE 6
7495 032241 000 .BYTE 0 ;DRIVE 7
7496
7497 ;*TABLE OF DRIVE STATUS INDICATORS (DRVSTA=8 BYTES)
7498 ;*DRVSTA=0 IMPLIES DRIVE IS OFFLINE
7499 ;*DRVSTA>0 IMPLIES DRIVE IS ONLINE
7500 ;*DRVSTA<0 IMPLIES DRIVE IS UNSAFE OR NONEXISTENT
7501
7502 032242 000 DRVSTA: .BYTE 0 ;DRIVE 0
7503 032243 000 .BYTE 0 ;DRIVE 1
7504 032244 000 .BYTE 0 ;DRIVE 2
7505 032245 000 .BYTE 0 ;DRIVE 3
7506 032246 000 .BYTE 0 ;DRIVE 4
7507 032247 000 .BYTE 0 ;DRIVE 5
7508 032250 000 .BYTE 0 ;DRIVE 6
7509 032251 000 .BYTE 0 ;DRIVE 7
7510
7511 ;*TABLE OF DRIVE TYPES (DRVTP=8 WORDS)
7512 ;*DRVTP WILL CONTAIN THE DRIVE TYPE OF ALL ONLINE, OFFLINE, AND
7513 ;*UNSAFE DRIVES. IF A DRIVE IS NONEXISTENT DRVTP WILL BE ZERO.
7514
7515 032252 000000 DRVTP: .WORD 0 ;DRIVE 0
7516 032254 000000 .WORD 0 ;DRIVE 1
7517 032256 000000 .WORD 0 ;DRIVE 2

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7518 032260 000000      .WORD 0      ;DRIVE 3
7519 032262 000000      .WORD 0      ;DRIVE 4
7520 032264 000000      .WORD 0      ;DRIVE 5
7521 032266 000000      .WORD 0      ;DRIVE 6
7522 032270 000000      .WORD 0      ;DRIVE 7
7523
7524      ;*TRANSFER WAIT FLAG (TRNSWT=1 WORD)
7525      ;*THIS IS A ONE WORD QUEUE. IT WILL CONTAIN THE ADDRESS OF
7526      ;*"DPB" OF THE I/O OPERATION.
7527
7528 032272 000000      TRNSWT: .WORD 0
7529
7530      ;*SEARCH WAIT KEYS (SRCHWT=1 WORD)
7531      ;*THIS IS A ONE WORD QUEUE THAT WILL CONTAIN A KEY FOR EACH OF
7532      ;*THE DRIVES THAT ARE PERFORMING A SEARCH COMMAND FOR THE I/O
7533      ;*REQUEST THAT IS AT THE TOP OF THEIR REQUEST QUEUE.
7534      ;*EACH DRIVE IS ASSIGNED ONE BIT, STARTING AT BIT00 FOR DRIVE 0.
7535
7536 032274 000000      SRCHWT: .WORD 0
7537
7538      ;*RP04 DRIVER ACTIVE FLAG (ACTDRV=1 BYTE)
7539      ;*ACTDRV=0 IMPLIES DRIVER IS INACTIVE
7540      ;*ACTDRV>0 IMPLIES DRIVER IS ACTIVE
7541
7542 032276      000      ACTDRV: .BYTE 0
7543
7544      ;*SOFTWARE TIMER ROUTINE ACTIVE FLAG (ACTSTR=1 BYTE)
7545      ;*ACTSTR=0 IMPLIES SOFTWARE TIMER ROUTINE IS INACTIVE
7546      ;*ACTSTR>0 IMPLIES SOFTWARE TIMER ROUTINE IS ACTIVE
7547
7548 032277      000      ACTSTR: .BYTE 0
7549
7550      ;*UNLOAD FLAG (ULDFLG=8 BYTES)
7551      ;*ULDFLG=0 IMPLIES NO UNLOAD COMMAND
7552      ;*ULDFLG>0 IMPLIES UNLOAD COMMAND IN PROGRESS
7553      ;*ULDFLG<0 IMPLIES UNLOAD COMMAND IN WAIT QUEUE
7554
7555 032300      000      ULDFLG: .BYTE 0      ;DRIVE 0
7556 032301      000      .BYTE 0      ;DRIVE 1
7557 032302      000      .BYTE 0      ;DRIVE 2
7558 032303      000      .BYTE 0      ;DRIVE 3
7559 032304      000      .BYTE 0      ;DRIVE 4
7560 032305      000      .BYTE 0      ;DRIVE 5
7561 032306      000      .BYTE 0      ;DRIVE 6
7562 032307      000      .BYTE 0      ;DRIVE 7
7563
7564      ;*LOOK AHEAD COUNT (LACNT=8 BYTES)
7565      ;*LACNT WILL INDICATE THE NUMBER OF LOOK AHEADS PERFORMED
7566
7567 032310      000      LACNT: .BYTE 0      ;DRIVE 0
7568 032311      000      .BYTE 0      ;DRIVE 1
7569 032312      000      .BYTE 0      ;DRIVE 2
7570 032313      000      .BYTE 0      ;DRIVE 3
7571 032314      000      .BYTE 0      ;DRIVE 4
7572 032315      000      .BYTE 0      ;DRIVE 5
7573 032316      000      .BYTE 0      ;DRIVE 6

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7574 032317 000 .BYTE 0 ;DRIVE 7
7575
7576 ;*SAVE REGISTERS FLAG (SAVEFG=1 WORD)
7577 ;*SAVEFG<0 IMPLIES SAVE THE RH11/RPO4 REGISTERS WHEN THE
7578 ;*OPERATION IS COMPLETED AS PER (DPB+14).
7579 ;*SAVEFG=0 IMPLIES SAVE THE RH11/RPO4 REGISTERS, AS PER
7580 ;*(DPB+14), AFTER AN ERROR.
7581
7582 032320 000000 SAVEFG: .WORD 0
7583
7584 ;*SEEK FLAG (SEEKFG=1 WORD)
7585 ;*SEEKFG=0 IMPLIES WHEN THE DISK ADDRESS ISN'T IN THE WINDOW
7586 ;*FOR A DATA TRANSFER START A SEARCH COMMAND
7587 ;*SEEKFG<0 IMPLIES DATA TRANSFER WILL DO IMPLIED SEEKS,
7588 ;*DISREGARD THE WINDOW
7589
7590 032322 000000 SEEKFG: .WORD 0
7591
7592 ;*TIMEOUT TABLE (TIMER=8 WORDS)
7593 ;*THIS TABLE CONTAINS THE TIME ALLOWED FOR AN OPERATION
7594
7595 032324 177777 TIMER: .WORD -1 ;DRIVE 0
7596 032326 177777 .WORD -1 ;DRIVE 1
7597 032330 177777 .WORD -1 ;DRIVE 2
7598 032332 177777 .WORD -1 ;DRIVE 3
7599 032334 177777 .WORD -1 ;DRIVE 4
7600 032336 177777 .WORD -1 ;DRIVE 5
7601 032340 177777 .WORD -1 ;DRIVE 6
7602 032342 177777 .WORD -1 ;DRIVE 7
7603
7604 ;*DATA TRANSFER UNDERWAY INDICATOR (DTUW=1 WORD)
7605 ;*DTUW<0 IMPLIES NO DATA TRANSFER UNDERWAY
7606 ;*DTUW=+N (WHERE N=0 TO 7) IMPLIES DATA TRANSFER UNDERWAY ON DRIVE N
7607
7608 032344 177777 DTUW: .WORD -1
7609
7610 ;*ATTENTION BITS TABLE (ATABIT=8 BYTES)
7611 ;*THIS TABLE CONTAINS THE CORRESPONDING BIT TO EACH DRIVES
7612 ;*ATTENTION BIT
7613
7614 032346 001 ATABIT: .BYTE 1 ;DRIVE 0
7615 032347 002 .BYTE 2 ;DRIVE 1
7616 032350 004 .BYTE 4 ;DRIVE 2
7617 032351 010 .BYTE 10 ;DRIVE 3
7618 032352 020 .BYTE 20 ;DRIVE 4
7619 032353 040 .BYTE 40 ;DRIVE 5
7620 032354 100 .BYTE 100 ;DRIVE 6
7621 032355 200 .BYTE 200 ;DRIVE 7
7622
7623 ;*RPO4 TO RH11 "MASS CONTROL BUS PARITY ERRORS" (MCPE) ALLOWED BEFORE
7624 ;*CALLING IT FATAL (MCPEMX=1 WORD)
7625
7626 032356 000003 MCPEMX: .WORD 3
7627
7628 ;*STORAGE FOR RPADR (THE FIRST ADDRESS (776700) OF THE RH11/RPO4),
7629 ;*RPVEC (THE VECTOR ADDRESS (254)), AND RPVEC+2 (THE BR LEVEL (5)).

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7630 032360 176700
7631 032362 000254 000240

RPADR: .WORD 176700
RPVEC: .WORD 254,5*32.

7632
7633
7634 032366 000004

; *MAXIMUM NUMBER OF LOOK AHEADS ALLOWED IS 4 (MXLACT=1 WORD)

7635
7636 032370 001000

MXLACT: .WORD 4
; *MAXIMUM DELTA DELAY IS 8 SECTORS (MXDLTA=1 WORD)

7637
7638 032372 000200

MXDLTA: .WORD 8*64.
; *MINIMUM DELTA DELAY IS 2 SECTORS (MNDLTA=1 WORD)

7639
7640 032374 000005

MNDLTA: .WORD 2*64.
; *MAXIMUM SEARCH FOR I/O WINDOW IS 5 SECTORS (MXWNDW=1 WORD)
MXWNDW: .WORD 5

7641
7642

; *DEFINITIONS OF THE RH11/RP04 ADDRESS INDEXES

7643
7644 000000

RHCS1=0

; CONTROL AND STATUS REGISTER #1 (DRIVE REG. 00)

7645 000002

RHWC=2

; WORD COUNT REGISTER (NOT A DRIVE REG)

7646 000004

RHBA=4

; UNIBUS ADDRESS REGISTER (NOT A DRIVE REG)

7647 000006

RHDA=6

; DESIRED SECTOR/TRACK ADDRESS REGISTER (DRIVE REG. 05)

7648 000010

RHCS2=10

; CONTROL AND STATUS REGISTER #2 (NOT A DRIVE REG)

7649 000012

RHDS1=12

; DRIVE STATUS REGISTER (DRIVE REG 01)

7650 000014

RHER1=14

; ERROR REGISTER #1 (DRIVE REG. 02)

7651 000016

RHAS=16

; ATTENTION SUMMARY PSEUDO REGISTER (DRIVE REG. 04)

7652 000020

RHLA=20

; LOOK AHEAD REGISTER (DRIVE REG. 07)

7653 000022

RHDB=22

; DATA BUFFER REGISTER (NOT A DRIVE REG.)

7654 000024

RHMR=24

; MAINTAINABILITY REGISTER (DRIVE REG. 03)

7655 000026

RHDT=26

; DRIVE TYPE REGISTER (DRIVE REG. 06)

7656 000030

RHSN=30

; SERIAL NUMBER REGISTER (DRIVE REG. 10)

7657 000032

RHOF=32

; OFFSET REGISTER (DRIVE REG. 11)

7658 000034

RHCA=34

; DESIRED CYLINDER ADDRESS REGISTER (DRIVE REG. 12)

7659 000036

RHCC=36

; CURRENT CYLINDER ADDRESS REGISTER (DRIVE REG. 13)

7660 000040

RHER2=40

; ERROR REGISTER #2 (DRIVE REG. 14)

7661 000042

RHER3=42

; ERROR REGISTER #3 (DRIVE REG. 15)

7662 000044

RHEC1=44

; ECC POSITION REGISTER (DRIVE REG. 16)

7663 000046

RHEC2=46

; ECC PATTERN REGISTER (DRIVE REG. 17)

7664 000050

RHBAE=50

7665 000052

RHCS3=52

7666

; *RH11/RP04 DRIVER INIT. CODE

7667

; *THIS ROUTINE WILL DETERMINE WHICH RP04 DRIVES ARE

7668

; *AVAILABLE FOR TESTING AND SET THE DRVSTA INDICATOR

7669

; *TO THE PROPER STATE FOR EACH DRIVE.

7670

; *NOTE: THIS ROUTINE CALLS DRVINT

7671

7672

7673

; *CALL

7674

; *

7675

JSR PC,RPINIT

7676

RETURN

7677

7678 032376 013746 177776

RPINIT: MOV @#PS, -(SP)

; SAVE PROCESSOR STATUS

7679 032402 013737 032364 177776

MOV RPVEC+2, @#PS

; SET PROCESSOR STATUS TO RH11/RP04 LEVEL

7680 032410 004037 037744

JSR R0,SAVR15

; GO SAVE R1-R5

7681 032414 004737 037502

JSR PC,CLRQUE

; CLEAR ALL REQUEST QUEUES

7682 032420 012701 032222

MOV #RPERRS,R1

; FIRST ADDRESS TO BE CLEARED

7683 032424 012702 032322

MOV #SEEKFG,R2

; LAST ADDRESS TO BE CLEARED

7684 032430 005021

15: CLR (R1)+

; CLEAR

7685 032432 020102

CMP R1,R2

; ARE WE DONE?

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7686 032434 101775          BLOS 1$          ;BRANCH IF NO
7687 032436 012702 032344    MOV  #DTUW,R2      ;LAST ADDRESS
7688 032442 012721 177777    2$: MOV  #-1,(R1)+   ;INITIALIZE
7689 032446 020102          CMP  R1,R2          ;DONE?
7690 032450 101774          BLOS 2$          ;LOOP IF NO
7691 032452 005001          CLR  R1             ;DRIVE NUMBER WILL BE IN R1
7692 032454 013704 032360    MOV  RPADR,R4      ;FIRST ADDRESS OF RH11/RP04
7693 032460 012764 000040 000010  MOV  #BIT05,RHCS2(R4) ;MASSBUS INIT.
7694 032466 004037 032540    3$: JSR  R0,DRVINT ;GO INIT. A DRIVE
7695 032472 000417          BR   7$
7696 032474 005201          4$: INC  R1          ;MOVE TO THE NEXT DRIVE
7697 032476 042701 177770    BIC  #C7,R1      ;DON'T LET THE DRIVE NUMBER GET TO BIG
7698 032502 001371          BNE  3$            ;BRANCH IF MORE DRIVES TO INIT.
7699 032504 013703 032362    MOV  RPVEC,R3      ;SETUP THE RH11/RP04 VECTOR
7700 032510 012723 034766    MOV  #ISR,(R3)+
7701 032514 013713 032364    MOV  RPVEC+2,(R3)
7702 032520 004037 037764    JSR  R0,GETR15    ;RESTORE R1-R5
7703 032524 012637 177776    MOV  (SP)+,2#PS  ;RESTORE THE PROCESSOR STATUS
7704 032530 000207          RTS  PC            ;BYE-BYE
7705 032532 105061 032242    7$: CLRB DRVSTA(R1) ;SET THE DRIVE STATUS TO OFFLINE
7706 032536 000756          BR   4$            ;GO DO THE NEXT DRIVE
7707
7708          ;*DRIVE INIT. ROUTINE
7709          ;*THIS ROUTINE DETERMINES IF A DRIVE EXIST AND IF IT IS
7710          ;*AN RP04. IF IT IS, A "READ-IN PRESET" IS ISSUED AND FMT22
7711          ;*IS SET TO A "1". THEN MOL, DPR, DRY, AND VV ARE CHECKED TO
7712          ;*INSURE THEY ARE ALL ON A "1". AND DEPENDING ON THEIR STATE,
7713          ;*DRVSTA IS SET TO THE PROPER CONDITION.
7714
7715          ;*CALL
7716          ;*
7717          ;*
7718          ;*
7719          ;*
7720          ;*
7721          ;*
7722          ;*
7723          ;*
7724          ;*
7725          ;*
7726          ;*
7727          ;*
7728          ;*
7729          ;*
7730          ;*
7731          ;*
7732          ;*
7733          ;*
7734          ;*
7735          ;*
7736          ;*
7737          ;*
7738          ;*
7739          ;*
7740          ;*
7741          ;*

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7742 032650 004037 036702      JSR      RO,WRT.RP
7743 032654 000000      RHCS1
7744 032656 032760      7$
7745 032660 012746 010000      MOV      #BIT12,-(SP)      ;SET FMT22=1
7746 032664 004037 036702      JSR      RO,WRT.RP
7747 032670 000032      RHOF
7748 032672 032760      7$
7749 032674 004037 036544      JSR      RO,RO.RP      ;READ RHDS1
7750 032700 000012      RHDS1
7751 032702 032760      7$
7752 032704 012605      MOV      (SP)+,R5      ;AND SAVE IT IN R5
7753 032706 100011      BPL      4$      ;BRANCH IF ATA=0
7754 032710 116164 032346 000016      MOV      ATABIT(R1),RHAS(R4) ;CLEAR ATTENTION BIT
7755 032716 004037 036544      JSR      RO,RO.RP      ;FIND OUT WHY ATA=1
7756 032722 000014      RHER1
7757 032724 032760      7$
7758 032726 006126      ROL      (SP)+      ;IS IT UNSAFE?
7759 032730 100412      BMI      6$      ;BRANCH IF YES
7760 032732 005105      4$:      COM      R5      ;CHECK MOL, DPR, DRY, AND VV
7761 032734 042705 167077      BIC      #1<BIT12:BIT08:BIT07:BIT06>,R5
7762 032740 001004      BNE      5$      ;BRANCH IF MOL, DPR, DRY, OR VV IS CLEAR
7763 032742 112761 000001 032242      MOV      #1,DRVSTA(R1) ;SET DRIVE STATUS TO ONLINE
7764 032750 000402      BR      6$
7765 032752 105061 032242      5$:      CLRB      DRVSTA(R1) ;DRIVE STATUS = OFFLINE
7766 032756 005720      6$:      TST      (RO)+      ;STEP OVER THE ERROR RETURN
7767 032760 004037 037764      7$:      JSR      RO,GETR15 ;RESTORE R1-R5
7768 032764 000200      RTS      RO      ;RETURN
7769
7770      ;*REQUEST PRE-PROCESSOR-HANDLES SUBSYSTEM REQUEST
7771
7772      ;*CALL
7773
7774      ;*      JSR      RO,@#RP04      ;CALL THE RP04 DRIVER
7775      ;*      PNTADR      ;ADDRESS OF POINTER OF DRIVES PARAMETER BLOCK
7776      ;*      RETURN1      ;RETURN HERE IF QUEUE IS FULL
7777      ;*      RETURN2      ;RETURN HERE IF REQUEST IS IN QUEUE OR THERE
7778      ;*      ;IS AN ERROR CONDITION
7779
7780 032766 013746 177776      RP04:  MOV      @#PS,-(SP)      ;SAVE THE CALLING STATUS
7781 032772 013737 032364 177776      MOV      RPVEC+2,@#PS      ;DON'T ALLOW ANY RP04 INTERRUPTS
7782 033000 112737 000001 032276      MOV      #1,ACTDRV      ;SET "ACTIVE DRIVER" FLAG
7783 033006 004037 037744      JSR      RO,SAVR15      ;SAVE R1-R5
7784 033012 012002      MOV      (RO)+,R2      ;PICKUP THE DRIVE PARAMETER BLOCK POINTER
7785 033014 005062 000016      CLR      16(R2)      ;CLEAR THE STATUS/ERROR INDICATOR
7786 033020 111201      MOV      (R2),R1      ;PICKUP THE DRIVE NUMBER
7787 033022 105761 032242      TST      DRVSTA(R1)      ;CHECK DRIVES STATUS
7788 033026 003017      BGT      1$      ;BRANCH IF ONLINE
7789 033030 105761 032300      TST      ULDFLG(R1)      ;UNLOAD COMMAND IN QUEUE?
7790 033034 001034      BNE      3$      ;BRANCH IF YES
7791 033036 013704 032360      MOV      RPADR,R4      ;UNIBUS ADDRESS OF RHCS!
7792 033042 004037 032540      JSR      RO,DRVINT      ;GO INIT. THE DRIVE
7793 033046 000442      BR      6$      ;ERROR RETURN
7794 033050 105761 032242      TST      DRVSTA(R1)      ;IS DRIVE STATUS ONLINE?
7795 033054 003004      BGT      1$      ;BRANCH IF YES
7796 033056 052762 140000 000016      BIS      #BIT15:BIT14,16(R2) ;ERROR--DRIVE IS OFFLINE OR NONEXISTENT
7797 033064 000423      BR      4$      ;GO TO EXIT

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7798 033066 004037 037604      1$: JSR    RD,DRVQUE      ;PUT THIS REQUEST IN QUEUE
7799 033072 000421              BR      5$              ;QUEUE IS FULL
7800 033074 122762 000103 000002      CMPB   #103,2(R2)      ;IS THIS REQ. FOR AN UNLOAD?
7801 033102 001003              BNE      2$              ;BR IF NO
7802 033104 112761 177777 032300      MOVB   #-1,ULDFLG(R1) ;SET THE "UNLOAD IN QUEUE" FLAG
7803 033112 105761 032232      2$: TSTB   DRVACT(R1)      ;IS THIS DRIVE ACTIVE?
7804 033116 001006              BNE      4$              ;BR IS YES
7805 033120 004737 033162      JSR      PC,OPT          ;CALL THE OPTIMIZER
7806 033124 000403              BR      4$
7807 033126 052762 120000 000016      3$: BIS    #BIT15:BIT13,16(R2) ;SET THE "UNLOAD IN QUEUE" ERROR FLAG
7808 033134 005720              4$: TST      (R0)+
7809 033136 004037 037764              5$: JSR      RD,GETR15      ;RESTORE R1-R5
7810 033142 105037 032276      CLRB   ACTDRV          ;CLEAR "ACTIVE DRIVER" FLAG
7811 033146 012637 177776      MOV     (SP)+,2#PS      ;RETURN "PS" TO USER LEVEL
7812 033152 000200              RTS      RD              ;RETURN TO CALLER
7813 033154 004737 034402      6$: JSR      PC,C17          ;GO HANDLE THE PARITY ERROR
7814 033160 000765              BR      4$
7815
7816      ;*OPTIMIZER-CALLED FOR A PARTICULAR DRIVE
7817      ;*CALL
7818      ;*
7819      ;*      MOV     #DRVNUM,R1      ;DRIVE NUMBER TO R1
7820      ;*      JSR      PC,OPT          ;SETUP A COMMAND
7821
7822 033162 004037 037744      OPT: JSR      RD,SAVR15      ;SAVE R1-R5
7823 033166 013746 177776      MOV     2#PS,-(SP)      ;SAVE PROC. STATUS
7824 033172 146137 032346 032274      BICB   ATABIT(R1),SRCHWT ;CLEAR "SEARCH WAIT" KEY
7825 033200 004737 037660      JSR      PC,GETREQ      ;GET "DPB" POINTER OF REQUEST
7826 033204 005702              TST      R2              ;IS THERE A REQUEST IN QUEUE?
7827 033206 001444              BEQ      6$              ;NO--BRANCH TO EXIT
7828 033210 105761 032242      TSTB   DRVSTA(R1)      ;IS DRIVE ONLINE?
7829 033214 003006              BGT      1$              ;YES--BRANCH
7830 033216 004737 037702      JSR      PC,POPQUE      ;NO--REMOVE REQUEST FROM QUEUE
7831 033222 052762 140000 000016      BIS    #BIT15:BIT14,16(R2) ;SET ERROR BIT OF STATUS/ERROR INDICATOR
7832 033230 000426              BR      5$              ;BRANCH TO EXIT
7833 033232 122762 000150 000002      1$: CMPB   #150,2(R2)      ;IS THE REQUEST FOR I/O?
7834 033240 002403              BLT      2$              ;YES--BRANCH
7835 033242 004737 033760      JSR      PC,C14          ;CALL THE COMMAND INITIATOR
7836 033246 000417              BR      5$              ;BRANCH TO EXIT
7837 033250 005737 032344      2$: TST      DTUW          ;DATA TRANSFER UNDERWAY?
7838 033254 002012              BGE      4$              ;YES--GO START A SEARCH
7839 033256 005737 032322      TST      SEEKFG        ;DO IMPLIED SEEKS?
7840 033262 100404              BMI      3$              ;YES---BRANCH
7841 033264 004037 034630      JSR      RD,LA              ;NO--DO LOOK AHEAD
7842 033270 000406              BR      5$              ;RETURN HERE ON A PARITY ERROR
7843 033272 000403              BR      4$              ;GO START A SEARCH
7844 033274 004737 033326      3$: JSR      PC,C11          ;START A DATA TRANSFER
7845 033300 000402              BR      5$
7846 033302 004737 033652      4$: JSR      PC,C13          ;START A SEARCH
7847 033306 012637 177776      5$: MOV     (SP)+,2#PS      ;RESTORE PROC. STATUS
7848 033312 004037 037764      JSR      RD,GETR15      ;RESTORE R1-R5
7849 033316 000207              RTS      PC
7850 033320 004737 037136      6$: JSR      PC,SET.IE      ;SET "IE" WITHOUT A "TRE"
7851 033324 000770              BR      5$              ;EXIT THE ROUTINE
7852
7853      ;*COMMAND INITIATOR

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7854
7855      ;*CALL
7856      ;*      MOV      #DRVNUM,R1      ;DRIVE NUMBER
7857      ;*      MOV      #DPB,R2        ;ADDRESS OF DPB
7858      ;*      JSR      PC,C1?          ;C1?= C11,C13, OR C14
7859      ;*                               ;WHERE:
7860      ;*                               ;C11=DATA TRANSFER
7861      ;*                               ;C12=SEARCH REQUESTED BY DATA XFER
7862      ;*                               ;C14=NOT DATA TRANSFER
7863
7864      033326 004737 037702      C11:   JSR      PC,POPQUE      ;REMOVE REQUEST FROM "DRIVES WAIT" QUEUE
7865      033332 010237 032272      MOV      R2,TRANSWT      ;PUT REQ. IN TRANSFER WAIT QUEUE
7866      033336 010203      C12:   MOV      R2,R3            ;DPB ADDRESS TO R3
7867      033340 013704 032360      MOV      RPADR,R4          ;RHCS1 ADDRESS
7868      033344 010164 000010      MOV      R1,RHCS2(R4)        ;SELECT DRIVE
7869      033350 062703 000004      ADD      #4,R3             ;DESIRED WORD COUNT
7870      033354 062704 000002      ADD      #2,R4             ;RHC ADDRESS
7871      033360 012324      MOV      (R3)+,(R4)+            ;LOAD WORD COUNT
7872      033362 005037 001232      CLR      TEMP9
7873      033366 122737 000017 001102  CMPB     #17,$TSTNM
7874      033374 001072      BNE      1$
7875      033376 012337 001222      MOV      (R3)+,TEMP4
7876      033402 004037 037744      JSR      R0,SAVR15
7877      033406 013701 001222      MOV      TEMP4,R1
7878      033412 000301      SWAB     R1
7879      033414 042701 177400      BIC      #177400,R1
7880      033420 006201      ASR      R1
7881      033422 006201      ASR      R1
7882      033424 006201      ASR      R1
7883      033426 006201      ASR      R1
7884      033430 016102 172340      MOV      KIPAR0(R1),R2
7885      033434 005003      CLR      R3
7886      033436 006302      ASL      R2
7887      033440 006103      ROL      R3
7888      033442 006302      ASL      R2
7889      033444 006103      ROL      R3
7890      033446 006302      ASL      R2
7891      033450 006103      ROL      R3
7892      033452 006302      ASL      R2
7893      033454 006103      ROL      R3
7894      033456 006302      ASL      R2
7895      033460 006103      ROL      R3
7896      033462 006302      ASL      R2
7897      033464 006103      ROL      R3
7898      033466 042737 160000 001222  BIC      #160000,TEMP4
7899      033474 050237 001222      BIS      R2,TEMP4
7900      033500 013704 032360      MOV      RPADR,R4
7901      033504 005737 001234      TST      TEMP10
7902      033510 001002      BNE      8$
7903      033512 010364 000050      MOV      R3,RHBAE(R4)
7904      033516 032703 000001      8$:   BIT      #1,R3
7905      033522 001403      BEQ      6$
7906      033524 052737 000400 001232  BIS      #A16,TEMP9
7907      033532 032703 000002      6$:   BIT      #2,R3
7908      033536 001403      BEQ      7$
7909      033540 052737 001000 001232  BIS      #A17,TEMP9

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7910 033546 013764 001222 000004 75: MOV TEMP4,RHBA(R4)
7911 033546 013764 001222 000004 :XYZ ABOVE R3 HAS VALUE FOR RHBAE IN 11/70
7912 :IN 11/45 LOWER 2 BITS MUST BE PUT IN A16 AND A17 POSITIONS IN 2(R2)
7913 :LOOK AT A FEW LINES DOWN AT LOCATION TAGED 55:
7914 :THAT 2(R2) MUST GET A16 A17 BY A BIS INSTRUCTION AND NOT A MOV INSTRUCTION
7915 :*****
7916 :*****
7917 :*****
7918 :*****
7919 :*****
7920 :*****
7921 :*****
7922 033554 004037 037764 JSR RO,GETR15
7923 033560 000401 BR 25
7924 033562 012324 15: MOV (R2)+,(R4)+ ;LOAD BUFFER ADDRESS
7925 033564 012346 25: MOV (R3)+,-(SP) ;LOAD SECTOR AND TRACK
7926 033566 004037 036702 JSR RO,WRT.RP ;CALL THE LOAD(WRITE) ROUTINE
7927 033572 000006 RHDA ;INDEX OF REGISTER TO LOAD
7928 033574 034402 CI7 ;ERROR RETURN ADDRESS
7929 033576 012346 MOV (R3)+,-(SP) ;LOAD CYLINDER ADDRESS
7930 033600 004037 036702 JSR RO,WRT.RP
7931 033604 000034 RHCA
7932 033606 034402 CI7
7933 033610 122737 000017 001102 CMPB #17,$TSTNM
7934 033616 001003 BNE 55
7935 033620 053762 001232 000002 BIS TEMP9,2(R2)
7936 033626 55: MOV 2(R2),-(SP) ;LOAD "COMMAND+GO", "A17&A16", AND "PSEL"
7937 033626 016246 000002 JSR RO,WRT.RP
7938 033632 004037 036702 RHCS1
7939 033636 000500 CI7
7940 033640 034402 MOV R1,DTJW ;SET "DATA TRANSFER UNDERWAY"
7941 033642 010137 032344 JMP CIS
7942 033646 000137 034336 CI3: MOV RPADR,R4 ;RHCS1 ADDRESS
7943 033652 013704 032360 MOV R1,RHCS2(R4) ;SELECT DRIVE
7944 033656 010164 000010 MOV 12(R2),-(SP) ;DESIRED CYLINDER ADDRESS
7945 033662 016246 000012 JSR RO,WRT.RP
7946 033666 004037 036702 RHCA
7947 033672 000034 CI7
7948 033674 034402 MOV 10(R2),R3 ;PICKUP SECTOR ADDRESS
7949 033676 116203 000010 SUB MXWIND,R3 ;BACKUP BY MAX. SEARCH FOR I/O WINDOW
7950 033702 163703 032374 BGE 15
7951 033706 002002 15: ADD #22,R3 ;COMBINE THE ADJUSTED SECTOR WITH
7952 033710 062703 000026 MOV R3,-(SP) ;THE DESIRED TRACK
7953 033714 010346 15: MOV 11(R2),1(SP) ;LOAD DESIRED TRACK & SECTOR
7954 033716 116266 000011 000001 JSR RO,WRT.RP
7955 033724 004037 036702 RHDA
7956 033730 000006 CI7
7957 033732 034402 MOV #131,-(SP) ;START A SEARCH
7958 033734 012746 000131 JSR RO,WRT.RP
7959 033740 004037 036702 RHCS1
7960 033744 000000 CI7
7961 033746 034402 BISB ATABIT(R1),SRCHWT ;SET "SEARCH WAIT" KEY
7962 033750 156137 032346 032274 BR CIS
7963 033756 000567 CI4: MOV RPADR,R4 ;RHCS1 ADDRESS
7964 033760 013704 032360 MOV R1,RHCS2(R4) ;SELECT DRIVE
7965 033764 010164 000010

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7966	033770	116203	000002		MOV B	2(R2), R3	; PICKUP THE REQUESTED COMMAND
7967	033774	122703	000131		CM B	#131, R3	; IS IT A SEARCH COMMAND?
7968	034000	001007			BNE	1\$	; BRANCH IF NO
7969	034002	016246	000010		MOV	10(R2), -(SP)	; LOAD DESIRED TRACK & SECTOR
7970	034006	004037	036702		JSR	RO, WRT.RP	
7971	034012	000006			RHDA		
7972	034014	034402			CI7		
7973	034016	000403			BR	2\$	; GO LOAD CYLINDER
7974	034020	122703	000105	1\$:	CM B	#105, R3	; IS IT A SEEK COMMAND
7975	034024	001007			BNE	3\$	; BRANCH IF NO
7976	034026	016246	000012	2\$:	MOV	12(R2), -(SP)	; LOAD DESIRED CYLINDER
7977	034032	004037	036702		JSR	RO, WRT.RP	
7978	034036	000034			RHCA		
7979	034040	034402			CI7		
7980	034042	000546			BR	CI6	
7981	034044	122703	000115	3\$:	CM B	#115, R3	; IS IT AN "OFFSET" COMMAND?
7982	034050	001013			BNE	4\$	; BR IF NO
7983	034052	004037	036544		JSR	RO, RD.RP	; MERGE THE OFFSET VALUE INTO RHOF
7984	034056	000032			RHOF		; BUT DON'T CHANGE THE UPPER
7985	034060	034402			CI7		
7986	034062	116216	000001		MOV B	1(R2), (SP)	; BYTE WHEN LOADING THE
7987	034066	004037	036702		JSR	RO, WRT.RP	; REGISTER (RHOF)
7988	034072	000032			RHOF		
7989	034074	034402			CI7		
7990	034076	000530			BR	CI6	; GO START THE COMMAND
7991	034100	122703	000107	4\$:	CM B	#107, R3	; IS IT A "RECALIBRATE" COMMAND?
7992	034104	001525			BEG	CI6	; BRANCH IF YES
7993	034106	122703	000117		CM B	#117, R3	; IS IT A RETURN TO CENTER?
7994	034112	001522			BEG	CI6	; BRANCH IF YES
7995	034114	122703	000103		CM B	#103, R3	; IS IT AN "UNLOAD" COMMAND?
7996	034120	001016			BNE	5\$	; BRANCH IF NO
7997	034122	112761	000001	032232	MOV B	#1, DRVACT(R1)	; SET THE DRIVE ACTIVE INDICATOR
7998	034130	105061	032242		CLRB	DRVSTA(R1)	; PUT DRIVE STATUS TO OFFLINE
7999	034134	112761	000001	-032300	MOV B	#1, ULDFLG(R1)	; SET "UNLOAD IN PROGRESS" FLAG
8000	034142	010346			MOV	R3, -(SP)	; START THE "UNLOAD" COMMAND
8001	034144	004037	036702		JSR	RO, WRT.RP	
8002	034150	000000			RHCS1		
8003	034152	034402			CI7		
8004	034154	000207			RTS	PC	; RETURN TO USER
8005	034156	122703	000143	5\$:	CM B	#143, R3	; IS IT A "SET FORMAT" COMMAND?
8006	034162	001014			BNE	6\$	; BRANCH IF NO
8007	034164	004037	036544		JSR	RO, RD.RP	; READ THE OFFSET REGISTER
8008	034170	000032			RHOF		
8009	034172	034402			CI7		
8010	034174	116266	000001	000001	MOV B	1(R2), 1(SP)	; COMBINE "FMT22", "ECI", AND "HCI"
8011	034202	004037	036702		JSR	RO, WRT.RP	; LOAD "FMT22", "ECI", AND/OR "HCI".
8012	034206	000032			RHOF		
8013	034210	034402			CI7		
8014	034212	000436			BR	12\$	
8015	034214	122703	000141	6\$:	CM B	#141, R3	; IS IT A "GET REGISTER" COMMAND?
8016	034220	001023			BNE	10\$	; BRANCH IF NO
8017	034222	016203	000006	7\$:	MOV	6(R2), R3	; POINTS TO 1ST ADDRESS OF WHERE
8018							; TO PUT THE REGISTER(S)
8019	034226	116237	000010	034244	MOV B	10(R2), 9\$	; INIT. THE INDEX FOR THE FIRST REG.
8020	034234	116205	000011		MOV B	11(R2), R5	; INDEX OF LAST REG. TO MOVE
8021	034240	004037	036544	8\$:	JSR	RO, RD.RP	; READ RP04 REGISTER

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8022 034244 000000          9$:  RHCS1          ;INDEX OF REG. TO READ
8023 034246 034402          CI7
8024 034250 012623          MOV      (SP)+,(R3)+      ;GET THE CONTENTS OF RH11/RPO4 REG.
8025 034252 023705 034244  CMP      9$,R5          ;LAST REG. BEEN READ?
8026 034256 001414          BEQ      12$          ;GET OUT IF YES
8027 034260 062737 000002 034244  ADD      #2,9$          ;INCREASE THE INDEX BY 2
8028 034266 000764          BR      9$          ;LOOP--MORE TO READ
8029 034270 122703 000145          10$:  CMPB     #145,R3          ;IS IT A "SELECT DRIVE" COMMAND?
8030 034274 001405          BEQ      12$          ;BRANCH IF YES
8031 034276 010346          11$:  MOV      R3,-(SP)      ;LOAD THE COMMAND
8032 034300 004037 036702  JSR      RD,WRT.RP
8033 034304 000000          RHCS1
8034 034306 034402          CI7
8035 034310 004737 037702          12$:  JSR      PC,POPQUE      ;REMOVE REQ. FROM QUEUE
8036 034314 052762 000200 000016  BIS      #BIT07,16(R2)      ;SET THE "DONE" BIT
8037 034322 005737 032320          TST      SAVEFG          ;SAVE THE RH11/RPO4 REGISTERS?
8038 034326 100002          BFL      13$          ;BRANCH IF NO
8039 034330 004737 037044          JSR      PC,SVRH11      ;YES--GO SAVE THE REGISTERS
8040 034334 000207          13$:  RTS      PC          ;RETURN TO USER
8041 034336 006301          CIS:  ASL      R1
8042 034340 012761 001750 032324  MOV      #1000.,TIMER(R1)      ;SET A ONE SECOND TIMER
8043 034346 006201          ASR      R1
8044 034350 112761 000001 032232  MOVB     #1,DRVACT(R1)      ;SET THE DRIVE ACTIVE
8045 034356 000207          RTS      PC          ;RETURN TO THE USER
8046 034360 010346          16$:  MOV      R3,-(SP)      ;LOAD THE COMMAND
8047 034362 004037 036702  JSR      RD,WRT.RP
8048 034366 000000          RHCS1
8049 034370 034402          CI7
8050 034372 000761          BR      CIS
8051 034374 105761 032232          17A:  TSTB     DRVACT(R1)      ;IS THE DRIVE ACTIVE?
8052 034400 001405          BEQ      CI7B          ;BRANCH IF NO
8053 034402 012762 104000 000016  17:  MOV      #BIT15:BIT11,16(R2)      ;SET "PARITY" ERROR INDICATOR
8054 034410 004737 037044          JSR      PC,SVRH11      ;GO SAVE THE RH11/RPO4 REGISTERS
8055 034414 012746 000111          17B:  MOV      #111,-(SP)      ;DO A "DRIVE CLEAR"
8056 034420 004037 036702  JSR      RD,WRT.RP
8057 034424 000300          RHCS1
8058 034426 034466          C18
8059 034430 004737 037564          JSR      PC,EMPTYQ      ;EMPTY THE QUEUE
8060 034434 105061 032300          CLRB     UNDFLG(R1)      ;CLEAR THE UNLOAD IN QUEUE FLAG
8061 034440 105061 032232          CLRB     DRVACT(R1)      ;DRIVE IS IDLE
8062 034444 020137 032344          CMP      R1,DTUW      ;IF THIS DRIVE HAD AN I/O REQUEST
8063 034450 001005          BNE     1$          ;IN PROGRESS CLEAR ALL OF THE FLAGS
8064 034452 005037 032272          CLR      TRNSWT
8065 034456 012737 177777 032344  MOV      #-1,DTUW
8066 034464 000207          1$:  RTS      PC
8067 034466 004037 037744          18:  JSR      RD,SAVR15      ;SAVE R1-R5
8068 034472 013704 032360          MOV      RPADR,R4      ;PICKUP THE ADDRESS OF THE FIRST REGISTER
8069 034476 005001          CLR      R1
8070 034500 005003          CLR      R3
8071 034502 105761 032232          1$:  TSTB     DRVACT(R1)      ;DRIVE ACTIVE?
8072 034506 001421          BEQ      3$          ;BRANCH IF NO
8073 034510 013702 032272          MOV      TRNSWT,R2      ;GET THE "TRANSFER WAIT" QUEUE
8074 034514 020137 032344          CMP      R1,DTUW      ;DID THIS DRIVE HAVE AN I/O IN PROGRESS?
8075 034520 001402          BEQ      2$          ;BRANCH IF YES
8076 034522 004737 037660          JSR      PC,GETREQ      ;GET THE DPB POINTER
8077 034526 004737 037044          2$:  JSR      PC,SVRH11      ;SAVE RH11/RPO4 REGISTERS

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E13

 MAINDEC-11-DERPK-C "MECHANICAL AND READ/WRITE TEST"
 DERPKC.P11 RH11-RP04 DRIVER (REV. 0.9)

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8078 034532 052762 102000 000016      BIS      #BIT15:BIT10,16(R2) ;SET "NON-CLEARABLE PARITY" ERROR INDICATOR
8079 034540 012763 177777 032324      MOV      #-1,TIMER(R3) ;STOP THE TIMER
8080 034546 105061 032232              CLRB     DRVACT(R1) ;SET "DRIVE ACTIVE" TO IDLE
8081 034552 105061 032300      3$:      CLRB     ULDFLG(R1) ;CLEAR UNLOAD FLAG
8082 034556 005201              INC      R1 ;MOVE TO THE NEXT DRIVE
8083 034560 062703 000002      ADD      #2,R3
8084 034564 042701 177770      BIC      #1<7,R1
8085 034570 001344              BNE      1$ ;BRANCH IF MORE DRIVES
8086 034572 012737 177777 032344      MOV      #-1,DTUW ;NO DATA TRANSFERS UNDERWAY
8087 034600 005037 032272              CLR      TRNSWT ;CLEAR THE "TRANSFER WAIT" QUEUE
8088 034604 004737 037502              JSR      PC,CLRQUE ;CLEAR ALL OF THE REQUEST QUEUES
8089 034610 012764 000040 000010      MOV      #BIT05,RHCS2(R4) ;DO A MASSBUS INIT.
8090 034616 004737 037136              JSR      PC,SET.IE ;SET "IE" WITHOUT "TRE"
8091 034622 004037 037764              JSR      RD,GETR15 ;RESTORE THE REGISTERS
8092 034626 000207              RTS      PC ;RETURN
8093
8094 ;*LOOK AHEAD ROUTINE
8095 ;*CALL
8096 ;*
8097 ;*      MOV      #DRVNUM,R1 ;DRIVE NUMBER
8098 ;*      MOV      #DPB,R2 ;POINT TO DPB
8099 ;*      JSR      RD,LA ;GO CHECK THE WINDOW
8100 ;*      RETURN1 ;ERROR RETURN
8101 ;*      RETURN2 ;START A SEARCH
8102 ;*      RETURN3 ;START A DATA TRANSFER
8103
8104 034630 013704 032360      LA:      MOV      RPADR,R4 ;GET RHCS1'S ADDRESS
8105 034634 010164 000010      MOV      R1,RHCS2(R4) ;SELECT DRIVE
8106 034640 004037 036544      JSR      RD,RD.RP ;READ CURRENT CYLINDER
8107 034644 000036              RHCC
8108 034646 034760              4$
8109 034650 022662 000012      CMP      (SP)+,12(R2) ;ERROR RETURN ADDRESS
8110 ;CYLINDER?
8111 034654 001037              BNE      3$ ;IS CURRENT CYLINDER=DESIRED
8112 034656 105261 032310              INCB     LACNT(R1) ;CYLINDER?
8113 034662 126137 032310 032366      CMPB     LACNT(R1),MXLACT ;EXIT IF NO
8114 034670 003026              BGT      2$ ;INCREMENT THE LOOK AHEAD COUNT
8115 034672 116203 000010              MOVB     10(R2),R3 ;EXCEED MAX?
8116 034676 000303              SWAB     R3 ;BRANCH IF YES
8117 034700 006203              ASR      R3 ;GET DESIRED SECTOR ADDRESS AND
8118 034702 006203              ASR      R3 ;MULT. BY 64--ALIGN WITH
8119 034704 012737 000340 177776      MOV      #340,2#PS ;LOOK AHEAD REGISTER
8120 034712 004037 036544      JSR      RD,RD.RP ;PRIORITY LEVEL "7"
8121 034716 000020              RHLA     4$ ;READ LOOK AHEAD REGISTER
8122 034720 034760              4$
8123 034722 162603              SUB      (SP)+,R3 ;CALCULATE THE DELTA
8124 034724 002002              BGE      1$
8125 034726 062703 002600              ADD      #<22.*64.>,R3 ;MAKE THE DELTA POSITIVE
8126 034732 023703 032370      1$:      CMP      MXDLTA,R3 ;CHECK THE DELTA TO SEE
8127 034736 002406              BLT      3$ ;IF IT IS WITHIN THE
8128 034740 023703 032372              CMP      MNDLTA,R3 ;WINDOW---IF YES, ZERO
8129 034744 002003              BGE      3$ ;THE LOOK AHEAD COUNT
8130 034746 105061 032310      2$:      CLRB     LACNT(R1) ;AND TAKE THE I/O EXIT
8131 034752 005720              TST      (RD)+
8132 034754 005720      3$:      TST      (RD)+ ;ADJUST THE RETURN ADDRESS
8133 034756 000200              RTS      RD

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8134 034760 004737 034402      45:   JSR   PC,C17      ;PROCESS THE ERROR
8135 034764 000200              RTS    RO        ;TAKE ERROR RET
8136
8137      ;*INTERRUPT SERVICE ROUTINE
8138
8139 034766 112737 000001 032276 ISR:   MOVB   #1,ACTDRV      ;SET "ACTIVE DRIVER" FLAG
8140 034774 004037 037744          JSR   RO,SAVR15      ;SAVE R1-R5
8141 035000 013704 032360          MOV   RPADR,R4      ;ADDRESS OF RHSCS1
8142 035004 013701 032344          MOV   DTUW,R1      ;GET "DATA TRANSFER UNDERWAY" INDICATOR
8143 035010 002403              BLT    1$              ;BRANCH IF NO DATA TRANSFER UNDERWAY
8144 035012 004737 035036          JSR   PC,TD        ;CALL TRANSFER DONE
8145 035016 000402              BR     2$              ;EXIT
8146 035020 004737 035164          1$:   JSR   PC,SC        ;CALL SPECIAL CONDITIONS
8147 035024 004037 037764          2$:   JSR   RO,GETR15      ;RESTORE R1-R5
8148 035030 105037 032276          CLRB   ACTDRV        ;CLEAR "ACTIVE DRIVER" FLAG
8149 035034 000002              RTI                    ;RETURN
8150
8151      ;*TRANSFER DONE ROUTINE
8152
8153 035036 105061 032232      TD:   CLRB   DRVACT(R1)      ;SET DRIVE ACTIVE INDICATOR TO IDLE
8154 035042 012737 177777 032344      MOV   #-1,DTUW      ;NO DATA TRANSFERS UNDERWAY
8155 035050 006301              ASL    R1
8156 035052 012761 177777 032324      MOV   #-1,TIMER(R1) ;CANCEL TIMEOUT
8157 035060 006201              ASR    R1
8158 035062 013702 032272      MOV   TRANSW,R2      ;GET "DPB" ADDRESS FROM THE
8159 035066 005037 032272      CLR     TRANSW        ;TRANSFER WAIT QUEUE--CLEAR QUEUE
8160 035072 052762 000200 000016      BIS   #BIT07,16(R2) ;SET DONE
8161 035100 010164 000010      MOV   R1,RHCS2(R4)      ;SELECT THE DRIVE
8162 035104 004037 036544      JSR   RO,RD.RP        ;TRANSFER ERROR(TRE=1)?
8163 035110 000000              RHCS1
8164 035112 034402              C17
8165 035114 006126              ROL    (SP)+
8166 035116 100410              BMI    2$              ;BR IF YES
8167 035120 005737 032320      TST     SAVEFG        ;SAVE THE RH11/RP04 REGISTERS?
8168 035124 100002              BPL    1$              ;BRANCH IF NO
8169 035126 004737 037044          JSR   PC,SVRH11      ;YES--SAVE THE REGISTERS
8170 035132 004737 033162          1$:   JSR   PC,OPT        ;CALL OPTIMIZER
8171 035136 000456              BR     SC2              ;SPECIAL CONDITION (ENTRY #2)
8172 035140 052762 100100 000016      2$:   BIS   #BIT15:BIT06,16(R2) ;SET DATA ERROR FLAG
8173 035146 004737 037564          JSR   PC,EMPTYQ      ;EMPTY THE "DRIVES WAIT" QUEUE
8174 035152 004737 037044          JSR   PC,SVRH11      ;SAVE THE RH11/RP04 REGISTERS
8175 035156 012714 040111      MOV   #40111,(R4)      ;ISSUE A "DRIVE CLEAR"
8176 035162 000444              BR     SC2              ;SPECIAL CONDITION (ENTRY #2)
8177
8178      ;*SPECIAL CONDITION ROUTINE
8179
8180 035164 005001      SC:   CLR     R1              ;START WITH DRIVE 0
8181 035166 012702 000001      MOV   #1,R2
8182 035172 105761 032242      1$:   TSTB   DRVSTA(R1)      ;NONEXISTENT?
8183 035176 002016              BGE    2$              ;NO--BRANCH
8184 035200 005201              INC     R1              ;YES--MOVE TO THE NEXT DRIVE
8185 035202 106302              ASLB   R2              ;MORE DRIVES?
8186 035204 103372              BCC    1$              ;YES--BRANCH
8187 035206 013746 032322      MOV   SEEKFG,-(SP)      ;SAVE THE "SEEK FLAG"
8188 035212 013746 032320      MOV   SAVEFG,-(SP)      ;SAVE THE "SAVE FLAG"
8189 035216 004737 032376          JSR   PC,RPINIT      ;GO INIT. THE SUBSYSTEM

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8190	035222	012637	032320		MOV	(SP)+,SAVEFG	;RESTORE THE "SAVE FLAG"
8191	035226	012637	032322		MOV	(SP)+,SEEKFG	;RESTORE THE "SEEK FLAG"
8192	035232	000405			BR	SC1	;TAKE ERROR EXIT
8193	035234	010164	000010	2\$:	MOV	R1,RHCS2(R4)	;SELECT DRIVE
8194	035240	116405	000001		MOVB	1(R4),R5	;IS "SC"=1?
8195	035244	100413			BMI	SC2	;BRANCH IF YES
8196	035246	012701	000010	SC1:	MOV	#8.,R1	;DO EIGHT DRIVES
8197	035252	005301		1\$:	DEC	R1	;NEXT DRIVE
8198	035254	002743			BLT	SC	;BRANCH IF OUT OF DRIVES
8199	035256	105761	032232		TSTB	DRVACT(R1)	;IS THIS DRIVE IDLE?
8200	035262	001373			BNE	1\$	;BRANCH IF NO
8201	035264	104001			ERROR	1	;REPORT THE ERROR
8202	035266	004737	037136		JSR	PC,SET.IE	;GO SET INTERRUPT ENABLE
8203	035272	000207			RTS	PC	
8204	035274	012701	000003	SC2:	MOV	#3,R1	;READ RHAS UP TO THREE TIMES
8205	035300	116403	000016	1\$:	MOVB	RHAS(R4),R3	;READ "RHAS"
8206	035304	001011			BNE	2\$	;BRANCH IF ANY ATA BITS = 1
8207	035306	005301			DEC	R1	;COUNT THIS READ
8208	035310	003373			BGT	1\$	;LOOP IF MORE READS ALLOWED
8209	035312	004037	036544		JSR	RD,RD.RP	;READ CONTROL AND STATUS REGISTER
8210	035316	000000			RHCS1		
8211	035320	034466			CIB		
8212	035322	106126			ROLB	(SP)+	;IS "IE"=1?
8213	035324	100350			BPL	SC1	;NO--TAKE ERROR EXIT
8214	035326	000207			RTS	PC	;YES--RETURN
8215	035330	005046		2\$:	CLR	-(SP)	;PROCESS ALL DRIVES THAT HAVE
8216	035332	110316			MOVB	R3,(SP)	;FN "ATA"=1
8217	035334	012703	000001		MOV	#1,R3	
8218	035340	005001			CLR	R1	
8219	035342	030316		SC4:	BIT	R3,(SP)	;ATA=1?
8220	035344	001005			BNE	SC5	;YES--BRANCH
8221	035346	005201		SC3:	INC	R1	;MOVE TO THE NEXT DRIVE
8222	035350	106303			ASLB	R3	
8223	035352	001373			BNE	SC4	;BRANCH IF MORE TO CHECK?
8224	035354	005726			TST	(SP)+	;CLEAN OFF THE STACK
8225	035356	000207			RTS	PC	;RETURN TO USER
8226	035360	023701	032344	SC5:	CMP	DTUW,R1	;IS THIS DRIVE SETUP FOR I/O?
8227	035364	001002			BNE	1\$	;NO---BRANCH
8228	035366	005726			TST	(SP)+	;YES---CLEAN OFF THE STACK (RHAS)
8229	035370	000622			BR	TD	;BRANCH TO "TRANSFER DONE"
8230	035372	105761	032242	1\$:	TSTB	DRVSTA(R1)	;CHECK THE DRIVE STATUS
8231	035376	003030			BGT	SC6	;BRANCH IF ONLINE
8232	035400	105761	032300		TSTB	ULDFLG(R1)	;UNLOAD IN PROGRESS?
8233	035404	003420			BLE	2\$	;BRANCH IF NO
8234	035406	004737	037660		JSR	PC,GETREQ	;GET DPB POINTER
8235	035412	004737	037044		JSR	PC,SVRH11	;SAVE THE RH11/RP04 REGISTERS
8236	035416	004737	036074		JSR	PC,SC12	;SAVE RHDS1, RHER1, RHER2, AND RHER3
8237							;ALSO DO A DRIVE INIT (DRVINT)
8238	035422	105761	032242		TSTB	DRVSTA(R1)	;DID DRIVE COME ONLINE?
8239	035426	003411			BLE	3\$	;NO---BRANCH
8240	035430	032737	040000 032222		BIT	#BIT14,RPERRS	;WAS THERE AN ERROR?
8241	035436	001565			BEQ	SC11	;NO -- BRANCH
8242	035440	013705	032224		MOV	RPERRS+2,R5	;YES -- PICKUP RHER1 AND
8243	035444	000447			BR	SC6A	;GO PROCESS THE ERROR
8244	035446	004737	036074	2\$:	JSR	PC,SC12	;SAVE RHDS1, RHER1, RHER2, AND RHER3
8245							;ALSO DO A DRVINT

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8246 035452 011605      3$:  MOV      (SP),R5      ;PICKUP (RHAS) BEFORE THE ERROR CALL
8247 035454 104005      ERROR      5      ;REPORT THE ERROR
8248 035456 000733      BR          SC3      ;GO CHECK FOR MORE ATA'S
8249 035460 006301      SC6:  ASL      R1
8250 035462 012761 177777 032324  MOV      #-1,TIMER(R1) ;STOP THE TIMER
8251 035470 006201      ASR      R1
8252 035472 004737 037660      JSR      PC,GETREQ      ;GET THE DPB POINTER FROM THE QUEUE
8253 035476 010364 000016      MOV      R3,RHAS(R4)      ;CLEAR ATTENTION
8254 035502 010164 000010      MOV      R1,RHCS2(R4)      ;SELECT DRIVE
8255 035506 004037 036544      JSR      RD,RD.RP      ;READ THE RP04'S STATUS REG.
8256 035512 000012      RHDS1
8257 035514 035732      SC8
8258 035516 011605      MOV      (SP),R5      ;AND PUT IT IN R5
8259 035520 006126      ROL      (SP)+      ;WAS THERE AN ERROR?
8260 035522 100115      BPL      SC9      ;BR IF NO
8261 035524 105761 032232      TSTB     DRVACT(R1)      ;CHECK THE DRIVE ACTIVE INDICATOR
8262 035530 001522      BEQ      SC10      ;BRANCH IF IDLE
8263 035532 004037 036544      JSR      RD,RD.RP      ;READ ERROR REGISTER #1
8264 035536 000014      RHER1
8265 035540 035732      SC8
8266 035542 012605      MOV      (SP)+,R5      ;AND SAVE IT IN R5
8267 035544 004737 037044      JSR      PC,SVRH11      ;SAVE RH11/RP04 REGISTERS
8268 035550 012746 000111      MOV      #11,-(SP)      ;ISSUE A DRIVE CLEAR
8269 035554 004037 036702      JSR      RD,WRT.RP
8270 035560 000000      RHCS1
8271 035562 035732      SC8
8272 035564 006105      SC6A:  ROL      R5      ;WAS "UNSAFE" CONDITION =1?
8273 035566 100404      BMI      1$      ;BRANCH IF YES
8274 035570 052762 100240 000016  BIS      #BIT15:BIT07:BIT05,16(R2) ;INFORM USER OF ERROR
8275 035576 000443      BR          SC7
8276 035600 004037 036544      1$:  JSR      RD,RD.RP      ;READ DRIVE STATUS REG. #1
8277 035604 000012      RHDS1
8278 035606 035732      SC8
8279 035610 011605      MOV      (SP),R5      ;SAVE RHDS1 IN R5
8280 035612 006126      ROL      (SP)+      ;"ERR"=1?
8281 035614 100113      BPL      2$      ;BR IF NO--UNSAFE CLEARED
8282 035616 112761 177777 032242  MOVB     #-1,DRVSTA(R1) ;DRIVE IS UNSAFE
8283 035624 004737 037044      JSR      PC,SVRH11      ;SAVE RH11/RP04 REGISTERS
8284 035630 010364 000016      MOV      R3,RHAS(R4)      ;CLEAR ATTENTION
8285 035634 052762 110000 000016  BIS      #BIT15:BIT12,16(R2) ;INFORM USER OF UNSAFE ERROR
8286 035642 000421      BR          SC7
8287 035644 105705      2$:  TSTB     R5      ;"DRY" =1?
8288 035646 100414      BMI      3$      ;BRANCH IF YES
8289 035650 112761 177777 032232  MOVB     #-1,DRVACT(R1) ;ACTIVE ERROR RECOVER
8290 035656 112761 000001 032242  MOVB     #1,DRVSTA(R1) ;ONLINE
8291 035664 006301      ASL      R1
8292 035666 012761 072460 032324  MOV      #30000.,TIMER(R1) ;START 30 SECOND TIMER
8293 035674 006201      ASR      R1
8294 035676 000623      BR          SC3
8295 035700 052762 100220 000016  3$:  BIS      #BIT15:BIT07:BIT04,16(R2) ;INFORM USER OF ERROR
8296 035706 105061 032232      SC7:  CLRB     DRVACT(R1)      ;DRIVE IS IDLE
8297 035712 004737 037564      JSR      PC,EMPTYQ      ;DUMP THE QUEUE
8298 035716 105761 032300      TSTB     ULDFLG(R1)      ;UNLOAD IN PROGRESS OR QUEUE?
8299 035722 001611      BEQ      SC3      ;BR IF NO
8300 035724 105061 032300      CLRB     ULDFLG(R1)      ;CLEAR UNLOAD FLAG
8301 035730 000606      BR          SC3

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8302 035732 005726          SC8:  TST      (SP)+      ;REMOVE (RHAS) FROM THE STACK
8303 035734 105761 032232    TSTB     DRVACT(R1)    ;IS DRIVE IDLE?
8304 035740 001404          BEQ       1$           ;YES--BRANCH
8305 035742 004737 037660    JSR       PC,GETREQ     ;GET DPB POINTER
8306 035746 000137 034402    JMP       CI7         ;PROCESS THE PARITY ERROR
8307 035752 000137 034414    1$:      JMP       CI7B        ;PROCESS THE PARITY ERROR
8308 035756 105761 032232    SC9:      TSTB     DRVACT(R1)    ;TEST DRIVE ACTIVE
8309 035762 003013          BGT       SC11         ;BRANCH IF DRIVE IS ACTIVE
8310 035764 001404          BEQ       SC10         ;BRANCH IF DRIVE IS IDLE
8311 035766 052762 100210 000016  BIS     #BIT15:BIT07:BIT03,16(R2) ;INFORM USER OF ERROR RECOVER COMPLETION
8312 035774 000744          BR        SC7
8313 035776 011605          SC10:  MOV      (SP),R5 ;PUT (RHAS) IN R5
8314 036000 004737 036074    JSR       PC,SC12        ;SAVE RHDS1, RHER1, RHER2, AND RHER3
8315 036004 104002          ERROR    2             ;REPORT THE ERROR
8316 036006 000137 035346    JMP       SC3         ;GO CHECK FOR MORE ATA'S
8317 036012 105761 032300    SC11:  TSTB     ULDFLG(R1)    ;"UNLOAD IN PROGRESS"?
8318 036016 003402          BLE       1$           ;BRANCH IF NO
8319 036020 105061 032300    CLR      ULDFLG(R1)    ;CLEAR UNLOAD FLAG
8320 036024 105061 032232    1$:      CLR      DRVACT(R1) ;SET DRIVE IDLE
8321 036030 136137 032346 032274  BITB     ATABIT(R1),SRCHWT ;DOING A SEARCH OPERATION FOR
8322                                     ;AN I/O COMMAND?
8323 036036 001012          BNE       2$           ;BRANCH IF YES
8324 036040 004737 037702    JSR       PC,POPQUE     ;REMOVE REQUEST FROM QUEUE
8325 036044 052762 000200 000016  BIS     #BIT07,16(R2) ;SET "DONE" BIT
8326 036052 005737 032320    TST       SAVEFG       ;SAVE THE RH11/RP04 REGISTERS?
8327 036056 100002          BPL       2$           ;BRANCH IF NO
8328 036060 004737 037044    JSR       PC,SVRH11    ;YES--SAVE ALL OF THE RH11/RP04 REG'S
8329 036064 004737 033162    2$:      JSR       PC,OPT     ;START A REQUEST
8330 036070 000137 035346    JMP       SC3
8331 036074 010164 000010    SC12:  MOV      R1,RHCS2(R4) ;SELECT DRIVE
8332 036100 016437 000012 032222  MOV      RHDS1(R4),RPERRS ;SAVE THE FOUR REGISTERS THAT
8333 036106 016437 000014 032224  MOV      RHER1(R4),RPERRS+2 ;WILL TELL US SOMETHING
8334 036114 016437 000040 032226  MOV      RHER2(R4),RPERRS+4
8335 036122 016437 000042 032230  MOV      RHER3(R4),RPERRS+6
8336 036130 004037 032540    JSR      RD,DRVINT ;INIT. THE STATE OF THE DRIVE
8337 036134 000401          BR        1$           ;TAKE ERROR EXIT
8338 036136 000207          PC         ;RETURN
8339 036140 005726          1$:      TST      (SP)+      ;POP PC OFF OF THE STACK
8340 036142 000673          BR        SC8          ;PROCESS THE PARITY ERROR

8341                                     ;*RP04 TIMER ROUTINE
8342                                     ;*CALL
8343                                     ;*
8344                                     ;*      MOV      #TIME,-(SP) ;ELAPSED TIME IN MILLISECONDS ON THE STACK
8345                                     ;*      JSR      RD,RPTMR ;CALL RP04 TIME ROUTINE
8346                                     ;*
8347 036144 005737 032276    RPTMR:  TST      ACTDRV     ;CHECK "ACTDRV & ACTSTR"
8348 036150 001032          BNE       4$           ;IF NON ZERO EXIT
8349 036152 112737 000001 032277  MOVB     #1,ACTSTR ;SET "ACTSTR"
8350 036160 004037 037744    JSR      RD,SAVR15    ;SAVE R1-R5
8351 036164 005001          CLR       R1           ;START WITH DRIVE 0
8352 036166 005003          CLR       R3
8353 036170 005763 032324    1$:      TST      TIMER(R3) ;IS THE TIMER RUNNING?
8354 036174 002407          BLT       2$           ;BRANCH IF NO
8355 036176 166663 000016 032324  SUB      16(SP),TIMER(R3) ;COUNT THE INTERVAL
8356 036204 003003          BGT       2$           ;BR IF NO SOFTWARE TIMEOUT
8357 036206 004037          JSR      RD,STO        ;CALL SOFTWARE TIMEOUT ROUTINE

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8358 036212 000405          BR      3$          ;GO TO THE EXIT
8359 036214 005201          2$: INC      R1          ;MOVE TO NEXT DRIVE
8360 036216 005723          TST      (R3)+
8361 036220 022701 000010   CMP      #8.,R1          ;OUT OF DRIVES?
8362 036224 003361          BGT      1$          ;BRANCH IF NO
8363 036226 004037 037764   3$: JSR      RD,GETR15      ;RESTORE R1-R5
8364 036232 105037 032277   CLR      ACTSTR      ;ZERO ACTIVE SOFTWARE TIMEOUT ROUTINE FLAG
8365 036236 012616          4$: MOV      (SP)+,(SP)      ;ADJUST THE STACK
8366 036240 000200          RTS      RD          ;RETURN
8367
8368          ;*SOFTWARE TIMEOUT ROUTINE
8369          ;*
8370          ;*CALL: STO
8371          ;*      MOV      #DRVNUM,R1          ;DRIVE NUMBER
8372          ;*      JSR      RD,STO          ;CALL--DRVACT MUST BE NONZERO
8373          ;*      RETURN
8374
8375 036242 013746 177776   STO: MOV      2*PS, -(SP)      ;SAVE THE PROCESSOR STATUS
8376 036246 013737 032364 177776   MOV      RPVEC+2, 2*PS      ;SET THE "PS" TO RP04 BR LEVEL
8377 036254 004037 037744          JSR      RD,SAVR15      ;SAVE R1-R5
8378 036260 013704 032360          MOV      RPADR,R4          ;GET ADDRESS OF "RHCS1"
8379 036264 010164 000010          MOV      R1,RHCS2(R4)      ;SELECT THE DRIVE
8380 036270 004037 036544          JSR      RD,RD.RP      ;READ "DRIVE STATUS REG"
8381 036274 000012          RHDS1
8382 036276 036536          STOS
8383 036300 105726          TSTB      (SP)+          ;IS "DRY"=1?
8384 036302 100471          BMI      ST02          ;BR IF YES
8385 036304 013702 032272   ST01: MOV      TRNSWT,R2      ;PICKUP TRANSFER WAIT QUEUE
8386 036310 020137 032344          CMP      R1,DTUW      ;TRANSFER UNDERWAY ON THIS DRIVE?
8387 036314 001402          BEQ      1$          ;BRANCH IF YES
8388 036316 004737 037660          JSR      PC,GETREQ      ;GET DPB ADDRESS
8389 036322 052762 101000 000016 1$: BIS      #BIT15:BIT09,16(R2) ;SET THE ERROR FLAGS
8390 036330 004737 037044          JSR      PC,SVRH11      ;SAVE RH11/RP04 REGISTERS
8391 036334 012764 000040 000010   MOV      #BIT05,RHCS2(R4) ;"INIT" THE MASS BUS
8392 036342 105061 032232          CLR      DRVACT(R1)      ;DRIVE IS IDLE
8393 036346 105061 032300          CLR      ULDFLG(R1)      ;CLEAR THE UNLOAD FLAG
8394 036352 005001          CLR      R1          ;START WITH DRIVE 0
8395 036354 005003          CLR      R3
8396 036356 004037 032540   2$: JSR      RD,DRVINT      ;INIT. THIS DRIVE
8397 036362 000465          BR      ST05          ;PARITY ERROR RETURN
8398 036364 105761 032232          TSTB      DRVACT(R1)      ;DRIVE IDLE BEFORE THE INIT.?
8399 036370 001414          BEQ      4$          ;YES--BRANCH
8400 036372 013702 032272          MOV      TRNSWT,R2      ;GET TRANSFER WAIT QUEUE
8401 036376 023701 032344          CMP      DTUW,R1      ;WAS THERE I/O ON THIS DRIVE?
8402 036402 001402          BEQ      3$          ;YES--BRANCH
8403 036404 004737 037660          JSR      PC,GETREQ      ;GET THE DPB POINTER FROM QUEUE
8404 036410 052762 100400 000016 3$: BIS      #BIT15:BIT08,16(R2) ;INFORM USER OF INIT.
8405 036416 105061 032232          CLR      DRVACT(R1)      ;SET DRIVE ACTIVE TO IDLE
8406 036422 105061 032300          CLR      ULDFLG(R1)      ;NO UNLOAD
8407 036426 012763 177777 032324   MOV      #-1,TIMER(R3) ;STOP THE TIMER
8408 036434 005723          TST      (R3)+          ;UPDATE THE INDEX
8409 036436 005201          INC      R1          ;INCREMENT THE DRIVE NUMBER
8410 036440 022701 000010          CMP      #8.,R1          ;LAST DRIVE BEEN CHECKED?
8411 036444 003344          BGT      2$          ;NO--LOOP
8412 036446 012737 177777 032344   MOV      #-1,DTUW      ;NO DATA TRANSFERS UNDERWAY
8413 036454 005037 032272          CLR      TRNSWT      ;CLEAR TRANSFER WAIT QUEUE

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8414 036460 004737 037502      JSR    PC,CLRQUE      ;CLEAR ALL REQUEST QUEUES
8415 036464 000417              BR      ST04              ;EXIT
8416 036466 016405 000016      ST02:  MOV    RHAS(R4),R5      ;IS ATTENTION FOR THIS
8417 036472 136105 032346      BITB   ATABIT(R1),R5      ;DRIVE UP?
8418 036476 001011              BNE     ST03              ;YES--BRANCH
8419 036500 020137 032344      CMP     R1,DTUW          ;DATA TRANSFER UNDERWAY FOR THIS DRIVE
8420 036504 001277              BNE     ST01              ;BR IF NO
8421 036506 004037 036544      JSR     RD,RD.RP          ;YES--CHECK "RDY"
8422 036512 000000              RHCS1  ST05
8423 036514 036536              ST05
8424 036516 105726              TSTB   (SP)+
8425 036520 100271              BPL     ST01              ;BR IF "RDY"=0
8426 036522 005720              ST03:  TST     (RD)+          ;ADJUST FOR THE PROPER RETURN
8427 036524 004037 037764      ST04:  JSR     RD,GETR15       ;RESTORE R1-R5
8428 036530 012637 177776      MOV     (SP)+,2*PS      ;RESTORE PROCESSOR STATUS
8429 036534 000200              RTS      RD              ;RETURN
8430 036536 004737 034466      ST05:  JSR     PC,CIB          ;GO HANDLE THE PARITY ERROR
8431 036542 000770              BR      ST04
8432
8433      ;*ROUTINE TO READ A RH11/RP04 REGISTER
8434      ;*CALL
8435      ;*
8436      ;*      JSR     RD,RD.RP          ;GO READ A REGISTER
8437      ;*      INDEX   ;REG. INDEX FROM BASE
8438      ;*      ERRADR   ;ERROR ADDRESS--PROCESS ERROR STARTING
8439      ;*              ;AT THIS ADDRESS
8440      ;*      RETURN   ;CONTENTS OF REG. IS ON THE STACK
8441
8442 036544 013737 032356 036670  RD.RP:  MOV     MCPEMX,RD.RP2      ;MAX. RETRYS ALLOWED
8443 036552 011646              MOV     (SP),-(SP)          ;SAVE RD FOR RETURN
8444 036554 013737 032360 036570      MOV     RPADR,RD.ADR      ;FORM THE DESIRED ADDRESS
8445 036562 062037 036570      ADD     (RD)+,RD.ADR      ;USING THE BASE AND THE INDEX
8446 036566 013727              RD.RP1: MOV     2(PC)+,(PC)+      ;READ THE DESIRED REGISTER OF THE RP04
8447 036570 000000              RD.ADR: .WORD    0          ;ADDRESS IS FORMED HERE
8448 036572 000000              RD.WRD: .WORD    0          ;REG. CONTENTS PUT HERE
8449 036574 013766 036572 000002      MOV     RD.WRD,2(SP)      ;RETURN IT TO THE USER
8450 036602 017746 173552              MOV     2RPADR,-(SP)      ;READ RHCS1
8451 036606 032716 020000              BIT     #BIT13,(SP)      ;DID MCPE SET?
8452 036612 001002              BNE     1$              ;BRANCH IF YES
8453 036614 022620              CMP     (SP)+,(RD)+          ;ADJUST FOR RETURN
8454 036616 000200              RTS      RD              ;RETURN IF NO
8455 036620
8456 036620 104003              1$:   ERROR    3          ;REPORT THE ERROR
8457 036622 005737 032344              TST     DTUW          ;DATA TRANSFER UNDERWAY?
8458 036626 100405              BMI     2$              ;NO--BRANCH
8459 036630 032716 040000              BIT     #BIT14,(SP)      ;NO--"TRE"=1?
8460 036634 001402              BEQ     2$              ;NO--BRANCH
8461 036636 005726              TST     (SP)+          ;YES--CLEAN OFF THE STACK AND
8462 036640 000415              BR      RD.RP3          ;TAKE THE FATAL ERROR EXIT
8463 036642 052716 040000      2$:   BIS     #BIT14,(SP)      ;CLEAR "MCPE" BY SENDING A "1" TO "TRE"
8464 036646 000316              SWAB   (SP)          ;POSITION BEFORE WRITING
8465 036650 013737 032360 036664      MOV     RPADR,3$      ;FORM ADDRESS OF HIGH BYTE
8466 036656 005237 036664              INC     3$
8467 036662 112637              MOVB   (SP)+,2(PC)+      ;WRITE THE HIGH BYTE OF RHCS1
8468 036664 000000              3$:   .WORD    0          ;ADDRESS STORAGE
8469 036666 005327              DEC     (PC)+          ;EXCEEDED MAX. RETRYS

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8470 036670 000003      RD.RP2: .WORD 3
8471 036672 002335      BGE RD.RP1 ;BRANCH IF NO
8472 036674 011000      RD.RP3: MOV (RD),RO ;FATAL ERROR EXIT
8473 036676 012616      MOV (SP)+,(SP)
8474 036700 000200      RTS RO
8475
8476 ;*ROUTINE TO WRITE A RH11/RP04 REGISTER
8477 ;*CALL
8478 ;*      MOV DATA, -(SP) ;DATA TO BE LOADED ON THE STACK
8479 ;*      JSR RO, WRT.RP ;CALL THE ROUTINE TO LOAD(WRITE) THE REG.
8480 ;*      INDEX ;INDEX OF THE REGISTER TO BE LOADED
8481 ;*      ERRADR ;ADDRESS TO RETURN TO ON AN ERROR
8482 ;*      RETURN ;ERROR FREE RETURN
8483
8484
8485 036702 016637 000002 036770 WRT.RP: MOV 2(SP), WRT.WD ;SAVE THE WORD TO WRITE
8486 036710 012616      MOV (SP)+, (SP) ;ADJUST THE STACK
8487 036712 012037 036772      MOV (RO)+, WRT.AD ;GET INDEX OF REGISTER TO BE WRITTEN
8488 036716 001020      BNE 2$ ;BRANCH IF NOT RHCS1
8489 036720 122737 000150 036770      CMPB #150, WRT.WD ;IS THE COMMAND FOR DATA TRANSFERS?
8490 036726 002414      BLT 2$ ;YES--DON'T GET THE OLD A16&A17, & PSEL
8491 036730 004037 036544      JSR RO, RD.RP ;NO---COMBINE A16&A17, & PSEL WITH
8492 036734 000000      RHCS1 ;THE COMMAND BEFORE SENDING IT TO
8493 036736 036754      1$ ;THE RH11/RP04
8494 036740 000316      SWAB (SP)
8495 036742 042716 177770      BIC #1C7, (SP)
8496 036746 112637 036771      MOVB (SP)+, WRT.WD+1
8497 036752 000402      BR 2$
8498 036754 011000      1$: MOV (RO), RO ;TAKE THE ERROR EXIT
8499 036756 000200      RTS RO
8500 036760 063737 032360 036772 2$: ADD RPADR, WRT.AD ;FORM THE ADDRESS OF THE DISK REG.
8501 036766 012737      MOV (PC)+, 2(PC)+ ;LOAD THE DESIRED REG.
8502 036770 000000      WRT.WD: .WORD 0 ;WORD TO WRITE GOES HERE
8503 036772 000000      WRT.AD: .WORD 0 ;ADDRESS IS FORMED HERE
8504 036774 004037 036544      JSR RO, RD.RP ;CHECK FOR PARITY ERROR ON WRITE
8505 037000 000014      RHER1
8506 037002 037034      2$
8507 037004 032726 000010      BIT #BIT03, (SP)+
8508 037010 001413      BEQ 3$ ;BRANCH IF "PAR=0"
8509 037012 016037 177776 037024      MOV -2(RO), 1$ ;PICKUP THE INDEX
8510 037020 004037 036544      JSR RO, RD.RP ;READ THE REG.
8511 037024 000000      1$: .WORD 0 ;REG. INDEX
8512 037026 037034      2$ ;RETURN TO THIS ADDRESS ON ERROR
8513 037030 104004      ERROR 4 ;REPORT THE ERROR
8514 037032 005726      TST (SP)+ ;CLEAN OFF THE STACK
8515 037034 011000      2$: MOV (RO), RO ;TAKE THE "PARITY ON WRITE" ERROR EXIT
8516 037036 000200      RTS RO
8517 037040 005720      3$: TST (RO)+ ;ADJUST FOR ERROR FREE EXIT
8518 037042 000200      RTS RO
8519
8520 ;*ROUTINE TO SAVE THE RH11/RP04 REGISTERS AS PER DPB+14
8521 ;*CALL
8522 ;*      MOV #DPBNUM, R2 ;DPB POINTER TO R2
8523 ;*      JSR PC, SVRH11 ;SAVE THE DPB'S REG'S
8524
8525

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8526 037044 004037 037744 SVRH11: JSR RD,SAVR15 ;SAVE REG.'S R1-R5
8527 037050 013704 032360 MOV RPADR,R4
8528 037054 111264 000010 MOV (R2),RHCS2(R4) ;SELECT DRIVE
8529 037060 016202 000014 MOV 14(R2),R2 ;GET THE ERROR TABLE POINTER
8530 037064 001421 BEQ 4$ ;EXIT IF 0
8531 037066 005003 CLR R3 ;COUNTER & POINTER
8532 037070 012705 000022 MOV #RHDB,R5 ;PROBLEM REGISTER
8533 037074 020305 1$: CMP R3,R5 ;REACHED RHDB?
8534 037076 001005 BNE 2$ ;BR IF NO
8535 037100 105764 000010 TSTB RHCS2(R4) ;CHECK "OR"
8536 037104 100402 BMI 2$ ;BRANCH IF RHDB CAN BE READ
8537 037106 005022 CLR (R2)+ ;ELSE SAVE IT AS 0'S
8538 037110 000403 BR 3$
8539 037112 010446 2$: MOV R4,-(SP) ;FORM RH11/RP04 ADDRESS THAT IS
8540 037114 060316 ADD R3,(SP) ;TO BE READ
8541 037116 013622 MOV 2(SP)+,(R2)+ ;AND READ IT
8542 037120 005723 3$: TST (R3)+ ;MOVE TO NEXT REG INDEX
8543 037122 020327 000046 CMP R3,#RHEC2 ;DONE?
8544 037126 003762 BLE 1$ ;BRANCH IF NO
8545 037130 004037 037764 4$: JSR RD,GETR15 ;GET REGISTERS R1-R5
8546 037134 000207 RTS PC ;RETURN TO USER
8547
8548 ;*ROUTINE TO SET THE INTERRUPT WITHOUT GETTING A "TRE"
8549 ;*CALL
8550 ;* MOV #DRVNUM,R1 ;DRIVE NUMBER TO R1
8551 ;* JSR PC,SET.IE ;SET "IE"
8552 ;* RETURN
8553
8554 037136 010446 SET.IE: MOV R4,-(SP) ;SAVE R4
8555 037140 013704 032360 MOV RPADR,R4 ;PICKUP ADDRESS OF RHCS1
8556 037144 010164 000010 MOV R1,RHCS2(R4) ;SELECT DRIVE
8557 037150 011446 MOV (R4),-(SP) ;READ RHCS1
8558 037152 052716 040000 BIS #BIT14,(SP) ;SET THE "TRE" BIT OF THE WORD READ
8559 037156 000316 SWAB (SP) ;ADJUST FOR DATO
8560 037160 112714 000100 MOV #BIT06,(R4) ;SET "IE"
8561 037164 032764 010000 000010 BIT #BIT12,RHCS2(R4) ;IS "NED"=1?
8562 037172 001002 BNE 1$ ;YES--CLEAR "TRE"
8563 037174 005726 TST (SP)+ ;CLEAN OFF THE STACK
8564 037176 000402 BR 2$
8565 037200 112664 000001 1$: MOV (SP)+,1(R4) ;CLEAR "TRE"
8566 037204 012604 2$: MOV (SP)+,R4 ;RESTORE R4
8567 037206 000207 RTS PC ;RETURN TO CALLER
8568
8569 ;*QUEUE COUNT
8570 037210 000 QCNT: .BYTE 0 ;DRIVE 0
8571 037211 000 .BYTE 0 ;DRIVE 1
8572 037212 000 .BYTE 0 ;DRIVE 2
8573 037213 000 .BYTE 0 ;DRIVE 3
8574 037214 000 .BYTE 0 ;DRIVE 4
8575 037215 000 .BYTE 0 ;DRIVE 5
8576 037216 000 .BYTE 0 ;DRIVE 6
8577 037217 000 .BYTE 0 ;DRIVE 7
8578
8579 ;QUEUE INPUT POINTERS
8580
8581 037220 037302 QINPT: .WORD QDRVD ;DRIVE 0

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8582 037222 037322 .WORD QDRV1 ;DRIVE 1
8583 037224 037342 .WORD QDRV2 ;DRIVE 2
8584 037226 037362 .WORD QDRV3 ;DRIVE 3
8585 037230 037402 .WORD QDRV4 ;DRIVE 4
8586 037232 037422 .WORD QDRV5 ;DRIVE 5
8587 037234 037442 .WORD QDRV6 ;DRIVE 6
8588 037236 037462 .WORD QDRV7 ;DRIVE 7
8589
8590 ;QUEUE OUTPUT POINTERS
8591
8592 037240 037302 QOUTPT: .WORD QDRV0 ;DRIVE 0
8593 037242 037322 .WORD QDRV1 ;DRIVE 1
8594 037244 037342 .WORD QDRV2 ;DRIVE 2
8595 037246 037362 .WORD QDRV3 ;DRIVE 3
8596 037250 037402 .WORD QDRV4 ;DRIVE 4
8597 037252 037422 .WORD QDRV5 ;DRIVE 5
8598 037254 037442 .WORD QDRV6 ;DRIVE 6
8599 037256 037462 .WORD QDRV7 ;DRIVE 7
8600
8601 037260 037302 QSTART: .WORD QDRV0 ;DRIVE 0 START ADDRESS
8602 037262 037322 QSTOP: .WORD QDRV1 ;DRIVE 0 STOP ADDRESS & DRIVE 1 START ADDRESS
8603 037264 037342 .WORD QDRV2 ;STOP DRIVE 1--START DRIVE 2
8604 037266 037362 .WORD QDRV3 ;STOP DRIVE 2--START DRIVE 3
8605 037270 037402 .WORD QDRV4 ;STOP DRIVE 3--START DRIVE 4
8606 037272 037422 .WORD QDRV5 ;STOP DRIVE 4--START DRIVE 5
8607 037274 037442 .WORD QDRV6 ;STOP DRIVE 5--START DRIVE 6
8608 037276 037462 .WORD QDRV7 ;STOP DRIVE 6--START DRIVE 7
8609 037300 037502 .WORD QTERM ;STOP DRIVE 7
8610
8611 ;DRIVE REQUEST QUEUES
8612
8613 037302 000010 QDRV0: .BLKW 10
8614 037322 000010 QDRV1: .BLKW 10
8615 037342 000010 QDRV2: .BLKW 10
8616 037362 000010 QDRV3: .BLKW 10
8617 037402 000010 QDRV4: .BLKW 10
8618 037422 000010 QDRV5: .BLKW 10
8619 037442 000010 QDRV6: .BLKW 10
8620 037462 000010 QDRV7: .BLKW 10
8621 037502 000010 QTERM=.
8622
8623 ;*ROUTINE TO CLEAR ALL OF THE REQUEST QUEUES
8624
8625 ;*CALL
8626 ;* JSR PC,CLRQUE
8627
8628 037502 004037 037744 CLRQUE: JSR R0,SAVR15 ;SAVE R1-R5
8629 037506 012702 037210 MOV #QA,R2 ;ZERO THE QUEUE COUNTS
8630 037512 005022 CLR (R2)+ ;DRIVES 0 & 1
8631 037514 005022 CLR (R2)+ ;DRIVES 2 & 3
8632 037516 005022 CLR (R2)+ ;DRIVES 4 & 5
8633 037520 005022 CLR (R2)+ ;DRIVES 6 & 7
8634 037522 012703 000010 MOV #8,R3 ;MOVE THE STARTING
8635 037526 012701 037260 MOV #QSTART,R1 ;ADDRESS OF THE QUEUE INTO
8636 037532 012122 15: MOV (R1)+,(R2)+ ;THE QUEUE INPUT POINTER
8637 037534 005303 DEC R3

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8638 037536 001375      BNE      1$
8639 037540 012703 000010      MOV     #8, R3      ;MOVE THE STARTING ADDRESS
8640 037544 012701 037260      MOV     #QSTART, R1 ;OF THE QUEUE INTO THE
2$:      MOV     (R1)+, (R2)+ ;QUEUE OUTPUT POINTER
8641 037550 012122      DEC     R3
8642 037552 005303      BNE     2$
8643 037554 001375      JSR     RD, GETR15 ;RESTORE R1-R5
8644 037556 004037 037764      RTS     PC
8645 037562 000207
8646
8647      ;*EMPTY THE QUEUE SPECIFIED BY R1
8648      ;*CALL
8649      ;*      MOV     DRVNUM, R1      ;DRIVE NUMBER TO R1
8650      ;*      JSR     PC, EMPTYQ
8651
8652      EMPTYQ: CLRB     QCNT(R1)      ;CLEAR NUMBER OF ITEMS IN QUEUE
8653 037564 105061 037210      ASL     R1
8654 037570 006301      MOV     QINPT(R1), QOUTPT(R1) ;SET OUTPUT QUEUE POINTER=INPUT POINTER
8655 037572 016161 037220 037240      ASR     R1
8656 037600 006201      RTS     PC
8657 037602 000207
8658
8659      ;*ROUTINE TO PUT A REQUEST IN QUEUE
8660      ;*CALL
8661      ;*      MOV     #DRVNUM, R1      ;DRIVE NUMBER
8662      ;*      MOV     #DPB, R2      ;ADDRESS OF PARAMETER BLOCK
8663      ;*      JSR     RD, DRVQUE      ;GO PUT REQUEST IN QUEUE
8664      ;*      RETURN1      ;RETURN HERE IF QUEUE IS FULL
8665      ;*      RETURN2      ;RETURN HERE IF REQUEST IS IN QUEUE
8666
8667      DRVQUE: CMPB     #10, QCNT(R1) ;IS QUEUE FULL?
8668 037604 122761 000010 037210      BEQ     2$      ;BR IF YES-TAKE RETURN1
8669 037612 001421      INCB     QCNT(R1)      ;INCREMENT QUEUE COUNT
8670 037614 105261 037210      ASL     R1
8671 037620 006301      MOV     R2, QINPT(R1) ;PUT THIS REQUEST IN QUEUE
8672 037622 010271 037220      ADD     #2, QINPT(R1) ;UPDATE THE QUEUE POINTER
8673 037626 062761 000002 037220      CMP     QINPT(R1), QSTOP(R1) ;TIME TO RESET THE POINTER
8674 037634 026161 037220 037262      BNE     1$      ;BRANCH IF NO
8675 037642 001003      MOV     QSTART(R1), QINPT(R1) ;YES--RESET POINTER
8676 037644 016161 037260 037220      ASR     R1
8677 037652 006201      TST     (R0)+      ;TAKE RETURN 2
8678 037654 005720      RTS     R0      ;RETURN TO USER
8679 037656 000200
8680
8681      ;*ROUTINE TO GET THE "DPB" ADDRESS OF NEXT REQUEST IN QUEUE
8682      ;*CALL
8683      ;*      MOV     #DRVNUM, R1      ;DRIVE NUMBER TO R1
8684      ;*      JSR     PC, GETREQ      ;GO GET THE REQUEST
8685      ;*      RETURN      ;R2="DPB" ADDRESS OF THE REQUEST
8686      ;*      ;R2=0 IF NO REQUEST IN QUEUE
8687
8688      GETREQ: CLR     R2
8689 037660 005002      TSTB     QCNT(R1)      ;IS THERE ANY REQUEST IN QUEUE?
8690 037662 105761 037210      BEQ     2$      ;NO---BRANCH
8691 037666 001404      ASL     R1
8692 037670 006301      MOV     QOUTPT(R1), R2 ;PICKUP "DPB" POINTER FOR THIS DRIVE
8693 037672 017102 037240

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8694 037676 006201      ASR      R1
8695 037700 000207      RTS      PC      ;RETURN TO USER
8696
8697      ;*ROUTINE TO "POP" THE REQUEST FROM QUEUE
8698      ;*CALL
8699      ;*      MOV      #DRVNUM,R1      ;DRIVE NUMBER TO R1
8700      ;*      JSR      PC,POPQUE      ;CALL TO REMOVE REQUEST
8701      ;*      RETURN      ;R2=ADDRESS OF DPB REMOVED
8702
8703      POPQUE: DECB      QCNT(R1)      ;DECREMENT QUEUE COUNT
8704 037702 105361 037210      ASL      R1
8705 037706 006301      MOV      @QOUTPT(R1),R2      ;GET THE "DPB" POINTER
8706 037710 017102 037240      ADD      #2,QOUTPT(R1)      ;UPDATE THE QUEUE POINTER
8707 037714 062761 000002 037240      CMP      QOUTPT(R1),QSTOP(R1)      ;TIME TO RESET THE POINTER?
8708 037722 026161 037240 037262      BNE      IS      ;NO--BRANCH TO EXIT
8709 037730 001003      MOV      QSTART(R1),QOUTPT(R1)      ;YES--RESET THE POINTER
8710 037732 016161 037260 037240      IS:      ASR      R1
8711 037740 006201      RTS      PC      ;RETURN TO USER
8712 037742 000207
8713
8714      ;*ROUTINES TO SAVE R0-R5 AND R1-R5
8715      ;*CALL: SAVR05
8716      ;*      JSR      R0,SAVR05      ;R0-R5 IS ON THE STACK
8717      ;*      RETURN
8718
8719      ;*CALL: SAVR15
8720      ;*      JSR      R0,SAVR15      ;R1-R5 IS ON THE STACK
8721      ;*      RETURN
8722
8723      ;*UPON RETURN FROM SAVR05 AND SAVR15 THE STACK WILL LOOK LIKE:
8724      ;*
8725      ;*+12      R0
8726      ;*+10      R1
8727      ;*+06      R2
8728      ;*+04      R3
8729      ;*+02      R4
8730      ;*TOP      R5
8731
8732      SAVR05:
8733 037744      SAVR15: MOV      R1,-(SP)      ;SAVE R0 BY THE JSR INST.
8734 037744 010146      MOV      R2,-(SP)      ;SAVE R1
8735 037746 010246      MOV      R3,-(SP)      ;SAVE R2
8736 037750 010346      MOV      R4,-(SP)      ;SAVE R3
8737 037752 010446      MOV      R5,-(SP)      ;SAVE R4
8738 037754 010546      MOV      12(SP),-(SP)      ;SAVE R5
8739 037756 016646 000012      MOV      R0      ;GET R0
8740 037762 000200      RTS      R0
8741
8742      ;*ROUTINES TO RESTORE R0-R5 AND R1-R5
8743      ;*CALL: GETR05
8744      ;*      JSR      R0,GETR05      ;R0-R5 HAVE BEEN RESTORED
8745      ;*      RETURN
8746
8747      ;*CALL: GETR15
8748      ;*      JSR      R0,GETR15
8749

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8750          ;*      RETURN          ;R1-R5 HAVE BEEN RESTORED
8751
8752 037764 011666 000014  GETR15: MOV      (SP),14(SP)  ;POSITION R0
8753 037770 005726  GETR05: TST      (SP)+  ;POP R0 OF THE JSR OFF OF THE STACK.
8754 037772 012605      MOV      (SP)+,R5  ;RESTORE R5
8755 037774 012604      MOV      (SP)+,R4  ;RESTORE R4
8756 037776 012603      MOV      (SP)+,R3  ;RESTORE R3
8757 040000 012602      MOV      (SP)+,R2  ;RESTORE R2
8758 040002 012601      MOV      (SP)+,R1  ;RESTORE R1
8759 040004 000200      RTS      R0       ;RESTORE R0
8760
8761          .SBTTL  ASCIZ MESSAGES
8762
8763
8764 040006 000122      MSG.R:  .ASCIZ  /R/
8765 040010 041506      MSG.FC:  .ASCIZ  /FC/
8766 040013      114 000103      MSG.LC: .ASCIZ  /LC/
8767 040016 041511      MSG.IC: .ASCIZ  /IC/
8768 040021      106 000124      MSG.FT: .ASCIZ  /FT/
8769 040024 052114      MSG.LT: .ASCIZ  /LT/
8770 040027      111 000124      MSG.IT: .ASCIZ  /IT/
8771 040032 051506      MSG.FS: .ASCIZ  /FS/
8772 040035      114 000123      MSG.LS: .ASCIZ  /LS/
8773 040040 040520      MSG.PAT: .ASCIZ  /PAT/
8774 040044 000075      MSG.EQ: .ASCIZ  /=/
8775 040046 005015 047503 052116      MSG.CS: .ASCIZ  <15><12>/CONTROL SWITCHES=/
8776 040054 047522 020114 053523
8777 040062 052111 044103 051505
8778 040070 000075
8779 040072 005015 044122 051503      MRHCS1: .ASCIZ  <15><12>/RHCS1=/
8780 040100 036461      000
8781 040103      015 051012 053110      MRHVEC: .ASCIZ  <15><12>/RHVEC=/
8782 040110 041505 000075
8783 040114 005015 044122 051120      MRHPRI: .ASCIZ  <15><12>/RHPRI0=/
8784 040122 047511 000075
8785
8786 040126 005015 051012 052117      MSG7:  .ASCIZ  <15><12><12>/ROTATIONAL SPEED TIMES/
8787 040134 052101 047511 040516
8788 040142 020114 050123 042505
8789 040150 020104 044524 042515
8790 040156 000123
8791 040160 005015 047412 042516      MSG10A: .ASCIZ  <15><12><12>/ONE CYLINDER SEEK TIMES/<15><12>/** 0, 1, 2,...410 **/
8792 040166 041440 046131 047111
8793 040174 042504 020122 042523
8794 040202 045505 052040 046511
8795 040210 051505 005015 025052
8796 040216 030040 020054 026061
8797 040224 031040 027054 027056
8798 040232 030464 020060 025052
8799 040240      000
8800 040241      015 025012 020052      MSG10B: .ASCIZ  <15><12>/** 410, 409, 408,...0 **/
8801 040246 030464 026060 032040
8802 040254 034460 020054 030064
8803 040262 026070 027056 030056
8804 040270 025040 000052
8805 040274 005015 040412 042526      MSG11A: .ASCIZ  <15><12><12>/AVERAGE SEEK TIMES/<15><12>/** 0 TO 136 **/

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MAINDEC-11-DERPK-C "MECHANICAL AND READ/WRITE TEST"
DERPKC.P11 ASCIZ MESSAGES

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8806	040302	040522	042507	051440	
8807	040310	042505	020113	044524	
8808	040316	042515	006523	025012	
8809	040324	020052	020060	047524	
8810	040332	030440	033063	025040	
8811	040340	000052			
8812	040342	005015	025052	030440	MSG11B: .ASCIZ <15><12>/** 136 TO 0 **/
8813	040350	033063	052040	020117	
8814	040356	020060	025052	000	
8815	040363	015	005012	040515	MSG12A: .ASCIZ <15><12><12>/MAXIMUM SEEK TIMES/<15><12>/** 0 TO 410 **/
8816	040370	044530	052515	020115	
8817	040376	042523	045505	052040	
8818	040404	046511	051505	005015	
8819	040412	025052	030040	052040	
8820	040420	020117	030464	020060	
8821	040426	025052	000		
8822	040431	015	025012	020052	MSG12B: .ASCIZ <15><12>/** 410 TO 0 **/
8823	040436	030464	020060	047524	
8824	040444	030040	025040	000052	
8825					
8826	040452	005015	044515	036516	MSGMIN: .ASCIZ <15><12>/MIN=
8827	040460	000			
8828	040461	015	046412	054101	MSGMAX: .ASCIZ <15><12>/MAX=
8829	040466	000075			
8830	040470	005015	053101	036507	MSGAVG: .ASCIZ <15><12>/AVG=
8831	040476	000			
8832	040477	060	052440	000123	MSGOUS: .ASCIZ /0 US/
8833	040504	041040	046105	053517	MBELOW: .ASCIZ / BELOW THE MINIMUM OF /
8834	040512	052040	042510	046440	
8835	040520	047111	046511	046525	
8836	040526	047440	020106	000	
8837	040533	040	041101	053117	MABOVE: .ASCIZ / ABOVE THE MAXIMUM OF /
8838	040540	020105	041124	020105	
8839	040546	040515	044517	052515	
8840	040554	020115	043117	000040	
8841	040562	051440	042505	051513	MSGNUM: .ASCIZ / SEEKS TIMED/
8842	040570	052040	046511	042105	
8843	040576	000			
8844	040577	040	047516	020124	MSGNON: .ASCIZ / NOT TIMED/
8845	040604	044524	042515	000104	
8846	040612	020043	000		MSG.SP: .ASCIZ / / ;TWO (2) SPACES
8847					
8848					.SBTTL ERROR HEADER (EM) MESSAGES
8849					
8850	040615	111	046114	043505	EM1: .ASCIZ /ILLEGAL RH11(SC=0),INTERRUPT OCCURRED/
8851	040622	046101	051040	030510	
8852	040630	024061	041523	030075	
8853	040636	026051	047111	042524	
8854	040644	051122	050125	020124	
8855	040652	041517	052503	051122	
8856	040660	042105	000		
8857	040663	111	046114	043505	EM2: .ASCIZ /ILLEGAL RPO4 INTERRUPT OCCURRED/
8858	040670	046101	051040	030120	
8859	040676	020064	047111	042524	
8860	040704	051122	050125	020124	
8861	040712	041517	052503	051122	

8862	040720	042105	000		
8863	040723	115	051501	041123	EM3: .ASCIZ /MASSBUS PARITY ERROR(MCPE=1)/
8864	040730	051525	050040	051101	
8865	040736	052111	020131	051105	
8866	040744	047522	024122	041515	
8867	040752	042520	030475	000051	
8868	040760	040515	051523	052502	EM4: .ASCIZ /MASSBUS PARITY ERROR(PAR=1)/
8869	040766	020123	040520	044522	
8870	040774	054524	042440	051122	
8871	041002	051117	050050	051101	
8872	041010	030475	000051		
8873	041014	043117	046106	047111	EM5: .ASCIZ /OFFLINE, NON-EXISTENT, OR UNSAFE DRIVE INTERRUPTED/
8874	041022	026105	047040	047117	
8875	041030	042455	044530	052123	
8876	041036	047105	026124	047440	
8877	041044	020122	047125	040523	
8878	041052	042506	042040	044522	
8879	041060	042526	044440	052116	
8880	041066	051105	052522	052120	
8881	041074	042105	000		
8882	041077	122	030510	027461	EM10: .ASCIZ "RH11/RP04 FAILED TO RESPOND TO ADDRESSING"
8883	041104	050122	032060	043040	
8884	041112	044501	042514	020104	
8885	041120	047524	051040	051505	
8886	041126	047520	042116	052040	
8887	041134	020117	042101	051104	
8888	041142	051505	044523	043516	
8889	041150	000			
8890	041151	104	044522	042526	EM11: .ASCIZ /DRIVE SELECTED IS NOT ONLINE/
8891	041156	051440	046105	041505	
8892	041164	042524	020104	051511	
8893	041172	047040	052117	047440	
8894	041200	046116	047111	000105	
8895	041206	046511	051120	050117	EM12: .ASCIZ /IMPROPER HEADER DATA/
8896	041214	051105	044040	040505	
8897	041222	042504	020122	040504	
8898	041230	040524	000		
8899	041233	104	052101	020101	EM13: .ASCIZ /DATA COMPARE FAILURE/
8900	041240	047503	050115	051101	
8901	041246	020105	040506	046111	
8902	041254	051125	000105		
8903	041260	044504	045523	042440	EM17: .ASCIZ /DISK ERROR IN TIMING TEST/
8904	041266	051122	051117	044440	
8905	041274	020116	044524	044515	
8906	041302	043516	052040	051505	
8907	041310	000124			
8908	041312	046103	041517	020113	EM20: .ASCIZ /CLOCK (KW11-P) OVERFLOW IN TIMING TEST/
8909	041320	045450	030527	026461	
8910	041326	024520	047440	042526	
8911	041334	043122	047514	020127	
8912	041342	047111	052040	046511	
8913	041350	047111	020107	042524	
8914	041356	052123	000		
8915	041361	122	030510	027461	EM41: .ASCIZ "RH11/RP04 ERROR"
8916	041366	050122	032060	042440	
8917	041374	051122	051117	000	

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DERPKC.P11 ERROR HEADER (EM) MESSAGES

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8918	041401	106	052101	046101	EM46: .ASCIZ /FATAL WRITE CHECK ERROR/
8919	041406	053440	044522	042524	
8920	041414	041440	042510	045503	
8921	041422	042440	051122	051117	
8922	041430	000			
8923					
8924					.SBTTL STATUS/ERROR INDICATOR MESSAGES
8925					
8926	041431	117	043106	044514	MSG814: .ASCIZ /OFFLINE OR UNSAFE DRIVE REQUESTED/
8927	041436	042516	047440	020122	
8928	041444	047125	040523	042506	
8929	041452	042040	044522	042526	
8930	041460	051040	050505	042525	
8931	041466	052123	042105	000	
8932	041473	125	046116	040517	MSG813: .ASCIZ /UNLOADED DRIVE REQUESTED/
8933	041500	042504	020104	051104	
8934	041506	053111	020105	042522	
8935	041514	052521	051505	042524	
8936	041522	000104			
8937	041524	042520	051522	051511	MSG812: .ASCIZ /PERSISTENT UNSAFE/
8938	041532	042524	052116	052440	
8939	041540	051516	043101	000105	
8940	041546	040520	044522	054524	MSG811: .ASCIZ /PARITY ERROR OCCURRED/
8941	041554	042440	051122	051117	
8942	041562	047440	041503	051125	
8943	041570	042522	000104		
8944	041574	040506	040524	020114	MSG810: .ASCIZ /FATAL PARITY ERROR/
8945	041602	040520	044522	054524	
8946	041610	042440	051122	051117	
8947	041616	000			
8948	041617	123	043117	053524	MSG809: .ASCIZ /SOFTWARE TIMEOUT ON THIS DRIVE/
8949	041624	051101	020105	044524	
8950	041632	042515	052517	020124	
8951	041640	047117	052040	044510	
8952	041646	020123	051104	053111	
8953	041654	000105			
8954	041656	047523	052106	040527	MSG808: .ASCIZ /SOFTWARE TIMEOUT ON ANOTHER DRIVE/
8955	041664	042522	052040	046511	
8956	041672	047505	052125	047440	
8957	041700	020116	047101	052117	
8958	041706	042510	020122	051104	
8959	041714	053111	000105		
8960	041720	051105	047522	020122	MSG806: .ASCIZ "ERROR OCCURRED DURING I/O OPERATION"
8961	041726	041517	052503	051122	
8962	041734	042105	042040	051125	
8963	041742	047111	020107	027511	
8964	041750	020117	050117	051105	
8965	041756	052101	047511	000116	
8966	041764	051105	047522	020122	MSG805: .ASCIZ "ERROR OCCURRED DURING NON-I/O OPERATION"
8967	041772	041517	052503	051122	
8968	042000	042105	042040	051125	
8969	042006	047111	020107	047516	
8970	042014	026516	027511	020117	
8971	042022	050117	051105	052101	
8972	042030	047511	000116		
8973	042034	047125	040523	042506	MSG804: .ASCIZ /UNSAFE OCCURRED/

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 DERPKC.P11 STATUS/ERROR INDICATOR MESSAGES

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8974	042042	047440	041503	051125
8975	042050	042522	000104	
8976	042054	052501	047524	040515
8977	042062	044524	020103	042522
8978	042070	040503	044514	051102
8979	042076	052101	020105	042523
8980	042104	052521	047105	042503
8981	042112	047440	041503	051125
8982	042120	042522	000104	

MSG803: .ASCIZ /AUTOMATIC RECALIBRATE SEQUENCE OCCURRED/

.SBTTL DATA HEADER (DT) MESSAGES

8986	042124	042524	052123	020040
8987	042132	020040	051105	020122
8988	042140	041520	000	
8989	042143	124	051505	020124
8990	042150	020040	042440	051122
8991	042156	050040	020103	042040
8992	042164	044522	042526	020040
8993	042172	051040	040510	020123
8994	042200	020040	051040	042110
8995	042206	020123	020040	051040
8996	042214	042510	030522	020040
8997	042222	051040	042510	031122
8998	042230	020040	051040	042510
8999	042236	031522	000	
9000	042241	124	051505	020124
9001	042246	020040	042440	051122
9002	042254	050040	020103	040440
9003	042262	042104	042522	051523
9004	042270	042040	052101	000101
9005	042276	042524	052123	020040
9006	042304	020040	051105	020122
9007	042312	041520	020040	042101
9008	042320	051104	051505	020123
9009	042326	042107	040504	040524
9010	042334	020040	042102	040504
9011	042342	040524	000	
9012	042345	122	041510	030523
9013	042352	020040	042440	051122
9014	042360	050040	000103	
9015	042364	051104	053111	020105
9016	042372	020040	051105	020122
9017	042400	041520	000	
9018	042403	124	051505	020124
9019	042410	020040	042440	051122
9020	042416	050040	020103	052040
9021	042424	052123	050040	020103
9022	042432	042040	044522	042526
9023	042440	020040	041440	046131
9024	042446	042116	020122	052040
9025	042454	040522	045503	020040
9026	042462	051440	041505	047524
9027	042470	000122		
9028	042472	042107	054503	020114
9029	042500	020040	042107	051124

DH1: .ASCIZ /TEST ERR PC/

DH2: .ASCIZ /TEST ERR PC DRIVE RHAS RHDS RHER1 RHER2 RHER3/

DH3: .ASCIZ /TEST ERR PC ADDRESS DATA/

DH4: .ASCIZ /TEST ERR PC ADDRESS GODATA BDDATA/

DH10: .ASCIZ /RHCS1 ERR PC/

DH11: .ASCIZ /DRIVE ERR PC/

DH12: .ASCIZ /TEST ERR PC TST PC DRIVE CYLNDR TRACK SECTOR/

DH12A: .ASCIZ /GDCYL GDTRK GDSCTR BDCYL BDTRK BDSCTR/

[illegible]

MAINDEC-11-DERPK-C "MECHANICAL AND READ/WRITE TEST"
DERPKC.P11 DATA HEADER (DT) MESSAGES

[illegible]

9106
9107
9108 043364

```

9109
9110 .SBTTL DATA TABLE (DT)

```

```

9111
9112 043364 001170 001116 DT1: .WORD $TMP0,$ERRPC
9113 043370 001170 001116 001156 DT2: .WORD $TMP0,$ERRPC,$REG1,$REG5,PPERRS,RPERRS+2,RPERRS+4,RPERRS+6

```

```

9114 043376 001166 032222 032224
9115 043404 032226 032230
9116 043410 001170 001116 036570 DT3: .WORD $TMP0,$ERRPC,RD.ADR,RD.WRD

```

9117 043416 036572
9118 043420 001170 001116 036772 DT4: .WORD \$TMPO,\$ERRPC,WRT.ADR,WRT.WD,RD.WRD

```

9119 043426 036770 036572
9120 043432 001170 001116 001156 DT5: .WORD $TMPO,$ERRPC,$REG1,$REG5,RPERRS,RPERRS+2,RPERRS+4,RPERRS+6

```

9121	043440	001166	032222	032224			
9122	043446	032226	032230				
9123	043452	001362	001116		DT10:	.WORD	RH.ADR,\$ERRPC
9124	043456	001160	001116		DT11:	.WORD	\$REG2,\$ERRPC
9125	043462	001170	001116	001154	DT12:	.WORD	\$TMPD,\$ERRPC,\$REGO,CHKDRV,CYL.DS,TRK.DS,SEC.DS

```

9126 043470 001272 001306 001312
9127 043476 001310
9128 043500 001306 001312 001310 DT12A: .WORD CYL.DS,TRK.DS,SEC.DS,CYL.RD,TRK.RD,SEC.RD

```

```

9129 043506 001300 001302 001304
9130 043514 001170 001116 001154 DT13: .WORD $TMPD,$ERRPC,$REGO,CHKDRV,CYL.DS,TRK.DS,SEC.DS

```

```

9131 040522 001272 001306 001312
9132 043530 001310
9133 043532 001124 001126 001164 DT13A: .WORD $GDDAT,$BDDAT,$REG4,$GDADR,$BDADR

```

9134 043540 001120 001122
9135 043544 001170 001116 001272 DT17: .WORD \$TMPO,\$ERRPC,CHKDRV,RP.REG,RP.REG+12,RP.REG+14,RP.REG+40,RP.REG+42

```

9136 043552 003574 003606 003610
9137 043560 003634 003636
9138 043564 001170 001116 001154 CT21: .WORD $TMPO,$ERRPC,$REGO,CHKDRV,CYL.DS,TRK.DS

```

```

9139 043572 001272 001306 001312
9140 043600 001156 001126 001164 DT21A: .WORD $REG1,$BDDAT,$REG4,$REG1

```

9141 043606 001156

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DERPKC.P11 DATA TABLE (DT)

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9142	043610	001170	001116	001154	DT41:	.WORD	\$TMPD,\$ERRPC,\$REGO,CHKDRV
9143	043616	001272					
9144	043620	001170	001116	001154	DT42:	.WORD	\$TMPD,\$ERRPC,\$REGO,CHKDRV,RP.REG,RP.REG+10,RP.REG+12
9145	043626	001272	003574	003604			
9146	043634	003606					
9147	043636	001170	001116	001154	DT43:	.WORD	\$TMPD,\$ERRPC,\$REGO,CHKDRV,RP.REG,RP.REG+10,RP.REG+12
9148	043644	001272	003574	003604			
9149	043652	003606					
9150	043654	003610	003634	003636	DT43A:	.WORD	RP.REG+14,RP.REG+40,RP.REG+42
9151	043662	001170	001116	001154	DT44:	.WORD	\$TMPD,\$ERRPC,\$REGO,CHKDRV,CYL.DS,TRK.DS,SEC.DS
9152	043670	001272	001306	001312			
9153	043676	001310					
9154	043700	003574	003604	003606	DT44A:	.WORD	RP.REG,RP.REG+10,RP.REG+12,RP.REG+36,RP.REG+34,RP.REG+06
9155	043706	003632	003630	003602			
9156	043714	003610	003634	003636	DT44B:	.WORD	RP.REG+14,RP.REG+40,RP.REG+42
9157	043722	001170	001116	001154	DT45:	.WORD	\$TMPD,\$ERRPC,\$REGO,CHKDRV,CYL.DS,TRK.DS,SEC.DS
9158	043730	001272	001306	001312			
9159	043736	001310					
9160	043740	003574	003604	003606	DT45A:	.WORD	RP.REG,RP.REG+10,RP.REG+12,RP.REG+36,RP.REG+34,RP.REG+06
9161	043746	003632	003630	003602			
9162	043754	003610	003634	003636	DT45B:	.WORD	RP.REG+14,RP.REG+40,RP.REG+42,RP.REG+2,RP.REG+4,RP.REG+22
9163	043762	003576	003600	003616			

.SBTTL DATA FORMAT (DF) TABLE

9167	043770	000001	DF1:	.WORD	1	;NUMBER OF DATA HEADERS ;NUMBER OF WORDS IN DATA TABLE ;BOTH NUMBERS ARE OCTAL
9168	043772	002		.BYTE	2	
9169	043773	000		.BYTE	0	
9171	043774	000001	DF2:	.WORD	1	
9172	043776	010		.BYTE	108	
9173	043777	000		.BYTE	0	
9175	044000	000001	DF3:	.WORD	1	
9176	044002	004		.BYTE	4	
9177	044003	000		.BYTE	0	
9179	044004	000001	DF4:	.WORD	1	
9180	044006	005		.BYTE	5	
9181	044007	000		.BYTE	0	
9183	044010	000001	DF10:	.WORD	1	
9184	044012	002		.BYTE	2	
9185	044013	000		.BYTE	0	
9187	044014	000001	DF11:	.WORD	1	
9188	044016	002		.BYTE	2	
9189	044017	000		.BYTE	0	
9191	044020	000002	DF12:	.WORD	2	;2 DH'S TO BE TYPED ;7 DATA WORDS FOLLOW THE 1ST DH ;WORDS 1-4 ARE OCTAL 5-7 ARE DECIMAL ;ADDRESS OF 2ND DH ;6 DATA WORDS FOLLOW THE 2ND DH ;ALL WORDS ARE OCTAL
9192	044022	007		.BYTE	7	
9193	044023	160		.BYTE	160	
9194	044024	042472		.WORD	DH12A	
9195	044026	006		.BYTE	6	
9196	044027	000		.BYTE	0	

9197

9198	044030	000002	DF13:	.WORD	2	
9199	044032	007		.BYTE	7	
9200	044033	160		.BYTE	160	
9201	044034	042551		.WORD	DH13A	
9202	044036	005		.BYTE	5	
9203	044037	004		.BYTE	4	;WORD 3 IS DECIMAL
9204						
9205	044040	000000	DF14:	.WORD	0	
9206	044042	005		.BYTE	5	
9207	044043	004		.BYTE	4	;WORD 3 IS DECIMAL
9208						
9209	044044	000001	DF17:	.WORD	1	
9210	044046	010		.BYTE	108	
9211	044047	000		.BYTE	0	
9212						
9213	044050	000002	DF21:	.WORD	2	
9214	044052	006		.BYTE	6	
9215	044053	060		.BYTE	60	
9216	044054	042773		.WORD	DH21A	
9217	044056	004		.BYTE	4	
9218	044057	014		.BYTE	14	
9219						
9220	044060	000000	DF22:	.WORD	0	
9221	044062	004		.BYTE	4	
9222	044063	014		.BYTE	14	
9223						
9224	044064	000001	DF41:	.WORD	1	
9225	044066	004		.BYTE	4	
9226	044067	000		.BYTE	0	
9227						
9228	044070	000001	DF42:	.WORD	1	
9229	044072	007		.BYTE	7	
9230	044073	000		.BYTE	0	
9231						
9232	044074	000002	DF43:	.WORD	2	
9233	044076	007		.BYTE	7	
9234	044077	000		.BYTE	0	
9235	044100	043155		.WORD	DH43A	
9236	044102	003		.BYTE	3	
9237	044103	000		.BYTE	0	
9238						
9239	044104	000003	DF44:	.WORD	3	
9240	044106	007		.BYTE	7	
9241	044107	160		.BYTE	160	
9242	044110	043203		.WORD	DH44A	
9243	044112	006		.BYTE	6	
9244	044113	000		.BYTE	0	
9245	044114	043260		.WORD	DH44B	
9246	044116	003		.BYTE	3	
9247	044117	000		.BYTE	0	
9248						
9249	044120	000003	DF45:	.WORD	3	
9250	044122	007		.BYTE	7	
9251	044123	160		.BYTE	160	
9252	044124	043203		.WORD	DH44A	
9253	044126	006		.BYTE	6	

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MAINDEC-11-DERPK-C "MECHANICAL AND READ/WRITE TEST"
DERPKC.P11 DATA FORMAT (DF) TABLE

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9254	044127	000	.BYTE	0
9255	044130	043306	.WORD	DH45A
9256	044132	006	.BYTE	6
9257	044133	000	.BYTE	0
9258				
9259			.EVEN	
9260	044134		BUFFER=.	
9261				
9262	000001		.END	

ACTDRV	032276	7542*	7782*	7810*	8139*	8148*	8347								
ACTSTR	032277	7548*	8349*	8364*											
ATABIT	032346	3014	6950	6955	7614*	7754	7824	7962	8321	8417					
A16	= 000400	2900*	7906												
A17	= 001000	2901*	7909												
BITS	001430	1921*	3185	3217	3252	3289	3323	3397	3436	3503	3605	3688	3780	3890	
		3948	4066	4108	4184	4291	4393	7009	7027	7030	7032	7082	7251		
BIT0	= 000001	1716*													
BIT00	= 000001	1706*	1716	1921											
BIT01	= 000002	1705*	1715	1922											
BIT02	= 000004	1704*	1714	1923											
BIT03	= 000010	1703*	1713	1924	6013	8311	8507								
BIT04	= 000020	1702*	1712	1925	6010	8295									
BIT05	= 000040	1701*	1711	1926	3543	3557	3572	3577	3639	3663	3668	3721	3739	3756	
		3761	3813	3831	3848	3853	6013	6126	7693	8089	8274	8391			
BIT06	= 000100	1700*	1710	1927	5067	6016	7761	8172	8560						
BIT07	= 000200	1699*	1709	1928	7761	8036	8160	8274	8295	8311	8325				
BIT08	= 000400	1698*	1708	1929	6004	7761	8404								
BIT09	= 001000	1697*	1707	1930	4544	5206	6019	8389							
BIT1	= 000002	1715*													
BIT10	= 002000	1696*	1931	4530	6007	7270	8078								
BIT11	= 004000	1695*	1932	5213	6007	8053									
BIT12	= 010000	1694*	1933	6010	7728	7745	7761	8285	8561						
BIT13	= 020000	1693*	1934	4537	6004	7807	8451								
BIT14	= 040000	1692*	1935	3538	3552	3634	3716	3734	3808	3826	5920	6004	7796	7831	
		8240	8459	8463	8558										
BIT15	= 100000	1691*	1936	6176	6177	7796	7807	7831	8053	8078	8172	8274	8285	8295	
		8311	8389	8404											
BIT2	= 000004	1714*													
BIT3	= 000010	1713*													
BIT4	= 000020	1712*													
BIT5	= 000040	1711*													
BIT6	= 000100	1710*													
BIT7	= 000200	1709*													
BIT8	= 000400	1708*													
BIT9	= 001000	1707*													
BPTVEC	= 000014	1723*													
BUF	001212	1848*	4336*	4337	4339*	4340*	4341	4359*	4382	6495	6532	6579	6627	6650	
		6672													
BUFFER	= 044134	2482	250												

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C16	034360	7980	7990	7992	7994	8046#								
C17	034402	7813	7928	7932	7940	7948	7957	7961	7972	7973	7995	7999	8002	8003
		8013	8023	8034	8049	8053#	8134	8164	8306					
C17A	034374	8051#												
C17B	034414	8052	8055#	8307										
C18	034466	8058	8067#	8211	8430									
CASCTR	025532	3914	6398#											
CK.CHR	031646	6884	6934	7124	7159	7198	7329#	7368	7381	7390	7443			
CK.DEC	031620	7305#	7337											
CK.DIG	031722	6544	7144	7362#										
CK.NUM	032102	6892	7174	7206	7426#									
CK.OCT	031572	6995	6999	7013	7017	7285#	7428	7438						
CLKSTA	001262	1858#	3052	3512	3614	3697	3789	5705*	5707*	5713*				
CLOSE	031506	7241	7245	7254#										
CLRBUF	025450	3911	6372#											
CLROUTE	037502	7681	8089	8414	8628#									
CLSMDOS	031404	7225	7229	7232#										
CNTRLC	001250	1863#	2911*	2927*	2952	3005								
COUNT	024646	3561	3543	3726	3744	3818	3836	6193#						
CYL.DS	001306	1880#	5786*	5818*	5857*	5903*	5933*	5959*	6104*	6138*	6464*	6593*	9125	9128
		9130	9138	9151	9157									
CYL.RD	001300	1877#	6099*	9128										
C.SMR	001246	1962#	3019	3336	3525	3581	4200	5720	5730	5740	5760	5935	5874	5975
		6045	6788	6792*										
DATCHP	026206	4142	4427	6528#										
DECSK	006304	3272#	3276											
DFLY	001650	2006#	2912											
DF1	043770	2630	9167#											
DF10	044010	2694	9183#											
DF11	044014	2734	9187#											
DF12	044020	2717	9191#											
DF13	044030	2730	2751	9198#										
DF14	044040	2738	2759	9205#										
DF17	044044	2769	2779	9209#										
DF2	043774	2640	2670	9171#										
DF21	044050	2792	9213#											
DF27	044060	2800	9220#											
DF3	044000	2650	9175#											
DF4	044004	2660	9179#											
DF41	044064	2831	9224#											
DF42	044070	2841	9228#											
DF43	044074	2853	9232#											
DF44	044104	2868	9239#											
DF45	044120	2883	2898	9249#										
DX1	042124	2628	8986#											
DX10	042345	2692	9012#											
DX11	042364	2702	9015#											
DX12	042403	2715	2728	2749	2866	2881	2896	9018#						
DX12A	042472	9028#	9194											
DX13A	042551	9036#	9201											
DX17	042617	2767	2777	9043#										
DX2	042143	2638	2668	8989#										
DX21	042715	2790	9054#											
DX21A	042773	9062#	9216											
DX3	042241	2648	9000#											
DX4	042276	2658	9005#											

DH41	043032	2829	9068#											
DH42	043070	2839	2851	9073#										
DH43A	043155	9082#	9235											
DH44A	043203	9086#	9242	9252										
DH44B	043260	9094#	9245											
DH45A	043306	9098#	9255											
DISPLA=	177570	1638#	3193*	3225*	3260*	3297*	3331*	3405*	3444*	3511*	3613*	3696*	3788*	3898*
		3956*	4074*	4192*	4299*	4529*	5225*							
DORTI	024600	3532	3627	3709	3801	6159#								
DPB.A	003474	2477#	3074*	3080*	3081*	3083*	3085*	3086*	3087*	3194*	5780	5782	5786	5787
		5788	5789											
DPB.B	003514	2501#	3075*	3195*	3196*	3197*	3226*	3228*	3230*	3261*	3262*	3265*	3268*	3269
		3271*	3274*	3275	3298*	3299*	3302*	3305*	3332*	3333*	3342*	3348*	3362*	3369*
		3406*	3407*	3412*	3414*	3445*	3446*	3454*	3456*	3458*	3460*	3462*	3464*	5752*
		5765*	5812	5814	5818	5819	5820	5821	5831	5834				
DPB.C	003534	2525#	3076*	3227*	3229*	3231*	5763*	5766*	5851	5853	5857	5858	5859	5860
		5870	5873											
DRVACT	032232	7488#	7803	7997*	8044*	8051	8061*	8071	8080*	8153*	8199	8261	8289*	8296*
		8303	8308	8320*	8392*	8398	8405*							
DRVCAL	023342	3908	3910	3913	3921	3926	3967	3976	3990	3994	4127	4131	4139	4205
		4223	4227	4233	4237	4243	4412	4416	4424	5891#	5895			
DRVCLR=	000111	1772#												
DRVINT	032540	7694	7721#	7792	8336	8396								
DRVMSK	001274	1874#	3061*	3062	3065*									
DRVOK	005360	3063	3069#											
DRVQUE	037604	7798	8668#											
DRVSEL	001256	1866#	3009*	3014*	3029	3062	4457	6856*	6927*	6950*	6955*			
DRVSTA	032242	3012	3070	7502#	7705*	7725*	7763*	7765*	7787	7794	7828	7998*	8182	8230
		8238	8282*	8290*										
DRV TYP	032252	7515#	7726*	7736*										
LTADPB	003554	2549#	3077*	3541	3544	3555	3558	3570	3573	3578	3623*	3629	3637	3640
		3647*	3648	3652*	3653	3661	3664	3669	3719	3722	3737	3740	3754	3757
		3762	3811	3814	3829	3832	3846	3849	3854	3902*	3903*	3904*	3905*	3906*
		3907*	3909*	3912*	3917*	3918*	3919*	3920*	3922*	3923*	3924*	3925*	3960*	3961*
		3962*	3963*	3964*	3966*	3968*	3972*	3974*	3975*	3977*	3982*	3984*	3987*	3989*
		3991*	3992*	3993*	3995	4096*	4097*	4111*	4112*	4113*	4118*	4126*	4130*	4138*
		4196*	4197*	4198*	4199*	4203*	4206*	4207	4209*	4210	4212*	4217	4218	4219*
		4221*	4225*	4226*	4229*	4230*	4231*	4232*	4235*	4236*	4239*	4240*	4241*	4242*
		4381*	4382*	4396*	4397*	4398*	4403*	4411*	4415*	4423*	5894	5896	5903	5904
		5905	5906	5918	5924*	5927	5929	5933	5934	5935	5936	5944*	5946	5948
		5952	5954	5959	5960	5961	5962	6127*	6128*	6129*	6132	6134	6138	6139
		6140	6141	6464	6465	6496	6533	6593	6594	6595	6766*	6767*	6768*	
DTJW	032344	7608#	7687	7837	7941*	8062	8065*	8074	8086*	8142	8154*	8226	8386	8401
		8412*	8419	8457										
DT1	043364	2629	9112#											
DT10	043452	2693	9123#											
DT11	043456	2703	9124#											
DT12	043462	2716	9125#											
DT12A	043530	9128#												
DT13	043514	2729	2750	9130#										
DT13A	043532	2737	2758	9133#										
DT17	043544	2768	2778	9135#										
DT2	043370	2639	2669	9113#										
DT21	043564	2791	9138#											
DT21A	043600	2799	9140#											
DT3	043410	2649	9116#											

[illegible]

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IC4	002216	2085#	3358	3378				
IC5	002234	2094#	3416	3417				
IC6	002252	2103#	3466					
INCCYL	025356	4105	4390	6333#				
INCSK	006254	3266#	3270					
INCTRK	025326	4143	4428	6314#				
IOTVEC=	000020	1724#	2935*	2936*				
ISR	034766	3580	3671	3764	3856	6124	7700	8139#
IT	001506	1947#						
ITEM41	004064	2821#	4581					
IT15	002344	2146#	6316					
KIPAR0=	172340	1758#	4313*	4736	5591	5619	7884	
KIPAR1=	172342	1759#	4314*					
KIPAR2=	172344	1760#	4315*					
KIPAR3=	172346	1761#	4316*					
KIPAR4=	172350	1762#	4317*					
KIPAR5=	172352	1763#	4318*	4349*	4350*	4355	4435*	
KIPAR6=	172354	1764#	4319*	4355*	4356*	4436*		
KIPAR7=	172356	1765#	4320*	5632				
KIPDR0=	172300	1747#	4324*					
KIPDR1=	172302	1748#	4325*					
KIPDR2=	172304	1749#	4326*					
KIPDR3=	172306	1750#	4327*					
KIPDR4=	172310	1751#	4328*					
KIPDR5=	172312	1752#	4329*					
KIPDR6=	172314	1753#	4330*					
KIPDR7=	172316	1754#	4331*					
LA	034630	7841	8104#					
LACNT	032310	7567#	8112*	8113	8130*			
LC	001476	1943#						
LCO	002122	2047#	3197					
LC1	002136	2055#	3231					
LC15	002334	2142#	6333	6336	6338			
LC16	002362	2155#	4210	6756				
LC2	002160	2066#	3269	3271				
LC3	002176	2075#	3308					
LC4	002214	2084#	3359	3361	3368			
LC5	002232	2093#	3411	3418				
LC6	002250	2102#	3450					
LDCMD	022660	3078	5760#					
LERADD	001236	1858#	2996	4828				
LKS	001406	1908#	5712	5744*				
LKV	001402	1907#	5742*	5743*				
LP8	001416	1912#	4526					
LPS	001414	1911#	4525	5674				
LPTAVL	001254	1865#	4523	5671*	5675*			
LP.AVL	022340	2958	5671#					
LS	001512	1949#						
LS1	002150	2060#	3227					
LS15	002350	2148#	4077	4362				
LT	001504	1946#						
LT1	002144	2058#	3229					
LT15	002342	2145#	6314	6317	6319			
MABOVE	040533	6276	8837#					
MBELOW	040504	6260	8833#					
MCPENX	032356	7626#	8442					

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CPN.N2	031432	7136	7167	7227	7240*
OPN.X1	031444	7149	7178	7243*	
OPN.X2	031450	7141	7171	7231	7244*
OPN.1	030554	7075*	7083	7242	
OPN.2	030E00	7074	7077	7080*	
OPT	033162	7805	7822*	8170	8329
PACK =	000123	1777*			
PARE70=	000114	2902*	2998*	2999*	3004*
PARITY	016566	2998	3004	4802*	
PAT	001511	1950*			
PAT.PT	002434	2184*	6497	6535	6583
PAT0	002474	2184	2203*	2919	7184
PAT1	002534	2185	2220*		
PAT10	003174	2194	2373*		
PAT11	003234	2195	2390*		
PAT12	003274	2196	2407*		
PAT13	003334	2197	2424*		
PAT14	003374	2198	2441*		
PAT15	003434	2199	2458*		
PAT2	002574	2186	2237*		
PAT3	002634	2187	2254*		
PAT4	002674	2188	2271*		
PAT5	002734	2189	2288*		
PAT6	002774	2190	2305*		
PAT7	003034	2191	2322*		
PAT8	003074	2192	2339*	2918	
PAT9	003134	2193	2356*	2921	
PC	=:000007	1650*	2958*	2959*	2970*

```
PIRQ      = 177772
PIRQVE= 000240
PKB       001376
PKC       001400
PKCS      001374

PKV       001370
POPQUE    037702
PRM       001470
PRMLMT    001554
PRMSG     001600
PRMPT     001516
PRMO      002116
```

7136	7167	7227	7240#									
7149	7178	7243#										
7141	7171	7231	7244#									
7075#	7083	7242										
7074	7077	7080#										
7805	7822#	8170	8329									
1777#												
2902#	2998*	2999*	3004*									
2998	3004	4802#										
1950#												
2184#	6497	6535	6583									
2184	2203#	2919	7184	7232								
2185	2220#											
2194	2373#											
2195	2390#											
2196	2407#											
2197	2424#											
2198	2441#											
2199	2458#											
2186	2237#											
2187	2254#											
2188	2271#											
2189	2288#											
2190	2305#											
2191	2322#											
2192	2339#	2918										
2193	2356#	2921										
1650#	2958*	2959*	2970*	2991*	2992*	2993*	2994*	3007*	3078*	3114*	3530*	3542*
3556*	3561*	3571*	3579*	3625*	3638*	3643*	3644*	3662*	3670*	3707*	3720*	3726*
3727*	3738*	3744*	3745*	3755*	3763*	3799*	3812*	3818*	3819*	3830*	3836*	3837*
3847*	3855*	3901*	3959*	4123*	4142*	4408*	4427*	4478*	4481*	4496*	4539*	4711*
4755*	4884*	4891*	4896*	5068*	5078*	5338*	5364*	5366*	5404*	5409*	5454*	5581*
5610	5656*	5679*	5708*	5714*	5727*	5737*	5745*	5767*	5790*	5791*	5822*	5823*
5861*	5862*	5907*	5908*	5937*	5938*	5963*	5964*	6003	6006	6009	6012	6015
6018	6031*	6047*	6082*	6142*	6143*	6179*	6218*	6251*	6252*	6258*	6259*	6262*
6263*	6267*	6268*	6274*	6275*	6278*	6279*	6285*	6290*	6291*	6295*	6296*	6362*
6517*	6573*	6708*	6725*	6794*	6850*	6957*	7072*	7120*	7121*	7191*	7192*	7225*
7229*	7238*	7241*	7245*	7273*	7681*	7704*	7730*	7805*	7813*	7825*	7830*	7835*
7844*	7846*	7849*	7850*	7864*	8004*	8035*	8039*	8040*	8045*	8054*	8059*	8066*
8076*	8077*	8088*	8090*	8092*	8134*	8144*	8146*	8169*	8170*	8173*	8174*	8189*
8202*	8203*	8214*	8225*	8234*	8235*	8236*	8244*	8252*	8267*	8283*	8297*	8305*
8314*	8324*	8328*	8329*	8338*	8388*	8390*	8403*	8414*	8430*	8446*	8467*	8469*
8501*	8546*	8567*	8645*	8657*	8695*	8712*						
1636#												
1730#												
1905#	3533*	3547*	3628*	3710*	3728*	3802*	3820*	5734*	6076*			
1906#	6197	6199	6200	6204	6206	620						

PRM1	002130	1954	2052#
PRM10	002272	1961	2115#
PRM11	002276	1962	2119#
PRM12	002302	1963	2123#
PRM13	002306	1964	2127#
PRM14	002316	1965	2133#
PRM15	002326	1966	2139#
PRM16	002354	1967	2152#
PRM2	002152	1955	2063#
PRM3	002170	1956	2072#
PRM4	002206	1957	2081#
PRM5	002224	1958	2090#
PRM6	002242	1959	2099#
PRM7	002260	1960	2108#
PRO	= 000000	1653#	
FR1	= 000040	1654#	
PR2	= 000100	1655#	
PR3	= 000140	1656#	
PR4	= 000200	1657#	
PR5	= 000240	1658#	
PR7	= 000340	1660#	
PS	= 177776	1633#	1634

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RPVEC	032362	3532*	3580*	3627*	3671*	3709*	3764*	3801*	3856*	6124*	7631*	7679	7699	7701
RP.REG	003574	7781	8376	2537	2561	2577*	5920	9135	9144	9147	9150	9154	9156	9160
RP04	032766	9162												
RP6	= 000300	5779	5811	5850	5893	5926	5945	5951	6131	7780*				
RSTRT1	005322	1659*												
RSTRT2	005334	3053	3055	3060*	3066									
RSTRT3	005342	3062*	3067											
RTC	= 000117	3063*												
RO	=%000000	1775*												
		1641*	2912*	2915	2916	2918*	2920	2921	2946*	2947*	2948	3010*	3012	3014
		3015*	3028*	3039	3049*	3082*	3084*	3088*	3102*	3117*	3200*	3201*	3234*	3235*
		3267*	3273*	3303*	3306*	3343*	3346*	3349*	3352*	3363*	3366*	3369*	3372*	3413*
		3415*	3455*	3457*	3459*	3461*	3463*	3465*	3515*	3567*	3583*	3587*	3617*	3658*
		3672*	3700*	3751*	3765*	3792*	3843*	3857*	3908*	3910*	3911*	3913*	3914*	3915*
		3919	3921*	3926*	3927*	3965*	3966	3967*	3969*	3970	3973*	3975	3976*	3978*
		3979	3981*	3982	3983	3990*	3994*	3997*	3998	4075*	4081*	4087	4102	4103
		4105*	4107*	4108	4127*	4131*	4139*	4143*	4202*	4205*	4216*	4222*	4223*	4224*
		4227*	4228*	4233*	4234*	4237*	4238*	4243*	4360*	4366*	4372	4387	4388	4390*
		4392*	4393	4412*	4416*	4424*	4428*	4489*	4491	4493	4496	4566*	4567*	4568
		4574*	4575	4576*	4577*	4578*	4579*	4581*	4582*	4583	4645	4650	4653*	4654
		4658	4659	4702	4710*	4723	4726*	4727	4728*	4729*	4730*	4731*	4732*	4733*
		4736	4762*	4876	4877*	4878	4881*	4989	4999*	5003	5019	5020	5033*	5248
		5273*	5284	5285*	5286	5287*	5288*	5289*	5327*	5331	5341*	5343*	5345*	5384*
		5385	5403*	5407*	5442	5443*	5444	5446	5448*	5449	5452*	5483	5490*	5493*
		5495*	5500*	5507*	5508	5511*	5518*	5519	5523*	5530	5534*	5550	5554*	5558*
		5563*	5567*	5573*	5575	5580*	5601	5607*	5647	5655*	5748*	5779*	5797*	5798*
		5811*	5829*	5833*	5837*	5839*	5850*	5868*	5872*	5876*	5878*	5893*	5926*	5945*
		5951*	5974*	5977*	5979*	5998	6000*	6001	6003	6006	6009	6012	6015	6018
		6021	6030*	6044	6054	6059*	6093	6106	6108*	6110*	6131*	6149	6153*	6170*
		6172*	6173	6175*	6237	6303*	6320	6321*	6339	6340*	6351*	6352*	6355	6358*
		6359	6361*	6372*	6386*	6387*	6398*	6448*	6450*	6451*	6491*	6497	6516*	6528*
		6535	6572*	6583	6596*	6599*	6629*	6632*	6657*	6692*	6693*	6714*	6769*	6789*
		6811*	6813	6814*	6818*	6820	6821*	6825*	6827	6832*	6836*	6838*	6840*	6845*
		6847	6848	6849	6884*	6892*	6897	6898	6910	6911	6917*	6926*	6934*	6944*
		6956*	6995*	6999*	7013*	7017*	7071*	7078*	7094*	7095	7103	7124*	7144*	7159*
		7174*	7182*	7193*	7190	7198*	7206*	7213*	7214	7226*	7230*	7233*	7234	7249*
		7254*	7255*	7257	7264	7268	7272*	7291	7292*	7311	7312*	7337*	7339	7340
		7341	7342	7343	7345*	7346*	7368*	7381*	7390*	7405*	7406	7411*	7412*	7428*
		7438*	7443*	7458*	7460*	7461*	7680*	7694*	7702*	7721*	7732*	7742*	7746*	7749*
		7755*	7766	7767*	7768*	7783*	7784	7792*	7798*	7808	7809*	7812*	7822*	7841*
		7848*	7876*	7922*	7926*	7930*	7938*	7946*	7955*	7959*	7970*	7977*	7983*	7987*
		8001*	8007*	8011*	8021*	8032*	8047*	8056*	8067*	8091*	8106*	8120*	8131	8132
		8133*	8135*	8140*	8147*	8162*	8209*	8255*	8263*	8269*	8276*	8336*	8350*	8357*
		8363*	8366*	8377*	8380*	8396*	8421*	8426	8427*	8429*	8445	8453	8454*	8472*
		8474*	8487	8491*	8498*	8499*	8504*	8509	8510*	8515*	8516*	8517	8518*	8526*
		8545*	8628*	8644*	8678	8679*	8740*	8759*						
R1	=%000001	1642*	2913*	2914	2915*	2919*	2920*	3011*	3016*	3029*	3036*	3043	3103*	3105*
		3107*	3109*	3111*	3304*	3305	3307*	3308	3340*	3342	3358*	3359	3361*	3362
		3378*	3379	3410*	3412	3416*	3418	3449*	3452	3454	3466*	3529*	3562*	3706*
		3746*	3798*	3838*	3916*	3920	3928*	3929	3983*	3985*	4077*	4078*	4080*	4083*
		4090*	4091*	4093*	4100*	4111	4114	4220*	4221	4362*	4363*	4365*	4368*	4375*
		4376*	4378*	4385*	4396	4399	4569	4575*	4588*	4590*	4591*	4592*	4600*	4607
		4650*	4662	4690	4990	5003*	5004	5008	5032*	5249	5272*	5323*	5327	5328*
		5340*	5342*	5344*	5386*	5392*	5398*	5484	5489*	5494*	5512*	5515	5519*	5528*
		5529	5533*	5551	5555*	5559*	5564*	5565*	5568*	5570*	5574*	5576	5579*	5602

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5609*	5640*	5642	5643	5645*	5650	5654*	5699	5700*	5701	5702*	5703	5704*
5711*	5717*	5718*	5719*	5999	6002*	6023*	6024*	6025*	6026*	6027*	6028	6029*
6092	6093*	6095	6097	6102	6103	6104	6109*	6122*	6171*	6173	6333	6335*
6336	6338*	6353*	6355*	6373*	6376	6377	6378	6379	6380	6381	6382	6383
6400*	6406	6408	6410	6412	6414	6416	6418	6420	6422	6424	6426	6428
6430	6432	6434	6436	6441*	6442	6492*	6495*	6498*	6499*	6500*	6501*	6502*
6503*	6504*	6505*	6506*	6507*	6508*	6509*	6510*	6511*	6512*	6513*	6529*	6532*
6537*	6539*	6541*	6543*	6545*	6547*	6549*	6551*	6553*	6555*	6557*	6559*	6561*
6563*	6565*	6567*	6574	6586*	6587	6589	6624*	6627*	6647*	6651*	6653*	6654
6688	6709*	6710*	6726*	6729	6731	6734*	6749	6766	6841*	6844	6846*	6847*
6848*	6849*	6851	6883*	6901	6904	6906	6908	6933*	6941*	6951	6965*	6966
6968	6970	6975	6979	6983	6987	6991	6998*	7001*	7010	7012*	7016*	7019*
7035*	7038	7042	7046	7048*	7049	7054*	7055	7057	7063*	7064	7123*	7131
7134	7137	7139	7158*	7166	7168	7170	7197*	7217	7219	7221	7232*	7236
7256*	7258	7264*	7267	7285	7287	7289	7305	7307	7309	7329	7331	7333
7335	7344*	7398	7401	7430*	7451	7453*	7456	7682*	7684*	7685	7688*	7689
7691*	7696*	7697*	7705*	7722	7723	7725*	7754	7763*	7765*	7786*	7787	7789
7794	7802*	7803	7824	7828	7868	7877*	7878*	7879*	7880*	7881*	7882*	7883*
7884	7941	7944	7962	7965	7997*	7998*	7999*	8041*	8042*	8043*	8044*	8051
8060*	8061*	8062	8069*	8071	8074	8080*	8081*	8082*	8084*	8105	8112*	8113
8130*	8142*	8153*	8155*	8156*	8157*	8161	8180*	8182	8184*	8193	8196*	8197*
8199	8204*	8207*	8218*	8221*	8226	8230	8232	8238	8249*	8250*	8251*	8254
8261	8282*	8289*	8290*	8291*	8292*	8293*	8296*	8298	8300*	8303	8308	8317
8319*	8320*	8321	8331	8351*	8359*	8361	8379	8386	8392*	8393*	8394*	8398
8401	8405*	8406*	8409*	8410	8417	8419	8556	8635*	8636	8640*	8641	8653*
8654*	8655*	8656*	8668	8670*	8671*	8672*	8673*	8674*	8676*	8677*	8690	8692*
8693	8694*	8704*	8705*	8706	8707*	8708	8710*	8711*	8734	8758*		
1643*	2914*	2916	3069*	3070	3074	3075	3076	3077	3093	3104*	3106*	3108*
3110*	3112*	3113*	3114	3335*	3338*	3344	3350	3364	3370	3411*	3414	3417*
3420	3450*	3451*	3452	3541*	3555*	3570*	3637*	3661*	3719*	3737*	3754*	3811*
3829*	3846*	4117*	4112	4116	4395*	4397	4401	4570	4593*	4599	4654*	4675
4696*	4724	4736*	4738*	4740*	4742*	4744*	4746*	4748*	4752	4761*	4991	5002*
5006*	5009	5016*	5017*	5018	5023*	5031*	5250	5271*	5329*	5330	5331*	5346*
5347*	5383*	5386	5387*	5393*	5394*	5399*	5400*	5485	5496*	5504*	5509	5532*
5552	5557*	5560*	5566*	5569*	5571*	5572*	5573	5578*	5603	5619*	5621*	5622*
5625*	5626*	5631*	5632	5634*	5639*	5641*	5646*	5651	5653*	6193*	6196*	6197
6199*	6202*	6203	6204	6206*	6209*	6210	6211*	6212*	6213*	6237*	6240	6241
6242	6243*	6277	6314	6316*	6317	6319*	6354*	6356*	6374*	6376*	6377*	6378*
6379*	6380*	6381*	6382*	6383*	6384	6403*	6438*	6496*	6514*	6533*	6569*	6628*
6630*	6646*	6650*	6651	6652*	6655	6656	6661*	6664*	6665	6667	6669	6705
6706*	6711*	6713*	6727*	6736	6733	6741*	6751	6767	6836	6840	6899	6912*
6913*	6914*	6915*	6916*	6943*	6950	6955	6997	7005*	7006	7008*	7009	7015
7023*	7024	7026*	7027	7030	7031	7032	7096*	7101	7103*	7143*	7150	7179
7180*	7211	7224	7228	7239	7243	7257*	7260	7289*	7290*	7309*	7310*	7364
7365*	7380	7407*	7437	7441*	7683*	7685	7687*	7689	7784*	7785*	7786	7796*
7800	7807*	7826	7831*	7833	7865	7866	7884*	7886*	7888*	7890*	7892*	7894*
7896*	7899	7935*	7937	7945	7949	7954	7966	7969	7976	7986	8010	8017
8019	8020	8036*	8053*	8073*	8078*	8109	8115	8158*	8160*	8172*	8181*	8185*
8274*	8285*	8295*	8311*	8325*	8385*	8389*	8400*	8404*	8528	8529*	8537*	8541*
8629*	8630*	8631*	8632*	8633*	8636*	8641*	8672	8689*	8693*	8706*	8735	8757*
1644*	3524*	3527*	3620*	3703*	3795*	4119*	4120*	4121	4404*	4405*	4406	4571
4594*	4602*	4658*	4677	4682	4692*	4725	4737*	4739*	4741*	4743*	4745*	4747*
4749*	4753	4760*	4931	4940*	4946*	4947*	4950*	4955*	4956*	4957	4966*	4992
5000*	5001*	5015*	5018*	5027*	5028*	5030*	5119	5121*	5122	5125*	5126	5133*
5134	5136	5144	5148	5150*	5156	5158	5160*	5163*	5251	5270*	5326*	5339*
5346	5391*	5396*	5402*	5403	5486	5508*	5509*	5511	5531*	5553	5556*	5561*

R2 =%000002

R3 =%000003

N15

 MAINDEC-11-DERPK-C "MECHANICAL AND READ/WRITE TEST"
 DERPKC.P11 CROSS REFERENCE TABLE -- USER SYMBOLS

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SC12	036074	8236	8244	8314	8331*															
SC2	035274	8171	8176	8195	8204*															
SC3	035346	8221*	8248	8294	8299	8301	8316	8330												
SC4	035342	8219*	8223																	
SC5	035360	8220	8226*																	
SC6	035460	8231	8249*																	
SC6A	035564	8243	8272*																	
SC7	035706	8275	8286	8296*	8312															
SC8	035732	8257	8265	8271	8278	8302*	8340													
SC9	035756	8260	8308*																	
SEARCH=	000131	1778*	3535	3548																
SEC.DS	001310	1881*	5788*	5820*	5859*	5905*	5935*	5961*	6102*	6140*	6595*	9125	9128	9130						
		9151	9157																	
SEC.RD	001304	1879*	6101*	9128																
SEEK =	000105	1770*	3630	3712	3730	3804	3822	5765	5766											
SEEKFG	032322	3018*	3021*	7590*	7683	7839	8187	8191*												
SELDIV=	000145	1787*																		
SETBUF	026076	4123	4408	6491*																
SETFOR=	000143	1786*	3080	3081	3083	3087	3194													
SET.IE	037136	7730	7850	8090	8202	8554*														
SP =	%000006	1649*	2934*	2975*	2976*	2977*	2978*	2979*	2980*	2981*	2982	3039*	3093*	3199*						
		3233*	3264*	3301*	3339*	3409*	3448*	3519*	3520*	3521	3529*	3567	3568	3622*						
		3658	3659	3705*	3751	3752	3797*	3843	3844	3900*	3958*	4215*	4323*	4324						
		4325	4326	4327	4328	4329	4330	4331	4341*	4342*	4343*	4344*	4345*	4346*						
		4347*	4352*	4354	4463*	4471*	4534	4546*	4549*	4629*	4635*	4641*	4643*	4662*						
		4690*	4723*	4724*	4725*	4726	4754*	4756*	4757	4760	4761	4762	4763*	4764*						
		4782*	4789*	4811*	4822*	4828*	4834*	4836*	4876*	4877	4878*	4880	4881	4882*						
		4885	4887*	4889*	4895	4923*	4924	4925	4926*	4931*	4932*	4933*	4939	4964						
		4965	4966	4967*	4968*	4989*	4990*	4991*	4992*	4993*	4994*	4995	4998*	5011						
		5013*	5015	5025	5027	5029	5030	5031	5032	5033	5035*	5036*	5073*	5074*						
		5075	5083	5086	5099*	5100*	5101*	5106*	5119*	5120*	5125	5128	5132*	5139						
		5143*	5162	5163	5164*	5165*	5166*	5193*	5196	5198	5199	5221	5222	5226*						
		5248*	5249*	5250*	5251*	5252*	5253*	5254*	5255*	5256*	5257*	5264*	5265*	5266*						
		5267*	5268	5269	5270	5271	5272	5273	527	5285	5323	5336*	5362	5363*						
		5365*	5383	5385*	5442*	5443	5452	5453*	5481*	5482*	5483*	5484*	5485*	5486*						
		5487*	5488*	5489	5490	5492*	5496	5499*	5502*	5513*	5517*	5520	5521	5524*						
		5525*	5526	5529*	5530*	5531	5532	5533	5534	5535*	5550*	5551*	5552*	5553*						
		5577	5578	5579	5580	5601*	5602*	5603*	5604*	5605*	5606*	5607	5618*	5622						
		5623*	5647*	5648	5649	5652	5653	5654	5655	5677	5699*	5701*	5703*	5710						
		5716	5717	5718	5719	5747*	5789*	5791	5821*	5823	5860*	5862	5906*	5908						
		5936*	5938	5962*	5964	5998*	5999*	6000	6028*	6029	6030	6044*	6048*	6049*						
		6050*	6051*	6053*	6055*	6058	6072*	6074*	6079*	6080	6081	6092*	6109	6141*						
		6143	6250*	6257*	6261*	6266*	6273*	6277*	6282*	6283*	6284*	6286*	6288*	6294*						
		6399*	6401*	6402*	6404	6440*	6444	6449*	6453	6462	6468*	6534*	6571	6591						
		6596	6599	6600*	6609*	6644*	6645*	6658	6659	6660*	6677	6679*	6690	6705*						
		6713	6852	6880*	6882	6933	6965	7088*	7095*	7098*	7105*	7107*	7119*	7123						
		7155*	7158	7190*	7194*	7197	7240	7244	7362*	7363*	7364*	7376*	7379	7403						
		7408	7409	7410	7426*	7459	7678*	7703	7735	7741*	7745*	7752	7758*	7780*						
		7811	7823*	7847	7925*	7929*	7937*	7945*	7953*	7954*	7958*	7969*	7976*	7986*						
		8000*	8010*	8024	8031*	8046*	8055*	8109	8123	8165*	8187*	8188*	8190	8191						
		8212*	8215*	8216*	8219	8224	8228	8246	8258	8259*	8266	8268*	8279	8280*						
		8302	8313	8339	8355	8365*	8375*	8383	8424	8428	8443*	8449*	8450*	8451						
		8453	8459	8461	8463*	8464*	8467	8473*	8485	8486*	8494*	8495*	8496	8507						
		8514	8539*	8540*	8541	8554*	8557*	8558*	8559*	8563	8565	8566	8734*	8735*						
		8736*	8737*	8738*	8739*	8752*	8753	8754	8755	8756	8757	8758								
		7536*	7824*	7962*	8321															

SRCHWT 032274


```

SW15      = 100000
SW2       = 000004
SW3       = 000010
SW4       = 000020
SW5       = 000040
SW6       = 000100
SW7       = 000200
SW8       = 000400
SW9       = 001000
TBITVE=   000014
TD        = 035036
TEMP1     = 001214
TEMP10    = 001234
TEMP2     = 001216
TEMP3     = 001220
TEMP4     = 001222
TEMP5     = 001224
TEMP6     = 001226
TEMP7     = 001230
TEMP9     = 001232
TEST0     = 005766
TEST1     = 006130
TEST10    = 010250
TEST11    = 010672
TEST12    = 011372
TEST13    = 012044
TEST14    = 012344
TEST15    = 013004
TEST16    = 013502
TEST17    = 014424
TEST2     = 006242
TEST3     = 006424
TEST4     = 006600
TEST5     = 007116
TEST6     = 007274
TEST7     = 007572
TICKMS    = 001264
TICKUS    = 001266
TIMEOUT    = 016426
TIMER      = 032324
TIM.DN    = 001332
TIM.PT    = 001350
TIM.LP    = 001314
TKVEC     = 000060
TPB        = 001412
TPS        = 001410
TPVEC     = 000064
TRAPVE=   000034
TRCKMC=   165000
TRK.DS    = 001312

TRK.RD    = 001302
TRK.DW    = 032272
TRY.EC=   000014
TSTNMS    = 001260

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[illegible]

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[illegible]

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MAINDEC-11-DERPK-C "MECHANICAL AND READ/WRITE TEST"
DERPKC.P11 CROSS REFERENCE TABLE -- USER SYMBOLS

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[illegible]

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[illegible]

MAINDEC-11-DERPK-C "MECHANICAL AND READ/WRITE TEST"
DERPKC.P11 CROSS REFERENCE TABLE -- USER SYMBOLS

```
STPFLG 001151
STPS 001142
STRAP 021004
STRP = 000024
STRPAD 021024
STSTNM 001102
```

1830#	4872	4897										
1825#	4525*	4551*	4893	4897								
2939	5284#											
5291#	5301#	5302#	5303#	5304#	5305#	5306#	5307#	5308#	5209#	5310#		
5288	5299#											
1809#	3191*	3193	3223*	3225	3258*	3260	3295*	3297	3329*	3331	3403*	3405
3442*	3444	3509*	3511	3611*	3613	3694*	3696	3786*	3788	3896*	3698	3954*
3956	4072*	4074	4190*	4192	4297*	4299	4474*	4529	4554	4565	4671	5179
5220*	5225	5229	5914	5916	6493	6530	6575	6625	6648	6670	7873	7933
5121	5122	5134	5152	5166	5171#							
5305												
4988#	5304											
4872#	5291	5300										
4884	48	4893#	4894									
4928#	5301											
4927	4930#	5303										
4923#	5302											
5191#												
5290#	5301	5302	5303	5304	5305	5306	5307	5308	5309	5310		
4924*	4928*	4938	4973#									
1610#	1614	1616#	1802#	1805#	1848	2933	2944	2945	2954	2957#	2971	2974#
2987	3023	3026#	3031	3034#	3045	3076	3059#	3089	3098	3101#	4453	4456#
4459	4467	4484	4501	4502#	4554	4595	4598#	4612	4631	4637	4640#	4778
4781#	4784	4787#	4803	4807	4810#	4813	4816#	4818	4824	4827#	4830	4833#
4897	5042#	5047	5050#	5051	5052	5171#	5172	5173	5228	5229	5349#	5430#
6783	6928	6960	7084	7087#	7186	8613#	8614#	8615#	8616#	8617#	8618#	8619#
8620#	8621	9108#	9260									

```

STTYIN      020437
STYPBN=     ***** U
STYPDS      017500
STYPE       017144
STYPEC      017234
STYPOC      017276
STYPON      017312
STYPOS      017252
EXTSTR      020476
SSTRP =     000002
SCFILL      017475
.           = 044134

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H16

 MAINDEC-11-DERPK-C "MECHANICAL AND READ/WRITE TEST"
 DERPKC.P11 CROSS REFERENCE TABLE -- MACRO NAMES

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CKCHR	2903#	6884	6934	7124	7159	7198	7368	7381	7390	7443					
CKDIG	2903#	6942	7142												
CKNUM	2903#	6891	7173	7205											
COMMEN	1#	1731#	3123	3158	3472	3862									
COMND	2903#	3080	3083	3087	3194										
DO	2903#	3082	3084	3088	3200	3201	3234	3235	3267	3273	3303	3306	3343	3349	3363
	3369	3413	3415	3455	3457	3459	3461	3463	3465						
DODTA	2903#	3908	3910	3913	3921	3926	3967	3976	3990	3994	4127	4131	4139	4204	4223
	4227	4233	4237	4243	4412	4416	4424								
DRV.IN	2903#	3577	3668	3761	3853										
ENDCOM	1#	1731#	3151	3169	3485	3871									
ENDPAS	2903#	4484													
ERRCAL	7463#	8201	8247	8315	8455	8513									
ERRENO	2903#	4551													
ERROR	1631#	3072	3546	3560	3575	3642	3666	3724	3742	3759	3816	3834	3851	5792	5793
	5794	5795	5796	5824	5825	5826	5827	5828	5863	5864	5865	5866	5867	5909	5910
	5911	5912	5913	5939	5940	5941	5942	5943	5965	5966	5967	5968	5969	6107	6144
	6145	6146	6147	6148	6467	6472	6598	6604	6680	6681	6853	8201	8247	8315	8456
	8513														
ERRTYP	2903#	4521													
ER.NDX	2903#	5786	5818	5857	5903	5933	5959	6138							
ESCAPE	1#	1731#	3522	3621	3704	3796	5785	5817	5856	5902	5932	5958	6105	6137	6456
	6470	6597	6602	6663											
MORETA	1795#	1848													
MORE.S	2903#	3184	3216	3251	3288	3322	3396	3435	3502	3604	3687	3779	3889	3947	4065
	4183	4290													
MSG	3174#	3176	3204#	3206	3238#	3240	3279#	3281	3312#	3314	3383#	3385	3424#	3426	3489#
	3492	3591#	3593	3676#	3678	3768#	3770	3876#	3878	3933#	3935	4003#	4005	4158#	4160
	4247#	4249													
MULT	1#	1731#													
NEWTST	1#	1731#	3174	3204	3238	3279	3312	3383	3424	3490	3591	3676	3768	3876	3933
	4003	4158	4247												
POP	1#	1731#	4760	5029	5268	5531	5577								
PUSH	1#	1731#	4722	4988	5248	5483	5549								
REPORT	2903#	3583	3586	3672	3765	3857									
RPO4.D	1552#	7463													
SAV.RH	2903#	3540	3554	3569	3636	3660	3718	3736	3753	3810	3828	3845			
SCOPE	1632#	3202	3236	3277	3310	3381	3422	3468	3576	3667	3760	3852	3931	4000	4146
	4244	4439													
SETTRA	5291#	5301	5302	5303	5304	5305	5306	5307	5308	5309					
SETUP	1#	1731#	2929												
SET.TN	2903#	3185	3217	3252	3289	3323	3397	3436	3503	3605	3688	3780	3890	3948	4066
	4184	4291													
SKIP	1#	1731#													
SLASH	1#	1731#													
SPACE	1731#														
STARS	1#	1731#	1795	2597	2802	3174	3183	3204	3215	3238	3250	3279	3287	3312	3321
	3383	3395	3424	3434	3490	3501	3591	3603	3676	3686	3768	3778	3876	3888	3933
	3946	4003	4064	4158	4182	4247	4289	4443	4505	4555	4773	4775	4799	4801	4850
	4897	4975	5043	5092	5112	5173	5229	5275	5310	5350	5368	5431	5455	5537	5584
	5661	5681	5751	5769	5800	5841	5881	5981	6033	6062	6084	6112	6155	6161	6181
	6220	6305	6324	6342	6364	6389	6483	6519	6613	6634	6695	6716	6771	6796	6860
	6919	7274	7294	7314	7348	7414	7462								
TRMTRP	5291#														
TYPBIN	1#	1731#													
TYPB2D	2903#	6250	6257	6261	6266	6273	6277	6289	6294	7119	7190				

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[illegible]

J16

MAINDEC-11-DERPK-C "MECHANICAL AND READ/WRITE TEST" MACY11 27(732) 14-OCT-76 10:36 PAGE 208
 DERPKC.P11 CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

ADC	5399	5564	5566	5568	5569	5571	5574	6212	6747						
ADD	2952	3113	3268	3358	3416	3456	3460	3464	3466	3927	3968	3377	3987	3991	4080
	4082	4092	4339	4350	4356	4365	4367	4377	4435	4436	4581	4582	4756	4882	4926
	4936	5008	5347	5398	5400	5509	5563	5565	5567	5570	5572	5573	5623	5631	5640
	5641	5791	5823	5862	5908	5938	5964	6079	6143	6211	6217	6316	6335	6440	6449
	6460	6514	6569	6585	6586	6652	6653	6664	6751	7005	7023	7379	7380	7405	7437
ASL	7458	7869	7870	7952	8027	8083	8125	8445	8500	8540	8673	8707			
	3307	4592	4600	4738	4740	4742	4744	4746	4748	5558	6027	6459	6584	6828	6829
	6830	7002	7003	7004	7008	7020	7021	7022	7026	7081	7269	7375	7377	7378	7431
	7433	7435	7724	7886	7888	7890	7892	7894	7896	8041	8155	8249	8291	8654	8671
ASLB	8692	8705													
ASR	3016	3065	4577	4578	4579	4591	5013	8185	8222						
	2976	2977	2978	2979	2980	2983	2985	3036	4343	4344	4345	4346	4347	4730	4731
	4732	4723	5339	6455	6581	6676	6914	6915	6916	7098	7107	7880	7881	7882	7883
BCC	8043	8117	8118	8157	8251	8293	8656	8677	8694	8711					
BCS	3037	4580	4601	5014	5510	7181	8186								
BEQ	2953	3066	4661	7099	7108	7432	7434	7436							
	3006	3044	3055	3337	3345	3351	3365	3371	3526	3539	3553	3635	3717	3735	3809
	3827	4088	4109	4122	4133	4135	4338	4373	4394	4407	4418	4420	4458	4490	4522
	4524	4528	4531	4545	4548	4584	4608	4617	4619	4621	4623	4625	4646	4651	4655
	4693	4953	5104	5140	5203	5207	5334	5445	5447	5527	5721	5783	5815	5836	5854
	5875	5897	5921	5930	5949	5955	5976	6020	6046	6098	6135	6195	6248	6255	6271
	6299	6315	6334	6445	6576	6662	6691	6782	6809	6855	6905	6971	7033	7039	7041
	7056	7058	7065	7083	7100	7109	7167	7171	7218	7222	7261	7263	7266	7271	7330
	7332	7334	7336	7399	7729	7738	7827	7905	7908	7992	7994	8026	8030	8052	8072
BGE	8075	8241	8262	8299	8304	8310	8387	8399	8402	8460	8508	8530	8669	8691	
BGT	3270	3380	3421	4079	4084	4094	4211	4364	4369	4379	4432	5217	5522	6198	6201
	6757	7029	7077	7838	7951	8124	8129	8183	8471						
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	3930	3971	3980	3996	3999	4104	4115	4117	4208	4389	4400	4402	4480	4960	5022
	5333	5498	6022	6357	6360	6443	6631	6712	6732	6739	6753	7007	7025	7215	7788
	7795	7829	8114	8208	8231	8309	8356	8362	8411						
BHI	5205	5633	5973	6447	6608	6689	7288	7308	7404						
BIC	2984	3537	3551	3565	3633	3656	3715	3733	3749	3807	3825	3841	4340	4477	4729
	4751	4950	5074	5346	5482	5637	6049	6094	6456	7290	7310	7697	7761	7879	7898
BICB	8084	8495													
BIS	7824														
	4752	4955	4956	5016	5017	5402	5499	5517	5615	7030	7036	7044	7796	7807	7831
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	8463	8558													
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	3581	3605	3634	3688	3716	3734	3780	3808	3826	3890	3948	4066	4108	4121	4124
	4128	4134	4136	4140	4184	4200	4291	4309	4337	4393	4406	4409	4413	4419	4421
	4425	4521	4530	4537	4544	5206	5213	5720	5730	5740	5760	5835	5874	5920	5922
	5970	5975	6003	6006	6009	6012	6015	6018	6045	6238	6473	6475	6479	6605	6682
	6686	6781	7032	7082	7251	7260	7262	7265	7270	7728	7904	7907	8219	8240	8451
	8459	8507	8561												
BITB	8321	8417													
BLE	3013	3276	3309	3360	4697	6205	6208	6318	6337	6744	6762	8233	8239	8318	8544
BLO	2917	2922	5135	6052	6174	6385	7286	7306							
BLOS	5123	6215	6478	6685	7686	7690									
BLT	3649	3986	4890	4961	5005	5021	5395	5497	6730	6737	7235	7248	7834	8127	8143
	8198	8354	8490												
BMI	4589	5012	5189	5950	7113	7759	7840	8166	8195	8273	8288	8384	8458	8536	
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	3606	3646	3689	3781	3891	3949	4067	4125	4129	4137	4141	4185	4201	4292	4310
	4353	4410	4414	4422	4426	4492	4494	4538	4603	4611	4628	4672	4674	4676	4678
	4681	4683	4700	4707	4879	4886	4951	5010	5076	5081	5089	5109	5127	5129	5145
	5149	5159	5214	5406	5514	5562	5644	5731	5741	5761	5832	5871	5915	5917	5919
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	7740	7762	7790	7801	7804	7874	7902	7934	7968	7975	7982	7996	8006	8016	8063
	8085	8111	8200	8206	8220	8223	8227	8323	8348	8418	8420	8452	8488	8534	8562
BPL	8638	8643	8675	8709											
BR	4542	4873	4894	4949	4996	5026	5491	5516	5612	5734	5816	5855	5858	5931	5956
	6136	6287	7753	8038	8168	8213	8260	8281	8327	8425					
	2908	2923	2925	2955	2972	2988	3000	3008	3024	3032	3046	3050	3057	3067	3073
	3090	3099	3467	3516	3517	3564	3585	3618	3619	3651	3655	3701	3702	3748	3793
	3794	3840	3988	4101	4106	4144	4145	4386	4391	4429	4430	4454	4460	4468	4485
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	5764	5781	5813	5830	5852	5869	5895	5899	6057	6133	6150	6301	6469	6578	6601
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CLC	8564														
CLR	5505	6733	6740	6745	6758										
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	3750	3802	3817	3820	3842	3916	3965	3973	3981	4075	4076	4089	4099	4107	4203
	4313	4348	4349	4360	4361	4374	4384	4392	4440	4473	4474	4475	4594	4652	4737
	4940	4999	5002	5061	5101	5102	5120	5143	5211	5223	5329	5391	5487	5518	5557
	5618	5626	5635	5639	5671	5673	5702	5705	5778	5810	5849	5891	5892	5925	6002
	6050	6122	6123	6127	6128	6130	6151	6152	6172	6300	6352	6400	6402	6534	6660
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	7442	7684	7691	7726	7785	7872	7885	8064	8069	8070	8087	8159	8180	8215	8218
CLRB	8351	8352	8394	8395	8413	8531	8537	8630	8631	8632	8633	8689			
	3905	3925	5028	5150	5160	5210	5407	5524	7705	7765	7810	7998	8060	8061	8080
CMP	8081	8130	8148	8153	8296	8300	8319	8320	8364	8392	8393	8405	8406	8653	
	2916	2921	2932	2948	3269	3275	3308	3355	3359	3375	3379	3418	3420	3452	3648
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	6430	6432	6434	6436	6442	6688	6743	6756	6761	6852	7006	7024	7027	7076	7214
	7234	7247	7403	7685	7689	7737	7739	8025	8062	8074	8109	8126	8128	8226	8361
CMPB	8386	8401	8410	8419	8453	8533	8543	8674	8708						
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COM	8489	8668													
COMB	3021	3338	4081	4120	4366	4405	4602	4656	4693	7760					
DEC	6468	6600	6679												
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	5105	5133	5332	5404	5448	5513	5525	6055	6356	6438	6630	6711	6941	8197	8207
DECB	8469	8637	8642												
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HALT	1631														
INC	1614	4543	4874	5659											
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INCB	8221	8359	8409	8466											
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JMP	1632														
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JSR	8307	8316	8330												
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MOV	8628	8644													
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	3001	3002	3003	3004	3011	3029	3039	3051	3061	3069	3074	3075	3076	3077	3079
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	3198	3199	3220	3221	3222	3223	3225	3230	3231	3232	3233	3255	3256	3257	3258
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	3326	3327	3328	3329	3331	3334	3339	3340	3342	3348	3361	3362	3368	3400	3401
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	3671	3691	3692	3693	3694	3696	3703	3704	3705	3706	3708	3709	3711	3712	3713

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4471	4481	4489	4525	4526	4529	4534	4546	4549	4551	4552	4568	4569	4570	4571
4572	4573	4575	4583	4590	4593	4599	4629	4630	4635	4641	4643	4645	4650	4653
4654	4662	4690	4702	4723	4724	4725	4726	4727	4736	4753	4754	4757	4760	4761
4762	4763	4764	4789	4822	4828	4834	4836	4876	4877	4881	4887	4923	4931	4932
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5208	5218	5219	5221	5222	5225	5226	5248	5249	5250	5251	5252	5253	5254	5255
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5387	5388	5389	5390	5442	5443	5449	5452	5453	5481	5483	5484	5485	5486	5488
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5551	5552	5553	5554	5555	5556	5575	5576	5577	5578	5579	5580	5601	5602	5603
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E01

MAINDEC-11-DERPK-C "MECHANICAL AND READ/WRITE TEST" MACY11 27(732) 14-OCT-76 10:36 PAGE 215
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	8924	8984	9110	9165											
.TITLE	1553														
.WORD	1614	1808	1811	1812	1813	1814	1817	1818	1819	1820	1821	1822	1831	1833	1834
	1835	1836	1837	1838	1839	1840	1841	1862	1863	1864	1865	1866	1867	1868	1870
	1871	1872	1873	1874	1875	1877	1878	1879	1880	1881	1882	1883	1884	1885	1886
	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1901	1902	1903
	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1921	1922	1923
	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1940	1941
	1942	1943	1944	1945	1946	1947	1948	1949	1950	1953	1954	1955	1956	1957	1958
	1959	1960	1961	1962	1963	1964	1965	1966	1967	1970	1971	1972	1973	1974	1975
	1976	1977	1978	1979	1982	1983	1984	1985	1986	1987	1988	1989	1990	1993	1994
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2006	2008	2011	2014	2017	2020
	2023	2026	2028	2029	2030	2031	2033	2035	2039	2045	2046	2047	2048	2049	2052
	2053	2054	2055	2056	2057	2058	2059	2060	2063	2064	2065	2066	2067	2068	2069
	2072	2073	2074	2075	2076	2077	2078	2081	2082	2083	2084	2085	2086	2087	2090
	2091	2092	2093	2094	2095	2096	2099	2100	2101	2102	2103	2104	2105	2108	2109
	2110	2111	2112	2115	2116	2119	2120	2123	2124	2127	2128	2129	2130	2133	2134
	2135	2136	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2152	2153
	2154	2155	2159	2160	2161	2162	2164	2165	2166	2167	2169	2170	2171	2172	2174
	2175	2176	2177	2179	2180	2181	2182	2184	2185	2186	2187	2188	2189	2190	2191
	2192	2193	2194	2195	2196	2197	2198	2199	2203	2204	2205	2206	2207	2208	2209
	2210	2211	2212	2213	2214	2215	2216	2217	2218	2220	2221	2222	2223	2224	2225
	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2237	2238	2239	2240	2241
	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2254	2255	2256	2257
	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2271	2272	2273
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	2465	2466	2467	2468	2469	2470	2471	2472	2473	2481	2482	2488	2489	2495	2505
	2506	2512	2513	2519	2529	2530	2536	2537	2543	2553	2554	2560	2561	2567	2577
	2578	2579	2580	2581	2582	2583	2584	2585	2586	2587	2588	2589	2590	2591	2592
	2593	2594	2595	2596	3115	3347	3353	3367	3373	4479	4482	4587	4606	4649	4704
	4759	4974	5047	5048	5049	5367	5405	5451	5582	5583	5611	5657	5658	5838	5877
	5978	6004	6007	6010	6013	6016	6019	6246	6879	7073	7117	7478	7479	7480	7481
	7515	7516	7517	7518	7519	7520	7521	7522	7526	7536	7582	7590	7595	7596	7597

F01

MAINDEC-11-DERPK-C "MECHANICAL AND READ/WRITE TEST" MACY11 27(732) 14-OCT-76 10:36 PAGE 216
 DERPKC.P11 CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

7598	7599	7600	7601	7602	7608	7626	7630	7631	7634	7636	7638	7640	8447	8448
8468	8470	8502	8503	8511	8581	8582	8583	8584	8585	8586	8587	8588	8592	8593
8594	8595	8596	8597	8598	8599	8601	8602	8603	8604	8605	8606	8607	8608	8609
9112	9113	9116	9118	9120	9123	9124	9125	9128	9130	9133	9135	9138	9140	9142
9144	9147	9150	9151	9154	9156	9157	9160	9162	9167	9171	9175	9179	9183	9187
9191	9194	9198	9201	9205	9209	9213	9216	9220	9224	9228	9232	9235	9239	9242
9245	9249	9252	9255											

ERRORS DETECTED: 0
 DEFAULT GLOBALS GENERATED: 0

*,DERPKC.SEG/SOL/CRF/NL:TOC/DS:ERFZ/PAGNUM=DERPKC.SML,DERPKC.P11
 RUN-TIME: 59 94 15 SECONDS
 RUN-TIME RATIO: 234/169=1.3
 CORE USED: 41K (81 PAGES)

