RL11,RLV11

CONTROLLER TEST PART 2

CZRLBB0

AH-E041B-MC

FICHE 1 OF 1

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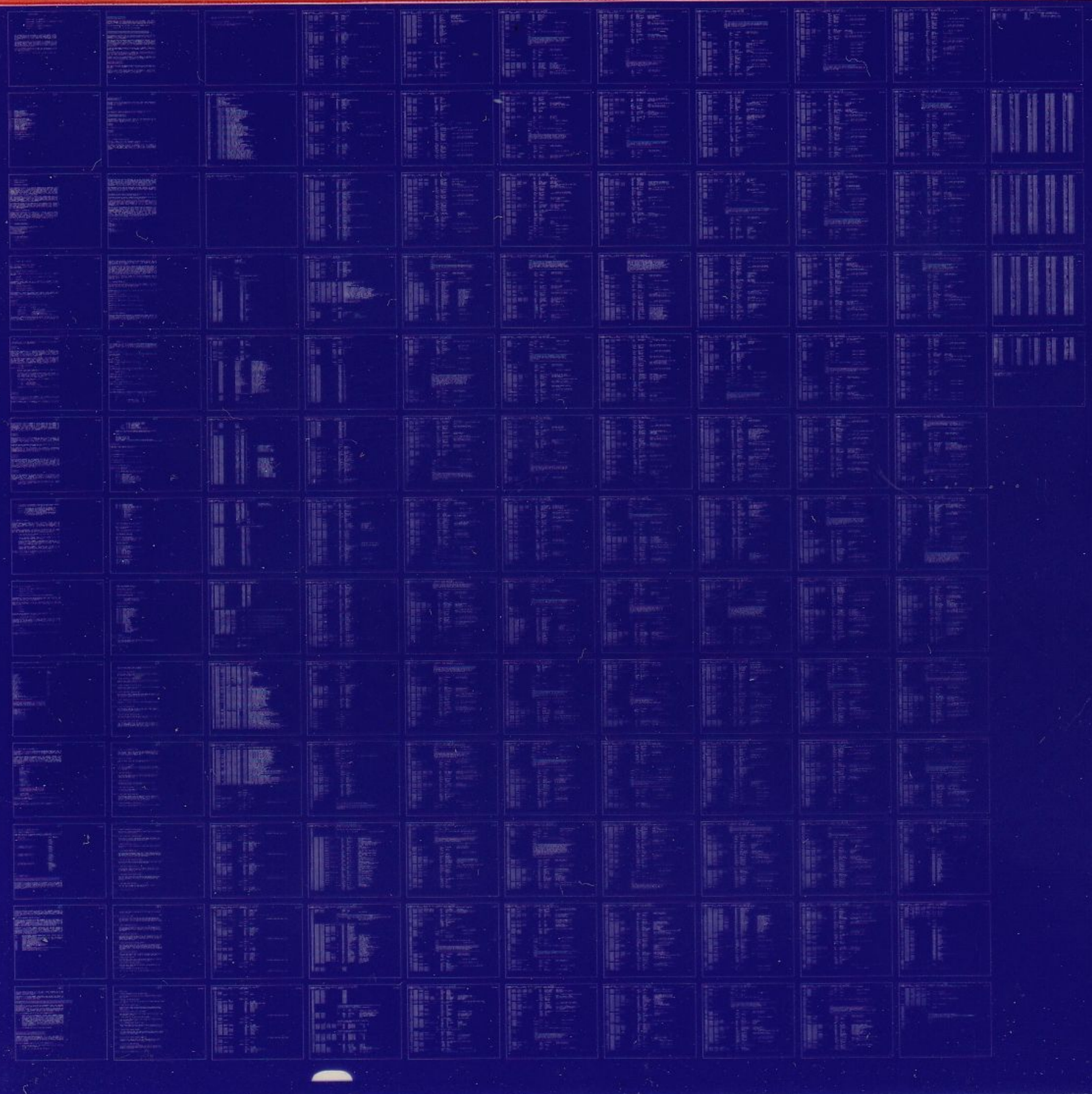

IDENTIFICATION

PRODUCT CODE: AC-E040B-MC

PRODUCT NAME: CZRLBB0 RL11/RLV11 CONTROLLER TEST PART 2

DATE CREATED: 11-OCT-78

MAINTAINER: DIAGNOSTIC ENGINEERING

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SEQ 0003

1.0 GENERAL INFORMATION

1.1 PROGRAM ABSTRACT

1.1.1 STRUCTURE OF PROGRAM

THIS DIAGNOSTIC OCCUPIES 14.5K WORDS OF MEMORY AND IS COMPATIBLE WITH BOTH XXDP AND ACT. IT CAN BE RUN STANDALONE UNDER XXDP, AND CAN BE CHAINED UNDER XXDP, ACT AND APT IN ACT MODE (SEE "CREATE CORE IMAGE" COMMAND BELOW FOR DETAILS OF CHAINING PROCEDURE). IT IS A SINGLE PROGRAM FROM THE STANDPOINT OF THE DIAGNOSTIC USER, BUT WE HAVE INCORPORATED INTO IT A CONTROL MODULE WHICH WILL LATER BE RELEASED INDEPENDENTLY AS A DIAGNOSTIC SUPERVISOR.

WHEN THIS DIAGNOSTIC IS STARTED AT ADDRESS 200, CONTROL GOES FIRST TO THE SUPERVISOR PORTION, WHICH WILL ASK CERTAIN "HARD CORE" QUESTIONS ABOUT THE ENVIRONMENT. THEN IT WILL ENTER COMMAND MODE, INDICATED BY A PROMPT CHARACTER (DS B>). AT COMMAND MODE THE OPERATOR MAY ENTER ANY OF SEVERAL COMMANDS AS DESCRIBED BELOW.

THE SUPERVISOR CODING FOLLOWS IMMEDIATELY THE DIAGNOSTIC TEST CODING, BUT THE SUPERVISOR LISTING HAS BEEN SUPPRESSED FOR GENERAL DISTRIBUTION. A LIMITED DISTRIBUTION HAS BEEN MADE TO FIELD SERVICE OF THE SUPERVISOR ASSEMBLY LISTING, AND IT MAY BE CONSULTED IN EVENT OF A SOFTWARE PROBLEM.

1.1.2 DIAGNOSTIC INFORMATION

THE RL11/RLV11 CONTROLLER TEST (PART 2) IS A PDP-11 (LSI-11) BASED PROGRAM THAT WILL TEST THE CONTROLLER. IT COMPLIMENTS PART 1 BY EXTENDING THE TEST COVERAGE TO INCLUDE WRITE DATA, READ DATA, WRITE CHECK AND READ DATA WITHOUT HEADER COMPARE. IT IS AIMED AT FULLY TESTING THE CONTROLLER IN THESE AREAS, BUT BY DEFAULT ALSO EXERCISES THE DRIVE. THE TEST COVERAGE OF THE PROGRAM IS EXTREMELY HIGH.

1.2 SYSTEM REQUIREMENTS

1.2.1 HARDWARE REQUIREMENTS

PDP-11/LSI-11 PROCESSOR WITH 16K OR MORE OF MEMORY
CONSOLE DEVICE (LA30,LA36,VT50,ETC.)
RL11/RLV11 CONTROLLER(S)
1 - 8 RL01 DRIVES
1 - 8 RL01K CARTRIDGES WITH BAD SECTOR FILE
KW11P, KW11L (OPTIONAL)
LINEPRINTER(OPTIONAL)

1.2.2 SOFTWARE REQUIREMENTS

CZRLBB RL11/RLV11 CTLR 2

(FORMERLY MD-11-DZRLB-A)

1.3 RELATED DOCUMENTS AND STANDARDS

RL01 USERS MANUAL (EK-RL01-UG-PRE)
XXDP USERS MANUAL

1.4 DIAGNOSTIC HIERARCY PREREQUISITES

THE RL01 SUBSYSTEM SHOULD HAVE SUCCESSFULLY RUN THE FOLLOWING PROGRAMS:

CZRLAB0 RL11/RLV11 RL01 CONTROLLER TEST (PART 1)

1.5 ASSUMPTIONS

THE HARDWARE OTHER THAN THE RL01 SUBSYSTEM IS ASSUMED TO WORK PROPERLY. FALSE ERRORS MAY BE REPORTED IF THE PROCESSOR, ETC., DO NOT FUNCTION PROPERLY.

2.0 OPERATING INSTRUCTIONS

2.1 HOW TO RUN THIS DIAGNOSTIC

2.1.1 THE SIX STEPS OF EXECUTION

THIS DIAGNOSTIC SHOULD BE LOADED AND STARTED USING NORMAL XXDP PROCEDURES. THE START COMMAND SHOULD NOT SPECIFY AN ADDRESS, BECAUSE THE DIAGNOSTIC HAS THE PROPER TRANSFER ADDRESS CODED INTO IT.

WHEN THIS DIAGNOSTIC IS STARTED, THE FOLLOWING STEPS WILL OCCUR:

****
* STEP 1 *
****

A SHORT SERIES OF "HARDCORE QUESTIONS" WILL BE ASKED:

QUESTION	MEANING
L-CLK (L) N ?	IS THERE AN L-CLOCK?
P-CLK (L) N ?	" " " P-CLOCK?
50HZ (L) N ?	IS THE POWER 50 CYCLES (AS IN EUROPE)?
LSI (L) N ?	IS MACHINE AN LSI?
LPT (L) N ?	IS THERE A LINE PRINTER?
MEM (K) (D) 16 ?	HOW MANY K OF MEMORY ARE THERE?

THE DEFAULTS (SHOWN AFTER EACH QUESTION) CAN BE SELECTED BY HITTING CARRIAGE RETURN. IT IS POSSIBLE THAT NOT ALL OF THE QUESTIONS WILL BE ASKED: FOR EXAMPLE, IF YOU SAY "YES" TO THE L-CLOCK QUESTION, THE P-CLOCK QUESTION WILL NOT BE ASKED.

IF NEITHER P OR L CLOCK ARE ANSWERED YES THE OPERATOR WILL BE ASKED TO TYPE TWO CHARACTERS 4 SECONDS APART.

****
* STEP 2 *
****

WHEN YOU HAVE ANSWERED ALL THE HARDCORE QUESTIONS, THE DIAGNOSTIC WILL ISSUE THE PROMPT "DS-B>". FROM THIS POINT UNTIL THE TIME WHEN YOU RESTART XXDP, YOU WILL BE TALKING TO THE DIAGNOSTIC, NOT XXDP. WE WILL REFER TO THE PRESENCE OF THIS PROMPT AS BEING IN DIAGNOSTIC COMMAND MODE, AS OPPOSED TO XXDP COMMAND MODE.

AT THIS POINT YOU WILL ENTER A "START" COMMAND. THIS IS NOT THE SAME AS THE XXDP "START" COMMAND, WHICH YOU ALREADY ISSUED IN RESPONSE TO THE XXDP DOT PROMPT. THIS "START" COMMAND CAN TAKE A NUMBER OF SWITCHES AND FLAGS (ALL OPTIONAL) AND THE DETAILS OF THESE ARE SET FORTH IN "2.3 DETAILS OF COMMANDS AND SYNTAX". HOWEVER, IN ORDER TO USE THE PROGRAM, ALL YOU NEED TO SAY IS SOMETHING LIKE THIS:

```
STA/PASS:1/FLAGS:HOE
```

THINGS TO NOTE HERE:

1. ONLY THE FIRST THREE CHARACTERS OF THIS OR ANY COMMAND AT THE "DS-B>" LEVEL NEED TO BE TYPED.

2. THE "PASS" SWITCH SPECIFIES HOW MANY PASSES YOU DESIRE. A PASS CONSISTS OF RUNNING THE FULL DIAGNOSTIC AGAINST ALL UNITS BEING TESTED (THIS WILL BE EXPLAINED SHORTLY). ONE PASS IS SPECIFIED IN THE ABOVE EXAMPLE.

3. THE "FLAGS" SWITCH MAY SPECIFY ANY OF A NUMBER OF FLAGS, BUT THE MAIN USEFUL ONES ARE:

LOE	LOOP ONE ERROR
HOE	HALT ON ERROR
IER	INHIBIT ERROR PRINTOUT

   THE HOE FLAG IS SPECIFIED IN THE ABOVE EXAMPLE (WE'LL SEE WHY SHORTLY).

****
* STEP 3 *
****

WHEN YOU HAVE TYPED IN A "START" COMMAND, THE DIAGNOSTIC WILL COME BACK WITH THE QUESTION "# UNITS?" TO WHICH YOU SHOULD RESPOND BY TYPING IN THE NUMBER OF DEVICES YOU WISH TO TEST.

A WORD OF WARNING HERE: THE NUMBER OF UNITS DEPENDS ON THE TARGET DEVICE OF THE DIAGNOSTIC. FOR EXAMPLE, IF THE DIAGNOSTIC IS DIRECTED

AT A DISK DRIVE, THEN THE NUMBER OF UNITS WOULD BE THE NUMBER OF DRIVES TO BE TESTED. WHEREAS IF THE DIAGNOSTIC WAS DIRECTED AT THE DISK CONTROLLER, THEN THE NUMBER OF UNITS WOULD BE THE NUMBER OF CONTROLLERS. THE TARGET DEVICE OF A DIAGNOSTIC CAN ALWAYS BE DETERMINED BY INSPECTING THE 'HEADER' STATEMENT NEAR THE BEGINNING OF THE SOURCE CODE. ONE OF THE OPERANDS OF THIS 'HEADER' STATEMENT SHOULD BE THE DEVICE TYPE OF THE DIAGNOSTIC.

****
* STEP 4 *
****

WHEN YOU HAVE TYPED IN THE NUMBER OF UNITS TO BE TESTED, THE DIAGNOSTIC WILL ASK YOU THE 'HARDWARE QUESTIONS'. THE ANSWERS TO THESE QUESTIONS ARE USED TO BUILD TABLES IN CORE, CALLED 'HARDWARE P-TABLES'. ONE HARDWARE P-TABLE WILL BE BUILT FOR EACH UNIT TO BE TESTED.

THERE ARE SEVERAL HARDWARE QUESTIONS AND THE ENTIRE SERIES WILL BE POSED N TIMES, WHERE N IS THE NUMBER OF UNITS.

THIS REPRESENTS A NEW PHILOSOPHY IN DIAGNOSTIC ENGINEERING. DIAGNOSTICS IN THE FUTURE WILL NOT BE WRITTEN TO AUTOSIZE OR ASSUME STANDARD ADDRESSES: INSTEAD, THEY WILL ASK THE OPERATOR FOR ALL THE INFORMATION THEY NEED TO TEST THE DEVICE.

****
* STEP 5 *
****

AFTER YOU HAVE ANSWERED ALL THE HARDWARE QUESTIONS (SEC 2.5) FOR ALL THE UNITS, YOU WILL BE ASKED 'CHANGE SW?' IF YOU WANT TO BE ASKED THE SOFTWARE QUESTIONS THAT DETERMINE THE BEHAVIOR OF THIS PROGRAM, TYPE 'Y'. IF YOU WANT TO TAKE ALL THE DEFAULTS TO THESE QUESTIONS, TYPE 'N'. IF YOU TYPE 'Y' YOU WILL BE ASKED THE SOFTWARE QUESTIONS (SEC 2.6), AND THE ANSWERS WILL BE PUT INTO THE SOFTWARE P-TABLE IN THE PROGRAM. THE SERIES OF QUESTIONS WILL BE ASKED JUST ONCE, REGARDLESS OF THE NUMBER OF UNITS TO BE TESTED.

****
* STEP 6 *
****

AFTER YOU HAVE ANSWERED THE SOFTWARE QUESTIONS, THE DIAGNOSTIC WILL BEGIN TO EXECUTE THE HARDWARE TEST CODE. THERE ARE SEVERAL THINGS THAT CAN HAPPEN NEXT, DEPENDING ON WHETHER A HARDWARE ERROR IS ENCOUNTERED AND ALSO ON WHAT SWITCH VALUES YOU SELECTED ON THE START COMMAND. CONSIDER THE POSSIBILITIES:

1. IF NO ERROR IS ENCOUNTERED, THEN THE DIAGNOSTIC WILL SIMPLY EXECUTE THE DESIRED NUMBER OF PASSES AND RETURN TO COMMAND MODE (PROMPT DS-B>).

2. IF AN ERROR IS ENCOUNTERED, THEN ONE OF THREE THINGS HAPPENS, DEPENDING ON THE SETTINGS OF THE HOE AND LOE FLAGS.

   HOE SET: THE ERROR WILL BE REPORTED ON THE CONSOLE AND THE DIAGNOSTIC WILL RETURN TO COMMAND MODE.
   LOE SET: THE DIAGNOSTIC WILL LOOP ENLESSLY ON THE BLOCK OF CODE THAT DETECTED THE ERROR.
   NEITHER HOE NOR LOE SET: THE ERROR WILL BE REPORTED ON THE CONSOLE AND NORMAL EXECUTION WILL RESUME AS IF NO ERROR HAD OCCURED.

2.1.2 SAMPLE RUN-THROUGH

LET'S SEE HOW ALL THIS WORKS IN A REAL SITUATION. RECALL THAT WE ENTERED THE COMMAND "STA/PASS.1/FLAGS:HOE". THIS WOULD BE A VERY TYPICAL WAY TO RUN THE DIAGNOSTIC. IF NO ERRORS ARE ENCOUNTERED, THE SINGLE REQUESTED PASS WILL BE EXECUTED AND THE PROMPT WILL BE REISSUED.

IF AN ERROR IS ENCOUNTERED, THE ERROR WILL BE REPORTED AND THE PROMPT WILL BE REISSUED (BECAUSE THE HOE FLAG IS SET). AT THIS POINT THERE ARE FOUR DIFFERENT WAYS YOU CAN GET THE PROGRAM GOING AGAINS:

1. ISSUE ANOTHER "START" COMMAND (THUS GOING THRU ALL OF STEPS 2, 3, 4, 5, AND 6 AGAIN)

2. ISSUE A "RESTART" COMMAND (SAME AS START COMMAND EXCEPT THAT THE HARDWARE QUESTIONS ARE NOT ASKED)

3. ISSUE A "CONTINUE" COMMAND (EXECUTION WILL RESUME AT THE BEGINNING OF THE PARTICULAR HARDWARE TEST (MOST DIAGNOSTICS CONSIST OF A NUMBER OF THESE) THAT IT WAS IN WHEN THE ERROR HALT OCCURED. NO QUESTIONS ASKED.

4. ISSUE A "PROCEED" COMMAND: EXECUTION WILL RESUME AT THE INSTRUCTION FOLLOWING THE ERROR REPORT (THIS IS A SPECIAL COMMAND AND CAN BE ISSUED ONLY AT A HALT ON ERROR).

THE MOST TYPICAL THING TO DO HERE IS TO ISSUE THE PROCEED, BUT WITH DIFFERENT FLAG SETTINGS. PROBABLY YOU WOULD WANT TO SAY

PRO/FLAGS:IER:LOE:HOE-0

THIS WILL DO THE FOLLOWING:

1. TURN ON THE IER (INHIBIT ERROR PRINTOUT) FLAG

2. TURN ON THE LOE FLAG

3. TURN OFF THE HOE FLAG

4. RESUME EXECUTION AT INSTRUCTION AFTER ERROR REPORT

THE DIAGNOSTIC WILL NOW LOOP ON THE BLOCK OF CODE THAT DETECTED AND REPORTED THE ERROR, BUT NO ERROR PRINTOUT WILL OCCUR. THUS YOU CAN STUDY THE ERROR OR SCOPE IT OR WHATEVER.

WHEN YOU'VE SEEN ENOUGH, YOU MAY HIT CONTROL/C. THIS WILL TAKE YOU OUT OF THE LOOP AND PUT YOU BACK INTO COMMAND MODE. YOU NOW HAVE THREE CHOICES:

1. START

2. RESTART

3. CONTINUE

LET'S SAY YOU'VE REPAIRED THE DEFECT FOUND ABOVE AND WANT TO FINISH RUNNING THE DIAGNOSTIC. YOU WOULD TYPE

```
CON/FLAGS:HOE:IER=0:LOE=0
```

THIS WILL RESTORE THE FLAGS TO THEIR ORIGINAL VALUES AND RESUME EXECUTION AT THE BEGINNING OF THE HARDWARE TEST YOU WERE IN. IF THE ERROR DOES NOT RECUR, THE EXECUTION WILL FLOW RIGHT ON THRU TO THE NEXT ERROR OR TO END OF PASS.

IF AT END OF PASS YOU WANT TO RUN THE DIAGNOSTIC AGAIN, YOU HAVE TWO CHOICES:

1. START

2. RESTART

YOU WOULD CHOOSE ONE, DEPENDING ON WHETHER YOU WANTED TO ANSWER THE HARDWARE QUESTIONS AGAIN.

SEQ 0009

THE FULL PRINT-OUT FROM THE ABOVE DIALOGUE MIGHT LOOK LIKE THIS:

```
                                                    BY
                                                    WHOM
                                                    ENTERED:
.R DZRKXX                                           O
DZRKXX                                              D
L-CLK (L) N ? *                                     D.O
50HZ (L) N ?                                        D
LSI (L) N ?                                         D
LPT (L) N ?                                         D
MEM (K) (D) 16 ?                                    D
DS-B>STA/PASS:1/FLAGS:HOE                           D.O
# UNITS (D) ? 2                                     D.O
UNIT 1                                              D
CSR (O) ?                                           D.O
VECTOR (O) ?                                        D.O
BR LEVEL (O) ?                                      D.O
DRIVE (O) ? 0                                       D.O
UNIT 2                                              D
CSR (O) ?                                           D.O
VECTOR (O) ?                                        D.O
BR LEVEL (O) ?                                      D.O
DRIVE (O) ? 1                                       D.O
CHANGE SW (L) ? N                                   D.O
DZRKXX HARD ERR 00004 TST 003 SUB 002 PC:004130     D
ERR HLT                                             D
DS-B>PRO/FLAGS:IER:LOE:HOE 0                        D.O

*****************************************************
AT THIS POINT THE DIAGNOSTIC IS LOOPING ON THE
ERROR WITHOUT PRINTING ANYTHING.  YOU CAN SCOPE
THE ERROR UNTIL YOU HAVE LOCATED IT, THEN ^C OUT
*****************************************************

^C                                                  O
DS-B>CON/FLAGS:HOE:IER:LOE=0                        D.O
CHANGE SW (L) ? N                                   D.O
DZRKXX EOP 1                                        D
DS-B>RESTART/PASS:1                                 D.O
CHANGE SW (L) ? N                                   D.O
------------------
------------------
------------------
------------------
------------------
```

2.2 HOW TO CREATE A CHAINABLE FILE

THE DIAGNOSTIC AS RECEIVED FROM RELEASE ENGINEERING CANNOT BE RUN IN CHAIN MODE. THA IS WHY IT BEARS THE EXTENSION 'BIN'' INSTEAD OF 'BIC''. THERE IS A WAY, HOWEVER, TO CREATE A CHAINABLE PROGRAM FROM WHAT YOU'VE GOT.

IT CONSISTS OF RUNNING THE PROGRAM WITH THE SPECIAL COMMAND ''CCI'' ISSUED WHERE YOU WOULD NORMALLY ISSUE A START COMMAND (TO THE PROMPT DS-B>. THIS COMMAND CAUSES THE DIAGNOSTIC TO GO THRU ALL THE QUESTIONS AND ANSWERS AND THEN TO HALT, JUST WHERE IT WOULD ORDINARILY BEGIN EXECUTION OF THE HARDWARE TEST CODE. AT THIS POINT YOU CAN DUMP THE PROGRAM AS IT SITS IN CORE TO THE LOAD MEDIUM, WITH THE NEW EXTENSION 'BIC''.

HERE IS A SAMPLE DIALOGUE TO ACCOMPLISH THIS:

```
.R UPD2
RESTART:  XXXXXX
*CLR
*LOAD DIAG.BIN
XFER:200   CORE:0,60602
*START 200
L-CLK (L) N ?
------------
------------
------------
DS-B>CCI
# UNITS (D) ? 4
------------
------------
------------
CHANGE SW (L) ? N
PTAB END:  60632

****************************************
*AT THIS POINT THE MACHINE HALTS AND*
*YOU MUST RESTART AT ADDRESS  XXXXXX*
****************************************

*HICORE 60632
CORE:  0,60632
*DUMP DK0: DIAG.BIC
```

THE RESULT OF DOING THIS IS THAT YOU CAN NOW BUILD AN XXDP CHAIN FILE CONTAINING THE XXDP COMMAND

```
.R DIAG.BIC
```

AND THE DIAGNOSTIC WILL EXECUTE WITHOUT MANUAL INTERVENTION, USING THE ANSWERS THAT YOU GAVE IT WHEN YOU DID THE CCI COMMAND.

2.3 DETAILS OF COMMANDS AND SYNTAX

2.3.1 TABLE OF COMMAND VALIDITY

THERE ARE FOUR WAYS OF ENTERING DIAGNOSTIC COMMAND MODE, AND DIFFERENT SUBSETS OF THE DIAG COMMAND SET ARE AVAILABLE WITH EACH:

	HOW ENTERED	LEGAL COMMANDS
1.	OPERATOR ENTERED 'RUN DIAG'	START PRINT DISPLAY FLAGS ZFLAGS
2.	DIAGNOSTIC HAS FINISHED ALL ITS REQUESTED PASSED	START RESTAR PRINT DISPLAY FLAGS ZFLAGS
3.	OPERATOR INTERRUPTED THE DIAGNOSTIC WITH CTRL/C	START RESTART CONTINUE PRIN DISPLAY FLAGS ZFLAGS
4.	AN ERROR WAS ENCOUNTERED WITH THE HOE FLAG SET SET	START RESTART CONTINUE PROCEED PRINT DISPLAY FLAGS ZFLAGS

2.3.2 COMMAND SYNTAX

```
**********************************************************************
STA(RT)/TESTS:TEST-LIST/PASS:PASS-CNT/FLAGS:FLAG-LIST/EOP:EOP-INCR
**********************************************************************
```

THE DIAGNOSTIC IN CORE IS EXECUTED IN ACCORDANCE WITH THE SWITCHES SPECIFIED. THE MESSAGE "# UNITS?" IS PRINTED. THE START COMMAND MAY BE ISSUED WHEN DIAGNOSTIC COMMAND MODE HAS BEEN ENTERED VIA ONE OF THE FOLLOWING: A) OPERATOR TYPED 'RUN DIAGNOSTIC" B) DIAGNOSTIC FINISHED EXECUTING C) ERROR WAS ENCOUNTERED WITH HOE FLAG SET D) OPERATOR ENTERED CONTROL/C.

AFTER THE OPERA OR RESPONDS TO ''# UNI'S?'', THE HARDWARE DIALOGUE IS INITIATED. WHEN IT IS COMPLETED, THE QUESTIONS ''CHANGE SW?'' IS ISSUED, AND THE ANSWERS, IF GIVEN, BECOME THE NEW DEFAULTS. THEREFORE IT IS NECESSARY TO RELOAD THE PROGRAM IN ORDER TO RETURN TO THE LOAD DEFAULTS.

THE SWITCH ARGUMENTS ARE AS FOLLOWS:

''TEST-LIST'' IS A SEQUENCE OF DECIMAL NUMBERS (1:2 ETC.) OR RANGES OF DECIMAL NUMBERS (1-5:8-10 ETC.) THAT SPECIFY THE TESTS TO BE EXECUTED. THE NUMBERS ARE SEPARATED BY COLONS. THE NUMBERS RANGE FROM 1 TO THE LARGEST TEST NUMBER IN THE DIAGNOSTIC. THEY MAY BE SPECIFIED IN ANY ORDER. TESTS WILL BE EXECUTED IN NUMBERICAL ORDER REGARDLESS OF THE ORDER OF SPECIFICATION. THE DEFAULT IS TO EXECUTE ALL TESTS.

''PASS-CNT'' IS A DECIMAL NUMBER INDICATING THE DESIRED NUMBER OF PASSES. A PASS IS DEFINED AS THE EXECUTION OF THE FULL DIAGNOSTIC (ALL SELECTED TESTS) AGAINST ALL UNITS SUMBITTED. THE DEFAULT IS NON-ENDING EXECUTION..B ''FLAG-LIST'' IS A SEQUENCE OF ELEMENTS OF THE FORM <FLAG>, <FLAG=1>, OR <FLAG-0>, SEPARATED BY COLONS, WHERE <FLAG> HAS ONE OF THE FOLLOWING VALUES:

HOE	HALT ON ERROR, CAUSING COMMAND MODE TO BE ENTERED WHEN AN ERROR IS ENCOUNTERED
LOE	LOOP ON ERROR, CAUSING THE DIAGNOSTIC TO LOOP CONTINUOUSLY WITHIN THE SMALLEST DEFINED BLOCK OF CODING (SEGMENT, SUBTEST, OR TEST) CONTAINING THE ERROR
IER	INHIBIT ERROR REPORTING
IBE	INHIBIT BASIC ERROR REPORTS
IXE	INHIBIT EXTENDED ERROR REPORTS
PRI	DIRECT ALL MESSAGES TO A LINE PRINTER
PNT	PRINT NUMBER OF TES BEING EXECUTED
BOE	BELL ON ERROR
UAM	RUN IN UNATTENDED MODE, BYPASSING MANUAL INTERVENTION TESTS
ISR	INHIBIT STATISTICAL REPORTS
IDU	INHIBIT DROPPING OF UNITS BY DIAGNOSTIC

SEQ 0013

THE FLAGS NAMED OR EQUATED TO 1 ARE SET, THOSE EQUATED TO 0 ARE CLEARED. A FLAG NOT SPECIFIED IS CLEARED. IF THE FLAGS SWITCH IS NOT GIVEN ALL FLAGS ARE CLEARED.

''EOP-INCR'' IS A DECIMAL NUMBER INDICATING HOW OFTEN (IN TERMS OF PASSES) IT IS DESIRED THAT THE END OF PASS MESSAGE BE PRINTED. THE DEFAULT IS AT THE END OF EVERY PASS.

****
RES(TART)/TEST:TEST-LIST/PASS:PASS-CNT/FLAGS:FLAG-LIST/EOP:EOP-INCR/UNITS:UNIT-LIST
****

THE DIAGNOSTIC IN CORE IS EXECUTED IN ACCORDANCE WITH THE SWITCHES SPECIFIED. HOWEVER, NEW P-TABLES ARE NOT BUILT. INSTEAD, THE ONES IN CORE ARE USED.
THE QUESTION ''CHANGE SW?'' IS ASKED, AND THE ANSERS IF GIVEN BECOME THE NEW DEFAULTS. THE COMMAND MAY BE ISSUED WHEN COMAND MODE HAS BEEN ENTERED VIA A) DIAGNOSTIC IS FINISHED B) HALT ON ERROR C) CONTROL/C.

THE SWITCH ARGUMENTS ARE AS IN THE START COMMAND EXCEPT:

1. ''UNIT-LIST'' IS A SEQUENCE OF LOGICAL UNIT NUMBERS RANGING FROM 1 THRU N (N = NUMBER OF UNITS BEING TESTED) SPECIFYING WHICH UNITS ARE TO BE TESTED. THE LOGICAL UNIT NUMBER DESIGNATES THE POSITION OF THE P-TABLE IN CORE, ACCORDING TO THE ORDER IN WHICH THEY WERE BUILT. THE UNITS SPECIFIED MUST NOT HAVE BEEN DROPPED BY THE OPERATOR DROP COMMAND. THE UNIT-LIST DEFAULTS TO ''ALL THAT HAVE NOT BEEN DROPPED BY OPERATOR COMMAND''. THE EFFECT OF THE UNIT-LIST LASTS UNTIL THE NEXT START (WHERE IT IS AUTOMATICALLY RESET TO ''ALL'') OR THE NEXT RESTART.

2. ALL UNSPECIFIED FLAG SETTINGS ARE UNCHANGED.

****
CON(TINUE)/PASS:<PASS-CNT/FLAGS:<FLAG-LIST>
****

COMMAND MODE MUST HAVE BEEN ENTERED DUE TO A HALT ON ERROR OR A CONTROL/C. THE EFFECT OF THE COMMAND IS TO GO TO THE BEGINNING OF THE TEST THAT WAS BEING EXECUTED WHEN THE HALT OR CONTROL/C TOOK PLACE. SOFTWARE DIALOGUE MAY OPTIONALLY BE REEXECUTED. HARDWARE PARAMETERS MAY NOT BE CHANGED.

THE SWITCH ARGUMENTS ARE AS IN THE START COMMAND EXCEPT:

1. DEFALT FOR PASS-CNT IS THE UNSATISFIED PASS-CNT FROM THE PREVIOUS START OR RESTART

2. UNSPECIFIED FLAG SETTINGS ARE UNCHANGED

****
PRO(CEED)/FLAGS:<FLAG-LIST>
****

COMMAND MODE MUST HAVE BEEN ENTERED VIA A HALT ON ERROR. THE EFFECT OF THE COMMAND IS TO BEGIN EXECUTION AT THE LOCATION FOLLOWING THE ERROR CALL. NEITHER HARDWARE NOR SOFTWARE PARAMETERS MAY BE ALTERED.

THE SWITCH ARGUMENTS ARE THE SAME AS THE START COMMAND EXCEPT:

1. UNSPECIFIED FLAG SETTINGS ARE UNCHANGED

****
CCI/TEST:TEST-LIST/PASS:PASS-CNT/FLAGS:FLAG-LIST/EOP:EOP-INCR
****

THE DIAGNOSTIC EXECUTES THRU ALL OPERATOR DIALOGUE AND HALTS AT THE HARDWARE TEST CODE. NOW THE OPERATOR CAN DUMP THE CORE IMAGE TO THE MEDIUM WITH A BIC EXTENSION.

THE BIC FILE MUST BE HANDLED DIFFERENTLY DEPENDING ON WHETHER IT IS RUN MANUALLY OR IN CHAIN MODE. IF RUN MANUALLY IT CAN BE INVOKED EITHER WITH A "START" (IN WHICH CASE IT WILL BEHAVE LIKE THE BIN FILE: THE PRE-GENERATED ANSWERS TO OPERATOR QUESTIONS WILL BE IGNORED) OR WITH A "RESTART" (IN WHICH CASE THE PRE-GENERATED OPERATOR ANSWERS WILL BE USED).

IF RUN IN CHAIN MODE, AUTOMATIC EXECUTION WILL COMMENCE IMMEDIATELY FROM THE XXDP COMMAND ".R DIAG". THE COMMAND PROMPT "DS-B>" WILL NOT BE ISSUED.

ANY SWITCHES SPECIFIED ON THE CCI COMMAND WILL CARRY OVER WHEN THE BIC FILE IS RUN IN CHAIN MODE (EXCEPT THAT UAM IS ALWAYS SET THERE) BUT WILL NOT CARRY OVER WHEN IT IS RUN MANUALLY.

TO DO A CCI ON A FULL SIZED DIAGNOSTIC (14.5K WORDS), A MACHINE SIZE LARGER THAN 16K IS REQUIRED. THE EXACT SIZE NEEDED DEPENDS ON WHICH UTILITY IS USED TO EXECUTE THE DIAGNOSTIC AT CCI TIME.

****
DRO(P)/UNITS:UNIT-LIST
****

THE UNITS SPECIFIED ARE DROPPED FROM TESTING UNTIL THEY ARE ADDED BACK OR UNTIL A START COMMAND IS GIVEN. A DROP CANNOT BE FOLLOWED BY A PROCEED.

THERE IS ALSO A "DROP" MACRO INTERNAL TO THE DIAGNOSTIC, WHICH GIVES THE FACILITY OF AUTO-DROPPING. THE DURATION OF A PROGRAM DROP, HOWEVER, IS ONLY UNTIL THE NEXT START OR RESTART.

****
ADD/UNITS:UNIT-LIST
****

THE UNITS SPECIFIED ARE ADDED BACK (THEY MUST HAVE BEEN PREVIOUSLY DROPPED BY THE DROP COMMAND) TO THE TEST SEQUENCE. AN ADD CANNOT BE FOLLOWED BY A PROCEED.

****
PRI(NT)
****

ALL STATISTICS TABLES ACCUMULATED BY THE DIAGNOSTIC ARE PRINTED. THE ISR (INHIBIT STATISTICAL REPORTING) FLAG IS CLEARED.

****
DIS(PLAY)/UNITS:<UNIT-LIST>
****

THE HARDWARE P-TABLES FOR ALL UNITS UNDER TEST ARE PRINTED OUT IN THE FORMAT IN WHICH THEY WERE ENTERED. ANY UNITS THAT WERE DROPPED BY THE OPERATOR ''DROP'' COMMAND ARE SO DESIGNATED.

****
FLA(GS)
****

THE CURRENT SETTINGS OF ALL FLAGS ARE PRINTED.

****
ZFL(AGS)
****

ALL FLAGS ARE CLEARED.

2.4 EXTENDED P-TABLE DIALOGUE

THE FULL CAPABILITY OF THE HARDWARE DIALOGUE IS REVEALED BY THE FOLLOWING DISCUSSION OF WHAT HAPPENS INTERNALLY.

AS SOON AS THE QUESTION ''# UNITS?'' IS ANSWERED (WITH THE NUMBER N, SAY) SPACE IN CORE IS ALLOCATED FOR N P-TABLES. ALL OF THE P-TABLES ARE OF THE SAME FORMAT, AND THERE IS A ONE-TO-ONE CORRESPONDENCE BETWEEN THE HARDWARE PARAMETER QUESTIONS AND THE SLOTS IN THE P-TABLE FORMAT.

ON THE FIRST TRIP THRU THE QUESTIONS, ALL OF THE SLOTS IN ALL OF THE P-TABLES ARE FILLED. IF THE OPERATOR TYPES IN LESS THAN N EXPLICIT VALUES IN RESPONSE TO A PARTICULAR QUESTION, THESE VALUES ARE PLACED IN THE P-TABLES (ONE VALUE GOING INTO THE PROPER SLOT OF EACH P-TABLE BEGINNING WITH THE FIRST P-TABLE) UNTIL THE STRING OF VALUES IS EXHAUSTED. THE LAST VALUE THAT SLOT IN THE REMAINING P-TABLES.

ON SUBSEQUENT TRIPS THRU THE QUESTIONS, THE SAME PROCESS IS CARRIED OUT, EXCEPT THAT THE EARLIEST P-TABLE NOT TO HAVE RECEIVED AN EXPLICIT VALUE IN ANY OF ITS SLOTS NOW ASSUMES THE ROLE THAT TABLE NUMBER ONE PLAYED IN THE FIRST TRIP.

THE SERIES OF QUESTIONS IS REISSUED UNTIL AT LEAST ONE QUESTION HAS RECEIVED N EXPLICIT VALUES FROM THE OPERATOR.

IN GIVING A STRING OF VALUES, COMMAS WITHOUT INTERVENING VALUES MAY BE USED TO INDICATE A REPETITION OF THE LAST NAMED VALUE.

A STRING OF VALUES MAY BE GIVEN AS A RANGE (6-10 FOR EXAMPLE). IF THE VALUES REPRESENT PURE NUMERICAL DATA, THIS SAMPLE RANGE TRANLATES TO THE STRING 6,7,8,9,10 (AN INCREMENT OF 1). IF THE VALUES ARE ADDRESSES, THE SAMPLE RANGE TRANSLATES TO THE STRING 6,8,10 (AN INCREMENT OF 2).

NOW LET US SEE HOW WE COULD USE THESE CAPABILITIES TO CONSTRUCT A SET OF P-TABLES. ASSUME THAT WE HAVE 64 UNITS, AND THAT THERE ARE THREE HARDWARE PARAMETERS FOR EACH (THREE SLOTS IN THE P-TABLE, THREE HARDWARE QUESTIONS IN THE DIALOGUE). LET THE DESIRED VALUE FOR THE FIRST PARAMETER BE THE NUMBER 75 FOR ALL 64 TABLES. LET THE DESIRED VALUE FOR THE SECOND PARAMETER BE EQUAL TO THE UNIT NUMBER (1,2,3,...,64) EXCEPT FOR UNIT 50, WHICH SOULD RECEIVE THE VALUE 49. LET THE DESIRED VALUE FOR THE THIRD PARAMETER BE THE NUMBER 76 FOR THE FIRST 20 UNITS AND THE NUMBER 77 FOR THE LAST 44 UNITS.

THE FOLLOWING DIALOGUE WOULD ACCOMPLISH THIS GOAL:

```
# UNITS (D) ? 64

UNIT 1
<QUESTION 1> ? 75
<QUESTION 2> ? 1-20
<QUESTION 3> ? 76

UNIT 21
<QUESTION 1> ?
<QUESTION 2> ? 21-49,,51-64
<QUESTION 3> ? 77
```

THE FIRST TIME THE SERIES IS ASKED, SLOT ONE RECEIVES A 75 IN ALL 64 TABLES. SLOT TWO RECEIVES THE VALUES 1,2,3,...,20 IN TABLES 1 THRU 20 AND A CONSTANT 20 IN TABLES 21 THRU 64. SLOT THREE RECEIVES A CONSTANT 76 IN ALL 64 TABLES.

THE SECOND TIME THRU THE SERIES, TABLES 21 THRU THE END ARE GOING TO BE AFFECTED (NOTE THAT THIS PIECE OF INFORMATION IS PRINTED OUT FOR THE OPERATOR IN THE FORM 'UNIT XX'' AT THE BEGINNING OF EACH SERIES). QUESTION 1 IS RESPONDED TO BY A <CR>, SO SLOT ONE STAYS A CONSTANT 75 IN TABLES 21 THRU 64, SINCE NO NEW EXLICIT VALUES ARE TYPED IN. SLOT TWO GETS THE VALUES 21,22,23,...,49 IN TABLES 21 THRU 49, AND GETS A 49 IN SLOT 50, AND GETS THE VALUES 51,52,53,...,64 IN TABLES 51 THRU 64. SLOT THREE GETS THE VALUE 77 IN TABLES 21 THRU 64.

THE DIALOGUE IS TERMINATED WHEN THE SOFTWARE RECOGNIZES THAT 64 EXPLICIT VALUES HAVE BEEN GIVEN FOR AT LEAST ON QUESTION (NAMELY QUESTION 2).

2.5 HARDWARE PARAMETERS

THE FOLLOWING QUESTIONS WILL BE ASKED ON A START COMMAND. THE VALUE LOCATED TO THE LEFT OF THE QUESTION MARK IS THE DEFAULT VALUE THAT WILL BE TAKEN ON A CARRIAGE RETURN RESPONCE.

RL11 (L) Y?

ANSWER YES(Y) IF YOU HAVE AN RL11 CONTROLLER, NO(N) IF YOU HAVE AN RLV11 CONTROLLER.

BUS ADDRESS (O) 174400?

ANSWER WITH THE BUS ADDRESS OF THE CONTROLLER.

VECTOR (O) 330?

ANSWER WITH THE INTERRUPT VECTOR OF THE CONTROLLER.

BR LEVEL (O) 5?

ANSWER WITH THE INTERRUPT PRIORITY OF THE CONTROLLER.

DRIVE (O) 0?

ANSWER WITH THE DRIVE(S) CONNECTED TO THE CONTROLLER.

2.6 SOFTWARE PARAMETERS

THE FOLLOWING QUESTIONS ARE ASKED IF REQUESTED ON A START, RESTART, OR CONTINUE. THEY ALLOW FLEXABILITY IN THE WAY THE PROGRAM BEHAVES. THE SOFTWARE PARAMETERS GIVE THE PROGRAM FLEXIBILITY IN THE WAY IT RUNS. THE PARAMETERS CAN BE MODIFIED ON A START, RESTART, OR CONTINUE BY ANSWERING (Y)ES TO THE FOLLOWING QUESTION:

CHANGE S.W. ?

A YES ANSWER WILL ASK THE FOLLOWING SOFTWARE PARAMETER QUESTIONS, WITH THE PRESENT DEFAULT VALUE PRINTED TO THE LEFT OF THE QUESTION MARK. (THE LAST ANSWER GIVEN IS THE DEFAULT) THE DEFAULT IS TAKEN ON A <CR>. CONTROL Z (^Z) WILL DEFAULT ALL REMAINING QUESTIONS AND START THE TEST.

DROP ON ERROR LIMIT (L) Y?

TO ALLOW THE UNIT TO BE DROPPED ONCE A PREDETERMINED NUMBER OF ERRORS ARE ENCOUNTERED.

ANSWER Y OR N

ERROR LIMIT (D) 10?

NUMBER OF ERRORS ALLOWED BEFORE DROPPING UNIT.

ANSWER 1 TO 65K

AUTOSIZE (L) N?

TO CHECK TO SEE IF UNIT SPECIFIED ACTUALLY EXISTS BEFORE TESTING IT (VIA DRIVE READY), IF NOT UNIT WILL NOT BE TESTED.

ANSWER Y OR N

COMPARE DATA ON DCK (L) N?

WHEN A DATA CHECK IS ENCOUNTERED AND DATA IS KNOWN, ALLOW AN INCORE COMPARISON OF DATA.

ANSWER Y OR N

OF WORDS IN ERROR REPORTED (D) 3?

NUMBER OF MISCOMPARES TO BE PRINTED ON CONSOLE DEVICE.

ANSWER 0 - 128

3.0 ERROR INFORMATION

ALL ERROR INFORMATION IS PRINTED ON THE CONSOLE DECIVE. ERROR REPORTS ARE AIMED AT BEING SELF EXPLANATORY. THE GENERAL FORMAT IS:

DZRL? XXX ERR YYYYY TST ZZZ SUB PPP PC: RRRRRR

WHERE:

?	IS PROGRAM LETTER
XXX	IS SFT - SOFT ERROR HRD - HARD ERROR

```
                DV FAT - DEVICE FATAL ERROR
               SYS FAT - SYSTEM FATAL ERROR
        YYYYY   IS THE ERROR NUMBER
        ZZZ     IS THE TEST NUMBER
        PPP     IS THE SUBTEST NUMBER
        RRRRRR  IS THE PROGRAM LISTING LOCATION
```

ERRORS GIVE THE REGISTER CONTENTS BEFORE AND AFTER THE ERROR
ALONG WITH A ONE LINE DESCRIPTION AND RELEVENT DATA.

EXAMPLE:

```
ONE LINE DESCRIPTION
(OPTIONAL SECOND LINE)
(OPTIONAL THIRD LINE)
BEFORE COMMAND: CS:XXXXXX BA:XXXXXX DA:XXXXXX MP:XXXXXX
TIME OF ERROR:  CS:XXXXXX BA:XXXXXX DA:XXXXXX MP:XXXXXX XXXXXX XXXXXX
```

3.2 ERROR HALTS

ERROR HALTS ARE SUPPORTED PER DESCRIBED IN THE PREVIOUS SECTION WITH /FLAG:HOE. THERE ARE NO OTHER HALTS.

4.0 PERFORMANCE AND PROGRESS REPORTS

4.1 PERFORMANCE REPORTS

THIS PROGRAM WILL NOT GIVE ANY PERFORMANCE REPORTS.

4.2 PROGPESS REPORTS

THIS PROGRAM WILL NOT GIVE ANY PRCGRESS RFPORTS.

5.0 DEVICE INFORMATION TABLES

THE RL11/RLV11 CONTROLLER HAS THE FOLLOWING FOUR(4) REGISTERS FOR CONTRO. OF THE SUBSYSTEM.

RLCS - CONTROL AND STATUS REGISTEP (XXXXX0)

```
BIT 15 - COMPOSITE ERROR
BIT 14 -  RIVE ERROR
BIT 13 - NON EXISTANT MEMORY ERROR
BIT 12 - HEADER NOT FOUND (WITH BIT 10 SET)
       - DATA LATE (WITH BIT 10 CLEAR)
BIT 11 - HEADER CRC (WITH BIT 10 SET)
       - DATA CRC (WITH BIT 10 CLEAR)
BIT 10 - OPERATION INCOMPLETE
BIT  9/8 - DRIVE SELECT (0-3)
```

```
BIT  7 - CONTROLLER READY
BIT  6 - INTERRUPT ENABLE
BIT  5 - EXTENDED BUS ADDRESS (BIT 17)
BIT  4 - EXTENDED BUS ADDRESS (BIT 16)
BIT 3-1 - FUNCTION CODE
        0 - NOP (PDP-11) MAINT (LSI-11)
        1 - WRITE CHECK
        2 - GET DRIVE STATUS
        3 - SEEK
        4 - READ HEADER
        5 - WRITE DATA
        6 - READ DATA
        7 - READ WITHOUT HEADER COMPARE

BIT  0 - DRIVE READY


RLBA - BUS ADDRESS REGISTER (XXXXX2)
------------------------------------

BITS 15-1 BUS ADDRESS OF DATA TRANSFER
BIT 0 SHOULD BE 0

RLDA - DISK ADDRESS REGISTER (XXXXX4)
-------------------------------------

FOR READ/WRITE FUNCTIONS
------------------------

BIT 15 - MUST BE ZERO(0)
BIT 14-7 - CYLINDER ADDRESS FOR TRANSFER
BIT 6 - SURFACE FOR TRANSFER
BIT 5-0 - SECTOR FOR TRANSFER (0-47)

FOR SEEK FUNCTION
-----------------

BIT 15 - MUST BE ZERO(0)
BIT 14-7 - DIFFERENCE TO NEW CYLINDER
BIT 6-5 - MUST BE ZERO(0)
BIT 4 - SURFACE
BIT 3 - MUST BE ZERO
BIT 2 - SEEK DIRECTION( 1 - IN / 0 - OUT )
BIT 1 - MUST BE ZERO
BIT 0 - MUST BE ONE(1)

FOR GET STATUS FUNCTION
-----------------------

BIT 15-4 - IGNORED SHOULD BE ZERO
BIT 3 - DRIVE RESET
BIT 2 - MUST BE ZERO
BIT 1 - MUST BE ONE
BIT 0 - MUST BE ONE
```

RLMP - MULTIPURPOSE REGISTER

FOR READ/WRITE FUNCTION

BIT 15 - 0 - WORD COUNT(TWO'S COMPLIMENT)

FOR READ HEADER FUNCTION

BIT 15-0 - DISK HEADER OF SECTOR (FIRST READ)
- ZERO WORD (SECOND READ)
- HEADER CRC (THIRD READ)

FOR GET STATUS FUNCTION

HAS DRIVE STATUS

BIT 15 - WRITE DATA ERROR
BIT 14 - CURRENT HEAD ERROR(CHE)
BIT 13 - WRITE LOCK STATUS(WL)
BIT 12 - SEEK TIME OUT(SKTO)
BIT 11 - SPIN ERROR(SPE)
BIT 10 - WRITE GATE ERROR(WGE)
BIT 9 - VOLUME CHECK(VC)
BIT 8 - DRIVE SELECT ERROR(DSE)
BIT 7 - RESERVED(0)
BIT 6 - SURFACE
BIT 5 - COVER OPEN
BIT 4 - HEADS HOME
BIT 3 - BRUSHES HOME
BIT 2-0 -STATE BITS
0 - LOAD STATE
1 - SPIN UP
2 - BRUSH CYCLE
3 - LOAD HEADS
4 - SEEK - TRACK COUNTING
5 - SEEK - LINEAR MODE
6 - UNLOAD HEADS
7 - SPIN DOWN

6.0 TEST SUMMARIES

TEST 01 - WRITE NPR INTEGRITY

THIS TEST WILL VERIFY THAT THE WRITE FUNCTION WILL NOT CAUSE
A BUS TRAP THEREFORE VERIFYING THE NPR LOGIC BETWEEN THE
CONTROLLER AND PROCESSOR.

TEST 02 - WRITE FUNCTION

THIS TEST WILL VERIFY THAT THE WRITE FUNCTION WILL RESET CONTROLLER READY AND POST NO ERRORS.

TEST 03 - WRITE FUNCTION INTERRUPT

THIS TEST WILL VERIFY THAT THE WRITE FUNCTION WILL GENERATE AN INTERRUPT ON COMPLETION.

TEST 04 - PROPER INCREMENT OF RLBA ON WRITE

THIS TEST WILL VERIFY THAT THE BUS ADDRESS REGISTER INCREMENTS PROPERLY ON A WRITE FUNCTION.

TEST 05 - PROPER INCREMENT OF RLDA ON WRITE

THIS TEST WILL VERIFY THAT THE DISK ADDRESS REGISTER INCREMENTS PROPERLY ON A WRITE FUNCTION.

TEST 06 - FORCE HEADER NOT FOUND WITH WRITE

THIS TEST WILL FORCE A HEADER NOT FOUND ERROR ON A WRITE. THE RLDA IS SET UP TO LOOK FOR SECTOR 40, A WRITE IS THEN ISSUED. THE HEADER NOT FOUND ERROR SHOULD THEN SET.

TEST 07 - FORCE INTERRUPT WITH HNF

THIS TEST WILL FORCE A HEADER NOT FOUND ERROR UNDER INTERRUPT CONTROL.

TEST 08 - CHECK OPI TIME WITH HNF

THIS TEST WILL TIME THE SETTING OF HNF (OPI) FROM ISSUANCE. THIS IS DONE BY ISSUING A WRITE TO SECTOR 40. THE TIME OF OPI SHOULD BE AROUND 200 MILLISECONDS.

TEST 09 - MULTIPLE SECTOR TRANSFER ON WRITE

THIS TEST THE ABILITY FOR THE WRITE FUNCTION TO WRITE MORE THAN ONE SECTOR. WE SET UP FOR A TWO SECTOR WRITE.

TEST 10 - CHECK DIRECTION OF WRITE NPR

THIS TEST WILL VERIFY THAT THE NPR DIRECTION OF A WRITE FUNCTION IS FROM MEMORY TO THE CONTROLLER. THIS IS DONE BY WRITING A PATTERN IN MEMORY AND ISSUING A WRITE, THEN CHECKING MEMORY TO VERIFY THAT IT DID NOT GET DISTURBED.

TEST 11 - CHECK FULL INCREMENT OF RLBA

THIS TFST WILL CHECK THAT THE RLBA CAN INCREMENT OF THE FULL 16 BIT RANGE. THIS IS DONE BY ISSUING A ONE WORD WRITE TO CHECK EACH BIT TOGGLE FROM 1-0 AND 0-1. THIS IS DONE FROM 0 TO 177776 REGARDLESS OF MEMORY SIZE.

TEST 12 - BA BIT 16 INCREMENT

THIS TEST WILL CHECK THAT BUS ADDRESS BIT 16 WILL SET WHEN THE RLBA IS 177776. AND THAT THE RLBA GOES TO 0.

TEST 13 - BA BIT 17 INCREMENT

THIS TEST WILL CHECK THAT BUS ADDRFSS BIT 17 WILL SET WHEN BIT 16 AND THE RLBA ARE SET. THE RLBA AND BIT 16 ARE CHECKED TO GO TO ZERO.

TEST 14 - READ NPR INTEGRITY

THIS TEST WILL VERIFY THAT THE READ FUNCTION WILL NOT CAUSE A BUS TRAP THEREFORE VERIFYING THE NPR LOGIC BETWEEN THE CONTROLLER AND PROCESSOR.

TEST 15 - READ FUNCTION

THIS TEST WILL VERIFY THAT THE READ FUNCTION WILL RESET CONTROLLER READY AND POST NO ERRORS.

TEST 16 - READ FUNCTION INTERRUPT

THIS TEST WILL VERIFY THAT THE READ FUNCTION WILL GENERATE AN INTERRUPT ON COMPLETION.

TEST 17 - CHECK DIRECTION OF READ NPR

THIS TEST WILL VERIFY THAT THE NPR DIRECTION OF A READ FUNCTION IS FROM CONTROLLER TO THE MEMORY. THIS IS DONE BY WRITING A PATTERN IN MEMORY AND ISSUING A READ, THEN CHECKING MEMORY TO VERIFY THAT IT DID NOT GET DISTURBED.

TEST 18 - PROPER INCREMENT OF RLBA ON READ

THIS TEST WILL VERIFY THAT THE BUS ADDRESS REGISTER INCREMENTS PROPERLY ON A READ FUNCTION.

TEST 19 - PROPER INCREMENT OF RLDA ON READ

THIS TEST WILL VERIFY THAT THE DISK ADDRESS REGISTER INCREMENTS PROPERLY ON A READ FUNCTION.

TEST 20 - FORCE HEADER NOT FOUND WITH READ

THIS TEST WILL FORCE A HEADER NOT FOUND ERROR ON A READ. THE RLDA IS SET UP TO LOOK FOR SECTOR 40, A READ IS THEN ISSUED. THE HEADER NOT FOUND ERROR SHOULD THEN SET.

TEST 21 - FORCE INTERRUPT WITH HNF

THIS TEST WILL FORCE A HEADER NOT FOUND ERROR UNDER INTERRUPT CONTROL.

TEST 22 - CHECK HEADER COMPARE LOGIC

THIS TEST WILL EXTENSIVELY CHECK THE CYLINDER AND HEAD BITS OF THE HEADER WORD TO COMPARE CORRECTLY. THIS IS DONE BY WALKING AND GROWING 0'S AND 1'S THRU THE PROPER RLDA BITS AND ISSUING READ TO SEE IF ALL BIT POSITIONS CAN COMPARE.

TEST 23 - MULTIPLE SECTOR TRANSFER ON READ

THIS TEST THE ABILITY FOR THE READ FUNCTION TO WRITE MORE THAN ONE SECTOR. WE SET UP FOR A TWO SECTOR READ.

TEST 24 - FORCE HNF AT END OF TRACK

THIS TEST WILL CHECK THE ABILITY TO DETECT HEADER NOT FOUND AT THE END OF A TRACK. THIS DONE BY SETTING UP FOR A TWO SECTOR READ AT SECTOR 39.

TEST 25 - FORCE NON-EXISTANT MEMORY ERROR

THIS TEST WILL CHECK THAT THE NON-EXISTANT MEMORY ERROR (NXM) CAN SET. WE WILL ISSUE A READ TO THE MAXIMUM ADDRESS AND EXPECT A NXM ERROR. (THIS TEST WILL NOT BE DONE ON A 128K MACHINE.)

TEST 26 - FORCE NXM UNDER INTERRUPT

THIS TEST WILL ATTEMPT TO FORCE AN INTERRUPT VIA NXM. (THIS TEST WILL NOT BE DONE ONA 128K MACHINE.)

TEST 27 - CHECK READ WRITE LOOP

THIS TEST WILL WRITE A PATTERN TO SECTOR 0 AND TRY TO RECOVER IT WITH A WRITE.

TEST 28 - CHECK OF SILO LINES

THIS TEST WILL CHECK THAT WE CAN WRITE AND READ UNIQUE BIT PATTERNS VERIFY THAT THE LINES ON THE SILO ARE NOT STUCK OR TIED TOGETHER. THIS IS DONE WITH WALKING AND GROWING 0'S AND 1'S.

TEST 29 - CHECK THROUGHPUT OF SILO

THIS TEST WILL ATTEMPT TO CHECK THAT THE FALL THROUGH OF THE SILO IS WORKING CORRECTLY. WE WRITE A SECTOR OF 128 UNIQUE PATTERNS AND READ IT BACK CHECKING THAT EACH LOCATION IS UNIQUE AND CORRECT.

TEST 30 - CHECK ZERO FILL ON WRITE

THIS TEST WILL CHECK THE ABILITY OF THE CONTROLLER TO FILL THE REMAINING SECTOR WITH ZEROS ON A WRITE. WE WRITE A SECTOR WITH FROM 1 TO 127 WORDS, READ IT BACK AND VERIFY THAT THE NON WRITTEN WORDS ARE ZERO.

TEST 31 - CHECK SECTOR BITS ON HEADER COMPARE

THIS TEST WILL CHECK THAT THE SECTOR BITS CAN COMPARE CORRECTLY. THIS IS DONE BY WRITING THE SECTORS ADDRESS INTO THE SECTOR FOR A FULL TRACK. EACH SECTOR IS READ TO VERIFY THE SECTOR HAS THE CORRECT DATA, IF NOT THEN THE SECTOR BITS ARE NOT COMPARING CORRECTLY.

TEST 32 - WRITE CHECK NPR INTEGRITY

THIS TEST WILL CHECK THAT THE WRITE CHECK WILL FUNCTION WITHOUT CAUSING A BUS TRAP. TEST IS SET UP TO HANDLE BUS TRAPS.

TEST 33 - WRITE CHECK FUNCTION

THIS TEST WILL CHECK THAT A WRITE CHECK FUNCTION WILL COMPLETE WITH THE SPECIFIED TIME WITHOUT POSTING ERRORS.

TEST 34 - WRITE CHECK FUNCTION INTERRUPT

THIS TEST WILL CHECK THAT AN INTERRUPT CAN BE GENERATED FROM ISSUING A WRITE CHECK.

TEST 35 - PROPER INCREMENT OF RLBA ON WRITE CHECK

THIS TEST WILL CHECK THAT THE RLBA INCREMENTS PROPERLY DURING A

WRITE CHECK.

TEST 36 - PROPER INCREMENT OF RLDA ON WRITE CHECK

THIS TEST WILL CHECK THAT THE RLDA INCREMENTS PROPERLY DURING A WRITE CHECK.

TEST 37 - MULTIPLE SECTOR WRITE CHECK

THIS TEST WILL CHECK THAT WE CAN WRITE CHECK MORE THAN ONE SECTOR AT A TIME.

TEST 38 - FORCE DCK WITH WRITE CHECK

THIS TEST WILL CHECK THAT WE CAN DETECT A DCK DURING A WRITE CHECK. THIS IS DONE BY MODIFYING MEMORY BETWEEN A WRITE AND A WRITE CHECK.

TEST 39 - FORCE DCK WITH WRITE CHECK INTERRUPT

THIS TEST WILL CHECK THAT A DCK DURING A WRITE CHECK WILL CAUSE AN INTERRUPT TO OCCUR.

TEST 40 - CHECK ZERO FILL ON WRITE WITH WRITE CHECK

THIS TEST WILL VERIFY THAT WE CAN SUCCESSFULLY WRITE CHECK ALL WORD COUNTS FROM 1 - 127.

TEST 41 - 42 - EXTENDED CHECK OF WRITE CHECK

THESE TESTS VERIFY THAT WE CAN WRITE CHECK SUCCESSFULLY ALL PATTERNS. PATTERNS USED ARE WALKING 1'S, 0'S, GROWING 1'S, 0'S.

TEST 43 - READ WITHOUT HEADER COMPARE

THIS TEST VERIFIES THAT THE FUNCTION READ WITHOUT HEADER COMPARE (7) RESETS THE CONTROLLER READY AND POSTS NO ERRORS. THE DISK ADDRESS IS SET TO ALL ONES.

TEST 44 - READ WITHOUT HEADER COMPARE INTERRUPT

THIS TEST WILL VERIFY THAT THE FUNCTION READ WITHOUT HEADER COMPARE (7) CAN GENERATE AN INTERRUPT ON COMPLETION.

TEST 45 - CHECK RD W/O HDR CMP READS

THIS TEST CHECKS THAT THE FUNCTION CAN ACTUALLY RECOVER DATA. WE WRITE A PATTERN IN MEMORY AND CHECK THAT THE FUNCTION CAN OVERLAY IT WITH DATA.

TEST 46 - CHECK RLBA INCREMENT WITH RD W/O HDR CMP

SEQ 0027

THIS TEST CHECKS THAT THE RLBA CAN INCREMENT PROPERLY ON THE FUNCTION.

TEST 47 - CHECK RLDA DOES INCREMENT

THIS TEST CHECKS THAT THE RLDA DOES INCREMENT WITH THE FUNCTION READ WITHOUT HEADER COMPARE.

```
     1                                  .ENABLE AMA
     2                                  .ENABLE ABS
     3                                  .NLIST  ME,CND,MD
     4
     5
     7
    18
    19
    20          002000                 .=2000
    21
    22  002000                         SVC
    23          000000                 SVCINS=0
    24          000000                 SVCTAG=0
    25
    26  002000                                 POINTER BGNSW,BGNSFT,BGNDU
    27
    28  002000                         BGNMOD  MDHEDR
    29
    30  002000                                 HEADER  CZRLB,B,0,60,60,4,RL01
(4) 002000      103                            .ASCII /C/
(4) 002001      132                            .ASCII /Z/
(4) 002002      122                            .ASCII /R/
(4) 002003      114                            .ASCII /L/
(4) 002004      102                            .ASCII /B/
(6) 002005      000                            .BYTE   0
(6) 002006      000                            .BYTE   0
(5) 002007      000                            .BYTE   0
(4) 002010      102                            .ASCII  /B/
(4) 002011      060                            .ASCII  /0/
(4) 002012  000000                             .WORD   0
(4) 002014  000004                             .WORD   4
(4) 002016  037606                             .WORD   L$HARD
(4) 002020  037732                             .WORD   L$SOFT
(4) 002022  016752                             .WORD   L$HW
(4) 002024  016766                             .WORD   L$SW
(4) 002026  040514                             .WORD   L$LAST
(4) 002030  000000                             .WORD   0
(4) 002032  000000                             .WORD   0
(4) 002034  000000                             .WORD   0
(4) 002036  000000                             .WORD   0
(4) 002040  017002                             .WORD   L$DISPATCH
(4) 002042  000000                             .WORD   0
(4) 002044  000000                             .WORD   0
(4) 002046  000000                             .WORD   0
(4) 002050      002                            .BYTE   C$REVISION
(3) 002051      002                            .BYTE   C$EDIT
(4) 002052  000060                             .WORD   60
(4) 002054  000060                             .WORD   60
(4) 002056  000000                             .WORD   0
(5) 002060  000000                             .WORD   0
(4) 002062  000000                             .WORD   0
(4) 002064  002114                             .WORD   L$DVTYP
(4) 002066  000000                             .WORD   0
(4) 002070  002112                             .WORD   L$DR
(4) 002072  002112                             .WORD   L$DRST
(4) 002074  000000                             .WORD   0
```

```
(4)  002076  020104                          .WORD   L$DU
(5)  002100  000014                          .WORD   14
(4)  002102  000000                          .WORD   0
(4)  002104  017140                          .WORD   L$INIT
(4)  002106  020010                          .WORD   L$CLEAN
 31
 32  002110                                  ENDMOD
 33
 34
 35  002110                                  DEVREG
(5)  002110  000000                          .WORD   0
(2)  002112  00000?                          .BLKW
 36
 37  002114                                  DEVTYP  <RL01>
(3)  002114  046122  030460      000         .ASCIZ  /RL01/
(2)          002122                          .EVEN
 38  002122                          BGNMOD  GLBEQAT
 39  002122                                  EQUALS
 40          000001                  DRDY=BIT0               ;DRIVE READY (RLCS)
 41          000100                  INTEN=BIT6              ;INTERRUPT ENABLE (RLCS)
 42          100000                  ERR=BIT15               ;R_11 ERROR (RLCS)
 43          040000                  DERR=BIT14              ;RL01 DRIVE ERROR (RLCS)
 44          002000                  OPI=BIT10               ;OPERATION INCOMPLETE (RLCS)
 45          000200                  CRDY=BIT7               ;CONTROLLER READY (RLCS)
 46          000040                  BA17=BIT5               ;EXTENDED ADDRESS BIT 17 (RLCS)
 47          000020                  BA16=BIT4               ;EXTENDED ADDRESS BIT 16 (RLCS)
 48          020000                  NXM=BIT13               ;NON-EXISTANT MEMORY (RLCS)
 49          000000                  DS0=0                   ;DRIVE SELECT 0 (RLCS)
 50          000400                  DS1=BIT8                ;DRIVE SELECT 1 (RLCS)
 51          001000                  DS2=BIT9                ;DRIVE SELECT 2 (RLCS)
 52          001400                  DS3=BIT8!BIT9           ;DRIVE SELECT 3 (RLCS)
 53          000000                  NOOP0=0                 ;FUNCTION-NOOP(0)
 54          000002                  WRCHK-BIT1              ;WRITE CHECK FUNCTION
 55          000004                  GSTAT=BIT2              ;GET STATUS FUNCTION
 56          000006                  SEEK=BIT2!BIT1          ;SEEK FUNCTION
 57          000010                  RDHDR=BIT3              ;READ HEADER FUNCTION
 58          000012                  WRITE=BIT3.BIT1         ;WRITE DATA FUNCTION
 59          000014                  READ=BIT3!BIT2          ;READ DATA FUNCTION
 60          000016                  RDNHD=BIT3!BIT2.BIT1    ;READ W/O HEADER VERIFICATION
 61          000202                  GODRVR=BIT1!BIT7        ;CRDY AND DRDY
 62          000010                  DRST=BIT3               ;DRIVE RESET (RLDA)
 63          000002                  GSBIT=BIT1              ;GET STATUS BIT (RLDA)
 64          000001                  MK-BIT0                 ;MARKER BIT (RLDA)
 65          000004                  SIGN=BIT2               ;SIGN BIT (RLDA)
 66          000100                  RHHS=BIT6               ;HEAD SELECT IN READ HEADER
 67          000100                  STHS BIT6               ;HEAD SELECT IN STATUS BACK
 68          000020                  DAHS=BIT4               ;HEAD SELECT IN SEEK
 69                                  ;OFFSET FOR HARDWARE P-TABLE
 70
 71          000000                  CSR=0
 72          000002                  VECT-2
 73          000004                  PRIOR 4
 74          000006                  DRBT-6
 75          000010                  CNT=10
 76
 77                                  ;OFFSET FOR SOFTWARE P-TABLE
```

```
              000000          DLT=0
              000002          ELT=2
              000004          SIZE=4
              000006          DMPCK=6
              000010          DLMT=10

      002122                          ENDMOD
      002122                  BGNMOD  GLBDAT

                              .SBTTL  GLOBAL DATA

      002122  000000          CHECK:  .WORD   0
      002124  000000          T.CRC:  .WORD   0
      002126  000000          WHY:    .WORD   0
      002130  000000          CDCNT:  .WORD   0
      002132  000004          ERRVEC: .WORD   4
      002134  000000          DRIVE:  .WORD   0
      002136  000000          UUT:    .WORD   0
      002140  000000          UNITST: .WORD   0
      002142  000000          TRPFLG: .WORD   0
      002144  000000          INTFLG: .WORD   0               ;INTERRUPT OCCURANCE FLAG
      002146  000000          LDCSR:  .WORD   0               ;LOCATION TO FORM RLCS
      002150  000077          SECMSK: .WORD   77              ;MASK OUT SECTOR
      002152  120001          XPOLY:  .WORD   120001          ;POLYNOMIAL FOR CRC 16
      002154  000000          BCCFBK: .WORD   0               ;LOCATION USED BY "SIMBCC"
      002156  000000          CALBCC: .WORD   0               ;LOCATION USED BY "SIMBCC"
      002160  000000          TMP0:   .WORD   0
      002162  000000          TMP1:   .WORD   0
      002164  000000          TMP2:   .WORD   0
      002166  000000          GDDAT:  .WORD   0
      002170  000000          BDDAT:  .WORD   0
      002172  000000          TEMP2:  .WORD   0               ;LOCATION USED BY "SIMBCC"
      002174  000000          TEMP3:  .WORD   0               ;LOCATION USED BY "SIMBCC"
      002176  000000          TEMP4:  .WORD   0               ;LOCATION USED BY "SIMBCC"
      002200  000000          FIRST:  .WORD   0               ;FIRST SECTOR READ
      002202  177700          CYLMSK: .WORD   177700          ;MASK CYLINDER AND HEAD SELECT
      002204  000050          MXSEC1: .WORD   40.             ;MAX SECTOR ADDRESS +1
      002206  000047          MAXSEC: .WORD   39.             ;MAX SECTOR ADDRESS
      002210  000000          DWORD:  .WORD   0               ;DIFFERENCE WORD (SEEK)
      002212  077600          MAXCYL: .WORD   77600           ;MAXIMUM CYLINDER ADDRESS
      002214  000000          SVHD:   .WORD   0               ;SAVE CURRENT HEAD SELECT
      002216  000000          B.CS:   .WORD   0               ;CS - BEFORE OPERATION
      002220  000000          B.BA:   .WORD   0               ;BA - BEFORE OPERATION
      002222  000000          B.DA:   .WORD   0               ;DA - BEFORE OPERATION
      002224  000000          B.MP:   .WORD   0               ;MP - BEFORE OPERATION
      002226  000000          E.CS:   .WORD   0               ;CS - AT OCCURANCE OF ERROR
      002230  000000          E.BA:   .WORD   0               ;BA - AT OCCURANCE OF ERROR
      002232  000000          E.DA:   .WORD   0               ;DA - AT OCCURANCE OF ERROR
      002234  000000          E.MP:   .WORD   0               ;MP - AT OCCURANCE OF ERROR
      002236  000000          E.MP1:  .WORD   0
      002240  000000          E.MP2:  .WORD   0
      002242  000000          RLCS:   .WORD   0
      002244  000000          RLBA:   .WORD   0
      002246  000000          RLDA:   .WORD   0
      002250  000000          RLMP:   .WORD   0
```

```
                                BCSR:   .WORD   0               ;CSR FROM P TABLE
                                BVEC:   .WORD   0               ;VECTOR FROM P TABLE
                                BPRIOR: .WORD   0               ;BR LEVEVL FROM P TABLE
                                FNDFNC: .WORD   0
                                XMEM:   .WORD   0
                                TRYFNC: .WORD   0               ;
                                ERFLG:  .WORD   0
                                LOPIMX: .WORD   650.
                                LOPIMN: .WORD   155.
                                UOPIMX: .WORD   400.
                                UOPIMN: .WORD   160.
                                OPIMN:  .WORD   0
                                OPIMX:  .WORD   0
                                PWRFLG: .WORD   0
                                T.CNTLR:        .WORD   0
                                DERFLG: .WORD   0
                                ERPOINT:        .WORD   0
                                ERCOUNT:        .BLKW   60.


                                .SBTTL  LIST TO CHECK HEADER COMPARE LOGIC
                                HDRTAB: .WORD   0               ;WALK 1
                                        .WORD   BIT0
                                        .WORD   BIT1
                                        .WORD   BIT2
                                        .WORD   BIT3
                                        .WORD   BIT4
                                        .WORD   BIT5
                                        .WORD   BIT6
                                        .WORD   BIT7
                                        .WORD   BIT8
                                        .WORD   BIT9
                                        .WORD   BIT10
                                        .WORD   BIT11
                                        .WORD   BIT12
                                        .WORD   BIT13
                                        .WORD   BIT14
                                        .WORD   3               ;GROW 1
                                        .WORD   7
                                        .WORD   17
                                        .WORD   37
                                        .WORD   137
                                        .WORD   337
                                        .WORD   737
                                        .WORD   1737
                                        .WORD   3737
                                        .WORD   7737
                                        .WORD   17737
                                        .WORD   37737
                                        .WORD   77737
                                        .WORD   77736           ;GROW 0
                                        .WORD   77734
                                        .WORD   77730
                                        .WORD   77720
                                        .WORD   77700
                                        .WORD   77600
```

```
 190  002612  077400                          .WORD   77400
 191  002614  077000                          .WORD   77000
 192  002616  076000                          .WORD   76000
 193  002620  074000                          .WORD   74000
 194  002622  070000                          .WORD   70000
 195  002624  060000                          .WORD   60000
 196  002626  077735                          .WORD   77735           ;WALK 0
 197  002630  077733                          .WORD   77733
 198  002632  077727                          .WORD   77727
 199  002634  077717                          .WORD   77717
 200  002636  077637                          .WORD   77637
 201  002640  077537                          .WORD   77537
 202  002642  077337                          .WORD   77337
 203  002644  076737                          .WORD   76737
 204  002646  075737                          .WORD   75737
 205  002650  073737                          .WORD   73737
 206  002652  067737                          .WORD   67737
 207  002654  057737                          .WORD   57737
 208  002656  037737                          .WORD   37737
 209  002660  000000                HDREND:   .WORD   0
 210
 211
 212  002662  000001  000002  000004  DATPAT: .WORD   1,2,4,10,20,40,100,200,400,1000,2000,4000,10000,20000,40000,100000
      002670  000010  000020  000040
      002676  000100  000200  000400
      002704  001000  002000  004000
      002712  010000  020000  040000
      002720  100000
 213  002722  177777  177776  177775          .WORD   177777,177776,177775,177773,177767,177757,177737,177677
      002730  177773  177767  177757
      002736  177737  177677
 214  002742  177577  177377  176777          .WORD   177577,177377,176777,175777,173777,167777,157777,137777
      002750  175777  173777  167777
      002756  157777  137777
 215  002762  077777  177774  177770          .WORD   77777,177774,177770,177760,177740,177700,177600,177400
      002770  177760  177740  177700
      002776  177600  177400
 216  003002  177000  176000  174000          .WORD   177000,176000,174000,170000,160000,140000,3,7,17,37,77
      003010  170000  160000  140000
      003016  000003  000007  000017
      003024  000037  000077
 217  003030  000177  000377  000777          .WORD   177,377,777,1777,3777,7777,17777,37777,0
      003036  001777  003777  007777
      003044  017777  037777  000000
 218
 219
 220
 221                                   .SBTTL  BUFFER FOR READ/WRITE
 222  003052  002000                   BUF:    .BLKW   1024.
 223
 224
 225  007052                         ENDMOD
 226
 227                                   .SBTTL  GLOBAL TEXT
 228  007052                         BGAMOD  GLBTXT
 232  007052  047516  041440  047???  NORES:  .ASCIZ  /NO CONTROLLER/
```

```
233  007070  047516  042040  044522  NORDY:   .ASCIZ  /NO DRIVE/
234  007101     103  035123  000040  ARLCS:   .ASCIZ  /CS: /
235  007106  041040  035101  000040  ARLBA:   .ASCIZ  / BA: /
236  007114  042040  035101  000040  ARLDA:   .ASCIZ  / DA: /
237  007122  046440  035120  000040  ARLMP:   .ASCIZ  / MP: /
238  007130  042502  047506  042522  BEREG:   .ASCIZ  /BEFORE COMMAND: /
239  007151     124  046511  020105  AFREG:   .ASCIZ  /TIME OF ERROR:  /
240  007172  047503  052116  047522  CRTIM:   .ASCIZ  /CONTROLLER TIMED OUT/
241  007217     104  044522  042526  DRTIM:   .ASCIZ  /DRIVE READY TIMED OUT/
242  007245     040  051104  000126  DEMES:   .ASCIZ  / DRV/
243  007252  047040  046530     000  NXMMES:  .ASCIZ  / NXM/
244  007257     040  050117  000111  OPIMES:  .ASCIZ  / OPI/
245  007264  044040  051103  000103  HCRCMES: .ASCIZ  / HCRC/
246  007272  044040  043116     000  HNFMES:  .ASCIZ  / HNF/
247  007277     040  041504  000113  DCKMES:  .ASCIZ  / DCK/
248  007304  042040  052114     000  DLTMES:  .ASCIZ  / DLT/
249  007311     015     000          LF:      .ASCIZ  <15>
250  007313     015  000012          MSCRLF:  .ASCIZ  <15><12>
251  007316  041440  046517  000120  COMP:    .ASCIZ  / COMP/
252  007324  047506  041522  042105  OPIERR:  .ASCIZ  /FORCED OPI(GET STATUS) CAUSED OTHER ERRORS/
253  007377     116  047517  020120  NOPMES:  .ASCIZ  /NOOP OPERATION-FLAG MODE/
254  007430  047516  050117  047440  NOPINT:  .ASCIZ  /NOOP OPERATION-INTR. MODE/
255  007462  051127  052111  020105  WCKMES:  .ASCIZ  /WRITE CHECK OPERATION-FLAG MODE/
256  007522  051127  052111  020105  WCKINT:  .ASCIZ  /WRITE CHECK OPERATION-INTR. MODE/
257  007563     122  040505  020104  RHDMES:  .ASCIZ  /READ HEADER OPERATION-FLAG MODE/
258  007623     122  040505  020104  RHDINT:  .ASCIZ  /READ HEADER OPERATION-INTR. MODE/
259  007664  042523  045505  047440  SEKMES:  .ASCIZ  /SEEK OPERATION-FLAG MODE/
260  007715     123  042505  020113  SEKINT:  .ASCIZ  /SEEK OPERATION-INTR. MODE/
261  007747     107  052105  051440  GSTMES:  .ASCIZ  /GET STATUS OPERATION-FLAG MODE/
262  010006  042507  020124  052123  GSTINT:  .ASCIZ  /GET STATUS OPERATION-INTR MODE/
263  010045     122  040505  020104  RDDMES:  .ASCIZ  /READ OPERATION-FLAG MODE/
264  010076  042522  042101  047440  RDDINT:  .ASCIZ  /READ OPERATION-INTR MODE/
265  010127     127  044522  042524  WRTMES:  .ASCIZ  /WRITE OPERATION-FLAG MODE/
266  010161     127  044522  042524  WRTINT:  .ASCIZ  /WRITE OPERATION-INTR MODE/
267  010213     122  040505  020104  RDNMES:  .ASCIZ  %READ W/O HEADER - FLAG MODE%
268  010247     122  040505  020104  RDNINT:  .ASCIZ  %READ W/O HEADER - INTR MODE%
269  010303     103  047101  052047  SKHOME:  .ASCIZ  /CAN'T SEEK TO TRACK 0/
270  010331     127  044522  042524  WRLOCK:  .ASCIZ  /WRITE LOCK ERROR/
271  010352  046122  051503  041440  EM1:     .ASCIZ  /RLCS CONTAINED FOLLOWING ERROR(S):  /
272  010417  000170                  EM100:   .BLKB   120.
273  010607     116  020117  047111  EM4:     .ASCIZ  /NO INTERRUPT ON READ OPERATION/
274  010646  042522  042101  047440  EM5:     .ASCIZ  /READ OPERATION DID NOT WRITE MEMORY/
275  010712  046122  040502  042040  EM6:     .ASCIZ  /RLBA DID NOT INCREMENT PROPERLY DURING READ/
276  010766  042523  052103  051117  EM7:     .ASCIZ  /SECTOR DID NOT INCREMENT PROPERLY AFTER READ/
277  011043     110  040505  042504  EM10:    .ASCIZ  /HEADER NOT FOUND COULD NOT BE FORCED/
278  011110  051127  047117  020107  EM11:    .ASCIZ  /WRONG CYLINDER ON SEEK/
279  011137     110  040505  042504  EM12:    .ASCIZ  /HEADER NOT FOUND WOULD NOT SET/
280  011176  051104  053111  020105  EM13:    .ASCIZ  /DRIVE READY WOULD NOT SET/
281  011230  044504  045523  040440  EM14:    .ASCIZ  /DISK ADDRESS INCORRECT AFTER MULTIPLE SECTOR READ/
282  011312  051104  053111  020105  EM16:    .ASCIZ  /DRIVE ERROR ON WRITE OPERATION/
283  011351     116  020117  047111  EM17:    .ASCIZ  /NO INTERRUPT ON WRITE OPERATION/
284  011411     122  041114  020101  EM20:    .ASCIZ  /RLBA DID NOT INCREMENT PROPERLY DURING WRITE/
285  011466  042523  052103  051117  EM21:    .ASCIZ  /SECTOR DID NOT INCREMENT PROPERLY AFTER WRITE/
286  011544  044504  045523  040440  EM22:    .ASCIZ  /DISK ADDRESS (RLDA) INCORRECT AFTER MULTIPLE SECTOR WRITE/
287  011636  042110  020122  047516  EM23:    .ASCIZ  /HDR NOT FND COULD NOT BE FORCED AT END OF TRACK/
288  011716  047516  026516  054105  EM24:    .ASCIZ  /NON-EXISTANT MEMORY ERROR COULD NOT BE FORCED/
```

```
289  011774  040504  040524  041440  EM25:   .ASCIZ  %DATA COMPARISON ERROR - READ/WRITE ERROR%
290
291  012045     127  044522  042524  EM26:   .ASCIZ  /WRITE OPERATION MODIFIED MEMORY/
292  012105     105  051122  051117  EM27:   .ASCIZ  /ERROR ON PARTIAL SECTOR WRITE - ZERO FILL CHECK/
293  012165     122  041114  020101  EM30:   .ASCIZ  /RLBA DID NOT INCREMENT PROPERLY/
294  012225     102  020101  044502  EM31:   .ASCIZ  /BA BIT 16 DID NOT SET ON INCREMENT/
295  012270  040502  041040  052111  EM32:   .ASCIZ  /BA BIT 17 SET ON BA16 INCREMENT TEST/
296  012335     122  041114  020101  EM33:   .ASCIZ  /RLBA DID NOT INCREMENT WITH BA16/
297  012376  040502  041040  052111  EM34:   .ASCIZ  /BA BIT 17 DID NOT SET ON INCREMENT/
298  012441     102  020101  044502  EM35:   .ASCIZ  /BA BIT 16 DID NOT CLEAR ON INCREMENT/
299  012506  046122  040502  042040  EM36:   .ASCIZ  /RLBA DID NOT INCREMENT WITH BA17/
300  012547     122  040505  024104  EM40:   .ASCIZ  /READ(FUNCTION 7) DID NOT INTERRUPT/
301  012612  042522  042101  043050  EM41:   .ASCIZ  /READ(FUNCTION 7) ERROR - BAD DATA/
302  012654  042522  042101  043050  EM42:   .ASCIZ  /READ(FUNCTION 7) ERROR AT END OF TRACK/
303  012723     116  020117  047111  EM43:   .ASCIZ  /NO INTERRUPT WITH HDR NT FND FORCED/
304  012767     116  020117  047111  EM44:   .ASCIZ  /NO INTERRUPT WITH NXM FORCED/
305  013024  051105  047522  020122  EM45:   .ASCIZ  %ERROR ON BIT BANG OF SILO%
306  013056  044523  047514  047440  EM47:   .ASCIZ  /SILO OPERATION FAILURE/
307  013105     110  040505  042504  EM50:   .ASCIZ  /HEADER COMPARE FAILURE - SECTOR/
308  013145     127  044522  042524  EM51:   .ASCIZ  /WRITE NPR CAUSED BUS TRAP/
309  013177     122  040505  020104  EM52:   .ASCIZ  /READ NPR CAUSED BUS TRAP/
310  013230  042522  042101  053440  EM55:   .ASCIZ  ?READ W/O HDR CMP OPERATION DID NOT WRITE MEMORY?
311  013310  046122  040502  042040  EM53:   .ASCIZ  ?RLBA DID NOT INCREMENT PROPERLY DURING READ W/O HDR CMP?
312  013400  046122  040504  042040  EM54:   .ASCIZ  ?RLDA DID NOT INCREMENT AFTER READ W/O HDR CMP?
313  013456  050117  020111  044524  EM56:   .ASCIZ  /OPI TIMING ERROR/
314  013477     127  044522  042524  EM57:   .ASCIZ  /WRITE CHECK NPR CAUSED BUS TRAP/
315  013537     127  044522  042524  EM60:   .ASCIZ  /WRITE CHECK DID NOT INTERRUPT/
316  013575     122  041114  020101  EM61:   .ASCIZ  /RLBA DID NOT INCREMENT PROPERLY DURING WRCHK/
317  013652  046122  040504  042040  EM62:   .ASCIZ  /RLDA DID NOT INCREMENT PROPERLY DURING WRCHK/
318  013727     122  042114  020101  EM63:   .ASCIZ  /RLDA DID NOT INCREMENT PROPERLY AFTER A MULTIPLE SECTOR WRITE CHK/
319  014031     127  044522  042524  EM64:   .ASCIZ  /WRITE CHECK OF PARTIAL SECTOR WRITE FAILURE/
320  014105     103  047101  047040  EM65:   .ASCIZ  /CAN NOT FORCE DCK ON WRITE CHECK/
321  014146  040503  020116  047516  EM66:   .ASCIZ  /CAN NOT FORCE INTERRUPT WITH DCK ON WRCHK/
322  014220  051127  052111  020105  EM70:   .ASCIZ  /WRITE CHECK FAILURE/
323
324                                  .EVEN
325
326
330  014244                                  ENDMOD
331
332  014244                          BGNMOD  GLBERR
333
334                                  .SBTTL  GLOBAL ERRORS
335  014244                          BGNMSG  ERR0
336
337  014244  004737  015256                  JSR     PC,LINE1
338  014250  004737  015312                  JSR     PC,LINE2
339
340
341  014254  004537  020126                  JSR     R5,CKERLT               ;INCREMENT ERROR AND CHECK LIMIT
342
343  014260                                  ENDMSG
(3)  014260                          L10000:
(3)  014260  104023                         EMT     C$MSG
344
345  014262                          BGNMSG  ERR1
```

```
346
347  014262  004737  015256                  JSR     PC,LINE1
348
349
350  014266  004537  020126                  JSR     R5,CKERLT               ;INCREMENT ERROR AND CHECK LIMIT
351
352  014272                                  ENDMSG
(3)  014272                          L10001:
(3)  014272  104023                          EMT     C$MSG
353
354  014274                          BGNMSG  ERR2
355
356  014274  004737  015256                  JSR     PC,LINE1
357  014300                                  PRINTB  #FRMT4,GDDAT,BDDAT
(9)  014300  013746  002170                  MOV     BDDAT,-(SP)
(8)  014304  013746  002166                  MOV     GDDAT,-(SP)
(7)  014310  012746  015733                  MOV     #FRMT4,-(SP)
(6)  014314  012746  000003                  MOV     #3,-(SP)
(3)  014320  010600                          MOV     SP,R0
(4)  014322  104014                          EMT     C$PNTB
(4)  014324  062706  000010                  ADD     #10,SP
358
359
360  014330  004537  020126                  JSR     R5,CKERLT               ;INCREMENT ERROR AND CHECK LIMIT
361
362  014334                                  ENDMSG
(3)  014334                          L10002:
(3)  014334  104023                          EMT     C$MSG
363
364  014336                          BGNMSG  ERR3
365
366  014336  004737  015256                  JSR     PC,LINE1
367  014342  004737  015312                  JSR     PC,LINE2
368  014346                                  PRINTB  #FRMT5,TMP0,BDDAT,GDDAT
(10) 014346  013746  002166                  MOV     GDDAT,-(SP)
(9)  014352  013746  002170                  MOV     BDDAT,-(SP)
(8)  014356  013746  002160                  MOV     TMP0,-(SP)
(7)  014362  012746  015771                  MOV     #FRMT5,-(SP)
(6)  014366  012746  000004                  MOV     #4,-(SP)
(3)  014372  010600                          MOV     SP,R0
(4)  014374  104014                          EMT     C$PNTB
(4)  014376  062706  000012                  ADD     #12,SP
369
370
371  014402  004537  020126                  JSR     R5,CKERLT               ;INCREMENT ERROR AND CHECK LIMIT
372
373  014406                                  ENDMSG
(3)  014406                          L10003:
(3)  014406  104023                          EMT     C$MSG
374
375  014410                          BGNMSG  ERR4
376
377  014410  004737  015256                  JSR     PC,LINE1
378  014414  004737  015312                  JSR     PC,LINE2
379  014420                                  PRINTB  #FRMT4,GDDAT,BDDAT
(9)  014420  013746  002170                  MOV     BDDAT,-(SP)
```

```
(8)  014424  013746  002166          MOV     GDDAT,-(SP)
(7)  014430  012746  015733          MOV     #FRMT4,-(SP)
(6)  014434  012746  000003          MOV     #3,-(SP)
(3)  014440  010600                  MOV     SP,R0
(4)  014442  104014                  EMT     C$PNTB
(4)  014444  062706  000010          ADD     #10,SP
380
381
382  014450  004537  020126          JSR     R5,CKERLT               ;INCREMENT ERROR AND CHECK LIMIT
383
384  014454                          ENDMSG
(3)  014454                  L10004:
(3)  014454  104023                  EMT     C$MSG
385
386  014456                  BGNMSG  ERR5
387
388  014456  004737  015256          JSR     PC,LINE1
389  014462                          PRINTB  #FRMT3,RESTMS
(8)  014462  013746  020440          MOV     RESTMS,-(SP)
(7)  014466  012746  015726          MOV     #FRMT3,-(SP)
(6)  014472  012746  000002          MOV     #2,-(SP)
(3)  014476  010600                  MOV     SP,R0
(4)  014500  104014                  EMT     C$PNTB
(4)  014502  062706  000006          ADD     #6,SP
390
391
392  014506  004537  020126          JSR     R5,CKERLT               ;INCREMENT ERROR AND CHECK LIMIT
393
394  014512                          ENDMSG
(3)  014512                  L10005:
(3)  014512  104023                  EMT     C$MSG
395
396  014514                  BGNMSG  ERR6
397
398  014514  004737  015256          JSR     PC,LINE1
399  014520  004737  015534          JSR     PC,LINE3
400  014524  004737  015312          JSR     PC,LINE2
401
402
403  014530                          PRINTB  #FRMT99
(7)  014530  012746  016667          MOV     #FRMT99,-(SP)
(6)  014534  012746  000001          MOV     #1,-(SP)
(3)  014540  010600                  MOV     SP,R0
(4)  014542  104014                  EMT     C$PNTB
(4)  014544  062706  000004          ADD     #4,SP
404  014550  004537  020126          JSR     R5,CKERLT               ;INCREMENT ERROR AND CHECK LIMIT
405
406  014554                          ENDMSG
(3)  014554                  L10006:
(3)  014554  104023                  EMT     C$MSG
407
408  014556                  BGNMSG  ERR7
409
410
411
412  014556  004537  020126          JSR     R5,CKERLT               ;INCREMENT ERROR AND CHECK LIMIT
```

```
413
414  014562                          ENDMSG
(3)  014562                    L10007:
(3)  014562  104023                   EMT     C$MSG
415
416
417
418  014564                    BGNMSG  ERR8
419
420  014564  004737  015256            JSR     PC,LINE1
421  014570  004737  015312            JSR     PC,LINE2
422  014574                           PRINTB  #FRMT6,TMP1,GDDAT,BDDAT
(10) 014574  013746  002170            MOV     BDDAT,-(SP)
(9)  014600  013746  002166            MOV     GDDAT,-(SP)
(8)  014604  013746  002162            MOV     TMP1,-(SP)
(7)  014610  012746  016042            MOV     #FRMT6,-(SP)
(6)  014614  012746  000004            MOV     #4,-(SP)
(3)  014620  010600                    MOV     SP,R0
(4)  014622  104014                    EMT     C$PNTB
(4)  014624  062706  000012            ADD     #12,SP
423
424
425  014630  004537  020126            JSR     R5,CKERLT               ;INCREMENT ERROR AND CHECK LIMIT
426
427  014634                           ENDMSG
(3)  014634                    L10010:
(3)  014634  104023                   EMT     C$MSG
428
429  014636                    BGNMSG  ERR9
430
431  014636  004737  015256            JSR     PC,LINE1
432  014642  004737  015312            JSR     PC,LINE2
433  014646                           PRINTB  #FRMT4,TMP0,R2
(9)  014646  010246                    MOV     R2,-(SP)
(8)  014650  013746  002160            MOV     TMP0,-(SP)
(7)  014654  012746  015733            MOV     #FRMT4,-(SP)
(6)  014660  012746  000003            MOV     #3,-(SP)
(3)  014664  010600                    MOV     SP,R0
(4)  014666  104014                    EMT     C$PNTB
(4)  014670  062706  000010            ADD     #10,SP
434
435
436  014674  004537  020126            JSR     R5,CKERLT               ;INCREMENT ERROR AND CHECK LIMIT
437
438  014700                           ENDMSG
(3)  014700                    L10011:
(3)  014700  104023                   EMT     C$MSG
439
440  014702                    BGNMSG  ERR10
441
442  014702  004737  015256            JSR     PC,LINE1
443  014706  004737  015312            JSR     PC,LINE2
444  014712                           PRINTB  #FRMT7,TMP1,GDDAT,BDDAT
(10) 014712  013746  002170            MOV     BDDAT,-(SP)
(9)  014716  013746  002166            MOV     GDDAT,-(SP)
(8)  014722  013746  002162            MOV     TMP1,-(SP)
```

```
   (7)  014726  012746  016117                MOV     #FRMT7,-(SP)
   (6)  014732  012746  000004                MOV     #4,-(SP)
   (3)  014736  010600                        MOV     SP,R0
   (4)  014740  104014                        EMT     C$PNTB
   (4)  014742  062706  000012                ADD     #12,SP
   445
   446
   447  014746  004537  020126                JSR     R5,CKERLT               ;INCREMENT ERROR AND CHECK LIMIT
   448
   449  014752                                ENDMSG
   (3)  014752                        L10012:
   (3)  014752  104023                        EMT     C$MSG
   450
   451  014754                        BGNMSG  ERR11
   452
   453  014754  004737  015256                JSR     PC,LINE1
   454  014760  004737  015312                JSR     PC,LINE2
   455  014764                                PRINTB  #FRMT8,TMP0,GDDAT,BDDAT
  (10)  014764  013746  002170                MOV     BDDAT,-(SP)
   (9)  014770  013746  002166                MOV     GDDAT,-(SP)
   (8)  014774  013746  002160                MOV     TMP0,-(SP)
   (7)  015000  012746  016171                MOV     #FRMT8,-(SP)
   (6)  015004  012746  000004                MOV     #4,-(SP)
   (3)  015010  010600                        MOV     SP,R0
   (4)  015012  104014                        EMT     C$PNTB
   (4)  015014  062706  000012                ADD     #12,SP
   456
   457
   458  015020  004537  020126                JSR     R5,CKERLT               ;INCREMENT ERROR AND CHECK LIMIT
   459
   460  015024                                ENDMSG
   (3)  015024                        L10013:
   (3)  015024  104023                        EMT     C$MSG
   461
   462  015026                        BGNMSG  ERR12
   463
   464  015026  004737  015256                JSR     PC,LINE1
   465  015032  004737  015312                JSR     PC,LINE2
   466  015036                                PRINTB  #FRMT9,TMP1,R3,GDDAT,BDDAT
  (11)  015036  013746  002170                MOV     BDDAT,-(SP)
  (10)  015042  013746  002166                MOV     GDDAT,-(SP)
   (9)  015046  010346                        MOV     R3,-(SP)
   (8)  015050  013746  002162                MOV     TMP1,-(SP)
   (7)  015054  012746  016312                MOV     #FRMT9,-(SP)
   (6)  015060  012746  000005                MOV     #5,-(SP)
   (3)  015064  010600                        MOV     SP,R0
   (4)  015066  104014                        EMT     C$PNTB
   (4)  015070  062706  000014                ADD     #14,SP
   467
   468
   469  015074  004537  020126                JSR     R5,CKERLT               ;INCREMENT ERROR AND CHECK LIMIT
   470
   471  015100                                ENDMSG
   (3)  015100                        L10014:
   (3)  015100  104023                        EMT     C$MSG
   472
```

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   473  015102                          BGNMSG  ERR13
   474
   475  015102  004737  015256                  JSR     PC,LINE1
   476  015106                          PRINTB  #FRMT10,OPIMN,OPIMX,BDDAT
  (10)  015106  013746  002170                  MOV     BDDAT,-(SP)
   (9)  015112  013746  002302                  MOV     OPIMX,-(SP)
   (8)  015116  013746  002300                  MOV     OPIMN,-(SP)
   (7)  015122  012746  016415                  MOV     #FRMT10,-(SP)
   (6)  015126  012746  000004                  MOV     #4,-(SP)
   (3)  015132  010600                          MOV     SP,R0
   (4)  015134  104014                          EMT     C$PNTB
   (4)  015136  062706  000012                  ADD     #12,SP
   477
   478
   479  015142  004537  020126                  JSR     R5,CKERLT               ;INCREMENT ERROR AND CHECK LIMIT
   480
   481  015146                                  ENDMSG
   (3)  015146                          L10015:
   (3)  015146  104023                          EMT     C$MSG
   482
   483  015150                          BGNMSG  ERR14
   484
   485  015150  004737  015256                  JSR     PC,LINE1
   486  015154  004737  015312                  JSR     PC,LINE2
   487  015160                          PRINTB  #FRMT14,TMP1,#BUF
   (9)  015160  012746  003052                  MOV     #BUF,-(SP)
   (8)  015164  013746  002162                  MOV     TMP1,-(SP)
   (7)  015170  012746  016241                  MOV     #FRMT14,-(SP)
   (6)  015174  012746  000003                  MOV     #3,-(SP)
   (3)  015200  010600                          MOV     SP,R0
   (4)  015202  104014                          EMT     C$PNTB
   (4)  015204  062706  000010                  ADD     #10,SP
   488
   489
   490  015210  004537  020126                  JSR     R5,CKERLT               ;INCREMENT ERROR AND CHECK LIMIT
   491
   492  015214                                  ENDMSG
   (3)  015214                          L10016:
   (3)  015214  104023                          EMT     C$MSG
   493
   494  015216                          BGNMSG  ERR15
   495
   496  015216  004737  015256                  JSR     PC,LINE1
   497  015222  004737  015312                  JSR     PC,LINE2
   498  015226                          PRINTB  #FRMT15,R2
   (8)  015226  010246                          MOV     R2,-(SP)
   (7)  015230  012746  016723                  MOV     #FRMT15,-(SP)
   (6)  015234  012746  000002                  MOV     #2,-(SP)
   (3)  015240  010600                          MOV     SP,R0
   (4)  015242  104014                          EMT     C$PNTB
   (4)  015244  062706  000006                  ADD     #6,SP
   499  015250  004537  020126                  JSR     R5,CKERLT
   500
   501  015254                                  ENDMSG
   (3)  015254                          L10017:
   (3)  015254  104023                          EMT     C$MSG
```

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    502
    503  015256                          LINE1:  PRINTB  #FRMT1,RLCS,<B,DRIVE+1>
    (9)  015256  005046                          CLR     -(SP)
    (9)  015260  153716  002135                 BISB    DRIVE+1,(SP)
    (8)  015264  013746  002242                 MOV     RLCS,-(SP)
    (7)  015270  012746  015606                 MOV     #FRMT1,-(SP)
    (6)  015274  012746  000003                 MOV     #3,-(SP)
    (3)  015300  010600                         MOV     SP,R0
    (4)  015302  104014                         EMT     C$PNTB
    (4)  015304  062706  000010                 ADD     #10,SP
    504  015310  000207                         RTS     PC
    505
    506  015312                          LINE2:  PRINTB  #FRMT2,#BEREG,#ARLCS,B.CS,#ARLBA,B.BA
    (12) 015312  013746  002220                 MOV     B.BA,-(SP)
    (11) 015316  012746  007106                 MOV     #ARLBA,-(SP)
    (10) 015322  013746  002216                 MOV     B.CS,-(SP)
    (9)  015326  012746  007101                 MOV     #ARLCS,-(SP)
    (8)  015332  012746  007130                 MOV     #BEREG,-(SP)
    (7)  015336  012746  015645                 MOV     #FRMT2,-(SP)
    (6)  015342  012746  000006                 MOV     #6,-(SP)
    (3)  015346  010600                         MOV     SP,R0
    (4)  015350  104014                         EMT     C$PNTB
    (4)  015352  062706  000016                 ADD     #16,SP
    507  015356                                 PRINTB  #FRMT2A,#ARLDA,B.DA,#ARLMP,B.MP
    (11) 015356  013746  002224                 MOV     B.MP,-(SP)
    (10) 015362  012746  007122                 MOV     #ARLMP,-(SP)
    (9)  015366  013746  002222                 MOV     B.DA,-(SP)
    (8)  015372  012746  007114                 MOV     #ARLDA,-(SP)
    (7)  015376  012746  015664                 MOV     #FRMT2A,-(SP)
    (6)  015402  012746  000005                 MOV     #5,-(SP)
    (3)  015406  010600                         MOV     SP,R0
    (4)  015410  104014                         EMT     C$PNTB
    (4)  015412  062706  000014                 ADD     #14,SP
    508  015416                                 PRINTB  #FRMT2,#AFREG,#ARLCS,E.CS,#ARLBA,E.BA
    (12) 015416  013746  002230                 MOV     E.BA,-(SP)
    (11) 015422  012746  007106                 MOV     #AR_BA,-(SP)
    (10) 015426  013746  002226                 MOV     E.CS,-(SP)
    (9)  015432  012746  00710?                 MOV     #ARLCS,-(SP)
    (8)  015436  012746  007151                 MOV     #AFREG,-(SP)
    (7)  015442  012746  015645                 MOV     #FRMT2,-(SP)
    (6)  015446  012746  000006                 MOV     #6,-(SP)
    (3)  015452  010600                         MOV     SP,R0
    (4)  015454  104014                         EMT     C$PNTB
    (4)  015456  062706  000016                 ADD     #16,SP
    509  015462                                 PRINTB  #FRMT2B,#ARLDA,E.DA,#ARLMP,E.MP,E.MP1,E.MP2
    (13) 015462  013746  002240                 MOV     E.MP2,-(SP)
    (12) 015466  013746  002236                 MOV     E.MP1,-(SP)
    (11) 015472  013746  002234                 MOV     E.MP,-(SP)
    (10) 015476  012746  007122                 MOV     #ARLMP,-(SP)
    (9)  015502  013746  002232                 MOV     E.DA,-(SP)
    (8)  015506  012746  007114                 MOV     #ARLDA,-(SP)
    (7)  015512  012746  015677                 MOV     #FRMT2B,-(SP)
    (6)  015516  012746  000007                 MOV     #7,-(SP)
    (3)  015522  010600                         MOV     SP,R0
    (4)  015524  104014                         EMT     C$PNTB
    (4)  015526  062706  000020                 ADD     #20,SP
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  510  015532  000207                          RTS     PC
  511
  512  015534                        LINE3:    PRINTB  #FRMT3,#EM1
  (8)  015534  012746  010352                  MOV     #EM1,-(SP)
  (7)  015540  012746  015726                  MOV     #FRMT3,-(SP)
  (6)  015544  012746  000002                  MOV     #2,-(SP)
  (3)  015550  010600                          MOV     SP,R0
  (4)  015552  104014                          EMT     C$PNTB
  (4)  015554  062706  000006                  ADD     #6,SP
  513  015560                                  PRINTB  #FRMT3,#EM100
  (8)  015560  012746  010417                  MOV     #EM100,-(SP)
  (7)  015564  012746  015726                  MOV     #FRMT3,-(SP)
  (6)  015570  012746  000002                  MOV     #2,-(SP)
  (3)  015574  010600                          MOV     SP,R0
  (4)  015576  104014                          EMT     C$PNTB
  (4)  015600  062706  000006                  ADD     #6,SP
  514  015604  000207                          RTS     PC
  515
  516
  520
  521  015606  040445  047503  052116  FRMT1:   .ASCIZ  /%ACONTROL_ER: %06%A DRIVE: %01/
  522  015645     045  022516  022524  FRMT2:   .ASCIZ  /%N%T%T%06%T%06/
  523  015664  052045  047445  022466  FRMT2A:  .ASCIZ  /%T%06%T%06/
  524  015677     045  022524  033117  FRMT2B:  .ASCIZ  /%T%06%T%06%A %06%A %06/
  525  015726  047045  052045     000  FRMT3:   .ASCIZ  /%N%T/
  526  015733     045  022516  042501  FRMT4:   .ASCIZ  /%N%AEXP'D: %06%A REC'D: %06%N/
  527  015771     045  022516  046101  FRMT5:   .ASCIZ  /%N%ALAST: %06%A PRES: %06%A EXP'D: %06%N/
  528  016042  047045  040445  052502  FRMT6:   .ASCIZ  /%N%ABUS ADR: %06%A EXP'D: %06%A REC'D: %06%N/
  529  016117     045  022516  053501  FRMT7:   .ASCIZ  /%N%AWORD: %D3%A EXP'D: %06%A REC'D: %06%N/
  530  016171     045  022516  042101  FRMT8:   .ASCIZ  /%N%ADA: %06%A REC'D: %06%A EXP'D: %06%N/
  531  016241     045  022516  053501  FRMT14:  .ASCIZ  /%N%AWORDS WRITTEN: %D3%A BUS ADDR: %06%N/
  532  016312  047045  040445  047527  FRMT9:   .ASCIZ  /%N%AWORDS WRITTEN: %D3%A BUS ADDR: %06%A EXP'D: %06%A REC'D: %06%N/
  533  016415     045  022516  051101  FRMT10:  .ASCII  /%N%ARANGE %D3%A - %D3%A  MILLISECONDS WAS %D6%N/
  534  016474  040445  040515  044530           .ASCIZ  /%AMAXIMUM TIMEOUT OF PROGRAM IS 3 SECONDS%N/
  535  016550  047045  040445  051105  FRMT11:  .ASCIZ  /%N%AERROR LIMIT EXCEEDED - DROPPED%N/
  536  016615     045  042101  044522  FRMT98:  .ASCII  /%ADRIVE DID NOT RECOVER FROM POWER FAILURE/
  537  016667     045  000116          FRMT99:  .ASCIZ  /%N/
  538  016672  047045  052045  040445  FRMT13:  .ASCIZ  /%N%T%A - WILL NOT TEST%N/
  539  016723     045  022516  050101  FRMT15:  .ASCIZ  /%N%APATTERN WAS: %06/
  540
  541                                  .EVEN
  542
  546
  547  016750                                  ENDMOD
  548  016750                        BGNMOD    HPTCODE
  549
  550  016750                        BGNHW
  (3)  016750  000005                          .WORD   L10020-L$HW/2
  551  016752  174400                          .WORD   174400          ;CSR
  552  016754  000160                          .WORD   160             ;VECTOR
  553  016756  000240                          .WORD   240             ;PRIORITY
  554  016760  000000                          .WORD   0               ;DRIVE (BITS 8,9,10)
  555  016762  000001                          .WORD   1               ;RL11=1 RLV11=0
  556
  557  016764                        ENDHW
  (3)  016764                        L10020:
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                                        ENDMOD

                                BGNMOD  SPTCODE

                                BGNSW
(3)  016764  000005                     .WORD   L10021-L$SW/2

016766  000000                  DROP:   .WORD   0
016770  000012                  MERLMT: .WORD   10.
016772  000000                  T.SIZE: .WORD   0
016774  000000                  T.DMP:  .WORD   0
016776  000000                  T.LMT:  .WORD   0

017000                          ENDSW
(3)  017000                     L10021:

017000                                  ENDMOD

017000                          BGNMOD  DSPCODE

017000                          DISPATCH        47
(4)  017000  000057                     .WORD   47
(6)  017002  021632                     .WORD   T1
(6)  017004  022102                     .WORD   T2
(6   017006  022246                     .WORD   T3
(6)  017010  022376                     .WORD   T4
(6)  017012  022532                     .WORD   T5
(6)  017014  022664                     .WORD   T6
(6)  017016  023022                     .WORD   T7
(6)  017020  023220                     .WORD   T8
(6)  017022  023522                     .WORD   T9
(6)  017024  023712                     .WORD   T10
(6)  017026  024110                     .WORD   T11
(6)  017030  024262                     .WORD   T12
(6)  017032  024460                     .WORD   T13
(6)  017034  024660                     .WORD   T14
(6)  017036  025030                     .WORD   T15
(6)  017040  025132                     .WORD   T16
(6)  017042  025256                     .WORD   T17
(6)  017044  025452                     .WORD   T18
(6)  017046  025606                     .WORD   T19
(6)  017050  025740                     .WORD   T20
(6)  017052  026060                     .WORD   T21
(6)  017054  026240                     .WORD   T22
(6)  017056  027016                     .WORD   T23
(6)  017060  027212                     .WORD   T24
(6)  017062  027356                     .WORD   T25
(6)  017064  027472                     .WORD   T26
(6)  017066  027650                     .WORD   T27
(6)  017070  030250                     .WORD   T28
(6)  017072  030672                     .WORD   T29
(6)  017074  031320                     .WORD   T30
(6)  017076  032000                     .WORD   T31
(6)  017100  032432                     .WORD   T32
(6)  017102  033042                     .WORD   T33
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    (6)  017104  033274                        .WORD   T34
    (6)  017106  033564                        .WORD   T35
    (6)  017110  034060                        .WORD   T36
    (6)  017112  034352                        .WORD   T37
    (6)  017114  034744                        .WORD   T38
    (6)  017116  035244                        .WORD   T39
    (6)  017120  035604                        .WORD   T40
    (6)  017122  036116                        .WORD   T41
    (6)  017124  036402                        .WORD   T42
    (6)  017126  036672                        .WORD   T43
    (6)  017130  036762                        .WORD   T44
    (6)  017132  037114                        .WORD   T45
    (6)  017134  037312                        .WORD   T46
    (6)  017136  037450                        .WORD   T47
    578  017140                                 ENDMOD
    579
    580                             .SBTTL  INITIALIZATION CODE
    581
    582  017140                     BGNMOD  INITCODE
    583
    584  017140                             BGNINIT
    585
    586  017140                             SETPRI  #PRI07
    (3)  017140  012700  000340            MOV     #PRI07,R0
    (3)  017144  104041                    EMT     C$SPRI
    587
    588  017146                             READEF  #EF.PWR
    (3)  017146  012700  000034            MOV     #EF.PWR,R0
    (3)  017152  104050                    EMT     C$REFG
    589  017154                             BNCOMPLETE      NOPWR
    (2)  017154  103004                    BCC     NOPWR
    590  017156  013737  002012  002304    MOV     L$UNIT,PWRFLG
    591  017164  000473                    BR      CONT
    592  017166                     NOPWR:  READEF  #EF.RESTART
    (3)  017166  012700  000037            MOV     #EF.RESTART,R0
    (3)  017172  104050                    EMT     C$REFG
    593  017174                             BCOMPLETE       START1
    (2)  017174  103404                    BCS     START1
    594  017176                             READEF  #EF.START
    (3)  017176  012700  000040            MOV     #EF.START,R0
    (3)  017202  104050                    EMT     C$REFG
    595  017204                             BNCOMPLETE      CONTINUET
    (2)  017204  103010                    BCC     CONTINUET
    596  017206  012700  002374    START1: MOV     #ERCOUNT,R0
    597  017212  012701  000100            MOV     #64.,R1
    598  017216  005020            1$:     CLR     (R0)+
    599  017220  005301                    DEC     R1
    600  017222  001375                    BNE     1$
    601
    602  017224  000407                    BR      START
    603
    604  017226                     CONTINUE:       READEF  #EF.CONTINUE
    (3)  017226  012700  000036            MOV     #EF.CONTINUE,R0
    (3)  017232  104050                    EMT     C$REFG
    605  017234                             BCOMPLETE       CONT
    (2)  017234  103447                    BCS     CONT
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  606  017236  005737  002136          NXT:    TST     UUT                     ;DONE WITH ALL UNITS
  607  017242  001011                          BNE     XXX                     ;NO
  608  017244  012737  177777  002140  START:  MOV     #-1,UNITST
  609  017252  013737  002012  002136          MOV     L$UNIT,UUT
  610  017260  012737  002312  002312          MOV     #ERCOUNT-2,ERPOINT
  611
  612  017266  005237  002140          XXX:    INC     UNITST
  613  017272  062737  000002  002312          ADD     #2,ERPOINT
  614  017300  005337  002136                  DEC     UUT
  615  017304                          REST:   GPHARD  UNITST,R0
  (3)  017304  013700  002140                  MOV     UNITST,R0
  (3)  017310  104042                          EMT     C$GPHRD
  616  017312                                  BCOMPLETE       2$
  (2)  017312  103406                          BCS     2$
  617  017314  005737  002304                  TST     PWRFLG
  618  017320  001746                          BEQ     NXT
  619  017322  005337  002304                  DEC     PWRFLG
  620  017326  000743                          BR      NXT
  621  017330  012037  002252          2$:     MOV     (R0)+,BCSR              ;GET BUS ADDRESS
  622  017334  012037  002254                  MOV     (R0)+,BVEC              ;GET VECTOR
  623  017340  012037  002256                  MOV     (R0)+,BPRIOR            ;GET PRIORITY
  624  017344  012037  002134                  MOV     (R0)+,DRIVE             ;GET DRIVE
  625  017350  012037  002306                  MOV     (R0)+,T.CNTLR           ;GET CONTROLLER TYPE
  626
  627  017354  013700  002252          CONT:   MOV     BCSR,R0                 ;CREATE REGISTERS
  628  017360  010037  002242                  MOV     R0,RLCS
  629  017364  062700  000002                  ADD     #2,R0
  630  017370  010037  002244                  MOV     R0,RLBA
  631  017374  062700  000002                  ADD     #2,R0
  632  017400  010037  002246                  MOV     R0,RLDA
  633  017404  062700  000002                  ADD     #2,R0
  634  017410  010037  002250                  MOV     R0,RLMP
  635
  636  017414  005737  002304                  TST     PWRFLG
  637  017420  001064                          BNE     5$
  638  017422  005737  016772                  TST     T.SIZE                  ;DO WE WANT TO CHECK UNITS??
  639  017426  001461                          BEQ     5$                      ;NO
  640  017430  005037  002142                  CLR     TRPFLG                  ;CLEAR OUT TRAP INDICATOR
  641  017434                                  SETVEC  ERRVEC,#TRPHAN,#340     ;SETUP TO CATCH TIMEOUT
  (7)  017434  012746  000340                  MOV     #340,-(SP)
  (6)  017440  012746  021350                  MOV     #TRPHAN,-(SP)
  (5)  017444  013746  002132                  MOV     ERRVEC,-(SP)
  (4)  017450  012746  000003                  MOV     #3,-(SP)
  (3)  017454  104037                          EMT     C$SVEC
  (2)  017456  062706  000010                  ADD     #10,SP
  642  017462  005777  162554                  TST     @RLCS                   ;ACCESS CONTROLLER
  643  017466                                  CLRVEC  ERRVEC
  (3)  017466  013700  002132                  MOV     ERRVEC,R0
  (3)  017472  104036                          EMT     C$CVEC
  644  017474  005737  002142                  TST     TRPFLG                  ;DID TRAP OCCUR??
  645  017500  001404                          BEQ     7$                      ;NO, CHECK DRIVE
  646  017502  012737  007052  002126          MOV     #NORES,WHY
  647  017510  000415                          BR      8$
  648
  649  017512  012777  000200  162522  7$:     MOV     #200,@RLCS              ;NOW CHECK DRIVE FOR READY
  650  017520  053777  002134  162514          BIS     DRIVE,@RLCS
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   651  017526  032777  000001  162506          BIT     #1,@RLCS
   652  017534  001016                          BNE     5$
   653  017536  012737  007070  002126          MOV     #NORDY,WHY
   654  017544                          8$:     PRINTB  #FRMT13,WHY
   (8)  017544  013746  002126                  MOV     WHY,-(SP)
   (7)  017550  012746  016672                  MOV     #FRMT13,-(SP)
   (6)  017554  012746  000002                  MOV     #2,-(SP)
   (3)  017560  010600                          MOV     SP,R0
   (4)  017562  104014                          EMT     C$PNTB
   (4)  017564  062706  000006                  ADD     #6,SP
   655  017570  000444                          BR      6$
   656
   657  017572  005737  002304          5$:     TST     PWRFLG                  ;POWER UP
   658  017576  001451                          BEQ     END                     ;NO
   659  017600  012777  000200  162434          MOV     #200,@RLCS
   660  017606  053777  002134  162426          BIS     DRIVE,@RLCS
   661  017614  012701  000074                  MOV     #60.,R1
   662  017620                          3$:     WAITMS  #10.
   (3)  017620  012700  000012                  MOV     #10.,R0
   (3)  017624  104026                          EMT     C$WTM
   663  017626  032777  000001  162406          BIT     #1,@RLCS
   664  017634  001032                          BNE     END
   665  017636  005301                          DEC     R1
   666  017640  001367                          BNE     3$
   667
   668  017642                                  PRINTF  #FRMT99
   (7)  017642  012746  016667                  MOV     #FRMT99,-(SP)
   (6)  017646  012746  000001                  MOV     #1,-(SP)
   (3)  017652  010600                          MOV     SP,R0
   (4)  017654  104017                          EMT     C$PNTF
   (4)  017656  062706  000004                  ADD     #4,SP
   669  017662                                  PRINTF  #FRMT98
   (7)  017662  012746  016615                  MOV     #FRMT98,-(SP)
   (6)  017666  012746  000001                  MOV     #1,-(SP)
   (3)  017672  010600                          MOV     SP,R0
   (4)  017674  104017                          EMT     C$PNTF
   (4)  017676  062706  000004                  ADD     #4,SP
   670  017702  004737  015256          6$:     JSR     PC,LINE1
   671  017706                                  DODU    UNITST
   (3)  017706  013700  002140                  MOV     UNITST,R0
   (3)  017712  104053                          EMT     C$DODU
   672  017714                                  DOCLN
   (3)  017714  104044                          EMT     C$DCLN
   673  017716  000137  017236                  JMP     NXT
   674
   675  017722  013737  002276  002300  END:    MOV     UOPIMN,OPIMN
   676  017730  013737  002274  002302          MOV     UOPIMX,OPIMX
   677  017736  005737  002306                  TST     T.CNTLR                 ;RL11?
   678  017742  001006                          BNE     1$                      ;YES. THEN KEEP LIMITS SET
   679  017744  013737  002272  002300          MOV     LOPIMN,OPIMN
   680  017752  013737  002270  002302          MOV     LOPIMX,OPIMX
   681  017760                          1$:
   682  017760                                  SETVEC  BVEC,#INTSRV,#340
   (7)  017760  012746  000340                  MOV     #340,-(SP)
   (6)  017764  012746  020110                  MOV     #INTSRV,-(SP)
   (5)  017770  013746  002254                  MOV     BVEC,-(SP)
```

```
   (4)  017774  012746  000003                    MOV     #3,-(SP)
   (3)  020000  104037                            EMT     C$SVEC
   (2)  020002  062706  000010                    ADD     #10,SP
   683
   684
   685
   686  020006                                    ENDINIT
   (3)  020006                            L10022:
   (3)  020006  104011                            EMT     C$INIT
   687
   688  020010                                    ENDMOD
   689
   690  020010                            BGNMOD  CLNCODE
   691
   692  020010                                    BGNCLN
   693
   694
   695  020010                                    SETVEC  ERRVEC,#TRPHAN,#340
   (7)  020010  012746  000340                    MOV     #340,-(SP)
   (6)  020014  012746  021350                    MOV     #TRPHAN,-(SP)
   (5)  020020  013746  002132                    MOV     ERRVEC,-(SP)
   (4)  020024  012746  000003                    MOV     #3,-(SP)
   (3)  020030  104037                            EMT     C$SVEC
   (2)  020032  062706  000010                    ADD     #10,SP
   696  020036  032777  000200  162176  1$:      BIT     #CRDY,@RLCS
   697  020044  001774                            BEQ     1$
   698
   699  020046  042777  000100  162166            BIC     #INTEN,@RLCS
   700
   701  020054                                    CLRVEC  BVEC
   (3)  020054  013700  002254                    MOV     BVEC,R0
   (3)  020060  104036                            EMT     C$CVEC
   702  020062  005737  002304                    TST     PWRFLG
   703  020066  001402                            BEQ     2$
   704  020070  005337  002304                    DEC     PWRFLG
   705  020074                            2$:     CLRVEC  ERRVEC
   (3)  020074  013700  002132                    MOV     ERRVEC,R0
   (3)  020100  104036                            EMT     C$CVEC
   706
   707
   708
   709  020102                                    ENDCLN
   (3)  020102                            L10023:
   (3)  020102  104012                            EMT     C$CLEAN
   710
   711  020104                                    ENDMOD
   712
   713  020104                            BGNMOD  DRPCODE
   714
   715  020104                                    BGNDU
   716
   717  020104  000240                            NOP
   718
   719  020106                                    ENDDU
   (3)  020106                            10024:
   (3)  020106  104055                            EMT     C$DU
```

```
                                ENDMOD

                                .SBTTL  GLOBAL SUBROUTINES

                                BGNMOD  GLBSUB

                                BGNSRV
020110  005237  002144        INTSRV: INC     INTFLG          ;SET INTERRUPT OCCURANCE FLAG

020114                                  ENDSRV
(3) 020114                      L10025:
(2) 020114  000002                      RTI

                                ;ROUTINE USED IN TIMING OPI

020116  005237  002144         TMSRV: INC     INTFLG
020122                                  ABORTWAIT
(3) 020122  104021                      EMT     C$ABRT
020124  000002                          RTI

020126  000240                  CKERLT: NOP
020130                                  INLOOP
(3) 020130  104020                      EMT     C$INLP
020132                                  BCOMPLETE       99$
(2) 020132  103427                      BCS     99$

020134  005737  016766                  TST     DROP
020140  001424                          BEQ     99$
020142  005277  162144                  INC     @ERPOINT
020146  027737  162140  016770          CMP     @ERPOINT,MERLMT
020154  002416                          BLT     99$

020156                                  PRINTF  #FRMT11
(7) 020156  012746  016550              MOV     #FRMT11,-(SP)
(6) 020162  012746  000001              MOV     #1,-(SP)
(3) 020166  010600                      MOV     SP,R0
(4) 020170  104017                      EMT     C$PNTF
(4) 020172  062706  000004              ADD     #4,SP
020176  004737  015256                  JSR     PC,LINE1
020202                                  DODU    UNITST  ;DROP THIS UNIT
(3) 020202  013700  002140              MOV     UNITST,R0
(3) 020206  104053                      EMT     C$DODU
020210                                  DOCLN
(3) 020210  104044                      EMT     C$DCLN

020212                          99$:
020212  000205                          RTS     R5


                                .SBTTL  ROUTINE TO CHECK FOR CONTROLLER ERRORS

                                ;*****************************************************************
                                ;*THIS ROUTINE WILL CHECK RLCS FOR ERRORS AND PRINT THEM
                                ;*ACCORDINGLY.  IT WILL MERGE THE ERROR PRINTOUT WITH THE TEST
                                ;*ERROR MESSAGE.
```

```
                                        ;*
                                        ;*ROUTINE USES R0,R1 AND PICKS HEADER FROM R3
                                        ;*
                                        ;*      CALL    JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
                                        ;*
                                        ;*
                                        ;*
020214  005037  002124          CHERR:  CLR     T.CRC
020220  032737  176000  002226          BIT     #176000,E.CS    ;ANY ERROR BITS SET?
020226  001001                          BNE     2$              ;YES,FIND OUT WHICH
020230  000205                          RTS     R5              ;NO EXIT
020232  012701  010417          2$:     MOV     #EM100,R1       ;GET START OF STRING
020236  005737  002226                  TST     E.CS            ;IS COMPOSITE ERROR SET?(BETTER BE)
020242  100003                          BPL     99$             ;IT'S NOT SOMETHING IS WRONG
020244  004537  020752                  JSR     R5,FIX          ;YES, PUT ''COMP'' IN STRING
020250  007316                          COMP                    ;''COMP''
020252  032737  040000  002226  99$:    BIT     #DERR,E.CS      ;DRIVE ERROR SET?
020260  001405                          BEQ     3$              ;NO, CONTINUE
020262  005237  002310                  INC     DERFLG
020266  004537  020752                  JSR     R5,FIX          ;YES, PUT 'DRV'' INTO STRING
020272  007245                          DEMES                   ;'DRV''
020274  032737  020000  002226  3$:     BIT     #NXM,E.CS       ;NON-EXISTENT MEMORY ERROR?
020302  001403                          BEQ     4$              ;NO, CONTINUE
020304  004537  020752                  JSR     R5,FIX          ;YES, PUT 'NXM'' INTO STRING
020310  007252                          NXMMES                  ;'NXM''
020312  032737  002000  002226  4$:     BIT     #OPI,E.CS       ;IS OPI SET?
020320  001422                          BEQ     6$              ;NO, GO CHECK BITS 11 & 12
020322  004537  020752                  JSR     R5,FIX          ;PUT 'OPI'' INTO STRING
020326  007257                          OPIMES                  ;'OPI''
020330  032737  004000  002226          BIT     #BIT11,E.CS     ;HEADERCRC ERROR?
020336  001403                          BEQ     5$              ;NO, GO CHECK HEADER NOT FOUND
020340  004537  020752                  JSR     R5,FIX          ;GO PUT 'HCRC'' IN STRING
020344  007264                          HCRCMES                 ;'HCRC''
020346  032737  010000  002226  5$:     BIT     #BIT12,E.CS     ;HEADER NOT FOUND?
020354  001424                          BEQ     8$              ;NO, GO PUT ''CRLF'' IN STRING
020356  004537  020752                  JSR     R5,FIX          ;PUT 'HNF'' IN STRING
020362  007272                          HNFMES                  ;'HNF''
020364  000420                          BR      8$              ;PUT ''CRLF'' IN STRING
020366  032737  004000  002226  6$:     BIT     #BIT11,E.CS     ;DATA CRC ERROR?
020374  001405                          BEQ     7$              ;NO, GO CHECK DATA LATE
020376  005237  002124                  INC     T.CRC
020402  004537  020752                  JSR     R5,FIX          ;PUT 'DCK'' IN STRING
020406  007277                          DCKMES                  ;'DCK''
020410  032737  010000  002226  7$:     BIT     #BIT12,E.CS     ;DATA LATE ERROR?
020416  001403                          BEQ     8$              ;NO, GO PUT IN ''CRLF''
020420  004537  020752                  JSR     R5,FIX          ;PUT 'DLT'' IN STRING
020424  007304                          DLTMES                  ;'DLT''
020426  004537  020752          8$:     JSR     R5,FIX          ;PUT ''CRLF'' INTO STRING
020432  007313                          MSCRLF                  ;''CRLF''
020434  004537  020752                  JSR     R5,FIX          ;MOVE HEADER
020440  000000                  RESTMS: .WORD   0               ;HEADER FROM TEST
020442  105011                          CLRB    (R1)            ;PUT TERMINATOR IN
020444                                  ERRDF   300.,LF,ERR6
(3) 020444  104462                      TRAP    T$ERCODE
(5) 020446  000454                      .WORD   300
```

```
(5)  020450  007311                        .WORD   LF
(5)  020452  014514                        .WORD   ERR6
817  020454  000205                        RTS     R5              ;EXIT ROUTINE
818
819                                 .SBTTL LOAD RLCS
820                                 ;*****************************************************************
821                                 ;* ROUTINE TO LOAD RLCS WITH FUNCTION TO BE PERFORMED
822                                 ;*      CALL:   JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
823                                 ;*              .WORD                   ;BITS TO BE LOADED, FUNCTION
824                                 ;*                                      ;AND INTR ENABLE ONLY
825                                 ;*
826                                 ;
827
828  020456  032777  040000  161556 LDFUNC: BIT     #BIT14,@RLCS    ;DRIVE ERROR SET
829  020464  001426                        BEQ     5$
830  020466  017737  161554  002222        MOV     @RLDA,B.DA
831  020474  012777  000013  161544        MOV     #13,@RLDA
832  020502  012737  000200  002216        MOV     #200,B.CS
833  020510  053737  002134  002216        BIS     DRIVE,B.CS
834  020516  013777  002216  161516        MOV     B.CS,@RLCS
835  020524  032777  000200  161510 6$:    BIT     #200,@RLCS
836  020532  001774                        BEQ     6$
837  020534  013777  002222  161504        MOV     B.DA,@RLDA
838  020542  012537  002146         5$:    MOV     (R5)+,LDCSR     ;GET BITS TO LOAD
839  020546  010346                        MOV     R3,-(SP)        ;SAVE R3
840  020550  042737  177661  002146        BIC     #177661,LDCSR   ;CLEAR ALL BUT FUNC & INTR EN
841  020556  013737  002146  002260        MOV     LDCSR,FNDFNC    ;SAVE FUNCTION
842  020564  042737  000100  002260        BIC     #INTEN,FNDFNC   ;ONLY FUNCTION
843  020572  012703  020712               MOV     #HDRLST,R3      ;GET HEADER LIST
844  020576  006237  002260               ASR     FNDFNC          ;ALIGN TO LEFT
845  020602  001404                        BEQ     2$              ;IF EQUAL TO ZERO, SET R3
846  020604  022323                1$:     CMP     (R3)+,(R3)+     ;BUMP R3 BY 4
847  020606  005337  002260               DEC     FNDFNC          ;DEC FUNCTION
848  020612  001374                        BNE     1$              ;FOUND IT? NO-GO BACK
849  020614  032737  000100  002146 2$:    BIT     #INTEN,LDCSR    ;YES, DO WE WANT FLAG OR INTR?
850  020622  001401                        BEQ     3$              ;FLAG BRANCH
851  020624  005723                        TST     (R3)+           ;INTR POINT TO THAT ONE
852  020626  011303                3$:     MOV     (R3),R3         ;SET HEADER
853  020630  010337  020440               MOV     R3,RESTMS       ;SET UP HEADER
854  020634  010337  002264               MOV     R3,TRYFNC       ;SAVE HEADER FOR LATER
855  020640  053737  002262  002146        BIS     XMEM,LDCSR      ;LOAD E.A. BITS
856  020646  005037  002262               CLR     XMEM            ;CLEAR OUT THE BITS
857  020652  053737  002134  002146        BIS     DRIVE,LDCSR     ;SELECT DRIVE
858  020660  052737  000200  002146        BIS     #200,LDCSR
859  020666  013777  002146  161346        MOV     LDCSR,@RLCS     ;LOAD FUNCTION
860  020674  004537  020764               JSR     R5,BEFORE       ;READ REGISTERS
861  020700  042777  000200  161334 4$:    BIC     #200,@RLCS      ;ISSUE COMMAND
862  020706  012603                        MOV     (SP)+,R3        ;RESTORE R3
863  020710  000205                        RTS     R5              ;EXIT
864
865
866
867  020712  007377               HDRLST: NOPMES
868  020714  007430                       NOPINT
869  020716  007462                       WCKMES
870  020720  007522                       WCKINT
```

```
                                        GSTMES
                                        GSTINT
                                        SEKMES
                                        SEKINT
                                        RHDMES
                                        RHDINT
                                        WRTMES
                                        WRTINT
                                        RDDMES
                                        RDDINT
                                        RDNMES
                                        RDNINT

                                ;*******************************************************************
                                ;*ROUTINE TO MOVE ASCII STRINGS
                                ;*USES REGISTERS R1 - WHERE STRING IS BEING BUILT
                                ;*
                                ;*      CALL    JSR     R5,FIX
                                ;*              .WORD           ;ADDRESS OF STRING TO MOVE

020752  012504                  FIX:    MOV     (R5)+,R4        ;GET ADDRESS AND MOVE RETURN
020754  112421                  1$:     MOVB    (R4)+,(R1)+     ;GET BYTE AND UPDATE
020756  001376                          BNE     1$              ;WATCH 0 BYTE TERMINATOR
020760  105741                          TSTB    -(R1)           ;BACK UP OVER ZERO BYTE
020762  000205                          RTS     R5              ;EXIT

                                ;ROUTINE TO READ REGISTERS PRIOR TO OPERATION
                                ;CALL:  JSR R5,BEFORE

020764  017737  161252  002216  BEFORE: MOV     @RLCS,B.CS      ;READ CS
020772  017737  161246  002220          MOV     @RLBA,B.BA      ;      BA
021000  017737  161242  002222          MOV     @RLDA,B.DA      ;      DA
021006  017737  161236  002224          MOV     @RLMP,B.MP      ;      MP
021014  000205                          RTS     R5

                                ;ROUTINE TO READ REGISTERS AT TIME OF ERROR
                                ;CALL:  JSR R5,AFTER

021016  017737  161220  002226  AFTER:  MOV     @RLCS,E.CS      ;READ CS
021024  017737  161214  002230          MOV     @RLBA,E.BA      ;      BA
021032  017737  161210  002232          MOV     @RLDA,E.DA      ;      DA
021040  017737  161204  002234          MOV     @RLMP,E.MP      ;      MP
021046  017737  161176  002236          MOV     @RLMP,E.MP1     ;      MP
021054  017737  161170  002240          MOV     @RLMP,E.MP2     ;      MP
021062  000205                          RTS     R5

021064  010046                  SIMBCC: MOV     R0,-(SP)        ;SAVE R0
021066  010146                          MOV     R1,-(SP)        ;SAVE R1
021070  010246                          MOV     R2,-(SP)        ;SAVE R2
021072  012537  002172                  MOV     (R5)+,TEMP2     ;GET NUMBER OF BITS
021076  012537  002174                  MOV     (R5)+,TEMP3     ;GET DATA FOR CRC CALCULATION
021102  012537  002176                  MOV     (R5)+,TEMP4     ;GET STARTING CRC
021106  005037  002154          1$:     CLR     BUFBK           ;
021112  013700  002176                  MOV     TEMP4,R0        ;GET PRESENT  R
```

```
 927  021116  006037  002174            ROR     TEMP3           ;ROTATE NEW DATA
 928  021122  005500                    ADC     R0              ;MERGE NEW WITH OLD
 929  021124  032700  000001            BIT     #1,R0           ;BIT 0 SET
 930  021130  001402                    BEQ     2$              ;IF NOT CONTINUE
 931  021132  005137  002154            COM     BCCFBK          ;
 932  021136  013700  002152    2$:     MOV     XPOLY,R0        ;GET CRC POLYNOMIAL (CRC-16)
 933  021142  005100                    COM     R0              ;COMPLIMENT POLYNOMIAL
 934  021144  040037  002154            BIC     R0,BCCFBK
 935  021150  000241                    CLC                     ;CLEAR CARRY
 936  021152  006037  002176            ROR     TEMP4
 937  021156  013700  002154            MOV     BCCFBK,R0
 938  021162  013701  002176            MOV     TEMP4,R1
 939  021166  010102                    MOV     R1,R2
 940  021170  040100                    BIC     R1,R0
 941  021172  043702  002154            BIC     BCCFBK,R2
 942  021176  050200                    BIS     R2,R0
 943  021200  043737  002152  002176    BIC     XPOLY,TEMP4
 944  021206  050037  002176            BIS     R0,TEMP4
 945  021212  005337  002172            DEC     TEMP2
 946  021216  001333                    BNE     1$
 947
 948  021220  013737  002176  002156    MOV     TEMP4,CALBCC
 949  021226  012602                    MOV     (SP)+,R2
 950  021230  012601                    MOV     (SP)+,R1
 951  021232  012600                    MOV     (SP)+,R0
 952  021234  000205                    RTS     R5              ;RETURN
 953
 954
 955                             ;ROUTINE TO WAIT FOR DRIVE READY
 956
 957
 958
 959
 960  021236  012701  000144    WTDRDY: MOV     #100.,R1
 961  021242  032777  000001  160772 1$:  BIT     #DRDY,@RLCS
 962  021250  001011                    BNE     2$
 963
 964  021252                            WAITUS  #20.
(3)   021252  012700  000024            MOV     #20.,R0
(3)   021256  104027                    EMT     C$WTU
 965  021260  005301                    DEC     R1
 966  021262  001367                    BNE     1$
 967
 968  021264                            ERRDF   200.,DRTIM,ERR5
(3)   021264  104462                    TRAP    T$ERCODE
(5)   021266  000310                    .WORD   200
(5)   021270  007217                    .WORD   DRTIM
(5)   021272  014456                    .WORD   ERR5
 969
 970  021274  000205            2$:     RTS     R5
 971
 972                             ;ROUTINE TO WAIT FOR CONTROLLER
 973
 974  021276  012701  000620    WTCRDY: MOV     #400.,R1
 975  021302  032777  000200  160732 1$:  BIT     #CRDY,@RLCS
 976  021310  001014                    BNE     2$
```

```
 977
 978  021312                                  WAITUS  #20.
 (3)  021312  012700  000024                  MOV     #20.,R0
 (3)  021316  104027                          EMT     C$WTU
 979  021320  005301                          DEC     R1
 980  021322  001367                          BNE     1$
 981  021324  004537  021016                  JSR     R5,AFTER
 982
 983  021330                                  ERRDF   100.,CRTIM,ERR5
 (3)  021330  104462                          TRAP    T$ERCODE
 (5)  021332  000144                          .WORD   100
 (5)  021334  007172                          .WORD   CRTIM
 (5)  021336  014456                          .WORD   ERR5
 984  021340  000205                          RTS     R5
 985
 986  021342  004537  021016          2$:     JSR     R5,AFTER
 987  021346  000205                          RTS     R5
 988
 989
 990  021350  005237  002142          TRPHAN: INC     TRPFLG
 991  021354  000002                          RTI
 992
 993  021356                          HDHOME:
 994
 995  021356                                  BGNSEG                                  ;%%START OF SEGMENT%%
 (3)  021356  104004                          EMT     C$BSEG
 996                                  ;ISSUE DRIVE RESET
 997
 998  021360  012737  000001  002266          MOV     #1,ERFLG                ;SET ERROR FLAG
 999  021366  012777  000013  160652          MOV     #DRST!MK.GSBIT,@RLDA
1000  021374  004537  020456                  JSR     R5,LDFUNC                       ;LOAD THE FUNCTION IN NEXT WORD
1001  021400  000004                          GSTAT
1002  021402  004537  021276                  JSR     R5,WTCRDY
1003  021406                                  ESCAPE  SEG                     ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  021406  104010                          EMT     C$ESCAPE
 (3)  021410  000216                          .WORD   10000$-.
1004  021412  004537  020214                  JSR     R5,CHERR                        ;CHECK CNTLR FOR ERRORS
1005  021416                                  ESCAPE  SEG                     ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  021416  104010                          EMT     C$ESCAPE
 (3)  021420  000206                          .WORD   10000$-.
1006
1007
1008  021422  004537  020456                  JSR     R5,LDFUNC                       ;LOAD THE FUNCTION IN NEXT WORD
1009  021426  000010                          RDHDR
1010  021430                                  ESCAPE  SEG                     ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  021430  104010                          EMT     C$ESCAPE
 (3)  021432  000174                          .WORD   10000$-.
1011  021434  004537  021276                  JSR     R5,WTCRDY
1012  021440                                  ESCAPE  SEG                     ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  021440  104010                          EMT     C$ESCAPE
 (3)  021442  000164                          .WORD   10000$-.
1013
1014  021444  004537  020214                  JSR     R5,CHERR                        ;CHECK CNTLR FOR ERRORS
1015  021450                                  ESCAPE  SEG                     ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  021450  104010                          EMT     C$ESCAPE
 (3)  021452  000154                          .WORD   10000$-.
```

```
 1016
 1017  021454  013737  002234  002160          MOV     E.MP,TMP0       ;GET HEADER
 1018  021462  042737  000077  002160          BIC     #77,TMP0
 1019  021470  001424                          BEQ     99$             ;SEEK IS NOT NECESSARY
 1020  021472  042737  000100  002160          BIC     #100,TMP0
 1021  021500  012777  000001  160540          MOV     #MK,@RLDA       ;SET TO SEEK
 1022  021506  053777  002160  160532          BIS     TMP0,@RLDA      ;SET IN DIFFERENCE
 1023
 1024  021514  004537  020456                  JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
 1025  021520  000006                          SEEK
 1026  021522  004537  021276                  JSR     R5,WTCRDY
 1027  021526                                  ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  021526  104010                          EMT     C$ESCAPE
  (3)  021530  000076                          .WORD   10000$-.
 1028
 1029  021532  004537  020214                  JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
 1030  021536                                  ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  021536  104010                          EMT     C$ESCAPE
  (3)  021540  000066                          .WORD   10000$-.
 1031
 1032  021542  004537  020456          99$:    JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
 1033  021546  000010                          RDHDR
 1034  021550  004537  021276                  JSR     R5,WTCRDY
 1035  021554                                  ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  021554  104010                          EMT     C$ESCAPE
  (3)  021556  000050                          .WORD   10000$-.
 1036  021560  004537  020214                  JSR     R5,CHERR
 1037  021564                                  ESCAPE  SEG
  (3)  021564  104010                          EMT     C$ESCAPE
  (3)  021566  000040                          .WORD   10000$-.
 1038
 1039  021570  013737  002234  002160          MOV     E.MP,TMP0               ;GET HEADER
 1040  021576  043737  002150  002160          BIC     SECMSK,TMP0             ;IGNORE SECTOR
 1041  021604  001404                          BEQ     1$                      ;ON ZERO
 1042
 1043  021606                                  ERRDF   400.,SKHOME,ERRO        ;CAN'T SEEK TO TRACK 0
  (3)  021606  104462                          TRAP    T$ERCODE
  (5)  021610  000620                          .WORD   400
  (5)  021612  010303                          .WORD   SKHOME
  (5)  021614  014244                          .WORD   ERRO
 1044
 1045  021616                          1$:     ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  021616  104010                          EMT     C$ESCAPE
  (3)  021620  000006                          .WORD   10000$-.
 1046
 1047  021622  005037  002266                  CLR     ERFLG           ;INDICATE SUCCESS BACK TO MAIN PROGRAM
 1048
 1049
 1050  021626                                  ENDSEG                          ;%%END OF SEGMENT%%
  (3)  021626                          10000$:
  (3)  021626  104005                          EMT     C$ESEG
 1051
 1052  021630  000207                          RTS     PC
 1053
 1054  021632                                  ENDMOD
 1055
```

```
                                .SBTTL  **TEST 1** - WRITE NPR INTEGRETY

021632                          BGNTST                          ;**START OF TEST**

021632                          STARS
 (2)                            ;;*****************************************************************
                                ;CHECK THAT NPR WILL NOT INTERFERE WITH THE OPERATION OF THE
                                ;UNIBUS. WE SET UP LOCATION 4 TO HANDLE THE TRAP IF IT HAPPENS.
021632                          STARS
 (2)                            ;;*****************************************************************

021632 004737 021356                    JSR     PC,HDHOME       ;HEADS OVER TRACK 0
021636                                  CKERFG                  ;HEADS GO HOME OKAY
 (4) 021644 104032                      EMT     C$EXIT
 (4) 021646 000232                      .WORD   L10026-.

021650                          BGNSEG                          ;%%START OF SEGMENT%%
 (3) 021650 104004                      EMT     C$BSEG

021652                          1$:     SETVEC  ERRVEC,#TRPHAN,#340     ;SET UP FOR TRAP
 (7) 021652 012745 000340               MOV     #340,-(SP)
 (6) 021656 012746 021350               MOV     #TRPHAN,-(SP)
 (5) 021662 013746 002132               MOV     ERRVEC,-(SP)
 (4) 021666 012746 000003               MOV     #3,-(SP)
 (3) 021672 104037                      EMT     C$SVEC
 (2) 021674 062706 000010               ADD     #10,SP
021700 005037 002142                    CLR     TRPFLG                  ;CLEAR TRAP OCCURANCE
021704 012777 003052 160332             MOV     #BUF,@RLBA              ;BUS ADDRESS
021712 005077 160330                    CLR     @RLDA                   ;LOAD DISK ADDRESS
021716 012777 177777 160324             MOV     #-1,@RLMP               ;WORD COUNT OF 1
021724 005037 002166                    CLR     GDDAT                   ;SET UP CSR TO LOAD
021730 013737 002134 002166             MOV     DRIVE,GDDAT             ;SET IN DRIVE
021736 052737 000012 002166             BIS     #WRITE,GDDAT            ;SET IN FUNCTION
021744 004537 020764                    JSR     R5,BEFORE               ;LOAD FOR ERROR PRINTOUT
021750 013737 002166 002216             MOV     GDDAT,B.CS              ;SET IN COMMAND
021756 052737 000201 002216             BIS     #201,B.CS               ;LOAD CRDY
021764 042737 002000 002216             BIC     #OPI,B.CS               ;CLEAR (BIT 10)
021772 013777 002166 160242             MOV     GDDAT,@RLCS             ;ISSUE WRITE
022000 012701 000144                    MOV     #100.,R1                ;WAIT FOR CRDY
022004 032777 000200 160230     5$:     BIT     #CRDY,@RLCS             ;NPR DONE
022012 001013                           BNE     6$                      ;YES, 6$
022014                                  WAITUS  #20.                    ;WAIT A WHILE
 (3) 022014 012700 000024               MOV     #20.,R0
 (3) 022020 104027                      EMT     C$WTU
022022 005301                           DEC     R1                      ;A WHILE UP
022024 001367                           BNE     5$                      ;NO, GO BACK

022026 004537 021016                    JSR     R5,AFTER
022032                                  ERRDF   0.,CRTIM,ERR5           ;CONTROLLER TIMED OUT
 (3) 022032 104462                      TRAP    T$ERCODE
 (5) 022034 000000                      .WORD   0
 (5) 022036 007172                      .WORD   CRTIM
 (5) 022040 014456                      .WORD   ERR5
022042                          6$:     CLRVEC  ERRVEC                  ;CLEAR VECTOR
 (3) 022042 013700 002132               MOV     ERRVEC,R0
```

```
  (3)  022046  104036                    EMT     C$CVEC
1094   022050                           ESCAPE  SEG                ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  022050  104010                    EMT     C$ESCAPE
  (3)  022052  000024                    .WORD   10001$-.
1095
1096   022054  005737  002142           TST     TRPFLG             ;DID TRAP OCCUR?
1097   022060  001406                   BEQ     7$                 ;NO
1098   022062  004537  021016           JSR     R5,AFTER
1099   022066                           ERRSF   1.,EM51,ERR0       ;TRAP ON WRITE
  (3)  022066  104461                    TRAP    T$ERCODE
  (5)  022070  000001                    .WORD   1
  (5)  022072  013145                    .WORD   EM51
  (5)  022074  014244                    .WORD   ERR0
1100   022076                   7$:
1101
1102
1103   022076                           ENDSEG                     ;%%END OF SEGMENT%%
  (3)  022076                   10001$:
  (3)  022076  104005                    EMT     C$ESEG
1104
1105   022100                   ENDTST                             ;**END OF TEST**
  (3)  022100                   L10026:
  (3)  022100  104001                    EMT     C$ETST
1106
1107                             .SBTTL  **TEST 2** - WRITE FUNCTION
1108
1109   022102                   BGNTST                             ;**START OF TEST**
1110
1111
1112
1113   022102                   STARS
  (2)                            ;;*****************************************************************
1114                             ;CHECK OF WRITE LOGIC UNDER FLAG MODE, WE WILL FIRST ISSUE A
1115                             ;READ HEADER SO THAT WE DON'T WRITE ON THE BAD SECTOR
1116                             ;FILE TRACK.  WE WILL WRITE A FULL SECTOR (128 WORDS) FROM
1117                             ;MEMORY (BUF).  WE CHECK THAT NO ERRORS OCCUR.  IF WE
1118                             ;HAVE A DRIVE ERROR WE WILL DO A ''GET STATUS'' TO SEE
1119                             ;IF WRITE PROTECT IS SET IF IT IS WE WILL ABORT THE
1120                             ;TEST.  AN ERROR ON THE WRITE WILL LOOP ON JUST THE
1121                             ;WRITE PORTION.  LOOP ON TEST WILL READ HEADER, SEEK (IF
1122                             ;NECESSARY) AND WRITE.
1123   022102                   STARS
  (2)                            ;;*****************************************************************
1124
1125
1126   022102  004737  021356           JSR     PC,HDHOME          ;HEADS OVER TRACK 0
1127   022106                           CKERFG                     ;HEADS GO HOME OKAY
  (4)  022114  104032                    EMT     C$EXIT
  (4)  022116  000126                    .WORD   L10027-.
1128
1129   022120                           BGNSEG                             ;%%START OF SEGMENT%%
  (3)  022120  104004                    EMT     C$BSEG
1130
1131   022122                   3$:
1132   022122  005077  160120           CLR     @RLDA              ;SET DISK ADDRESS
1133   022126  012777  177600  160114   MOV     #-128.,@RLMP       ;WORD COUNT
```

```
1134  022134  012777  003052  160102          MOV     #BUF,@RLBA      ;BUS ADDRESS
1135  022142  004537  020456                  JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
1136  022146  000012                          WRITE                   ;WRITE
1137
1138  022150  004537  021276                  JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY
1139  022154                                  ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  022154  104010                          EMT     C$ESCAPE
 (3)  022156  000064                          .WORD   10000$-.
1140
1141
1142  022160  032777  040000  160054          BIT     #DERR,@RLCS     ;DRIVE ERROR SET?
1143  022166  001425                          BEQ     4$              ;BRANCH IF NOT
1144
1145  022170  012777  000003  160050          MOV     #MK.GSBIT,@RLDA ;SET GET STATUS OF DRIVE
1146  022176  004537  020456                  JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
1147  022202  000004                          GSTAT                   ;GET STATUS
1148  022204  004537  021276                  JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY
1149  022210                                  ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  022210  104010                          EMT     C$ESCAPE
 (3)  022212  000030                          .WORD   10000$-.
1150
1151  022214  013737  002234  002166          MOV     E.MP,GDDAT      ;READ DRIVE STATUS
1152  022222  032737  020000  002166          BIT     #BIT13,GDDAT    ;WRITE LOCK ERROR?
1153  022230  001404                          BEQ     4$              ;NO, BRANCH
1154
1155
1156  022232                                  ERRSF   3.,WRLOCK,ERRO          ;WRITE LOCK ERROR
 (3)  022232  104461                          TRAP    T$ERCODE
 (5)  022234  000003                          .WORD   3
 (5)  022236  010331                          .WORD   WRLOCK
 (5)  022240  014244                          .WORD   ERRO
1157  022242                          4$:
1158
1159
1160  022242                                  ENDSEG                          ;%%END OF SEGMENT%%
 (3)  022242                          10000$:
 (3)  022242  104005                          EMT     C$FSEG
1161  022244                          ENDTST                          ;**END OF TEST**
 (3)  022244                          L10027:
 (3)  022244  104001                          EMT     C$ETST
1162
1163                                    .SBTTL  **TEST 3** - WRITE FUNCTION INTERRUPT
1164
1165  022246                            BGNTST                          ;**START OF TEST**
1166
1167  022246                            STARS
 (2)                                    ;;**************************************************************
1168                                    ;
1169                                    ;CHECK OF WRITE LOGIC UNDER INTERRUPT MODE, WE WILL ISSUE A
1170                                    ;READ HEADER SO THAT WE DON'T WRITE ON THE BAD SECTOR FILE
1171                                    ;TRACK.  WE WILL WRITE A FULL SECTOR (128 WORDS) FROM MEMORY (BUF).
1172                                    ;WE CHECK THAT NO ERRORS OCCUR.  WE DO NOT CHECK RLDA OR RLBA
1173  022246                            ;INCREMENT AT THIS TIME.
 (2)                                    STARS
1174                                    ;;**************************************************************
1175
```

```
1176  022246  004737  021356                JSR     PC,HDHOME       ;HEADS OVER TRACK 0
1177  022252                                CKERFG                  ;HEADS GO HOME OKAY
 (4)  022260  104032                        EMT     C$EXIT
 (4)  022262  000112                        .WORD   L10030-.
1178
1179  022264                                BGNSEG                          ;%%START OF SEGMENT%%
 (3)  022264  104004                        EMT     C$BSEG
1180
1181
1182  022266  005037  002144                CLR     INTFLG          ;CLEAR INTERRUPT OCCURANCE FLAG
1183  022272  005077  157750                CLR     @RLDA
1184  022276  012777  177600  157744        MOV     #-128.,@RLMP    ;SET UP WORD COUNT
1185  022304  012777  003052  157732        MOV     #BUF,@RLBA      ;SET UP BUS ADDRESS
1186
1187  022312                                SETPRI  #PRI00          ;PRIORITY TO 0
 (3)  022312  012700  000000                MOV     #PRI00,R0
 (3)  022316  104041                        EMT     C$SPRI
1188  022320  004537  020456                JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
1189  022324  000112                        WRITE.INTEN             ;WRITE UNDER INTERRUPT
1190  022326  004537  021276                JSR     R5,WTCRDY       ;WAIT FOR INTERRUPT
1191  022332                                ESCAPE  SEG             ;CHECK FOR FLAG:OE, ELSE EXIT SEG
 (3)  022332  104010                        EMT     C$ESCAPE
 (3)  022334  000036                        .WORD   10000$-.
1192
1193  022336                                SETPRI  #PRI07          ;SET PRIORITY TO 7
 (3)  022336  012700  000340                MOV     #PRI07,R0
 (3)  022342  104041                        EMT     C$SPRI
1194  022344  005737  002144                TST     INTFLG          ;DID INTERRUPT OCCUR?
1195  022350  001004                        BNE     2$              ;YES-BRANCH NO-REPORT
1196
1197  022352                                ERRDF   4.,EM17,ERR0    ;WRITE DID NOT INTERRUPT
 (3)  022352  104462                        TRAP    T$ERCODE
 (5)  022354  000004                        .WORD   4
 (5)  022356  011351                        .WORD   EM17
 (5)  022360  014244                        .WORD   ERR0
1198  022362                          2$:   ESCAPE  SEG             ;CHECK FOR FLAG:OE, ELSE EXIT SEG
 (3)  022362  104010                        EMT     C$ESCAPE
 (3)  022364  000006                        .WORD   10000$-.
1199
1200  022366  004537  020214                JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
1201
1202  022372                                ENDSEG                          ;%%END OF SEGMENT%%
 (3)  022372                          10000$:
 (3)  022372  104005                        EMT     C$ESEG
1203  022374                          ENDTST                          ;**END OF TEST**
 (3)  022374                          L10030:
 (3)  022374  104001                        EMT     C$ETST
1204
1205                                  .SBTTL  **TEST 4** - PROPER INCREMENT OF RLBA ON WRITE
1206
1207  022376                          BGNTST                          ;**START OF TEST**
1208
1209
1210  022376                          STARS
 (2)                                  ;;*************** **********************************************
1211                                  ;CHECK THAT THE RLBA WILL INCREMENT PROPERLY AFTER THE
```

```
                                   ;WRITE WAS FINISHED THE RLBA SHOULD BE 128 WORDS (256 BYTES)
                                   ;CREATER.  STARTING RLBA IS 'BUF', ENDING SHOULD BE 'BUF + 256.'
                                   ;WE WILL MONITOR ALL ERRORS AND REPORT THEM ACCORDINGLY
022376                             STARS
                                   ;;**************************************************************


022376  004737  021356                     JSR     PC,HDHOME       ;HEADS OVER TRACK 0
022402                                     CKERFG                  ;HEADS GO HOME OKAY
022410  104032                             EMT     C$EXIT
022412  000116                             .WORD   L10031-.

022414                                     BGNSEG                          ;%%START OF SEGMENT%%
022414  104004                             EMT     C$BSEG

022416                             3$:
022416  005077  157624                     CLR     @RLDA
022422  012777  003052  157614             MOV     #BUF,@RLBA      ;SET UP BUS ADDRESS
022430  012777  177600  157612             MOV     #-128.,@RLMP    ;WORD COUNT
022436  012737  003052  002166             MOV     #BUF,GDDAT      ;FORM EXPECTED BUS ADDRESS
022444  062737  000400  002166             ADD     #256.,GDDAT     ;AFTER WRITE

022452  004537  020456                     JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
022456  000012                             WRITE                   ;WRITE
022460  004537  021276                     JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY
022464                                     ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
022464  104010                             EMT     C$ESCAPE
022466  000040                             .WORD   10000$-.

022470  004537  020214                     JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
022474                                     ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
022474  104010                             EMT     C$ESCAPE
022476  000030                             .WORD   10000$-.
022500  017737  157540  002170             MOV     @RLBA,BDDAT     ;READ 'RLBA' FOR PRESENT ADDRESS
022506  023737  002170  002166             CMP     BDDAT,GDDAT     ;DID 'BA' INCREMENT PROPERLY?
022514  001404                             BEQ     2$              ;YES, CONTINUE

022516                                     ERRDF   5.,EM20,ERR4    ;BA DID NOT INCREMENT
022516  104462                             TRAP    T$ERCODE
022520  000005                             .WORD   5
022522  011411                             .WORD   EM20
022524  014410                             .WORD   ERR4

022526                             2$:

022526                                     ENDSEG                          ;%%END OF SEGMENT%%
022526                             10000$:
022526  104005                             EMT     C$ESEG
022530                             ENDTST                                  ;**END OF TEST**
022530                             L10031:
022530  104001                             EMT     C$ETST

                                   .SBTTL  **TEST 5** - PROPER INCREMENT OF RLDA ON WRITE

022532                             BGNTST                                  ;**START OF TEST**
```

```
                                STARS
                                ;;*****************************************************************
                                ;CHECK THAT THE SECTOR INCREMENTS AFTER THE WRITE WAS FINISHED.
                                ;WE RANDOMLY PICK A SECTOR (OTHER THAN LAST TRACK) AND ISSUE
                                ;A FULL SECTOR WRITE THE RLDA SHOULD REFLECT AN INCREMENT
                                ;OF THE SECOTR.  'GDDAT' WAS THE EXPECTED RLDA.
                                STARS
                                ;;*****************************************************************

022532  004737  021356          JSR     PC,HDHOME       ;HEADS OVER TRACK 0
022536                          CKERFG                  ;HEADS GO HOME OKAY
022544  104032                  EMT     C$EXIT
022546  000114                  .WORD   L10032-.

022550                          BGNSEG                          ;%%START OF SEGMENT%%
022550  104004                  EMT     C$BSEG

022552                  3$:
022552  005037  002166          CLR     GDDAT
022556  013777  002166  157462  MOV     GDDAT,@RLDA     ;SETUP DISK ADDRESS
022564  005237  002166          INC     GDDAT           ;CREATE EXPECTED SECTOR
022570  012777  177600  157452  MOV     #-128.,@RLWP    ;WORD COUNT
022576  012777  003052  157440  MOV     #BUF,@RLBA      ;SETUP BUS ADDRESS

022604  004537  020456          JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
022610  000012                  WRITE                   ;WRITE
022612  004537  021276          JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY
022616                          ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
022616  104010                  EMT     C$ESCAPE
022620  000040                  .WORD   10000$-.

022622  004537  020214          JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
022626                          ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
022626  104010                  EMT     C$ESCAPE
022630  000030                  .WORD   10000$-.

022632  013737  002232  002170  MOV     E.DA,BDDAT      ;READ DISK ADDRESS
022640  023737  002166  002170  CMP     GDDAT,BDDAT     ;DID SECTOR INCREMENT PROPERLY
022646  001404                  BEQ     2$              ;YES, BRANCH  NO, REPORT ERROR

022650                          ERRDF   6.,EM21,ERR4    ;DA DID NOT INCREMENT
022650  104462                  TRAP    T$ERCODE
022652  000006                  .WORD   6
022654  011466                  .WORD   EM21
022656  014410                  .WORD   ERR4

022660                  2$:

022660                          ENDSEG                          ;%%END OF SEGMENT%%
022660                  10000$:
022660  104005                  EMT     C$ESEG
022662                  ENDTST                          ;**END OF TEST**
022662                  L10032:
022662  104001                  EMT     C$ETST
```

```
                                .SBTTL  **TEST 6** - FORCE HEADER NOT FOUND WITH WRITE

022664                          BGNTST                          ;**START OF TEST**

022664                          STARS
 (2)                            ;;*****************************************************************
                                ;FORCE HEADER NOT FOUND ERROR TO OCCUR.  THIS IS DONE
                                ;BY SETTING SECTOR 40 OF THE RLDA AND ISSUING A
                                ;WRITE.  SECTOR 40 DOES NOT EXIST ON THE RL01 PACK
                                ;THEREFORE HDR NT FOUND SHOULD SET.
022664                          STARS
 (2)                            ;;*****************************************************************

022664  004737  021356                JSR     PC,HDHOME       ;HEADS OVER TRACK 0
022670                              CKERFG                      ;HEADS GO HOME OKAY
 (4)    022676  104032              EMT     C$EXIT
 (4)    022700  000120              .WORD   10033-.

022702                              BGNSEG                          ;%%START OF SEGMENT%%
 (3)    022702  104004              EMT     C$BSEG

022704  012777  000050  157334      MOV     #40.,@RLDA      ;INSURE NOT TO FIND HEADER BY
022712  012777  003052  157324      MOV     #BUF,@RLBA      ;SETTING SECTOR 40 OF CYL. ADDR.
022720  012777  177777  157322      MOV     #-1,@RLMP       ;WORD COUNT

022726  004537  020456              JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
022732  000012                      WRITE                   ;WRITE
022734  004537  021276              JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY
022740                              ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)    022740  104010              EMT     C$ESCAPE
 (3)    022742  000054              .WORD   10000$-.

022744  013737  002226  002160      MOV     E.CS,TMP0       ;GET RLCS
022752  042737  001777  002160      BIC     #1777,TMP0      ;SAVE ERROR BITS
022760  022737  112000  002160      CMP     #BIT15.BIT12!BIT10,TMP0  ;HDR NOT FOUND SET.
022766  001402                      BEQ     1$              ;YES, CONTINUE

022770  004537  020274              JSR     R5,CHERR
022774                      1$:     CKLOOP
 (3)    022774  104006              EMT     C$CLP1

022776  022737  112000  002160      CMP     #BIT15.BIT12!BIT10,TMP0
023004  001404                      BEQ     2$
023006                              ERRDF   23.,EM10,ERR0
 (3)    023006  104462              TRAP    T$ERCODE
 (5)    023010  000027              .WORD   23
 (5)    023012  011043              .WORD   EM10
 (5)    023014  014244              .WORD   ERR0

023016                      2$:                             ;WHEN FORCED

023016                              ENDSEG                          ;%%END OF SEGMENT%%
 (3)    023016                  10000$:
 (3)    023016  104005              EMT     C$ESEG
023020                      ENDTST                          ;**END OF TEST**
```

```
  (3)  023020                          L10033:
  (3)  023020  104001                          EMT     C$ETST
1333
1334                                   .SBTTL  **TEST 7** - FORCE HEADER NOT FOUND WITH WRITE INTERRUPT
1335
1336  023022                           BGNTST                                  ;**START OF TEST**
1337
1338
1339  023022                           STARS
  (2)                                  ;;*********************************************************************
1340                                   ;TEST THAT HEADER NOT FOUND ERROR WILL GENERATE AN INTERRUPT
1341                                   ;ON OCCURANCE.  HEADER NOT FOUND WILL BE FORCED BY SETTING
1342                                   ;SECTOR 40 OF RLDA AND ISSUEING A WRITE
1343  023022                           STARS
  (2)                                  ;;*********************************************************************
1344
1345
1346  023022  00 737  021356                       JSR     PC,HDHOME       ;HEADS OVER TRACK 0
1347  023026                                       CKERFG                  ;HEADS GO HOME OKAY
  (4)  023034  104032                            EMT     C$EXIT
  (4)  023036  000160                            .WORD   L10034-.
1348
1349  023040                                       BGNSEG                          ;%%START OF SEGMENT%%
  (3)  023040  104004                            EMT     C$BSEG
1350
1351  023042                                       SETPRI  #PRI00
  (3)  023042  012700  000000                    MOV     #PRI00,R0
  (3)  023046  104041                            EMT     C$SPRI
1352  023050  005037  002144                      CLR     INTFLG          ;CLEAR INTERRUPT OCCURANCE FLAG
1353  023054  012777  000050  157164             MOV     #40.,@RLDA      ;INSURE NOT TO FIND HEADER BY
1354  023062  012777  003052  157154             MOV     #BUF,@RLBA      ;SETTING SECTOR 40 OF CYL. ADDR.
1355  023070  012777  177777  157152             MOV     #-1,@RLMP       ;WORD COUNT
1356
1357  023076  004537  020456                      JSR     R5,'DFUNC               ;LOAD THE FUNCTION IN NEXT WORD
1358  023102  000112                              WRITE.INTEN             ,WRITE
1359  023104  004537  021276                      JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY
1360  023110                                       CKLOOP
  (3)  023110  104006                            EMT     C$CLP1
1361  023112                                       SETPRI  #PRI07
  (3)  023112  012700  000340                    MOV     #PRI07,R0
  (3)  023116  104041                            EMT     C$SPRI
1362
1363  023120  005737  002144                      TST     INTFLG          ;DID INTERRUPT OCCUR
1364  023124  001004                              BNE     2$              ;YES OKAY
1365
1366  023126                                       ERRDF   24.,EM43,ERR0   ;NO INTERRUPT FROM OPI
  (3)  023126  104462                            TRAP    T$ERCODE
  (5)  023130  000030                            .WORD   24
  (5)  023132  012723                            .WORD   EM43
  (5)  023134  014244                            .WORD   ERR0
1367
1368  023136                           2$:         ESCAPE  SEG             ;CHECK FOR FLOE, ELSE EXIT SEG
  (3)  023136  104010                            EMT     C$ESCAPE
  (3)  023140  000054                            .WORD   10000$-.
1369
1370
```

```
1371  023142  013737  002226  002160          MOV     E.CS,TMP0       ;GET RLCS
1372  023150  042737  001777  002160          BIC     #1777,TMP0      ;SAVE ERROR BITS
1373  023156  022737  112000  002160          CMP     #BIT15.BIT12.BIT10,TMP0  ;WDR NOT FOUND SET.
1374  023164  001402                          BEQ     1$              ;YES, CONTINUE
1375
1376  023166  004537  020214                  JSR     R5,CHERR
1377  023172                          1$:     CKLOOP
 (3)  023172  104006                          EMT     C$CLP1
1378
1379  023174  022737  112000  002160          CMP     #BIT15!BIT12!BIT10,TMP0
1380  023202  001404                          BEQ     3$
1381  023204                                  ERRDF   25.,EM10,ERR0
 (3)  023204  104462                          TRAP    T$ERCODE
 (5)  023206  000031                          .WORD   25
 (5)  023210  011043                          .WORD   EM10
 (5)  023212  014244                          .WORD   ERR0
1382                                                            ;WHEN FORCED
1383  023214                            3$:
1384
1385  023214                                  ENDSEG                          ;%%END OF SEGMENT%%
 (3)  023214                            10000$:
 (3)  023214  104005                          EMT     C$ESEG
1386  023216                            ENDTST                                ;**END OF TEST**
 (3)  023216                            L10034:
 (3)  023216  104001                          EMT     C$ETST
1387
1388
1389
1390                                    .SBTTL  **TEST 8** - CHECK OPI TIME WITH HDR NT FND
1391
1392  023220                            BGNTST                                ;**START OF TEST**
1393
1394  023220                            STARS
 (2)                                    ;;*************************************************************************
1395                                    ;CHECK OPI TIME IT SHOULD BE AROUND 200 MILLISECONDS (ON UNIBUS)
1396                                    ;CHECK THIS BY TIMING OPI ON A FORCED HEADER NOT FOUND
1397                                    ;ISSUE WRITE WITH SECTOR 40 SET IN THE DISK ADDRESS
1398  023220                            STARS
 (2)                                    ;;*************************************************************************
1399
1400  023220  004737  021356                  JSR     PC,HDHOME       ;HEADS OVER TRACK 0
1401  023224                                  CKERFG                  ;HEADS GO HOME OKAY
 (4)  023232  104032                          EMT     C$EXIT
 (4)  023234  000264                          .WORD   L10035-.
1402
1403  023236                                  BGNSEG                          ;%%START OF SEGMENT%%
 (3)  023236  104004                          EMT     C$BSEG
1404
1405  023240                                  CLRVEC  BVEC            ;CLEAR PRESENT INTERRUPT VECTOR
 (3)  023240  013700  002254                  MOV     BVEC,R0
 (3)  023244  104036                          EMT     C$CVEC
1406  023246                                  SETVEC  BVEC,#TIMSRV,#340       ;SET INTR. VEC. WITH ABORT WAIT
 (7)  023246  012746  000340                  MOV     #340,-(SP)
 (6)  023252  012746  020116                  MOV     #TIMSRV,-(SP)
 (5)  023256  013746  002254                  MOV     BVEC,-(SP)
 (4)  023262  012746  000003                  MOV     #3,-(SP)
```

```
   (3)  023266  104037                          EMT     C$SVEC
   (2)  023270  062706  000010                  ADD     #10,SP
  1407  023274                                  SETPRI  #PRI00
   (3)  023274  012700  000000                  MOV     #PRI00,R0
   (3)  023300  104041                          EMT     C$SPRI
  1408  023302  005037  002144                  CLR     INTFLG          ;CLEAR INTERRUPT FLAG
  1409  023306  012777  000050  156732          MOV     #40.,@RLDA      ;SET UP FOR HDR NT FND
  1410  023314  012777  003052  156722          MOV     #BUF,@RLBA      ;BUS ADDRESS
  1411  023322  012777  177777  156720          MOV     #-1,@RLMP       ;WORD COUNT
  1412
  1413  023330  004537  020456                  JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
  1414  023334  000112                          WRITE!INTEN
  1415
  1416  023336  013700  002302                  MOV     OPIMX,R0
  1417  023342  006300                          ASL     R0
  1418  023344  006300                          ASL     R0
  1419  023346  006300                          ASL     R0
  1420  023350  063700  002302                  ADD     OPIMX,R0
  1421  023354  063700  002302                  ADD     OPIMX,R0
  1422  023360                                  WAITUS  R0              ;WAIT MAX MILLISECONDS
   (3)  023360  104027                          EMT     C$WTJ
  1423  023362  010037  002170                  MOV     R0,BDDAT        ;SETUP FOR WORST CASE
  1424  023366  005737  002144                  TST     INTFLG          ;DID INTERRUPT OCCUR
  1425  023372  001427                          BEQ     4$              ;NO, REPORT ERROR
  1426
  1427  023374                                  GETTIM  BDDAT           ;GET TIME EXPIRED
   (3)  023374  104052                          EMT     C$GTIM
   (3)  023376  010037  002170                  MOV     R0,BDDAT
  1428  023402  005000                          CLR     R0              ;DIVIDE
  1429  023404  162737  000012  002170  1$:     SUB     #10.,BDDAT      ;ANSWER
  1430  023412  100402                          BMI     3$              ;BY 10 TO GET
  1431  023414  005200                          INC     R0              ;RIGHT ANSWER
  1432  023416  000772                          BR      1$
  1433  023420  010037  002170          3$:     MOV     R0,BDDAT
  1434
  1435                                  ;CHECK THAT OPI TIME IS WITHIN LIMITS
  1436
  1437  023424                          2$:     SETPRI  #PRI07
   (3)  023424  012700  000340                  MOV     #PRI07,R0
   (3)  023430  104041                          EMT     C$SPRI
  1438  023432  023737  002302  002170          CMP     OPIMX,BDDAT     ;IS IT WITHIN LIMITS
  1439  023440  002404                          BLT     4$              ;NO, REPORT ERROR
  1440
  1441  023442  023737  002300  002170          CMP     OPIMN,BDDAT     ;WITHIN LIMITS
  1442  023450  003404                          BLE     5$              ;YES
  1443
  1444  023452                          4$:     ERRDF   974.,EM56,ERR13 ;OPI TIMING INCORRECT
   (3)  023452  104462                          TRAP    T$ERCODE
   (5)  023454  001716                          .WORD   974
   (5)  023456  013456                          .WORD   EM56
   (5)  023460  015102                          .WORD   ERR13
  1445
  1446  023462                          5$:     CLRVEC  BVEC            ;CLEAR PRESENT VECTOR
   (3)  023462  013700  002254                  MOV     BVEC,R0
   (3)  023466  104036                          EMT     C$CVEC
  1447  023470                                  SETVEC  BVEC,#INTSR,,#34.       ;SET IN OLD VECTOR
```

```
  (7)  023470  012746  000340                MOV     #340,-(SP)
  (6)  023474  012746  020110                MOV     #INTSRV,-(SP)
  (5)  023500  013746  002254                MOV     BVEC,-(SP)
  (4)  023504  012746  000003                MOV     #3,-(SP)
  (3)  023510  104037                        EMT     C$SVEC
  (2)  023512  062706  000010                ADD     #10,SP
1448
1449  023516                                 ENDSEG                          ;%%END OF SEGMENT%%
  (3)  023516                          10000$:
  (3)  023516  104005                        EMT     C$ESEG
1450
1451  023520                               ENDTST                            ;**END OF TEST**
  (3)  023520                          L10035:
  (3)  023520  104001                        EMT     C$ETST
1452
1453                                       .SBTTL  **TEST 9** - MULTIPLE SECTOR TRANSFER ON WRITE
1454
1455  023522                               BGNTST                            ;**START OF TEST**
1456
1457  023522                               STARS
  (2)                                      ;;*****************************************************************
1458                                       ;CHECK FOR MULTIPLE SECTOR TRANSFER ON WRITE. THIS TEST CHECKS
1459                                       ;THAT TWO SECTORS CAN BE SUCCESSFULLY WRITTEN.  WE LOAD
1460                                       ;A WORD COUNT OF 129 WORDS (ONE SECTOR + 1 WORD) STARTING AT
1461                                       ;SECTOR 0 THRU SECTOR 37 AND VERIFY THAT THE RLDA DOES
1462                                       ;A DOUBLE INCREMENT EACH TIME.
1463  023522                               STARS
  (2)                                      ;;*****************************************************************
1464
1465
1466
1467  023522  004737  021356                     JSR     PC,HDHOME          ;HEADS OVER TRACK 0
1468  023526                                     CKERFG                     ;HEADS GO HOME OKAY
  (4)  023534  104032                          EMT     C$EXIT
  (4)  023536  000152                          .WORD   L10036-.
1469
1470  023540  005037  002160                    CLR     TMP0               ;CLEAR TEMP LOCATIONS
1471  023544  005037  002162                    CLR     TMP1
1472
1473  023550                                     BGNSEG                             ;%%START OF SEGMENT%%
  (3)  023550  104004                          EMT     C$BSEG
1474
1475
1476  023552  013737  002162  002166  1$:      MOV     TMP1,GDDAT         ;GET CYLINDER
1477  023560  053737  002160  002166           BIS     TMP0,GDDAT         ;GET SECTOR
1478  023566  013777  002166  156452           MOV     GDDAT,@RLDA        ;SET DISK ADDRESS-SECTOR 0
1479  023574  062737  000002  002166           ADD     #2,GDDAT           ;SET EXPECTED + 2
1480  023602  012777  003052  156434           MOV     #BUF,@RLBA         ;SET BUS ADDRESS
1481  023610  012777  177577  156432           MOV     #-129.,@RLMP       ;WORD COUNT-SECTOR+1 WORD
1482
1483  023616  004537  020456                   JSR     R5,LDFUNC                  ;LOAD THE FUNCTION IN NEXT WORD
1484  023622  000012                           WRITE                      ;WRITE
1485  023624  004537  021276                   JSR     R5,WTCRDY          ;WAIT FOR CONTROLLER READY?
1486  023630                                   ESCAPE  SEG                ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  023630  104010                          EMT     C$ESCAPE
  (3)  023632  000054                          .WORD   10000$-.
```

```
1487
1488  023634  004537  020214                JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
1489  023640                                ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  023640  104010                        EMT     C$ESCAPE
 (3)  023642  000044                        .WORD   10000$-.
1490
1491  023644  013737  002232  002170        MOV     E.DA,BDDAT      ;READ DISK ADDRESS
1492  023652  023737  002170  002166        CMP     BDDAT,GDDAT     ;IS DISK ADDRESS CORRECT
1493  023660  001404                        BEQ     2$              ;YES, BRANCH  NO, REPORT ERROR
1494
1495  023662                                ERRDF   7.,EM22,ERR4    ;DISK ADDRESS NOT CORRECT
 (3)  023662  104462                        TRAP    T$ERCODE
 (5)  023664  000007                        .WORD   7
 (5)  023666  011544                        .WORD   EM22
 (5)  023670  014410                        .WORD   ERR4
1496
1497  023672                        2$:
1498
1499  023672  005237  002160                INC     TMP0            ;NEXT SECTOR
1500  023676  022737  000046  002160        CMP     #46,TMP0        ;AT END?
1501  023704  001322                        BNE     1$              ;NO, GO BACK
1502
1503  023706                                ENDSEG                          ;%%END OF SEGMENT%%
 (3)  023706                        10000$:
 (3)  023706  104005                        EMT     C$ESEG
1504  023710                        ENDTST                          ;**END OF TEST**
 (3)  023710                        L10036:
 (3)  023710  104001                        EMT     C$ETST
1505
1506                                .SBTTL  **TEST 10** - CHECK DIRECTION OF WRITE NPR
1507
1508  023712                        BGNTST                          ;**START OF TEST**
1509
1510  023712                        STARS
 (2)                                ;;**********************************************************************
1511                                ;VERIFY THAT A WRITE IS WRITING NOT READING.  WE WRITE A
1512                                ;KNOWN PATTERN IN 'BUF' (128 WORD), WF THEN ISSUE A WRITE.
1513                                ;ONCE THE WRITE IS FINISHED WE CHECK THAT 'BUF' IS INTACT.
1514                                ;THIS IS DONE TO PROVE THAT THE NPR IS GOING THE RIGHT
1515                                ;WAY.
1516  023712                        STARS
 (2)                                ;;**********************************************************************
1517
1518
1519  023712  004737  021356                JSR     PC,HDHOME       ;HEADS OVER TRACK 0
1520  023716                                CKERFG                  ;HEADS GO HOME OKAY
 (4)  023724  104032                        EMT     C$EXIT
 (4)  023726  000160                        .WORD   L10037-.
1521
1522  023730                                BGNSEG                          ;%%START OF SEGMENT%%
 (3)  023730  104004                        EMT     C$BSEG
1523
1524  023732                        2$:
1525  023732  012702  003052                MOV     #BUF,R2         ;WRITE BUFFER FOR WRITE OPERATION
1526  023736  012701  000200                MOV     #128.,R1        ;ONE SECTOR'S WORTH
1527  023742  012722  125252        3$:     MOV     #125252,(R2)+   ;WRITE BUFFER
```

```
1528  023746  005301                        DEC     R1              ;DONE?
1529  023750  001374                        BNE     3$              ;NO, GO BACK
1530
1531  023752  005077  156270                CLR     @RLDA           ;LOAD DISK ADDRESS
1532  023756  012777  177600  156264        MOV     #-128.,@RLMP    ;WORD COUNT
1533  023764  012777  003052  156252        MOV     #BUF,@RLBA      ;BUS ADDRESS
1534  023772  004537  020456                JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
1535  023776  000012                        WRITE                   ;WRITE SOME DATA
1536  024000  004537  021276                JSR     R5,WTCRDY       ;WAIT FOR IT TO FINISH
1537  024004                                ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  024004  104010                        EMT     C$ESCAPE
 (3)  024006  000076                        .WORD   10000$-.
1538
1539  024010  004537  020214                JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
1540  024014                                ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  024014  104010                        EMT     C$ESCAPE
 (3)  024016  000066                        .WORD   10000$-.
1541
1542  024020  012702  003052                MOV     #BUF,R2         ;SET UP TO CHECK BUFFER
1543  024024  012701  000200                MOV     #128.,R1        ;CHECK 128 WORDS
1544
1545  024030                                BGNSEG                          ;%%START OF SEGMENT%%
 (3)  024030  104004                        EMT     C$BSEG
1546
1547  024032  012737  125252  002166        MOV     #125252,GDDAT   ;DATA SHOULD BE 125252
1548  024040  011237  002170        4$:     MOV     (R2),BDDAT      ;LOAD DATA INTO BDDAT
1549  024044  023737  002166  002170        CMP     GDDAT,BDDAT     ;IS IT OKAY?
1550  024052  001406                        BEQ     5$              ;YES, CONTINUE
1551
1552  024054  010237  002162                MOV     R2,TMP1 ;LOAD MEMORY LOCATION OF FAILURE
1553  024060                                ERRDF   8.,EM26,ERR8
 (3)  024060  104462                        TRAP    T$ERCODE
 (5)  024062  000010                        .WORD   8
 (5)  024064  012045                        .WORD   EM26
 (5)  024066  014564                        .WORD   ERR8
1554
1555  024070                        5$:     ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  024070  104010                        EMT     C$ESCAPE
 (3)  024072  000010                        .WORD   10001$-.
1556  024074  005722                6$:     TST     (R2)+           ;NEXT
1557  024076  005301                        DEC     R1              ;DONE?
1558  024100  001357                        BNE     4$              ;NO, GO BACK
1559
1560  024102                                ENDSEG                          ;%%END OF SEGMENT%%
 (3)  024102                        10001$:
 (3)  024102  104005                        EMT     C$ESEG
1561  024104                                ENDSEG                          ;%%END OF SEGMENT%%
 (3)  024104                        10000$:
 (3)  024104  104005                        EMT     C$ESEG
1562  024106                        ENDTST                          ;**END OF TEST**
 (3)  024106                        L10037:
 (3)  024106  104001                        EMT     C$ETST
1563
1564                                .SBTTL  **TEST 11** - CHECK FULL RLBA INCREMENT
1565
1566  024110                        BGNTST                          ;**START OF TEST**
```

```
1567
1568  024110                          STARS
 (2)                                  ;;*****************************************************************
1569                                  ;TEST THAT THE RLBA WILL INCREMENT, WE DO NOT DO A FULL 16
1570                                  ;BIT INCREMENT WE CHECK THAT EACH BIT WILL TOGGLE 0 TO 1
1571                                  ;AND 1 TO 0.  WE DO CHECK ALL BITS EVEN IF ALL MEMORY
1572                                  ;IS NOT AVAILABLE.  (WE IGNORE NON-EXISTANT MEMORY ERRORS).
1573                                  ;WE USE THE SAME DISK ADDRESS (RANDOM) AND A 1 WORD TRANSFER.
1574  024110                          STARS
 (2)                                  ;;*****************************************************************
1575
1576
1577  024110  004737  021356                  JSR     PC,HDHOME       ;HEADS OVER TRACK 0
1578  024114                          CKERFG                          ;HEADS GO HOME OKAY
 (4)  024122  104032                  EMT     C$EXIT
 (4)  024124  000134                  .WORD   L10040-.
1579
1580
1581  024126  005037  002162                  CLR     TMP1            ;CLEAR LOCATION
1582
1583  024132                          BGNSEG                                  ;%%START OF SEGMENT%%
 (3)  024132  104004                  EMT     C$BSEG
1584
1585  024134                          3$:
1586  024134  012777  177777  156106          MOV     #-1,@RLMP       ;ONLY ONE (1) WORD
1587  024142  005077  156100                  CLR     @RLDA           ;LOAD DISK ADDRESS
1588  024146  013777  002162  156070          MOV     TMP1,@RLBA      ;BUS ADDRESS
1589
1590  024154  004537  020456                  JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
1591  024160  000012                  WRITE
1592  024162  004537  021276                  JSR     R5,WTCRDY       ;WAIT FOR WRITE TO FINISH
1593  024166                          ESCAPE  SEG                     ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  024166  104010                  EMT     C$ESCAPE
 (3)  024170  000066                  .WORD   10000$-.
1594
1595  024172  013737  002162  002166  4$:     MOV     TMP1,GDDAT      ;SET UP EXPECTED RLBA
1596  024200  062737  000002  002166          ADD     #2,GDDAT        ;PREVIOUS RLBA+2
1597  024206  013737  002230  002170          MOV     E.BA,BDDAT      ;READ RLBA
1598  024214  023737  002166  002170          CMP     GDDAT,BDDAT     ;WAS IT UPDATED PROPERLY?
1599  024222  001404                  BEQ     5$              ;YES, CONTINUE
1600
1601  024224                          ERRDF   9.,EM30,ERR4    ;BA INCREMENT ERROR
 (3)  024224  104462                  TRAP    T$ERCODE
 (5)  024226  000011                  .WORD   9
 (5)  024230  012165                  .WORD   EM30
 (5)  024232  014410                  .WORD   ERR4
1602  024234                  5$:     ESCAPE  SEG                     ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  024234  104010                  EMT     C$ESCAPE
 (3)  024236  000020                  .WORD   10000$-.
1603
1604  024240  006337  002162                  ASL     TMP1            ;NEXT PATTERN TO TEST RLBA
1605  024244  103404                  BCS     6$              ;DONE?
1606  024246  052737  000002  002162          BIS     #BIT1,TMP1      ;NO, SET IN BIT 1
1607  024254  000727                  BR      3$              ;GO CHECK NEXT.
1608
1609  024256                  6$:                             ;END TEST
```

```
1610
1611  024256                                    ENDSEG                          ;%%END OF SEGMENT%%
 (3)  024256                              10000$:
 (3)  024256  104005                              EMT     C$ESEG
1612  024260                              ENDTST                               ;**END OF TEST**
 (3)  024260                              L10040:
 (3)  024260  104001                              EMT     C$ETST
1613
1614                                      .SBTTL  **TEST 12** - BA BIT 16 INCREMENT
1615
1616  024262                              BGNTST                               ;**START OF TEST**
1617
1618  024262                              STARS
 (2)                                      ;;*****************************************************************
1619                                      ;CHECK THAT BA BIT 16 WILL INCREMENT.  WE WILL LOAD THE
1620                                      ;RLBA WITH 177776 AND ISSUE A ONE WORD WRITE WE THEN
1621                                      ;CHECK BA BIT 16 TO SET, BA 17 TO STAY A 0 AND THE RLBA
1622                                      ;TO GO TO ZERO
1623  024262                              STARS
 (2)                                      ;;*****************************************************************
1624
1625
1626  024262  004737  021356                      JSR     PC,HDHOME       ;HEADS OVER TRACK 0
1627  024266                                      CKERFG                  ;HEADS GO HOME OKAY
 (4)  024274  104032                              EMT     C$EXIT
 (4)  024276  000160                              .WORD   L10041-.
1628
1629  024300                                      BGNSEG                          ;%%START OF SEGMENT%%
 (3)  024300  104004                              EMT     C$BSEG
1630
1631  024302                              2$:
1632  024302  012777  177776  155734              MOV     #177776,@RLBA   ;SET MAX BA TO INC. BA16
1633  024310  005037  002262                      CLR     XMEM            ;WE DON'T WANT TO LOAD ANY EA
1634  024314  012777  177777  155726              MOV     #-1,@RLMP       ;ONE WORD TRANSFER
1635  024322  005077  155720                      CLR     @RLDA
1636  024326  004537  020456                      JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
1637  024332  000012                              WRITE
1638  024334  004537  021276                      JSR     R5,WTCRDY       ;WAIT FOR WRITE TO FINISH
1639  024340                                      ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  024340  104010                              EMT     C$ESCAPE
 (3)  024342  000112                              .WORD   10000$-.
1640  024344  032737  020000  002226              BIT     #NXM,E.CS       ;NON-EXISTANT MEMORY ERROR?
1641  024352  001002                              BNE     3$              ;YES, CONTINUE
1642
1643  024354  004537  020214                      JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
1644  024360                              3$:     ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  024360  104010                              EMT     C$ESCAPE
 (3)  024362  000072                              .WORD   10000$-.
1645
1646  024364  032737  000020  002226              BIT     #BA16,E.CS      ;DID BA16 SET?
1647  024372  001004                              BNE     4$              ;YES, CONTINUE
1648
1649  024374                                      ERRDF   10.,EM31,ERRC   ;BA 16 DID NOT INCREMENT
 (3)  024374  104462                              TRAP    T$ERCODE
 (5)  024376  000012                              .WORD   10
 (5)  024400  012225                              .WORD   EM31
```

```
   (5)  024402  014244                          .WORD   ERR0
1650
1651  024404                          4$:     CKLOOP
   (3)  024404  104006                          EMT     C$CLP1
1652
1653  024406  032737  000040  002226           BIT     #BA17,E.CS      ;DID BA17 SET ALSO?
1654  024414  001404                           BEQ     5$              ;NO, GOOD CONTINUE
1655
1656  024416                                   ERRDF   11.,EM32,ERR0   ;BA 17 GOT CARRIED AWAY
   (3)  024416  104462                          TRAP    T$ERCODE
   (5)  024420  000013                          .WORD   11
   (5)  024422  012270                          .WORD   EM32
   (5)  024424  014244                          .WORD   ERR0
1657
1658  024426                          5$:     CKLOOP
   (3)  024426  104006                          EMT     C$CLP1
1659
1660  024430  005037  002166                   CLR     GDDAT           ;CHECK THAT BA15-BA0 IS CLEAR
1661  024434  013737  002230  002170           MOV     E.BA,BDDAT      ;READ BA
1662  024442  001404                           BEQ     6$              ;IS BA ZERO?
1663  024444                                   ERRDF   12.,EM33,ERR4   ;BA SHOULD BE ZERO
   (3)  024444  104462                          TRAP    T$ERCODE
   (5)  024446  000014                          .WORD   12
   (5)  024450  012335                          .WORD   EM33
   (5)  024452  014410                          .WORD   ERR4
1664
1667  024454                          6$:                             ;
1666
1667  024454                                   ENDSEG                          ;%%END OF SEGMENT%%
   (3)  024454                          10000$:
   (3)  024454  104005                          EMT     C$ESEG
1668  024456                                   ENDTST                          ;**END OF TEST**
   (3)  024456                          L10041:
   (3)  024456  104001                          EMT     C$ETST
1669
1670                                    .SBTTL  **TEST 13** - BA BIT 17 INCREMENT
1671
1672  024460                            BGNTST                                ;**START OF TEST**
1673
1674  024460                            STARS
   (2)                                  ;;*****************************************************************
1675                                    ;CHECK THAT BA BIT 17 WILL INCREMENT.  WE WILL LOAD THE
1676                                    ;RLBA WITH 177776 AND BA 16 SET, WE WILLISSUE A ONE WORD
1677                                    ;WRITE.  WE THEN CHECK BA17 TO SET, BA16 TO CLEAR AND
1678                                    ;BA15 - BA0 TO CLEAR.
1679  024460                            STARS
   (2)                                  ;;*****************************************************************
1680
1681
1682
1683  024460  004737  021356            JSR     PC,HDHOME       ;HEADS OVER TRACK 0
1684  024464                            CKERFG                  ;HEADS GO HOME OKAY
   (4)  024472  104032                  EMT     C$EXIT
   (4)  024474  000162                  .WORD   L10042-.
1685
1686  024476                            BGNSEG                          ;%%START OF SEGMENT%%
```

```
  (3)  024476  104004                          EMT     C$BSEG
1687
1688  024500                            2$:
1689  024500  012777  177776  155536          MOV     #177776,@RLBA   ;SET MAX BA TO INC. BA16
1690  024506  012737  000020  002262          MOV     #BA16,XMEM      ;SET BA16 IN RLCS
1691  024514  012777  177777  155526          MOV     #-1,@RLMP       ;ONE WORD TRANSFER
1692  024522  005077  155520                  CLR     @RLDA
1693  024526  004537  020456                  JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
1694  024532  000012                          WRITE
1695  024534  004537  021276                  JSR     R5,WTCRDY       ;WAIT FOR WRITE TO FINISH
1696  024540                                  ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  024540  104010                          EMT     C$ESCAPE
  (3)  024542  000112                          .WORD   10000$-.
1697  024544  032737  020000  002226          BIT     #NXM,E.CS       ;NON-EXISTANT MEMORY ERROR?
1698  024552  001002                          BNE     3$              ;YES, CONTINUE
1699
1700  024554  004537  020214                  JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
1701  024560                            3$:   ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  024560  104010                          EMT     C$ESCAPE
  (3)  024562  000072                          .WORD   10000$-.
1702
1703  024564  032737  000040  002226          BIT     #BA17,E.CS      ;DID BA17SET?
1704  024572  001004                          BNE     4$              ;YES, CONTINUE
1705
1706  024574                                  ERRDF   13.,EM34,ERR0   ;BA 17 DID NOT SET
  (3)  024574  104462                          TRAP    T$ERCODE
  (5)  024576  000015                          .WORD   13
  (5)  024600  012376                          .WORD   EM34
  (5)  024602  014244                          .WORD   ERR0
1707
1708  024604                            4$:   CKLOOP
  (3)  024604  104006                          EMT     C$CLP1
1709
1710  024606  032737  000020  002226          BIT     #BA16,E.CS      ;DID BA16 SET ALSO?
1711  024614  001404                          BEQ     5$              ;NO, GOOD CONTINUE
1712
1713  024616                                  ERRDF   14.,EM35,ERR0   ;BA 16 DIDN'T KNOW WHEN TO QUIT.
  (3)  024616  104462                          TRAP    T$ERCODE
  (5)  024620  000016                          .WORD   14
  (5)  024622  012441                          .WORD   EM35
  (5)  024624  014244                          .WORD   ERR0
1714  024626                            5$:   CKLOOP
  (3)  024626  104006                          EMT     C$CLP1
1715
1716  024630  005037  002166                  CLR     GDDAT           ;CHECK THAT BA15-BA0 IS CLEAR
1717  024634  013737  002230  002170          MOV     E.BA,BDDAT      ;READ BA
1718  024642  001404                          BEQ     6$              ;IS BA ZERO?
1719  024644                                  ERRDF   15.,EM36,ERR4   ;BA SHOULD BE ZERO
  (3)  024644  104462                          TRAP    T$ERCODE
  (5)  024646  000017                          .WORD   15
  (5)  024650  012506                          .WORD   EM36
  (5)  024652  014410                          .WORD   ERR4
1720
1721  024654                            6$:   ;
1722
1723  024654                                  ENDSEG                  ;%%END OF SEGMENT%%
```

```
   (3)  024654                          10000$:
   (3)  024654  104005                          EMT     C$ESEG
 1724   024656                          ENDTST                          ;**END OF TEST**
   (3)  024656                          L10042:
   (3)  024656  104001                          EMT     C$ETST
 1725
 1726                                   .SBTTL  **TEST 14** - TEST READ NPR INTEGRITY
 1727
 1728   024660                          BGNTST                          ;**START OF TEST**
 1729
 1730
 1731
 1732
 1733   024660                          STARS
   (2)                                  ;;**************************************************************************
 1734                                   ;CHECK THAT NPR WILL NOT INTERFERE WITH THE OPERATION OF THE  UNIBUS
 1735                                   ;WE SETUP LOCATION 4 TO HANDLE THE TRAP IF IT HAPPENS
 1736   024660                          STARS
   (2)                                  ;;**************************************************************************
 1737
 1738
 1739   024660  004737  021356                  JSR     PC,HDHOME       ;HEADS OVER TRACK 0
 1740   024664                                  CKERFG                  ;HEADS GO HOME OKAY
   (4)  024672  104032                          EMT     C$EXIT
   (4)  024674  000132                          .WORD   L10043-.
 1741
 1742   024676                                  BGNSEG                          ;%%START OF SEGMENT%%
   (3)  024676  104004                          EMT     C$BSEG
 1743                                                   .
 1744
 1745   024700                          1$:     SETVEC  ERRVEC,#TRPHAN,#340     ;SET UP VECTOR
   (7)  024700  012746  000340                  MOV     #340,-(SP)
   (6)  024704  012746  021350                  MOV     #TRPHAN,-(SP)
   (5)  024710  013746  002132                  MOV     ERRVEC,-(SP)
   (4)  024714  012746  000003                  MOV     #3,-(SP)
   (3)  024720  104037                          EMT     C$SVEC
   (2)  024722  062706  000010                  ADD     #10,SP
 1746   024726  005037  002142                  CLR     TRPFLG                  ;CLEAR TRAP PLAY
 1747   024732  012777  003052  155304          MOV     #BUF,@RLBA              ;LOAD BA
 1748   024740  005077  155302                  CLR     @RLDA                   ;LOAD DA
 1749   024744  012777  177777  155276          MOV     #-1,@RLMP               ;LOAD WC
 1750   024752  004537  020456                  JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
 1751   024756  000014                          READ
 1752   024760  004537  021276                  JSR     R5,WTCRDY               ;
 1753   024764                                  CLRVEC  ERRVEC                  ;CLEAR OUT VECTOR
   (3)  024764  013700  002132                  MOV     ERRVEC,R0
   (3)  024770  104036                          EMT     C$CVEC
 1754   024772                                  ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
   (3)  024772  104010                          EMT     C$ESCAPE
   (3)  024774  000030                          .WORD   10000$-.
 1755   024776  004537  020214                  JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
 1756   025002                                  ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
   (3)  025002  104010                          EMT     C$ESCAPE
   (3)  025004  000020                          .WORD   10000$-.
 1757
 1758   025006  005737  002142          ;       TST     TRPFLG                  ;DID TRAP OCCUR?
```

```
1759  025012  001404                        BEQ     7$                      ;NO, OKAY
1760  025014                                ERRDF   17.,EM52,ERR0           ;YES, PRINT ERROR
 (3)  025014  104462                        TRAP    T$ERCODE
 (5)  025016  000021                        .WORD   17
 (5)  025020  013177                        .WORD   EM52
 (5)  025022  014244                        .WORD   ERR0
1761  025024                          7$:
1762
1763
1764  025024                                ENDSEG                          ;%%END OF SEGMENT%%
 (3)  025024                          10000$:
 (3)  025024  104005                        EMT     C$ESEG
1765
1766
1767  025026                          ENDTST                                ;**END OF TEST**
 (3)  025026                          L10043:
 (3)  025026  104001                        EMT     C$ETST
1768
1769                                  .SBTTL  **TEST 15** - READ FUNCTION
1770
1771  025030                          BGNTST                                ;**START OF TEST**
1772
1773  025030                          STARS
 (2)                                  ;;*****************************************************************
1774                                  ;CHECK OF THE READ FUNCTION.  WE WILL FIRST DO A READ
1775                                  ;HEADER TO FIND OUT WHERE WE ARE AND THEN ISSUE
1776                                  ;A FULL SECTOR READ, WAIT FOR READY AND CHECK FOR
1777                                  ;ANY ERRORS
1778  025030                          STARS
 (2)                                  ;;*****************************************************************
1779
1780
1781  025030  004737  021356                  JSR     PC,HDHOME       ;HEADS OVER TRACK 0
1782  025034                                  CKERFG                  ;HEADS GO HOME OKAY
 (4)  025042  104032                        EMT     C$EXIT
 (4)  025044  000064                        .WORD   L10044-.
1783
1784  025046                                  BGNSEG                          ;%%START OF SEGMENT%%
 (3)  025046  104004                        EMT     C$BSEG
1785
1786  025050  012737  001750  002160          MOV     #1000.,TMP0
1787  025056  005077  155164          1$:     CLR     @RLDA           ;LOAD DISK ADDRESS
1788  025062  012777  177600  155160          MOV     #-128.,@RLMP    ;SET WORD LENGTH
1789  025070  012777  003052  155146          MOV     #BUF,@RLBA      ;SET BUS ADDRESS
1790
1791  025076  004537  020456                  JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
1792  025102  000014                          READ                    ;READ
1793  025104  004537  021276                  JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY
1794  025110                                  ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  025110  104010                        EMT     C$ESCAPE
 (3)  025112  000014                        .WORD   10000$-.
1795
1796  025114  004537  020214                  JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
1797
1798  025120  005337  002160                  DEC     TMP0
1799  025124  001354                          BNE     1$
```

```
1800  025126                          ENDSEG                          ;%%END OF SEGMENT%%
 (3)  025126                    10000$:
 (3)  025126  104005                   EMT     C$ESEG
1801  025130                    ENDTST                                ;**END OF TEST**
 (3)  025130                    L10044:
 (3)  025130  104001                   EMT     C$ETST
1802
1803                            .SBTTL  **TEST 16** - READ FUNCTION INTERRUPT
1804
1805  025132                    BGNTST                                ;**START OF TEST**
1806
1807  025132                    STARS
 (2)                            ;;*****************************************************************
1808                            ;CHECK OF THE READ FUNCTION UNDER INTERRUPT CONTROL, WE WILL
1809                            ;ISSUE A READ HEADER TO GET POSITION AND THEN READ
1810                            ;A FULL SECTOR WAITING FOR THE INTERRUPT.  CHECK FOR
1811                            ;ERRORS ON INTERRUPT.
1812  025132                    STARS
 (2)                            ;;*****************************************************************
1813
1814
1815  025132  004737  021356          JSR     PC,HDHOME       ;HEADS OVER TRACK 0
1816  025136                          CKERFG                  ;HEADS GO HOME OKAY
 (4)  025144  104032                   EMT     C$EXIT
 (4)  025146  000106                   .WORD   L10045-.
1817
1818  025150                          BGNSEG                          ;%%START OF SEGMENT%%
 (3)  025150  104004                   EMT     C$BSEG
1819
1820  025152  005037  002144          CLR     INTFLG          ;CLEAR INTERRUPT INDICATOR
1821  025156  005077  155064          CLR     @RLDA           ;SET DISK ADDRESS
1822  025162  012777  177600  155060  MOV     #-128.,@RLMP    ;SET UP WORD COUNT
1823  025170  012777  003052  155046  MOV     #BUF,@RLBA      ;SET UP BUS ADDRESS
1824
1825  025176                          SETPRI  #PRI00          ;PRIORITY TO 0
 (3)  025176  012700  000000          MOV     #PRI00,R0
 (3)  025202  104041                   EMT     C$SPRI
1826  025204  004537  020456          JSR     P5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
1827  025210  000114                  READ.INTEN              ;READ UNDER INTERRUPT
1828  025212  004537  021276          JSR     R5,WTCRDY       ;WAIT FOR INTERRUPT
1829  025216                          CKLOOP
 (3)  025216  104006                   EMT     C$CLP1
1830  025220                          SETPRI  #PRI07          ;PRIORITY TO 7
 (3)  025220  012700  000340          MOV     #PRI07,R0
 (3)  025224  104041                   EMT     C$SPRI
1831
1832  025226  005737  002144          TST     INTFLG          ;DID INTERRUPT OCCUR?
1833  025232  001004                  BNE     1$              ;YES-BRANCH NO-REPORT
1834
1835  025234                          ERRDF   19.,EM4,ERR0    ;READ DID NOT INTERRUPT
 (3)  025234  104462                   TRAP    T$ERCODE
 (5)  025236  000023                   .WORD   19
 (5)  025240  010607                   .WORD   EM4
 (5)  025242  014244                   .WORD   ERR0
1836  025244                    1$:   CKLOOP                          ;CHECK FOR LOOP
 (3)  025244  104006                   EMT     C$CLP1
```

```
1837
1838  025246  004537  020214                JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
1839
1840  025252                                ENDSEG                          ;%%END OF SEGMENT%%
 (3)  025252                          10000$:
 (3)  025252  104005                        EMT     C$ESEG
1841  025254                          ENDTST                                ;**END OF TEST**
 (3)  025254                          L10045:
 (3)  025254  104001                        EMT     C$ETST
1842
1843                                  .SBTTL  **TEST 17** - CHECK READ NPR DIRECTION
1844
1845  025256                          BGNTST                                ;**START OF TEST**
1846
1847  025256                          STARS
 (2)                                ;;*********************************************************************
1848                                ;CHECK THAT THE READ FUNCTION ACTUALLY READS (INTO MEMORY)
1849                                ;WE WILL WRITE A PATTERN INTO MEMORY AND THEN ISSUE
1850                                ;A READ TO OVERLAY THAT PATTERN.  AFTER THE READ
1851                                ;WE CHECK TO SEE IF THE WRITTEN PATTERN HAS CHANGED.
1852                                ;IF NOT WE ISSUE IT AGAIN AT THE SAME SECTION AFTER
1853                                ;HAVING MODIFIED OUR PATTERN IN MEMORY (SINCE THERE IS
1854                                ;ONE CHANCE THAT THE DISK COULD HAVE OUR PATTERN).  AFTER
1855                                ;THE SECOND READ WE CHECK THE BUFFER AGAIN.  IF IT'S
1856                                ;NO CHANGED WE REPORT AN ERROR
1857  025256                          STARS
 (2)                                ;;*********************************************************************
1858
1859
1860  025256  004737  021356                JSR     PC,HDHOME       ;HEADS OVER TRACK 0
1861  025262                                CKERFG                  ;HEADS GO HOME OKAY
 (4)  025270  104032                        EMT     C$EXIT
 (4)  025272  000156                        .WORD   L10046-.
1862
1863  025274                                BGNSEG                          ;%%START OF SEGMENT%%
 (3)  025274  104004                        EMT     C$BSEG
1864
1865  025276  012737  123456  002160        MOV     #123456,TMP0    ;SET PATTERN TO WRITE
1866  025304  005037  002162                CLR     TMP1            ;CLEAR PASS INDICATOR
1867  025310  012700  003052          1$:   MOV     #BUF,R0         ;SET UP BUFFER BEGINNING
1868  025314  012701  000200                MOV     #128.,R1
1869  025320  013720  002160          2$:   MOV     TMP0,(R0)+      ;WRITE BUFFER
1870  025324  005301                        DEC     R1              ;DONE??
1871  025326  001374                        BNE     2$              ;NO, GO BACK
1872  025330  005077  154712                CLR     @RLDA           ;LOAD DISK ADDRESS
1873  025334  012777  177600  154706        MOV     #-128.,@RLMP    ;SET WORD COUNT
1874  025342  012777  003052  154674        MOV     #BUF,@RLBA      ;LOAD BUS ADDRESS
1875  025350  012737  003052  002166        MOV     #BUF,GDDAT      ;FOR ERROR PRINT
1876
1877  025356  004537  020456                JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
1878  025362  000014                        READ                    ;READ
1879  025364  004537  021276                JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY
1880  025370                                ESCAPE  SEG             ;CHECK FOR FLOE, ELSE EXIT SEG
 (3)  025370  104010                        EMT     C$ESCAPE
 (3)  025372  000054                        .WORD   10000$-.
1881
```

```
1882  025374  004537  020214          JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
1883  025400                          ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  025400  104010                  EMT     C$ESCAPE
 (3)  025402  000044                  .WORD   10000$-.
1884
1885  025404  012702  003052          MOV     #BUF,R2         ;SET TO START COMPARING DATA
1886  025410  022237  002160  4$:     CMP     (R2)+,TMP0      ;DID DATA CHANGE?
1887  025414  001014                  BNE     6$              ;YES, CHECK FOR END
1888                                                          ;
1889
1890                                                          ;DATA DIDN'T CHANGE, CHECK
1891  025416  005737  002162          TST     TMP1            ;IF 1ST OR 2ND TIME?
1892  025422  001005                  BNE     5$              ;2ND-REPORT 1ST-TRY AGAIN
1893
1894  025424  005237  002162          INC     TMP1            ;INC PASS COUNT
1895  025430  005137  002160          COM     TMP0            ;COMPLIMENT PATTERN
1896  025434  000725                  BR      1$              ;GO DO IT AGAIN
1897
1898  025436                  5$:     ERRDF   20.,EM5,ERR9    ;READ DID NOT MODIFY MEMORY
 (3)  025436  104462                  TRAP    T$ERCODE
 (5)  025440  000024                  .WORD   20
 (5)  025442  010646                  .WORD   EM5
 (5)  025444  014636                  .WORD   ERR9
1899
1900  025446                  6$:
1901
1902  025446                          ENDSEG                                  ;%%END OF SEGMENT%%
 (3)  025446                  10000$:
 (3)  025446  104005                  EMT     C$ESEG
1903  025450                  ENDTST                                          ;**END OF TEST**
 (3)  025450                  L10046:
 (3)  025450  104001                  EMT     C$ETST
1904
1905                                  .SBTTL  **TEST 18** - PROPER INCREMENT OF RLBA ON READ
1906
1907  025452                  BGNTST                                          ;**START OF TEST**
1908
1909  025452                  STARS
 (2)                                  ;;*****************************************************************
1910                                  ;CHECK THAT THE RLBA WILL INCREMENT WITH THE READ
1911                                  ;THE RLBA SHOULD CONTAIN 'BUF +2^6.'' AFTER A FULL SECTOR
1912                                  ;READ.
1913  025452                  STARS
 (2)                                  ;;*****************************************************************
1914
1915
1916  025452  004737  021356          JSR     PC,HDHOME       ;HEADS OVER TRACK 0
1917  025456                          CKERFG                  ;HEADS GO HOME OKAY
 (4)  025464  104032                  EMT     C$EXIT
 (4)  025466  000116                  .WORD   L10047-.
1918
1919  025470                          BGNSEG                                  ;%%START OF SEGMENT%%
 (3)  025470  104004                  EMT     C$BSEG
1920
1921  025472  005077  154550          CLR     @RLDA           ;SET UP DISK ADDRESS
1922  025476  012777  003052  154540  MOV     #BUF,@RLBA      ;SET UP BUS ADDRESS
```

```
1923  025504  012777  177600  154536          MOV     #-128.,@RLMP    ;WORD COUNT
1924  025512  012737  003052  002166          MOV     #BUF,GDDAT      ;FORM EXPECTED BUS ADDRESS
1925  025520  062737  000400  002166          ADD     #256.,GDDAT     ;AFTER READ
1926
1927  025526  004537  020456                  JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
1928  025532  000014                          READ                    ;READ
1929  025534  004537  021276                  JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY
1930  025540                                  ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  025540  104010                          EMT     C$ESCAPE
 (3)  025542  000040                          .WORD   10000$-.
1931
1932  025544  004537  020214                  JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
1933  025550                                  ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  025550  104010                          EMT     C$ESCAPE
 (3)  025552  000030                          .WORD   10000$-.
1934  025554  013737  002230  002170          MOV     E.BA,BDDAT      ;READ 'RLBA' FOR PRESENT ADDRESS
1935  025562  023737  002170  002166          CMP     BDDAT,GDDAT     ;DID 'BA' INCREMENT PROPERLY?
1936  025570  001404                          BEQ     1$              ;YES, CONTINUE
1937
1938  025572                                  ERRDF   21.,EM6,ERR4    ;BA DID NOT INCREMENT PROPERLY
 (3)  025572  104462                          TRAP    T$ERCODE
 (5)  025574  000025                          .WORD   21
 (5)  025576  010712                          .WORD   EM6
 (5)  025600  014410                          .WORD   ERR4
1939
1940  025602                          1$:
1941
1942  025602                                  ENDSEG                          ;%%END OF SEGMENT%%
 (3)  025602                          10000$:
 (3)  025602  104005                          EMT     C$ESEG
1943  025604                          ENDTST                          ;**END OF TEST**
 (3)  025604                          L10047:
 (3)  025604  104001                          EMT     C$ETST
1944
1945                                    .SBTTL  **TEST 19** - PROPER INCREMENT OF RLDA ON READ
1946
1947  025606                          BGNTST                          ;**START OF TEST**
1948
1949  025606                          STARS
 (2)                                    ;;**********************************************************************
1950                                    ;CHECK THAT THE RLDA INCREMENTS BY ONE AFTER A
1951                                    ;FULL SECTOR READ, WE FIRST READ A HEADER TO FIND
1952                                    ;OUT WHERE WE ARE, THEN ISSUE A READ AFTER
1953                                    ;THE READ THE RLDA SHOULD BE RLDA (START) + 1
1954  025606                            STARS
 (2)                                    ;;**********************************************************************
1955
1956  025606  004737  021356                  JSR     PC,HDHOME       ;HEADS OVER TRACK 0
1957  025612                                  CKERFG                  ;HEADS GO HOME OKAY
 (4)  025620  104032                          EMT     C$EXIT
 (4)  025622  000114                          .WORD   L10050-.
1958
1959  025624                                  BGNSEG                          ;%%START OF SEGMENT%%
 (3)  025624  104004                          EMT     $BSEG
1960
1961
```

```
1962  025626  005037  002166                  CLR     GDDAT
1963  025632  013777  002166  154406          MOV     GDDAT,@RLDA     ;SETUP DISK ADDRESS
1964  025640  005237  002166                  INC     GDDAT           ;CREATE EXPECTED SECTOR
1965  025644  012777  177600  154376          MOV     #-128.,@RLMP    ;WORD COUNT
1966  025652  012777  003052  154364          MOV     #BUF,@RLBA      ;SETUP BUS ADDRESS
1967
1968  025660  004537  020456                  JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
1969  025664  000014                          READ                    ;READ
1970  025666  004537  021276                  JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY
1971  025672                                  ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  025672  104010                          EMT     C$ESCAPE
 (3)  025674  000040                          .WORD   10000$-.
1972
1973  025676  004537  020214                  JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
1974  025702                                  ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  025702  104010                          EMT     C$ESCAPE
 (3)  025704  000030                          .WORD   10000$-.
1975
1976  025706  013737  002232  002170          MOV     E.DA,BDDAT      ;READ DISK ADDRESS
1977  025714  023737  002166  002170          CMP     GDDAT,BDDAT     ;DID SECTOR INCREMENT PROPERLY
1978  025722  001404                          BEQ     1$              ;YES, BRANCH  NO, REPORT ERROR
1979
1980  025724                                  ERRDF   22.,EM7,ERR4    ;DISK ADDRESS DID NOT INCREMENT
 (3)  025724  104462                          TRAP    T$ERCODE
 (5)  025726  000026                          .WORD   22
 (5)  025730  010766                          .WORD   EM7
 (5)  025732  014410                          .WORD   ERR4
1981
1982  025734                          1$:
1983
1984  025734                                  ENDSEG                          ;%%END OF SEGMENT%%
 (3)  025734                          10000$:
 (3)  025734  104005                          EMT     C$ESEG
1985  025736                          ENDTST                          ;**END OF TEST**
 (3)  025736                          L10050:
 (3)  025736  104001                          EMT     C$ETST
1986
1987                                    .SBTTL  **TEST 20** - FORCE HEADER NOT FOUND WITH READ
1988
1989  025740                            BGNTST                          ;**START OF TEST**
1990
1991  025740                            STARS
 (2)                                    ;;*****************************************************************
1992                                    ;FORCE HEADER NOT FOUND ERROR TO OCCUR.  THIS IS DONE
1993                                    ;BY SETTING SECTOR 40 OF THE RLDA AND ISSUING A
1994                                    ;READ.  SECTOR 40 DOES NOT EXIST ON THE RL01 PACK
1995                                    ;THEREFORE HDR NT FOUND SHOULD SET.
1996  025740                            STARS
 (2)                                    ;;*****************************************************************
1997
1998  025740  004737  021356                  JSR     PC,HDHOME       ;HEADS OVER TRACK 0
1999  025744                                  CKERFG                  ;HEADS GO HOME OKAY
 (4)  025752  104032                          EMT     C$EXIT
 (4)  025754  000102                          .WORD   L10051-.
2000
2001  025756                                  BGNSEG                          ;%%START OF SEGMENT%%
```

```
  (3)  025756  104004                          EMT     C$BSEG
2002
2003
2004  025760  012777  000050  154260           MOV   , #40.,@RLDA      ;INSURE NOT TO FIND HEADER BY
2005  025766  012777  003052  154250           MOV     #BUF,@RLBA      ;SETTING SECTOR 40 OF CYL. ADDR.
2006  025774  012777  177777  154246           MOV     #-1,@RLMP       ;WORD COUNT
2007
2008  026002  004537  020456                   JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
2009  026006  000014                           READ                    ;READ
2010  026010  004537  021276                   JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY
2011  026014                                   ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  026014  104010                          EMT     C$ESCAPE
  (3)  026016  000036                          .WORD   10000$-.
2012
2013  026020  013737  002226  002160           MOV     E.CS,TMP0       ;GET RLCS
2014  026026  042737  001777  002160           BIC     #1777,TMP0      ;SAVE ERROR BITS
2015  026034  022737  112000  002160           CMP     #BIT15!BIT12!BIT10,TMP0  ;HDR NOT FOUND SET.
2016  026042  001404                           BEQ     1$              ;YES, CONTINUE
2017
2018  026044                                   ERRDF   23.,EM10,ERR0   ;HEADER NOT FOUND WOULD NOT SET
  (3)  026044  104462                          TRAP    T$ERCODE
  (5)  026046  000027                          .WORD   23
  (5)  026050  011043                          .WORD   EM10
  (5)  026052  014244                          .WORD   ERR0
2019
2020  026054                             1$:
2021                                     ;
2022
2023  026054                                   ENDSEG                          ;%%END OF SEGMENT%%
  (3)  026054                        10000$:
  (3)  026054  104005                          EMT     C$ESEG
2024  026056                             ENDTST                              ;**END OF TEST**
  (3)  026056                        L10051:
  (3)  026056  104001                          EMT     C$ETST
2025
2026                                     .SBTTL  **TEST 21** - FORCE HEADER NOT FOUND WITH READ INTERRUPT
2027
2028  026060                             BGNTST                              ;**START OF TEST**
2029
2030
2031  026060                             STARS
  (2)                                    ;;*****************************************************************
2032                                     ;TEST THAT HEADER NOT FOUND ERROR WILL GENERATE AN INTERRUPT
2033                                     ;ON OCCURANCE.  HEADER NOT FOUND WILL BE FORCED BY SETTING
2034                                     ;SECTOR 40 OF RLDA AND ISSUING A READ
2035  026060                             STARS
  (2)                                    ;;*****************************************************************
2036
2037
2038  026060  004737  021356                   JSR     PC,HDHOME       ;HEADS OVER TRACK 0
2039  026064                                   CKERFG                  ;HEADS GO HOME OKAY
  (4)  026072  104032                          EMT     C$EXIT
  (4)  026074  000142                          .WORD   L10052-.
2040
2041  026076                                   BGNSEG                          ;%%START OF SEGMENT%%
  (3)  026076  104004                        . EMT     C$BSEG
```

```
2042
2043  026100                                    SETPRI  #PRI00
 (3)  026100  012700  000000                    MOV     #PRI00,R0
 (3)  026104  104041                            EMT     C$SPRI
2044  026106  005037  002144                    CLR     INTFLG          ;CLEAR INTERRUPT OCCURANCE FLAG
2045  026112  012777  000050  154126            MOV     #40.,@RLDA      ;INSURE NOT TO FIND HEADER BY
2046  026120  012777  003052  154116            MOV     #BUF,@RLBA      ;SETTING SECTOR 40 OF CYL. ADDR.
2047  026126  012777  177777  154114            MOV     #-1,@RLMP       ;WORD COUNT
2048
2049  026134  004537  020456                    JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
2050  026140  000114                            READ!INTEN              ;READ
2051  026142  004537  021276                    JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY
2052  026146                                    CKLOOP
 (3)  026146  104006                            EMT     C$CLP1
2053  026150                                    SETPRI  #PRI07
 (3)  026150  012700  000340                    MOV     #PRI07,R0
 (3)  026154  104041                            EMT     C$SPRI
2054
2055  026156  005737  002144                    TST     INTFLG          ;DID INTERRUPT OCCUR
2056  026162  001004                            BNE     2$              ;YES
2057
2058  026164                                    ERRDF   24.,EM43,ERR0   ;HNF DID NOT INTERRUPT
 (3)  026164  104462                            TRAP    T$ERCODE
 (5)  026166  000030                            .WORD   24
 (5)  026170  012723                            .WORD   EM43
 (5)  026172  014244                            .WORD   ERR0
2059
2060  026174                            2$:     ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  026174  104010                            EMT     C$ESCAPE
 (3)  026176  000036                            .WORD   10000$-.
2061
2062
2063  026200  013737  002226  002160            MOV     E.CS,TMP0       ;GET RLCS
2064  026206  042737  001777  002160            BIC     #1777,TMP0      ;SAVE ERROR BITS
2065  026214  022737  112000  002160            CMP     #BIT15.BIT12.BIT10,TMP0  ;WDR NOT FOUND SET.
2066  026222  001404                            BEQ     1$              ;YES, CONTINUE
2067
2068  026224                                    ERRDF   25.,EM10,ERR0
 (3)  026224  104462                            TRAP    T$ERCODE
 (5)  026226  000031                            .WORD   25
 (5)  026230  011043                            .WORD   EM10
 (5)  026232  014244                            .WORD   ERR0
2069                                                                    ;WHEN FORCED
2070  026234                            1$:
2071
2072  026234                                    ENDSEG                          ;%%END OF SEGMENT%%
 (3)  026234                            10000$:
 (3)  026234  104005                            EMT     C$ESEG
2073  026236                            ENDTST                          ;**END OF TEST**
 (3)  026236                            L10052:
 (3)  026236  104001                            EMT     C$ETST
2074
2075                                    .SBTTL  **TEST 22** - CHECK HEADER COMPARE LOGIC
2076
2077  026240                            BGNTST                          ;**START OF TEST**
2078
```

```
 2079  026240                          STARS
  (2)                                  ;;*****************************************************************
 2080                                  ;CHECK THE HEADER COMPARE LOGIC WORKS.  UP TO THIS POINT WE
 2081                                  ;KNOW THAT THE LOGIC FUNCTIONS PROPERLY BUT NOW WE WILL
 2082                                  ;CHECK ALL THE BITS IN THE HEADER WORD.  FOUR PATTERNS
 2083                                  ;ARE USED A WALKING 1, GROWING 1, WALKING 0, GROWING 0.  A SEEK
 2084                                  ;IS ISSUED BEFORE EACH READ TO INSURE WE ARE ON THE PROPER
 2085                                  ;TRACK.  ONCE WE ARE ON THE RIGHT TRACKWE LOAD THE RLDA
 2086                                  ;AND ISSUE THE READ.  UPON COMPLETION WE WILLCHECK FOR ERRORS
 2087                                  ;WE THEN LOAD THE COMPLIMENT PATTERN INTO THE RLDA
 2088                                  ;EXPECTING A HEADER NOT FOUND TO SET
 2089  026240                          STARS
  (2)                                  ;;*****************************************************************
 2090
 2091
 2092  026240  004737  021356                JSR     PC,HDHOME       ;HEADS OVER TRACK 0
 2093  026244                                CKERFG                  ;HEADS GO HOME OKAY
  (4)  026252  104032                        EMT     C$EXIT
  (4)  026254  000540                        .WORD   L10053-.
 2094
 2095  026256                                BGNSEG                          ;%%START OF SEGMENT%%
  (3)  026256  104004                        EMT     C$BSEG
 2096
 2097  026260                                SETPRI  #PRI07          ;PRIORITY TO 7
  (3)  026260  012700  000340                MOV     #PRI07,R0
  (3)  026264  104041                        EMT     C$SPRI
 2098  026266  012703  002504                MOV     #HDRTAB,R3      ;GET LIST START
 2099
 2100  026272                                BGNSEG                          ;%%START OF SEGMENT%%
  (3)  026272  104004                        EMT     C$BSEG
 2101  026274                          1$:
 2102  026274  004537  020456                JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
 2103  026300  000010                        RDHDR                   ;READ HEADER
 2104  026302  004537  021276                JSR     R5,WTCRDY       ;WAIT FOR CONTROLLRE READY
 2105  026306                                ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  026306  104010                        EMT     C$ESCAPE
  (3)  026310  000500                        .WORD   10001$-.
 2106
 2107  026312  004537  020274                JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
 2108  026316                                ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  026316  104010                        EMT     C$ESCAPE
  (3)  026320  000470                        .WORD   10001$-.
 2109  026322  013737  002234  002162        MOV     E.MP,TMP1       ;READ AND SAVE HEADER
 2110
 2111  026330  042737  000177  002162        BIC     #177,TMP1       ;CLEAR OUT SECTOR AND H.S.
 2112  026336  012777  000001  153702        MOV     #1,@RLDA        ;SETUP MARKER FOR SEEK
 2113  026344  011337  002164                MOV     (R3),TMP2       ;GET HEADER PATTERN
 2114  026350  042737  000177  002164        BIC     #177,TMP2       ;CLEAR OUT SECTOR AND H.S.
 2115  026356  163737  002162  002164        SUB     TMP1,TMP2       ;CALCULATE DIFFERENCE TO SEEK
 2116  026364  103404                        BCS     2$              ;BRANCH FOR SEEK OUT
 2117  026366  052777  000004  153652        BIS     #SIGN,@RLDA     ;SEEK TOWARDS SPINDLE
 2118  026374  000402                        BR      3$              ;GO PUT IN DIFFERENCE WORD
 2119  026376  005437  002164          2$:   NEG     TMP2            ;WE HAVE TO NEGATE DIFFERENCE
 2120  026402  053777  002164  153636  3$:   BIS     TMP2,@RLDA      ;SET IN DIFFERENCE WORD
 2121  026410  032713  000100                BIT     #RDHS,(R3)      ;DO WE WANT HEAD SELECT AS 0?
 2122  026414  001403                        BEQ     4$              ;YES, SKIP OVER SETTING H.S.
```

```
2123  026416  052777  000020  153622          BIS     #DAHS,@RLDA     ;SET HEAD SELECT TO ONE
2124  026424  004537  020456          4$:     JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
2125  026430  000006                          SEEK                    ;SEEK
2126
2127
2128  026432  004537  021276                  JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY
2129  026436                                  ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3) 026436  104010                          EMT     C$ESCAPE
  (3) 026440  000350                          .WORD   10001$-.
2130
2131  026442  004537  020214                  JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
2132  026446                                  ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3) 026446  104010                          EMT     C$ESCAPE
  (3) 026450  000340                          .WORD   10001$-.
2133
2134  026452  004537  021236                  JSR     R5,WTDRDY       ;WAIT FOR DRIVE READY
2135  026456                                  ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3) 026456  104010                          EMT     C$ESCAPE
  (3) 026460  000330                          .WORD   10001$-.
2136  026462  004537  020456                  JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
2137  026466  000010                          RDHDR                   ;READ HEADER (VERIFY SEEK)
2138  026470  004537  021276                  JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY
2139  026474                                  ESCAPE  SEG             ;CHECK FOR FL:LOE, FLSE EXIT SEG
  (3) 026474  104010                          EMT     C$ESCAPE
  (3) 026476  000312                          .WORD   10001$-.
2140
2141  026500  004537  020214                  JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
2142  026504                                  ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3) 026504  104010                          EMT     C$ESCAPE
  (3) 026506  000302                          .WORD   10001$-.
2143
2144  026510  013737  002234  002170          MOV     E.MP,BDDAT      ;READ HEADER
2145  026516  043737  002150  002170          BIC     SECMSK,BDDAT    ;SAVE CYLINDER FOR COMPARE
2146  026524  011337  002166                  MOV     (R3),GDDAT      ;GET EXPECTED HEADER
2147  026530  043737  002150  002166          BIC     SECMSK,GDDAT    ;SAVE CYLINDER FOR COMPARE
2148  026536  023737  002166  002170          CMP     GDDAT,BDDAT     ;SEEK END UP OKAY
2149  026544  001404                          BEQ     5$              ;YES, CONTINUE
2150
2151  026546                                  ERRDF   27.,EM11,ERR4   ;SEEK INCORRECT
  (3) 026546  104462                          TRAP    T$ERCODE
  (5) 026550  000033                          .WORD   27
  (5) 026552  011110                          .WORD   EM11
  (5) 026554  014410                          .WORD   ERR4
2152
2153  026556                          5$:     ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3) 026556  104010                          EMT     C$ESCAPE
  (3) 026560  000230                          .WORD   10001$-.
2154
2155  026562  011377  153460                  MOV     (R3),@RLDA      ;SET UP DISK ADDRESS
2156  026566  042777  000077  153452          BIC     #77,@RLDA
2157  026574  012777  177777  153446          MOV     #-1,@RLMP       ;WORD COUNT
2158  026602  012777  003052  153434          MOV     #BUF,@RLBA      ;BUS ADDRESS
2159
2160  026610  004537  020456                  JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
2161  026614  000014                          READ                    ;READ
2162  026616  004537  021276                  JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY
```

```
2163  026622                                    ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  026622  104010                            EMT     C$ESCAPE
 (3)  026624  000164                            .WORD   10001$-.
2164
2165  026626  004537  020214                    JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
2166  026632                                    ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  026632  104010                            EMT     C$ESCAPE
 (3)  026634  000154                            .WORD   10001$-.
2167
2168  026636  011377  153404                    MOV     (R3),@RLDA      ;SET UP DISK ADDRESS AS
2169  026642  005177  153400                    COM     @RLDA           ;COMPLIMENT TO CAUSE HDR NT FND
2170  026646  012777  177777  153374            MOV     #-1,@RLMP       ;WORD COUNT
2171  026654  012777  003052  153362            MOV     #BUF,@RLBA      ;BUS ADDRESS
2172
2173  026662  004537  020456                    JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
2174  026666  000014                            READ                    ;READ
2175  026670  004537  021276                    JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY
2176  026674                                    ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  026674  104010                            EMT     C$ESCAPE
 (3)  026676  000112                            .WORD   10001$-.
2177  026700  013737  002226  002160            MOV     E.CS,TMP0       ;GET CS
2178  026706  042737  001777  002160            BIC     #1777,TMP0      ;SAVE ERROR BITS
2179  026714  022737  112000  002160            CMP     #BIT15!BIT12.BIT10,TMP0  ;DID HEADER NOT FOUND SET
2180  026722  001402                            BEQ     8$              ;YES, CONTINUE
2181  026724  004537  020214                    JSR     R5,CHERR
2182  026730                            8$:     CKLOOP
 (3)  026730  104006                            EMT     C$CLP1
2183
2184  026732  022737  112000  002160            CMP     #BIT15!BIT12!BIT10,TMP0
2185  026740  001413                            BEQ     6$
2186
2187  026742  011337  002166                    MOV     (R3),GDDAT      ;SET UP DATA FOR ERROR
2188  026746  013737  002166  002170            MOV     GDDAT,BDDAT     ;PRINT OUT
2189  026754  005137  002170                    COM     BDDAT
2190
2191  026760                                    ERRDF   28.,EM12,ERR4   ;HDR NOT FOUND WOULD NCT SET
 (3)  026760  104462                            TRAP    T$ERCODE
 (5)  026762  000034                            .WORD   28
 (5)  026764  011137                            .WORD   EM12
 (5)  026766  014410                            .WORD   ERR4
2192
2193  026770                            6$:     ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  026770  104010                            EMT     C$ESCAPE
 (3)  026772  000016                            .WORD   10001$-.
2194
2195  026774  005723                            TST     (R3)+           ;GET NEXT PATTERN
2196  026776  020327  002660                    CMP     R3,#HDREND      ;AT END?
2197  027002  001402                            BEQ     7$              ;YES, EXIT TEST
2198  027004  000137  026274                    JMP     1$              ;NO, GO BACK
2199
2200  027010                            7$:
2201  027010                                    ENDSEG                          ;%%END OF SEGMENT%%
 (3)  027010                            10001$:
 (3)  027010  104005                            EMT     C$ESEG
2202
2203  027012                                    ENDSEG                          ;%%END OF SEGMENT%%
```

```
  (3)  027012                          10000$:
  (3)  027012  104005                          EMT     C$ESEG
2204   027014                          ENDTST                          ;**END OF TEST**
  (3)  027014                          L10053:
  (3)  027014  104001                          EMT     C$ETST
2205
2206                                   .SBTTL  **TEST 23** - CHECK MULTIPE SECTORS ON READ
2207
2208   027016                          BGNTST                          ;**START OF TEST**
2209
2210   027016                          STARS
  (2)                                  ;;*************************************************************
2211                                   ;VERIFY THAT MULTIPLE SECTORS CAN BE READ, WE WILL CHECK
2212                                   ;THAT THE RLDA INCREMENTS PROPERLY.
2213   027016                          STARS
  (2)                                  ;;*************************************************************
2214
2215
2216   027016  004737  021356                  JSR     PC,HDHOME       ;HEADS OVER TRACK 0
2217   027022                          CKERFG                          ;HEADS GO HOME OKAY
  (4)  027030  104032                  EMT     C$EXIT
  (4)  027032  000156                  .WORD   L10054-.
2218
2219
2220   027034  005037  002160                  CLR     TMP0            ;CLEAR LOCATIONS
2221   027040  005037  002162                  CLR     TMP1
2222
2223   027044                                  BGNSEG                          ;%%START OF SEGMENT%%
  (3)  027044  104004                          EMT     C$BSEG
2224
2225   027046                          1$:
2226   027046  013737  002162  002166          MOV     TMP1,GDDAT      ;GET CYLINDER
2227   027054  053737  002160  002166          BIS     TMP0,GDDAT      ;GET SECTOR
2228   027062  013777  002166  153156          MOV     GDDAT,@RLDA     ;SET DISK ADDRESS-SECTOR 0
2229   027070  062737  000002  002166          ADD     #2,GDDAT        ;SET EXPECTED + 2
2230   027076  012777  003052  153140          MOV     #BUF,@RLBA      ;SET BUS ADDRESS
2231   027104  012777  177577  153136          MOV     #-129.,@RLMP    ;WORD COUNT-SECTOR+1 WORD
2232
2233   027112  004537  020456                  JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
2234   027116  000014                  READ                            ;READ
2235   027120  004537  021276                  JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY?
2236   027124                                  ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  027124  104010                          EMT     C$ESCAPE
  (3)  027126  000060                          .WORD   10000$-.
2237
2238   027130  004537  020214                  JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
2239   027134                                  ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  027134  104010                          EMT     C$ESCAPE
  (3)  027136  000050                          .WORD   10000$-.
2240
2241   027140  013737  002232  002170          MOV     E.DA,BDDAT      ;READ DISK ADDRESS
2242   027146  023737  002170  002166          CMP     BDDAT,GDDAT     ;IS DISK ADDRESS CORRECT
2243   027154  001404                          BEQ     2$              ;YES, BRANCH  NO, REPORT ERROR
2244
2245   027156                                  ERRDF   22.,EM14,ERR4   ;DA DID NOT INCREMENT
  (3)  027156  104462                          TRAP    T$ERCODE
```

```
  (5)  027160  000035                    .WORD   29
  (5)  027162  011230      -             .WORD   EM14
  (5)  027164  014410                    .WORD   ERR4
2246
2247  027166                    2$:      ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  027166  104010                    EMT     C$ESCAPE
  (3)  027170  000016                    .WORD   10000$-.
2248
2249  027172  005237  002160             INC     TMP0            ;NEXT SECTOR?
2250  027176  022737  000046  002160     CMP     #46,TMP0        ;DONE?
2251  027204  001320                    BNE     1$              ;NO, GO BACK
2252
2253
2254  027206                            ENDSEG                          ;%%END OF SEGMENT%%
  (3)  027206                    10000$:
  (3)  027206  104005                    EMT     C$ESEG
2255  027210                    ENDTST                          ;**END OF TEST**
  (3)  027210                    L10054:
  (3)  027210  104001                    EMT     C$ETST
2256  027212                    STARS
  (2)                             ;;*************************************************************************
2257                              ;CHECK THAT WE CAN FORCE A HEADER NOT FOUND AT THE
2258                              ;END OF A TRACK DOING A MULTIPLE SECTOR READ.  WE
2259                              ;SET UP TO READ TWO SECTORS STARTING AT SECTOR 39
2260                              ;WE SHOULD TRANSFER 128 WORDS THEN ABORT WITH A
2261                              ;HEADER NOT FOUND FOR SECTOR 40
2262  027212                      STARS
  (2)                             ;;*****************************************  **********************
2263
2264
2265                              .SBTTL  **TEST 24** - FORCE HDR NT FND AT END OF TRACK
2266
2267  027212                    BGNTST                          ;**START OF TEST**
2268
2269
2270  027212  004737  021356             JSR     PC,HDHOME       ;HEADS OVER TRACK 0
2271  027216                             CKERFG                  ;HEADS GO HOME OKAY
  (4)  027224  104032                    EMT     C$EXIT
  (4)  027226  000126                    .WORD   L10055-.
2272
2273  027230                            BGNSEG                          ;%%START OF SEGMENT%%
  (3)  027230  104004                    EMT     C$BSEG
2274
2275  027232  012737  000047  002166     MOV     #39.,GDDAT      ;CREATE LAST SECTOR
2276  027240  013777  002166  153000     MOV     GDDAT,@RLDA     ;LOAD DISK ADDRESS
2277  027246  012777  177577  152774     MOV     #-129.,@RLMP    ;WORD COUNT
2278  027254  012777  003052  152762     MOV     #BUF,@RLBA      ;BUS ADDRESS
2279  027262  004537  020456             JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
2280  027266  000014                     READ                    ;READ
2281  027270  004537  021276             JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY
2282  027274                             ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  027274  104010                    EMT     C$ESCAPE
  (3)  027276  000054                    .WORD   10000$-.
2283
2284  027300  013737  002226  002170     MOV     E.CS,BDDAT      ;READ CS
2285  027306  042737  001777  002170     BIC     #1777,BDDAT     ;SAVE ERROR BITS
```

```
2286  027314  022737  112000  002170          CMP     #112000,BDDAT   ;HDR NOT FOUND SET?
2287  027322  001402                          BEQ     4$              ;YES, CONTINUE
2288  027324  004537  020214                  JSR     R5,CHERR
2289  027330                          4$:     CKLOOP
 (3)  027330  104006                          EMT     C$CLP1
2290
2291  027332  022737  112000  002170          CMP     #112000,BDDAT
2292  027340  001404                          BEQ     1$
2293
2294  027342                                  ERRDF   30.,EM23,ERR0   ;HEADER NOT FOUND DID NOT SET
 (3)  027342  104462                          TRAP    T$ERCODE
 (5)  027344  000036                          .WORD   30
 (5)  027346  011636                          .WORD   EM23
 (5)  027350  014244                          .WORD   ERR0
2295
2296  027352                          1$:
2297
2298  027352                                  ENDSEG                          ;%%END OF SEGMENT%%
 (3)  027352                          10000$:
 (3)  027352  104005                          EMT     C$ESFG
2299  027354                          ENDTST                                  ;**END OF TEST**
 (3)  027354                          L10055:
 (3)  027354  104001                          EMT     C$ETST
2300
2301                                    .SBTTL  **TEST 25** - FORCE NON-EXISTANT MEMORY ERROR
2302
2303  027356                            BGNTST                                ;**START OF TEST**
2304
2305
2306  027356                            STARS
 (2)                                    ;;*****************************************************************
2307                                    ;FORCE A NON-EXISTANT MEMORY ERROR,
2308                                    ;WE SET THE R_BA TO EQUAL THE
2309                                    ;LAST ADDRESS IN MEMORY AND ISSUE A READ.  THE
2310                                    ;READ SHOULD ABORT AFTER ONE WORD TRANSFERRED
2311  027356                            STARS
 (2)                                    ;;*****************************************************************
2312
2313
2314  027356  004737  021356                  JSR     PC,HDHOME       ;HEADS OVER TRACK 0
2315  027362                                  CKERFG                  ;HEADS GO HOME OKAY
 (4)  027370  104032                          EMT     C$EXIT
 (4)  027372  000076                          .WORD   L10056-.
2316
2317  027374                                  BGNSEG                          ;%%START OF SEGMENT%%
 (3)  027374  104004                          EMT     C$BSEG
2318
2319
2320
2321
2322  027376  012777  177774  152640          MOV     #177774,@RLBA   ;LEAD BA
2323  027404  012737  000060  002262          MOV     #BA16!BA17,XMEM ;SET EA BIT
2324  027412  005077  152630                  CLR     @RLDA           ;LOAD DISK AVAILABLE
2325  027416  012777  177600  152624          MOV     #-128.,@RLMP    ;WORD COUNT
2326  027424  004537  020456                  JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
2327  027430  000014                          READ                    ;READ
```

```
2328  027432  004537  021276                JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER
2329  027436                                ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  027436  104010                        EMT     C$ESCAPE
 (3)  027440  000026                        .WORD   10000$-.
2330
2331  027442  0  737  020000  002226        BIT     #NXM,E.CS       ;DID NXM SET?
2332  027450  (  004                        BNE     3$              ;YES, CONTINUE
2333
2334  027452                                ERRDF   31.,EM24,ERR0   ;NXM DID NOT SET
 (3)  027452  *04462                        TRAP    T$ERCODE
 (5)  027454  000037                        .WORD   31
 (5)  027456  011716                        .WORD   EM24
 (5)  027460  014244                        .WORD   ERR0
2335
2336  027462                          3$:   ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  027462  104010                        EMT     C$ESCAPE
 (3)  027464  000002                        .WORD   10000$-.
2337
2338
2339
2340
2341  027466                                ENDSEG                          ;%%END OF SEGMENT%%
 (3)  027466                    10000$:
 (3)  027466  *04005                        EMT     C$ESEG
2342  027470                    ENDTST                                      ;**END OF TEST**
 (3)  027470                    L10056:
 (3)  027470  104001                        EMT     C$ETST
2343
2344                            .SBTTL  **TEST 26** - FORCE NON-EXISTANT MEMORY ERROR INTERRUPT
2345
2346  027472                    BGNTST                                      ;**START OF TEST**
2347  027472                    STARS
 (2)                            ;;*****************************************************************
2348                            ;CHECK THAT WE CAN FORCE AN INTERRUPT WITH A
2349                            ;NON-EXISTANT MEMORY ERROR.
2350  027472                    STARS
 (2)                            ;;*****************************************************************
2351
2352
2353  027472  004737  021356                JSR     PC,HDHOME       ;HEADS OVER TRACK 0
2354  027476                                CKERFG                  ;HEADS GO HOME OKAY
 (4)  02750$  104032                        EMT     C$EXIT
 (4)  027506  000140                        .WORD   L10057-.
2355
2356  027510                                BGNSEG                          ;%%START OF SEGMENT%%
 (3)  027510  104004                        EMT     C$BSEG
2357
2358  027512  005037  002144                CLR     INTFLG          ;CLEAR INTERRUPT OCCURANCE FLAG
2359
2360
2361
2362  027516                                SETPRI  #PRI00
 (3)  027516  012700  000000                MOV     #PRI00,R0
 (3)  027522  104041                        EMT     C$SPRI
2363  027524  012777  177774  152512        MOV     #^177774,@RLBA  ;PRELOAD BA
2364  027532  012737  000060  002262        MOV     #BA16.BA17,XMEM ;SET EA BITS
```

```
2365  027540  005077  152502                CLR     @RLDA           ;LOAD DA
2366  027544  012777  177777  152476        MOV     #-1,@RLMP       ;WORD COUNT
2367  027552  004537  020456                JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
2368  027556  000114                        READ!INTEN              ;READ
2369  027560  004537  021276                JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER
2370  027564                                SETPRI  #PRI07          ;PRIORITY TO 7
  (3) 027564  012700  000340                MOV     #PRI07,R0
  (3) 027570  104041                        EMT     C$SPRI
2371  027572                                ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3) 027572  104010                        EMT     C$ESCAPE
  (3) 027574  000050                        .WORD   10000$-.
2372
2373  027576  005737  002144                TST     INTFLG          ;INTERRUPT OCCUR?
2374  027602  001004                        BNE     4$              ;YES OKAY
2375
2376  027604                                ERRDF   32.,EM44,ERR0   ;NO INTERRUPT W/NXM
  (3) 027604  104462                        TRAP    T$ERCODE
  (5) 027606  000040                        .WORD   32
  (5) 027610  012767                        .WORD   EM44
  (5) 027612  014244                        .WORD   ERR0
2377
2378  027614                          4$:   ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3) 027614  104010                        EMT     C$ESCAPE
  (3) 027616  000026                        .WORD   10000$-.
2379
2380  027620  032737  020000  002226        BIT     #NXM,E.CS       ;DID NXM SET?
2381  027626  001004                        BNE     3$              ;YES, CONTINUE
2382
2383  027630                                ERRDF   33.,EM24,ERR0   ;NO NXM
  (3) 027630  104462                        TRAP    T$ERCODE
  (5) 027632  000041                        .WORD   33
  (5) 027634  011716                        .WORD   EM24
  (5) 027636  014244                        .WORD   ERR0
2384
2385  027640                          3$:   ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3) 027640  104010                        EMT     C$ESCAPE
  (3) 027642  000002                        .WORD   10000$-.
2386
2387
2388  027644                                ENDSEG                          ;%%END OF SEGMENT%%
  (3) 027644                    10000$:
  (3) 027644  104005                        EMT     C$ESEG
2389  027646                    ENDTST                                      ;**END OF TEST**
  (3) 027646                    L10057:
  (3) 027646  104001                        EMT     C$ETST
2390
2391                                .SBTTL  **TEST 27** - CHECK READ WRITE LOOP
2392
2393  027650                        BGNTST                                  ;**START OF TEST**
2394
2395  027650                        STARS
  (2)                             ;;*****************************************************************
2396                              ;VERIFY THAT THE WRITE ACTUALLY WRITES.  AT THIS
2397                              ;TIME WE KNOW THAT THE WRITE FUNCTION GOES THRU
2398                              ;THE MOTIONS BUT WE DON'T KNOW THAT THE DATA
2399                              ;ACTUALLY GETS RECORDED ON THE PLATTER.
```

```
027650                          STARS
                                ;;*****************************************************************


027650  004737  021356                  JSR     PC,HDHOME           ;HEADS OVER TRACK 0
027654                                  CKERFG                      ;HEADS GO HOME OKAY
027662  104032                          EMT     C$EXIT
027664  000362                          .WORD   L10060-.

027666                                  BGNSEG                              ;%%START OF SEGMENT%%
027666  104004                          EMT     C$BSEG

027670  012700  003052                  MOV     #BUF,R0             ;SET UP WRITE BUFFER
027674  012701  000200                  MOV     #128.,R1            ;128 WORDS/ONE SECTOR
027700  012720  125252          3$:     MOV     #125252,(R0)+       ;WRITE PATTERN TO BUFFER
027704  005301                          DEC     R1                  ;DONE?
027706  001374                          BNE     3$                  ;NO, BRANCH BACK
027710  005077  152332                  CLR     @RLDA               ;DISK ADDRESS
027714  012777  177600  152326          MOV     #-128.,@RLMP        ;WORD COUNT
027722  012777  003052  152314          MOV     #BUF,@RLBA          ;BUS ADDRESS
027730  004537  020456                  JSR     R5,LDFUNC                   ;LOAD THE FUNCTION IN NEXT WORD
027734  000012                          WRITE                       ;WRITE THE PATTERN
027736  004537  021276                  JSR     R5,WTCRDY           ;WAIT FOR CONTROLLER READY
027742                                  ESCAPE  SEG                 ;CHECK FOR FL:LOE, ELSE EXIT SEG
027742  104010                          EMT     C$ESCAPE
027744  000300                          .WORD   10000$-.

027746  004537  020214                  JSR     R5,CHERR                    ;CHECK CNTLR FOR ERRORS
027752                                  ESCAPE  SEG                 ;CHECK FOR FL:LOE, ELSE EXIT SEG
027752  104010                          EMT     C$ESCAPE
027754  000270                          .WORD   10000$-.
027756                                  BGNSEG                              ;%%START OF SEGMENT%%
027756  104004                          EMT     C$BSEG
027760  012700  003052                  MOV     #BUF,R0             ;CLEAR OUT BUFFER BEFORE
027764  012701  000200                  MOV     #128.,R1            ;READING
027770  005020                  4$:     CLR     (R0)+               ;CLEAR BUFFER
027772  005301                          DEC     R1                  ;DONE?
027774  001375                          BNE     4$                  ;NO, BRANCH BACK

027776  005077  152244                  CLR     @RLDA               ;LOAD DISK ADDRESS
030002  012777  177600  152240          MOV     #-128.,@RLMP        ;WORD COUNT/ONE SECTION
030010  012777  003052  152226          MOV     #BUF,@RLBA          ;LOAD BUS ADDRESS
030016  004537  020456                  JSR     R5,LDFUNC                   ;LOAD THE FUNCTION IN NEXT WORD
030022  000014                          READ                        ;GO READ
030024  004537  021276                  JSR     R5,WTCRDY           ;WAIT FOR CONTROLLER READY
030030                                  ESCAPE  SEG                 ;CHECK FOR FL:LOE, ELSE EXIT SEG
030030  104010                          EMT     C$ESCAPE
030032  000210                          .WORD   10001$-.

030034  004537  020214                  JSR     R5,CHERR                    ;CHECK CNTLR FOR ERRORS
030040  005737  002124                  TST     T.CRC               ;WAS ERROR A DCK??
030044  001003                          BNE     8$                  ;YES,SEE IF WE A DUMP
030046                          10$:    ESCAPE  SEG                 ;CHECK FOR FL:LOE, ELSE EXIT SEG
030046  104010                          EMT     C$ESCAPE
030050  000172                          .WORD   10001$-.
030052  000404                          BR      99$                 ;SKIP AROUND
```

```
 2443  030054  005737  016774          8$:     TST     T.DMP           ;DO WE STILL WANT TO CHECK IT
 2444  030060  001772                          BEQ     10$             ;NO
 2445  030062                                  CKLOOP                  ;YES, CHECK FOR LOOP FIRST
  (3)  030062  104006                          EMT     C$CLP1
 2446
 2447  030064  005037  002130          99$:    CLR     CDCNT           ;CLEAR NUMBER WE'RE TO PRINT
 2448  030070  005037  002122                  CLR     CHECK           ;ALLOW HEADER ON FIRST PRINT
 2449  030074  012702  003052                  MOV     #BUF,R2         ;COMPARE BUFFER TO CHECK WRITE
 2450  030100  012701  000200                  MOV     #128.,R1        ;128 WORDS
 2451  030104  012737  125252  002166          MOV     #125252,GDDAT   ;SET UP EXPECTED
 2452  030112  011237  002170          5$:     MOV     (R2),BDDAT      ;GET DATA
 2453  030116  023737  002166  002170          CMP     GDDAT,BDDAT     ;IS DATA OKAY
 2454  030124  001442                          BEQ     6$              ;YES, CONTINUE
 2455  030126  010237  002162                  MOV     R2,TMP1         ;LOAD BAD MEM LOCATION
 2456  030132  023737  002130  016776          CMP     CDCNT,T.LMT             ;CHECKED ENOUGH??
 2457  030140  001002                          BNE     333$            ;NO
 2458  030142                                  ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  030142  104010                          EMT     C$ESCAPE
  (3)  030144  000076                          .WORD   10001$-.
 2459  030146  005237  002130          333$:   INC     CDCNT           ;ACCOUNT FOR IT
 2460
 2461  030152  005737  002122                  TST     CHECK           ;HEADER OR JUST DATA
 2462  030156  001007                          BNE     9$              ;JUST DATA
 2463  030160                                  ERRDF   34.,EM25,ERR8   ;BAD DATA
  (3)  030160  104462                          TRAP    T$ERCODE
  (5)  030162  000042                          .WORD   34
  (5)  030164  011774                          .WORD   EM25
  (5)  030166  014564                          .WORD   ERR8
 2464  030170  005237  002122                  INC     CHECK           ;ACCOUNT FOR PRINT OF HEADER
 2465  030174  000416                          BR      6$
 2466
 2467  030176                          9$:     PRINTB  #FRMT6,TMP1,GDDAT,BDDAT
 (10)  030176  013746  002170                  MOV     BDDAT,-(SP)
  (9)  030202  013746  002166                  MOV     GDDAT,-(SP)
  (8)  030206  013746  002162                  MOV     TMP1,-(SP)
  (7)  030212  012746  016042                  MOV     #FRMT6,-(SP)
  (6)  030216  012746  000004                  MOV     #4,-(SP)
  (3)  030222  010600                          MOV     SP,R0
  (4)  030224  104014                          EMT     C$PNTB
  (4)  030226  062706  000012                  ADD     #12,SP
 2468
 2469  030232                          6$:     CKLOOP
  (3)  030232  104006                          EMT     C$CLP1
 2470  030234  005722                  7$:     TST     (R2)+           ;BUMP BUFFER POINTER
 2471  030236  005301                          DEC     R1              ;DONE?
 2472  030240  001324                          BNE     5$              ;NO, GO BACK
 2473  030242                                  ENDSEG                          ;%%END OF SEGMENT%%
  (3)  030242                          10001$:
  (3)  030242  104005                          EMT     C$ESEG
 2474  030244                                  ENDSEG                          ;%%END OF SEGMENT%%
  (3)  030244                          10000$:
  (3)  030244  104005                          EMT     C$ESEG
 2475  030246                          ENDT27:                         ;**END OF TEST**
  (3)  030246                          10000$:
  (3)  030246  104005                          EMT     C$ESEG
```

```
                                        .SBTTL  **TEST 28** - CHECK SILO LINES

      030250                            BGNTST                                          ;**START OF TEST**



      030250                            STARS
 (2)                                    ;;******************************************* ********************
                                        ;TEST THAT LINES IN / TO SILO ARE GOOD, THAT IS THAT EACH LINE IS
                                        ;GOOD AND CAN BE AT EITHER A 1 OR A 0 STATE INDEPENTENTLY OF EACH
                                        ;OTHER BIT POSITION THIS IS DONE BY WRITING PATTERNS OF FLOATING 1,
                                        ;FLOATING 0, WALKING 0, WALKING 1
      030250                            STARS
 (2)                                    ;;******************************************************************


      030250  004737  021356                    JSR     PC,HDHOME       ;HEADS OVER TRACK 0
      030254                                    CKERFG                  ;HEADS GO HOME OKAY
 (4)  030262  104032                            EMT     C$EXIT
 (4)  030264  000404                            .WORD   L10061-.

      030266  012703  002662                    MOV     #DATPAT,R3


      030272                                    BGNSEG                                  ;%%START OF SEGMENT%%
 (3)  030272  104004                            EMT     C$BSEG
      030274  012700  003052            6$:     MOV     #BUF,R0         ;WRITE PATTERN INTO MEMORY
      030300  012701  000200                    MOV     #128.,R1        ;128 WORDS
      030304  011320                    2$:     MOV     (R3),(R0)+      ;WRITE THE PATTERN
      030306  005301                            DEC     R1              ;DONE?
      030310  001375                            BNE     2$              ;NO GO BACK

      030312  012777  003052  151724            MOV #BUF,@RLBA          ;SETUP TO WRITE PATTERN ONTO DISK
      030320  005077  151722                    CLR     @RLDA           ;LOAD DA
      030324  012777  177600  151716            MOV     #-128.,@RLMP    ;WORD COUNT
      030332  004537  020456                    JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
      030336  000012                            WRITE
      030340  004537  021276                    JSR     R5,WTCRDY
      030344                                    ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  030344  104010                            EMT     C$ESCAPE
 (3)  030346  000320                            .WORD   10000$-.
      030350  004537  020214                    JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
      030354                                    ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  030354  104010                            EMT     C$ESCAPE
 (3)  030356  000310                            .WORD   10000$-.
      030360                                    BGNSEG                                  ;%%START OF SEGMENT%%
 (3)  030360  104004                            EMT     C$BSEG
      030362  012700  003052                    MOV     #BUF,R0         ;CLEAR MEMORY BEFORE READING IT BACK
      030366  012701  000200                    MOV     #128.,R1        ;128 WORDS
      030372  005020                    3$:     CLR     (R0)+           ;CLEAR
      030374  005301                            DEC     R1              ;EONE
      030376  001375                            BNE     3$              ;NO

      030400  012777  003052  151636            MOV     #BUF,@RLBA      ;SETUP TO READ IT BACK
      030406  012777  177600  151634            MOV     #-128.,@RLMP    ;128 WORDS
      030414  005077  151626                    CLR     @RLDA           ;SECTOR ZERO
```

```
2523  030420  004537  020456          JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
2524  030424  000014                  READ
2525  030426  004537  021276          JSR     R5,WTCRDY
2526  030432                          ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  030432  104010                  EMT     C$ESCAPE
 (3)  030434  000224                  .WORD   10001$-.
2527  030436  004537  020214          JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
2528  030442  005737  002124          TST     T.CRC           ;WAS ERROR A DCK??
2529  030446  001003                  BNE     8$              ;YES,SEE IF WE A DUMP
2530  030450                  10$:    ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  030450  104010                  EMT     C$ESCAPE
 (3)  030452  000206                  .WORD   10001$-.
2531  030454  000404                  BR      99$             ;SKIP AROUND
2532  030456  005737  016774    8$:   TST     T.DMP           ;DO WE STILL WANT TO CHECK IT
2533  030462  001772                  BEQ     10$             ;NO
2534  030464                          CKLOOP                  ;YES, CHECK FOR LOOP FIRST
 (3)  030464  104006                  EMT     C$CLP1
2535
2536  030466  005037  002130    99$:  CLR     CDCNT           ;CLEAR NUMBER WE'RE TO PRINT
2537  030472  005037  002122          CLR     CHECK           ;ALLOW HEADER ON FIRST PRINT
2538  030476  011337  002166          MOV     (R3),GDDAT      ;COMPARE WHAT WE READ BACK
2539  030502  012737  003052  002164  MOV     #BUF,TMP2       ;BUFFER START
2540  030510  012737  000001  002162  MOV     #1,TMP1         ;START WITH FIRST
2541
2542  030516  017737  151442  002170  5$:   MOV     @TMP2,BDDAT     ;GET DATA
2543  030524  023737  002166  002170        CMP     GDDAT,BDDAT     ;GOOD?
2544  030532  001440                  BEQ     4$              ;YES, BRANCH
2545
2546  030534  023737  002130  016776  CMP     CDCNT,T.LMT             ;CHECKED ENOUGH??
2547  030542  001002                  BNE     333$            ;NO
2548  030544                          ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  030544  104010                  EMT     C$ESCAPE
 (3)  030546  000112                  .WORD   10001$-.
2549  030550  005237  002130    333$: INC     CDCNT           ;ACCOUNT FOR IT
2550
2551  030554  005737  002122          TST     CHECK           ;HEADER OR JUST DATA
2552  030560  001007                  BNE     9$              ;JUST DATA
2553  030562                          ERRDF   35.,EM45,ERR10  ;BAD DATA BACK
 (3)  030562  104462                  TRAP    T$ERCODE
 (5)  030564  000043                  .WORD   35
 (5)  030566  013024                  .WORD   EM45
 (5)  030570  014702                  .WORD   ERR10
2554
2555  030572  005237  002122          INC     CHECK           ;ACCOUNT FOR PRINT OF HEADER
2556  030576  000416                  BR      4$
2557
2558  030600                    9$:   PRINTB  #FRMT7,TMP1,GDDAT,BDDAT
(10)  030600  013746  002170          MOV     BDDAT,-(SP)
 (9)  030604  013746  002166          MOV     GDDAT,-(SP)
 (8)  030610  013746  002162          MOV     TMP1,-(SP)
 (7)  030614  012746  016117          MOV     #FRMT7,-(SP)
 (6)  030620  012746  000004          MOV     #4,-(SP)
 (3)  030624  010600                  MOV     SP,R0
 (4)  030626  104014                  EMT     C$PNTB
 (4)  030630  062706  000012          ADD     #12,SP
2559  030634                    4$:   CKLOOP
```

```
  (3)  030634  104006                          EMT     C$CLP1
2560
2561  030636  062737  000002  002164           ADD     #2,TMP2          ;NEXT LOCATION
2562  030644  005237  002162                   INC     TMP1             ;NEXT WORD
2563  030650  023727  002162  000201           CMP     TMP1,#129.       ;DONE
2564  030656  001317                          BNE     5$               ;NO, GO BACK
2565
2566  030660                                   ENDSEG                           ;%%END OF SEGMENT%%
  (3)  030660                          10001$:
  (3)  030660  104005                          EMT     C$ESEG
2567
2568  030662  005723                          TST     (R3)+            ;DONE ALL PATTERNS
2569  030664  001203                          BNE     6$               ;NO, GO BACK
2570
2571  030666                                   ENDSEG                           ;%%END OF SEGMENT%%
  (3)  030666                          10000$:
  (3)  030666  104005                          EMT     C$ESEG
2572  030670                          ENDTST                                    ;**END OF TEST**
  (3)  030670                          L10061:
  (3)  030670  104001                          EMT     C$ETST
2573
2574                                   .SBTTL  **TEST 29** - CHECK THROUGHPUT OF SILO
2575
2576  030672                           BGNTST                                   ;**START OF TEST**
2577
2578
2579
2580  030672                           STARS
  (2)                                ;;*********************************************************************
2581                                 ;TEST THAT THE SILO OPERATES CORRECTLY, WE WILL WRITE A PATTERRN THAT CONTAINS
2582                                 ;A UNIQUE PATTERN IN EACH LOCATION. WE EXPECT IT BACK IN PROPER
2583                                 ;ORDER, WE DO A ONE SECTOR TRANSFER
2584  030672                           STARS
  (2)                                ;;*********************************************************************
2585
2586
2587  030672  004737  02?356                   JSR     PC,HDHOME        ;HEADS OVER TRACK 0
2588  030676                                   CKERFG                   ;HEADS GO HOME OKAY
  (4)  030704  104C32                          EMT     C$EXIT
  (4)  030706  000410                          .WORD   L10062-.
2589
2590  030710                                   BGNSEG                           ;%%START OF SEGMENT%%
  (3)  030710  104004                          EMT     C$BSEG
2591
2592
2593  030712  012700  000001                   MOV     #1,R0            ;INITIAL 1
2594  030716  012701  000200                   MOV     #128.,R1         ;128 WORDS
2595  030722  012702  003052                   MOV     #BUF,R2          ;BUFFER
2596  030726  010022                  2$:      MOV     R0,(R2)+         ;WRITE A WORD
2597  030730  005200                          INC     R0               ;NEXT PATTERN (1-128)
2598  030732  005301                          DEC     R1               ;DONE
2599  030734  001374                          BNE     2$               ;NO
2600
2601  030736  012777  003052  151300           MOV     #BUF,@RLBA       ;SETUP TO WRITE
2602  030744  012777  177600  151276           MOV     #-128.,@RLMP     ;128 WORDS
2603  030752  005077  151270                   CLR     @RLDA            ;DISK ADDRESS 0
```

```
 2604  030756  004537  020456                JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
 2605  030762  000012                        WRITE
 2606  030764  004537  021276                JSR     R5,WTCRDY
 2607  030770                                ESCAPE  SEG                     ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  030770  104010                        EMT     C$ESCAPE
  (3)  030772  000322                        .WORD   10000$-.
 2608
 2609  030774  004537  020214                JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
 2610  031000                                ESCAPE  SEG                     ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  031000  104010                        EMT     C$ESCAPE
  (3)  031002  000312                        .WORD   10000$-.
 2611  031004                                BGNSEG                          ;%%START OF SEGMENT%%
  (3)  031004  104004                        EMT     C$BSEG
 2612  031006  012700  003052                MOV     #BUF,R0                 ;CLEAR BUFFER
 2613  031012  012701  000200                MOV     #128.,R1                ;128 IN LENGTH
 2614  031016  005020              3$:       CLR     (R0)+                   ;CLEAR
 2615  031020  005301                        DEC     R1                      ;DOWN COUNT
 2616  031022  001375                        BNE     3$                      ;DONE?
 2617
 2618  031024  012777  003052  151212        MOV     #BUF,@RLBA              ;BUS ADDRESS
 2619  031032  012777  177600  151210        MOV     #-128.,@RLMP            ;WORD COUNT
 2620  031040  005077  151202                CLR     @RLDA                   ;DISK ADDRESS
 2621  031044  004537  020456                JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
 2622  031050  000014                        READ
 2623  031052  004537  021276                JSR     R5,WTCRDY
 2624  031056                                ESCAPE  SEG                     ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  031056  104010                        EMT     C$ESCAPE
  (3)  031060  000232                        .WORD   10001$-.
 2625
 2626  031062  004537  020214                JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
 2627  031066  005737  002124                TST     T.CRC                   ;WAS ERROR A DCK??
 2628  031072  001003                        BNE     8$                      ;YES,SEE IF WE A DUMP
 2629  031074              10$:              ESCAPE  SEG                     ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  031074  104010                        EMT     C$ESCAPE
  (3)  031076  000214                        .WORD   10001$-.
 2630  031100  000404                        BR      99$                     ;SKIP AROUND
 2631  031102  005737  016774        8$:     TST     T.DMP                   ;DO WF STILL WANT TO CHECK IT
 2632  031106  001772                        BEQ     10$                     ;NO
 2633  031110                                CKLOOP                          ;YES, CHECK FOR LOOP FIRST
  (3)  031110  104006                        EMT     C$CLP1
 2634
 2635  031112  005037  002130        99$:    CLR     CDCNT                   ;CLEAR NUMBER WE'RE TO PRINT
 2636  031116  005037  002122                CLR     CHECK                   ;ALLOW HEADER ON FIRST PRINT
 2637  031122  012737  000001  002166        MOV     #1,GDDAT                ;START GOOD AT 1
 2638  031130  012737  003052  002164        MOV     #BUF,TMP2               ;START OF BUFFER
 2639  031136  012737  000001  002162        MOV     #1,TMP1                 ;FIRST WORD
 2640
 2641  031144  017737  151014  002170  4$:    MOV     @TMP2,BDDAT             ;GET WORD
 2642  031152  023737  002170  002166        CMP     BDDAT,GDDAT             ;CORRECT?
 2643  031160  001440                        BEQ     6$                      ;YES
 2644
 2645  031162  023737  002130  016776        CMP     CDCNT,T.LMT             ;CHECKED ENOUGH??
 2646  031170  001002                        BNE     333$                    ;NO
 2647  031172                                ESCAPE  SEG                     ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  031172  104010                        EMT     C$ESCAPE
  (3)  031174  000116                        .WORD   10001$-.
```

```
 2648  031176  005237  002130          333$:   INC     CDCNT           ;ACCOUNT FOR IT
 2649
 2650  031202  005737  002122                  TST     CHECK           ;HEADER OR JUST DATA
 2651  031206  001007                          BNE     9$              ;JUST DATA
 2652  031210                                  ERRDF   36.,EM47,ERR10  ;BAD DATA
  (3)  031210  104462                          TRAP    T$ERCODE
  (5)  031212  000044                          .WORD   36
  (5)  031214  013056                          .WORD   EM47
  (5)  031216  014702                          .WORD   ERR10
 2653  031220  005237  002122                  INC     CHECK           ;ACCOUNT FOR PRINT OF HEADER
 2654  031224  000416                          BR      6$
 2655
 2656  031226                          9$:     PRINTB #FRMT7,TMP1,GDDAT,BDDAT
  (10) 031226  013746  002170                  MOV     BDDAT,-(SP)
  (9)  031232  013746  002166                  MOV     GDDAT,-(SP)
  (8)  031236  013746  002162                  MOV     TMP1,-(SP)
  (7)  031242  012746  016117                  MOV     #FRMT7,-(SP)
  (6)  031246  012746  000004                  MOV     #4,-(SP)
  (3)  031252  010600                          MOV     SP,R0
  (4)  031254  104014                          EMT     C$PNTB
  (4)  031256  062706  000012                  ADD     #12,SP
 2657  031262                          6$:     CKLOOP
  (3)  031262  104006                          EMT     C$CLP1
 2658
 2659  031264  062737  000002  002164          ADD     #2,TMP2         ;NEXT
 2660  031272  005237  002162                  INC     TMP1            ;NEXT
 2661  031276  005237  002166                  INC     GDDAT           ;NEXT
 2662  031302  023727  002162  000201          CMP     TMP1,#129.      ;DONE?
 2663  031310  001315                          BNE     4$
 2664
 2665  031312                                  ENDSEG                          ;%%END OF SEGMENT%%
  (3)  031312                  10001$:
  (3)  031312  104005                          EMT     C$ESEG
 2666
 2667  031314                                  ENDSEG                          ;%%END OF SEGMENT%%
  (3)  031314                  10000$:
  (3)  031314  104005                          EMT     C$ESEG
 2668  031316                  ENDTST                                          ;**END OF TEST**
  (3)  031316                  L10062:
  (3)  031316  104001                          EMT     C$ETST
 2669
 2670                                     .SBTTL  **TEST 30** - CHECK ZERO FILL ON WRITE
 2671
 2672  031320                             BCNTST                              ;**START OF TEST**
 2673
 2674
 2675
 2676  031320                             STARS
  (2)                                     ;;**********.**********.**********.**********.**********
 2677                                     ;WHEN WRITING PARTIAL SECTORS (LESS THAN 128 WORDS) THE
 2678                                     ;CONTROLLER WILL FILL IN THE REMAINING PORTION OF
 2679                                     ;THE SECTOR WITH ZERO WORDS.  CHECK THIS FEATURE
 2680                                     ;WITH WORD COUNTS FROM 1 TO 127
 2681  031320                             STARS
  (2)                                     ;;********** **********.**********.**********.**********
 2682
```

```
 2683  031320  004737  021356                JSR     PC,HDHOME       ;HEADS OVER TRACK 0
 2684  031324                                CKERFG                  ;HEADS GO HOME OKAY
  (4)  031332  104032                        EMT     C$EXIT
  (4)  031334  000442                        .WORD   L10063-.
 2685
 2686  031336                                BGNSEG                          ;%%START OF SEGMENT%%
  (3)  031336  104004                        EMT     C$BSEG
 2687
 2688  031340  012737  000001  002162        MOV     #1,TMP1         ;START WITH 1 WORD WRITE
 2689  031346  012700  003052          35$:  MOV     #BUF,R0         ;WRITE BUFFER WITH 52525, WE'LL
 2690  031352  012701  000200                MOV     #128.,R1        ;WRITE 128 WORDS ALL THOUGH WE'RE
 2691  031356  012720  052525          3$:   MOV     #52525,(R0)+    ;ONLY GOING TO TRANSFER < 128
 2692  031362  005301                        DEC     R1              ;DONE WITH BUFFER?
 2693  031364  001374                        BNE     3$              ;NO, GO BACK
 2694  031366  013700  002162          33$:  MOV     TMP1,R0         ;GET TRANSFER WORD COUNT
 2695  031372  005400                        NEG     R0              ;NEGATE FOR RLMP
 2696  031374  010077  150650                MOV     R0,@RLMP        ;STORE WORD COUNT AWAY
 2697  031400  012777  003052  150636        MOV     #BUF,@RLBA      ;SET UP RLBA
 2698  031406  005077  150634                CLR     @RLDA
 2699  031412  004537  020456                JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
 2700  031416  000012                        WRITE                   ;WRITE IT
 2701  031420  004537  021276                JSR     R5,WTCRDY       ;WAIT FOR WRITE TO FINISH
 2702  031424                                ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  031424  104010                        EMT     C$ESCAPE
  (3)  031426  000346                        .WORD   10000$-.
 2703
 2704  031430  004537  020214                JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
 2705  031434                                ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  031434  104010                        EMT     C$ESCAPE
  (3)  031436  000336                        .WORD   10000$-.
 2706  031440                                BGNSEG                          ;%%START OF SEGMENT%%
  (3)  031440  104004                        EMT     C$BSEG
 2707  031442  012700  003052                MOV     #BUF,R0         ;WE'RE GOING TO OVERLAY BUFFER BEFORE
 2708  031446  012701  000200                MOV     #128.,R1        ;READING IT BACK.
 2709  031452  012720  125252          18$:  MOV     #125252,(R0)+   ;OVERLAY IT WITH COMPLIMENT
 2710  031456  005301                        DEC     R1              ;DONE?
 2711  031460  001374                        BNE     18$             ;NO, KEEP GOING
 2712
 2713  031462  012777  003052  150554        MOV     #BUF,@RLBA      ;SET UP TO READ
 2714  031470  012777  177600  150552        MOV     #-128.,@RLMP    ;128 WORDS TO CHECK ZERO FILL
 2715  031476  005077  150544                CLR     @RLDA           ;SECTOR
 2716  031502  004537  020456                JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
 2717  031506  000014                        READ
 2718  031510  004537  021276                JSR     R5,WTCRDY       ;WAIT TIL WE FINISH THE READ
 2719  031514                                ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  031514  104010                        EMT     C$ESCAPE
  (3)  031516  000234                        .WORD   10001$-.
 2720
 2721  031520  004537  020214                JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
 2722  031524  005737  002124                TST     T.CRC           ;WAS ERROR A DCK??
 2723  031530  001003                        BNE     8$              ;YES,SEE IF WE A DUMP
 2724  031532                          10$:  ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  031532  104010                        EMT     C$ESCAPE
  (3)  031534  000216                        .WORD   10001$-.
 2725  031536  000404                        BR      9$              ;SKIP AROUND
 2726  031540  005737  016774           8$:  TST     T.DMP           ;DO WE STILL WANT TO CHECK IT
```

```
 2727  031544  001772                        BEQ     10$             ;NO
 2728  031546                                CKLOOP                  ;YES, CHECK FOR LOOP FIRST
   (3) 031546  104006                        EMT     C$CLP1
 2729  031550  005037  002130          99$:  CLR     CDCNT           ;CLEAR NUMBER WE'RE TO PRINT
 2730  031554  005037  002122                CLR     CHECK           ;ALLOW HEADER ON FIRST PRINT
 2731  031560  013702  002162                MOV     TMP1,R2         ;WORDS WRITTEN IN R2
 2732  031564  012701  000200                MOV     #128.,R1        ;CHECK 128 WORDS
 2733
 2734  031570  012703  003052                MOV     #BUF,R3         ;SET UP BUFFER BEGINNING
 2735  031574  005037  002164                CLR     TMP2            ;ZERO WORD COUNT
 2736  031600  012737  052525  002166        MOV     #52525,GDDAT    ;SET UP EXPECTED
 2737  031606  011337  002170          4$:   MOV     (R3),BDDAT      ;GET WORD
 2738  031612  023737  002170  002166        CMP     BDDAT,GDDAT     ;IS WORD CORRECT?
 2739  031620  001441                        BEQ     12$             ;YES, GO CHECK COUNTS AND REPEAT
 2740
 2741  031622  023737  002130  016776        CMP     CDCNT,T.LMT             ;CHECKED ENOUGH??
 2742  031630  001002                        BNE     333$            ;NO
 2743  031632                                ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
   (3) 031632  104010                        EMT     C$ESCAPE
   (3) 031634  000116                        .WORD   10001$-.
 2744  031636  005237  002130          333$: INC     CDCNT           ;ACCOUNT FOR IT
 2745
 2746  031642  005737  002122                TST     CHECK           ;HEADER OR JUST DATA
 2747  031646  001007                        BNE     9$              ;JUST DATA
 2748  031650                                ERRDF   37.,EM27,ERR12
   (3) 031650  104462                        TRAP    T$ERCODE
   (5) 031652  000045                        .WORD   37
   (5) 031654  012105                        .WORD   EM27
   (5) 031656  015026                        .WORD   ERR12
 2749  031660  005237  002122                INC     CHECK           ;ACCOUNT FOR PRINT OF HEADER
 2750  031664  000417                        BR      12$
 2751
 2752  031666                          9$:   PRINTB #FRMT9,TMP1,R3,GDDAT,BDDAT
  (11) 031666  013746  002170                MOV     BDDAT,-(SP)
  (10) 031672  013746  002166                MOV     GDDAT,-(SP)
   (9) 031676  010346                        MOV     R3,-(SP)
   (8) 031700  013746  002162                MOV     TMP1,-(SP)
   (7) 031704  012746  016312                MOV     #FRMT9,-(SP)
   (6) 031710  012746  000005                MOV     #5,-(SP)
   (3) 031714  010600                        MOV     SP,R0
   (4) 031716  104014                        EMT     C$PNTB
   (4) 031720  062706  000014                ADD     #14,SP
 2753  031724                          12$:  CKLOOP
   (3) 031724  104006                        EMT     C$CLP1
 2754  031726  005723                  6$:   TST     (R3)+
 2755  031730  005237  002164                INC     TMP2
 2756  031734  005301                        DEC     R1              ;DONE ALL WORDS?
 2757  031736  001405                        BEQ     7$              ;EXIT TEST
 2758  031740  005302                        DEC     R2              ;DONE CHECKING NON-ZERO WORDS
 2759  031742  003321                        BGT     4$              ;NO, BRANCH BACK
 2760  031744  005037  002166                CLR     GDDAT           ;YES, SET EXP'D AS ZERO
 2761  031750  000716                        BR      4$              ;BRANCH BACK
 2762
 2763  031752                          7$:                           ;EXIT TEST
 2764  031752                                ENDSEG                          ;%%END OF SEGMENT%%
   (3) 031752                          10001$:
```

```
  (3)  031752  104005                          EMT     C$ESEG
2765
2766  031754  005237  002162                   INC     TMP1
2767  031760  023727  002162  000200           CMP     TMP1,#128.
2768  031766  001402                           BEQ     34$
2769  031770  000137  031346                   JMP     35$
2770  031774                        34$:
2771
2772  031774                                   ENDSEG                          ;%%END OF SEGMENT%%
  (3)  031774                        ^0000$:
  (3)  031774  104005                          EMT     C$ESEG
2773  031776                        ENDTST                                     ;**END OF TEST**
  (3)  031776                        L10063:
  (3)  031776  104001                          EMT     C$ETST
2774
2775                                 .SBTTL  **TEST 31** - CHECK SECTOR BITS OF HEADER COMPARE
2776
2777  032000                         BGNTST                                    ;**START OF TEST**
2778
2779
2780  032000                         STARS
  (2)                                ;;*************************************************************************
2781                                 ;TEST THAT ALL SECTOR BITS OF HEADER WORD CAN COMPARE
2782                                 ;UNIQUELY.  WE TESTED THE HEADER COMPARE LOGIC EARLIER
2783                                 ;BUT THAT WAS NOT AN EXTENSIVE TEST OF THE SECTOR BITS.
2784                                 ;THE TEST PROCEDURE IS TO WRITE EACH SECTOR OF TRACK
2785                                 ;0 WITH THE SECTOR ADDRESS, THEN GO BACK AND READ
2786                                 ;EACH SECTOR.  IF ANY SECTOR HAS ANY DATA THEN THAT
2787                                 ;WHICH WAS EXPECTED THEN WE HAVE AN ERROR
2788                                 ;ERROR PRINT OUT WILL GIVE SECTOR, EXPECTED AND RECEIVED
2789  032000                         STARS
  (2)                                ;;*************************************************************************
2790
2791
2792
2793
2794
2795
2796
2797  032000  004737  021356                   JSR     PC,HDHOME       ;HEADS OVER TRACK 0
2798  032004                                   CKERFG                  ;HEADS GO HOME OKAY
  (4)  032012  104032                          EMT     C$EXIT
  (4)  032014  000414                          .WORD   L10064-.
2799
2800  032016                                   BGNSEG                          ;%%START OF SEGMENT%%
  (3)  032016  104004                          EMT     C$BSEG
2801
2802  032020  005037  002160           1$:    CLR     TMP0            ;CLEAR
2803
2804  032024                                   BGNSEG                          ;%%START OF SEGMENT%%
  (3)  032024  104004                          EMT     C$BSEG
2805
2806  032026  012702  003052           199$:  MOV     #BUF,R2         ;WRITE A PATTERN FOR THE WRITE
2807  032032  012701  000200                   MOV     #128.,R1        ;ONE SECTOR'S WORTH
2808  032036  013722  002160           2$:    MOV     TMP0,(R2)+      ;WRITE IT
2809  032042  005301                          DEC     R1              ;DONE.
```

```
2810  032044  001374                          BNE     2$              ;IF NOT, GO BACK
2811
2812  032046  012777  177600  150174          MOV     #-128.,@RLMP    ;ONE SECTOR WORD COUNT
2813  032054  012777  003052  150162          MOV     #BUF,@RLBA      ;WRITE FROM BUF
2814  032062  013777  002160  150156          MOV     TMP0,@RLDA      ;SECTOR
2815  032070  004537  020456                  JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
2816  032074  000012                          WRITE
2817  032076  004537  021276                  JSR     R5,WTCRDY       ;WAIT FOR WRITE TO FINISH
2818  032102                                  ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  032102  104010                          EMT     C$ESCAPE
 (3)  032104  000320                          .WORD   10001$-.
2819  032106  005237  002160                  INC     TMP0            ;NEXT SECTOR
2820  032112  023727  002160  000050          CMP     TMP0,#40.       ;ALL DONE?
2821  032120  001342                          BNE     199$            ;NO GO BACK
2822  032122  005037  002160                  CLR     TMP0            ;CLEAR
2823
2824  032126                                  BGNSEG                          ;%%START OF SEGMENT%%
 (3)  032126  104004                          EMT     C$BSEG
2825
2826  032130  012702  003052          98$:    MOV     #BUF,R2         ;CLEAR THE BUFFER FIRST
2827  032134  012701  000200                  MOV     #128.,R1        ;128 WORDS
2828  032140  005022                  3$:     CLR     (R2)+
2829  032142  005301                          DEC     R1
2830  032144  001375                          BNE     3$
2831
2832  032146  013777  002160  150072          MOV     TMP0,@RLDA      ;GET SECTOR
2833  032154  012777  003052  150062          MOV     #BUF,@RLBA      ;SETUP BUS ADDRESS
2834
2835  032162  012777  177600  150060          MOV     #-128.,@RLMP    ;READ A SECTOR
2836  032170  004537  020456                  JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
2837  032174  000014                          READ
2838  032176  004537  021276                  JSR     R5,WTCRDY
2839  032202                                  ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  032202  104010                          EMT     C$ESCAPE
 (3)  032204  000216                          .WORD   10002$-.
2840
2841  032206  004537  020214                  JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
2842  032212  005737  002124                  TST     T.CRC           ;WAS ERROR A DCK??
2843  032216  001003                          BNE     8$              ;YES,SEE IF WE A DUMP
2844  032220                          10$:    ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  032220  104010                          EMT     C$ESCAPE
 (3)  032222  000200                          .WORD   10002$-.
2845  032224  000404                          BR      99$             ;SKIP AROUND
2846  032226  005737  016774          8$:     TST     T.DMP           ;DO WE STILL WANT TO CHECK IT
2847  032232  001772                          BEQ     10$             ;NO
2848  032234                                  CKLOOP                  ;YES, CHECK FOR LOOP FIRST
 (3)  032234  104006                          EMT     C$CLP1
2849
2850                                  ;CHECK NOW TO SEE IF WE READ THE RIGHT SECTOR
2851
2852  032236  005037  002130          99$:    CLR     CDCNT           ;CLEAR NUMBER WE'RE TO PRINT
2853  032242  005037  002122                  CLR     CHECK           ;ALLOW HEADER ON FIRST PRINT
2854  032246  013737  002160  002166          MOV     TMP0,GDDAT      ;EXPECTED DATA
2855  032254  012702  003052                  MOV     #BUF,R2         ;BUFFER
2856  032260  012701  000200                  MOV     #128.,R1        ;WORD COUNT
2857  032264  012237  002170          5$:     MOV     (R2)+,BDDAT     ;
```

```
2858  032270  023737  002170  002166          CMP     BDDAT,GDDAT
2859  032276  001440                          BEQ     6$
2860
2861  032300  023737  002130  016776          CMP     CDCNT,T.LMT             ;CHECKED ENOUGH??
2862  032306  001002                          BNE     333$                    ;NO
2863  032310                                  ESCAPE  SEG                     ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  032310  104010                          EMT     C$ESCAPE
 (3)  032312  000110                          .WORD   10002$-.
2864  032314  005237  002130          333$:   INC     CDCNT                   ;ACCOUNT FOR IT
2865
2866  032320  005737  002122                  TST     CHECK                   ;HEADER OR JUST DATA
2867  032324  001007                          BNE     9$                      ;JUST DATA
2868  032326                                  ERRDF   38.,EM50,ERR11          ;
 (3)  032326  104462                          TRAP    T$ERCODE
 (5)  032330  000046                          .WORD   38
 (5)  032332  013105                          .WORD   EM50
 (5)  032334  014754                          .WORD   FRR11
2869  032336  005237  002122                  INC     CHECK                   ;ACCOUNT FOR PRINT OF HEADER
2870  032342  000416                          BR      6$
2871
2872  032344                          9$:     PRINTB #FRMT8,TMP0,GDDAT,BDDAT
 (10) 032344  013746  002170                  MOV     BDDAT,-(SP)
 (9)  032350  013746  002166                  MOV     GDDAT,-(SP)
 (8)  032354  013746  002160                  MOV     TMP0,-(SP)
 (7)  032360  012746  016171                  MOV     #FRMT8,-(SP)
 (6)  032364  012746  000004                  MOV     #4,-(SP)
 (3)  032370  010600                          MOV     SP,R0
 (4)  032372  104014                          EMT     C$PNTB
 (4)  032374  062706  000012                  ADD     #12,SP
2873  032400                          6$:     CKLOOP
 (3)  032400  104006                          EMT     C$CLP1
2874
2875  032402  005301                          DEC     R1                      ;ALL OF SECTOR CHECKED?
2876  032404  001327                          BNE     5$                      ;GO BACK IF NOT
2877  032406  005237  002160                  INC     TMP0                    ;NEXT SECTOR
2878  032412  023727  002160  000050          CMP     TMP0,#40.               ;DONE?
2879  032420  001243                          BNE     98$                     ;NO, GO BACK
2880
2881  032422                                  ENDSEG                          ;%%END OF SEGMENT%%
 (3)  032422                          10002$:
 (3)  032422  104005                          EMT     C$ESEG
2882
2883  032424                                  ENDSEG                          ;%%END OF SEGMENT%%
 (3)  032424                          10001$:
 (3)  032424  104005                          EMT     C$ESEG
2884  032426                                  ENDSEG                          ;%%END OF SEGMENT%%
 (3)  032426                          10000$:
 (3)  032426  104005                          EMT     C$ESEG
2885  032430                          ENDTST                                  ;**END OF TEST**
 (3)  032430                          L10064:
 (3)  032430  104001                          EMT     C$ETST
2886
2887                                    .SBTTL  **TEST 32** - WRITE CHECK NPR INTEGRETY
2888
2889  032432                          BGNTST                                  ;**START OF TEST**
2890
```

```
 2891  032432                          STARS
  (2)                                  ;;*****************************************************************
 2892                                  ;CHECK THAT NPR WILL NOT INTERFERE WITH THE OPERATION OF THE
 2893                                  ;UNIBUS. WE SET UP LOCATION 4 TO HANDLE THE TRAP IF IT HAPPENS.
 2894  032432                          STARS
  (2)                                  ;;*****************************************************************
 2895
 2896
 2897  032432  004737  021356                JSR     PC,HDHOME       ;HEADS OVER TRACK 0
 2898  032436                                CKERFG                  ;HEADS GO HOME OKAY
  (4)  032444  104032                        EMT     C$EXIT
  (4)  032446  000372                        .WORD   L10065-.
 2899
 2900  032450                                BGNSEG                          ;%%START OF SEGMENT%%
  (3)  032450  104004                        EMT     C$BSEG
 2901
 2902  032452  012700  003052                MOV     #BUF,R0         ;SETUP AND WRITE
 2903  032456  012701  000200                MOV     #128.,R1        ;128 WORDS
 2904  032462  012720  125252        299$:   MOV     #125252,(R0)+   ;WRITE
 2905  032466  005301                        DEC     R1              ;DONE??
 2906  032470  001374                        BNE     299$
 2907
 2908  032472  012777  003052  147544        MOV     #BUF,@RLBA      ;LOAD BUS ADDRESS
 2909  032500  012777  177600  147542        MOV     #-128.,@RLMP    ;WORD COUNT
 2910  032506  005077  147534                CLR     @RLDA           ;CLEAR DISK ADDRESS
 2911  032512  004537  020456                JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
 2912  032516  000012                        WRITE
 2913  032520  004537  021276                JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY
 2914  032524                                ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  032524  104010                        EMT     C$ESCAPE
  (3)  032526  000310                        .WORD   10000$-.
 2915  032530  004537  020214                JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
 2916  032534                                ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  032534  104010                        EMT     C$ESCAPE
  (3)  032536  000300                        .WORD   10000$-.
 2917
 2918
 2919                          ;VERIFY WRITE WITH READ BEFORE WRCHK
 2920
 2921  032540  005077  147502                CLR     @RLDA
 2922  032544  012777  003052  147472        MOV     #BUF,@RLBA
 2923  032552  012777  177600  147470        MOV     #-128.,@RLMP
 2924  032560  004537  020456                JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
 2925  032564  000014                        READ
 2926  032566  004537  021276                JSR     R5,WTCRDY
 2927  032572                                ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  032572  104010                        EMT     C$ESCAPE
  (3)  032574  000242                        .WORD   10000$-.
 2928  032576  004537  020214                JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
 2929  032602                                ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  032602  104010                        EMT     C$ESCAPE
  (3)  032604  000232                        .WORD   10000$-.
 2930
 2931  032606                                BGNSEG                          ;%%START OF SEGMENT%%
  (3)  032606  104004                        EMT     C$BSEG
 2932
```

```
2933  032610                                1$:   SETVEC  ERRVEC,#TRPHAN,#340     ;SET UP FOR TRAP
 (7)  032610  012746  000340                      MOV     #340,-(SP)
 (6)  032614  012746  021350                      MOV     #TRPHAN,-(SP)
 (5)  032620  013746  002132                      MOV     ERRVEC,-(SP)
 (4)  032624  012746  000003                      MOV     #3,-(SP)
 (3)  032630  104037                              EMT     C$SVEC
 (2)  032632  062706  000010                      ADD     #10,SP
2934  032636  005037  002142                      CLR     TRPFLG                  ;CLEAR TRAP OCCURANCE
2935  032642  012?.7  003052  147374              MOV     #BUF,@RLBA              ;BUS ADDRESS
2936  032650  005077  147372                      CLR     @RLDA                   ;LOAD DISK ADDRESS
2937  032654  012777  177600  147366              MOV     #-128.,@RLMP            ;WORD COUNT OF 128
2938  032662  005037  002166                      CLR     GDDAT                   ;SET UP CSR TO LOAD
2939  032666  013737  002134  002166              MOV     DRIVE,GDDAT             ;SET IN DRIVE
2940  032674  052737  000002  002166              BIS     #WRCHK,GDDAT            ;SET IN FUNCTION
2941  032702  004537  020764                      JSR     R5,BEFORE               ;LOAD FOR ERROR PRINTOUT
2942  032706  013737  002166  002216              MOV     GDDAT,B.CS              ;SET IN COMMAND
2943  032714  052737  000201  002216              BIS     #201,B.CS               ;LOAD CRDY
2944  032722  042737  002000  002216              BIC     #OPI,B.CS               ;CLEAR (BIT 10)
2945  032730  013777  002166  147304              MOV     GDDAT,@RLCS             ;ISSUE WRITE CHECK
2946  032736  012701  000144                      MOV     #100.,R1                ;WAIT FOR CRDY
2947  032742  032777  000200  147272  5$:   BIT     #CRDY,@RLCS             ;NPR DONE
2948  032750  001013                              BNE     6$                      ;YES, 6$
2949  032752                                      WAITUS  #20.                    ;WAIT A WHILE
 (3)  032752  012700  000024                      MOV     #20.,R0
 (3)  032756  104027                              EMT     C$WTU
2950  032760  005301                              DEC     R1                      ;A WHILE UP
2951  032762  001367                              BNE     5$                      ;NO, GO BACK
2952
2953  032764  004537  021016                      JSR     R5,AFTER
2954  032770                                      ERRDF   0.,CRTIM,ERR5           ;CONTROLLER TIMED OUT
 (3)  032770  104462                              TRAP    T$ERCODE
 (5)  032772  000000                              .WORD   0
 (5)  032774  007172                              .WORD   CRTIM
 (5)  032776  014456                              .WORD   ERR5
2955  033000                                6$:   CLRVEC  ERRVEC                  ;CLEAR VECTOR
 (3)  033000  013700  002132                      MOV     ERRVEC,R0
 (3)  033004  104036                              EMT     C$CVEC
2956  033006                                      ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  033006  104010                              EMT     C$ESCAPE
 (3)  033010  000024                              .WORD   10001$-.
2957
2958  033012  005737  002142                      TST     TRPFLG                  ;DID TRAP OCCUR?
2959  033016  001406                              BEQ     7$                      ;NO
2960  033020  004537  021016                      JSR     R5,AFTER
2961  033024                                      ERRSF   1.,EM57,ERR0            ;TRAP ON WRITE
 (3)  033024  104461                              TRAP    T$ERCODE
 (5)  033026  000001                              .WORD   1
 (5)  033030  013477                              .WORD   EM57
 (5)  033032  014244                              .WORD   ERR0
2962  033034                                7$:
2963
2964
2965  033034                                      ENDSEG                          ;%%END OF SEGMENT%%
 (3)  033034                                10001$:
 (3)  033034  104005                              EMT     C$ESEG
2966  033036                                      ENDSEG                          ;%%END OF SEGMENT%%
```

```
  (3)  033036                          10000$:
  (3)  033036  104005                          EMT     C$ESEG
2967
2968  033040                         ENDTST                                  ;**END OF TEST**
  (3)  033040                         L10065:
  (3)  033040  104001                          EMT     C$ETST
2969
2970                                 .SBTTL  **TEST 33** - WRITE CHECK FUNCTION
2971
2972  033042                         BGNTST                                  ;**START OF TEST**
2973
2974  033042                         STARS
  (2)                                ;;*********************************************************************
2975                                 ;CHECK OF WRITE CHECK LOGIC UNDER FLAG MODE
2976                                 ; WE WILL WRITE CHECK A FULL SECTOR (128 WORDS) FROM
2977                                 ;MEMORY (BUF).  WE CHECK THAT NO ERRORS OCCUR.
2978  033042                         STARS
  (2)                                ;;*********************************************************************
2979
2980
2981  033042  004737  021356                 JSR     PC,HDHOME       ;HEADS OVER TRACK 0
2982  033046                                 CKERFG                  ;HEADS GO HOME OKAY
  (4)  033054  104032                          EMT     C$EXIT
  (4)  033056  000214                          .WORD   L10066-.
2983
2984  033060                                 BGNSEG                          ;%%START OF SEGMENT%%
  (3)  033060  104004                          EMT     C$BSEG
2985
2986  033062  012700  003052                 MOV     #BUF,R0         ;SETUP AND WRITE
2987  033066  012701  000200                 MOV     #128.,R1        ;128 WORDS
2988  033072  012720  125252         299$:   MOV     #125252,(R0)+   ;WRITE
2989  033076  005301                         DEC     R1              ;DONE??
2990  033100  001374                         BNE     299$
2991
2992  033102  012777  003052  147134         MOV     #BUF,@RLBA      ;LOAD BUS ADDRESS
2993  033110  012777  177600  147132         MOV     #-128.,@RLMP    ;WORD COUNT
2994  033116  005077  147124                 CLR     @RLDA           ;CLEAR DISK ADDRESS
2995  033122  004537  020456                 JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
2996  033126  000012                         WRITE
2997  033130  004537  021276                 JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY
2998  033134                                 ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  033134  104010                          EMT     C$ESCAPE
  (3)  033136  000132                          .WORD   10000$-.
2999  033140  004537  020214                 JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
3000  033144                                 ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  033144  104010                          EMT     C$ESCAPE
  (3)  033146  000122                          .WORD   10000$-.
3001  033150                                 BGNSEG                          ;%%START OF SEGMENT%%
  (3)  033150  104004                          EMT     C$BSEG
3002
3003                                 ;VERIFY WRITE WITH READ BEFORE WRITE
3004
3005  033152  005077  147070                 CLR     @RLDA
3006  033156  012777  003052  147060         MOV     #BUF,@RLBA
3007  033164  012777  177600  147056         MOV     #-128.,@RLMP
3008  033172  004537  020456                 JSR     R5,LDFUN                ;  AL THE FUNCTION IN NEXT WORD
```

```
3009  033176  000014                          READ
3010  033200  004537  021276                  JSR     R5,WTCRDY
3011  033204                                  ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  033204  104010                          EMT     C$ESCAPE
 (3)  033206  000060                          .WORD   10001$-.
3012  033210  004537  020214                  JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
3013  033214                                  ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  033214  104010                          EMT     C$ESCAPE
 (3)  033216  000050                          .WORD   10001$-.
3014
3015  033220                                  BGNSEG                          ;%%START OF SEGMENT%%
 (3)  033220  104004                          EMT     C$BSEG
3016
3017  033222                          3$:
3018  033222  005077  147020                  CLR     @RLDA
3019  033226  012777  177600  147014          MOV     #-128.,@RLMP    ;WORD COUNT
3020  033234  012777  003052  147002          MOV     #BUF,@RLBA      ;BUS ADDRESS
3021  033242  004537  020456                  JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
3022  033246  000002                          WRCHK                   ;WRITE CHECK
3023
3024  033250  004537  021276                  JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY
3025  033254                                  ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  033254  104010                          EMT     C$ESCAPE
 (3)  033256  000006                          .WORD   10002$-.
3026
3027
3028  033260  004537  020214                  JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
3029
3030  033264                                  ENDSEG                          ;%%END OF SEGMENT%%
 (3)  033264                          10002$:
 (3)  033264  104005                          EMT     C$ESEG
3031  033266                                  ENDSEG                          ;%%END OF SEGMENT%%
 (3)  033266                          10001$:
 (3)  033266  104005                          EMT     C$ESEG
3032  033270                                  ENDSEG                          ;%%END OF SEGMENT%%
 (3)  033270                          10000$:
 (3)  033270  104005                          EMT     C$ESEG
3033  033272                          ENDTST                          ;**END OF TEST**
 (3)  033272                          L10066:
 (3)  033272  104001                          EMT     C$ETST
3034
3035                                    .SBTTL  **TEST 34** - WRITE CHECK FUNCTION INTERRUPT
3036
3037  033274                            BGNTST                                ;**START OF TEST**
3038
3039  033274                            STARS
 (2)                                    ;;*****************************************************************
3040                                    ;CHECK OF WRITE CHECK LOGIC UNDER INTERRUPT MODE
3041                                    ;WE WILL WRITE CHECK A FULL SECTOR (128 WORDS) FROM MEMORY (BUF).
3042                                    ;WE CHECK THAT NO ERRORS OCCUR.  WE DO NOT CHECK RLDA OR RLBA
3043                                    ;INCREMENT AT THIS TIME.
3044  033274                            STARS
 (2)                                    ;;*****************************************************************
3045
3046
3047  033274  004737  021356                    JSR     PC,HDHOME       ;HEADS OVER TRACK 0
```

```
3048  033300                                  CKERFG                  ;HEADS GO HOME OKAY
 (4)  033306  104032                          EMT     C$EXIT
 (4)  033310  000252                          .WORD   L10067-.
3049
3050  033312                                  BGNSEG                          ;%%START OF SEGMENT%%
 (3)  033312  104004                          EMT     C$BSEG
3051
3052  033314  012700  003052                  MOV     #BUF,R0         ;SETUP AND WRITE
3053  033320  012701  000200                  MOV     #128.,R1        ;128 WORDS
3054  033324  012720  125252          299$:   MOV     #125252,(R0)+   ;WRITE
3055  033330  005301                          DEC     R1              ;DONE??
3056  033332  001374                          BNE     299$
3057
3058  033334  012777  003052  146702          MOV     #BUF,@RLBA      ;LOAD BUS ADDRFSS
3059  033342  012777  177600  146700          MOV     #-128.,@RLMP    ;WORD COUNT
3060  033350  005077  146672                  CLR     @RLDA           ;CLEAR DISK ADDRESS
3061  033354  004537  020456                  JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
3062  033360  000012                          WRITE
3063  033362  004537  021276                  JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY
3064  033366                                  ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  033366  104010                          EMT     C$ESCAPE
 (3)  033370  000170                          .WORD   10000$-.
3065  033372  004537  020214                  JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
3066  033376                                  ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  033376  104010                          EMT     C$ESCAPE
 (3)  033400  000160                          .WORD   10000$-.
3067                                    ;VERIFY WRITE WITH READ BEFORE WRCHK
3068
3069  033402  005077  146640                  CLR     @RLDA
3070  033406  012777  003052  146630          MOV     #BUF,@RLBA
3071  033414  012777  177600  146626          MOV     #-128.,@RLMP
3072  033422  004537  020456                  JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
3073  033426  000014                          READ
3074  033430  004537  021276                  JSR     R5,WTCRDY
3075  033434                                  ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  033434  104010                          EMT     C$ESCAPE
 (3)  033436  000122                          .WORD   10000$-.
3076  033440  004537  020214                  JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
3077  033444                                  ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  033444  104010                          EMT     C$ESCAPE
 (3)  033446  000112                          .WORD   10000$-.
3078
3079  033450                                  BGNSEG                          ;%%START OF SEGMENT%%
 (3)  033450  104004                          EMT     C$BSEG
3080
3081
3082  033452  005037  002144                  CLR     INTFLG          ;CLEAR INTERRUPT OCCURANCE FLAG
3083  033456  005077  146564                  CLR     @RLDA
3084  033462  012777  177600  146560          MOV     #-128.,@RLMP    ;SET UP WORD COUNT
3085  033470  012777  003052  146546          MOV     #BUF,@RLBA      ;SET UP BUS ADDRESS
3086
3087  033476                                  SETPRI  #PRI00          ;PRIORITY TO 0
 (3)  033476  012700  000000                  MOV     #PRI00,R0
 (3)  033502  104041                          EMT     C$SPRI
3088  033504  004537  020456                  JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
3089  033510  000102                          WRCHK.INTEN             ;WRITE CHECK UNDER INTERRUPT
```

```
3090  033512  004537  021276                JSR     R5,WTCRDY       ;WAIT FOR INTERRUPT
3091  033516                                ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  033516  104010                        EMT     C$ESCAPE
 (3)  033520  000036                        .WORD   10001$-.
3092
3093  033522                                SETPRI  #PRI07          ;SET PRIORITY TO 7
 (3)  033522  012700  000340                MOV     #PRI07,R0
 (3)  033526  104041                        EMT     C$SPRI
3094  033530  005737  002144                TST     INTFLG          ;DID INTERRUPT OCCUR?
3095  033534  001004                        BNE     2$              ;YES-BRANCH NO-REPORT
3096
3097  033536                                ERRDF   4.,EM60,ERR0    ;WRITE DID NOT INTERRUPT
 (3)  033536  104462                        TRAP    T$ERCODE
 (5)  033540  000004                        .WORD   4
 (5)  033542  013537                        .WORD   EM60
 (5)  033544  014244                        .WORD   ERR0
3098  033546                          2$:   ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  033546  104010                        EMT     C$ESCAPE
 (3)  033550  000006                        .WORD   10001$-.
3099
3100  033552  004537  020214                JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
3101
3102  033556                                ENDSEG                          ;%%END OF SEGMENT%%
 (3)  033556                          10001$:
 (3)  033556  104005                        EMT     C$ESEG
3103  033560                                ENDSEG                          ;%%END OF SEGMENT%%
 (3)  033560                          10000$:
 (3)  033560  104005                        EMT     C$ESEG
3104  033562                          ENDTST                                ;**END OF TEST**
 (3)  033562                          L10067:
 (3)  033562  104001                        EMT     C$ETST
3105
3106                                  .SBTTL  **TEST 35** - PROPER INCREMENT OF RLBA ON WRITE CHECK
3107
3108  033564                          BGNTST                                ;**START OF TEST**
3109
3110
3111  033564                          STARS
 (2)                                  ;;**********************************************************************
3112                                  ;CHECK THAT THE RLBA WILL INCREMENT PROPERLY AFTER THE
3113                                  ;WRITE CHECK WAS FINISHED THE RLBA SHOULD BE 128 WORDS (256 BYTES)
3114                                  ;CREATER.  STARTING RLBA IS 'BUF', ENDING SHOULD BE 'BUF + 256.'
3115                                  ;WE WILL MONITOR ALL ERRORS AND REPORT THEM ACCORDINGLY
3116  033564                          STARS
 (2)                                  ;;**********************************************************************
3117
3118
3119  033564  004737  021356                JSR     PC,HDHOME       ;HEADS OVER TRACK 0
3120  033570                                CKERFG                  ;HEADS GO HOME OKAY
 (4)  033576  104032                        EMT     C$EXIT
 (4)  033600  000256                        .WORD   L10070-.
3121
3122  033602                                BGNSEG                          ;%%START OF SEGMENT%%
 (3)  033602  104004                        EMT     C$BSEG
3123
3124  033604  012700  003052                MOV     #BUF,R0         ;SETUP AND WRITE
```

```
 3125  033610  012701  000200              MOV     #128.,R1          ;128 WORDS
 3126  033614  012720  125252      299$:   MOV     #125252,(R0)+     ;WRITE
 3127  033620  005301                      DEC     R1                ;DONE??
 3128  033622  001374                      BNE     299$
 3129
 3130  033624  012777  003052  146412      MOV     #BUF,@RLBA        ;LOAD BUS ADDRESS
 3131  033632  012777  177600  146410      MOV     #-128.,@RLMP      ;WORD COUNT
 3132  033640  005077  146402              CLR     @RLDA             ;CLEAR DISK ADDRESS
 3133  033644  004537  020456              JSR     R5,LDFUNC                 ;LOAD THE FUNCTION IN NEXT WORD
 3134  033650  000012                      WRITE
 3135  033652  004537  021276              JSR     R5,WTCRDY         ;WAIT FOR CONTROLLER READY
 3136  033656                              ESCAPE  SEG               ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  033656  104010                      EMT     C$ESCAPE
  (3)  033660  000174                      .WORD   10000$-.
 3137  033662  004537  020214              JSR     R5,CHERR                  ;CHECK CNTLR FOR ERRORS
 3138  033666                              ESCAPE  SEG               ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  033666  104010                      EMT     C$ESCAPE
  (3)  033670  000064                      .WORD   10000$-.
 3139                              ;VERIFY WRITE WITH READ BEFORE WRCHK
 3140
 3141  033672  005077  146350              CLR     @RLDA
 3142  033676  012777  003052  146340      MOV     #BUF,@RLBA
 3143  033704  012777  177600  146336      MOV     #-128.,@RLMP
 3144  033712  004537  020456              JSR     R5,LDFUNC                 ;LOAD THE FUNCTION IN NEXT WORD
 3145  033716  000014                      READ
 3146  033720  004537  021276              JSR     R5,WTCRDY
 3147  033724                              ESCAPE  SEG               ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  033724  104010                      EMT     C$ESCAPE
  (3)  033726  000126                      .WORD   10000$-.
 3148  033730  004537  020214              JSR     R5,CHERR                  ;CHECK CNTLR FOR ERRORS
 3149  033734                              ESCAPE  SEG               ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  033734  104010                      EMT     C$ESCAPE
  (3)  033736  000116                      .WORD   10000$-.
 3150
 3151  033740                              BGNSEG                            ;%%START OF SEGMENT%%
  (3)  033740  104004                      EMT     C$BSEG
 3152
 3153  033742                      3$:
 3154  033742  005077  146300              CLR     @RLDA
 3155  033746  012777  003052  146270      MOV     #BUF,@RLBA        ;SET UP BUS ADDRESS
 3156  033754  012777  177600  146266      MOV     #-128.,@RLMP      ;WORD COUNT
 3157  033762  012737  003052  002166      MOV     #BUF,GDDAT        ;FORM EXPECTED BUS ADDRESS
 3158  033770  062737  000400  002166      ADD     #256.,GDDAT       ;AFTER WRITE
 3159
 3160  033776  004537  020456              JSR     R5,LDFUNC                 ;LOAD THE FUNCTION IN NEXT WORD
 3161  034002  000002                      WRCHK                     ;WRITE CHECK
 3162  034004  004537  021276              JSR     R5,WTCRDY         ;WAIT FOR CONTROLLER READY
 3163  034010                              ESCAPE  SEG               ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  034010  104010                      EMT     C$ESCAPE
  (3)  034012  000040                      .WORD   10001$-.
 3164
 3165  034014  004537  020214              JSR     R5,CHERR                  ;CHECK CNTLR FOR ERRORS
 3166  034020                              ESCAPE  SEG               ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  034020  104010                      EMT     C$ESCAPE
  (3)  034022  000030                      .WORD   10001$-.
 3167  034024  017737  146214  002170      MOV     @RLBA,BDDAT       ;READ 'RLBA' FOR PRESENT ADDRESS
```

```
3168  034032  023737  002170  002166          CMP     BDDAT,GDDAT     ;DID 'BA' INCREMENT PROPERLY?
3169  034040  001404                          BEQ     2$              ;YES, CONTINUE
3170
3171  034042                                  ERRDF   5.,EM61,ERR4    ;BA DID NOT INCREMENT
 (3)  034042  104462                          TRAP    T$ERCODE
 (5)  034044  000005                          .WORD   5
 (5)  034046  013575                          .WORD   EM61
 (5)  034050  014410                          .WORD   ERR4
3172
3173  034052                          2$:
3174
3175  034052                                  ENDSEG                          ;%%END OF SEGMENT%%
 (3)  034052                          10001$:
 (3)  034052  104005                          EMT     C$ESEG
3176  034054                                  ENDSEG                          ;%%END OF SEGMENT%%
 (3)  034054                          10000$:
 (3)  034054  104005                          EMT     C$ESEG
3177  034056                          ENDTST                                  ;**END OF TEST**
 (3)  034056                          L10070:
 (3)  034056  104001                          EMT     C$ETST
3178
3179                                  .SBTTL  **TEST 36** - PROPER INCREMENT OF RLDA ON WRITE CHECK
3180
3181  034060                          BGNTST                                  ;**START OF TEST**
3182
3183  034060                          STARS
 (2)                                  ;;**********************************************************************
3184                                  ;CHECK THAT THE SECTOR INCREMENTS AFTER THE WRITE CHECK WAS FINISHED.
3185                                  ;A FULL SECTOR WRITE CHECK THE RLDA SHOULD REFLECT AN INCREMENT
3186                                  ;OF THE SECOTR.  ''GDDAT'' WAS THE EXPECTED RLDA.
3187  034060                          STARS
 (2)                                  ;;**********************************************************************
3188
3189
3190  034060  004737  021356                  JSR     PC,HDHOME       ;HEADS OVER TRACK 0
3191  034064                                  CKERFG                  ;HEADS GO HOME OKAY
 (4)  034072  104032                          EMT     C$EXIT
 (4)  034074  000254                          .WORD   L10071-.
3192
3193  034076                                  BGNSEG                          ;%%START OF SEGMENT%%
 (3)  034076  104004                          EMT     C$BSEG
3194
3195  034100  012700  003052                  MOV     #BUF,R0         ;SETUP AND WRITE
3196  034104  012701  000200                  MOV     #128.,R1        ;128 WORDS
3197  034110  012720  125252          299$:   MOV     #125252,(R0)+   ;WRITE
3198  034114  005301                          DEC     R1              ;DONE??
3199  034116  001374                          BNE     299$
3200
3201  034120  012777  003052  146116          MOV     #BUF,@RLBA      ;LOAD BUS ADDRESS
3202  034126  012777  177600  146114          MOV     #-128.,@RLMP    ;WORD COUNT
3203  034134  005077  146106                  CLR     @RLDA           ;CLEAR DISK ADDRESS
3204  034140  004537  020456                  JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
3205  034144  000012                          WRITE
3206  034146  004537  021276                  JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY
3207  034152                                  ESCAPE  SEC             ;CHECK FOR FLOE, ELSE EXIT SEG
 (3)  034152  104010                          EMT     C$ESCAPE
```

```
  (3)  034154  000172                        .WORD   10000$-.
3208   034156  004537  020214                JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
3209   034162                                ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  034162  104010                        EMT     C$ESCAPE
  (3)  034164  000162                        .WORD   10000$-.
3210                                  ;VERIFY WRITE WITH READ BEFORE WRCHK
3211
3212   034166  005077  146054                CLR     @RLDA
3213   034172  012777  003052  146044        MOV     #BUF,@RLBA
3214   034200  012777  177600  146042        MOV     #-128.,@RLMP
3215   034206  004537  020456                JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
3216   034212  000014                        READ
3217   034214  004537  021276                JSR     R5,WTCRDY
3218   034220                                ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  034220  104010                        EMT     C$ESCAPE
  (3)  034222  000124                        .WORD   10000$-.
3219   034224  004537  020214                JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
3220   034230                                ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  034230  104010                        EMT     C$ESCAPE
  (3)  034232  000114                        .WORD   10000$-.
3221
3222   034234                                BGNSEG                          ;%%START OF SEGMENT%%
  (3)  034234  104004                        EMT     C$BSEG
3223
3224   034236                          3$:
3225   034236  005037  002166                CLR     GDDAT
3226   034242  013777  002166  145776        MOV     GDDAT,@RLDA     ;SETUP DISK ADDRESS
3227   034250  005237  002166                INC     GDDAT           ;CREATE EXPECTED SECTOR
3228   034254  012777  177600  145766        MOV     #-128.,@RLMP    ;WORD COUNT
3229   034262  012777  003052  145754        MOV     #BUF,@RLBA      ;SETUP BUS ADDRESS
3230
3231   034270  004537  020456                JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
3232   034274  000002                        WRCHK                   ;WRITE CHECK
3233   034276  004537  021276                JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY
3234   034302                                ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  034302  104010                        EMT     C$ESCAPE
  (3)  034304  000040                        .WORD   10001$-.
3235
3236   034306  004537  020214                JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
3237   034312                                ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  034312  104010                        EMT     C$ESCAPE
  (3)  034314  000030                        .WORD   10001$-.
3238
3239   034316  013737  002232  002170        MOV     E.DA,BDDAT      ;READ DISK ADDRESS
3240   034324  023737  002166  002170        CMP     GDDAT,BDDAT     ;DID SECTOR INCREMENT PROPERLY
3241   034332  001404                        BEQ     2$              ;YES, BRANCH  NO, REPORT ERROR
3242
3243   034334                                ERRDF   6.,EM62,ERR4    ;DA DID NOT INCREMENT
  (3)  034334  104462                        TRAP    T$ERRCODE
  (5)  034336  000006                        .WORD   6
  (5)  034340  013652                        .WORD   EM62
  (5)  034342  014410                        .WORD   ERR4
3244
3245   034344                          2$:
3246
3247   034344                                ENDSEG                          ;%%END OF SEGMENT%%
```

```
  (3)  034344                          10001$:
  (3)  034344  104005                          EMT     C$ESEG
3248   034346                                 ENDSEG                          ;%%END OF SEGMENT%%
  (3)  034346                          10000$:
  (3)  034346  104005                          EMT     C$ESEG
3249   034350                         ENDTST                                  ;**END OF TEST**
  (3)  034350                          L10071:
  (3)  034350  104001                          EMT     C$ETST
3250
3251
3252                                   .SBTTL  **TEST 37** - MULTIPLE SECTOR WRITE CHECK
3253
3254   034352                          BGNTST                                  ;**START OF TEST**
3255
3256   034352                          STARS
  (2)                                  ;;*****************************************************************
3257                                   ;CHECK FOR MULTIPLE SECTOR WRITE CHECK. THIS TEST CHECKS
3258                                   ;THAT TWO SECTORS CAN BE SUCCESSFULLY CHECKED.  WE LOAD
3259                                   ;A WORD COUNT OF 129 WORDS (ONE SECTOR + 1 WORD) STARTING AT
3260                                   ;SECTOR 0 THRU SECTOR 37 AND VERIFY THAT THE RLDA DOES
3261                                   ;A DOUBLE INCREMENT EACH TIME.
3262   034352                          STARS
  (2)                                  ;;*****************************************************************
3263
3264
3265
3266   034352  004737  021356                  JSR     PC,HDHOME       ;HEADS OVER TRACK 0
3267   034356                                   CKERFG                  ;HEADS GO HOME OKAY
  (4)  034364  104032                          EMT     C$EXIT
  (4)  034366  000354                          .WORD   L10072-.
3268
3269   034370                                   BGNSEG                          ;%%START OF SEGMENT%%
  (3)  034370  104004                          EMT     C$BSEG
3270
3271   034372  012737  000000  002160          MOV     #0,TMP0
3272   034400  012737  000000  002162          MOV     #0,TMP1
3273   034406  012700  003052                  MOV     #BUF,R0         ;SETUP AND WRITE
3274   034412  012701  000201                  MOV     #129.,R1        ;129 WORDS
3275   034416  012720  125252          299$:   MOV     #125252,(R0)+   ;WRITE
3276   034422  005301                          DEC     R1              ;DONE??
3277   034424  001374                          BNE     299$
3278
3279   034426  012777  003052  145610  1$:     MOV     #BUF,@RLBA      ;LOAD BUS ADDRESS
3280   034434  012777  177577  145606          MOV     #-129.,@RLMP    ;WORD COUNT
3281   034442  013737  002162  002166          MOV     TMP1,GDDAT
3282   034450  053737  002160  002166          BIS     TMP0,GDDAT
3283   034456  013777  002166  145562          MOV     GDDAT,@RLDA
3284   034464  004537  020456                  JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
3285   034470  000012                          WRITE
3286   034472  004537  021276                  JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY
3287   034476                                   ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  034476  104010                          EMT     C$ESCAPE
  (3)  034500  000240                          .WORD   10000$-.
3288   034502  004537  020214                  JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
3289   034506                                   ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  034506  104010                          EMT     C$ESCAPE
```

```
  (3)  034510  000230                          .WORD   10000$-.
3290
3291                                  ;VERIFY WRITE WITH READ BEFORE WRCHK
3292
3293  034512  013737  002162  002166          MOV     TMP1,GDDAT
3294  034520  053737  002160  002166          BIS     TMP0,GDDAT
3295  034526  013777  002166  145512          MOV     GDDAT,@RLDA
3296  034534  012777  003052  145502          MOV     #BUF,@RLBA
3297  034542  012777  177577  145500          MOV     #-129.,@RLMP
3298  034550  004537  020456                  JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
3299  034554  000014                          READ
3300  034556  004537  021276                  JSR     R5,WTCRDY
3301  034562                                  ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  034562  104010                          EMT     C$ESCAPE
  (3)  034564  000154                          .WORD   10000$-.
3302  034566  004537  020214                  JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
3303  034572                                  ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  034572  104010                          EMT     C$ESCAPE
  (3)  034574  000144                          .WORD   10000$-.
3304
3305  034576                                  BGNSEG                          ;%%START OF SEGMENT%%
  (3)  034576  104004                          EMT     C$BSEG
3306
3307
3308  034600  013737  002162  002166          MOV     TMP1,GDDAT      ;GET CYLINDER
3309  034606  053737  002160  002166          BIS     TMP0,GDDAT      ;GET SECTOR
3310  034614  013777  002166  145424          MOV     GDDAT,@RLDA     ;SET DISK ADDRESS-SECTOR 0
3311  034622  062737  000002  002166          ADD     #2,GDDAT        ;SET EXPECTED + 2
3312  034630  012777  003052  145406          MOV     #BUF,@RLBA      ;SET BUS ADDRESS
3313  034636  012777  177577  145404          MOV     #-129.,@RLMP    ;WORD COUNT-SECTOR+1 WORD
3314
3315  034644  004537  020456                  JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
3316  034650  000002                          WRCHK                   ;WRITE CHECK
3317  034652  004537  021276                  JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY?
3318  034656                                  ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  034656  104010                          EMT     C$ESCAPE
  (3)  034660  000042                          .WORD   10001$-.
3319
3320  034662  004537  020214                  JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
3321  034666                                  ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  034666  104010                          EMT     C$ESCAPE
  (3)  034670  000032                          .WORD   10001$-.
3322
3323  034672  013737  002232  002170          MOV     E.DA,BDDAT      ;READ DISK ADDRESS
3324  034700  023737  002170  002166          CMP     BDDAT,GDDAT     ;IS DISK ADDRESS CORRECT
3325  034706  001404                          BEQ     2$              ;YES, BRANCH  NO, REPORT ERROR
3326
3327  034710                                  ERRDF   7.,EM63,ERR4    ;DISK ADDRESS NOT CORRECT
  (3)  034710  104462                          TRAP    T$ERCODE
  (5)  034712  000007                          .WORD   7
  (5)  034714  013727                          .WORD   EM63
  (5)  034716  014410                          .WORD   ERR4
3328
3329  034720                          2$:     CKLOOP
  (3)  034720  104006                          EMT     C$CLP1
3330
```

```
3331  034722                                  ENDSEG                          ;%%END OF SEGMENT%%
 (3)  034722                            10001$:
 (3)  034722  104005                       EMT     C$ESEG
3332
3333  034724  005237  002160                INC     TMP0            ;NEXT SECTOR
3334  034730  022737  000046  002160        CMP     #46,TMP0        ;AT END?
3335  034736  001233                       BNE     1$              ;NO, GO BACK
3336  034740                                 ENDSEG                          ;%%END OF SEGMENT%%
 (3)  034740                            10000$:
 (3)  034740  104005                       EMT     C$ESEG
3337  034742                            ENDTST                          ;**END OF TEST**
 (3)  034742                            L10072:
 (3)  034742  104001                       EMT     C$ETST
3338                                    .SBTTL  **TEST 38** - FORCE DCK WITH WRITE CHECK
3339
3340  034744                            BGNTST                          ;**START OF TEST**
3341
3342  034744                            STARS
 (2)                                    ;;*****************************************************************
3343                                    ;FORCE A DCK WITH WRITE CHECK. THIS IS DONE BY WRITING
3344                                    ;A SECTOR AND CHANGING A WORD IN MEMORY BEFORE WRITE CHECK
3345                                    ;IS ISSUED..
3346  034744                            STARS
 (2)                                    ;;*****************************************************************
3347
3348  034744  004737  021356                   JSR     PC,HDHOME       ;HEADS OVER TRACK 0
3349  034750                                   CKERFG                  ;HEADS GO HOME OKAY
 (4)  034756  104032                       EMT     C$EXIT
 (4)  034760  000262                       .WORD   L10073-.
3350
3351  034762                                 BGNSEG                          ;%%START OF SEGMENT%%
 (3)  034762  104004                       EMT     C$BSEG
3352
3353  034764  012700  003052                   MOV     #BUF,R0         ;SETUP AND WRITE
3354  034770  012701  000200                   MOV     #128.,R1        ;128 WORDS
3355  034774  012720  125252            299$:  MOV     #125252,(R0)+   ;WRITE
3356  035000  005301                           DEC     R1              ;DONE??
3357  035002  001374                           BNE     299$
3358
3359  035004  012777  003052  145232           MOV     #BUF,@RLBA      ;LOAD BUS ADDRESS
3360  035012  012777  177600  145230           MOV     #-128.,@RLMP    ;WORD COUNT
3361  035020  005077  145222                   CLR     @RLDA           ;CLEAR DISK ADDRESS
3362  035024  004537  020456                   JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
3363  035030  000012                           WRITE
3364  035032  004537  021276                   JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY
3365  035036                                   ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  035036  104010                       EMT     C$ESCAPE
 (3)  035040  000200                       .WORD   10000$-.
3366  035042  004537  020214                   JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
3367  035046                                   ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  035046  104010                       EMT     C$ESCAPE
 (3)  035050  000170                       .WORD   10000$-.
3368                                    ;VERIFY WRITE WITH READ BEFORE WRCHK
3369
3370  035052  005077  145170                   CLR     @RLDA
3371  035056  012777  003052  145160           MOV     #BUF,@RLBA
```

```
 3372  035064  012777  177600  145156          MOV     #-128.,@RLMP
 3373  035072  004537  020456                  JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
 3374  035076  000014                          READ
 3375  035100  004537  021276                  JSR     R5,WTCRDY
 3376  035104                                  ESCAPE  SEG                     ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  035104  104010                          EMT     C$ESCAPE
  (3)  035106  000132                          .WORD   10000$-.
 3377  035110  004537  020214                  JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
 3378  035114                                  ESCAPE  SEG                     ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  035114  104010                          EMT     C$ESCAPE
  (3)  035116  000122                          .WORD   10000$-.
 3379
 3380  035120                                  BGNSEG                          ;%%START OF SEGMENT%%
  (3)  035120  104004                          EMT     C$BSEG
 3381
 3382
 3383  035122  005037  003052                  CLR     BUF
 3384  035126  005077  145114                  CLR     @RLDA
 3385  035132  012777  003052  145104          MOV     #BUF,@RLBA              ;SETTING SECTOR 40 OF CYL. ADDR.
 3386  035140  012777  177600  145102          MOV     #-128.,@RLMP            ;WORD COUNT
 3387
 3388  035146  004537  020456                  JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
 3389  035152  000002                          WRCHK                           ;WRITE CHECK
 3390  035154  004537  021276                  JSR     R5,WTCRDY               ;WAIT FOR CONTROLLER READY
 3391  035160                                  ESCAPE  SEG                     ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  035160  104010                          EMT     C$ESCAPE
  (3)  035162  000054                          .WORD   10001$-.
 3392
 3393  035164  013737  002226  002160          MOV     E.CS,TMP0               ;GET RLCS
 3394  035172  042737  001777  002160          BIC     #1777,TMP0              ;SAVE ERROR BITS
 3395  035200  022737  104000  002160          CMP     #BIT15!BIT11,TMP0       ;DCK SET.
 3396  035206  001402                          BEQ     1$                      ;YES, CONTINUE
 3397  035210  004537  020214                  JSR     R5,CHERR
 3398  035214                          1$:     CKLOOP
  (3)  035214  104006                          EMT     C$CLP1
 3399
 3400  035216  022737  104000  002160          CMP     #BIT15.BIT11,TMP0
 3401  035224  001404                          BEQ     2$
 3402
 3403  035226                                  ERRDF   23.,EM65,ERR0
  (3)  035226  104462                          TRAP    T$ERCODE
  (5)  035230  000027                          .WORD   23
  (5)  035232  014105                          .WORD   EM65
  (5)  035234  014244                          .WORD   ERR0
 3404                                                                    ;WHEN FORCED
 3405  035236                          2$:
 3406
 3407  035236                                  ENDSEG                          ;%%END OF SEGMENT%%
  (3)  035236                          10001$:
  (3)  035236  104005                          EMT     C$ESEG
 3408  035240                                  ENDSEG                          ;%%END OF SEGMENT%%
  (3)  035240                          10000$:.
  (3)  035240  104005                          EMT     C$ESEG
 3409  035242                          ENDTST                                  ;**END OF TEST**
  (3)  035242                          L10073:
  (3)  035242  104001                          EMT     C$ETST
```

```
3410
3411                                    .SBTTL  **TEST 39** - FORCE DCK WITH WRITE CHECK INTERRUPT
3412
3413  035244                            BGNTST                                  ;**START OF TEST**
3414
3415
3416  035244                            STARS
 (2)                                    ;;**********************************************************************
3417                                    ;FORCE A DCK    INTERRUPT MODE
3418  035244                            STARS
 (2)                                    ;;*********       ************************************************
3419
3420
3421  035244  004737  021356                    ,HDHOME         ;HEADS OVER TRACK 0
3422  035250                            L                       ;HEADS GO HOME OKAY
 (4)  035256  104032                    EMT     C$EXIT
 (4)  035260  000322                    .WORD   L10074-.
3423
3424  035262                            BGNSEG                                  ;%%START OF SEGMENT%%
 (3)  035262  104004                    EMT     C$BSEG
3425
3426  035264  012700  003052            MOV     #BUF,R0         ;SETUP AND WRITE
3427  035270  012701  000200            MOV     #128.,R1        ;128 WORDS
3428  035274  012720  125252    299$:   MOV     #125252,(R0)+   ;WRITE
3429  035300  005301                    DEC     R1              ;DONE??
3430  035302  001374                    BNE     299$
3431
3432  035304  012777  003052  144732    MOV     #BUF,@RLBA      ;LOAD BUS ADDRESS
3433  035312  012777  177600  144730    MOV     #-128.,@RLMP    ;WORD COUNT
3434  035320  005077  144722            CLR     @RLDA           ;CLEAR DISK ADDRESS
3435  035324  004537  020456            JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
3436  035330  000012                    WRITE
3437  035332  004537  021276            JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY
3438  035336                            ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  035336  104010                    EMT     C$ESCAPE
 (3)  035340  000240                    .WORD   10000$-.
3439  035342  004537  020214            JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
3440  035346                            ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  035346  104010                    EMT     C$ESCAPE
 (3)  035350  000230                    .WORD   10000$-.
3441                                ;VERIFY WRITE WITH READ BEFORE WPCHK
3442
3443  035352  005077  144670            CLR     @RLDA
3444  035356  012777  003052  144660    MOV     #BUF,@RLBA
3445  035364  012777  177600  144656    MOV     #-128.,@RLMP
3446  035372  004537  020456            JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
3447  035376  000014                    READ
3448  035400  004537  021276            JSR     R5,WTCRDY
3449  035404                            ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  035404  104010                    EMT     C$ESCAPE
 (3)  035406  000172                    .WORD   10000$-.
3450  035410  004537  020214            JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
3451  035414                            ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  035414  104010                    EMT     C$ESCAPE
 (3)  035416  000162                    .WORD   10000$-.
3452
```

```
3453  035420                                    BGNSEG                          ;%%START OF SEGMENT%%
 (3)  035420  104004                            EMT     C$BSEG
3454
3455  035422                                    SETPRI  #PRI00
 (3)  035422  012700  000000                    MOV     #PRI00,R0
 (3)  035426  104041                            EMT     C$SPRI
3456  035430  005037  002144                    CLR     INTFLG          ;CLEAR INTERRUPT OCCURANCE FLAG
3457  035434  005037  003052                    CLR     BUF
3458  035440  005077  144602                    CLR     @RLDA
3459  035444  012777  003052  144572            MOV     #BUF,@RLBA      ;SETTING SECTOR 40 OF CYL. ADDR.
3460  035452  012777  177600  144570            MOV     #-128.,@RLMP    ;WORD COUNT
3461
3462  035460  004537  020456                    JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
3463  035464  000102                            WRCHK.INTEN             ;WRITE CHECK
3464  035466  004537  021276                    JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY
3465  035472                                    CKLOOP
 (3)  035472  104006                            EMT     C$CLP1
3466  035474                                    SETPRI  #PRI07
 (3)  035474  012700  000340                    MOV     #PRI07,R0
 (3)  035500  104041                            EMT     C$SPRI
3467
3468  035502  005737  002144                    TST     INTFLG          ;DID INTERRUPT OCCUR
3469  035506  001004                            BNE     2$              ;YES OKAY
3470
3471  035510                                    ERRDF   24.,EM66,ERR0   ;NO INTERRUPT FROM DCK
 (3)  035510  104462                            TRAP    T$ERCODE
 (5)  035512  000030                            .WORD   24
 (5)  035514  014146                            .WORD   EM66
 (5)  035516  014244                            .WORD   ERR0
3472
3473  035520                            2$:     ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  035520  104010                            EMT     C$ESCAPE
 (3)  035522  000054                            .WORD   10001$-.
3474
3475
3476  035524  013737  002226  002160            MOV     E.CS,TMP0       ;GET RLCS
3477  035532  042737  001777  002160            BIC     #1777,TMP0      ;SAVE ERROR BITS
3478  035540  022737  104000  002160            CMP     #BIT15!BIT11,TMP0  ;DCK  SET.
3479  035546  001402                            BEQ     1$              ;YES, CONTINUE
3480
3481  035550  004537  020214                    JSR     R5,CHERR
3482  035554                            1$:     CKLOOP
 (3)  035554  104006                            EMT     C$CLP1
3483
3484  035556  022737  104000  002160            CMP     #BIT15.BIT11,TMP0
3485  035564  001404                            BEQ     3$
3486  035566                                    ERRDF   25.,EM65,ERR0
 (3)  035566  104462                            TRAP    T$ERCODE
 (5)  035570  000031                            .WORD   25
 (5)  035572  014105                            .WORD   EM65
 (5)  035574  014244                            .WORD   ERR0
3487                                                                      ;WHEN FORCED
3488  035576                            3$:
3489
3490  035576                                    ENDSEG                          ;%%END OF SEGMENT%%
 (3)  035576                            10001$:
```

```
  (3)  035576  104005                        EMT     C$ESEG
3491   035600                                ENDSEG                          ;%%END OF SLGMENT%%
  (3)  035600                          10000$:
  (3)  035600  104005                        EMT     C$ESEG
3492   035602                          ENDTST                              ;**END OF TEST**
  (3)  035602                          L10074:
  (3)  035602  104001                        EMT     C$ETST
3493
3494
3495                                   .SBTTL  **TEST 40** - CHECK ZERO FILL ON WRITE WITH WRITE CHECK
3496
3497   035604                          BGNTST                              ;**START OF TEST**
3498
3499
3500
3501   035604                          STARS
  (2)                                  ;;*****************************************************************
3502                                   ;WHEN WRITING PARTIAL SECTORS (LESS THAN 128 WORDS) THE
3503                                   ;CONTROLLER WILL FILL IN THE REMAINING PORTION OF
3504                                   ;THE SECTOR WITH ZERO WORDS.  CHECK THIS FEATURE CAN BE WRITE CHECKED
3505                                   ;WITH WORD COUNTS FROM 1 TO 127
3506   035604                          STARS
  (2)                                  ;;*****************************************************************
3507
3508   035604  004737  021356                  JSR     PC,HDHOME       ;HEADS OVER TRACK 0
3509   035610                                  CKERFG                  ;HEADS GO HOME OKAY
  (4)  035616  104032                        EMT     C$EXIT
  (4)  035620  000274                        .WORD   L10075-.
3510
3511   035622                                  BGNSEG                          ;%%START OF SEGMENT%%
  (3)  035622  104004                        EMT     C$BSEG
3512
3513   035624  012737  000001  002162        MOV     #1,TMP1         ;START WITH 1 WORD WRITE
3514   035632  012700  003052          33$:  MOV     #BUF,R0         ;WRITE BUFFER WITH 52525, WE'LL
3515   035636  012701  000200                MOV     #128.,R1        ;WRITE 128 WORDS ALL THOUGH WE'RE
3516   035642  012720  052525           3$:  MOV     #52525,(R0)+    ;ONLY GOING TO TRANSFER < 128
3517   035646  005301                        DEC     R1              ;DONE WITH BUFFER?
3518   035650  001374                        BNE     3$              ;NO, GO BACK
3519   035652  013700  002162                MOV     TMP1,R0         ;GET TRANSFER WORD COUNT
3520   035656  005400                        NEG     R0              ;NEGATE FOR RLMP
3521   035660  010077  144364                MOV     R0,@RLMP        ;STORE WORD COUNT AWAY
3522   035664  012777  003052  144352        MOV     #BUF,@RLBA      ;SET UP RLBA
3523   035672  005077  144350                CLR     @RLDA
3524   035676  004537  020456                JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
3525   035702  000012                        WRITE                   ;WRITE IT
3526   035704  004537  021276                JSR     R5,WTCRDY       ;WAIT FOR WRITE TO FINISH
3527   035710                                  ESCAPE  SEG             ;CHECK FOR FLOE, ELSE EXIT SEG
  (3)  035710  104010                        EMT     C$ESCAPE
  (3)  035712  000200                        .WORD   10000$-.
3528
3529   035714  004537  020214                JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
3530   035720                                  ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
  (3)  035720  104010                        EMT     C$ESCAPE
  (3)  035722  000170                        .WORD   10000$-.
3531                                   ;;;;;;; WRITE WITH READ BACK AND WRITE CHECK
3532
```

```
3533  035724  005077  144316                  CLR     @RLDA
3534  035730  012777  003052  144306          MOV     #BUF,@RLBA
3535  035736  013700  002162                  MOV     TMP1,R0
3536  035742  005400                          NEG     R0
3537  035744  010077  144300                  MOV     R0,@RLMP
3538  035750  004537  020456                  JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
3539  035754  000014                          READ
3540  035756  004537  021276                  JSR     R5,WTCRDY
3541  035762                                  ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  035762  104010                          EMT     C$ESCAPE
 (3)  035764  000126                          .WORD   10000$-.
3542  035766  004537  020214                  JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
3543  035772                                  ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  035772  104010                          EMT     C$ESCAPE
 (3)  035774  000116                          .WORD   10000$-.
3544
3545  035776                                  BGNSEG                  ;%%START OF SEGMENT%%
 (3)  035776  104004                          EMT     C$BSEG
3546  036000  012777  003052  144236          MOV     #BUF,@RLBA      ;SET UP TO READ
3547  036006  013700  002162                  MOV     TMP1,R0
3548  036012  005400                          NEG     R0
3549  036014  010077  144230                  MOV     R0,@RLMP
3550  036020  005077  144222                  CLR     @RLDA           ;SECTOR
3551  036024  004537  020456                  JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
3552  036030  000002                          WRCHK
3553  036032  004537  021276                  JSR     R5,WTCRDY       ;WAIT TIL WE FINISH THE WRCHK
3554  036036                                  ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  036036  104010                          EMT     C$ESCAPE
 (3)  036040  000034                          .WORD   10001$-.
3555
3556  036042  004537  020214                  JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
3557  036046  005737  002124                  TST     T.CRC           ;WAS ERROR A DCK??
3558  036052  001003                          BNE     8$              ;YES, GIVE MOR INFO
3559  036054                          10$:    ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  036054  104010                          EMT     C$ESCAPE
 (3)  036056  000016                          .WORD   10001$-.
3560  036060  000405                          BR      99$             ;SKIP AROUND
3561  036062                          8$:     CKLOOP                  ;YES, CHECK FOR LOOP FIRST
 (3)  036062  104006                          EMT     C$CLP1
3562  036064                                  ERRDF   37.,EM64,ERR14
 (3)  036064  104462                          TRAP    T$ERCODE
 (5)  036066  000045                          .WORD   37
 (5)  036070  014031                          .WORD   EM64
 (5)  036072  015150                          .WORD   ERR14
3563  036074                          99$:                            ;EXIT TEST
3564  036074                                  ENDSEG                  ;%%END OF SEGMENT%%
 (3)  036074                          10001$:
 (3)  036074  104005                          EMT     C$ESEG
3565
3566  036076  005237  002162                  INC     TMP1
3567  036102  023727  002162  000200          CMP     TMP1,#128.
3568  036110  001250                          BNE     33$
3569
3570  036112                                  ENDSEG                  ;%%END OF SEGMENT%%
 (3)  036112                          10000$:
 (3)  036112  104005                          EMT     C$ESEG
```

```
                                ENDTST                                  ;**END OF TEST**
                                L10075:
                                        EMT     C$ETST
                                .SBTTL  **TEST 41** - EXTENDED CHECK OF WRITE CHECK FUNCTION

                                BGNTST                                  ;**START OF TEST**

                                STARS
                                ;;*****************************************************************
                                ;CHECK OF WRITE CHECK LOGIC UNDER FLAG MODE
                                ;THIS TEST IS DONE WITH ALL BIT PATTERNS
                                ; WE WILL WRITE CHECK A FULL SECTOR (128 WORDS) FROM
                                ;MEMORY (BUF).  WE CHECK THAT NO ERRORS OCCUR.
                                STARS
                                ;;*****************************************************************

036116  004737  021356                  JSR     PC,HDHOME       ;HEADS OVER TRACK 0
036122                                  CKERFG                  ;HEADS GO HOME OKAY
036130  104032                          EMT     C$EXIT
036132  000246                          .WORD   L10076-.

036134  012703  002504                  MOV     #HDRTAB,R3

036140                                  BGNSEG                          ;%%START OF SEGMENT%%
036140  104004                          EMT     C$BSEG

036142  012700  003052          298$:   MOV     #BUF,R0         ;SETUP AND WRITE
036146  012701  000200                  MOV     #128.,R1        ;128 WORDS
036152  011302                          MOV     (R3),R2
036154  010220          299$:   MOV     R2,(R0)+        ;WRITE
036156  005301                          DEC     R1              ;DONE??
036160  001375                          BNE     299$

036162  012777  003052  144054          MOV     #BUF,@RLBA      ;LOAD BUS ADDRESS
036170  012777  177600  144052          MOV     #-128.,@RLMP    ;WORD COUNT
036176  005077  144044                  CLR     @RLDA           ;CLEAR DISK ADDRESS
036202  004537  020456                  JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
036206  000012                          WRITE
036210  004537  021276                  JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY
036214                                  ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
036214  104010                          EMT     C$ESCAPE
036216  000160                          .WORD   10000$-.
036220  004537  020214                  JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
036224                                  ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
036224  104010                          EMT     C$ESCAPE
036226  000150                          .WORD   10000$-.
036230                                  BGNSEG                          ;%%START OF SEGMENT%%
036230  104004                          EMT     C$BSEG

                        ;VERIFY WRITE WITH READ BEFORE WRCHK

036232  005077  144010                  CLR     @RLDA
036236  012777  003052  144000          MOV     #BUF,@RLBA
036244  012777  177600  143776          MOV     #-128.,@RLMP
036252  004537  020456                  JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
```

```
                                        READ
                                        JSR     R5,WTCRDY
                                        ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
                                        EMT     C$ESCAPE
                                        .WORD   10001$-.
                                        JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
                                        ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
                                        EMT     C$ESCAPE
                                        .WORD   10001$-.

                                        BGNSEG                          ;%%START OF SEGMENT%%
                                        EMT     C$BSEG

                                3$:
                                        CLR     @RLDA
                                        MOV     #-128.,@RLMP    ;WORD COUNT
                                        MOV     #BUF,@RLBA      ;BUS ADDRESS
                                        JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
                                        WRCHK                   ;WRITE CHECK

                                        JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY
                                        ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
                                        EMT     C$ESCAPE
                                        .WORD   10002$-.


                                        JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
                                        TST     T.CRC           ;WRITE CHECK ERROR??
                                        BEQ     4$              ;NO

                                        ERRHRD  410.,ERR15,EM70
                                        TRAP    T$ERCODE
                                        .WORD   410
                                        .WORD   ERR15
                                        .WORD   EM70

                                4$:

                                        ENDSEG                          ;%%END OF SEGMENT%%
                                10002$:
                                        EMT     C$ESEG
                                        ENDSEG                          ;%%END OF SEGMENT%%
                                10001$:
                                        EMT     C$ESEG

                                        TST     (R3)+
                                        CMP     R3,#HDREND
                                        BNE     298$

                                        ENDSEG                          ;%%END OF SEGMENT%%
                                10000$:
                                        EMT     C$ESEG
                                ENDTST                          ;**END OF TEST**
                                L10076:
                                        EMT     C$ETST
```

```
3652
3653                                    .SBTTL  **TEST 42** - EXTENDED CHECK OF WRITE CHECK FUNCTION
3654
3655  036402                            BGNTST                                  ;**START OF TEST**
3656
3657  036402                            STARS
 (2)                                    ;;**********************************************************************
3658                                    ;CHECK OF WRITE CHECK LOGIC UNDER FLAG MODE
3659                                    ;TEST IS DONE WITH ALL BIT PATTERNS
3660                                    ; WE WILL WRITE CHECK A FULL SECTOR (128 WORDS) FROM
3661                                    ;MEMORY (BUF).  WE CHECK THAT NO ERRORS OCCUR.
3662  036402                            STARS
 (2)                                    ;;**********************************************************************
3663
3664
3665  036402  004737  021356                   JSR     PC,HDHOME       ;HEADS OVER TRACK 0
3666  036406                                    CKERFG                  ;HEADS GO HOME OKAY
 (4)  036414  104032                          EMT     C$EXIT
 (4)  036416  000252                          .WORD   L10077-.
3667
3668  036420  012703  002504                   MOV     #HDRTAB,R3
3669
3670  036424                                    BGNSEG                          ;%%START OF SEGMENT%%
 (3)  036424  104004                          EMT     C$BSEG
3671
3672  036426  012700  003052          298$:   MOV     #BUF,R0         ;SETUP AND WRITE
3673  036432  012701  000200                   MOV     #128.,R1        ;128 WORDS
3674  036436  011302                          MOV     (R3),R2         ;GET PATTERN
3675  036440  052702  100000                   BIS     #BIT15,R2
3676  036444  010220                  299$:   MOV     R2,(R0)+
3677  036446  005301                          DEC     R1              ;DONE??
3678  036450  001375                          BNE     299$
3679
3680  036452  012777  003052  143564          MOV     #BUF,@RLBA      ;LOAD BUS ADDRESS
3681  036460  012777  177600  143562          MOV     #-128.,@RLMP    ;WORD COUNT
3682  036466  005077  143554                   CLR     @RLDA           ;CLEAR DISK ADDRESS
3683  036472  004537  020456                   JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
3684  036476  000012                          WRITE
3685  036500  004537  021276                   JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY
3686  036504                                    ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  036504  104010                          EMT     C$ESCAPE
 (3)  036506  000160                          .WORD   10000$-.
3687  036510  004537  020214                   JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
3688  036514                                    ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  036514  104010                          EMT     C$ESCAPE
 (3)  036516  000150                          .WORD   10000$-.
3689  036520                                    BGNSEG                          ;%%START OF SEGMENT%%
 (3)  036520  104004                          EMT     C$BSEG
3690
3691                                ;VERIFY WRITE WITH READ BEFORE WRCHK
3692
3693  036522  005077  143520                   CLR     @RLDA
3694  036526  012777  003052  143510          MOV     #BUF,@RLBA
3695  036534  012777  177600  143506          MOV     #-128.,@RLMP
3696  036542  004537  020456                   JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
3697  036546  000014                          READ
```

```
3698  036550  004537  021276            JSR     R5,WTCRDY
3699  036554                            ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  036554  104010                    EMT     C$ESCAPE
 (3)  036556  000076                    .WORD   10001$-.
3700  036560  004537  020214            JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
3701  036564                            ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  036564  104010                    EMT     C$ESCAPE
 (3)  036566  000066                    .WORD   10001$-.
3702
3703  036570                            BGNSEG                          ;%%START OF SEGMENT%%
 (3)  036570  104004                    EMT     C$BSEG
3704
3705  036572                      3$:
3706  036572  005077  143450            CLR     @RLDA
3707  036576  012777  177600  143444    MOV     #-128.,@RLMP    ;WORD COUNT
3708  036604  012777  003052  143432    MOV     #BUF,@RLBA      ;BUS ADDRESS
3709  036612  004537  020456            JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
3710  036616  000002                    WRCHK                   ;WRITE CHECK
3711
3712  036620  004537  021276            JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY
3713  036624                            ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  036624  104010                    EMT     C$ESCAPE
 (3)  036626  000024                    .WORD   10002$-.
3714
3715
3716  036630  004537  020214            JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
3717  036634  005737  002124            TST     T.CRC
3718  036640  001404                    BEQ     4$
3719
3720  036642                            ERRHRD  410.,ERR15,EM70
 (3)  036642  104463                    TRAP    T$ERCODE
 (5)  036644  000632                    .WORD   410
 (5)  036646  015216                    .WORD   ERR15
 (5)  036650  014220                    .WORD   EM70
3721
3722  036652                      4$:
3723
3724
3725  036652                            ENDSEG                          ;%%END OF SEGMENT%%
 (3)  036652                      10002$:
 (3)  036652  104005                    EMT     C$ESEG
3726  036654                            ENDSEG                          ;%%END OF SEGMENT%%
 (3)  036654                      10001$:
 (3)  036654  104005                    EMT     C$ESEG
3727
3728  036656  005723                    TST     (R3)+
3729  036660  020327  002660            CMP     R3,#HDREND
3730  036664  001260                    BNE     29B$
3731
3732  036666                            ENDSEG                          ;%%END OF SEGMENT%%
 (3)  036666                      10000$:
 (3)  036666  104005                    EMT     C$ESEG
3733  036670                      ENDTST                                ;**END OF TEST**
 (3)  036670                      L10077:
 (3)  036670  104001                    EMT     C$ETST
3734                              .SBTTL  **TEST 43** - READ WITHOUT HEADER COMPARE FUNCTION
```

```
3735
3736  036672                          STARS
 (2)                                  ;;*****************************************************************
3737                                  ;TEST THAT READ WITHOUT HEADER VERIFICATION WORKS.  THIS FUNCTION SHOULD
3738                                  ;READ AT THE NEXT SECTOR ENCOUNTERED.  SET THE RLDA TO 0
3739                                  ;AND ISSUE THE FUNCTION IN FLAG MODE.  UPON COMPLETION CHECK
3740                                  ;FOR ERRORS
3741  036672                          STARS
 (2)                                  ;;*****************************************************************
3742  036672                          BGNTST                                  ;**START OF TEST**
3743
3744
3745  036672  004737  021356                  JSR     PC,HDHOME       ;HEADS OVER TRACK 0
3746  036676                          CKERFG                          ;HEADS GO HOME OKAY
 (4)  036704  104032                  EMT     C$EXIT
 (4)  036706  000052                  .WORD   L10100-.
3747
3748  036710                          BGNSEG                                  ;%%START OF SEGMENT%%
 (3)  036710  104004                  EMT     C$BSEG
3749
3750
3751  036712  012777  177600  143330        MOV     #-128.,@RLMP    ;SET UP WORD COUNT
3752  036720  012777  003052  143316        MOV     #BUF,@RLBA      ;SETUP BUS ADDRESS
3753  036726  012777  177777  143312        MOV     #-1,@RLDA       ;HEADER SHOULDN'T MATTER
3754  036734  004537  020456                JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
3755  036740  000016                  RDNHD                           ;READ DATA WITHOUT HEADER VERIFY
3756  036742  004537  021276                JSR     R5,WTCRDY       ;WAIT FOR IT TO FINISH
3757  036746                          ESCAPE  SEG                     ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  036746  104010                  EMT     C$ESCAPE
 (3)  036750  000006                  .WORD   10000$-.
3758
3759  036752  004537  020214                JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
3760
3761  036756                          ENDSEG                                  ;%%END OF SEGMENT%%
 (3)  036756                  10000$:
 (3)  036756  104005                  EMT     C$ESEG
3762  036760                          ENDTST                                  ;**END OF TEST**
 (3)  036760                  L10100:
 (3)  036760  104001                  EMT     C$ETST
3763
3764                                  .SBTTL  **TEST 44** - READ WITHOUT HEADER COMPARE FUNCTION INTERRUPT
3765
3766  036762                          BGNTST                                  ;**START OF TEST**
3767
3768  036762                          STARS
 (2)                                  ;;*****************************************************************
3769                                  ;TEST THAT READ WITHOUT HEADER VERIFICATION WORKS IN
3770                                  ;INTERRUPT MODE.
3771  036762                          STARS
 (2)                                  ;;*****************************************************************
3772
3773  036762  004737  021356                  JSR     PC,HDHOME       ;HEADS OVER TRACK 0
3774  036766                          CKERFG                          ;HEADS GO HOME OKAY
 (4)  036774  104032                  EMT     C$EXIT
 (4)  036776  000114                  .WORD   L10101-.
3775
```

```
3776  037000                                BGNSEG                          ;%%START OF SEGMENT%%
 (3)  037000  104004                        EMT     C$BSEG
3777
3778  037002  005037  002144                CLR     INTFLG  ;CLEAR INTERRUPT OCCURANCE FLAG
3779  037006  012777  177600  143234        MOV     #-128.,@RLMP    ;SET UP WORD COUNT FOR ONE SECTOR
3780  037014  012777  003052  143222        MOV     #BUF,@RLBA      ;SETUP BUFFER ADDRESS
3781  037022  012777  177777  143216        MOV     #-1,@RLDA       ;DISK ADDRESS IS A DON'T CARE
3782  037030                                SETPRI  #PRI00
 (3)  037030  012700  000000                MOV     #PRI00,R0
 (3)  037034  104041                        EMT     C$SPRI
3783  037036  004537  020456                JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
3784  037042  000116                        RDNHD!INTEN             ;INTERRUPT ENABLED
3785  037044  004537  021276                JSR     R5,WTCRDY       ;WAIT FOR INTERRUPT
3786  037050                                SETPRI  #PRI07
 (3)  037050  012700  000340                MOV     #PRI07,R0
 (3)  037054  104041                        EMT     C$SPRI
3787  037056                                ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  037056  104010                        EMT     C$ESCAPE
 (3)  037060  000030                        .WORD   10000$-.
3788
3789  037062  005737  002144                TST     INTFLG          ;DID IT INTERRUPT
3790  037066  001004                        BNE     1$              ;IF INTERRUPT GO TO 1$
3791
3792  037070                                ERRDF   40.,EM40,ERR0   ;NO INTERRUPT
 (3)  037070  104462                        TRAP    T$ERCODE
 (5)  037072  000050                        .WORD   40
 (5)  037074  012547                        .WORD   EM40
 (5)  037076  014244                        .WORD   ERR0
3793  037100                          1$:   ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  037100  104010                        EMT     C$ESCAPE
 (3)  037102  000006                        .WORD   10000$-.
3794
3795  037104  004537  020214                JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
3796
3797  037110                                ENDSEG                          ;%%END OF SEGMENT%%
 (3)  037110                          10000$:
 (3)  037110  104005                        EMT     C$ESEG
3798  037112                                ENDTST                          ;**END OF TEST**
 (3)  037112                          L10101:
 (3)  037112  104001                        EMT     C$ETST
3799
3800                                       .SBTTL  **TEST 45** - CHECK RD W/O HDR CMP ACTUALLY READS
3801
3802  037114                               BGNTST                          ;**START OF TEST**
3803
3804  037114                               STARS
 (2)                                       ;;*****************************************************************
3805                                       ;CHECK THAT THE READ W/O HDR CMP FUNCTION ACTUALLY READS (INTO MEMORY)
3806                                       ;WE WILL WRITE A PATTERN INTO MEMORY AND THEN ISSUE
3807                                       ;A READ TO OVERLAY THAT PATTERN.  AFTER THE READ
3808                                       ;WE CHECK TO SEE IF THE WRITTEN PATTERN HAS CHANGED.
3809                                       ;IF NOT WE ISSUE IT AGAIN AT THE SAME SECTION AFTER
3810                                       ;HAVING MODIFIED OUR PATTERN IN MEMORY (SINCE THERE IS
3811                                       ;ONE CHANCE THAT THE DISK COULD HAVE OUR PATTERN).  AFTER
3812                                       ;THE SECOND READ WE CHECK THE BUFFER AGAIN.  IF IT'S
3813                                       ;NOT CHANGED WE REPORT AN ERROR
```

```
3814  037114                          STARS
 (2)                                  ;;*****************************************************************
3815
3816
3817  037114  004737  021356                JSR     PC,HDHOME       ;HEADS OVER TRACK 0
3818  037120                                 CKERFG                  ;HEADS GO HOME OKAY
 (4)  037126  104032                          EMT     C$EXIT
 (4)  037130  000160                          .WORD   L10102-.
3819
3820  037132                                 BGNSEG                          ;%%START OF SEGMENT%%
 (3)  037132  104004                          EMT     C$BSEG
3821
3822  037134  012737  024350  002160          MOV     #24350,TMP0     ;SET PATTERN TO WRITE
3823  037142  005037  002162                  CLR     TMP1            ;CLEAR PASS INDICATOR
3824  037146  012700  003052          1$:     MOV     #BUF,R0         ;SET UP BUFFER BEGINNING
3825  037152  012701  000200                  MOV     #128.,R1
3826  037156  013720  002160          2$:     MOV     TMP0,(R0)+      ;WRITE BUFFER
3827  037162  005301                          DEC     R1              ;DONE??
3828  037164  001374                          BNE     2$              ;NO, GO BACK
3829  037166  012777  000050  143052          MOV     #40.,@RLDA      ;LOAD DISK ADDRESS TO NONSENSE
3830  037174  012777  177600  143046          MOV     #-128.,@RLMP    ;SET WORD COUNT
3831  037202  012777  003052  143034          MOV     #BUF,@RLBA      ;LOAD BUS ADDRESS
3832  037210  012737  003052  002166          MOV     #BUF,GDDAT      ;FOR ERROR PRINT
3833
3834  037216  004537  020456                JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
3835  037222  000016                         RDNHD                   ;READ W/O HDR CMP
3836  037224  004537  021276                JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY
3837  037230                                 ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  037230  104010                          EMT     C$ESCAPE
 (3)  037232  000054                          .WORD   10000$-.
3838
3839  037234  004537  020214                JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
3840  037240                                 ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
 (3)  037240  104010                          EMT     C$ESCAPE
 (3)  037242  000044                          .WORD   10000$-.
3841
3842  037244  012702  003052                MOV     #BUF,R2         ;SET TO START COMPARING DATA
3843  037250  022237  002160          4$:     CMP     (R2)+,TMP0      ;DID DATA CHANGE?
3844  037254  001014                          BNE     6$              ;YES, CHECK FOR END
3845                                                                  ;
3846
3847                                                                  ;DATA DIDN'T CHANGE, CHECK
3848  037256  005737  002162                  TST     TMP1            ;IF 1ST OR 2ND TIME?
3849  037262  001005                          BNE     5$              ;2ND-REPORT 1ST-TRY AGAIN
3850
3851  037264  005237  002162                  INC     TMP1            ;INC PASS COUNT
3852  037270  005137  002160                  COM     TMP0            ;COMPLIMENT PATTERN
3853  037274  000724                          BR      1$              ;GO DO IT AGAIN
3854
3855  037276                          5$:     ERRDF   20.,EM55,ERR9
 (3)  037276  104462                          TRAP    T$ERCODE
 (5)  037300  000024                          .WORD   20
 (5)  037302  013230                          .WORD   EM55
 (5)  037304  014636                          .WORD   ERR9
3856
3857  037306                          6$:
```

```
                                        ENDSEG                          ;%%END OF SEGMENT%%
                                10000$:
(3)  037306  104005                     EMT     C$ESEG
                                ENDTST                                  ;**END OF TEST**
                                L10102:
(3)  037310  104001                     EMT     C$ET

                                .SBTTL  **TEST 46** - CHECK RLBA INCREMENT WITH RD W/O HDR CMP

                                BGNTST                                  ;**START OF TEST**

                                STARS
                                ;;*************************************************************
                                ;CHECK THAT THE RLBA WILL INCREMENT WITH THE READ W/O HDR CMP
                                ;THE RLBA SHOULD CONTAIN 'BUF +256.' AFTER A FULL SECTOR
                                ;READ.
                                STARS
                                ;;*************************************************************

037312  004737  021356                JSR     PC,HDHOME       ;HEADS OVER TRACK 0
037316                                  CKERFG                  ;HEADS GO HOME OKAY
(4)  037324  104032                     EMT     C$EXIT
(4)  037326  000120                     .WORD   L10103-.

037330                                  BGNSEG                          ;%%START OF SEGMENT%%
(3)  037330  104004                     EMT     C$BSEG

037332  012777  000050  142706          MOV     #40.,@RLDA
037340  012777  003052  142676          MOV     #BUF,@RLBA      ;SET UP BUS ADDRESS
037346  012777  177600  142674          MOV     #-128.,@RLMP    ;WORD COUNT
037354  012737  003052  002166          MOV     #BUF,GDDAT      ;FORM EXPECTED BUS ADDRESS
037362  062737  000400  002166          ADD     #256.,GDDAT     ;AFTER READ

037370  004537  020456                  JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
037374  000016                          RDNHD                   ;READ W/O HDR CMP
037376  004537  021276                  JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY
037402                                  ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
(3)  037402  104010                     EMT     C$ESCAPE
(3)  037404  000040                     .WORD   10000$-.

037406  004537  020214                  JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
037412                                  ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
(3)  037412  104010                     EMT     C$ESCAPE
(3)  037414  000030                     .WORD   10000$-.
037416  013737  002230  002170          MOV     E.BA,BDDAT      ;READ 'RLBA' FOR PRESENT ADDRESS
037424  023737  002170  002166          CMP     BDDAT,GDDAT     ;DID 'BA' INCREMENT PROPERLY?
037432  001404                          BEQ     1$              ;YES, CONTINUE

037434                                  ERRDF   21.,EM53,ERR4
(3)  037434  104462                     TRAP    T$ERCODE
(5)  037436  000025                     .WORD   21
(5)  037440  013310                     .WORD   EM53
(5)  037442  014410                     .WORD   ERR4
```

```
                                1$:

                                        ENDSEG                          ;%%END OF SEGMENT%%
                                10000$:
                                        EMT     C$ESEG
                                ENDTST                                  ;**END OF TEST**
                                L10103:
                                        EMT     C$ETST



                                .SBTTL  **TEST 47** - CHECK RLDA DOES INCREMENT WITH RD W/O HDR CMP

                                BGNTST                                  ;**START OF TEST**

                                STARS
                                ;;*****************************************************************
                                ;CHECK THAT THE RLDA DOES INCREMENT BY ONE AFTER A
                                ;FULL SECTOR READ W/O HDR CMP
                                ;AFTER THE READ THE RLDA SHOULD STILL BE THE INITIAL RLDA + 1
                                STARS
                                ;;*****************************************************************

                                        JSR     PC,HDHOME       ;HEADS OVER TRACK 0
                                        CKERFG                  ;HEADS GO HOME OKAY
                                        EMT     C$EXIT
                                        .WORD   L10104-.

                                        BGNSEG                          ;%%START OF SEGMENT%%
                                        EMT     C$BSEG

                                        MOV     #40.,GDDAT      ;DA TO NONSENSE
                                        MOV     GDDAT,@RLDA     ;SETUP DISK ADDRESS
                                        INC     GDDAT
                                        MOV     #-128.,@RLMP    ;WORD COUNT
                                        MOV     #BUF,@RLBA      ;SETUP BUS ADDRESS

                                        JSR     R5,LDFUNC               ;LOAD THE FUNCTION IN NEXT WORD
                                        RDNHD                   ;READ WITHOUT HEADER COMPARE
                                        JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY
                                        ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
                                        EMT     C$ESCAPE
                                        .WORD   10000$-.

                                        JSR     R5,CHERR                ;CHECK CNTLR FOR ERRORS
                                        ESCAPE  SEG             ;CHECK FOR FL:LOE, ELSE EXIT SEG
                                        EMT     C$ESCAPE
                                        .WORD   10000$-.

                                        MOV     E.DA,BDDAT      ;READ DISK ADDRESS
                                        CMP     GDDAT,BDDAT     ;DID SECTOR INCREMENT PROPERLY
```

```
3940  037566  001404                        BEQ     1$              ;YES, BRANCH  NO, REPORT ERROR
3941
3942  037570                                ERRDF   22.,EM54,ERR4
 (3)  037570  104462                        TRAP    T$ERCODE
 (5)  037572  000026                        .WORD   22
 (5)  037574  013400                        .WORD   EM54
 (5)  037576  014410                        .WORD   ERR4
3943
3944  037600                          1$:
3945
3946  037600                                ENDSEG                          ;%%END OF SEGMENT%%
 (3)  037600                          10000$:
 (3)  037600  104005                        EMT     C$ESEG
3947  037602                          ENDTST                              ;**END OF TEST**
 (3)  037602                          L10104:
 (3)  037602  10400?                        EMT     C$ETST
3948
3949
3950
3951
3952  037604                          BGNMOD  HRDPRM
3953
3954  037604                                BGNHRD
 (3)  037604  000025                        .WORD L10105-L$HARD/2
3955
3956  037606                                GPRML   CNTYPE,CNT,1,YES
 (4)  037606  004130                        .WORD   T$CODE
 (4)  037610  037660                        .WORD   CNTYPE
 (4)  037612  000001                        .WORD   1
3957  037614                                GPRMA   CSRMSG,CSR,0,160000,177776,YES
 (4)  037614  000031                        .WORD   T$CODE
 (4)  037616  037665                        .WORD   CSRMSG
 (4)  037620  160000                        .WORD   T$LOLIM
 (4)  037622  177776                        .WORD   T$HILIM
3958  037624                                GPRMA   VECMSG,VECT,0,0,776,YES
 (4)  037624  001031                        .WORD   T$CODE
 (4)  037626  037712                        .WORD   VECMSG
 (4)  037630  000000                        .WORD   T$LOLIM
 (4)  037632  000776                        .WORD   T$HILIM
3959  037634                                GPRMD   BRMSG,PRIOR,0,340,0,7,YES
 (4)  037634  002032                        .WORD   T$CODE
 (4)  037636  037701                        .WORD   BRMSG
 (4)  037640  000340                        .WORD   340
 (4)  037642  000000                        .WORD   T$LOLIM
 (4)  037644  000007                        .WORD   T$HILIM
3960  037646                                GPRMD   DRMSG,DRBT,0,03400,0,7,YES
 (4)  037646  003032                        .WORD   T$CODE
 (4)  037650  037721                        .WORD   DRMSG
 (4)  037652  003400                        .WORD   03400
 (4)  037654  000000                        .WORD   T$LOLIM
 (4)  037656  000007                        .WORD   T$HILIM
3961
3962  037660                                ENDHRD
 (2)                                        .EVEN
 (3)  037660                    *0105:
3963
```

```
 3964  037660  046122  030461     000  CNTYPE: .ASCIZ  /RL11/
 3965  037665     102  051525  040440  CSRMSC: .ASCIZ  /BUS ADDRESS/
       037672  042104  042522  051523
       037700     000
 3966  037701     102  020122  042514  BRMSG:  .ASCIZ  /BR LEVEL/
       037706  042526  000114
 3967  037712  042526  052103  051117  VECMSG: .ASCIZ  /VECTOR/
       037720     000
 3968  037721     104  044522  042526  DRMSG:  .ASCIZ  /DRIVE/
       037726     000
 3969          037730                  .EVEN
 3970
 3971  037730                          ENDMOD
 3972
 3973
 3974  037730                  BGNMOD  SFTPRM
 3975
 3976  037730                          BGNSFT
  (3)  037730  000025                  .WORD L10106-L$SOFT/2
 3977
 3978  037732                          GPRML   DMSG,DLT,1$,YES
  (4)  037732  000130                  .WORD   T$CODE
  (4)  037734  040004                  .WORD   DMSG
  (4)  037736  000001                  .WORD   1
 3979  037740                          XFERF   1$
  (5)  037740  006044                  .WORD   T$CODE
 3980  037742                          GPRMD   EMSG,ELT,D,177777,0,177777,YES
  (4)  037742  001052                  .WORD   T$CODE
  (4)  037744  040122                  .WORD   EMSG
  (4)  037746  177777                  .WORD   177777
  (4)  037750  000000                  .WORD   T$LOLIM
  (4)  037752  177777                  .WORD   T$HILIM
 3981  037754                  1$:     GPRML   SMSG,SIZE,1,YES
  (4)  037754  002130                  .WORD   T$CODE
  (4)  037756  040030                  .WORD   SMSG
  (4)  037760  000001                  .WORD   1
 3982  037762                          GPRML   CMSG,DMPCK,1,YES
  (4)  037762  003130                  .WORD   T$CODE
  (4)  037764  040041                  .WORD   CMSG
  (4)  037766  000001                  .WORD   1
 3983  037770                          XFERF   2$
  (5)  037770  006044                  .WORD   T$CODE
 3984  037772                          GPRMD   LMSG,DLMT,D,177777,1,128.,YES
  (4)  037772  004052                  .WORD   T$CODE
  (4)  037774  040065                  .WORD   LMSG
  (4)  037776  177777                  .WORD   177777
  (4)  040000  000001                  .WORD   T$LOLIM
  (4)  040002  000200                  .WORD   T$HILIM
 3985  040004                  2$:
 3986
 3987
 3988  040004                          ENDSFT
  (2)                                 .EVEN
  (3)  040004                  L10106:
 3989
 3990  040004  051104  050117  047440  DMSG:   .ASCIZ  /DROP ON ERROR LIMIT/
```

```
                040012  020116  051105  047522
                040020  020122  044514  044515
                040026  000124
 3991           040030  052501  047524  044523  SMSG:   .ASCIZ  /AUTOSIZE/
                040036  042532     000
 3992           040041     103  046517  040520  CMSG:   .ASCIZ  /COMPARE DATA ON DCK/
                040046  042522  042040  052101
                040054  020101  047117  042040
                040062  045503     000
 3993           040065     043  047440  020106  LMSG:   .ASCIZ  /# OF WORDS IN ERROR REPORTED/
                040072  047527  042122  020123
                040100  047111  042440  051122
                040106  051117  051040  050105
                040114  051117  042524  000104
 3994           040122  051105  047522  020122  EMSG:   .ASCIZ  /ERROR LIMIT/
                040130  044514  044515  000124
 3995
 3996           040136                          ENDMOD
 3997
 3998
 3999
 4000                   040514                  .=40514
 4001
 4002                                           ;AREA RESERVED AS PATCH AREA FOR DIAGNOSTICS.
 4003                                           ;.-40514 WAS SELECTED AS ''LASTAD'' TO PROVIDE APT TO LSI-11 COMPATIBILITY.
 4004                                           ;BIT 7 OF ''LASTAD'' MUST BE CLEARED TO ACHIEVE A VALID MAILBOX ADDRESS
 4005                                           ;WHEN RUNNING ON THE LSI-11 UNDER APT.
 4006
 4007           040514                          LASTAD
  (2)                                                  .EVFN
  (3)           040514                          L$LAST::
 4008
 4009
 4010
 4011
 4012
 4013
```

```
 4015
14886  071310  000000                    .SBTTL  DIAGNOSTIC SUPERVISOR -- LOW CORE SET UP
14887  071312  000000                    .WORD   0               ;SPACE FOR USER POOL POINTER
14888  071314  000000                    .WORD   0               ;SIZE
14889  071316  000000                    .WORD   0               ;CHECKSUM (NOT CURRENTLY USED)
1489C          071322                    .WORD   0               ;SIZE OF H.W. PTAB. ALLOCATION
14891          000200                    END.SUPV=.+2
                                         .END 200
```

```
ABOFLA  041040 G
ABOPAS  040756 G
ABO.FM  043320
AFREG   007151
AFSI    040546 G
AFTER   021016
ALLOC   061460
APT.ER  042450
ARLBA   007106
ARLCS   007101
ARLDA   007114
ARLMP   007122
ASSEMB= 000010
A$AAV   045316
A$AAW   045332
A$AAX   045344
A$AAY   045352
A$AAZ   045366
A$ABA   045376
BA16  = 000020
BA17  = 000040
BCCFBK  002154
BCSR    002252
BDDAT   002170
BEFORE  020764
BEREG   007130
BGN.SU= 040514
BINMSG  057770
BIT0  = 000001 G
BIT00 = 000001 G
BIT01 = 000002 G
BIT02 = 000004 G
BIT03 = 000010 G
BIT04 = 000020 G
BIT05 = 000040 G
BIT06 = 000100 G
BIT07   000200 G
BIT08 = 000400 G
BIT09 = 001000 G
BIT1  = 000002 G
BIT10 = 002000 G
BIT11 = 004000 G
BIT12 = 010000 G
BIT13 = 020000 G
BIT14 = 040000 G
BIT15 = 100000 G
BIT2  = 000004 G
BIT3  = 000010 G
BIT4  = 000020 G
BIT5    000040 G
BIT6  = 000100 G
BIT7    000200 G
BIT8    000400 G
BIT9  = 001000 G
BLD.HW  046202
BLOCK   063614
BPRIOR  002256
BRMSG   037701
BUF     003052
BVEC    002254
B$AAB   047604
B$AAF   047516
B.BA    002220
B.CS    002216
B.DA    002222
B.MP    002224
CALBCC  002156
CALLPC= 000022
CALLPS= 000024
CALLSP= 000026
CALLTC= 000030
CAL.CL  066202
CAL.TI  066240 .G.
CDCNT   002130
CHECK   002122
CHERR   020214
CHKLUP  047620
CHKSTR  062022
CHKTTY  060110
CHK.MA  045760
CHK.PC  053110
CHK.SW  042150
CHRCNT  061342
CH.FLA  045466
CH.PAS  045504
CKERLT  020126
CLEAR.  047102
CLKACC  040754 G
CLKBFR  066204
CLKCNT  040752 G
CLKJUM  066610 G
CLKRES  067612 G
CLKSER  067746 G
CLKSON  041012 G
CLK.SE  045562
CLNCOD  020010 G
CLR.MA  046036
CMSG    040041
CNT   = 000010
CNTYPE  037660
CNVT    064260
COMMAN  040564 G
COMMTA  064074
COMP    007316
CONT    017354
CONTCL  067672 G
CONTIN  017226
CRDY  = 000200
CRLF    060172
CRTIM   007172
CSR   = 000000
CSRMSG  037665
CURR.S  040522 G
CURR.T  040524 G
CYLMSK  002202
C$AAD   053062
C$AAE   053074
C$AAK   054072
C$AAL   054236
C$ABRT= 000021
C$ADR = 000020
C$AU  = 000054
C$BRK = 000022
C$BSEG= 000004
C$BSUB= 000002
C$BUFF= 000030
C$CEFG= 000046
C$CLEA= 000012
C$CLP1= 000006
C$CVEC= 000036
C$DCLN= 000044
C$DODU= 000053
C$DRPT= 000024
C$DU  = 000055
C$EDIT= 000002
C$ERDF= 000002
C$ERHR= 000003
C$ERSF= 000001
C$ERSO= 000004
C$ESCA= 000010
C$ESEG= 000005
C$ESUB= 000003
C$ETST= 000001
C$EXIT= 000032
C$GMAN= 000043
C$GPHR= 000042
C$GPRI= 000040
C$GTIM= 000052
C$INIT= 000011
C$INLP= 000020
C$KWOF= 000035
C$KWON= 000034
C$LOOP= 000100
C$MANI= 000051
C$MSG = 000023
C$PNTB= 000014
C$PNTF= 000017
C$PNTS  000016
C$PNTX= 000015
C$POIN= 000040
C$QIO = 000377
C$RDBU= 000007
C$REFG= 00005C
C$REQT= 000045
C$RESE= 000033
C$REVI= 000002
C$RPT = 000025
C$SEFG= 000047
C$SPRI= 000041
C$SVEC= 000037
C$TPRI= 000013
C$UNBU= 000031
C$WTM = 000026
C$WTU = 000027
DAHS  = 000020
DATPAT  002662
DCKMES  007277
DECMSG  060004
DEMES   007245
DERFLG  002310
DERR  = 040000
DEV.CO  040526 G
DIAGMC= 000000
DIAG.T  041046 G
DLMT  = 000010
DLT   = 000000
DLTMES  007304
DMPCK = 000006
DMSG    040004
DPDVD   070456 G
DPMUL   070344 G
DRBT  = 000006
DRDY  = 000001
DRIVE   002134
DRMSG   037721
DROP    016766
DRPCOD  020104 G
DRST  = 000010
DRTIM   007217
DSPCOD  017000 G
DS0   = 000000
DS1   = 000400
DS2   = 001000
DS3   = 001400
DUNIT.  040762 G
DVC.FT  054042
DWORD   002210
D$AAG   054746
D$AAH   054764
D$AAI   057532
D$AAJ   057536
D$AAK   057554
D$AAL   057572
D$AAM   057602
EF CON= 000036 G
EF.NEW= 000035 G
EF.PWR= 000034 G
EF.RES= 000037 G
EF.STA= 000040 G
EF01  = 000001 G
EF02  = 000002 G
EF03  = 000003 G
EF04  = 000004 G
EF05  = 000005 G
EF06  = 000006 G
EF07  = 000007 G
EF08  = 000010 G
EF09  = 000011 G
EF10  = 000012 G
EF11  = 000013 G
EF12  = 000014 G
EF13  = 000015 G
EF14  = 000016 G
EF15  = 000017 G
EF16  = 000020 G
ELT   = 000002
EMSG    040122
EMT.TR  041044 G
EM1     010352
EM10    011043
EM100   010417
EM11    011110
EM12    011137
EM13    011176
EM14    011230
EM16    011312
EM17    011351
EM20    011411
EM21    011466
EM22    011544
EM23    011636
EM24    011716
EM25    011774
EM26    012045
EM27    012105
EM30    012165
EM31    012225
EM32    012270
EM33    012335
EM34    012376
EM35    012441
EM36    012506
EM4     010607
EM40    012547
EM41    012612
```

```
EM42    012654          ERR5    014456 G        F$MOD = 000000          HDREND  002660          LPBFR   040622 G
EM43    012723          ERR6    014514 G        F$MSG = 000011          HDRLST  020712          LPCNTR  040620 G
EM44    012767          ERR7    014556 G        F$PWR = 000017          HDRTAB  002504          LPT.AD  045144
EM45    013024          ERR8    014564 G        F$RPT = 000012          HERTZ.  045126          LPT.RE  045140
EM47    013056          ERR9    014636 G        F$SEG = 000003          HWFMES  007272          LSI.RE  045134
EM5     010646          ESC.PC  053106          F$SOFT= 000005          HOLDSP= 000020          LUP     066106
EM50    013105          EV.COU  040520 G        F$SRV = 000010          HPTCOD  016750 G        LUP.AD  053112
EM51    013145          E.BA    002230          F$SUB = 000002          HRDPRM  037604 G        L$APT   002036 G
EM52    013177          E.CS    002226          F$SW  = 000014          HW.ADR  040550 G        L$AUT   002074 G
EM53    013310          E.DA    002232          F$TEST= 000001          H$AAB   064606          L$CCP   002106 G
EM54    013400          E.MP    002234          GARBAG  061344        ININIT  040772 G        L$CLEA  020010 G
EM55    013230          E.MP1   002236          GDDAT   002166        INITCO  017140 G        L$CO    002032 G
EM56    013456          E.MP2   002240          GETCHR  060050        INITIA  060020          L$DEPO  002011 G
EM57    013477          FILL    060640          GETCMN  063434        INIT.M  046104          L$DESC  002102 G
EM6     010712          FILL.C  000204 G        GETPAR  055126        INIT.R  040606 G        L$DEVP  002064 G
EM60    013537          FIRST   002200          GETSWI  062430        INPUTA  060746          L$DISP  017002 G
EM61    013575          FIX     020752          GET.TW  062200        INTEN = 000100          L$DR    002112 G
EM62    013652          FLAGS   040560 G        GLBDAT  002122 G      INTFLG  002144          L$DRCT  002070 G
EM63    013727          FLAGS1  040562 G        GLBEQA  002122 G      INTFOR  054244          L$DRS   002072 G
EM64    014031          FLAGTA  064012          GLBERR  014244 G      INTSRV  020110          L$DRST  002112 G
EM65    014105          FLAG.I  045546          GLBSUB  020110 G      INVAL.  045052          L$DTP   002040 G
EM66    014146          FLA.SE  063760          GLBTXT  007052 G      INVINT  054102          L$DU    020104 G
EM7     010766          FLG.MA  045506          GODRVR= 000202        INV.SW  042104          L$DUT   002076 G
EM70    014220          FNDFNC  002260          GSBIT = 000002        IN.SUF  047054          L$DVTY  002114 G
END     017722          FORM.T  054410          GSTAT = 000004        I$AU  = 000041          L$EF    002056 G
END.OF  047070          FREE    061716          GSTINT  010006        I$CLN = 000041          L$EFLG  002034 G
END.SU- 071322          FRMT1   015606          GSTMES  007747        I$DU  = 000041          L$EXP1  002042 G
ENVIRO  040566 G        FRMT10  016415          G$EXCP= 000400        I$HRD = 000041          L$EXP2  002044 G
EOP.CH  067770 G        FRMT11  016550          G$HILI= 000002        I$INIT= 000041          L$EXP3  002046 G
EOP.FM  043334          FRMT13  016672          G$LOLI= 000001        I$MOD = 000041          L$HARD  037606 G
EOP.IN  045500          FRMT14  016241          G$NO  = 000000        I$MSG = 000041          L$HPCP  002016 G
ERCOUN  002314          FRMT15  016723          G$OFFS= 000400        I$PWR = 000041          L$HPTP  002022 G
ERFLG   002266          FRMT2   015645          G$OFSI- 000376        I$RPT = 000041          L$HW    016752 G
ERPOIN  002312          FRMT2A  015664          G$PRMA= 000001        I$SEG = 000041          L$ICP   002104 G
ERR   - 100000          FRMT2B  015677          G$PRMD= 000002        I$SFT = 000041          L$INIT  017140 G
ERRFOR  054314          FRMT3   015726          G$PRML= 000000        I$SRV = 000041          L$LADP  002026 G
ERRHAN  053114          FRMT4   015733          G$RADA= 000140        I$SUB = 000041          L$LAST  040514 G
ERRVEC  002132          FRMT5   015771          G$RADB= 000000        I$TST = 000041          L$MREV  002050 G
ERR.HR  054052          FRMT6   016042          G$RADD= 000040        J$JMP = 000167          L$NAME  002000 G
ERR.NU  040516 G        FRMT7   016117          G$RADF= 000200        KBPTR   040624 G        L$REPP  002066 G
ERR.SF  054056          FRMT8   016171          G$RADL= 000120        KBUF    040626 G        L$REV   002010 G
ERR0    014244 G        FRMT9   016312          G$RADO= 000020        LDCSR   002146          L$SOFT  037732 G
ERR1    014262 G        FRMT98  016615          G$RADT= 000100        LDFUNC  020456          L$SPC   002062 G
ERR1FO  054400          FRMT99  016667          G$XFER= 000004        LF      007311          L$SPCP  002020 G
ERR10   014702 G        F$AU  - 000015          G$YES = 000010        LINE.F  041042 G        L$SPTP  002024 G
ERR11   014754 G        F$BGN = 000040          HCORED  045256        LINE1   015256          L$STA   002030 G
ERR12   015026 G        F$CLEA= 000007          HCOREQ  045166        LINE2   015312          L$SW    016766 G
ERR13   015102 G        F$DU  = 000016          HCORET  041002 G      LINE3   015534          L$TIML  002014 G
ERR14   015150 G        F$END = 000041          HCRCME  007264        LMSG    040065          L$TIMU  002054 G
ERR15   015216 G        F$HARD= 000004          HC.ADR  040552 G      LOAD.F  045502          L$TIM1  002052 G
ERR2    014274 G        F$HW  - 000013          HC.DEF  040544 G      LOGMSG  060012          L$TSTI  002100 G
ERR3    014336 G        F$INIT- 000006          HC.DIA  040542 G      LOPIMN  002272          L$UNIT  002012 G
ERR4    014410 G        F$JMP   000050          HDHOME  021356        LOPIMX  002270          L.CLK.  045112
```

```
L10000  014260
L10001  014272
L10002  014334
L10003  014406
L10004  014454
L10005  014512
L10006  014554
L10007  014562
L10010  014634
L10011  014700
L10012  014752
L10013  015024
L10014  015100
L10015  015146
L10016  015214
L10017  015254
L10020  016764
L10021  017000
L10022  020006
L10023  020102
L10024  020106
L10025  020114
L10026  022100
L10027  022244
L10030  022374
L10031  022530
L10032  022662
L10033  023020
L10034  023216
L10035  023520
L10036  023710
L10037  024106
L10040  024260
L10041  024456
L10042  024656
L10043  025026
L10044  025130
L10045  025254
L10046  025450
L10047  025604
L10050  025736
L10051  026056
L10052  026236
L10053  027014
L10054  027210
L10055  027354
L10056  027470
L10057  027646
L10060  030246
L10061  030670
L10062  031316
L10063  031776
L10064  032430
L10065  033040
L10066  033272
L10067  033562
L10070  034056
L10071  034350
L10072  034742
L10073  035242
L10074  035602
L10075  036114
L10076  036400
L10077  036670
L10100  036760
L10101  037112
L10102  037310
L10103  037446
L10104  037602
L10105  037660
L10106  040004
MAJ.IN  040576 G
MAJ.LO  066206
MAJ.US  040600 G
MAN.TI  001244
MAP16   070714 G
MASK.B  047616
MASK.W  047614
MAXCYL  002212
MAXSEC  002206
MDHEDR  002000 G
MEM.SI  045154
MERLMT  016770
MIN.IN  040572 G
MIN.US  040574 G
MK    = 000001
MODR    070256 G
MSCRLF  007313
MSG.AD  040540 G
MSG.TY  040514 G
MUL     070212 G
MXSEC1  002204
NEWPRI  067736 G
NEXTAR  064176
NOOPC = 000000
NOPINT  007430
NOPMES  007377
NOPWR   017166
NORDY   007070
NORES   007052
NO.CLK  045102
NO.FLA  063772
NO.LPT  061310
NO.PTA  045306
NR    - 000000
NUMBIN  054434
NUM.LA  054602
NUM.NO  040556 G
NUM.UN  041164
NUNITS  047572
NXM   = 020000
NXMMES  007252
NXT     017236
NXTFOR  064252
OCTMSG  057776
OPI   = 002000
OPIERR  007324
OPIMES  007257
OPIMN   002300
OPIMX   002302
O$APTS= 000000
O$AU  = 000000
O$BGNR= 000000
O$BGNS= 000001
O$DU  - 000001
O$GNSW= 000001
O$POIN= 000001
PARSES  063506
PAR.LA  057474
PASS.C  040530 G
PRINTC  061320
PRINTF  064626
PRIOR = 000004
PRIO0 = 000000 G
PRIO1 = 000040 G
PRIO2 = 000100 G
PRIO3 = 000140 G
PRIO4 = 000200 G
PRIO5 - 000240 G
PRIO6 = 000300 G
PRIO7 = 000340 G
PRNTST  061210
PRO.CM  045460
PTAB.S  041000 G
PUTCHR  060024
PWRFLG  002304
PWR.FA  071150 G
PWR.FL  040604 G
PWR.MS  071276
PWR.SA  071272
PWR.UP  071274
P.CLK.  045120
RDDINT  010076
RDDMES  010045
RDHDR - 000010
RDNHD = 000016
RDNINT  010247
RDNMES  010213
READ  = 000014
READ.P  066210 G
REGBAC  070700 G
REGSAV  070664 G
REQN.P  040570 G
REQN.T  045462
REST    017304
RESTMS  020440
RE.SET  042252
RHDINT  007623
RHDMES  007563
RHHS  = 000100
RLBA    002244
RLCS    002242
RLDA    002246
RLMP    002250
RSTACK  070140 G
SAVEDO= 042450
SEARCH  062146
SECMSK  002150
SEEK  = 000006
SEGSTA  041014 G
SEKINT  007715
SEKMES  007664
SET.MA  045672
SFTPRM  037730 G
SHIFT   070776 G
SIGN  = 000004
SIMBCC  021064
SIZE  = 000004
SKHOME  010303
SMSG    040030
SPEC.U  045406
SPTCOD  016764 G
SPV.SE  000400
START   017244
STARTC  067666 G
START1  017206
STHS  = 000100
STRCHR  060700
STRT.T  045464
ST.SET  042316
SUNIT.  045470
SUPERV  043352
SUPFLA  040760 G
SUPV.T  041132 G
SUP.PR  042070
SVCGBL= 000000
SVCHAN  050006
SVCINS= 000000
SVCSUB= 177777
SVCTAG- 000000
SVCTST= 177777
SVHD    002214
SWCHAN  045300
SWITCH  064152
SW.ADR  040554 G
SW.PTA  045264
SYS.FT  054032
S$LSYM= 010000
TEMP2   002172
TEMP3   002174
TEMP4   002176
TERMI   066176
TERMLI  064000
TERMTA  057762
TEST.M  045420
TIMFLG  040750 G
TIMSRV  020116
TIM.CO  040602 G
TIM.OP  054406
TMP0    002160
TMP1    002162
TMP2    002164
TOO.MA  057742
TRPFLG  002142
TRPHAN  021350
TRYFNC  002264
TST.AB  047730
TST.TO  042132
TYPEC   060336
TYPEPC  054232
TYPFLA  063654
TYPLIN  060234
TYPNUM  057616
TYPSTR  060254
TYP.ER  054062
TY.UNI  047074
T$ARGC= 000004
T$CODE= 004052
T$ERCO= 000062
T$ERRN= 000026
T$EXCP= 000000
T$FLAG= 000040
T$HILI= 000200
T$LOLI= 000001
T$LSYM= 010000
T$NEST= 177777
T$NSK0= 000000
T$NSK1= 000005
T$NSK2= 000003
T$NSK3= 000003
T$SAVL= 177777
T$SEGL= 177777
T$SEK0= 010000
T$SEK1= 010001
T$SEK2- 010002
```

```
T$SUBN= 000000          T11    024110 G    T34    033274 G    USER.P  040774 G    XEQ.OP  047310
T$TAGL= 177777          T12    024262 G    T35    033564 G    USER.T  040776 G    XEQ.PR  042510
T$TAGN= 010107          T13    024460 G    T36    034060 G    UUT     002136      XEQ.TE  047354
T$TEMP= 000000          T14    024660 G    T37    034352 G    VALID.  041234      XMEM    002262
T$TEST= 000057          T15    025030 G    T38    034744 G    VAL.LA  042054      XPOLY   002152
T$TSTM= 177777          T16    025132 G    T39    035244 G    VAL.SW  045520      XTIME   066676 G
T$TSTS= 000001          T17    025256 G    T4     022376 G    VECMSG  037712      XTIMEN  067522
T$$CLE= 010023          T18    025452 G    T40    035604 G    VECT  = 000002      XTIMST  066720
T$$DU = 010024          T19    025606 G    T41    036116 G    WCKINT  007522      XXDP.D  045064
T$$HAR= 010105          T2     022102 G    T42    036402 G    WCKMES  007462      XXX     017266
T$$HW = 010020          T20    025740 G    T43    036672 G    WHY     002126      X$ALWA= 000000
T$$INI= 010022          T21    026060 G    T44    036762 G    WIDTH   055002      X$FALS= 000040
T$$MSG= 010017          T22    026240 G    T45    037114 G    WRCHK = 000002      X$OFFS= 000400
T$$SEG= 010000          T23    027016 G    T46    037312 G    WRITE = 000012      X$TRUE= 000020
T$$SOF= 010106          T24    027212 G    T47    037450 G    WRLOCK  010331      $BREG   045560
T$$SRV= 010025          T25    027356 G    T5     022532 G    WRTINT  010161      $ENDAD  067776 G
T$$SW = 010021          T26    027472 G    T6     022664 G    WRTMES  010127      $SAV2   071042 G
T$$TES= 010104          T27    027650 G    T7     023022 G    WTCRDY  021276      $SAV3   071056 G
T.CNTL  002306          T28    030250 G    T8     023220 G    WTDRDY  021236      $SAV4   071074 G
T.CRC   002124          T29    030672 G    T9     023522 G    XEQDIA  070024 G    $SAV5   071114 G
T.DMP   016774          T3     022246 G    UNITST 002140      XEQSUB  070012 G    .     = 071320
T.LMT   016776          T30    031320 G    UNIT.D 040532 G    XEQ.CL  047534
T.SIZE  016772          T31    032000 G    UNI.MA 045410      XEQ.CM  045044
T1      021632 G        T32    032432 G    UOPIMN 002276      XEQ.IN  047216
T10     023712 G        T33    033042 G    UOPIMX 002274      XEQ.LA  043306

. ABS.  071320      000

 ERRORS DETECTED:  0

 DSKZ:CZRLBB,DSKZ:CZRLBB=CZRLBB/ML,CZRLBB.P11,CZRLBB.SUP
 RUN-TIME: 66 62 1 SECONDS
 RUN-TIME RATIO: 323/130-2.4
 CORE USED:  16K  (31 PAGES)
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