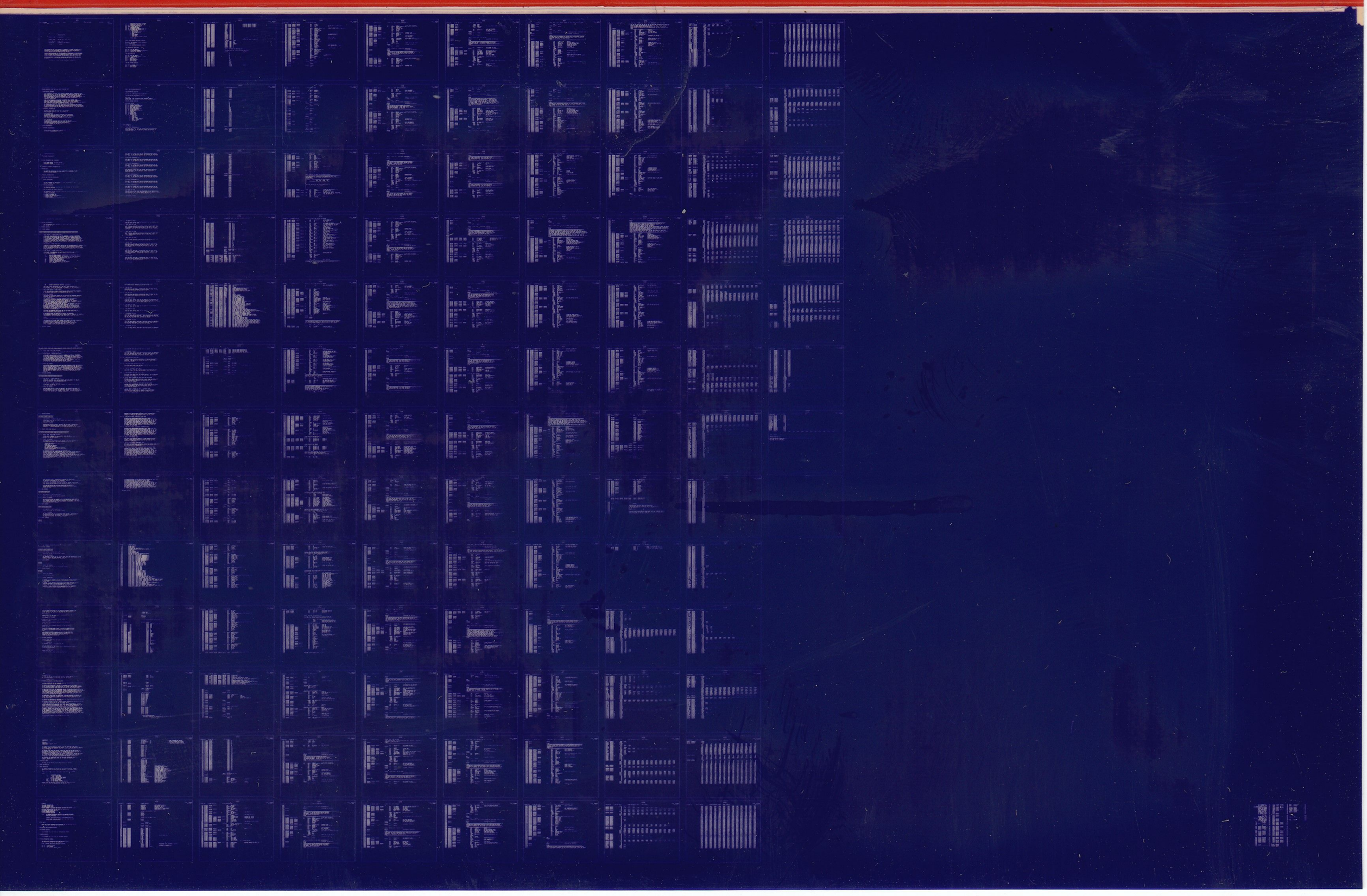
RLV11/RL01

DISKLESS
CVRLAA0

AH-B108A-MC

FICHE 1 OF 1

JUN 1978
digital
MADE IN USA



IDENTIFICATION

PRODUCT CODE: AC-B107A-MC

PRODUCT NAME: CVRLAAD RLV11 RL01 DSKLS
DATE CREATED: APRIL 1978
MAINTAINER: DIAGNOSTIC ENGINEERING
AUTHOR: W. HEAVEY

1.1 PROGRAM ABSTRACT FOR THE RLV11 RL01 DISKLESS TEST

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 RLV11 RL01 DISKLESS TEST IS A LSI-11(PDP-11) BASED PROGRAM THAT WILL TEST THE CONTROLLER.

RLV11 CONTROLLER

THE PROGRAM TESTS THE BASIC INTERFACE LOGIC,REGISTER MANIPULATION AND FUNCTIONALITY. THE RLV11 MAINTENANCE FUNCTION IS PERFORMED TO TEST THE CONTROLLER WRITE/READ DATA PATHS WITHOUT A DRIVE PRESENT.
THIS TEST WILL RUN WITH OR WITHOUT A DRIVE PRESENT.

RL11 CONTROLLER

THE MAINTENANCE FUNCTION DOES NOT EXIST ON THE RL11 CONTROLLER. THIS PROGRAM WILL ONLY TEST THE BASIC INTERFACE LOGIC,REGISTER MANIPULATION AND FUNCTIONALITY.
THE "NOP" COMMAND IS THE ONLY FUNCTION PERFORMED IN THIS DIAGNOSTIC FOR THE RL11.

1.2 SYSTEM REQUIREMENTS

1.2.1 HARDWARE REQUIREMENTS

PDP-11/LSI-11 PROCESSOR WITH 16K OR MORE OF CORE
CONSOLE DEVICE (LA30,LA36,VT50,ETC.)
RL11/RLV11 CONTROLLER(S) (1-8)

LINEPRINTER(OPTIONAL)

1.2.2 SOFTWARE REQUIREMENTS

1.3 RELATED DOCUMENTS AND STANDARDS

RL01 USERS MANUAL (EK-RL01-UG-PRE)
XXDP USERS MANUAL
DIAGNOSTIC SUPERVISOR PROGRAM LISTING

1.4 DIAGNOSTIC HIERARCHY PREREQUISITES

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 LOADING AND STARTING PROCEDURES

2.1.1 LOADING PROCEDURES

FOLLOW STANDARD DEC PROCEDURES TO LOAD THE PROGRAM. (XXDP, ABSOLUTE LOADER, UPD1, UPD2)

2.1.2 STARTING PROCEDURES

THE PROGRAM STARTS AT LOCATION 200. USE STANDARD DEC PROCEDURES TO START THE PROGRAM.

2.1.3 STEPS FOR QUICK AND SIMPLE EXECUTION

THE DIAGNOSTIC CAN BE EXECUTED STANDALONE WITHOUT READING THE REMAINDER OF THIS DOCUMENT AS FOLLOWS:

A) LOAD THE DIAGNOSTIC
B) START AT ADDRESS 200
C) ANSWER THE HARDCORE QUESTIONS
D) RECEIVE PROMPT (DS-B>)
E) ENTER STA<CR>
F) ANSWER HARDWARE AND SOFTWARE QUESTIONS

H) TO END EXECUTION, ENTER CONTROL/C

2.2 SPECIAL ENVIRONMENTS

THE ENVIRONMENTS THIS PROGRAM WILL RUN IN ARE XXDP, XXDP CHAIN, ACT, SLIDE AND APT.

2.3 PROGRAM OPTIONS

2.3.1 START COMMAND

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

2.3.1.1 TESTS SWITCH (/TESTS:<TEST-LIST>)

<TEST-LIST> IS A SEQUENCE OF DECIMAL NUMBERS (1:2 ETC.) OR RANGES OF DECIMAL NUMBERS (1-5:8-10 ETC.) SEPARATED BY COLONS, SPECIFYING WHICH TESTS IT IS DESIRED BE EXECUTED. THE TEST NUMBERS RANGE FROM 1 TO THE LARGEST TEST NUMBER IN THE DIAGNOSTIC. THEY MAY BE SPECIFIED IN ANY ORDER. TESTS WILL BE EXECUTED IN NUMERICAL ORDER REGARDLESS OF ORDER OF SPECIFICATION. THE DEFAULT IS TO EXECUTE ALL TESTS. ON THIS AND ALL SWITCHES, THE ANGLE BRACKETS <> ARE PUNCTUATION USED IN THE DEFINITION ONLY, AND ARE NOT TO BE TYPED BY THE OPERATOR. SEE EXAMPLE AT END OF 2.3.1.

2.3.1.2 PASS SWITCH (/PASS:<PASS-CNT>)

<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 SUBMITTED. THE DEFAULT IS NON-ENDING EXECUTION: IE, EXIT IS ACCOMPLISHED EITHER BY TYPING A CONTROL/C OR BY A HALT ON ERROR BEING ENCOUNTERED, IN WHICH CASE WE RETURN TO COMMAND MODE. SEE EXAMPLE AT END OF 2.3.1.

2.3.1.3 FLAGS SWITCH (/FLAGS:<FLAG-LIST>)

<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 TEST BEING EXECUTED
BOE	BELL ON ERROR

ISR INHIBIT STATISTICAL REPORTS
IDR INHIBIT DROPPING OF UNITS BY DIAGNOSTIC

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. SEE EXAMPLE AT END OF 2.3.1.

2.3.1.4 END OF PASS SWITCH (/EOP:<INCR>)

<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. SEE EXAMPLE AT END OF 2.3.1.

2.3.1.5 EFFECT OF COMMAND

THE EFFECT OF THE START COMMAND IS TO INITIATE THE HARDWARE PARAMETER DIALOGUE, THE SOFTWARE PARAMETER DIALOGUE, AND THEN THE DIAGNOSTIC TESTS THEMSELVES.

THE HARDWARE PARAMETER DIALOGUE COMMENCES WITH THE QUESTION "# UNITS?" TO WHICH THE OPERATOR REPLIES WITH A DECIMAL NUMBER N FROM 1 TO 64. THE TERM "UNIT" REFERS TO THE DEVICE TO WHICH THIS SERIES OF DIAGNOSTICS IS DEDICATED. FOLLOWING THIS ARE THE QUESTIONS WHEREBY THE P-TABLES THEMSELVES WILL BE BUILT. EACH P-TABLE IS A CORE-RESIDENT TABLE CONTAINING ALL THE HARDWARE INFORMATION FOR ONE UNIT. THE OPERATOR MUST SUPPLY N (NUMBER OF UNITS) VALUES FOR EACH QUESTION. HE MAY DO THIS BY GIVING ONE ANSWER TO EACH QUESTION (IN WHICH CASE THE SERIES OF QUESTIONS WILL BE POSED N TIMES) OR BY GIVING N VALUES, SEPARATED BY COMMAS, TO EACH QUESTION (SERIES WILL BE POSED ONCE). EACH QUESTION IS FOLLOWED BY THE RESPONSE RADIX (D FOR DECIMAL, B FOR BINARY, O FOR OCTAL, L FOR YES/NO) IN PARENTHESES AND THE DEFAULT VALUE AFTER THE PARENTHESES.

FOLLOWING THE HARDWARE QUESTIONS ARE THE SOFTWARE QUESTIONS TO BUILD THE SOFTWARE TABLES, WHICH DEFINE THE MODE (QUICK VERIFY ETC.) THAT THE DIAGNOSTIC WILL EXECUTE IN.

AT THE POINT WHERE THE QUESTION "# UNITS?" IS ANSWERED, CORE STORAGE IS ALLOCATED FOR THE P-TABLES, AND IF THERE IS NOT ENOUGH TO ACCOMMODATE THEM THE MESSAGE "TOO MANY UNITS" IS ISSUED. IN THIS CASE THE DIAGNOSTIC MUST BE EXECUTED MORE THAN ONCE TO TEST ALL UNITS.

EXAMPLE.

STA/TESTS:1:2-4:6:8-10/PASS:3/FLAGS:IER:HOE=1:UAM:LOE

THIS COMMAND WILL CAUSE THREE PASSES TO BE MADE, EACH PASS CONSISTING OF TESTS 1,2,3,4,6,8,9, AND 10 EXECUTED AGAINST ALL UNITS. THERE IS NO DIFFERENCE BETWEEN SAYING <FLAG> AND SAYING <FLAG=1>. THE NOTATION <FLAG=0> IS MEANINGFUL ONLY ON A COMMAND OTHER THAN START TO CLEAR A FLAG THAT WAS PREVIOUSLY SET. NOTE THAT ON ALL COMMANDS ONLY THE FIRST THREE LETTERS ARE SCANNED.

2.3.2 RESTART COMMAND

RES(TART)/TESTS:<TEST-LIST>/PASS:<PASS-CNT>/FLAGS:<FLAG-LIST>/UNITS:<UNIT-LIST>
****

2.3.2.1 TESTS, PASS, AND FLAGS SWITCHES

<TEST-LIST>, <PASS-CNT>, AND <FLAG-LIST> ARE AS IN THE START COMMAND.

2.3.2.2 UNITS SWITCH (/UNITS:<UNIT-LIST>)

<UNIT-LIST> IS A SEQUENCE OF DECIMAL NUMBERS (1,2 ETC.) OR RANGES OF DECIMAL NUMBERS (1-5, 8-10 ETC.) SEPARATED BY COLONS, INDICATING WHICH UNITS IT IS DESIRED BE TESTED. THE NUMBERS MAY RANGE FROM 1 THRU N (N IS THE NUMBER OF UNITS SPECIFIED IN THE PREVIOUS START COMMAND). THE NUMBER INDICATES THE POSITION OF THE P-TABLE AS THE DATA WAS ENTERED DURING THE HARDWARE DIAGLOGUE. THE UNITS WHICH ARE SELECTED MUST NOT HAVE BEEN DROPPED BY THE DROP COMMAND. SEE THE DISCUSSION OF ADD AND DROP COMMANDS BELOW. DEFAULT IS TO TEST ALL UNITS WHICH HAVE NOT BEEN DROPPED BY A DROP COMMAND.

2.3.2.3 EFFECT OF COMMAND

THE RESTART COMMAND DIFFERS FROM THE START COMMAND IN THAT THE P-TABLES FROM THE PREVIOUS START COMMAND (THERE MUST HAVE BEEN ONE) ARE USED, INSTEAD OF NEW ONES BEING BUILT. THE UNITS SWITCH GIVES THE ABILITY TO SELECT A SUBSET OF THESE. THE SOFTWARE DIALOGUE MAY OPTIONALLY BE RE-EXECUTED (OPERATOR WILL BE ASKED). THE COMMAND CAN BE USED AFTER COMMAND MODE HAS BEEN REENTERED IN ANY OF THE THREE NORMAL WAYS: A) THE REQUESTED NUMBER OF PASSES HAVE BEEN MADE B) AN ERROR WAS ENCOUNTERED WITH THE HALT ON ERROR FLAG SET C) A CONTROL/C WAS ENTERED BY THE OPERATOR.

2.3.3 CONTINUE COMMAND

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

2.3.3.1 PASS SWITCH (/PASS:<PASS-CNT>)

<PASS-CNT> IS SAME AS IN START COMMAND, BUT THE DEFAULT IS THE UNSATISFIED PASS-CNT FROM THE PREVIOUS START OR RESTART. IF NONE REMAINS, THE DEFAULT IS NON-ENDING EXECUTION.

2.3.3.2 FLAG SWITCH (/FLAGS:<FLAG-LIST>)

<FLAG-LIST> IS SAME AS IN START COMMAND, BUT UNSPECIFIED FLAGS RETAIN THEIR CURRENT VALUE.

2.3.3.3 EFFECT OF COMMAND

CONTINUE MUST FOLLOW A START OR RESTART, AND 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.

2.3.4 PROCEED COMMAND

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

2.3.4.1 FLAGS SWITCH (/FLAGS:<FLAG-LIST>)

<FLAG-LIST> IS AS IN THE START COMMAND, BUT UNSPECIFIED FLAGS RETAIN THEIR CURRENT VALUE.

2.3.4.2 EFFECT OF COMMAND

PROCEED MUST FOLLOW A START, RESTART, OR CONTINUE. 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.

2.3.5 CREATE CORE IMAGE COMMAND

```
*************************************************************
CCI/TESTS:<TEST-LIST>/PASS:<PASS-CNT>/FLAGS:<FLAG-LIST>
*************************************************************
```

2.3.5.1 TESTS, PASS, AND FLAGS SWITCHES

<TEST-LIST>, <PASS-CNT>, <FLAG-LIST>, AND ARE AS IN THE START COMMAND, EXCEPT THAT THE UAM (UNATTENDED MODE) FLAG DEFAULTS TO THE SET POSITION.

2.3.5.2 EFFECT OF COMMAND

THE PURPOSE OF THIS COMMAND IS TO CREATE A BIC FILE SUITABLE FOR CHAIN MODE EXECUTION. THE XXDP PROCEDURE IS AS FOLLOWS:

```
INVOKE THE XXDP UTILITY UPD1 OR UPD2
LOAD XXN:FILE.BIN
START 200
<QUESTIONS AND ANSWERS>
GET PTAB END MESSAGE
LET MACHINE COME TO HALT
RESTART UTILITY USING RESTART ADDRESS
CHANGE HICORE ADDRESS TO PTAB END VALUE
DUMP XXN:FILE.BIC
```

THE OPERATOR DIALOGUE (HARDWARE AND SOFTWARE) WILL BE EXECUTED AS IN THE START COMMAND, BUT AT THE END OF THE QUESTIONS THE HALT STATE WILL BE ENTERED, AT WHICH TIME THE OPERATOR SHOULD DUMP THE PROGRAM TO THE XXDP LIBRARY USING A BIC EXTENSION TO INDICATE THAT THIS FILE IS CHAINABLE. HE SHOULD USE THE XXDP UTILITY "UPD1" OR "UPD2" TO DO THIS. IF THE P-TABLES EXTEND BEYOND 14.5K, A MESSAGE WILL BE ISSUED GIVING THE NEW UPPER CORE LIMIT, TO WHICH THE OPERATOR MUST ADJUST BEFORE DUMPING. HE MAY NOW DELETE THE NON-CHAINABLE BIN FILE IF DESIRED, SINCE THE BIC FILE HAS ALL THE CAPABILITIES OF IT.

WHEN THIS BIC FILE IS SUBSEQUENTLY EXECUTED IN CHAIN MODE,
THE OPERATOR DIALOGUES WILL BE BYPASSED. HOWEVER, IF IT IS EXECUTED
STANDALONE, THE DIALOGUE WILL BE REISSUED.

NOTE THAT IF THE MESSAGE "TOO MANY UNITS" IS ISSUED, TWO OR MORE
CORE IMAGES MUST BE CREATED (WITH DIFFERENT NAMES) TO TEST ALL UNITS.

NOTE THAT ALTHOUGH THE CHAINABLE IMAGE CAN BE EXECUTED ON A
16K MACHINE,THE ORIGINAL CCI CREATION MUST BE DONE ON A
LARGER MACHINE,THE EXACT SIZE BEING DEPENDENT ON WHICH UPDATE
UTILITY IS USED.

2.3.6 ADD COMMAND

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

2.3.6.1 UNITS SWITCH (/UNITS:<UNIT-LIST>

<UNIT-LIST> IS AS IN THE RESTART COMMAND.

2.3.6.2 EFFECT OF COMMAND

THE UNITS SPECIFIED ARE ADDED TO THE TEST SEQUENCE. EACH UNIT
MUST HAVE A P-TABLE IN MEMORY DUE TO AN EARLIER HARDWARE DIALOGUE.
THIS COMMAND MUST BE FOLLOWED BY A RESTART OR CONTINUE. THE UNITS
SWITCH MUST BE SPECIFIED. THE ADD COMMAND IS MEANINGFUL ONLY FOR UNITS
THAT WERE PREVIOUSLY DROPPED.

2.3.7 DROP COMMAND

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

2.3.7.1 UNITS SWITCH (/UNITS:<UNIT-LIST>)

<UNIT-LIST> IS AS IN THE RESTART COMMAND.

2.3.7.2 EFFECT OF COMMAND

THE UNITS SPECIFIED WILL BE DROPPED FROM TESTING. THE UNITS WILL
BE RESELECTED ONLY BY THE EXECUTION OF AN ADD OR START COMMAND.
THE UNITS SWITCH MUST BE ENTERED. THIS COMMAND MUST BE
FOLLOWED BY A RESTART OR A CONTINUE COMMAND.

2.3.8 PRINT COMMAND

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

2.3.8.1 EFFECT OF COMMAND

ISR (INHIBIT STATISTICAL REPORTING) FLAG IS CLEARED.

2.3.9 DISPLAY COMMAND

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

2.3.9.1 UNITS SWITCH (/UNITS:<UNIT-LIST>)

<UNIT-LIST> IS AS IN THE RESTART COMMAND.

2.3.9.2 EFFECT OF COMMAND

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.

2.3.10 FLAGS COMMAND

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

2.3.10.1 EFFECT OF COMMAND

THE CURRENT SETTINGS OF ALL FLAGS ARE PRINTED.

2.3.11 ZFLAGS COMMAND

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

2.3.11.1 EFFECT OF COMMAND

ALL FLAGS ARE CLEARED.

2.3.12 CONTROL CHARACTERS

A CONTROL C (↑C) ENTERED VIA THE CONSOLE DEVICE DURING THE EXECUTION OF A DIAGNOSTIC CAUSES A RETURN TO THE DIAGNOSTIC SUPERVISOR COMMAND MODE.

A CONTROL Z (↑Z) ENTERED WITHIN ONE OF THE THREE OPERATOR DIALOGS (HARDCORE, HARDWARE, OR SOFTWARE QUESTIONS) CAUSES TO DEFAULT VALUES TO BE TAKEN FOR THE REMAINDER OF THAT DIALOGUE.

A CONTROL O (↑O) ENTERED DURING THE EXECUTION OF A DIAGNOSTIC CAUSES ALL CONSOLE OUTPUT TO BE SUPPRESSED FOR THE REMAINDER OF THE DIAGNOSTIC OR UNTIL ANOTHER CONTROL O IS TYPED.

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 RESPONSE.

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?

SINCE THIS PROGRAM RUNS WITHOUT A DRIVE, THIS QUESTION DOES NOT APPLY. THE HARDWARE QUESTION ON DRIVE NUMBER IS ASKED TO MAINTAIN COMPATIBILITY WITH THE RL11 PROGRAMS FOR CHAIN MODE.

WHEN TESTING MULTIPLE CONTROLLERS(0 TO 7), THE OPERATOR CAN RESPOND TO DRIVE NUMBER BY TYPING A NUMBER(0-7) FOR EACH CONTROLLER. THEN WHEN AN ERROR IS PRINTED, THE DRIVE NUMBER IN THE ERROR PRINTOUT WILL REFER TO THE NUMBER ASSIGNED THE CONTROLLER.

2.3.14 SOFTWARE PARAMETERS

THE FOLLOWING QUESTIONS ARE ASKED ON A START, RESTART OR CONTINUE IF THE QUESTION:

CHANGE SW?

IS ANSWERED YES(Y). THE QUESTIONS ARE:

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.

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

2.3.15 EXTENDED DISCUSSION OF 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 OF THE STRING BECOMES THE NEW DEFAULT AND IS USED THEN AND THERE TO FILL 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 TRANSLATES 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 SHOULD 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 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 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 AT 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 ONE QUESTION (NAMELY QUESTION 2).

2.4 EXECUTION TIMES

ONE PASS OF THE PROGRAM TAKES APPROXIMATELY 45 SECONDS.

3.0 ERROR INFORMATION

3.1 ERROR REPORTING

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

```
CVRL?  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
```

REGISTER DESCRIPTIONS CAN BE FOUND IN SECTION 5.0.
CS:CONTROL AND STATUS REGISTER
BA:BUS ADDRESS REGISTER
DA:DISK ADDRESS REGISTER
MP:MULTIPURPOSE REGISTER

NOTE: TO PREVENT EXTENSIVE PRINTOUTS ON BUFFER FAILURES USE THE "FLAG:IXE" (INHIBIT EXTENDED ERROR REPORTS) SUPERVISOR COMMAND.

EXAMPLE: DS-B>STA/FLAG:IXE OR DS-B>PES/FLAG:IXE

USE OF THIS FLAG WILL PRINT ONLY THE FIRST FAILURE ENCOUNTERED IN THE BUFFER.

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 PROGRESS REPORTS

THIS PROGRAM WILL NOT GIVE ANY PROGRESS REPORTS.

5.0 DEVICE INFORMATION TABLES

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

RLCS - CONTROL AND STATUS REGISTER (XXXXX0)

BIT 15 - COMPOSITE ERROR
BIT 14 - DRIVE ERROR
BIT 13 - NON EXISTENT MEMORY ERROR

```
        - 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
```

RLMP - MULTIPURPOSE REGISTER

FOR READ/WRITE FUNCTION

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

FOR READ AFTER MAINTENANCE FUNCTION

BIT 15-0
FIRST RLMP: CRC OF STARTING DISK ADDRESS VALUE+3
SECOND RLMP: CRC OF CRC OF STARTING DISK ADDRESS VALUE+4

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

3.0 TEST SUMMARIES

TEST 1 - RLCS WRITE ADDRESSABILITY

THIS TEST WILL CHECK THAT THE CONTROL AND STATUS REGISTER CAN BE ACCESSED. IF THE REGISTER CANNOT BE ACCESSED THE PROCESSOR WILL TRAP TO LOCATION 4, WHICH IS SET UP TO HANDLE THE TRAP.

THIS TEST WILL CHECK THAT THE BUS ADDRESS REGISTER CAN BE ACCESSED. IF THE REGISTER CANNOT BE ACCESSED THE PROCESSOR WILL TRAP TO LOCATION 4, WHICH IS SET UP TO HANDLE THE TRAP.

TEST 3 - RLDA WRITE ADDRESSABILITY

THIS TEST WILL CHECK THAT THE DISK ADDRESS REGISTER CAN BE ACCESSED. IF THE REGISTER CANNOT BE ACCESSED THE PROCESSOR WILL TRAP TO LOCATION 4, WHICH IS SET UP TO HANDLE THE TRAP.

TEST 4 - RLMP WRITE ADDRESSABILITY

THIS TEST WILL CHECK THAT THE MULTIPURPOSE REGISTER CAN BE ACCESSED. IF THE REGISTER CANNOT BE ACCESSED THE PROCESSOR WILL TRAP TO LOCATION 4, WHICH IS SET UP TO HANDLE THE TRAP.

TEST 5 - RLCS READ ADDRESSABILITY

THIS TEST WILL CHECK THAT THE CONTROL AND STATUS REGISTER CAN BE ACCESSED. IF THE REGISTER CANNOT BE ACCESSED THE PROCESSOR WILL TRAP TO LOCATION 4, WHICH IS SET UP TO HANDLE THE TRAP.

TEST 6 - RLBA READ ADDRESSABILITY

THIS TEST WILL CHECK THAT THE BUS ADDRESS REGISTER CAN BE ACCESSED. IF THE REGISTER CANNOT BE ACCESSED THE PROCESSOR WILL TRAP TO LOCATION 4, WHICH IS SET UP TO HANDLE THE TRAP.

TEST 7 - RLDA READ ADDRESSABILITY

THIS TEST WILL CHECK THAT THE DISK ADDRESS REGISTER CAN BE ACCESSED. IF THE REGISTER CANNOT BE ACCESSED THE PROCESSOR WILL TRAP TO LOCATION 4, WHICH IS SET UP TO HANDLE THE TRAP.

TEST 8 - RLMP READ ADDRESSABILITY

THIS TEST WILL CHECK THAT THE MULTIPURPOSE REGISTER CAN BE ACCESSED. IF THE REGISTER CANNOT BE ACCESSED THE PROCESSOR WILL TRAP TO LOCATION 4, WHICH IS SET UP TO HANDLE THE TRAP.

TEST 9 - BUS RESET OF RLCS

THIS TEST WILL VERIFY THAT THE BUS RESET OF THE PROCESSOR WILL CLEAR ALL BITS OF THE RLCS WITH THE EXCEPTION OF BIT 7 (CONTROLLER READY), BIT 0 (DRIVE READY) AND BIT 15 (COMPOSITE ERROR) WHICH WILL BE SET IF BIT 14 (DRIVE ERROR) IS SET.

TEST 10 - BUS RESET OF RLBA

THIS TEST WILL VERIFY THAT THE BUS RESET OF THE PROCESSOR WILL

TEST 11 - BUS RESET OF RLDA

THIS TEST WILL VERIFY THAT THE BUS RESET OF THE PROCESSOR WILL CLEAR ALL BITS OF THE RLDA.

TEST 12 - READ WRITE OF RLCS

THIS TEST WILL ATTEMPT TO WRITE RLCS BITS 9-1 AND READ THEM BACK. WALKING AND GROWING 0'S AND 1'S ARE USED. BIT 7 (CONTROLLER READY) IS ALWAYS WRITTEN AS A 1 SO NOT TO INITIATE A FUNCTION. BITS 15, 14 AND 0 ARE TREATED AS DON'T CARE FOR THIS TEST.

TEST 13 - READ WRITE OF RLBA

THIS TEST WILL ATTEMPT TO WRITE RLBA BITS 15-0 AND READ THEM BACK. WALKING AND GROWING 0'S AND 1'S ARE USED. BIT 0 ON A RL11 SHOULD ALWAYS COME BACK AS A 0, WHILE ON AN RLV11 IT IS LOADABLE.

TEST 14 - READ WRITE OF RLDA

THIS TEST WILL ATTEMPT TO WRITE RLDA BITS 15-0 AND READ THEM BACK. WALKING AND GROWING 0'S AND 1'S ARE USED.

TEST 15 - BIS OF RLCS

THIS TEST WILL USE THE 11 INSTRUCTION "BIS" TO SHOW THAT A READ-MODIFY-WRITE SEQUENCE OF THE RLCS WORKS. BITS 9-1 ARE USED, BIT SETTING IN WALKING AND GROWING 0'S AND 1'S. BIT 7 (CONTROLLER READY) IS ALWAYS SET. BITS 15, 14 AND 0 ARE DON'T CARES.

TEST 16 - BIC OF RLCS

THIS TEST WILL USE THE 11 INSTRUCTION "BIC" TO SHOW THAT A READ-MODIFY-WRITE SEQUENCE OF THE RLCS WORKS. BITS 9-1 ARE USED, BIT CLEARING IN WALKING AND GROWING 0'S AND 1'S. BIT 7 (CONTROLLER READY) IS ALWAYS SET. BITS 15, 14 AND 0 ARE DON'T CARES.

TEST 17 - BIS OF RLBA

THIS TEST WILL USE THE 11 INSTRUCTION "BIS" TO SHOW THAT A READ-MODIFY-WRITE SEQUENCE OF THE RLBA WORKS. BITS 15-0 ARE BIT SET USING GROWING AND WALKING 0'S AND 1'S. BIT 0 CANNOT SET ON A RL11, BUT CAN ON A RLV11.

TEST 18 - BIC OF RLBA

READ-MODIFY-WRITE SEQUENCE OF THE RLBA WORKS. BITS 15-0 ARE BIT CLEARED USING GROWING AND WALKING 0'S AND 1'S.

TEST 19 - BIS OF RLDA

THIS TEST WILL USE THE 11 INSTRUCTION "BIS" TO SHOW THAT A READ-MODIFY-WRITE SEQUENCE OF THE RLDA WORKS. BITS 15-0 ARE BIT SET USING GROWING AND WALKING 0'S AND 1'S.

TEST 20 - BIC OF RLDA

THIS TEST WILL USE THE 11 INSTRUCTION "BIC" TO SHOW THAT A READ-MODIFY-WRITE SEQUENCE OF THE RLDA WORKS. BITS 15-0 ARE BIT CLEARED USING GROWING AND WALKING 0'S AND 1'S.

TEST 21 - BUS RESET OF RLCS

THIS TEST WILL VERIFY THAT THE BUS RESET OF THE PROCESSOR WILL CLEAR ALL BITS OF THE RLCS WITH THE EXCEPTION OF BIT 7 (CONTROLLER READY), BIT 0 (DRIVE READY) AND BIT 15 (COMPOSITE ERROR) WHICH WILL BE SET IF BIT 14 (DRIVE ERROR) IS SET.

TEST 22 - BUS RESET OF RLBA

THIS TEST WILL VERIFY THAT THE BUS RESET OF THE PROCESSOR WILL CLEAR ALL BITS OF THE RLBA.

TEST 23 - BUS RESET OF RLDA

THIS TEST WILL VERIFY THAT THE BUS RESET OF THE PROCESSOR WILL CLEAR ALL BITS OF THE RLDA.

TEST 24 - UNIQUENESS OF RLCS

THIS TEST WILL VERIFY THAT WHEN THE RLCS (XXXXX0) IS ADDRESSED ONLY THAT REGISTER IS EFFECTED. BOTH THE RLBA AND THE RLDA ARE SET UP WITH KNOWN DATA, THE RLDA IS WRITTEN, THEN THE RLBA AND RLDA ARE VERIFIED THAT THEY DID NOT CHANGE.

TEST 25 - UNIQUENESS OF RLBA

THIS TEST WILL VERIFY THAT WHEN THE RLBA (XXXXX2) IS ADDRESSED ONLY THAT REGISTER IS EFFECTED. BOTH THE RLCS AND RLDA ARE WRITTEN WITH KNOWN DATA, THE RLBA IS WRITTEN, THEN THE RLCS AND RLDA ARE VERIFIED THAT THEY DID NOT CHANGE.

TEST 26 - UNIQUENESS OF RLDA

THIS TEST WILL VERIFY THAT WHEN THE RLDA (XXXXX4) IS ADDRESSED ONLY THAT REGISTER IS EFFECTED. BOTH THE RLCS AND RLBA ARE

AND RLBA ARE VERIFIED THAT THEY DID NOT CHANGE.

TEST 27 - UNIQUENESS OF RLMP

THIS TEST WILL VERIFY THAT WHEN THE RLMP (XXXXX6) IS ADDRESSED ONLY THAT REGISTER IS EFFECTED. THE RLCS, RLBA AND RLDA ARE WRITTEN WITH KNOW DATA. THE RLMP IS WRITTEN, THEN THE RLCS, RLBA AND RLDA ARE VERIFIED THAT THEY DID NOT CHANGE.

TEST 28 - NOOP FUNCTION (RL11 ONLY)

THIS TEST WILL VERIFY THE OPERATION OF THE NOOP (0) FUNCTION ON PDP-11'S ONLY, SINCE ON AN LSI-11 IT IS A MAINTENANCE FUNCTION. THE ABILITY OF CONTROLLER READY TO RESET AND NO ERRORS ARE CHECKED.

TEST 29 - TEST NOOP DOES NOTHING (RL11 ONLY)

THIS TEST WILL CHECK THAT THE NOOP FUNCTION WILL NOT DISTRUB ANY REGISTERS OF THE CONTROLLER.

TEST 30 - TEST OF INTERRUPT (RL11 ONLY)

THIS TEST WILL CAUSE AN INTERRUPT FROM THE CONTROLLER USING NOOP (RL11 ONLY) TO CHECK THE INTERRUPT LOGIC AND VECTOR.

TEST 31 - TEST PRIORITY BR LEVEL (RL11 ONLY)

THIS TEST WILL CHECK THAT THE PROPER PRIORITY IS ON THE BOARD. WE VERIFY THAT ABOVE THE LEVEL THE BOARD WILL NOT INTERRUPT AND BELOW IT, IT WILL.

TEST 32 - RLV11 MAINT. FORCED OPI TEST,LESS THAN 510 WORDS

PERFORM RLV11 MAINTENANCE FUNCTION 0 WITH LESS THAN 510 WORDS TO FORCE OPI ERROR. THE TEST SHOULD FORCE COMPOSITE ERROR (BIT 15),HEADER NOT FOUND(BIT 12) AND OPI(BIT 10). DRIVE ERROR IS IGNORED.

TEST 33 - RLV11 MAINT. FORCED OPI TEST,MORE THAN 511 WORDS

PERFORM RLV11 MAINTENANCE FUNCTION 0 WITH MORE THAN 511 WORDS TO FORCE OPI ERROR. THE TEST SHOULD FORCE COMPOSITE ERROR (BIT 15),HEADER NOT FOUND(BIT 12) AND OPI(BIT 10). DRIVE ERROR IS IGNORED.

TEST 34 - RLV11 MAINT. FORCED OPI TEST - INTERRUPT MODE

PERFORM TEST OF INTERRUPT BY ISSUING RLV11 MAINTENANCE FUNCTION 0 WITH MORE THAN 511 WORDS TO FORCE OPI ERROR. CHECK INTERRUPT OPERATION AND REPORT IF ERROR FOUND.

TEST 35 - RLV11 OPI TIMEOUT TEST

PERFORM RLV11 MAINTENANCE FUNCTION 0 WITH INTERRUPT MODE.
FORCE OPI TIMEOUT BY SETTING WORD COUNT TO -512 WORDS.
MEASURE OPI TIMEOUT AND COMPARE TO MIN. AND MAX. LIMITS.

TEST 36 - TEST RLV11 MAINT. FUNCTION -FLAG MODE

PERFORM RLV11 MAINTENANCE FUNCTION 0 (FLAG MODE) AND CHECK
DA AND BA REGISTERS FOR PROPER INCREMENT. CHECK
THE SERIAL WRITE/READ DATA PATHS BY READING OUT OF THE FIFO
VIA THE MP REGISTER THE CRC OF THE DA+3 AND THE CRC OF THE
CRC OF THE DA+4 AND COMPARING TO EXPECTED RESULTS. CHECK
THE TRANSFER OF 255 WORDS FROM BUF1 MEMORY THROUGH THE FIFO
INTO BUF2 MEMORY FOR PROPER DATA. CHECK THE PREVIOUSLY
WRITTEN DATA IN THE LAST WORD+1 OF BUF2 FOR A VALUE=123456
TO INSURE THAT THE DATA TRANSFER IN MAINTENANCE MODE WAS
NOT MORE THAN 255 WORDS.

TEST 37 - TEST RLV11 MAINT. FUNCTION -INTERRUPT MODE

PERFORM RLV11 MAINTENANCE FUNCTION 0 (INT. MODE) AND CHECK
DA AND BA REGISTERS FOR PROPER INCREMENT. CHECK
THE SERIAL WRITE/READ DATA PATHS BY READING OUT OF THE FIFO
VIA THE MP REGISTER THE CRC OF THE DA+3 AND THE CRC OF THE
CRC OF THE DA+4 AND COMPARING TO EXPECTED RESULTS. CHECK
THE TRANSFER OF 255 WORDS FROM BUF1 MEMORY THROUGH THE FIFO
INTO BUF2 MEMORY FOR PROPER DATA. CHECK THE PREVIOUSLY
WRITTEN DATA IN THE LAST WORD+1 OF BUF2 FOR A VALUE=123456
TO INSURE THAT THE DATA TRANSFER IN MAINTENANCE MODE WAS
NOT MORE THAN 255 WORDS.

TEST 38 - RLV11 FIFO ADDRESS TEST

TEST THAT FIFO OPERATES CORRECTLY. STORE ADDRESS PATTERN
IN BUF1 (0-255) WHICH CONTAINS A UNIQUE PATTERN IN EACH
LOCATION. PERFORM MAINTENANCE FUNCTION AND TEST BUF2 FOR
PROPER FIFO ADDRESSING.

TEST 39 - RLV11 FIFO ADDRESS COMPLEMENT TEST

TEST THAT FIFO ADDRESSES CORRECTLY. STORE THE ADDRESS COMPLEMENT
OF 0-255 INTO BUF1. PERFORM MAINTENANCE FUNCTION AND CHECK
BUF2 FOR PROPER FIFO ADDRESSING.

TEST 40 - TEST RLV11 MAINT. WITH COMPLEMENT DATA -INTERRUPT MODE

PERFORM RLV11 MAINT. FUNCTION WITH COMPLEMENT DATA IN BUF1.
CHECK DA AND BA REGISTERS FOR PROPER INCREMENT. CHECK
THE SERIAL WRITE/READ DATA PATHS BY READING OUT OF THE FIFO
VIA THE MP REGISTER THE CRC OF THE DA+3 AND THE CRC OF THE
CRC OF THE DA+4 AND COMPARING TO EXPECTED RESULTS. CHECK
THE TRANSFER OF 255 WORDS FROM BUF1 MEMORY THROUGH THE FIFO
INTO BUF2 MEMORY FOR PROPER DATA. CHECK THE PREVIOUSLY
WRITTEN DATA IN THE LAST WORD+1 OF BUF2 FOR A VALUE=123456
TO INSURE THAT THE DATA TRANSFER IN MAINTENANCE MODE WAS
NOT MORE THAN 255 WORDS.

TEST 41 - TEST RLV11 MAINT. WITH RANDOM DATA -INTERRUPT MODE

THE RANDOM PATTERN IS THE SAME FOR EACH CONTROLLER UNDER TEST.
THE RANDOM PATTERN WILL CHANGE AT END OF PASS.
THE RANDOM PATTERN WILL INIT AT START OR RESTART.
CHECK DA AND BA REGISTERS FOR PROPER INCREMENT. CHECK
THE SERIAL WRITE/READ DATA PATHS BY READING OUT OF THE FIFO
VIA THE MP REGISTER THE CRC OF THE DA+3 AND THE CRC OF THE
CRC OF THE DA+4 AND COMPARING TO EXPECTED RESULTS. CHECK
THE TRANSFER OF 255 WORDS FROM BUF1 MEMORY THROUGH THE FIFO
INTO BUF2 MEMORY FOR PROPER DATA. CHECK THE PREVIOUSLY
WRITTEN DATA IN THE LAST WORD+1 OF BUF2 FOR A VALUE=123456
TO INSURE THAT THE DATA TRANSFER IN MAINTENANCE MODE WAS
NOT MORE THAN 255 WORDS.

7.0 PROGRAM LISTING

```
                                .ENABLE AMA
                                .ENABLE ABS
                                .NLIST  ME,CND,MD

000000                          SVC
                000000          SVCINS=0
                000000          SVCTAG=0
                002000          .=2000


002000                                  POINTER BGNSFT,BGNSW,BGNDU,BGNAU


002000                          BGNMOD  MDHEDR

002000                                  HEADER  CVRLA,A,0,,.20.,RL01
002000          103                     .ASCII  ∂C∂
002001          126                     .ASCII  ∂V∂
002002          122                     .ASCII  ∂R∂
002003          114                     .ASCII  ∂L∂
002004          101                     .ASCII  ∂A∂
002005          000                     .BYTE   0
002006          000                     .BYTE   0
002007          000                     .BYTE   0
002010          101                     .ASCII  ∂A∂
002011          060                     .ASCII  ∂0∂
002012  000000                          .WORD   0
002014  000024                          .WORD   20.
002016  027552                          .WORD   L$HARD
002020  027676                          .WORD   L$SOFT
002022  013314                          .WORD   L$HW
002024  013330                          .WORD   L$SW
002026  030114                          .WORD   L$LAST
002030  000000                          .WORD   0
002032  000000                          .WORD   0
002034  000000                          .WORD   0
002036  000000                          .WORD   0
002040  013340                          .WORD   L$DISPATCH
002042  000000                          .WORD   0
002044  000000                          .WORD   0
002046  000000                          .WORD   0
002050      002                         .BYTE   C$REVISION
002051      000                         .BYTE   C$EDIT
002052  000000                          .WORD
002054  000000                          .WORD
002056  000000                          .WORD   0
002060  000000                          .WORD   0
002062  000000                          .WORD   0
002064  002114                          .WORD   L$DVTYP
002066  000000                          .WORD   0
002070  002112                          .WORD   L$DR
002072  002112                          .WORD   L$DRST
002074  014212                          .WORD   L$AU
002076  014206                          .WORD   L$DU
```

```
                                        .WORD   14
002102  000000                          .WORD   0
002104  013462                          .WORD   L$INIT
002106  014144                          .WORD   L$CLEAN

002110                                  ENDMOD


002110                                  DEVREG
002110  000000                          .WORD   0
002112  000001                          .BLKW

002114                                  DEVTYP  <RL01>
002114  046122  030460      000         .ASCIZ  @RL01@
        002122                          .EVEN

                                .SBTTL  GLOBAL EQUATES
002122                          BGNMOD  GLBEQAT

002122                                  EQUALS

                                ;
                                ; BIT DIFINITIONS
                                ;
                100000          BIT15== 100000
                040000          BIT14== 40000
                020000          BIT13== 20000
                010000          BIT12== 10000
                004000          BIT11== 4000
                002000          BIT10== 2000
                001000          BIT09== 1000
                000400          BIT08== 400
                000200          BIT07== 200
                000100          BIT06== 100
                000040          BIT05== 40
                000020          BIT04== 20
                000010          BIT03== 10
                000004          BIT02== 4
                000002          BIT01== 2
                000001          BIT00== 1
                                ;
                001000          BIT9==  BIT09
                000400          BIT8==  BIT08
                000200          BIT7==  BIT07
                000100          BIT6==  BIT06
                000040          BIT5==  BIT05
                000020          BIT4==  BIT04
                000010          BIT3==  BIT03
                000004          BIT2==  BIT02
                000002          BIT1==  BIT01
                000001          BIT0==  BIT00
                                ;
                                ; EVENT FLAG DEFINITIONS
                                ;   EF32:EF17 RESERVED FOR SUPERVISOR TO PROGRAM COMMUNICATION
                                ;   EF16:EF01 AVAILABLE FOR PROGRAM USE
                                ;
```

```
                                EF.START==      32.             ; START COMMAND WAS ISSUED
                                EF.RESTART==    31.             ; RESTART COMMAND WAS ISSUED
                                EF.CONTINUE==   30.             ; CONTINUE COMMAND WAS ISSUED
                                EF.NEW==        29.             ; A NEW PASS HAS BEEN STARTED
                                EF.PWR==        28.             ; A POWER-FAIL/POWER-UP OCCURRED
                                ;
                                EF16==  16.
                                EF15==  15.
                                EF14==  14.
                                EF13==  13.
                                EF12==  12.
                                EF11==  11.
                                EF10==  10.
                                EF09==  9.
                                EF08==  8.
                                EF07==  7
                                EF06==  6
                                EF05==  5
                                EF04==  4
                                EF03==  3
                                EF02==  2
                                EF01==  1
                                ;
                                ; PRIORITY LEVEL DEFINITIONS
                                ;
                                PRI07== 340
                                PRI06== 300
                                PRI05== 240
                                PRI04== 200
                                PRI03== 140
                                PRI02== 100
                                PRI01== 40
                                PRI00== 0
                                DRDY=BIT0               ;DRIVE READY (RLCS)
                                INTEN=BIT6              ;INTERRUPT ENABLE (RLCS)
                                ERR=BIT15               ;RL11 ERROR (RLCS)
                                DERR=BIT14              ;RL01 DRIVE ERROR (RLCS)
                                OPI=BIT10               ;OPERATION INCOMPLETE (RLCS)
                                CRDY=BIT7               ;CONTROLLER READY (RLCS)
                                BA17=BIT5               ;EXTENDED ADDRESS BIT 17 (RLCS)
                                BA16=BIT4               ;EXTENDED ADDRESS BIT 16 (RLCS)
                                NXM=BIT13               ;NON-EXISTANT MEMORY (RLCS)
                                DS0=0                   ;DRIVE SELECT 0 (RLCS)
                                DS1=BIT8                ;DRIVE SELECT 1 (RLCS)
                                DS2=BIT9                ;DRIVE SELECT 2 (RLCS)
                                DS3=BIT8!BIT9           ;DRIVE SELECT 3 (RLCS)
                                NOOP0=0                 ;FUNCTION-NOOP(0)-RL11
                                NOOP7=BIT1!BIT2!BIT3    ;FUNCTION-NOOP(7)-RL11
                                MAINT=0                 ;MAINTENANCE FUNCTION-RLV11
                                WRCHK=BIT1              ;WRITE CHECK FUNCTION
                                GSTAT=BIT2              ;GET STATUS FUNCTION
                                SEEK=BIT2!BIT1          ;SEEK FUNCTION
                                RDHDR=BIT3              ;READ HEADER FUNCTION
                                WRITE=BIT3!BIT1         ;WRITE DATA FUNCTION
                                READ=BIT3!BIT2          ;READ DATA FUNCTION
                                GODRVR=BIT1!BIT7        ;CRDY AND DRDY
```

```
                000010          DRST=BIT3               ;DRIVE RESET (RLDA)
                000002          GSBIT=BIT1              ;GET STATUS BIT (RLDA)
                000001          MK=BIT0                 ;MARKER BIT (RLDA)
                000004          SIGN=BIT2               ;SIGN BIT (RLDA)
                000100          RHHS=BIT6               ;HEAD SELECT IN READ HEADER
                000100          STHS=BIT6               ;HEAD SELECT IN STATUS BACK
                000020          DAHS=BIT4               ;HEAD SELECT IN SEEK

                                ;OFFSET FOR HARDWARE P-TABLE

                000000          CSR=0
                000002          VECT=2
                000004          PRIOR=4
                000006          DRBT=6
                000010          CNT=10

                                ;OFFSET FOR SOFTWARE P-TABLE

                000000          DLT=0
                000002          ELT=2
                000004          SIZE=4

002122                          ENDMOD

                                .SBTTL  GLOBAL DATA

002122                          BGNMOD  GLBDAT

                                .SBTTL  GLOBAL DATA

002122  000000          UUT:    .WORD   0
002124  000000          UNITST: .WORD   0
002126  000000          RLCS:   .WORD   0
002130  000000          RLBA:   .WORD   0
002132  000000          RLDA:   .WORD   0
002134  000000          RLMP:   .WORD   0
002136  000000          BCSR:   .WORD   0
002140  000000          BPRIOR: .WORD   0
002142  000000          BVEC:   .WORD   0
002144  000000          DRIVE:  .WORD   0               ;DRIVE UNDER TEST
002146  000000          B.CS:   .WORD   0
002150  000000          B.BA:   .WORD   0
002152  000000          B.DA:   .WORD   0
002154  000000          B.MP:   .WORD   0
002156  000000          DERFLG: .WORD
002160  000000          E.CS:   .WORD   0
002162  000000          E.BA:   .WORD   0
002164  000000          E.DA:   .WORD   0
002166  000000          E.MP:   .WORD   0
002170  000000          E.MP1:  .WORD   0
002172  000000          PFLG:   .WORD   0               ;PROCESSOR TYPE  0=UNIBUS  1=Q-BUS
002174  000000          TRPFLG: .WORD   0
002176  000000          INTFLG: .WORD   0               ;INTERRUPT OCCURANCE FLAG
002200  000000          LDCSR:  .WORD   0               ;LOCATION TO FORM RLCS
002202  120001          XPOLY:  .WORD   120001
002204  000004          ERRVEC: .WORD   4
```

```
    225  002206  000000          BCCFBK: .WORD   0               ;LOCATION USED BY "SIMBCC"
    226  002210  000000          CALBCC: .WORD   0               ;LOCATION USED BY "SIMBCC"
    227  002212  000000          TEMP2:  .WORD   0               ;LOCATION USED BY "SIMBCC"
    228  002214  000000          TEMP3:  .WORD   0               ;LOCATION USED BY "SIMBCC"
    229  002216  000000          TEMP4:  .WORD   0               ;LOCATION USED BY "SIMBCC"
    230  002220  000000          TEMP5:  .WORD   0
    231  002222  000000          TEMP1:  .WORD   0
    232  002224  000000          TMP0:   .WORD   0
    233  002226  000000          TMP1:   .WORD   0
    234  002230  000000          TMP2:   .WORD   0
    235  002232  000000          CHECK:  .WORD   0
    236  002234  000000          GDDAT:  .WORD   0
    237  002236  000000          BDDAT:  .WORD   0
    238  002240  000000          GCRCPT: .WORD   0
    239  002242  000000          GDCRCA: .WORD   0
    240  002244  000000          GDCRCB: .WORD   0
    241  002246  000000          GDDATP: .WORD   0
    242  002250  000000          GDATMP: .WORD   0
    243  002252  000000          MATFLG: .WORD   0
    244  002254  000000          ERRLMT: .WORD   0
    245  002256  000000          WHY:    .WORD   0               ;REASON FOR DROP IN AUTOSIZE
    246  002260  000000          T.CNTLR:        .WORD   0
    247  002262  000000          TMPFNC: .WORD   0
    248  002264  000233          OPIMN:  .WORD   155.
    249  002266  001212          OPIMX:  .WORD   650.
    250  002270  176543          HINUM:  .WORD   176543
    251  002272  123456          LONUM:  .WORD   123456
    252  002274  000000          TEMLO:  .WORD   0
    253  002276  000000          TEMHI:  .WORD   0
    254  002300  000000          PATSAV: .WORD   0
    255  002302  000000          SAVCNT: .WORD   0
    256
    257                          .SBTTL  PATTERNS FOR REGISTER R/W
    258                          ;
    259                          ;PATTERNS USED FOR LOADING/READING REGISTERS
    260
    261  002304  000000          BEGPAT: 0                       ;GROWING 1
    262  002306  000001                  1
    263  002310  000003                  3
    264  002312  000007                  7
    265  002314  000017                  17
    266  002316  000037                  37
    267  002320  000077                  77
    268  002322  000177                  177
    269  002324  000377                  377
    270  002326  000777                  777
    271  002330  001777                  1777
    272  002332  003777                  3777
    273  002334  007777                  7777
    274  002336  017777                  17777
    275  002340  037777                  37777
    276  002342  077777                  77777
    277  002344  177777                  177777
    278  002346  177776                  177776                ;GROWING 0
    279  002350  177774                  177774
    280  002352  177770                  177770
```

```
                                                177760
                                                177740
                                                177700
                                                177600
                                                177400
                                                177000
                                                176000
                                                174000
                                                170000
                                                160000
                                                140000
                                                100000

                                                000000
                                                1                       ;WALKING 1
                                                2
                                                4
                                                10
                                                20
                                                40
                                                100
                                                200
                                                400
                                                1000
                                                2000
                                                4000
                                                10000
                                                20000
                                                40000
                                                100000
                                                177777                  ;WALKING 0
                                                177776
                                                177775
                                                177773
                                                177767
                                                177757
                                                177737
                                                177677
                                                177577
                                                177377
                                                176777
                                                175777
                                                173777
                                                167777
                                                157777
                                                137777
                                                077777
                                                177777
                                ENDPAT:         000000

                                .SBTTL  PATTERNS FOR MAINT. CRC TEST OF SERIAL DATA PATH
                                PATCRC: 155552
                                        133330
                                        066663
                                        125247
```

CVRLAA.P11 14-APR-78 15:04 PATTERNS FOR MAINT. CRC TEST OF SERIAL DATA PATH

```
337  002524  052522                    052522
338  002526  177774                    177774
339  002530  000374                    000374
340  002532  022217                    022217
341  002534  044441                    044441
342  002536  166663                    166663
343  002540  144441                    144441
344  002542  033330                    033330
345  002544  011106                    011106
346  002546  070704                    070704
347  002550  107065                    107065
348  002552  111106                    111106
349  002554  167353                    167353
350  002556  156732                    156732
351  002560  146311                    146311
352  002562  135670                    135670
353  002564  114626                    114626
354  002566  104205                    104205
355  002570  073564                    073564
356  002572  063143                    063143
357  002574  042101                    042101
358  002576  031460                    031460
359  002600  021037                    021037
360  002602  010416                    010416
361  002604  000000            CRCEND: 000000
362
363                             ;DATA PATTERNS FOR MAINTENANCE TEST
364  002606  155555            PATDAT: 155555
365  002610  133333                    133333
366  002612  066666                    066666
367  002614  125252                    125252
368  002616  052525                    052525
369  002620  177777                    177777
370  002622  000000                    000000
371  002624  107070                    107070
372  002626  070707                    070707
373  002630  144444                    144444
374  002632  033333                    033333
375  002634  011111                    011111
376  002636  022222                    022222
377  002640  044444                    044444
378  002642  111111                    111111
379  002644  166666                    166666
380  002646  010421                    010421
381  002650  021042                    021042
382  002652  031463                    031463
383  002654  042104                    042104
384  002656  063146                    063146
385  002660  073567                    073567
386  002662  104210                    104210
387  002664  114631                    114631
388  002666  135673                    135673
389  002670  146314                    146314
390  002672  156735                    156735
391  002674  167356                    167356
392  002676  000000            ENDDAT: 000000
```

```
                                ;PATTERNS FOR TEST OF RLCS
002700  000000  CSPAT:   .WORD   0               ;SHIFTING 1
002702  000002           .WORD   BIT1
002704  000004           .WORD   BIT2
002706  000010           .WORD   BIT3
002710  000020           .WORD   BIT4
002712  000040           .WORD   BIT5
002714  000100           .WORD   BIT6
002716  000400           .WORD   BIT8
002720  001000           .WORD   BIT9
002722  001576           .WORD   1576            ;GROWING 0
002724  001574           .WORD   1574
002726  001570           .WORD   1570
002730  001560           .WORD   1560
002732  001540           .WORD   1540
002734  001500           .WORD   1500
002736  001400           .WORD   1400
002740  001576           .WORD   1576            ;SHIFT 0
002742  001574           .WORD   1574
002744  001566           .WORD   1566
002746  001556           .WORD   1556
002750  001536           .WORD   1536
002752  001436           .WORD   1436
002754  001136           .WORD   1136
002756  000076           .WORD   76
002760  000006           .WORD   6               ;GROWING 1
002762  000016           .WORD   16
002764  000036           .WORD   36
002766  000076           .WORD   76
002770  000176           .WORD   176             ;
002772  000576           .WORD   576
002774  001576           .WORD   1576
002776  000000  CSEND:   .WORD   0
003000  000240  HDRBUF:  .BLKW   160.
                .SBTTL  BUFFERS FOR RLV11 MAINTENANCE FUNCTION
003500  000400  BUF1:    .BLKW   256.
004500  000400  BUF2:    .BLKW   256.
005500          ENDMOD
005500          BGNMOD  GLBTXT
                .SBTTL  GLOBAL TEXT
005500  047516  041440  047117  NORES:   .ASCIZ  /NO CONTROLLER/
005516  047516  042040  044522  NODRY:   .ASCIZ  /NO DRIVE CONNECTED/
005541    040   051104  000126  DEMES:   .ASCIZ  / DRV/
005546  047040  046530     000  NXMMES:  .ASCIZ  / NXM/
005553    040   050117  000111  OPIMES:  .ASCIZ  / OPI/
005560  044040  051103  000103  HCRCMES: .ASCIZ  / HCRC/
005566  044040  043116     000  HNFMES:  .ASCIZ  / HNF/
005573    040   041504  000113  DCKMES:  .ASCIZ  / DCK/
005600  042040  052114     000  DLTMES:  .ASCIZ  / DLT/
005605    105   050130  042047  EXPMES:  .ASCIZ  /EXP'D: COMP HNF OPI  REC'D: /
```

```
005642  047516  042440  050130  NONMES: .ASCIZ  /NO EXPECTED ERRORS FOUND/
005673     015  000012          MSCRLF: .ASCIZ  <15><12>
005676  000015                  LF:     .ASCIZ  <15>
005700  041440  046517  000120  COMP:   .ASCIZ  / COMP/
005706  047506  041522  042105  OPIERR: .ASCIZ  /FORCED OPI(GET STATUS) CAUSED OTHER ERRORS/
005761     116  047517  020120  NOPMES: .ASCIZ  /NOOP OPERATION-FLAG MODE/
006012  047516  050117  047440  NOPINT: .ASCIZ  /NOOP OPERATION-INTR. MODE/
006044  040515  047111  042524  MATMES: .ASCIZ  /MAINTENANCE OPERATION-FLAG MODE/
006104  040515  047111  042524  MAT!NT: .ASCIZ  /MAINTENANCE OPERATION-INTERRUPT MODE/
006151     103  035123  000040  ARLCS:  .ASCIZ  /CS: /
006156  041040  035101  000040  ARLBA:  .ASCIZ  / BA: /
006164  042040  035101  000040  ARLDA:  .ASCIZ  / DA: /
006172  046440  035120  000040  ARLMP:  .ASCIZ  / MP: /
006200  042502  047506  042522  BEREG:  .ASCIZ  /BEFORE COMMAND: /
006221     124  046511  020105  AFREG:  .ASCIZ  /TIME OF ERROR:  /
006242  047503  052116  047522  CRTIM:  .ASCIZ  /CONTROLLER TIMED OUT/
006267     104  044522  042[illegible]6  DRTIM:  .ASCIZ  /DRIVE READY TIMED OUT/
006315     103  047101  047040  EM1:    .ASCIZ  /CAN NOT ADDRESS RLCS/
006342  040503  020116  047516  EM2:    .ASCIZ  /CAN NOT ADDRESS RLBA/
006367     103  047101  047040  EM3:    .ASCIZ  /CAN NOT ADDRESS RLDA/
006414  040503  020116  047516  EM4:    .ASCIZ  /CAN NOT ADDRESS RLMP/
006441     122  041514  020123  EM5:    .ASCIZ  %RLCS READ/WRITE ERROR (BIT 0 DON'T CARE)%
006512  046122  040502  051040  EM6:    .ASCIZ  %RLBA READ/WRITE ERROR%
006540  046122  040504  051040  EM7:    .ASCIZ  %RLDA READ/WRITE ERROR%
006566  046122  040502  042440  EM10:   .ASCIZ  /RLBA ERROR AFTER MAINT. FUNCTION/
006627     117  044520  053440  EM11:   .ASCIZ  /OPI WOULD NOT GENERATE INTERRUPT/
006670  046122  040504  042440  EM12:   .ASCIZ  /RLDA ERROR AFTER MAINT. FUNCTION/
006731     116  020117  047111  EM13:   .ASCIZ  /NO INTERRUPT FROM NOOP(0)/
006763     116  047517  024120  EM14:   .ASCIZ  /NOOP(0) MODIFIED RLMP/
007011     116  047517  024120  EM15:   .ASCIZ  /NOOP(0) MODIFIED RLBA/
007037     116  047517  024120  EM16:   .ASCIZ  /NOOP(0) MODIFIED RLDA/
007065     111  052116  051105  EM17:   .ASCIZ  /INTERRUPT PRIORITY FAILURE/
007120  046122  050115  020072  EM20:   .ASCIZ  /RLMP: CRC OF DA+3 ERROR (SERIAL DATA PATH)/
007173     122  046514  035120  EM21:   .ASCIZ  /RLMP; CRC OF CRC OF DA+4 ERROR (SERIAL DATA PATH)/
007255     115  044501  052116  EM22:   .ASCIZ  %MAINT. FILL/EMPTY FIFO DMA DATA TRANSFER COMPARE ERROR%
007344  040515  047111  042524  EM23:   .ASCIZ  /MAINTENANCE LAST WORD+1 FAILURE/
007404  047516  044440  052116  EM24:   .ASCIZ  /NO INTERRUPT FROM MAINT. FUNCTION/
007446  040515  047111  042524  EM25:   .ASCIZ  /MAINTENANCE FIFO ADDRESS ERROR/
007505     115  044501  052116  EM26:   .ASCIZ  /MAINTENANCE FIFO ADDRESS COMPLEMENT ERROR/
007557     115  044501  052116  EM27:   .ASCIZ  /MAINT. FORCED OPI ERROR,LESS THAN 510 WORDS/
007633     115  044501  052116  EM30:   .ASCIZ  /MAINT. FORCED OPI ERROR,MORE THAN 511 WORDS/
007707     117  044520  052040  EM31:   .ASCIZ  /OPI TIMING ERROR/
007730  051127  052111  047111  EM44:   .ASCIZ  /WRITING RLMP MODIFIED RLCS/
007763     127  044522  044524  EM45:   .ASCIZ  /WRITING RLMP MODIFIED RLBA/
010016  051127  052111  047111  EM46:   .ASCIZ  /WRITING RLMP MODIFIED RLDA/
010051     102  052111  051440  EM61:   .ASCIZ  /BIT SET INSTRUCTION ON RLCS YIELDED WRONG RESULT/
010132  044502  020124  046103  EM62:   .ASCIZ  /BIT CLEAR INSTRUCTION ON RLCS YIELDED WRONG RESULT/
010215     102  052111  051440  EM63:   .ASCIZ  /BIT SET INSTRUCTION ON RLBA YIELDED WRONG RESULT/
010276  044502  020124  046103  EM64:   .ASCIZ  /BIT CLEAR INSTRUCTION ON RLBA YIELDED WRONG RESULT/
010361     102  052111  051440  EM65:   .ASCIZ  /BIT SET INSTRUCTION ON RLDA YIELDED WRONG RESULT/
010442  044502  020124  046103  EM66:   .ASCIZ  /BIT CLEAR INSTRUCTION ON RLDA YIELDED WRONG RESULT/
010525     102  051525  051040  EM67:   .ASCIZ  /BUS RESET DID NOT CLEAR RLCS/
010562  052502  020123  042522  EM70:   .ASCIZ  /BUS RESET DID NOT CLEAR RLBA/
010617     102  051525  051040  EM71:   .ASCIZ  /BUS RESET DID NOT CLEAR RLDA/
010654  051127  052111  047111  EM72:   .ASCIZ  /WRITING RLCS MODIFIED RLBA/
010707     127  044522  044524  EM73:   .ASCIZ  /WRITING RLCS MODIFIED RLDA/
```

```
        010742  051127  052111  047111  EM74:   .ASCIZ  /WRITING RLBA MODIFED RLCS/
        010774  051127  052111  047111  EM75:   .ASCIZ  /WRITING RLBA MODIFED RLDA/
        011026  051127  052111  047111  EM76:   .ASCIZ  /WRITING RLDA MODIFIED RLCS/
        011061     127  044522  044524  EM77:   .ASCIZ  /WRITING RLDA MODIFIED RLBA/
        011114  046122  051503  041440  EM101:  .ASCIZ  /RLCS CONTAINED FOLLOWING ERROR(S):  /
        011161  000170                   EM102:  .BLKB   120.

                011352                   .EVEN

   (0)  011352                           ENDMOD
   440
   441                                   .SBTTL  GLOBAL ERRORS
   442
   443  011352                           BGNMOD  GLBERR
   444
   445  011352                           BGNMSG  ERRO
   446
   447  011352  004737  012042                   JSR     PC,LINE1
   448  011356  004737  012076                   JSR     PC,LINE2
   449
   450  011362  004537  014216                   JSR     R5,CKERLT       ;CHECK ERROR LIMIT
   451  011366                                   ENDMSG
   452  011366                           L10000:
   453  011366  104023                           EMT     C$MSG
   454
   455  011370                           BGNMSG  ERR1
   456
   457  011370  004737  012042                   JSR     PC,LINE1
   458
   459  011374  004537  014216                   JSR     R5,CKERLT       ;CHECK ERROR LIMIT
   460  011400                                   ENDMSG
   461  011400                           L10001:
   462  011400  104023                           EMT     C$MSG
```

```
463
464  011402                          BGNMSG  ERR2
465
466  011402  004737  012042                  JSR     PC,LINE1
467  011406                                  PRINTB  #FRMT4,GDDAT,BDDAT
468  011406  013746  002236                  MOV     BDDAT,-(SP)
469  011412  013746  002234                  MOV     GDDAT,-(SP)
470  011416  012746  012534                  MOV     #FRMT4,-(SP)
471  011422  012746  000003                  MOV     #3,-(SP)
472  011426  010600                          MOV     SP,R0
473  011430  104014                          EMT     C$PNTB
474  011432  062706  000010                  ADD     #10,SP
475  011436  004537  014216                  JSR     R5,CKERLT
476  011442                                  ENDMSG
477  011442                          L10002:
478  011442  104023                          EMT     C$MSG
479
480
481  011444                          BGNMSG  ERR3
482  011444  004737  012042                  JSR     PC,LINE1
483  011450  004737  012076                  JSR     PC,LINE2
484  011454                                  PRINTB  #FRMT99
485  011454  012746  012655                  MOV     #FRMT99,-(SP)
486  011460  012746  000001                  MOV     #1,-(SP)
487  011464  010600                          MOV     SP,R0
488  011466  104014                          EMT     C$PNTB
489  011470  062706  000004                  ADD     #4,SP
490  011474                                  PRINTB  #FRMT14,E.BA,E.DA,TMP0,GDDAT,BDDAT
491  011474  013746  002236                  MOV     BDDAT,-(SP)
492  011500  013746  002234                  MOV     GDDAT,-(SP)
493  011504  013746  002224                  MOV     TMP0,-(SP)
494  011510  013746  002164                  MOV     E.DA,-(SP)
495  011514  013746  002162                  MOV     E.BA,-(SP)
496  011520  012746  013217                  MOV     #FRMT14,-(SP)
497  011524  012746  000006                  MOV     #6,-(SP)
498  011530  010600                          MOV     SP,R0
499  011532  104014                          EMT     C$PNTB
500  011534  062706  000016                  ADD     #16,SP
501  011540  004537  014216                  JSR     R5,CKERLT
502  011544                                  ENDMSG
503  011544                          L10003:
504  011544  104023                          EMT     C$MSG
505
506
507
508  011546                          BGNMSG  ERR4
509
510  011546  004737  012042                  JSR     PC,LINE1
511  011552  004737  012076                  JSR     PC,LINE2
512  011556                                  PRINTB  #FRMT4,GDDAT,BDDAT
513  011556  013746  002236                  MOV     BDDAT,-(SP)
514  011562  013746  002234                  MOV     GDDAT,-(SP)
515  011566  012746  012534                  MOV     #FRMT4,-(SP)
516  011572  012746  000003                  MOV     #3,-(SP)
517  011576  010600                          MOV     SP,R0
518  011600  104014                          EMT     C$PNTB
```

```
519  011602  062705  000010                  ADD     #10,SP
520
521  011606  004537  014216                  JSR     R5,CKERLT       ;CHECK ERROR LIMIT
522  011612                                  ENDMSG
523  011612                          L10004:
524  011612  104023                          EMT     C$MSG
525
526  011614                          BGNMSG  ERR5
527
528  011614  004737  012042                  JSR     PC,LINE1
529
530  011620  004537  014216                  JSR     R5,CKERLT       ;CHECK ERROR LIMIT
531  011624                                  ENDMSG
532  011624                          L10005:
533  011624  104023                          EMT     C$MSG
534
535  011626                          BGNMSG  ERR6
536
537  011626  004737  012042                  JSR     PC,LINE1
538  011632  004737  012314                  JSR     PC,LINE3
539  011636  004737  012076                  JSR     PC,LINE2
540
541
542  011642                          1$:     PRINTB  #FRMT99
543  011642  012746  012655                  MOV     #FRMT99,-(SP)
544  011646  012746  000001                  MOV     #1,-(SP)
545  011652  010600                          MOV     SP,R0
546  011654  104014                          EMT     C$PNTB
547  011656  062706  000004                  ADD     #4,SP
548  011662  004537  014216                  JSR     R5,CKERLT       ;CHECK ERROR LIMIT
549  011666                                  ENDMSG
550  011666                          L10006:
551  011666  104023                          EMT     C$MSG
552
553  011670                          BGNMSG  ERR7
554
555  011670  004737  012042                  JSR     PC,LINE1
556  011674                                  PRINTB  #FRMT6,BDDAT
557  011674  013746  002236                  MOV     BDDAT,-(SP)
558  011700  012746  012731                  MOV     #FRMT6,-(SP)
559  011704  012746  000002                  MOV     #2,-(SP)
560  011710  010600                          MOV     SP,R0
561  011712  104014                          EMT     C$PNTB
562  011714  062706  000006                  ADD     #6,SP
563
564  011720  004537  014216                  JSR     R5,CKERLT
565
566  011724                                  ENDMSG
567  011724                          L10007:
568  011724  104023                          EMT     C$MSG
569
570  011726                          BGNMSG  ERR10
571  011726  004737  012042                  JSR     PC,LINE1
572  011732  004737  012076                  JSR     PC,LINE2
573  011736  004737  012366                  JSR     PC,LINE4
574  011742                                  PRINTB  #FRMT99
```

```
   575  011742  012746  012655          MOV     #FRMT99,-(SP)
   576  011746  012746  000001          MOV     #1,-(SP)
   577  011752  010600                  MOV     SP,R0
   578  011754  104014                  EMT     C$PNTB
   579  011756  062706  000004          ADD     #4,SP
   580  011762  004537  014216          JSR     R5,CKERLT
   581  011766                          ENDMSG
   582  011766                  L10010:
   583  011766  104023                  EMT     C$MSG
   584
   585  011770                  BGNMSG  ERR11
   586  011770  004737  012042          JSR     PC,LINE1
   587  011774  004737  012076          JSR     PC,LINE2
   588  012000                          PRINTB  #FRMT10,OPIMN,OPIMX,BDDAT
   589  012000  013746  002236          MOV     BDDAT,-(SP)
   590  012004  013746  002266          MOV     OPIMX,-(SP)
   591  012010  013746  002264          MOV     OPIMN,-(SP)
   592  012014  012746  012766          MOV     #FRMT10,-(SP)
   593  012020  012746  000004          MOV     #4,-(SP)
   594  012024  010600                  MOV     SP,R0
   595  012026  104014                  EMT     C$PNTB
   596  012030  062706  000012          ADD     #12,SP
   597  012034  004537  014216          JSR     R5,CKERLT
   598  012040                          ENDMSG
   599  012040                  L10011:
   600  012040  104023                  EMT     C$MSG
   601
   602
   603  012042                  LINE1:  PRINTB  #FRMT1,RLCS,<B,DRIVE+1>
   604  012042  005046                  CLR     -(SP)
   605  012044  153716  002145          BISB    DRIVE+1,(SP)
   606  012050  013746  002126          MOV     RLCS,-(SP)
   607  012054  012746  012414          MOV     #FRMT1,-(SP)
   608  012060  012746  000003          MOV     #3,-(SP)
   609  012064  010600                  MOV     SP,R0
   610  012066  104014                  EMT     C$PNTB
   611  012070  062706  000010          ADD     #10,SP
   612  012074  000207                  RTS     PC
   613
   614  012076                  LINE2:  PRINTB  #FRMT2,#BEREG,#ARLCS,B.CS,#ARLBA,B.BA
   615  012076  013746  002150          MOV     B.BA,-(SP)
   616  012102  012746  006156          MOV     #ARLBA,-(SP)
   617  012106  013746  002146          MOV     B.CS,-(SP)
   618  012112  012746  006151          MOV     #ARLCS,-(SP)
   619  012116  012746  006200          MOV     #BEREG,-(SP)
   620  012122  012746  012454          MOV     #FRMT2,-(SP)
   621  012126  012746  000006          MOV     #6,-(SP)
   622  012132  010600                  MOV     SP,R0
   623  012134  104014                  EMT     C$PNTB
   624  012136  062706  000016          ADD     #16,SP
   625  012142                          PRINTB  #FRMT2A,#ARLDA,B.DA,#ARLMP,B.MP
   626  012142  013746  002154          MOV     B.MP,-(SP)
   627  012146  012746  006172          MOV     #ARLMP,-(SP)
   628  012152  013746  002152          MOV     B.DA,-(SP)
   629  012156  012746  006164          MOV     #ARLDA,-(SP)
   630  012162  012746  012473          MOV     #FRMT2A,-(SP)
```

```
  631  012166  012746  000005            MOV     #5,-(SP)
  632  012172  010600                    MOV     SP,R0
  633  012174  104014                    EMT     C$PNTB
  634  012176  062706  000014            ADD     #14,SP
  635  012202                            PRINTB  #FRMT2,#AFREG,#ARLCS,E.CS,#ARLBA,E.BA
  636  012202  013746  002162            MOV     E.BA,-(SP)
  637  012206  012746  006156            MOV     #ARLBA,-(SP)
  638  012212  013746  002160            MOV     E.CS,-(SP)
  639  012216  012746  006151            MOV     #ARLCS,-(SP)
  640  012222  012746  006221            MOV     #AFREG,-(SP)
  641  012226  012746  012454            MOV     #FRMT2,-(SP)
  642  012232  012746  000006            MOV     #6,-(SP)
  643  012236  010600                    MOV     SP,R0
  644  012240  104014                    EMT     C$PNTB
  645  012242  062706  000016            ADD     #16,SP
  646  012246                            PRINTB  #FRMT2B,#ARLDA,E.DA,#ARLMP,E.MP,E.MP1
  647  012246  013746  002170            MOV     E.MP1,-(SP)
  648  012252  013746  002166            MOV     E.MP,-(SP)
  649  012256  012746  006172            MOV     #ARLMP,-(SP)
  650  012262  013746  002164            MOV     E.DA,-(SP)
  651  012266  012746  006164            MOV     #ARLDA,-(SP)
  652  012272  012746  012506            MOV     #FRMT2B,-(SP)
  653  012276  012746  000006            MOV     #6,-(SP)
  654  012302  010600                    MOV     SP,R0
  655  012304  104014                    EMT     C$PNTB
  656  012306  062706  000016            ADD     #16,SP
  657  012312  000207                    RTS     PC
  658
  659  012314                    LINE3:  PRINTB  #FRMT3,#EM101
  660  012314  012746  011114            MOV     #EM101,-(SP)
  661  012320  012746  012527            MOV     #FRMT3,-(SP)
  662  012324  012746  000002            MOV     #2,-(SP)
  663  012330  010600                    MOV     SP,R0
  664  012332  104014                    EMT     C$PNTB
  665  012334  062706  000006            ADD     #6,SP
  666  012340                            PRINTB  #FRMT3,#EM102
  667  012340  012746  011161            MOV     #EM102,-(SP)
  668  012344  012746  012527            MOV     #FRMT3,-(SP)
  669  012350  012746  000002            MOV     #2,-(SP)
  670  012354  010600                    MOV     SP,R0
  671  012356  104014                    EMT     C$PNTB
  672  012360  062706  000006            ADD     #6,SP
  673  012364  000207                    RTS     PC
  674
  675  012366                    LINE4:  PRINTB  #FRMT3,#EM102
  676  012366  012746  011161            MOV     #EM102,-(SP)
  677  012372  012746  012527            MOV     #FRMT3,-(SP)
  678  012376  012746  000002            MOV     #2,-(SP)
  679  012402  010600                    MOV     SP,R0
  680  012404  104014                    EMT     C$PNTB
  681  012406  062706  000006            ADD     #6,SP
  682  012412  000207                    RTS     PC
  683
  684
       012414  040445  047503  052116  FRMT1:  .ASCIZ  /%ACONTROLLER: %06%A  DRIVE: %01/
       012454  047045  052045  052045  FRMT2:  .ASCIZ  /%N%T%T%06%T%06/
```

```
012473  045   022524  033117  FRMT2A: .ASCIZ  /%T%06%T%06/
012506  052045  047445  022466  FRMT2B: .ASCIZ  /%T%06%T%06%A %06/
012527  045   022516  000124  FRMT3:  .ASCIZ  /%N%T/
012534  047045  040445  054105  FRMT4:  .ASCIZ  /%N%AEXP'D: %06%A REC'D: %06%N/
012572  047045  042045  022463  FRMT98: .ASCIZ  /%N%D3%A WORDS BAD OUT OF 255 WORDS TRANSFERRED%N%N/
012655  045   000116          FRMT99: .ASCIZ  /%N/
012660  047045  040445  040514  FRMT5:  .ASCIZ  /%N%ALAST: %06%A PRES: %06%A EXP'D: %06%N/
012731  045   022516  040501  FRMT6:  .ASCIZ  /%N%AAT PROCESSOR LEVEL %06%N/
012766  047045  040445  040522  FRMT10: .ASCIZ  /%N%ARANGE %D3%A - %D3%A  MILLISECONDS WAS %D6%N/
013046  040445  051105  047522  FRMT11: .ASCIZ  /%AERROR LIMIT EXCEEDED-DROPPED%N/
013107  045   022516  042101  FRMT12: .ASCIZ  /%N%ADRIVE DID NOT RECOVER FROM POWER FAILURE%N/
013166  047045  052045  040445  FRMT13: .ASCIZ  /%N%T%A - WILL NOT TEST%N/
013217  045   041101  035101  FRMT14: .ASCIZ  /%ABA: %06%A DA: %06%A ADDR: %06%A EXP'D: %06%A REC'D %06%N/

                                .EVEN


685
686
687  013312                             ENDMOD
688
689  013312                     BGNMOD  HPTCODE
690
691  013312                     BGNHW
692  013312  000005                     .WORD   L10012-L$HW/2
693  013314  174400                     .WORD   174400          ;CSR
694  013316  000330                     .WORD   330             ;VECTOR
695  013320  000240                     .WORD   240             ;PRIORITY
696  013322  000000                     .WORD   0               ;DRIVE (BITS 8,9,10)
697  013324  000001                     .WORD   1               ;RL11 = 1, RLV11 = 0
698
699  013326                     ENDHW
700  013326                     L10012:
701
702  013326                             ENDMOD
703
704  013326                     BGNMOD  SPTCODE
705
706  013326                     BGNSW
707  013326  000003                     .WORD   L10013-L$SW/2
708
709  013330  000000             DROP:   .WORD   0
710  013332  000012             MERLMT: .WORD   10.
711  013334  000000             T.SIZE: .WORD   0
712
713  013336                     ENDSW
714  013336                     L10013:
715
716  013336                             ENDMOD
717
718  013336                     BGNMOD  DSPCODE
719
720  013336                     DISPATCH        41
721  013336  000051                     .WORD   41
722  013340  016432                     .WORD   T1
```

```
723  013342  016530                          .WORD   T2
724  013344  016626                          .WORD   T3
725  013346  016724                          .WORD   T4
726  013350  017022                          .WORD   T5
727  013352  017116                          .WORD   T6
728  013354  017212                          .WORD   T7
729  013356  017306                          .WORD   T8
730  013360  017402                          .WORD   T9
731  013362  017512                          .WORD   T10
732  013364  017564                          .WORD   T11
733  013366  017622                          .WORD   T12
734  013370  017742                          .WORD   T13
735  013372  020044                          .WORD   T14
736  013374  020132                          .WORD   T15
737  013376  020256                          .WORD   T16
738  013400  020402                          .WORD   T17
739  013402  020506                          .WORD   T18
740  013404  020606                          .WORD   T19
741  013406  020676                          .WORD   T20
742  013410  020776                          .WORD   T21
743  013412  021106                          .WORD   T22
744  013414  021160                          .WORD   T23
745  013416  021216                          .WORD   T24
746  013420  021342                          .WORD   T25
747  013422  021502                          .WORD   T26
748  013424  021642                          .WORD   T27
749  013426  022046                          .WORD   T28
750  013430  022076                          .WORD   T29
751  013432  022302                          .WORD   T30
752  013434  022366                          .WORD   T31
753  013436  022532                          .WORD   T32
754  013440  022642                          .WORD   T33
755  013442  022752                          .WORD   T34
756  013444  023106                          .WORD   T35
757  013446  023436                          .WORD   T36
758  013450  024250                          .WORD   T37
759  013452  025126                          .WORD   T38
760  013454  025474                          .WORD   T39
761  013456  026046                          .WORD   T40
762  013460  026724                          .WORD   T41
763
764  013462                                  ENDMOD
765
766                              .SBTTL  INITIALIZATION CODE
767  013462                      BGNMOD  INITCODE
768
769  013462                              BGNINIT
770
771  013462                              BRESET
772  013462  104033                      EMT     C$RESET
773  013464                              READEF  #EF.PWR                 ;POWER UP?????
774  013464  012700  000034              MOV     #EF.PWR,R0
775  013470  104050                      EMT     C$REFG
776  013472                              BCOMPLETE       CONT            ;BRANCH
777  013472  103501                      BCS     CONT
778  013474                      NOPWR:  READEF  #EF.RESTART             ;RESTART?
```

```
779  013474  012700  000037            MOV     #EF.RESTART,R0
780  013500  104050                    EMT     C$REFG
781  013502                            BCOMPLETE START
782  013502  103411                    BCS     START
783  013504                            READEF  #EF.START               ;START?
784  013504  012700  000040            MOV     #EF.START,R0
785  013510  104050                    EMT     C$REFG
786  013512                            BCOMPLETE       START
787  013512  103405                    BCS     START
788  013514                            READEF  #EF.NEW                 ;NEW PASS????
789  013514  012700  000035            MOV     #EF.NEW,R0
790  013520  104050                    EMT     C$REFG
791  013522                            BCOMPLETE       START1          ;YES,THEN RE INIT
792  013524  103411                    BCS     START1
793  013526  000425                    BR      CONTINUE
794  013530  012737  176543  002270  START:  MOV     #176543,HINUM           ;RANDOM GEN. PRIME
795  013536  012737  123456  002272          MOV     #123456,LONUM           ;RANDOM GEN. PRIME
796  013542  005037  002254                  CLR     ERRLMT                  ;CLEAR ERROR LIMIT
797  013546  013737  002012  002122  START1: MOV     L$UNIT,UUT
798  013554  012737  177777  002124          MOV     #-1,UNITST
799  013562  013737  002272  002274          MOV     LONUM,TEMLO
800  013570  013737  002270  002276          MOV     HINUM,TEMHI             ;NEW PRIMES AT END OF PASS
801  013576  000404                    BR      NXT
802
803  013600                          CONTINUE:       READEF  #EF.CONTINUE    ;CONTINUE????
804  013600  012700  000036                  MOV     #EF.CONTINUE,R0
805  013604  104050                    EMT     C$REFG
806  013606                            BCOMPLETE       CONT
807  013606  103433                    BCS     CONT
808
809  013610  005737  002122          NXT:    TST     UUT                     ;DONE ALL UUT'S
810  013614  001006                    BNE     1$                      ;NO
811  013616  012737  177777  002124          MOV     #-1,UNITST
812  013624  013737  002012  002122          MOV     L$UNIT,UUT
813
814  013632  005237  002124          1$:     INC     UNITST
815  013636  005337  002122                  DEC     UUT
816  013642                          REST:   GPHARD  UNITST,R0
817  013642  013700  002124                  MOV     UNITST,R0
818  013646  104042                    EMT     C$GPHRD
819  013650                            BNCOMPLETE      NXT
820  013650  103357                    BCC     NXT
821  013652  012037  002136          1$:     MOV     (R0)+,BCSR
822  013656  012037  002142                  MOV     (R0)+,BVEC
823  013662  012037  002140                  MOV     (R0)+,BPRIOR
824  013666  012037  002144                  MOV     (R0)+,DRIVE
825  013672  012037  002260                  MOV     (R0)+,T.CNTLR   ;GET CONTROLLER TYPE
826
827  013676  013737  002274  002272  CONT:   MOV     TEMLO,LONUM             ;RESTORE RANDOM FOR NEXT UUT
828  013704  013737  002276  002270          MOV     TEMHI,HINUM             ;RESTORE PRIME FOR NEXT UUT
829  013712  013700  002136                  MOV     BCSR,R0
830  013716  010037  002126                  MOV     R0,RLCS
831  013722  062700  000002                  ADD     #2,R0
832  013726  010037  002130                  MOV     R0,RLBA
833  013732  062700  000002                  ADD     #2,R0
834  013736  010037  002132                  MOV     R0,RLDA
```

```
835  013742  062700  000002            ADD     #2,R0
836  013746  010037  002134            MOV     R0,RLMP
837  013752  005737  013334            TST     T.SIZE          ;DO WE WANT TO CHECK UNITS??
838  013756  001450                    BEQ     END             ;NO
839
840  013760  005037  002174            CLR     TRPFLG          ;CLR OUT TRAP FLAG
841  013764                            SETVEC  ERRVEC,#TRPHAN,#340     ;SETUP VECTOR TO CATCH NON-EXIST
842  013764  012746  000340            MOV     #340,-(SP)
843  013770  012746  016264            MOV     #TRPHAN,-(SP)
844  013774  013746  002204            MOV     ERRVEC,-(SP)
845  014000  012746  000003            MOV     #3,-(SP)
846  014004  104037                    EMT     C$$VEC
847  014006  062706  000010            ADD     #10,SP
848  014012  005777  166110            TST     @RLCS           ;ACCESS CONTROLLER
849  014016                            CLRVEC  ERRVEC          ;RELEASE VECTOR
850  014016  013700  002204            MOV     ERRVEC,R0
851  014022  104036                    EMT     C$CVEC
852  014024  005737  002174            TST     TRPFLG          ;DID IT TRAP
853  014030  001423                    BEQ     END
854  014032  012737  005500  002256    MOV     #NORES,WHY      ;SETUP ERR MESS
855  014040                    8$:     PRINTB  #FRMT13,WHY
856  014040  013746  002256            MOV     WHY,-(SP)
857  014044  012746  013166            MOV     #FRMT13,-(SP)
858  014050  012746  000002            MOV     #2,-(SP)
859  014054  010600                    MOV     SP,R0
860  014056  104014                    EMT     C$PNTB
861  014060  062706  000006            ADD     #6,SP
862  014064  004737  012042    6$:     JSR     PC,LINE1        ;GIVE DRIVE INFO
863  014070                            DODU    UNITST          ;TELL SUPERVISOR TO DROP IT
864  014070  013700  002124            MOV     UNITST,R0
865  014074  104053                    EMT     C$DODU
866  014076                            DOCLN                   ;FORCE AN ABORT
867  014076  104044                    EMT     C$DCLN
868  014100                    END:    SETVEC  BVEC,#INTSRV,#340
869  014100  012746  000340            MOV     #340,-(SP)
870  014104  012746  016272            MOV     #INTSRV,-(SP)
871  014110  013746  002142            MOV     BVEC,-(SP)
872  014114  012746  000003            MOV     #3,-(SP)
873  014120  104037                    EMT     C$$VEC
874  014122  062706  000010            ADD     #10,SP
875  014126  005037  002172            CLR     PFLG            ;CLR PROCESSOR FLAG
876  014132                            READBUS                 ;Q-BUS
877  014132  104007                    EMT     C$RDBU
878  014134                            BNCOMPLETE      1$
879  014134  103002                    BCC     1$
880  014136  005237  002172            INC     PFLG            ;NO, Q-BUS THEN
881  014142                    1$:
882  014142                            ENDINIT
883  014142                    L10014:
884  014142  104011                    EMT     C$INIT
885
886  014144                            ENDMOD
887
888  014144                    BGNMOD  CLNCODE
889
890  014144                            BGNCLN
```

```
891
892  014144                                        SETPRI  #PRI00
893  014144  012700  000000                       MOV     #PRI00,R0
894  014150  104041                               EMT     C$SPRI
895
896  014152  032777  000200  165746  1$:         BIT     #CRDY,@RLCS
897  014160  001774                               BEQ     1$
898
899  014162                                        SETPRI  #PRI07
900  014162  012700  000340                       MOV     #PRI07,R0
901  014166  104041                               EMT     C$SPRI
902  014170  042777  000100  165730               BIC     #INTEN,@RLCS
903
904  014176                                        CLRVEC  BVEC
905  014176  013700  002142                       MOV     BVEC,R0
906  014202  104036                               EMT     C$CVEC
907  014204                            2$:
908  014204                                        ENDCLN
909  014204                            L10015:
910  014204  104012                               EMT     C$CLEAN
911
912  014206                                        ENDMOD
913
914
915
916  014206                            BGNMOD      DRPCODE
917
918  014206                                        BGNDU
919
920  014206  000240                               NOP
921
922  014210                                        ENDDU
923  014210                            L10016:
924  014210  104055                               EMT     C$DU
925
926  014212                            ENDMOD
927
928  014212                            BGNMOD      ADDCODE
929
930  014212                                        BGNAU
931
932  014212  000240                               NOP
933
934  014214                                        ENDAU
935  014214                            L10017:
936  014214  104054                               EMT     C$AU
937
938  014216                            ENDMOD
939
940
941                                    .SBTTL      GLOBAL SUBROUTINES
942
943  014216                            BGNMOD      GLBSUB
944
945  014216                            CKERLT:     INLOOP
946  014216  104020                               EMT     C$INLP
```

```
 947  014220                                          BCOMPLETE       99$
 948  014220  103427                                  BCS     99$
 949  014222  005737  013330                          TST     DROP
 950  014226  001424                                  BEQ     99$
 951  014230  005237  002254                          INC     ERRLMT
 952  014234  023737  002254  013332                  CMP     ERRLMT,MERLMT
 953  014242  002416                                  BLT     99$
 954
 955  014244                                          PRINTF  #FRMT11
 956  014244  012746  013046                          MOV     #FRMT11,-(SP)
 957  014250  012746  000001                          MOV     #1,-(SP)
 958  014254  010600                                  MOV     SP,R0
 959  014256  104017                                  EMT     C$PNTF
 960  014260  062706  000004                          ADD     #4,SP
 961  014264  004737  012042                          JSR     PC,LINE1
 962  014270                                          DODU    UNITST          ;DROP THE UNIT
 963  014270  013700  002124                          MOV     UNITST,R0
 964  014274  104053                                  EMT     C$DODU
 965  014276                                          DOCLN
 966  014276  104044                                  EMT     C$DCLN
 967  014300                                  99$:
 968  014300  000205                                  RTS     R5
 969
 970
 971
 972                                          .SBTTL  ROUTINE TO CHECK FOR CONTROLLER ERRORS
 973
 974                                          ;*****************************************************************
 975                                          ;*THIS ROUTINE WILL CHECK RLCS FOR ERRORS AND PRINT THEM
 976                                          ;*ACCORDINGLY.  IT WILL MERGE THE ERROR PRINTOUT WITH THE TEST
 977                                          ;*ERROR MESSAGE.
 978                                          ;*
 979                                          ;*EXAMPLE:   RLCS CONTAINED FOLLOWING ERROR(S):
 980                                          ;*                  DRV   OPI   HCRC   HNF
 981                                          ;*      MAINTENANCE OPERATION-INTERRUPT MODE
 982                                          ;*
 983                                          ;*
 984                                          ;*
 985                                          ;*ROUTINE USES R0,R1 AND PICKS HEADER FROM R3
 986                                          ;*
 987                                          ;*      CALL    JSR     R5,CHERR
 988                                          ;*
 989                                          ;*
 990                                          ;*
 991
 992  014302  005037  002156                  CHERR:  CLR     DERFLG          ;CLEAR OUT DRIVE ERROR FLAG
 993  014306  032737  176000  002160                  BIT     #176000,E.CS    ;ANY ERRORS SET
 994  014314  001001                                  BNE     199$            ;IF YES, INVESTIGATE
 995  014316  000205                                  RTS     R5              ;NO, EXIT
 996  014320  023727  002262  000004  199$:   CMP     TMPFNC,#GSTAT   ;FUNCTION-NOP, RESET, GETSTATUS
 997  014326  002401                                  BLT     98$             ;YES, GO CHECK IF ONLY DRIVE ERROR
 998  014330  000414                                  BR      1$              ;YES SERVICE ERROR
 999  014332  023727  002262  000002  98$:   CMP     TMPFNC,#WRCHK
1000  014340  001410                                  BEQ     1$
1001  014342  013700  002160                          MOV     E.CS,R0         ;GET E.CS
1002  014346  042700  001777                          BIC     #1777,R0        ;
```

```
1003  014352  022700  140000            CMP     #140000,R0      ;DRIVE ERROR ALONE?
1004  014356  001001                    BNE     1$              ;NO, GO SERVICE
1005  014360  000205              2$:   RTS     R5              ;YES, EXIT
1006
1007  014362  012701  011161      1$:   MOV     #EM102,R1       ;GET START OF STRING
1008  014366  005737  002160            TST     E.CS            ;IS COMPOSITE ERROR SET?(BETTER BE)
1009  014372  100003                    BPL     99$             ;IT'S NOT SOMETHING IS WRONG
1010  014374  004537  015204            JSR     R5,FIX          ;YES, PUT "COMP" IN STRING
1011  014400  005700                    COMP                    ;"COMP"
1012  014402  032737  040000  002160  99$:   BIT     #DERR,E.CS      ;DRIVE ERROR SET?
1013  014410  001405                    BEQ     3$              ;NO, CONTINUE
1014  014412  005237  002156            INC     DERFLG          ;SET DRV ERROR FLAG
1015  014416  004537  015204            JSR     R5,FIX          ;YES, PUT "DRV" INTO STRING
1016  014422  005541                    DEMES                   ;"DRV"
1017  014424  032737  020000  002160  3$:   BIT     #NXM,E.CS       ;NON-EXISTENT MEMORY ERROR?
1018  014432  001403                    BEQ     4$              ;NO, CONTINUE
1019  014434  004537  015204            JSR     R5,FIX          ;YES, PUT "NXM" INTO STRING
1020  014440  005546                    NXMMES                  ;"NXM"
1021  014442  032737  002000  002160  4$:   BIT     #OPI,E.CS       ;IS OPI SET?
1022  014450  001422                    BEQ     6$              ;NO, GO CHECK BITS 11 & 12
1023  014452  004537  015204            JSR     R5,FIX          ;PUT "OPI" INTO STRING
1024  014456  005553                    OPIMES                  ;"OPI"
1025  014460  032737  004000  002160    BIT     #BIT11,E.CS     ;HEADERCRC ERROR?
1026  014466  001403                    BEQ     5$              ;NO, GO CHECK HEADER NOT FOUND
1027  014470  004537  015204            JSR     R5,FIX          ;GO PUT "HCRC" IN STRING
1028  014474  005560                    HCRCMES                 ;"HCRC"
1029  014476  032737  010000  002160  5$:   BIT     #BIT12,E.CS     ;HEADER NOT FOUND?
1030  014504  001422                    BEQ     8$              ;NO, GO PUT "CRLF" IN STRING
1031  014506  004537  015204            JSR     R5,FIX          ;PUT "HNF" IN STRING
1032  014512  005566                    HNFMES                  ;"HNF"
1033  014514  000416                    BR      8$              ;PUT "CRLF" IN STRING
1034  014516  032737  004000  002160  6$:   BIT     #BIT11,E.CS     ;DATA CRC ERROR?
1035  014524  001403                    BEQ     7$              ;NO, GO CHECK DATA LATE
1036  014526  004537  015204            JSR     R5,FIX          ;PUT "DCK" IN STRING
1037  014532  005573                    DCKMES                  ;"DCK"
1038  014534  032737  010000  002160  7$:   BIT     #BIT12,E.CS     ;DATA LATE ERROR?
1039  014542  001403                    BEQ     8$              ;NO, GO PUT IN "CRLF"
1040  014544  004537  015204            JSR     R5,FIX          ;PUT "DLT" IN STRING
1041  014550  005600                    DLTMES                  ;"DLT"
1042  014552  004537  015204      8$:   JSR     R5,FIX
1043  014556  005673                    MSCRLF
1044  014560  004537  015204            JSR     R5,FIX
1045  014564  000000            RESTMS: .WORD   0               ;HEADER FROM TEST
1046  014566  105011                    CLRB    (R1)            ;PUT TERMINATOR IN
1047
1048  014570                            ERRDF   300.,LF,ERR6
1049  014570  104462                    TRAP    TSERCODE
1050  014572  000454                    .WORD   300
1051  014574  005676                    .WORD   LF
1052  014576  011626                    .WORD   ERR6
1053
1054  014600  000205                    RTS     R5              ;EXIT ROUTINE
1055
1056                            ;*****************************************************************
1057                            ;* ROUTINE TO LOAD RLCS WITH FUNCTION TO BE PERFORMED FOR RL11
1058                            ;*       CALL:   JSR     R5,LDFUNC
```

```
1059                                    ;*              .WORD           ;BITS TO BE LOADED, FUNCTION
1060                                    ;*                              ;AND INTR ENABLE ONLY
1061                                    ;*
1062                                    ;
1063
1064  014602  012537  002200           LDFUNC: MOV     (R5)+,LDCSR     ;GET BITS TO LOAD
1065  014606  005737  002156                   TST     DERFLG
1066  014612  001424                           BEQ     98$
1067  014614  013746  002146                   MOV     B.CS,-(SP)
1068  014620  012777  000013  165304           MOV     #13,@RLDA
1069  014626  012737  000004  002146           MOV     #GSTAT,B.CS
1070  014634  053737  002144  002146           BIS     DRIVE,B.CS
1071  014642  013777  002146  165256           MOV     B.CS,@RLCS
1072  014650  012637  002146                   MOV     (SP)+,B.CS
1073  014654  032777  000200  165244   99$:    BIT     #200,@RLCS
1074  014662  001774                           BEQ     99$
1075  014664  010346                   98$:    MOV     R3,-(SP)        ;SAVE R3
1076  014666  042737  177661  002200           BIC     #177661,LDCSR   ;CLEAR ALL BUT FUNC & INTR EN
1077  014674  013737  002200  015020           MOV     LDCSR,FNDFNC    ;SAVE FUNCTION
1078  014702  042737  000100  015020           BIC     #INTEN,FNDFNC   ;ONLY FUNCTION
1079  014710  013737  015020  002262           MOV     FNDFNC,TMPFNC
1080  014716  012703  015022                   MOV     #HDRLST,R3      ;GET HEADER LIST
1081  014722  006237  015020                   ASR     FNDFNC          ;ALIGN TO RIGHT
1082  014726  001404                           BEQ     2$
1083  014730  022323                   1$:     CMP     (R3)+,(R3)+     ;BUMP R3 BY 4
1084  014732  005337  015020                   DEC     FNDFNC          ;FOUND IT
1085  014736  001374                           BNE     1$              ;NO,KEEP LOOKING
1086  014740  032737  000100  002200   2$:     BIT     #INTEN,LDCSR    ;YES,DO WE WANT FLAG OR INTR
1087  014746  001401                           BEQ     3$              ;FLAG BRANCH
1088  014750  005723                           TST     (R3)+           ;INTR POINT TO THAT ONE
1089  014752  011303                   3$:     MOV     (R3),R3         ;SET HEADER
1090  014754  010337  014564                   MOV     R3,RESTMS       ;SET UP HEADER
1091  014760  053737  002144  002200           BIS     DRIVE,LDCSR     ;SELECT DRIVE
1092  014766  052737  000200  002200   4$:     BIS     #200,LDCSR      ;CONTROLLER READY
1093  014774  013777  002200  165124           MOV     LDCSR,@RLCS
1094  015002  004537  015362                   JSR     R5,BEFORE
1095  015006  042777  000200  165112   5$:     BIC     #200,@RLCS
1096  015014  012603                           MOV     (SP)+,R3        ;RESTORE R3
1097  015016  000205                           RTS     R5              ;EXIT
1098
1099  015020  000000           FNDFNC: .WORD   0
1100
1101  015022  005761           HDRLST: NOPMES
1102  015024  006012                   NOPINT
1103
1104
1105                                    ;*****************************************************************
1106                                    ;THIS ROUTINE WILL CHECK RLV11 CSR FOR COMP,HNF AND OPI ERRORS
1107                                    ;IN THE MAINTENANCE FORCED OPI TESTS. IT WILL MERGE THE ERROR PRINTOUT
1108                                    ;WITH THE TEST ERROR MESSAGE. DRIVE ERRORS WILL BE IGNORED.
1109                                    ;
1110                                    ;       CALL    JSR     R5,CHKOPI
1111                                    ;
1112  015026  010146           CHKOPI: MOV     R1,-(SP)
1113  015030  012701  112000           MOV     #112000,R1      ;EXPECTED RESULTS
1114  015034  005037  002252           CLR     MATFLG          ;CLEAR ERROR FOUND FLAG
```

```
 1115  015040  043701  002160                BIC     E.CS,R1         ;CHECK COMP,HNF,OPI
 1116  015044  005701                        TST     R1
 1117  015046  001001                        BNE     1$              ;EXPECTED ERRORS NOT SET
 1118  015050  000453                        BR      6$              ;ALL EXPECTED ERRORS SET,EXIT
 1119  015052  012701  011161          1$:   MOV     #EM102,R1       ;GET START OF TEXT STRING
 1120  015056  004537  015204                JSR     R5,FIX          ;STORE MESSAGE
 1121  015062  005605                        EXPMES                  ;EXPECTED
 1122  015064  032737  100000  002160        BIT     #BIT15,E.CS     ;IS COMP SET?
 1123  015072  001405                        BEQ     2$              ;NO,CONTINUE ERROR SEARCH
 1124  015074  005237  002252                INC     MATFLG          ;YES,SET ERROR FOUND
 1125  015100  004537  015204                JSR     R5,FIX          ;STORE COMP MESSAGE
 1126  015104  005700                        COMP
 1127  015106  032737  010000  002160  2$:   BIT     #BIT12,E.CS     ;IS HNF SET?
 1128  015114  001405                        BEQ     3$              ;NO,CONTINUE ERROR SEARCH
 1129  015116  005237  002252                INC     MATFLG          ;YES,SET ERROR FOUND
 1130  015122  004537  015204                JSR     R5,FIX          ;STORE HNF MESSAGE
 1131  015126  005566                        HNFMES
 1132  015130  032737  002000  002160  3$:   BIT     #BIT10,E.CS     ;IS OPI SET?
 1133  015136  001405                        BEQ     4$              ;NO,COMPLETE MESSAGE
 1134  015140  005237  002252                INC     MATFLG          ;YES,SET ERROR FOUND
 1135  015144  004537  015204                JSR     R5,FIX          ;STORE OPI MESSAGE
 1136  015150  005553                        OPIMES
 1137  015152  005737  002252          4$:   TST     MATFLG          ;CHECK IF EXPECTED ERRORS FOUND
 1138  015156  001003                        BNE     5$
 1139  015160  004537  015204                JSR     R5,FIX          ;STORE MESSAGE
 1140  015164  005642                        NONMES                  ;NO EXPECTED ERRORS FOUND
 1141  015166  004537  015204          5$:   JSR     R5,FIX
 1142  015172  005673                        MSCRLF
 1143  015174  105011                        CLRB    (R1)            ;STORE MESSAGE TERMINATOR
 1144  015176  005725                        TST     (R5)+           ;RETURN TO PRINT ERROR
 1145  015200  012601                6$:     MOV     (SP)+,R1
 1146  015202  000205                        RTS     R5
 1147                          ;*****************************************************************
 1148                          ;*ROUTINE TO MOVE ASCII STRINGS
 1149                          ;*USES REGISTERS R1 - WHERE STRING IS BEING BUILT
 1150                          ;*
 1151                          ;*      CALL    JSR     R5,FIX
 1152                          ;*              .WORD           ;ADDRESS OF STRING TO MOVE
 1153
 1154  015204  012500          FIX:    MOV     (R5)+,R0        ;GET ADDRESS AND MOVE RETURN
 1155  015206  112021          1$:     MOVB    (R0)+,(R1)+     ;GET BYTE AND UPDATE
 1156  015210  001376                  BNE     1$              ;WATCH 0 BYTE TERMINATOR
 1157  015212  105741                  TSTB    -(R1)           ;BACK UP OVER ZERO BYTE
 1158  015214  000205                  RTS     R5              ;EXIT
 1159
 1160
 1161                          ;*****************************************************************
 1162                          ;RLV11 MAINTENANCE SUBROUTINE FOR CRC CALCULATIONS
 1163                          ;ROUTINE TO RETRIEVE PATTERN AND CALCULATE CRC OF PATTERN+3
 1164                          ;AND CRC OF CRC OF PATTERN+4.
 1165                          ;CRC OF PATTERN+3 WILL BE STORED IN "GDCRCA".
 1166                          ;CRC OF CRC OF PATTERN+4 WILL BE STORED IN "GDCRCB".
 1167                          ;PATTERN WILL BE STORED IN "GDDATA".
 1168                          ;
 1169                          ;       CALL    JSR     R5,CALCRC
 1170                          ;               .WORD           ;PATTERN IN DA
```

```
1171
1172  015216  012537  002240          CALCRC: MOV     (R5)+,GCRCPT    ;STORE PATTERN
1173  015222  013737  002240  002222          MOV     GCRCPT,TEMP1
1174  015230  113737  002222  002220          MOVB    TEMP1,TEMP5
1175  015236  062737  000003  002220          ADD     #3.,TEMP5       ;ADD 3 TO PATTERN
1176  015244  113737  002220  002222          MOVB    TEMP5,TEMP1
1177  015252  013737  002222  015266          MOV     TEMP1,1$
1178  015260  004537  016112                  JSR     R5,SIMBCC       ;CALCULATE EXPECTED CRC
1179  015264  000020                          16.                     ;DATA BITS
1180  015266  000000                  1$:     .WORD   0               ;INITIAL PATTERN+3
1181  015270  000000                          .WORD   0
1182  015272  013737  002210  002242          MOV     CALBCC,GDCRCA   ;SAVE CRC OF PATTERN+3
1183  015300  005237  002220                  INC     TEMP5           ;VALUE=PATTERN+4
1184  015304  113737  002220  002222          MOVB    TEMP5,TEMP1
1185  015312  013737  002222  015326          MOV     TEMP1,2$
1186  015320  004537  016112                  JSR     R5,SIMBCC       ;CALCULATE EXPECTED CRC
1187  015324  000020                          16.                     ;DATA BITS
1188  015326  000000                  2$:     .WORD   0               ;INITIAL PATTERN+4
1189  015330  000000                          .WORD   0               ;STARTING CRC=0
1190  015332  013737  002210  015346          MOV     CALBCC,3$       ;STORE CRC FOR NEXT CALL
1191  015340  004537  016112                  JSR     R5,SIMBCC       ;CAL. CRC OF CRC OF DA+4
1192  015344  000020                          16.                     ;DATA BITS
1193  015346  000000                  3$:     .WORD   0               ;CRC OF DA+4
1194  015350  000000                          .WORD   0               ;STARTING CRC=0
1195  015352  013737  002210  002244          MOV     CALBCC,GDCRCB   ;SAVE CRC OF CRC OF DA+4
1196  015360  000205                          RTS     R5
1197
1198                                  ;LOAD REGISTERS BEFORE FUNCTION
1199                                  ;CALL:  JSR     R5,BEFORE
1200
1201  015362  017737  164540  002146  BEFORE: MOV     @RLCS,B.CS      ;READ CS
1202  015370  017737  164534  002150          MOV     @RLBA,B.BA      ;READ BA
1203  015376  017737  164530  002152          MOV     @RLDA,B.DA      ;READ DA
1204  015404  017737  164524  002154          MOV     @RLMP,B.MP      ;READ MP
1205  015412  000205                          RTS     R5
1206
1207
1208                                  ;LOAD REGISTERS AT ERROR
1209                                  ;CALL:  JSR     R5,AFTER
1210
1211  015414  017737  164506  002160  AFTER:  MOV     @RLCS,E.CS      ;READ CS
1212  015422  017737  164502  002162          MOV     @RLBA,E.BA      ;READ BA
1213  015430  017737  164476  002164          MOV     @RLDA,E.DA      ;READ DA
1214  015436  017737  164472  002166          MOV     @RLMP,E.MP      ;READ MP
1215  015444  017737  164464  002170          MOV     @RLMP,E.MP1     ;READ MP
1216  015452  000205                          RTS     R5
1217
1218                                  ;ROUTINE TO SETUP BUFFERS FOR RLV11 MAINTENANCE FUNCTION
1219                                  ;BUF1 IS SET WITH 256 WORDS OF PATTERN
1220                                  ;BUF2 IS CLEARED BEFORE MAINTENANCE FUNCTION
1221                                  ;       CALL    JSR     R5,SETPAT
1222                                  ;               .WORD           ;PATTERN FOR BUFFER
1223                                  ;
1224  015454  010146                  SETPAT: MOV     R1,-(SP)
1225  015456  010246                          MOV     R2,-(SP)
1226  015460  012537  002246                  MOV     (R5)+,GDDATP
```

```
1227  015464  012701  003500          MOV     #BUF1,R1        ;FIRST BUFFER START
1228  015470  012702  000400          MOV     #256.,R2
1229  015474  013721  002246  1$:     MOV     GDDATP,(R1)+
1230  015500  005302                  DEC     R2
1231  015502  001374                  BNE     1$              ;STORE PATTERN IN 256 WORDS
1232  015504  012701  004500          MOV     #BUF2,R1        ;START OF SECOND BUFFER
1233  015510  012702  000377          MOV     #255.,R2
1234  015514  005021          2$:     CLR     (R1)+
1235  015516  005302                  DEC     R2
1236  015520  001375                  BNE     2$              ;CLEAR 255 WORDS OF SECOND BUFFER
1237  015522  012721  123456          MOV     #123456,(R1)+   ;STORE IN LAST BUFFER WORD
1238  015526  012602                  MOV     (SP)+,R2
1239  015530  012601                  MOV     (SP)+,R1
1240  015532  000205                  RTS     R5
1241
1242                                  ;ROUTINE TO LOAD RLCS WITH RLV11 MAINT. FUNCTION
1243                                  ;EITHER FLAG DRIVEN OR INTERRUPT MODE.
1244                                  ;       CALL    JSR     R5,LDFUN
1245  015534  000000                  .WORD           ;MAINT!INTEN
1246  015536  000000                  .WORD           ;WORD COUNT COMP.
1247  015540  000000                  .WORD           ;MAINTENANCE MESSAGE
1248                                  ;
1249  015542  012537  002200  LDFUN:  MOV     (R5)+,LDCSR     ;GET FUNCTION
1250  015546  012577  164362          MOV     (R5)+,@RLMP     ;LOAD WORD COUNT
1251  015552  012537  014564          MOV     (R5)+,RESTMS    ;GET MESSAGE
1252  015556  005037  002262          CLR     TMPFNC          ;CLEAR FUNCTION STORAGE
1253  015562  012777  003500  164340  MOV     #BUF1,@RLBA     ;SET BA REGISTER
1254  015570  013777  002240  164334  MOV     GCRCPT,@RLDA    ;LOAD DA REGISTER
1255  015576  042737  177661  002200  BIC     #177661,LDCSR   ;CLEAR ALL BUT FUNC.+INT.
1256  015604  053737  002144  002200  BIS     DRIVE,LDCSR     ;SELECT DRIVE
1257  015612  052737  000200  002200  BIS     #200,LDCSR      ;CONTROLLER READY
1258  015620  013777  002200  164300  MOV     LDCSR,@RLCS     ;LOAD CS REGISTER
1259  015626  004537  015362          JSR     R5,BEFORE       ;STORE REGISTERS BEFORE OPERATION
1260  015632  042777  000200  164266  BIC     #200,@RLCS      ;CLEAR CONTROLLER READY
1261  015640  000205                  RTS     R5              ;RETURN
1262
1263
1264                                  ;ROUTINE TO SETUP COMPLEMENT BUFFERS FOR RLV11 MAINTENANCE FUNCTION
1265                                  ;BUF1 IS SET WITH PATTERN
1266                                  ;BUF1+1 IS SET WITH COMPLEMENT OF PATTERN
1267                                  ;       CALL    JSR     R5,SETCMP
1268                                  ;       .WORD           ;PATTERN FOR BUFFER
1269                                  ;
1270  015642  010146  SETCMP: MOV     R1,-(SP)
1271  015644  010246          MOV     R2,-(SP)
1272  015646  012537  002246          MOV     (R5)+,GDDATP
1273  015652  012701  003500          MOV     #BUF1,R1        ;FIRST BUFFER START
1274  015656  012702  000400          MOV     #256.,R2        ;BUFFER COUNT
1275  015662  013737  002246  002250  MOV     GDDATP,GDATMP   ;STORE DATA PATTERN FOR BUF FILL
1276  015670  013721  002250  1$:     MOV     GDATMP,(R1)+
1277  015674  005137  002250          COM     GDATMP          ;STORE COMP. IN NEXT BUF LOCATION
1278  015700  005302                  DEC     R2
1279  015702  001372                  BNE     1$              ;CHECK FOR BUFFER END
1280  015704  012701  004500          MOV     #BUF2,R1        ;SETUP TO CLEAR BUF2
1281  015710  012702  000377          MOV     #255.,R2
1282  015714  005021          2$:     CLR     (R1)+
```

```
1283  015716  005302                  DEC     R2
1284  015720  001375                  BNE     2$                      ;CHECK FOR BUF2 END
1285  015722  012721  123456          MOV     #123456,(R1)+           ;STORE IN LAST BUFFER WORD
1286  015726  012602                  MOV     (SP)+,R2
1287  015730  012601                  MOV     (SP)+,R1
1288  015732  000205                  RTS     R5
1289
1290
1291                                  ;ROUTINE TO SETUP BUFFER WITH RANDOM NUMBERS FOR RLV11 MAINT. FUNCTION
1292                                  ;SAME PATTERN IS USED FOR EACH CONTROLLER
1293                                  ;END OF PASS WILL CHANGE RANDOM PATTERN PRIMES
1294                                  ;       CALL    JSR     R5,SETRAN
1295                                  ;
1296  015734  010146          SETRAN: MOV     R1,-(SP)
1297  015736  010246                  MOV     R2,-(SP)
1298  015740  012701  003500          MOV     #BUF1,R1                ;FIRST BUFFER START
1299  015744  012702  000400          MOV     #256.,R2                ;BUFFER COUNT
1300  015750  004537  016014  1$:     JSR     R5,RAND                 ;GET RANDOM NUMBER
1301  015754  013721  002272          MOV     LONUM,(R1)+             ;STORE IN BUFFER
1302  015760  005302                  DEC     R2                      ;CHECK FOR BUFFER END
1303  015762  001372                  BNE     1$
1304  015764  012701  004500          MOV     #BUF2,R1                ;SETUP TO CLEAR BUF2
1305  015770  012702  000377          MOV     #255.,R2
1306  015774  005021          2$:     CLR     (R1)+
1307  015776  005302                  DEC     R2
1308  016000  001375                  BNE     2$                      ;CHECK FOR BUFFER END
1309  016002  012721  123456          MOV     #123456,(R1)+           ;STORE IN LAST BUFFER WORD
1310  016006  012602                  MOV     (SP)+,R2
1311  016010  012601                  MOV     (SP)+,R1
1312  016012  000205                  RTS     R5
1313
1314
1315                                  ;THIS ROUTINE IS A DOUBLE PRECISION PSEUDO RANDOM NUMBER GENERATOR
1316                                  ;WITH A RANGE OF 0 TO 2(+33)-1.
1317                                  ;CALL:
1318                                  ;       JSR     R5,RAND         ;CALL THE ROUTINE
1319                                  ;       RETURN                  ;RETURN HERE THE RANDOM NUMBER
1320                                  ;                               ;WILL BE IN HINUM,LONUM
1321  016014  010146          RAND:   MOV     R1,-(SP)                ;PUSH R1 ON STACK
1322  016016  010246                  MOV     R2,-(SP)                ;PUSH R2 ON STACK
1323  016020  010346                  MOV     R3,-(SP)                ;PUSH R3 ON STACK
1324  016022  013703  002272          MOV     LONUM,R3                ;SET R3 WITH LOW
1325  016026  013701  002270          MOV     HINUM,R1                ;SET R1 WITH HIGH
1326  016032  012702  177771          MOV     #-7,R2                  ;SET SHIFT COUNTER
1327  016036  006303          1$:     ASL     R3                      ;SHIFT R3 LEFT AND
1328  016040  006101                  ROL     R1                      ;ROTATE CARRY INTO R1 AND
1329  016042  005202                  INC     R2                      ;CHECK FOR DONE
1330  016044  001374                  BNE     1$                      ;CONTINUE SHIFT LOOP
1331  016046  063703  002272          ADD     LONUM,R3                ;ADD NUMBER TO MAKE X 129
1332  016052  005501                  ADC     R1                      ;PROPOGATE CARRY
1333  016054  063701  002270          ADD     HINUM,R1                ;ADD NUMBER TO MAKE X 129
1334  016060  062703  001057          ADD     #1057,R3                ;ADD LOW CONSTANT
1335  016064  005501                  ADC     R1                      ;PROPOGATE CARRY
1336  016066  062701  047401          ADD     #47401,R1               ;ADD HIGH CONSTANT
1337  016072  010337  002272          MOV     R3,LONUM                ;SAVE R3
1338  016076  010137  002270          MOV     R1,HINUM                ;SAVE R1
```

```
1339  016102  012603                  MOV     (SP)+,R3        ;POP STACK INTO R3
1340  016104  012602                  MOV     (SP)+,R2        ;POP STACK INTO R2
1341  016106  012601                  MOV     (SP)+,R1        ;POP STACK INTO R1
1342  016110  000205                  RTS     R5              ;RETURN
1343
1344
1345                                   .SBTTL  ROUTINE TO CALCULATE CRC
1346
1347                                   ;ROUTINE WILL CALCULATE A CRC-16 CRC ON A WORD OF
1348                                   ;1-16 BITS IN LENGTH, RESULT IS RETURNED IN "CALBCC"
1349                                   ;
1350                                   ;       CALL:   JSR     R5,SIMBCC
1351                                   ;               .WORD           ;NUMBER OF BITS (1-16)
1352                                   ;               .WORD           ;DATA FOR CRC CALCULATION
1353                                   ;               .WORD           ;PREVIOUS OR STARTING CRC
1354                                   ;                               (SHOULD BE ZEROED FOR START)
1355                                   ;       ROUTINE USES R0,R1,R2
1356
1357  016112  010046                  SIMBCC: MOV     R0,-(SP)        ;SAVE R0
1358  016114  010146                          MOV     R1,-(SP)        ;SAVE R1
1359  016116  010246                          MOV     R2,-(SP)        ;SAVE R2
1360  016120  012537  002212                  MOV     (R5)+,TEMP2     ;GET NUMBER OF BITS
1361  016124  012537  002214                  MOV     (R5)+,TEMP3     ;GET DATA FOR CRC CALCULATION
1362  016130  012537  002216                  MOV     (R5)+,TEMP4     ;GET STARTING CRC
1363  016134  005037  002206          1$:     CLR     BCCFBK          ;
1364  016140  013700  002216                  MOV     TEMP4,R0        ;GET PRESENT CRC
1365  016144  006037  002214                  ROR     TEMP3           ;ROTATE NEW DATA
1366  016150  005500                          ADC     R0              ;MERGE NEW WITH OLD
1367  016152  032700  000001                  BIT     #1,R0           ;BIT 0 SET
1368  016156  001402                          BEQ     2$              ;IF NOT CONTINUE
1369  016160  005137  002206                  COM     BCCFBK          ;
1370  016164  013700  002202          2$:     MOV     XPOLY,R0        ;GET CRC POLYNOMIAL (CRC-16)
1371  016170  005100                          COM     R0              ;COMPLIMENT POLYNOMIAL
1372  016172  040037  002206                  BIC     R0,BCCFBK
1373  016176  000241                          CLC                     ;CLEAR CARRY
1374  016200  006037  002216                  ROR     TEMP4
1375  016204  013700  002206                  MOV     BCCFBK,R0
1376  016210  013701  002216                  MOV     TEMP4,R1
1377  016214  010102                          MOV     R1,R2
1378  016216  040100                          BIC     R1,R0
1379  016220  043702  002206                  BIC     BCCFBK,R2
1380  016224  050200                          BIS     R2,R0
1381  016226  043737  002202  002216          BIC     XPOLY,TEMP4
1382  016234  050037  002216                  BIS     R0,TEMP4
1383  016240  005337  002212                  DEC     TEMP2
1384  016244  001333                          BNE     1$
1385  016246  013737  002216  002210          MOV     TEMP4,CALBCC
1386  016254  012602                          MOV     (SP)+,R2
1387  016256  012601                          MOV     (SP)+,R1
1388  016260  012600                          MOV     (SP)+,R0
1389  016262  000205                          RTS     R5              ;RETURN
1390
1391
1392
1393                                   ;ROUTINE TO SET FLAG IF TRAP OCCURRED
1394                                   ;"TRPHAN" IS IN LOCATION 4.
```

```
1395
1396
1397  016264  005237  002174          TRPHAN: INC     TRPFLG          ;INDICATE TRAP
1398  016270  000002                          RTI                     ;RETURN
1399
1400  016272                          BGNSRV
1401
1402  016272  005237  002176          INTSRV: INC     INTFLG          ;INDICATE INTERRUPT
1403
1404  016276                          ENDSRV
1405  016276                          L10020:
1406  016276  000002                          RTI
1407
1408                                  ;ROUTINE USED IN TIMING OPI
1409  016300  005237  002176          TIMSRV: INC     INTFLG
1410  016304                                  ABORTWAIT
1411  016304  104021                          EMT     C$ABRT
1412  016306  000002                          RTI
1413
1414
1415                                  ;ROUTINE TO WAIT FOR DRIVE READY
1416  016310  010146                  WTDRDY: MOV     R1,-(SP)        ;SAVE R1
1417  016312  012701  003720                  MOV     #2000.,R1       ;TIME OUT OF 200 MILLISECONDS
1418  016316  032777  000001  163602  1$:     BIT     #DRDY,@RLCS     ;DRIVE READY?
1419  016324  001011                          BNE     2$              ;YES, EXIT
1420
1421  016326                                  WAITUS  #1              ;WAIT A WHILE
1422  016326  012700  000001                  MOV     #1,R0
1423  016332  104027                          EMT     C$WTU
1424  016334  005301                          DEC     R1              ;CHECK IF TIME UP
1425  016336  001367                          BNE     1$              ;NO, GO CHECK DRIVE READY
1426
1427  016340                                  ERRDF   200.,DRTIM,ERR5 ;DRIVE READY DID NOT SET
1428  016340  104462                          TRAP    T$ERCODE
1429  016342  000310                          .WORD   200
1430  016344  006267                          .WORD   DRTIM
1431  016346  011614                          .WORD   ERR5
1432
1433  016350  012601                  2$:     MOV     (SP)+,R1        ;RESTORE
1434  016352  000205                          RTS     R5              ;EXIT
1435
1436                                  ;ROUTINE TO WAIT FOR CONTROLLER READY
1437  016354  010146                  WTCRDY: MOV     R1,-(SP)        ;SAVE R1
1438  016356  012701  017500                  MOV     #8000.,R1       ;WAIT 800 MILLISECONDS
1439  016362  032777  000200  163536  1$:     BIT     #CRDY,@RLCS     ;CONTROLLER READY
1440  016370  001014                          BNE     2$              ;YES, EXIT
1441  016372                                  WAITUS  #1              ;WAIT A WHILE
1442  016372  012700  000001                  MOV     #1,R0
1443  016376  104027                          EMT     C$WTU
1444  016400  005301                          DEC     R1              ;CHECK IF TIME UP
1445  016402  001367                          BNE     1$              ;NO GO BACK
1446
1447  016404  004537  015414                  JSR     R5,AFTER        ;GET REGISTERS
1448
1449  016410                                  ERRDF   100.,CRTIM,ERR6 ;CONTROLLER TIMED OUT
1450  016410  104462                          TRAP    T$ERCODE
```

```
                                        .WORD   100
                                        .WORD   CRTIM
                                        .WORD   ERR6

                                        BR      3$              ;EXIT

                                2$:     JSR     R5,AFTER        ;GET REGISTERS
                                3$:     MOV     (SP)+,R1
                                        RTS     R5              ;EXIT


                                        ENDMOD


                                .SBTTL  **TEST 1** - RLCS WRITE ADDRESSABILITY

                                BGNTST                          ;****START OF TEST****
                                STARS
                                ;;*************************************************************
                                ;TEST TO SEE IF WE CAN ADDRESS THE CONTROL
                                ;AND STATUS REGISTER.  IF WE TRAP WE WILL REPORT
                                ;THE ERROR AND ABORT.  AFTER THIS TEST WE ONLY KNOW
                                ;THAT WE CAN ADDRESS THE REGISTER.
                                STARS
                                ;;*************************************************************

                                1$:     CLR     TRPFLG          ;CLEAR TRAP OCCURANCE
                                2$:     SETVEC  ERRVEC,#TRPHAN,#340  ;SET TO CATCH TRAP
                                        MOV     #340,-(SP)
                                        MOV     #TRPHAN,-(SP)
                                        MOV     ERRVEC,-(SP)
                                        MOV     #3,-(SP)
                                        EMT     C$$VEC
                                        ADD     #10,SP

                                        MOV     #177777,@RLCS   ;ADDRESS RLCS
                                        CLRVEC  ERRVEC          ;RELEASE TRAP VECTOR
                                        MOV     ERRVEC,R0
                                        EMT     C$CVEC
                                        TST     TRPFLG          ;TRAP OCCURRED???
                                        BEQ     3$              ;NO, OKAY PROCEED
                                        MOV     RLCS,GDDAT      ;SET UP ERROR DATA

                                        ERRSF   0.,EM1,ERR1     ;BUS TIMEOUT IN ADDRESSING RLCS
                                        TRAP    T$ERCODE
                                        .WORD   0
                                        .WORD   EM1
                                        .WORD   ERR1
                                3$:     CKLOOP                  ;CHECK IF /FL:LOE IS SET
                                        EMT     C$CLP1
                                ENDTST                          ;****END OF TEST****
                                L10021:
                                        EMT     C$ETST
```

```
                                .SBTTL  **TEST 2** - RLBA WRITE ADDRESSABILITY

016530                          BGNTST                          ;****START OF TEST****

016530                          STARS
                                ;;*************************************************************************
                                ;TEST TO SEE IF WE CAN ADDRESS THE BUS ADDRESS
                                ;REGISTER.  IF WE TRAP WE WILL REPORT THE ERROR
                                ;AND ABORT.  AFTER THIS TEST WE ONLY KNOW THAT
                                ;WE CAN ADDRESS THE REGISTER.
016530                          STARS
                                ;;*************************************************************************

016530  005037  002174          1$:     CLR     TRPFLG          ;CLEAR TRAP OCCURANCE
016534                          2$:     SETVEC  ERRVEC,#TRPHAN,#340  ;SET TO CATCH TRAP
016534  012746  000340                  MOV     #340,-(SP)
016540  012746  016264                  MOV     #TRPHAN,-(SP)
016544  013746  002204                  MOV     ERRVEC,-(SP)
016550  012746  000003                  MOV     #3,-(SP)
016554  104037                          EMT     C$SVEC
016556  062706  000010                  ADD     #10,SP

016562  012777  177777  163340          MOV     #177777,@RLBA   ;ADDRESS RLBA
016570                          CLRVEC  ERRVEC                  ;RELEASE TRAP VECTOR
016570  013700  002204                  MOV     ERRVEC,R0
016574  104036                          EMT     C$CVEC
016576  005737  002174                  TST     TRPFLG          ;TRAP OCCURRED???
016602  001407                          BEQ     3$              ;NO, CONTINUE
016604  013737  002130  002234          MOV     RLBA,GDDAT      ;SETUP ERROR DATA

016612                          ERRSF   1,,EM2,ERR1             ;BUS TIMEOUT IN ADDRESSING RLBA
016612  104461                  TRAP    T$ERCODE
016614  000001                  .WORD   1
016616  006342                  .WORD   EM2
016620  011370                  .WORD   ERR1
016622                          3$:     CKLOOP                  ;CHECK IF /FL:LOE IS SET
016622  104006                  EMT     C$CLP1
016624                          ENDTST                          ;****END OF TEST****
016624                          L10022:
016624  104001                  EMT     C$ETST


                                .SBTTL  **TEST 3** - RLDA WRITE ADDRESSABILITY

016626                          BGNTST                          ;****START OF TEST****
016626                          STARS
                                ;;*************************************************************************
                                ;TEST TO SEE IF WE CAN ADDRESS THE DISK ADDRESS
                                ;REGISTER IF WE TRAP WE WILL REPORT THE ERROR
                                ;AND ABORT.  AFTER THIS TEST WE ONLY KNOW THAT
                                ;WE CAN ADDRESS THE REGISTER.
016626                          STARS
                                ;;*************************************************************************
```

```
1563
1564
1565  016626  005037  002174          1$:     CLR     TRPFLG          ;CLEAR TRAP OCCURANCE
1566  016632                          2$:     SETVEC  ERRVEC,#TRPHAN,#340  ;SET TO CATCH TRAP
1567  016632  012746  000340                  MOV     #340,-(SP)
1568  016636  012746  016264                  MOV     #TRPHAN,-(SP)
1569  016642  013746  002204                  MOV     ERRVEC,-(SP)
1570  016646  012746  000003                  MOV     #3,-(SP)
1571  016652  104037                          EMT     C$SVEC
1572  016654  062706  000010                  ADD     #10,SP
1573
1574  016660  012777  177777  163244          MOV     #177777,@RLDA   ;ADDRESS RLDA
1575  016666                                  CLRVEC  ERRVEC          ;RELEASE TRAP VECTOR
1576  016666  013700  002204                  MOV     ERRVEC,R0
1577  016672  104036                          EMT     C$CVEC
1578  016674  005737  002174                  TST     TRPFLG          ;TRAP OCCURRED???
1579  016700  001407                          BEQ     3$              ;NO, CONTINUE
1580
1581  016702  013737  002132  002234          MOV     RLDA,GDDAT      ;SETUP ERROR INFO
1582  016710                                  ERRSF   2.,EM3,ERR1     ;BUS TIMEOUT IN ADDRESSING RLDA
1583  016710  104461                          TRAP    T$ERCODE
1584  016712  000002                          .WORD   2
1585  016714  006367                          .WORD   EM3
1586  016716  011370                          .WORD   ERR1
1587  016720                          3$:     CKLOOP                  ;CHECK IF /FL:LOE IS SET
1588  016720  104006                          EMT     C$CLP1
1589  016722                          ENDTST                          ;****END OF TEST****
1590  016722                          L10023:
1591  016722  104001                          EMT     C$ETST
1592
1593
1594                                  .SBTTL  **TEST 4** - RLMP WRITE ADDRESSABILITY
1595
1596  016724                          BGNTST                          ;****START OF TEST****
1597  016724                          STARS
1598                                  ;;*************************************************************
1599                                  ;TEST TO SEE IF WE CAN ADDRESS THE MULTIPURPOSE
1600                                  ;REGISTER.  IF WE TRAP WE WILL REPORT THE ERROR AND
1601                                  ;ABORT.  AFTER THIS TEST WE ONLY KNOW THAT WE CAN
1602                                  ;ADDRESS THE REGISTER.
1603  016724                          STARS
1604                                  ;;*************************************************************
1605
1606
1607  016724  005037  002174          1$:     CLR     TRPFLG          ;CLEAR TRAP OCCURANCE
1608  016730                          2$:     SETVEC  ERRVEC,#TRPHAN,#340  ;SET UP TO CATCH TRAP
1609  016730  012746  000340                  MOV     #340,-(SP)
1610  016734  012746  016264                  MOV     #TRPHAN,-(SP)
1611  016740  013746  002204                  MOV     ERRVEC,-(SP)
1612  016744  012746  000003                  MOV     #3,-(SP)
1613  016750  104037                          EMT     C$SVEC
1614  016752  062706  000010                  ADD     #10,SP
1615
1616  016756  012777  177777  163150          MOV     #177777,@RLMP   ;ADDRESS RLMP
1617  016764                                  CLRVEC  ERRVEC          ;RELEASE TRAP VECTOR
1618  016764  013700  002204                  MOV     ERRVEC,R0
```

```
1619  016770  104036                  EMT     C$CVEC
1620  016772  005737  002174          TST     TRPFLG          ;TRAP OCCURRED???
1621  016776  001407                  BEQ     3$              ;NO, CONTINUE
1622  017000  013737  002134  002234  MOV     RLMP,GDDAT      ;SET UP ERROR INFO
1623
1624  017006                          ERRSF   3.,EM4,ERR1     ;BUS TIMEOUT IN ADDRESSING RLMP
1625  017006  104461                  TRAP    T$ERCODE
1626  017010  000003                  .WORD   3
1627  017012  006414                  .WORD   EM4
1628  017014  011370                  .WORD   ERR1
1629  017016                  3$:     CKLOOP                  ;CHECK IF /FL:LOE IS SET
1630  017016  104006                  EMT     C$CLP1
1631  017020                  ENDTST                          ;****END OF TEST****
1632  017020                  L10024:
1633  017020  104001                  EMT     C$ETST
1634
1635                          .SBTTL  **TEST 5** - RLCS READ ADDRESSABILITY
1636
1637  017022                  BGNTST                          ;****START OF TEST****
1638  017022                  STARS
1639                          ;;*************************************************************
1640                          ;TEST TO SEE IF WE CAN ADDRESS THE CONTROL
1641                          ;AND STATUS REGISTER.  IF WE TRAP WE WILL REPORT
1642                          ;THE ERROR AND ABORT.  AFTER THIS TEST WE ONLY KNOW
1643                          ;THAT WE CAN ADDRESS THE REGISTER.
1644  017022                  STARS
1645                          ;;*************************************************************
1646
1647
1648  017022  005037  002174  1$:     CLR     TRPFLG          ;CLEAR TRAP OCCURANCE
1649  017026                  2$:     SETVEC  ERRVEC,#TRPHAN,#340  ;SET TO CATCH TRAP
1650  017026  012746  000340          MOV     #340,-(SP)
1651  017032  012746  016264          MOV     #TRPHAN,-(SP)
1652  017036  013746  002204          MOV     ERRVEC,-(SP)
1653  017042  012746  000003          MOV     #3,-(SP)
1654  017046  104037                  EMT     C$SVEC
1655  017050  062706  000010          ADD     #10,SP
1656
1657  017054  005777  163046          TST     @RLCS           ;ADDRESS RLCS
1658  017060                          CLRVEC  ERRVEC          ;RELEASE TRAP VECTOR
1659  017060  013700  002204          MOV     ERRVEC,R0
1660  017064  104036                  EMT     C$CVEC
1661  017066  005737  002174          TST     TRPFLG          ;TRAP OCCURRED???
1662  017072  001407                  BEQ     3$              ;NO, OKAY PROCEED
1663  017074  013737  002126  002234  MOV     RLCS,GDDAT      ;SET UP ERROR DATA
1664
1665  017102                          ERRSF   100.,EM1,ERR1   ;BUS TIMEOUT IN ADDRESSING RLCS
1666  017102  104461                  TRAP    T$ERCODE
1667  017104  000144                  .WORD   100
1668  017106  006315                  .WORD   EM1
1669  017110  011370                  .WORD   ERR1
1670  017112                  3$:     CKLOOP                  ;CHECK IF /FL:LOE IS SET
1671  017112  104006                  EMT     C$CLP1
1672  017114                  ENDTST                          ;****END OF TEST****
1673  017114                  L10025:
1674  017114  104001                  EMT     C$ETST
```

```
                                .SBTTL  **TEST 6** - RLBA READ ADDRESSABILITY

017116                          BGNTST                          ;****START OF TEST****

017116                          STARS
                                ;;*************************************************************************
                                ;TEST TO SEE IF WE CAN ADDRESS THE BUS ADDRESS
                                ;REGISTER.  IF WE TRAP WE WILL REPORT THE ERROR
                                ;AND ABORT.  AFTER THIS TEST WE ONLY KNOW THAT
                                ;WE CAN ADDRESS THE REGISTER.
017116                          STARS
                                ;;*************************************************************************

017116  005037  002174          1$:     CLR     TRPFLG          ;CLEAR TRAP OCCURANCE
017122                          2$:     SETVEC  ERRVEC,#TRPHAN,#340  ;SET TO CATCH TRAP
017122  012746  000340                  MOV     #340,-(SP)
017126  012746  016264                  MOV     #TRPHAN,-(SP)
017132  013746  002204                  MOV     ERRVEC,-(SP)
017136  012746  000003                  MOV     #3,-(SP)
017142  104037                          EMT     C$SVEC
017144  062706  000010                  ADD     #10,SP

017150  005777  162754                  TST     @RLBA           ;ADDRESS RLBA
017154                          CLRVEC  ERRVEC                  ;RELEASE TRAP VECTOR
017154  013700  002204                  MOV     ERRVEC,R0
017160  104036                          EMT     C$CVEC
017162  005737  002174                  TST     TRPFLG          ;TRAP OCCURRED???
017166  001407                          BEQ     3$              ;NO, CONTINUE
017170  013737  002130  002234          MOV     RLBA,GDDAT      ;SETUP ERROR DATA

017176                          ERRSF   101.,EM2,ERR1   ;BUS TIMEOUT IN ADDRESSING RLBA
017176  104461                  TRAP    T$ERCODE
017200  000145                  .WORD   101
017202  006342                  .WORD   EM2
017204  011370                  .WORD   ERR1
017206                          3$:     CKLOOP                  ;CHECK IF /FL:LOE IS SET
017206  104006                          EMT     C$CLP1
017210                          ENDTST                          ;****END OF TEST****
017210                          L10026:
017210  104001                          EMT     C$ETST


                                .SBTTL  **TEST 7** - RLDA READ ADDRESSABILITY

017212                          BGNTST                          ;****START OF TEST****
017212                          STARS
                                ;;*************************************************************************
                                ;TEST TO SEE IF WE CAN ADDRESS THE DISK ADDRESS
                                ;REGISTER IF WE TRAP WE WILL REPORT THE ERROR
                                ;AND ABORT.  AFTER THIS TEST WE ONLY KNOW THAT
                                ;WE CAN ADDRESS THE REGISTER.
017212                          STARS
                                ;;*************************************************************************
```

```
1731
1732
1733  017212  005037  002174          1$:     CLR     TRPFLG          ;CLEAR TRAP OCCURANCE
1734  017216                          2$:     SETVEC  ERRVEC,#TRPHAN,#340  ;SET TO CATCH TRAP
1735  017216  012746  000340                  MOV     #340,-(SP)
1736  017222  012746  016264                  MOV     #TRPHAN,-(SP)
1737  017226  013746  002204                  MOV     ERRVEC,-(SP)
1738  017232  012746  000003                  MOV     #3,-(SP)
1739  017236  104037                          EMT     C$$VEC
1740  017240  062706  000010                  ADD     #10,SP
1741
1742  017244  005777  162662                  TST     @RLDA           ;ADDRESS RLDA
1743  017250                                   CLRVEC  ERRVEC          ;RELEASE TRAP VECTOR
1744  017250  013700  002204                  MOV     ERRVEC,R0
1745  017254  104036                          EMT     C$CVEC
1746  017256  005737  002174                  TST     TRPFLG          ;TRAP OCCURRED???
1747  017262  001407                          BEQ     3$              ;NO, CONTINUE
1748
1749  017264  013737  002132  002234          MOV     RLDA,GDDAT      ;SETUP ERROR INFO
1750  017272                                   ERRSF   102.,EM3,ERR1   ;BUS TIMEOUT IN ADDRESSING RLDA
1751  017272  104461                          TRAP    T$ERCODE
1752  017274  000146                          .WORD   102
1753  017276  006367                          .WORD   EM3
1754  017300  011370                          .WORD   ERR1
1755  017302                          3$:     CKLOOP                  ;CHECK IF /FL:LOE IS SET
1756  017302  104006                          EMT     C$CLP1
1757  017304                          ENDTST                          ;****END OF TEST****
1758  017304                          L10027:
1759  017304  104001                          EMT     C$ETST
1760
1761
1762                                  .SBTTL  **TEST 8** - RLMP READ ADDRESSABILITY
1763
1764  017306                          BGNTST                          ;****START OF TEST****
1765  017306                          STARS
1766                                  ;;*****************************************************************
1767                                  ;TEST TO SEE IF WE CAN ADDRESS THE MULTIPURPOSE
1768                                  ;REGISTER.  IF WE TRAP WE WILL REPORT THE ERROR AND
1769                                  ;ABORT.  AFTER THIS TEST WE ONLY KNOW THAT WE CAN
1770                                  ;ADDRESS THE REGISTER.
1771  017306                          STARS
1772                                  ;;*****************************************************************
1773
1774
1775  017306  005037  002174          1$:     CLR     TRPFLG          ;CLEAR TRAP OCCURANCE
1776  017312                          2$:     SETVEC  ERRVEC,#TRPHAN,#340  ;SET UP TO CATCH TRAP
1777  017312  012746  000340                  MOV     #340,-(SP)
1778  017316  012746  016264                  MOV     #TRPHAN,-(SP)
1779  017322  013746  002204                  MOV     ERRVEC,-(SP)
1780  017326  012746  000003                  MOV     #3,-(SP)
1781  017332  104037                          EMT     C$$VEC
1782  017334  062706  000010                  ADD     #10,SP
1783
1784  017340  005777  162570                  TST     @RLMP           ;ADDRESS RLMP
1785  017344                                   CLRVEC  ERRVEC          ;RELEASE TRAP VECTOR
1786  017344  013700  002204                  MOV     ERRVEC,R0
```

```
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                                       EMT     C$CVEC
                                       TST     TRPFLG          ;TRAP OCCURRED???
                                       BEQ     3$              ;NO, CONTINUE
                                       MOV     RLMP,GDDAT      ;SET UP ERROR INFO

                                       ERRSF   103.,EM4,ERR1   ;BUS TIMEOUT IN ADDRESSING RLMP
                                       TRAP    T$ERCODE
                                       .WORD   103
                                       .WORD   EM4
                                       .WORD   ERR1
                                3$:    CKLOOP                  ;CHECK IF /FL:LOE IS SET
                                       EMT     C$CLP1
                                ENDTST                         ;****END OF TEST****
                                L10030:
                                       EMT     C$ETST

                                .SBTTL  **TEST 9** - BUS RESET OF RLCS

                                BGNTST                         ;****START OF TEST****

                                STARS
                                ;;*****************************************************************
                                ;TEST THAT A BUS RESET WILL CLEAR THE PROPER BITS
                                ;OF THE CONTROL AND STATUS REGISTER.  THOSE BITS ARE
                                ;BITS 6-1,8,9,10,11,12,13,15.  BIT 15 WILL CLEAR ONLY
                                ;IF BIT 14 (DRIVE ERROR IS NOT SET).  BIT 0 (DRIVE READY)
                                ;IS A DON'T CARE.  IF AT THE START UP THIS TEST BIT
                                ;14 (DRIVE ERROR) IS SET WE WILL INSIST IF IS THERE AFTER
                                ;THE "RESET" ALONG WITH BIT 15 (COMPOSITE ERROR).  BITS
                                ;15-10 ARE NOT WRITEABLE.
                                STARS
                                ;;*****************************************************************

                                       SETPRI  #PRI07          ;PRIORITY TO SEVEN
                                       MOV     #PRI07,R0
                                       EMT     C$SPRI
                                       MOV     #377,@RLCS      ;LOAD ALL RLCS LOADABLE BITS
                                       MOV     #CRDY,GDDAT     ;SETUP EXPECTED
                                       BIT     #DERR,@RLCS     ;DRIVE ERR SET?
                                       BEQ     1$              ;IF NOT DON'T EXPECT IT
                                       BIS     #DERR!ERR,GDDAT  ;IT'S SET, INIT BETTER NOT CLR
                                1$:    MOV     #100,R0         ;SET UP A WAIT LOOP
                                       BRESET                  ;BUS RESET
                                       EMT     C$RESET
                                2$:    DEC     R0              ;WAIT IN CASE OF DRIVE ERROR
                                       BNE     2$              ;
                                       MOV     @RLCS,BDDAT     ;READ RLCS
                                       BIC     #DRDY,BDDAT     ;CLEAR OUT DRDY - DON'T CARE
                                       CMP     BDDAT,GDDAT     ;DID INIT WORK
                                       BEQ     3$              ;YES, BRANCH

                                       ERRDF   113.,EM67,ERR2  ;WRONG DATA IN RLCS
                                       TRAP    T$ERCODE
                                       .WORD   113
                                       .WORD   EM67
```

```
1843  017506  011402                        .WORD   ERR2
1844  017510                        3$:
1845  017510                        ENDTST                          ;****END OF TEST****
1846  017510                        L10031:
1847  017510  104001                        EMT     C$ETST
1848
1849
1850                                .SBTTL  **TEST 10** - BUS RESET OF RLBA
1851
1852  017512                        BGNTST                          ;****START OF TEST****
1853
1854  017512                        STARS
1855                                ;;**************************************************************
1856                                ;TEST THAT A BUS RESET WILL CLEAR THE ENTIRE
1857                                ;BUS ADDRESS REGISTER.  THE BUS ADDRESS IS LOADED WITH 177776
1858                                ;AND IS EXPECTED TO BE ZERO AFTER THE RESET
1859  017512                        STARS
1860                                ;;**************************************************************
1861
1862
1863  017512  012777  177776  162410        MOV     #-2,@RLBA       ;SET BA TO ALL 1'S
1864  017520  005737  002260                TST     T.CNTLR         ;RL11??
1865  017524  001403                        BEQ     2$              ;NO
1866  017526  052777  000001  162374        BIS     #1,@RLBA
1867  017534  005037  002234        2$:     CLR     GDDAT           ;CLEAR EXPECTED DATA
1868  017540                                BRESET                  ;ISSUE BUS INIT
1869  017540  104033                        EMT     C$RESET
1870  017542  017737  162362  002236        MOV     @RLBA,BDDAT     ;READ RLBA
1871  017550  001404                        BEQ     1$              ;IF CLEAR BRANCH
1872
1873  017552                                ERRDF   114.,EM70,ERR2  ;WRONG DATA IN RLBA
1874  017552  104462                        TRAP    T$ERCODE
1875  017554  000162                        .WORD   114
1876  017556  010562                        .WORD   EM70
1877  017560  011402                        .WORD   ERR2
1878  017562                        1$:
1879
1880  017562                        ENDTST                          ;****END OF TEST****
1881  017562                        L10032:
1882  017562  104001                        EMT     C$ETST
1883
1884
1885                                .SBTTL  **TEST 11** - BUS RESET OF RLDA
1886
1887  017564                        BGNTST                          ;****START OF TEST****
1888
1889  017564                        STARS
1890                                ;;**************************************************************
1891                                ;TEST THAT A BUS RESET WILL CLEAR THE ENTIRE
1892                                ;DISK ADDRESS REGISTER.  THE DISK ADDRESS IS LOADED WITH 177777
1893                                ;AND IS EXPECTED TO BE ZERO AFTER THE RESET.
1894  017564                        STARS
1895                                ;;**************************************************************
1896
1897
1898  017564  012777  177777  162340        MOV     #-1,@RLDA       ;SET DA TO ALL 1'S
```

```
CVRLAA.P11    14-APR-78 15:04          **TEST 11** - BUS RESET OF RLDA

 1899  017572  005037  002234                CLR     GDDAT           ;CLEAR EXPECTED
 1900  017576                                BRESET                  ;ISSUE BUS INIT
 1901  017576  104033                        EMT     C$RESET
 1902  017600  017737  162326  002236        MOV     @RLDA,BDDAT     ;READ RLDA
 1903  017606  001404                        BEQ     1$              ;IF CLEAR BRANCH
 1904
 1905  017610                                ERRDF   115.,EM71,ERR2  ;WRONG DATA IN RLDA
 1906  017610  104462                        TRAP    T$ERCODE
 1907  017612  000163                        .WORD   115
 1908  017614  010617                        .WORD   EM71
 1909  017616  011402                        .WORD   ERR2
 1910  017620                        1$:
 1911
 1912  017620                        ENDTST                          ;****END OF TEST****
 1913  017620                        L10033:
 1914  017620  104001                        EMT     C$ETST
 1915
 1916
 1917                                .SBTTL  **TEST 12** - READ WRITE OF RLCS
 1918
 1919  017622                        BGNTST                          ;****START OF TEST****
 1920
 1921
 1922
 1923  017622                        STARS
 1924                                ;;*****************************************************************
 1925                                ;TEST THAT WE CAN WRITE/READ BITS 8,9 AND BITS 6-1
 1926                                ;OF THE CONTROL AND STATUS REGISTER.  BITS 15-10 AND 0
 1927                                ;ARE DON'T CARE BITS AT THIS TIME AND BIT 7
 1928                                ;(CONTROLLER READY) IS ALWAYS WRITTEN TO A ONE.
 1929  017622                        STARS
 1930                                ;;*****************************************************************
 1931
 1932
 1933  017622  012703  002700                MOV     #CSPAT,R3       ;SET UP TABLE POINTER OF PATTERNS
 1934
 1935  017626                        BGNSEG                          ;****START OF SEGMENT****
 1936  017626  104004                        EMT     C$BSEG
 1937
 1938  017630                        CSTEST:
 1939  017630  011337  002234                MOV     (R3),GDDAT      ;GET PATTERN INTO GDDAT
 1940  017634  052737  000200  002234        BIS     #200,GDDAT      ;INSURE GO IS SET
 1941  017642  013777  002234  162256        MOV     GDDAT,@RLCS     ;LOAD RLCS (CONTROL AND STATUS)
 1942  017650  032777  040000  162250        BIT     #DERR,@RLCS     ;IF DRIVE ERROR PRESENT
 1943  017656  001403                        BEQ     99$             ;THEN EXPECT DRIVE AND
 1944  017660  052737  140000  002234        BIS     #ERR!DERR,GDDAT ;COMPOSITE ERROR
 1945  017666  017737  162234  002236  99$:  MOV     @RLCS,BDDAT     ;READ RLCS BACK
 1946  017674  042737  000001  002236        BIC     #DRDY,BDDAT     ;IGNORE DRIVE READY
 1947  017702  023737  002234  002236        CMP     GDDAT,BDDAT     ;DID WE READ WHAT WE LOADED
 1948  017710  001404                        BEQ     1$              ;YES, THEN BRANCH
 1949
 1950  017712                                ERRDF   4.,EM5,ERR2     ;WRONG DATA IN RLCS
 1951  017712  104462                        TRAP    T$ERCODE
 1952  017714  000004                        .WORD   4
 1953  017716  006441                        .WORD   EM5
 1954  017720  011402                        .WORD   ERR2
```

```
                                **TEST 12** - READ WRITE OF RLCS

1$:     ESCAPE  SEG             ;IF /FL:LOE SET LOOP, ELSE EXIT SEG
        EMT     C$ESCAPE
        .WORD   10000$-.


        TST     (R3)+           ;BUMP FOR NEXT PATTERN
        CMP     R3,#CSEND       ;CHECK FOR END
        BNE     CS1EST          ;NOT END, LOAD NEXT PATTERN

ENDSEG                          ;****END OF SEGMENT****
10000$:
        EMT     C$ESEG
ENDTST                          ;****END OF TEST****
L10034:
        EMT     C$ETST


.SBTTL  **TEST 13** - READ WRITE OF RLBA

BGNTST                          ;****START OF TEST****

STARS
;;*********************************************************************
;TEST THAT WE CAN WRITE/READ BITS IS THRU 1 OF THE
;BUS ADDRESS REGISTER.  FOUR PATTERNS ARE USED: GROWING 1, SHIFTING 1,
;GROWING 0 AND SHIFTING 0.  BIT 0 IS ALSO LOADED BUT
;SHOULD ALWAYS COME BACK AS 0
STARS
;;*********************************************************************


        MOV     #BEGPAT,R3      ;GET START OF PATTERN LIST
BGNSEG                          ;****START OF SEGMENT****
        EMT     C$BSEG
BATEST:
        MOV     (R3),GDDAT      ;GET PATTERN TO SEND
        TST     T.CNTLR         ;RL11??
        BEQ     2$              ;NO
        BIC     #BIT0,GDDAT     ;KEEP RLBA EVEN (UNIBUS)
2$:     MOV     GDDAT,@RLBA     ;LOAD PATTERN TO BUS ADDRESS
        MOV     @RLBA,BDDAT     ;READ IT BACK
        CMP     GDDAT,BDDAT     ;IS IT CORRECT?
        BEQ     1$              ;IF SO, BRANCH

        ERRDF   5.,EM6,ERR2     ;DATA WRONG IN RLBA
        TRAP    T$ERCODE
        .WORD   5
        .WORD   EM6
        .WORD   ERR2
1$:     ESCAPE  SEG             ;IF /FL:LOE SET LOOP, ELSE EXIT SEG
        EMT     C$ESCAPE
        .WORD   10000$-.
```

```
2007
2008
2009  020030  005723                          TST     (R3)+           ;BUMP FOR NEXT PATTERN
2010  020032  020327  002512                  CMP     R3,#ENDPAT      ;CHECK FOR END
2011  020036  001344                          BNE     BATEST          ;NOT END, BRANCH FOR NEXT
2012
2013  020040                          ENDSEG                          ;****END OF SEGMENT****
2014  020040                          10000$:
2015  020040  104005                          EMT     C$ESEG
2016  020042                          ENDTST                          ;****END OF TEST****
2017  020042                          L10035:
2018  020042  104001                          EMT     C$ETST
2019
2020
2021                                  .SBTTL  **TEST 14** - READ WRITE OF RLDA
2022
2023  020044                          BGNTST                          ;****START OF TEST****
2024
2025  020044                          STARS
2026                                  ;;**********************************************************************
2027                                  ;TEST THAT WE CAN WRITE/READ THE DISK ADDRESS REGISTER
2028                                  ;ALL BIT POSITIONS ARE WRITTEN USING FOUR PATTERNS:
2029                                  ;GROWING 1, SHIFTING 1, GROWING 0 AND SHIFTING 0
2030  020044                          STARS
2031                                  ;;**********************************************************************
2032
2033
2034  020044  012703  002304                  MOV     #BEGPAT,R3      ;SET UP POINTER TO PATTERN LIST
2035  020050                          BGNSEG                          ;****START OF SEGMENT****
2036  020050  104004                          EMT     C$BSEG
2037  020052                          DATEST:
2038  020052  011337  002234                  MOV     (R3),GDDAT      ;GET PATTERN
2039  020056  013777  002234  162046          MOV     GDDAT,@RLDA     ;LOAD PATTERN IN DA
2040
2041  020064  017737  162042  002236          MOV     @RLDA,BDDAT     ;READ PATTERN BACK
2042  020072  023737  002234  002236          CMP     GDDAT,BDDAT     ;IS IT CORRECT?
2043  020100  001404                          BEQ     1$              ;BRANCH IF CORRECT
2044
2045  020102                                  ERRDF   6.,EM7,ERR2     ;WRONG DATA IN RLDA
2046  020102  104462                          TRAP    T$ERCODE
2047  020104  000006                          .WORD   6
2048  020106  006540                          .WORD   EM7
2049  020110  011402                          .WORD   ERR2
2050  020112                          1$:     ESCAPE  SEG             ;IF /FL:LOE SET LOOP, ELSE EXIT SEG
2051  020112  104010                          EMT     C$ESCAPE
2052  020114  000012                          .WORD   10000$-.
2053
2054
2055  020116  005723                          TST     (R3)+           ;BUMP POINTER
2056  020120  020327  002512                  CMP     R3,#ENDPAT      ;AT END OF PATTERNS?
2057  020124  001352                          BNE     DATEST          ;NO, BRANCH BACK
2058
2059  020126                          ENDSEG                          ;****END OF SEGMENT****
2060  020126                          10000$:
2061  020126  104005                          EMT     C$ESEG
2062  020130                          ENDTST                          ;****END OF TEST****
```

```
2063  020130
2064  020130  104001                    L10036:
                                                EMT     C$ETST
2065
2066
2067                                    .SBTTL  **TEST 15** - BIS OF RLCS
2068
2069  020132                            BGNTST                          ;****START OF TEST****
2070  020132                            STARS
2071                                    ;;**********************************************************************
2072                                    ;TEST THAT WE CAN USE THE "BIS" INSTRUCTION ON THE CONTROL
2073                                    ;AND STATUS REGISTER.  BITS 8,9 AND 6-1 ARE TESTED TO
2074                                    ;SET INDIVIDUALLY AS WELL AS COLLECTIVELY WITHOUT DESTROYING
2075                                    ;ANY PREVIOUS DATA PATTERN
2076  020132                            STARS
2077                                    ;;**********************************************************************
2078
2079
2080  020132  012703  002700                        MOV     #CSPAT,R3       ;GET BEGINNING OF LIST
2081  020136                            BGNSEG                                ;****START OF SEGMENT****
2082  020136  104004                                EMT     C$BSEG
2083  020140                            1$:
2084  020140  012777  000200  161760               MOV     #CRDY,@RLCS     ;INSURE GO IS THERE
2085  020146  011337  002234                       MOV     (R3),GDDAT      ;SET UP EXPECTED RLCS
2086  020152  052737  000200  002234               BIS     #CRDY,GDDAT     ;IN GDDAT
2087  020160  051377  161742                       BIS     (R3),@RLCS      ;BIT SET PATTERN IN RLCS
2088  020164  032777  040000  161734               BIT     #DERR,@RLCS     ;IF ERROR BIT SET THEN
2089  020172  001403                               BEQ     99$             ;EXPECT IT ON THE READ
2090  020174  052737  140000  002234               BIS     #ERR!DERR,GDDAT ;BACK
2091  020202  017737  161720  002236   99$:        MOV     @RLCS,BDDAT     ;READ RLCS TO CHECK "BIS"
2092  020210  042737  000001  002236               BIC     #DRDY,BDDAT     ;CLEAR OUT DRIVE READY
2093  020216  023737  002236  002234               CMP     BDDAT,GDDAT     ;DID BIS WORK?
2094  020224  001404                               BEQ     2$              ;BRANCH IF OKAY
2095
2096  020226                                       ERRDF   7.,EM61,ERR2    ;WRONG DATA IN RLCS
2097  020226  104462                               TRAP    T$ERCODE
2098  020230  000007                               .WORD   7
2099  020232  010051                               .WORD   EM61
2100  020234  011402                               .WORD   ERR2
2101  020236                            2$:        ESCAPE  SEG             ;IF /FL:LOE SET LOOP, ELSE EXIT SEG
2102  020236  104010                               EMT     C$ESCAPE
2103  020240  000012                               .WORD   10000$-.
2104                                                                        ;BIT OR CLEARED OTHER BIT
2105
2106  020242  005723                               TST     (R3)+           ;GET NEXT PATTERN
2107  020244  022703  002776                       CMP     #CSEND,R3       ;AT END OF LIST
2108  020250  001333                               BNE     1$              ;NO GO BACK FOR TEST OF
2109                                                                        ;NEXT PATTERN
2110  020252                            ENDSEG                              ;****END OF SEGMENT****
2111  020252                            10000$:
2112  020252  104005                               EMT     C$ESEG
2113  020254                            ENDTST                              ;****END OF TEST****
2114  020254                            L10037:
2115  020254  104001                               EMT     C$ETST
2116
2117
2118                                    .SBTTL  **TEST 16** - BIC OF RLCS
```

```
2119
2120  020256                                  BGNTST                          ;****START OF TEST****
2121
2122  020256                                  STARS
2123                                          ;;*************************************************************************
2124                                          ;TEST THAT THE "BIC" INSTRUCTION WILL WORK ON THE
2125                                          ;CONTROL AND STATUS REGISTER.  BITS 8-9 AND 6-1 ARE
2126                                          ;TESTED.
2127  020256                                  STARS
2128                                          ;;*************************************************************************
2129
2130
2131  020256  012703  002700                          MOV     #CSPAT,R3       ;GET BEGINNING OF PATTERNS
2132  020262                                  BGNSEG                          ;****START OF SEGMENT****
2133  020262  104004                                  EMT     C$BSEG
2134  020264                                  1$:
2135  020264  012777  001776  161634                 MOV     #1776,@RLCS     ;SET ALL SETTABLE BITS
2136  020272  012737  001776  002234                 MOV     #1776,GDDAT     ;SET UP EXPECT DATA IN
2137  020300  041337  002234                         BIC     (R3),GDDAT      ;GDDAT
2138  020304  041377  161616                         BIC     (R3),@RLCS      ;CLEAR BITS IN RLCS VIA "BIC"
2139  020310  032777  040000  161610                 BIT     #DERR,@RLCS     ;IF DRIVE ERROR BIT SET
2140  020316  001403                                 BEQ     99$             ;EXPECT IT SET WHEN WE
2141  020320  052737  140000  002234                 BIS     #ERR!DERR,GDDAT ;READ IT BACK
2142  020326  017737  161574  002236  99$:           MOV     @RLCS,BDDAT     ;MOVE RLCS TO BDDAT FOR COMPARE
2143  020334  042737  000001  002236                 BIC     #DRDY,BDDAT     ;CLEAR DRIVE READY
2144  020342  023737  002236  002234                 CMP     BDDAT,GDDAT     ;DID "BIC" WORK PROPERLY
2145  020350  001404                                 BEQ     2$              ;BRANCH IF OKAY
2146
2147  020352                                         ERRDF   8.,EM62,ERR2    ;WRONG DATA IN RLCS
2148  020352  104462                                 TRAP    T$ERCODE
2149  020354  000010                                 .WORD   8
2150  020356  010132                                 .WORD   EM62
2151  020360  011402                                 .WORD   ERR2
2152  020362                                  2$:    ESCAPE  SEG             ;IF /FL:LOE SET LOOP, ELSE EXIT SEG
2153  020362  104010                                 EMT     C$ESCAPE
2154  020364  000012                                 .WORD   10000$-.
2155
2156  020366  005723                                 TST     (R3)+           ;GET NEXT PATTERN
2157  020370  020327  002776                         CMP     R3,#CSEND       ;AT END OF LIST
2158  020374  001333                                 BNE     1$              ;NO, GO BACK WITH NEXT PATTERN
2159  020376                                  ENDSEG                          ;****END OF SEGMENT****
2160  020376                                  10000$:
2161  020376  104005                                 EMT     C$ESEG
2162  020400                                  ENDTST                          ;****END OF TEST****
2163  020400                                  L10040:
2164  020400  104001                                 EMT     C$ETST
2165
2166
2167                                          .SBTTL  **TEST 17** - BIS OF RLBA
2168
2169  020402                                  BGNTST                          ;****START OF TEST****
2170
2171  020402                                  STARS
2172                                          ;;*************************************************************************
2173                                          ;TEST THAT THE "BIS" INSTRUCTION WILL WORK ON THE BUS
2174                                          ;ADDRESS REGISTER.  BITS 15-0 ARE LOADED, ONLY BITS 15-1
```

```
                                        **TEST 17** - BIS OF RLBA

                                        ;ARE EXPECTED BACK.  FOUR PATTERNS ARE USED: GROWING 1, SHIFTING 1,
                                        ;GROWING 0, AND SHIFTING 0.
020402                                  $TARS
                                        ;;*****************************************************************

                                                MOV     #BEGPAT,R3      ;GET START OF LIST
                                        BGNSEG                          ;****START OF SEGMENT****
                                                EMT     C$BSEG
                                        1$:
                                                CLR     @RLBA           ;CLEAR "BA"
                                                MOV     (R3),GDDAT      ;SET EXPECTED
                                                TST     T.CNTLR         ;RL11
                                                BEQ     3$              ;NO
                                                BIC     #1,GDDAT        ;BIT 0 CAN'T SET IN RLBA (UNIBUS)
                                        3$:     BIS     (R3),@RLBA      ;BIS RLBA WITH PATTERN
                                                MOV     @RLBA,BDDAT     ;READ "BA"
                                                CMP     BDDAT,GDDAT     ;DID RLBA LOAD PROPERLY?
                                                BEQ     2$              ;BRANCH IF YES

                                                ERRDF   9.,EM63,ERR2    ;WRONG DATA IN RLBA
                                                TRAP    T$ERCODE
                                                .WORD   9
                                                .WORD   EM63
                                                .WORD   ERR2
                                        2$:     ESCAPE  SEG             ;IF /FL:LOE SET LOOP, ELSE EXIT SEG
                                                EMT     C$ESCAPE
                                                .WORD   10000$-.

                                                TST     (R3)+           ;GET NEXT PATTERN
                                                CMP     R3,#ENDPAT      ;DID WE COMPLETE LIST
                                                BNE     1$              ;NO, GO BACK FOR NEXT.
                                        ENDSEG                          ;****END OF SEGMENT****
                                        10000$:
                                                EMT     C$ESEG
                                        ENDTST                          ;****END OF TEST****
                                        L10041:
                                                EMT     C$ETST


                                        .SBTTL  **TEST 18** - BIC OF RLBA

                                        BGNTST                          ;****START OF TEST****

                                        $TARS
                                        ;;*****************************************************************
                                        ;TEST THAT THE "BIC" INSTRUCTION WILL WORK ON THE BUS
                                        ;ADDRESS REGISTER.  BITS 15-1 ARE TESTED WITH 4 PATTERNS
                                        ;GROWING 1, SHIFTING 1, GROWING 0 AND SHIFTING 0.
020506                                  $TARS
                                        ;;*****************************************************************


020506  012703  002304                          MOV     #BEGPAT,R3      ;GET START OF LIST
020512                                  BGNSEG                          ;****START OF SEGMENT****
020512  104004                                  EMT     C$BSEG
```

```
2231  020514
2232  020514  012777  177776  161406          **TEST 18** - BIC OF RLBA
2233  020522  012737  177776  002234  1$:     MOV     #-2,@RLBA       ;SET RLBA TO ALL 1'S (BIT 0=0)
2234  020530  041337  002234                  MOV     #-2,GDDAT       ;SET UP EXPECTED RESULTS
2235  020534  041377  161370                  BIC     (R3),GDDAT      ;IN GDDAT
2236  020540  017737  161364  002236          BIC     (R3),@RLBA      ;BIC RLBA
2237  020546  023737  002236  002234          MOV     @RLBA,BDDAT     ;READ RLBA
2238  020554  001404                          CMP     BDDAT,GDDAT     ;BIC WORK OKAY?
2239                                          BEQ     2$              ;IF YES BRANCH
2240  020556                                  ERRDF   10.,EM64,ERR2   ;WRONG DATA IN RLBA
2241  020556  104462                          TRAP    T$ERCODE
2242  020560  000012                          .WORD   10
2243  020562  010276                          .WORD   EM64
2244  020564  011402                          .WORD   ERR2
2245  020566                          2$:     ESCAPE  SEG             ;IF /FL:LOE SET LOOP, ELSE EXIT SEG
2246  020566  104010                          EMT     C$ESCAPE
2247  020570  000012                          .WORD   10000$-.
2248
2249  020572  005723                          TST     (R3)+           ;GET NEXT PATTERN
2250  020574  020327  002512                  CMP     R3,#ENDPAT      ;HAVE WE COMPLETED LIST
2251  020600  001345                          BNE     1$              ;NO, GO BACK FOR NEXT
2252  020602                          ENDSEG                          ;****END OF SEGMENT****
2253  020602                          10000$:
2254  020602  104005                          EMT     C$ESEG
2255  020604                          ENDTST                          ;****END OF TEST****
2256  020604                          L10042:
2257  020604  104001                          EMT     C$ETST
2258
2259
2260                                   SBTTL  **TEST 19** - BIS OF RLDA
2261
2262  020606                          BGNTST                          ;****START OF TEST****
2263
2264  020606                          STARS
2265                                  ;;*************************************************************
2266                                  ;TEST THAT THE "BIS" INSTRUCTION WILL WORK ON THE DISK ADDRESS
2267                                  ;REGISTER.  BITS 15-0 ARE TESTED WITH 4 PATTERNS, GROWING 1,
2268                                  ;SHIFTING 1, GROWING 0, AND SHIFTING 0.
2269  020606                          STARS
2270                                  ;;*************************************************************
2271
2272
2273  020606  012703  002304                  MOV     #BEGPAT,R3      ;GET START OF LIST
2274  020612                          BGNSEG                          ;****START OF SEGMENT****
2275  020612  104004                          EMT     C$BSEG
2276  020614                          1$:
2277  020614  005077  161312                  CLR     @RLDA           ;CLEAR "DA"
2278  020620  011337  002234                  MOV     (R3),GDDAT      ;SET EXPECTED
2279  020624  051377  161302                  BIS     (R3),@RLDA      ;BIS RLDA
2280  020630  017737  161276  002236          MOV     @RLDA,BDDAT     ;READ RLDA
2281  020636  023737  002236  002234          CMP     BDDAT,GDDAT     ;IS RLDA CORRECT
2282  020644  001404                          BEQ     2$              ;IF OKAY BRANCH
2283
2284  020646                                  ERRDF   11.,EM65,ERR2   ;WRONG DATA IN RLDA
2285  020646  104462                          TRAP    T$ERCODE
2286  020650  000013                          .WORD   11
```

```
2287  020652  010361                        .WORD   EM65
2288  020654  011402                        .WORD   ERR2
2289  020656                        2$:     ESCAPE  SEG             ;IF /FL:LOE SET LOOP, ELSE EXIT SEG
2290  020656  104010                        EMT     C$ESCAPE
2291  020660  000012                        .WORD   10000$-.
2292
2293  020662  005723                        TST     (R3)+           ;GET NEXT PATTERN
2294  020664  020327  002512                CMP     R3,#ENDPAT      ;HAVE WE FINISHED?
2295  020670  001351                        BNE     1$              ;NO GO BACK
2296  020672                        ENDSEG                          ;****END OF SEGMENT****
2297  020672                        10000$:
2298  020672  104005                        EMT     C$ESEG
2299  020674                        ENDTST                          ;****END OF TEST****
2300  020674                        L10043:
2301  020674  104001                        EMT     C$ETST
2302
2303
2304                                .SBTTL  **TEST 20** - BIC OF RLDA
2305
2306  020676                        BGNTST                          ;****START OF TEST****
2307
2308  020676                        STARS
2309                                ;;*****************************************************************
2310                                ;TEST THAT THE "BIC" INSTRUCTION WORKS ON THE DISK
2311                                ;ADDRESS REGISTER.  ALL BITS ARE TESTED WITH FOUR
2312                                ;PATTERNS: GROWING 1, SHIFTING 1, GROWING 0 AND SHIFTING 0
2313  020676                        STARS
2314                                ;;*****************************************************************
2315
2316
2317  020676  012703  002304                MOV     #BEGPAT,R3      ;GET START OF LIST
2318  020702                        BGNSEG                          ;****START OF SEGMENT****
2319  020702  104004                        EMT     C$BSEG
2320  020704                        1$:
2321  020704  012777  177777  161220        MOV     #-1,@RLDA       ;SET RLDA TO ALL 1'S
2322  020712  012737  177777  002234        MOV     #-1,GDDAT       ;SET EXPECTED DATA
2323  020720  041337  002234                BIC     (R3),GDDAT      ;SET EXPECTED DATA
2324  020724  041377  161202                BIC     (R3),@RLDA      ;"BIC" RLDA
2325  020730  017737  161176  002236        MOV     @RLDA,BDDAT     ;READ RLDA
2326  020736  023737  002234  002236        CMP     GDDAT,BDDAT     ;DID "BIC" WORK?
2327  020744  001404                        BEQ     2$              ;IF IT DID BRANCH
2328
2329  020746                                ERRDF   12.,EM66,ERR2   ;WRONG DATA IN RLDA
2330  020746  104462                        TRAP    T$ERCODE
2331  020750  000014                        .WORD   12
2332  020752  010442                        .WORD   EM66
2333  020754  011402                        .WORD   ERR2
2334  020756                        2$:     ESCAPE  SEG             ;IF /FL:LOE SET LOOP, ELSE EXIT SEG
2335  020756  104010                        EMT     C$ESCAPE
2336  020760  000012                        .WORD   10000$-.
2337
2338  020762  005723                        TST     (R3)+           ;GET NEXT PATTERN
2339  020764  020327  002512                CMP     R3,#ENDPAT      ;DONE?
2340  020770  001345                        BNE     1$              ;NO GO BACK
2341  020772                        ENDSEG                          ;****END OF SEGMENT****
2342  020772                        10000$:
```

```
2343  020772  104005                          EMT     C$ESEG
2344  020774                                  ENDTST                          ;****END OF TEST****
2345  020774                                  L10044:
2346  020774  104001                          EMT     C$ETST
2347
2348
2349                                          .SBTTL  **TEST 21** - BUS RESET OF RLCS
2350
2351  020776                                  BGNTST                          ;****START OF TEST****
2352
2353  020776                                  STARS
2354                                          ;;*****************************************************************
2355                                          ;TEST THAT A BUS RESET WILL CLEAR THE PROPER BITS
2356                                          ;OF THE CONTROL AND STATUS REGISTER.  THOSE BITS ARE
2357                                          ;BITS 6-1,8,9,10,11,12,13,15.  BIT 15 WILL CLEAR ONLY
2358                                          ;IF BIT 14 (DRIVE ERROR IS NOT SET).  BIT 0 (DRIVE READY)
2359                                          ;IS A DON'T CARE.  IF AT THE START UP THIS TEST BIT
2360                                          ;14 (DRIVE ERROR) IS SET WE WILL INSIST IF IS THERE AFTER
2361                                          ;THE "RESET" ALONG WITH BIT 15 (COMPOSITE ERROR).  BITS
2362                                          ;15-10 ARE NOT WRITEABLE.
2363  020776                                  STARS
2364                                          ;;*****************************************************************
2365
2366
2367  020776                                          SETPRI  #PRI07          ;PRIORITY TO SEVEN
2368  020776  012700  000340                          MOV     #PRI07,R0
2369  021002  104041                          EMT     C$SPRI
2370  021004  012777  000377  161114          MOV     #377,@RLCS      ;LOAD ALL RLCS LOADABLE BITS
2371  021012  012737  000200  002234          MOV     #CRDY,GDDAT     ;SETUP EXPECTED
2372  021020  032777  040000  161100          BIT     #DERR,@RLCS     ;DRIVE ERR SET?
2373  021026  001403                          BEQ     1$              ;IF NOT DON'T EXPECT IT
2374  021030  052737  140000  002234          BIS     #DERR!ERR,GDDAT ;IT'S SET, INIT BETTER NOT CLR
2375  021036  012700  000100                  1$:     MOV     #100,R0         ;SET UP A WAIT LOOP
2376  021042                                  BRESET                          ;BUS RESET
2377  021042  104033                          EMT     C$RESET
2378  021044  005300                  2$:     DEC     R0                      ;WAIT IN CASE OF DRIVE ERROR
2379  021046  001376                          BNE     2$                      ;
2380  021050  017737  161052  002236          MOV     @RLCS,BDDAT     ;READ RLCS
2381  021056  042737  000001  002236          BIC     #DRDY,BDDAT     ;CLEAR OUT DRDY - DON'T CARE
2382  021064  023737  002236  002234          CMP     BDDAT,GDDAT     ;DID INIT WORK
2383  021072  001404                          BEQ     3$              ;YES, BRANCH
2384
2385  021074                                          ERRDF   13.,EM67,ERR2   ;WRONG DATA IN RLCS
2386  021074  104462                          TRAP    T$ERCODE
2387  021076  000015                          .WORD   13
2388  021100  010525                          .WORD   EM67
2389  021102  011402                          .WORD   ERR2
2390  021104                                  3$:
2391  021104                                  ENDTST                          ;****END OF TEST****
2392  021104                                  L10045:
2393  021104  104001                          EMT     C$ETST
2394
2395
2396                                          .SBTTL  **TEST 22** - BUS RESET OF RLBA
2397
2398  021106                                  BGNTST                          ;****START OF TEST****
```

```
                                STARS
                                ;;*****************************************************************
                                ;TEST THAT A BUS RESET WILL CLEAR THE ENTIRE
                                ;BUS ADDRESS REGISTER.  THE BUS ADDRESS IS LOADED WITH 177776
                                ;AND IS EXPECTED TO BE ZERO AFTER THE RESET
021106                          STARS
                                ;;*****************************************************************

021106  012777  177776  161014          MOV     #-2,@RLBA       ;SET BA TO ALL 1'S
021114  005737  002260                  TST     T.CNTLR         ;RL11??
021120  001403                          BEQ     2$              ;NO
021122  052777  000001  161000          BIS     #1,@RLBA
021130  005037  002234          2$:     CLR     GDDAT           ;CLEAR EXPECTED DATA
021134                                  BRESET                  ;ISSUE BUS INIT
021134  104033                          EMT     C$RESET
021136  017737  160766  002236          MOV     @RLBA,BDDAT     ;READ RLBA
021144  001404                          BEQ     1$              ;IF CLEAR BRANCH

021146                                  ERRDF   14.,EM70,ERR2   ;WRONG DATA IN RLBA
021146  104462                          TRAP    T$ERCODE
021150  000016                          .WORD   14
021152  010562                          .WORD   EM70
021154  011402                          .WORD   ERR2
021156                          1$:

021156                          ENDTST                          ;****END OF TEST****
021156                          L10046:
021156  104001                          EMT     C$ETST


                                .SBTTL  **TEST 23** - BUS RESET OF RLDA

021160                          BGNTST                          ;****START OF TEST****

021160                          STARS
                                ;;*****************************************************************
                                ;TEST THAT A BUS RESET WILL CLEAR THE ENTIRE
                                ;DISK ADDRESS REGISTER.  THE DISK ADDRESS IS LOADED WITH 177777
                                ;AND IS EXPECTED TO BE ZERO AFTER THE RESET.
021160                          STARS
                                ;;*****************************************************************

021160  012777  177777  160744          MOV     #-1,@RLDA       ;SET DA TO ALL 1'S
021166  005037  002234                  CLR     GDDAT           ;CLEAR EXPECTED
021172                                  BRESET                  ;ISSUE BUS INIT
021172  104033                          EMT     C$RESET
021174  017737  160732  002236          MOV     @RLDA,BDDAT     ;READ RLDA
021202  001404                          BEQ     1$              ;IF CLEAR BRANCH

021204                                  ERRDF   15.,EM71,ERR2   ;WRONG DATA IN RLDA
021204  104462                          TRAP    T$ERCODE
021206  000017                          .WORD   15
021210  010617                          .WORD   EM71
```

```
2455  021212  011402                        .WORD   ERR2
2456  021214                          1$:
2457
2458  021214                          ENDTST                          ;****END OF TEST****
2459  021214                          L10047:
2460  021214  104001                        EMT     C$ETST
2461
2462
2463                                  .SBTTL  **TEST 24** - UNIQUENESS OF RLCS
2464
2465  021216                          BGNTST                          ;****START OF TEST****
2466
2467  021216                          STARS
2468                                  ;;*************************************************************************
2469                                  ;TEST THE UNIQUENESS OF THE CONTROL AND STATUS
2470                                  ;REGISTER.  THE RLBA AND RLDA ARE PRELOADED WITH
2471                                  ;177776 AND 177777 RESPECTIVELY.  THE RLCS IS THEN
2472                                  ;LOADED TO INSURE THAT NEITHER THE RLBA OR RLDA
2473                                  ;ARE MODIFIED BY THE WRITING OF THE RLCS.
2474  021216                          STARS
2475                                  ;;*************************************************************************
2476
2477
2478  021216  012737  000201  002200          MOV     #DRDY!CRDY,LDCSR        ;SET DRIVE AND CONTROLLER READY
2479  021224  012777  177776  160676          MOV     #-2,@RLBA               ;SET RLBA TO ALL 1'S
2480  021232  012777  177777  160672          MOV     #-1,@RLDA               ;SET RLDA TO ALL 1'S
2481  021240  013777  002200  160660          MOV     LDCSR,@RLCS             ;WRITE RLCS
2482
2483                                  ;CHECK THAT RLBA REMAINED UNEFFECTED
2484
2485  021246  022777  177776  160654          CMP     #-2,@RLBA       ;RLBA OKAY?
2486  021254  001412                          BEQ     1$              ;YES, GO CHECK DA
2487
2488  021256  012737  177776  002234          MOV     #-2,GDDAT       ;SET UP EXPECTED
2489  021264  017737  160640  002236          MOV     @RLBA,BDDAT     ;READ RLBA
2490
2491  021272                                  ERRDF   16.,EM72,ERR2   ;CS MODIFIED BA
2492  021272  104462                          TRAP    T$ERCODE
2493  021274  000020                          .WORD   16
2494  021276  010654                          .WORD   EM72
2495  021300  011402                          .WORD   ERR2
2496  021302                          1$:     CKLOOP                  ;CHECK IF /FL:LOE IS SET
2497  021302  104006                          EMT     C$CLP1
2498
2499  021304  022777  177777  160620          CMP     #-1,@RLDA       ;RLDA OKAY?
2500  021312  001412                          BEQ     2$              ;YES, CONTINUE
2501
2502  021314  012737  177777  002234          MOV     #-1,GDDAT       ;SET UP EXPECTED
2503  021322  017737  160604  002236          MOV     @RLDA,BDDAT     ;READ DA
2504
2505  021330                                  ERRDF   17.,EM73,ERR2   ;CS MODIFIED DA
2506  021330  104462                          TRAP    T$ERCODE
2507  021332  000021                          .WORD   17
2508  021334  010707                          .WORD   EM73
2509  021336  011402                          .WORD   ERR2
2510  021340                          2$:
```

```
2511
2512
2513  021340                          ENDTST                          ;****END OF TEST****
2514  021340                          L10050:
2515  021340  104001                         EMT     C$ETST
2516
2517
2518                                  .SBTTL  **TEST 25** - UNIQUENESS OF RLBA
2519
2520  021342                          BGNTST                          ;****START OF TEST****
2521  021342                          STARS
2522                                  ;;*****************************************************************
2523                                  ;TEST THE UNIQUENESS OF THE BUS ADDRESS REGISTER.  THE
2524                                  ;RLCS AND RLDA ARE LOADED WITH XXX20X AND 177777
2525                                  ;RESPECTIVELY.  THE RLBA IS THEN WRITTEN TO INSURE
2526                                  ;THAT NEITHER THE RLCS OR RLDA ARE MODIFIED
2527                                  ;BY WRITING THE RLBA.
2528  021342                          STARS
2529                                  ;;*****************************************************************
2530
2531
2532  021342  012737  000200  002234          MOV     #CRDY,@DDAT     ;CONTROLLER READY
2533  021350  032777  040000  160550          BIT     #DERR,@RLCS     ;IF DRIVE ERROR IS
2534  021356  001403                          BEQ     99$             ;SET THEN EXPECT IT
2535  021360  052737  140000  002234          BIS     #ERR!DERR,@DDAT ;SET WHEN WE READ IT.
2536  021366  013777  002234  160532  99$:    MOV     @DDAT,@RLCS     ;LOAD RLCS
2537  021374  012777  177777  160530          MOV     #-1,@RLDA       ;LOAD RLDA
2538  021402  005077  160522                  CLR     @RLBA           ;CLEAR RLBA
2539
2540                                  ;CHECK IF RLCS IS OKAY
2541
2542  021406  017737  160514  002236          MOV     @RLCS,@BDDAT    ;READ RLCS
2543  021414  042737  000001  002236          BIC     #DRDY,@BDDAT    ;IGNORE DRIVE READY
2544  021422  023737  002236  002234          CMP     @BDDAT,@DDAT    ;CS OK?
2545  021430  001404                          BEQ     1$              ;YES, GO CHECK DA
2546
2547  021432                                  ERRDF   18.,EM74,ERR2   ;BA MODIFIED CS
2548  021432  104462                          TRAP    T$ERCODE
2549  021434  000022                          .WORD   18
2550  021436  010742                          .WORD   EM74
2551  021440  011402                          .WORD   ERR2
2552  021442                          1$:     CKLOOP                  ;CHECK IF /FL:LOE IS SET
2553  021442  104006                          EMT     C$CLP1
2554
2555  021444  022777  177777  160460          CMP     #-1,@RLDA       ;IS RLDA OKAY?
2556
2557  021452  001412                          BEQ     2$              ;IF OKAY BRANCH
2558
2559  021454  012737  177777  002234          MOV     #-1,@DDAT       ;SET UP EXPECTED
2560  021462  017737  160444  002236          MOV     @RLDA,@BDDAT    ;READ RLDA
2561
2562  021470                                  ERRDF   19.,EM75,ERR2   ;BA MODIFIED DA
2563  021470  104462                          TRAP    T$ERCODE
2564  021472  000023                          .WORD   19
2565  021474  010774                          .WORD   EM75
2566  021476  011402                          .WORD   ERR2
```

```
2567  021500                          2$:
2568  021500                          ENDTST                          ;****END OF TEST****
2569  021500                          L10051:
2570  021500  104001                         EMT     C$ETST
2571
2572
2573                                  .SBTTL  **TEST 26** - UNIQUENESS OF RLDA
2574
2575  021502                          BGNTST                          ;****START OF TEST****
2576
2577
2578  021502                          STARS
2579                                  ;;*****************************************************************
2580                                  ;TEST THE UNIQUENESS OF THE DISK ADDRESS REGISTER.  THE RLCS
2581                                  ;AND RLBA ARE LOADED WITH XXX20X AND 177776
2582                                  ;RESPECTIVELY.  THE RLDA IS THEN WRITTEN TO INSURE
2583                                  ;THAT NEITHER THE RLCS OR THE RLBA ARE MODIFIED
2584                                  ;BY WRITING THE RLDA.
2585  021502                          STARS
2586                                  ;;*****************************************************************
2587
2588
2589  021502  012737  000200  002234          MOV     #CRDY,@DDAT     ;CONTROLLER READY
2590  021510  032777  040000  160410          BIT     #DERR,@RLCS     ;IF DRIVE ERROR SET
2591  021516  001403                          BEQ     99$             ;THEN EXPECT IT LATER
2592  021520  052737  140000  002234          BIS     #ERR!DERR,@DDAT
2593  021526  013777  002234  160372  99$:    MOV     @DDAT,@RLCS     ;LOAD CS
2594  021534  012777  177776  160366          MOV     #-2,@RLBA       ;LOAD BA WITH ALL 1'S
2595  021542  005077  160364                  CLR     @RLDA           ;CLEAR RLDA
2596
2597                                  ;CHECK IF RLCS IS OKAY
2598
2599  021546  017737  160354  002236          MOV     @RLCS,@BDDAT    ;READ RLCS
2600  021554  042737  000001  002236          BIC     #DRDY,@BDDAT    ;IGNORE DRIVE READY
2601  021562  023737  002234  002236          CMP     @DDAT,@BDDAT    ;RLCS OKAY?
2602  021570  001404                          BEQ     1$              ;YES, THEN BRANCH
2603
2604  021572                                  ERRDF   20.,EM76,ERR2   ;DA MODIFIED CS
2605  021572  104462                          TRAP    T$ERCODE
2606  021574  000024                          .WORD   20
2607  021576  011026                          .WORD   EM76
2608  021600  011402                          .WORD   ERR2
2609  021602                          1$:     CKLOOP                  ;CHECK IF /FL:LOE IS SET
2610  021602  104006                          EMT     C$CLP1
2611
2612  021604  022777  177776  160316          CMP     #-2,@RLBA       ;IS RLBA OKAY?
2613  021612  001412                          BEQ     2$              ;BRANCH IF OKAY
2614
2615  021614  012737  177776  002234          MOV     #-2,@DDAT       ;SET UP EXPECTED
2616  021622  017737  160302  002236          MOV     @RLBA,@BDDAT    ;READ RLBA
2617
2618  021630                                  ERRDF   21.,EM77,ERR2   ;DA MODIFIED BA
2619  021630  104462                          TRAP    T$ERCODE
2620  021632  000025                          .WORD   21
2621  021634  011061                          .WORD   EM77
2622  021636  011402                          .WORD   ERR2
```

```
2623  021640                          2$:
2624
2625
2626  021640                          ENDTST                          ;****END OF TEST****
2627  021640                          L10052:
2628  021640  104001                          EMT     C$ETST
2629
2630                                  .SBTTL  **TEST 27** - UNIQUENESS OF RLMP
2631
2632  021642                          BGNTST                          ;****START OF TEST****
2633
2634
2635  021642                          STARS
2636                                  ;;*****************************************************************
2637                                  ;TEST THE UNIQUENESS OF THE MULTI-PURPOSE REGISTER
2638                                  ;WE WILL WRITE THE RLCS, RLBA, AND THE RLDA, THEN THE
2639                                  ;RLMP IS WRITTEN. WE THEN GO BACK AN VERIFY THE CONTENTS
2640                                  ;OF THE RLCS, RLBA, RLDA.
2641  021642                          STARS
2642                                  ;;*****************************************************************
2643
2644
2645  021642  012737  000200  002234          MOV     #CRDY,GDDAT     ;CONTROLLER READY
2646  021650  032777  040000  160250          BIT     #DERR,@RLCS     ;IF DRIVE ERROR SET
2647  021656  001403                          BEQ     99$             ;THE EXPECT IT LATER
2648  021660  052737  140000  002234          BIS     #ERR!DERR,GDDAT
2649  021666  013777  002234  160232  99$:    MOV     GDDAT,@RLCS     ;LOAD CS
2650  021674  012777  177776  160226          MOV     #-2,@RLBA       ;LOAD BA WITH ALL 1'S
2651  021702  012777  177777  160222          MOV     #-1,@RLDA       ;LOAD RLDA
2652  021710  005077  160220                  CLR     @RLMP           ;WRITE RLMP
2653
2654                                  ;CHECK IF RLCS IS OKAY
2655
2656  021714  017737  160206  002236          MOV     @RLCS,BDDAT     ;READ RLCS
2657  021722  042737  000001  002236          BIC     #DRDY,BDDAT     ;IGNORE DRIVE READY
2658  021730  023737  002234  002236          CMP     GDDAT,BDDAT     ;RLCS OKAY?
2659  021736  001404                          BEQ     1$              ;YES, THEN BRANCH
2660
2661  021740                                  ERRDF   22.,EM44,ERR2   ;MP MODIFIED CS
2662  021740  104462                          TRAP    T$ERCODE
2663  021742  000026                          .WORD   22
2664  021744  007730                          .WORD   EM44
2665  021746  011402                          .WORD   ERR2
2666  021750                          1$:     CKLOOP                  ;CHECK IF /FL:LOE IS SET
2667  021750  104006                          EMT     C$CLP1
2668
2669  021752  022777  177776  160150          CMP     #-2,@RLBA       ;IS RLBA OKAY?
2670  021760  001412                          BEQ     2$              ;BRANCH IF OKAY
2671
2672  021762  012737  177776  002234          MOV     #-2,GDDAT       ;SET UP EXPECTED
2673  021770  017737  160134  002236          MOV     @RLBA,BDDAT     ;READ RLBA
2674
2675  021776                                  ERRDF   23.,EM45,ERR2   ;MP MODIFIED BA
2676  021776  104462                          TRAP    T$ERCODE
2677  022000  000027                          .WORD   23
2678  022002  007763                          .WORD   EM45
```

```
2679  022004  011402                          .WORD   ERR2
2680  022006                          2$:     CKLOOP                  ;CHECK IF /FL:LOE IS SET
2681  022006  104006                          EMT     C$CLP1
2682  022010  022777  177777  160114          CMP     #-1,@RLDA       ;DISK ADDRESS OKAY
2683  022016  001412                          BEQ     3$              ;YES, CONTINUE
2684
2685  022020  017737  160106  002236          MOV     @RLDA,BDDAT     ;SET UP BAD
2686  022026  012737  177777  002234          MOV     #-1,GDDAT       ;SET UP EXPECTED
2687
2688  022034                                  ERRDF   24.,EM46,ERR2   ;MP MODIFIED DA
2689  022034  104462                          TRAP    T$ERCODE
2690  022036  000030                          .WORD   24
2691  022040  010016                          .WORD   EM46
2692  022042  011402                          .WORD   ERR2
2693
2694  022044                          3$:
2695
2696
2697  022044                          ENDTST                          ;****END OF TEST****
2698  022044                          L10053:
2699  022044  104001                          EMT     C$ETST
2700
2701                                  .SBTTL  **TEST 28** - NOOP FUNCTION(RL11 ONLY)
2702
2703  022046                          BGNTST                          ;****START OF TEST****
2704
2705
2706
2707  022046                          STARS
2708                                  ;;*************************************************************
2709                                  ;TEST THAT NOOP WILL FUNCTION.  WE WILL ISSUE THE
2710                                  ;NOOP AND WAIT FOR CONTROLLER READY TO SET.  A
2711                                  ;TIMEOUT OF 200 MILLISECS IS ALLOWED.  DRIVE 0 IS ALWAYS
2712                                  ;SELECTED SINCE THE DRIVE IS NOT NECESSARY.
2713  022046                          STARS
2714                                  ;;*************************************************************
2715
2716
2717  022046  005737  002260                  TST     T.CNTLR         ;RL11??
2718  022052  001410                          BEQ     99$             ;YES SKIP TEST
2719
2720
2721  022054  004537  014602                  JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
2722  022060  000000                          NOOP0                   ;NOOP(0) FUNCTION
2723  022062  004537  016354                  JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
2724  022066                          2$:     CKLOOP                  ;CHECK IF /FL:LOE IS SET
2725  022066  104006                          EMT     C$CLP1
2726
2727  022070  004537  014302                  JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
2728
2729  022074                          99$:
2730  022074                          ENDTST                          ;****END OF TEST****
2731  022074                          L10054:
2732  022074  104001                          EMT     C$ETST
2733
2734
```

```
CVRLAA.P11    14-APR-78 15:04          **TEST 29** - TEST NOOP DOES NOTHING (RL11 ONLY)

                                       .SBTTL  **TEST 29** - TEST NOOP DOES NOTHING (RL11 ONLY)

022076                                 BGNTST                          ;****START OF TEST****

022076                                 STARS
                                       ;;*************************************************************************
                                       ;TEST THAT ISSUING A NOOP FUNCTION DOES NOTHING.  THIS IS DONE BY WRITING
                                       ;THE RLBA, AND RLDA, READING THE RLMP AND MAKING SURE NOTHING CHANGES.
022076                                 STARS
                                       ;;*************************************************************************

022076  005737  002260                         TST     T.CNTLR         ;RLV11??
022102  001476                               BEQ     3$

022104  012777  000001  160020               MOV     #1,@RLDA        ;LOAD DISK ADDRESS
022112  012777  000002  160010               MOV     #2,@RLBA        ;LOAD BUS ADDRESS
022120  005077  160010                       CLR     @RLMP
022124  017737  160004  002234               MOV     @RLMP,GDDAT     ;READ RLMP

022132  004537  014602                       JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
022136  000000                             NOOP0
022140  004537  016354                       JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
022144                                     CKLOOP                  ;CHECK IF /FL:LOE IS SET
022144  104006                             EMT     C$CLP1

022146  004537  014302                       JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
022152                                     ESCAPE  TST             ;IF /FL:LOE SET LOOP, ELSE EXIT TST
022152  104010                             EMT     C$ESCAPE
022154  000124                             .WORD   L10055-.

022156  017737  157752  002236               MOV     @RLMP,BDDAT     ;READ RLMP
022164  023737  002234  002236               CMP     GDDAT,BDDAT     ;RLMP OK?
022172  001404                               BEQ     1$

022174                                     ERRDF   25.,EM14,ERR2
022174  104462                             TRAP    T$ERCODE
022176  000031                             .WORD   25
022200  006763                             .WORD   EM14
022202  011402                             .WORD   ERR2

022204                                 1$: CKLOOP                  ;CHECK IF /FL:LOE IS SET
022204  104006                             EMT     C$CLP1

022206  012737  000002  002234               MOV     #2,GDDAT        ;SET UP EXP'D BA
022214  017737  157710  002236               MOV     @RLBA,BDDAT     ;READ BA
022222  023737  002234  002236               CMP     GDDAT,BDDAT     ;BA OK?
022230  001404                               BEQ     2$              ;YES

022232                                     ERRDF   26.,EM15,ERR2
022232  104462                             TRAP    T$ERCODE
022234  000032                             .WORD   26
022236  007011                             .WORD   EM15
022240  011402                             .WORD   ERR2

022242                                 2$: CKLOOP                  ;CHECK IF /FL:LOE IS SET
022242  104006                             EMT     C$CLP1
```

```
2791
2792  022244  012737  000001  002234          MOV     #1,GDDAT        ;SET UP EXP'D DA
2793  022252  017737  157654  002236          MOV     @RLDA,BDDAT     ;READ DA
2794  022260  023737  002234  002236          CMP     GDDAT,BDDAT     ;DA OKAY
2795  022266  001404                          BEQ     3$
2796
2797  022270                                  ERRDF   27.,EM16,ERR2
2798  022270  104462                          TRAP    T$ERCODE
2799  022272  000033                          .WORD   27
2800  022274  007037                          .WORD   EM16
2801  022276  011402                          .WORD   ERR2
2802
2803  022300                          3$:
2804
2805  022300                          ENDTST                          ;****END OF TEST****
2806  022300                          L10055:
2807  022300  104001                          EMT     C$ETST
2808
2809
2810                                  .SBTTL  **TEST 30** - TEST OF INTERRUPT (RL11 ONLY)
2811
2812  022302                          BGNTST                          ;****START OF TEST****
2813
2814  022302                          STARS
2815                                  ;;*****************************************************************
2816                                  ;CHECK THE INTERRUPT WITH A NOOP.  WE WILL SET UP THE
2817                                  ;INTERRUPT VECTOR, LOWER THE PSW TO ZERO AND ISSUE
2818                                  ;A NOOP.  THE INTERRUPT SERVICE ROUTINE WILL SET A
2819                                  ;FLAG UPON INTERRUPT AND RETURN IN LINE.  WE WAIT 200 MILLISECONDS
2820                                  ;LOOKING FOR THAT FLAG TO BE SET BEFORE CALLING IT
2821                                  ;AN ERROR.  IF THE INTERRUPT SENDS US TO ANOTHER
2822                                  ;VECTOR ADDRESS THEN THE ERROR HANDLER WILL REPORT
2823                                  ;"TRAP TO XXXX FROM YYYY" AND RETURN  TO DIAG SUP MONITOR.  IF THE
2824                                  ;INTERRUPT GOES TO ABOVE 1000 WHO KNOWS WHAT WILL HAPPEN.
2825  022302                          STARS
2826                                  ;;*****************************************************************
2827
2828
2829  022302  005737  002260                  TST     T.CNTLR
2830  022306  001426                          BEQ     99$
2831
2832  022310  005037  002176                  CLR     INTFLG          ;CLEAR INTERRUPT OCCRUANCE FLAG
2833  022314                                  SETPRI  #PRI00          ;SET PSW TO 0
2834  022314  012700  000000                  MOV     #PRI00,R0
2835  022320  104041                          EMT     C$SPRI
2836  022322  004537  014602                  JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
2837  022326  000100                          NOOP0!INTEN             ;NOOP AND INTERRUPT ENABLE
2838  022330  004537  016354                  JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
2839  022334  005737  002176                  TST     INTFLG          ;DID INTERRUPT OCCUR
2840  022340  001004                          BNE     2$              ;IF SO BRANCH
2841  022342                                  ERRDF   28.,EM13,ERR0
2842  022342  104462                          TRAP    T$ERCODE
2843  022344  000034                          .WORD   28
2844  022346  006731                          .WORD   EM13
2845  022350  011352                          .WORD   ERR0
2846  022352  005037  002176          2$:     CLR     INTFLG
```

```
2847  022356                                  CKLOOP                          ;CHECK IF /FL:LOE IS SET
2848  022356  104006                         EMT     C$CLP1
2849  022360  004537  014302                 JSR     R5,CHERR                ;CHECK CONTROLLER FOR ERRORS
2850
2851
2852  022364                                  99$:
2853  022364                                  ENDTST                          ;****END OF TEST****
2854  022364                                  L10056:
2855  022364  104001                         EMT     C$ETST
2856
2857
2858                                          .SBTTL  **TEST 31** - TEST PRIORITY BR LEVEL (RL11 ONLY)
2859
2860  022366                                  BGNTST                          ;****START OF TEST****
2861
2862  022366                                  STARS
2863                                          ;;*************************************************************************
2864                                          ;TEST THAT PRIORITY GIVEN IS ACTUAL PRIORITY OF CONTROLLER.  WE KNOW
2865                                          ;THE BOARD WILL INTERRUPT.  WE WILL START TRYING TO INTERRUPT AT 7
2866                                          ;AND WORK DOWN TIL IT DOES INTERRUPT.
2867  022366                                  STARS
2868                                          ;;*************************************************************************
2869
2870  022366  005737  002260                 TST     T.CNTLR                 ;RLV11??
2871  022372  001456                         BEQ     6$                      ;YES, SKIP TEST
2872
2873  022374  012737  000340  002236         MOV     #340,BDDAT              ;SET UP INITIAL OF 7
2874  022402  013737  002140  002234         MOV     3PRIOR,GDDAT            ;GET GIVEN PRIORITY
2875
2876  022410                                  BGNSEG                          ;****START OF SEGMENT****
2877  022410  104004                         EMT     C$BSEG
2878
2879  022412  005037  002176                 5$:     CLR     INTFLG          ;CLEAR INTERRUPT OCCURRANCE
2880  022416                                          SETPRI  BDDAT           ;SET PRIORITY
2881  022416  013700  002236                         MOV     BDDAT,R0
2882  022422  104041                         EMT     C$SPRI
2883
2884  022424  004537  014602                 JSR     R5,LDFUNC               ;ISSUE FUNCTION OF FOLLOWING WORD
2885  022430  000100                         NOOPO!INTEN
2886
2887  022432  004537  016354                 JSR     R5,WTCRDY               ;WAIT FOR CONTROLLER READY HIGH
2888  022436                                  ESCAPE  TST↑                    ;IF /FL:LOE SET LOOP, ELSE EXIT TST
2889  022436  104010                         EMT     C$ESCAPE
2890  022440  000070                         .WORD   L10057-.
2891
2892  022442  004537  014302                 JSR     R5,CHERR                ;CHECK CONTROLLER FOR ERRORS
2893  022446                                  ESCAPE  TST↑                    ;IF /FL:LOE SET LOOP, ELSE EXIT TST
2894  022446  104010                         EMT     C$ESCAPE
2895  022450  000060                         .WORD   L10057-.
2896
2897  022452  023737  002236  002234         CMP     BDDAT,GDDAT             ;SHOULD IT INTERRUPT
2898  022460  002012                         BGE     1$                      ;NO, BRANCH
2899
2900  022462  005737  002176                 TST     INTFLG                  ;DID INTERRUPT OCCUR
2901  022466  001004                         BNE     2$                      ;YES, OK
2902
```

```
CVRLAA.P11    14-APR-78 15:04          **TEST 31** - TEST PRIORITY BR LEVEL (RL11 ONLY)

                                3$:     ERRDF   29, EM17,ERR7
022470                                  TRAP    T$ERCODE
022470  104462                          .WORD   29
022472  000035                          .WORD   EM17
022474  007065                          .WORD   ERR7
022476  011670                          .WORD   ERR7

022500                          2$:     ESCAPE  SEG             ;IF /FL:LOE SET LOOP, ELSE EXIT SEG
022500  104010                          EMT     C$ESCAPE
022502  000014                          .WORD   10000$-.
022504  000405                          BR      4$
022506  005737  002176          1$:     TST     INTFLG          ;DID INTERRUPT OCCUR
022512  001772                          BEQ     2$              ;NO, OK
022514  000765                          BR      3$              ;YES, ERROR

022516                          ENDSEG                          ;****END OF SEGMENT****
022516                          10000$:
022516  104005                          EMT     C$ESEG
022520  162737  000040  002236  4$:     SUB     #40,BDDAT       ;NEXT LEVEL
022526  100331                          BPL     5$

022530                          6$:
022530                          ENDTST                          ;****END OF TEST****
022530                          L10057:
022530  104001                          EMT     C$ETST


                                .SBTTL  **TEST 32** - RLV11 MAINT. FORCED OPI TEST,LESS THAN 510 WORDS

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

022532                          STARS
                                ;;**************************************************************
                                ;PERFORM RLV11 MAINTENANCE FUNCTION 0 WITH LESS THAN 510 WORDS
                                ;TO FORCE OPI ERROR. THE TEST SHOULD FORCE COMPOSITE ERROR(BIT 15),
                                ;HEADER NOT FOUND(BIT12) AND OPI(BIT 10). DRIVE ERROR IS IGNORED.
022532                          STARS
                                ;;**************************************************************
022532  005737  002260                  TST     T.CNTLR         ;RLV11?
022536  001040                          BNE     10$             ;NO,EXIT TEST
022540  012703  002514          1$:     MOV     #PATCRC,R3      ;GET CRC PATTERN TABLE
022544  012704  002606                  MOV     #PATDAT,R4      ;GET DATA PATTERN TABLE
022550  011337  022564                  MOV     (R3),2$         ;STORE CRC PATTERN
022554  011437  022572                  MOV     (R4),3$         ;STORE DATA PATTERN
022560  004537  015216                  JSR     R5,CALCRC       ;CALCULATE CRC BEFORE TEST
022564  000000          2$:     .WORD   0
022566  004537  015454                  JSR     R5,SETPAT       ;SETUP PATTERN BEFORE TEST
022572  000000          3$:     .WORD   0
022574                          BGNSEG
022574  104004                  EMT     C$BSEG
022576  004537  015542                  JSR     R5,LDFUN        ;PERFORM MAINT FUNCTION
022602  000000                  MAINT
022604  177271                  -507                            ;LESS THAN 510 WORDS
022606  006044                  MATMES                          ;MAINT. MESSAGE
022610  004537  016354                  JSR     R5,WTCRDY
022614                          CKLOOP                          ;LOOP SWITCH
022614  104006                  EMT     C$CLP1
```

```
2959  022616  004537  015026          JSR     R5,CHKOPI       ;CHECK FOR EXPECTED ERRORS
2960  022622  000404                  BR      4$              ;EXPECTED ERRORS FOUND,EXIT TEST
2961  022624                          ERRDF   30.,EM27,ERR10
2962  022624  104462                  TRAP    T$ERCODE
2963  022626  000036                  .WORD   30
2964  022630  007557                  .WORD   EM27
2965  022632  011726                  .WORD   ERR10
2966  022634                  4$:     CKLOOP
2967  022634  104006                  EMT     C$CLP1
2968  022636                          ENDSEG
2969  022636                  10000$:
2970  022636  104005                  EMT     C$ESEG
2971  022640                  10$:
2972
2973  022640                  ENDTST
2974  022640                  L10060:
2975  022640  104001                  EMT     C$ETST
2976
2977                          .SBTTL  **TEST 33** - RLV11 MAINT. FORCED OPI TEST,MORE THAN 511 WORDS
2978
2979  022642                  BGNTST                          ;****START OF TEST****
2980
2981  022642                  STARS
2982                          ;;*************************************************************
2983                          ;PERFORM RLV11 MAINTENANCE FUNCTION 0 WITH MORE THAN 511 WORDS
2984                          ;TO FORCE OPI ERROR. THE TEST SHOULD FORCE COMPOSITE ERROR(BIT 15),
2985                          ;HEADER NOT FOUND(BIT12) AND OPI(BIT 10). DRIVE ERROR IS IGNORED.
2986 022642                  STARS
2987                          ;;*************************************************************
2988 022642  005737  002260          TST     T.CNTLR         ;RLV11?
2989 022646  001040                  BNE     10$             ;NO,EXIT TEST
2990 022650  012703  002514  1$:     MOV     #PATCRC,R3      ;GET CRC PATTERN TABLE
2991 022654  012704  002606          MOV     #PATDAT,R4      ;GET DATA PATTERN TABLE
2992 022660  011337  022674          MOV     (R3),2$         ;STORE CRC PATTERN
2993 022664  011437  022702          MOV     (R4),3$         ;STORE DATA PATTERN
2994 022670  004537  015216          JSR     R5,CALCRC       ;CALCULATE CRC BEFORE TEST
2995 022674  000000          2$:     .WORD   0
2996 022676  004537  015454          JSR     R5,SETPAT       ;SETUP PATTERN BEFORE TEST
2997 022702  000000          3$:     .WORD   0
2998 022704                          BGNSEG
2999 022704  104004                  EMT     C$BSEG
3000 022706  004537  015542          JSR     R5,LDFUN        ;PERFORM MAINT FUNCTION
3001 022712  000000                  MAINT
3002 022714  177266                  -512                    ;MORE THAN 511 WORDS
3003 022716  006044                  MAIMES                  ;MAINT. MESSAGE
3004 022720  004537  016354          JSR     R5,WTCRDY
3005 022724                          CKLOOP                  ;LOOP SWITCH
3006 022724  104006                  EMT     C$CLP1
3007 022726  004537  015026          JSR     R5,CHKOPI       ;CHECK FOR EXPECTED ERRORS
3008 022732  000404                  BR      4$              ;EXPECTED ERRORS FOUND,EXIT TEST
3009 022734                          ERRDF   31.,EM30,ERR10
3010 022734  104462                  TRAP    T$ERCODE
3011 022736  000037                  .WORD   31
3012 022740  007633                  .WORD   EM30
3013 022742  011726                  .WORD   ERR10
3014 022744                  4$:     CKLOOP
```

```
 3015  022744  104006                        EMT     C$CLP1
 3016  022746                                ENDSEG
 3017  022746                        10000$:
 3018  022746  104005                        EMT     C$ESEG
 3019  022750                        10$:
 3020
 3021  022750                        ENDTST
 3022  022750                        L10061:
 3023  022750  104001                        EMT     C$ETST
 3024
 3025                                .SBTTL  **TEST 34** - RLV11 MAINT. FORCED OPI TEST - INTERRUPT MODE
 3026
 3027  022752                        BGNTST                          ;****START OF TEST****
 3028
 3029  022752                        STARS
 3030                                ;;*********************************************************************
 3031                                ;PERFORM TEST OF INTERRUPT BY ISSUING RLV11 MAINTENANCE FUNCTION 0
 3032                                ;WITH MORE THAN 511 WORDS TO FORCE OPI ERROR. CHECK INTERRUPT
 3033                                ;OPERATION AND REPORT IF ERROR OCCURS.
 3034  022752                        STARS
 3035                                ;;*********************************************************************
 3036
 3037  022752  005737  002260                TST     T.CNTLR         ;RLV11?
 3038  022756  001052                        BNE     10$             ;NO,EXIT TEST
 3039  022760  012703  002514        1$:     MOV     #PATCRC,R3      ;GET CRC PATTERN TABLE
 3040  022764  012704  002606                MOV     #PATDAT,R4      ;GET DATA PATTERN TABLE
 3041  022770  011337  023004                MOV     (R3),2$         ;STORE CRC PATTERN
 3042  022774  011437  023012                MOV     (R4),3$         ;STORE DATA PATTERN
 3043  023000  004537  015216                JSR     R5,CALCRC       ;CALCULATE CRC
 3044  023004  000000        2$:             .WORD   0
 3045  023006  004537  015454                JSR     R5,SETPAT       ;SETUP PATTERN
 3046  023012  000000        3$:             .WORD   0
 3047  023014                                BGNSEG
 3048  023014  104004                        EMT     C$BSEG
 3049  023016                                SETPRI  #PRI00          ;SET PRIORITY TO ZERO
 3050  023016  012700  000000                MOV     #PRI00,R0
 3051  023022  104041                        EMT     C$SPRI
 3052  023024  005037  002176                CLR     INTFLG          ;CLEAR INT. FLAG
 3053  023030  004537  015542                JSR     R5,LDFUN
 3054  023034  000100                        MAINT!INTEN             ;MAINT FUNCTION,INT DRIVEN
 3055  023036  177266                        -512                    ;MORE THAN 511 TO FORCE OPI ERROR
 3056  023040  006104                        MATINT
 3057  023042  004537  016354                JSR     R5,WTCRDY       ;WAIT FOR READY
 3058  023046                                CKLOOP
 3059  023046  104006                        EMT     C$CLP1
 3060  023050                                SETPRI  #PRI07
 3061  023050  012700  000340                MOV     #PRI07,R0
 3062  023054  104041                        EMT     C$SPRI
 3063  023056  005737  002176                TST     INTFLG          ;CHECK IF INTERRUPT OCCURRED
 3064  023062  001004                        BNE     4$
 3065  023064                                ERRDF   32.,EM24,ERR0
 3066  023064  104462                        TRAP    T$ERCODE
 3067  023066  000040                        .WORD   32
 3068  023070  007404                        .WORD   EM24
 3069  023072  011352                        .WORD   ERR0
 3070  023074  005037  002176        4$:     CLR     INTFLG          ;CLEAR INT. FLAG
```

```
3071  023100                        CKLOOP
3072  023100  104006               EMT     C$CLP1
3073  023102                        ENDSEG
3074  023102                  10000$:
3075  023102  104005               EMT     C$ESEG
3076  023104                  10$:
3077
3078  023104                  ENDTST
3079  023104                  L10062:
3080  023104  104001               EMT     C$ETST
3081
3082
3083                          .SBTTL  **TEST 35** - RLV11 OPI TIMEOUT TEST
3084
3085  023106                  BGNTST                          ;START OF TEST
3086
3087  023106                  STARS
3088                          ;;*********************************************************************
3089                          ;PERFORM RLV11 MAINTENANCE FUNCTION (0) WITH INTERRUPT MODE. FORCE
3090                          ;OPI TIMEOUT BY SETTING WORD COUNT TO -512 WORDS. MEASURE OPI TIMEOUT
3091                          ;AND COMPARE TO MIN. AND MAX. LIMITS.
3092  023106                  STARS
3093                          ;;*********************************************************************
3094
3095  023106  005737  002260         TST     T.CNTLR         ;RLV11?
3096  023112  001402                 BEQ     1$              ;YES,PERFORM TEST
3097  023114  000137  023434         JMP     10$             ;RL11,EXIT TEST
3098  023120  012703  002514   1$:   MOV     #PATCRC,R3      ;GET CRC PATTERN TABLE
3099  023124  012704  002606         MOV     #PATDAT,R4      ;GET DATA PATTERN TABLE
3100  023130  011337  023144         MOV     (R3),2$         ;STORE CRC PATTERN
3101  023134  011437  023152         MOV     (R4),3$         ;STORE DATA PATTERN
3102  023140  004537  015216         JSR     R5,CALCRC       ;CALCULATE CRC BEFORE TEST
3103  023144  000000           2$:   .WORD   0
3104  023146  004537  015454         JSR     R5,SETPAT       ;SETUP PATTERN BEFORE TEST
3105  023152  000000           3$:   .WORD   0
3106  023154                        BGNSEG
3107  023154  104004                EMT     C$BSEG
3108  023156                        CLRVEC  BVEC            ;CLEAR PRESENT INT. VECTOR
3109  023156  013700  002142         MOV     BVEC,R0
3110  023162  104036                EMT     C$CVEC
3111  023164                        SETVEC  BVEC,#TIMSRV,#340
3112  023164  012746  000340         MOV     #340,-(SP)
3113  023170  012746  016300         MOV     #TIMSRV,-(SP)
3114  023174  013746  002142         MOV     BVEC,-(SP)
3115  023200  012746  000003         MOV     #3,-(SP)
3116  023204  104037                EMT     C$$VEC
3117  023206  062706  000010         ADD     #10,SP
3118  023212                        SETPRI  #PRI00          ;SETUP FOR WAIT ABORT
3119  023212  012700  000000         MOV     #PRI00,R0
3120  023216  104041                EMT     C$SPRI
3121  023220  005037  002176         CLR     INTFLG          ;CLEAR INTERRUPT FLAG
3122  023224  013700  002266         MOV     OPIMX,R0        ;OPI LIMIT SETUP
3123  023230  006300                ASL     R0
3124  023232  006300                ASL     R0
3125  023234  006300                ASL     R0
3126  023236  063700  002266         ADD     OPIMX,R0
```

CVRLAA.P11 14-APR-78 15:04 **TEST 35** - RLV11 OPI TIMEOUT TEST

```
3127  023242  063700  002266          ADD     OPIMX,R0
3128  023246  004537  015542          JSR     R5,LDFUN        ;PERFORM MAINT. FUNCTION
3129  023252  000100                  MAINT!INTEN             ;MAINT FUNCTION WITH INT.MODE
3130  023254  177266                  -512                    ;WORD COUNT
3131  023256  006104                  MATINT                  ;MAINT MESSAGE
3132  023260                          WAITUS  R0              ;WAIT MAX. MILLISECONDS
3133  023260  104027                  EMT     C$WTU
3134  023262  005737  002176          TST     INTFLG          ;CHECK INT. FLG
3135  023266  001004                  BNE     4$
3136  023270                          ERRDF   33.,EM24,ERR0   ;ERROR ON INTERRUPT
3137  023270  104462                  TRAP    T$ERCODE
3138  023272  000041                  .WORD   33
3139  023274  007404                  .WORD   EM24
3140  023276  011352                  .WORD   ERR0
3141  023300  005037  002176  4$:     CLR     INTFLG
3142  023304                          CKLOOP
3143  023304  104006                  EMT     C$CLP1
3144  023306                          GETTIM  BDDAT           ;GET TIME EXPIRED
3145  023306  104052                  EMT     C$GTIM
3146  023310  010037  002236          MOV     R0,BDDAT
3147  023314  005000                  CLR     R0              ;DIVIDE
3148  023316  162737  000012  002236  5$:     SUB     #10.,BDDAT      ;ANSWER
3149  023324  100402                  BMI     6$              ;BY 10 TO GET
3150  023326  005200                  INC     R0              ;RIGHT ANSWER
3151  023330  000772                  BR      5$
3152  023332  010037  002236  6$:     MOV     R0,BDDAT        ;STORE DIVIDED RESULT
3153
3154                          ;CHECK THAT OPI IS WITHIN LIMITS
3155
3156  023336                  7$:     SETPRI  #PRI07
3157  023336  012700  000340          MOV     #PRI07,R0
3158  023342  104041                  EMT     C$SPRI
3159  023344  023737  002266  002236  CMP     OPIMX,BDDAT     ;IS OPI WITHIN LIMITS
3160  023352  002404                  BLT     8$              ;NO,REPORT ERROR
3161  023354  023737  002264  002236  CMP     OPIMN,BDDAT     ;WITHIN LIMITS?
3162  023362  003404                  BLE     9$              ;YES
3163  023364                  8$:     ERRDF   34.,EM31,ERR11  ;OPI TIMING INCORRECT
3164  023364  104462                  TRAP    T$ERCODE
3165  023366  000042                  .WORD   34
3166  023370  007707                  .WORD   EM31
3167  023372  011770                  .WORD   ERR11
3168  023374                  9$:     CKLOOP
3169  023374  104006                  EMT     C$CLP1
3170  023376                          CLRVEC  BVEC            ;CLEAR PRESENT VECTOR AND RESET OLD
3171  023376  013700  002142          MOV     BVEC,R0
3172  023402  104036                  EMT     C$CVEC
3173  023404                          SETVEC  BVEC,#INTSRV,#340
3174  023404  012746  000340          MOV     #340,-(SP)
3175  023410  012746  016272          MOV     #INTSRV,-(SP)
3176  023414  013746  002142          MOV     BVEC,-(SP)
3177  023420  012746  000003          MOV     #3,-(SP)
3178  023424  104037                  EMT     C$$VEC
3179  023426  062706  000010          ADD     #10,SP
3180  023432                          ENDSEG
3181  023432                  10000$:
3182  023432  104005                  EMT     C$ESEG
```

```
3183  023434                        10$:
3184
3185  023434                        ENDTST
3186  023434                        L10063:
3187  023434  104001                        EMT     C$ETST
3188
3189
3190                                .SBTTL  **TEST 36** - TEST RLV11 MAINT. FUNCTION - FLAG MODE
3191
3192  023436                        BGNTST                          ;****START OF TEST****
3193
3194  023436                        STARS
3195                                ;;*****************************************************************
3196                                ;PERFORM RLV11 MAINTENANCE FUNCTION 0 IN FLAG MODE AND CHECK
3197                                ;FOR PROPER INCREMENT OF THE DA AND BA REGISTERS. CHECK THE SERIAL
3198                                ;WRITE/READ DATA PATHS BY READING OUT OF THE FIFO VIA THE MP REGISTER
3199                                ;THE CRC OF DA+3 AND THE CRC OF CRC OF DA+4 AND COMPARING WITH EXPECTED
3200                                ;RESULTS. CHECK THE TRANSFER OF 255 WORDS FROM BUF1 MEMORY THROUGH THE
3201                                ;FIFO INTO BUF2 MEMORY FOR PROPER DATA.
3202                                ;CHECK THE PREVIOUSLY WRITTEN DATA IN THE LAST WORD+1 OF BUF2 FOR
3203                                ;A VALUE:123456 TO INSURE THAT THE TRANSFER WAS NOT MORE THAN 255 WORDS.
3204  023436                        STARS
3205                                ;;*****************************************************************
3206  023436  005737  002260                TST     T.CNTLR         ;RLV11?
3207  023442  001402                        BEQ     100$            ;YES,RLV11
3208  023444  000137  024246                JMP     10$             ;NO,SKIP TEST
3209  023450  012703  002514        100$:   MOV     #PATCRC,R3      ;GET CRC PATTERN TABLE
3210  023454  012737  002606  002300        MOV     #PATDAT,PATSAV  ;GET DATA PATTERN TABLE
3211  023462  011337  023500        101$:   MOV     (R3),102$       ;STORE CRC PATTERN FOR CALCULATION
3212  023466  017737  156606  023510        MOV     @PATSAV,103$    ;STORE DATA PAT. FOR BUFFER FILL
3213  023474  004537  015216                JSR     R5,CALCRC       ;CALCULATE CRC BEFORE TEST
3214  023500  000000        102$:   .WORD   0               ;PATTERN FOR CRC TEST
3215  023502                        BGNSEG
3216  023502  104004                EMT     C$BSEG
3217  023504  004537  015454                JSR     R5,SETPAT       ;SETUP PATTERN IN BUFFER
3218  023510  000000        103$:   .WORD   0               ;BUFFER PATTERN
3219  023512  004537  015542                JSR     R5,LDFUN        ;PERFORM MAINT. FUNCTION
3220  023516  000000                        MAINT                   ;MAINT FUNCTION FLAG DRIVEN
3221  023520  177001                        -511.                   ;.ORD COUNT
3222  023522  006044                        MATMES                  ;MESSAGE
3223  023524  004537  016354                JSR     R5,WTCRDY       ;WAIT FOR READY
3224  023530                        CKLOOP
3225  023530  104006                EMT     C$CLP1
3226  023532  004537  014302                JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
3227  023536                        CKLOOP
3228  023536  104006                EMT     C$CLP1
3229  023540  012737  005476  002234        MOV     #BUF1+1776,GDDAT
3230  023546  013737  002162  002236        MOV     E.BA,BDDAT
3231  023554  023737  002234  002236        CMP     GDDAT,BDDAT     ;TEST BA REGISTER
3232  023562  001404                        BEQ     1$
3233  023564                        ERRDF   35.,EM10,ERR4   ;DATA WRONG IN BA REGISTER
3234  023564  104462                TRAP    T$ERCODE
3235  023566  000043                .WORD   35
3236  023570  006566                .WORD   EM10
3237  023572  011546                .WORD   ERR4
3238  023574               1$:      CKLOOP                  ;CHECK FOR LOOP MODE
```

```
3239  023574  104006                          EMT     C$CLP1
3240  023576  013737  002152  002234          MOV     B.DA,GDDAT      ;GET BEFORE DA REGISTER
3241  023604  013737  002164  002236          MOV     E.DA,BDDAT
3242  023612  005037  002222                  CLR     TEMP1
3243  023616  113737  002152  002222          MOVB    B.DA,TEMP1
3244  023624  062737  000006  002222          ADD     #6,TEMP1        ;+6 TO DA LOW BYTE
3245  023632  113737  002222  002234          MOVB    TEMP1,GDDAT     ;STORE LOW BYTE OF DA
3246  023640  023737  002234  002236          CMP     GDDAT,BDDAT
3247  023646  001404                          BEQ     2$
3248  023650                                  ERRDF   36.,EM12,ERR4
3249  023650  104462                          TRAP    T$ERCODE
3250  023652  000044                          .WORD   36
3251  023654  006670                          .WORD   EM12
3252  023656  011546                          .WORD   ERR4
3253  023660                          2$:     CKLOOP
3254  023660  104006                          EMT     C$CLP1
3255  023662  013737  002242  002234          MOV     GDCRCA,GDDAT    ;GET CRC OF DA+3 VALUE
3256  023670  013737  002166  002236          MOV     E.MP,BDDAT      ;GET CONTROLLER CRC OF DA+3
3257  023676  023737  002234  002236          CMP     GDDAT,BDDAT
3258  023704  001404                          BEQ     3$
3259  023706                                  ERRDF   37.,EM20,ERR4
3260  023706  104462                          TRAP    T$ERCODE
3261  023710  000045                          .WORD   37
3262  023712  007120                          .WORD   EM20
3263  023714  011546                          .WORD   ERR4
3264  023716                          3$:     CKLOOP
3265  023716  104006                          EMT     C$CLP1
3266  023720  013737  002244  002234          MOV     GDCRCB,GDDAT
3267  023726  013737  002170  002236          MOV     E.MP1,BDDAT
3268  023734  023737  002234  002236          CMP     GDDAT,BDDAT
3269  023742  001404                          BEQ     4$
3270  023744                                  ERRDF   38.,EM21,ERR4
3271  023744  104462                          TRAP    T$ERCODE
3272  023746  000046                          .WORD   38
3273  023750  007173                          .WORD   EM21
3274  023752  011546                          .WORD   ERR4
3275  023754                          4$:     CKLOOP
3276  023754  104006                          EMT     C$CLP1
3277  023756  005037  002302                  CLR     SAVCNT          ;CLEAR BAD WORD COUNTER
3278  023762  005037  002232                  CLR     CHECK           ;CLEAR PRINT HEADER INDICATOR
3279  023766  012704  003500                  MOV     #BUF1,R4        ;GOOD DATA STORED IN BUF1
3280  023772  012702  004500                  MOV     #BUF2,R2        ;DATA BUFFER WRITTEN INTO BY MAINT.
3281  023776  012701  000377                  MOV     #255.,R1
3282  024002  011437  002234          5$:     MOV     (R4),GDDAT      ;EXPECTED DATA
3283  024006  011237  002236                  MOV     (R2),BDDAT      ;GET DATA FROM BUFFER
3284  024012  023737  002234  002236          CMP     GDDAT,BDDAT
3285  024020  001440                          BEQ     7$              ;DATA COMPARE
3286  024022  010237  002224                  MOV     R2,TMP0         ;DATA ERR-GET ADDRESS
3287  024026  005237  002302                  INC     SAVCNT          ;INC BAD WORD COUNTER
3288  024032  005737  002232                  TST     CHECK           ;CHECK IF FIRST TIME
3289  024036  001007                          BNE     6$
3290  024040                                  ERRDF   39.,EM22,ERR3
3291  024040  104462                          TRAP    T$ERCODE
3292  024042  000047                          .WORD   39
3293  024044  007255                          .WORD   EM22
3294  024046  011444                          .WORD   ERR3
```

```
3295  024050  005237  002232            INC     CHECK           ;PRINT HEADER ONCE
3296  024054  000422                    BR      7$
3297  024056                    6$:     PRINTX  #FRMT14,E.BA,E.DA,TMPO,GDDAT,BDDAT
3298  024056  013746  002236            MOV     BDDAT,-(SP)
3299  024062  013746  002234            MOV     GDDAT,-(SP)
3300  024066  013746  002224            MOV     TMPO,-(SP)
3301  024072  013746  002164            MOV     E.DA,-(SP)
3302  024076  013746  002162            MOV     E.BA,-(SP)
3303  024102  012746  013217            MOV     #FRMT14,-(SP)
3304  024106  012746  000006            MOV     #6,-(SP)
3305  024112  010600                    MOV     SP,R0
3306  024114  104015                    EMT     C$PNTX
3307  024116  062706  000016            ADD     #16,SP
3308  024122                    7$:     CKLOOP
3309  024122  104006                    EMT     C$CLP1
3310  024124  005722                    TST     (R2)+           ;INCREMENT BUFFER
3311  024126  005724                    TST     (R4)+           ;INCREMENT BUFFER
3312  024130  005301                    DEC     R1              ;FINISHED BUFFER?
3313  024132  001323                    BNE     5$              ;RETURN FOR NEXT COMPARE
3314  024134  005737  002232            TST     CHECK           ;CHECK FOR ERROR HEADER FLAG
3315  024140  001412                    BEQ     77$
3316  024142                            PRINTB  #FRMT98,SAVCNT  ;PRINT BAD WORD COUNT
3317  024142  013746  002302            MOV     SAVCNT,-(SP)
3318  024146  012746  012572            MOV     #FRMT98,-(SP)
3319  024152  012746  000002            MOV     #2,-(SP)
3320  024156  010600                    MOV     SP,R0
3321  024160  10401,                    EMT     C$PNTB
3322  024162  062706  000006            ADD     #6,SP
3323  024166  012737  123456  002234  77$:     MOV     #123456,GDDAT   ;EXPECTED DATA IN LAST WORD+1
3324  024174  011237  002236            MOV     (R2),BDDAT      ;GET LAST WORD+1 FROM BUF2
3325  024200  023737  002234  002236    CMP     GDDAT,BDDAT
3326  024206  001404                    BEQ     8$
3327  024210                            ERRDF   40.,EM23,ERR4
3328  024210  104462                    TRAP    T$ERCODE
3329  024212  000050                    .WORD   40
3330  024214  007344                    .WORD   EM23
3331  024216  011546                    .WORD   ERR4
3332  024220                    8$:     CKLOOP
3333  024220  104006                    EMT     C$CLP1
3334  024222                            ENDSEG
3335  024222                    10000$:
3336  024222  104005                    EMT     C$ESEG
3337  024224  005723                    TST     (R3)+           ;INC CRC PATTERN
3338  024226  062737  000002  002300    ADD     #2,PATSAV       ;UPDATE PATTERN TABLE
3339  024234  020327  002604            CMP     R3,#CRCEND      ;CHECK FOR END
3340  024240  001402                    BEQ     10$             ;END OF TEST
3341  024242  000137  023462            JMP     101$            ;CONTINUE TEST
3342
3343  024246                    10$:
3344
3345  024246                    ENDTST
3346  024246                    L10064:
3347  024246  104001                    EMT     C$ETST
3348
3349
3350                            .SBTTL  **TEST 37** - TEST RLV11 MAINT. FUNCTION -INTERRUPT MODE
```

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

                                        STARS
                                        ;;*****************************************************************
                                        ;PERFORM RLV11 MAINTENANCE FUNCTION 0 (INT. MODE) AND CHECK
                                        ;FOR PROPER INCREMENT OF THE DA AND BA REGISTERS. CHECK THE SERIAL
                                        ;WRITE/READ DATA PATHS BY READING OUT OF THE FIFO VIA THE MP REGISTER
                                        ;THE CRC OF DA+3 AND THE CRC OF CRC OF DA+4 AND COMPARING WITH EXPECTED
                                        ;RESULTS. CHECK THE TRANSFER OF 255 WORDS FROM BUF1 MEMORY THROUGH THE
                                        ;FIFO INTO BUF2 MEMORY FOR PROPER DATA.
                                        ;CHECK THE PREVIOUSLY WRITTEN DATA IN THE LAST WORD+1 OF BUF2 FOR
                                        ;VALUE:123456 TO INSURE THAT THE TRANSFER WAS NOT MORE THAN 255 WORDS.
                                        STARS
                                        ;;*****************************************************************
024250  005737  002260                  TST     T.CNTLR                 ;RLV11?
024254  001402                          BEQ     100$                    ;YES,RLV11
024256  000137  025124                  JMP     10$                     ;NO,SKIP TEST
024262  012703  002514          100$:   MOV     #PATCRC,R3              ;GET CRC PATTERN
024266  012737  002606  002300          MOV     #PATDAT,PATSAV          ;GET DATA PATTERN
024274  011337  024312          101$:   MOV     (R3),102$
024300  017737  155774  024322          MOV     @PATSAV,103$
024306  004537  015216                  JSR     R5,CALCRC               ;CALCULATE CRC BEFORE TEST
024312  000000                  102$:   .WORD   0                       ;PATTERN FOR CRC TEST
024314                                  BGNSEG
024314  104004                          EMT     C$BSEG
024316  004537  015454                  JSR     R5,SETPAT               ;SETUP PATTERN IN BUFFER
024322  000000                  103$:   .WORD   0                       ;BUFFER PATTERN
024324                                  SETPRI  #PRI00                  ;SET PRIORITY TO ZERO
024324  012700  000000                  MOV     #PRI00,R0
024330  104041                          EMT     C$SPRI
024332  005037  002176                  CLR     INTFLG                  ;CLEAR INT. FLAG
024336  004537  015542                  JSR     R5,LDFUN                ;PERFORM MAINT. FUNCTION
024342  000100                          MAINT!INTEN                     ;MAINT FUNCTION INT. DRIVEN
024344  177001                          -511.                           ;WORD COUNT
024346  006104                          MAINT                           ;MESSAGE
024350  004537  016354                  JSR     R5,WTCRDY               ;WAIT FOR READY
024354                                  CKLOOP
024354  104006                          EMT     C$CLP1
024356                                  SETPRI  #PRI07
024356  012700  000340                  MOV     #PRI07,R0
024362  104041                          EMT     C$SPRI
024364  005737  002176                  TST     INTFLG
024370  001004                          BNE     104$
024372                                  ERRDF   41.,EM24,ERR0
024372  104462                          TRAP    T$ERCODE
024374  000051                          .WORD   41
024376  007404                          .WORD   EM24
024400  011352                          .WORD   ERR0
024402  005037  002176          104$:   CLR     INTFLG                  ;CLEAR INT. FLAG
024406                                  CKLOOP
024406  104006                          EMT     C$CLP1
024410  004537  014302                  JSR     R5,CHERR                ;CHECK CONTROLLER FOR ERRORS
024414                                  CKLOOP
024414  104006                          EMT     C$CLP1
024416  012737  005476  002234          MOV     #BUF1+1776,GDDAT
```

```
3407  024424  013737  002162  002236          MOV     E.BA,BDDAT
3408  024432  023737  002234  002236          CMP     GDDAT,BDDAT     ;TEST BA REGISTER
3409  024440  001404                          BEQ     1$
3410  024442                                  ERRDF   42.,EM10,ERR4   ;DATA WRONG IN BA REGISTER
3411  024442  104462                          TRAP    T$ERCODE
3412  024444  000052                          .WORD   42
3413  024446  006566                          .WORD   EM10
3414  024450  011546                          .WORD   ERR4
3415  024452                          1$:     CKLOOP                  ;CHECK FOR LOOP MODE
3416  024452  104006                          EMT     C$CLP1
3417  024454  013737  002152  002234          MOV     B.DA,GDDAT      ;GET BEFORE DA REGISTER
3418  024462  013737  002164  002236          MOV     E.DA,BDDAT
3419  024470  005037  002222                  CLR     TEMP1
3420  024474  113737  002152  002222          MOVB    B.DA,TEMP1
3421  024502  062737  000006  002222          ADD     #6,TEMP1        ;+6 TO DA LOW BYTE
3422  024510  113737  002222  002234          MOVB    TEMP1,GDDAT     ;STORE LOW BYTE OF DA
3423  024516  023737  002234  002236          CMP     GDDAT,BDDAT
3424  024524  001404                          BEQ     2$
3425  024526                                  ERRDF   43.,EM12,ERR4
3426  024526  104462                          TRAP    T$ERCODE
3427  024530  000053                          .WORD   43
3428  024532  006670                          .WORD   EM12
3429  024534  011546                          .WORD   ERR4
3430  024536                          2$:     CKLOOP
3431  024536  104006                          EMT     C$CLP1
3432  024540  013737  002242  002234          MOV     GDCRCA,GDDAT    ;GET CRC OF DA+3 VALUE
3433  024546  013737  002166  002236          MOV     E.MP,BDDAT      ;GET CONTROLLER CRC OF DA+3
3434  024554  023737  002234  002236          CMP     GDDAT,BDDAT
3435  024562  001404                          BEQ     3$
3436  024564                                  ERRDF   44.,EM20,ERR4
3437  024564  104462                          TRAP    T$ERCODE
3438  024566  000054                          .WORD   44
3439  024570  007120                          .WORD   EM20
3440  024572  011546                          .WORD   ERR4
3441  024574                          3$:     CKLOOP
3442  024574  104006                          EMT     C$CLP1
3443  024576  013737  002244  002234          MOV     GDCRCB,GDDAT
3444  024604  013737  002170  002236          MOV     E.MP1,BDDAT
3445  024612  023737  002234  002236          CMP     GDDAT,BDDAT
3446  024620  001404                          BEQ     4$
3447  024622                                  ERRDF   45.,EM21,ERR4
3448  024622  104462                          TRAP    T$ERCODE
3449  024624  000055                          .WORD   45
3450  024626  007173                          .WORD   EM21
3451  024630  011546                          .WORD   ERR4
3452  024632                          4$:     CKLOOP
3453  024632  104006                          EMT     C$CLP1
3454  024634  005037  002302                  CLR     SAVCNT          ;CLEAR BAD WORD COUNTER
3455  024640  005037  002232                  CLR     CHECK           ;CLEAR PRINT HEADER INDICATOR
3456  024644  012704  003500                  MOV     #BUF1,R4        ;GOOD DATA BUFFER
3457  024650  012702  004500                  MOV     #BUF2,R2        ;DATA BUFFER WRITTEN INTO BY MAINT.
3458  024654  012701  000377                  MOV     #255.,R1
3459  024660  011437  002234          5$:     MOV     (R4),GDDAT      ;EXPECTED DATA
3460  024664  011237  002236                  MOV     (R2),BDDAT      ;GET DATA FROM BUFFER
3461  024670  023737  002234  002236          CMP     GDDAT,BDDAT
3462  024676  001440                          BEQ     7$              ;DATA COMPARE
```

```
3463  024700  010237  002224                    MOV     R2,TMPO          ;DATA ERR-GET ADDRESS
3464  024704  005237  002302                    INC     SAVCNT           ;INC. BAD WORD COUNT
3465  024710  005737  002232                    TST     CHECK            ;CHECK IF FIRST TIME
3466  024714  001007                            BNE     6$
3467  024716                                    ERRDF   46.,EM22,ERR3
3468  024716  104462                            TRAP    T$ERCODE
3469  024720  000056                            .WORD   46
3470  024722  007255                            .WORD   EM22
3471  024724  011444                            .WORD   ERR3
3472  024726  005237  002232                    INC     CHECK            ;PRINT HEADER ONCE
3473  024732  000422                            BR      7$
3474  024734                            6$:     PRINTX  #FRMT14,E.BA,E.DA,TMPO,GDDAT,BDDAT
3475  024734  013746  002236                    MOV     BDDAT,-(SP)
3476  024740  013746  002234                    MOV     GDDAT,-(SP)
3477  024744  013746  002224                    MOV     TMPO,-(SP)
3478  024750  013746  002164                    MOV     E.DA,-(SP)
3479  024754  013746  002162                    MOV     E.BA,-(SP)
3480  024760  012746  013217                    MOV     #FRMT14,-(SP)
3481  024764  012746  000006                    MOV     #6,-(SP)
3482  024770  010600                            MOV     SP,R0
3483  024772  104015                            EMT     C$PNTX
3484  024774  062706  000016                    ADD     #16,SP
3485  025000                            7$:     CKLOOP
3486  025000  104006                            EMT     C$CLP1
3487  025002  005722                            TST     (R2)+            ;INCREMENT BUFFER
3488  025004  005724                            TST     (R4)+            ;INCREMENT BUFFER
3489  025006  005301                            DEC     R1               ;FINISHED BUFFER?
3490  025010  001323                            BNE     5$               ;RETURN FOR NEXT COMPARE
3491  025012  005737  002232                    TST     CHECK            ;CHECK ERROR HEADER FLAG
3492  025016  001412                            BEQ     77$
3493  025020                                    PRINTB  #FRMT98,SAVCNT   ;PRINT BAD WORD COUNT
3494  025020  013746  002302                    MOV     SAVCNT,-(SP)
3495  025024  012746  012572                    MOV     #FRMT98,-(SP)
3496  025030  012746  000002                    MOV     #2,-(SP)
3497  025034  010600                            MOV     SP,R0
3498  025036  104014                            EMT     C$PNTB
3499  025040  062706  000006                    ADD     #6,SP
3500  025044  012737  123456  002234    77$:    MOV     #123456,GDDAT    ;EXPECTED DATA IN LAST WORD+1
3501  025052  011237  002236                    MOV     (R2),BDDAT       ;GET LAST WORD+1 FROM BUF2
3502  025056  023737  002234  002236            CMP     GDDAT,BDDAT
3503  025064  001404                            BEQ     8$
3504  025066                                    ERRDF   47.,EM23,ERR4
3505  025066  104462                            TRAP    T$ERCODE
3506  025070  000057                            .WORD   47
3507  025072  007344                            .WORD   EM23
3508  025074  011546                            .WORD   ERR4
3509  025076                            8$:     CKLOOP
3510  025076  104006                            EMT     C$CLP1
3511  025100                                    ENDSEG
3512  025100                            10000$:
3513  025100  104005                            EMT     C$ESEG
3514  025102  005723                            TST     (R3)+            ;INC. CRC PATTERN
3515  025104  062737  000002  002300            ADD     #2,PATSAV        ;UPDATE PATTERN TABLE
3516  025112  020327  002604                    CMP     R3,#CRCEND       ;CHECK FOR END
3517  025116  001402                            BEQ     10$              ;END OF TEST
3518  025120  000137  024274                    JMP     101$             ;CONTINUE TEST
```

```
                                        10$:

                                        ENDTST
                                        L10065:
025124  104001                                EMT     C$ETST

                                        .SBTTL  **TEST 38** - RLV11 FIFO ADDRESS TEST

025126                                  BGNTST

025126                                  STARS
                                        ;;*********************************************************************
                                        ;TEST THAT FIFO OPERATES CORRECTLY.STORE ADDRESS PATTERN
                                        ;IN BUF1 (0-255) THAT CONTAINS A UNIQUE PATTERN IN EACH LOCATION.
                                        ;PERFORM MAINTENANCE FUNCTION AND TEST BUF2 FOR PROPER FIFO
                                        ;ADDRESSING.
025126                                  STARS
                                        ;;*********************************************************************
025126  005737  002260                          TST     T.CNTLR         ;RL11 OR RLV11
025132  001402                                BEQ     1$              ;RLV11;PERFORM TEST
025134  000137  025472                          JMP     10$             ;RL11;SKIP TEST
025140  005001                        1$:       CLR     R1
025142  012702  000400                          MOV     #256.,R2
025146  012703  003500                          MOV     #BUF1,R3        ;SETUP TO STORE PATTERN IN BUF1
025152  010123                        2$:       MOV     R1,(R3)+
025154  005201                                INC     R1              ;INC. PATTERN
025156  005302                                DEC     R2
025160  001374                                BNE     2$
025162  012702  000400                          MOV     #256.,R2        ;SETUP TO CLEAR BUF2
025166  012703  004500                          MOV     #BUF2,R3
025172  005023                        3$:       CLR     (R3)+
025174  005302                                DEC     R2
025176  001375                                BNE     3$
025200  005037  002176                          CLR     INTFLG          ;CLEAR INT. FLAG
025204                                        SETPRI  #PRI00
025204  012700  000000                          MOV     #PRI00,R0
025210  104041                                EMT     C$SPRI
025212  004537  015542                          JSR     R5,LDFUN        ;LOAD FUNCTION
025216  000100                                MAINT!INTEN             ;MAINT. WITH INTERRUPT
025220  177001                                -511.                   ;WORD COUNT
025222  006104                                MAINT                   ;MAINT. MESSAGE
025224  004537  016354                          JSR     R5,WTCRDY       ;WAIT FOR READY
025230                                        CKLOOP
025230  104006                                EMT     C$CLP1
025232                                        SETPRI  #PRI07
025232  012700  000340                          MOV     #PRI07,R0
025236  104041                                EMT     C$SPRI
025240  005737  002176                          TST     INTFLG          ;CHECK FOR INTERRUPT
025244  001004                                BNE     4$
025246                                        ERRDF   48.,EM24,ERR0
025246  104462                                TRAP    T$ERCODE
025250  000060                                .WORD   48
025252  007404                                .WORD   EM24
025254  011352                                .WORD   ERR0
025256  005037  002176                4$:       CLR     INTFLG
```

```
3575  025262                                  CKLOOP
3576  025262  104006                          EMT     C$CLP1
3577  025264  005037  002302                  CLR     SAVCNT          ;CLEAR BAD WORD COUNTER
3578  025270  005037  002232                  CLR     CHECK           ;CLEAR ERROR HEADER FLAG
3579  025274  005001                          CLR     R1
3580  025276  012702  000377                  MOV     #255.,R2
3581  025302  012703  004500                  MOV     #BUF2,R3
3582  025306  010137  002234          5$:     MOV     R1,GDDAT        ;EXPECTED DATA
3583  025312  011337  002236                  MOV     (R3),BDDAT      ;DATA IN BUFFER
3584  025316  023737  002234  002236          CMP     GDDAT,BDDAT
3585  025324  001440                          BEQ     7$
3586  025326  010337  002224                  MOV     R3,TMP0         ;GET ADDRESS FOR PRINTOUT
3587  025332  005237  002302                  INC     SAVCNT          ;INC. BAD WORD COUNTER
3588  025336  005737  002232                  TST     CHECK           ;CHECK ERROR HEADER FLAG
3589  025342  001007                          BNE     6$
3590  025344                                  ERRDF   49.,EM25,ERR3
3591  025344  104462                          TRAP    TSERCODE
3592  025346  000061                          .WORD   49
3593  025350  007446                          .WORD   EM25
3594  025352  011444                          .WORD   ERR3
3595  025354  005237  002232                  INC     CHECK
3596  025360  000422                          BR      7$
3597  025362                          6$:     PRINTX  #FRMT14,E.BA,E.DA,TMP0,GDDAT,BDDAT
3598  025362  013746  002236                  MOV     BDDAT,-(SP)
3599  025366  013746  002234                  MOV     GDDAT,-(SP)
3600  025372  013746  002224                  MOV     TMP0,-(SP)
3601  025376  013746  002164                  MOV     E.DA,-(SP)
3602  025402  013746  002162                  MOV     E.BA,-(SP)
3603  025406  012746  013217                  MOV     #FRMT14,-(SP)
3604  025412  012746  000006                  MOV     #6,-(SP)
3605  025416  010600                          MOV     SP,R0
3606  025420  104015                          EMT     C$PNTX
3607  025422  062706  000016                  ADD     #16,SP
3608  025426                          7$:     CKLOOP
3609  025426  104006                          EMT     C$CLP1
3610  025430  005723                          TST     (R3)+
3611  025432  005201                          INC     R1              ;UPDATE PATTERN EXPECTED
3612  025434  005302                          DEC     R2
3613  025436  001323                          BNE     5$
3614  025440  005737  002232                  TST     CHECK           ;CHECK ERROR FLAG
3615  025444  001412                          BEQ     10$
3616  025446                                  PRINTB  #FRMT98,SAVCNT  ;PRINT NUMBER OF BAD WORDS
3617  025446  013746  002302                  MOV     SAVCNT,-(SP)
3618  025452  012746  012572                  MOV     #FRMT98,-(SP)
3619  025456  012746  000002                  MOV     #2,-(SP)
3620  025462  010600                          MOV     SP,R0
3621  025464  104014                          EMT     C$PNTB
3622  025466  062706  000006                  ADD     #6,SP
3623
3624  025472                          10$:
3625
3626  025472                          ENDTST
3627  025472                          L10066:
3628  025472  104001                          EMT     C$ETST
3629
3630                                  .SBTTL  **TEST 39** - RLV11 FIFO ADDRESS COMPLEMENT TEST
```

```
                                BGNTST

025474                          STARS
                                ;;*****************************************************************
                                ;TEST THAT FIFO OPERATES CORRECTLY. STORE ADDRESS COMPLEMENT PAT.
                                ;IN BUF1 (0-255) THAT CONTAINS A UNIQUE PATTERN IN EACH LOCATION.
                                ;PERFORM MAINTENANCE FUNCTION AND TEST BUF2 FOR PROPER FIFO
                                ;ADDRESSING.
025474                          STARS
                                ;;*****************************************************************
025474  005737  002260                TST     T.CNTLR         ;RL11 OR RLV11
025500  001402                        BEQ     1$              ;RLV11;PERFORM TEST
025502  000137  026044                JMP     10$             ;RL11;SKIP TEST
025506  012701  177777        1$:     MOV     #177777,R1
025512  012702  000400                MOV     #256.,R2
025516  012703  003500                MOV     #BUF1,R3        ;SETUP TO STORE PATTERN IN BUF1
025522  010123                2$:     MOV     R1,(R3)+
025524  005301                        DEC     R1              ;NEXT COMP. PATTERN
025526  005302                        DEC     R2
025530  001374                        BNE     2$
025532  012702  000400                MOV     #256.,R2        ;SETUP TO CLEAR BUF2
025536  012703  004500                MOV     #BUF2,R3
025542  005023                3$:     CLR     (R3)+
025544  005302                        DEC     R2
025546  001375                        BNE     3$
025550  005037  002176                CLR     INTFLG          ;CLEAR INT. FLAG
025554                                SETPRI  #PRI00
025554  012700  000000                MOV     #PRI00,R0
025560  104041                        EMT     C$SPRI
025562  004537  015542                JSR     R5,LDFUN        ;LOAD FUNCTION
025566  000100                        MAINT!INTEN             ;MAINT. WITH INTERRUPT
025570  177001                        -511.                   ;WORD COUNT
025572  006104                        MAINT                   ;MAINT. MESSAGE
025574  004537  016354                JSR     R5,WTCRDY       ;WAIT FOR READY
025600                                CKLOOP
025600  104006                        EMT     C$CLP1
025602                                SETPRI  #PRI07
025602  012700  000340                MOV     #PRI07,R0
025606  104041                        EMT     C$SPRI
025610  005737  002176                TST     INTFLG          ;CHECK FOR INTERRUPT
025614  001004                        BNE     4$
025616                                ERRDF   50.,EM24,ERR0
025616  104462                        TRAP    T$ERCODE
025620  000062                        .WORD   50
025622  007404                        .WORD   EM24
025624  011352                        .WORD   ERR0
025626  005037  002176        4$:     CLR     INTFLG
025632                                CKLOOP
025632  104006                        EMT     C$CLP1
025634  005037  002302                CLR     SAVCNT          ;CLEAR BAD WORD COUNTER
025640  005037  002232                CLR     CHECK           ;CLEAR ERROR HEADER FLAG
025644  012701  177777                MOV     #177777,R1
025650  012702  000377                MOV     #255.,R2
025654  012703  004500                MOV     #BUF2,R3
025660  010137  002234        5$:     MOV     R1,GDDAT        ;EXPECTED DATA
```

```
3687  025664  011337  002236                MOV     (R3),BDDAT      ;DATA IN BUFFER
3688  025670  023737  002234  002236        CMP     GDDAT,BDDAT
3689  025676  001440                        BEQ     7$
3690  025700  010337  002224                MOV     R3,TMPO         ;GET ADDRESS FOR PRINTOUT
3691  025704  005237  002302                INC     SAVCNT          ;INC. BAD WORD COUNTER
3692  025710  005737  002232                TST     CHECK           ;CHECK ERROR HEADER FLAG
3693  025714  001007                        BNE     6$
3694  025716                                ERRDF   51.,EM26,ERR3
3695  025716  104462                        TRAP    T$ERCODE
3696  025720  000063                        .WORD   51
3697  025722  007505                        .WORD   EM26
3698  025724  011444                        .WORD   ERR3
3699  025726  005237  002232                INC     CHECK
3700  025732  000422                        BR      7$
3701  025734                        6$:     PRINTX  #FRMT14,E.BA,E.DA,TMPO,GDDAT,BDDAT
3702  025734  013746  002236                MOV     BDDAT,-(SP)
3703  025740  013746  002234                MOV     GDDAT,-(SP)
3704  025744  013746  002224                MOV     TMPO,-(SP)
3705  025750  013746  002164                MOV     E.DA,-(SP)
3706  025754  013746  002162                MOV     E.BA,-(SP)
3707  025760  012746  013217                MOV     #FRMT14,-(SP)
3708  025764  012746  000006                MOV     #6,-(SP)
3709  025770  010600                        MOV     SP,R0
3710  025772  104015                        EMT     C$PNTX
3711  025774  062706  000016                ADD     #16,SP
3712  026000                        7$:     CKLOOP
3713  026000  104006                        EMT     C$CLP1
3714  026002  005723                        TST     (R3)+
3715  026004  005301                        DEC     R1              ;GET NEXT PATTERN
3716  026006  005302                        DEC     R2
3717  026010  001323                        BNE     5$
3718  026012  005737  002232                TST     CHECK           ;CHECK ERROR FLAG
3719  026016  001412                        BEQ     10$
3720  026020                                PRINTB  #FRMT98,SAVCNT  ;PRINT NO. OF BAD WORDS
3721  026020  013746  002302                MOV     SAVCNT,-(SP)
3722  026024  012746  012572                MOV     #FRMT98,-(SP)
3723  026030  012746  000002                MOV     #2,-(SP)
3724  026034  010600                        MOV     SP,R0
3725  026036  104014                        EMT     C$PNTB
3726  026040  062706  000006                ADD     #6,SP
3727
3728  026044                        10$:
3729  026044                        ENDTST
3730  026044                        L10067:
3731  026044  104001                        EMT     C$ETST
3732
3733
3734                                .SBTTL  **TEST 40** - TEST RLV11 MAINT. WITH COMPLEMENT DATA -INT. MODE
3735
3736  026046                        BGNTST                          ;****START OF TEST****
3737
3738  026046                        STARS
3739                                ;;*************************************************************
3740                                ;PERFORM RLV11 MAINT. FUNCTION WITH COMPLEMENT DATA PATTERNS IN BUF1
3741                                ;CHECK FOR PROPER INCREMENT OF THE DA AND BA REGISTERS. CHECK THE SERIAL
3742                                ;WRITE/READ DATA PATHS BY READING OUT OF THE FIFO VIA THE MP REGISTER
```

```
3743                                    ;THE CRC OF DA+3 AND THE CRC OF CRC OF DA+4 AND COMPARING WITH EXPECTED
3744                                    ;RESULTS. CHECK THE TRANSFER OF 255 WORDS FROM BUF1 MEMORY THROUGH THE
3745                                    ;FIFO INTO BUF2 MEMORY FOR PROPER DATA.
3746                                    ;CHECK THE PREVIOUSLY WRITTEN DATA IN THE LAST WORD+1 OF BUF2 FOR
3747                                    ;VALUE:123456 TO INSURE THAT THE TRANSFER WAS NOT MORE THAN 255 WORDS.
3748  026046                            STARS
3749                                    ;;**********************************************************************
3750  026046  005737  002260                       TST     T.CNTLR         ;RLV11?
3751  026052  001402                               BEQ     100$            ;YES,RLV11
3752  026054  000137  026722                       JMP     10$             ;NO,SKIP TEST
3753  026060  012703  002514           100$:       MOV     #PATCRC,R3      ;GET CRC PATTERN
3754  026064  012737  002606  002300               MOV     #PATDAT,PATSAV  ;GET DATA PATTERN
3755  026072  011337  026110           101$:       MOV     (R3),102$
3756  026076  017737  154176  026120               MOV     @PATSAV,103$
3757  026104  004537  015216                       JSR     R5,CALCRC       ;CALCULATE CRC BEFORE TEST
3758  026110  000000                   102$:       .WORD   0               ;PATTERN FOR CRC TEST
3759  026112                                       BGNSEG
3760  026112  104004                               EMT     C$BSEG
3761  026114  004537  015642                       JSR     R5,SETCMP       ;SETUP PATTERN IN BUFFER
3762  026120  000000                   103$:       .WORD   0               ;BUFFER PATTERN
3763  026122                                       SETPRI  #PRI00          ;SET PRIORITY TO ZERO
3764  026122  012700  000000                       MOV     #PRI00,R0
3765  026126  104041                               EMT     C$SPRI
3766  026130  005037  002176                       CLR     INTFLG          ;CLEAR INT. FLAG
3767  026134  004537  015542                       JSR     R5,LDFUN        ;PERFORM MAINT. FUNCTION
3768  026140  000100                               MAINT!INTEN             ;MAINT FUNCTION INT. DRIVEN
3769  026142  177001                               -511.                   ;WORD COUNT
3770  026144  006104                               MAINT                   ;MESSAGE
3771  026146  004537  016354                       JSR     R5,WTCRDY       ;WAIT FOR READY
3772  026152                                       CKLOOP
3773  026152  104006                               EMT     C$CLP1
3774  026154                                       SETPRI  #PRI07
3775  026154  012700  000340                       MOV     #PRI07,R0
3776  026160  104041                               EMT     C$SPRI
3777  026162  005737  002176                       TST     INTFLG
3778  026166  001004                               BNE     104$
3779  026170                                       ERRDF   52.,EM24,ERR0
3780  026170  104462                               TRAP    T$ERCODE
3781  026172  000064                               .WORD   52
3782  026174  007404                               .WORD   EM24
3783  026176  011352                               .WORD   ERR0
3784  026200  005037  002176           104$:       CLR     INTFLG          ;CLEAR INT. FLAG
3785  026204                                       CKLOOP
3786  026204  104006                               EMT     C$CLP1
3787  026206  004537  014302                       JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
3788  026212                                       CKLOOP
3789  026212  104006                               EMT     C$CLP1
3790  026214  012737  005476  002234               MOV     #BUF1+1776,GDDAT
3791  026222  013737  002162  002236               MOV     E.BA,BDDAT
3792  026230  023737  002234  002236               CMP     GDDAT,BDDAT     ;TEST BA REGISTER
3793  026236  001404                               BEQ     1$
3794  026240                                       ERRDF   53.,EM10,ERR4   ;DATA WRONG IN BA REGISTER
3795  026240  104462                               TRAP    T$ERCODE
3796  026242  000065                               .WORD   53
3797  026244  006566                               .WORD   EM10
3798  026246  011546                               .WORD   ERR4
```

```
3799  026250                                  1$:   CKLOOP                  ;CHECK FOR LOOP MODE
3800  026250  104006                              EMT     C$CLP1
3801  026252  013737  002152  002234              MOV     B.DA,GDDAT        ;GET BEFORE DA REGISTER
3802  026260  013737  002164  002236              MOV     E.DA,BDDAT
3803  026266  005037  002222                      CLR     TEMP1
3804  026272  113737  002152  002222              MOVB    B.DA,TEMP1
3805  026300  062737  000006  002222              ADD     #6,TEMP1          ;+6 TO DA LOW BYTE
3806  026306  113737  002222  002234              MOVB    TEMP1,GDDAT       ;STORE LOW BYTE OF DA
3807  026314  023737  002234  002236              CMP     GDDAT,BDDAT
3808  026322  001404                              BEQ     2$
3809  026324                                      ERRDF   54.,EM12,ERR4
3810  026324  104462                              TRAP    T$ERCODE
3811  026326  000066                              .WORD   54
3812  026330  006670                              .WORD   EM12
3813  026332  011546                              .WORD   ERR4
3814  026334                                  2$:   CKLOOP
3815  026334  104006                              EMT     C$CLP1
3816  026336  013737  002242  002234              MOV     GDCRCA,GDDAT      ;GET CRC OF DA+3 VALUE
3817  026344  013737  002166  002236              MOV     E.MP,BDDAT        ;GET CONTROLLER CRC OF DA+3
3818  026352  023737  002234  002236              CMP     GDDAT,BDDAT
3819  026360  001404                              BEQ     3$
3820  026362                                      ERRDF   55.,EM20,ERR4
3821  026362  104462                              TRAP    T$ERCODE
3822  026364  000067                              .WORD   55
3823  026366  007120                              .WORD   EM20
3824  026370  011546                              .WORD   ERR4
3825  026372                                  3$:   CKLOOP
3826  026372  104006                              EMT     C$CLP1
3827  026374  013737  002244  002234              MOV     GDCRCB,GDDAT
3828  026402  013737  002170  002236              MOV     E.MP1,BDDAT
3829  026410  023737  002234  002236              CMP     GDDAT,BDDAT
3830  026416  001404                              BEQ     4$
3831  026420                                      ERRDF   56.,EM21,ERR4
3832  026420  104462                              TRAP    T$ERCODE
3833  026422  000070                              .WORD   56
3834  026424  007173                              .WORD   EM21
3835  026426  011546                              .WORD   ERR4
3836  026430                                  4$:   CKLOOP
3837  026430  104006                              EMT     C$CLP1
3838  026432  005037  002302                      CLR     SAVCNT            ;CLEAR BAD WORD COUNTER
3839  026436  005037  002232                      CLR     CHECK             ;CLEAR PRINT HEADER INDICATOR
3840  026442  012704  003500                      MOV     #BUF1,R4          ;GOOD DATA BUFFER
3841  026446  012702  004500                      MOV     #BUF2,R2          ;DATA BUFFER WRITTEN INTO BY MAINT.
3842  026452  012701  000377                      MOV     #255.,R1
3843  026456  011437  002234              5$:     MOV     (R4),GDDAT        ;EXPECTED DATA
3844  026462  011237  002236                      MOV     (R2),BDDAT        ;GET DATA FROM BUFFER
3845  026466  023737  002234  002236              CMP     GDDAT,BDDAT
3846  026474  001440                              BEQ     7$                ;DATA COMPARE
3847  026476  010237  002224                      MOV     R2,TMP0           ;DATA ERR-GET ADDRESS
3848  026502  005237  002302                      INC     SAVCNT            ;INC. BAD WORD COUNTER
3849  026506  005737  002232                      TST     CHECK             ;CHECK IF FIRST TIME
3850  026512  001007                              BNE     6$
3851  026514                                      ERRDF   57.,EM22,ERR3
3852  026514  104462                              TRAP    T$ERCODE
3853  026516  000071                              .WORD   57
3854  026520  007255                              .WORD   EM22
```

```
3855  026522  011444                        .WORD   ERR3
3856  026524  005237  002232                INC     CHECK           ;PRINT HEADER ONCE
3857  026530  000422                        BR      7$
3858  026532                        6$:     PRINTX  #FRMT14,E.BA,E.DA,TMPO,GDDAT,BDDAT
3859  026532  013746  002236                MOV     BDDAT,-(SP)
3860  026536  013746  002234                MOV     GDDAT,-(SP)
3861  026542  013746  002224                MOV     TMPO,-(SP)
3862  026546  013746  002164                MOV     E.DA,-(SP)
3863  026552  013746  002162                MOV     E.BA,-(SP)
3864  026556  012746  013217                MOV     #FRMT14,-(SP)
3865  026562  012746  000006                MOV     #6,-(SP)
3866  026566  010600                        MOV     SP,R0
3867  026570  104015                        EMT     C$PNTX
3868  026572  062706  000016                ADD     #16,SP
3869  026576                        7$:     CKLOOP
3870  026576  104006                        EMT     C$CLP1
3871  026600  005722                        TST     (R2)+           ;INCREMENT BUFFER
3872  026602  005724                        TST     (R4)+           ;INCREMENT BUFFER
3873  026604  005301                        DEC     R1              ;FINISHED BUFFER?
3874  026606  001323                        BNE     5$              ;RETURN FOR NEXT COMPARE
3875  026610  005737  002232                TST     CHECK           ;CHECK ERROR FLAG
3876  026614  001412                        BEQ     77$
3877  026616                                PRINTB  #FRMT98,SAVCNT  ;PRINT NO OF BAD WORDS
3878  026616  013746  002302                MOV     SAVCNT,-(SP)
3879  026622  012746  012572                MOV     #FRMT98,-(SP)
3880  026626  012746  000002                MOV     #2,-(SP)
3881  026632  010600                        MOV     SP,R0
3882  026634  104014                        EMT     C$PNTB
3883  026636  062706  000006                ADD     #6,SP
3884  026642  012737  123456  002234  77$:  MOV     #123456,GDDAT   ;EXPECTED DATA IN LAST WORD+1
3885  026650  011237  002236                MOV     (R2),BDDAT      ;GET LAST WORD+1 FROM BUF2
3886  026654  023737  002234  002236        CMP     GDDAT,BDDAT
3887  026662  001404                        BEQ     8$
3888  026664                                ERRDF   58.,EM23,ERR4
3889  026664  104462                        TRAP    T$ERCODE
3890  026666  000072                        .WORD   58
3891  026670  007344                        .WORD   EM23
3892  026672  011546                        .WORD   ERR4
3893  026674                        8$:     CKLOOP
3894  026674  104006                        EMT     C$CLP1
3895  026676                                ENDSEG
3896  026676                        10000$:
3897  026676  104005                        EMT     C$ESEG
3898  026700  005723                        TST     (R3)+           ;INC. CRC PATTERN
3899  026702  062737  000002  002300        ADD     #2,PATSAV       ;UPDATE PATTERN TABLE
3900  026710  020327  002604                CMP     R3,#CRCEND      ;CHECK FOR END
3901  026714  001402                        BEQ     10$             ;END OF TEST
3902  026716  000137  026072                JMP     101$            ;CONTINUE TEST
3903
3904  026722                        10$:
3905  026722                        ENDTST
3906  026722                        L10070:
3907  026722  104001                        EMT     C$ETST
3908
3909                                .SBTTL  **TEST 41** - TEST RLV11 MAINT. WITH RANDOM DATA -INT. MODE
3910
```

```
3911  026724                          BGNTST                          ;****START OF TEST****
3912
3913  026724                          STARS
3914                                  ;;*****************************************************************
3915                                  ;PERFORM RLV11 MAINT. FUNCTION WITH RANDOM DATA PATTERNS IN BUF1
3916                                  ;RANDOM PATTERN IS THE SAME FOR EACH CONTROLLER UNDER TEST.
3917                                  ;RANDOM PATTERN WILL CHANGE AT END OF PASS.
3918                                  ;RANDOM PATTERN WILL INIT AT START OR RESTART.
3919                                  ;CHECK FOR PROPER INCREMENT OF THE DA AND BA REGISTERS. CHECK THE SERIAL
3920                                  ;WRITE/READ DATA PATHS BY READING OUT OF THE FIFO VIA THE MP REGISTER
3921                                  ;THE CRC OF DA+3 AND THE CRC OF CRC OF DA+4 AND COMPARING WITH EXPECTED
3922                                  ;RESULTS. CHECK THE TRANSFER OF 255 WORDS FROM BUF1 MEMORY THROUGH THE
3923                                  ;FIFO INTO BUF2 MEMORY FOR PROPER DATA.
3924                                  ;CHECK THE PREVIOUSLY WRITTEN DATA IN THE LAST WORD+1 OF BUF2 FOR
3925                                  ;VALUE:123456 TO INSURE THAT THE TRANSFER WAS NOT MORE THAN 255 WORDS.
3926  026724                          STARS
3927                                  ;;*****************************************************************
3928  026724  005737  002260                  TST     T.CNTLR         ;RLV11?
3929  026730  001402                          BEQ     101$            ;YES,RLV11
3930  026732  000137  027544                  JMP     10$             ;NO,SKIP TEST
3931  026736  013737  002274  026756  101$:   MOV     TEMLO,102$      ;STARTING RANDOM PATTERN
3932  026744  013737  002274  002272          MOV     TEMLO,LONUM     ;RESET RANDOM START
3933  026752  004537  015216                  JSR     R5,CALCRC       ;CALCULATE CRC BEFORE TEST
3934  026756  000000          102$:   .WORD   0               ;PATTERN FOR CRC TEST
3935  026760  004537  015734                  JSR     R5,SETRAN       ;SETUP RANDOM PATTERN IN BUFFER
3936  026764                                  BGNSEG
3937  026764  104004                          EMT     C$BSEG
3938  026766                                  SETPRI  #PRI00          ;SET PRIORITY TO ZERO
3939  026766  012700  000000                  MOV     #PRI00,R0
3940  026772  104041                          EMT     C$SPRI
3941  026774  005037  002176                  CLR     INTFLG          ;CLEAR INT. FLAG
3942  027000  004537  015542                  JSR     R5,LDFUN        ;PERFORM MAINT. FUNCTION
3943  027004  000100                          MAINT!INTEN             ;MAINT FUNCTION INT. DRIVEN
3944  027006  177001                          -511.                   ;WORD COUNT
3945  027010  006104                          MATINT                  ;MESSAGE
3946  027012  004537  016354                  JSR     R5,WTCRDY       ;WAIT FOR READY
3947  027016                                  CKLOOP
3948  027016  104006                          EMT     C$CLP1
3949  027020                                  SETPRI  #PRI07
3950  027020  012700  000340                  MOV     #PRI07,R0
3951  027024  104041                          EMT     C$SPRI
3952  027026  005737  002176                  TST     INTFLG
3953  027032  001004                          BNE     104$
3954  027034                                  ERRDF   59.,EM24,ERR0
3955  027034  104462                          TRAP    T$ERCODE
3956  027036  000073                          .WORD   59
3957  027040  007404                          .WORD   EM24
3958  027042  011352                          .WORD   ERR0
3959  027044  005037  002176          104$:   CLR     INTFLG          ;CLEAR INT. FLAG
3960  027050                                  CKLOOP
3961  027050  104006                          EMT     C$CLP1
3962  027052  004537  014302                  JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
3963  027056                                  CKLOOP
3964  027056  104006                          EMT     C$CLP1
3965  027060  012737  005476  002234          MOV     #BUF1+1776,GDDAT
3966  027066  013737  002162  002236          MOV     E.BA,BDDAT
```

```
3967  027074  023737  002234  002236          CMP     GDDAT,BDDAT     ;TEST BA REGISTER
3968  027102  001404                          BEQ     1$
3969  027104                                  ERRDF   60.,EM10,ERR4   ;DATA WRONG IN BA REGISTER
3970  027104  104462                          TRAP    T$ERCODE
3971  027106  000074                          .WORD   60
3972  027110  006566                          .WORD   EM10
3973  027112  011546                          .WORD   ERR4
3974  027114                          1$:     CKLOOP                  ;CHECK FOR LOOP MODE
3975  027114  104006                          EMT     C$CLP1
3976  027116  013737  002152  002234          MOV     B.DA,GDDAT      ;GET BEFORE DA REGISTER
3977  027124  013737  002164  002236          MOV     E.DA,BDDAT
3978  027132  005037  002222                  CLR     TEMP1
3979  027136  113737  002152  002222          MOVB    B.DA,TEMP1
3980  027144  062737  000006  002222          ADD     #6,TEMP1        ;+6 TO DA LOW BYTE
3981  027152  113737  002222  002234          MOVB    TEMP1,GDDAT     ;STORE LOW BYTE OF DA
3982  027160  023737  002234  002236          CMP     GDDAT,BDDAT
3983  027166  001404                          BEQ     2$
3984  027170                                  ERRDF   61.,EM12,ERR4
3985  027170  104462                          TRAP    T$ERCODE
3986  027172  000075                          .WORD   61
3987  027174  006670                          .WORD   EM12
3988  027176  011546                          .WORD   ERR4
3989  027200                          2$:     CKLOOP
3990  027200  104006                          EMT     C$CLP1
3991  027202  013737  002242  002234          MOV     GDCRCA,GDDAT    ;GET CRC OF DA+3 VALUE
3992  027210  013737  002166  002236          MOV     E.MP,BDDAT      ;GET CONTROLLER CRC OF DA+3
3993  027216  023737  002234  002236          CMP     GDDAT,BDDAT
3994  027224  001404                          BEQ     3$
3995  027226                                  ERRDF   62.,EM20,ERR4
3996  027226  104462                          TRAP    T$ERCODE
3997  027230  000076                          .WORD   62
3998  027232  007120                          .WORD   EM20
3999  027234  011546                          .WORD   ERR4
4000  027236                          3$:     CKLOOP
4001  027236  104006                          EMT     C$CLP1
4002  027240  013737  002244  002234          MOV     GDCRCB,GDDAT
4003  027246  013737  002170  002236          MOV     E.MP1,BDDAT
4004  027254  023737  002234  002236          CMP     GDDAT,BDDAT
4005  027262  001404                          BEQ     4$
4006  027264                                  ERRDF   63.,EM21,ERR4
4007  027264  104462                          TRAP    T$ERCODE
4008  027266  000077                          .WORD   63
4009  027270  007173                          .WORD   EM21
4010  027272  011546                          .WORD   ERR4
4011  027274                          4$:     CKLOOP
4012  027274  104006                          EMT     C$CLP1
4013  027276  005037  002302                  CLR     SAVCNT          ;CLEAR BAD WORD COUNTER
4014  027302  005037  002232                  CLR     CHECK           ;CLEAR PRINT HEADER INDICATOR
4015  027306  012703  003500                  MOV     #BUF1,R3        ;BUFFER WITH RANDOM NUMBERS
4016  027312  012702  004500                  MOV     #BUF2,R2        ;DATA BUFFER WRITTEN INTO BY MAINT.
4017  027316  012701  000377                  MOV     #255.,R1
4018  027322  011337  002234          5$:     MOV     (R3),GDDAT      ;EXPECTED DATA
4019  027326  011237  002236                  MOV     (R2),BDDAT      ;GET DATA FROM BUFFER
4020  027332  023737  002234  002236          CMP     GDDAT,BDDAT
4021  027340  001440                          BEQ     7$              ;DATA COMPARE
4022  027342  010237  002224                  MOV     R2,TMP0         ;DATA ERR-GET ADDRESS
```

```
4023  027346  005237  002302          INC     SAVCNT          ;INC BAD WORD COUNT
4024  027352  005737  002232          TST     CHECK           ;CHECK IF FIRST TIME
4025  027356  001007                  BNE     6$
4026  027360                          ERRDF   64.,EM22,ERR3
4027  027360  104462                  TRAP    T$ERCODE
4028  027362  000100                  .WORD   64
4029  027364  007255                  .WORD   EM22
4030  027366  011444                  .WORD   ERR3
4031  027370  005237  002232          INC     CHECK           ;PRINT HEADER ONCE
4032  027374  000422                  BR      7$
4033  027376                  6$:     PRINTX  #FRMT14,E.BA,E.DA,TMPO,GDDAT,BDDAT
4034  027376  013746  002236          MOV     BDDAT,-(SP)
4035  027402  013746  002234          MOV     GDDAT,-(SP)
4036  027406  013746  002224          MOV     TMPO,-(SP)
4037  027412  013746  002164          MOV     E.DA,-(SP)
4038  027416  013746  002162          MOV     E.BA,-(SP)
4039  027422  012746  013217          MOV     #FRMT14,-(SP)
4040  027426  012746  000006          MOV     #6,-(SP)
4041  027432  010600                  MOV     SP,R0
4042  027434  104015                  EMT     C$PNTX
4043  027436  062706  000016          ADD     #16,SP
4044  027442                  7$:     CKLOOP
4045  027442  104006                  EMT     C$CLP1
4046  027444  005722                  TST     (R2)+           ;INCREMENT BUFFER
4047  027446  005723                  TST     (R3)+           ;INCREMENT GOOD BUFFER
4048  027450  005301                  DEC     R1              ;FINISHED BUFFER?
4049  027452  001323                  BNE     5$              ;RETURN FOR NEXT COMPARE
4050  027454  005737  002232          TST     CHECK           ;CHECK ERROR FLAG
4051  027460  001412                  BEQ     77$
4052  027462                          PRINTB  #FRMT98,SAVCNT  ;PRINT NO. OF BAD WORDS
4053  027462  013746  002302          MOV     SAVCNT,-(SP)
4054  027466  012746  012572          MOV     #FRMT98,-(SP)
4055  027472  012746  000002          MOV     #2,-(SP)
4056  027476  010600                  MOV     SP,R0
4057  027500  104014                  EMT     C$PNTB
4058  027502  062706  000006          ADD     #6,SP
4059  027506  012737  123456  002234  77$:    MOV     #123456,GDDAT   ;EXPECTED DATA IN LAST WORD+1
4060  027514  011237  002236          MOV     (R2),BDDAT      ;GET LAST WORD+1 FROM BUF2
4061  027520  023737  002234  002236  CMP     GDDAT,BDDAT
4062  027526  001404                  BEQ     8$
4063  027530                          ERRDF   65.,EM23,ERR4
4064  027530  104462                  TRAP    T$ERCODE
4065  027532  000101                  .WORD   65
4066  027534  007344                  .WORD   EM23
4067  027536  011546                  .WORD   ERR4
4068  027540                  8$:     CKLOOP
4069  027540  104006                  EMT     C$CLP1
4070  027542                          ENDSEG
4071  027542                  10000$:
4072  027542  104005                  EMT     C$ESEG
4073
4074  027544  000240          10$:    NOP                     ;NOP IS NEEDED TO INSURE THAT "LASTAD"
4075                                                          ;WILL HAVE BIT 7 CLEARED FOR APT
4076                                                          ;COMPATIBILITY.
4077  027546                  ENDTST
4078  027546                  L10071:
```

```
 4079  027546  104001                          EMT     CSETST
 4080
 4081  027550                                BGNMOD  HRDPRM
 4082
 4083  027550                                        BGNHRD
 4084  027550  000025                                .WORD L10072-L$HARD/2
 4085
 4086  027552                                        GPRML   CNTMSG,CNT,1,YES
 4087  027552  004130                                .WORD   T$CODE
 4088  027554  027640                                .WORD   CNTMSG
 4089  027556  000001                                .WORD   1
 4090  027560                                        GPRMA   CSRMSG,CSR,0,160000,177776,YES
 4091  027560  000031                                .WORD   T$CODE
 4092  027562  027624                                .WORD   CSRMSG
 4093  027564  160000                                .WORD   T$LOLIM
 4094  027566  177776                                .WORD   T$HILIM
 4095  027570                                        GPRMA   VECMSG,VECT,0,0,776,YES
 4096  027570  001031                                .WORD   T$CODE
 4097  027572  027656                                .WORD   VECMSG
 4098  027574  000000                                .WORD   T$LOLIM
 4099  027576  000776                                .WORD   T$HILIM
 4100  027600                                        GPRMD   BRMSG,PRIOR,0,340,0,7,YES
 4101  027600  002032                                .WORD   T$CODE
 4102  027602  027645                                .WORD   BRMSG
 4103  027604  000340                                .WORD   340
 4104  027606  000000                                .WORD   T$LOLIM
 4105  027610  000007                                .WORD   T$HILIM
 4106  027612                                        GPRMD   DRMSG,DRBT,0,03400,0,7,YES
 4107  027612  003032                                .WORD   T$CODE
 4108  027614  027665                                .WORD   DRMSG
 4109  027616  003400                                .WORD   03400
 4110  027620  000000                                .WORD   T$LOLIM
 4111  027622  000007                                .WORD   T$HILIM
 4112
 4113  027624                                        ENDHRD
 4114                                                .EVEN
 4115  027624                                L10072:
 4116
 4117  027624  052502  020123  042101  CSRMSG: .ASCIZ  /BUS ADDRESS/
 4118  027632  051104  051505  000123
 4119  027640  046122  030461     000  CNTMSG: .ASCIZ  /RL11/
 4120  027645     102  020122  042514  BRMSG:  .ASCIZ  /BR LEVEL/
 4121  027652  042526  000114
 4122  027656  042526  052103  051117  VECMSG: .ASCIZ  /VECTOR/
 4123  027664     000
 4124  027665     104  044522  042526  DRMSG:  .ASCIZ  /DRIVE/
 4125  027672     000
 4126        027674                    .EVEN
 4127
 4128  027674                                        ENDMOD
 4129
 4130
 4131
 4132  027674                                BGNMOD  SFTPRM
 4133
 4134  027674                                        BGNSFT
```

```
4135  027674  000014                        .WORD L10073-L$SOFT/2
4136  027676                                GPRML   DMSG,DLT,1,YES
4137  027676  000130                        .WORD   T$CODE
4138  027700  027726                        .WORD   DMSG
4139  027702  000001                        .WORD   1
4140  027704                                XFERF   1$
4141  027704  006044                        .WORD   T$CODE
4142  027706                                GPRMD   EMSG,ELT,0,177777,0,177777,YES
4143  027706  001032                        .WORD   T$CODE
4144  027710  027763                        .WORD   EMSG
4145  027712  177777                        .WORD   177777
4146  027714  000000                        .WORD   T$LOLIM
4147  027716  177777                        .WORD   T$HILIM
4148  027720                        1$:     GPRML   SMSG,SIZE,1,YES
4149  027720  002130                        .WORD   T$CODE
4150  027722  027752                        .WORD   SMSG
4151  027724  000001                        .WORD   1
4152  027726                                ENDSFT
4153                                        .EVEN
4154  027726                        L10073:
4155
4156
      027726  051104  050117  047440  DMSG:   .ASCIZ  /DROP ON ERROR LIMIT/
      027752  052501  047524  044523  SMSG:   .ASCIZ  /AUTOSIZE/
      027763     105  051122  051117  EMSG:   .ASCIZ  /ERROR LIMIT/

4157          030000                        .EVEN
4158
4159  030000                                ENDMOD
4160
4161          030114                        .=30114
4162                                        ;AREA RESERVED AS PATCH AREA FOR DIAGNOSTIC
4163                                        ;.=30114 WAS SELECTED TO PROVIDE AN ACT MAILBOX ADDRESS
4164                                        ;IN THE SUPERVISOR WITH THE PARITY BIT CLEARED.
4165  030114                                LASTAD
4166                                              .EVEN
4167  030114                                L$LAST::
4168
4169                                        ;FOR LSI-11 APT COMPATIBILITY MAKE SURE THAT THE "LASTAD" ADDRESS
4170                                        ;HAS A CLEAR BIT 7. WHEN APT TRANSMITS THE MAILBOX ADDRESS TO
4171                                        ;THE LSI-11,THE LSI ODT WILL CLEAR BIT 7 CREATING AN INVALID
4172                                        ;MAILBOX ADDRESS IF THAT BIT WAS SET.
4173
```

```
 4174
 4175  060710  000000                .SBTTL  DIAGNOSTIC SUPERVISOR -- LOW CORE SET UP
       060712  000000                .WORD   0               ;SPACE FOR USER POOL POINTER
       060714  000000                .WORD   0               ;SIZE
       060716  000000                .WORD   0               ;CHECKSUM (NOT CURRENTLY USED)
               060722                .WORD   0               ;SIZE OF H.W. PTAB. ALLOCATION
               000200               END.SUPV=.+2
                                    .END 200
```

CVRLAA.SUP 11-APR-78 09:27 CROSS REFERENCE TABLE -- USER SYMBOLS

```
ABOFLA  030440 G        4175#*
%BOPAS  030356 G        4175#*
ABO.FM  032720          4175#
ADDCOD  014212 G         929#
AFREG   006221           439#   640
AFSI    030146 G        4175#
AFTER   015414          1211#  1447   1457
ALLOC   051060          4175#
APT.ER  032050          4175#
ARLBA   006156           439#   616    637
ARLCS   006151           439#   618    639
%RLDA   006164           439#   629    651
ARLMP   006172           439#   627    649
%$AAV   034716          4175#
A$AAW   034732          4175#
A$AAX   034744          4175#
A$AAY   034752          4175#
A$AAZ   034766          4175#
A$ABA   034776          4175#
BATEST  017750          1989#  2011
BA16  = 000020           153#
BA17  = 000040           152#
BCCFBK  002206           225#  1363*  1369*  1372*  1375   1379
BCSR    002136           205#   821*   829
BDDAT   002236           237#   468    491     513    557    589  1834*  1835*  1836  1870*  1902*  1945*  1946*
                        1947   1995*  1996   2041*  2042  2091*  2092*  2093  2142*  2143*  2144   2191*  2192
                        2236*  2237   2280*  2281   2325*  2326  2380*  2381*  2382  2416*  2448*  2489*  2503*
                        2542*  2543*  2544   2560*  2599*  2600*  2601  2616*  2656*  2657*  2658   2673*  2685*
                        2765*  2766   2779*  2780   2793*  2794  2873*  2881  2897  2920*  3146*  3148*  3152*
                        3159   3161   3230*  3231   3241*  3246  3256*  3257  3267*  3268  3283*  3284   3298
                        3324*  3325   3407*  3408   3418*  3423  3433*  3434  3444*  3445  3460*  3461   3475
                        3501*  3502   3583*  3584   3598  3687*  3688  3702  3791*  3792  3802*  3807   3817*
                        3818   3828*  3829   3844*  3845  3859  3885*  3886  3966*  3967  3977*  3982   3992*
                        3993   4003*  4004   4019*  4020  4034  4060*  4061
BEFORE  015362          1094   1201#  1259
BEGPAT  002304           261#  1986   2034   2181   2228  2273  2317
BEREG   006200           439#   619
BGN.SU= 030114          4175#
BINMSG  047370          4175#
BIT0  = 000001 G         107#   146    171    1993
BIT00 = 000001 G          96#   107
BIT01 = 000002 G          95#   106
BIT02 = 000004 G          94#   105
BIT03 = 000010 G          93#   104
BIT04 = 000020 G          92#   103
BIT05 = 000040 G          91#   102
BIT06 = 000100 G          90#   101
BIT07 = 000200 G          89#   100
BIT08 = 000400 G          88#    99
BIT09 = 001000 G          87#    98
BIT1  = 000002 G         106#   160    162    164    166   168   170   398
BIT10 = 002000 G          86#   150   1132
BIT11 = 004000 G          85#  1025   1034
BIT12 = 010000 G          84#  1029   1038   1127
BIT13 = 020000 G          83#   154
BIT14 = 040000 G          82#   149
```

```
BIT15 = 100000 G          81#   148   1122
BIT2  = 000004 G         105#   160    163   164   167   172   399
BIT3  = 000010 G         104#   160    165   166   167   169   400
BIT4  = 000020 G         103#   153    175   401
BIT5  = 000040 G         102#   152    402
BIT6  = 000100 G         101#   147    173   174   403
BIT7  = 000200 G         100#   151    168
BIT8  = 000400 G          99#   156    158   404
BIT9  = 001000 G          98#   157    158   405
BLD.MW  035602           4175#
BLOCK   053214           4175#
BPRIOR  002140            206#   823*   2874
BRMSG   027645           4102   4120#
BUF1    003500            432#  1227   1253  1273  1298  3229  3279  3406  3456  3543  3647  3790  3840
                         3965  4015
BUF2    004500            433#  1232   1280  1304  3280  3457  3549  3581  3653  3685  3841  4016
BVEC    002142            207#   822*   871   905  3109  3114  3171  3176
B$AAB   037204           4175#
B$AAF   037116           4175#
B.BA    002150            210#   615   1202*
B.CS    002146            209#   617   1067  1069* 1070* 1071  1072* 1201*
B.DA    002152            211#   628   1203* 3240  3243  3417  3420  3801  3804  3976  3979
B.MP    002154            212#   626   1204*
CALBCC  002210            226#  1182   1190  1195  1385*
CALCRC  015216           1172#  2946   2994  3043  3102  3213  3373  3757  3933
CALLPC= 000022           4175#*
CALLPS= 000024           4175#*
CALLSP= 000026           4175#*
CALLTC= 000030           4175#*
CAL.CL  055602           4175#*
CAL.TI  055640 G         4175#
CHECK   002232            235#  3278*  3288  3295* 3314  3455* 3465  3472* 3491  3578* 3588  3595* 3614
                         3682* 3692   3699* 3718  3839* 3849  3856* 3875  4014* 4024  4031* 4050
CHERR   014302            992#  2727   2760  2849  2892  3226  3403  3787  3962
CHKLUP  037220           4175#
CHKOPI  015026           1112#  2959   3007
CHKSTR  051422           4175#
CHKTTY  047510           4175#
CHK.MA  035360           4175#
CHK.PC  042510           4175#*
CHK.SW  031550           4175#
CHRCNT  050742           4175#*
CH.FLA  035066           4175#*
CH.PAS  035104           4175#
CKERLT  014216            450    459   475   501   521   530   548   564   580   597   945#
CLEAR.  036502           4175#
CLKACC  030354 G         4175#*
CLKBFR  055604           4175#*
CLKCNT  030352 G         4175#*
CLKJUM  056210 G         4175#
CLKRES  057212 G         4175#
CLKSER  057346 G         4175#
CLKSON  030412 G         4175#*
CLK.SE  035162           4175#
CLNCOD  014144 G          889#
CLR.MA  035436           4175#
```

```
CNT    = 000010          183#  4087
CNTMSG  027640          4088   4119#
CNVT    053660          4175#
COMMAN  030164 G        4175#*
COMMTA  053474          4175#
COMP    005700           439#  1011   1126
CONT    013676           777    807    827#
CONTCL  057272 G        4175#
CONTIN  013600           793    803#
CRCEND  002604           361#  3339   3516   3900
CRDY   = 000200           151#   896   1439   1825   2084   2086   2371   2478   2532   2589   2645
CRLF    047572          4175#
CRTIM   006242           439#  1452
CSEND   002776           428#  1961   2107   2157
CSPAT   002700           397#  1933   2080   2131
CSR    = 000000           179#  4091
CSRMSG  027624          4092   4117#
CSTEST  017630          1938#  1962
CURR.S  030122 G        4175#*
CURR.T  030124 G        4175#*
C$AAD   042462          4175#
C$AAE   042474          4175#
C$AAK   043472          4175#
C$AAL   043636          4175#
C$ABRT= 000021             8#  1411
C$ADR  = 000020            8#  1049   1428   1450   1498   1541   1583   1625   1666   1709   1751   1793   1840
                        1874   1906   1951   2000   2046   2097   2148   2196   2241   2285   2330   2386   2420
                        2452   2492   2506   2548   2563   2605   2619   2662   2676   2689   2770   2784   2798
                        2842   2904   2962   3010   3066   3137   3164   3234   3249   3260   3271   3291   3328
                        3396   3411   3426   3437   3448   3468   3505   3570   3591   3674   3695   3780   3795
                        3810   3821   3832   3852   3889   3955   3970   3985   3996   4007   4027   4064
C$AU   = 000054             8#   936
C$BRK  = 000022             8#
C$BSEG= 000004              8#  1936   1988   2036   2082   2133   2183   2230   2275   2319   2877   2951   2999
                        3048   3107   3216   3376   3760   3937
C$BSUB= 000002              8#
C$BUFF= 000030              8#
C$CEFG= 000046              8#
C$CLEA= 000012              8#   910
C$CLP1= 000006              8#  1503   1546   1588   1630   1671   1714   1756   1798   2497   2553   2610   2667
                        2681   2725   2758   2776   2790   2848   2958   2967   3006   3015   3059   3072   3143
                        3169   3225   3228   3239   3254   3265   3276   3309   3333   3389   3402   3405   3416
                        3431   3442   3453   3486   3510   3563   3576   3609   3667   3680   3713   3773   3786
                        3789   3800   3815   3826   3837   3870   3894   3948   3961   3964   3975   3990   4001
                        4012   4045   4069
C$CVEC= 000036              8#   851    906   1492   1535   1577   1619   1660   1703   1745   1787   3110   3172
C$DCLN= 000044              8#   867    966
C$DODU= 000053              8#   865    964
C$DRPT= 000024              8#
C$DU   = 000055             8#   924
C$EDIT= 000000              8#    45
C$ERDF= 000002              8#  1049   1428   1450   1840   1874   1906   1951   2000   2046   2097   2148   2196
                        2241   2285   2330   2386   2420   2452   2492   2506   2548   2563   2605   2619   2662
                        2676   2689   2770   2784   2798   2842   2904   2962   3010   3066   3137   3164   3234
                        3249   3260   3271   3291   3328   3396   3411   3426   3437   3448   3468   3505   3570
                        3591   3674   3695   3780   3795   3810   3821   3832   3852   3889   3955   3970   3985
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                    3996    4007    4027    4064
C$ERHR= 000003       8#
C$ERSF= 000001       8#  1498    1541    1583    1625    1666    1709    1751    1793
C$ERSO= 000004       8#
C$ESCA= 000010       8#  1956    2005    2051    2102    2153    2201    2246    2290    2335    2762    2889    2894
                    2910
C$ESEG= 000005       8#  1966    2015    2061    2112    2161    2209    2254    2298    2343    2919    2970    3018
                    3075    3182    3336    3513    3897    4072
C$ESUB= 000003       8#
C$ETST= 000001       8#  1506    1549    1591    1633    1674    1717    1759    1801    1847    1882    1914    1969
                    2018    2064    2115    2164    2212    2257    2301    2346    2393    2428    2460    2515    2570
                    2628    2699    2732    2807    2855    2926    2975    3023    3080    3187    3347    3524    3628
                    3731    3907    4079
C$EXIT= 000032       8#
C$GMAN= 000043       8#
C$GPHR= 000042       8#   818
C$GPRI= 000040       8#
C$GTIM= 000052       8#  3145
C$INIT= 000011       8#   884
C$INLP= 000020       8#   946
C$KWOF= 000035       8#
C$KWON= 000034       8#
C$LOOP= 000100       8#
C$MANI= 000051       8#
C$MSG = 000023       8#   453     462     478     504     524     533     551     568     583     600
C$PNTB= 000014       8#   473     488     499     518     546     561     578     595     610     623     633     644
                     655    664     671     680     860    3321    3498    3621    3725    3882    4057
C$PNTF= 000017       8#   959
C$PNTS= 000016       8#
C$PNTX= 000015       8#  3306    3483    3606    3710    3867    4042
C$POIN= 000040       8#  1049    1428    1450    1498    1541    1583    1625    1666    1709    1751    1793    1840
                    1874    1906    1951    2000    2046    2097    2148    2196    2241    2285    2330    2386    2420
                    2452    2492    2506    2548    2563    2605    2619    2662    2676    2689    2770    2784    2798
                    2842    2904    2962    3010    3066    3137    3164    3234    3249    3260    3271    3291    3328
                    3396    3411    3426    3437    3448    3468    3505    3570    3591    3674    3695    3780    3795
                    3810    3821    3832    3852    3889    3955    3970    3985    3996    4007    4027    4064
C$QIO = 000377       8#
C$RDBU= 000007       8#   877
C$REFG= 000050       8#   775     780     785     790     805
C$REQT= 000045       8#
C$RESE= 000033       8#   772    1831    1869    1901    2377    2415    2447
C$REVI= 000002       8#    44
C$RPT = 000025       8#
C$SEFG= 000047       8#
C$SPRI= 000041       8#   894     901    1823    2369    2835    2882    3051    3062    3120    3158    3381    3392
                    3556    3566    3660    3670    3765    3776    3940    3951
C$SVEC= 000037       8#   846     873    1486    1529    1571    1613    1654    1697    1739    1781    3116    3178
C$TPRI= 000013       8#
C$UNBU= 000031       8#
C$WTM = 000026       8#
C$WTU = 000027       8#  1423    1443    3133
DAHS  = 000020     175#
DATEST 020052     2037#  2057
DCKMES 005573      439#  1037
DECMSG 047404     4175#
DEMES  005541      439#  1016
```

```
DERFLG  002156            213#   992*  1014*  1065
DERR   = 040000            149#  1012   1826   1828   1942   1944   2088   2090   2139   2141   2372   2374   2533
                          2535   2590   2592   2646   2648
DEV.CO  030126 G          4175#*
DIAG.T  030446 G          4175#*
DLT    = 000000            187#  4137
DLTMES  005600             439#  1041
DMSG    027726            4138   4156#
DPDVD   060056 G          4175#
DPMUL   057744 G          4175#
DRBT   = 000006            182#  4107
DRDY   = 000001            146#  1418   1835   1946   2092   2143   2381   2478   2543   2600   2657
DRIVE   002144             208#   605    824*  1070   1091   1256
DRMSG   027665            4108   4124#
DROP    013330             709#   949
DRPCOD  014206 G           917#
DRST   = 000010            169#
DRTIM   006267             439#  1430
DSPCOD  013336 G           719#
DS0    = 000000            155#
DS1    = 000400            156#
DS2    = 001000            157#
DS3    = 001400            158#
DUNIT.  030362 G          4175#*
DVC.FT  043442            4175#
D$AAG   044346            4175#
D$AAH   044364            4175#
D$AAI   047132            4175#
D$AAJ   047136            4175#
D$AAK   047154            4175#
D$AAL   047172            4175#
D$AAM   047202            4175#
EF.CON= 000036 G           115#   804
EF.NEW= 000035 G           116#   789
EF.PWR= 000034 G           117#   774
EF.RES= 000037 G           114#   779
EF.S.A= 000040 G           113#   784
EF01   = 000001 G          134#
EF02   = 000002 G          133#
EF03   = 000003 G          132#
EF04   = 000004 G          131#
EF05   = 000005 G          130#
EF06   = 000006 G          129#
EF07   = 000007 G          128#
EF08   = 000010 G          127#
EF09   = 000011 G          126#
EF10   = 000012 G          125#
EF11   = 000013 G          124#
EF12   = 000014 G          123#
EF13   = 000015 G          122#
EF14   = 000016 G          121#
EF15   = 000017 G          120#
EF16   = 000020 G          119#
ELT    = 000002            188#  4143
EMSG    027763            4144   4156#
EMT.TR  030444 G          4175#*
```

```
EM1       006315              439#    1500    1668
EM10      006566              439#    3236    3413    3797    3972
EM101     011114              439#     660
EM102     011161              439#     667     676    1007    1119
EM11      006627              439#
EM12      006670              439#    3251    3428    3812    3987
EM13      006731              439#    2844
EM14      006763              439#    2772
EM15      007011              439#    2786
EM16      007037              439#    2800
EM17      007065              439#    2906
EM2       006342              439#    1543    1711
EM20      007120              439#    3262    3439    3823    3998
EM21      007173              439#    3273    3450    3834    4009
EM22      007255              439#    3293    3470    3854    4029
EM23      007344              439#    3330    3507    3891    4066
EM24      007404              439#    3068    3139    3398    3572    3676    3782    3957
EM25      007446              439#    3593
EM26      007505              439#    3697
EM27      007557              439#    2964
EM3       006367              439#    1585    1753
EM30      007633              439#    3012
EM31      007707              439#    3166
EM4       006414              439#    1627    1795
EM44      007730              439#    2664
EM45      007763              439#    2678
EM46      010016              439#    2691
EM5       006441              439#    1953
EM6       006512              439#    2002
EM61      010051              439#    2099
EM62      010132              439#    2150
EM63      010215              439#    2198
EM64      010276              439#    2243
EM65      010361              439#    2287
EM66      010442              439#    2332
EM67      010525              439#    1842    2388
EM7       006540              439#    2048
EM70      010562              439#    1876    2422
EM71      010617              439#    1908    2454
EM72      010654              439#    2494
EM73      010707              439#    2508
EM74      010742              439#    2550
EM75      010774              439#    2565
EM76      011026              439#    2607
EM77      011061              439#    2621
END       014100              838      853     868#
ENDDAT    002676              392#
ENDPAT    002512              329#    2010    2056    2205    2250    2294    2339
END.OF    036470             4175#
END.SU=   060722             4175#*
ENVIRO    030166 G           4175#*
EOP.CH    057370 G           4175#
EOP.FM    032734             4175#
EOP.IN    035100             4175#*
ERR    =  100000              148#    1828    1944    2090    2141    2374    2535    2592    2648
ERRFOR    043714             4175#
```

CVRLAA.SUP 11-APR-78 09:27 CROSS REFERENCE TABLE -- USER SYMBOLS

```
ERRHAN  042514          4175#
ERRLMT  002254           244#   796*   951*   952
ERRVEC  002204           224#   844    850   1484   1491   1527   1534   1569   1576   1611   1618   1652   1659
                        1695   1702   1737   1744   1779   1786
ERR.HR  043452          4175#
ERR.NU  030116 G        4175#*
ERR.SF  043456          4175#
ERR0    011352 G         446#  2845   3069   3140   3399   3573   3677   3783   3958
ERR1    011370 G         456#  1501   1544   1586   1628   1669   1712   1754   1796
ERR1F0  044000          4175#
ERR10   011726 G         571#  2965   3013
ERR11   011770 G         586#  3167
ERR2    011402 G         465#  1843   1877   1909   1954   2003   2049   2100   2151   2199   2244   2288   2333
                        2389   2423   2455   2495   2509   2551   2566   2608   2622   2665   2679   2692   2773
                        2787   2801
ERR3    011444 G         482#  3294   3471   3594   3698   3855   4030
ERR4    011546 G         509#  3237   3252   3263   3274   3331   3414   3429   3440   3451   3508   3798   3813
                        3824   3835   3892   3973   3988   3999   4010   4067
ERR5    011614 G         527#  1431
ERR6    011626 G         536#  1052   1453
ERR7    011670 G         554#  2907
ESC.PC  042506          4175#*
EV.COU  030120 G        4175#*
EXPMES  005605           439#  1121
E.BA    002162           215#   495    636   1212*  3230   3302   3407   3479   3602   3706   3791   3863   3966
                        4038
E.CS    002160           214#   638    993   1001   1008   1012   1017   1021   1025   1029   1034   1038   1115
                        1122   1127   1132   1211*
E.DA    002164           216#   494    650   1213*  3241   3301   3418   3478   3601   3705   3802   3862   3977
                        4037
E.MP    002166           217#   648   1214*  3256   3433   3817   3992
E.MP1   002170           218#   647   1215*  3267   3444   3828   4003
FILL    050240          4175#
FILL.C  000204 G        4175#
FIX     015204          1010   1015   1019   1023   1027   1031   1036   1040   1042   1044   1120   1125   1130
                        1135   1139   1141   1154#
FLAGS   030160 G        4175#*
FLAGS1  030162 G        4175#
FLAGTA  053412          4175#
FLAG.I  035146          4175#
FLA.SE  053360          4175#
FLG.MA  035106          4175#
FNOFNC  015020          1077*  1078*  1079   1081*  1084*  1099#
FORM.T  044010          4175#*
FREE    051316          4175#
FRMT1   012414           607    684#
FRMT10  012766           592    684#
FRMT11  013046           684#   956
FRMT12  013107           684#
FRMT13  013166           684#   857
FRMT14  013217           496    684#  3303   3480   3603   3707   3864   4039
FRMT2   012454           620    641    684#
FRMT2A  012473           630    684#
FRMT2B  012506           652    684#
FRMT3   012527           661    668    677    684#
FRMT4   012534           470    515    684#
```

E09


```
FRMT5   012660              684#
FRMT6   012731              558    684#
FRMT98  012572              684#  3318   3495   3618   3722   3879   4054
FRMT99  012655              485    543    575    684#
FSAU  = 000015                8#   931    935
FSBGN = 000040                8#    17     63     76    192    196    435    437    440    444    446    456    465
                            482    509    527    536    554    571    586    688    690    703    705    717    719
                            765    768    770    887    889    891    913    917    919    927    929    931    939
                            944   1401   1464   1470   1505   1512   1548   1555   1590   1597   1632   1638   1673
                           1680   1716   1723   1758   1765   1800   1806   1846   1853   1881   1888   1913   1920
                           1936   1956   1968   1975   1988   2005   2017   2024   2036   2051   2063   2070   2082
                           2102   2114   2121   2133   2153   2163   2170   2183   2201   2211   2218   2230   2246
                           2256   2263   2275   2290   2300   2307   2319   2335   2345   2352   2392   2399   2427
                           2434   2459   2466   2514   2521   2569   2576   2627   2633   2698   2704   2731   2738
                           2762   2806   2813   2854   2861   2877   2889   2894   2910   2925   2932   2951   2974
                           2980   2999   3022   3028   3048   3079   3086   3107   3186   3193   3216   3346   3353
                           3376   3523   3529   3627   3633   3730   3737   3760   3906   3912   3937   4078   4082
                           4084   4129   4133   4135   4160
FSCLEA= 000007                8#   891    909
FSDU  = 000016                8#   919    923
FSEND = 000041                8#    17     63     76    192    196    435    437    440    444    454    463    479
                            505    525    534    552    569    584    601    688    690    703    705    717    719
                            765    768    885    887    889    911    913    917    925    927    929    937    939
                            944   1407   1464   1470   1505   1507   1512   1548   1550   1555   1590   1592   1597
                           1632   1634   1638   1673   1675   1680   1716   1718   1723   1758   1760   1765   1800
                           1802   1806   1846   1848   1853   1881   1883   1888   1913   1915   1920   1956   1967
                           1968   1970   1975   2005   2016   2017   2019   2024   2051   2062   2063   2065   2070
                           2102   2113   2114   2116   2121   2153   2162   2163   2165   2170   2201   2210   2211
                           2213   2218   2246   2255   2256   2258   2263   2290   2299   2300   2302   2307   2335
                           2344   2345   2347   2352   2392   2394   2399   2427   2429   2434   2459   2461   2466
                           2514   2516   2521   2569   2571   2576   2627   2629   2633   2698   2700   2704   2731
                           2733   2738   2762   2806   2808   2813   2854   2856   2861   2889   2894   2910   2920
                           2925   2927   2932   2971   2974   2976   2980   3019   3022   3024   3028   3076   3079
                           3081   3086   3183   3186   3188   3193   3337   3346   3348   3353   3514   3523   3525
                           3529   3627   3629   3633   3730   3732   3737   3898   3906   3908   3912   4073   4078
                           4080   4082   4116   4129   4133   4155   4160
FSHARD= 000004                8#  4084   4114   4141
FSHW  = 000013                8#   692    700
FSINIT= 000006                8#   770    883
FSJMP = 000050                8#
FSMOD = 000000                8#    17     63     76    192    196    435    437    440    444    688    690    703
                            705    717    719    765    768    887    889    913    917    927    929    939    944
                           1464   4082   4129   4133   4160
FSMSG = 000011                8#   446    452    456    461    465    477    482    503    509    523    527    532
                            536    550    554    567    571    582    586    599
FSPWR = 000017                8#
FSRPT = 000012                8#
FSSEG = 000003                8#  1936   1965   1988   2014   2036   2060   2082   2111   2133   2160   2183   2208
                           2230   2253   2275   2297   2319   2342   2877   2918   2951   2969   2999   3017   3048
                           3074   3107   3181   3216   3335   3376   3512   3760   3896   3937   4071
FSSOFT= 000005                8#  4135   4141   4153
FSSRV = 000010                8#  1401   1405
FSSUB = 000002                8#
FSSW  = 000014                8#   707    714
FSTEST= 000001                8#  1470   1505   1512   1548   1555   1590   1597   1632   1638   1673   1680   1716
                           1723   1758   1765   1800   1806   1846   1853   1881   1888   1913   1920   1968   1975
```

F09


```
                    2017    2024    2063    2070    2114    2121    2163    2170    2211    2218    2256    2263    2300
                    2307    2345    2352    2392    2399    2427    2434    2459    2466    2514    2521    2569    2576
                    2627    2633    2698    2704    2731    2738    2806    2813    2854    2861    2925    2932    2974
                    2980    3022    3028    3079    3086    3186    3193    3346    3353    3523    3529    3627    3633
                    3730    3737    3906    3912    4078
GARBAG  050744      4175#
GCRCPT  002240       238#   1172*   1173    1254
GDATMP  002250       242#   1275*   1276    1277*
GDCRCA  002242       239#   1182*   3255    3432    3816    3991
GDCRCB  002244       240#   1195*   3266    3443    3827    4002
GDDAT   002234       236#    469     492     514    1495*   1538*   1581*   1622*   1663*   1706*   1749*   1790*   1825*
                    1828*   1836    1867*   1899*   1939*   1940*   1941    1944*   1947    1990*   1993*   1994    1996
                    2038*   2039    2042    2085*   2086*   2090*   2093    2136*   2137*   2141*   2144    2186*   2189*
                    2192    2233*   2234*   2237    2278*   2281    2322*   2323*   2326    2371*   2374*   2382    2413*
                    2445*   2488*   2502*   2532*   2535*   2536    2544    2559*   2589*   2592*   2593    2601    2615*
                    2645*   2648*   2649    2658    2672*   2686*   2752*   2766    2778*   2780    2792*   2794    2874*
                    2897    3229*   3231    3240*   3245*   3246    3255*   3257    3266*   3268    3282*   3284    3299
                    3323*   3325    3406*   3408    3417*   3422*   3423    3432*   3434    3443*   3445    3459*   3461
                    3476    3500*   3502    3582*   3584    3599    3686*   3688    3703    3790*   3792    3801*   3806*
                    3807    3816*   3818    3827*   3829    3843*   3845    3860    3884*   3886    3965*   3967    3976*
                    3981*   3982    3991*   3993    4002*   4004    4018*   4020    4035    4059*   4061
GDDATP  002246       241#   1226*   1229    1272*   1275
GETCHR  047450      4175#
GETCMN  053034      4175#
GETPAR  044526      4175#
GETSWI  052030      4175#
GET.TW  051600      4175#
GLBDAT  002122 G     196#
GLBEQA  002122 G      76#
GLBERR  011352 G     444#
GLBSUB  014216 G     944#
GLBTXT  005500 G     437#
GOORVR= 000202       168#
GSBIT = 000002       170#
GSTAT = 000004       163#    996     1069
G$EXCP= 000400         8#
G$HILI= 000002         8#
G$LOLI= 000001         8#
G$NO  = 000000         8#
G$OFFS= 000400         8#    4087    4091    4096    4101    4107    4137    4143    4149
G$OFSI= 000376         8#    4087    4091    4096    4101    4107    4137    4143    4149
G$PRMA= 000001         8#    4091    4096
G$PRMD= 000002         8#    4101    4107    4143
G$PRML= 000000         8#    4087    4137    4149
G$RADA= 000140         8#
G$RADB= 000000         8#
G$RADD= 000040         8#
G$RADF= 000200         8#
G$RADL= 000120         8#    4087    4137    4149
G$RADO= 000020         8#    4091    4096    4101    4107    4143
G$RADT= 000100         8#
G$XFER= 000004         8#    4141
G$YES = 000010         8#    4087    4091    4096    4101    4107    4137    4143    4149
HCORED  034656      4175#
HCOREQ  034566      4175#
HCORET  030402 G    4175#*
```

```
HCRCME  005560            439#  1028
HC.ADR  030152 G         4175#
HC.DEF  030144 G         4175#
HC.DIA  030142 G         4175#
HORBUF  003000            429#
HORLST  015022           1080  1101#
HERTZ.  034526           4175#
HINUM   002270            250#   794#   800   828#  1325  1333  1338#
HNFMES  005566            439#  1032  1131
HOLDSP= 000020           4175#
HPTCOD  013312 G          690#
HRDPRM  027550 G         4082#
HW.ADR  030150 G         4175#
HSAAB   054206           4175#
ININIT  030372 G         4175#*
INITCO  013462 G          768#
INITIA  047420           4175#
INIT.M  035504           4175#
INIT.R  030206 G         4175#
INPUTA  050346           4175#
INTEN = 000100            147#   902  1078  1086  2837  2885  3054  3129  3384  3558  3662  3768  3943
INTFLG  002176            221#  1402# 1409# 2832# 2839  2846# 2879# 2900  2913  3052# 3063  3070# 3121#
                         3134   3141# 3382# 3393  3400# 3553# 3567  3574# 3657# 3671  3678# 3766# 3777
                         3784# 3941# 3952  3959#
INTFOR  043644           4175#
INTSRV  016272            870  1402#  3175
INVAL.  034452           4175#
INVINT  043502           4175#
INV.SW  031504           4175#
IN.SUF  036454           4175#
I$AU  = 000041              8#   931#  937#
I$CLN = 000041              8#   891#  911#
I$DU  = 000041              8#   919#  925#
I$HRD = 000041           4084#  4116#
I$INIT= 000041              8#   770#  885#
I$MOD = 000041              8#    17#   63#   76#  192#  196#  435#  437#  440#  444#  688#  690#  703#
                          705#   717#  719#  765#  768#  887#  889#  913#  917#  927#  929#  939#  944#
                         1464#  4082# 4129# 4133# 4160#
I$MSG = 000041              8#   446#  454#  456#  463#  465#  479#  482#  505#  509#  525#  527#  534#
                          536#   552#  554#  569#  571#  584#  586#  601#
I$PWR = 000041              8#
I$RPT = 000041              8#
I$SEG = 000041              8#  1470  1512  1555  1597  1638  1680  1723  1765  1806  1853  1888  1920
                         1936#  1956  1967# 1975  1988# 2005  2016# 2024  2036# 2051  2062# 2070  2082#
                         2102   2113# 2121  2133# 2153  2162# 2170  2183# 2201  2210# 2218  2230# 2246
                         2255#  2263  2275# 2290  2299# 2307  2319# 2335  2344# 2352  2399  2434  2466
                         2521   2576  2633  2704  2738  2813  2861  2877# 2910  2920# 2932  2951# 2971#
                         2980   2999# 3019# 3028  3048# 3076# 3086  3107# 3183# 3193  3216# 3337# 3353
                         3376#  3514# 3529  3633  3737  3760# 3898# 3912  3937# 4073#
I$SFT = 000041           4135#  4155#
I$SRV = 000041              8#  1401# 1407#
I$SUB = 000041              8#  1470  1512  1555  1597  1638  1680  1723  1765  1806  1853  1888  1920
                         1975   2024  2070  2121  2170  2218  2263  2307  2352  2399  2434  2466  2521
                         2576   2633  2704  2738  2813  2861  2932  2980  3028  3086  3193  3353  3529
                         3633   3737  3912
ISTST = 000041              8#  1470# 1505# 1507# 1512# 1548# 1550# 1555# 1590# 1592# 1597# 1632# 1634#
```

```
                        1638#  1673#  1675#  1680#  1716#  1718#  1723#  1758#  1760#  1765#  1800#  1802#  1806#
                        1846#  1848#  1853#  1881#  1883#  1888#  1913#  1915#  1920#  1968#  1970#  1975#  2017#
                        2019#  2024#  2063#  2065#  2070#  2114#  2116#  2121#  2163#  2165#  2170#  2211#  2213#
                        2218#  2256#  2258#  2263#  2300#  2302#  2307#  2345#  2347#  2352#  2392#  2394#  2399#
                        2427#  2429#  2434#  2459#  2461#  2466#  2514#  2516#  2521#  2569#  2571#  2576#  2627#
                        2629#  2633#  2698#  2700#  2704#  2731#  2733#  2738#  2762    2806#  2808#  2813#  2854#
                        2856#  2861#  2889    2894    2925#  2927#  2932#  2974#  2976#  2980#  3022#  3024#  3028#
                        3079#  3081#  3086#  3186#  3188#  3193#  3346#  3348#  3353#  3523#  3525#  3529#  3627#
                        3629#  3633#  3730#  3732#  3737#  3906#  3908#  3912#  4078#  4080#
J$JMP = 000167            8#
KBPTR   030224 G       4175#*
KBUF    030226 G       4175#*
LDCSR   002200          222#  1064#  1076#  1077    1086    1091#  1092#  1093    1249#  1255#  1256#  1257#  1258
                       2478#  2481
LDFUN   015542         1249#  2952    3000    3053    3128    3219    3383    3557    3661    3767    3942
LDFUNC  014602         1064#  2721    2754    2836    2884
LF      005676          439#  1051
LINE.F  030442 G       4175#*
LINE1   012042          447    457     466     482     510     528     537     555     571     586     603#   862     961
LINE2   012076          448    483     511     539     572     587     614#
LINE3   012314          538    659#
LINE4   012366          573    675#
LOHD.F  035102         4175#*
LOGMSG  047412         4175#
LONUM   002272          251#   795#    799     827#    1301    1324    1331    1337#   3932#
LPBFR   030222 G       4175#*
LPCNTR  030220 G       4175#*
LPT.AD  034544         4175#
LPT.RE  034540         4175#
LSI.RE  034534         4175#
LUP     055506         4175#
LUP.AD  042512         4175#*
L$APT   002036 G         39#
L$AU    014212 G         55     931#
L$AUT   002074 G         55#
L$CCP   002106 G         60#
L$CLEA  014144 G         60     891#
L$CO    002032 G         37#
L$DEPO  002011 G         28#
L$DESC  002102 G         58#
L$DEVP  002064 G         51#
L$DISP  013240 G         40     722#
L$DR    002112 G         53      68#
L$DRCT  002070 G         53#
L$DRS   002072 G         54#
L$DRST  002112 G         54      68#
L$DTP   002040 G         40#
L$DU    014206 G         56     919#
L$DUT   002076 G         56#
L$DVTY  002114 G         51      71#
L$EF    002056 G         48#
L$EFLG  002034 G         38#
L$EXP1  002042 G         41#
L$EXP2  002044 G         42#
L$EXP3  002046 G         43#
L$HARD  027552 G         31    4084    4085#
```

CVRLAA.SUP 11-APR-78 09:27 CROSS REFERENCE TABLE -- USER SYMBOLS

```
LSHPCP  002016 G          31#
LSHPTP  002022 G          33#
LSHW    013314 G          33     692     693#
LSICP   002104 G          59#
LSINIT  013462 G          59     770#
LSLAOP  002026 G          35#
LSLAST  030114 G          35    4167#
LSMREV  002050 G          44#
LSNAME  002000 G          19#
LSREPP  002066 G          52#
LSREV   002010 G          27#
LSSOFT  027676 G          32    4135    4136#
LSSPC   002062 G          50#
LSSPCP  002020 G          32#
LSSPTP  002024 G          34#
LSSTA   002030 G          36#
LSSW    013330 G          34     707     708#
LSTIML  002014 G          30#
LSTIMU  002054 G          47#
LSTIM1  002052 G          46#
LSTSTI  002100 G          57#
LSUNIT  002012 G          29#    797     812
L.CLK.  034512          4175#
L10000  011366           452#
L10001  011400           461#
L10002  011442           477#
L10003  011544           503#
L10004  011612           523#
L10005  011624           532#
L10006  011666           550#
L10007  011724           567#
L10010  011766           582#
L10011  012040           599#
L10012  013326           692     700#
L10013  013336           707     714#
L10014  014142           883#
L10015  014204           909#
L10016  014210           923#
L10017  014214           935#
L10020  016276          1405#
L10021  016526          1505#
L10022  016624          154A#
L10023  016722          1590#
L10024  017020          1632#
L10025  017114          1673#
L10026  017210          1716#
L10027  017304          1758#
L10030  017400          1800#
L10031  017510          1846#
L10032  017562          1881#
L10033  017620          1913#
L10034  017740          1968#
L10035  020042          2017#
L10036  020130          2063#
L10037  020254          2114#
L10040  020400          2163#
```

```
L10041  020504            2211#
L10042  020604            2256#
L10043  020674            2300#
L10044  020774            2345#
L10045  021104            2392#
L10046  021156            2427#
L10047  021214            2459#
L10050  021340            2514#
L10051  021500            2569#
L10052  021640            2627#
L10053  022044            2698#
L10054  022074            2731#
L10055  022300            2763    2806#
L10056  022364            2854#
L10057  022530            2890    2895    2925#
L10060  022640            2974#
L10061  022750            3022#
L10062  023104            3079#
L10063  023434            3186#
L10064  024246            3346#
L10065  025124            3523#
L10066  025472            3627#
L10067  026044            3730#
L10070  026722            3906#
L10071  027546            4078#
L10072  027624            4084    4115#
L10073  027726            4135    4154#
MAINT = 000000             161#   2953    3001    3054    3129    3220    3384    3558    3662    3768    3943
MAJ.IN  030176 G          4175#*
MAJ.LO  055606            4175#*
MAJ.US  030200 G          4175#*
MAN.TI  001244            4175#
MAP16   060314 G          4175#
MASK.B  037216            4175#
MASK.W  037214            4175#
MATFLG  002252             243#   1114*   1124*   1129*   1134*   1137
MATINT  006104             439#   3056    3131    3386    3560    3664    3770    3945
MATMES  006044             439#   2955    3003    3222
MOHEDR  002000 G            17#
MEM.SI  034554            4175#
MERLMT  013332             710#    952
MIN.IN  030172 G          4175#*
MIN.US  030174 G          4175#*
MK    = 000001             171#
MODR    057656 G          4175#
MSCRLF  005673             439#   1043    1142
MSG.AD  030140 G          4175#
MSG.TY  030114 G          4175#*
MUL     057612 G          4175#
NEWPRI  057336 G          4175#
NEXTAR  053576            4175#
NODRY   005516             439#
NONMES  005642             439#   1140
NOOP0 = 000000             159#   2722    2755    2837    2885
NOOP7 = 000016             160#
NOPINT  006012             439#   1102
```

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```
NOPMES  005761            439#   1101
NOPWR   013474            778#
NORES   005500            439#    854
NO.CLK  034502           4175#
NO.FLA  053372           4175#
NO.LPT  050710           4175#
NO.PTA  034706           4175#
NR    = 000000             67#
NUMBIN  044034           4175#
NUM.LA  044202           4175#
NUM.NO  030156 G         4175#
NUM.UN  030564           4175#
NUNITS  037172           4175#
NXM   = 020000            154#   1017
NXMMES  005546            439#   1020
NXT     013610            801     809#    820
NXTFOR  053652           4175#
OCTMSG  047376           4175#
OPI   = 002000            150#   1021
OPIERR  005706            439#
OPIMES  005553            439#   1024    1136
OPIMN   002264            248#    591    3161
OPIMX   002266            249#    590    3122    3126    3127    3159
O$APTS= 000000              8#     36
O$AU  = 000001              8#     14#     55
O$BGNR= 000000              8#     52
O$BGNS= 000001              8#     14#     32
O$DU  = 000001              8#     14#     56
O$GNSW= 000001              8#     14#     34
O$POIN= 000001              8#     14#     61
O.ODT = ****** U         4175
PARSES  053106           4175#
PAR.LA  047074           4175#
PASS.C  030130 G         4175#*
PATCRC  002514            333#   2942    2990    3039    3098    3209    3369    3753
PATDAT  002606            364#   2943    2991    3040    3099    3210    3370    3754
PATSAV  002300            254#   3210*   3212    3338*   3370*   3372    3515*   3754*   3756    3899*
PFLG    002172            219#    875*    880*
PRINTC  050720           4175#
PRINTF  054226           4175#
PRIOR = 000004            181#   4101
PRIO0 = 000000 G          145#    893    2834    3050    3119    3380    3555    3659    3764    3939
PRIO1 = 000040 G          144#
PRIO2 = 000100 G          143#
PRIO3 = 000140 G          142#
PRIO4 = 000200 G          141#
PRIO5 = 000240 G          140#
PRIO6 = 000300 G          139#
PRIO7 = 000340 G          138#    900    1822    2368    3061    3157    3391    3565    3669    3775    3950
PRNTST  050610           4175#
PRO.CM  035060           4175#*
PTAB.S  030400 G         4175#*
PUTCHR  047424           4175#
PWR.FA  060550 G         4175#
PWR.FL  030204 G         4175#*
PWR.MS  060676           4175#
```

```
PWR.SA  060672          4175#*
PWR.UP  060674          4175#*
P.CLK.  034520          4175#
RAND    016014          1300    1321#
RDHDR = 000010           165#
READ  = 000014           167#
READ.P  055610 G        4175#
REGBAC  060300 G        4175#
REGSAV  060264 G        4175#
REQN.P  030170 G        4175#*
REQN.T  035062          4175#*
RET     013642           816#
RESTMS  014564          1045#   1090*   1251*
RE.SET  031652          4175#
RHMS  = 000100           173#
RLBA    002130           202#    832*    1202    1212    1253*   1532*   1538    1700    1706    1863*   1866*   1870    1994*
                1995    2185*   2190*   2191    2232*   2235*   2236    2409*   2412*   2416    2479*   2485    2489
                2538*   2594*   2612    2616    2650*   2669    2673    2750*   2779
RLCS    002126           201#    606     830*    848     896     902*    1071*   1073    1093*   1095*   1201    1211    1258*
                1260*   1418    1439    1489*   1495    1657    1663    1824*   1826    1834    1941*   1942    1945
                2084*   2087*   2088    2091    2135*   2138*   2139    2142    2370*   2372    2380    2481*   2533
                2536*   2542    2590    2593*   2599    2646    2649*   2656
RLDA    002132           203#    834*    1068*   1203    1213    1254*   1574*   1581    1742    1749    1898*   1902    2039*
                2041    2277*   2279*   2280    2321*   2324*   2325    2444*   2448    2480*   2499    2503    2537*
                2555    2560    2595*   2651*   2682    2685    2749*   2793
RLMP    002134           204#    836*    1204    1214    1215    1250*   1616*   1622    1784    1790    2652*   2751*   2752
                2765
RSTACK  057540 G        4175#
SAVCNT  002302           255#    3277*   3287*   3317    3454*   3464*   3494    3577*   3587*   3617    3681*   3691*   3721
                3838*   3848*   3878    4013*   4023*   4053
SAVEDO= 032050          4175#
SEARCH  051546          4175#
SEEK  = 000006           164#
SEGSTA  030414 G        4175#*
SETCMP  015642          1270#   3761
SETPAT  015454          1224#   2948    2996    3045    3104    3217    3377
SETRAN  015734          1296#   3935
SET.MA  035272          4175#
SFTPRM  027674 G        4133#
SHIFT   060376 G        4175#
SIGN  = 000004           172#
SIMBCC  016112          1178    1186    1191    1357#
SIZE  = 000004           189#   4149
SMSG    027752          4150    4156#
SPEC.U  035006          4175#*
SPTCOD  013326 G         705#
SPV.SE  000400          4175#
START   013526           762     787     794#
STARTC  057266 G        4175#
START1  013546           792     797#
STHS  = 000100           174#
STRCHR  050300          4175#
STRT.T  035064          4175#*
ST.SET  031716          4175#
SUNIT.  035070          4175#*
SUPERV  032752          4175#
```

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```
SUPFLA  030360 G        4175#*
SUPV.T  030532 G        4175#*
SUP.PR  031470          4175#
SVCCNT= 177777             8#    17    63    76   192   196   435   437   440   444   446   452   456
                          461   465   477   482   503   509   523   527   532   536   550   554   567
                          571   582   586   599   688   690   692   700   703   705   707   714   717
                          719   765   768   770   883   887   889   891   909   913   917   919   923
                          927   929   931   935   939   944  1401  1405  1464  1470  1505  1512  1548
                         1555  1590  1597  1632  1638  1673  1680  1716  1723  1758  1765  1800  1806
                         1846  1853  1881  1888  1913  1920  1936  1965  1968  1975  1988  2014  2017
                         2024  2036  2060  2063  2070  2082  2111  2114  2121  2133  2160  2163  2170
                         2183  2208  2211  2218  2230  2253  2256  2263  2275  2297  2300  2307  2319
                         2342  2345  2352  2392  2399  2427  2434  2459  2466  2514  2521  2569  2576
                         2627  2633  2698  2704  2731  2738  2806  2813  2854  2861  2877  2918  2925
                         2932  2951  2969  2974  2980  2999  3017  3022  3028  3048  3074  3079  3086
                         3107  3181  3186  3193  3216  3335  3346  3353  3376  3512  3523  3529  3627
                         3633  3730  3737  3760  3896  3906  3912  3937  4071  4078  4082  4084  4114
                         4129  4133  4135  4153  4160
SVCGBL= 000000             8#    17    19    27    28    29    30    31    32    33    34    35    36
                           37    38    39    40    41    42    43    44    46    47    48    50    51
                           52    53    54    55    56    57    58    59    60    68    71    76   196
                          437   444   446   456   465   482   509   527   536   554   571   586   690
                          693   705   708   719   722   768   770   889   891   917   919   929   931
                          944  4082  4085  4133  4136  4167#  4168
SVCHAN  037406          4175#
SVCINS= 000000             8#    19    20    21    22    23    24    25    26    27    28    29    30
                           31    32    33    34    35    36    37    38    39    40    41    42    43
                           44    45    46    47    48    49    50    51    52    53    54    55    56
                           57    58    59    60    61    67    68    69    71    72    73   453   454
                          462   463   468   469   470   471   472   473   474   475   478   479   485
                          486   487   488   489   490   491   492   493   494   495   496   497   498
                          499   500   501   504   505   513   514   515   516   517   518   519   520
                          524   525   533   534   543   544   545   546   547   548   551   552   557
                          558   559   560   561   562   563   568   569   575   576   577   578   579
                          580   583   584   589   590   591   592   593   594   595   596   597   600
                          601   604   605   606   607   608   609   610   611   612   615   616   617
                          618   619   620   621   622   623   624   625   626   627   628   629   630
                          631   632   633   634   635   636   637   638   639   640   641   642   643
                          644   645   646   647   648   649   650   651   652   653   654   655   656
                          657   660   661   662   663   664   665   666   667   668   669   670   671
                          672   673   676   677   678   679   680   681   682   692   693   707   708
                          721   722   723   724   725   726   727   728   729   730   731   732   733
                          734   735   736   737   738   739   740   741   742   743   744   745   746
                          747   748   749   750   751   752   753   754   755   756   757   758   759
                          760   761   762   763   772   773   774   775   776   777   778   779   780
                          781   782   783   784   785   786   787   788   789   790   791   792   793
                          804   805   806   807   808   817   818   819   820   821   842   843   844
                          845   846   847   848   850   851   852   856   857   858   859   860   861
                          862   864   865   866   867   868   869   870   871   872   873   874   875
                          877   878   879   880   884   885   893   894   895   900   901   902   905
                          906   907   910   911   924   925   936   937   946   947   948   949   956
                          957   958   959   960   961   963   964   965   966   967  1049  1050  1051
                         1052  1053  1406  1407  1411  1412  1422  1423  1424  1428  1429  1430  1431
                         1432  1442  1443  1444  1450  1451  1452  1453  1454  1482  1483  1484  1485
                         1486  1487  1488  1491  1492  1493  1498  1499  1500  1501  1502  1503  1504
                         1506  1507  1525  1526  1527  1528  1529  1530  1531  1534  1535  1536  1541
```

1542	1543	1544	1545	1546	1547	1549	1550	1567	1568	1569	1570	1571	
1572	1573	1576	1577	1578	1583	1584	1585	1586	1587	1588	1589	1591	
1592	1609	1610	1611	1612	1613	1614	1615	1618	1619	1620	1625	1626	
1627	1628	1629	1630	1631	1633	1634	1650	1651	1652	1653	1654	1655	
1656	1659	1660	1661	1666	1667	1668	1669	1670	1671	1672	1674	1675	
1693	1694	1695	1696	1697	1698	1699	1702	1703	1704	1709	1710	1711	
1712	1713	1714	1715	1717	1718	1735	1736	1737	1738	1739	1740	1741	
1744	1745	1746	1751	1752	1753	1754	1755	1756	175[illegible]	1759	1760	1777	
1778	1779	1780	1781	1782	1783	1786	1787	1788	1793	1794	1795	1796	
1797	1798	1799	1801	1802	1822	1823	1824	1831	1832	1840	1841	1842	
1843	1844	1847	1848	1869	1870	1874	1875	1876	1877	1878	1882	1883	
1901	1902	1906	1907	1908	1909	1910	1914	1915	1936	1937	1951	1952	
1953	1954	1955	1956	1957	1958	1966	1967	1969	1970	1988	1989	2000	
2001	2002	2003	2004	2005	2006	2007	2015	2016	2018	2019	2036	2037	
2046	2047	2048	2049	2050	2051	2052	2053	2061	2062	2064	2065	2082	
2083	2097	2098	2099	2100	2101	2102	2103	2104	2112	2113	2115	2116	
2133	2134	2148	2149	2150	2151	2152	2153	2154	2155	2161	2162	2164	
2165	2183	2184	2196	2197	2198	2199	2200	2201	2202	2203	2209	2210	
2212	2213	2230	2231	2241	2242	2243	2244	2245	2246	2247	2248	2254	
2255	2257	2258	2275	2276	2285	2286	2287	2288	2289	2290	2291	2292	
2298	2299	2301	2302	2319	2320	2330	2331	2332	2333	2334	2335	2336	
2337	2343	2344	2346	2347	2368	2369	2370	2377	2378	2386	2387	2388	
2389	2390	2393	2394	2415	2416	2420	2421	2422	2423	2424	2428	2429	
2447	2448	2452	2453	2454	2455	2456	2460	2461	2492	2493	2494	2495	
2496	2497	2498	2506	2507	2508	2509	2510	2515	2516	2548	2549	2550	
2551	2552	2553	2554	2563	2564	2565	2566	2567	2570	2571	2605	2606	
2607	2608	2609	2610	2611	2619	2620	2621	2622	2623	2628	2629	2662	
2663	2664	2665	2666	2667	2668	2676	2677	2678	2679	2680	2681	2682	
2689	2690	2691	2692	2693	2699	2700	2725	2726	2732	2733	2758	2759	
2762	2763	2764	2770	2771	2772	2773	2774	2776	2777	2784	2785	2786	
2787	2788	2790	2791	2798	2799	2800	2801	2802	2807	2808	2834	2835	
2836	2842	2843	2844	2845	2846	2848	2849	2855	2856	2877	2878	2881	
2882	2883	2889	2890	2891	2894	2895	2896	2904	2905	2906	2907	2908	
2910	2911	2912	2919	2920	2926	2927	2951	2952	2958	2959	2962	2963	
2964	2965	2966	2967	2968	2970	2971	2975	2976	2999	3000	3006	3007	
3010	3011	3012	3013	3014	3015	3016	3018	3019	3023	3024	3048	3049	
3050	3051	3052	3059	3060	3061	3062	3063	3066	3067	3068	3069	3070	
3072	3073	3075	3076	3080	3081	3107	3108	3109	3110	3111	3112	3113	
3114	3115	3116	3117	3118	3119	3120	3121	3133	3134	3137	3138	3139	
3140	3141	3143	3144	3145	3146	3147	3157	3158	3159	3164	3165	3166	
3167	3168	3169	3170	3171	3172	3173	3174	3175	3176	3177	3178	3179	
3180	3182	3183	3187	3188	3216	3217	3225	3226	3228	3229	3234	3235	
3236	3237	3238	3239	3240	3249	3250	3251	3252	3253	3254	3255	3260	
3261	3262	3263	3264	3265	3266	3271	3272	3273	3274	3275	3276	3277	
3291	3292	3293	3294	3295	3298	3299	3300	3301	3302	3303	3304	3305	
3306	3307	3308	3309	3310	3317	3318	3319	3320	3321	3322	3323	3328	
3329	3330	3331	3332	3333	3334	3336	3337	3347	3348	3376	3377	3380	
3381	3382	3389	3390	3391	3392	3393	3396	3397	3398	3399	3400	3402	
3403	3405	3406	3411	3412	3413	3414	3415	3416	3417	3426	3427	3428	
3429	3430	3431	3432	3437	3438	3439	3440	3441	3442	3443	3448	3449	
3450	3451	3452	3453	3454	3468	3469	3470	3471	3472	3475	3476	3477	
3478	3479	3480	3481	3482	3483	3484	3485	3486	3487	3494	3495	3496	
3497	3498	3499	3500	3505	3506	3507	3508	3509	3510	3511	3513	3514	
3524	3525	3555	3556	3557	3563	3564	3565	3566	3567	3570	3571	3572	
3573	3574	3576	3577	3591	3592	3593	3594	3595	3598	3599	3600	3601	
3602	3603	3604	3605	3606	3607	3608	3609	3610	3617	3618	3619	3620	

```
                    3621    3622    3623    3628    3629    3659    3660    3661    3667    3668    3669    3670    3671
                    3674    3675    3676    3677    3678    3680    3681    3695    3696    3697    3698    3699    3702
                    3703    3704    3705    3706    3707    3708    3709    3710    3711    3712    3713    3714    3721
                    3722    3723    3724    3725    3726    3727    3731    3732    3760    3761    3764    3765    3766
                    3773    3774    3775    3776    3777    3780    3781    3782    3783    3784    3786    3787    3789
                    3790    3795    3796    3797    3798    3799    3800    3801    3810    3811    3812    3813    3814
                    3815    3816    3821    3822    3823    3824    3825    3826    3827    3832    3833    3834    3835
                    3836    3837    3838    3852    3853    3854    3855    3856    3859    3860    3861    3862    3863
                    3864    3865    3866    3867    3868    3869    3870    3871    3878    3879    3880    3881    3882
                    3883    3884    3889    3890    3891    3892    3893    3894    3895    3897    3898    3907    3908
                    3937    3938    3939    3940    3941    3948    3949    3950    3951    3952    3955    3956    3957
                    3958    3959    3961    3962    3964    3965    3970    3971    3972    3973    3974    3975    3976
                    3985    3986    3987    3988    3989    3990    3991    3996    3997    3998    3999    4000    4001
                    4002    4007    4008    4009    4010    4011    4012    4013    4027    4028    4029    4030    4031
                    4034    4035    4036    4037    4038    4039    4040    4041    4042    4043    4044    4045    4046
                    4053    4054    4055    4056    4057    4058    4059    4064    4065    4066    4067    4068    4069
                    4070    4072    4073    4079    4080    4084    4085    4087    4088    4089    4090    4091    4092
                    4093    4094    4095    4096    4097    4098    4099    4100    4101    4102    4103    4104    4105
                    4106    4107    4108    4109    4110    4111    4112    4114    4115    4135    4136    4137    4138
                    4139    4140    4141    4142    4143    4144    4145    4146    4147    4148    4149    4150    4151
                    4152    4153    4154    4166    4167
SVCSTK= 177777        8#      17      63      76     192     196     435     437     440     444     446     452     456
                     461     465     477     482     503     509     523     527     532     536     550     554     567
                     571     582     586     599     688     690     692     700     703     705     707     714     717
                     719     765     768     770     883     887     889     891     909     913     917     919     923
                     927     929     931     935     939     944    1401    1405    1464    1470    1505    1512    1548
                    1555    1590    1597    1632    1638    1673    1680    1716    1723    1758    1765    1800    1806
                    1846    1853    1881    1888    1913    1920    1936    1957    1965    1968    1975    1988    2006
                    2014    2017    2024    2036    2052    2060    2063    2070    2082    2103    2111    2114    2121
                    2133    2154    2160    2163    2170    2183    2202    2208    2211    2218    2230    2247    2253
                    2256    2263    2275    2291    2297    2300    2307    2319    2336    2342    2345    2352    2392
                    2399    2427    2434    2459    2466    2514    2521    2569    2576    2627    2633    2698    2704
                    2731    2738    2806    2813    2854    2861    2877    2911    2918    2925    2932    2951    2969
                    2974    2980    2999    3017    3022    3028    3048    3074    3079    3086    3107    3181    3186
                    3193    3216    3335    3346    3353    3376    3512    3523    3529    3627    3633    3730    3737
                    3760    3896    3906    3912    3937    4071    4078    4082    4084    4114    4129    4133    4135
                    4141    4153    4160
SVCSUB= 177777        8#
SVCTAG= 000000        8#      9#     452     453     461     462     477     478     503     504     523     524     532
                     533     550     551     567     568     582     583     599     600     700     701     714     715
                     883     884     909     910     923     924     935     936    1405    1406    1471    1472    1477
                    1478    1505    1506    1515    1516    1521    1522    1548    1549    1556    1557    1562    1563
                    1590    1591    1598    1599    1604    1605    1632    1633    1639    1640    1645    1646    1673
                    1674    1683    1684    1689    1690    1716    1717    1724    1725    1730    1731    1758    1759
                    1766    1767    1772    1773    1800    1801    1808    1809    1818    1819    1846    1847    1855
                    1856    1860    1861    1881    1882    1890    1891    1895    1896    1913    1914    1924    1925
                    1930    1931    1965    1966    1968    1969    1977    1978    1983    1984    2014    2015    2017
                    2018    2026    2027    2031    2032    2060    2061    2063    2064    2071    2072    2077    2078
                    2111    2112    2114    2115    2123    2124    2128    2129    2160    2161    2163    2164    2172
                    2173    2178    2179    2208    2209    2211    2212    2220    2221    2225    2226    2253    2254
                    2256    2257    2265    2266    2270    2271    2297    2298    2300    2301    2309    2310    2314
                    2315    2342    2343    2345    2346    2354    2355    2364    2365    2392    2393    2401    2402
                    2406    2407    2427    2428    2436    2437    2441    2442    2459    2460    2468    2469    2475
                    2476    2514    2515    2522    2523    2529    2530    2569    2570    2579    2580    2586    2587
                    2627    2628    2636    2637    2642    2643    2698    2699    2708    2709    2714    2715    2731
                    2732    2740    2741    2744    2745    2806    2807    2815    2816    2826    2827    2854    2855
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                        2863    2864    2868    2869    2918    2919    2925    2926    2934    2935    2939    2940    2969
                        2970    2974    2975    2982    2983    2987    2988    3017    3018    3022    3023    3030    3031
                        3035    3036    3074    3075    3079    3080    3088    3089    3093    3094    3181    3182    3186
                        3187    3195    3196    3205    3206    3335    3336    3346    3347    3355    3356    3365    3366
                        3512    3513    3523    3524    3531    3532    3537    3538    3627    3628    3635    3636    3641
                        3642    3730    3731    3739    3740    3749    3750    3896    3897    3906    3907    3914    3915
                        3927    3928    4071    4072    4078    4079    4115    4116    4154    4155
SVCTST= 177777            8#    1470    1512    1555    1597    1638    1680    1723    1765    1806    1853    1888    1920
                        1975    2024    2070    2121    2170    2218    2263    2307    2352    2399    2434    2466    2521
                        2576    2633    2704    2738    2813    2861    2932    2980    3028    3086    3193    3353    3529
                        3633    3737    3912
SWCHAN  034700          4175#
SWITCH  053552          4175#
SW.ADR  030154 G        4175#
SW.PTA  034664          4175#
SYS.FT  043432          4175#
S$LSYM= 010000            8#     453#    462#    478#    504#    524#    533#    551#    568#    583#    600#    701#    715#
                        884#    910#    924#    936#   1406#   1506#   1549#   1591#   1633#   1674#   1717#   1759#   1801#
                       1847#   1882#   1914#   1936#   1969#   1988#   2018#   2036#   2064#   2082#   2115#   2133#   2164#
                       2183#   2212#   2230#   2257#   2275#   2301#   2319#   2346#   2393#   2428#   2460#   2515#   2570#
                       2628#   2699#   2732#   2807#   2855#   2877#   2926#   2951#   2975#   2999#   3023#   3048#   3080#
                       3107#   3187#   3216#   3347#   3376#   3524#   3628#   3731#   3760#   3907#   3937#   4079#   4116#
                       4155#
TEMHI   002276          253#    800#    828
TEMLO   002274          252#    799#    827    3931    3932
TEMP1   002222          231#   1173#   1174    1176#   1177    1184#   1185    3242#   3243#   3244#   3245    3419#   3420#
                       3421#   3422    3803#   3804#   3805#   3806    3978#   3979#   3980#   3981
TEMP2   002212          227#   1360#   1383#
TEMP3   002214          228#   1361#   1365#
TEMP4   002216          229#   1362#   1364    1374#   1376    1381#   1382#   1385
TEMP5   002220          230#   1174#   1175#   1176    1183#   1184
TERMI   055576          4175#
TERMLI  053400          4175#
TERMTA  047362          4175#
TEST.M  035020          4175#*
TIMFLG  030350 G        4175#*
TIMSRV  016300          1409#   3113
TIM.CO  030202 G        4175#*
TIM.OP  044006          4175#*
TMPFNC  002262          247#    996     999    1079#   1252#
TMPO    002224          232#    493    3286#   3300    3463#   3477    3586#   3600    3690#   3704    3847#   3861    4022#
                        4036
TMP1    002226          233#
TMP2    002230          234#
TOO.MA  047342          4175#
TRPFLG  002174          220#    840#    852    1397#   1480#   1493    1523#   1536    1565#   1578    1607#   1620    1648#
                       1661    1691#   1704    1733#   1746    1775#   1788
TRPHAN  016264          843    1397#   1483    1526    1568    1610    1651    1694    1736    1778
TST.AB  037330          4175#
TST.TO  031532          4175#
TYPEC   047736          4175#
TYPEPC  043632          4175#
TYPFLA  053254          4175#
TYPLIN  047634          4175#
TYPNUM  047216          4175#
TYPSTR  047654          4175#
```

```
TYP.ER  043462          4175#
TY.UNI  036474          4175#
T$ARGC= 000002            19#    20#    21#    22#    23#    24#   468#   474   485#   489   491#   500   513#
                         519   543#   547   557#   562   575#   579   589#   596   604#   611   615#   624
                         626#   634   636#   645   647#   656   660#   665   667#   672   676#   681   856#
                         861   956#   960  3298#  3307  3317#  3322  3475#  3484  3494#  3499  3598#  3607
                        3617#  3622  3702#  3711  3721#  3726  3859#  3868  3878#  3883  4034#  4043  4053#
                        4058
T$CODE= 002130          4087#  4091#  4096#  4101#  4107#  4137#  4141#  4143#  4149#
T$ERCO= 000062          1049#  1428#  1450#  1498#  1541#  1583#  1625#  1666#  1709#  1751#  1793#  1840#  1874#
                        1906#  1951#  2000#  2046#  2097#  2148#  2196#  2241#  2285#  2330#  2386#  2420#  2452#
                        2492#  2506#  2548#  2563#  2605#  2619#  2662#  2676#  2689#  2770#  2784#  2798#  2842#
                        2904#  2962#  3010#  3066#  3137#  3164#  3234#  3249#  3260#  3271#  3291#  3328#  3396#
                        3411#  3426#  3437#  3448#  3468#  3505#  3570#  3591#  3674#  3695#  3780#  3795#  3810#
                        3821#  3832#  3852#  3889#  3955#  3970#  3985#  3996#  4007#  4027#  4064#
T$ERRN= 000101             8#  1050#  1429#  1451#  1499#  1542#  1584#  1626#  1667#  1710#  1752#  1794#  1841#
                        1875#  1907#  1952#  2001#  2047#  2098#  2149#  2197#  2242#  2286#  2331#  2387#  2421#
                        2453#  2493#  2507#  2549#  2564#  2606#  2620#  2663#  2677#  2690#  2771#  2785#  2799#
                        2843#  2905#  2963#  3011#  3067#  3138#  3165#  3235#  3250#  3261#  3272#  3292#  3329#
                        3397#  3412#  3427#  3438#  3449#  3469#  3506#  3571#  3592#  3675#  3696#  3781#  3796#
                        3811#  3822#  3833#  3853#  3890#  3956#  3971#  3986#  3997#  4008#  4028#  4065#
T$EXCP= 000000          4091#  4095   4096#  4100   4101#  4106   4107#  4112   4143#  4148
T$FLAG= 000040          1956#  2005#  2051#  2102#  2153#  2201#  2246#  2290#  2335#  2762#  2889#  2894#  2910#
T$HILI= 177777          4091#  4094   4096#  4099   4101#  4105   4107#  4111   4143#  4147
T$LOLI= 000000          4091#  4093   4096#  4098   4101#  4104   4107#  4110   4143#  4146
T$LSYM= 010000             8#   453    462    478    504    524    533    551    568    583    600    701    715
                         884    910    924    936   1406   1506   1549   1591   1633   1674   1717   1759   1801
                        1847   1882   1914   1969   2018   2064   2115   2164   2212   2257   2301   2346   2393
                        2428   2460   2515   2570   2628   2699   2732   2807   2855   2926   2975   3023   3080
                        3187   3347   3524   3628   3731   3907   4079   4116   4155
T$MCAL= 177777             1#      8
T$NEST= 177777             8#     17#    63#    76#   192#   196#   435#   437#   440#   444#   446#   452#   456#
                         461#   465#   477#   482#   503#   509#   523#   527#   532#   536#   550#   554#   567#
                         571#   582#   586#   599#   688#   690#   692#   700#   703#   705#   707#   714#   717#
                         719#   765#   768#   770#   883#   887#   889#   891#   909#   913#   917#   919#   923#
                         927#   929#   931#   935#   939#   944#  1401#  1405#  1464#  1470#  1505#  1512#  1548#
                        1555#  1590#  1597#  1632#  1638#  1673#  1680#  1716#  1723#  1758#  1765#  1800#  1806#
                        1846#  1853#  1881#  1888#  1913#  1920#  1936#  1965#  1968#  1975#  1988#  2014#  2017#
                        2024#  2036#  2060#  2063#  2070#  2082#  2111#  2114#  2121#  2133#  2160#  2163#  2170#
                        2183#  2208#  2211#  2218#  2230#  2253#  2256#  2263#  2275#  2297#  2300#  2307#  2319#
                        2342#  2345#  2352#  2392#  2399#  2427#  2434#  2459#  2466#  2514#  2521#  2569#  2576#
                        2627#  2633#  2698#  2704#  2731#  2738#  2806#  2813#  2854#  2861#  2877#  2918#  2925#
                        2932#  2951#  2969#  2974#  2980#  2999#  3017#  3022#  3028#  3048#  3074#  3079#  3086#
                        3107#  3181#  3186#  3193#  3216#  3335#  3346#  3353#  3376#  3512#  3523#  3529#  3627#
                        3633#  3730#  3737#  3760#  3896#  3906#  3912#  3937#  4071#  4078#  4082#  4084#  4114#
                        4129#  4133#  4135#  4141   4153#  4160#
T$NSK0= 000000             17#    63     76#   192    196#   435    437#   440    444#   688    690#   703    705#
                         717    719#   765    768#   887    889#   913    917#   927    929#   939    944#  1464
                        1470#  1505   1512#  1548   1555#  1590   1597#  1632   1638#  1673   1680#  1716   1723#
                        1758   1765#  1800   1806#  1846   1853#  1881   1888#  1913   1920#  1968   1975#  2017
                        2024#  2063   2070#  2114   2121#  2163   2170#  2211   2218#  2256   2263#  2300   2307#
                        2345   2352#  2392   2399#  2427   2434#  2459   2466#  2514   2521#  2569   2576#  2627
                        2633#  2698   2704#  2731   2738#  2806   2813#  2854   2861#  2925   2932#  2974   2980#
                        3022   3028#  3079   3086#  3186   3193#  3346   3353#  3523   3529#  3627   3633#  3730
                        3737#  3906   3912#  4078   4082#  4129   4133#  4160
T$NSK1= 000005           446#   452    456#   461    465#   477    482#   503    509#   523    527#   532    536#
```

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                    550     554#    567     571#    582     586#    599     692#    700     707#    714     770#    883
                    891#    909     919#    923     931#    935     1401#   1405    1936#   1965    1988#   2014    2036#
                   2060    2082#   2111    2133#   2160    2183#   2208    2230#   2253    2275#   2297    2319#   2342
                   2877#   2918    2951#   2969    2999#   3017    3048#   3074    3107#   3181    3216#   3335    3376#
                   3512    3760#   3896    3937#   4071    4084#   4114    4135#   4141    4153
TSSAVL= 177777        8#
TSSEGL= 177777        8#   1936#   1957    1965#   1967    1988#   2006    2014#   2016    2036#   2052    2060#   2062
                   2082#   2103    2111#   2113    2133#   2154    2160#   2162    2183#   2202    2208#   2210    2230#
                   2247    2253#   2255    2275#   2291    2297#   2299    2319#   2336    2342#   2344    2877#   2911
                   2918#   2920    2951#   2969#   2971    2999#   3017#   3019    3048#   3074#   3076    3107#   3181#
                   3183    3216#   3335#   3337    3376#   3512#   3514    3760#   3896#   3898    3937#   4071#   4073
TSSEKO= 010000     1936#   1957    1965    1988#   2006    2014    2036#   2052    2060    2082#   2103    2111    2133#
                   2154    2160    2183#   2202    2208    2230#   2247    2253    2275#   2291    2297    2319#   2336
                   2342    2877#   2911    2918    2951#   2969    2999#   3017    3048#   3074    3107#   3181    3216#
                   3335    3376#   3512    3760#   3896    3937#   4071
TSSUBN= 000000        8#   1470#   1512#   1555#   1597#   1638#   1680#   1723#   1765#   1806#   1853#   1888#   1920#
                   1975#   2024#   2070#   2121#   2170#   2218#   2263#   2307#   2352#   2399#   2434#   2466#   2521#
                   2576#   2633#   2704#   2738#   2813#   2861#   2932#   2980#   3028#   3086#   3193#   3353#   3529#
                   3633#   3737#   3912#
TSTAGL= 177777        8#
TSTAGN= 010074        8#    446#    456#    465#    482#    509#    527#    536#    554#    571#    586#    692#    707#
                    770#    891#    919#    931#   1401#   1470#   1512#   1555#   1597#   1638#   1680#   1723#   1765#
                   1806#   1853#   1888#   1920#   1975#   2024#   2070#   2121#   2170#   2218#   2263#   2307#   2352#
                   2399#   2434#   2466#   2521#   2576#   2633#   2704#   2738#   2813#   2861#   2932#   2980#   3028#
                   3086#   3193#   3353#   3529#   3633#   3737#   3912#   4084#   4135#
TSTEMP= 000000       63#    192#    435#    440#    452#    461#    477#    503#    523#    532#    550#    567#    582#
                    599#    688#    700#    703#    714#    717#    722#    723#    724#    725#    726#    727#    728#
                    729#    730#    731#    732#    733#    734#    735#    736#    737#    738#    739#    740#    741#
                    742#    743#    744#    745#    746#    747#    748#    749#    750#    751#    752#    753#    754#
                    755#    756#    757#    758#    759#    760#    761#    762#    763#    765#    883#    887#    909#
                    913#    923#    927#    935#    939#   1405#   1464#   1471#   1477#   1505#   1515#   1521#   1548#
                   1556#   1562#   1590#   1598#   1604#   1632#   1639#   1645#   1673#   1683#   1689#   1716#   1724#
                   1730#   1758#   1766#   1772#   1800#   1808#   1818#   1846#   1855#   1860#   1881#   1890#   1895#
                   1913#   1924#   1930#   1956#   1957#   1965#   1968#   1977#   1983#   2005#   2006#   2014#   2017#
                   2026#   2031#   2051#   2052#   2060#   2063#   2071#   2077#   2102#   2103#   2111#   2114#   2123#
                   2128#   2153#   2154#   2160#   2163#   2172#   2178#   2201#   2202#   2208#   2211#   2220#   2225#
                   2246#   2247#   2253#   2256#   2265#   2270#   2290#   2291#   2297#   2300#   2309#   2314#   2335#
                   2336#   2342#   2345#   2354#   2364#   2392#   2401#   2406#   2427#   2436#   2441#   2459#   2468#
                   2475#   2514#   2522#   2529#   2569#   2579#   2586#   2627#   2636#   2642#   2698#   2708#   2714#
                   2731#   2740#   2744#   2762#   2763    2806#   2815#   2826#   2854#   2863#   2868#   2889#   2890
                   2894#   2895    2910#   2911#   2918#   2925#   2934#   2939#   2969#   2974#   2982#   2987#   3017#
                   3022#   3030#   3035#   3074#   3079#   3088#   3093#   3181#   3186#   3195#   3205#   3335#   3346#
                   3355#   3365#   3512#   3523#   3531#   3537#   3627#   3635#   3641#   3730#   3739#   3749#   3896#
                   3906#   3914#   3927#   4071#   4078#   4087#   4091#   4096#   4101#   4107#   4114#   4129#   4137#
                   4143#   4149#   4153#   4160#
TSTEST= 000051        8#   1470#   1512#   1555#   1597#   1638#   1680#   1723#   1765#   1806#   1853#   1888#   1920#
                   1975#   2024#   2070#   2121#   2170#   2218#   2263#   2307#   2352#   2399#   2434#   2466#   2521#
                   2576#   2633#   2704#   2738#   2813#   2861#   2932#   2980#   3028#   3086#   3193#   3353#   3529#
                   3633#   3737#   3912#
TSTSTM= 177777        8#    453     462     473     478     488     499     504     518     524     533     546     551
                    561     568     578     583     595     600     610     623     633     644     655     664     671
                    680     772     775     780     785     790     805     818     846     851     860     865     867
                    873     877     884     894     901     906     910     924     936     946     959     964     966
                   1049    1411    1423    1428    1443    1450    1486    1492    1498    1503    1506    1529    1535
                   1541    1546    1549    1571    1577    1583    1588    1591    1613    1619    1625    1630    1633
                   1654    1660    1666    1671    1674    1697    1703    1709    1714    1717    1739    1745    1751
```

F10


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                        1756   1759   1781   1787   1793   1798   1801   1823   1831   1840   1847   1869   1874
                        1882   1901   1906   1914   1936   1951   1956   1966   1969   1988   2000   2005   2015
                        2018   2036   2046   2051   2061   2064   2082   2097   2102   2112   2115   2133   2148
                        2153   2161   2164   2183   2196   2201   2209   2212   2230   2241   2246   2254   2257
                        2275   2285   2290   2298   2301   2319   2330   2335   2343   2346   2369   2377   2386
                        2393   2415   2420   2428   2447   2452   2460   2492   2497   2506   2515   2548   2553
                        2563   2570   2605   2610   2619   2628   2662   2667   2676   2681   2689   2699   2725
                        2732   2758   2762   2770   2776   2784   2790   2798   2807   2835   2842   2848   2855
                        2877   2882   2889   2894   2904   2910   2919   2926   2951   2958   2962   2967   2970
                        2975   2999   3006   3010   3015   3018   3023   3048   3051   3059   3062   3066   3072
                        3075   3080   3107   3110   3116   3120   3133   3137   3143   3145   3158   3164   3169
                        3172   3178   3182   3187   3216   3225   3228   3234   3239   3249   3254   3260   3265
                        3271   3276   3291   3306   3309   3321   3328   3333   3336   3347   3376   3381   3389
                        3392   3396   3402   3405   3411   3416   3426   3431   3437   3442   3448   3453   3468
                        3483   3496   3498   3505   3510   3513   3524   3556   3563   3566   3570   3576   3591
                        3606   3609   3621   3628   3660   3667   3670   3674   3680   3695   3710   3713   3725
                        373'   3760   3765   3773   3776   3780   3786   3789   3795   3800   3810   3815   3821
                        3P     3832   3837   3852   3867   3870   3882   3889   3894   3897   3907   3937   3940
                        3      3951   3955   3961   3964   3970   3975   3985   3990   3996   4001   4007   4012
                        40     4042   4045   4057   4064   4069   4072   4079
TSTSTS= 000001            8#  1470#  1512#  1555#  1597#  1638#  1680#  1723#  1765#  1806#  1853#  1888#  1920#
                        1975#  2024#  2070#  2121#  2170#  2218#  2263#  2307#  2352#  2399#  2434#  2466#  2521#
                        2576#  2633#  2704#  2738#  2813#  2861#  2932#  2980#  3028#  3086#  3193#  3353#  3529#
                        3633#  3737#  3912#
TSSAU = 010017           931#   935
TSSCLE= 010015           891#   909
TSSDU = 010016           919#   923
TSSHAR= 010072          4084#  4115
TSSHW = 010012           692#   700
TSSINI= 010014           770#   883
TSSMSG= 010011           446#   452    456#   461    465#   477    482#   503    509#   523    527#   532    536#
                         550    554#   567    571#   582    586#   599
TSSSEG= 010000          1936#  1956   1965#  1988#  2005   2014#  2036#  2051   2060#  2082#  2102   2111#  2133#
                        2153   2160#  2183#  2201   2208#  2230#  2246   2253#  2275#  2290   2297#  2319#  2335
                        2342#  2877#  2910   2918#  2951#  2969#  2999#  3017#  3048#  3074#  3107#  3181#  3216#
                        3335#  3376#  3512#  3760#  3896#  3937#  4071#
TSSSOF= 010073          4135#  4154
TSSSRV= 010020          1401#  1405
TSSSW = 010013           707#   714
TSSTES= 010071          1470#  1505   1512#  1548   1555#  1590   1597#  1632   1638#  1673   1680#  1716   1723#
                        1758   1765#  1800   1806#  1846   1853#  1881   1888#  1913   1920#  1968   1975#  2017
                        2024#  2063   2070#  2114   2121#  2163   2170#  2211   2218#  2256   2263#  2300   2307#
                        2345   2352#  2392   2399#  2427   2434#  2459   2466#  2514   2521#  2569   2576#  2627
                        2633#  2698   2704#  2731   2738#  2762   2806   2813#  2854   2861#  2889   2894   2925
                        2932#  2974   2980#  3022   3028#  3079   3086#  3186   3193#  3346   3353#  3523   3529#
                        3627   3633#  3730   3737#  3906   3912#  4078
T.CNTL  002260           246#   825#  1864   1991   2187   2410   2717   2746   2829   2870   2940   2988   3037
                        3095   3206   3366   3538   3642   3750   3928
T.SIZE  013334           711#   837
T1      016432 G         722   1470#
T10     017512 G         731   1853#
T11     017564 G         732   1888#
T12     017622 G         733   1920#
T13     017742 G         734   1975#
T14     020044 G         735   2024#
T15     020132 G         736   2070#
```

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T16       020256 G            737     2121#
T17       020402 G            738     2170#
T18       020506 G            739     2218#
T19       020606 G            740     2263#
T2        016530 G            723     1515#
T20       020676 G            741     2307#
T21       020776 G            742     2352#
T22       021106 G            743     2399#
T23       021160 G            744     2434#
T24       021216 G            745     2466#
T25       021342 G            746     2521#
T26       021502 G            747     2576#
T27       021642 G            748     2633#
T28       022046 G            749     2704#
T29       022076 G            750     2738#
T3        016626 G            724     1555#
T30       022302 G            751     2813#
T31       022366 G            752     2861#
T32       022532 G            753     2932#
T33       022642 G            754     2980#
T34       022752 G            755     3028#
T35       023106 G            756     3086#
T36       023436 G            757     3193#
T37       024250 G            758     3353#
T38       025126 G            759     3529#
T39       025474 G            760     3633#
T4        016724 G            725     1597#
T40       026046 G            761     3737#
T41       026724 G            762     3912#
T5        017022 G            726     1638#
T6        017116 G            727     1680#
T7        017212 G            728     1723#
T8        017306 G            729     1765#
T9        017402 G            730     1806#
UNITST    002124              200#     798*    811*    814*    817     864     963
UNIT.D    030132 G           4175#*
UNI.MA    035010             4175#*
USER.P    030374 G           4175#*
USER.T    030376 G           4175#*
UUT       002122              199#     797*    809     812*    815*
VALID.    030634             4175#
VAL.LA    031454             4175#
VAL.SW    035120             4175#
VECMSG    027656             4097    4122#
VECT   =  000002              180#    4096
WHY       002256              245#     854*    856
WIDTH     044402             4175#
WRCHK  =  000002              162#     999
WRITE  =  000012              166#
WTCRDY    016354             1437#    2723    2756    2838    2887    2956    3004    3057    3223    3387    3561    3665    3771
                             3946
WTDRDY    016310             1416#
XEQDIA    057424 G           4175#
XEQSUB    057412 G           4175#
XEQ.CL    037134             4175#
XEQ.CM    034444             4175#
```

```
CVRLAA.SUP    11-APR-78 09:27          CROSS REFERENCE TABLE -- USER SYMBOLS

XEQ.IN  036616            4175#
XEQ.LA  032706            4175#
XEQ.OP  036710            4175#
XEQ.PR  032110            4175#
XEQ.TE  036754            4175#
XPOLY   002202             223#    1370    1381
XTIME   056276 G          4175#
XTIMEN  057122            4175#
XTIMST  056320            4175#*
XXDP.D  034464            4175#
X$ALWA= 000000               8#
X$FALS= 000040               8#    4141
X$OFFS= 000400               8#    4141
X$TRUE= 000020               8#
$BREG   035160            4175#*
$ENDAD  057376 G          4175#
$SAV2   060442 G          4175#
$SAV3   060456 G          4175#
$SAV4   060474 G          4175#
$SAV5   060514 G          4175#
.     = 060720              10#      68#      72#     429#     432#     433#     439#    1957     2006     2052     2103     2154     2202
                           2247     2291     2336     2763     2830     2895     2911    4136#     4141     4157#    4161#    4175#

. ABS.  060720      000

 ERRORS DETECTED:  0

 DSKZ:CVRLAA,DSKZ:CVRLAA/CRF:SYM/SOL=DSKZ:CVRLAA.SML,DSKM:CVRLAA.P11,DSKZ:CVRLAA.SUP
 RUN-TIME:  50 54 4 SECONDS
 RUN-TIME RATIO:  1395/109=12.7
 CORE USED:  18K  (35 PAGES)
```