

11/21+
KXT 11-CA

KXT 11-CA DIAGNOSTIC
CNKTCR0

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AH-T825A-MC
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JUL 1984
digital
Made In USA

Microfiche grid containing multiple frames of data, likely diagnostic test results or program listings. The content is too faint to transcribe accurately.

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.SBTTL IDENTIFICATION

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IDENTIFICATION

PRODUCT CODE: AC T824A MC
PRODUCT NAME: CNKTCAO KXT11 CA LSI-11 BUS DIAGNOSTIC
PRODUCT DATE: APRIL 9,1984
MAINTAINER: ISS DIAGNOSTIC SERVICES GROUP
AUTHOR: JACK RICHARDSON
MODIFIED BY: JAKI BERG 9-APR 1983

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DIGITAL PDP UNIBUS MASSBUS
DEC DECUS DECTAPE

PARAMETER CODING
IDENTIFICATION

MACRO M1200 20 FEB 84 09:45 PAINT 1

SEP 0002

***** MODIFICATION HISTORY *****

ORIGINAL RELEASE: REV 0 JACK RICHARDSON 5 JUL 83

CZKTCA -> CNKTCA JAKI BERG 9 APR 84
CHANGES WERE MADE TO CZKTCA TO PRODUCE CNKTCA FOR THE FALCON-PLUS
PROJECT (SBC-11/21*). CHANGES, MARKED BY ";JB REV A-0", ARE:
- SET THE ODT BREAK VECTOR (LOCATION 140) TO THE STARTING ADDRESS OF
FALCON'S ODT ROM (170000-OCTAL).
THE GENERAL OPERATING PRIORITY OF THE PROGRAM WAS LOWERED FROM LEVEL
7 TO LEVEL 6 TO ALLOW THE BREAK KEY TO INTERRUPT AND INVOKE ODT.
VECTOR ADDRESSES ARE ACCEPTED ONLY ON BDAL <7:2>. LIMITING VECTOR
ADDRESS SPACE TO 374. THE INTERRUPT VECTOR ADDRESS 1770 WAS CHANGED
TO 370 TO ACCOMODATE THIS LIMITATION.

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1.0 GENERAL INFORMATION
1.1 PROGRAM ABSTRACT

THIS DIAGNOSTIC HAS BEEN WRITTEN FOR USE WITH THE DIAGNOSTIC RUNTIME SERVICES SOFTWARE (SUPERVISOR). THESE SERVICES PROVIDE THE INTERFACE TO THE OPERATOR AND TO THE SOFTWARE ENVIRONMENT. THIS PROGRAM CAN BE USED WITH XXDP+. FOR A COMPLETE DESCRIPTION OF THE RUNTIME SERVICES, REFER TO THE XXDP+ USER'S MANUAL. THERE IS A BRIEF DESCRIPTION OF THE RUNTIME SERVICES IN SECTION 2 OF THIS DOCUMENT.

1.2 SYSTEM REQUIREMENTS
1.3 RELATED DOCUMENTS AND STANDARDS
1.4 DIAGNOSTIC HIERARCHY PREREQUISITES
1.5 ASSUMPTIONS

2.0 OPERATING INSTRUCTIONS

THIS SECTION CONTAINS A BRIEF DESCRIPTION OF THE RUNTIME SERVICES. FOR DETAILED INFORMATION, REFER TO THE XXDP+ USER'S MANUAL (CHQUS).

STARTING THE XXDP+ SYSTEM

THE XXDP+ TEST SOFTWARE SYSTEM CONSISTS OF THE XXDP+ MONITOR WITH VARIOUS UTILITY SOFTWARE, THE KXT11 CA IOP TEST SOFTWARE, AND THE DIAGNOSTIC RUNTIME SERVICES (SUPERVISOR) ALL RESIDING ON A BOOTABLE MEDIUM. THE TEST SYSTEM REQUIRES DEDICATION OF THE ENTIRE HARDWARE SYSTEM, I.E., IT CANNOT SHARE WITH ANY OTHER OPERATING SYSTEM.

STARTING PROCEDURES:

1. SHUT OFF POWER TO THE SYSTEM; THIS INCLUDES ALL IOP AND ARBITER POWER.
2. FOR EACH KXT11-CA TO BE TESTED, PLACE THE BOOT/SELFTTEST SWITCH TO POSITION 10. THE BOOT/SELFTTEST SWITCH RESIDES ON EACH KXT11 CA MODULE. IF LESS THAN THE FULL COMPLEMENT OF KXT11-CA'S ARE TO BE TESTED WITH THIS SOFTWARE, IT IS SUFFICIENT TO CHANGE THE BOOT SWITCHES OF ONLY THE KXT11'S TO BE TESTED. IF THE THREE I/O PORTS ARE TO BE THOROUGHLY TESTED, THE DATA LOOPBACK CONNECTORS SHOULD BE INSTALLED AT THIS TIME.
3. RESTORE POWER TO THE SYSTEM.
4. PLACE THE XXDP+ STORAGE MEDIUM IN THE MAIN SYSTEM DEVICE.
5. BOOT THE SYSTEM.

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6. ENTER THE DATE AND ANSWER THE LSI AND 50M2 QUESTIONS.
7. TYPE "R CNKTCA" TO LOAD THE KXT11-CA TEST SOFTWARE.
8. AFTER THE PROGRAM IS LOADED INTO ARBITER MEMORY, THE PROMPT "DS>" WILL APPEAR.
9. TYPE "START"
10. ANSWER THE QUESTION, "CHANGE HW(L)?" QUESTION WITH 'Y'.
11. ANSWER ALL THE HARDWARE QUESTIONS (SEE THE NEXT SECTION, 2.4, FOR VARIATIONS AND COMMANDS ASSOCIATED WITH THE DRS).
12. THE TEST SOFTWARE IS INVOKED IMMEDIATELY AFTER COMPLETING THE HARDWARE SPECIFICATION INPUT.

2.1 COMMANDS

THERE ARE ELEVEN LEGAL COMMANDS FOR THE DIAGNOSTIC RUNTIME SERVICES (SUPERVISOR). THIS SECTION LISTS THE COMMANDS AND GIVES A VERY BRIEF DESCRIPTION OF THEM. THE XXDP+ USER'S MANUAL HAS MORE DETAILS.

COMMAND	EFFECT
START	START THE DIAGNOSTIC FROM AN INITIAL STATE
RESTART	START THE DIAGNOSTIC WITHOUT INITIALIZING
CONTINUE	CONTINUE AT TEST THAT WAS INTERRUPTED (AFTER ^C)
PROCEED	CONTINUE FROM AN ERROR HALT
EXIT	RETURN TO XXDP+ MONITOR (XXDP+ OPERATION ONLY!)
ADD	ACTIVATE A UNIT FOR TESTING (ALL UNITS ARE CONSIDERED TO BE ACTIVE AT START TIME)
DROP	DEACTIVATE A UNIT
PRINT	PRINT STATISTICAL INFORMATION (IF IMPLEMENTED BY THE DIAGNOSTIC - SECTION 4.0)
DISPLAY	TYPE A LIST OF ALL DEVICE INFORMATION
FLAGS	TYPE THE STATE OF ALL FLAGS (SEE SECTION 2.3)
ZFLAGS	CLEAR ALL FLAGS (SEE SECTION 2.3)

A COMMAND CAN BE RECOGNIZED BY THE FIRST THREE CHARACTERS. YOU MAY, FOR EXAMPLE, TYPE "STA" INSTEAD OF "START".

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2.2 SWITCHES

THERE ARE SEVERAL SWITCHES WHICH ARE USED TO MODIFY SUPERVISOR OPERATION. THESE SWITCHES ARE APPENDED TO THE LEGAL COMMANDS. ALL OF THE LEGAL SWITCHES ARE TABULATED BELOW WITH A BRIEF DESCRIPTION OF EACH. IN THE DESCRIPTIONS BELOW, A DECIMAL NUMBER IS DESIGNATED BY "DDDD".

SWITCH	EFFECT
/TESTS:LIST	EXECUTE ONLY THOSE TESTS SPECIFIED IN THE LIST. LIST IS A STRING OF TEST NUMBERS, FOR EXAMPLE /TESTS:1:5:7 10. THIS LIST WILL CAUSE TESTS 1,5,7,8,9,10 TO BE RUN. ALL OTHER TESTS WILL NOT BE RUN.
/PASS:DDDD	EXECUTE DDDDD PASSES (DDDD = 1 TO 64000)
/FLAGS:FLGS	SET SPECIFIED FLAGS. FLAGS ARE DESCRIBED IN SECTION 2.3.
/EOP:DDDD	REPORT END OF PASS MESSAGE AFTER EVERY DDDDD PASSES ONLY. (DDDD = 1 TO 64000)
/UNITS:LIST	TEST/ADD/DROP ONLY THOSE UNITS SPECIFIED IN THE LIST. LIST EXAMPLE /UNITS:0:5:10-12 USE UNITS 0,5,10,11,12 (UNIT NUMBERS = 0-14)

EXAMPLE OF SWITCH USAGE:

START/TESTS:1 5/PASS:1000/EOP:100

THE EFFECT OF THIS COMMAND WILL BE: 1) TESTS 1 THROUGH 5 WILL BE EXECUTED, 2) ALL UNITS WILL TESTED 1000 TIMES, AND 3) THE END OF PASS MESSAGES WILL BE PRINTED AFTER EACH 100 PASSES ONLY. A SWITCH CAN BE RECOGNIZED BY THE FIRST THREE CHARACTERS. YOU MAY, FOR EXAMPLE, TYPE '/TES:1-5' INSTEAD OF "/TESTS:1-5'.

BELOW IS A TABLE THAT SPECIFIES WHICH SWITCHES CAN BE USED BY EACH COMMAND.

	TESTS	PASS	FLAGS	EOP	UNITS
START	X	X	X	X	X
RESTART	X	X	X	X	X
CONTINUE		X	X	X	
PROCEED			X		
DROP					X
ADD					X
PRINT					
DISPLAY					X
FLAGS					
ZFLAGS					
EXIT					

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2.3 FLAGS

FLAGS ARE USED TO SET UP CERTAIN OPERATIONAL PARAMETERS SUCH AS LOOPING ON ERROR. ALL FLAGS ARE CLEARED AT STARTUP AND REMAIN CLEARED UNTIL EXPLICITLY SET USING THE FLAGS SWITCH. FLAGS ARE ALSO CLEARED AFTER A START COMMAND UNLESS SET USING THE FLAG SWITCH. THE ZFLAGS COMMAND MAY ALSO BE USED TO CLEAR ALL FLAGS. WITH THE EXCEPTION OF THE START AND ZFLAGS COMMANDS, NO COMMANDS AFFECT THE STATE OF THE FLAGS; THEY REMAIN SET OR CLEARED AS SPECIFIED BY THE LAST FLAG SWITCH.

FLAG	EFFECT
HOE	HALT ON ERROR - CONTROL IS RETURNED TO RUNTIME SERVICES COMMAND MODE
LOE	LOOP ON ERROR
IER*	INHIBIT ALL ERROR REPORTS
IBR*	INHIBIT ALL ERROR REPORTS EXCEPT FIRST LEVEL (FIRST LEVEL CONTAINS ERROR TYPE, NUMBER, PC, TEST AND UNIT)
IXR*	INHIBIT EXTENDED ERROR REPORTS (THOSE CALLED BY PRINTX MACRO'S)
PRI	DIRECT MESSAGES TO LINE PRINTER
PNT	PRINT TEST NUMBER AS TEST EXECUTES
BOE	"BELL" ON ERROR
UAM	UNATTENDED MODE (NO MANUAL INTERVENTION)
ISR	INHIBIT STATISTICAL REPORTS (DOES NOT APPLY TO DIAGNOSTICS WHICH DO NOT SUPPORT STATISTICAL REPORTING)
IDR	INHIBIT PROGRAM DROPPING OF UNITS
ADR	EXECUTE AUTODROP CODE
LOT	LOOP ON TEST
EVL	EXECUTE EVALUATION (ON DIAGNOSTICS WHICH HAVE EVALUATION SUPPORT)

*ERROR MESSAGES ARE DESCRIBED IN SECTION 3.1

SEE THE XXDP* USER'S MANUAL FOR MORE DETAILS ON FLAGS. YOU MAY SPECIFY MORE THAN ONE FLAG WITH THE FLAG SWITCH. FOR EXAMPLE, TO CAUSE THE PROGRAM TO LOOP ON ERROR, INHIBIT ERROR REPORTS AND TYPE A "BELL" ON ERROR, YOU MAY USE THE FOLLOWING STRING:

/FLAGS:LOE:IER:BOE

IDENTIFICATION

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2.4 HARDWARE QUESTIONS

WHEN A DIAGNOSTIC IS STARTED, THE RUNTIME SERVICES WILL PROMPT THE USER FOR HARDWARE INFORMATION BY TYPING "CHANGE HW (L) ?" YOU MUST ANSWER "Y" AFTER A START COMMAND UNLESS THE HARDWARE INFORMATION HAS BEEN "PRELOADED" USING THE SETUP UTILITY (SEE CHAPTER 6 OF THE XXDP USER'S MANUAL, OR SECTION 2.5 BELOW). WHEN YOU ANSWER THIS QUESTION WITH A "Y", THE RUNTIME SERVICES WILL ASK FOR THE NUMBER OF UNITS (IN DECIMAL). YOU WILL THEN BE ASKED QUESTIONS FOR EACH UNIT.

WHEN YOU ANSWER THE HARDWARE QUESTIONS, YOU ARE BUILDING ENTRIES IN A TABLE THAT DESCRIBES THE DEVICES UNDER TEST. THE SIMPLEST WAY TO BUILD THIS TABLE IS TO ANSWER ALL QUESTIONS FOR EACH UNIT TO BE TESTED. THIS CAN BECOME TEDIOUS, HOWEVER, SINCE THE ANSWERS FOR EACH UNIT ARE REPETITIOUS.

TO ILLUSTRATE, YOU WISH TO TEST 4 KXT11-CA'S WITH THIS PROGRAM, AND THEIR SBC NUMBERS HAPPEN TO BE 2 THROUGH 5. THERE ARE 5 PARAMETERS THAT MAY VARY AMONG THE UNITS. THESE ARE THE BUS ADDRESS, THE THREE I/O PORT LOOPBACK CONNECTORS, AND WHETHER THE USER ROM TEST SHOULD OR SHOULDN'T BE INVOKED DURING TESTING. NOTE THAT A "UNIT" NUMBER IMPLIES A UNIT UNDER TEST AND DOES NOT HAVE TO HAVE A UNIT NUMBER CORRESPONDING TO A KXT11-CA SBC NUMBER.

UNITS (D) ? 4<CR>

UNIT 0

SBC ID SWITCH SETTING(D) ? 2<CR>
IS IOP'S LSI 11 BUS ADDRESS IN THE LOW ADDRESS RANGE(Y/N) Y ? Y<CR>
LOOP-BACK CONNECTOR ON SERIAL PORT #1 (L) N ? Y<CR>
CHANNEL A LOOP BACK CONNECTOR ON SERIAL PORT #2 (L) N ? Y<CR>
CHANNEL B LOOP-BACK CONNECTOR ON SERIAL PORT #2 (L) N ? Y<CR>
LOOP-BACK CONNECTOR ON PARALLEL PORT (L) N ? Y<CR>
IS SLU2 SERIAL PORT CONFIGURED FOR DMA OPERATION(Y/N) N ?<CR>
TEST USER ROM (L) N ? Y<CR>

UNIT 1

SBC ID SWITCH SETTING(D) ? 2<CR>
IS IOP'S LSI 11 BUS ADDRESS IN THE LOW ADDRESS RANGE(Y/N) Y ? Y<CR>
LOOP BACK CONNECTOR ON SERIAL PORT #1 (L) Y ? <CR>
CHANNEL A LOOP BACK CONNECTOR ON SERIAL PORT #2 (L) N ? Y<CR>
CHANNEL B LOOP BACK CONNECTOR ON SERIAL PORT #2 (L) N ? Y<CR>
LOOP BACK CONNECTOR ON PARALLEL PORT (L) Y ? <CR>
IS SLU2 SERIAL PORT CONFIGURED FOR DMA OPERATION(Y/N) N ?<CR>
TEST USER ROM (L) Y ? <CR>

IDENTIFICATION

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344          UNIT 2
345          SBC ID SWITCH SETTING(D) ? 2<CR>
346          IS IOP'S LSI-11 BUS ADDRESS IN THE LOW ADDRESS RANGE(Y/N) Y ? Y<CR>
347          LOOP BACK CONNECTOR ON SERIAL PORT #1 (L) Y ? <CR>
348          CHANNEL A LOOP BACK CONNECTOR ON SERIAL PORT #2 (L) N ? Y<CR>
349          CHANNEL B LOOP BACK CONNECTOR ON SERIAL PORT #2 (L) N ? Y<CR>
350          LOOP BACK CONNECTOR ON PARALLEL PORT (L) Y ? <CR>
351          IS SLU2 SERIAL PORT CONFIGURED FOR DMA OPERATION(Y/N) N ?<CR>
352          TEST USER ROM (L) Y ? N<CR>
353
354          UNIT 3
355          SBC ID SWITCH SETTING(D) ? 2<CR>
356          IS IOP'S LSI-11 BUS ADDRESS IN THE LOW ADDRESS RANGE(Y/N) Y ? Y<CR>
357          LOOP BACK CONNECTOR ON SERIAL PORT #1 (L) Y ? N <CR>
358          CHANNEL A LOOP-BACK CONNECTOR ON SERIAL PORT #2 (L) N ? Y<CR>
359          CHANNEL B LOOP-BACK CONNECTOR ON SERIAL PORT #2 (L) N ? Y<CR>
360          LOOP-BACK CONNECTOR ON PARALLEL PORT (L) Y ? N<CR>
361          IS SLU2 SERIAL PORT CONFIGURED FOR DMA OPERATION(Y/N) N ?<CR>
362          TEST USER ROM (L) N ? Y<CR>
363
364          NOTICE THAT THE DEFAULT VALUES CHANGE WHEN A NON-DEFAULT RESPONSE
365          IS GIVEN AS IN THE RESPONSES TO THE USER ROM QUESTION FOR UNITS 2 AND 3.
366          BE CAREFUL WHEN SPECIFYING MULTIPLE UNITS!
367
368          AS YOU CAN SEE FROM THE ABOVE EXAMPLE, THE HARDWARE PARAMETERS
369          DO NOT VARY SIGNIFICANTLY FROM UNIT TO UNIT. THE PROCEDURE SHOWN IS
370          NOT VERY EFFICIENT.
371
372          THE RUNTIME SERVICES WILL ACCEPT MULTIPLE UNIT SPECIFICATIONS, HOWEVER.
373          LET'S BUILD THE SAME TABLE USING THE MULTIPLE SPECIFICATION
374          FEATURE AND ACCOMPLISH THE SAME IN ONE SINGLE UNIT ENTRY.
375
376          # UNITS (D) ? 4<CR>
377
378          UNIT 0
379          SBC ID SWITCH SETTING(D) ? 2<CR>
380          IS IOP'S LSI-11 BUS ADDRESS IN THE LOW ADDRESS RANGE(Y/N) Y ? Y...<CR>
381          LOOP-BACK CONNECTOR ON SERIAL PORT #1 (L) Y ? ...N<CR>
382          CHANNEL A LOOP-BACK CONNECTOR ON SERIAL PORT #2 (L) N ? ...N<CR>
383          CHANNEL B LOOP-BACK CONNECTOR ON SERIAL PORT #2 (L) N ? ...N<CR>
384          LOOP-BACK CONNECTOR ON PARALLEL PORT (L) Y ? ...N<CR>
385          IS SLU2 SERIAL PORT CONFIGURED FOR DMA OPERATION(Y/N) N ?...N<CR>
386          TEST USER ROM (L) N ? Y...N.Y<CR>

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THE KEY TO REMEMBER HERE IS THAT EACH UNIT UNDER TEST MUST HAVE A CORRESPONDING RESPONSE ON EACH LINE. AS YOU CAN SEE FROM THIS EXAMPLE, NULL REPLIES (COMMAS ENCLOSING A NULL FIELD) TELL THE RUNTIME SERVICES TO REPEAT THE LAST REPLY.

THESE HARDWARE QUESTIONS MUST BE ANSWERED EACH TIME THE PROGRAM IS LOADED AND STARTED; HOWEVER, IF THE TEST CONFIGURATION RARELY OR NEVER DIFFERS FOR EACH STARTUP THE XXDP+ UTILITY "SETUP" MAY BE USED TO PERMANENTLY RETAIN THE ANSWERS TO THE HARDWARE QUESTIONS. THE USER WOULD THEN ANSWER "N" TO THE STARTUP QUESTION, "CHANGE HW?(L)". SETUP MAY BE USED TO REPLACE THE TEST PROGRAM ON THE XXDP+ MEDIUM, OR TO MAKE ADDITIONAL COPIES WITH DIFFERENT FILE NAMES AND HARDWARE CONFIGURATIONS.

TO RUN SETUP, USE THE XXDP+ "RUN" COMMAND. THE FIRST THING THAT SETUP WILL DO IS ASK FOR THE TYPE OF ENVIRONMENT YOU ARE GOING TO BE USING, XXDP+ OR ACT/SLIDE. FOR THIS TEST SOFTWARE, THE ANSWER WILL ALWAYS BE XXDP+. BELOW IS AN EXAMPLE OF STARTING SETUP:

```
.R SETUP
TARGET ENVIRONMENT:    XX(DP) OR AC(T)?  XX
*
```

SETUP IS NOW READY TO ACCEPT COMMANDS. THERE ARE ONLY THREE COMMANDS IN SETUP:

```
SETUP  BUILD TABLES FOR A SPECIFIED DIAGNOSTIC
LIST   PRINT A LIST OF DRS DIAGNOSTICS ON THE XXDP+ MEDIUM.
EXIT   RETURN CONTROL TO XXDP+.
```

2.5 SETUP

THE SETUP COMMAND WILL CAUSE THE SPECIFIED DIAGNOSTIC TO BE LOADED INTO MEMORY. SETUP WILL THEN PROCESS THE TABLE BUILDING CODE IN THE TEST SOFTWARE MUCH THE SAME AS IF THE TEST SOFTWARE WERE LOADED AND STARTED. THE USER WILL GO THROUGH THE SAME PROCESS THAT WOULD OCCUR IF ACTUALLY RUNNING THE TEST SOFTWARE AND ISSUING A START COMMAND. THE FORMAT OF THE COMMAND IS:

```
SETUP  [DEVO:]OFILE={DEVI:}IFILE
```

WHERE,

```
DEVO  DEVICE TO WHICH FILE IS TO BE WRITTEN; DEFAULT IS
      SYSTEM DEVICE; DEVICE MUST BE ON LINE.
```

IDENTIFICATION

433 OFILE NAME OF THE OUTPUT FILE FOR THE TEST SOFTWARE THAT HAS
434 BEEN "SETUP" WITH .BIN OR .BIC EXTENSION.
435
436 DEVI - DEVICE FROM WHICH FILE IS TO BE READ; DEFAULT IS SYSTEM
437 DEVICE; DEVICE MUST BE ON LINE.
438
439 IFILE NAME OF THE FILE FOR THE TEST SOFTWARE THAT IS TO BE
440 "SETUP".
441

442 THE OUTPUT FILE MAY BE GIVEN THE SAME NAME AS THE INPUT FILE; HOWEVER,
443 A WARNING MESSAGE WILL BE OUTPUT. THIS IS TO AVOID ACCIDENTAL LOSS OF
444 THE ORIGINAL FILE. FOR EXAMPLE:

445
446 DELETE IFILE? (Y/N/CR=Y)
447

448 IF "Y" OR NO ANSWER AT ALL IS TYPED, THE INPUT FILE "IFILE" WILL
449 BE DELETED AFTER THE SETUP PROCESS, AND THE NEW FILE WILL THEN BE
450 WRITTEN TO THE MEDIUM. IF "N" IS TYPED, SETUP RETURNS TO PROMPT
451 MODE SO THAT A NEW COMMAND OR FILE NAME MAY BE SPECIFIED.
452

453 LIST
454 - - -
455

456 THE LIST COMMAND IS USED TO OBTAIN A LIST OF ALL DRS-COMPATIBLE
457 TEST SOFTWARE ON THE MEDIUM. THE FORMAT OF THE COMMAND IS:
458

459 LIST [DEV:][FILE.EXT]
460

461 WHERE.
462

463 DEV - DEVICE TO SEARCH FOR DRS COMPATIBLE FILES; DEFAULT IS
464 THE SYSTEM DEVICE.
465

466 FILE.EXT - FILE(S) TO SEARCH; EXTENSION MUST BE BIN OR BIC;
467 WILDCARD SPECIFICATIONS ARE ACCEPTED; DEFAULT IS
468 "*.BI?".
469

IDENTIFICATION

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2.6 QUICK START UP PROCEDURE (XXDP*)

TO START-UP THIS PROGRAM:

1. BOOT XXDP*
2. GIVE THE DATE AND ANSWER THE LSI AND 50HZ (IF THERE IS A CLOCK) QUESTIONS
3. TYPE "R NAME", WHERE NAME IS THE NAME OF THE BIN OR BIC FILE FOR THIS PROGRAM
4. TYPE "START"
5. ANSWER THE "CHANGE HW" QUESTION WITH 'Y'
6. ANSWER ALL THE HARDWARE QUESTIONS

WHEN YOU FOLLOW THIS PROCEDURE YOU WILL BE USING ONLY THE DEFAULTS FOR FLAGS AND SOFTWARE PARAMETERS. THESE DEFAULTS ARE DESCRIBED IN SECTIONS 2.3 AND 2.4.

3.0 ERROR INFORMATION

3.1 TYPES OF ERROR MESSAGES

THERE ARE THREE LEVELS OF ERROR MESSAGES THAT MAY BE ISSUED BY A DIAGNOSTIC: GENERAL, BASIC AND EXTENDED. GENERAL ERROR MESSAGES ARE ALWAYS PRINTED UNLESS THE "IER" FLAG IS SET (SECTION 2.3). THE GENERAL ERROR MESSAGE IS OF THE FORM:

NAME	TYPE	NUMBER	ON	UNIT	NUMBER	TST	NUMBER	PC:XXXXXX
ERROR MESSAGE								

IDENTIFICATION

506
507
508
509
510
511
512
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514
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537
538
539

.WHEREF: NAME = DIAGNOSTIC NAME
TYPE = ERROR TYPE (SYS FATAL, DEV FATAL, HARD OR SOFT)
NUMBER = ERROR NUMBER
UNIT NUMBER = 0 - N (N IS LAST UNIT IN PTABLE)
TST NUMBER = TEST AND SUBTEST WHERE ERROR OCCURRED
PC:XXXXXX = ADDRESS OF ERROR MESSAGE CALL

BASIC ERROR MESSAGES ARE MESSAGES THAT CONTAIN SOME ADDITIONAL INFORMATION ABOUT THE ERROR. THESE ARE ALWAYS PRINTED UNLESS THE 'IER' OR 'IBR' FLAGS ARE SET (SECTION 2.3). THESE MESSAGES ARE PRINTED AFTER THE ASSOCIATED GENERAL MESSAGE.

EXTENDED ERROR MESSAGES CONTAIN SUPPLEMENTARY ERROR INFORMATION SUCH AS REGISTER CONTENTS OR GOOD/BAD DATA. THESE ARE ALWAYS PRINTED UNLESS THE 'IER', 'IBR' OR 'IXR' FLAGS ARE SET (SECTION 2.3). THESE MESSAGES ARE PRINTED AFTER THE ASSOCIATED GENERAL ERROR MESSAGE AND ANY ASSOCIATED BASIC ERROR MESSAGES.

3.2 SPECIFIC ERROR MESSAGES

4.0 PERFORMANCE AND PROGRESS REPORTS

AT THE END OF EACH PASS, THE PASS COUNT IS GIVEN ALONG WITH THE TOTAL NUMBER OF ERRORS REPORTED SINCE THE DIAGNOSTIC WAS STARTED. THE "EOP" SWITCH CAN BE USED TO CONTROL HOW OFTEN THE END OF PASS MESSAGE IS PRINTED. SECTION 2.2 DESCRIBES SWITCHES.

5.0 DEVICE INFORMATION TABLES

6.0 TEST SUMMARIES

IDENTIFICATION

```

541
542
543 002000          .MCALL  SVC
544          000000          SVC
545          000000          SVCINS=0
546          000000          SVCGBL=0
547          000000          SVCTAG=0
548          .TITLE PROGRAM HEADER AND TABLES
549          .SBTTL IDENTIFICATION
550
551
552
553
554
555
556
557          .SBTTL PROGRAM HEADER
558
559 002000          BGNMOD  MDHEDR
560 002000          MDHEDR::
561
562          ;**
563          ; THE PROGRAM HEADER IS THE INTERFACE BETWEEN
564          ; THE DIAGNOSTIC PROGRAM AND THE SUPERVISOR.
565          ;
566 002000          POINTER BGNRPT,BGNAU,BGNDU,BGNSETUP
567
568
569
570
571
572
573
574
575
576
577
578
579
580
581
582
583
584
585 002000          HEADER  CNKTCA,A,0,120,0
586 002000          L$NAME::          ;DIAGNOSTIC NAME
587          002000          103          .ASCII  /C/
588          002001          116          .ASCII  /N/
589          002002          113          .ASCII  /K/
590          002003          124          .ASCII  /T/
591          002004          103          .ASCII  /C/
592          002005          101          .ASCII  /A/
593          002006          000          .BYTE   0
594          002007          000          .BYTE   0
595          002010          L$REV::          ;REVISION LEVEL
596          002010          101          .ASCII  /A/
597          002011          L$DEPO::          ;0
598          002011          060          .ASCII  /0/
599          002012          L$UNIT::          ;NUMBER OF UNITS
600          002012          000016          .WORD   T$PTHV
601          002014          L$TIML::          ;LONGEST TEST TIME
602          002014          000120          .WORD   120
603          002016          L$HPCP::          ;POINTER TO H.W. QUES.
604          002016          024502          .WORD   L$HARD
605          002020          L$SPCP::          ;POINTER TO S.W. QUES.
606          002020          000000          .WORD   0
607          002022          L$HPTP::          ;PTR. TO DEF. H.W. PTABLE
608          002022          002162          .WORD   L$HW
609          002024          L$SPTP::          ;PTR. TO S.W. PTABLE
610          002024          000000          .WORD   0
611          002026          L$LADP::          ;DIAG. END ADDRESS
612          002026          024716          .WORD   L$LAST
613          002030          L$STA::          ;RESERVED FOR APT STATS
614          002030          000000          .WORD   0
615          002032          L$CO::          .WORD   0
616          002032          000000          .WORD   0
617          002034          L$DTYP::          ;DIAGNOSTIC TYPE
618          002034          000000          .WORD   0

```


PROGRAM HEADER

002036
 002036 000000
 002040
 002040 002124
 002042
 002042 000000
 002044
 002044 000000
 002046
 002046 000000
 002050
 002050 003
 002051 003
 002052
 002052 000000
 002054 000000
 002056
 002056 000000
 002060
 002060 014422
 002062
 002062 017402
 002064
 002064 000000
 002066
 002066 000000
 002070
 002070 020076
 002072
 002072 020042
 002074
 002074 000000
 002076
 002076 014432
 002100
 002100 104035
 002102
 002102 000000
 002104
 002104 017412
 002106
 002106 020034
 002110
 002110 017710
 002112
 002112 017404
 002114
 002114 000000
 002116
 002116 000000
 002120
 002120 000000
 586 002122
 587

L\$APT:: .WORD 0 ;APT EXPANSION
 L\$DTP:: .WORD L\$DISPATCH ;PTR. TO DISPATCH TABLE
 L\$PRIO:: .WORD 0 ;DIAGNOSTIC RUN PRIORITY
 L\$ENVI:: .WORD 0 ;FLAGS DESCRIBE HOW IT WAS SETUP
 L\$EXP1:: .WORD 0 ;EXPANSION WORD
 L\$MREV:: .BYTE C\$REVISION ;SVC REV AND EDIT #
 .BYTE C\$EDIT
 L\$EF:: .WORD 0 ;DIAG. EVENT FLAGS
 .WORD 0
 L\$SPC:: .WORD 0
 L\$DEVP:: .WORD L\$DVTYP ; POINTER TO DEVICE TYPE LIST
 L\$REPP:: .WORD L\$RPT ;PTR. TO REPORT CODE
 L\$EXP4:: .WORD 0
 L\$EXP5:: .WORD 0
 L\$AUT:: .WORD L\$AU ;PTR. TO ADD UNIT CODE
 L\$DUT:: .WORD L\$DU ;PTR. TO DROP UNIT CODE
 L\$LUN:: .WORD 0 ;LUN FOR EXERCISERS TO FILL
 L\$DESP:: .WORD L\$DESC ;PTR. TO DIAG. DESCRIPTION
 L\$LOAD:: EMT E\$LOAD ;GENERATE SPECIAL AUTOLOAD EMT
 L\$ETP:: .WORD 0 ;PTR. TO ERR TBL
 L\$ICP:: .WORD L\$INIT ;PTR. TO INIT CODE
 L\$CCP:: .WORD L\$CLEAN ;PTR. TO CLEAN-UP CODE
 L\$ACP:: .WORD L\$AUTO ;PTR. TO AUTO CODE
 L\$PRT:: .WORD L\$PROT ;PTR. TO PROTECT TABLE
 L\$TEST:: .WORD 0 ;TEST NUMBER
 L\$DLY:: .WORD 0 ;DELAY COUNT
 L\$HIME:: .WORD 0 ;PTR. TO HIGH MEM
 .WORD 0
 ENDMOD

DISPATCH TABLE

```
590  
600  
601  
602  
603  
604  
605 002122  
002122  
606 002122  
002122 000016  
002124  
002124 020104  
002126 020244  
002130 020446  
002132 020606  
002134 021122  
002136 021342  
002140 021566  
002142 022024  
002144 022304  
002146 022544  
002150 022776  
002152 023240  
002154 023522  
002156 024304  
607 002160
```

```
.SBTTL DISPATCH TABLE  
:  
: THE DISPATCH TABLE CONTAINS THE STARTING ADDRESS OF EACH TEST.  
: IT IS USED BY THE SUPERVISOR TO DISPATCH TO EACH TEST.  
:  
      BGNMOD  DSPCODE  
DSPCODE.:  
      DISPATCH 14  
      .WORD   14  
L$DISPATCH:.  
      .WORD   T1  
      .WORD   T2  
      .WORD   T3  
      .WORD   T4  
      .WORD   T5  
      .WORD   T6  
      .WORD   T7  
      .WORD   T8  
      .WORD   T9  
      .WORD   T10  
      .WORD   T11  
      .WORD   T12  
      .WORD   T13  
      .WORD   T14  
      ENDMOD
```

DEFAULT HARDWARE P TABLE

```

615          .SBTTL  DEFAULT HARDWARE P TABLE
616
617          ;**
618          ; THE DEFAULT HARDWARE P-TABLE CONTAINS DEFAULT VALUES OF
619          ; THE TEST-DEVICE PARAMETERS.  THE STRUCTURE OF THIS TABLE
620          ; IS IDENTICAL TO THE STRUCTURE OF THE HARDWARE P-TABLES.
621          ; AND IS USED AS A "TEMPLATE" FOR BUILDING THE P TABLES.
622          ; -
623
624          BGNHW  DFPTBL
625          .WORD  L10000 L$HW/2
626          L$HW::
627          DFPTBL::
628
629          ;*
630          ; DUMMY HARDWARE P TABLE.  THIS JUST LETS THE DRS KNOW WHAT FORMAT
631          ; WE WANT.
632          ;
633
634          .WORD  0          ; SBC ID SWITCH (2 TO 15.)
635          .WORD  1          ; BUS ADDRESS RANGE (LOW IS DEFAULT)
636
637          ; FLAG FOR LOOP BACK CONNECTORS.
638          ; 0 = NOT INSTALLED; 1 = INSTALLED
639
640          .WORD  0          ; CONNECTOR FOR SLU1
641          .WORD  0          ; CONNECTOR FOR SLU2, CHANNEL A
642          .WORD  0          ; CONNECTOR FOR SLU2, CHANNEL B
643          .WORD  0          ; CONNECTOR FOR PARALLEL I/O
644          .WORD  0          ; SLU2 DMA CONFIGURATION
645          .WORD  0          ; FLAG FOR USER ROM TESTS (0 = DON'T TEST)
646
647          002160  000010
648          002162  000000
649          002164  000001
650          002166  000000
651          002170  000000
652          002172  000000
653          002174  000000
654          002176  000000
655          002178  000000
656          002200  000000
657          002202
658          002202
659
660          ENDHW
661          L10000:

```

SOFTWARE P-TABLE

655
656
657
658
659
660
661
662
663
664 002202
002202 000000
002204
002204
665
673
674 002204
002204

```
.SBTTL SOFTWARE P TABLE

; **
; THE SOFTWARE TABLE CONTAINS VARIOUS DATA USED BY THE
; PROGRAM AS OPERATIONAL PARAMETERS. THESE PARAMETERS ARE
; SET UP AT ASSEMBLY TIME AND MAY BE VARIED BY THE OPERATOR
; AT RUN TIME.
; --

          BGNSW   SFPTBL
          .WORD   L10001 L$SW/2

L$SW::
SFPTBL::

          ENDSW

L10001:
```

SOFTWARE P-TABLE

676
677
683
684
685
686
687
688
689
690 002204
002204
691 002204

```

.TITLE GLOBAL AREAS
.SBTTL IDENTIFICATION

.SBTTL GLOBAL EQUATES SECTION

; **
; THE GLOBAL EQUATES SECTION CONTAINS PROGRAM EQUATES THAT
; ARE USED IN MORE THAN ONE TEST.
; **
      BGNMOD  GLBEQAT
GLBEQAT::
      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
;
;
; BIT POSITION IN SECOND STATUS WORD
000040 EF.START== 32. ; (100000) START COMMAND WAS ISSUED
000037 EF.RESTART== 31. ; (040000) RESTART COMMAND WAS ISSUED
000036 EF.CONTINUE== 30. ; (020000) CONTINUE COMMAND WAS ISSUED
000035 EF.NEW== 29. ; (010000) A NEW PASS HAS BEEN STARTED
000034 EF.PWR== 28. ; (004000) A POWER-FAIL/POWER UP OCCURRED

;
; PRIORITY LEVEL DEFINITIONS
;
000340 PRI07== 340
    
```

T.

GLOBAL EQUATES SECTION

```
000300      PRI06== 300
000240      PRI05== 240
000200      PRI04== 200
000140      PRI03== 140
000100      PRI02== 100
000040      PRI01== 40
000000      PRI00== 0
;
;OPERATOR FLAG BITS
;
000004      EVL=      4
000010      LOT=-    10
000020      ADR=-    20
000040      IDU==    40
000100      ISR=-   100
000200      UAM=-   200
000400      BOE==   400
001000      PNT==  1000
002000      PRI==  2000
004000      IXE=-  4000
010000      IBE== 10000
020000      IER=- 20000
040000      LOE== 40000
100000      HOE=- 100000
;
ENDMOD
```

692
707 002204

GLOBAL DATA SECTION

```

709      .SBTTL  GLOBAL DATA SECTION
710
711      ;**
712      ; THE GLOBAL DATA SECTION CONTAINS DATA THAT ARE USED
713      ; IN MORE THAN ONE TEST.
714      ;
715      BGNMOD  GLBDAT
002204  GLBDAT:
002204
716
717      ; **
718      ;
719      ; TWO PORT RAM Q BUS ADDRESS OFFSETS.
720      ;
721      ; --
722
723      000000  DPR0==0
724      00C002  DPR1==2
725      000004  DPR2==4
726      000006  DPR3==6
727      000010  DPR4==10
728      000012  DPR5==12
729      000014  DPR6==14
730      000016  DPR7==16
731      000020  DPR10==20
732      000022  DPR11==22
733      000024  DPR12==24
734      000026  DPR13==26
735      000030  DPR14==30
736      000032  DPR15==32
737      000034  DPR16==34
738      000036  DPR17==36
739
740      002204  000000  SAVEC:  .WORD  0      ; TEMP SAVE FOR VECTOR CONTENTS
741      002206  000000  DROPUN: .WORD  0      ; IOP UNIT DROPPED FLAG (NON-0 = DROPPED)
742      002210  000000  LUN:   .WORD  0      ; LOGICAL UNIT NUMBER
743      002212  000000  IOPN:  .WORD  0      ; SBC ID SWITCH FROM P-TABLE
744      002214  000000  IOPNN: .WORD  0      ; SBC ID SWITCH RIGHT JUSTIFIED
745      002216  000000  QBASE: .WORD  0      ; Q-BUS BASE ADDRESS FROM P-TABLE
746      002220  000000  QIRVEC: .WORD  0      ; VECTOR FOR QIR TEST
747      002222  000000  LOOPB1: .WORD  0      ; LOOPBACK CONN. FLAG FOR SLU1
748      002224  000000  LOOPB2: .WORD  0      ; LOOPBACK CONN. FLAG FOR SLU2 CHANNEL A
749      002226  000000  LOOPB3: .WORD  0      ; LOOPBACK CONN. FLAG FOR CHANNEL B
750      002230  000000  LOOPB4: .WORD  0      ; LOOPBACK CONN. FLAG FOR PL'L I/O
751      002232  000000  SL2DMA: .WORD  0      ; "1" SAYS SLU2 SETUP FOR DMA
752      002234  000000  ROMTST: .WORD  0      ; FLAG FOR USER ROM TESTS (NON-0 = TEST ROM)
753      002236  000000  DELCNT: .WORD  0      ; USED IN RDELAY SUBROUTINE.
754      002240  000000  INTFLG: .WORD  0      ; SOFTWARE FLAG FOR QIR TEST
755      002242  000000  HIMEM: .WORD  0      ; BASE OF HIGHEST 4KW PAGE FROM L$HIME
756
757      ;
758      ; THE FOLLOWING ARE THE DATA TO INVOKE INDIVIDUAL ROM TESTS.
759      ; EACH XXDP+ TEST MUST WRITE ONE OF THESE WORDS INTO THE IOP'S TWO
760      ; PORT REGISTER FILE (TWO-PORT RAM, REGISTER 0). THE IOP BOOT
761      ; CODE WILL INTERPRET THE CONTENTS OF DPR0 AND INVOKE THE APPROPRIATE
762      ; IOP ROM TEST.
763      ;
764      002244  100001  CSR:   .WORD  100001      ; CSR TEST
    
```

K.

GLOBAL DATA SECTION

765 002246 100002
 766 002250 100004
 767 002252 100010
 768 002254 100020
 769 002256 100040
 770 002260 100100
 771 002262 100200
 772 002264 100400
 773 002266 101000
 774 002270 102000

RAM: .WORD 100002
 ROM: .WORD 100004
 CPU: .WORD 100010
 BVNT: .WORD 100020
 SLU1: .WORD 100040
 SLU2: .WORD 100100
 PLLIO: .WORD 100200
 DMA: .WORD 100400
 QIR: .WORD 101000
 DPR: .WORD 102000

; 16KW RAM TEST
 ; ROM TEST
 ; IOP INSTRUCTION TEST
 ; BEVNT INTERRUPT TEST
 ; SERIAL PORT #1 TEST (CONSOLE)
 ; SERIAL PORT #2 TEST (MODEM)
 ; PARALLEL I/O TEST
 ; DMA CONTROLLER TEST
 ; Q BUS INTERRUPT TEST
 ; TWO PORT RAM TEST

GLOBAL DATA SECTION

```

819 ;
820 ; ADD THE NEXT FOUR ADDRESSES WHEN AND IF ADDITIONAL TESTS ARE INSERTED INTO
821 ; THE ROM-RESIDENT CODE.
822 ;
823 ;T14ADR:      RT14      ; POINTER TO TEST 14 STRINGS
824 ;T15ADR:      RT15      ; POINTER TO TEST 15 STRINGS
825 ;T16ADR:      RT16      ; POINTER TO TEST 16 STRINGS
826 ;T17ADR:      RT17      ; POINTER TO TEST 17 STRINGS
827 ;
828 ;
829 ;**
830 ; HERE IS THE SECOND TABLE WHICH WAS MENTIONED ABOVE.
831 ;--
832
833 002320 004721 RT1:  ROMT1      ; POINTER TO T1 STRING
834 002322 005524      T1E0      ; ERROR BIT: 0
835 002324 005570      T1E1      ;           1
836 002326 005634      T1E2      ;           2
837 002330 005700      T1E3      ;           3
838 002332 005746      T1E4      ;           4
839 002334 006016      T1E5      ;           5
840 002336 006064      T1E6      ;           6
841 002340 006132      T1E7      ;           7
842 002342 000000      .WORD 0      ; ADD UP TO 4 MORE ERROR BIT MESSAGE POINTERS.
843 002344 000000      .WORD 0
844 002346 000000      .WORD 0
845 002350 000000      .WORD 0
846
847 002352 004744 RT2:  ROMT2      ; POINTER TO T2 ASCII STRING
848 002354 006200      T2E0      ; ERROR BIT: 0
849 002356 006253      T2E1      ;           1
850 002360 006323      T2E2      ;           2
851 002362 006374      T2E3      ;           3
852 002364 006457      T2E4      ;           4
853 002366 006542      T2E5      ;           5
854 002370 006613      T2E6      ;           6
855 002372 006661      T2E7      ;           7
856 002374 006725      T2E8      ;           8
857 002376 007003      T2E9      ;           9
858 002400 000000      .WORD 0      ; ADD UP TO 2 MORE ERROR BIT MESSAGE POINTERS.
859 002402 000000      .WORD 0

```

N.

GLOBAL DATA SECTION

```

861
862 002404 004767
863 002406 007061
864 002410 007137
865 002412 007215
866 002414 007313
867 002416 000000
868 002420 000000
869 002422 000000
870 002424 000000
871 002426 000000
872 002430 000000
873 002432 000000
874 002434 000000
875
876 002436 005023
877 002440 000000
878 002442 000000
879 002444 000000
880 002446 000000
881 002450 000000
882 002452 000000
883 002454 000000
884 002456 000000
885 002460 000000
886 002462 000000
887 002464 000000
888 002466 000000

```

```

RT3:  ROMT3
      T3E0
      T3E1
      T3E2
      T3E3
      .WORD 0
      .WORD 0
      .WORD 0
      .WORD 0
      .WORD 0
      .WORD 0
      .WORD 0
      .WORD 0

```

```

; POINTER TO T3 ASCII STRING
; ERROR BIT:      0
;                1
;                2
;                3
; ADD UP TO 8 MORE ERROR BIT MESSAGE POINTERS.

```

```

RT4:  ROMT4
      .WORD 0
      .WORD 0
      .WORD 0
      .WORD 0
      .WORD 0
      .WORD 0
      .WORD 0
      .WORD 0
      .WORD 0
      .WORD 0
      .WORD 0

```

```

; POINTER TO T4 ASCII STRING
; ****T4 NOT INSTALLED AS YET***

```

GLOBAL DATA SECTION

890				
891	002470	005062	RT5:	ROMT5
892	002472	007411		T5E0
893	002474	007471		T5E1
894	002476	007544		T5E2
895	002500	007607		T5E3
896	002502	000000		.WORD 0
897	002504	000000		.WORD 0
898	002506	000000		.WORD 0
899	002510	000000		.WORD 0
900	002512	000000		.WORD 0
901	002514	000000		.WORD 0
902	002516	000000		.WORD 0
903	002520	000000		.WORD 0
904				
905	002522	005117	RT6:	ROMT6
906	002524	007647		T6E0
907	002526	007745		T6E1
908	002530	010025		T6E2
909	002532	010074		T6E3
910	002534	010154		T6E4
911	002536	010223		T6E5
912	002540	010266		T6E6
913	002542	000000		.WORD 0
914	002544	000000		.WORD 0
915	002546	000000		.WORD 0
916	002550	000000		.WORD 0
917	002552	000000		.WORD 0

				: POINTER TO T5 ASCII STRING
				: ERROR BIT: 0
				: 1
				: 2
				: 3
				: ADD UP TO 8 MORE ERROR BIT MESSAGE POINTERS

				: POINTER TO T6 ASCII STRING
				: ERROR BIT: 0
				: 1
				: 2
				: 3
				: 4
				: 5
				: 6
				: ADD UP TO 5 MORE ERROR BIT MESSAGE POINTERS.

GLOBAL DATA SECTION

919

920 002554 000000G
 921 002556 010337
 922 002560 010417
 923 002562 010504
 924 002564 010560
 925 002566 010634
 926 002570 010707
 927 002572 010775
 928 002574 011054
 929 002576 011132
 930 002600 011227
 931 002602 011320
 932 002604 011412
 933
 934 002606 005267
 935 002610 011477
 936 002612 011560
 937 002614 011621
 938 002616 011657
 939 002620 011714
 940 002622 011767
 941 002624 012037
 942 002626 012116
 943 002630 000000
 944 002632 000000
 945 002634 000000
 946 002636 000000

RT7: ROMT7
 T7E0
 T7E1
 T7E2
 T7E3
 T7E4
 T7E5
 T7E6
 T7E7
 T7E8
 T7E9
 T7E10
 T7E11

 RT10: ROMT10
 T10E0
 T10E1
 T10E2
 T10E3
 T10E4
 T10E5
 T10E6
 T10E7
 .WORD 0
 .WORD 0
 .WORD 0
 .WORD 0

```

; POINTER TO T7 ASCII STRING;
; ERROR BIT:      0
;                  1
;                  2
;                  3
;                  4
;                  5
;                  6
;                  7
;                  8
;                  9
;                  10
;                  11
;
; POINTER TO T10 ASCII STRING
; ERROR BIT:      0
;                  1
;                  2
;                  3
;                  4
;                  5
;                  6
;                  7
; ADD UP TO 4 MORE FRPQR BIT MESSAGE POINTERS.
    
```

D:

SEP 0029

GLOBAL DATA SECTION

```

948
949 002640 005317      RT11:  ROMT11
950 002642 012161      T11E0
951 002644 012260      T11E1
952 002646 012365      T11E2
953 002650 012437      T11E3
954 002652 012524      T11F4
955 002654 012573      T11E5
956 002656 000000      .WORD  0
957 002660 000000      .WORD  0
958 002662 000000      .WORD  0
959 002664 000000      .WORD  0
960 002666 000000      .WORD  0
961 002670 000000      .WORD  0
962
963 002672 005462      RT12:  ROMT12
964 002674 012625      T12E0
965 002676 012721      T12E1
966 002700 012771      T12E2
967 002702 013052      T12E3
968 002704 013132      T12E4
969 002706 013205      T12E5
970 002710 013262      T12E6
971 002712 000000      .WORD  0
972 002714 000000      .WORD  0
973 002716 000000      .WORD  0
974 002720 000000      .WORD  0
975 002722 000000      .WORD  0
    
```

```

; POINTER TO T11 ASCII STRING
; ERROR BIT:      0
;                 1
;                 2
;                 3
;                 4
;                 5
; ADD UP TO 6 MORE ERROR BIT MESSAGE POINTERS
    
```

```

; POINTER TO T12 ASCII STRING
; ERROR BIT:      0
;                 1
;                 2
;                 3
;                 4
;                 5
;                 6
; ADD UP TO 5 MORE ERROR BIT MESSAGE POINTERS.
    
```

GLOBAL DATA SECTION

```

977
978 002724 005507          RT13:  ROMT13          ; POINTER TO T13 ASCII STRING
979 002726 013336          T13E0          ; ERROR BIT: 0
980 002730 013404          T13E1          ;           1
981 002732 013460          T13E2          ;           2
982 002734 013545          T13E3          ;           3
983 002736 013653          T13E4          ;           4
984 002740 013727          T13E5          ;           5
985 002742 014005          T13E6          ;           6
986 002744 014105          T13E7          ;           7
987 002746 014161          T13E8          ;           8
988 002750 014227          T13E9          ;           9
989 002752 014277          T13E10         ;          10
990 002754 014350          T13E11         ;          11
991
992
993
994 ; IF (UP TO) 4 MORE TESTS ARE ADDED TO THE ROM-RESIDENT CODE, PLACE THE
995 ; MESSAGE POINTERS HERE. USE IDENTICAL FORMAT AS FOR 1 THRU 13, ABOVE.
996 ; DON'T FORGET TO MODIFY THE TABLE IMMEDIATELY PRECEDING THIS ONE, ALSO.
997 ;
998
999 002756          ENDMOD
1000

```

GLOBAL TEXT SECTION

```

1002          .SBTTL GLOBAL TEXT SECTION
1003
1004          ;**
1005          ; THE GLOBAL TEXT SECTION CONTAINS FORMAT STATEMENTS,
1006          ; MESSAGES, AND ASCII INFORMATION THAT ARE USED IN
1007          ; MORE THAN ONE TEST.
1008          ;--
1009
1010          ; **
1011          ;
1012          ;          GLOBAL MESSAGES - ERROR AND OTHERWISE
1013          ;
1014          ; -
1015
1016 002756      114      123      111  NOIOP:  .ASCIZ  /LSI-11 BUS TIMEOUT  NO IOP PRESENT, OR KXT11 INTERFACE ERROR/
      002761      055      061      061
      002764      040      102      125
      002767      123      040      124
      002772      111      115      105
      002775      117      125      124
      003000      040      055      040
      003003      116      117      040
      003006      111      117      120
      003011      040      120      122
      003014      105      123      105
      003017      116      124      054
      003022      040      117      122
      003025      040      113      130
      003030      124      061      061
      003033      040      111      116
      003036      124      105      122
      003041      106      101      103
      003044      105      040      105
      003047      122      122      117
      003052      122      000
1017 003054      116      117      040  NORES:  .ASCIZ  /NO RESPONSE FROM ROM SELFTEST/
      003057      122      105      123
      003062      120      117      116
      003065      123      105      040
      003070      106      122      117
      003073      115      040      122
      003076      117      115      040
      003101      123      105      114
      003104      106      124      105
      003107      123      124      000

```


(6)

SEQ 0032

GLOBAL TEXT SECTION

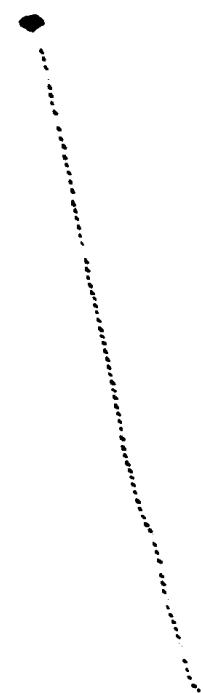
1019	003112	105	122	122	ROMD: .ASCII /ERROR DETECTED BY IOP SELFTEST/
	003115	117	122	040	
	003120	104	105	124	
	003123	105	103	124	
	003126	105	104	040	
	003131	102	131	040	
	003134	111	117	120	
	003137	040	123	105	
	003142	114	106	124	
	003145	105	123	124	
	003150	000			
1020	003151	102	117	117	RADSW: .ASCII 'BOOT/SELFTEST SWITCH NOT SETUP PROPERLY'
	003154	124	057	123	
	003157	105	114	106	
	003162	124	105	123	
	003165	124	040	123	
	003170	127	111	124	
	003173	103	110	040	
	003176	116	117	124	
	003201	040	123	105	
	003204	124	125	120	
	003207	040	120	122	
	003212	117	120	105	
	003215	122	114	131	
	003220	000			

GLOBAL TEXT SECTION

1022	003221	124	105	123	CMND: .ASCIZ /TEST COMMAND STATUS ERROR FROM IOP/
	003224	124	040	103	
	003227	117	115	115	
	003232	101	116	104	
	003235	040	123	124	
	003240	101	124	125	
	003243	123	040	105	
	003246	122	122	117	
	003251	122	040	106	
	003254	122	117	115	
	003257	040	111	117	
	003262	120	000		
1023	003264	124	120	122	NOTRDY: .ASCIZ /TPRO NOT - 000000; IOP IS NOT READY TO ACCEPT COMMANDS/
	003267	060	040	116	
	003272	117	124	040	
	003275	075	040	060	
	003300	060	060	060	
	003303	060	060	073	
	003306	040	111	117	
	003311	120	040	111	
	003314	123	040	116	
	003317	117	124	040	
	003322	122	105	101	
	003325	104	131	040	
	003330	124	117	040	
	003333	101	103	103	
	003336	105	120	124	
	003341	040	103	117	
	003344	115	115	101	
	003347	116	104	123	
	003352	000			

GLOBAL TEXT SECTION

1025	003353	120	117	123	NOTPR: .ASCIZ /POSSIBLE FATAL IOP ERROR DETECTED/
	003356	123	111	102	
	003361	114	105	040	
	003364	106	101	124	
	003367	101	114	040	
	003372	111	117	120	
	003375	040	105	122	
	003400	122	117	122	
	003403	040	104	105	
	003406	124	105	103	
	003411	124	105	104	
	003414	000			
1026	003415	123	102	103	CCPU: .ASCIZ /SBC ID SWITCH SETTING/
	003420	040	111	104	
	003423	040	123	127	
	003426	111	124	103	
	003431	110	040	123	
	003434	105	124	124	
	003437	111	116	107	
	003442	000			



GLOBAL TEXT SECTION

1028	003443	111	123	040	BASE: .ASCIZ "IS IOP'S LSI-11 BUS ADDRESS IN THE LOW ADDRESS RANGE(Y/N)"
	003446	111	117	120	
	003451	047	123	040	
	003454	114	123	111	
	003457	055	061	061	
	003462	040	102	125	
	003465	123	040	101	
	003470	104	104	122	
	003473	105	123	123	
	003476	040	111	116	
	003501	040	124	110	
	003504	105	040	114	
	003507	117	127	040	
	003512	101	104	104	
	003515	122	105	123	
	003520	123	040	122	
	003523	101	116	107	
	003526	105	050	131	
	003531	057	116	051	
	003534	000			
1029	003535	114	117	117	LOOP1: .ASCIZ /LOOP BACK CONNECTOR ON SERIAL PORT #1 (CONSOLE PORT)/
	003540	120	055	102	
	003543	101	103	113	
	003546	040	103	117	
	003551	116	116	105	
	003554	103	124	117	
	003557	122	040	117	
	003562	116	040	123	
	003565	105	122	111	
	003570	101	114	040	
	003573	120	117	122	
	003576	124	040	043	
	003601	061	040	050	
	003604	103	117	116	
	003607	123	117	114	
	003612	105	040	120	
	003615	117	122	124	
	003620	051	000		

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GLOBAL TEXT SECTION

1031	003622	103	110	101	LOOP2: .ASCIZ /CHANNEL A LOOP BACK CONNECTOR ON SERIAL PORT #2/
	003625	116	116	105	
	003630	114	040	101	
	003633	040	114	117	
	003636	117	120	055	
	003641	102	101	103	
	003644	113	040	103	
	003647	117	116	116	
	003652	105	103	124	
	003655	117	122	040	
	003660	117	116	040	
	003663	123	105	122	
	003666	111	101	114	
	003671	040	120	117	
	003674	122	124	040	
	003677	043	062	000	
1032	003702	103	110	101	LOOP3: .ASCIZ /CHANNEL B LOOP BACK CONNECTOR ON SERIAL PORT #2/
	003705	116	116	105	
	003710	114	040	102	
	003713	040	114	117	
	003716	117	120	055	
	003721	102	101	103	
	003724	113	040	103	
	003727	117	116	116	
	003732	105	103	124	
	003735	117	122	040	
	003740	117	116	040	
	003743	123	105	122	
	003746	111	101	114	
	003751	040	120	117	
	003754	122	124	040	
	003757	043	062	000	

GLOBAL TEXT SECTION

1034	003762	114	117	117	LOOP4: .ASCIZ /LOOP BACK CONNECTOR ON PARALLEL PORT/
	003765	120	055	102	
	003770	101	103	113	
	003773	040	103	117	
	003776	116	116	105	
	004001	103	124	117	
	004004	122	040	117	
	004007	116	040	120	
	004012	101	122	101	
	004015	114	114	105	
	004020	114	040	120	
	004023	117	122	124	
	004026	000			
1035	004027	111	123	040	SLU2CF: .ASCIZ "IS SLU2 CHANNEL A SERIAL PORT CONFIGURED FOR DMA OPERATION(Y/N)"
	004032	123	114	125	
	004035	062	040	103	
	004040	110	101	116	
	004043	116	105	114	
	004046	040	101	040	
	004051	123	105	122	
	004054	111	101	114	
	004057	040	120	117	
	004062	122	124	040	
	004065	103	117	116	
	004070	106	111	107	
	004073	125	122	105	
	004076	104	040	106	
	004101	117	122	040	
	004104	104	115	101	
	004107	040	117	120	
	004112	105	122	101	
	004115	124	111	117	
	004120	116	050	131	
	004123	057	116	051	
	004126	000			

GLOBAL TEXT SECTION

1037	004127	124	105	123	UROM:	.ASCIZ	/TEST USER ROM/
	004132	124	040	125			
	004135	123	105	122			
	004140	040	122	117			
	004143	115	000				
1036							
1039	004145	103	123	122	CSRT:	.ASCIZ	/CSR/
	004150	000					

GLOBAL TEXT SECTION

1041	004151	061	066	113	RAMT:	.ASCIZ	/16KW LOCAL RAM/
	004154	127	040	114			
	004157	117	103	101			
	004162	114	040	122			
	004165	101	115	000			
1042	004170	122	117	115	ROMT:	.ASCIZ	/ROM/
	004173	000					

GLOBAL TEXT SECTION

1044	004174	102	105	126	BEVNT: .ASCII /BEVNT/
	004177	116	124	000	
1045	004202	103	117	116	SLUIT: .ASCII /CONSOLE SERIAL PORT (SLU1)/
	004205	123	117	114	
	004210	105	040	123	
	004213	105	122	111	
	004216	101	114	040	
	004221	120	117	122	
	004224	124	040	050	
	004227	123	114	125	
	004232	061	051	000	
1046	004235	123	105	122	SLU2A: .ASCII /SERIAL PORT (SLU2), CHANNEL A/
	004240	111	101	114	
	004243	040	120	117	
	004246	122	124	040	
	004251	050	123	114	
	004254	125	062	051	
	004257	054	040	103	
	004262	110	101	116	
	004265	116	105	114	
	004270	040	101	000	

GLOBAL TEXT SECTION

1048	004273	123	105	122	SERIAL PORT (SERIAL), CHANNEL B
	004276	111	101	114	
	004301	040	120	117	
	004304	122	124	040	
	004307	050	123	114	
	004312	125	062	051	
	004315	054	040	103	
	004320	110	101	116	
	004323	116	105	114	
	004326	040	102	000	
1049	004331	120	101	122	PARALLEL I/O PORT
	004334	101	114	114	
	004337	105	114	040	
	004342	111	057	117	
	004345	040	120	117	
	004350	122	124	000	

GLOBAL TEXT SECTION

1051	004353	104	115	101	DMAL: .ASCII7 /DMA CONTROLLER (LOCAL IOP ONLY)/
	004356	040	103	117	
	004361	116	124	122	
	004364	117	114	114	
	004367	105	122	040	
	004372	050	114	117	
	004375	103	101	114	
	004400	040	111	117	
	004403	120	040	117	
	004406	116	114	131	
	004411	051	000		
1052	004413	104	115	101	DMAT: .ASCII7 /DMA CONTROLLER (LSI 11 BUS DMA)
	004416	040	103	117	
	004421	116	124	122	
	004424	117	114	114	
	004427	105	122	040	
	004432	050	114	123	
	004435	111	055	061	
	004440	061	040	102	
	004443	125	123	040	
	004446	104	115	101	
	004451	051	000		

GLOBAL TEXT SECTION

1054	004453	114	123	111	GIRT: .ASCIZ /LSI 11 BUS INTERRUPT/
	004456	055	061	061	
	004461	040	102	125	
	004464	123	040	111	
	004467	116	124	105	
	004472	122	122	125	
	004475	120	124	000	
1055	004500	116	117	040	GIRT1: .ASCIZ /NO IOP INTERRUPT FROM FIRST OF 2 ATTEMPTS/
	004503	111	117	120	
	004506	040	111	116	
	004511	124	105	122	
	004514	122	125	120	
	004517	124	040	106	
	004522	122	117	115	
	004525	040	106	111	
	004530	122	123	124	
	004533	040	117	106	
	004536	040	062	040	
	004541	101	124	124	
	004544	105	115	120	
	004547	124	123	000	

GLOBAL TEXT SECTION

1057	004552	116	117	040	QIRT2: .ASCIZ /NO IOP INTERRUPT FROM SECOND OF 2 ATTEMPTS./
	004555	111	117	120	
	004560	040	111	116	
	004563	124	105	122	
	004566	122	125	120	
	004571	124	040	106	
	004574	122	117	115	
	004577	040	123	105	
	004602	103	117	116	
	004605	104	040	117	
	004610	106	040	062	
	004613	040	101	124	
	004616	124	105	115	
	004621	120	124	123	
	004624	056	000		
1058	004626	124	127	117	DPRT: .ASCIZ /TWO-PORT RAM/
	004631	055	120	117	
	004634	122	124	040	
	004637	122	101	115	
	004642	000			

GLOBAL TEXT SECTION

1060	004643	103	120	125	CPUT:	.ASCIZ	/CPU INSTRUCTION/
	004646	040	111	116			
	004651	123	124	122			
	004654	125	103	124			
	004657	111	117	116			
	004662	000					
:061	004663	126	105	122	TST1:	.ASCIZ	/VERIFY THE IOP IS ADDRESSABLE/
	004666	111	106	131			
	004671	040	124	110			
	004674	105	040	111			
	004677	117	120	040			
	004702	111	123	040			
	004705	101	104	104			
	004710	122	105	123			
	004713	123	101	102			
	004716	114	105	000			

GLOBAL TEXT SECTION

1063	004721	111	057	117	ROMT1: .ASCIZ "I/O REGISTER CHECK"
	004724	040	122	105	
	004727	107	111	123	
	004732	124	105	122	
	004735	040	103	110	
	004740	105	103	113	
	004743	000			
1064	004744	116	101	124	ROMT2: .ASCIZ /NATIVE OR USER RAM/
	004747	111	126	105	
	004752	040	117	122	
	004755	040	125	123	
	004760	105	122	040	
	004763	122	101	115	
	004766	000			

GLOBAL TEXT SECTION

1066	004767	116	101	124	ROMT3: .ASCIZ /NATIVE OR USER ROM CHECKSUM/
	004772	111	126	105	
	004775	040	117	122	
	005000	040	125	123	
	005003	105	122	040	
	005006	122	117	115	
	005011	040	103	110	
	005014	105	103	113	
	005017	123	125	115	
	005022	000			
1067	005023	124	061	061	ROMT4: .ASCIZ /T11 CPU INSTRUCTIONS AND TRAPS/
	005026	040	103	120	
	005031	125	040	111	
	005034	116	123	124	
	005037	122	125	103	
	005042	124	111	117	
	005045	116	123	040	
	005050	101	116	104	
	005053	040	124	122	
	005056	101	120	123	
	005061	000			

GLOBAL TEXT SECTION

1069	005062	114	111	116	ROMT5: .ASCIIZ /LINE CLOCK (BEVNT) INTERRUPT/
	005065	105	040	103	
	005070	114	117	103	
	005073	113	040	050	
	005076	102	105	126	
	005101	116	124	051	
	005104	040	111	116	
	005107	124	105	122	
	005112	122	125	120	
	005115	124	000		
1070	005117	103	117	116	ROMT6: .ASCIIZ /CONSOLE SERIAL PORT DC319/
	005122	123	117	114	
	005125	105	040	123	
	005130	105	122	111	
	005133	101	114	040	
	005136	120	117	122	
	005141	124	040	104	
	005144	103	063	061	
	005147	071	000		

GLOBAL TEXT SECTION

1072	005151	123	105	103	ROMT7A: .ASCIZ /SECOND SERIAL PORT NEC7201 (CHANNEL A)/	
	005154	117	116	104		
	005157	040	123	105		
	005162	122	111	101		
	005165	114	040	120		
	005170	117	122	124		
	005173	040	116	105		
	005176	103	067	062		
	005201	060	061	040		
	005204	050	103	110		
	005207	101	116	116		
	005212	105	114	040		
	005215	101	051	000		
1073	005220	123	105	103		ROMT7B: .ASCIZ /SECOND SERIAL PORT NEC7201 (CHANNEL B)/
	005223	117	116	104		
	005226	040	123	105		
	005231	122	111	101		
	005234	114	040	120		
	005237	117	122	124		
	005242	040	116	105		
	005245	103	067	062		
	005250	060	061	040		
	005253	050	103	110		
	005256	101	116	116		
	005261	105	114	040		
	005264	102	051	000		

GLOBAL TEXT SECTION

1075	005267	120	101	122	ROMT10: .ASCIIZ "PARALLEL I/O PORT Z8036"
	005272	101	114	114	
	005275	105	114	040	
	005300	111	057	117	
	005303	040	120	117	
	005306	122	124	040	
	005311	132	070	060	
	005314	063	066	000	
1076	005317	104	115	101	ROMT11: .ASCIIZ /DMA CONTROLLER AMZ8016/
	005322	040	103	117	
	005325	116	124	122	
	005330	117	114	114	
	005333	105	122	040	
	005336	101	115	132	
	005341	070	060	061	
	005344	066	000		

GLOBAL TEXT SECTION

1078	005346	104	115	101	ROM11A: .ASCIZ /DMA CONTROLLER AMZ8016 (LOCAL IOP ONLY)/
	005351	040	103	117	
	005354	116	124	122	
	005357	117	114	114	
	005362	105	122	040	
	005365	101	115	132	
	005370	070	060	061	
	005373	066	040	050	
	005376	114	117	103	
	005401	101	114	040	
	005404	111	117	120	
	005407	040	117	116	
	005412	114	131	051	
	005415	000			
1079	005416	104	115	101	ROM11B: .ASCIZ /DMA CONTROLLER AMZ8016 (LSI 11 BUS)/
	005421	040	103	117	
	005424	116	124	122	
	005427	117	114	114	
	005432	105	122	040	
	005435	101	115	132	
	005440	070	060	061	
	005443	066	040	050	
	005446	114	123	111	
	005451	055	061	061	
	005454	040	102	125	
	005457	123	051	000	

GLOBAL TEXT SECTION

1081	005462	114	123	111	ROMT12: .ASCIZ /LSI 11 BUS INTERRUPT/
	005465	055	061	061	
	005470	040	102	125	
	005473	123	040	111	
	005476	116	124	105	
	005501	122	122	125	
	005504	120	124	000	
1082	005507	124	127	117	ROMT13: .ASCIZ /TWO PORT RAM/
	005512	055	120	117	
	005515	122	124	040	
	005520	122	101	115	
	005523	000			

GLOBAL TEXT SECTION

1084	005524	105	122	122	TIE0: .ASCII7 /ERROR #0 . BUS ERROR AT CSR ADDRESS/
	005527	117	122	040	
	005532	043	060	040	
	005535	055	040	102	
	005540	125	123	040	
	005543	105	122	122	
	005546	117	122	040	
	005551	101	124	040	
	005554	103	123	122	
	005557	040	101	104	
	005562	104	122	105	
	005565	123	123	000	
1085	005570	105	122	122	TIE1: .ASCII2 /ERROR #1 . BUS ERROR AT QIR ADDRESS/
	005573	117	122	040	
	005576	043	061	040	
	005601	055	040	102	
	005604	125	123	040	
	005607	105	122	122	
	005612	117	122	040	
	005615	101	124	040	
	005620	121	111	122	
	005623	040	101	104	
	005626	104	122	105	
	005631	123	123	000	

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GLOBAL TEXT SECTION

1087	005634	105	122	122	TIE2:	.ASCIZ	/ERROR #2	BUS ERROR AT TPR ADDRESS/
	005637	117	122	040				
	005642	043	062	040				
	005645	055	040	102				
	005650	125	123	040				
	005653	105	122	122				
	005656	117	122	040				
	005661	101	124	040				
	005664	124	120	122				
	005667	040	101	104				
	005672	104	122	105				
	005675	123	123	000				
1088	005700	105	122	122	TIE3:	.ASCIZ	/ERROR #3	BUS ERROR AT DC319 ADDRESS/
	005703	117	122	040				
	005706	043	063	040				
	005711	055	040	102				
	005714	125	123	040				
	005717	105	122	122				
	005722	117	122	040				
	005725	101	124	040				
	005730	104	103	063				
	005733	061	071	040				
	005736	101	104	104				
	005741	122	105	123				
	005744	123	000					

GLOBAL TEXT SECTION

1090	005746	105	122	122	T1E4: .ASCIZ /ERROR #4 BUS ERROR AT NEC7201 ADDRESS/
	005751	117	122	040	
	005754	043	064	040	
	005757	055	040	102	
	005762	125	123	040	
	005765	105	122	122	
	005770	117	122	040	
	005773	101	124	040	
	005776	116	105	103	
	006001	067	062	060	
	006004	061	040	101	
	006007	104	104	122	
	006012	105	123	123	
	006015	000			
1091	006016	105	122	122	T1E5: .ASCIZ /ERROR #5 BUS ERROR AT I8254 ADDRESS/
	006021	117	122	040	
	006024	043	065	040	
	006027	055	040	102	
	006032	125	123	040	
	006035	105	122	122	
	006040	117	122	040	
	006043	101	124	040	
	006046	111	070	062	
	006051	065	064	040	
	006054	101	104	104	
	006057	122	105	123	
	006062	123	000		

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GLOBAL TEXT SECTION

1093	006064	105	122	122	T1E6:	.ASCIZ	/ERROR #6	BUS ERROR AT Z8036 ADDRESS/
	006067	117	122	040				
	006072	043	066	040				
	006075	055	040	102				
	006100	125	123	040				
	006103	105	122	122				
	006106	117	122	040				
	006111	101	124	040				
	006114	132	070	060				
	006117	063	066	040				
	006122	101	104	104				
	006125	122	105	123				
	006130	123	000					
1094	006132	105	122	122	T1E7:	.ASCIZ	/ERROR #7	BUS ERROR AT Z8016 ADDRESS/
	006135	117	122	040				
	006140	043	067	040				
	006143	055	040	102				
	006146	125	123	040				
	006151	105	122	122				
	006154	117	122	040				
	006157	101	124	040				
	006162	132	070	060				
	006165	061	066	040				
	006170	101	104	104				
	006173	122	105	123				
	006176	123	000					

GLOBAL TEXT SECTION

1096	006200	105	122	122	T2E0:	.ASCIZ	/ERROR #0	BUS ERROR AT NATIVE RAM ADDRESS/
	006203	117	122	040				
	006206	043	060	040				
	006211	055	040	102				
	006214	125	123	040				
	006217	105	122	122				
	006222	117	122	040				
	006225	101	124	040				
	006230	116	101	124				
	006233	111	126	105				
	006236	040	122	101				
	006241	115	040	101				
	006244	104	104	122				
	006247	105	123	123				
	006252	000						
1097	006253	105	122	122	T2E1:	.ASCIZ	/ERROR #1	WRITE READ ERROR, NATIVE RAM/
	006256	117	122	040				
	006261	043	061	040				
	006264	055	040	127				
	006267	122	111	124				
	006272	105	055	122				
	006275	105	101	104				
	006300	040	105	122				
	006303	122	117	122				
	006306	054	040	116				
	006311	101	124	111				
	006314	126	105	040				
	006317	122	101	115				
	006322	000						

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GLOBAL TEXT SECTION

1099	006323	105	122	122	T2E2:	.ASCIZ	/ERROR #2	READ MODIFY WRITE, NATIVE RAM/
	006326	117	122	040				
	006331	043	062	040				
	006334	055	040	122				
	006337	105	101	104				
	006342	055	115	117				
	006345	104	111	106				
	006350	131	055	127				
	006353	122	111	124				
	006356	105	054	040				
	006361	116	101	124				
	006364	111	126	105				
	006367	040	122	101				
	006372	115	000					
1100	006374	105	122	122	T2E3:	.ASCIZ	/ERROR #3	READ MODIFY WRITE (LO BYTE), NATIVE RAM/
	006377	117	122	040				
	006402	043	063	040				
	006405	055	040	122				
	006410	105	101	104				
	006413	055	115	117				
	006416	104	111	106				
	006421	131	055	127				
	006424	122	111	124				
	006427	105	040	050				
	006432	114	117	040				
	006435	102	131	124				
	006440	105	051	054				
	006443	040	116	101				
	006446	124	111	126				
	006451	105	040	122				
	006454	101	115	000				

GLOBAL TEXT SECTION

1102	006457	105	122	122	T2E4:	.ASCIZ	/ERROR #4	READ MODIFY-WRITE (HI BYTE), NATIVE RAM/
	006462	117	122	040				
	006465	043	064	040				
	006470	055	040	122				
	006473	105	101	104				
	006476	055	115	117				
	006501	104	111	106				
	006504	131	055	127				
	006507	122	111	124				
	006512	105	040	050				
	006515	110	111	040				
	006520	102	131	124				
	006523	105	051	054				
	006526	040	116	101				
	006531	124	111	126				
	006534	105	040	122				
	006537	101	115	000				
1103	006542	105	122	122	T2E5:	.ASCIZ	/ERROR #5	BUS ERROR AT USER RAM ADDRESS/
	006545	117	122	040				
	006550	043	065	040				
	006553	055	040	102				
	006556	125	123	040				
	006561	105	122	122				
	006564	117	122	040				
	006567	101	124	040				
	006572	125	123	105				
	006575	122	040	122				
	006600	101	115	040				
	006603	101	104	104				
	006606	122	105	123				
	006611	123	000					

GLOBAL TEXT SECTION

1105	006613	105	122	122	T2E6:	.ASCIZ	/ERROR #6	WRITE READ ERROR, USER RAM/
	006616	117	122	040				
	006621	043	066	040				
	006624	055	040	127				
	006627	122	111	124				
	006632	105	055	122				
	006635	105	101	104				
	006640	040	105	122				
	006643	122	117	122				
	006646	054	040	125				
	006651	123	105	122				
	006654	040	122	101				
	006657	115	000					
1106	006661	105	122	122	T2E7:	.ASCIZ	/ERROR #7	READ-MOD WRITE, USER RAM/
	006664	117	122	040				
	006667	043	067	040				
	006672	055	040	122				
	006675	105	101	104				
	006700	055	115	117				
	006703	104	055	127				
	006706	122	111	124				
	006711	105	054	040				
	006714	125	123	105				
	006717	122	040	122				
	006722	101	115	000				

GLOBAL TEXT SECTION

1108	006725	105	122	122	T2E8:	.ASCIZ	/ERROR #8	READ MOD WRITE (LO BYTE), USER RAM/
	00673C	117	122	040				
	006733	043	070	040				
	006736	055	040	122				
	006741	105	101	104				
	006744	055	115	117				
	006747	104	055	127				
	006752	122	111	124				
	006755	105	040	050				
	006760	114	117	040				
	006763	102	131	124				
	006766	105	051	054				
	006771	040	125	123				
	006774	105	122	040				
	006777	122	101	115				
	007002	000						
1109	007003	105	122	122	T2E9:	.ASCIZ	/ERROR #9	READ MOD-WRITE (HI BYTE), USER RAM/
	007006	117	122	040				
	007011	043	071	040				
	007014	055	040	122				
	007017	105	101	104				
	007022	055	115	117				
	007025	104	055	127				
	007030	122	111	124				
	007033	105	040	050				
	007036	110	111	040				
	007041	102	131	124				
	007044	105	051	054				
	007047	040	125	123				
	007052	105	122	040				
	007055	122	101	115				
	007060	000						

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GLOBAL TEXT SECTION

1111	007061	105	122	122	T3E0: .ASCIZ /ERROR #0 LO BYTE CHECKSUM ERROR, NATIVE ROM/
	007064	117	122	040	
	007067	043	060	040	
	007072	055	040	114	
	007075	117	040	102	
	007100	131	124	105	
	007103	040	103	110	
	007106	105	103	113	
	007111	123	125	115	
	007114	040	105	122	
	007117	122	117	122	
	007122	054	040	116	
	007125	101	124	111	
	007130	126	105	040	
	007133	122	117	115	
	007136	000			
1112	007137	105	122	122	T3E1: .ASCIZ /ERROR #1 - HI BYTE CHECKSUM ERROR, NATIVE ROM/
	007142	117	122	040	
	007145	043	061	040	
	007150	055	040	110	
	007153	111	040	102	
	007156	131	124	105	
	007161	040	103	110	
	007164	105	103	113	
	007167	123	125	115	
	007172	040	105	122	
	007175	122	117	122	
	007200	054	040	116	
	007203	101	124	111	
	007206	126	105	040	
	007211	122	117	115	
	007214	000			

GLOBAL TEXT SECTION

1114	007215	105	122	122	T3E2: .ASCIZ /ERROR #2 USER ROM LO BYTE CHECKSUM ERROR OR ROM NOT PRESENT/
	007220	117	122	040	
	007223	043	062	040	
	007226	055	040	125	
	007231	123	105	122	
	007234	040	122	117	
	007237	115	040	114	
	007242	117	040	102	
	007245	131	124	105	
	007250	040	103	110	
	007253	105	103	113	
	007256	123	125	115	
	007261	040	105	122	
	007264	122	117	122	
	007267	040	117	122	
	007272	040	122	117	
	007275	115	040	116	
	007300	117	124	040	
	007303	120	122	105	
	007306	123	105	116	
	007311	124	000		
1115	007313	105	122	122	T3E3: .ASCIZ /ERROR #3 USER ROM HI BYTE CHECKSUM ERROR OR ROM NOT PRESENT/
	007316	117	122	040	
	007321	043	063	040	
	007324	055	040	125	
	007327	123	105	122	
	007332	040	122	117	
	007335	115	040	110	
	007340	111	040	102	
	007343	131	124	105	
	007346	040	103	110	
	007351	105	103	113	
	007354	123	125	115	
	007357	040	105	122	
	007362	122	117	122	
	007365	040	117	122	
	007370	040	122	117	
	007373	115	040	116	
	007376	117	124	040	
	007401	120	122	105	
	007404	123	105	116	
	007407	124	000		

GLOBAL TEXT SECTION

1117	007411	052	052	040	T5E0: .ASCIZ /** ROM IN VECTOR SPACE - SELFTEST #5 SKIPPED **/
	007414	122	117	115	
	007417	040	111	116	
	007422	040	126	105	
	007425	103	124	117	
	007430	122	040	123	
	007433	120	101	103	
	007436	105	040	055	
	007441	040	123	105	
	007444	114	106	124	
	007447	105	123	124	
	007452	040	043	065	
	007455	040	123	113	
	007460	111	120	120	
	007463	105	104	040	
	007466	052	052	000	
1118	007471	105	122	122	T5E1: .ASCIZ /ERROR #1 - CLOCK INTERRUPT LEVEL INCORRECT/
	007474	117	122	040	
	007477	043	061	040	
	007502	055	040	103	
	007505	114	117	103	
	007510	113	040	111	
	007513	116	124	105	
	007516	122	122	125	
	007521	120	124	040	
	007524	114	105	126	
	007527	105	114	040	
	007532	111	116	103	
	007535	117	122	122	
	007540	105	103	124	
	007543	000			

GLOBAL TEXT SECTION

1120	007544	105	122	122	T5E2:	.ASCIZ	/ERROR #2 - CLOCK DOESN'T INTERRUPT/
	007547	117	122	040			
	007552	043	062	040			
	007555	055	040	103			
	007560	114	117	103			
	007563	113	040	104			
	007566	117	105	123			
	007571	116	047	124			
	007574	040	111	116			
	007577	124	105	122			
	007602	122	125	120			
	007605	124	000				
1121	007607	105	122	122	T5E3:	.ASCIZ	/ERROR #3 CAN'T SHUT CLOCK OFF/
	007612	117	122	040			
	007615	043	063	040			
	007620	055	040	103			
	007623	101	116	047			
	007626	124	040	123			
	007631	110	125	124			
	007634	040	103	114			
	007637	117	103	113			
	007642	040	117	106			
	007645	106	000				

GLOBAL TEXT SECTION

1123	007647	052	052	040	T6E0: .ASCIZ /** SELFTEST #6 INTERRUPTS NOT TESTED ROM IN VECTOR SPACE **/
	007652	123	105	114	
	007655	106	124	105	
	007660	123	124	040	
	007663	043	066	040	
	007666	111	116	124	
	007671	105	122	122	
	007674	125	120	124	
	007677	123	040	116	
	007702	117	124	040	
	007705	124	105	123	
	007710	124	105	104	
	007713	040	055	040	
	007716	122	117	115	
	007721	040	111	116	
	007724	040	126	105	
	007727	103	124	117	
	007732	122	040	123	
	007735	120	101	103	
	007740	105	040	052	
	007743	052	000		
1124	007745	105	122	122	T6E1: .ASCIZ /ERROR #1 XMTR INTERRUPT NOT MASKED AT LEVEL 4/
	007750	117	122	040	
	007753	043	061	040	
	007756	055	040	130	
	007761	115	124	122	
	007764	040	111	116	
	007767	124	105	122	
	007772	122	125	120	
	007775	124	040	116	
	010000	117	124	040	
	010003	115	101	123	
	010006	113	105	104	
	010011	040	101	124	
	010014	040	114	105	
	010017	126	105	114	
	010022	040	064	000	

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GLOBAL TEXT SECTION

1126	010025	105	122	122	T6E2: .ASCIZ /ERROR #2 XMTA INTERRUPT NOT RECEIVED/
	010030	117	122	040	
	010033	043	062	040	
	010036	055	040	130	
	010041	115	124	122	
	010044	040	111	116	
	010047	124	105	122	
	010052	122	125	120	
	010055	124	040	116	
	010060	117	124	040	
	010063	122	105	103	
	010066	105	111	126	
	010071	105	104	000	
1127	010074	105	122	122	T6E3: .ASCIZ /ERROR #3 RCVP INTERRUPT NOT MASKED AT LEVEL 4/
	010077	117	122	040	
	010102	043	063	040	
	010105	055	040	122	
	010110	103	126	122	
	010113	040	111	116	
	010116	124	105	122	
	010121	122	125	120	
	010124	124	040	116	
	010127	117	124	040	
	010132	115	101	123	
	010135	113	105	104	
	010140	040	101	124	
	010143	040	114	105	
	010146	126	105	114	
	010151	040	064	000	

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GLOBAL TEXT SECTION

1129	010154	105	122	122	T6E4: .ASCIZ /ERROR #4 RCVR INTERRUPT NOT RECEIVED/
	010157	117	122	040	
	010162	043	064	040	
	010165	055	040	122	
	010170	103	126	122	
	010173	040	111	116	
	010176	124	105	122	
	010201	122	125	120	
	010204	124	040	116	
	010207	117	124	040	
	010212	122	105	103	
	010215	105	111	126	
	010220	105	104	000	
1130	010223	105	122	122	T6E5: .ASCIZ /ERROR #5 RECEIVED DATA INCORRECT/
	010226	117	122	040	
	010231	043	065	040	
	010234	055	040	122	
	010237	105	103	105	
	010242	111	126	105	
	010245	104	040	104	
	010250	101	124	101	
	010253	040	111	116	
	010256	103	117	122	
	010261	122	105	103	
	010264	124	000		

GLOBAL TEXT SECTION

1132	010266	105	122	122	T6E6:	.ASCII7	/ERROR #6	NO RCVR DONE	LOOPBACK OPEN/
	010271	117	122	040					
	010274	043	066	040					
	010277	055	040	116					
	010302	117	040	122					
	010305	103	126	122					
	010310	040	104	117					
	010313	116	105	040					
	010316	055	055	040					
	010321	114	117	117					
	010324	120	102	101					
	010327	103	113	040					
	010332	117	120	105					
	010335	116	000						
1133	010337	052	052	040	T7E0:	.ASCIIZ	/** ROM IN VECTOR SPACE	SELFTEST #7 SKIPPED **/	
	010342	122	117	115					
	010345	040	111	116					
	010350	040	126	105					
	010353	103	124	117					
	010356	122	040	123					
	010361	120	101	103					
	010364	105	040	055					
	010367	040	123	105					
	010372	114	106	124					
	010375	105	123	124					
	010400	040	043	067					
	010403	040	123	113					
	010406	111	120	120					
	010411	105	104	040					
	010414	052	052	000					

GLOBAL TEXT SECTION

1135	010417	105	122	122	T7E1: .ASCIZ /ERROR #1 - I8254 TIMER #2 (800 HZ) DOESN T INTERRUPT/
	010422	117	122	040	
	010425	043	061	040	
	010430	055	040	111	
	010433	070	062	065	
	010436	064	040	124	
	010441	111	115	105	
	010444	122	040	043	
	010447	062	040	050	
	010452	070	060	060	
	010455	040	110	132	
	010460	051	040	104	
	010463	117	105	123	
	010466	116	047	124	
	010471	040	111	116	
	010474	124	105	122	
	010477	122	125	120	
	010502	124	000		
1136	010504	105	122	122	T7E2: .ASCIZ /ERROR #2 - ASYNC MODE, DATA XFER INCOMPLETE/
	010507	117	122	040	
	010512	043	062	040	
	010515	055	040	101	
	010520	123	131	116	
	010523	103	040	115	
	010526	117	104	105	
	010531	054	040	104	
	010534	101	124	101	
	010537	040	130	106	
	010542	105	122	040	
	010545	111	116	103	
	010550	117	115	120	
	010553	114	105	124	
	010556	105	000		

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GLOBAL TEXT SECTION

1138	010560	105	122	122	T7E3:	.ASCIZ	/ERROR #3	SYNC MODE, EOF SDLC NOT RECEIVED/
	010563	117	122	040				
	010566	043	063	040				
	010571	055	040	123				
	010574	131	116	103				
	010577	040	115	117				
	010602	104	105	054				
	010605	040	105	117				
	010610	106	055	123				
	010613	104	114	103				
	010616	040	116	117				
	010621	124	040	122				
	010624	105	103	105				
	010627	111	126	105				
	010632	104	000					
1139	010634	105	122	122	T7E4:	.ASCIZ	/ERROR #4	SYNC MODE, DATA XFER INCOMPLETE/
	010637	117	122	040				
	010642	043	064	040				
	010645	055	040	123				
	010650	131	116	103				
	010653	040	115	117				
	010656	104	105	054				
	010661	040	104	101				
	010664	124	101	040				
	010667	130	106	105				
	010672	122	040	111				
	010675	116	103	117				
	010700	115	120	114				
	010703	105	124	105				
	010706	000						

GLOBAL TEXT SECTION

1141	010707	105	122	122	T7E5: .ASCIZ "ERROR #5 SYNC/ASYNC MODES RECEIVED DATA INCORRECT"
	010712	117	122	040	
	010715	043	065	040	
	010720	055	040	123	
	010723	131	116	103	
	010726	057	101	123	
	010731	131	116	103	
	010734	040	115	117	
	010737	104	105	123	
	010742	040	055	040	
	010745	122	105	103	
	010750	105	111	126	
	010753	105	104	040	
	010756	104	101	124	
	010761	101	040	111	
	010764	116	103	117	
	010767	122	122	105	
	010772	103	124	000	
1142	010775	105	122	122	T7E6: .ASCIZ /ERROR #6 DMA MODE - DATA TRANSFER INCOMPLETE/
	011000	117	122	040	
	011003	043	066	040	
	011006	055	040	104	
	011011	115	101	040	
	011014	115	117	104	
	011017	105	040	055	
	011022	040	104	101	
	011025	124	101	040	
	011030	124	122	101	
	011033	116	123	106	
	011036	105	122	040	
	011041	111	116	103	
	011044	117	115	120	
	011047	114	105	124	
	011052	105	000		

GLOBAL TEXT SECTION

1144	011054	105	122	122	T7E7:	.ASCIZ	/ERROR #7	DMA MODE	RECEIVED DATA INCORRECT/
	011057	117	122	040					
	011062	043	067	040					
	011065	055	040	104					
	011070	115	101	040					
	011073	115	117	104					
	011076	105	040	055					
	011101	040	122	105					
	011104	103	105	111					
	011107	126	105	104					
	011112	040	104	101					
	011115	124	101	040					
	011120	111	116	103					
	011123	117	122	122					
	011126	105	103	124					
	011131	000							
1145	011132	105	122	122	T7E8:	.ASCIZ	/ERROR #8	STATUS WRONG OR NO INTERRUPT WITH REQ TO SEND SET/	
	011135	117	122	040					
	011140	043	070	040					
	011143	055	040	123					
	011146	124	101	124					
	011151	125	123	040					
	011154	127	122	117					
	011157	116	107	040					
	011162	117	122	040					
	011165	116	117	040					
	011170	111	116	124					
	011173	105	122	122					
	011176	125	120	124					
	011201	040	127	111					
	011204	124	110	040					
	011207	122	105	121					
	011212	055	124	117					
	011215	055	123	105					
	011220	116	104	040					
	011223	123	105	124					
	011226	000							

GLOBAL TEXT SECTION

1147	011227	105	122	122	T7E9: .ASCIZ "ERROR #9 STATUS WRONG OR NO INTERRUPT WITH T1108/2 SET"
	011232	117	122	040	
	011235	043	071	040	
	011240	055	040	123	
	011243	124	101	124	
	011246	125	123	040	
	011251	127	122	117	
	011254	116	107	040	
	011257	117	122	040	
	011262	116	117	040	
	011265	111	116	124	
	011270	105	122	122	
	011273	125	120	124	
	011276	040	127	111	
	011301	124	110	040	
	011304	124	124	061	
	011307	060	070	057	
	011312	062	040	123	
	011315	105	124	000	
1148	011320	105	122	122	T7E10: .ASCIZ /ERROR #10 STATUS WRONG OR NO INT. WITH TERM-IN SERV SET/
	011323	117	122	040	
	011326	043	061	060	
	011331	040	055	040	
	011334	123	124	101	
	011337	124	125	123	
	011342	040	127	122	
	011345	117	116	107	
	011350	040	117	122	
	011353	040	116	117	
	011356	040	111	116	
	011361	124	056	040	
	011364	127	111	124	
	011367	110	040	124	
	011372	105	122	115	
	011375	055	111	116	
	011400	055	123	105	
	011403	122	126	040	
	011406	123	105	124	
	011411	000			

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GLOBAL TEXT SECTION

1150	011412	105	122	122	T7E11: .ASCIZ /ERROR #11 STATUS WRONG WITH ALL OPTIONS DESELECTED/
	011415	117	122	040	
	011420	043	061	061	
	011423	040	055	040	
	011426	123	124	101	
	011431	124	125	123	
	011434	040	127	122	
	011437	117	116	107	
	011442	040	127	111	
	011445	124	110	040	
	011450	101	114	114	
	011453	040	117	120	
	011456	124	111	117	
	011461	116	123	040	
	011464	104	105	123	
	011467	105	114	105	
	011472	103	124	105	
	011475	104	000		
1151	011477	052	052	040	T10E0: .ASCIZ /** ROM IN VECTOR SPACE - SELFTEST #10 SKIPPED **/
	011502	122	117	115	
	011505	040	111	116	
	011510	040	126	105	
	011513	103	124	117	
	011516	122	040	123	
	011521	120	101	103	
	011524	105	040	055	
	011527	040	123	105	
	011532	114	106	124	
	011535	105	123	124	
	011540	040	043	061	
	011543	060	040	123	
	011546	113	111	120	
	011551	120	105	104	
	011554	040	052	052	
	011557	000			

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GLOBAL TEXT SECTION

1153	011560	105	122	122	T10E1: .ASCIZ /ERROR #1	RESET STATE INCORRECT/
	011563	117	122	040		
	011566	043	061	040		
	011571	055	040	122		
	011574	105	123	105		
	011577	124	040	123		
	011602	124	101	124		
	011605	105	040	111		
	011610	116	103	117		
	011613	122	122	105		
	011616	103	124	000		
1154	011621	105	122	122	T10E2: .ASCII /ERROR #2	TIMER DIDN'T START/
	011624	117	122	040		
	011627	043	062	040		
	011632	055	040	124		
	011635	111	115	105		
	011640	122	040	104		
	011643	111	104	116		
	011646	047	124	040		
	011651	123	124	101		
	011654	122	124	000		

GLOBAL TEXT SECTION

1156	011657	105	122	122	T10E3: .ASCIZ /ERROR #3	TIMER NEVER STOPS/
	011662	117	122	040		
	011665	043	063	040		
	011670	055	040	124		
	011673	111	115	105		
	011676	122	040	116		
	011701	105	126	105		
	011704	122	040	123		
	011707	124	117	120		
	011712	123	000			
1157	011714	105	122	122	T10E4: .ASCIZ /ERROR #4	INTERRUPT NOT MASKED AT LEVEL 4/
	011717	117	122	040		
	011722	043	064	040		
	011725	055	040	111		
	011730	116	124	105		
	011733	122	122	125		
	011736	120	124	040		
	011741	116	117	124		
	011744	040	115	101		
	011747	123	113	105		
	011752	104	040	101		
	011755	124	040	114		
	011760	105	126	105		
	011763	114	040	064		
	011766	000				

GLOBAL TEXT SECTION

1159	011767	105	122	122	T10E5: .ASCIZ /ERROR #5 TIMER INTERRUPT NOT RECEIVED/
	011772	117	122	040	
	011775	043	065	040	
	012000	055	040	124	
	012003	111	115	105	
	012006	122	040	111	
	012011	116	124	105	
	012014	122	122	125	
	012017	120	124	040	
	012022	116	117	124	
	012025	040	122	105	
	012030	103	105	111	
	012033	126	105	104	
	012036	000			
1160	012037	105	122	122	T10E6: .ASCIZ /ERROR #6 - LOOP TIME OUT, DATA XFER INCOMPLETE/
	012042	117	122	040	
	012045	043	066	040	
	012050	055	040	114	
	012053	117	117	120	
	012056	040	124	111	
	012061	115	105	055	
	012064	117	125	124	
	012067	054	040	104	
	012072	101	124	101	
	012075	040	130	106	
	012100	105	122	040	
	012103	111	116	103	
	012106	117	115	120	
	012111	114	105	124	
	012114	105	000		

GLOBAL TEXT SECTION

1162	012116	105	122	122	T10E7: .ASCII /ERROR #7 RECEIVED DATA INCORRECT/
	012121	117	122	040	
	012124	043	067	040	
	012127	055	040	122	
	012132	105	103	105	
	012135	111	126	105	
	012140	104	040	104	
	012143	101	124	101	
	012146	040	111	116	
	012151	103	117	122	
	012154	122	105	103	
	012157	124	000		
1163	012161	052	052	040	T11E0: .ASCII /** SELFTEST #11 INTERRUPTS NOT TESTED ROM IN VECTOR SPACE **/
	012164	123	105	114	
	012167	106	124	105	
	012172	123	124	040	
	012175	043	061	061	
	012200	040	111	116	
	012203	124	105	122	
	012206	122	125	120	
	012211	124	123	040	
	012214	116	117	124	
	012217	040	124	105	
	012222	123	124	105	
	012225	104	040	055	
	012230	040	122	117	
	012233	115	040	111	
	012236	116	040	126	
	012241	105	103	124	
	012244	117	122	040	
	012247	123	120	101	
	012252	103	105	040	
	012255	052	052	000	

GLOBAL TEXT SECTION

1165	012260	052	052	040	T11E1: .ASCIZ /** SELF TEST #11 ISI 11 BUS ACCESS NOT TESTED NO ADDRESS DEFINED **/
	012263	123	105	114	
	012266	106	124	105	
	012271	123	124	040	
	012274	043	061	061	
	012277	040	114	123	
	012302	111	055	061	
	012305	061	040	102	
	012310	125	123	040	
	012313	101	103	103	
	012316	105	123	123	
	012321	040	116	117	
	012324	124	040	124	
	012327	105	123	124	
	012332	105	104	040	
	012335	055	040	116	
	012340	117	040	101	
	012343	104	104	122	
	012346	105	123	123	
	012351	040	104	105	
	012354	106	111	116	
	012357	105	104	040	
	012362	052	052	000	
1166	012365	105	122	122	T11E2: .ASCIZ /ERROR #2 CHANNEL INTERRUPT NOT RECEIVED/
	012370	117	122	040	
	012373	043	062	040	
	012376	055	040	103	
	012401	110	101	116	
	012404	116	105	114	
	012407	040	111	116	
	012412	124	105	122	
	012415	122	125	120	
	012420	124	040	116	
	012423	117	124	040	
	012426	122	105	103	
	012431	105	111	126	
	012434	105	104	000	

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GLOBAL TEXT SECTION

1168	012437	105	122	122	T11E3: .ASCIZ /ERROR #3 DMA CHANNEL HUNG (TC.EOP BITS BOTH CLEAR)/
	012442	117	122	040	
	012445	043	063	040	
	012450	055	040	104	
	012453	115	101	040	
	012456	103	110	101	
	012461	116	116	105	
	012464	114	040	110	
	012467	125	116	107	
	012472	040	050	124	
	012475	103	054	105	
	012500	117	120	040	
	012503	102	111	124	
	012506	123	040	102	
	012511	117	124	110	
	012514	040	103	114	
	012517	105	101	122	
	012522	051	000		
1169	012524	105	122	122	T11E4: .ASCIZ /ERROR #4 DMA ABORTED (EOP = 1 = NXM)/
	012527	117	122	040	
	012532	043	064	040	
	012535	055	040	104	
	012540	115	101	040	
	012543	101	102	117	
	012546	122	124	105	
	012551	104	040	050	
	012554	105	117	120	
	012557	040	075	040	
	012562	061	040	075	
	012565	040	116	130	
	012570	115	051	000	

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GLOBAL TEXT SECTION

1171	012573	105	122	122	T11E5: .ASCIZ /ERROR #5 DMA DATA ERROR/
	012576	117	122	040	
	012601	043	065	040	
	012604	055	040	104	
	012607	115	101	040	
	012612	104	101	124	
	012615	101	040	105	
	012620	122	122	117	
	012623	122	000		
1172	012625	052	052	040	T12E0: .ASCIZ /** LSI 11 BUS ADDRESS NOT DEFINED SELFTEST #12 SKIPPED **/
	012630	114	123	111	
	012633	055	061	061	
	012636	040	102	125	
	012641	123	040	101	
	012644	104	104	122	
	012647	105	123	123	
	012652	040	116	117	
	012655	124	040	104	
	012660	105	106	111	
	012663	116	105	104	
	012666	040	055	040	
	012671	123	105	114	
	012674	106	124	105	
	012677	123	124	040	
	012702	043	061	062	
	012705	040	123	113	
	012710	111	120	120	
	012713	105	104	040	
	012716	052	052	000	

GLOBAL TEXT SECTION

1174	012721	105	122	122	T12E1: .ASCIZ /ERROR #1 - BREQ (CSR<14>) NEVER GOT SET/
	012724	117	122	040	
	012727	043	061	040	
	012732	055	040	102	
	012735	122	105	121	
	012740	040	050	103	
	012743	123	122	074	
	012746	061	064	076	
	012751	051	040	116	
	012754	105	126	105	
	012757	122	040	107	
	012762	117	124	040	
	012765	123	105	124	
	012770	000			
1175	012771	052	052	040	T12E2: .ASCIZ /** SELFTEST #12 SKIPPED ROM IN VECTOR SPACE **/
	012774	123	105	114	
	012777	106	124	105	
	013002	123	124	040	
	013005	043	061	062	
	013010	040	123	113	
	013013	111	120	120	
	013016	105	104	040	
	013021	055	040	122	
	013024	117	115	040	
	013027	111	116	040	
	013032	126	105	103	
	013035	124	117	122	
	013040	040	123	120	
	013043	101	103	105	
	013046	040	052	052	
	013051	000			

GLOBAL TEXT SECTION

1177	013052	105	122	122	T12E3: .ASCIZ /ERROR #3 INTERRUPT ON-BIACK NOT MASKED AT PR5/
	013055	117	122	040	
	013060	043	063	040	
	013063	055	040	111	
	013066	116	124	105	
	013071	122	122	125	
	013074	120	124	055	
	013077	117	116	055	
	013102	102	111	101	
	013105	103	113	040	
	013110	116	117	124	
	013113	040	115	101	
	013116	123	113	105	
	013121	104	040	101	
	013124	124	040	120	
	013127	122	065	000	
1178	013132	105	122	122	T12E4: .ASCIZ /ERROR #4 - INTERRUPT-ON BIACK NOT RECEIVED/
	013135	117	122	040	
	013140	043	064	040	
	013143	055	040	111	
	013146	116	124	105	
	013151	122	122	125	
	013154	120	124	055	
	013157	117	116	055	
	013162	102	111	101	
	013165	103	113	040	
	013170	116	117	124	
	013173	040	122	105	
	013176	103	105	111	
	013201	126	105	104	
	013204	000			

GLOBAL TEXT SECTION

1180	013205	105	122	122	T12E5: .ASCIZ /ERROR #5 BIACK DIDN'T CLEAR BREQ (CSR<14>)/
	013210	117	122	040	
	013213	043	065	040	
	013216	055	040	102	
	013221	111	101	103	
	013224	113	040	104	
	013227	111	104	116	
	013232	047	124	040	
	013235	103	114	105	
	013240	101	122	040	
	013243	102	122	105	
	013246	121	040	050	
	013251	103	123	122	
	013254	074	061	064	
	013257	076	051	000	
1181	013262	105	122	122	T12E6: .ASCIZ /ERROR #6 BRESET TRAP THRU 24 DIDN'T OCCUR/
	013265	117	122	040	
	013270	043	066	040	
	013273	055	040	102	
	013276	122	105	123	
	013301	105	124	040	
	013304	124	122	101	
	013307	120	040	124	
	013312	110	122	125	
	013315	040	062	064	
	013320	040	104	111	
	013323	104	116	047	
	013326	124	040	117	
	013331	103	103	125	
	013334	122	000		

GLOBAL TEXT SECTION

1183	013336	105	122	122	T13E0: .ASCIZ /ERROR #0 LOCAL TPR WRITE-READ ERROR/
	013341	117	122	040	
	013344	043	060	040	
	013347	055	040	114	
	013352	117	103	101	
	013355	114	040	124	
	013360	120	122	040	
	013363	127	122	111	
	013366	124	105	055	
	013371	122	105	101	
	013374	104	040	105	
	013377	122	122	117	
	013402	122	000		
1184	013404	105	122	122	T13E1: .ASCIZ /ERROR #1 BUS ERROR ON LSI-11 BUS TPR READ/
	013407	117	122	040	
	013412	043	061	040	
	013415	055	040	102	
	013420	125	123	040	
	013423	105	122	122	
	013426	117	122	040	
	013431	117	116	040	
	013434	114	123	111	
	013437	055	061	061	
	013442	040	102	125	
	013445	123	040	124	
	013450	120	122	040	
	013453	122	105	101	
	013456	104	000		

GLOBAL TEXT SECTION

1186	013460	105	122	122	T13E2: .ASCIZ /ERROR #2 NON ZERO DATA RETURNED ON LSI 11 BUS READ/
	013463	117	122	040	
	013466	043	062	040	
	013471	055	040	116	
	013474	117	116	055	
	013477	132	105	122	
	013502	117	040	104	
	013505	101	124	101	
	013510	040	122	105	
	013513	124	125	122	
	013516	116	105	104	
	013521	040	117	116	
	013524	040	114	123	
	013527	111	055	061	
	013532	061	040	102	
	013535	125	123	040	
	013540	122	105	101	
	013543	104	000		

1187	013545	052	052	040	T13E3: .ASCIZ "•• TEST #13 BUS WRITES/INTERRUPTS NOT TESTED ROM IN VECTOR SPACE ••
	013550	124	105	123	
	013553	124	040	043	
	013556	061	063	040	
	013561	102	125	123	
	013564	040	127	122	
	013567	111	124	105	
	013572	123	057	111	
	013575	116	124	105	
	013600	122	122	125	
	013603	120	124	123	
	013606	040	116	117	
	013611	124	040	124	
	013614	105	123	124	
	013617	105	104	040	
	013622	055	040	122	
	013625	117	115	040	
	013630	111	116	040	
	013633	126	105	103	
	013636	124	117	122	
	013641	040	123	120	
	013644	101	103	105	
	013647	040	052	052	
	013652	000			

GLOBAL TEXT SECTION

1189	013653	105	122	122	T13E4: .ASCIZ /ERROR #4 BUS ERROR ON WRITE TO TPR WORD 0/
	013656	117	122	040	
	013661	043	064	040	
	013664	055	040	102	
	013667	125	123	040	
	013672	105	122	122	
	013675	117	122	040	
	013700	117	116	040	
	013703	127	122	111	
	013706	124	105	040	
	013711	124	117	040	
	013714	124	120	122	
	013717	040	127	117	
	013722	122	104	040	
	013725	060	000		
1190	013727	105	122	122	T13E5: .ASCIZ /ERROR #5 TPR COMMAND INTERRUPT DIDN'T OCCUR/
	013732	117	122	040	
	013735	043	065	040	
	013740	055	040	124	
	013743	120	122	040	
	013746	103	117	115	
	013751	115	101	116	
	013754	104	040	111	
	013757	116	124	105	
	013762	122	122	125	
	013765	120	124	040	
	013770	104	111	104	
	013773	116	047	124	
	013776	040	117	103	
	014001	103	125	122	
	014004	000			

GLOBAL TEXT SECTION

1192	014005	105	122	122	T13E6: .ASCIZ "ERROR #6 - LSI 11 BUS WRITE AND/OR INTERUPTS WITH TPR DISABLED"
	014010	117	122	040	
	014013	043	066	040	
	014016	055	040	114	
	014021	123	111	055	
	014024	061	061	040	
	014027	102	125	123	
	014032	040	127	122	
	014035	111	124	105	
	014040	040	101	116	
	014043	104	057	117	
	014046	122	040	111	
	014051	116	124	105	
	014054	122	122	125	
	014057	120	124	123	
	014062	040	127	111	
	014065	124	110	040	
	014070	124	120	122	
	014073	040	104	111	
	014076	123	101	102	
	014101	114	105	104	
	014104	000			
1193	014105	105	122	122	T13E7: .ASCIZ /ERROR #7 LSI-11 BUS WRITE DIDN'T TIME OUT/
	014110	117	122	040	
	014113	043	067	040	
	014116	055	040	114	
	014121	123	111	055	
	014124	061	061	040	
	014127	102	125	123	
	014132	040	127	122	
	014135	111	124	105	
	014140	040	104	111	
	014143	104	116	047	
	014146	124	040	124	
	014151	111	115	105	
	014154	040	117	125	
	014157	124	000		

GLOBAL TEXT SECTION

1195	014161	105	122	122	T13E8: .ASCIZ /ERROR #8 - LSI 11 BUS WRITE TIMED OUT/
	014164	117	122	040	
	014167	043	070	040	
	014172	055	040	114	
	014175	123	111	055	
	014200	061	061	040	
	014203	102	125	123	
	014206	040	127	122	
	014211	111	124	105	
	014214	040	124	111	
	014217	115	105	104	
	014222	040	117	125	
	014225	124	000		
1196	014227	105	122	122	T13E9: .ASCIZ /ERROR #9 - TPR INTERRUPT 4 NOT RECEIVED/
	014232	117	122	040	
	014235	043	071	040	
	014240	055	040	124	
	014243	120	122	040	
	014246	111	116	124	
	014251	105	122	122	
	014254	125	120	124	
	014257	040	064	040	
	014262	116	117	124	
	014265	040	122	105	
	014270	103	105	111	
	014273	126	105	104	
	014276	000			

GLOBAL TEXT SECTION

1198	014277	105	122	122	T13E10: .ASCIZ /ERROR #10 TPR INTERRUPT 8 NOT RECEIVED/
	014302	117	122	040	
	014305	043	061	060	
	014310	040	055	040	
	014313	124	120	122	
	014316	040	111	116	
	014321	124	105	122	
	014324	122	125	120	
	014327	124	040	070	
	014332	040	116	117	
	014335	124	040	122	
	014340	105	103	105	
	014343	111	126	105	
	014346	104	000		
1199	014350	105	122	122	T13E11: .ASCIZ /ERROR #11 TPR INTERRUPT 12 NOT RECEIVED/
	014353	117	122	040	
	014356	043	061	061	
	014361	040	055	040	
	014364	124	120	122	
	014367	040	111	116	
	014372	124	105	122	
	014375	122	125	120	
	014400	124	040	061	
	014403	062	040	116	
	014406	117	124	040	
	014411	122	105	103	
	014414	105	111	126	
	014417	105	104	000	

GLOBAL TEXT SECTION

```

1201
1202
1203      ; NAMES OF DEVICE , SUPPORTED BY PROGRAM
1204      ;
1205 014422      DEVTYP <KXT11CA>
      014422      L$DVTYP:
      014422      113      130      124      .ASCIZ <KXT11CA>
      014425      061      061      103
      014430      101      000
      .EVEN

1206
1212
1213      ; TEST DESCRIPTION
1214      ;
1215 014432      DESCRIPT      <CNK1CA KXT11 CA LSI-11 BUS DIAGNOSTIC>
      014432      L$DESC:
      014432      103      116      113      .ASCIZ /CNK1CA KXT11 CA LSI-11 BUS DIAGNOSTIC/
      014435      124      103      101
      014440      040      113      130
      014443      124      061      061
      014446      055      103      101
      014451      040      114      123
      014454      111      055      061
      014457      061      040      102
      014462      125      123      040
      014465      104      111      101
      014470      107      116      117
      014473      123      124      111
      014476      103      000
      .EVEN

1216
1223
    
```

GLOBAL TEXT SECTION

```

1225
1226      ;
1227      ; FORMAT STATEMENTS USED IN PRINT CALLS
1228      ;
1229 014500 045 116 045 NOREG: .ASCIZ /#N#ANXM ADDRESS IS #06#N/
      014503 101 116 130
      014506 115 040 101
      014511 104 104 122
      014514 105 123 123
      014517 040 111 123
      014522 040 045 117
      014525 066 045 116
      014530 000
1230 014531 045 116 045 ROMSG: .ASCIZ /#N#T#A ERROR(S):#N#N/
      014534 124 045 101
      014537 040 105 122
      014542 122 117 122
      014545 050 123 051
      014550 072 045 116
      014553 045 116 000
1231 014556 045 101 040 ROMETX: .ASCIZ /#A #T#N/
      014561 040 040 045
      014564 124 045 116
      014567 000
1232 014570 045 116 045 TESTID: .ASCIZ /#N#ATHE #T#A TEST DID NOT COMPLETE ON IOP #Z2#N#N/
      014573 101 124 110
      014576 105 040 045
      014601 124 045 101
      014604 040 124 105
      014607 123 124 040
      014612 104 111 104
      014615 040 116 117
      014620 124 040 103
      014623 117 115 120
      014626 114 105 124
      014631 105 040 117
      014634 116 040 111
      014637 117 120 040
      014642 043 045 132
      014645 062 045 116
      014650 045 116 000
    
```

GLOBAL TEXT SECTION

1234	014653	045	124	045	INTERR: .ASCIIZ /STMA TEST FAILED ON IOP 00720N/
	014656	101	040	124	
	014661	105	123	124	
	014664	040	106	101	
	014667	111	114	105	
	014672	104	040	117	
	014675	116	040	111	
	014700	117	120	040	
	014703	043	045	132	
	014706	062	045	116	
	014711	000			
1235	014712	045	116	045	NOINFO: .ASCIIZ /STMA <NO FURTHER ERROR INFORMATION AVAILABLE>0N/
	014715	101	011	074	
	014720	116	117	040	
	014723	106	125	122	
	014726	124	110	105	
	014731	122	040	105	
	014734	122	122	117	
	014737	122	040	111	
	014742	116	106	117	
	014745	122	115	101	
	014750	124	111	117	
	014753	116	040	101	
	014756	126	101	111	
	014761	114	101	102	
	014764	114	105	076	
	014767	045	116	000	

GLOBAL TEXT SECTION

1237 014772 045 116 045 DROP: .ASCIZ /~~EN~~A KXT11-CA ~~Z~~A DROPPED FROM TESTING.~~1~~/

014775 101 011 113

015000 130 124 061

015003 061 055 103

015006 101 040 043

015011 045 132 062

015014 045 101 040

015017 104 122 117

015022 120 120 105

015025 104 040 106

015030 122 117 115

015033 040 124 105

015036 123 124 111

015041 116 107 056

015044 045 116 000

1238 015047 045 116 045 SWITCH: .ASCIZ "~~N~~ABOOT/SELFTEST SWITCH ON IOP ~~Z~~A NOT SET FOR XXDP.~~N~~

015052 101 102 117

015055 117 124 057

015060 123 105 114

015063 106 124 105

015066 123 124 040

015071 123 127 111

015074 124 103 110

015077 040 117 116

015102 040 111 117

015105 120 040 043

015110 045 132 062

015113 045 101 040

015116 116 117 124

015121 040 123 105

015124 124 040 106

015127 117 122 040

015132 130 130 104

015135 120 053 045

015140 116 000

GLOBAL TEXT SECTION

1240	015142	045	116	045	CMNDR: .ASCIZ /%N%ACOMMAND STATUS ERROR FROM IOP 0%Z2%A AFTER LAST COMMAND%N/
	015145	101	103	117	
	015150	115	115	101	
	015153	116	104	040	
	015156	123	124	101	
	015161	124	125	123	
	015164	040	105	122	
	015167	122	117	122	
	015172	040	106	122	
	015175	117	115	040	
	015200	111	117	120	
	015203	040	043	045	
	015206	132	062	045	
	015211	101	040	101	
	015214	106	124	105	
	015217	122	040	114	
	015222	101	123	124	
	015225	040	103	117	
	015230	115	115	101	
	015233	116	104	045	
	015236	116	000		
1241	015240	045	116	045	NOTST: .ASCIZ /%N%AIOP 0%Z2%A %T%N/
	015243	101	111	117	
	015246	120	040	043	
	015251	045	132	062	
	015254	045	101	040	
	015257	045	124	045	
	015262	116	000		

GLOBAL TEXT SECTION

1243	015264	045	101	123	SETSW: .ASCIZ /#ASET SWITCH TO POSITION 10./
	015267	105	124	040	
	015272	123	127	111	
	015275	124	103	110	
	015300	040	124	117	
	015303	040	120	117	
	015306	123	111	124	
	015311	111	117	116	
	015314	040	061	060	
	015317	056	000		
1244	015321	045	116	045	NOTCLR: .ASCIZ /#N#AIOP #Z2#A NOT READY TO ACCEPT COMMANDS#N/
	015324	101	111	117	
	015327	120	040	043	
	015332	045	132	062	
	015335	045	101	040	
	015340	116	117	124	
	015343	040	122	105	
	015346	101	104	131	
	015351	040	124	117	
	015354	040	101	103	
	015357	103	105	120	
	015362	124	040	103	
	015365	117	115	115	
	015370	101	116	104	
	015373	123	045	116	
	015376	000			

GLOBAL TEXT SECTION

1246	015377	045	116	045	TPR:	.ASCIZ	/'N#ATWO-PORT RAM ON IOP #Z2#A IS DISABLED./
	015402	101	124	127			
	015405	117	055	120			
	015410	117	122	124			
	015413	040	122	101			
	015416	115	040	117			
	015421	116	040	111			
	015424	117	120	040			
	015427	043	045	132			
	015432	062	045	101			
	015435	040	111	123			
	015440	040	104	111			
	015443	123	101	102			
	015446	114	105	104			
	015451	056	000				
1247	015453	045	116	045	TPR1:	.ASCIZ	/'N#ACHECK LEDS ON IOP #Z2#A FOR ERROR CODE.#N/
	015456	101	103	110			
	015461	105	103	113			
	015464	040	114	105			
	015467	104	123	040			
	015472	117	116	040			
	015475	111	117	120			
	015500	040	043	045			
	015503	132	062	045			
	015506	101	040	106			
	015511	117	122	040			
	015514	105	122	122			
	015517	117	122	040			
	015522	103	117	104			
	015525	105	056	045			
	015530	116	000				

GLOBAL TEXT SECTION

1249	015532	045	116	045	SLOT: .ASCIZ / N AENSURE BACKPLANE DMA GRANT CONTINUITY N /
	015535	101	105	116	
	015540	123	125	122	
	015543	105	040	102	
	015546	101	103	113	
	015551	120	114	101	
	015554	116	105	040	
	015557	104	115	101	
	015562	040	107	122	
	015565	101	116	124	
	015570	040	103	117	
	015573	116	124	111	
	015576	116	125	111	
	015601	124	131	045	
	015604	116	000		
1250	015606	045	116	045	INTACK: .ASCIZ / N AENSURE BACKPI ANE INTERRJPT ACKNOWLEDGE CONTINUITY N /
	015611	101	105	116	
	015614	123	125	122	
	015617	105	040	102	
	015622	101	103	113	
	015625	120	114	101	
	015630	116	105	040	
	015633	111	116	124	
	015636	105	122	122	
	015641	125	120	124	
	015644	040	101	103	
	015647	113	116	117	
	015652	127	114	105	
	015655	104	107	105	
	015660	040	103	117	
	015663	116	124	111	
	015666	116	125	111	
	015671	124	131	045	
	015674	116	000		

GLOBAL TEXT SECTION

1252	015676	045	116	045	INITNG: .ASCIZ /NNAREINITIALIZING IOP 0Z2A. PLEASE WAITNN/
	015701	101	011	056	
	015704	056	056	056	
	015707	122	105	111	
	015712	116	111	124	
	015715	111	101	114	
	015720	111	132	111	
	015723	116	107	040	
	015726	111	117	120	
	015731	040	043	045	
	015734	132	062	045	
	015737	101	056	040	
	015742	040	120	114	
	015745	105	101	123	
	015750	105	040	127	
	015753	101	111	124	
	015756	045	116	045	
	015761	116	000		
1253	015763	045	101	011	INITOK: .ASCIZ /NA INITIALIZATION COMPLETE... STARTING TESTS.NN/
	015766	111	116	111	
	015771	124	111	101	
	015774	114	111	132	
	015777	101	124	111	
	016002	117	116	040	
	016005	103	117	115	
	016010	120	114	105	
	016013	124	105	056	
	016016	056	056	040	
	016021	123	124	101	
	016024	122	124	111	
	016027	116	107	040	
	016032	124	105	123	
	016035	124	123	056	
	016040	045	116	045	
	016043	116	000		
1254	016045	045	101	040	TSTNO: .ASCIZ /NA TA - IOP 0Z2/
	016050	045	124	045	
	016053	101	040	055	
	016056	040	111	117	
	016061	120	040	043	
	016064	045	132	062	
	016067	000			

1255 .EVEN
 1256
 1267
 1268

GLOBAL ERROR REPORT SECTION

```

1277
1278
1279
1280
1281
1282
1283
1284
1285
1286 016070
      016070
1287 016070 013704 002214
1288 016074
      016074 010446
      016076 010246
      016100 012746 014653
      016104 012746 000003
      016110 010600
      016112 104414
      016114 062706 000010
1289 016120 032703 007777
1290 016124 001507
1291 016126 010304
1292 016130 042704 007777
1293 016134 012702 177772
1294 016140 006104
1295 016142 005202
1296 016144 001375
1297
1298 016146 022704 000022
1299 016152 001010
1300 016154
      016154 012746 015532
      016160 012746 000001
      016164 010600
      016166 104415
      016170 062706 000004
1301
1302 016174 022704 000024
1303 016200 001010
1304 016202
      016202 012746 015606
      016206 012746 000001
      016212 010600
      016214 104415
      016216 062706 000004
    
```

.SBTTL GLOBAL ERROR REPORT SECTION

```

***
; THE GLOBAL ERROR REPORT SECTION CONTAINS MESSAGE PRINTING AREAS
; USED BY MORE THAN ONE TEST TO OUTPUT ADDITIONAL ERROR INFORMATION. PRINTB
; (BASIC) AND PRINTX (EXTENDED) CALLS ARE USED TO CALL PRINT SERVICES.
;
    
```

```

      BGNMSG  RTERR
RTERR::
      MOV     IOPNN,R4           ; GET SBC ID SWITCH NUMBER
      PRINTB  #TSTERR,R2,R4     ; PRINT TEST IDENTIFICATION
      MOV     R4,-(SP)
      MOV     R2,-(SP)
      MOV     #TSTERR,-(SP)
      MOV     #3,-(SP)
      MOV     SP,R0
      TRAP   C#PNTB
      ADD     #10,SP
      BIT     #7777,R3           ; CHECK FOR EXTENDED INFO
      BEQ    7$                 ; BRANCH, IF NO EXTENDED INFO
      MOV     R3,R4             ; SAVE ROM TEST # AND ERROR BITS
      BIC    #7777,R4           ; STRIP OFF THE TEST #
      MOV     #-6,R2           ; SETUP COUNTER FOR TEST NUMBER
1$:      ROL     R4               ; PUT TEST NUMBER IN BITS 3 - 0
      INC     R2
      BNE    1$                 ; BRANCH, IF NOT DONE SHIFTING
2$:      CMP     #22,R4           ; IS THE FAILING TEST "TEST #11"?
      BNE    3$                 ; BRANCH, IF NOT TEST 11 (DMA TEST)
      PRINTX  #SLOT              ; PRINT DMA CONTINUITY MESSAGE
      MOV     #SLOT,-(SP)
      MOV     #1,-(SP)
      MOV     SP,R0
      TRAP   C#PNTX
      ADD     #4,SP
3$:      CMP     #24,R4           ; IS THE FAILING TEST "TEST #12"?
      BNE    4$                 ; BRANCH, IF NOT TEST 12 (QIR TEST)
      PRINTX  #INTACK            ; PRINT INTERRUPT ACK CONTINUITY MESSAGE
      MOV     #INTACK,-(SP)
      MOV     #1,-(SP)
      MOV     SP,R0
      TRAP   C#PNTX
      ADD     #4,SP
    
```

GLOBAL ERROR REPORT SECTION

```

1306 016222 062704 002270      4$:  ADD    #T1ADR 2,R4      ; COMPUTE TEST # ASCII STRING ADDRESS
1307 016226 017405 000000      MOV    @R4,R5          ; GET STRING ADDRESS AND PUT IN R5
1308 016232                                PRINTX #ROMSG,R5      ; PRINT "ERROR(S):" MESSAGE
      016232 010546      MOV    R5,(SP)
      016234 012746 014531      MOV    #ROMSG,-(SP)
      016240 012746 000002      MOV    #2,-(SP)
      016244 010600      MOV    SP,R0
      016246 104415      TRAP   C$PNTX
      016250 062706 000006      ADD    #6,SP
1309 016254 011405      MOV    (R4),R5        ; SETUP R5 FOR LATER USE
1310 016256 010304      MOV    R3,R4          ; GET TEST # AND ERROR BITS AGAIN
1311 016260 042704 170000      BIC    #170000,R4    ; STRIP OFF ERROR BITS
1312 016264 012703 000001      MOV    #1,R3         ; SETUP FOR BIT TESTING
1313 016270 012702 000001      MOV    #1,R2         ; SETUP BIT POSITION COUNTER
1314
1315 016274 030304      5$:  BIT    R3,R4          ; CHECK FOR AN ERROR BIT SET
1316 016276 001414      BEQ    6$            ; BR, IF NONE IN THIS POSITION
1317 016300 010201      MOV    R2,R1         ; PUT BIT POSITION COUNT IN R1
1318 016302 006301      ASL    R1            ; MAKE IT WORD ADDRESSABLE
1319 016304 060501      ADD    R5,R1         ; INDEX TO ERROR BIT MESSAGE ADDRESS
1320 016306                                PRINTX #ROMETX,(R1)  ; PRINT ERROR NUMBER AND I.D.
      016306 011146      MOV    (R1),-(SP)
      016310 012746 014556      MOV    #ROMETX,-(SP)
      016314 012746 000002      MOV    #2,-(SP)
      016320 010600      MOV    SP,R0
      016322 104415      TRAP   C$PNTX
      016324 062706 000006      ADD    #6,SP
1321
1322 016330 006303      6$:  ASL    R3            ; SHIFT TO NEXT POSITION..AND
1323 016332 005202      INC    R2            ; INCREMENT BIT POSITION COUNT
1324 016334 020227 000015      CMP    R2,#13.     ; CHECK FOR ALL BITS CHECKED.
1325 016340 001355      BNE    5$            ; BRANCH, IF NOT ALL 12 BITS CHECKED
1326 016342 000410      BR     8$            ; EXIT THE PRINT ROUTINE
1327
1328 016344                                7$:  PRINTX #NOINFO      ; PRINT NO MORE INFO AVAILABLE
      016344 012746 014712      MOV    #NOINFO,-(SP)
      016350 012746 000001      MOV    #1,-(SP)
      016354 010600      MOV    SP,R0
      016356 104415      TRAP   C$PNTX
      016360 062706 000004      ADD    #4,SP
1329 016364                                8$:  ENDMMSG
      016364                                L10002:
      016364 104423      TRAP   C$MSG

```

GLOBAL ERROR REPORT SECTION

1331					
1332	016366				
	016366				
1333	016366				
	016366	010146			
	016370	012746	014500		
	016374	012746	000002		
	016400	010600			
	016402	104414			
	016404	062706	000006		
1334	016410				
	016410				
	016410	104423			
1335					
1336	016412				
	016412				
1337	016412	013704	002214		
1338	016416				
	016416	010446			
	016420	010246			
	016422	012746	014570		
	016426	012746	000003		
	016432	010600			
	016434	104414			
	016436	062706	000010		
1339	016442				
	016442				
	016442	104423			
1340					
1341	016444				
	016444				
1342	016444	013704	002214		
1343	016450				
	016450	010446			
	016452	010246			
	016454	012746	014653		
	016460	012746	000003		
	016464	010600			
	016466	104414			
	016470	062706	000010		
1344	016474				
	016474	010346			
	016476	012746	014556		
	016502	012746	000002		
	016506	010600			
	016510	104415			
	016512	062706	000006		
1345	016516				
	016516				
	016516	104423			

```

BGNMSG  NXM
NXM::
PRINTB  #NOREG,R1
MOV     R1,-(SP)
MOV     #NOREG,(SP)
MOV     #2,-(SP)
MOV     SP,R0
TRAP   C#PNTB
ADD     #6,SP
ENDMSG
L10003:
TRAP   C#MSG
BGNMSG  NRES
NRES::
MOV     IOPNN,R4
PRINTB  #TESTID,R2,R4
MOV     R4,-(SP)
MOV     R2,-(SP)
MOV     #TESTID,-(SP)
MOV     #3,-(SP)
MOV     SP,R0
TRAP   C#PNTB
ADD     #10,SP
ENDMSG
L10004:
TRAP   C#MSG
BGNMSG  GENMSG
GENMSG::
MOV     IOPNN,R4
PRINTB  #TSTERR,R2,R4
MOV     R4,-(SP)
MOV     R2,-(SP)
MOV     #TSTERR,-(SP)
MOV     #3,-(SP)
MOV     SP,R0
TRAP   C#PNTB
ADD     #10,SP
PRINTX  #ROMETX,R3
MOV     R3,-(SP)
MOV     #ROMETX,-(SP)
MOV     #2,-(SP)
MOV     SP,R0
TRAP   C#PNTX
ADD     #6,SP
ENDMSG
L10005:
TRAP   C#MSG
    
```


GLOBAL ERROR REPORT SECTION

1347	016520			BGNMSG	SOFT	
	016520			SOFT::		
1348	016520	013704	002214	MOV	IOPNN,R4	; GET CURRENT IOP NUMBER
1349	016524			PRINTB	#SWITCH,R4	
	016524	010446		MOV	R4,-(SP)	
	016526	012746	015047	MOV	#SWITCH,(SP)	
	016532	012746	000002	MOV	#2,-(SP)	
	016536	010600		MOV	SP,R0	
	016540	104414		TRAP	C#PNTB	
	016542	062706	000006	ADD	#6,SP	
1350	016546			PRINTX	#SETSW	
	016546	012746	015264	MOV	#SETSW,-(SP)	
	016552	012746	000001	MOV	#1,-(SP)	
	016556	010600		MOV	SP,R0	
	016560	104415		TRAP	C#PNTX	
	016562	062706	000004	ADD	#4,SP	
1351	016566			ENDMSG		
	016566			L10006:		
	016566	104423		TRAP	C#MSG	
1352				BGNMSG	CMDERR	
1353	016570			CMDERR::		
	016570			MOV	IOPNN,R4	; GET CURRENT IOP NUMBER
1354	016570	013704	002214	PRINTB	#CMNDR,R4	
1355	016574			MOV	R4,-(SP)	
	016574	010446		MOV	#CMNDR,-(SP)	
	016576	012746	015142	MOV	#2,-(SP)	
	016602	012746	000002	MOV	SP,R0	
	016606	010600		TRAP	C#PNTB	
	016610	104414		ADD	#6,SP	
	016612	062706	000006	ENDMSG		
1356	016616			L10007:		
	016616			TRAP	C#MSG	
	016616	104423		BGNMSG	NONO	
1357				NONO::		
1358	016620			MOV	IOPNN,R4	; GET CURRENT IOP NUMBER
	016620			PRINTB	#NOTCLR,R4	
1359	016620	013704	002214	MOV	R4,-(SP)	
1360	016624			MOV	#NOTCLR,-(SP)	
	016624	010446		MOV	#2,-(SP)	
	016626	012746	015321	MOV	SP,R0	
	016632	012746	000002	TRAP	C#PNTB	
	016636	010600		ADD	#6,SP	
	016640	104414		ENDMSG		
	016642	062706	000006	L10010:		
1361	016646			TRAP	C#MSG	
	016646					
	016646	104423				

GLOBAL ERROR REPORT SECTION

1363					
1364	016650			BGNMSG	TPRDIS
	016650			TPRDIS: :	
1365	016650	013704	002214	MOV	IOPNN,R4 ; GET CURRENT IOP NUMBER
1366	016654			PRINTB	@TPR,R4 ; PRINT TWO PORT RMM DISABLED
	016654	010446		MOV	R4,(SP)
	016656	012746	015377	MOV	@TPR,(SP)
	016662	012746	000002	MOV	@2,-(SP)
	016666	010600		MOV	SP,R0
	016670	104414		TRAP	C\$PNTB
	016672	062706	000006	ADD	@6,SP
1367	016676			PRINTX	@TPR1,R4 ; PRINT CHECK THE LEDS
	016676	010446		MOV	R4,(SP)
	016700	012746	015453	MOV	@TPR1,(SP)
	016704	012746	000002	MOV	@2,-(SP)
	016710	010600		MOV	SP,R0
	016712	104415		TRAP	C\$PNTX
	016714	062706	000006	ADD	@6,SP
1368	016720			ENDMSG	
	016720			L10011:	
	016720	104423		TRAP	C\$MSG
1369					
1370					
1371					
1372					
1373					
1374					
1375					
1376					
1377					
1378					
1379					
1380					
1381	016722	013704	002214	SKIPPED: MOV	IOPNN,R4 ; GET CURRENT IOP NUMBER
1382	016726			PRINTB	@NOTST,R4,R2
	016726	010246		MOV	R2,(SP)
	016730	010446		MOV	R4,-(SP)
	016732	012746	015240	MOV	@NOTST,(SP)
	016736	012746	000003	MOV	@3,-(SP)
	016742	010600		MOV	SP,R0
	016744	104414		TRAP	C\$PNTB
	016746	062706	000010	ADD	@10,SP
1383	016752	000205		RTS	R5 ; RETURN
1384					

GLOBAL SUBROUTINES SECTION

```

1401          SUBTTL GLOBAL SUBROUTINES SECTION
1402
1403          ;**
1404          ; THE GLOBAL SUBROUTINES SECTION CONTAINS THE SUBROUTINES
1405          ; THAT ARE USED IN MORE THAN ONE TEST.
1406          ;
1407
1408          ;**
1409          ;
1410          ; FUNCTIONAL DESCRIPTION:
1411          ;
1412          ;   SUBROUTINE TO DELAY IN MILLISECONDS.
1413          ;
1414          ;   CALL:
1415          ;
1416          ;   JSR      R5,RDELAY
1417          ;   N.
1418          ;
1419          ;
1420          RDELAY: MOV      R1,-(SP)          ; SAVE REGS 1 & 2 ON STACK
1421          MOV      R2,(SP)
1422          MOV      (R5),R2          ; GET MILLISECOND ARGUMENT
1423          MOV      #100.,DELCNT     ; SETUP COUNT FOR 1 MS LOOP
1424
1425          2$:   MOV      DELCNT,R1      ; SETUP R1 FOR 1 MS LOOP
1426          BREAK   TRAP      C$BRK     ; ALLOWS <CTRL C> RECOGNITION
1427          3$:   DEC      R1            ; START OF 1 MS LOOP
1428          BNE     3$              ; BRANCH, IF < 1 MS
1429          DEC      R2              ; DECREMENT MULTIPLIER (WHICH YOU WANT)
1430          BNE     2$              ; DO ANOTHER MS, IF BRANCH
1431          MOV      (SP),R2         ; RESTORE R1 AND R2
1432          MOV      (SP),R1
1433          RTS      R5              ; RETURN

```

GLOBAL SUBROUTINES SECTION

```

1435
1436
1437
1438
1439
1440
1441
1442 017014 013701 002216      CKTPRO: MOV      QBASE,R1      ; GET LSI-11 BASE BUS ADDRESS
1443 017020 004537 016754      JSR      R5,RDELAY          ; DELAY A BIT BEFORE READING TPRO
1444 017024 000372                250.                        ; ABOUT 250 MILLISECONDS
1445 017026 016102 000000      MOV      DPRO(R1),R2        ; READ TPRO
1446 017032 001416                BEQ      1$                  ; BR, IF IOP IS ALL SET FOR TESTING.
1447 017034 004537 017210      JSR      R5,REINIT          ; RE INITIALIZE THE CURRENT IOP
1448 017040 000413                BR       1$                  ; SUCCESS RETURN
1449
1450 017042                ERDF   3,NOTRDY,NONO        ; PRINT DEVICE FATAL
      017042 104455                TRAP   C$ERDF
      017044 000003                .WORD 3
      017046 003264                .WORD NOTRDY
      017050 016620                .WORD NONO
1451 017052                DODU   LUN                  ; DROP THE UNIT FROM TESTING
      017052 013700 002210      MOV      LUN,R0
      017056 104451                TRAP   C$DODU
1452 017060 012737 177777 002206  MOV      #-1,DROPUN         ; SET THE DROPPED UNIT FLAG AND GET OUT
1453 017066                DOCLN C$DOCLN               ; ABORT THE DIAGNOSTIC FOR THIS UNIT
      017066 104444                TRAP
1454
1455 017070 016102 000002      1$:  MOV      DPR1(R1),R2      ; READ BOOT COMMAND STATUS REGISTER
1456 017074 042702 177770      BIC      # 10,R2            ; CLEAR ALL BUT BITS 2 0.
1457 017100 022702 000002      CMP      #002,R2           ; CHECK BOOT SWITCH..IF SET FOR XXDP..
1458                                ; ..COMMAND REGISTER SHOULD = 00000?
1459 017104 001434                BEQ      3$                  ; BR, IF THE SWITCH IS CORRECT
1460 017106 004537 017210      JSR      R5,REINIT          ; RE INITIALIZE THE CURRENT IOP
1461 017112 000431                BR       3$                  ; SUCCESS RETURN

```

GLOBAL SUBROUTINES SECTION

```

1463
1464 017114 016102 000002      MOV     DPR1(R1),R2      ; READ BOOT COMMAND STATUS REGISTER
1465 017120 001413           BEQ     2$              ; BR. IF TPR IS DISABLED (ERROR)
1466 017122           ERRSOFT 1,BADSW,SOFT ; SOFT ERROR. PRINT IT, AND THEN
      017122 104457          TRAP   C$ERSOFT
      017124 000001          .WORD  1
      017126 003151          .WORD  BADSW
      017130 016520          .WORD  SOFT
1467 017132           DODU    LUN              ; DROP THIS UNIT
      017132 013700 002210   MOV     LUN,R0
      017136 104451          TRAP   C$DODU
1468 017140 012737 177777 002206  MOV     *-1,DROPUN      ; SET DROPPED UNIT FLAG
1469 017146           DOCLN  C$DCLN      ; ABORT THE DIAGNOSTIC FOR THIS UNIT
      017146 104444          TRAP   C$DCLN
1470
1471 017150           2$:   ERRDF  4,NOTPR,TPRDIS ; FATAL ERROR. TPR IS DISABLED
      017150 104455          TRAP   C$ERDF
      017152 000004          .WORD  4
      017154 003353          .WORD  NOTPR
      017156 016650          .WORD  TPRDIS
1472 017160           DODU    LUN              ; DROP THIS UNIT
      017160 013700 002210   MOV     LUN,R0
      017164 104451          TRAP   C$DODU
1473 017166 012737 177777 002206  MOV     *-1,DROPUN      ; SET DROPPED UNIT FLAG
1474 017174           DOCLN  C$DCLN      ; ABORT THE DIAGNOSTIC FOR THIS UNIT
      017174 104444          TRAP   C$DCLN
1475
1476 017176 005061 000004       3$:   CLR     DPR2(R1)      ; CLEAR SELFTEST ERROR REGISTER
1477 017202 005061 000006       CLR     DPR3(R1)      ; CLEAR SELFTEST EXTENDED ERROR REGISTER
1478 017206 000205       4$:   RTS     R5              ; EXIT

```

GLOBAL SUBROUTINES SECTION

```

1480
1481
1482      ;**
1483      ;
1484      ; SUBROUTINE REINIT
1485      ;
1486      ; CALLED WHENEVER TPRO OR TPR1 ARE NOT SETUP PROPERLY.
1487      ;
1488      ; CALL: JSR R5,REINIT
1489      ;
1490      ; RETURN: RETURN+4 IF ERROR IN INITIALIZING
1491      ;         RETURN+2 IF SUCCESSFUL INITIALIZATION
1492      ;--
1493 017210 013704 002214 REINIT: MOV IOPNN,R4 ; GET CURRENT IOP NUMBER
1494 017214 013701 002216      MOV QBASE,R1 ; GET Q BUS BASE ADDRESS
1495 017220      PRINTF @INITNG,R4 ; PRINT "...RE INITIALIZING"
      017220 010446      MOV R4,-(SP)
      017222 012746 015676      MOV @INITNG,-(SP)
      017226 012746 000002      MOV @2,-(SP)
      017232 010600      MOV SP,R0
      017234 104417      TRAP C$PNTF
      017236 062706 000006      ADD @6,SP
1496 017242 012761 000010 000006      MOV @10,DPR3(R1) ; SETUP SOFTWARE BOOTSELECT CODE
1497 017250 012761 000004 000000      MOV @4,DPRO(R1) ; SEND INITIALIZE COMMAND
1498 017256 004537 016754      JSR R5,RDELAY ; DELAY ABOUT 5 SECONDS
1499 017262 013560      6000.
1500 017264 016102 000000      MOV DPRO(R1),R2 ; READ TPRO
1501 017270 001402      BEQ 2$ ; TPRO SHOULD NOW BE ALL 0'S
1502
1503 017272 005725      1$: TST (R5)+ ; SETUP FOR ERROR RETURN
1504 017274 000205      RTS R5 ; ERROR RETURN
1505
1506 017276 016102 000002      2$: MOV DPR1(R1),R2 ; READ TPR1
1507 017302 042702 177770      BIC @-10,R2 ; CLEAR ALL BUT BITS 2-0.
1508 017306 022702 000002      CMP @2,R2 ; TPR1 SHOULD SAY Q-BUS TESTING MODE.
1509 017312 001367      BNE 1$ ; BRANCH, IF NOT SETUP FOR XXDP+ (ERROR)
1510 017314      PRINTF @INITOK ; PRINT "INITIALIZATION COMPLETE..."
      017314 012746 015763      MOV @INITOK,-(SP)
      017320 012746 000001      MOV @1,-(SP)
      017324 010600      MOV SP,R0
      017326 104417      TRAP C$PNTF
      017330 062706 000004      ADD @4,SP
1511 017334 000205      RTS R5 ; SUCCESS RETURN

```

GLOBAL SUBROUTINES SECTION

```

1513
1514
1515
1516
1517
1518
1519
1520
1521
1522
1523
1524 017336
017336 104421
017340 010004
1525 017342 032704 001000
1526 017346 001414
1527 017350 013704 002214
1528 017354
017354 010446
017356 010246
017360 012746 016045
017364 012746 000003
017370 010600
017372 104417
017374 062706 000010
1529 017400 000205
1530

```

```

; **
;
; SUBROUTINE TO APPEND TEST TITLES TO TEST NUMBER IF
; OPERATOR HAS SET THE "PNT" FLAG AT START TIME.
;
; CALL:  MOV   #STRING,R2      ; TEST TITLE ADDRESS
;        JSR   R5,PNTFLG
;
; --
PNTFLG: RFLAGS  R4              ; READ DRS FLAGS
        TRAP  C$RFLA
        MOV   R0,R4
        BIT   #BIT9,R4        ; CHECK DRS BIT 9 FLAG (PNT)
        BEQ   1$              ; RETURN, IF PNT NOT SET
        MOV   1OPNN,R4        ; GET CURRENT IOP NUMBER
        PRINTF #TSTNO,R2,R4   ; PRINT TITLE, IOP # AFTER TEST NUMBER
        MOV   R4,-(SP)
        MOV   R2,-(SP)
        MOV   #TSTNO,-(SP)
        MOV   #3,-(SP)
        MOV   SP,R0
        TRAP  C$PNTF
        ADD   #10,SP
1$:     RTS   R5              ; RETURN TO TEST

```

GLOBAL SUBROUTINES SECTION

1532
1534
1545
1552
1558
1565
1571
1579
1588
1595
1601
1602
1608
1609
1610
1611
1612
1613
1614
1615 017402
017402
1616
1628
1640
1641
1642
1643 017402
017402
017402 104425

.TITLE MISCELLANEOUS SECTIONS
.SBTTL IDENTIFICATION
.SBTTL REPORT CODING SECTION

: THE REPORT CODING SECTION CONTAINS THE
: "PRINTS" CALLS THAT GENERATE STATISTICAL REPORTS.
:

BGNRPT
L\$RPT::

.EVEN

ENDRPT
L10012: TRAP C\$RPT

PROTECTION TABLE

1645
1646
1647
1648
1649
1650
1651
1652
1653
1654
1655
1656
1657
1658
1659

017404
017404
017404 177777
017406 177777
017410 177777
017412

.SBTTL PROTECTION TABLE

; THIS TABLE IS USED BY THE RUNTIME SERVICES
; TO PROTECT THE LOAD MEDIA.
;

BGNPROT
L\$PROT::

1
-1
1

;OFFSET INTO P TABLE FOR CSR ADDRESS
;OFFSET INTO P-TABLE FOR MASSBUS ADDRESS
;OFFSET INTO P TABLE FOR DRIVE NUMBER

ENDPROT

INITIALIZE SECTION

.SBTTL INITIALIZE SECTION

```

;
; THE INITIALIZE SECTION CONTAINS THE CODING THAT IS PERFORMED
; AT THE BEGINNING OF EACH PASS.
;

```

```

1674
1675
1676
1677
1678
1679
1680
1681 017412          BGNINIT
      017412          L$INIT::
1682
1706
1707 017412          SETVEC  #140,#170000,#340      ;ODT ROM ADDRESS
      017412 012746 000340      MOV      #340,-(SP)
      017416 012746 170000      MOV      #170000,(SP)
      017422 012746 000140      MOV      #140,-(SP)
      017426 012746 000003      MOV      #3,-(SP)
      017432 104437          TRAP    C$SVEC
      017434 062706 000010      ADD      #10,SP
1708
1709 017440          READEF  #EF.CONTINUE      ; CHECK FOR CONTINUED
      017440 012700 000036      MOV      #EF.CONTINUE,RO
      017444 104447          TRAP    C$REFG
1710 017446          BCOMPLETE      END          ; BRANCH, IF CONTINUED.
      017446 103517          BCS     END
1711
1712 017450 005037 002206      CLR      DROPUN      ; CLEAR THE DROPPED IOP FLAG
1713 017454          READEF  #EF.PWR          ; CHECK FOR POWER FAIL RESTART
      017454 012700 000034      MOV      #EF.PWR,RO
      017460 104447          TRAP    C$REFG
1714 017462          BCOMPLETE      ABORT      ; ABORT NO SENSE TRYING TO GO ON.
      017462 103510          BCS     ABORT
1715 017464          READEF  #EF.NEW          ; CHECK FOR THIS PASS BEING A FIRST
      017464 012700 000035      MOV      #EF.NEW,RO
      017470 104447          TRAP    C$REFG
1716 017472          BNCOMPLETE      NEXT      ; BRANCH, IF NOT FIRST PASS
      017472 103011          BCC     NEXT
1717 017474 013737 002120 002242      MOV      L$HIME,HIMEM      ; GET HIGHEST 4KW PAGE FROM DRS.
1718 017502 162737 000577 002242      SUB      #577,HIMEM      ; ADJUST IT TO = START OF PAGE BEFORE..
1719
1720 017510 012737 177777 002210      MOV      #-1,LUN          ; ...THE I/O PAGE.
1721
1722 017516 005237 002210          ; SETUP UNIT NUMBER FOR #0 MINUS 1
1723 017522 023737 002210 002012      NEXT: INC      LUN          ; INCREMENT IOP CPU NUMBER
1724 017530 001465          CMP      LUN,L$UNIT      ; CHECK CURRENT AS LAST UNIT + 1
1725 017532          BEQ      ABORT      ; BRANCH, IF DONE ALL IOPS.
      017532 013700 002210      GPHARD  LUN,R1          ; GET HW P TABLE ADDRESS
      017536 104442          MOV      LUN,RO
      017540 010001          TRAP    C$GPHRD
      017540 010001          MOV      RO,R1
1726 017542          BNCOMPLETE      NEXT      ; BRANCH, IF NO PTABLE FOR THIS LUN
      017542 103365          BCC     NEXT

```

; JB REV A C

INITIALIZE SECTION

```

1728 017544 012137 002212          MOV      (R1)+,IOPN          ; GET IOP CPU NUMBER
1729 017550 001455                BEQ      ABORT              ; BRANCH, IF THIS IS UNIT 0.
1730 017552 013737 002212 002214  MOV      IOPN,IOPNN        ; SAVE FOR PRINTOUTS
1731 017560 012702 177773          MOV      #-5,R2            ; SETUP SHIFT COUNTER
1732
1733 017564 006237 002214          1$:     ASR      IOPNN        ; SHIFT 5 RIGHT FOR PRINTOUTS
1734 017570 005202                INC      R2
1735 017572 001374                BNE     1$                  ; BRANCH, IF NOT DONE SHIFTING
1736 017574 023727 002212 000340  CMP      IOPN,#340         ; SEE IF IOP NO. IS GREATER THAN 7
1737 017602 003004                BGT     2$                  ; BRANCH IF NO. IS 8 OR MORE
1738 017604 012737 160000 002216  MOV      #160000,QBASE    ; SET BASE ADDRESS FOR UNITS 0-7
1739 017612 000406                BR      3$                  ; THEN ADD IN IOP NUMBER
1740
1741 017614 012737 175400 002216  2$:     MOV      #175400,QBASE ; SET BASE ADDRESS TO UNITS 8-15
1742 017622 042737 000400 002212  BIC      #400,IOPN        ; CLEAR BIT 8 OF NUMBER INPUT
1743
1744 017630 063737 002212 002216  3$:     ADD      IOPN,QBASE       ; COMBINE IOP # AND BASE ADDRESS
1745 017636 005721                TST     (R1)+              ; CHECK IF HIGH OR LOW RANGE WANTED
1746 017640 001003                BNE     4$                  ; BRANCH, IF LOW RANGE WANTED
1747 017642 062737 002000 002216  ADD      #BIT10,QBASE     ; ADD IN 2000 TO GET HIGH RANGE
1748
1749 017650 012137 002222          4$:     MOV      (R1)+,LOOPB1     ; GET LOOP CONN FLAG FOR SLU1
1750 017654 012137 002224          MOV      (R1)+,LOOPB2     ; GET LOOP CONN FLAG FOR SLU2 CHANNEL A
1751 017660 012137 002226          MOV      (R1)+,LOOPB3     ; GET LOOP CONN FLAG FOR CHANNEL B
1752 017664 012137 002230          MOV      (R1)+,LOOPB4     ; GET LOOP CONN FLAG FOR PARALLEL I/O
1753 017670 012137 002232          MOV      (R1)+,SL2DMA     ; GET SLU2 DMA CONFIGURATION
1754 017674 011137 002234          MOV      (R1),ROMTST      ; GET FLAG FOR USER ROM TEST
1755 017700                EXIT     INIT              ; EXIT THE INIT CODE
      017700 104432          TRAP    C$EXIT
      017702 000004          .WORD  L10014-.
1756
1757 017704                ABORT:  DOCLN              ; EXECUTE CLEANUP CODE
      017704 104444          TRAP    C$DOCLN
1758 017706                END:
1759
1771
1772 017706                ENDINIT
      017706                L10014:
      017706 104411          TRAP    C$INIT

```

AUTODROP SECTION

```

1774 .SBTTL AUTODROP SECTION
1775
1776 ;**
1777 ; THIS CODE IS EXECUTED IMMEDIATELY AFTER THE INITIALIZE CODE IF
1778 ; THE "ADR" FLAG WAS SET. THE UNIT(S) UNDER TEST ARE CHECKED TO
1779 ; SEE IF THEY WILL RESPOND. THOSE THAT DON'T ARE IMMEDIATELY
1780 ; DROPPED FROM TESTING.
1781 ;--
1782
1783 017710 BGNAUTO
017710 L$AUTO::
1784
1791 ; THIS SECTION IS NOT USED. RUN XXDP* TEST 1 TO CHECK FOR RESPONSE.
1792
1793 017710 PRINTF #NOSEC
017710 012746 017732 MOV #NOSEC,-(SP)
017714 012746 000001 MOV #1,-(SP)
017720 010600 MOV SP,RO
017722 104417 TRAP C$PNTF
017724 062706 000004 ADD #4,SP
1794
1795 017730 ENDAUTO
017730 L10015:
017730 104461 TRAP C$AUTO
1796
1797 017732 045 116 045 NOSEC: .ASCIZ /#N#A"ADR" SWITCH NOT SUPPORTED. RUN TEST 1 FOR RESPONSE CHECK.#N/
017735 101 042 101
017740 104 122 042
017743 040 123 127
017746 111 124 103
017751 110 040 116
017754 117 124 040
017757 123 125 120
017762 120 117 122
017765 124 105 104
017770 056 040 040
017773 122 125 116
017776 040 124 105
020001 123 124 040
020004 061 040 106
020007 117 122 040
020012 122 105 123
020015 120 117 116
020020 123 105 040
020023 103 110 105
020026 103 113 056
020031 045 116 000

```

CLEANUP CODING SECTION

1799
 1800
 1801
 1802
 1803
 1804
 1805
 1806 020034
 020034
 1807
 1816
 1817 020034
 020034 104432
 020036 000002
 1818
 1830
 1831
 1832
 1833 020040
 020040
 020040 104412

```

.SBTTL CLEANUP CODING SECTION
; **
; THE CLEANUP CODING SECTION CONTAINS THE CODING THAT IS PERFORMED
; AFTER THE HARDWARE TESTS HAVE BEEN PERFORMED.
; -

                  BGNCLN
L$CLEAN::

                  EXIT      CLN
                  TRAP     C$EXIT
                  .WORD    L10016 .

                  .EVEN

                  ENDCLN
L10016:          TRAP      C$CLEAN

```

DROP UNIT SECTION

1835
 1836
 1837
 1838
 1839
 1840
 1841
 1842 020042
 020042
 1843
 1844 020042 013701 002214
 1845 020046
 020046 010146
 020050 012746 014772
 020054 012746 000002
 020060 010600
 020062 104417
 020064 062706 000000
 1846
 1847 020070
 020070 000167
 020072 000000
 1848
 1860
 1861
 1862
 1863 020074
 020074
 020074 104453

```
.SBTTL DROP UNIT SECTION
; **
; THE DROP UNIT SECTION CONTAINS THE CODING THAT CAUSES A DEVICE
; TO NO LONGER BE TESTED.
;
L$DU: BGNDU
L$DU:
MOV IOPNN,R1 ; GET IOP NUMBER
PRINTF #DROP,R1 ; PRINT IOP #N DROPPED
MOV R1,-(SP)
MOV #DROP,-(SP)
MOV #2,-(SP)
MOV SP,R0
TRAP C$PNTF
ADD #6,SP

EXIT DU
.WORD J$JMP
.WORD L10017-2 .

.EVEN
ENDDU
L10017: TRAP C$DU
```

ADD UNIT SECTION

1865
 1866
 1867
 1868
 1869
 1870
 1871
 1872
 1873 020076
 020076
 1874
 1883
 1884 020076
 020076 000167
 020100 000000
 1885
 1897
 1898
 1899
 1900 020102
 020102
 020102 104452
 1901

```

.BTTL ADD UNIT SECTION
;
; THE ADD UNIT SECTION CONTAINS ANY CODE THE PROGRAMMER WISHES
; TO BE EXECUTED IN CONJUNCTION WITH THE ADDING OF A UNIT BACK
; TO THE TEST CYCLE.
;
      BGNAU
L$AU::
      EXIT  AU
      .WORD JSJMP
      .WORD L10020 2 .
      .EVEN
      ENDAU
L10020:
      TRAP  C$AU

```

ADD UNIT SECTION

```

1903 .TITLE HARDWARE TESTS
1904 .SBTTL IDENTIFICATION
1910
1911
1912 .SBTTL TEST 1: VERIFY THAT THE IOP(S) IS ADDRESSABLE
1913
1914
1915 ;
1916 ; THE CURRENT IOP IS CHECKED FOR BEING PRESENT ON THE Q BUS BY REFERENCING
1917 ; ITS I/O PAGE ADDRESS. THE I/O ADDRESS IS THE LSI-11 BUS BASE ADDRESS PLUS
1918 ; THE IOP NUMBER. AN NXM WILL OCCUR IF THE IOP IS NOT PRESENT.
1919 ;
1920
1921 NXMVEC=4
1922
1923 020104 BGNTST
1924 020104 012702 004663 MOV #TST1,R2 ; GET TITLE ADDRESS
1925 020110 004537 017336 JSR R5,PNTFLG ; SEE IF PNT FLAG IS SET
1926 020114 012746 000300 ;1$: SETVEC #NXMVEC,#3#,#PRI07 ; SETUP NXM VECTOR ; B REV A 0
1927 020114 012746 020170 ;2$: SETVEC #NXMVEC,#3#,#PRI06 ; SETUP NXM VECTOR ; B REV A 0
1928 020120 012746 000004 MOV #PRI06,(SP)
1929 020124 012746 000003 MOV #3,-(SP)
1930 020130 012746 000003 MOV #NXMVEC,-(SP)
1931 020134 104437 TRAP C$SVEC
1932 020136 062706 000010 ADD #10,SP
1933 020142 012702 177760 MOV #-20,R2 ; SETUP TPR REGISTER COUNTER
1934 020146 013701 002216 MOV QBASE,R1 ; IOP BASE ADDRESS TO R1
1935
1936
1937 2$: SETPRI #PRI00 ; LOWER PRIORITY FOR NXM
1938 020152 012700 000000 MOV #PRI00,R0
1939 020156 104441 TRAP C$SPRI
1940 020160 005721 TST (R1) ; REFERENCE AN IOP REGISTER
1941 020162 005202 INC R2 ; INCR. COUNTER...NO NXM AS YET
1942 020164 001372 BNE 2$ ; BRANCH, IF NOT DONE
1943 020166 000414 BR 4$ ; ALL REGISTERS ARE THERE.
1944
1945 ; A NXM INTERRUPT WILL END UP HERE FROM THE TRAP TO 4.
1946
1947 3$: CMP (SP),(SP) ; FIX THE STACK, SINCE NO RTI ISSUED
1948 020170 022626 ERDF 1,NOIOP,NXM ; FATAL DEVICE ERROR
1949 020172 104455 TRAP C$ERDF
1950 020174 000001 .WORD 1
1951 020176 002756 .WORD NOIOP
1952 020200 016366 .WORD NXM
1953
1954 DODU LUN ; DROP THIS IOP
1955 020202 013700 002210 MOV LUN,R0
1956 020206 104451 TRAP C$DODU
1957 1941 020210 012737 177777 002206 MOV #-1,DROPUN ; SET DROPPED UNIT FLAG
1958 1942 020216 DOCLN ; EXIT TEST
1959 020216 104444 TRAP C$DOCLN

```


TEST 1: VERIFY THAT THE IOP(S) IS ADDRESSABLE

```

1944
1945      ;
1946      ; NOW MAKE SURE BOOT/SELFTEST SWITCH IS SET PROPERLY.
1947      ;
1948 020220 004537 017210      4$:   JSR      R5,REINIT      ; INITIALIZE THE CURRENT IOP
1949 020224 000240              NOP      ; NORMALLY A SUCCESS RETURN...WE DON'T
1950                                ; CARE IN THIS CASE.
1951 020226 004537 017014              JSR      R5,CKTPRO      ; NOW SEE IF THE IOP IS READY
1952
1953 020232              5$:   CKLOOP
1954 020232 104406          TRAP      C$CLP1      ; CHECK FOR LOOP ON TEST
1955 020234 012700 000004      CLRVEC  @NXMVEC      ; CLEAR AND RESTORE NXM VECTOR
1956 020240 104436          MOV       @NXMVEC,R0
1957 020242              TRAP      C$CVEC
1958 020242              ENDTST      ; DONE
1959 020242 104401      L10021:  TRAP      C$ETST

```


TEST 2: INVOKE ROM RESIDENT TEST OF THE KXT11 S CSR REGS.

```

1996
1997
1998
1999
2000
2001 020362 016102 000002      4$:  MOV    DPR1(R1),R2      ; READ BOOT COMMAND STATUS REGISTER
2002 020366 100005              BPL    5$                ; BR, IF NO COMMAND STATUS ERROR
2003 020370              ERRHRD  3,CMND,CMDERR    ; ERROR. BOOT CODE DIDN'T LIKE THE COMMAND
      020370 104456              TRAP  C$ERRHRD
      020372 000003              .WORD 3
      020374 003221              .WORD CMND
      020376 016570              .WORD CMDERR
2004 020400 000420              BR     6$                ; EXIT TEST
2005
2006 020402 016102 000004      5$:  MOV    DPR2(R1),R2      ; READ IOP DPR2
2007 020406 033702 002244      BIT    CSR,R2            ; CHECK FOR ERROR IN CSR TEST
2008 020412 001413              BEQ    6$                ; BRANCH, IF SUCCESSFUL TEST
2009 020414 043761 002244 000004 BIC    CSR,DPR2(R1)      ; CLEAR THE ERROR BIT FOR THIS TIME.
2010 020422 016103 000006      MOV    DPR3(R1),R3      ; READ DPR3 FOR EXTENDED INFO
2011 020426 012702 004145      MOV    @CSRT,R2         ; ERROR MESSAGE POINTER
2012 020432              ERRHRD  4,ROMD,RTERR    ; CSR TEST FAILED
      020432 104456              TRAP  C$ERRHRD
      020434 000004              .WORD 4
      020436 003112              .WORD ROMD
      020440 016070              .WORD RTERR
2013
2014 020442              6$:  CKLOOP                ; CHECK FOR LOOP ON TEST
      020442 104406              TRAP  C$CLP1
2015
2016 020444              ENDTST
      020444              L10022:
      020444 104401              TRAP  C$ETST
    
```


TEST 3: INVOKE ROM TEST OF THE IOP 16KW LOCAL RAM

```

2055
2056
2057      ;
2058      ; TO HERE IF TEST COMPLETED, AND CHECK DPR2 FOR SUCCESS/FAILURE.
2059      ;
2060 020564 016102 000002      4$:      MOV      DPR1(R1),R2      ; READ BOOT COMMAND STATUS REGISTER
2061 020570 100005      BPL      5$      ; BR, IF NO COMMAND STATUS ERROR
2062 020572      ERRHRD 6,CMND,CMDERR      ; ERROR. BOOT CODE DIDN'T LIKE THE COMMAND
      020572 104456      TRAP     C$FRHRD
      020574 000006      .WORD   6
      020576 003221      .WORD   CMND
      020600 016570      .WORD   CMDERR
2063 020602 000427      BR       6$      ; EXIT TEST
2064
2065 020604 016102 000004      5$:      MOV      DPR2(R1),R2      ; READ IOP DPR2
2066 020610 033702 002246      BIT      RAM,R2      ; CHECK FOR ERROR IN RAM TEST
2067 020614 001422      BEQ     6$      ; BRANCH, IF SUCCESSFUL TEST
2068 020616 043761 002246 000004      BIC     RAM,DPR2(R1)      ; CLEAR THE ERROR BIT FOR THIS TIME.
2069 020624 016103 000006      MOV     DPR3(R1),R3      ; READ DPR3 FOR EXTENDED INFO
2070 020630 012702 004151      MOV     @RAMT,R2      ; ERROR MESSAGE POINTER
2071 020634      ERRDF 7,ROMD,RTERR      ; RAM TEST FAILED
      020634 104455      TRAP     C$ERDF
      020636 000007      .WORD   7
      020640 003112      .WORD   ROMD
      020642 016070      .WORD   RTERR
2072 020644      DODU  LUN      ; DROP THIS UNIT 'CAUSE OF FATAL ERROR
      020644 013700 002210      MOV     LUN,R0
      020650 104451      TRAP     C$DODU
2073 020652 012737 177777 002206      MOV     #-1,DROPUN      ; SET DROPPED UNIT FLAG
2074 020660      DOCLN      ; ABORT THE DIAGNOSTIC FOR THIS UNIT
      020660 104444      TRAP     C$DCLN
2075
2076 020662      6$:      CKLOOP      ; CHECK FOR LOOP ON TEST
      020662 104406      TRAP     C$CLP1
2077
2078 020664      ENDTST
      020664      L10023:
      020634 104401      TRAP     C$ETST

```

TEST 3: INVOKE ROM TEST OF THE IOP 16KW LOCAL RAM

```

2080
2081
2082          .SBTTL TEST 4: INVOKE THE BOOT/SELFTEST CHECKSUM TEST
2083
2084          :
2085          :
2086          :           IOP SELFTEST #3.
2087          :
2088          : THE ROM TEST OF THE BOOT/SELFTEST ROM WILL BE INVOKED. THE USER ROM
2089          : WILL BE TESTED HERE IF SO INDICATED BY THE OPERATOR.
2090          :
2091          :
2092
2093 020666          BGNTST
2094
2095 020666 012702 004767          MOV          #ROMT3,R2          ; GET TITLE ADDRESS
2096 020672 004537 017336          JSR          R5,PNTFLG          ; SEE IF PNT FLAG IS SET
2097 020676 005737 002206          TST          DROPUN          ; CHECK THIS UNIT FOR BEING DROPPED
2098 020702 001401          BEQ          1$          ; BRANCH, IF NOT DROPPED
2099 020704          DOCLN          ; ABORT THE DIAGNOSTIC FOR THIS UNIT
          020704 104444          TRAP         C$DCLN
2100
2101 020706 004537 017014          1$: JSR          R5,CKTPRO          ; SEE IF THE CURRENT IOP IS READY
2102 020712 013701 002216          MOV          QBASE,R1          ; R1 = IOP BASE ADDRESS
2103 020716 005737 002234          TST          ROMTST          ; CHECK IF USER ROM IS TO BE TESTED
2104 020722 001403          BEQ          2$          ; BRANCH, IF NOT
2105 020724 012761 177777 000006          MOV          #-1,DPR3(R1)          ; DPR 3 MUST BE NON-0 FOR USER ROM...
2106          ; ...TO BE TESTED
2107 020732 013761 002250 000000 2$: MOV          ROM,DPRO(R1)          ; SEND COMMAND TO DPRO
2108 020740 012704 140000          MOV          #140000,R4          ; R4 WILL BE USED AS A COUNTER
2109 020744 005761 000000          3$: TST          DPRO(R1)          ; TEST THE IOP'S DPRO REG.
2110 020750 001423          BEQ          5$          ; BRANCH, IF THE TEST HAS COMPLETED
2111 020752 004537 016754          JSR          R5,RDELAY          ; DELAY ABOUT 1 MS
2112 020756 000001          1
2113 020760 005204          INC          R4          ; ERROR, IF R4 WRAPS TO 0
2114 020762 001370          BNE          3$          ; ERROR, IF NO BRANCH
2115 020764 012702 004170          MOV          #ROMT,R2          ; SETUP FOR ERROR REPORTING
2116 020770          ERRDF          10,NORES,NRES          ; FATAL ERROR. NO RESPONSE FROM TEST.
          020770 104455          TRAP         C$ERDF
          020772 000012          .WORD        10
          020774 003054          .WORD        NORES
          020776 016412          .WORD        NRES
2117 021000          CKLOOP          ; CHECK FOR LOOP ON TEST
          021000 104406          TRAP         C$CLP1
2118 021002          DODU          LUN          ; DROP THIS UNIT
          021002 013700 002210          MOV          LUN,R0
          021006 104451          TRAP         C$DODU
2119 021010 012737 177777 002206          MOV          #-1,DROPUN          ; SET DROPPED UNIT FLAG.
2120 021016          DOCLN          ; ABORT THE DIAGNOSTIC FOR THIS UNIT
          021016 104444          TRAP         C$DCLN

```

TEST 4: INVOKE THE BOOT SELFTEST CHECKSUM TEST

```

2122
2123
2124      ; TO HERE IF TEST COMPLETED, AND CHECK DPR2 FOR SUCCESS/FAILURE.
2125      ;
2126
2127 021020 016102 000002      5$:   MOV     DPR1(R1),R2      ; READ BOOT COMMAND STATUS REGISTER
2128 021024 100005           BPL     6$              ; BR, IF NO COMMAND STATUS ERROR
2129 021026      104456      ERRHRD  11,CMND,CMDERR ; ERROR. BOOT CODE DIDN'T LIKE THE COMMAND
                                TRAP   C$ERRHRD
                                .WORD  11
                                .WORD  CMND
                                .WORD  CMDERR
2130 021036 000427           BR      7$              ; EXIT TEST
2131
2132 021040 016102 000004      6$:   MOV     DPR2(R1),R2      ; READ IOP DPR2
2133 021044 033702 002250     BIT     ROM,R2          ; CHECK FOR ERROR IN ROM TEST
2134 021050 001422           BEQ     7$              ; BRANCH, IF SUCCESSFUL TEST
2135 021052 043761 002250 000004 BIC     ROM,DPR2(R1)    ; CLEAR THE ERROR BIT FOR THIS TIME.
2136 021060 016103 000006     MOV     DPR3(R1),R3    ; READ DPR3 FOR EXTENDED INFO
2137 021064 012702 004170     MOV     #ROMT,R2      ; ERROR MESSAGE POINTER
2138 021070      104455      ERDF   12,ROMD,RTERR   ; ROM TEST FAILED
                                TRAP   C$ERDF
                                .WORD  12
                                .WORD  ROMD
                                .WORD  RTERR
2139 021100      013700 002210     DODU   LUN              ; FATAL ERROR. DROP THIS UNIT
                                MOV     LUN,RO
                                TRAP   C$DODU
2140 021106 012737 177777 002206     MOV     #-1,DROPUN    ; SET DROPPED UNIT FLAG
2141 021114      104444      DOCLN  ; ABORT THE DIAGNOSTIC FOR THIS UNIT
                                TRAP   C$DCLN
2142
2143 021116      104406      7$:   CKLOOP ; CHECK FOR LOOP ON TEST
                                TRAP   C$CLP1
2144
2145      021120           ENDTST
                                L10024: TRAP  C$ETST
                                021120 104401

```

TEST 4: INVOKE THE BOOT/SELFTEST CHECKSUM TEST

```

2147
2148 .SBTTL TEST 5: IOP CPU INSTRUCTION TEST
2149
2150 ;**
2151 ;
2152 ; IOP SELFTEST #4.
2153 ;
2154 ; INVOKE THE IOP T11 INSTRUCTION TEST.
2155 ;
2156 ;-
2157
2158 021122 BGNTST
2159
2160 021122 012702 005023 MOV #ROMT4,R2 ; GET TITLE ADDRESS
2161 021126 004537 017336 JSR R5,PNTFLG ; SEE IF PNT FLAG IS SET
2162 021132 005737 002206 TST DROPUN ; CHECK THIS UNIT FOR BEING DROPPED
2163 021136 001401 BEQ 1$ ; BRANCH, IF NOT DROPPED
2164 021140 DOCLN ; ABORT THE DIAGNOSTIC FOR THIS UNIT
021140 104444 TRAP C$DCLN
2165
2166 021142 004537 017014 1$: JSR R5,CKTPRO ; SEE IF THE CURRENT IOP IS READY
2167 021146 013701 002216 MOV QBASE,R1 ; R1 = IOP BASE ADDRESS
2168 021152 013761 002252 000000 MOV CPU,DPRO(R1) ; SEND COMMAND TO DPRO
2169
2170 021160 012704 140000 MOV #140000,R4 ; R4 WILL BE USED AS A COUNTER
2171 021164 005761 000000 2$: TST DPRO(R1) ; TEST THE IOP'S DPRO REG.
2172 021170 001423 BEQ 4$ ; BRANCH, IF THE TEST HAS COMPLETED
2173 021172 004537 016754 JSR R5,RDELAY ; DELAY ABOUT 1 MS
2174 021176 000001 1
2175 021200 005204 INC R4 ; ERROR, IF R4 WRAPS TO 0
2176 021202 001370 BNE 2$ ; ERROR, IF NO BRANCH
2177 021204 012702 004643 MOV #CPUT,R2 ; SETUP FOR ERROR REPORTING.
2178 021210 ERRDF 13,NORES,NRES ; FATAL ERROR. NO RESPONSE FROM TEST.
021210 104455 TRAP C$ERDF
021212 000015 .WORD 13
021214 003054 .WORD NORES
021216 016412 .WORD NRES
2179 021220 CKLOOP ; CHECK FOR LOOP ON TEST
021220 104406 TRAP C$CLP1
2180 021222 DODU LUN ; DROP THIS UNIT
021222 013700 002210 MOV LUN,R0
021226 104451 TRAP C$DODU
2181 021230 012737 177777 002206 MOV #-1,DROPUN ; SET DROPPED UNIT FLAG.
2182 021236 DOCLN ; ABORT THE DIAGNOSTIC FOR THIS UNIT
021236 104444 TRAP C$DCLN

```


TEST 5: IOP CPU INSTRUCTION TEST

```

2184
2185
2186      ;
2187      ; TO HERE IF TEST COMPLETED, AND CHECK DPR2 FOR SUCCESS/FAILURE.
2188      ;
2189 021240 016102 000002      4$:   MOV     DPR1(R1),R2      ; READ BOOT COMMAND STATUS REGISTER
2190 021244 100005           BPL     5$              ; BR, IF NO COMMAND STATUS ERROR
2191 021246           ERRHRD 14,CMND,CMDERR ; ERROR. BOOT CODE DIDN'T LIKE THE COMMAND
      021246 104456           TRAP   C$ERRHRD
      021250 000016           .WORD 14
      021252 003221           .WORD CMND
      021254 016570           .WORD CMDERR
2192 021256 000427           BR     6$              ; EXIT TEST
2193
2194 021260 016102 000004      5$:   MOV     DPR2(R1),R2      ; READ IOP DPR2
2195 021264 033702 002252     BIT     CPU,R2          ; CHECK FOR ERROR IN CPU TEST
2196 021270 001422           BEQ     6$              ; BRANCH, IF SUCCESSFUL TEST
2197 021272 043761 002252 000004 BIC     CPU,DPR2(R1)    ; CLEAR THE ERROR BIT FOR THIS TIME.
2198 021300 016103 000006     MOV     DPR3(R1),R3    ; READ DPR3 FOR EXTENDED INFO
2199 021304 012702 004643     MOV     #CPU2,R2       ; ERROR MESSAGE POINTER
2200 021310           ERRDF 15,ROMD,RTERR ; CPU TEST FAILED
      021310 104455           TRAP   C$ERDF
      021312 000017           .WORD 15
      021314 003112           .WORD ROMD
      021316 016070           .WORD RTERR
2201 021320           DODU  LUN              ; FATAL ERROR. DROP THIS UNIT
      021320 013700 002210     MOV     LUN,RO
      021324 104451           TRAP   C$DODU
2202 021326 012737 177777 002206 MOV     #-1,DROPUN     ; SET DROPPED UNIT FLAG
2203 021334           DOCLN ; ABORT THE DIAGNOSTIC FOR THIS UNIT
      021334 104444           TRAP   C$DCLN
2204
2205 021336           6$:   CKLOOP ; CHECK FOR LOOP ON TEST
      021336 104406           TRAP   C$CLP1
2206
2207 021340           ENDTST
      021340           L10025:
      021340 104401           TRAP   C$ETST
2208

```

TEST 5: IOP CPU INSTRUCTION TEST

```

2210
2211
2212           .SBTTL TEST 6: INVOKE THE LINE CLOCK INTERRUPT TEST
2213
2214           ;**
2215           ;
2216           ;           IOP SELFTEST #5.
2217           ;
2218           ; THE LINE CLOCK (BEVNT) INTERRUPT TEST IS INVOKED IN THE IOP ROM
2219           ;
2220           ;
2221           ;
2222 021342           BGNTST
2223
2224 021342 012702 005062           MOV     #ROMT5,R2           ; GET TITLE ADDRESS
2225 021346 004537 017336           JSR     R5,PNTFLG           ; SEE IF PNT FLAG IS SET
2226 021352 005737 002206           TST     DROPUN           ; CHECK THIS UNIT FOR BEING DROPPED
2227 021356 001401           BEQ     1$                 ; BRANCH, IF NOT DROPPED
2228 021360           DOCLN           ; ABORT THE DIAGNOSTIC FOR THIS UNIT
2229 021360 104444           TRAP   C$DCLN
2230 021362 004537 017014           1$:   JSR     R5,CKTPRO           ; SEE IF THE CURRENT IOP IS READY
2231 021366 013701 002216           MOV     QBASE,R1           ; R1 = IOP BASE ADDRESS
2232 021372 013761 002254 000000           MOV     BVNT,DPRO(R1)       ; SEND COMMAND TO DPRO
2233
2234 021400 012704 140000           MOV     #140000,R4         ; R4 WILL BE USED AS A COUNTER
2235 021404 005761 000000           2$:   TST     DPRO(R1)         ; TEST THE IOP'S DPRO REG.
2236 021410 001423           BEQ     4$                 ; BRANCH, IF THE TEST HAS COMPLETED
2237 021412 004537 016754           JSR     R5,RDELAY          ; DELAY ABOUT 1 MS
2238 021416 000001           1
2239 021420 005204           INC     R4                 ; ERROR, IF R4 WRAPS TO 0
2240 021422 001370           BNE     2$                 ; ERROR, IF NO BRANCH
2241 021424 012702 004174           MOV     #BEVNT,R2          ; SETUP FOR ERROR REPORTING.
2242 021430           ERRDF 16,NORES,NRES       ; FATAL ERROR. NO RESPONSE FROM TEST.
2243 021430 104455           TRAP   C$ERDF
2244 021432 000020           .WORD 16
2245 021434 003054           .WORD NORES
2246 021436 016412           .WORD NRES
2247 021440           CKLOOP
2248 021440 104406           TRAP   C$CLP1             ; CHECK FOR LOOP ON TEST
2249 021442           DODU  LUN                 ; DROP THIS UNIT
2250 021442 013700 002210           MOV     LUN,R0
2251 021446 104451           TRAP   C$DODU
2252 021450 012737 177777 002206           MOV     #-1,DROPUN         ; SET DROPPED UNIT FLAG.
2253 021456           DOCLN           ; ABORT THE DIAGNOSTIC FOR THIS UNIT
2254 021456 104444           TRAP   C$DCLN

```

TEST 6: INVOKE THE LINE CLOCK INTERRUPT TEST

```

2248
2249
2250
2251
2252
2253 021460 016102 000002      4$:   MOV     DPR1(R1),R2      ; READ BOOT COMMAND STATUS REGISTER
2254 021464 100005              BPL     5$              ; BR, IF NO COMMAND STATUS ERROR
2255 021466              ERRHRD  17,CMND,CMDERR ; ERROR. BOOT CODE DIDN'T LIKE THE COMMAND
      021466 104456              TRAP   C$ERHRD
      021470 000021              .WORD  17
      021472 003221              .WORD  CMND
      021474 016570              .WORD  CMDEPR
2256 021476 000431              BR      7$              ; EXIT TEST
2257
2258 021500 016102 000004      5$:   MOV     DPR2(R1),R2      ; READ IOP DPR2
2259 021504 033702 002254      BIT     BVNT,R2          ; CHECK FOR ERROR IN CLOCK TEST
2260 021510 001424              BEQ     7$              ; BRANCH, IF SUCCESSFUL TEST
2261 021512 043761 002254 000004 BIC     BVNT,DPR2(R1)    ; CLEAR THE ERROR BIT FOR THIS TIME.
2262 021520 016103 000006      MOV     DPR3(R1),R3      ; READ DPR3 FOR EXTENDED INFO
2263 021524 032703 000001      BIT     #BIT0,R3         ; CHECK FOR ENTIRE TEST SKIPPED
2264 021530 001406              BEQ     6$              ; BR, IF TEST WASN'T SKIPPED
2265 021532 012702 007411      MOV     #T5E0,R2         ; SETUP MESSAGE ADDRESS FOR PRINTOUT
2266 021536 004537 016722      JSR     R5,SKIPED        ; PRINT THIS TEST SKIPPED
2267 021542              EXIT   TST              ; EXIT THIS TEST
      021542 104432              TRAP   C$EXIT
      021544 000020              .WORD  L10026-.
2268
2269 021546 012702 004174      6$:   MOV     #BEVNT,R2        ; ERROR MESSAGE POINTER
2270 021552              ERRHRD  20,ROMD,RTERR   ; CLOCK TEST FAILED
      021552 104456              TRAP   C$ERHRD
      021554 000024              .WORD  20
      021556 003112              .WORD  ROMD
      021560 016070              .WORD  RTERR
2271
2272 021562              7$:   CKLOOP
      021562 104406              TRAP   C$CLP1          ; CHECK FOR LOOP ON TEST
2273
2274 021564              ENDTST
      021564              L10026:
      021564 104401              TRAP   C$ETST

```


TEST 7: INVOKE SERIAL PORT #1 TEST

```

2315
2316
2317
2318
2319
2320 021712 016102 000002      4$:  MOV    DPR1(R1),R2      ; READ BOOT COMMAND STATUS REGISTER
2321 021716 100005                BPL    5$                ; BR, IF NO COMMAND STATUS ERROR
2322 021720                ERRHRD  22,CMND,CMDERR    ; ERROR. BOOT CODE DIDN'T LIKE THE COMMAND
      021720 104456                TRAP  C$ERRHRD
      021722 000026                .WORD  22
      021724 003221                .WORD  CMND
      021726 016570                .WORD  CMDERR
2323 021730 000433                BR     7$                ; EXIT TEST
2324
2325 021732 016102 000004      5$:  MOV    DPR2(R1),R2      ; READ IOP DPR2
2326 021736 033702 002256                BIT    SLU1,R2          ; CHECK FOR ERROR IN SLU1 TEST
2327 021742 001426                BEQ    7$                ; BRANCH, IF SUCCESSFUL TEST
2328 021744 043761 002256 000004      BIC    SLU1,DPR2(R1)    ; CLEAR THE ERROR BIT FOR THIS TIME.
2329 021752 016103 000006                MOV    DPR3(R1),R3     ; READ DPR3 FOR EXTENDED INFO
2330 021756 032703 000001                BIT    #BIT0,R3        ; CHECK IF INTERRUPTS WERE TESTED
2331 021762 001404                BEQ    6$                ; BR, IF INTERRUPTS WERE TESTED
2332 021764 012702 007411                MOV    #T5E0,R2        ; SETUP MESSAGE ADDRESS FOR PRINTOUT
2333 021770 004537 016722                JSR    R5,SKIPPED      ; PRINT A PORTION OF SELFTEST NOT RUN
2334
2335 021774 042703 000001      6$:  BIC    #BIT0,R3        ; CLEAR BIT 0 FOR NEXT TEST
2336 022000 005703                TST    R3                ; SEE IF ANY LEGITIMATE ERRORS
2337 022002 001406                BEQ    7$                ; BRANCH, IF NO ERRORS
2338 022004 012702 004202                MOV    #SLU1T,R2       ; ERROR MESSAGE POINTER
2339 022010                ERRHRD  23,ROMD,RTERR  ; SLU1 TEST FAILED
      022010 104456                TRAP  C$ERRHRD
      022012 000027                .WORD  23
      022014 003112                .WORD  ROMD
      022016 016070                .WORD  RTERR
2340
2341 022020                7$:  CKLOOP                ; CHECK FOR LOOP ON TEST
      022020 104406                TRAP  C$CLP1
2342
2343 022022                ENDTST
      022022                L10027:
      022022 104401                TRAP  C$ETST

```

TEST 7: INVOKE SERIAL PORT #1 TEST

```

2345
2346
2347
2348
2349
2350
2351
2352
2353
2354
2355
2356 022024          BGNTST
2357
2358 022024 012702 005151      MOV    #ROMT7A,R2      ; GET TITLE ADDRESS
2359 022030 004537 017336      JSR    R5,PNTFLG      ; SEE IF PNT FLAG IS SET
2360 022034 005737 002206      TST   DROPUN         ; CHECK THIS UNIT FOR BEING DROPPED
2361 022040 001401              BEQ    1$             ; BRANCH, IF NOT DROPPED
2362 022042              DOCLN          ; ABORT THE DIAGNOSTIC FOR THIS UNIT
      022042 104444          TRAP   C#DCLN
2363
2364 022044 004537 017014      1$:   JSR    R5,CKTPRO  ; SEE IF THE CURRENT IOP IS READY
2365 022050 005737 002224      TST   LOOPB2         ; CHECK IF LOOPBACK CONNECTOR INSTALLED
2366 022054 001511              BEQ    8$             ; BRANCH, IF NO CONNECTOR INSTALLED
2367
2368 022056 013701 002216      MOV    QBASE,R1       ; R1 = IOP BASE ADDRESS
2369 022062 012761 000001 000006  MOV    #1,DPR3(R1)    ; SET TEST FLAG FOR CHANNEL A
2370 022070 013761 002260 000000  MOV    SLU2,DPRO(R1)  ; SEND COMMAND TO DPRO
2371
2372 022076 012704 140000      MOV    #140000,R4     ; R4 WILL BE USED AS A COUNTER
2373 022102 005761 000000      2$:   TST   DPRO(R1)    ; TEST THE IOP'S DPRO REG.
2374 022106 001423              BEQ    4$             ; BRANCH, IF THE TEST HAS COMPLETED
2375 022110 004537 016754      JSR    R5,RDELAY      ; DELAY ABOUT 1 MS
2376 022114 000001              1
2377 022116 005204              INC    R4             ; ERROR, IF R4 WRAPS TO 0
2378 022120 001370              BNE   2$             ; ERROR, IF NO BRANCH
2379 022122 012702 004235      MOV    #SLU2A,R2      ; SETUP FOR ERROR REPORTING.
2380 022126              ERRDF 24,NORES,NRES  ; FATAL ERROR. NO RESPONSE FROM TEST.
      022126 104455          TRAP   C#ERDF
      022130 000030          .WORD 24
      022132 003054          .WORD NORES
      022134 016412          .WORD NRES
2381 022136              CKLOOP              ; CHECK FOR LOOP ON TEST
      022136 104406          TRAP   C#CLP1
2382 022140              DODU   LUN           ; DROP THIS UNIT
      022140 013700 002210      MOV    LUN,R0
      022144 104451          TRAP   C#DODU
2383 022146 012737 177777 002206  MOV    #1,DROPUN      ; SET DROPPED UNIT FLAG.
2384 022154              DOCLN          ; ABORT THE DIAGNOSTIC FOR THIS UNIT
      022154 104444          TRAP   C#DCLN

```

TEST 8: INVOKE ROM TEST OF SERIAL PORT #2 (CHANNEL A) NEC720

```

2386
2387
2388 ; TO HERE IF TEST COMPLETED, AND CHECK DPR2 FOR SUCCESS/FAILURE.
2389 ;
2390
2391 022156 016102 000002 4$: MOV DPR1(R1),R2 ; READ BOOT COMMAND STATUS REGISTER
2392 022162 100005 BPL 5$ ; BR, IF NO COMMAND STATUS ERROR
2393 022164 ERRHRD 25,CMND,CMDERR ; ERROR. BOOT CODE DIDN'T LIKE THE COMMAND
      022164 104456 TRAP C$ERRHD
      022166 000031 .WORD 25
      022170 003221 .WORD CMND
      022172 016570 .WORD CMDERR
2394 022174 000441 BR 8$ ; EXIT TEST
2395
2396 022176 016102 000004 5$: MOV DPR2(R1),R2 ; READ IOP DPR2
2397 022202 033702 002260 BIT SLU2,R2 ; CHECK FOR ERROR IN SLU2 TEST
2398 022206 001434 BEQ 8$ ; BRANCH, IF SUCCESSFUL TEST
2399 022210 043761 002260 000004 BIC SLU2,DPR2(R1) ; CLEAR THE ERROR BIT FOR THIS TIME.
2400 022216 016103 000006 MOV DPR3(R1),R3 ; READ DPR3 FOR EXTENDED INFO
2401 022222 005737 002232 TST SL2DMA ; CHECK SLU2 SETUP FOR DMA OPERATION
2402 022226 001002 BNE 6$ ; BRANCH, IF DMA JUMPER IS IN
2403 022230 042703 000300 BIC #300,R3 ; JUMPER IS OUT. FORCE ERRORS 6,7 CLEAR.
2404
2405 022234 032703 000001 6$: BIT #BIT0,R3 ; CHECK FOR ENTIRE TEST SKIPPED
2406 022240 001406 BEQ 7$ ; BR, IF TEST WASN'T SKIPPED
2407 022242 012702 010337 MOV #T7E0,R2 ; SETUP MESSAGE ADDRESS FOR PRINTOUT
2408 022246 004537 016722 JSR R5,SKIPED ; PRINT THIS TEST SKIPPED
2409 022252 EXIT TST ; EXIT THIS TEST
      022252 104432 TRAP C$EXIT
      022254 000026 .WORD L10030
2410
2411 022256 032703 007777 7$: BIT #7777,R3 ; CHECK FOR LEGITIMATE ERRORS
2412 022262 001406 BEQ 8$ ; BRANCH IF NO LEGITIMATE ERRORS
2413 022264 012702 004235 MOV #SLU2A,R2 ; ERROR MESSAGE POINTER
2414 022270 ERRHRD 26,ROMD,RTERR ; SLU2 CHANNEL A FAILED
      022270 104456 TRAP C$ERRHD
      022272 000032 .WORD 26
      022274 003112 .WORD ROMD
      022276 016070 .WORD RTERR
2415
2416 022300 8$: CKLOOP ; CHECK FOR LOOP ON TEST
      022300 104406 TRAP C$CLP1
2417
2418 022302 ENDTST
      022302 L10030: TRAP C$ETST
      022302 104401

```


TEST 9: INVOKE ROM TEST OF SERIAL PORT #2 (CHANNEL B) NLC720

```

2461
2462
2463      ;
2464      ; TO HERE IF TEST COMPLETED, AND CHECK DPR2 FOR SUCCESS/FAILURE.
2465      ;
2466 022436 016102 000002 4$:  MOV    DPR1(R1),R2      ; READ BOOT COMMAND STATUS REGISTER
2467 022442 100005      BPL    5$              ; BR, IF NO COMMAND STATUS ERROR
2468 022444      ERRHRD 30,CMND,CMDERR ; ERROR. BOOT CODE DIDN'T LIKE THE COMMAND
      022444 104456      TRAP  C$ERRHRD
      022446 000036      .WORD 30
      022450 003221      .WORD CMND
      022452 016570      .WORD CMDERR
2469 022454 000431      BR     7$              ; EXIT TEST
2470
2471 022456 016102 000004 5$:  MOV    DPR2(R1),R2      ; READ IOP DPR2
2472 022462 033702 002260      BIT    SLU2,R2          ; CHECK FOR ERROR IN SLU2 TEST
2473 022466 001424      BEQ    7$              ; BRANCH, IF SUCCESSFUL TEST
2474 022470 043761 002260 000004 BIC    SLU2,DPR2(R1)    ; CLEAR THE ERROR BIT FOR THIS TIME.
2475 022476 016103 000006      MOV    DPR3(R1),R3      ; READ DPR3 FOR EXTENDED INFO
2476 022502 032703 000001      BIT    #BIT0,R3        ; CHECK FOR ENTIRE TEST SKIPPED
2477 022506 001406      BEQ    6$              ; BR, IF TEST WASN'T SKIPPED
2478 022510 012702 010337      MOV    #T7E0,R2        ; SETUP MESSAGE ADDRESS FOR PRINTOUT
2479 022514 004537 016722      JSR    R5,SKIPPED      ; PRINT THIS TEST SKIPPED
2480 022520      EXIT    TST              ; EXIT THIS TEST
      022520 104432      TRAP  C$EXIT
      022522 000020      .WORD L10031-.
2481
2482 022524 012702 004273 6$:  MOV    #SLU2B,R2        ; ERROR MESSAGE POINTER
2483 022530      ERRHRD 31,ROMD,RTERR ; SLU2 CHANNEL B FAILED
      022530 104456      TRAP  C$ERRHRD
      022532 000037      .WORD 31
      022534 003112      .WORD ROMD
      022536 016070      .WORD RTERR
2484
2485 022540      CKLOOP ; CHECK FOR LOOP ON TEST
      022540 104406      TRAP  C$CLP1
2486
2487 022542      ENDTST
      022542      L10031:
      022542 104401      TRAP  C$ETST

```

TEST 9: INVOKE ROM TEST OF SERIAL PORT #. (CHANNEL B) NEC720

2489
2490
2491
2492
2493
2494
2495
2496
2497
2498
2499
2500 022544
2501
2502 022544 012702 005267
2503 022550 004537 017336
2504 022554 005737 002206
2505 022560 001401
2506 022562
2507 022562 104444
2508 022564 004537 017014
2509 022570 005737 002230
2510 022574 001476
2511
2512 022576 013701 002216
2513 022602 013761 002262 000000
2514
2515 022610 012704 140000
2516 022614 005761 000000
2517 022620 001423
2518 022622 004537 016754
2519 022626 000001
2520 022630 005204
2521 022632 001370
2522 022634 012702 004331
2523 022640
2524 022650
2525 022652
2526 022660 012737 177777 002206
2527 022666

.SBTTL TEST 10: INVOKE TEST OF THE PARALLEL I/O PORT, Z8036

```

;..
;
;           IOP SELFTEST #10.
;
; INVOKE THE ROM TEST OF THE Z8036 (PARALLEL I/O).
;
;..
    
```

BGNTST

```

MOV    #ROMT10,R2      ; GET TITLE ADDRESS
JSR    R5,PNTFLG       ; SEE IF PNT FLAG IS SET
TST    DROPUN          ; CHECK THIS UNIT FOR BEING DROPPED
BEQ    1$              ; BRANCH, IF NOT DROPPED
DOCLN  C$DCLN          ; ABORT THE DIAGNOSTIC FOR THIS UNIT
TRAP

1$:    JSR    R5,CKTPRO  ; SEE IF THE CURRENT IOP IS READY
TST    LOOPB4          ; CHECK LOOPBACK CONNECTOR INSTALLED
BEQ    7$              ; BRANCH IF NO CONNECTOR INSTALLED

MOV    QBASE,R1        ; R1 = IOP BASE ADDRESS
MOV    PLLIO,DPRO(R1)  ; SEND COMMAND TO DPRO

2$:    MOV    #140000,R4 ; R4 WILL BE USED AS A COUNTER
TST    DPRO(R1)        ; TEST THE IOP'S DPRO REG.
BEQ    4$              ; BRANCH, IF THE TEST HAS COMPLETED
JSR    R5,RDELAY       ; DELAY ABOUT 1 MS
INC    R4              ; ERROR, IF R4 WRAPS TO 0
BNE    2$              ; ERROR, IF NO BRANCH
MOV    #PLLIP,R2       ; SETUP FOR ERROR REPORTING.
ERRDF  32,NORES,NRES   ; FATAL ERROR. NO RESPONSE FROM TEST.
TRAP  C$ERRDF

        .WORD    32
        .WORD    NORES
        .WORD    NRES

CKLOOP ; CHECK FOR LOOP ON TEST
TRAP  C$CLP1

DODU   LUN              ; DROP THIS UNIT
MOV    LUN,R0
TRAP  C$DODU

MOV    #-1,DROPUN     ; SET DROPPED UNIT FLAG.
DOCLN C$DCLN          ; ABORT THE DIAGNOSTIC FOR THIS UNIT
TRAP
    
```

TEST 10: INVOKE TEST OF THE PARALLEL I/O PORT, 28036

```

2529
2530
2531      ;
2532      ; TO HERE IF TEST COMPLETED, AND CHECK DPR2 FOR SUCCESS/FAILURE.
2533      ;
2534 022670 016102 000002      4$:   MOV     DPR1(R1),R2      ; READ BOOT COMMAND STATUS REGISTER
2535 022674 100005              BPL     5$              ; BR, IF NO COMMAND STATUS ERROR
2536 022676              ERRHRD 33,CMND,CMDERR ; ERROR. BOOT CODE DIDN'T LIKE THE COMMAND
      022676 104456          TRAP  C$ERRHRD
      022700 000041          .WORD  3$
      022702 003221          .WORD  CMND
      022704 016570          .WORD  CMDERR
2537 022706 000431              BR      7$              ; EXIT TEST
2538
2539 022710 016102 000004      5$:   MOV     DPR2(R1),R2      ; READ IOP DPR2
2540 022714 033702 002262      BIT     PLLIO,R2      ; CHECK FOR ERROR IN PARALLEL I/O TEST
2541 022720 001424              BEQ     7$              ; BRANCH, IF SUCCESSFUL TEST
2542 022722 043761 002262 000004 BIC     PLLIO,DPR2(R1) ; CLEAR THE ERROR BIT FOR THIS TIME.
2543 022730 016103 000006      MOV     DPR3(R1),R3      ; READ DPR3 FOR EXTENDED INFO
2544 022734 032703 000001      BIT     #BIT0,R3      ; CHECK FOR ENTIRE TEST SKIPPED
2545 022740 001406              BEQ     6$              ; BR, IF TEST WASN'T SKIPPED
2546 022742 012702 011477      MOV     #T10E0,R2      ; SETUP MESSAGE ADDRESS FOR PRINTOUT
2547 022746 004537 016722      JSR     R5,SKIPED      ; PRINT THIS TEST SKIPPED
2548 022752              EXIT  TST
      022752 104432          TRAP  C$EXIT
      022754 000020          .WORD  L10032-.
2549
2550 022756 012702 004331      6$:   MOV     #PLL,R2         ; ERROR MESSAGE POINTER
2551 022762              ERRHRD 34,ROMD,RTERR ; PARALLEL I/O TEST FAILED
      022762 104456          TRAP  C$ERRHRD
      022764 000042          .WORD  34
      022766 003112          .WORD  ROMD
      022770 016070          .WORD  RTERR
2552
2553 022772              7$:   CKLOOP
      022772 104406          TRAP  C$CLP1      ; CHECK FOR LOOP ON TEST
2554
2555 022774              ENDTST
      022774              L10032:
      022774 104401          TRAP  C$ETST

```

TEST 10: INVOKE TEST OF THE PARALLEL I/O PORT, Z8036

```

2557
2558           .SBTTL TEST 11: INVOKE THE DMA CONTROLLER TEST OF THE AMZ8016 (LOCAL SIDE)
2559
2560           ;**
2561           ;
2562           ;           IOP SELFTEST #11.
2563           ;
2564           ; THE ROM TEST OF THE IOP S AMZ8016 DMA CONTROLLER CHIP IS INVOKED.
2565           ;
2566           ; DMA TRANSFERS WILL BE DONE ON THE LOCAL SIDE ONLY. NEXT TEST DOES LSI-11.
2567           ;
2568           ;--
2569 022776           BGNTST
2570
2571 022776 012702 005346           MOV     #ROM11A,R2           ; GET TITLE ADDRESS
2572 023002 004537 017336           JSR     R5,PNTFLG           ; SEE IF PNT FLAG IS SET
2573 023006 005737 002206           TST     DROPUN             ; CHECK THIS UNIT FOR BEING DROPPED
2574 023012 001401                   BEQ     1$                 ; BRANCH, IF NOT DROPPED
2575 023014                   DOCLN             ; ABORT THE DIAGNOSTIC FOR THIS UNIT
           023014 104444           TRAP   C$DCLN
2576
2577 023016 004537 017014           1$:   JSR     R5,CKTPRO           ; SEE IF THE CURRENT IOP IS READY
2578 023022 013701 002216           MOV     QBASE,R1           ; R1 = IOP BASE ADDRESS
2579 023026 005061 000006           CLR     DPR3(R1)           ; CLEAR TPR3 SO ONLY LOCAL DMA'S DONE.
2580 023032 013761 002264 000000           MOV     DMA,DPRO(R1)       ; SEND COMMAND TO DPRO
2581
2582 023040 012704 140000           MOV     #140000,R4         ; R4 WILL BE USED AS A COUNTER
2583 023044 005761 000000           2$:   TST     DPRO(R1)         ; TEST THE IOP'S DPRO REG.
2584 023050 001423                   BEQ     4$                 ; BRANCH, IF THE TEST HAS COMPLETED
2585 023052 004537 016754           JSR     R5,RDELAY           ; DELAY ABOUT 1 MS
2586 023056 000001                   1
2587 023060 005204                   INC     R4                 ; ERROR, IF R4 WRAPS TO 0
2588 023062 001370                   BNE     2$                 ; ERROR, IF NO BRANCH
2589 023064 012702 004353           MOV     #DMAL,R2           ; SETUP FOR ERROR REPORTING.
2590 023070           ERRDF 35,NORES,NRES       ; FATAL ERROR. NO RESPONSE FROM TEST.
           023070 104455           TRAP   C$ERDF
           023072 000043           .WORD 35
           023074 003054           .WORD NORES
           023076 016412           .WORD NRES
2591 023100           CKLOOP
           023100 104406           TRAP   C$CLP1           ; CHECK FOR LOOP ON TEST
2592 023102           DODU  LUN
           023102 013700 002210           MOV     LUN,R0           ; DROP THIS UNIT
           023106 104451           TRAP   C$DODU
2593 023110 012737 177777 002206           MOV     #-1,DROPUN       ; SET DROPPED UNIT FLAG.
2594 023116           DOCLN
           023116 104444           TRAP   C$DCLN             ; ABORT THE DIAGNOSTIC FOR THIS UNIT

```

TEST 11: INVOKE THE DMA CONTROLLER TEST OF THE AMZ8016 (LOCAL

```

2596
2597
2598
2599
2600
2601 023120 016102 000002 4$: MOV DPR1(R1),R2 ; READ BOOT COMMAND STATUS REGISTER
2602 023124 100005 BPL 5$ ; BR, IF NO COMMAND STATUS ERROR
2603 023126 104456 ERRHRD 36,CMND,CMDErr ; ERROR. BOOT CODE DIDN'T LIKE THE COMMAND
      023126 104456 TRAP C$ERRHD
      023130 000044 .WORD 36
      023132 003221 .WORD CMND
      023134 016570 .WORD CMDErr
2604 023136 000436 BR 8$ ; EXIT TEST
2605
2606 023140 016102 000004 5$: MOV DPR2(R1),R2 ; READ IOP DPR2
2607 023144 033702 002264 BIT DMA,R2 ; CHECK FOR ERROR IN DMA TEST
2608 023150 001431 BEQ 8$ ; BRANCH, IF SUCCESSFUL TEST
2609 023152 043761 002264 000004 BIC DMA,DPR2(R1) ; CLEAR THE ERROR BIT FOR THIS TIME.
2610 023160 016103 000006 MOV DPR3(R1),R3 ; READ DPR3 FOR EXTENDED INFO
2611 023164 032703 000001 BIT #BIT0,R3 ; CHECK IF INTERRUPTS WERE TESTED
2612 023170 001406 BEQ 6$ ; BR, IF INTERRUPTS WERE TESTED
2613 023172 013702 012161 MOV T11E0,R2 ; SETUP MESSAGE ADDRESS
2614 023176 004537 016722 JSR R5,SKIPPED ; PRINT A PORTION OF SELFTEST NOT RUN
2615 023202 042703 000001 BIC #BIT0,R3 ; CLEAR IT SO NEXT TEST NOT CONFUSED
2616 023206 042703 000002 6$: BIC #BIT1,R3 ; THE BIT 1 ERROR DOESN'T APPLY HERE
2617
2618 023212 032703 007777 7$: BIT #7777,R3 ; SEE IF ANY LEGITIMATE ERRORS EXIST
2619 023216 001406 BEQ 8$ ; BRANCH, IF NO ERRORS
2620 023220 012702 004353 MOV #DMAL,R2 ; ERROR MESSAGE POINTER
2621 023224 104456 ERRHRD 37,ROMD,RTERR ; DMA TEST FAILED
      023224 104456 TRAP C$ERRHD
      023226 000045 .WORD 37
      023230 003112 .WORD ROMD
      023232 016070 .WORD RTERR
2622
2623 023234 104406 8$: CKLOOP ; CHECK FOR LOOP ON TEST
      023234 104406 TRAP C$CLP1
2624
2625 023236 ENDTST
      023236 L10033: TRAP C$ETST
      023236 104401

```

TEST 11: INVOKE THE DMA CONTROLLER TEST OF THE AMZ8016 (LOCAL

```

2627
2628
2629           .SBTTL TEST 12: INVOKE THE DMA CONTROLLER TEST OF THE AMZ8016 (LSI-11 SIDE)
2630
2631           ;**
2632           ;
2633           ;           IOP SELFTEST #11.
2634           ;
2635           ; THE ROM TEST OF THE IOP'S AMZ8016 DMA CONTROLLER CHIP IS INVOKED.
2636           ;
2637           ; TESTS OF DMA TRANSFERS TO AND FROM THE LSI-11 BUS ARE DONE.
2638           ;
2639           ;--
2640 023240           BGNTST
2641
2642 023240 012702 005416      MOV     #ROM11B,R2      ; GET TITLE ADDRESS
2643 023244 004537 017336      JSR     R5,PNTFLG      ; SEE IF PNT FLAG IS SET
2644 023250 005737 002206      TST     DROPUN        ; CHECK THIS UNIT FOR BEING DROPPED
2645 023254 001401             BEQ     1$             ; BRANCH, IF NOT DROPPED
2646 023256             DOCLN        ; ABORT THE DIAGNOSTIC FOR THIS UNIT
2647 023256 104444      TRAP    C$DCLN
2648 023260 004537 017014      1$:    JSR     R5,CKTPRO ; SEE IF THE CURRENT IOP IS READY
2649 023264 013701 002216      MOV     QBASE,R1      ; R1 = IOP BASE ADDRESS
2650 023270 013761 002242 000006  MOV     HIMEM,DPR3(R1) ; SEND BASE OF HI 4KW PAGE (PAR FORMAT)
2651 023276 013761 002264 000000  MOV     DMA,DPRO(R1)  ; SEND COMMAND TO DPRO
2652
2653 023304 012704 140000      MOV     #140000,R4    ; R4 WILL BE USED AS A COUNTER
2654 023310 005761 000000      2$:    TST     DPRO(R1)  ; TEST THE IOP'S DPRO REG.
2655 023314 001423             BEQ     4$             ; BRANCH, IF THE TEST HAS COMPLETED
2656 023316 004537 016754      JSR     R5,RDELAY     ; DELAY ABOUT 1 MS
2657 023322 000001             1
2658 023324 005204             INC     R4             ; ERROR, IF R4 WRAPS TO 0
2659 023326 001370             BNE     2$            ; ERROR, IF NO BRANCH
2660 023330 012702 004413      MOV     #DMAT,R2      ; SETUP FOR ERROR REPORTING.
2661 023334             ERRDF     40,NORES,NRES ; FATAL ERROR. NO RESPONSE FROM TEST.
2662 023334 104455      TRAP    C$ERDF
2663 023336 000050             .WORD  40
2664 023340 003054             .WORD  NORES
2665 023342 016412             .WORD  NRES
2666 023344             CKLOOP        ; CHECK FOR LOOP ON TEST
2667 023344 104406      TRAP    C$CLP1
2668 023346             DODU         ; DROP THIS UNIT
2669 023346 013700 002210      MOV     LUN,R0
2670 023352 104451      TRAP    C$DODU
2671 023354 012737 177777 002206  MOV     #-1,DROPUN    ; SET DROPPED UNIT FLAG.
2672 023362             DOCLN        ; ABORT THE DIAGNOSTIC FOR THIS UNIT
2673 023362 104444      TRAP    C$DCLN

```

TEST 12: INVOKE THE DMA CONTROLLER TEST OF THE AMZ8016 (LSI 11

```

2667
2668
2669 ; TO HERE IF TEST COMPLETED, AND CHECK DPR2 FOR SUCCESS/FAILURE.
2670 ;
2671
2672 023364 016102 000002 4$: MOV DPR1(R1),R2 ; READ BOOT COMMAND STATUS REGISTER
2673 023370 100005 BPL 5$ ; BR, IF NO COMMAND STATUS ERROR
2674 023372 ERRHRD 41,CMND,CMDERR ; ERROR. BOOT CODE DIDN'T LIKE THE COMMAND
      023372 104456 TRAP C$ERHRD
      023374 000051 .WORD 41
      023376 003221 .WORD CMND
      023400 016570 .WORD CMDERR
2675 023402 000445 BR 8$ ; EXIT TEST
2676
2677 023404 016102 000004 5$: MOV DPR2(R1),R2 ; READ IOP DPR2
2678 023410 033702 002264 BIT DMA,R2 ; CHECK FOR ERROR IN DMA TEST
2679 023414 001440 BEQ 8$ ; BRANCH, IF SUCCESSFUL TEST
2680 023416 043761 002264 000004 BIC DMA,DPR2(R1) ; CLEAR THE ERROR BIT FOR THIS TIME.
2681 023424 016103 000006 MOV DPR3(R1),R3 ; READ DPR3 FOR EXTENDED INFO
2682 023430 032703 000001 BIT #BIT0,R3 ; CHECK IF INTERRUPTS WERE TESTED
2683 023434 001406 BEQ 6$ ; BR, IF INTERRUPTS WERE TESTED
2684 023436 013702 012161 MOV T11E0,R2 ; SETUP MESSAGE ADDRESS
2685 023442 004537 016722 JSR R5,SKIPPED ; PRINT A PORTION OF SELFTEST NOT RUN
2686 023446 042703 000001 BIC #BIT0,R3 ; CLEAR IT SO NEXT TEST NOT CONFUSED
2687
2688 023452 032703 000002 6$: BIT #BIT1,R3 ; CHECK IF BUS TESTS WERE RUN
2689 023456 001406 BEQ 7$ ; BR, IF BUS TESTS WERE RUN
2690 023460 012702 012260 MOV #T11E1,R2 ; SETUP MESSAGE ADDRESS
2691 023464 004537 016722 JSR R5,SKIPPED ; PRINT BUS TESTS NOT DONE
2692 023470 042703 000002 BIC #BIT1,R3 ; CLEAR IT SO NEXT TEST NOT CONFUSED
2693
2694 023474 032703 007777 7$: BIT #7777,R3 ; SEE IF ANY LEGITIMATE ERRORS EXIST
2695 023500 001406 BEQ 8$ ; BRANCH, IF NO ERRORS
2696 023502 012702 004413 MOV #DMAT,R2 ; ERROR MESSAGE POINTER
2697 023506 ERRHRD 42,ROMD,RTERR ; DMA TEST FAILED
      023506 104456 TRAP C$ERHRD
      023510 000052 .WORD 42
      023512 003112 .WORD ROMD
      023514 016070 .WORD RTERR
2698
2699 023516 8$: CKLOOP ; CHECK FOR LOOP ON TEST
      023516 104406 TRAP C$CLP1
2700
2701 023520 ENDTST
      023520 L10034: TRAP C$ETST
      023520 104401

```

TEST 12: INVOKE THE DMA CONTROLLER TEST OF THE AMZ8016 (LSI 11)

```

2703
2704
2705          .SBTTL TEST 13: LSI-11 BUS INTERRUPT TEST
2706
2707          :++
2708          :
2709          :           IOP SELFTEST #12.
2710          :
2711          :           INVOKE THE LSI-11 BUS INTERRUPT TEST
2712          :
2713          :--
2714
2715 023522          BGNTST
2716
2717 023522 012702 005462          MOV      #ROMT12,R2          ; GET TITLE ADDRESS
2718 023526 004537 017336          JSR      R5,PNTFLG          ; SEE IF PNT FLAG IS SET
2719 023532 005737 002206          TST      DROPUN          ; CHECK THIS UNIT FOR BEING DROPPED
2720 023536 001401          BEQ      1$          ; BRANCH, IF NOT DROPPED
2721 023540          DOCLN          ; ABORT THE DIAGNOSTIC FOR THIS UNIT
      023540 104444          TRAP     C$DCLN
2722
2723 023542 004537 017014          1$:     JSR      R5,CKTPRO          ; SEE IF THE CURRENT IOP IS READY
2724
2725 023546 013701 002216          2$:     MOV      QBASE,R1          ; R1 = IOP BASE ADDRESS
2726          :           MOV      #1770,QIRVEC          ; ADDRESS 1770 IS THE INTERRUPT VECTOR ;JB REV A-0
2727 023552 012737 000370 002220          :           MOV      #370,QIRVEC          ; ADDRESS 370 IS THE INTERRUPT VECTOR ;JB REV A 0
2728 023560 005037 002240          :           CLR      INTFLG          ; SOFTWARE FLAG INDICATES INT. OCCURED
2729          :           SETVEC  QIRVEC,#QIRSRV,#PRI07          ; SETUP THE VECTOR; TEMP PRIORITY OF 7 ;JB REV A 0
2730 023564          :           SETVEC  QIRVEC,#QIRSRV,#PRI06          ; SETUP THE VECTOR; TEMP PRIORITY OF 6 ;JB REV A-0
      023564 012746 000300          MOV      #PRI06,-(SP)
      023570 012746 024272          MOV      #QIRSRV,-(SP)
      023574 013746 002220          MOV      QIRVEC,-(SP)
      023600 012746 000003          MOV      #3,-(SP)
      023604 104437          TRAP     C$SVEC
      023606 062706 000010          ADD      #10,SP
2731          :           SETPRI  #PRI07          ; RAISE CPU SO IOP CAN'T INTERRUPT YET. ;JB REV A-0
2732 023612          :           SETPRI  #PRI06          ; RAISE CPU SO IOP CAN'T INTERRUPT YET. ;JB REV A 0
      023612 012700 000300          MOV      #PRI06,R0
      023616 104441          TRAP     C$SPRI
2733 023620 013761 002220 000006          MOV      QIRVEC,DPR3(R1)          ; TELL IOP WHICH VECTOR WE WANT
2734 023626 013761 002266 000000          MOV      QIR,DPRO(R1)          ; SEND QIR TEST COMMAND TO DPRO
2735 023634          SETPRI  #PRI00          ; LOWER PRIORITY SO IOP CAN INTERRUPT
      023634 012700 000000          MOV      #PRI00,R0
      023640 104441          TRAP     C$SPRI
2736
2737 023642 004537 016754          JSR      R5,RDELAY          ; DELAY, AND THEN CHECK INT. OCCURED
2738 023646 000002          2          ; 2 MILLISECONDS
2739 023650 005737 002240          TST      INTFLG          ; IOP INTERRUPTED, IF INTFLG SET
2740 023654 001060          BNE      6$          ; BR, IF OK
2741 023656 016102 000002          MOV      DPR1(R1),R2          ; READ BCOT COMMAND STATUS REGISTER
2742 023662 100006          BPL      3$          ; BR, IF NO COMMAND STATUS ERROR
2743 023664          ERRHRD  43,CMND,CMDERR          ; ERROR. BOOT CODE DIDN'T LIKE THE COMMAND
      023664 104456          TRAP     C$ERHRD
      023666 000053          .WORD   43
      023670 003221          .WORD   CMND
      023672 016570          .WORD   CMDERR
2744 023674          EXIT      TST          ; EXIT TEST

```


HARDWARE TESTS MACRO M1200 20 FEB 64 09:26 140 1

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TEST 13: LSI 11 BUS INTERRUPT TEST

023674 104432
023676 000404

TRAP C9FXIT
.WORD 110035 .

TEST 13: LSI 11 BUS INTERRUPT TEST

```

2746
2747 023700 016102 000004      3$:  MOV    DPR2(R1),R2      ; READ IOP IPR2
2748 023704 033702 002266      BIT    QIR,R2           ; CHECK FOR A SELFTEST ERROR
2749 023710 001424              BEQ    5$              ; BR, IF NO ERROR.
2750 023712 016103 000006      MOV    DPR3(R1),R3     ; READ SELFTEST EXTENDED ERROR REGISTER
2751 023716 032703 000001      BIT    #BIT0,R3       ; CHECK FOR ENTIRE TEST SKIPPED
2752 023722 001406              BEQ    4$              ; BR, IF TEST WASN'T SKIPPED
2753 023724 012702 012625      MOV    #T12E0,R2      ; SETUP MESSAGE ADDRESS FOR PRINTOUT
2754 023730 004537 016722      JSR    R5,SKIPPED     ; PRINT THIS TEST SKIPPED
2755 023734              EXIT   TST            ; EXIT THIS TEST
      023734 104432      TRAP  C$EXIT
      023736 000344      .WORD L10035 .

2756
2757 023740 032703 000004      4$:  BIT    #BIT2,R3       ; NOW CHECK FOR ROM IN VECTOR SPACE
2758 023744 001406              BEQ    5$              ; BR, IF RAM AND NOT ROM IN VECTOR SPACE
2759 023746 012702 012771      MOV    #T12E2,R2      ; SETUP MESSAGE ADDRESS FOR PRINTOUT
2760 023752 004537 016722      JSR    R5,SKIPPED     ; PRINT THIS TEST SKIPPED
2761 023756              EXIT   TST            ; EXIT THIS TEST
      023756 104432      TRAP  C$EXIT
      023760 000322      .WORD L10035-.

2762
2763              ;5$:  SETPRI #PRI07          ; RESTORE PRIORITY TO 7
2764 023762              5$:  SETPRI #PRI06          ; RESTORE PRIORITY TO 6
      023762 012700 000300      MOV    #PRI06,R0
      023766 104441      TRAP  C$SPRI
2765 023770 012702 004453      MOV    #QIRT,R2       ; ERROR MESSAGE POINTER
2766 023774 012703 004500      MOV    #QIRT1,R3      ; ERROR MESSAGE POINTER
2767 024000      ERRHRD 44,ROMD,GENMSG ; ERROR. NO INTERRUPT FROM IOP
      024000 104456      TRAP  C$ERHRD
      024002 000054      .WORD 44
      024004 003112      .WORD ROMD
      024006 016444      .WORD GENMSG

2768 024010      CKLOOP
      024010 104406      TRAP  C$CLP1
2769 024012              EXIT   TST            ; CHECK FOR LOOP ON TEST
      024012 104432      TRAP  C$EXIT          ; EXIT THIS TEST
      024014 000266      .WORD L10035 .

```

:JB REV A-0
:JB REV A-0

TEST 13: ISI 11 BUS INTERRUPT TEST

```

2771
2772          ;6$: SETPRI @PRI07          ; SET CPU TEMPORARILY TO 7          ; JB REV A 0
2773 024016          6$: SETPRI @PRI06          ; SET CPU TEMPORARILY TO 6          ; JB REV A 0
      024016 012700 000300      MOV @PRI06,R0
      024022 104441      TRAP C$SPRI
2774 024024 005037 002240      CLR INTFLG          ; CLEAR THE SOFTWARE INT. FLAG
2775 024030          CLRVEC          ; CLEAR THE VECTOR JUST USED
      024030 013700 002220      MOV QIRVEC,R0
      024034 104436      TRAP C$CVEC
2776 024036 062737 000004 002220      ADD #4,QIRVEC          ; ADVANCE TO THE NEXT (#1774)
2777          ; SETVEC QIRVEC,@QIRSRV,@PRI07          ; SETUP VECTOR FOR NEXT TEST          ; JB REV A 0
2778 024044          ; SETVEC QIRVEC,@QIRSRV,@PRI06          ; SETUP VECTOR FOR NEXT TEST          ; JB REV A 0
      024044 012746 000300      MOV @PRI06,-(SP)
      024050 012746 024272      MOV @QIRSRV,(SP)
      024054 013746 002220      MOV QIRVEC,(SP)
      024060 012746 000003      MOV #3,-(SP)
      024064 104437      TRAP C$SVEC
      024066 062706 000010      ADD #10,SP
2779 024072          SETPRI @PRI00          ; LOWER PRIORITY TO 0
      024072 012700 000000      MOV @PRI00,R0
      024076 104441      TRAP C$SPRI
2780
2781 024100 012704 140000      MOV #140000,R4          ; R4 WILL BE USED AS A COUNTER
2782 024104 005737 002240      TST INTFLG          ; IOP INTERRUPTED, IF INTFLG SET
2783 024110 001023          BNE B$          ; BR. IF OK
2784 024112 004537 016754      JSR R5,RDELAY          ; DELAY, AND THEN TEST THAT INT. OCCURED
2785 024116 000001          1          ; 1 MILLISECOND
2786 024120 005204          INC R4          ; WAIT FOR INTERRUPT FROM IOP
2787 024122 001370          BNE 7$          ; WAIT. ERROR IF R4 WRAPS TO 0
2788
2789          ;
2790 024124          ; SETPRI @PRI07          ; RESTORE PRIORITY TO 7          ; JB REV A 0
      024124 012700 000300      SETPRI @PRI06          ; RESTORE PRIORITY TO 6          ; JB REV A-0
      024130 104441      MOV @PRI06,R0
      024132 012702 004453      TRAP C$SPRI
2791 024136 012703 004552      MOV @QIRT,R2          ; ERROR MESSAGE POINTER
2792 024142          MOV @QIRT2,R3          ; ERROR MESSAGE POINTER
2793 024142 104456      ERRHRD 45,ROMD,GENMSG          ; ERROR. NO INTERRUPT FROM IOP...
      024144 000055      TRAP C$ERHRD
      024146 003112      .WORD 45
      024150 016444      .WORD ROMD
2794 024152          .WORD GENMSG
      024152 104406      CKLOOP          ; CHECK FOR LOOP ON TEST
2795 024154          TRAP C$CLP1
      024154 104432      EXIT          ; EXIT THIS TEST
      024156 000124      TRAP C$EXIT
      .WORD L10035 .

```

TEST 13: LSI-11 BUS INTERRUPT TEST

```

2797
2798 024160 000005      8$:  RESET      ; ISSUE A BUS RESET AS PART OF..
2799                                     ; ..THE IOP SELFTEST CODE.
2800 024162 004537 016754      JSR    R5,RDELAY ; WAIT FOR THE RESET TO COMPLETE
2801 024166 000062          50.          ; 50 MILLISECONDS
2802 024170 005761 000000      TST    DPRO(R1)  ; TEST THE IOP'S DPR0 REGISTER
2803 024174 001413          BEQ    9$        ; BR MEANS TEST COMPLETED
2804 024176 012702 004453      MOV    @QIRT,R2  ; QIR TEST MESSAGE ADDRESS
2805
2806 024202          ERRDF  46,NORES,NRES ; FATAL ERROR. NO RESPONSE FROM TEST
      024202 104455      TRAP  C$ERDF
      024204 000056          .WORD  46
      024206 003054          .WORD  NORES
      024210 016412          .WORD  NRES
2807 024212          CKLOOP ; CHECK FOR LOOP ON TEST
      024212 104406      TRAP  C$CLP1
2808 024214 012737 177777 002206  MOV    @-1,DROPUN ; SET DROPPED UNIT FLAG
2809 024222          DOCLN ; ABORT THE DIAGNOSTIC FOR THIS UNIT
      024222 104444      TRAP  C$DCLN
2810
2811 024224 016102 000004      9$:  MOV    DPR2(R1),R2 ; READ IOP DPR2
2812 024230 033702 002266      BIT    QIR,R2    ; CHECK FOR ERROR IN QIR TEST
2813 024234 001413          BEQ    10$        ; BR, IF NO ERROR
2814 024236 043761 002266 000004  BIC    QIR,DPR2(R1) ; CLEAR THE ERROR BIT FOR THIS TIME.
2815 024244 016103 000006      MOV    DPR3(R1),R3 ; READ DPR3 FOR EXTENDED INFO
2816 024250 012702 004453      MOV    @QIRT,R2  ; ERROR MESSAGE POINTER
2817 024254          ERRHRD ; QIR TEST FAILED
      024254 104456      TRAP  C$ERHRD
      024256 000057          .WORD  47
      024260 003112          .WORD  ROMD
      024262 016070          .WORD  RTERR
2818
2819 024264          10$:  CKLOOP ; CHECK FOR LOOP ON TEST
      024264 104406      TRAP  C$CLP1
2820 024266          EXIT  TST    ; EXIT THIS TEST
      024266 104432      TRAP  C$EXIT
      024270 000012          .WORD  L10035-.
2821
2822
2823      ;++
2824      ;
2825      ; IOP INTERRUPT SERVICE ROUTINE FOR TEST 12.
2826      ;
2827      ;--
2828 024272          BG,SRV  QIRSRV
      024272          QIRSRV::
2829
2830 024272 012737 177777 002240  MOV    @-1,INTFLG ; SET FLAG TO INDICATE INT. OCCURED
2831 024300          ENDSRV ; EXIT SERVICE ROUTINE
      024300          L10036:
      024300 000002          RTI
2832
2833 024302          L10035:
      024302 104401          TRAP  C$ETST

```

TEST 13: LSI-11 BUS INTERRUPT TEST

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.SBTTL TEST 14: INVOKE THE TWO-PORT RAM TEST

```

: **
:
:         IOP SELFTEST #13.
:
: THE ROM TEST OF THE IOP'S TWO-PORT RAM IS INVOKED. THE TWO-PORT RAM
: IS ALSO CONSIDERED AS THE LSI 11 BUS INTERFACE.
:
: THE PROTOCOL BETWEEN THIS PROGRAM AND THE IOP BREAKS DOWN FOR THIS
: PARTICULAR TEST, BECAUSE THE IOP TEST OF THE TWO-PORT RAM MUST
: DISABLE THE DPR IN ORDER TO TEST IT. THEREFORE, THE STANDARD COMMUNI
: CATION METHOD ISN'T POSSIBLE. THIS TEST SIMPLY INITIATES IOP TEST
: #13 AND THEN DELAYS ABOUT 1 SECOND; AFTER WHICH, WE MUST ASSUME THAT
: THE TEST HAS COMPLETED AND THE DPR HAS BEEN RE ENABLED. DPR2 IS THEN
: CHECKED FOR ERROR BITS.
:
: -
    
```

2856 024304

BGNTST

```

2857
2858 024304 012702 005507      MOV     #ROMT13,R2      ; GET TITLE ADDRESS
2859 024310 004537 017336      JSR     R5,PNTFLG      ; SEE IF PNT FLAG IS SET
2860 024314 005737 002206      TST     DROPUN        ; CHECK THIS UNIT FOR BEING DROPPED
2861 024320 001401              BEQ     1$             ; BRANCH, IF NOT DROPPED
2862 024322              DOCLN              ; ABORT THE DIAGNOSTIC FOR THIS UNIT
      024322 104444      TRAP     C$DCLN
2863
2864 024324 004537 017014      1$: JSR     R5,CKTPRO    ; SEE IF THE CURRENT IOP IS READY
2865 024330 013701 002216      MOV     QBASE,R1      ; R1 = IOP BASE ADDRESS
2866 024334 013761 002270 000000  MOV     DPR,DPRO(R1)  ; SEND COMMAND TO DPRO
2867 024342 004537 016754      JSR     R5,RDELAY     ; DELAY BEFORE CHECKING FOR ERROR.
2868 024346 011610      5000.        ; ABOUT 5 SECONDS.
2869
2870 024350 016102 000002      MOV     DPR1(R1),R2   ; READ BOOT COMMAND STATUS REGISTER
2871 024354 100005      BPL     2$            ; BR, IF NO COMMAND STATUS ERROR
2872 024356              ERRHRD 50,CMND,CMDERR ; ERROR. BOOT CODE DIDN'T LIKE THE COMMAND
      024356 104456      TRAP     C$ERRHRD
      024360 000062      .WORD   50
      024362 003221      .WORD   CMND
      024364 016570      .WORD   CMDERR
2873 024366 000442      BR      4$           ; EXIT TEST
    
```

TEST 14: INVOKE THE TWO-PORT RAM TEST

2875									
2876	024370	016102	000004	2\$:	MOV	DPR2(R1),R2			; READ IOP DPR2
2877	024374	033702	002270		BIT	DPR,R2			; CHECK FOR ERROR IN DPR TEST
2878	024400	001435			BEQ	4\$; BRANCH, IF SUCCESSFUL TEST
2879	024402	043761	002270	000004	BIC	DPR,DPR2(R1)			; CLEAR THE ERROR BIT FOR THIS TIME.
2880	024410	016103	000006		MOV	DPR3(R1),R3			; READ DPR3 FOR EXTENDED INFO
2881	024414	032703	000010		BIT	#BIT3,R3			; CHECK IF BUS WRITES/INTERRUPTS RUN
2882	024420	001410			BEQ	3\$; BR, IF THE TESTS WERE RUN
2883	024422	012702	013545		MOV	#T13E3,R2			; SETUP MESSAGE ADDRESS
2884	024426	004537	016722		JSR	R5,SKIPPED			; PRINT THAT THE TESTS WERE NOT RUN
2885	024432	042703	000010		BIC	#BIT3,R3			; CLEAR THE BIT SO NEXT TEST NOT CONFUSED
2886	024436	005703			TST	R3			; CHECK IF LEGITIMATE ERRORS EXIST
2887	024440	001415			BEQ	4\$; BRANCH, IF NO ERRORS
2888									
2889	024442	012702	004626	3\$:	MOV	#DPRT,R2			; ERROR MESSAGE POINTER
2890	024446				ERRDF	51,ROMD,RTERR			; DPR TEST FAILED
	024446	104455			TRAP	C\$ERDF			
	024450	000063			.WORD	51			
	024452	003112			.WORD	ROMD			
	024454	016070			.WORD	RTERR			
2891	024456				DODU	LUN			; FATAL ERROR. DROP THIS UNIT
	024456	013700	002210		MOV	LUN,R0			
	024462	104451			TRAP	C\$DODU			
2892	024464	012737	177777	002206	MOV	#-1,DROPUN			; SET DROPPED UNIT FLAG
2893	024472				DOCLN				; ABORT THE DIAGNOSTIC FOR THIS UNIT
	024472	104444			TRAP	C\$DCLN			
2894									
2895	024474			4\$:	CKLOOP				; CHECK FOR LOOP ON TEST
	024474	104406			TRAP	C\$CLP1			
2896									
2897	024476				ENDTST				
	024476			L10037:					
	024476	104401			TRAP	C\$ETST			

TEST 14: INVOKE THE TWO PORT RAM TEST

```

2899
2900      .TITLE PARAMETER CODING
2901      .SBTTL IDENTIFICATION
2902
2903      .SBTTL HARDWARE PARAMETER CODING SECTION
2904
2905      ;**
2906      ; THE HARDWARE PARAMETER CODING SECTION CONTAINS MACROS
2907      ; THAT ARE USED BY THE SUPERVISOR TO BUILD P TABLES. THE
2908      ; MACROS ARE NOT EXECUTED AS MACHINE INSTRUCTIONS BUT ARE
2909      ; INTERPRETED BY THE SUPERVISOR AS DATA STRUCTURES. THE
2910      ; MACROS ALLOW THE SUPERVISOR TO ESTABLISH COMMUNICATIONS
2911      ; WITH THE OPERATOR.
2912      ;--
2913
2914      BGNHRD
2915      .WORD L10040 L$HARD/2
2916      L$HARD::
2917
2918      GPRMD   CCPU,0,D,740,2,15.,NO      ; GET SBC ID SWITCH
2919      .WORD   T$CODE
2920      .WORD   CCPU
2921      .WORD   740
2922      .WORD   T$LOLIM
2923      .WORD   T$HILIM
2924
2925      GPRML   BASE,2,-1,YES              ; GET LSI-11 BUS BASE ADDR. RANGE
2926      .WORD   T$CODE
2927      .WORD   BASE
2928      .WORD   -1
2929
2930      GPRML   LOOP1,4,-1,YES             ; ASK IF LOOPBACK...
2931      .WORD   T$CODE
2932      .WORD   LOOP1
2933      .WORD   -1
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```

T12?

HARDWARE PARAMETER CODING SECTION

2929

2930 024552 006130
024552 004027
024554 004027
024556 177777

GPRML SLU2CF,14,-1,YES
.WORD T\$CODE
.WORD SLU2CF
.WORD -1

; IS SLU2 SET FOR DMA?

2931

2932 024560 007130
024560 004127
024564 177777

GPRML UROM,16,1,YES
.WORD T\$CODE
.WORD UROM
.WORD -1

; ASK IF USER ROM IS TO...

2933

2934 024566 001004
024566 001004

EXIT HRD
.WORD T\$CODE

; ...BE TESTED.

2935

024570

ENDHRD
.EVEN

L10040:

2936

SOFTWARE PARAMETER CODING SECTION

```
2938
2939
2940
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2942
2943
2944
2945
2946
2947
2948
2949 024570
      024570 000000
      024572
2950
2951 024572
      024572
2952
2953 024572
2954 024572
2955
2956 024712
      024712 025346
      024714 000214
      024716
```

```
.SBTTL SOFTWARE PARAMETER CODING SECTION
;
;
; THE SOFTWARE PARAMETER CODING SECTION CONTAINS MACROS
; THAT ARE USED BY THE SUPERVISOR TO BUILD P-TABLES. THE
; MACROS ARE NOT EXECUTED AS MACHINE INSTRUCTIONS BUT ARE
; INTERPRETED BY THE SUPERVISOR AS DATA STRUCTURES. THE
; MACROS ALLOW THE SUPERVISOR TO ESTABLISH COMMUNICATIONS
; WITH THE OPERATOR.
;-
      BGNSFT
      .WORD L10041-L$SOFT/2
L$SOFT::
      ENDSFT
      .EVEN
L10041:
$PATCH::
      .BLKW 50
      LASTAD
      .EVEN
      .WORD T$FREE
      .WORD T$SIZE
L$LAST::
```

SOFTWARE PARAMETER CODING SECTION

```

2958
2959
2960      ; **
2961      ; HARD-CODED HARDWARE P-TABLES
2962      ;
2963      ; THERE ARE 14 HARDWARE P-TABLES HERE; HOWEVER, KEEP IN MIND THAT
2964      ; THE MAXIMUM LEGAL NUMBER OF KXT11-CA IOP'S ON ANY ONE SYSTEM IS
2965      ; 14(D), AND THE LEGAL UNIT NUMBERS ARE 2 THROUGH 15(D). IOP UNITS
2966      ; 0 AND 1 ARE RESERVED FOR THE NON-MULTIPROCESSING ARBITER OR DMA
2967      ; DEVICE AND THE HOST MULTIPROCESSOR ARBITER, RESPECTIVELY, AND SHOULD
2968      ; NOT BE USED. IOPS 0 AND 1 AUTOMATICALLY DISCONNECT THE IOP FROM
2969      ; THE LSI 11 BUS.
2970      ; --
2971 024716      BGNSETUP          14.
2972
2973      ; UNIT 0
2974
2975 024716      BGNPTAB
2976 024716      .WORD L10043
2977 024720      .WORD L10044-./2-1
2978 024722      L10042:
2979 024722      .WORD 0
2980 024724      .WORD 1          ; BUS ADDRESS RANGE (LOW IS DEFAULT)
2981 024726      .WORD 0          ; LOOP-BACK DEFAULT IS NO (SLU1)
2982 024730      .WORD 0          ; CHANNEL A LOOP-BACK DEFAULT IS NO (SLU2)
2983 024732      .WORD 0          ; CHANNEL B LOOP-BACK DEFAULT IS NO (SLU2)
2984 024734      .WORD 0          ; LOOP-BACK DEFAULT IS NO (PARALLEL I/O)
2985 024736      .WORD 0          ; SLU2 DMA OPERATION DEFAULT IS NO
2986 024740      .WORD 0          ; TEST USER ROM DEFAULT IS NO
2987 024742      ENDPTAB
2988 024742      L10044:
2989
2990      ; UNIT 1
2991
2992 024742      BGNPTAB
2993 024742      .WORD L10045
2994 024744      .WORD L10046 ./2-1
2995 024746      L10043:
2996 024746      .WORD 0
2997 024750      .WORD 1          ; BUS ADDRESS RANGE (LOW IS DEFAULT)
2998 024752      .WORD 0          ; LOOP-BACK DEFAULT IS NO (SLU1)
2999 024754      .WORD 0          ; CHANNEL A LOOP-BACK DEFAULT IS NO (SLU2)
3000 024756      .WORD 0          ; CHANNEL B LOOP-BACK DEFAULT IS NO (SLU2)
3001 024760      .WORD 0          ; LOOP-BACK DEFAULT IS NO (PARALLEL I/O)
3002 024762      .WORD 0          ; SLU2 DMA OPERATION DEFAULT IS NO
3003 024764      .WORD 0          ; TEST USER ROM DEFAULT IS NO
3004 024766      ENDPTAB
3005 024766      L10046:

```

SOFTWARE PARAMETER CODING SECTION

```

2999
3000
3001
3002 024766
      024766 025016
      024770 000010
      024772
3003 024772 000000
3004 024774 000001
3005 024776 000000
3006 025000 000000
3007 025002 000000
3008 025004 000000
3009 025006 000000
3010 025010 000000
3011 025012
      025012
3012
3013
3014
3015 025012
      025012 025042
      025014 000010
      025016
3016 025016 000000
3017 025020 000001
3018 025022 000000
3019 025024 000000
3020 025026 000000
3021 025030 000000
3022 025032 000000
3023 025034 000000
3024 025036
      025036

```

```

; UNIT 2
BGNPTAB
.WORD L10047
.WORD L10050 ./2 1
L10045:
.WORD 0
.WORD 1
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
ENDPTAB
L10050:
; BUS ADDRESS RANGE (LOW IS DEFAULT)
; LOOP-BACK DEFAULT IS NO (SLU1)
; CHANNEL A LOOP BACK DEFAULT IS NO (SLU2)
; CHANNEL B LOOP BACK DEFAULT IS NO (SLU2)
; LOOP-BACK DEFAULT IS NO (PARALLEL I/O)
; SLU2 DMA OPERATION DEFAULT IS NO
; TEST USER ROM DEFAULT IS NO

```

```

; UNIT 3
BGNPTAB
.WORD L10051
.WORD L10052 ./2 1
L10047:
.WORD 0
.WORD 1
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
ENDPTAB
L10052:
; BUS ADDRESS RANGE (LOW IS DEFAULT)
; LOOP BACK DEFAULT IS NO (SLU1)
; CHANNEL A LOOP BACK DEFAULT IS NO (SLU2)
; CHANNEL B LOOP BACK DEFAULT IS NO (SLU2)
; LOOP BACK DEFAULT IS NO (PARALLEL I/O)
; SLU2 DMA OPERATION DEFAULT IS NO
; TEST USER ROM DEFAULT IS NO

```

SOFTWARE PARAMETER CODING SECTION

```

3026
3027
3028
3029 025036      BGNPTAB
      025036 025066 .WORD L10053
      025040 000010 .WORD L10054 ./2 1
      025042      L10051:
3030 025042 000000 .WORD 0
3031 025044 000001 .WORD 1 ; BUS ADDRESS RANGE (LOW IS DEFAULT)
3032 025046 000000 .WORD 0 ; LOOP-BACK DEFAULT IS NO (SLU1)
3033 025050 000000 .WORD 0 ; CHANNEL A LOOP BACK DEFAULT IS NO (SLU2)
3034 025052 000000 .WORD 0 ; CHANNEL B LOOP BACK DEFAULT IS NO (SLU2)
3035 025054 000000 .WORD 0 ; LOOP BACK DEFAULT IS NO (PARALLEL I/O)
3036 025056 000000 .WORD 0 ; SLU2 DMA OPERATION DEFAULT IS NO
3037 025060 000000 .WORD 0 ; TEST USER ROM DEFAULT IS NO
3038 025062      ENDPTAB
      025062      L10054:
3039
3040
3041
3042 025062      BGNPTAB
      025062 025112 .WORD L10055
      025064 000010 .WORD L10056-./2-1
      025066      L10053:
3043 025066 000000 .WORD 0
3044 025070 000001 .WORD 1 ; BUS ADDRESS RANGE (LOW IS DEFAULT)
3045 025072 000000 .WORD 0 ; LOOP-BACK DEFAULT IS NO (SLU1)
3046 025074 000000 .WORD 0 ; CHANNEL A LOOP-BACK DEFAULT IS NO (SLU2)
3047 025076 000000 .WORD 0 ; CHANNEL B LOOP-BACK DEFAULT IS NO (SLU2)
3048 025100 000000 .WORD 0 ; LOOP-BACK DEFAULT IS NO (PARALLEL I/O)
3049 025102 000000 .WORD 0 ; SLU2 DMA OPERATION DEFAULT IS NO
3050 025104 000000 .WORD 0 ; TEST USER ROM DEFAULT IS NO
3051 025106      ENDPTAB
      025106      L10056:

```

SOFTWARE PARAMETER CODING SECTION

```

3053
3054
3055
3056 025106          ; UNIT 6
      025106 025136  BGNPTAB
      025110 000010  .WORD L10057
      025112          .WORD L10060-./2-1
L10055:
      025112 000000  .WORD 0
3057 025112 000000  .WORD 1
3058 025114 000001  .WORD 0
3059 025116 000000  .WORD 0
3060 025120 000000  .WORD 0
3061 025122 000000  .WORD 0
3062 025124 000000  .WORD 0
3063 025126 000000  .WORD 0
3064 025130 000000  .WORD 0
3065 025132          .WORD 0
      025132          ENDPTAB
L10060:
3066
3067          ; UNIT 7
3068
3069 025132          BGNPTAB
      025132 025162  .WORD L10061
      025134 000010  .WORD L10062-./2-1
L10057:
      025136 000000  .WORD 0
3070 025136 000000  .WORD 1
3071 025140 000001  .WORD 0
3072 025142 000000  .WORD 0
3073 025144 000000  .WORD 0
3074 025146 000000  .WORD 0
3075 025150 000000  .WORD 0
3076 025152 000000  .WORD 0
3077 025154 000000  .WORD 0
3078 025156          .WORD 0
      025156          ENDPTAB
L10062:

```

```

; BUS ADDRESS RANGE (LOW IS DEFAULT)
; LOOP-BACK DEFAULT IS NO (SLU1)
; CHANNEL A LOOP-BACK DEFAULT IS NO (SLU2)
; CHANNEL B LOOP-BACK DEFAULT IS NO (SLU2)
; LOOP-BACK DEFAULT IS NO (PARALLEL I/O)
; SLU2 DMA OPERATION DEFAULT IS NO
; TEST USER ROM DEFAULT IS NO

```

```

; BUS ADDRESS RANGE (LOW IS DEFAULT)
; LOOP-BACK DEFAULT IS NO (SLU1)
; CHANNEL A LOOP BACK DEFAULT IS NO (SLU2)
; CHANNEL B LOOP-BACK DEFAULT IS NO (SLU2)
; LOOP-BACK DEFAULT IS NO (PARALLEL I/O)
; SLU2 DMA OPERATION DEFAULT IS NO
; TEST USER ROM DEFAULT IS NO

```

SOFTWARE PARAMETER CODING SECTION

```

3080
3081
3082
3083 025156
      025156 025206
      025160 000010
      025162
3084 025162 000000
3085 025164 000001
3086 025166 000000
3087 025170 000000
3088 025172 000000
3089 025174 000000
3090 025176 000000
3091 025200 000000
3092 025202
      025202
3093
3094
3095
3096 025202
      025202 025232
      025204 000010
      025206
3097 025206 000000
3098 025210 000001
3099 025212 000000
3100 025214 000000
3101 025216 000000
3102 025220 000000
3103 025222 000000
3104 025224 000000
3105 025226
      025226

      ; UNIT 8
      BGNPTAB
      .WORD L10063
      .WORD L10064 /2 1
L10061:
      .WORD 0
      .WORD 1
      .WORD 0
      .WORD 0
      .WORD 0
      .WORD 0
      .WORD 0
      .WORD 0
      .WORD 0
      ENDP TAB
      L10064:

      ; UNIT 9
      BGNPTAB
      .WORD L10065
      .WORD L10066 /2 1
L10063:
      .WORD 0
      .WORD 1
      .WORD 0
      .WORD 0
      .WORD 0
      .WORD 0
      .WORD 0
      .WORD 0
      .WORD 0
      .WORD 0
      ENDP TAB
      L10066:

      ; BUS ADDRESS RANGE (LOW IS DEFAULT)
      ; LOOP BACK DEFAULT IS NO (SLU1)
      ; CHANNEL A LOOP BACK DEFAULT IS NO (SLU2)
      ; CHANNEL B LOOP BACK DEFAULT IS NO (SLU2)
      ; LOOP BACK DEFAULT IS NO (PARALLEL I/O)
      ; SLU2 DMA OPERATION DEFAULT IS NO
      ; TEST USER ROM DEFAULT IS NO

```

SOFTWARE PARAMETER CODING SECTION

```

310
3108
3109
3110 025226
      025226 025256
      025230 000010
      025232
3111 025232 000000
3112 025234 000001
3113 025236 000000
3114 025240 000000
3115 025242 000000
3116 025244 000000
3117 025246 000000
3118 025250 000000
3119 025252
      025252
3120
3121
3122
3123 025252
      025252 025302
      025254 000010
      025256
3124 025256 000000
3125 025260 000001
3126 025262 000000
3127 025264 000000
3128 025266 000000
3129 025270 000000
3130 025272 000000
3131 025274 000000
3132 025276
      025276

```

```

; UNIT 10
BGNPTAB
.LWORD L10067
.LWORD L10070 ./2 1
L10065:
.WORD 0
.WORD 1
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
ENDPTAB
L10070:
; BUS ADDRESS RANGE (LOW IS DEFAULT)
; LOOP-BACK DEFAULT IS NO (SLU1)
; CHANNEL A LOOP BACK DEFAULT IS NO (SLU2)
; CHANNEL B LOOP BACK DEFAULT IS NO (SLU2)
; LOOP BACK DEFAULT IS NO (PARALLEL I/O)
; SLU2 DMA OPERATION DEFAULT IS NO
; TEST USER ROM DEFAULT IS NO

```

```

; UNIT 11
BGNPTAB
.LWORD L10071
.LWORD L10072 ./2 1
L10067:
.WORD 0
.WORD 1
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
ENDPTAB
L10072:
; BUS ADDRESS RANGE (LOW IS DEFAULT)
; LOOP BACK DEFAULT IS NO (SLU1)
; CHANNEL A LOOP-BACK DEFAULT IS NO (SLU2)
; CHANNEL B LOOP-BACK DEFAULT IS NO (SLU2)
; LOOP-BACK DEFAULT IS NO (PARALLEL I/O)
; SLU2 DMA OPERATION DEFAULT IS NO
; TEST USER ROM DEFAULT IS NO

```

SOFTWARE PARAMETER CODING SECTION

```

3134
3135
3136
3137 025276
      025276 025326
      025300 000010
      025302
L10071:
3138 025302 000000
3139 025304 000001
3140 025306 000000
3141 025310 000000
3142 025312 000000
3143 025314 000000
3144 025316 000000
3145 025320 000000
3146 025322
      025322
L10074:
3147
3148
3149
3150 025322
      025322 000000
      025324 000010
      025326
L10073:
3151 025326 000000
3152 025330 000001
3153 025332 000000
3154 025334 000000
3155 025336 000000
3156 025340 000000
3157 025342 000000
3158 025344 000000
3159 025346
      025346
L10076:
3160
3161 025346
3162      000001
      .END

; UNIT 12
BGNPTAB
.WORD L10073
.WORD L10074 ./2 1
.WORD 0
.WORD 1
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
ENDPTAB

; BUS ADDRESS RANGE (LOW IS DEFAULT)
; LOOP BACK DEFAULT IS NO (SLU1)
; CHANNEL A LOOP BACK DEFAULT IS NO (SLU2)
; CHANNEL B LOOP BACK DEFAULT IS NO (SLU2)
; LOOP BACK DEFAULT IS NO (PARALLEL I/O)
; SLU2 DMA OPERATION DEFAULT IS NO
; TEST USER ROM DEFAULT IS NO

; UNIT 13
BGNPTAB
.WORD 0
.WORD L10076 ./2 1
.WORD 0
.WORD 1
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
ENDPTAB

; BUS ADDRESS RANGE (LOW IS DEFAULT)
; LOOP-BACK DEFAULT IS NO (SLU1)
; CHANNEL A LOOP-BACK DEFAULT IS NO (SLU2)
; CHANNEL B LOOP-BACK DEFAULT IS NO (SLU2)
; LOOP-BACK DEFAULT IS NO (PARALLEL I/O)
; SLU2 DMA OPERATION DEFAULT IS NO
; TEST USER ROM DEFAULT IS NO
    
```


SYMBOL TABLE

ABORT	017704	C\$DU	= 000053	DPR2	= 000004 G	G\$RADL	= 000120	L\$DESC	014432 G
ADR	= 000020 G	C\$EDIT	= 000003	DPR3	= 000006 G	G\$RADO	= 000020	L\$DESP	002076 G
ASSEMB	= 000010	C\$ERDF	= 000055	DPR4	= 000010 G	G\$XFER	= 000004	L\$DEVP	002060 G
BADSW	003151	C\$ERMR	= 000056	DPR5	= 000012 G	G\$YES	= 000010	L\$DISP	002124 G
BASE	003443	C\$ERR0	= 000060	DPR6	= 000014 G	HELP	= 000000	L\$DLT	002116 G
BEVNT	004174	C\$ERSF	= 000054	DPR7	= 000016 G	HIMEM	002242	L\$DTP	002040 G
BIT0	= 000001 G	C\$ERSO	= 000057	DROP	014772	HOE	= 100000 G	L\$DTYP	002034 G
BIT00	= 000001 G	C\$ESCA	= 000010	DROPUN	002206	IBE	= 010000 G	L\$DU	020042 G
BIT01	= 000002 G	C\$ESCG	= 000005	DSPCOD	002122 G	IDU	= 000040 G	L\$DUT	002072 G
BIT02	= 000004 G	C\$ESUB	= 000003	EF.CON	= 000036 G	IER	= 020000 G	L\$DVTY	014422 G
BIT03	= 000010 G	C\$ETST	= 000001	EF.NEW	= 000035 G	INITNG	015676	L\$EF	002052 G
BIT04	= 000020 G	C\$EXIT	= 000032	EF.PWR	= 000034 G	INITOK	015763	L\$ENVI	002044 G
BIT05	= 000040 G	C\$GETB	= 000026	EF.RES	= 000037 G	INTACK	015606	L\$ETP	002102 G
BIT06	= 000100 G	C\$GETW	= 000027	EF.STA	= 000040 G	INTFLG	002240	L\$EXP1	002046 G
BIT07	= 000200 G	C\$GMAN	= 000043	END	017706	IOPN	002212	L\$EXP4	002064 G
BIT08	= 000400 G	C\$GPHR	= 000042	EVL	= 000004 G	ICPMN	002214	L\$EXP5	002066 G
BIT09	= 001000 G	C\$GPLD	= 000030	E\$END	= 002100	ISR	= 000100 G	L\$HARD	024502 G
BIT1	= 000002 G	C\$GPRI	= 000040	E\$LOAD	= 000035	IXE	= 004000 G	L\$HIME	002120 G
BIT10	= 002000 G	C\$INIT	= 000011	F\$AU	= 000015	I\$AU	= 000041	L\$HPCP	002016 G
BIT11	= 004000 G	C\$INLP	= 000020	F\$AUTO	= 000020	I\$AUTO	= 000041	L\$HPTP	002022 G
BIT12	= 010000 G	C\$MANI	= 000050	F\$BGN	= 000040	I\$CLN	= 000041	L\$HW	002162 G
BIT13	= 020000 G	C\$MEM	= 000031	F\$CLEA	= 000007	I\$DU	= 000041	L\$ICP	002104 G
BIT14	= 040000 G	C\$MSG	= 000023	F\$DU	= 000016	I\$HRD	= 000041	L\$INIT	017412 G
BIT15	= 100000 G	C\$OPEN	= 000034	F\$END	= 000041	I\$INIT	= 000041	L\$LADP	002026 G
BIT2	= 000004 G	C\$PNTB	= 000014	F\$HARD	= 000004	I\$MOD	= 000041	L\$LAST	024716 G
BIT3	= 000010 G	C\$PNTF	= 000017	F\$HW	= 000013	I\$MSG	= 000041	L\$LOAD	002100 G
BIT4	= 000020 G	C\$PNTS	= 000016	F\$INIT	= 000006	I\$PROT	= 000040	L\$LUN	002074 G
BIT5	= 000040 G	C\$PNTX	= 000015	F\$JMP	= 000050	I\$PTAB	= 000041	L\$MREV	002050 G
BIT6	= 000100 G	C\$GIO	= 000377	F\$MOD	= 000000	I\$PWR	= 000041	L\$NAME	002000 G
BIT7	= 000200 G	C\$RDBU	= 000007	F\$MSG	= 000011	I\$RPT	= 000041	L\$PRIO	002042 G
BIT8	= 000400 G	C\$REFG	= 000047	F\$PROT	= 000021	I\$SEG	= 000041	L\$PROT	017404 G
BIT9	= 001000 G	C\$RESE	= 000033	F\$PWR	= 000017	I\$SETU	= 000041	L\$PRT	002112 G
BOE	= 000400 G	C\$REVI	= 000003	F\$RPT	= 000012	I\$SFT	= 000041	L\$REPP	002062 G
BVNT	002254	C\$RFLA	= 000021	F\$SEG	= 000003	I\$SRV	= 000041	L\$REV	002010 G
CCPU	003415	C\$RPT	= 000025	F\$SOFT	= 000005	I\$SUB	= 000041	L\$RPT	017402 G
CKTPRO	017014	C\$SEFG	= 000046	F\$SRV	= 000010	I\$TST	= 000041	L\$SOFT	024572 G
CMDERR	016570 G	C\$SPRI	= 000041	F\$SUB	= 000002	J\$JMP	= 000167	L\$SPC	002056 G
CMND	003221	C\$SVEC	= 000037	F\$SW	= 000014	LOE	= 040000 G	L\$SPCP	002020 G
CMNDR	015142	C\$TPRI	= 000013	F\$TEST	= 000001	LOOPB1	002222	L\$SPTP	002024 G
CPU	002252	DEL CNT	002236	GENMSG	016444 G	LOOPB2	002224	L\$STA	002030 G
CPUT	004643	DFPTBL	002162 G	GLBDAT	002204 G	LOOPB3	002226	L\$SW	002204 G
CSR	002244	DIAGMC	= 000000	GLBEQA	002204 G	LOOPB4	002230	L\$TEST	002114 G
CSRT	004145	DMA	002264	G\$CNT0	= 000200	LOOP1	003535	L\$TIML	002014 G
C\$AU	= 000052	DMAL	004353	G\$DELM	= 000372	LOOP2	003622	L\$UNIT	002012 G
C\$AUTO	= 000061	DMAT	004413	G\$DISP	= 000003	LOOP3	003702	L10000	002202
C\$BRK	= 000022	DPR	002270	G\$EXCP	= 000400	LOOP4	003762	L10001	002204
C\$BSEG	= 000004	DPR1	= 000000 G	G\$HILI	= 000002	LOT	= 000010 G	L10002	016364
C\$BSUB	= 000002	DPR10	= 000002 G	G\$LOLI	= 000001	LUN	002210	L10003	016410
C\$CEFG	= 000045	DPR11	= 000020 G	G\$NO	= 000000	L\$ACP	002110 G	L10004	016442
C\$CLCK	= 000062	DPR12	= 000022 G	G\$OFFS	= 000400	L\$APT	002036 G	L10005	016516
C\$CLEA	= 000012	DPR13	= 000024 G	G\$OSI	= 000376	L\$AU	020076 G	L10006	016566
C\$CLOS	= 000035	DPR14	= 000026 G	G\$PRMA	= 000001	L\$AUT	002070 G	L10007	016616
C\$CLP1	= 000006	DPR15	= 000030 G	G\$PRMD	= 000002	L\$AUTO	017710 G	L10010	016646
C\$CVEC	= 000036	DPR16	= 000032 G	G\$PRML	= 000000	L\$CCP	002106 G	L10011	016720
C\$DCLN	= 000044	DPR17	= 000034 G	G\$RADA	= 000140	L\$CLEA	020034 G	L10012	017402
C\$DDDU	= 000051			G\$RADB	= 000000	L\$CO	002032 G	L10014	017706
C\$DRPT	= 000024			G\$RADD	= 000040	L\$DEPO	002011 G	L10015	017730

SYMBOL TABLE

L10016	020040	NOTPR	003353	ROMT7B	005220	T\$PCNT	000000	T11E4	012524
L10017	020074	NOTRD1	003264	ROM11A	005346	T\$PTAB	010075	T11E5	012573
L10020	020102	NOTST	015240	ROM11B	005416	T\$PTHV	000016	T12	023240 G
L10021	020242	NRES	016412 G	RTERR	016070 G	T\$PTNU	000016	T12ADR	002314
L10022	020444	NXM	016366 G	RT1	002320	T\$SAVL	177777	T12E0	012625
L10023	020664	NXMVEC	000004	RT10	002606	T\$SEGL	177777	T12E1	012721
L10024	021120	O\$APTS	000000	RT11	002640	T\$SIZE	000214	T12E2	012771
L10025	021340	O\$AU	000001	RT12	002672	T\$SUBN	000000	T12E3	013052
L10026	021564	O\$BGMR	000001	RT13	002724	T\$TAGL	177777	T12E4	013132
L10027	022022	O\$BGNS	000000	RT2	002352	T\$TAGN	010077	T12E5	013205
L10030	022302	O\$DU	000001	RT3	002404	T\$TEMP	000005	T12E6	013262
L10031	022542	O\$ERRT	000000	RT4	002436	T\$TEST	000016	T13	023522 G
L10032	022774	O\$GNSW	000000	RT5	002470	T\$TSTM	177777	T13ADR	002316
L10033	023236	O\$POIN	000001	RT6	002522	T\$TSTS	000001	T13E0	013336
L10034	023520	O\$SETU	000001	RT7	002554	T\$AU	010020	T13E1	013404
L10035	024302	PLLIO	002262	SAVEC	002204	T\$AUT	010015	T13E10	014277
L10036	024300	PLL	004331	SETSW	015264	T\$CLE	010016	T13E11	014350
L10037	024476	PNT	001000 G	SFPTBL	002204 G	T\$DAT	010076	T13E2	013460
L10040	024570	PNTFLG	017336	SKIPPED	016722	T\$DU	010017	T13E3	013545
L10041	024572	PRI	002000 G	SLOT	015532	T\$HAR	010040	T13E4	013653
L10042	024722	PRI00	000000 G	SLU1	002256	T\$HW	010000	T13E5	013727
L10043	024746	PRI01	000040 G	SLU1T	004202	T\$INI	010014	T13E6	014005
L10044	024742	PRI02	000100 G	SLU2	002260	T\$MSG	010011	T13E7	014105
L10045	024772	PRI03	000140 G	SLU2A	004235	T\$PC	000016	T13E8	014161
L10046	024766	PRI04	000200 G	SLU2B	004273	T\$PRO	010013	T13E9	014227
L10047	025016	PRI05	000240 G	SLU2CF	004027	T\$PTA	010075	T14	024304 G
L10050	025012	PRI06	000300 G	SL2DMA	002232	T\$RPT	010012	T2	020244 G
L10051	025042	PRI07	000340 G	SOFT	016520 G	T\$SOF	010041	T2ADR	002274
L10052	025036	QBASE	002216	SVCGBL	000000	T\$SRV	010036	T2E0	006200
L10053	025066	QIR	002266	SVCINS	000000	T\$SW	010001	T2E1	006253
L10054	025062	QIRSRV	024272 G	SVCSUB	177777	T\$TES	010037	T2E2	006323
L10055	025112	QIRT	004453	SVCTAG	000000	T1	020104 G	T2E3	006374
L10056	025106	QIRT1	004500	SVCTST	177777	T1ADR	002272	T2E4	006457
L10057	025136	QIRT2	004552	SWITCH	015047	T1E0	005524	T2E5	006542
L10060	025132	QIRVEC	002220	S\$LSYM	010000	T1E1	005570	T2E6	006613
L10061	025162	RAM	002246	TESTID	014570	T1E2	005634	T2E7	006661
L10062	025156	RAMT	004151	TPR	015377	T1E3	005700	T2E8	006725
L10063	025206	RDELAY	016754	TPRDIS	016650 G	T1E4	005746	T2E9	007003
L10064	025202	REINIT	017210	TPR1	015453	T1E5	006016	T3	020446 G
L10065	025232	ROM	002250	TSTERR	014653	T1E6	006064	T3ADR	002276
L10066	025226	ROMD	003112	TSTNO	016045	T1E7	006132	T3E0	007061
L10067	025256	ROMETX	014556	TST1	004663	T10	022544 G	T3E1	007137
L10070	025252	ROMSG	014531	T\$ARGC	000002	T10ADR	002310	T3E2	007215
L10071	025302	ROMT	004170	T\$CODE	001004	T10E0	011477	T3E3	007313
L10072	025276	ROMTST	002234	T\$ERRN	000063	T10E1	011560	T4	020666 G
L10073	025326	ROMT1	004721	T\$EXCP	000000	T10E2	011621	T4ADR	002300
L10074	025322	ROMT10	005267	T\$FLAG	000041	T10E3	011657	T5	021122 G
L10076	025346	ROMT11	005317	T\$FREE	025346	T10E4	011714	T5ADR	002302
MDHEDR	002000 G	ROMT12	005462	T\$GMAN	000000	T10E5	011767	T5E0	007411
NEXT	017516	ROMT13	005507	T\$HILI	000017	T10E6	012037	T5E1	007471
NOINFO	014712	ROMT2	004744	T\$LAST	000001	T10E7	012116	T5E2	007544
NOIOP	002756	ROMT3	004767	T\$LOLI	000002	T11	022776 G	T5E3	007607
NONO	016620 G	ROMT4	005023	T\$LSYM	010000	T11ADR	002312	T6	021342 G
NOREG	014500	ROMT5	005062	T\$LTNO	000016	T11E0	012161	T6ADR	002304
NORES	003054	ROMT6	005117	T\$NEST	177777	T11E1	012260	T6E0	007647
NOSEC	017732	ROMT7	***** GX	T\$NSO	000005	T11E2	012365	T6E1	007745
NOTCLR	015321	ROMT7A	005151	T\$NS1	000010	T11E3	012437	T6E2	010025

SYMBOL TABLE

T6E3	010074	T7E0	010337	T7E4	010634	T7E9	011227	X\$ALWA-	000000
T6E4	010154	T7E1	010417	T7E5	010707	T8	022024 G	X\$FALS-	000040
T6E5	010223	T7E10	011320	T7E6	010775	T9	022304 G	X\$OFFS-	000400
T6E6	010266	T7E11	011412	T7E7	011054	UAM	= 000200 G	X\$TRUE-	000020
T7	021566 G	T7E2	010504	T7E8	011132	JROM	004127	\$PATCH	024572 G
T7ADR	002306	T7E3	010560						

. ABS. 025346 000
 000000 001

ERRORS DETECTED: 0

VIRTUAL MEMORY USED: 28581 WORDS (112 PAGES)
 DYNAMIC MEMORY: 19748 WORDS (75 PAGES)
 ELAPSED TIME: 00:18:19
 CNKTCA.BIC,CNKTCA.LST/CR/ SP=SVC34.MLB/ML,CNKTCA.P11

143

SEG 0163

SYMBOL CROSS REFERENCE

CRFF VO2

SYMBOL	VALUE	REFERENCES
ABORT	017704	110-1714 110-1724 111-1729 #111-1757
ADR	= 000020 G	#19-691
ASSEMB	= 000010	15-543
BADSW	003151	#29-1020 105-1466
BASE	003443	#32-1028 146-2918
BEVNT	004174	#37-1044 126-2241 127-2269
BIT0	= 000001 G	#19-691 127-2263 129-2330 129-2335 131-2405 133-2476 135-2544 137-2611 137-2615
		139-2682 139-2686 141-2751
BIT00	= 000001 G	#19-691 19-691
BIT01	= 000002 G	#19-691 19-691
BIT02	= 000004 G	#19-691 19-691
BIT03	= 000010 G	#19-691 19-691
BIT04	= 000020 G	#19-691 19-691
BIT05	= 000040 G	#19-691 19-691
BIT06	= 000100 G	#19-691 19-691
BIT07	= 000200 G	#19-691 19-691
BIT08	= 000400 G	#19-691 19-691
BIT09	= 001000 G	#19-691 19-691
BIT1	= 000002 G	#19-691 137-2616 139-2688 139-2692
BIT10	= 002000 G	#19-691 111-1747
BIT11	= 004000 G	#19-691
BIT12	= 010000 G	#19-691
BIT13	= 020000 G	#19-691
BIT14	= 040000 G	#19-691
BIT15	= 100000 G	#19-691
BIT2	= 000004 G	#19-691 141-2757
BIT3	= 000010 G	#19-691 145-2881 145-2885
BIT4	= 000020 G	#19-691
BIT5	= 000040 G	#19-691
BIT6	= 000100 G	#19-691
BIT7	= 000200 G	#19-691
BIT8	= 000400 G	#19-691
BIT9	= 001000 G	#19-691 107-1525
BOE	= 000400 G	#19-691
BVNT	002254	#20-768 126-2232 127-2259 127-2261
CCPU	003415	#31-1026 146-2916
CKTPRO	017014	#104-1442 117-1951 118-1978 120-2037 122-2101 124-2166 126-2230 128-2295 130-2364
		132-2439 134-2508 136-2577 138-2648 140-2723 144-2864
CMDERR	016570 G	#101-1353 119-2003 121-2062 123-2129 125-2191 127-2255 129-2322 131-2393 - 133-2468
		135-2536 137-2603 139-2674 140-2743 144-2872
CMND	003221	#30-1022 119-2003 121-2062 123-2129 125-2191 127-2255 129-2322 131-2393 133-2468
		135-2536 137-2603 139-2674 140-2743 144-2872
CMNDR	015142	#93-1240 101-1355
CPU	002252	#20-767 124-2168 125-2195 125-2197
CPUT	004643	#42-1060 124-2177 125-2199
CSR	002244	#20-764 118-1980 119-2007 119-2009
CSRT	004145	#35-1039 118-1989 119-2011
C\$AU	= 000052	#15-543 115-1900
C\$AUTO	= 000061	#15-543 112-1795
C\$BRK	= 000022	#15-543 103-1426
C\$BSEG	= 000004	#15-543
C\$BSUB	= 000002	#15-543

S Y M B O L C R O S S R E F E R E N C E

C R E F V 0 2

S Y M B O L	V A L U E	R E F E R E N C E S
C\$CEFG	= 000045	#15-543
C\$CLCK	= 000062	#15-543
C\$CLEA	= 000012	#15-543 113-1833
C\$CLOS	= 000035	#15-543
C\$CLP1	= 000006	#15-543 117-1953 118-1991 119-2014 120-2050 121-2076 122-2117 123-2143 124-2179
		125-2205 126-2243 127-2272 128-2310 129-2341 130-2381 131-2416 132-2456 133-2485
		134-2524 135-2553 136-2591 137-2623 138-2662 139-2699 141-2768 142-2794 143-2807
		143-2819 145-2895
C\$CVEC	= 000036	#15-543 117-1954 142-2775
C\$DCLN	= 000044	#15-543 104-1453 105-1469 105-1474 111-1757 116-1942 118-1976 118-1994 120-2035
		120-2053 121-2074 122-2099 122-2120 123-2141 124-2164 124-2182 125-2203 126-2228
		126-2246 128-2293 128-2313 130-2362 130-2384 132-2437 132-2459 134-2506 134-2527
		136-2575 136-2594 138-2646 138-2665 140-2721 143-2809 144-2862 145-2893
C\$DODU	= 000051	#15-543 104-1451 105-1467 105-1472 116-1940 118-1992 120-2051 121-2072 122-2118
		123-2139 124-2180 125-2201 126-2244 128-2311 130-2382 132-2457 134-2525 136-2592
		138-2663 145-2891
C\$DRPT	= 000024	#15-543
C\$DU	= 000053	#15-543 114-1863
C\$EDIT	= 000003	#15-543 15-585
C\$ERDF	= 000055	#15-543 104-1450 105-1471 116-1939 118-1990 120-2049 121-2071 122-2116 123-2138
		124-2178 125-2200 126-2242 128-2309 130-2380 132-2455 134-2523 136-2590 138-2661
		143-2806 145-2890
C\$ERHR	= 000056	#15-543 119-2003 119-2012 121-2062 123-2129 125-2191 127-2255 127-2270 129-2322
		129-2339 131-2393 131-2414 133-2468 133-2483 135-2536 135-2551 137-2603 137-2621
		139-2674 139-2697 140-2743 141-2767 142-2793 143-2817 144-2872
C\$ERRO	= 000060	#15-543
C\$ERSF	= 000054	#15-543
C\$ERSO	= 000057	#15-543 105-1466
C\$ESCA	= 000010	#15-543
C\$ESEG	= 000005	#15-543
C\$ESUB	= 000003	#15-543
C\$ETST	= 000001	#15-543 117-1955 119-2016 121-2078 123-2145 125-2207 127-2274 129-2343 131-2418
		133-2487 135-2555 137-2625 139-2701 143-2833 145-2897
C\$EXIT	= 000032	#15-543 111-1755 113-1817 127-2267 131-2409 133-2480 135-2548 140-2744 141-2755
		141-2761 141-2769 142-2795 143-2820
C\$GETB	= 000026	#15-543
C\$GETW	= 000027	#15-543
C\$GMAN	= 000043	#15-543
C\$GPHR	= 000042	#15-543 110-1725
C\$GPLO	= 000030	#15-543
C\$GPRI	= 000040	#15-543
C\$INIT	= 000011	#15-543 111-1772
C\$INLP	= 000020	#15-543
C\$MANI	= 000050	#15-543
C\$MEM	= 000031	#15-543
C\$MSG	= 000023	#15-543 99-1329 100-1334 100-1339 100-1345 101-1351 101-1356 101-1361 102-1368
C\$OPEN	= 000034	#15-543
C\$PNTB	= 000014	#15-543 98-1288 100-1333 100-1338 100-1343 101-1349 101-1355 101-1360 102-1366
		102-1382
C\$PNTF	= 000017	#15-543 106-1495 106-1510 107-1528 112-1793 114-1845
C\$PNTS	= 000016	#15-543
C\$PNTX	= 000015	#15-543 98-1300 98-1304 99-1308 99-1320 99-1328 100-1344 101-1350 102-1367

SYMBOL CROSS REFERENCE

CRFF V02

SYMBOL	VALUE	REFERENCES
EF.PWR	= 000034 G	#19-691 110-1713
EF.RES	= 000037 G	#19-691
EF.STA	= 000040 G	#19-691
END	017706	110-1710 #111-1758
EVL	= 000004 G	#19-691
E\$END	= 002100	#15-543
E\$LOAD	= 000035	#15-543 15-585
F\$AL	= 000015	#15-543 115-1873 115-1900
F\$AUTO	= 000020	#15-543 112-1783 112-1795
F\$BGN	= 000040	#15-543 15-559 15-586 16-605 16-607 19-690 19-707 20-715 27-999
		98-1286 100-1332 100-1336 100-1341 101-1347 101-1353 101-1358 102-1364 108-1615
		109-1652 110-1681 111-1755 112-1783 113-1806 113-1817 114-1842 115-1873 116-1922
		117-1955 118-1971 119-2016 120-2029 121-2078 122-2093 123-2145 124-2158 125-2207
		126-2222 127-2267 127-2274 128-2287 129-2343 130-2356 131-2409 131-2418 132-2431
		133-2480 133-2487 134-2500 135-2548 135-2555 136-2569 137-2625 138-2640 139-2701
		140-2715 140-2744 141-2755 141-2761 141-2769 142-2795 143-2820 143-2828 143-2833
		144-2856 145-2897 146-2914 147-2934 148-2949 149-2971 149-2975 149-2984 149-2988
		149-2988 149-2997 150-3002 150-3002 150-3011 150-3015 150-3015 150-3024
		151-3029 151-3029 151-3038 151-3042 151-3042 151-3051 152-3056 152-3056 152-3065
		152-3069 152-3069 152-3078 153-3083 153-3083 153-3092 153-3096 153-3096 153-3105
		154-3110 154-3110 154-3119 154-3123 154-3123 154-3132 155-3137 155-3137 155-3146
		155-3150 155-3150 155-3159 155-3161
F\$CLEA	= 000007	#15-543 113-1806 113-1833
F\$DU	= 000016	#15-543 114-1842 114-1863
F\$END	= 000041	#15-543 15-543 15-543 15-543 15-543 15-543 15-543 15-543 15-543 15-543
		15-543 15-543 15-543 15-543 15-543 15-543 15-543 15-543 15-543 15-543
		15-586 16-605 16-607 19-690 19-707 20-715 27-999 99-1329 100-1334
		100-1339 100-1345 101-1351 101-1356 101-1361 102-1368 108-1643 111-1755 111-1772
		112-1795 113-1817 113-1833 114-1847 114-1863 115-1884 115-1900 116-1922 116-1922
		116-1922 117-1955 117-1955 118-1971 118-1971 118-1971 119-2016 119-2016 120-2029
		120-2029 120-2029 121-2078 121-2078 122-2093 122-2093 122-2093 123-2145 123-2145
		124-2158 124-2158 124-2158 125-2207 125-2207 126-2222 126-2222 126-2222 127-2267
		127-2274 127-2274 128-2287 128-2287 128-2287 129-2343 129-2343 130-2356 130-2356
		130-2356 131-2409 131-2418 131-2418 132-2431 132-2431 132-2431 133-2480 133-2487
		133-2487 134-2500 134-2500 134-2500 135-2548 135-2555 135-2555 136-2569 136-2569
		136-2569 137-2625 137-2625 138-2640 138-2640 138-2640 139-2701 139-2701 140-2715
		140-2715 140-2715 140-2744 141-2755 141-2761 141-2769 142-2795 143-2820 143-2831
		143-2833 143-2833 144-2856 144-2856 144-2856 145-2897 145-2897 147-2934 147-2935
		148-2951 149-2971 149-2975 149-2984 149-2988 149-2997 150-3002 150-3011 150-3015
		150-3024 151-3029 151-3038 151-3042 151-3051 152-3056 152-3065 152-3069 152-3078
		153-3083 153-3092 153-3096 153-3105 154-3110 154-3119 154-3123 154-3132 155-3137
		155-3146 155-3150 155-3159 155-3161
F\$HARD	= 000004	#15-543 146-2914 147-2934 147-2934 147-2935
F\$HW	= 000013	#15-543 17-624 17-653
F\$INIT	= 000006	#15-543 110-1681 111-1772
F\$JMP	= 000050	#15-543 111-1755 113-1817 114-1847 114-1847 115-1884 115-1884 127-2267 131-2409
		133-2480 135-2548 140-2744 141-2755 141-2761 141-2769 142-2795 143-2820 147-2934
F\$MOD	= 000000	#15-543 15-559 15-586 16-605 16-607 19-690 19-707 20-715 27-999
F\$MSG	= 000011	#15-543 98-1286 99-1329 100-1332 100-1334 100-1336 100-1339 100-1341 100-1345
		101-1347 101-1351 101-1353 101-1356 101-1358 101-1361 102-1364 102-1368
F\$PROT	= 000021	#15-543 109-1652 109-1658
F\$PWR	= 000017	#15-543

SYMBOL CROSS REFERENCE		CREF	V02							
SYMBOL	VALUE	REFERENCES								
F\$RPT	= 000012	#15-543	108-1615	108-1643						
F\$SEG	= 000003	#15-543								
F\$SOFT	= 000005	#15-543	148-2949	148-2951						
F\$SRV	= 000010	#15-543	143-2828	143-2831						
F\$SUB	= 000002	#15-543								
F\$SW	= 000014	#15-543	18-664	18-674						
F\$TEST	= 000001	#15-543	116-1922	117-1955	118-1971	119-2016	120-2029	121-2078	122-2093	123-2145
		124-2158	125-2207	126-2222	127-2274	128-2287	129-2343	130-2356	131-2418	132-2431
		133-2487	134-2500	135-2555	136-2569	137-2625	138-2640	139-2701	140-2715	143-2833
		144-2856	145-2897							
GENMSG	016444	G #100-1341	141-2767	142-2793						
GLBDAT	002204	G #20-715								
GLBEQA	002204	G #19-690								
G\$CNT0	= 000200	#15-543								
G\$DELM	= 000372	#15-543								
G\$DISP	= 000003	#15-543								
G\$EXCP	= 000400	#15-543								
G\$HILI	= 000002	#15-543								
G\$LOLI	= 000001	#15-543								
G\$NO	= 000000	#15-543	146-2916							
G\$OFFS	= 000400	#15-543	146-2916	146-2918	146-2920	146-2923	146-2925	146-2927	147-2930	147-2932
G\$OFFSI	= 000376	#15-543	146-2916	146-2918	146-2920	146-2923	146-2925	146-2927	147-2930	147-2932
G\$PRMA	= 000001	#15-543								
G\$PRMD	= 000002	#15-543	146-2916							
G\$PRML	= 000000	#15-543	146-2918	146-2920	146-2923	146-2925	146-2927	147-2930	147-2932	
G\$RADA	= 000140	#15-543								
G\$RADB	= 000000	#15-543								
G\$RADD	= 000040	#15-543	146-2916							
G\$RADL	= 000120	#15-543	146-2918	146-2920	146-2923	146-2925	146-2927	147-2930	147-2932	
G\$RADO	= 000020	#15-543								
G\$XFER	= 000004	#15-543	147-2934							
G\$YES	= 000010	#15-543	146-2918	146-2920	146-2923	146-2925	146-2927	147-2930	147-2932	
HELP	= 000000	#2-9	#15-550	15-568	15-588	16-608	17-626	18-666	#19-679	19-693
		89-1207	89-1217	97-1257	97-1269	102-1385	108-1533	108-1540	108-1546	108-1553
		108-1559	108-1566	108-1572	108-1580	108-1589	108-1596	#108-1604	108-1617	108-1629
		109-1660	110-1683	111-1760	112-1785	113-1808	113-1819	114-1849	115-1875	115-1886
		#116-1906								
HIMEM	002242	#20-755	*110-1717	*110-1718	138-2650					
HOE	= 100000	G #19-691								
IBE	= 010000	G #19-691								
IDU	= 000040	G #19-691								
IER	= 020000	G #19-691								
INITNG	015676	#97-1252	106-1495							
INITOK	015763	#97-1253	106-1510							
INTACK	015606	#96-1250	98-1304							
INTFLG	002240	#20-754	*140-2728	140-2739	*142-2774	142-2782	*143-2830			
IOPN	002212	#20-743	*111-1728	111-1730	111-1736	*111-1742	111-1744			
IOPNN	002214	#20-744	98-1287	100-1337	100-1342	101-1348	101-1354	101-1359	102-1365	102-1381
		106-1493	107-1527	*111-1730	*111-1733	114-1844				
ISR	= 000100	G #19-691								
IXE	= 004000	G #19-691								
I\$AU	= 000041	#15-543	#115-1873	#115-1900						

SYMBOL CROSS REFERENCE

CREF V02

SYMBOL	VALUE	REFERENCES
I\$AUTO	= 000041	#15-543 #112-1783 #112-1795
I\$CLN	= 000041	#15-543 #113-1806 113-1817 #113-1833
I\$DU	= 000041	#15-543 #114-1842 #114-1863
I\$HRD	= 000041	#146-2914 #147-2935
I\$INIT	= 000041	#15-543 #110-1681 111-1755 #111-1772
I\$MOD	= 000041	#15-543 15-559 #15-559 15-586 #15-586 16-605 #16-605 16-607 #16-607
		19-690 #19-690 19-707 #19-707 20-715 #20-715 27-999 #27-999
I\$MESSG	= 000041	#15-543 #98-1286 #99-1329 #100-1332 #100-1334 #100-1336 #100-1339 #100-1341 #100-1345
		#101-1347 #101-1351 #101-1353 #101-1356 #101-1358 #101-1361 #102-1364 #102-1368
I\$PROT	= 000040	#15-543 #109-1652
I\$PTAB	= 000041	#15-543 149-2975 #149-2975 149-2984 #149-2984 149-2988 #149-2988 149-2997 #149-2997
		150-3002 #150-3002 150-3011 #150-3011 150-3015 #150-3015 150-3024 #150-3024 151-3029 #151-3029
		#151-3029 151-3038 #151-3038 151-3042 #151-3042 151-3051 #151-3051 152-3056 #152-3056
		152-3065 #152-3065 152-3069 #152-3069 152-3078 #152-3078 153-3083 #153-3083 153-3092 #153-3092
		#153-3092 153-3096 #153-3096 153-3105 #153-3105 154-3110 #154-3110 154-3119 #154-3119
		154-3123 #154-3123 154-3132 #154-3132 155-3137 #155-3137 155-3146 #155-3146 155-3150 #155-3150
		155-3159 #155-3159
I\$PWR	= 000041	#15-543
I\$RPT	= 000041	#15-543 #108-1615 #108-1643
I\$SEG	= 000041	#15-543 116-1922 118-1971 120-2029 122-2093 124-2158 126-2222 128-2287 130-2356
		132-2431 134-2500 136-2569 138-2640 140-2715 144-2856
I\$SETU	= 000041	#15-543 149-2971 #149-2971 149-2988 150-3002 150-3015 151-3029 151-3042
		152-3056 152-3069 153-3083 153-3096 154-3110 154-3123 155-3137 155-3150 155-3161
I\$SFT	= 000041	#148-2949 #148-2951
I\$SRV	= 000041	#15-543 #143-2828 #143-2831
I\$SUB	= 000041	#15-543 116-1922 118-1971 120-2029 122-2093 124-2158 126-2222 128-2287 130-2356
		132-2431 134-2500 136-2569 138-2640 140-2715 144-2856
I\$TST	= 000041	#15-543 116-1922 #116-1922 117-1955 #117-1955 #117-1955 118-1971 #118-1971 119-2016 #119-2016
		#119-2016 120-2029 #120-2029 121-2078 #121-2078 #121-2078 122-2093 #122-2093 #122-2093
		123-2145 #123-2145 #123-2145 124-2158 #124-2158 125-2207 #125-2207 #125-2207 126-2222 #126-2222
		#126-2222 127-2267 #127-2267 127-2274 #127-2274 128-2287 #128-2287 #128-2287 129-2343 #129-2343
		#129-2343 130-2356 #130-2356 131-2409 131-2418 #131-2418 #131-2418 132-2431 #132-2431
		133-2480 133-2487 #133-2487 #133-2487 134-2500 #134-2500 135-2548 135-2555 #135-2555
		#135-2555 136-2569 #136-2569 137-2625 #137-2625 #137-2625 138-2640 #138-2640 139-2701 #139-2701
		#139-2701 #139-2701 140-2715 #140-2715 140-2744 141-2755 141-2761 141-2769 142-2795
		143-2820 143-2833 #143-2833 #143-2833 144-2856 #144-2856 145-2897 #145-2897 #145-2897
J\$JMP	= 000167	#15-543 114-1847 115-1884
LOE	= 040000 G	#19-691
LOOPB1	002222	#20-747 #111-1749 128-2296
LOOPB2	002224	#20-748 #111-1750 130-2365
LOOPB3	002226	#20-749 #111-1751 132-2440
LOOPB4	002230	#20-750 #111-1752 134-2509
LOOP1	003535	#32-1029 146-2920
LOOP2	003622	#33-1031 146-2923
LOOP3	003702	#33-1032 146-2925
LOOP4	003762	#34-1034 146-2927
LOT	= 000010 G	#19-691
LUN	002210	#20-742 104-1451 105-1467 105-1472 #110-1720 #110-1722 110-1723 110-1725 116-1940
		118-1992 120-2051 121-2072 122-2118 123-2139 124-2180 125-2201 126-2244 128-2311
		130-2382 132-2457 134-2525 136-2592 138-2663 145-2891
L\$ACP	002110 G	#15-585

S Y M B O L C R O S S R E F E R E N C E

C R E F V 0 2

S Y M B O L	V A L U E		R E F E R E N C E S		
L\$APT	002036	G	#15-585		
L\$AU	020076	G	15-585	#115-1873	
L\$AUT	002070	G	#15-585		
L\$AUTO	017710	G	15 585	#112-1783	
L\$CCP	002106	G	#15-585		
L\$CLEA	020034	G	15-585	#113-1806	
L\$CO	002032	G	#15-585		
L\$DEPO	002011	G	#15-585		
L\$DESC	014432	G	15-585	#89-1215	
L\$DESP	002076	G	#15-585		
L\$DEVP	002060	G	#15-585		
L\$DISP	002124	G	15-585	#16-606	
L\$DLY	002116	G	#15-585		
L\$DTP	002040	G	#15-585		
L\$DTYP	002034	G	#15-585		
L\$DU	020042	G	15-585	#114-1842	
L\$DUT	002072	G	#15-585		
L\$DVTY	014422	G	15-585	#89-1205	
L\$EF	002052	G	#15-585		
L\$ENVI	002044	G	#15-585		
L\$ETP	002102	G	#15-585		
L\$EXP1	002046	G	#15-585		
L\$EXP4	002064	G	#15-585		
L\$EXP5	002066	G	#15-585		
L\$HARD	024502	G	15-585	146-2914	#146-2914
L\$HIME	002120	G	#15-585	110-1717	
L\$HPCP	002016	G	#15-585		
L\$HPTP	002022	G	#15-585		
L\$HW	002162	G	15-585	17-624	#17-624
L\$ICP	002104	G	#15-585		
L\$INIT	017412	G	15-585	#110-1681	
L\$LADP	002026	G	#15-585		
L\$LAST	024716	G	15-585	#148-2956	155-3161
L\$LOAD	002100	G	#15-585		
L\$LUN	002074	G	#15-585		
L\$MREV	002050	G	#15-585		
L\$NAME	002000	G	#15-585		
L\$PRIO	002042	G	#15-585		
L\$PROT	017404	G	15-585	#109-1652	
L\$PRT	002112	G	#15-585		
L\$REPP	002062	G	#15-585		
L\$REV	002010	G	#15-585		
L\$RPT	017402	G	15-585	#108-1615	
L\$SOFT	024572	G	148-2949	#148-2949	
L\$SPC	002056	G	#15-585		
L\$SPCP	002020	G	#15-585		
L\$SPTP	002024	G	#15-585		
L\$STA	002030	G	#15-585		
L\$SW	002204	G	18-664	#18-664	
L\$TEST	002114	G	#15-585		
L\$TIML	002014	G	#15-585		
L\$UNIT	002012	G	#15-585	110-1723	

SYMBOL CROSS REFERENCE

CRF VOP

SYMBOL	VALUE	REFERENCES	CRF	VOP
L10000	002202	17-624	#17-653	
L10001	002204	18-664	#18-674	
L10002	016364	#99-1329		
L10003	016410	#100-1334		
L10004	016442	#100-1339		
L10005	016516	#100-1345		
L10006	016566	#101-1351		
L10007	016616	#101-1356		
L10010	016646	#101-1361		
L10011	016720	#102-1368		
L10012	017402	#108-1643		
L10014	017706	111-1755	#111-1772	
L10015	017730	#112-1795		
L10016	020040	113-1817	#113-1833	
L10017	020074	114-1847	#114-1863	
L10020	020102	115-1884	#115-1900	
L10021	020242	#117-1955		
L10022	020444	#119-2016		
L10023	020664	#121-2078		
L10024	021120	#123-2145		
L10025	021340	#125-2207		
L10026	021564	127-2267	#127-2274	
L10027	022022	#129-2343		
L10030	022302	131-2409	#131-2418	
L10031	022542	133-2480	#133-2487	
L10032	022774	135-2548	#135-2555	
L10033	023236	#137-2625		
L10034	023520	#139-2701		
L10035	024302	140-2744	141-2755	141-2761 141-2769 142-2795 143-2820 #143-2833
L10036	024300	#143-2831		
L10037	024476	#145-2897		
L10040	024570	146-2914	147-2934	#147-2935
L10041	024572	148-2949	#148-2951	
L10042	024722	#149-2975		
L10043	024746	149-2975	#149-2988	
L10044	024742	149-2975	#149-2984	
L10045	024772	149-2988	#150-3002	
L10046	024766	149-2988	#149-2997	
L10047	025016	150-3002	#150-3015	
L10050	025012	150-3002	#150-3011	
L10051	025042	150-3015	#151-3029	
L10052	025036	150-3015	#150-3024	
L10053	025066	151-3029	#151-3042	
L10054	025062	151-3029	#151-3038	
L10055	025112	151-3042	#152-3056	
L10056	025106	151-3042	#151-3051	
L10057	025136	152-3056	#152-3069	
L10060	025132	152-3056	#152-3065	
L10061	025162	152-3069	#153-3083	
L10062	025156	152-3069	#152-3078	
L10063	025206	153-3083	#153-3096	
L10064	025202	153-3083	#153-3092	

SYMBOL CROSS REFERENCE

CRF VOL

SYMBOL	VALUE		REFERENCES								
L10065	025232		153-3096	#154-3110							
L10066	025226		153-3096	#153-3105							
L10067	025256		154-3110	#154-3123							
L10070	025252		154-3110	#154-3119							
L10071	025302		154-3123	#155-3137							
L10072	025276		154-3123	#154-3132							
L10073	025326		155-3137	#155-3150							
L10074	025322		155-3137	#155-3146							
L10076	025346		155-3150	#155-3159							
MOHEDR	002000	G	#15-559								
NEXT	017516		110-1716	#110-1722	110-1726						
NOINFO	014712		#91-1235	99-1328							
NOIOP	002756		#28-1016	116-1939							
NONO	016620	G	#101-1358	104-1450							
NOREG	014500		#90-1229	100-1333							
NORES	003054		#28-1017	118-1990	120-2049	122-2116	124-2178	126-2242	128-2309	130-2380	132-2455
			134-2523	136-2590	138-2661	143-2806					
NOSEC	017732		112-1793	#112-1797							
NOTCLR	015321		#94-1244	101-1360							
NOTPR	003353		#31-1025	105-1471							
NOTRDY	003264		#30-1023	104-1450							
NOTST	015240		#93-1241	102-1382							
NRES	016412	G	#100-1336	118-1990	120-2049	122-2116	124-2178	126-2242	128-2309	130-2380	132-2455
			134-2523	136-2590	138-2661	143-2806					
NXM	016366	G	#100-1332	116-1939							
NXMVEC	= 000004		#116-1920	116-1926	117-1954						
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O\$AIJ	= 000001		#15-543	#15-566	15-585						
O\$BGNR	= 000001		#15-543	#15-566	15-585						
O\$BGNS	= 000000		#15-543	15-585							
O\$DU	= 000001		#15-543	#15-566	15-585						
O\$ERRT	= 000000		#15-543	15-585							
O\$GNSW	= 000000		#15-543	15-585							
O\$POIN	= 000001		#15-543	#15-566	#15-566	#15-566	#15-566	15-566	15-585		
O\$SETU	= 000001		#15-543	#15-566	15-585	148-2956					
PLLIO	002262		#20-771	134-2513	135-2540	135-2542					
PLLP	004331		#38-1049	134-2522	135-2550						
PNT	= 001000	G	#19-691								
PNTFLG	017336		#107-1524	116-1924	118-1973	120-2032	122-2096	124-2161	126-2225	128-2290	130-2359
			132-2434	134-2503	136-2572	138-2643	140-2718	144-2859			
PRI	= 002000	G	#19-691								
PRI00	= 000000	G	#19-691	116-1930	140-2735	142-2779					
PRI01	= 000040	G	#19-691								
PRI02	= 000100	G	#19-691								
PRI03	= 000140	G	#19-691								
PRI04	= 000200	G	#19-691								
PRI05	= 000240	G	#19-691								
PRI06	= 000300	G	#19-691	116-1926	140-2730	140-2732	141-2764	142-2773	142-2778	142-2790	
PRI07	= 000340	G	#19-691								
QBASE	002216		#20-745	104-1442	106-1494	#111-1738	#111-1741	#111-1744	#111-1747	116-1928	118-1979
			120-2038	122-2102	124-2167	126-2231	128-2298	130-2368	132-2443	134-2512	136-2578
			138-2649	140-2725	144-2865						

SYMBOL CROSS REFERENCE

CREF V02

SYMBOL	VALUE	REFERENCES
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102-1368	102-1368	102-1382
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105-1466	105-1466	105-1466
105-1469	105-1471	105-1471
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106-1510	107-1524	107-1524
107-1528	107-1528	107-1528
107-1528	108-1643	108-1643
110-1707	110-1707	110-1707
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110-1725	110-1725	110-1725
111-1757	111-1757	111-1772
112-1793	112-1793	112-1793
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114-1845	114-1845	114-1845
114-1847	114-1847	114-1863
115-1900	116-1926	116-1926
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116-1939	116-1939	116-1939
116-1940	116-1940	116-1942
117-1954	117-1955	117-1955
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SEP 0175

SYMBOL CROSS REFERENCE

CREF V02

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125-2207	125-2207	126-2228
126-2242	126-2242	126-2242
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128-2293	128-2309	128-2309
128-2310	128-2310	128-2311
129-2322	129-2322	129-2322
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SYMBOL CROSS REFERENCE

REF VOZ

SYMBOL	VALUE	REFERENCES
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SWITCH	015047	#92-1238 101-1349
S\$LSYM	= 010000	#15-543 #17-653 #18-674 #99-1329 #100-1334 #100-1339 #100-1345 #101-1351 #101-1356
		#101-1361 #102-1368 #108-1643 #111-1772 #112-1795 #113-1833 #114-1863 #115-1900 #117-1955
		#119-2016 #121-2078 #123-2145 #125-2207 #127-2274 #129-2343 #131-2418 #133-2487 #135-2555

SYMBOL CROSS REFERENCE

CREF V02

SYMBOL	VALUE	REFERENCES
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TPR	015377	#90-1232 100-1338
TPRDIS	016650 G	#95-1246 102-1366
TPR1	015453	#102 1364 105-1471
TSTERR	014653	#95-1247 102-1367
TSTNO	016045	#91-1234 98-1288 100 1343
TST1	004663	#97-1254 107-1528
T\$ARGC	= 000002	#42-1061 116-1923
		#15-585 15-585 #15-585 15-585 15-585 #15 585 15 585 15-585 #15 585
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		15-585 15-585 #98-1288 98-1288 #98-1288 98-1288 #98-1288 98-1288 98-1288
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		99-1308 99-1308 #99-1320 99-1320 #99-1320 99-1320 #99-1320 99-1320 #99-1328 99-1328
		99-1328 #100-1333 100-1333 #100-1333 100-1333 100 1333 #100-1338 100-1338 #100-1338
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		#102-1366 102-1366 102-1366 #102-1367 102-1367 #102-1367 102-1367 102-1367 #102-1382
		102-1382 #102-1382 102-1382 #102-1382 102-1382 102-1382 #106-1495 106-1495 #106-1495
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		#147-2930 147-2930 #147-2930 147-2930 #147-2930 147-2930 #147-2932 147-2932 #147-2932
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T\$ERRN	= 000063	#15-543 #104-1450 104-1450 #105-1466 105-1466 #105-1471 105-1471 #116-1939 116-1939
		#118-1930 118-1990 #119-2003 119-2003 #119-2012 119-2012 #120-2049 120-2049 #121-2062
		121-2062 #121-2071 121-2071 #122-2116 122-2116 #123-2129 123-2129 #123-2138 123-2138
		#124-2178 124-2178 #125-2191 125-2191 #125-2200 125-2200 #126-2242 126-2242 #127-2255
		127-2255 #127-2270 127-2270 #128-2309 128-2309 #129-2322 129-2322 #129-2339 129-2339
		#130-2380 130-2380 #131-2393 131-2393 #131-2414 131-2414 #132-2455 132-2455 #133-2468
		133-2468 #133-2483 133-2483 #134-2523 134-2523 #135-2536 135-2536 #135-2551 135-2551
		#136-2590 136-2590 #137-2603 137-2603 #137-2621 137-2621 #138-2661 138-2661 #139-2674
		139-2674 #139-2697 139-2697 #140-2743 140-2743 #141-2767 141-2767 #142-2793 142-2793
		#143-2806 143-2806 #143-2817 143-2817 #144-2872 144-2872 #145-2890 145-2890
		#146-2916 146-2916
T\$EXCP	= 000000	
T\$FLAG	= 000041	#111-1755 #111-1755 111-1755 111-1755 #113-1817 #113-1817 113-1817 113-1817 #114-1847
		#114-1847 114-1847 #115-1884 #115-1884 115-1884 #127-2267 #127 2267 127 2267 127-2267
		#131-2409 #131-2409 131-2409 131-2409 #133-2480 #133-2480 133-2480 133-2480 #135-2548
		#135-2548 135-2548 135-2548 #140-2744 #140-2744 140 2744 140-2744 #141-2755 #141-2755
		141 2755 141-2755 #141-2761 #141-2761 141-2761 141 2761 #141-2769 #141-2769 141-2769
		141-2769 #142-2795 #142-2795 142-2795 142-2795 #143-2820 #143-2820 143-2820 143-2820
		#147-2934 147-2934 147-2934
T\$FREE	= 025346	148-2956 #155-3161
T\$GMAN	= 000000	#15-543
T\$HILI	= 000017	#146-2916 146-2916
T\$LAST	= 000001	#15-543 #148-2956 149-2971

SYMBOL CROSS REFERENCE

CREF V02

SYMBOL	VALUE	REFERENCES
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		117-1955 119-2016 121-2078 123-2145 125-2207 127-2274 129-2343 131-2418 133-2487
		135-2555 137-2625 139-2701 143-2831 143-2833 145-2897 147-2935 148-2951
T\$LTNO	000016	#148-2956
T\$NEST	= 177777	#15-543 15-559 #15-559 15-559 15-586 15-586 15-586 #15-586 16-605
		#16-605 16-605 16-607 16-607 16-607 #16-607 17-624 #17-624 17-624
		17-653 17-653 17-653 #17-653 18-664 #18-664 18-664 18-674 18-674
		18-674 #18-674 19-690 #19-690 19-690 19-707 19-707 19-707 19-707 #19-707
		20-715 #20-715 20-715 27-999 27-999 27-999 #27-999 98-1286 #98-1286
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		115-1900 115-1900 115-1900 #115-1900 116-1922 #116-1922 116-1922 117-1955 117-1955
		117-1955 #117-1955 118-1971 #118-1971 118-1971 119-2016 119-2016 119-2016 #119-2016
		120-2029 #120-2029 120-2029 121-2078 121-2078 121-2078 #121-2078 122-2093 #122-2093
		122-2093 123-2145 123-2145 123-2145 #123-2145 124-2158 #124-2158 124-2158 125-2207
		125-2207 125-2207 #125-2207 126-2222 #126-2222 126-2222 127-2274 127-2274 127-2274
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		133-2487 133-2487 133-2487 #133-2487 134-2500 #134-2500 134-2500 135-2555 135-2555
		135-2555 #135-2555 136-2569 #136-2569 136-2569 137-2625 137-2625 137-2625 #137-2625
		138-2640 #138-2640 138-2640 139-2701 139-2701 139-2701 #139-2701 140-2715 #140-2715
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T\$NSO	= 000005	#15-559 15-586 #16-605 16-607 #17-624 17-653 #18-664 18-674 #19-690
		19-707 #20-715 27-999 #98-1286 99-1329 #100-1332 100-1334 #100-1336 100-1339
		#100-1341 100-1345 #101-1347 101-1351 #101-1353 101-1356 #101-1358 101-1361 #102-1364
		102-1368 #108-1615 108-1643 #109-1652 109-1658 #110-1681 111-1772 #112-1783 112-1795
		#113-1806 113-1833 #114-1842 114-1863 #115-1873 115-1900 #116-1922 117-1955 #118-1971
		119-2016 #120-2029 121-2078 #122-2093 123-2145 #124-2158 125-2207 #126-2222 127-2274
		#128-2287 129-2343 #130-2356 131-2418 #132-2431 133-2487 #134-2500 135-2555 #136-2569
		137-2625 #138-2640 139-2701 #140-2715 143-2833 #144-2856 145-2897 #146-2914 147-2934
		147-2934 147-2935 #148-2949 148-2951
T\$NS1	= 000010	#143-2828 143-2831
T\$PCNT	= 000000	#149-2971 149-2975 #149-2975 149-2975 149-2988 #149-2988 149-2988 150-3002 #150-3002
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		154-3123 155-3137 #155-3137 155-3137 155-3150 #155-3150 155-3150 155-3150
T\$PTAB	= 010075	#149-2975 149-2975 149-2975 #149-2988 149-2988 #150-3002 150-3002 150-3002

SYMBOL CROSS REFERENCE

CREF V02

SYMBOL	VALUE	REFERENCES
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		#153-3096 153-3096 153-3096 #154-3110 154-3110 154-3110 #154-3123 154-3123 154-3123
		#155-3137 155-3137 155-3137 #155-3150 155-3150
T\$PTHV	= 000016	15-585 #155-3161
T\$PTNU	= 000016	#15-543 149-2975 #149-2975 149-2988 #149-2988 150-3002 #150-3002 150-3015 #150-3015
		151-3029 #151-3029 151-3042 #151-3042 152-3056 #152-3056 152-3069 #152-3069 153-3083
		#153-3083 153-3096 #153-3096 154-3110 #154-3110 154-3123 #154-3123 155-3137 #155-3137
		155-3150 #155-3150 155-3161 155-3161
T\$SAVL	= 177777	#15-543
T\$SEGL	= 177777	#15-543
T\$SIZE	= 000214	148-2956 #155-3161
T\$SUBN	= 000000	#15-543 #116-1922 #118-1971 #120-2029 #122-2093 #124-2158 #126-2222 #128-2287 #130-2356
		#132-2431 #134-2500 #136-2569 #138-2640 #140-2715 #144-2856
T\$TAGL	= 177777	#15-543
T\$TAGN	= 010077	#15-543 17-624 17-624 #17-624 18-664 18-664 #18-664 98-1286 98-1286
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		#109-1652 110-1681 110-1681 #110-1681 112-1783 112-1783 #112-1783 113-1806 113-1806
		#113-1806 114-1842 114-1842 #114-1842 115-1873 115-1873 #115-1873 116-1922 116-1922
		#116-1922 118-1971 118-1971 #118-1971 120-2029 120-2029 #120-2029 122-2093 122-2093
		#122-2093 124-2158 124-2158 #124-2158 126-2222 126-2222 #126-2222 128-2287 128-2287
		#128-2287 130-2356 130-2356 #130-2356 132-2431 132-2431 #132-2431 134-2500 134-2500
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		#155-3137 155-3137 155-3137 #155-3137 155-3150 155-3150 #155-3150 155-3150 155-3150
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		#113-1817 113-1817 #113-1833 113-1833 #114-1847 114-1847 #114-1863 114-1863 #115-1884
		115-1884 #115-1900 115-1900 #117-1955 117-1955 #119-2016 119-2016 #121-2078 121-2078
		#123-2145 123-2145 #125-2207 125-2207 #127-2267 127-2267 #127-2274 127-2274 #129-2343
		129-2343 #131-2409 131-2409 #131-2418 131-2418 #133-2480 133-2480 #133-2487 133-2487
		#135-2548 135-2548 #135-2555 135-2555 #137-2625 137-2625 #139-2701 139-2701 #140-2744
		140-2744 #141-2755 141-2755 #141-2761 141-2761 #141-2769 141-2769 #142-2795 142-2795

SYMBOL CROSS REFERENCE

CREF V02

SYMBOL	VALUE	REFERENCES								
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		#146-2918	146-2918	#146-2920	146-2920	#146-2920	146-2920	#146-2920	146 2920	#146-2923
		146-2923	#146-2923	146-2923	#146-2923	146-2923	#146-2925	146-2925	#146-2925	146-2925
		#146-2925	146-2925	#146-2927	146-2927	#146-2927	146-2927	#146-2927	146-2927	#147-2930
		147-2930	#147-2930	147-2930	#147-2930	147-2930	#147-2932	147-2932	#147-2932	147-2932
		#147-2932	147-2932	#147-2934	147-2934	#147 2935	147-2935	#148-2951	148-2951	
		#15-543	116-1922	#116-1922	116-1922	118-1971	#118-1971	118-1971	120-2029	#120-2029
		120-2029	122-2093	#122-2093	122-2093	124 2158	#124-2158	124-2158	126-2222	#126-2222
		126-2222	128-2287	#128-2287	128-2287	130-2356	#130-2356	130-2356	132-2431	#132-2431
		132-2431	134-2500	#134-2500	134-2500	136-2569	#136-2569	136-2569	138-2640	#138-2640
		138-2640	140-2715	#140-2715	140-2715	144-2856	#144-2856	144-2856	148-2956	
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		101-1355	101-1356	101-1360	101-1361	102-1366	102-1367	102-1368	102-1382	103-1426
		104-1450	104-1451	104-1453	105-1466	105-1467	105 1469	105-1471	105-1472	105-1474
		106-1495	106-1510	107-1524	107-1528	108-1643	110-1707	110-1709	110-1713	110-1715
		110-1725	111-1755	111-1757	111-1772	112-1793	112-1795	113-1817	113-1833	114-1845
		114-1863	115-1900	116-1926	116-1930	116-1939	116-1940	116-1942	117-1953	117-1954
		117-1955	118-1976	118-1990	118-1991	118-1992	118-1994	119-2003	119-2012	119-2014
		119-2016	120-2035	120-2049	120-2050	120-2051	120-2053	121-2062	121-2071	121-2072
		121-2074	121-2076	121-2078	122-2099	122-2116	122-2117	122-2118	122-2120	123-2129
		123-2138	123-2139	123-2141	123-2143	123-2145	124-2164	124-2178	124-2179	124-2180
		124-2182	125-2191	125-2200	125-2201	125-2203	125-2205	125-2207	126-2228	126-2242
		126-2243	126-2244	126-2246	127-2255	127-2267	127-2270	127-2272	127-2274	128-2293
		128-2309	128-2310	128-2311	128-2313	129-2322	129-2339	129-2341	129-2343	130-2362
		130-2380	130-2381	130-2382	130-2384	131-2393	131-2409	131-2414	131-2416	131-2418
		132-2437	132-2455	132-2456	132-2457	132-2459	133-2468	133-2480	133-2483	133-2485
		133-2487	134-2506	134-2523	134-2524	134-2525	134-2527	135-2536	135-2548	135-2551
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		137-2623	137-2625	138-2646	138-2661	138-2662	138-2663	138-2665	139-2674	139-2697
		139-2699	139-2701	140-2721	140-2730	140-2732	140-2735	140-2743	140-2744	141-2755
		141-2761	141-2764	141-2767	141-2768	141-2769	142-2773	142-2775	142-2778	142-2779
		142-2790	142-2793	142-2794	142-2795	143-2806	143-2807	143-2809	143-2817	143-2819
		143-2820	143-2833	144-2862	144-2872	145-2890	145-2891	145-2893	145-2895	145-2897
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		#132-2431	#134-2500	#136-2569	#138-2640	#140-2715	#144-2856			
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T\$\$AUT	= 010015	#112-1783	112-1795							
T\$\$CLE	= 010016	#113-1806	113-1817	113-1833						
T\$\$DAT	= 010076	#149-2975	149-2975	149-2984	#149-2988	149-2988	149-2997	#150-3002	150-3002	150-3011
		#150-3015	150-3015	150-3024	#151-3029	151-3029	151-3038	#151-3042	151-3042	151-3051
		#152-3056	152-3056	152-3065	#152-3069	152-3069	152-3078	#153 3083	153-3083	153-3092
		#153-3096	153-3096	153-3105	#154-3110	154-3110	154-3119	#154-3123	154-3123	154-3132
		#155-3137	155-3137	155-3146	#155-3150	155-3150	155-3159			
T\$\$DU	= 010017	#114-1842	114-1847	114-1863						
T\$\$HAR	= 010040	#146-2914	146-2914	147-2934	147-2935					
T\$\$HW	= 010000	#17-624	17-624	17-653						
T\$\$INI	= 010014	#110-1681	111-1755	111-1772						
T\$\$MSG	= 010011	#98-1286	99-1329	#100-1332	100-1334	#100-1336	100 1339	#100-1341	100-1345	#101 1347
		101-1351	#101-1353	101-1356	#101-1358	101-1361	#102-1364	102-1368		
T\$\$PC	= 000016	#149-2971	155-3161							

S Y M B O L C R O S S R E F E R E N C E

C R E F V 0 2

S Y M B O L	V A L U E		R E F E R E N C E S								
T\$\$PRO	= 010013		#109-1652								
T\$\$PTA	= 010075		#149-2971	149-2975	#149-2975	149-2988	#149 2988	150-3002	#150-3002	150-3015	#150-3015
			151-3029	#151-3029	151-3042	#151-3042	152-3056	#152-3056	152-3069	#152 3069	153-3083
			#153-3083	153-3096	#153-3096	154 3110	#154 3110	154-3123	#154-3123	155-3137	#155-3137
			155-3150	#155-3150							
T\$\$RPT	- 010012		#108-1615	108-1643							
T\$\$SOF	= 010041		#148-2949	148-2949	148 2951						
T\$\$SRV	= 010036		#143-2828	143-2831							
T\$\$SW	= 010001		#18-664	18-664	18-674						
T\$\$TES	= 010037		#116-1922	117-1955	#118-1971	119-2016	#120-2029	121-2078	#122-2093	123-2145	#124-2158
			125-2207	#126-2222	127-2267	127-2274	#128-2287	129-2343	#130-2356	131-2409	131-2418
			#132-2431	133-2480	133-2487	#134-2500	135-2548	135-2555	#136-2569	137-2625	#138-2640
			139-2701	#140-2715	140-2744	141-2755	141-2761	141-2769	142-2795	143-2820	143 2833
			#144-2856	145-2897							
T1	020104	G	16-606	#116-1922							
T1ADR	002272		#21-807	99-1306							
T1E0	005524		22-834	#50-1084							
T1E1	005570		22-835	#50-1085							
T1E2	005634		22-836	#51-1087							
T1E3	005700		22-837	#51-1088							
T1E4	005746		22-838	#52-1090							
T1E5	006016		22-839	#52-1091							
T1E6	006064		22-840	#53-1093							
T1E7	006132		22-841	#53-1094							
T10	022544	G	16-606	#134-2500							
T10ADR	002310		#21-814								
T10E0	011477		25-935	#72-1151	135-2546						
T10E1	011560		25-936	#73-1153							
T10E2	011621		25-937	#73-1154							
T10E3	011657		25-938	#74-1156							
T10E4	011714		25-939	#74-1157							
T10E5	011767		25-940	#75-1159							
T10E6	012037		25-941	#75-1160							
T10E7	012116		25-942	#76-1162							
T11	022776	G	16-606	#136-2569							
T11ADR	002312		#21-815								
T11E0	012161		26-950	#76-1163	137-2613	139-2684					
T11E1	012260		26-951	#77-1165	139-2690						
T11E2	012365		26-952	#77-1166							
T11E3	012437		26-953	#78-1168							
T11E4	012524		26-954	#78-1169							
T11E5	012573		26-955	#79-1171							
T12	023240	G	16-606	#138-2640							
T12ADR	002314		#21-816								
T12E0	012625		26-964	#79-1172	141-2753						
T12E1	012721		26-965	#80-1174							
T12E2	012771		26-966	#80-1175	141-2759						
T12E3	013052		26-967	#81-1177							
T12E4	013132		26-968	#81-1178							
T12E5	013205		26-969	#82-1180							
T12E6	013262		26-970	#82-1181							
T13	023522	G	16-606	#140-2715							

S Y M B O L C R O S S R E F E R E N C E

C R E F V 0 2

S Y M B O L	V A L U E		R E F E R E N C E S		
T13ADR	002316		#21-817		
T13E0	013336		27-979	#83-1183	
T13E1	013404		27-980	#83-1184	
T13E10	014277		27-989	#88-1198	
T13E11	014350		27-990	#88-1199	
T13E2	013460		27-981	#84-1186	
T13E3	013545		27-982	#84-1187	145 2883
T13E4	013653		27-983	#85-1189	
T13E5	013727		27-984	#85-1190	
T13E6	014005		27-985	#86-1192	
T13E7	014105		27-986	#86-1193	
T13E8	014161		27-987	#87-1195	
T13E9	014227		27-988	#87-1196	
T14	024304	G	16-606	#144-2856	
T2	020244	G	16-606	#118-1971	
T2ADR	002274		#21-808		
T2E0	006200		22-848	#54-1096	
T2E1	006253		22-849	#54-1097	
T2E2	006323		22-850	#55-1099	
T2E3	006374		22-851	#55-1100	
T2E4	006457		22-852	#56-1102	
T2E5	006542		22-853	#56-1103	
T2E6	006613		22-854	#57-1105	
T2E7	006661		22-855	#57-1106	
T2E8	006725		22-856	#58-1108	
T2E9	007003		22-857	#58-1109	
T3	020446	G	16-606	#120-2029	
T3ADR	002276		#21-809		
T3E0	007061		23-863	#59-1111	
T3E1	007137		23-864	#59-1112	
T3E2	007215		23-865	#60-1114	
T3E3	007313		23-866	#60-1115	
T4	020666	G	16-606	#122-2093	
T4ADR	002300		#21-810		
T5	021122	G	16-606	#124-2158	
T5ADR	002302		#21-811		
T5E0	007411		24-892	#61-1117	127-2265 129-2332
T5E1	007471		24-893	#61-1118	
T5E2	007544		24-894	#62-1120	
T5E3	007607		24-895	#62-1121	
T6	021342	G	16-606	#126-2222	
T6ADR	002304		#21-812		
T6E0	007647		24-906	#63-1123	
T6E1	007745		24-907	#63-1124	
T6E2	010025		24-908	#64-1126	
T6E3	010074		24-909	#64-1127	
T6E4	010154		24-910	#65-1129	
T6E5	010223		24-911	#65-1130	
T6E6	010266		24-912	#66-1132	
T7	021566	G	16-606	#128-2287	
T7ADR	002306		#21-813		
T7E0	010337		25-921	#66-1133	131-2407 133-2478

FILE

08 01 83

SYMBOL CROSS REFERENCE

CRF VOP

SYMBOL	VALUE	REFERENCES
T7E1	010417	25 922 #67 1135
T7E10	011320	25-931 #71-1148
T7E11	011412	25-932 #72-1150
T7E2	010504	25 923 #67 1136
T7E3	010560	25-924 #68-1138
T7E4	010634	25-925 #68-1139
T7E5	010707	25 926 #69 1141
T7E6	010775	25 927 #69-1142
T7E7	011054	25 928 #70-1144
T7E8	011132	25 929 #70 1145
T7E9	011227	25 930 #71-1147
T8	022024 G	16 606 #130-2356
T9	022304 G	16-606 #132 2431
IAM	= 000200 G	#19 691
UROM	004127	#35-1037 147-2932
X\$ALWA	= 000000	#15-543 147-2934
X\$FALS	= 000040	#15 543
X\$OFFS	= 000400	#15-543 147 2934
X\$TRLE	= 000020	#15 543
\$PATCH	024572 G	#148 2953

MACRO CROSS REFERENCE

CRFF V02

MACRO NAME	REFERENCES										
ENDTST	117 1955 137 2625 19-691	119-2016 139-2701	121-2078 143-2833	123 2145 145-2897	125-2207	127-2274	129 2343	131-2418	133 2487	135 2555	
EQUALS ERRDF	104-1450 126-2242	105-1471 128-2309	116-1939 130-2380	118 1990 132 2455	120 2049 134 2523	121 2071 136 2590	122-2116 138 2661	123-2138 143 2806	124-2178 145 2890	125-2200	
ERRHRD	119-2003 131 2414 141-2767	119 2012 133-2468 142-2793	121-2062 133-2483 143-2817	123-2129 135 2536 144-2872	125-2191 135-2551	127 2255 137 2603	127 2270 137 2621	129 2322 139 2674	129-2339 139-2697	131 2393 140-2743	
ERRSOF EXIT	105-1466 111-1755 141-2761	113 1817 141-2769	114-1847 142-2795	115-1884 143-2820	127 2267 147 2934	131-2409	133 2480	135 2548	140 2744	141 2755	
GPHARD GPRMD GPRML HEADER LASTAD M\$BYTE M\$CHEC	110-1725 146-2916 146-2918 15-585 148-2956 #15-585 #111-1755 #131-2409 #141-2761 #146-2916 #146-2927	146-2920 146-2923 146 2925 146-2927	146-2923 146 2925 146-2927	146 2925 146-2927	146-2927 147-2930 147 2932	147-2930 147 2932	147 2932				
M\$CNT0	#98-1288 99-1320 100-1343 101-1360 #106-1510 #15-585 15-585 15-585 15-585 89-1205	98-1288 #99-1328 #100-1344 #102-1366 106-1510 15-585 15-585 15-585 15-585 #89-1215	98-1288 99-1328 100-1344 #102-1366 #107-1528 15-585 15-585 15-585 15-585 89-1215	#98-1300 #100-1333 #101-1349 #102-1367 107-1528 15-585 15-585 15-585 15-585 16-607	98-1300 100-1333 101-1349 102-1367 107-1528 15-585 15-585 15-585 15-585 #17-653	#98-1304 #100-1338 #101-1350 #102-1382 #112 1793 15-585 15-585 15-585 15-585 17 653	98-1304 100-1338 101-1350 102-1382 112-1793 15-585 15-585 15-585 15-585 #18-674	98-1304 100-1338 101-1355 102-1382 #114 1845 15-585 15-585 15-585 15-585 18-674	#99-1308 100-1338 #101-1355 #106-1495 114-1845 15-585 15-585 15-585 15-585 #19-707	99-1308 #100-1343 101-1355 #106-1495 114-1845 15-585 15-585 15-585 15-585 19-707	#99-1320 100-1343 #101-1360 106-1495 114-1845 15-585 15-585 15-585 15-585 19-707
M\$DATA	#15-585 15-585 15-585 15-585 89-1205	15-585 15-585 15-585 15-585 #89-1215	15-585 15-585 15-585 15-585 89-1215	15-585 15-585 15-585 15-585 16-607	15-585 15-585 15-585 15-585 #17-653	15-585 15-585 15-585 15-585 17 653	15-585 15-585 15-585 15-585 #18-674	15-585 15-585 15-585 15-585 18-674	15-585 15-585 15-585 15-585 #19-707	15-585 15-585 15-585 15-585 19-707	15-585 15-585 15-585 15-585 19-707
M\$DECR	#15-586 #27-999 #101-1351 #109-1658 #115-1900 #125-2207 #135-2555 #145-2897 #150-3002 #152-3069 #155-3137	15-586 27-999 101-1351 109-1658 115-1900 125 2207 135-2555 145-2897 150-3002 152-3069 155-3137	#16-607 #99-1329 #101-1356 #111-1772 #117-1955 #127-2274 #137-2625 #147-2935 #150-3015 #153-3083 #155-3150	16-607 99-1329 101-1356 111-1772 117-1955 127-2274 137-2625 147-2935 150-3015 153-3083 155-3150	#17-653 #100-1334 #101-1361 #112-1795 #119-2016 #129-2343 #139-2701 #148-2951 #151-3029 #153-3096	17 653 100-1334 101-1361 112-1795 119-2016 129-2343 139-2701 148-2951 151-3029 153-3096	#18-674 #100-1339 #102-1368 #113-1833 #121-2078 #129-2343 #131-2418 #143-2831 #149-2975 #151-3042 #154-3110	18-674 100-1339 102-1368 113-1833 121-2078 129-2343 131-2418 143-2831 149-2975 151-3042 154-3110	#19-707 #100-1345 #108-1643 #114-1863 #123-2145 #133-2487 #143-2831 #149-2988 #152-3056 #154-3123	19-707 100-1345 108-1643 114-1863 123-2145 133-2487 143-2831 149-2988 152-3056 154-3123	19-707 100-1345 108-1643 114-1863 123-2145 133-2487 143-2831 149-2988 152-3056 154-3123
M\$DEFA	#146-2916 #146-2927	146-2916 146-2927	#146-2918 #147-2930	146-2918 147-2930	#146-2920 #147-2932	146-2920 147-2932	#146-2923 147-2932	146-2923	#146-2925	146-2925	
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M\$ERRI	#104-1450 #119 2003 #122 2116	104-1450 119-2003 122-2116	#105-1466 #119 2012 #123-2129	105-1466 119-2012 123 2129	#105-1471 #120-2049 #123 2138	105 1471 120 2049 123 2138	#116-1939 #121-2062 #124-2178	116-1939 121 2062 124-2178	#118-1990 #121 2071 #125 2191	118-1990 121-2071 125-2191	

MACRO CROSS REFERENCE

REF V02

MACRO NAME

REFERENCES

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	#132-2455	132-2455	#133-2468	133-2468	#133-2483	133-2483	#134-2523	134-2523	#135-2536	135-2536
	#135-2551	135-2551	#136-2590	136-2590	#137-2603	137-2603	#137-2621	137-2621	#138-2661	138-2661
	#139-2674	139-2674	#139-2697	139-2697	#140-2743	140-2743	#141-2767	141-2767	#142-2793	142-2793
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	#133-2480	133-2480	#135-2548	135-2548	#140-2744	140-2744	#141-2755	141-2755	#141-2761	141-2761
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	#136-2569	136-2569	#137-2625	137-2625	#138-2640	138-2640	#139-2701	139-2701	#140-2715	140-2715
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	#154-3110	154-3110	#154-3119	154-3119	#154-3123	154-3123	#154-3132	154-3132	#155-3137	155-3137
	#155-3146	155-3146	#155-3150	155-3150	#155-3159	155-3159				
M\$GETS	#15-586	15-586	#16-607	16-607	#17-653	17-653	#18-674	18-674	#19-707	19-707
	#27-999	27-999	#99-1329	99-1329	#100-1334	100-1334	#100-1339	100-1339	#100-1345	100-1345
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	#109-1658	109-1658	#111-1772	111-1772	#112-1795	112-1795	#113-1833	113-1833	#114-1863	114-1863
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MACRO NAME	REFERENCES
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