

M8268

PDP11/34 CACHE
CFKKAB0

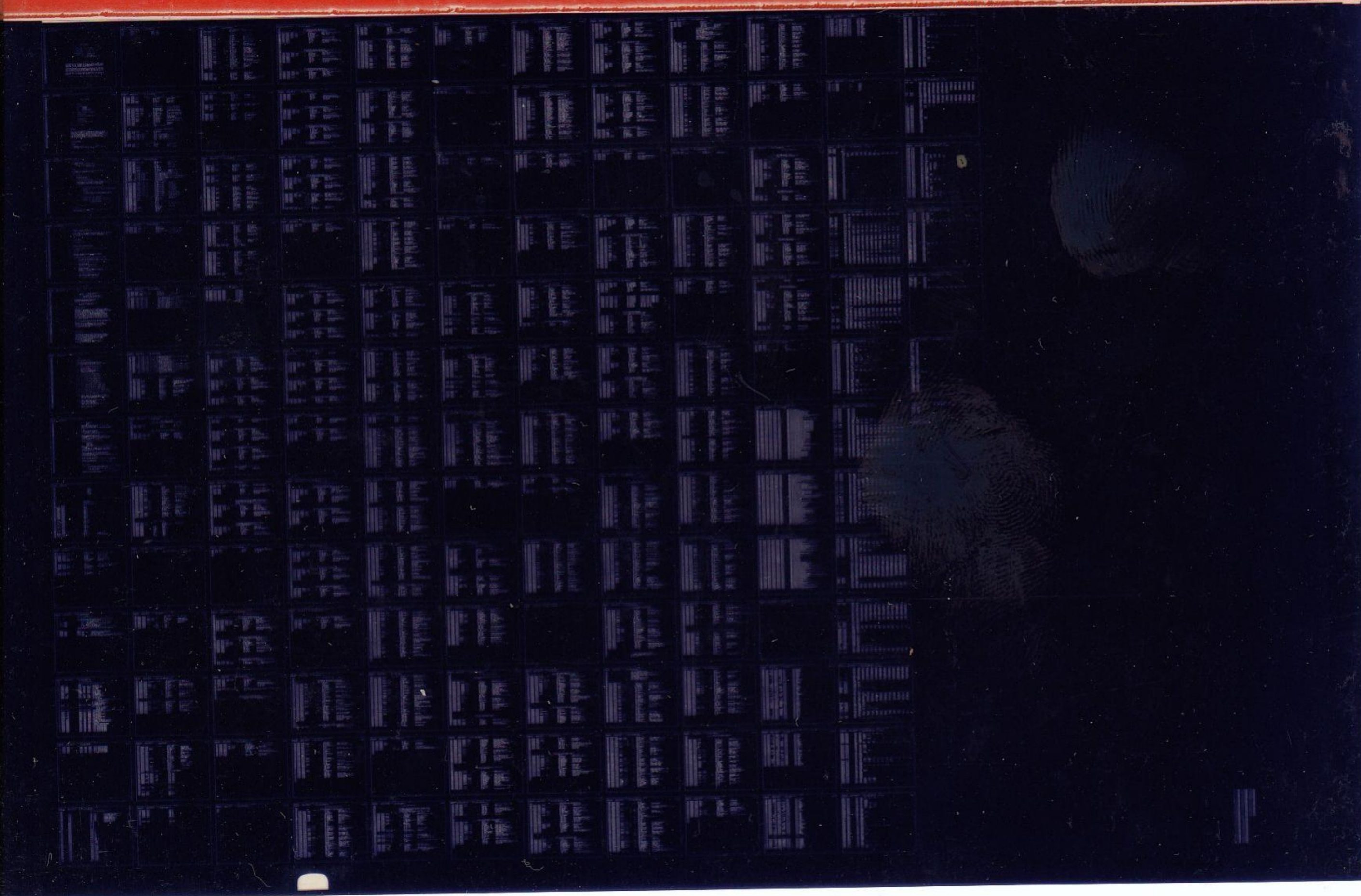
AH-E111B-MC

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MADE IN USA



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IDENTIFICATION

PRODUCT CODE:	AC-E110B-MC
PRODUCT NAME:	CFKKABO PDP11/34 CACHE
DATE CREATED:	MAY 1979
MAINTAINER:	DIAGNOSTIC GROUP
AUTHOR:	SCOTT GORDON REVISED BY JOHN W. CIUKAJ REV. DATE JAN 1979

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1.0 ABSTRACT

THE 11/34 CACHE DIAGNOSTIC IS COMPRISED OF A SERIES OF TESTS WHICH WERE DESIGNED TO CHECK THE CACHE'S DATA PATHS AND ITS CONTROL LOGIC. THE TESTS ARE ARRANGED IN A LOGICAL ORDER SUCH THAT THEY BUILD ON ONE ANOTHER. THAT IS, THE CURRENTLY RUNNING TEST WILL DEPEND ON LOGIC EXERCISED BY PREVIOUS TESTS. THOSE TESTS REQUIRING EXTENSIVE AMOUNTS OF CACHE FUNCTIONING ARE DONE NEAR THE END OF THE PROGRAM. THIS TESTING PROCEDURE SHOULD PROVIDE AN EFFECTIVE DEGREE OF FAULT ISOLATION.

2.0 SYSTEM REQUIREMENTS

2.1 HARDWARE

1. A WORKING 11/34 CPU
2. A MINIMUM OF 16K TO A MAX OF 124K OF MEMORY. 124K IS NEEDED FOR COMPLETE CHECK OF TAG MEMORY.

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3. A CONSOLE TERMINAL
4. A UNIBUS EXERCISER IF NPR DATOS ARE TO BE TESTED.
HARDWARE SETTINGS: ADDRESS = 770000 (ALL SWITCHES ON)
VECTOR NOT USED

2.2 SOFTWARE

THIS DIAGNOSTIC WILL RUN UNDER ACT, XXDP AND STAND ALONE.
IT CAN ALSO BE RUN UNDER APT IN ACT MODE.

2.3 ACT& APT SETUP

2.3.1 RUN TIMES

FIRST PASS RUN TIME = 10
MAXIMUM PASS RUN TIME = 10

2.3.2 50HZ/60HZ SYSTEM CONFIGURATION

PROPER OPERATION OF FORCE MISS TESTS ARE DEPENDANT ON WHETHER LINE FREQU
IS 50HZ OR 60HZ. THE DIAGNOSTIC OPERATES IN THE
FOLLOWING MANNER UNDER THE SPECIFIED ENVIRONMENTS:

1. ACT,XXDP

A. QUICK VERIFY,AUTO ACCEPT,XXDP CHAIN

DIAGNOSTIC RUNS FORCE MISS TESTS FOR 60HZ CONFIGURATION ONLY.

B. DUMP MODE

1ST PASS OF DIAGNOSTIC FOLLOWING LOADING OF PROGRAM
WILL PROMPT USER FOR 60HZ OR 50HZ CONFIGURATION.

2. APT

A. QUICK VERIFY,RUN TIME ,STANDALONE

APT SCRIPT MUST USE BIT0 IN SWITCH 1(CONSOLE SWITCH
REGISTERS)

1= 50HZ CONFIGURATION
0= 60HZ CONFIGURATION

2.4 EXECUTION TIME

FOR AN ERROR FREE, FIRST RUN PASS ON A 11/34 WITH CORE MEMORY.
IT TAKES APPROXIMATELY 10 SECONDS.

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3.0 DIAGNOSTIC HIERARCHY PREREQUISITES

IT IS ASSUMED THAT CPU, MEMORY, MEMORY MANAGEMENT AND TTY ARE WORKING PROPERLY FOR THIS PROGRAM TO GIVE CORRECT ERROR REPORTS. IF NOT, THEIR RESPECTIVE DIAGNOSTIC SHOULD BE RUN BEFORE THE CACHE DIAGNOSTIC.

4.0 STARTING ADDRESS

200 FOR NORMAL STARTUP

5.0 PROGRAM CONTROL AND OPERATOR ACTION

5.1 THE STANDARD DIAGNOSTIC LOADING PROCEDURES ARE TO BE FOLLOWED.

5.2 LOAD ADDRESS 200

5.3 START

5.4 DIAG. WILL THEN PRINT ITS NAME AND EXPECTED RUN TIME AFTER WHICH PROGRAM ENTERS COMMAND MODE AND PROMPTS USER WITH 'CACHE=>'.

5.5 THE USER THEN HAS THE OPTION OF USING THE FOLLOWING COMMANDS

5.5.1 'LOT' ENTER LOOP ON ERRORING TEST MODE
PROGRAM WILL LOOP ON ANY TEST IN WHICH AN ERROR HAS OCCURED

5.5.2 'CLOT' (DEFAULT) CANCELS EFFECT OF 'LOT'

5.5.3 'LOE' LOOP ON ERROR
PROGRAM WILL LOOP ON CURRENT ERROR

5.5.4 'CLOE' (DEFAULT) CANCELS EFFECT OF 'LOE'

5.5.5 'HOE' HALT ON ERROR
PROGRAM WILL PRINT TEST NUMBER OF FAILING TEST THEN HALT. TEST MAY THEN BE REENTERED BY USING THE CONSOLE CONTINUE SWITCH.

5.5.6 'CHOE' (DEFAULT) CANCELS EFFECT OF 'HOE'

5.5.7 'CIER' (DEFAULT) ENABLE ERROR PRINTOUT
ENABLES THE PRINTING OF ERROR MESSAGES.

5.5.8 'IER' DISABLE PRINTING ERROR MESSAGES

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5.5.9 'LST XXX' LOOP ON SELECTED TEST
WHERE XXX = TEST TO BE LOOPED ON
EXAMPLE: LST 121

WILL EXECUTE ALL TESTS BEFORE TEST 121
THEN HOLD AT TEST 121 IN A LOOP

5.5.10 'CLST' (DEFAULT) CANCELS EFFECT OF 'LST XXX'

5.6 AFTER DESIRED OPTIONS HAVE BEEN SELECTED THE
PROGRAM MAY THEN BE RUN BY TYPING 'RUN'
AFTER WHICH TESTING WILL BEGIN.

5.7 TYPING '^C' AT ANY TIME WILL STOP TESTING
AND RETURN TO COMMAND MODE.

6.0 PROGRAM DESCRIPTION

UPON START OF THE PROGRAM, THE CACHE IS IMMEDIATELY TURNED OFF
(FORCE MISS IS ON FOR BOTH HALVES OF CACHE, INTERRUPTS ARE DISABLED
AND CACHE IS IN BYPASS MODE). THE TESTS THEN PROCEED TO SELECTIVELY
TURN ON ONLY THE HALF OF CACHE THAT IS TO BE EXERCISED.
THIS IS TO ENSURE THAT THE INSTRUCTIONS ARE NOT EXECUTED OUT
OF A POSSIBLY BAD CACHE. IN ORDER TO IMPLEMENT THIS SCHEME,
THE TESTS THAT ENABLE CACHE ARE RELOCATED TO AREAS OF CACHE
THAT ARE NOT ENABLED. THE TESTS ARE STRUCTURED ON A HALF CACHE
BASIS. THAT IS A TEST MAY BE RUN IN LOW CACHE WHILE TESTING
HIGH CACHE AFTER WHICH AN IDENTICAL TEST WILL RUN IN HIGH CACHE
WHILE TESTING LOW CACHE.

TO FACILITATE THE TESTING OF CACHE, A 2K BUFFER IS RESERVED AT THE
END OF THE PROGRAM FOR READ WRITE OPERATIONS AND RELOCATION OF TESTS.

IMMEDIATELY AFTER THE PROGRAM IS STARTED THE PROGRAM
IDENTIFIES ITSELF AND THEN PROMPTS USER TO ENTER COMMANDS
THAT WILL SET THE CONDITIONS FOR TESTING (SEE SEC. 5.4).
THIS IS ONLY DONE ON PROGRAM START AND NOT REPEATED
FOR SUBSEQUENT PROGRAM LOOPS.

7.0 ERROR REPORTING

THE CONTENTS OF THE ERROR REPORTS IDENTIFIES THE HARDWARE
UNDER TEST AT THE TIME OF FAILURE. OTHER PERTINENT INFORMATION
SUCH AS CONTENTS OF CACHE CONTROL FIELDS AND FAILING ADDRESS
GOOD DATA, BAD DATA ARE ALSO REPORTED. EACH ERROR REPORT
THAT USES THE (ADDRESS,GOOD DATA, BAD DATA) FORMAT
WILL BE PRECEDED WITH AN EXPLANATION OF WHO'S ADDRESS
AND WHAT DATA IS BEING REPORTED.

IF THE PROGRAM SHOULD HANG OR HALT WITHOUT
PRINTING AN ERROR MESSAGE THE NUMBER OF THE LAST
TEST EXECUTED CAN BE FOUND AT \$TESTN: LOCATION 612 .

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8.0 HANDLERS AND COMMON ROUTINES

8.1 THE FOLLOWING SECTION OFFERS EXPLANATION OF THE
UTILITY ROUTINES USED BY THE PROGRAM. THESE ROUTINES ARE
LOCATED ON THE FIRST 16 PAGES OF THE LISTING

- 8.1.1 'START:'' PREPARES PROGRAM FOR EXECUTION
- 8.1.2 'PREPARE:'' PREPARES 11/34 AND CACHE FOR
EXECUTION OF TESTS
- 8.1.3 'AHALT:'' HALT ON ERROR HANDLER
PRINTS HALT ON ERROR MESSAGE, THEN HALTS.
- 8.1.3 'PNTNAM:'' PRINT PROGRAM TITLE
- 8.1.4 'LP1:'' LOOP ON TEST COMMAND HANDLER
- 8.1.5 'LP2:'' NO LOOP ON TEST COMMAND HANDLER
- 8.1.6 'LP3:'' LOOP ON ERROR COMMAND HANDLER
- 8.1.7 'LP4:'' NO LOOP ON ERROR COMMAND HANDLER
- 8.1.8 'HL1:'' HALT ON ERROR COMMAND HANDLER
- 8.1.9 'HL2:'' NO HALT ON ERROR COMMAND HANDLER
- 8.1.10 'DIS1:'' DISABLE ERROR PRINTOUT COMMAND HANDLER
- 8.1.11 'DIS2:'' ENABLE ERROR PRINTOUT COMMAND HANDLER
- 8.1.12 'LP5:'' LOOP ON SPECIFIED TEST COMMAND HANDLER
- 8.1.13 'LP6:'' DISABLE LOOP ON SPECIFIED TEST COMMAND HANDLER
- 8.1.14 'PTID:'' USED TO PRINT TEST I.D. ON CURRENT TEST RUNNING
- 8.1.15 'TSTFLG:'' LOOKS FOR KEYBOARD INPUT
- 8.1.16 'GETCHA:'' INPUTS CHAR. FORM KEYBOARD, PERFORMS
LOWER TO UPPER CASE CONVERSION AND CHECKS FOR SPECIAL
CONDITIONS SUCH AS RUBOUT AND CARRIAGE RETURN. THEN
ENTERS CHAR. INTO INPUT BUFFER.
- 8.1.17 'ECHO:'' ECHO'S CHAR. JUST INPUT FROM KEYBOARD
- 8.1.18 'TRAP:'' TIMEOUT TRAP HANDLER
SETS TRAP FLAG AND RETURNS
- 8.1.19 'PARITY:'' PARITY TRAP HANDLER
DISABLES CACHE, SAVES CONTENTS OF ERROR REGISTER.
CLEARS ERROR REGISTER AND RETURNS.
- 8.1.20 'ERTSHI:'' ERROR LOOP HANDLER
HANDLER IS CALLED BY

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JSR R0,(R0)
.WORD 1
.WORD 2

WHERE WORD1 IS THE RETURN ADDRESS IF LOOP ON ERROR
ENABLED AND AN ERROR OCCURED.
WORD 2 IS THE RETURN ADDRESS IF LOOP ON TEST WAS ENABLED.
IF NO ERROR, RETURN IS MADE TO INSTRUCTION FOLLOWING
WORD 2.

8.1.21 'LPONTS:'' LOOP ON TEST HANDLER
CHECKS LOOP ON TEST MODE FLAG
IF IN LOOP MODE (LOPERR) WILL BE CHECKED TO SEE IF TEST HAD ANY FAILURE
IF IT DID TEST WILL BE RESTARTED.

8.1.22 'DECODE:'' PROGRAM COMMAND DECODER
READS COMMAND FROM INPUT BUFFER AND COMPAIRS IT
TO COMMAND LIST. IF FOUND IN LIST THE SELECTED COMMAND
HANDLER WILL BE ENTERED . IF NOT FOUND THE MESSAGE
'ILLEGAL COMMAND!!' WILL BE PRINTED.

8.1.23 'SETEN:'' PRINT SELECTED ERROR MESSAGE
CALLED BY

JSR R0,SETEN
.WORD 4
.WORD SEN001
.WORD SEN002

WHERE THE FIRST WORD AFTER THE CALL IS USED AS AN OFFSET
FOR RETURN.
THE SECOND WORD IS THE NUMBER OF THE FIRST SENTENCE TO BE PRINTED
THE THIRD WORD IS THE SECOND SENTENCE TO BE PRINTED
THERE ARE NO LIMITS ON THE NUMBER OF SENTENCES THAT CAN
BE PRINTED BY THIS CALL.

8.1.24 'RELCTH:'' AND 'RELCTL:'' TEST RELOCATION HANDLERS
THESE HANDLERS ARE USED TO RELOCATE TESTS TO A
HIGH OR LOW CACHE AREA LOCATED AT THE END OF PROGRAM.
AFTER RELOCATION IS COMPLETE A JUMP WILL BE MADE TO THE RELOCATED
AREA AND TESTING WILL BEGIN.

8.1.25 'GDBD:'' GOOD BAD DATA PRINTER
PRINTS THE OCTAL CONTENTS OF LOCATIONS (ADD),(GOOD) AND (BAD).

8.1.26 'BITNAM:'' BIT NAME PRINTER
PRINTS THE NAME OF ANY BIT LEFT SET IN LOCATION (ERROR).

9.0 REV B CHANGES

REASON: 1.ALLOW FORCE MISS TESTS TO OPERATE UNDER VARIOUS CONFIGURATIONS
OF LINE FREQUENCY/MAIN MEMORY SPEED

2. ALLOW CNTRLC TO ABORT ERROR PRINTOUTS AND RETURN
TO SOFTWARE MONITOR.

FOR EACH OF THE FOLLOWING CODING BLOCKS SPECIFIED, CHECK APPROPRIATE
COMMENTS FOR INDICATION OF CHANGES.

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035662
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000052
000114
004650
000340
000176
000000
000200
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000500
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000005
012706
000240
000240

000274
001015
060000

177240 START:

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CONWRD:

START:
PREPARE:
LINFRQ:
CMDLST:
CMDLS1:
SETEN:
DIC131:
FORCE MISS TESTS

.ENABLE ABS
.TITLE CACHE DIAG.
.LIST ME
.NLIST TTM,BEX,MD,MC,CND
.ASECT
.=0
.WORD 2
.WORD 0
.WORD 6
.WORD 0
.WORD 12
.WORD 0
.WORD 16
.WORD 0
.WORD 22
.WORD 0
.WORD 200
.WORD 0
.WORD 32
.WORD 0
.=42
.WORD 0
.WORD \$APTHDR
.=46
.WORD ENDIT
.=52
.WORD 0
.=114
.WORD PARITY
.WORD 340
.=176
.WORD 0
.=200
JMP START
.=500
MOV #OFF,CCR
RESET
MOV #60000,SP
NOP
NOP

:DISABLE CACHE
:DISABLE ALL INTERRUPTS
:SET STACK POINTER

5989						:REVB	
5990	000520	056767	000140	177450		BIS \$\$WREG,CONWRD	:SET ANY BITS FROM APT LOADING
5991							
5992	000526	105767	000130			TSTB \$ENV	:IS THIS APT MODE
5993	000532	001003				BNE 3\$	:YES
5994	000534	005737	000042			TST @#42	:IS THIS DUMP MODE
5995	000540	001407				BEQ 2\$	:YES
5996	000542	052767	100000	177426	3\$:	BIS #BIT15,CONWRD	:SET HALT ON ERROR MODE
5997	000550	004767	000610			JSR PC,PNTNAM	:PRINT TITLE
5998	000554	000167	000220			JMP PREPARE	:START TEST
5999							
6000						:REV B	
6001							
6002	000560	005227	177777		2\$:	INC #-1	:PROMPT LINE FREQ. ON FIRST PASS ONLY
6003	000564	001010				BNE TITLE	
6004	000566	004767	000404			JSR PC,LINFRQ	:PRINT LINE FREQ. PROMPT MESSAGE
6005	000572	012767	004430	003624		MOV #INBUF,BUFPNT	:GET ANSWER
6006	000600	004767	003322		4\$:	JSR PC,TSTFLG	
6007	000604	000775				BR 4\$	
6008							
6009						:REV B	
6010							
6011	000606	004767	000552		TITLE:	JSR PC,PNTNAM	:PRINT TITLE
6012	000612	012767	004430	003604		MOV #INBUF,BUFPNT	
6013	000620	004767	003302		1\$:	JSR PC,TSTFLG	
6014	000624	000775				BR 1\$	

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6016      .SBTTL  APT PARAMETER BLOCK
(1)
(2)      ::*****
(1)      ::SET LOCATIONS 24 AND 44 AS REQUIRED FOR APT
(2)      ::*****
(1)      000626      .SX=.      ::SAVE CURRENT LOCATION
(1)      000024      .=24      ::SET POWER FAIL TO POINT TO START OF PROGRAM
(1) 000024 000200      200      ::FOR APT START UP
(1)      000044      .=44      ::POINT TO APT INDIRECT ADDRESS PNTR.
(1) 000044 000626      $APTHDR ::POINT TO APT HEADER BLOCK
(1)      000626      .=$X      ::RESET LOCATION COUNTER
(2)      ::*****
(1)      ::SETUP APT PARAMETER BLOCK AS DEFINED IN THE APT-PDP11 DIAGNOSTIC
(1)      ::INTERFACE SPEC.
(1)
(1) 000626      $APTHD:
(1) 000626 000000      $HIBTS: .WORD 0      ::TWO HIGH BITS OF 18 BIT MAILBOX ADDR.
(1) 000630 000642      $MBADR: .WORD $MAIL ::ADDRESS OF APT MAILBOX (BITS 0-15)
(1) 000632 000000      $TSTM:  .WORD      ::RUN TIM OF LONGEST TEST
(1) 000634 000000      $PASTM: .WORD      ::RUN TIME IN SECS. OF 1ST PASS ON 1 UNIT (QUICK VERIFY)
(1) 000636 000000      $UNITM: .WORD      ::ADDITIONAL RUN TIME (SECS) OF A PASS FOR EACH ADDITIONAL UNIT
(1) 000640 000052      .WORD      SETEND-$MAIL/2 ;;LENGTH MAILBOX-ETABLE(WORDS)

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6018

.SBTTL APT MAILBOX-ETABLE

(1)
(2)
(1)
(1) 000642
(1) 000642 000000
(1) 000644 000000
(1) 000646 000000
(1) 000650 000000
(1) 000652 000000
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*****
::EVEN
$MAIL:      ::APT MAILBOX
$MSGTY: .WORD  AMSGTY  ::MESSAGE TYPE CODE
$FATAL: .WORD  AFATAL  ::FATAL ERROR NUMBER
$TESTN: .WORD  ATESTN  ::TEST NUMBER
$PASS:   .WORD  APASS   ::PASS COUNT
$DEVCT:  .WORD  ADEVCT  ::DEVICE COUNT
$UNIT:   .WORD  AUNIT   ::I/O UNIT NUMBER
$MSGAD:  .WORD  AMSGAD  ::MESSAGE ADDRESS
$MSGLG:  .WORD  AMSGLG  ::MESSAGE LENGTH
$ETABLE:  ::APT ENVIRONMENT TABLE
$ENV:    .BYTE  AENV    ::ENVIRONMENT BYTE
$ENVM:   .BYTE  AENVM   ::ENVIRONMENT MODE BITS
$SWREG:  .WORD  ASWREG  ::APT SWITCH REGISTER
$USWR:   .WORD  AUSWR   ::USER SWITCHES
$CPUOP:  .WORD  ACPUOP  ::CPU TYPE,OPTIONS
::BITS 15-11=CPU TYPE
::11/04=01,11/05=02,11/20=03,11/40=04,11/45=05
::11/70=06,PDQ=07,Q=10
BIT 10=REAL TIME CLOCK
BIT 9=FLOATING POINT PROCESSOR
BIT 8=MEMORY MANAGEMENT
$MAMS1: .BYTE  AMAMS1  ::HIGH ADDRESS,M.S. BYTE
$MTYP1: .BYTE  AMTYP1  ::MEM. TYPE,BLK#1
::MEM. TYPE BYTE -- (HIGH BYTE)
::900 NSEC CORE=001
::300 NSEC BIPOLAR=002
::500 NSEC MOS=003
$MADR1: .WORD  AMADR1  ::HIGH ADDRESS,BLK#1
::MEM.LAST ADDR.=3 BYTES,THIS WORD AND LOW OF "TYPE" ABOVE
$MAMS2: .BYTE  AMAMS2  ::HIGH ADDRESS,M.S. BYTE
$MTYP2: .BYTE  AMTYP2  ::MEM. TYPE,BLK#2
$MADR2: .WORD  AMADR2  ::MEM.LAST ADDRESS,BLK#2
$MAMS3: .BYTE  AMAMS3  ::HIGH ADDRESS,M.S.BYTE
$MTYP3: .BYTE  AMTYP3  ::MEM. TYPE,BLK#3
$MADR3: .WORD  AMADR3  ::MEM.LAST ADDRESS,BLK#3
$MAMS4: .BYTE  AMAMS4  ::HIGH ADDRESS,M.S.BYTE
$MTYP4: .BYTE  AMTYP4  ::MEM. TYPE,BLK#4
$MADR4: .WORD  AMADR4  ::MEM.LAST ADDRESS,BLK#4
$VECT1: .WORD  AVECT1  ::INTERRUPT VECTOR#1,BUS PRIORITY#1
$VECT2: .WORD  AVECT2  ::INTERRUPT VECTOR#2BUS PRIORITY#2
$BASE:  .WORD  ABASE   ::BASE ADDRESS OF EQUIPMENT UNDER TEST
$DEVM:  .WORD  ADEVM   ::DEVICE MAP
$CDW1:  .WORD  ACDW1   ::CONTROLLER DESCRIPTION WORD#1
$CDW2:  .WORD  ACDW2   ::CONTROLLER DESCRIPTION WORD#2
$DDW0:  .WORD  ADDW0   ::DEVICE DESCRIPTOR WORD#0
$DDW1:  .WORD  ADDW1   ::DEVICE DESCRIPTOR WORD#1
$DDW2:  .WORD  ADDW2   ::DEVICE DESCRIPTOR WORD#2
$DDW3:  .WORD  ADDW3   ::DEVICE DESCRIPTOR WORD#3
$DDW4:  .WORD  ADDW4   ::DEVICE DESCRIPTOR WORD#4
$DDW5:  .WORD  ADDW5   ::DEVICE DESCRIPTOR WORD#5
$DDW6:  .WORD  ADDW6   ::DEVICE DESCRIPTOR WORD#6
$DDW7:  .WORD  ADDW7   ::DEVICE DESCRIPTOR WORD#7

```

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APT MAILBOX-ETABLE

M 1

SEQ 0012

(1) 000746 000000
(1) 000750 000000
(1) 000752 000000
(1) 000754 000000
(1) 000756 000000
(1) 000760 000000
(1) 000762 000000
(1) 000764 000000
(1)
(1)
(1) 000766
(1)

\$DDW8:	.WORD	ADDW8	::DEVICE	DESCRIPTOR	WORD#8
\$DDW9:	.WORD	ADDW9	::DEVICE	DESCRIPTOR	WORD#9
\$DDW10:	.WORD	ADDW10	::DEVICE	DESCRIPTOR	WORD#10
\$DDW11:	.WORD	ADDW11	::DEVICE	DESCRIPTOR	WORD#11
\$DDW12:	.WORD	ADDW12	::DEVICE	DESCRIPTOR	WORD#12
\$DDW13:	.WORD	ADDW13	::DEVICE	DESCRIPTOR	WORD#13
\$DDW14:	.WORD	ADDW14	::DEVICE	DESCRIPTOR	WORD#14
\$DDW15:	.WORD	ADDW15	::DEVICE	DESCRIPTOR	WORD#15

SETEND:

.SBTTL REGISTER DEFINITIONS

6020
6021
6022
6023 177744
6024 177746
6025 177750
6026 177752
6027 177560
6028 177562
6029 177564
6030 177566
6031 177776
6032 000000
6033 000001
6034 000002
6035 000003
6036 000004
6037 000005
6038 000006
6039 000007
6040 000001
6041 000002
6042 000004
6043 000010
6044 000020
6045 000040
6046 000100
6047 000200
6048 000400
6049 001000
6050 002000
6051 004000
6052 010000
6053 020000
6054 040000
6055 100000
6056 177546
6057 001015
6058 172300
6059 172302
6060 172304
6061 172306
6062 172310
6063 172312
6064 172314
6065 172316
6066 172340
6067 172342
6068 172344
6069 172346
6070 172350
6071 172352
6072 172354
6073 172356
6074 177572
6075 170002

CMPE = 177744
CCR = 177746
CMR = 177750
CHR = 177752
KRS = 177560
KRB = 177562
PPS = 177564
PPB = 177566
PSW = 177776
R0 = %0
R1 = %1
R2 = %2
R3 = %3
R4 = %4
R5 = %5
SP = %6
PC = %7
BIT00 = 1
BIT01 = 2
BIT02 = 4
BIT03 = 10
BIT04 = 20
BIT05 = 40
BIT06 = 100
BIT07 = 200
BIT08 = 400
BIT09 = 1000
BIT10 = 2000
BIT11 = 4000
BIT12 = 10000
BIT13 = 20000
BIT14 = 40000
BIT15 = 100000
KOOK00 = 177546
OFF = 1015
KPDR0 = 172300
KPDR1 = 172302
KPDR2 = 172304
KPDR3 = 172306
KPDR4 = 172310
KPDR5 = 172312
KPDR6 = 172314
KPDR7 = 172316
KPAR0 = 172340
KPAR1 = 172342
KPAR2 = 172344
KPAR3 = 172346
KPAR4 = 172350
KPAR5 = 172352
KPAR6 = 172354
KPAR7 = 172356
SR0 = 177572
BECC = 170002

;CACHE MEMORY PARITY ERROR REGISTER
;CACHE CONTROL REGISTER
;CACHE MAINTENANCE REGISTER
;CACHE HIT REGISTER
;KEYBOARD READER STATUS
;KEYBOARD READER BUFFER
;PRINTER PUNCH STATUS
;PRINTER PUNCH BUFFER
;PROCESSOR STATUS WORD
;GENERAL REGISTERS

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REGISTER DEFINITIONS

B 2

SEQ 0014

6076	170004
6077	170000
6078	170006
6079	170016
6080	000646

BEBA	=	170004
BEDA	=	170000
BECA1	=	170006
BECA2	=	170016
TID	=	STESTN


```
6083      001000 012701 044000      PREPARE:      . = 1000
6084      001004 012102 050000      5$:      MOV #LOWSP,R1      ;LOW CACHE ADDRESS
6085      001006 020127 060000      MOV (R1)+,R2      ;TAG ALL CACHE
6086      001012 001374 003662      CMP R1,#LOW1      ;TAGGING COMPLETE
6087      001014 012706 177616      BNE 5$      ;NO
6088      001020 005067      MOV #60000,SP      ;SET UP STACK
6089      001024 005067      CLR ACTION      ;ERROR ACTION
6090      001024 005067      CLR TID      ;RESET TEST ID
6091
6092      ;REV B
6093
6094      001030 056767 177630 177140      BIS $SWREG,CONWRD      ;SET BITS LOADED FROM APT
6095
6096      001036 012737 004650 000114      MOV #PARITY,@#114      ;LOAD PARITY TRAP HANDLER
6097      001044 012737 000340 000116      MOV #340,@#116
6098      001052 012767 001415 176666      MOV #OFF+BIT08,CCR      ;DISABLE AND FLUSH CACHE
6099      001060 032767 040000 177110      BIT #BIT14,CONWRD      ;IS THIS LOOP ON TEST MODE ?
6100      001066 001403      BEQ 1$      ;NO
6101      001070 012767 000004 003610      MOV #4,ACTION      ;SET ACTION TO LOOP ON TEST
6102      001076 032767 001000 177072      BIT #BIT09,CONWRD      ;IS THIS LOOP ON ERROR MODE?
6103      001104 001403      BEQ 4$      ;NO
6104      001106 012767 000002 003572      MOV #2,ACTION      ;SET ACTION TO LOOP ON TEST
6105      001114 000167 005576      JMP TST001      ;START TESTING
6106      001120 010246      AHALT:      MOV R2,-(SP)      ;FREE R2 FOR USE
6107      001122 012702 001154      MOV #HLONER,R2      ;PRINT HALT ON ERROR MESSAGE
6108      001126 004767 004732      JSR PC,TYPE
6109      001132 004767 002652      JSR PC,PTID      ;PRINT CURRENT TEST I.D.
6110      001136 012702 005634      MOV #CRLF,R2      ;ADD <CR>,<LF> TO END OF LINE
6111      001142 004767 004716      JSR PC,TYPE
6112      001146 012602      MOV (SP)+,R2      ;RESTORE R2
6113      001150 000000      HALT      ;ERROR HALT
6114      001152 000207      RTS PC      ;RETURN
6115      001154 040510 052114 047440      HLONER:      .ASCIZ /HALT ON ERROR AT /
6116      .EVEN
6117
6118      ;LINE FREQUENCY DETERMINATION(REV B)
6119
6120
6121      001176 012702 001210      LINFRQ:      MOV #QUESHZ,R2
6122      001202 004767 004656      JSR PC,TYPE
6123      001206 000207      RTS PC
6124      001210      015      177      QUESHZ:      .BYTE 15,12,177,177,177
6125      001215      111 020123 044514      .ASCII *IS LINE FREQUENCY OF THIS SYSTEM 60HZ?*
6126      001263      015      177      .BYTE 15,12,177,177,177
6127      001270 044450 020106 047516      .ASCII *(IF NO, ASSUMPTION IS 50HZ)*
6128      001323      015      177      .BYTE 15,12,177,177,177
6129      001330 054524 042520 023440      .ASCII *TYPE 'Y' OR 'N' : *
6130      001352      040      040      .BYTE 40,40,40,40,40,40,177,177,177,0
6131      .EVEN
6132
6133
6134      PRINT TITLE
6135      001364 105767 177272      PNTNAM:      TSTB $ENV      ;IS THIS APT MODE
6136      001370 001411      BEQ 1$      ;NO
6137      001372 000207      RTS PC      ;YES
6138      001374 005737 000042      TST @#42      ;IS THIS DUMP MODE
```

6139	001400	001405				BEQ 1\$	:YES
6140	001402	023737	000042	000046		CMP @#42,@#46	:IS THIS ACT MODE
6141	001410	001001				BNE 1\$	:YES
6142	001412	000207				RTS PC	:RETURN
6143	001414	005767	177230		1\$:	TST \$PASS	
6144	001420	001405				BEQ 3\$	
6145	001422	012702	001730			MOV #PROM,R2	:PRINT PROMPT
6146	001426	004767	004432			JSR PC,TYPE	
6147	001432	000207				RTS PC	
6148	001434	012702	001446		3\$:	MOV #NAME,R2	:ADDRESS OF LINE TO PRINT
6149	001440	004767	004420			JSR PC,TYPE	:PRINT IT
6150	001444	000207				RTS PC	:RETURN
6151	001446	043103	045513	041101	NAME:	.ASCII *CFKKABO PDP 11/34 CACHE DIAGNOSTIC*	
6152	001510	015	012	177		.BYTE 15,12,177,177,177	
6153	001515	105	050130	041505		.ASCII *EXPECTED RUN TIME APROX. 10 SECONDS*	
6154	001560	015	012	177		.BYTE 15,12,177,177,177	
6155	001565	105	052116	051105		.ASCII *ENTER 'H' FOR HELP OR 'RUN' TO START DIAGNOSTIC*	
6156	001644	015	012	177		.BYTE 15,12,177,177,177	
6157	001651	106	046117	047514		.ASCII *FOLLOW ALL COMMANDS WITH A CARRIAGE RETURN*	
6158	001723	015	012	177		.BYTE 15,12,177,177,177	
6159	001730	040503	044103	036505	PROM:	.ASCII *CACHE=>*	
6160	001737	040	177	177		.BYTE 40,177,177,177,0	
6161						.EVEN	
6162	001744	052767	040000	176224	LP1:	BIS #BIT14,CONWRD	:LOOP ON TEST
6163	001752	000207				RTS PC	
6164	001754	042767	040000	176214	LP2:	BIC #BIT14,CONWRD	:NO LOOP ON TEST
6165	001762	000207				RTS PC	
6166	001764	052767	001000	176204	LP3:	BIS #BIT09,CONWRD	:LOOP ON ERROR
6167	001772	000207				RTS PC	
6168	001774	042767	001000	176174	LP4:	BIC #BIT09,CONWRD	:NO LOOP ON ERROR
6169	002002	000207				RTS PC	
6170	002004	052767	100000	176164	HL1:	BIS #BIT15,CONWRD	:HALT ON ERROR
6171	002012	000207				RTS PC	
6172	002014	042767	100000	176154	HL2:	BIC #BIT15,CONWRD	:NO HALT ON ERROR
6173	002022	000207				RTS PC	
6174	002024	052767	020000	176144	DIS1:	BIS #BIT13,CONWRD	:DISABLE ERROR PRINTOUT
6175	002032	000207				RTS PC	
6176	002034	042767	020000	176134	DIS2:	BIC #BIT13,CONWRD	:ENABLE ERROR PRINTOUT
6177	002042	000207				RTS PC	
6178	002044	005005			LP5:	CLR R5	:LOOP ON THIS TEST
6179	002046	121127	000060		1\$:	CMPB (R1),#0	:MUST BE DIGIT
6180	002052	103403				BLO 2\$	
6181	002054	121127	000070			CMPB (R1),#8	
6182	002060	103402				BLO 3\$	
6183	002062	005201			2\$:	INC R1	:NEXT CHAR.
6184	002064	000770				BR 1\$	
6185	002066	006305			3\$:	ASL R5	:POSITION TO ADD DIGIT
6186	002070	006305				ASL R5	
6187	002072	006305				ASL R5	
6188	002074	111102			4\$:	MOVB (R1),R2	:ADD DIGIT
6189	002076	042702	177700			BIC #177700,R2	
6190	002102	162702	000060			SUB #60,R2	
6191	002106	060205				ADD R2,R5	
6192	002110	005201				INC R1	:NEXT DIGIT
6193	002112	121127	000060			CMPB (R1),#0	
6194	002116	103403				BLO 6\$	

6195	002120	121127	000070				CMPB (R1),#8	
6196	002124	103760					BLO 3\$	
6197	002126	052767	000400	176042		6\$:	BIS #BIT08,CONWRD	;SET LOOP ON TEST MODE
6198	002134	110567	176036				MOVB R5,CONWRD	
6199	002140	000207					RTS PC	
6200	002142	042767	000777	176026	LP6:		BIC #BIT08+377,CONWRD	;EXIT LOOP ON TEST MODE
6201	002150	000207					RTS PC	
6202	002152	012702	002210		HELP:		MOV #LOST,R2	;PRINT HELP MESSAGE

6204	002156	004767	003702			JSR PC,TYPE
6205	002162	000207				RTS PC
6206	002164	052767	000001	176004	FRQ50:	BIS #1,CONWRD ;SPECIFY 50HZ
6207	002172	000167	176410			JMP TITLE
6208	002176	042767	000001	175772	FRQ60:	BIC #1,CONWRD ;SPECIFY 60HZ
6209	002204	000167	176376			JMP TITLE
6210						
6211	002210	047105	042524	020122	LOST:	.ASCII /ENTER ANY OF THE FOLLOWING COMMANDS AFTER THE 'CACHE=>' PROMPT./
6212	002307	015	012	177		.BYTE 15,12,177,177,177
6213	002314	044042	042517	020042		.ASCII *'HOE' = HALT ON ERROR (SW/SWR BIT 15)*
6214	002361	015	012	177		.BYTE 15,12,177,177,177
6215	002366	046042	052117	020042		.ASCII *'LOT' = LOOP ON FAILING TEST (SW/SWR BIT 14)*
6216	002442	015	012	177		.BYTE 15,12,177,177,177
6217	002447	042	042511	021122		.ASCII *'IER' = INHIBIT ERROR TYPEOUTS (SW/SWR BIT 13)*
6218	002525	015	012	177		.BYTE 15,12,177,177,177
6219	002532	046042	042517	020042		.ASCII *'LOE' LOOP ON ERROR (SW/SWR BIT 9)*
6220	002574	015	012	177		.BYTE 15,12,177,177,177
6221	002601	042	051514	021124		.ASCII *'LST' LOOP ON TEST XXX (SW/SWR BIT 8)*
6222	002646	015	012	177		.BYTE 15,12,177,177,177
6223	002653	124	042510	041440		.ASCII *THE COMMAND MUST BE FOLLOWED BY A CARRIDGE RETURN. THE PROGRAM WILL*

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SEQ 0019

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6225 002756 015 012 177 .BYTE 15,12,177,177,177
6226 002763 124 042510 020116 .ASCII *THEN RESPOND ANOTHER PROMPT.THE USER MAY ENETER ANOTHER COMMAND*
6227 003062 015 012 177 .BYTE 15,12,177,177,177
6228 003067 117 020122 051047 .ASCII /OR 'RUN' TO START DIAGNOSTIC./
6229 003124 015 012 177 .BYTE 15,12,177,177,177
6230 003131 101 054516 041440 .ASCII ANY COMMAND MAY BE CANCELLED BY TYPING 'C' PLUS THE COMMAND*
6231 003224 015 012 177 .BYTE 15,12,177,177,177
6232 003231 050 054105 020056 .ASCII *(EX. CHOE REMOVES HALTING ON ERROR).*
6233 003275 015 012 177 .BYTE 15,12,177,177,177
6234 003302 054524 044520 043516 .ASCII *TYPING ^C AT ANY TIME WILL STOP TESTING AND RETURN TO COMMAND MODE.*
6235 003405 015 012 177 .BYTE 15,12,177,177,177
6236 003412 040527 047122 047111 .ASCII *WARNING !!! THE HARDWARE SWITCHES ON THE CACHE MODULE MUST BE*
6237 003507 015 012 177 .BYTE 15,12,177,177,177
6238 003514 047111 052040 042510 .ASCII *IN THE ON POSITION I.E. BOTH SWITCHES FACING TOWARDS THE CONSOLE*
6239 003614 015 012 177 .BYTE 15,12,177,177,177
6240 003621 116 052117 035105 .ASCII *NOTE: EACH OF THE ABOVE COMMANDS SETS THE DESIGNATED BIT IN THE*
6241 003720 015 012 177 .BYTE 15,12,177,177,177
6242 003725 123 043117 053524 .ASCII *SOFTWARE SWITCH REGISTER LOCATED AT 000176*
6243 003777 015 012 177 .BYTE 15,12,177,177,177,0,0,0
6244 004010 .EVEN
6245
6246
6247
6248
6249

```

PRINT THE CURRENT TID

```

6250 004010 010246 PTID: MOV R2,-(SP) ;SAVE REGISTERS R2,R3
6251 004012 010346 MOV R3,-(SP)
6252 004014 016702 174626 MOV TID,R2 ;PLACE CURRENT TEST I.D. FOR DISMEMBERING
6253 004020 012703 000057 MOV #57,R3 ;SET UP TO GENERATE THE HUNDREDS DIGIT
6254 004024 005203 1$: INC R3 ;R3=R3+1 FOR EVERY HUNDRED FOUND
6255 004026 162702 000100 SUB #100,R2 ;DIVISION BY SUBTRACTION
6256 004032 100374 BPL 1$
6257 004034 110367 000055 MOVB R3,STID+3 ;ADD DIGIT TO STRING
6258 004040 062702 000100 ADD #100,R2 ;CORRECT THE REMAINDER OF NUMBER
6259 004044 012703 000057 MOV #57,R3 ;FIND TENS ASCII DIGIT
6260 004050 005203 2$: INC R3 ;FIND NUMBER OF TENS IN NUMBER
6261 004052 162702 000010 SUB #10,R2
6262 004056 100374 BPL 2$
6263 004060 110367 000032 MOVB R3,STID+4 ;ADD DIGIT TO NUMBER
6264 004064 062702 000070 ADD #70,R2 ;CORRECT NUMBER FOR ONES DIGIT
6265 004070 110267 000023 MOVB R2,STID+5 ;ADD DIGIT TO STRING
6266 004074 012702 004112 MOV #STID,R2 ;CORRECT DONES DIGIT
6267 004100 004767 001760 JSR PC,TYPE
6268 004104 012603 MOV (SP)+,R3 ;RESTORE R3
6269 004106 012602 MOV (SP)+,R2 ;RESTORE R2
6270 004110 000207 RTS PC
6271 004112 051524 020124 020040 STID: .ASCII /TST /
6272 004120 015 012 001 .BYTE 15,12,1,1,0
6273 004126 .EVEN

```

```

6275                                     .SBTTL KEYBOARD HANDLER
6276                                     : TEST TO SEE IF THE THE KEYBOARD WANTS US FOR ANYTHING
6277                                     :-----
6278                                     :
6279 004126 105767 173426               TSTFLG:          TSTB KRS          ;ANY CHARS. AVAIL
6280 004132 100002                      BPL 1$          ;NO
6281 004134 004767 000002              1$:          JSR PC,GETCHA      ;INPUT CHAR.
6282 004140 000207                      RTS PC
6283                                     :
6284                                     : INPUT CHAR. AND TEST FOR SPECIAL CONDITIONS
6285                                     :-----
6286                                     :
6287                                     :
6288 004142 010246                      GETCHA:          MOV R2,-(SP)      ;FREE R2 FOR USE
6289 004144 116777 173412 000252          MOVB KRB,@BUFPNT      ;STORE CHAR.
6290 004152 142777 000200 000244          BICB #200,@BUFPNT      ;NO PARITY ALLOWED
6291 004160 122777 000003 000236          CMPB #3,@BUFPNT      ;LOOK FOR ^C
6292 004166 001002                      BNE 10$          ;NOT THIS TIME
6293 004170 000167 174304                      JMP START        ;RESTART PROGRAM
6294 004174 127727 000224 000177          10$:          CMPB @BUFPNT,#177 ;IS THIS A RUBOUT,WELL IS IT!!

```


6296	004202	001023			BNE 1\$	;NO ,NOT AT ALL
6297	004204	005767	000216		TST SLASH	;IS IT THE FIRST RUBOUT
6298	004210	001007			BNE 2\$	;NO
6299	004212	112767	000057	000206	MOVB #'/.SLASH	;ITS THE FIRST SO PRINT SLASH
6300	004220	012702	004426		MOV #SLASH,R2	
6301	004224	004767	001634		JSR PC,TYPE	
6302	004230	022767	004430	000166	2\$: CMP #INBUF,BUFPNT	;YOU CAN'T DELETE WHAT YOU DIDN'T TYPE
6303	004236	001445			BEQ 5\$	
6304	004240	005367	000160		DEC BUFPNT	;ADJUST BUFFER POINTER
6305	004244	004767	000136		JSR PC,ECHO	;ECHO DELETED CHAR.
6306	004250	000440			BR 5\$	
6307	004252	005767	000150		1\$: TST SLASH	;WAS LAST CHAR. RUBOUT
6308	004256	001406			BEQ 3\$	;NO
6309	004260	012702	004426		MOV #SLASH,R2	;YUP SO PRINT OTHER SLASH
6310	004264	004767	001574		JSR PC,TYPE	
6311	004270	005067	000132		CLR SLASH	;RESET FLAG
6312	004274	127727	000124	000015	3\$: CMPB @BUFPNT,#15	; <CR> OR <LF>
6313	004302	001425			BEQ 6\$	;TERMINATE STRING
6314	004304	127727	000114	000012	CMPB @BUFPNT,#12	
6315	004312	001421			BEQ 6\$	
6316	004314	122777	000140	000102	CMPB #140,@BUFPNT	; CONVERT TO UPPER CASE
6317	004322	101003			BHI 4\$	
6318	004324	142777	000040	000072	BICB #40,@BUFPNT	;CORRECT FOR THAT
6319	004332	004767	000050		JSR PC,ECHO	;ECHO CHAR.
6320	004336	026727	000062	004537	4\$: CMP BUFPNT,#INBUF+^D71	;IS BUFFER FULL
6321	004344	103002			BHIS 5\$	;YES
6322	004346	005267	000052		INC BUFPNT	;POINT TO NEXT
6323	004352	012602			5\$: MOV (SP)+,R2	;RESTORE R2
6324	004354	000207			RTS PC	;RETURN
6325	004356	105077	000042		6\$: CLRB @BUFPNT	;MARK END OF STRING
6326	004362	012767	004430	000034	MOV #INBUF,BUFPNT	;RESET BUFFER POINTER
6327	004370	012702	005634		MOV #CRLF,R2	;ECHO <CR>,<LF>
6328	004374	004767	001464		JSR PC,TYPE	
6329	004400	004767	000462		JSR PC,DECODE	;DECODE COMMAND
6330	004404	000762			BR 5\$	
6331						
6332						
6333						
6334						
6335						
6336	004406	105767	173152		ECHO: TSTB PPS	;IS PRINTER READY
6337	004412	100375			BPL ECHO	;NO
6338	004414	117767	000004	173144	MOVB @BUFPNT,PPB	;YES SO PRINT IT
6339	004422	000207			RTS PC	
6340	004424	000000			BUF PNT: .WORD 0	
6341	004426	000000			SLASH: .WORD 0	
6342	004430	000044			INBUF: .BLKW ^D36	
6343	004540	000000			ITTRAP: .WORD 0	
6344	004542	000000			ERROR: .WORD 0	
6345	004544	000000			ERR1: .WORD 0	
6346	004546	000000			SAVTAT: .WORD 0	
6347	004550	000000			GOOD: .WORD 0	
6348	004552	000000			BAD: .WORD 0	
6349	004554	000000			ADD: .WORD 0	
6350	004556	000000			GOODBD: .WORD 0	
6351	004560	000000			BITFLG: .WORD 0	

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SEQ 0022

6352	004562	047125	041111	051525	NOUBE:	.ASCII /UNIBUS EXERCISER PRESENT AT ADDRESS 770000/
6353	004634	015	012	177		.BYTE 15,12,177,177,177,0
6354						.EVEN

ADDRESS	DATA	DESCRIPTION	ASSEMBLY	COMMENT
6356			.SBTTL TRAP HANDELERS	
6357	004642 005267 177672	TRAP:	INC ITTRAP	;IND. TRAP OCCURED
6358	004646 000002		RTI	
6359	004650 012767 001015 173070	PARITY:	MOV #OFF,CCR	;DISABLE CACHE
6360	004656 056767 173062 177660		BIS CMPE,ERR1	;UPDATE ERROR INFO
6361	004664 012767 000000 173052		MOV #0,CMPE	;RESET PARITY ERROR
6362	004672 000002		RTI	;INSTANT RETURN
6363	004674 005267 000002	CLOCK:	INC TIME	;BUMP COUNTER
6364	004700 000002		RTI	;RETURN
6365	004702 000000	TIME:	.WORD 0	
6366	004704 000000	COUNT:	.WORD 0	
6367	004706 000000	ACTION:	.WORD 0	
6368	004710 000000	LAST:	.WORD 0	
6369	004712 000000	NOINC:	.WORD 0	

```
6371          .SBTTL HIGH CACHE ERROR LOOP HANDLER
6372 004714 056767 177622 000142 ERTSHI: BIS ERROR,LOPERR      ;SET LOOP ON TEST FLAG
6373 004722 105767 173734          TSTB $ENV        ;IS THIS APT MODE
6374 004726 001002          BNE 5$                ;YES
6375 004730 004767 177172          JSR PC,TSTFLG     ;LOOK FOR KEYBOARD INPUT
6376 004734 062700 000004          ADD #4,R0        ;NORMAL RETURN IF NO ERROR
6377 004740 032767 000400 173230          BIT #BIT08,CONWRD ;IS THIS LOOP ON TEST MODE
6378 004746 001413          BEQ 1$                ;NO
6379 004750 126767 173222 173670          CMPB CONWRD,TID  ;IS THIS THE TEST TO LOOP ON
6380 004756 001007          BNE 1$                ;YES
6381 004760 005740          TST -(R0)
6382 004762 000403          BR 4$
6383 004764 005767 177716          3$: TST ACTION      ;SET LOOP FLAG IF LOOPING
6384 004770 001401          BEQ 2$
6385 004772 011000          4$: MOV (R0),R0          ;SET RETURN ADDRESS
6386 004774 000200          2$: RTS R0              ;RETURN
6387 004776 005767 177540          1$: TST ERROR      ;ANY ERRORS
6388 005002 001774          BEQ 2$                ;NO
6389 005004 166700 177676          SUB ACTION,R0      ;TAKE SELECTED ACTION
6390 005010 000765          BR 3$
6391
6392
6393
6394 005012 032767 000400 173156 LPONTS: BIT #BIT08,CONWRD ;IS THIS LOOP ON TEST MODE
6395 005020 001410          BEQ 1$                ;NO
6396 005022 126767 173150 173616          CMPB CONWRD,TID  ;IS THIS TEST TO LOOP ON
6397 005030 001004          BNE 1$                ;NO
6398 005032 011000          2$: MOV (R0),R0          ;SET RETURN ADDRESS
6399 005034 005067 000024          CLR LOPERR        ;RESET LOOP FLAG
6400 005040 000200          RTS R0                ;RETURN
6401 005042 026727 177640 000004          1$: CMP ACTION,#4 ;IS THIS LOOP ON ERRORING TEST MODE
6402 005050 001003          BNE 3$                ;NO
6403 005052 005767 000006          TST LOPERR        ;DID TEST FAIL
6404 005056 001365          BNE 2$                ;YES , RESTART TEST
6405 005060 005720          3$: TST (R0)+          ;RETURN ADDRESS NO LOOP
6406 005062 000200          RTS R0
6407 005064 000000          LOPERR: .WORD 0
```


6409						.SBTTL COMMAND DECODER	
6410	005066	010046			DECODE:	MOV R0,-(SP)	;FREE REGISTER 0
6411	005070	010146				MOV R1,-(SP)	;FREE REGISTER 1
6412	005072	012702	005316			MOV #CMDLS1,R2	;COMMAND COUNTER
6413	005076	012700	005224			MOV #CMDLST,R0	;COMMAND LIST POINTER
6414	005102	012701	004430		1\$:	MOV #INBUF,R1	;INPUT FROM KEYBOARD
6415	005106	105711				TSTB (R1)	;SPECIAL CASE ,NO INPUT
6416	005110	001406				BEQ 11\$	;YES
6417	005112	122120			2\$:	CMPB (R1)+,(R0)+	;ATTEMPT LOOKUP
6418	005114	001013				BNE 3\$	;NO WAY
6419	005116	105710				TSTB (R0)	;ANY MORE CHARS.
6420	005120	001374				BNE 2\$	;YES
6421	005122	011202				MOV (R2),R2	;SUBROUTINE ADDRESS
6422	005124	004712				JSR PC,(R2)	;ENTER HANDLES
6423	005126	012702	001730		11\$:	MOV #PROM,R2	;PRINT PROMPT
6424	005132	004767	000726			JSR PC,TYPE	
6425	005136	012601			4\$:	MOV (SP)+,R1	;RESTORE R1
6426	005140	012600				MOV (SP)+,R0	;RESTORE R1
6427	005142	000207				RTS PC	;RETURN
6428	005144	105720			3\$:	TSTB (R0)+	;SCAN TO NEXT COMMAND
6429	005146	001376				BNE 3\$	
6430	005150	105710				TSTB (R0)	;TWO 0'S = END OF LIST
6431	005152	001005				BNE 10\$	
6432	005154	012702	005174			MOV #ILL,R2	;ILLEGAL COMMAND
6433	005160	004767	000700			JSR PC,TYPE	
6434	005164	000760				BR 11\$	
6435	005166	062702	000002		10\$:	ADD #2,R2	;UPDATE P[O]INTER
6436	005172	000743				BR 1\$	
6437	005174	046111	042514	040507	ILL:	.ASCII *ILLEGAL COMMAND !!*	
6438	005216	015	012	177		.BYTE 15,12,177,177,177,0	
6439						.EVEN	
6440	005224	052522	000116		CMDLST:	.ASCIZ /RUN/	
6441	005230	047514	000124			.ASCIZ /LOT/	
6442	005234	046103	052117	000		.ASCIZ /CLOT/	
6443	005241	114	042517	000		.ASCIZ /LOE/	
6444	005245	103	047514	000105		.ASCIZ /CLOE/	
6445	005252	047510	000105			.ASCIZ /HOE/	
6446	005256	044103	042517	000		.ASCIZ /CHOE/	
6447	005263	111	051105	000		.ASCIZ /IER/	
6448	005267	103	042511	000122		.ASCIZ /CIER/	
6449	005274	051514	000124			.ASCIZ /LST/	
6450	005300	046103	052123	000		.ASCIZ /CLST/	
6451	005305	110	000			.ASCIZ /H/	
6452							
6453						:REVB	
6454							
6455	005307	116	000			.ASCIZ /N/	
6456	005311	131	000			.ASCIZ /Y/	
6457							
6458						:REV B	
6459							
6460	005313	000	000			.BYTE 0,0	
6461		005316				.EVEN	
6462	005316	001000			CMDLS1:	.WORD PREPARE	
6463	005320	001744				.WORD LP1	
6464	005322	001754				.WORD LP2	

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COMMAND DECODER

SEQ 0026

6465 005324 001764
6466 005326 001774
6467 005330 002004
6468 005332 002014
6469 005334 002024
6470 005336 002034
6471 005340 002044
6472 005342 002142
6473 005344 002152
6474
6475
6476
6477 005346 002164
6478 005350 002176
6479
6480
6481

.WORD LP3
.WORD LP4
.WORD HL1
.WORD HL2
.WORD DIS1
.WORD DIS2
.WORD LP5
.WORD LP6
.WORD HELP

;REV B

.WORD FRQ50
.WORD FRQ60

;REV B

Address	Offset	PC	Value	Label	Instruction	Comment
6483					.SBTTL ERROR MESSAGE HANDLERS	
6484	005352	012067	177332		MOV (R0)+,LAST	:FIND RETURN ADDRESS
6485	005356	060067	177326		ADD R0, LAST	
6486						
6487	005362	004767	176540		JSR PC, TSTFLG	:REV B
6488						
6489	005366	105767	173270		TSTB \$ENV	:IS THIS APT MODE
6490	005372	001410			BEQ 11\$	:NO
6491	005374	005767	177142		TST ERROR	:ANY ERROR
6492	005400	001411			BEQ 1\$	:NO
6493	005402	005267	173234		INC \$MSGTY	:SET APT ERROR FLAG
6494	005406	004767	173506		JSR PC, AHALT	:HALT
6495	005412	000404			BR 1\$	
6496	005414	032767	020000	172554	11\$: BIT #BIT13, CONWRD	: ERROR PRINT MODE
6497	005422	001407			BEQ 4\$	:NO
6498	005424	016700	177260		1\$: MOV LAST, R0	:SO RETURN
6499	005430	005067	177122		CLR GOODBD	:RESET DATA PRINT FLAG
6500	005434	005067	177120		CLR BITFLG	:RESET BIT PRINT FLAG
6501	005440	000200			RTS R0	
6502	005442	005767	177074		4\$: TST ERROR	:ANY ERRORS
6503	005446	001766			BEQ 1\$	:NO SO RETURN
6504	005450	004767	176334		JSR PC, PTID	:PRINT CURRENT TEST ID
6505	005454	010146			MOV R1, -(SP)	:FREE R1 FOR USE
6506	005456	012001			3\$: MOV (R0)+, R1	:SENTENCE POINTER
6507	005460	004767	000100		JSR PC, PRINT	:PRINT SENTENCE
6508	005464	020067	177220		CMP R0, LAST	:ALL SENTENCES PRINTED YET
6509	005470	001372			BNE 3\$	:NO
6510	005472	005767	177060		TST GOODBD	:IS THIS DATA PRINT MODE
6511	005476	001402			BEQ 5\$	:NO
6512	005500	004767	000464		JSR PC, GDBD	:ENTER DATA PRINTER
6513	005504	005767	177050		5\$: TST BITFLG	:IS THIS BIT PRINT MODE
6514	005510	001402			BEQ 6\$	:NO
6515	005512	004767	000736		JSR PC, BITNAM	:ENTER BIT PRINTER
6516	005516	010246			6\$: MOV R2, -(SP)	:FREE R2 FOR USE
6517	005520	012702	005552		MOV #LFLF, R2	:ADD LINE FEEDS TO END OF MESSAGE
6518	005524	004767	000334		JSR PC, TYPE	
6519	005530	032767	100000	172440	BIT #BIT15, CONWRD	:IS THIS HALT ON ERROR MODE
6520	005536	001402			BEQ 10\$	:NO
6521	005540	004767	173354		JSR PC, AHALT	:YES !! SO HALT
6522	005544	012602			10\$: MOV (SP)+, R2	:RESTORE R2
6523	005546	012601			MOV (SP)+, R1	:RESTORE R1
6524	005550	000725			BR 1\$	:EXIT
6525	005552	012	012	012	.BYTE 12,12,12,1,1,1,1,1,0	
6526		005564			.EVEN	
6527						
6528						
6529						
6530	005564	010346			PRINT: MOV R3, -(SP)	:FREE R3 FOR USE
6531	005566	012703	005657		MOV #LINE, R3	:STRING POINTER
6532	005572	010246			MOV R2, -(SP)	:SAVE R2
6533	005574	012102			2\$: MOV (R1)+, R2	:WORD POINTER
6534	005576	001013			BNE 1\$	:O=RETURN
6535	005600	012702	005634		MOV #CRLF, R2	:PRINT CARIDGE RETURN, LINE FEED AND FILL
6536	005604	004767	000032		JSR PC, ADWRD	:ADD WORD TO STRING
6537	005610	012702	005657		MOV #LINE, R2	:ADDRESS OF

6539	005620	012602				MOV (SP)+,R2	;RESTORE R2
6540	005622	012603				MOV (SP)+,R3	;RESTORE R3
6541	005624	000207				RTS PC	
6542	005626	004767	000010		1\$:	JSR PC,ADWRD	;ADD WORD TO STRING
6543	005632	000760				BR 2\$	
6544	005634	015	012	001	CRLF:	.BYTE 15,12,1,1,1,0	
6545						.EVEN	
6546							
6547							
6548							
6549	005642	112763	000040	177777	ADWRD:	MOVB #40,-1(R3)	;ADD SPACE TO START OF WORD
6550	005650	112223			1\$:	MOVB (R2)+,(R3)+	;ADD WORD TO STRING
6551	005652	001376				BNE 1\$	
6552	005654	000207				RTS PC	
6553	005656	000				.BYTE 0	
6554	005657	000204			LINE:	.BLKB ^D132	
6555		006064				.EVEN	
6556							
6557							
6558							
6559	006064	105767	172572		TYPE:	TSTB \$ENV	;IS THIS APT MODE
6560	006070	001401				BEQ 1\$	;NO
6561	006072	000207				RTS PC	;NO TYPING IN APT MODE
6562	006074	105767	171464		1\$:	TSTB PPS	;IS PRINTER READY
6563	006100	100375				BPL 1\$	;NO
6564	006102	112267	171460			MOVB (R2)+,PPB	;YES, SO PRINT IT
6565	006106	105712				TSTB (R2)	;LAST CHAR.
6566	006110	001365				BNE TYPE	;NO
6567	006112	000207				RTS PC	;YES RETURN

.SBTTL RELOCATION HANDLERS

6569							
6570							
6571							
6572							
6573							
6574	006114	012701	044000	RELCTL:	MOV #LOWSP,R1		;START OF LOW SPACE
6575	006120	012402			MOV (R4)+,R2		;END OF MOVE
6576	006122	012421		1\$:	MOV (R4)+,(R1)+		;TRANSFER TEST
6577	006124	020402			CMP R4,R2		;PROCEED TO STOP MARK
6578	006126	001375			BNE 1\$		
6579	006130	016721	000004		MOV 2\$,(R1)+		;RETURN INSTRUCTION
6580	006134	000167	035640		JMP LOWSP		;START TESTS
6581	006140	000204		2\$:	RTS R4		
6582							
6583							
6584							
6585							
6586	006142	012701	046000	RELCTH:	MOV #HIGHSP,R1		;START OF HIGH CACHE SPACE
6587	006146	012402			MOV (R4)+,R2		;END OF MOVE
6588	006150	012421		1\$:	MOV (R4)+,(R1)+		;TRANSFER TEST
6589	006152	020402			CMP R4,R2		;CONTINUE UNTIL START OF NEXT TEST
6590	006154	001375			BNE 1\$		
6591	006156	016721	000004		MOV 2\$,(R1)+		;RETURN INSTRUCTION
6592	006162	000167	037612		JMP HIGHSP		;START TEST
6593	006166	000204		2\$:	RTS R4		
6594							
6595							
6596							
6597							
6598	006170	010346		GDBD:	MOV R3,-(SP)		;SAVE R3
6599	006172	010246			MOV R2,-(SP)		;SAVE R2
6600	006174	012703	005657		MOV #LINE,R3		;LINE POINTER
6601	006200	012702	006400		MOV #ADDST,R2		;ADDRESS HEADER
6602	006204	112223		5\$:	MOVB (R2)+,(R3)+		;MOVE HEADER TO LINE
6603	006206	001376			BNE 5\$		
6604	006210	016702	176340		MOV ADD,R2		;ADDRESS TO PRINT
6605	006214	004767	000070		JSR PC,OCTASC		;ADD TO LINE
6606	006220	012702	006413		MOV #GOODST,R2		;POINTER TO LINE HEADER
6607	006224	112223		1\$:	MOVB (R2)+,(R3)+		;MOVE HEADER TO LINE
6608	006226	001376			BNE 1\$		
6609	006230	016702	176314		MOV GOOD,R2		;GOOD DATA
6610	006234	004767	000050		JSR PC,OCTASC		;ADD DATA STRING TO LINE
6611	006240	012702	006434		MOV #BADST,R2		;POINTER TO BAD HEADER
6612	006244	112223		3\$:	MOVB (R2)+,(R3)+		;MOVE HEADER TO LINE
6613	006246	001376			BNE 3\$		
6614	006250	016702	176276		MOV BAD,R2		;BAD DATA
6615	006254	004767	000030		JSR PC,OCTASC		;ADD STRING TO LINE
6616	006260	005203			INC R3		;ADJUST LINE POINTER
6617	006262	012702	005634		MOV #CRLF,R2		;ADD <CR> <LF> TO END OF LINE
6618	006266	004767	177350		JSR PC,ADWRD		
6619	006272	012702	005657		MOV #LINE,R2		;LINE POINTER
6620	006276	004767	177562		JSR PC,TYPE		;PRINT LINE
6621	006302	012602			MOV (SP)+,R2		;RESTORE R2
6622	006304	012603			MOV (SP)+,R3		;RESTORE R3
6623	006306	000207			RTS PC		
6624	006310	010446		OCTASC:	MOV R4,-(SP)		;FREE R4 FOR USE

6625	006312	010546				MOV R5,-(SP)	;FREE R5 FOR USE
6626	006314	010146				MOV R1,-(SP)	;FREE R1 FOR USE
6627	006316	012704	000006			MOV #6,R4	;PASS COUNTER
6628	006322	062703	000005			ADD #5,R3	;LAST DIGIT POINTER
6629	006326	012705	000003	3\$:		MOV #3,R5	;PASS COUNTER FOR OCTAL DIGIT
6630	006332	010201				MOV R2,R1	;GRAB LSD
6631	006334	042701	177770			BIC #177770,R1	;MASK OFF OTHER DIGITS
6632	006340	062701	000060			ADD #60,R1	;CONVERT TO ASCII
6633	006344	110143				MOVB R1,-(R3)	;ADD CAHR TO LINE
6634	006346	005304				DEC R4	
6635	006350	001405				BEQ 1\$	;LAST DIGIT SO EXIT
6636	006352	000241		2\$:		CLC	;POSITION NEXT DIGIT
6637	006354	006002				ROR R2	
6638	006356	005305				DEC R5	
6639	006360	001374				BNE 2\$	
6640	006362	000751				BR 3\$	
6641	006364	062703	000006	1\$:		ADD #6,R3	;CORRECT LINE POINTER
6642	006370	012601				MOV (SP)+,R1	;RESTORE R1
6643	006372	012605				MOV (SP)+,R5	;RESTORE R5
6644	006374	012604				MOV (SP)+,R4	;RESTORE R4
6645	006376	000207				RTS PC	
6646	006400	042101	051104	051505	ADDST:	.ASCIZ /ADDRESS = /	
6647	006413	040	020040	043440	GOODST:	.ASCIZ / GOOD DATA = /	
6648	006434	020040	020040	040502	BADST:	.ASCIZ / BAD DATA = /	
6649						.EVEN	
6650							
6651							
6652							
6653							
6654	006454	010446			BITNAM:	MOV R4,-(SP)	;FREE R4 FOR USE
6655	006456	016704	176060			MOV ERROR,R4	;ERRORING BIT(S)
6656	006462	012701	006556			MOV #BIT,R1	;BIT TABLE
6657	006466	005704		2\$:		TST R4	;RETURN IF NO BITS SET
6658	006470	001002				BNE 1\$	
6659	006472	012604				MOV (SP)+,R4	;RESTORE R4
6660	006474	000207				RTS PC	
6661	006476	032704	000001	1\$:		BIT #1,R4	;DID BIT FAIL
6662	006502	001420				BEQ 3\$	;NO
6663	006504	012703	005657			MOV #LINE,R3	;LINE TO PRINT
6664	006510	112123		4\$:		MOVB (R1)+,(R3)+	
6665	006512	001376				BNE 4\$	
6666	006514	112743	000015			MOVB #15,-(R3)	
6667	006520	112723	000012			MOVB #12,(R3)+	
6668	006524	105023				CLRB (R3)+	
6669	006526	012702	005657			MOV #LINE,R2	;PRINT LINE
6670	006532	004767	177326			JSR PC,TYPE	
6671	006536	000257				CCC	
6672	006540	006004				ROR R4	
6673	006542	000751				BR 2\$	
6674	006544	062701	000006	3\$:		ADD #6,R1	;POINT TO NEXT NAME
6675	006550	000257				CCC	
6676	006552	006004				ROR R4	
6677	006554	000744				BR 2\$	
6678	006556	044502	030124	000060	BIT:	.ASCIZ /BIT00/	
6679	006564	044502	030124	000061		.ASCIZ /BIT01/	
6680	006572	044502	030124	000062		.ASCIZ /BIT02/	

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SEQ 0031

6681	006600	044502	030124	000063	.ASCIZ /BIT03/
6682	006606	044502	030124	000064	.ASCIZ /BIT04/
6683	006614	044502	030124	000065	.ASCIZ /BIT05/
6684	006622	044502	030124	000066	.ASCIZ /BIT06/
6685	006630	044502	030124	000067	.ASCIZ /BIT07/
6686	006636	044502	030124	000070	.ASCIZ /BIT08/
6687	006644	044502	030124	000071	.ASCIZ /BIT09/
6688	006652	044502	030524	000060	.ASCIZ /BIT10/
6689	006660	044502	030524	000061	.ASCIZ /BIT11/
6690	006666	044502	030524	000062	.ASCIZ /BIT12/
6691	006674	044502	030524	000063	.ASCIZ /BIT13/
6692	006702	044502	030524	000064	.ASCIZ /BIT14/
6693	006710	044502	030524	000065	.ASCIZ /BIT15/

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```

:
:
TST001:      ATTEMPT READ INTO CMPE TO TEST ADDRESS SELECT LOGIC
              IF TIME OUT OCCURES THEN LOGIC IN ERROR
              INC TID                      ;UPDATE TEST ID
              MOV #OFF,CCR                 ;DISABLE CACHE
              MOV #TRAP,4                  ;SETUP TRAP VECTOR
              MOV #340,6
              MOV #ERTSHI,R0               ;ERROR LOOP HANDLER
1$:           CLR ITTRAP                   ;RESET TRAP FLAG
              MOV CMPE,R1                  ;READ PARITY REGISTER
              MOV ITTRAP,ERROR             ;SET ERROR FLAG IF TRAPPED
              JSR R0,SETEN                 ;PRINT LIST OF SENTENCES
              .WORD ^D4
              .WORD SEN1                   ;CACHE REGISTER RESPONSE TESTS
              .WORD SEN2                   ;READING PARITY ERROR REGISTER CAUSED TIME OUT
              JSR R0,(R0)                  ;TAKE SELECTED ACTION IF ERROR
              .WORD 1$                     ;LOOP ON ERROR
              .WORD 1$                     ;LOOP ON TEST
:
:
:
:
TST002:      ATTEMPT READ INTO CMPE TO CHECK ADDRESS SELECT LOGIC
              IF TIME OUT OCCURES THEN LOGIC IN ERROR
              INC TID                      ;UPDATE TEST ID
1$:           MOV #OFF,CCR                 ;DISABLE CACHE
              CLR ITTRAP                   ;RESET TRAP FLAG
              MOV CCR,R1                   ;ATTEMPT READ TO CONTROL REGISTER
              MOV ITTRAP,ERROR             ;SET ERROR FLAG IF TRAP OCCURED
              JSR R0,SETEN                 ;PRINT LIST OF SENTENCES
              .WORD ^D4
              .WORD SEN1                   ;CACHE REGISTER RESPONSE TESTS
              .WORD SEN3                   ;READING CONTROL REGISTER CAUSED TIME OUT
              JSR R0,(R0)                  ;TAKE SELECTED ACTION IF ERROR
              .WORD 1$                     ;LOOP ON ERROR
              .WORD 1$                     ;LOOP ON TEST
:
:
:
:
TST003:      ATTEMPT READ INTO CMR TO CHECK ADDRESS SELECT LOGIC
              IF TIME OCCURES THEN LOGIC IN ERROR
              INC TID                      ;UPDATE TEST ID
1$:           MOV #OFF,CCR                 ;DISABLE CACHE
              CLR ITTRAP                   ;RESET TRAP FLAG
              MOV CMR,R1                   ;READ MAINTENANCE REGISTER
              MOV ITTRAP,ERROR             ;SET ERROR FLAG IF TRAP OCCURED
              JSR R0,SETEN                 ;PRINT LIST OF SENTENCES
              .WORD ^D4
              .WORD SEN1                   ;CACHE REGISTER RESPONSE TESTS

```


6751	007116	035772			.WORD SEN4	:READING MAINTENANCE REGISTER CAUSED TIME OUT
6752	007120	004010			JSR R0,(R0)	:TAKE SELECTED ACTION ON ERROR
6753	007122	007062			.WORD 1\$	:LOOP ON ERROR
6754	007124	007062			.WORD 1\$	:LOOP ON TEST
6755						
6756						
6757						
6758						
6759						
6760						
6761						
6762						
6763	007126	005267	171514		ATTEMPT READ INTO CHR TO CHECK ADDRESS SELECT LOGIC	
6764	007132	012767	001015	170606	IF TIME OUT OCCURES THEN LOGIC IN ERROR	
6765	007140	005067	175374		TST004: INC TID	:UPDATE TEST ID
6766	007144	016701	170602		1\$: MOV #OFF,CCR	:DISABLE CACHE
6767	007150	016767	175364	175364	CLR ITTRAP	:RESET TRAP FLAG
6768	007156	004067	176170		MOV CHR,R1	:READ HIT REGISTER
6769	007162	000004			MOV ITTRAP,ERROR	:SET ERROR FLAG IF TRAP OCCURED
6770	007164	035722			JSR R0,SETEN	:PRINT LIST OF SENTENCES
6771	007166	036010			.WORD ^D4	
6772	007170	004010			.WORD SEN1	:CACHE REGISTER RESPONSE TESTS
6773	007172	007132			.WORD SEN5	:READING HIT REGISTER CAUSED TIME OUT
6774	007174	007132			JSR R0,(R0)	:TAKE SELECTED ACTION ON ERROR
6775					.WORD 1\$	:LOOP ON ERROR
6776					.WORD 1\$	:LOOP ON TEST
6777						
6778						
6779						
6780						
6781						
6782						
6783	007176	005267	171444		READ ADDRESS BELOW ERROR REGISTER TO CHECK THAT CACHE	
6784	007202	012767	001015	170536	WILL NOT RESPOND TO THAT LOCATION	
6785	007210	005067	175324		TST005: INC TID	:UPDATE TEST ID
6786	007214	016701	170522		1\$: MOV #OFF,CCR	:DISABLE CACHE
6787	007220	016767	175314	175314	CLR ITTRAP	:RESET TRAP FLAG
6788	007226	005367	175310		MOV CMPE-2,R1	:READ ADDRESS BELOW ERROR REGISTER
6789	007232	004067	176114		MOV ITTRAP,ERROR	:ERROR IF NO TRAP
6790	007236	000004			DEC ERROR	
6791	007240	035722			JSR R0,SETEN	:PRINT LIST OF SENTENCES
6792	007242	036026			.WORD ^D4	
6793	007244	004010			.WORD SEN1	:CACHE REGISTER RESPONSE TESTS
6794	007246	007202			.WORD SEN6	:READING INVALID ADDRESS 177740 DID NOT CAUSE TI
6795	007250	007202			JSR R0,(R0)	:TAKE SELECTED ACTION ON ERROR
6796					.WORD 1\$	:LOOP ON ERROR
6797					.WORD 1\$	:LOOP ON TEST
6798						
6799						
6800						
6801						
6802						
6803						
6804	007252	005267	171370		READ LOCATION ABOVE HIT REGISTER TO CHECK THAT	
6805	007256	012767	001015	170462	CACHE WILL NOT RESPOND	
6806	007264	005067	175250		TST006: INC TID	:UPDATE TEST ID
					1\$: MOV #OFF,CCR	:DISABLE CACHE
					CLR ITTRAP	:RESET TRAP FLAG

```
6807 007270 016701 170462      MOV CHR+4,R1      ;READ TWO LOCATIONS ABOVE HIT REGISTER
6808 007274 016767 175240 175240 MOV ITTRAP,ERROR  ;IF NO TRAP THEN ERROR
6809 007302 005367 175234      DEC ERROR
6810
6811 007306 004067 176040      JSR R0,SETEN      ;PRINT LIST OF SENTENCES
6812 007312 000004      .WORD ^D4
6813 007314 035722      .WORD SEN1      ;CACHE REGISTER RESPONSE TESTS
6814 007316 036052      .WORD SEN7      ;READING INVALID ADDRESS 177756 DID NOT CAUSE TI
6815 007320 004010      JSR R0,(R0)      ;TAKE SELECT ACTION ON ERROR
6816 007322 007256      .WORD 1$      ;LOOP ON ERROR
6817 007324 007256      .WORD 1$      ;LOOP ON TEST
6818
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6829 007326 005267 171314      TST007: INC TID      ;UPDATE TEST ID
6830 007332 012767 001015 170406 1$: MOV #OFF,CCR      ;DISABLE CACHE
6831 007340 005067 175174      CLR ITTRAP      ;RESET TRAP FLAG
6832 007344 012767 000001 170372 MOV #1,CMPE      ;WRITE 1 INTO ERROR REGISTER
6833 007352 016767 170366 175162 MOV CMPE,ERROR    ;ERROR IF BIT 0 SET
6834 007360 042767 177776 175154 BIC #177776,ERROR ;DON'T LOOK AT UPPER BITS
6835 007366 004067 175760      JSR R0,SETEN      ;PRINT LIST OF SENTENCES
6836 007372 000006      .WORD ^D6
6837 007374 035722      .WORD SEN1      ;CACHE REGISTER RESPONSE TESTS
6838 007376 036076      .WORD SEN8      ;UNUSED CMPE BIT00 READ AS ONE
6839 007400 036114      .WORD SEN9      ;POSSIBLE REGISTER ADDRESSING ERROR
6840 007402 004010      JSR R0,(R0)      ;TAKE SELECTED ACTION ON ERROR
6841 007404 007332      .WORD 1$      ;LOOP ON ERROR
6842 007406 007332      .WORD 1$      ;LOOP ON TEST
6843
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6851
6852
6853 007410 005267 171232      TST010: INC TID      ;UPDATE TEST ID
6854 007414 012767 001015 170324 1$: MOV #OFF,CCR      ;DISABLE CACHE
6855 007422 052767 000001 170316 BIS #1,CCR      ;WRITE 1 INTO CONTROL REGISTER
6856 007430 016767 170312 175104 MOV CCR,ERROR    ;ERROR IF BIT00 NOT SET
6857 007436 042767 177776 175076 BIC #177776,ERROR
6858 007444 005367 175072      DEC ERROR
6859 007450 004067 175676      JSR R0,SETEN      ;PRINT LIST OF SENTENCES
6860 007454 000006      .WORD ^D6
6861 007456 035722      .WORD SEN1      ;CACHE REGISTER RESPONSE TESTS
6862 007460 036126      .WORD SEN10     ;WROTE ONE INTO CCR BIT00 READ BACK ZERO
```


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CACHE REGISTER RESPONSE TESTS

SEQ 0035

6863 007462 036114
6864 007464 004010
6865 007466 007414
6866 007470 007414
6867
6868
6869
6870

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⋮

.WORD SEN9
JSR R0,(R0)
.WORD 1\$
.WORD 1\$

;POSSIBLE REGISTER ADDRESSING ERROR
;TAKE SELECTED ACTION ON ERROR
;LOOP ON ERROR
;LOOP ON TEST

.SBTTL CONTROL REGISTER DATA TEST

```

6872
6873
6874
6875
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6877
6878 007472 005267 171150
6879 007476 012767 001415 170242
6880 007504 042767 000001 170234
6881 007512 016767 170230 175022
6882 007520 012767 001015 170220
6883 007526 042767 177776 175006
6884 007534 004067 175612
6885 007540 000004
6886 007542 036150
6887 007544 036162
6888 007546 004010
6889 007550 007504
6890 007552 007504
6891
6892
6893
6894
6895
6896
6897
6898
6899
6900 007554 005267 171066
6901 007560 004467 176356
6902 007564 007640
6903 007566 042737 000004 177746
6904 007574 013737 177746 004542
6905 007602 012737 001015 177746
6906 007610 042737 177773 004542
6907 007616 004037 005352
6908 007622 000006
6909 007624 036150
6910 007626 036204
6911 007630 042166
6912 007632 004010
6913 007634 046000
6914 007636 046000
6915
6916
6917
6918
6919
6920
6921
6922
6923
6924 007640 005267 171002
6925 007644 052737 000004 177746
6926 007652 013737 177746 004542
6927 007660 012737 001015 177746

WRITE ZERO INTO CCR BIT00 THEN READ CCR
IF CCR IS READ AS ONE THEN CACHE CCR REGISTER MAY BE BAD
OR CACHE REGISTER DATA PATH COULD BE IN ERROR
TST011: INC TID ;UPDATE TEST ID
MOV #OFF+BIT08,CCR ;DISABLE CACHE
1$: BIC #BIT00,CCR ;WRITE ZERO TO BIT00
MOV CCR,ERROR ;ERROR IF BIT00 = 1
MOV #OFF,CCR ;DISABLE CACHE
BIC #-BIT00-1,ERROR ;PRINT LIST OF SENTENCES
JSR R0,SETEN
WORD ^D4
WORD SEN11 ;CONTROL REGISTER DATA TEST
WORD SEN12 ;WROTE ZERO INTO CCR BIT00 READ BACK ONE
JSR R0,(R0) ;TAKE SELECTED ACTION ON ERROR
WORD 1$ ;LOOP ON ERROR
WORD 1$ ;LOOP ON TEST

WRITE ZERO INTO CCR BIT02 THEN READ CCR
IF BIT02 IS READ AS ONE THEN CCR REGISTER MAY BE BAD
OR CACHE REGISTER DATA PATH MAY BE AT FAULT
TST012: INC TID ;UPDATE TEST ID
JSR R4,RELCTH ;RELOCATE TEST TO HIGH CACHE
WORD TST013
1$: BIC #BIT02,@CCR ;WRITE 0 INTO BIT02
MOV @CCR,@ERROR ;ERROR IF BIT02 = 1
MOV #OFF,@CCR ;DISABLE CACHE
BIC #-BIT02-1,@ERROR ;PRINT LIST OF SENTENCES
JSR R0,@SETEN
WORD ^D6
WORD SEN11 ;CONTROL REGISTER DATA TEST
WORD SEN13 ;WROTE ZERO INTO CCR BIT02 READ ONE
WORD SEN168
JSR R0,(R0) ;TAKE SELECTED ACTION ON ERROR
WORD HIGHSP ;LOOP ON ERROR
WORD HIGHSP ;LOOP ON TEST

WRITE ONE INTO CCR BIT02 THEN READ CCR
IF CCR BIT02 READ BACK AS ZERO THEN CCR REGISTER BIT MAY BE BAD
OR CACHE REGISTER DATA PATH MAY BE AT FAULT
TST013: INC TID ;UPDATE TEST ID
1$: BIS #BIT02,@CCR ;WRITE 4 INTO CONTROL REGISTER
MOV @CCR,@ERROR ;ERROR IF BIT02 <> 1
MOV #OFF,@CCR ;DISABLE CACHE

```


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CONTROL REGISTER DATA TEST

L 3

SEQ 0037

6928 007666 042737 177773 004542
6929 007674 162737 000004 004542
6930 007702 004037 005352
6931 007706 000004
6932 007710 036150
6933 007712 036224
6934 007714 004010
6935 007716 007644
6936 007720 007644
6937
6938 007722 000167 000102
6939 007726 047520 051523 041111
6940 010020 015 012 012
6941
6942
6943
6944
6945
6946
6947
6948
6949
6950 010030 005267 170612

:
MAYBE:
:
:
:
:
:
TST014:

2\$:

BIC #-BIT02-1,@#ERROR
SUB #4,@#ERROR
JSR R0,@#SETEN
.WORD ^D4
.WORD SEN11
.WORD SEN14
JSR R0,(R0)
.WORD 1\$
.WORD 1\$
JMP TST014
.ASCII /POSSIBLE FORCE MISS SWITCH ERROR!! VERIFY SWITCH POSITIONS/
.BYTE 15,12,12,12,177,177,177,0
.EVEN

;PRINT LIST OF SENTENCES

;CONTROL REGISTER DATA TEST
;WROTE ONE INTO CCR BIT02 READ ZERO
;TAKE SELECTED ACTION ON ERROR
;LOOP ON ERROR
;LOOP ON TEST

WRITE ZERO INTO CCR BIT03 THEN READ CCR
IF BIT03 READ BACK AS ONE THEN CCR REGISTER BIT MAY BE BAD
OR CACHE REGISTER DATA PATH MAY BE AT FAULT
INC TID
;UPDATE TEST ID

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CONTROL REGISTER DATA TEST

M 3

SEQ 0038

6952	010034	004467	176054
6953	010040	010114	
6954	010042	042737	000010 177746
6955	010050	013737	177746 004542
6956	010056	012737	001015 177746
6957	010064	042737	177767 004542
6958	010072	004037	005352
6959	010076	000006	
6960	010100	036150	
6961	010102	036244	
6962	010104	042166	
6963	010106	004010	
6964	010110	044000	
6965	010112	044000	

```
1$: JSR R4,RELCTL      ;RELOCATE TEST TO LOW CACHE
      .WORD TST015
      BIC #BIT03,@#CCR      ;WRITE 0 TO BIT03
      MOV @#CCR,@#ERROR    ;ERROR IF BIT = 1
      MOV #OFF,@#CCR      ;DISABLE CACHE
      BIC #-BIT03-1,@#ERROR
      JSR R0,@#SETEN      ;PRINT LIST OF SENTENCES
      .WORD ^D6
      .WORD SEN11        ;CONTROL REGISTER DATA TEST
      .WORD SEN15        ;WROTE ZERO INTO CCR BIT03 READ ONE
      .WORD SEN168
      JSR R0,(R0)        ;TAKE SELECTED ACTION ON ERROR
      .WORD LOWSP        ;LOOP ON ERROR
      .WORD LOWSP        ;LOOP ON TEST
```


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CONTROL REGISTER DATA TEST

N 3

SEQ 0039

6967
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6973
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6976
6977 010114 005267 170526
6978 010120 052767 000010 167620
6979 010126 016767 167614 174406
6980 010134 012767 001015 167604
6981 010142 042767 177767 174372
6982 010150 162767 000010 174364
6983 010156 004067 175170
6984 010162 000004
6985 010164 036150
6986 010166 036264
6987 010170 004010
6988 010172 010120
6989 010174 010120

```

WRITE ONE INTO CCR BIT03 THEN READ CCR
IF CCR BIT03 READ AS ZERO THEN CCR REGISTER BIT MAY BE BAD
OR CACHE REGISTER DATA PATH MAY BE AT FAULT
TST015: INC TID          :UPDATE TEST ID
1$:     BIS #BIT03,CCR    :WRITE 1 INTO CONTROL REGISTER BIT03
        MOV CCR,ERROR     :ERROR IF BIT03 = 0
        MOV #OFF,CCR      :DISABLE CACHE
        BIC #-BIT03-1,ERROR
        SUB #10,ERROR
        JSR RO,SETEN
        .WORD ^D4
        .WORD SEN11
        .WORD SEN16
        JSR RO,(RO)
        .WORD 1$
        .WORD 1$
        :PRINT LIST OF SENTENCES
        :CONTROL REGISTER DATA TEST
        :WROTE ONE INTO CCR BIT03 READ ZERO
        :TAKE SELECTED ACTION ON ERROR
        :LOOP ON ERROR
        :LOOP ON TEST

```

6990
6991
6992
6993
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6995
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6997
6998
6999 010176 005267 170444
7000 010202 042767 000100 167536
7001 010210 016767 167532 174324
7002 010216 012767 001015 167522
7003 010224 042767 177677 174310
7004 010232 004067 175114
7005 010236 000004
7006 010240 036150
7007 010242 036304
7008 010244 004010
7009 010246 010202
7010 010250 010202

```

WRITE ONE INTO CCR BIT06 THEN READ CCR
IF BIT06 READ AS ONE THEN CCR REGISTER BIT MAY BE BAD
OR CACHE REGISTER DATA PATH MAY BE AT FAULT
TST016: INC TID          :UPDATE TEST ID
1$:     BIC #BIT06,CCR    :WRITE 0 INTO CONTROL REGISTER BIT06
        MOV CCR,ERROR     :ERROR IF BIT06 = 1
        MOV #OFF,CCR      :DISABLE CACHE
        BIC #-BIT06-1,ERROR
        JSR RO,SETEN
        .WORD ^D4
        .WORD SEN11
        .WORD SEN17
        JSR RO,(RO)
        .WORD 1$
        .WORD 1$
        :PRINT LIST OF SENTENCES
        :CONTROL REGISTER DATA TEST
        :WROTE ZERO INTO CCR BIT06 READ ONE
        :TAKE SELECTED ACTION ON ERROR
        :LOOP ON ERROR
        :LOOP ON TEST

```

7011
7012
7013
7014
7015
7016
7017
7018
7019
7020 010252 005267 170370
7021 010256 052767 000100 167462
7022 010264 016767 167456 174250
7023 010272 012767 001015 167446
7024 010300 012701 044000
7025 010304 012102
7026 010306 020127 050000
7027 010312 001374
7028 010314 042767 177677 174220

```

WRITE ONE INTO CCR BIT06 THEN READ CCR
IF CCR BIT06 READ AS ZERO THEN CCR REGISTER BIT MAY BE BAD
OR CACHE REGISTER DATA PATH MAY BE AT FAULT
TST017: INC TID          :UPDATE TEST ID
1$:     BIS #BIT06,CCR    :WRITE 1 INPUT CONTROL REGISTER BIT06
        MOV CCR,ERROR     :ERROR IF BIT06 = 0
        MOV #OFF,CCR      :DISABLE CACHE
        MOV #LOWSP,R1      :RETAG ALL CACHE
        MOV (R1)+,R2       :READ TO TAG LOCATION
        CMP R1,#LOW1       :TAG FULL 1K
        BNE 10$
        BIC #-BIT06-1,ERROR
10$:

```



```
7029 010322 162767 000100 174212 SUB #100,ERROR
7030 010330 004067 175016 JSR R0,SETEN ;PRINT LIST OF SENTENCES
7031 010334 000004 .WORD ^D4
7032 010336 036150 .WORD SEN11 ;CONTROL REGISTER DATA TEST
7033 010340 036324 .WORD SEN18 ;WROTE ONE INTO CCR BIT06 READ ZERO
7034 010342 004010 JSR R0,(R0) ;TAKE SELECTED ACTION ON ERROR
7035 010344 010256 .WORD 1$ ;LOOP ON ERROR
7036 010346 010256 .WORD 1$ ;LOOP ON TEST
7037
7038
7039
7040
7041
7042
7043
7044
7045
7046 010350 005267 170272 TST020: INC TID ;UPDATE TEST ID
7047 010354 042767 000200 167364 1$ BIC #BIT07,CCR ;WRITE 0 INTO CONTROL REGISTER BIT07
7048 010362 016767 167360 174152 MOV CCR,ERROR ;ERROR IF BIT07 = 1
7049 010370 012767 001015 167350 MOV #OFF,CCR ;DISABLE CACHE
7050 010376 042767 177577 174136 BIC #-BIT07-1,ERROR
7051 010404 004067 174742 JSR R0,SETEN ;PRINT LIST OF SENTENCES
7052 010410 000004 .WORD ^D4
7053 010412 036150 .WORD SEN11 ;CONTROL REGISTER DATA TEST
7054 010414 036344 .WORD SEN19 ;WROTE ZERO INTO CCR BIT07 READ ONE
7055 010416 004010 JSR R0,(R0) ;TAKE SELECTED ACTION ON ERROR
7056 010420 010354 .WORD 1$ ;LOOP ON ERROR
7057 010422 010354 .WORD 1$ ;LOOP ON TEST
7058
7059
7060
7061
7062
7063
7064
7065
7066
7067 010424 005267 170216 TST021: INC TID ;UPDATE TEST ID
7068 010430 052767 000200 167310 2$ BIS #BIT07,CCR ;WRITE 1 INTO CONTROL REGISTER BIT07
7069 010436 016767 167304 174076 MOV CCR,ERROR ;ERROR IF BIT07 = 0
7070 010444 012767 001015 167274 MOV #OFF,CCR ;DISABLE CACHE
7071 010452 042767 177577 174062 BIC #-BIT07-1,ERROR
7072 010460 162767 000200 174054 SUB #200,ERROR
7073 010466 004067 174660 JSR R0,SETEN ;PRINT LIST OF SENTENCES
7074 010472 000004 .WORD ^D4
7075 010474 036150 .WORD SEN11 ;CONTROL REGISTER DATA TEST
7076 010476 036364 .WORD SEN20 ;WROTE ONE INTO CCR BIT07 READ ZERO
7077 010500 004010 JSR R0,(R0) ;TAKE SELECTED ACTION ON ERROR
7078 010502 010430 .WORD 2$ ;LOOP ON ERROR
7079 010504 010430 .WORD 2$ ;LOOP ON TEST
7080
7081
7082
7083
7084
```

WRITE ZERO INTO CCR BIT07 THEN READ CCR
IF CCR BIT07 READ AS ONE THEN CCR REGISTER BIT MAY BE BAD
OR CACHE REGISTER DATA PATH MAY BE AT FAULT

WRITE ONE INTO CCR BIT07 THEN READ CCR
IF CCR BIT07 READ AS ZERO THEN CCR REGISTER BIT MAY BE BAD
OR CACHE REGISTER DATA PATH MAY BE AT FAULT

WRITE ZERO INTO CCR BIT08 THEN READ CCR
IF CCR BIT08 READ AS ONE THEN CCR REGISTER BIT MAY BE BAD
OR CACHE REGISTER DATA PATH MAY BE AT FAULT

7085	010506	005267	170134		TST022:	INC TID	:UPDATE TEST ID
7086	010512	042767	001000	167226	1\$:	BIC #BIT09,CCR	:WRITE 0 INTO CONTROL REGISTER BIT08
7087	010520	016767	167222	174014		MOV CCR,ERROR	:ERROR IF BIT08 = 1
7088	010526	012767	001015	167212		MOV #OFF,CCR	:DISABLE CACHE
7089	010534	042767	177377	174000		BIC #-BIT08-1,ERROR	
7090	010542	004067	174604			JSR RO,SETEN	:PRINT LIST OF SENTENCES
7091	010546	000004				.WORD ^D4	
7092	010550	036150				.WORD SEN11	:CONTROL REGISTER DATA TEST
7093	010552	036404				.WORD SEN21	:WROTE ZERO INTO CCR BIT09 READ ONE
7094	010554	004010				JSR RO,(RO)	:TAKE SELECTED ACTION ON ERROR
7095	010556	010512				.WORD 1\$	:LOOP ON ERROR
7096	010560	010512				.WORD 1\$	:LOOP ON TEST
7097					:		
7098					:		
7099					:		
7100					:		
7101					:		
7102					:		
7103					:	WRITE ONE INTO CCR BIT09 THEN READ CCR	
7104					:	IF CCR BIT09 READ AS ZERO THEN CCR REGISTER BIT MAY BE BAD	
7105					:	OR CACHE REGISTER DATA PATH MAY BE AT FAULT	
7106	010562	005267	170060		TST023:	INC TID	:UPDATE TEST ID
7107	010566	052767	001000	167152	1\$:	BIS #BIT09,CCR	:WRITE 1 INTO CONTROL REGISTER BIT09
7108	010574	016767	167146	173740		MOV CCR,ERROR	:ERROR IF BIT09 = 0
7109	010602	012767	001015	167136		MOV #OFF,CCR	:DISABLE CACHE
7110	010610	042767	176777	173724		BIC #-BIT09-1,ERROR	
7111	010616	162767	001000	173716		SUB #1000,ERROR	
7112	010624	004067	174522			JSR RO,SETEN	:PRINT LIST OF SENTENCES
7113	010630	000004				.WORD ^D4	
7114	010632	036150				.WORD SEN11	:CONTROL REGISTER DATA TEST
7115	010634	036424				.WORD SEN22	:WROTE ONE INTO CCR BIT09 READ ZERO
7116	010636	004010				JSR RO,(RO)	:TAKE SELECTED ACTION ON ERROR
7117	010640	010566				.WORD 1\$	:LOOP ON ERROR
7118	010642	010566				.WORD 1\$	:LOOP ON TEST
7119					:		
7120					:		
7121					:		
7122					:		
7123	010644	005267	167776		TST024:	INC TID	:UPDATE TEST ID
7124	010650	042737	002000	177746	1\$:	BIC #BIT10,CCR	:WRITE ZERO INTO CONTROL REG BIT10
7125	010656	016767	167064	173656		MOV CCR,ERROR	:READ CONTROL REGISTER
7126	010664	042767	175777	173650		BIC #-BIT10-1,ERROR	:MASK BIT10
7127	010672	004067	174454			JSR RO,SETEN	:REPORT ERROR IF ANY
7128	010676	000004				.WORD ^D4	
7129	010700	036150				.WORD SEN11	:CONTROL REGISTER DATA TEST
7130	010702	036444				.WORD SEN23	:WROTE ZERO INTO CCR BIT10 READ ONE
7131	010704	004010				JSR RO,(RO)	:TAKE SELECTED ACTION ON ERROR
7132	010706	010650				.WORD 1\$	
7133	010710	010650				.WORD 1\$	
7134							
7135							
7136							
7137							
7138	010712	005267	167730		TST025:	INC TID	:UPDATE TEST ID
7139	010716	052767	002000	167022	1\$:	BIS #BIT10,CCR	:WRITE ONE TO BIT 10
7140	010724	016767	167016	173610		MOV CCR,ERROR	:SAVE CCR

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CONTROL REGISTER DATA TEST

SEQ 0043

7141	010732	012767	001015	167006
7142	010740	042767	175777	173574
7143	010746	162767	002000	173566
7144	010754	004067	174372	
7145	010760	000004		
7146	010762	036150		
7147	010764	036464		
7148	010766	004010		
7149	010770	010716		
7150	010772	010716		

```
MOV #OFF,CCR
BIC #-BIT10-1,ERROR
SUB #BIT10,ERROR
JSR R0,SETEN
.WORD ^D4
.WORD SEN11
.WORD SEN24
JSR R0,(R0)
.WORD 1$
.WORD 1$
```

```
;DISABLE CACHE
;MASK BIT10

;REPORT ERROR IF ANY

;CONTROL REGISTER DATA TEST
;WROTE ONE INTO CCR BIT10 READ ZERO
;TAKE SELECTED ACTION ON ERROR
;LOOP ON ERROR
;LOOP ON TEST
```

.SBTTL CONTROL REGISTER UNUSED BIT TEST

```
7152
7153
7154
7155
7156
7157
7158 010774 005267 167646
7159 011000 012767 001015 166740
7160 011006 052767 000002 166732
7161 011014 016767 166726 173520
7162 011022 042767 177775 173512
7163 011030 004067 174316
7164 011034 000004
7165 011036 036504
7166 011040 036520
7167 011042 004010
7168 011044 011000
7169 011046 011000
7170
7171
7172
7173
7174
7175
7176
7177
7178 011050 005267 167572
7179 011054 012767 001015 166664
7180 011062 052767 000020 166656
7181 011070 016767 166652 173444
7182 011076 042767 177757 173436
7183 011104 004067 174242
7184 011110 000004
7185 011112 036504
7186 011114 036536
7187 011116 004010
7188 011120 011054
7189 011122 011054
7190
7191
7192
7193
7194
7195
7196
7197
7198 011124 005267 167516
7199 011130 012767 001015 166610
7200 011136 052767 000040 166602
7201 011144 016767 166576 173370
7202 011152 042767 177757 173362
7203 011160 004067 174166
7204 011164 000004
7205 011166 036504
7206 011170 036554
7207 011172 004010
```

WRITE INTO UNUSED CCR REGISTER BIT01 THEN READ CCR
IF CCR BIT01 READ AS ONE THEN CACHE DATA PATH
ERROR

TST026: 1\$: INC TID ;UPDATE TEST ID
MOV #OFF,CCR ;DISABLE CACHE
BIS #BIT01,CCR ;WRITE 1 INTO CONTROL REGISTER BIT01
MOV CCR,ERROR ;ERROR IF BIT01 = 1
BIC #-BIT01-1,ERROR
JSR RO,SETEN ;PRINT LIST OF SENTENCES
.WORD ^D4
.WORD SEN25 ;CONTROL REGISTER UNUSED BIT TEST
.WORD SEN26 ;READ ONE FROM UNUSED CCR BIT01
JSR RO,(RO) ;TAKE SELECTED ACTION ON ERROR
.WORD 1\$;LOOP ON ERROR
.WORD 1\$;LOOP ON TEST

WRITE ONE INTO UNUSED CCR BIT04 THEN READ CCR
IF CCR BIT04 READ AS ONE THEN CACHE REGISTER DATA PATH ERROR

TST027: 1\$: INC TID ;UPDATE TEST ID
MOV #OFF,CCR ;DISABLE CACHE
BIS #BIT04,CCR ;WRITE 1 INTO CONTROL REGISTER BIT04
MOV CCR,ERROR ;ERROR IF BIT04 = 1
BIC #-BIT04-1,ERROR
JSR RO,SETEN ;PRINT LIST OF SENTENCES
.WORD ^D4
.WORD SEN25 ;CONTROL REGISTER UNUSED BIT TEST
.WORD SEN27 ;READ ONE FROM UNUSED CCR BIT04
JSR RO,(RO) ;TAKE SELECTED ACTION IF ERROR
.WORD 1\$;LOOP ON ERROR
.WORD 1\$;LOOP ON TEST

WRITE ONE INTO UNUSED CCR BIT05 THEN READ CCR
IF CCR BIT05 READ AS ONE THEN CACHE REGISTER DATA PATH ERROR

TST030: 1\$: INC TID ;UPDATE TEST ID
MOV #OFF,CCR ;DISABLE CACHE
BIS #BIT05,CCR ;WRITE 1 INTO CONTROL REGISTER BIT05
MOV CCR,ERROR ;ERROR IF BIT05 = 1
BIC #-BIT05-1,ERROR
JSR RO,SETEN ;PRINT LIST OF SENTENCES
.WORD ^D4
.WORD SEN25 ;CONTROL REGISTER UNUSED BIT TEST
.WORD SEN28 ;READ ONE FROM UNUSED CCR BIT05
JSR RO,(RO) ;TAKE SELECTED ACTION ON ERROR

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CONTROL REGISTER UNUSED BIT TEST

SEQ 0045

```

7208 011174 011130 .WORD 1$ ;LOOP ON ERROR
7209 011176 011130 .WORD 1$ ;LOOP ON TEST
7210
7211
7212
7213
7214
7215
7216
7217
7218 011200 005267 167442
7219 011204 012767 001015 166534
7220 011212 052767 000400 166526
7221 011220 016767 166522 173314
7222 011226 042767 177377 173306
7223 011234 004067 174112
7224 011240 000004
7225 011242 036504
7226 011244 036572
7227 011246 004010
7228 011250 011204
7229 011252 011204
7230
7231
7232
7233
7234
7235
7236
7237
7238 011254 005267 167366
7239 011260 012767 001015 166460
7240 011266 052767 004000 166452
7241 011274 016767 166446 173240
7242 011302 042767 173777 173232
7243 011310 004067 174036
7244 011314 000004
7245 011316 036504
7246 011320 036610
7247 011322 004010
7248 011324 011260
7249 011326 011260
7250
7251
7252
7253
7254
7255
7256
7257
7258 011330 005267 167312
7259 011334 012767 001015 166404
7260 011342 052767 040000 166376
7261 011350 016767 166372 173164
7262 011356 042767 137777 173156
7263 011364 004067 173762

WRITE ONE INTO UNUSED CCR BIT08 THEN READ CCR
IF CCR BIT08 READ AS ONE THEN CACHE REGISTER DATA PATH ERROR
TST031: INC TID ;UPDATE TEST ID
1$: MOV #OFF,CCR ;DISABLE CACHE
BIS #BIT08,CCR ;WRITE 1 INTO CONTROL REGISTER BIT08
MOV CCR,ERROR ;ERROR IF BIT08 = 1
BIC #-BIT08-1,ERROR
JSR RO,SETEN ;PRINT LIST OF SENTENCES
.WORD *D4
.WORD SEN25 ;CONTROL REGISTER UNUSED BIT TEST
.WORD SEN29 ;READ ONE FROM UNUSED CCR BIT08
JSR RO,(RO) ;TAKE SELECTED ACTION ON ERROR
.WORD 1$ ;LOOP ON ERROR
.WORD 1$ ;LOOP ON TEST

WRITE ONE INTO UNUSED CCR BIT11 THEN READ CCR
IF CCR BIT11 READ AS ONE THEN CACHE REGISTER DATA PATH ERROR
TST032: INC TID ;UPDATE TEST ID
1$: MOV #OFF,CCR ;DISABLE CACHE
BIS #BIT11,CCR ;WRITE 1 INTO CONTROL REGISTER BIT11
MOV CCR,ERROR ;ERROR IF BIT11 = 1
BIC #-BIT11-1,ERROR
JSR RO,SETEN ;PRINT LIST OF SENTENCES
.WORD *D4
.WORD SEN25 ;CONTROL REGISTER UNUSED BIT TEST
.WORD SEN30 ;READ ONE FROM UNUSED CCR BIT11
JSR RO,(RO) ;TAKE SELECTED ACTION ON ERROR
.WORD 1$ ;LOOP ON ERROR
.WORD 1$ ;LOOP ON TEST

WRITE ONE INTO UNUSED CCR BIT14 THEN READ CCR
IF CCR BIT14 READ AS ONE THEN CACHE REGISTER DATA PATH ERROR
TST033: INC TID ;UPDATE TEST ID
1$: MOV #OFF,CCR ;DISABLE CACHE
BIS #BIT14,CCR ;WRITE 1 INTO CONTROL REGISTER BIT14
MOV CCR,ERROR ;ERROR IF BIT14 = 1
BIC #-BIT14-1,ERROR
JSR RO,SETEN ;PRINT LIST OF SENTENCES

```

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CONTROL REGISTER UNUSED BIT TEST

SEQ 0046

```

7264 011370 000004      .WORD ^D4
7265 011372 036504      .WORD SEN25      ;CONTROL REGISTER UNUSED BIT TEST
7266 011374 036626      .WORD SEN31      ;READ ONE FROM UNUSED CCR BIT14
7267 011376 004010      JSR R0,(R0)      ;TAKE SELECTED ACTION ON ERROR
7268 011400 011334      .WORD 1$        ;LOOP ON ERROR
7269 011402 011334      .WORD 1$        ;LOOP ON TEST
7270      :
7271      :
7272      :
7273      :
7274      :
7275      :
7276      :
7277      :
7278 011404 005267 167236  TST034:      WRITE ONE INTO UNUSED CCR BIT15 THEN READ CCR
7279 011410 012767 001015 166330      IF CCR BIT15 READ AS ONE THEN CACHE REGISTER DATA PATH ERROR
7280 011416 052767 100000 166322      1$:      INC TID      ;UPDATE TEST ID
7281 011424 016767 166316 173110      MOV #OFF,CCR      ;DISABLE CACHE
7282 011432 042767 077777 173102      BIS #BIT15,CCR      ;WRITE 1 INTO CONTROL REGISTER BIT15
7283 011440 004067 173706      MOV CCR,ERROR      ;ERROR IF BIT15 = 1
7284 011444 000004      BIC #-BIT15-1,ERROR
7285 011446 036504      JSR R0,SETEN      ;PRINT LIST OF SENTENCES
7286 011450 036644      .WORD ^D4
7287 011452 004010      .WORD SEN25      ;CONTROL REGISTER UNUSED BIT TEST
7288 011454 011410      .WORD SEN32      ;READ ONE FROM UNUSED CCR BIT15
7289 011456 011410      JSR R0,(R0)      ;TAKE SELECTED ACTION ON ERROR
7290      :
7291      :
7292      :
7293      :

```



```

REGISTER BYTE SELECTION LOGIC TEST
WRITE ZERO INTO LOW BYTE WRITE ONE INTO HIGH BYTE
VERIFY THAT LOW BYTE DATA IS NOT EFFECTED BY WRITE TO HIGH BYTE
TST035:      INC TID                                ;UPDATE TEST ID
1$:          MOV #OFF,CCR                            ;DISABLE CACHE
            BICB #BIT01,CCR                          ;WRITE 0 INTO CONTROL REGISTER BIT01
            BISB #BIT01,CCR+1                        ;WRITE 1 INTO CONTROL REGISTER BIT09
            MOV CCR,ERROR                            ;ERROR IF BIT01 = 1
            BIC #-<BIT01+BIT09>-1,ERROR              ;OR BIT09 = 0
            SUB #1000,ERROR
            JSR R0,SETEN                             ;PRINT LIST OF SENTENCES
            .WORD ^D8
            .WORD SEN33                             ;CACHE CONTROL REGISTER BYTE TESTS
            .WORD SEN34                             ;WROTE ZERO INTO LOW BYTE BIT01
            .WORD SEN35                             ;WROTE ONE INTO HIGH BYTE BIT09
            .WORD SEN36                             ;READ ZERO FROM BIT09
            JSR R0,(R0)                             ;TAKE SELECTED ACTION ON ERROR
            .WORD 1$                                ;LOOP ON ERROR
            .WORD 1$                                ;LOOP ON TEST

WRITE ZERO INTO HIGH BYTE WRITE ONE INTO LOW BYTE
VERIFY HIGH BYTE NOT EFFECTED BY WRITE INTO LOW BYTE
TST036:      INC TID                                ;UPDATE TEST ID
1$:          MOV #OFF,CCR                            ;DISABLE CACHE
            BICB #BIT02,CCR+1                        ;WRITE 0 INTO CONTROL REGISTER BIT10
            BISB #BIT02,CCR                          ;WRITE 1 INTO CONTROL REGISTER BIT02
            MOV CCR,ERROR                            ;ERROR IF BIT01 = 0 OR IF BIT09 = 1
            BIC #-BIT02-1,ERROR
            SUB #BIT02,ERROR
            JSR R0,SETEN                             ;PRINT LIST OF SENTENCES
            .WORD ^D8
            .WORD SEN33                             ;CACHE CONTROL REGISTER BYTE TESTS
            .WORD SEN37                             ;WROTE ZERO INTO HIGH BYTE BIT10
            .WORD SEN38                             ;WROTE ONE INTO LOW BYTE BIT02
            .WORD SEN39                             ;READ ZERO FROM BIT02 OR READ ONE FROM BIT10
            JSR R0,(R0)                             ;TAKE SELECTED ACTION ON ERROR
            .WORD 1$                                ;LOOP ON ERROR
            .WORD 1$                                ;LOOP ON TEST

```

.SBTTL MAINTENANCE REGISTER DATA TEST

```
7346
7347
7348
7349
7350 011650 005267 166772
7351 011654 012767 001015 166064
7352 011662 042767 000001 166060
7353 011670 016767 166054 172644
7354 011676 042767 177776 172636
7355 011704 004067 173442
7356 011710 000004
7357 011712 037024
7358 011714 037036
7359 011716 004010
7360 011720 011654
7361 011722 011654
7362
7363
7364
7365
7366
7367
7368
7369 011724 005267 166716
7370 011730 052767 000001 166012
7371 011736 016767 166006 172576
7372 011744 005067 166000
7373 011750 042767 177776 172564
7374 011756 005367 172560
7375 011762 004067 173364
7376 011766 000004
7377 011770 037024
7378 011772 037054
7379 011774 004010
7380 011776 011730
7381 012000 011730
7382
7383
7384
7385
7386
7387
7388
7389
7390 012002 005267 166640
7391 012006 052767 000002 165734
7392 012014 016767 165730 172520
7393 012022 042767 177775 172512
7394 012030 004067 173316
7395 012034 000004
7396 012036 037024
7397 012040 037072
7398 012042 004010
7399 012044 012006
7400 012046 012006
7401
```

VERIFY CMR BIT00 CAN BE WRITTEN TO A ONE

TST037:

1\$: INC TID ;UPDATE TEST ID
MOV #OFF,CCR ;DISABLE CACHE
BIC #BIT00,CMR ;WRITE 1 INTO MAINTENANCE REGISTER
MOV CMR,ERROR ;ERROR IF BIT00 = 1
BIC #-BIT00-1,ERROR
JSR RO,SETEN ;PRINT LIST OF SENTENCES
.WORD ^D4
.WORD SEN40 ;MAINTENANCE REGISTER DATA TEST
.WORD SEN41 ;WROTE ZERO INTO CMR READ ONE
JSR RO,(RO) ;TAKE SELECTED ACTION ON ERROR
.WORD 1\$;LOOP ON ERROR
.WORD 1\$;LOOP ON TEST

VERIFY CMR BIT00 CAN BE WRITTEN TO A ZERO

TST040:

1\$: INC TID ;UPDATE TEST ID
BIS #BIT00,CMR ;WRITE 1 INTO MAINTENANCE REGISTER BIT00
MOV CMR,ERROR ;ERROR IF BIT00 = 0
CLR CMR ;EXIT MAINT MODE
BIC #-BIT00-1,ERROR
DEC ERROR
JSR RO,SETEN ;PRINT LIST OF SENTENCES
.WORD ^D4
.WORD SEN40 ;MAINTENANCE REGISTER DATA TEST
.WORD SEN42 ;WROTE ONE INTO CMR READ ZERO
JSR RO,(RO) ;TAKE SELECTED ACTION ON ERROR
.WORD 1\$;LOOP ON ERROR
.WORD 1\$;LOOP ON TEST

ATTEMPT TO WRITE ONE INTO UNUSED MAINT REGISTER BIT01
READ INTO CMR SHOULD RESULT IN ZERO FROM BIT01

TST041:

1\$: INC TID ;UPDATE TEST ID
BIS #BIT01,CMR ;WRITE 1 INTO MAINTENANCE REGISTER BIT01
MOV CMR,ERROR ;ERROR IF BIT01 = 1
BIC #-BIT01-1,ERROR
JSR RO,SETEN ;PRINT LIST OF SENTENCES
.WORD ^D4
.WORD SEN40 ;MAINTENANCE REGISTER DATA TEST
.WORD SEN43 ;READ ONE FROM UNUSED CMR BIT01
JSR RO,(RO) ;TAKE SELECTED ACTION ON ERROR
.WORD 1\$;LOOP ON ERROR
.WORD 1\$;LOOP ON TEST

[illegible]

```

:      ATTEMPT TO WRITE ONE INTO UNUSED MAINT. REGISTER BIT02
:      READ INTO CMR SHOULD RESULT IN ZERO FROM BIT02
TST042:      INC TID                                ;UPDATE TEST ID
1$:          BIS #BIT02,CMR                        ;WRITE 1 INTO MAINTENANCE REGISTER BIT02
            MOV CMR,ERROR                          ;ERROR IF BIT02 = 1
            BIC #-BIT02-1,ERROR
            JSR R0,SETEN                            ;PRINT LIST OF SENTENCES
            .WORD ^D4
            .WORD SEN40                            ;MAINTENANCE REGISTER DATA TEST
            .WORD SEN44                            ;READ ONE FROM UNUSED CMR BIT02
            JSR R0,(R0)                            ;TAKE SELECTED ACTION ON ERROR
            .WORD 1$                               ;LOOP ON ERROR
            .WORD 1$                               ;LOOP ON TEST

```

.SBTTL DATA PATH TEST

```
7425
7426
7427
7428
7429
7430
7431
7432 012116 005267 166524
7433 012122 004467 173766
7434 012126 012310
7435 012130 012701 046000
7436 012134 012737 000005 177746
7437 012142 012102
7438 012144 020127 050000
7439 012150 001374
7440 012152 012702 177777
7441 012156 010241
7442 012160 020127 046000
7443 012164 001374
7444 012166 005037 004542
7445 012172 005003
7446 012174 012102
7447 012176 032737 000010 177752
7448 012204 001403
7449 012206 005203
7450 012210 050237 004542
7451 012214 020127 050000
7452 012220 001365
7453 012222 012737 001015 177746
7454 012230 005703
7455 012232 001011
7456 012234 005237 004542
7457 012240 004037 005352
7458 012244 000006
7459 012246 037126
7460 012250 037136
7461 012252 037154
7462 012254 000412
7463 012256 005137 004542
7464 012262 005237 004560
7465 012266 004037 005352
7466 012272 000006
7467 012274 037126
7468 012276 037136
7469 012300 037170
7470 012302 004010
7471 012304 044000
7472 012306 044000
7473
7474
7475
7476
7477
7478
7479 012310 005267 166332
7480 012314 004467 173574
```

TEST WRITES ALL ONES TO HIGH CACHE THEN READS
SAME LOCATIONS. IF READ WAS A HIT FORM CACHE
THEN TEST DATA FOR ALL ONES . ANY BIT READ AS ZERO
CAUSES ERROR REPORT.

TST043:

```
INC TID
JSR R4,RELCTL
WORD TST044
MOV #HIGHSP,R1
MOV #5,@CCR
1$: MOV (R1)+,R2
    CMP R1,#HIGHSP+2000
    BNE 1$
    MOV #177777,R2
2$: MOV R2,-(R1)
    CMP R1,#HIGHSP
    BNE 2$
    CLR @ERROR
    CLR R3
3$: MOV (R1)+,R2
    BIT #BIT03,@CHR
    BEQ 4$
    INC R3
    BIS R2,@ERROR
4$: CMP R1,#HIGHSP+2000
    BNE 3$
    MOV #OFF,@CCR
    TST R3
    BNE 5$
    INC @ERROR
    JSR R0,@SETEN
    WORD *D6
    WORD SEN45
    WORD SEN46
    WORD SEN47
    BR 6$
5$: COM @ERROR
    INC @BITFLG
    JSR R0,@SETEN
    WORD *D6
    WORD SEN45
    WORD SEN46
    WORD SEN48
6$: JSR R0,(R0)
    WORD LOWSP
    WORD LOWSP
```

;UPDATE TEST ID
;RELOCATE TEST TO LOW CACHE
;POINT TO HIGH CACHE
;ENABLE HIGH CACHE
;TAG ALL HIGH CACHE LOCATIONS
;DATA FOR TEST
;WRITE ALL ONES TO HIGH CACHE
;DATA READ FROM CACHE FLAG
;READ DATA
;VERIFY DATA READ FROM CACHE
;OR READ DATA
;END OF PASS YET
;NO
;DISABLE CACHE
;SEE IF ANY DATA READ FROM CACHE
;PRINT LIST OF SENTENCES
;DATA PATH TEST
;WRITE ALL ONES TO HIGH CACHE
;NO HITS ON DATA READ
;PRINT FAILING BIT NUMBER
;PRINT LIST OF SENTENCES
;DATA PATH TEST
;WRITE ALL ONES TO HIGH CACHE
;DATA BIT(S) READ AS ZERO
;TAKE SELECTED ACTION ON ERROR
;LOOP ON ERROR
;LOOP ON TEST

WRITE ALL ZEROS INTO LOW CACHE. READ AND VERIFY
ZEROS READ FORM CACHE. IF READ HIT AND BIT READ AS ONE THEN ERROR

TST044:

```
INC TID
JSR R4,RELCTL
```

;UPDATE TEST ID
;RELOCATE TEST TO LOW CACHE

7481	012320	012502				.WORD TST045	
7482	012322	012701	046000			MOV #HIGHSP,R1	;POINT TO HIGH CACHE
7483	012326	012737	000005	177746		MOV #5,@CCR	;ENABLE HIGH CACHE
7484	012334	012102			1\$:	MOV (R1)+,R2	;TAG ALL HIGH CACHE LOCATIONS
7485	012336	020127	050000			CMP R1,#HIGHSP+2000	
7486	012342	001374				BNE 1\$	
7487	012344	005002				CLR R2	;DATA FOR TEST
7488	012346	010241			2\$:	MOV R2,-(R1)	;WRITE ALL ZEROS TO HIGH CACHE
7489	012350	020127	046000			CMP R1,#HIGHSP	
7490	012354	001374				BNE 2\$	
7491	012356	005037	004542			CLR @ERROR	
7492	012362	005003				CLR R3	;DATA READ FROM CACHE ,FLAG
7493	012364	012102			3\$:	MOV (R1)+,R2	;READ DATA
7494	012366	032737	000004	177744		BIT #BIT02,@CMPE	;VERIFY DATA READ FROM CACHE
7495	012374	001404				BEQ 4\$	
7496	012376	005203				INC R3	;DATA READ FROM CACHE INDICATOR
7497	012400	005102				COM R2	
7498	012402	050237	004542			BIS R2,@ERROR	;OR ALL READ DATA
7499	012406	020127	050000		4\$:	CMP R1,#HIGHSP+2000	
7500	012412	001364				BNE 3\$	
7501	012414	012737	001015	177746		MOV #OFF,@CCR	;DISABLE CACHE
7502	012422	005137	004542			COM @ERROR	
7503	012426	005703				TST R3	;SEE IF ANY DATA READ FROM CACHE
7504	012430	001011				BNE 5\$	
7505	012432	005237	004542			INC @ERROR	;ERROR FLAG
7506	012436	004037	005352			JSR R0,@SETEN	;PRINT LIST OF SENTENCES
7507	012442	000006				.WORD ^D6	
7508	012444	037126				.WORD SEN45	;DATA PATH TEST
7509	012446	037204				.WORD SEN49	;WRITE ALL ZEROS TO HIGH CACHE
7510	012450	037154				.WORD SEN47	;NO HITS ON DATA READ
7511	012452	000410				BR 6\$	
7512	012454	005237	004560		5\$:	INC @BITFLG	;PRINT ERRORING BIT(S)
7513	012460	004037	005352			JSR R0,@SETEN	
7514	012464	000006				.WORD ^D6	
7515	012466	037126				.WORD SEN45	;DATA PATH TEST
7516	012470	037204				.WORD SEN49	;WRITE ALL ZEROS TO HIGH CACHE
7517	012472	037222				.WORD SEN50	;DATA BIT(S) READ AS ONE
7518	012474	004010			6\$:	JSR R0,(R0)	;TAKE SELECTED ACTION ON ERROR
7519	012476	044000				.WORD LOWSP	;LOOP ON ERROR
7520	012500	044000				.WORD LOWSP	;LOOP ON TEST
7521							
7522							
7523							
7524							

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DATA PATH BIT SHORT TEST

SEQ 0052

.SBTTL DATA PATH BIT SHORT TEST

```

7526
7527
7528
7529
7530 012502 005267 166140
7531 012506 005067 172030
7532 012512 004467 173424
7533 012516 013034
7534 012520 012703 000001
7535 012524 012737 000011 177746
7536 012532 013702 050000
7537 012536 013702 044000
7538 012542 010337 044000
7539 012546 005037 177744
7540 012552 013702 044000
7541 012556 032737 000010 177752
7542 012564 001410
7543 012566 020203
7544 012570 001071
7545 012572 006303
7546 012574 001353
7547 012576 012737 001015 177746
7548 012604 000513
7549 012606 052737 000200 177746
7550 012614 013705 177744
7551 012620 042737 000200 177746
7552 012626 032705 000040
7553 012632 001407
7554 012634 013702 050000
7555 012640 052737 002000 177746
7556 012646 013702 044000
7557 012652 032705 000100
7558 012656 001403
7559 012660 052737 000100 177746
7560 012666 110337 044000
7561 012672 042737 000100 177746
7562 012700 032705 000200
7563 012704 001403
7564 012706 052737 000100 177746
7565 012714 000303
7566 012716 110337 044001
7567 012722 000303
7568 012724 042737 002100 177746
7569 012732 013702 044000
7570 012736 010705
7571 012740 014515
7572 012742 020527 046132
7573 012746 001374
7574 012750 020203
7575 012752 001707
7576 012754 012737 001015 177746
7577 012762 012737 000001 004542
7578 012770 010337 004550
7579 012774 005037 004554
7580 013000 010237 004552
7581 013004 005237 004556

```

: ROTATE A ONE ACROSS THE DATA PATH TO VERIFY THAT EACH
 : BIT CAN BE WRITTEN TO A ONE INDIVIDUALLY.
 TST045: INC TID ;UPDATE TEST ID
 CLR ERROR ;RESET ERROR FLAG
 JSR R4,RELCTH ;RELOCATE TEST TO HIGH CACHE
 .WORD TST046
 1\$: MOV #1,R3 ;DATA FOR TEST
 MOV #11,@#CCR ;ENABLE LOW CACHE
 MOV @#LOW1,R2 ;TAG LOW CACHE BLOCK #2
 MOV @#LOWSP,R2 ;TAG LOW CACHE LOCATION
 MOV R3,@#LOWSP ;WRITE DATA
 CLR @#CMPE ;RESET ERROR REGISTER
 MOV @#LOWSP,R2 ;READ DATA
 BIT #BIT03,@#CHR ;VERIFY A HIT
 BEQ 2\$;NO HIT
 CMP R2,R3 ;VERIFY DATA
 BNE 7\$;BAD DATA
 10\$: ASL R3
 BNE 1\$
 MOV #OFF,@#CCR ;DISABLE CACHE
 BR TST046
 2\$: BIS #BIT07,@#CCR ;ENABLE ABORT FOR ERROR READ
 MOV @#CMPE,R5 ;SAVE ERROR IN R5
 BIC #BIT07,@#CCR ;DISABLE ABORT
 BIT #BIT05,R5 ;ANY TAG FAILURE
 BEQ 3\$
 MOV @#LOW1,R2 ;TAG LOW BLOCK #2
 BIS #BIT10,@#CCR ;WRITE WRONG TAG
 MOV @#LOWSP,R2 ;WRITE WRONG TAG
 3\$: BIT #BIT06,R5 ;ANY LOW BYTE ERROR
 BEQ 4\$
 BIS #BIT06,@#CCR ;SET WRITE WRONG DATA
 MOV R3,@#LOWSP ;WRITE LOW BYTE
 4\$: BIC #BIT06,@#CCR ;DISABLE WRITE WRONG DATA
 BIT #BIT07,R5 ;DID BYTE FAIL
 BEQ 5\$;YES
 BIS #BIT06,@#CCR ;ENABLE WRITE WRONG DATA
 5\$: SWAB R3 ;POS DATA FOR MOV
 MOV R3,@#LOWSP+1 ;WRITE HIGH BYTE
 SWAB R3 ;RESTORE DATA
 BIC #BIT06+BIT10,@#CCR ;DISABLE WRITE WRONG
 MOV @#LOWSP,R2 ;READ DATA
 MOV PC,R5 ;CORRECT WRONG PARITY
 6\$: MOV -(R5),(R5)
 CMP R5,#3\$-TST045-16+HIGHSP
 BNE 6\$
 CMP R2,R3 ;VERIFY DATA
 BEQ 10\$
 7\$: MOV #OFF,@#CCR ;DISABLE CACHE
 MOV #1,@#ERROR ;SET ERROR FLAG
 MOV R3,@#GOOD ;GOOD DATA
 CLR @#ADD ;CACHE ADDRESS
 MOV R2,@#BAD ;BAD DATA
 9\$: INC @#GOODBD ;BIT PRINT MODE

7582	013010	004037	005352		JSR R0, @#SETEN	
7583	013014	000006			.WORD *D6	
7584	013016	037236			.WORD SEN51	:DATA PATH BIT SHORT TEST
7585	013020	037252			.WORD SEN52	:ROTATE ONE THROUGH FIELD OF ZEROS
7586	013022	037270			.WORD SEN53	:TESTING LOW CACHE
7587	013024	004010			JSR R0, (R0)	:TAKE SELECTED ACTION ON ERROR
7588	013026	046004			.WORD 1\$-TST045-16+HIGHSP	:LOOP ON ERROR
7589	013030	046004			.WORD 1\$-TST045-16+HIGHSP	:LOOP ON TEST
7590	013032	000657			BR 10\$	
7591						
7592						
7593						
7594						
7595						
7596						
7597	013034	005267	165606		ROTATE ONE ACROSS DATA PATH TO VERIFY THAT EACH	
7598	013040	005067	171476		BIT CAN BE WRITTEN TO A ONE INDIVIDUALLY.	
7599	013044	004467	173044		TST046: INC TID	:UPDATE TEST ID
7600	013050	013366			CLR ERROR	:RESET ERROR FLAG
7601	013052	012703	000001		JSR R4, RELCTL	:RELOCATE TEST TO LOW CACHE
7602	013056	012737	000005	177746	.WORD TST047	
7603	013064	013702	052000		MOV #1, R3	:DATA FOR TEST
7604	013070	013702	046000		MOV #5, @#CCR	:ENABLE HIGH CACHE
7605	013074	010337	046000		MOV @#HIGH1, R2	:TAG HIGH BLOCK #2
7606	013100	005037	177744		MOV @#HIGHSP, R2	:TAG HIGH BLOCK #1
7607	013104	013702	046000		MOV R3, @#HIGHSP	:WRITE DATA TO CACHE
7608	013110	032737	000010	177752	CLR @#CMPE	:RESET ERROR REGISTER
7609	013116	001410			MOV @#HIGHSP, R2	:READ DATA FROM CACHE
7610	013120	020203			BIT #BIT03, @#CHR	:VERIFY DATA READ FROM CACHE
7611	013122	001071			BEQ 2\$	:NOT READ FROM CACHE
7612	013124	006303			CMP R2, R3	:VERIFY DATA CORRECT
7613	013126	001353			BNE 7\$	
7614	013130	012737	001015	177746	10\$: ASL R3	:DATA FOR NEXT TEST
7615	013136	000513			BNE 1\$	
7616	013140	052737	000215	177746	MOV #OFF, @#CCR	:DISABLE CACHE
7617	013146	013705	177744		BR TST047	:TEST COMPLETE
7618	013152	012737	000005	177746	2\$: BIS #215, @#CCR	:ENABLE ABORT FOR DATA READ
7619	013160	032705	000040		MOV @#CMPE, R5	:SAVE ERROR IN R5
7620	013164	001407			MOV #5, @#CCR	:DISABLE ABORT
7621	013166	013702	052000		BIT #BIT05, R5	:ANY TAG FAILURE
7622	013172	052737	002000	177746	BEQ 3\$	:NO
7623	013200	013702	046000		MOV @#HIGH1, R2	:TAG HIGH BLOCK #2
7624	013204	032705	000100		BIS #BIT10, @#CCR	:ENABLE WRITE WRONG TAG
7625	013210	001403			MOV @#HIGHSP, R2	:WRITE WRONG TAG
7626	013212	052737	000100	177746	3\$: BIT #BIT06, R5	:ANY LOW BYTE FAILURE
7627	013220	110337	046000		BEQ 4\$	:NO
					4\$: BIS #BIT06, @#CCR	:WRITE WRONG DATA
					MOVB R3, @#HIGHSP	:WRITE LOW BYTE

7629	013224	042737	000100	177746	BIC #BIT06,@CCR	:DISABLE WRITE WRONG DATA
7630	013232	032705	000200		BIT #BIT07,R5	:DID HIGH BYTE FAIL
7631	013236	001403			BEQ 8\$	:NO
7632	013240	052737	000100	177746	BIS #BIT06,@CCR	:WRITE WRONG DATA
7633	013246	000303			8\$: SWAB R3	:POS. DATA FOR HIGH WRITE
7634	013250	110367	032525		MOVB R3,HIGHSP+1	:WRITE HIGH BYTE
7635	013254	042737	002100	177746	BIC #BIT06+BIT10,@CCR	:DISABLE WRITE WRONG
7636	013262	000303			SWAB R3	:RESTORE DATA
7637	013264	013702	046000		MOV @HIGHSP,R2	:READ DATA
7638	013270	010705			MOV PC,R5	:CORRECT WRONG PARITY
7639	013272	014515			6\$: MOV -(R5),(R5)	:CAUSE TAG AND DATA WRITE
7640	013274	020527	044132		CMP R5,#3\$-TST046-16+LOWSP	
7641	013300	001374			BNE 6\$	
7642	013302	020203			CMP R2,R3	:VERIFY DATA
7643	013304	001707			BEQ 10\$	
7644	013306	012737	001015	177746	7\$: MOV #OFF,@CCR	:DISABLE CACHE
7645	013314	012737	001000	004554	MOV #1000,@ADD	:CACHE ADDRESS
7646	013322	012737	000001	004542	MOV #1,@ERROR	:SET ERROR FLAG
7647	013330	010337	004550		MOV R3,@GOOD	:GOOD DATA
7648	013334	010237	004552		MOV R2,@BAD	:BAD DATA
7649	013340	005237	004556		INC @GOODBD	:SET DATA PRINT MODE
7650	013344	004037	005352		JSR R0,@SETEN	:REPORT ERROR
7651	013350	000006			.WORD ^D6	
7652	013352	037236			.WORD SEN51	:DATA PATH BIT SHORT TEST
7653	013354	037252			.WORD SEN52	:ROTATE ONE THROUGH FIELD OF ZEROS
7654	013356	037300			.WORD SEN54	:TESTING HIGH CACHE
7655	013360	004010			JSR R0,(R0)	:TAKE SELECTED ACTION ON ERROR
7656	013362	044004			.WORD 1\$-TST046-16+LOWSP	:LOOP ON ERROR
7657	013364	044004			.WORD 1\$-TST046-16+LOWSP	:LOOP ON TEST
7658						
7659						
7660						
7661						
7662						
7663						
7664	013366	005267	165254		ROTATE ZERO ACROSS DATA PATH TO VERIFY THAT EACH	
7665	013372	005067	171144		BIT CAN BE WRITTEN TO A ZERO INDIVIDUALLY.	
7666	013376	004467	172540		TST047: INC TID	:UPDATE TEST ID
7667	013402	013724			CLR ERROR	:RESET ERROR FLAG
7668	013404	012703	177776		JSR R4,RELCTH	:RELOCATE TEST TO HIGH CACHE
7669	013410	012737	000011	177746	.WORD TST050	
7670	013416	013702	050000		MOV #177776,R3	:DATA FOR TEST
7671	013422	013702	044000		1\$: MOV #11,@CCR	:ENABLE LOW CACHE
7672	013426	010337	044000		MOV @LOW1,R2	:TAG LOW BLOCK #2
7673	013432	005037	177744		MOV @LOWSP,R2	:TAG LOW BLOCK #1
7674	013436	013702	044000		MOV R3,@LOWSP	:WRITE TEST DATA TO CACHE
7675	013442	032737	000010	177752	CLR @CMPE	:RESET ERROR REGISTER
7676	013450	001413			MOV @LOWSP,R2	:READ DATA FROM CACHE
7677	013452	020203			BIT #BIT03,@CHR	:VERIFY READ FROM CACHE
7678	013454	001074			BEQ 2\$	:NOT READ FROM CACHE
7679	013456	000261			CMP R2,R3	:VERIFY DATA CORRECT
7680	013460	006103			BNE 7\$	:DATA INCORRECT
7681	013462	022703	177777		10\$: SEC	:DATA FOR NEXT TEST
7682	013466	001350			ROL R3	
7683	013470	012737	001015	177746	CMP #177777,R3	
7684	013476	000512			BNE 1\$	
					MOV #OFF,@CCR	:DISABLE CACHE
					BR TST050	:TEST COMPLETE

CACHE DIAG.
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DATA PATH BIT SHORT TEST

SEQ 0055

7685	013500	052737	000200	177746	2\$:	BIS #BIT07,@#CCR	:ENABLE ABORT FOR ERROR READ
7686	013506	013705	177744			MOV @#CMPE,R5	:SAVE ERROR IN R5
7687	013512	042737	000200	177746		BIC #BIT07,@#CCR	:DISABLE ABORT
7688	013520	032705	000040			BIT #BIT05,R5	:ANY TAG FAILURE
7689	013524	001407				BEQ 3\$	:NO
7690	013526	013702	050000			MOV @#LOW1,R2	:TAG LOW BLOCK #2
7691	013532	052737	002000	177746		BIS #BIT10,@#CCR	:WRITE WRONG TAG
7692	013540	013702	044000			MOV @#LOWSP,R2	:WRITE WRONG TAG
7693	013544	032705	000100		3\$:	BIT #BIT06,R5	:ANY LOW BYTE ERRORS
7694	013550	001403				BEQ 4\$	:NO
7695	013552	052737	000100	177746		BIS #BIT06,@#CCR	:WRITE WRONG DATA
7696	013560	110337	044000		4\$:	MOVB R3,@#LOWSP	:WRITE LOW BYTE
7697	013564	042737	000100	177746		BIC #BIT06,@#CCR	:DISABLE WRITE WRONG DATA
7698	013572	032705	000200			BIT #BIT07,R5	:DID HIGH BYTE FAIL
7699	013576	001403				BEQ 8\$	:NO
7700	013600	052737	000100	177746		BIS #BIT06,@#CCR	:ENABLE WRITE WRONG DATA
7701	013606	000303			8\$:	SWAB R3	:POS. DATA FOR HIGH WRITE
7702	013610	110337	044001			MOVB R3,@#LOWSP+1	:WRITE HIGH BYTE
7703	013614	042737	002100	177746		BIC #BIT06+BIT10,@#CCR	:DISABLE WRITE WRONG
7704	013622	000303				SWAB R3	
7705	013624	013702	044000			MOV @#LOWSP,R2	:READ DATA FROM CACHE
7706	013630	010705				MOV PC,R5	:CORRECT WRONG WRITTEN PARITY
7707	013632	014515			6\$:	MOV -(R5),(R5)	:CAUSE WRITE TAG AND DATA
7708	013634	020527	044140			CMP R5,#3\$-TST047-16+LOWSP	
7709	013640	001374				BNE 6\$	
7710	013642	020203				CMP R2,R3	:VERIFY DATA
7711	013644	001704				BEQ 10\$	
7712	013646	012737	001015	177746	7\$:	MOV #OFF,@#CCR	:DISABLE CACHE
7713	013654	005037	004554			CLR @#ADD	:CACHE ADDRESS
7714	013660	012737	000001	004542		MOV #1,@#ERROR	:SET ERROR FLAG
7715	013666	010337	004550			MOV R3,@#GOOD	:GOOD DATA
7716	013672	010237	004552			MOV R2,@#BAD	:BAD DATA
7717	013676	005237	004556			INC @#GOODBD	:SET DATA PRINT MODE
7718	013702	004037	005352			JSR R0,@#SETEN	:REPORT ERROR
7719	013706	000006				.WORD #D6	
7720	013710	037236				.WORD SEN51	:DATA PATH BIT SHORT TEST
7721	013712	037310				.WORD SEN55	:ROTATE ZERO THROUGH A FIELD OF ONES
7722	013714	037270				.WORD SEN53	:TESTING LOW CACHE
7723	013716	004010				JSR R0,(R0)	:TAKE SELECTED ACTION ON ERROR
7724	013720	046004				.WORD 1\$-TST047-16+HIGHSP	:LOOP ON ERROR
7725	013722	046052				.WORD 10\$-TST047-16+HIGHSP	
7726							
7727							
7728							
7729							
7730							
7731							
7732	013724	005267	164716			INC TID	:UPDATE TEST ID
7733	013730	005067	170606			CLR ERROR	:RESET ERROR FLAG
7734	013734	004467	172154			JSR R4,RELCTL	:RELOCATE TEST TO LOW CACHE
7735	013740	014262				.WORD TST051	
7736	013742	012703	177776			MOV #177776,R3	:DATA FOR TEST
7737	013746	012737	000005	177746	1\$:	MOV #5,@#CCR	:ENABLE HIGH CACHE
7738	013754	013702	052000			MOV @#HIGH1,R2	:TAG HIGH BLOCK #2
7739	013760	013702	046000			MOV @#HIGHSP,R2	:TAG HIGH BLOCK #1
7740	013764	010337	046000			MOV R3,@#HIGHSP	:WRITE TEST DATA INTO CACHE

:
: ROTATE A ZERO ACROSS DATA PATH TO VERIFY THAT EACH
: DATA BIT CAN WRITTEN TO A ZERO INDIVIDUALLY.

TST050:
: INC TID
: CLR ERROR
: JSR R4,RELCTL
: .WORD TST051

1\$:
: MOV #177776,R3
: MOV #5,@#CCR
: MOV @#HIGH1,R2
: MOV @#HIGHSP,R2
: MOV R3,@#HIGHSP

7741	013770	005037	177744		CLR @#CMPE	:RESET ERROR REGISTER
7742	013774	013702	046000		MOV @#HIGHSP,R2	:READ DATA FROM CACHE
7743	014000	032737	000010	177752	BIT #BIT03,@#CHR	:VERIFY DATA READ FROM CACHE
7744	014006	001413			BEQ 2\$	:NOT READ FROM CACHE
7745	014010	020203			CMP R2,R3	:VERIFY DATA READ IS CORRECT
7746	014012	001074			BNE 7\$	:DATA IN ERROR
7747	014014	000261			10\$: SEC	:DATA FOR NEXT TEST
7748	014016	006103			ROL R3	
7749	014020	022703	177777		CMP #177777,R3	:INDICATES TEST COMPLETE
7750	014024	001350			BNE 1\$	
7751	014026	012737	001015	177746	MOV #OFF,@#CCR	:DISABLE CACHE
7752	014034	000512			BR TST051	:TEST COMPLETE
7753	014036	052737	000215	177746	2\$: BIS #215,@#CCR	:ENABLE ABORT FOR ERROR READ
7754	014044	013705	177744		MOV @#CMPE,R5	:SAVE ERROR IN R5
7755	014050	012737	000005	177746	MOV #5,@#CCR	:DISABLE ABORT
7756	014056	032705	000040		BIT #BIT05,R5	:ANY TAG FAILURE
7757	014062	001407			BEQ 3\$	
7758	014064	013702	052000		MOV @#HIGH1,R2	:TAG HIGH BLOCK #2
7759	014070	052737	002000	177746	BIS #BIT10,@#CCR	:WRITE WRONG TAG
7760	014076	013702	046000		MOV @#HIGHSP,R2	:WRITE WRONG TAG
7761	014102	032705	000100		3\$: BIT #BIT06,R5	:ANY LOW BYTE ERRORS
7762	014106	001403			BEQ 4\$	
7763	014110	052737	000100	177746	BIS #BIT06,@#CCR	:WRITE WRONG DATA
7764	014116	110337	046000		4\$: MOVB R3,@#HIGHSP	:WRITE LOW BYTE
7765	014122	042737	000100	177746	BIC #BIT06,@#CCR	:DISABLE WRITE WRONG DATA
7766	014130	032705	000200		BIT #BIT07,R5	:DID HIGH BYTE FAIL
7767	014134	001403			BEQ 8\$	
7768	014136	052737	000100	177746	BIS #BIT06,@#CCR	:DISABLE WRITE WRONG DATA
7769	014144	000303			8\$: SWAB R3	:POS DATA FOR HIGH WRITE
7770	014146	110337	046001		MOVB R3,@#HIGHSP+1	:WRITE HIGH BYTE
7771	014152	042737	002100	177746	BIC #BIT06+BIT10,@#CCR	:DISABLE WRITE WRONG
7772	014160	000303			SWAB R3	:RESTORE DATA
7773	014162	013702	046000		MOV @#HIGHSP,R2	:READ DATA
7774	014166	010705			MOV PC,R5	:CORRECT WRONG WRITTEN PARITY
7775	014170	014515			6\$: MOV -(R5),(R5)	:CAUSE WRITE TAG AND DATA
7776	014172	020527	044140		CMP R5,#3\$-TST050-16+LOWSP	
7777	014176	001374			BNE 6\$	
7778	014200	020203			CMP R2,R3	:VERIFY DATA
7779	014202	001704			BEQ 10\$	
7780	014204	012737	001015	177746	7\$: MOV #OFF,@#CCR	:DISABLE CACHE
7781	014212	005037	004554		CLR @#ADD	:CACHE ADDRESS
7782	014216	012737	000002	004542	MOV #2,@#ERROR	:SET ERROR FLAG
7783	014224	010337	004550		MOV R3,@#GOOD	:GOOD DATA
7784	014230	010237	004552		MOV R2,@#BAD	:BAD DATA
7785	014234	005237	004556		INC @#GOODBD	:SET DATA PRINT MODE
7786	014240	004037	005352		JSR R0,@#SETEN	:REPORT ERROR
7787	014244	000006			.WORD ^D6	
7788	014246	037236			.WORD SEN51	:DATA PATH BIT SHORT TEST
7789	014250	037310			.WORD SEN55	:ROTATE ZERO THROUGH A FIELD OF ONES
7790	014252	037330			.WORD SEN56	:TESTING IN HIGH CACHE
7791	014254	004010			JSR R0,(R0)	:TAKE SELECTED ACTION ON ERROR
7792	014256	044004			.WORD 1\$-TST050-16+LOWSP	
7793	014260	044056			.WORD 10\$-TST050-12+LOWSP	
7794						
7795						
7796						

7852
3953

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VERIFY VALID SET IN USE BIT WILL CHANGE AS RESULT
OF CACHE FLUSH.
6$:      INC TID                      :UPDATE TEST ID FLAG
        CLR ERROR                     :RESET ERROR FLAG
        BIT #BIT13,CCR                :SELECT VALID BITS SET A

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7854	014464	001412				BEQ 1\$	:ON SET A NOW
7855	014466	005002				CLR R2	:RESET TIME OUT COUNTER
7856	014470	052767	000400	163250		BIS #BIT08,CCR	:CAUSE FLUSH
7857	014476	032767	010000	163242	3\$:	BIT #BIT12,CCR	:WAIT FOR FLUSH TO COMPLETE
7858	014504	001402				BEQ 1\$	:FLUSH COMPLETE
7859	014506	005302				DEC R2	:WAIT LOOP
7860	014510	001372				BNE 3\$	
7861	014512	052767	000400	163226	1\$:	BIS #BIT08,CCR	:CAUSE FLUSH
7862	014520	005002				CLR R2	:RESET WAIT LOOP COUNTER
7863	014522	032767	010000	163216	4\$:	BIT #BIT12,CCR	:WAIT FOR FLUSH TO COMPLETE
7864	014530	001402				BEQ 2\$	
7865	014532	005302				DEC R2	:OR TIME TO RUN OUT
7866	014534	001372				BNE 4\$	
7867	014536	016767	163204	167776	2\$:	MOV CCR,ERROR	:VALID SET B SELECTED
7868	014544	032767	020000	167770		BIT #BIT13,ERROR	:SHOULD BE SET
7869	014552	001406				BEQ 5\$	:ERROR
7870	014554	005067	167762			CLR ERROR	
7871	014560	004010			7\$:	JSR R0,(R0)	:TAKE SELECTED ACTION ON ERROR
7872	014562	014452				.WORD 6\$	:LOOP ON ERROR
7873	014564	014452				.WORD 6\$	:LOOP ON TEST
7874	014566	000413				BR TST054	:NEXT TEST
7875	014570	005267	167746		5\$:	INC ERROR	:SET ERROR FLAG
7876	014574	004067	170552			JSR R0,SETEN	:REPORT ERROR
7877	014600	000006				.WORD *D6	
7878	014602	037342				.WORD SEN57	:CACHE FLUSH TESTS
7879	014604	037450				.WORD SEN62	:VALID BIT IN USE BIT DID NOT SET AS
7880	014606	037474				.WORD SEN63	:RESULT OF FLUSH
7881	014610	005067	170250			CLR LOPERR	:RESET LOOP ON TEST FLAG
7882	014614	000761				BR 7\$	
7883							
7884							
7885							
7886							
7887							
7888							
7889	014616	005267	164024		TST054:	INC TID	:UPDATE TEST ID
7890	014622	005002			4\$:	CLR R2	:RESET FLUSH TIME OUT COUNTER
7891	014624	005067	167712			CLR ERROR	:RESET ERROR FLAG
7892	014630	052767	000400	163110		BIS #BIT08,CCR	:FLUSH CACHE
7893	014636	032767	010000	163102	1\$:	BIT #BIT12,CCR	:WAIT TILL COMPLETE
7894	014644	001402				BEQ 2\$	:FLUSH COMPLETE
7895	014646	005302				DEC R2	:FLUSH TIME OUT COUNTER
7896	014650	001372				BNE 1\$	
7897	014652	032767	020000	163066	2\$:	BIT #BIT13,CCR	:VALID SET A SHOULD BE INUSE
7898	014660	001410				BEQ 3\$	
7899	014662	005267	167654			INC ERROR	:SET ERROR FLAG
7900	014666	004067	170460			JSR R0,SETEN	:REPORT ERROR
7901	014672	000006				.WORD *D6	
7902	014674	037342				.WORD SEN57	:CACHE FLUSH TESTS
7903	014676	037504				.WORD SEN64	:VALID SET INUSE BIT FAILED TO CLEAR
7904	014700	037524				.WORD SEN65	:AFTER FLUSH
7905	014702	004010			3\$:	JSR R0,(R0)	:TAKE SELECTED ACTION ON ERROR
7906	014704	014712				.WORD 5\$	:LOOP ON ERROR
7907	014706	014712				.WORD 5\$	:LOOP ON TEST
7908	014710	000416				BR TST055	
7909	014712	032767	020000	163026	5\$:	BIT #BIT13,CCR	:SELECT VALID SET B

:
: VERIFY VALID SET IN USE BIT WILL CHANGE AS RESULT
: OF CACHE FLUSH.

7910 014720 001340
7911 014722 052767 000400 163016
7912 014730 005002
7913 014732 032767 010000 163006
7914 014740 001730
7915 014742 005302
7916 014744 001372
7917
7918
7919
7920
7921
7922
7923 014746 005267 163674
7924 014752 004467 171164
7925 014756 015302
7926 014760 005037 004542
7927 014764 032737 020000 177746
7928 014772 001407
7929 014774 052737 000400 177746
7930 015002 032737 010000 177746
7931 015010 001374
7932 015012 012737 000011 177746
7933 015020 012702 044000
7934 015024 012203
7935 015026 020227 046000
7936 015032 001374
7937 015034 052737 000400 177746
7938 015042 032737 010000 177746
7939 015050 001374
7940 015052 052737 000400 177746
7941 015060 032737 010000 177746
7942 015066 001374
7943 015070 012702 052000
7944 015074 012703 044000
7945 015100 005037 004550
7946 015104 005037 004552
7947 015110 012305
7948 015112 032737 000010 177752
7949 015120 001410
7950 015122 005237 004552
7951 015126 012722 000001
7952 015132 020327 046000
7953 015136 001364
7954 015140 000404
7955 015142 005237 004550
7956 015146 005022
7957 015150 000770
7958 015152 012737 001015 177746
7959 015160 005737 004552
7960 015164 001446
7961 015166 023737 004550 004552
7962 015174 001414
7963 015176 005237 004542
7964 015202 004037 005352
7965 015206 000006

6\$: BNE 4\$
BIS #BIT08,CCR ;FLUSH CACHE
CLR R2 ;RESET TIME OUT COUNTER
BIT #BIT12,CCR ;WAIT TILL COMPLETE
BEQ 4\$;OR TIME HAS RUN OUT
DEC R2
BNE 6\$

VERIFY THAT ALL TAGGED LOCATIONS WILL BE INVALIDATED
AS RESULT OF CACHE FLUSH.

TST055: INC TID ;UPDATE TEST ID
1\$: JSR R4,RELCTH ;RELOCATE TEST TO HIGH CACHE
WORD TST056
CLR @ERROR ;RESET ERROR FLAG
BIT #BIT13,@CCR ;SELECT VALID BITS SET A
BEQ 3\$;SET A INUSE NOW
BIS #BIT08,@CCR ;FLUSH CACHE
BIT #BIT12,@CCR ;WAIT TILL COMPLETE
BNE 2\$
2\$: MOV #11,@CCR ;ENABLE LOW CACHE
MOV #LOWSP,R2 ;LOW BLOCK #1 POINTER
4\$: MOV (R2)+,R3 ;TAG LOCATION
CMP R2,#LOWSP+2000 ;TAG ALL OF LOW BLOCK
BNE 4\$;NOT COMPLETE
BIS #BIT08,@CCR ;FLUSH CACHE SELECT VALID B
BIT #BIT12,@CCR ;WAIT TILL COMPLETE
BNE 5\$
5\$: BIS #BIT08,@CCR ;FLUSH CACHE SELECT VALID A
BIT #BIT12,@CCR ;WAIT TILL COMPLETE
BNE 6\$
6\$: MOV #HIGH1,R2 ;ERROR LOG BLOCK
MOV #LOWSP,R3 ;PREV. TAGGED LOW BLOCK
CLR @GOOD ;SUCCESSFUL VALID BIT CLEAR COUNT
CLR @BAD ;UNSUCCESSFUL VALID BIT CLEAR COUNT
7\$: MOV (R3)+,R5 ;READ FROM LOW BLOCK #1
BIT #BIT03,@CHR ;LOOK FOR READ HIT
BEQ 8\$;NO HIT
INC @BAD ;READ HIT FROM FLUSHED CACHE
MOV #1,(R2)+ ;SET ERROR FLAG FOR LOCATION
9\$: CMP R3,#LOWSP+2000 ;REPEAT FOR ALL OF LOW CACHE
BNE 7\$;NOT COMPLETE
BR 10\$;COMPLETE
8\$: INC @GOOD ;NO READ HIT FROM FLUSHED CACHE
CLR (R2)+ ;CLEAR ERROR FLAG FOR LOCATION
BR 9\$
10\$: MOV #OFF,@CCR ;DISABLE CACHE
TST @BAD ;ANY ERRORS
BEQ TST056 ;NO
CMP @GOOD,@BAD ;IS IT FLUSH COUNTER ERROR
BEQ 11\$;LOOKS LIKE
INC @ERROR ;SET ERROR FLAG
JSR R0,@SETEN ;REPORT ERROR
WORD *D6

7966 015210 037342
7967 015212 037532
7968 015214 037546
7969 015216 004010
7970 015220 046000
7971 015222 046000
7972 015224 000426
7973 015226 012702 052000
7974 015232 005722
7975 015234 001776
7976 015236 005037 004542
7977 015242 005237 004542
7978 015246 005722
7979 015250 001374
7980 015252 006337 004542
7981 015256 005237 004560
7982 015262 004037 005352
7983 015266 000010
7984 015270 037342
7985 015272 037532
7986 015274 037546
7987 015276 037570
7988 015300 000746
7989
7990
7991
7992
7993

7994 015302 005267 163340
7995 015306 004467 170602
7996 015312 015636
7997 015314 005037 004542
7998 015320 032737 020000 177746
7999 015326 001407
8000 015330 052737 000400 177746
8001 015336 032737 010000 177746
8002 015344 001374
8003 015346 012737 000005 177746
8004 015354 012702 046000
8005 015360 012203
8006 015362 020227 050000
8007 015366 001374
8008 015370 052737 000400 177746
8009 015376 032737 010000 177746
8010 015404 001374
8011 015406 052737 000400 177746
8012 015414 032737 010000 177746
8013 015422 001374
8014 015424 012702 050000
8015 015430 012703 046000
8016 015434 005037 004550
8017 015440 005037 004552
8018 015444 012305
8019 015446 032737 000010 177752
8020 015454 001410
8021 015456 005237 004552

14\$: .WORD SEN57
.WORD SEN66
.WORD SEN67
JSR R0,(R0)
.WORD HIGHSP
.WORD HIGHSP
BR TST056
11\$: MOV #HIGH1,R2
12\$: TST (R2)+
BEQ 12\$
CLR @#ERROR
13\$: INC @#ERROR
TST (R2)+
BNE 13\$
ASL @#ERROR
INC @#BITFLG
JSR R0,@#SETEN
.WORD ^D8
.WORD SEN57
.WORD SEN66
.WORD SEN67
.WORD SEN68
BR 14\$

;CACHE FLUSH TESTS
;FLUSH FAILED TO INVALIDATE CACHE
;TESTING LOW CACHE USING VALID BITS SET A
;TAKE SELECTED ACTION ON ERROR
;LOOP ON ERROR
;LOOP ON TEST
;NO ACTION
;ERROR FLAGS POINTER
;LOOK FOR FIRST ERROR

;RESET ERROR FLAG
;FIND ERRORING BIT
;FIND NO. OF BITS

;FAILING BIT
;BIT PRINT MODE
;REPORT ERROR

;CACHE FLUSH TESTS
;FLUSH FAILED TO INVALIDATE CACHE
;TESTING LOW CACHE USING VALID BITS SET A
;POSSIBLE FLUSH COUNTER BIT FAILURE

;TST056: VERIFY FLUSH COUNTER LOGIC BY EXAMINING FLUSH FAILURE

1\$: INC TID
JSR R4,RELCTL
.WORD TST057
CLR @#ERROR
BIT #BIT13,@#CCR
BEQ 3\$
BIS #BIT08,@#CCR
2\$: BIT #BIT12,@#CCR
BNE 2\$
3\$: MOV #5,@#CCR
MOV #HIGHSP,R2
4\$: MOV (R2)+,R3
CMP R2,#HIGHSP+2000
BNE 4\$
BIS #BIT08,@#CCR
5\$: BIT #BIT12,@#CCR
BNE 5\$
BIS #BIT08,@#CCR
6\$: BIT #BIT12,@#CCR
BNE 6\$
MOV #LOW1,R2
MOV #HIGHSP,R3
CLR @#GOOD
CLR @#BAD
7\$: MOV (R3)+,R5
BIT #BIT03,@#CHR
BEQ 8\$
INC @#BAD

;UPDATE TEST ID
;RELOCATE TEST TO LOW CACHE

;RESET ERROR FLAG
;SELECT VALID BITS SET A
;SET A INUSE NOW
;FLUSH CACHE
;WAIT TILL COMPLETE

;ENABLE HIGH CACHE
;HIGH BLOCK #1 POINTER
;TAG LOCATION
;TAG ALL OF HIGH BLOCK

;FLUSH CACHE SELECT VALID SET B
;WAIT TILL COMPLETE

;FLUSH CACHE SELECT VALID A
;WAIT TILL COMPLETE

;ERROR LOG BLOCK
;PREV. TAGGED LOW BLOCK
;SUCCESSFUL VALID BIT CLEAR COUNT
;UNSUCCESSFUL VALID BIT CLEAR COUNT
;READ FROM HIGH BLOCK #1
;LOOK FOR READ HIT
;NO HIT
;READ HIT FROM FLUSHED CACHE

8022	015462	012722	000001			MOV #1,(R2)+	:SET ERROR FLAG FOR LOCATION
8023	015466	020327	050000			9\$: CMP R3,#HIGHSP+2000	:REPEAT FOR ALL OF HIGH BLOCK
8024	015472	001364				BNE 7\$	:NOT COMPLETE
8025	015474	000404				BR 10\$	:COMPLETE
8026	015476	005237	004550			8\$: INC @#GOOD	:NO READ FROM FLUSHED CACHE
8027	015502	005022				CLR (R2)+	:CLEAR ERROR FLAG FOR LOCATION
8028	015504	000770				BR 9\$	
8029	015506	012737	001015	177746		10\$: MOV #OFF,@#CCR	:DISABLE CACHE
8030	015514	005737	004552			TST @#BAD	:ANY ERRORS
8031	015520	001446				BEQ TST057	:NO
8032	015522	023737	004550	004552		CMP @#GOOD,@#BAD	:IS IT FLUSH COUNTER ERROR
8033	015530	001414				BEQ 11\$	:LOOKS LIKE
8034	015532	005237	004542			INC @#ERROR	:SET ERROR FLAG
8035	015536	004037	005352			JSR R0,@#SETEN	:REPORT ERROR
8036	015542	000006				.WORD ^D6	
8037	015544	037342				.WORD SEN57	:CACHE FLUSH TESTS
8038	015546	037532				.WORD SEN66	:FLUSH FAILED TO INVALIDATE CACHE
8039	015550	037604				.WORD SEN69	:TESTING HIGH CACHE USING VALID BITS SET A
8040	015552	004010				14\$: JSR R0,(R0)	:TAKE SELECTED ACTION ON ERROR
8041	015554	044000				.WORD LOWSP	:LOOP ON ERROR
8042	015556	044000				.WORD LOWSP	:LOOP ON TEST
8043	015560	000426				BR TST057	:NO ACTION
8044	015562	012702	050000			11\$: MOV #LOW1,R2	:ERROR FLAGS POINTER
8045	015566	005722				12\$: TST (R2)+	:LOOK FOR FIRST ERROR
8046	015570	001776				BEQ 12\$	
8047	015572	005037	004542			CLR @#ERROR	:RESET ERROR FLAG
8048	015576	005237	004542			13\$: INC @#ERROR	:FIND ERRORING BIT
8049	015602	005722				TST (R2)+	:FIND NO. OF BITS
8050	015604	001374				BNE 13\$	
8051	015606	006337	004542			ASL @#ERROR	:FAILING BIT
8052	015612	005237	004560			INC @#BITFLG	:BIT PRINT MODE
8053	015616	004037	005352			JSR R0,@#SETEN	:REPORT ERROR
8054	015622	000010				.WORD ^D8	
8055	015624	037342				.WORD SEN57	:CACHE FLUSH TESTS
8056	015626	037532				.WORD SEN66	:FLUSH FAILED TO INVALIDATE CACHE
8057	015630	037626				.WORD SEN70	:TESTING HIGH CACHE USING LID BITS SET A
8058	015632	037570				.WORD SEN68	:POSSIBLE FLUSH COUNTER BIT FAILURE
8059	015634	000746				BR 14\$	
8060							
8061							
8062							
8063							
8064							
8065	015636	005267	163004			TST057: INC TID	:VERIFY FLUSH COUNTER LOGIC BY EXAMINING FLUSH FAILURE
8066	015642	004467	170274			1\$: JSR R4,RELCTH	:UPDATE TEST ID
8067	015646	016170				.WORD TST060	:RELOCATE TEST TO HIGH CACHE
8068	015650	005037	004542			CLR @#ERROR	:RESET ERROR FLAG
8069	015654	032737	020000	177746		BIT #BIT13,@#CCR	:SELECT VALID BITS SET B
8070	015662	001007				BNE 3\$	:SET B IN USE NOW
8071	015664	052737	000400	177746		BIS #BIT08,@#CCR	:FLUSH CACHE
8072	015672	032737	010000	177746		2\$: BIT #BIT12,@#CCR	:WAIT TILL COMPLETE
8073	015700	001374				BNE 2\$	
8074	015702	012737	000011	177746		3\$: MOV #11,@#CCR	:ENABLE LOW CACHE
8075	015710	012702	044000			MOV #LOWSP,R2	:LOW BLOCK #1 POINTER
8076	015714	012203				4\$: MOV (R2)+,R3	:TAG LOCATION
8077	015716	020227	046000			CMP R2,#LOWSP+2000	:TAG ALL OF LOW BLOCK

8078	015722	001374			BNE 4\$	
8079	015724	052737	000400	177746	BIS #BIT08,@#CCR	;FLUSH CACHE SELECT VALID A
8080	015732	032737	010000	177746	BIT #BIT12,@#CCR	;WAIT TILL COMPLETE
8081	015740	001374			BNE 5\$	
8082	015742	052737	000400	177746	BIS #BIT08,@#CCR	;FLUSH CACHE SELECT VALID B
8083	015750	032737	010000	177746	BIT #BIT12,@#CCR	;WAIT TILL COMPLETE
8084	015756	001374			BNE 6\$	
8085	015760	012702	052000		MOV #HIGH1,R2	;ERROR LOG BLOCK
8086	015764	012703	044000		MOV #LOWSP,R3	;PREV. TAGGED LOW BLOCK
8087	015770	005037	004550		CLR @#GOOD	;SUCCESSFUL VALID BIT CLEAR COUNT
8088	015774	005037	004552		CLR @#BAD	;UNSUCCESSFUL VALID BIT CLEAR COUNT
8089	016000	012305			MOV (R3)+,R5	;READ FROM LOW BLOCK #1
8090	016002	032737	000010	177752	BIT #BIT03,@#CHR	;LOOK FOR READ HIT
8091	016010	001410			BEQ 8\$	;NO HIT
8092	016012	005237	004552		INC @#BAD	;READ HIT FROM FLUSH CACHE
8093	016016	012722	000001		MOV #1,(R2)+	;SET ERROR FLAG FOR LOCATION
8094	016022	020327	046000		CMP R3,#LOWSP+2000	;REPEAT FOR ALL LOW CACHE
8095	016026	001364			BNE 7\$	;NOT COMPLETE
8096	016030	000404			BR 10\$	;COMPLETE
8097	016032	005237	004550		INC @#GOOD	;NO READ HIT FROM FLUSHED CACHE
8098	016036	005022			CLR (R2)+	;SET ERROR FLAG FOR LOCATION
8099	016040	000770			BR 9\$	
8100	016042	012737	001015	177746	MOV #OFF,@#CCR	;DISABLE CACHE
8101	016050	005737	004552		TST @#BAD	;ANY ERRORS
8102	016054	001445			BEQ TST060	
8103	016056	023737	004550	004552	CMP @#GOOD,@#BAD	;IS IT FLUSH COUNTER ERROR
8104	016064	001414			BEQ 11\$	;LOOKS LIKE
8105	016066	005237	004542		INC @#ERROR	;SET ERROR FLAG
8106	016072	004037	005352		JSR R0,@#SETEN	;REPORT ERROR
8107	016076	000006			.WORD ^D6	
8108	016100	037342			.WORD SEN57	;CACHE FLUSH TESTS
8109	016102	037532			.WORD SEN66	;FLUSH FAILED TO INVALIDATE CACHE
8110	016104	037650			.WORD SEN71	;TESTING LOW CACHE USING VALID BITS SET B
8111	016106	004010			JSR R0,(R0)	;TAKE SELECTED ACTION ON ERROR
8112	016110	046000			.WORD HIGHSP	;LOOP ON ERROR
8113	016112	046000			.WORD HIGHSP	;LOOP ON TEST
8114	016114	000425			BR TST060	
8115	016116	012702	052000		MOV #HIGH1,R2	;ERROR FLAGS POINTER
8116	016122	005722			TST (R2)+	;LOOK FOR FIRST ERROR
8117	016124	001776			BEQ 12\$	
8118	016126	005037	004542		CLR @#ERROR	;RESET ERROR FLAG
8119	016132	005237	004542		INC @#ERROR	;FIND ERRORING BIT
8120	016136	005722			TST (R2)+	;FIND NO. OF BITS
8121	016140	001374			BNE 13\$	
8122	016142	006337	004542		ASL @#ERROR	;FAILING BIT
8123	016146	005237	004560		INC @#BITFLG	;BIT PRINT MODE
8124	016152	004037	005352		JSR R0,@#SETEN	;REPORT ERROR
8125	016156	000006			.WORD ^D6	
8126	016160	037342			.WORD SEN57	;CACHE FLUSH TESTS
8127	016162	037532			.WORD SEN66	;FLUSH FAILED TO INVALIDATE CACHE
8128	016164	037570			.WORD SEN68	;POSSIBLE FLUSH COUNTER BIT FAILURE
8129	016166	000747			BR 14\$	
8130						
8131						
8132						
8133						

CACHE DIAG.
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CACHE FLUSH TESTS

M 5

SEQ 0064

8190	016470	005722	
8191	016472	001374	
8192	016474	006337	004542
8193	016500	005237	004560
8194	016504	004037	005352
8195	016510	000010	
8196	016512	037342	
8197	016514	037532	
8198	016516	037672	
8199	016520	037570	
8200	016522	000746	
8201			
8202			
8203			
8204			

TST (R2)+
BNE 13\$
ASL @#ERROR
INC @#BITFLG
JSR R0,@#SETEN
.WORD ^D8
.WORD SEN57
.WORD SEN66
.WORD SEN72
.WORD SEN68
BR 14\$

;FIND NO. OF BITS

;FAILING BIT
;BIT PRINT MODE
;REPORT ERROR

;CACHE FLUSH TESTS
;FLUSH FAILED TO INVALIDATE CACHE
;TESTING HIGH CACHE USING VALID BITS SET B
;POSSIBLE FLUSH COUNTER BIT FAILURE

.SBTTL FORCE MISS TESTS

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8206
8207
8208
8209
8210
8211
8212
8213
8214 016524 005267 162116
8215 016530 004467 167406
8216 016534 016712
8217 016536 005037 004704
8218 016542 005037 004702
8219 016546 012702 044000
8220 016552 005001
8221 016554 005037 177546
8222 016560 042737 001004 177746
8223 016566 105737 177546
8224 016572 001404
8225 016574 005237 004702
8226 016600 005037 177546
8227 016604 021212
8228 016606 021212
8229 016610 021212
8230 016612 021212
8231 016614 005201
8232 016616 001363
8233 016620 012737 001015 177746
8234 016626 013737 004702 004542
8235
8236
8237
8238 016634 032737 000001 000176
8239 016642 001405
8240 016644 023727 004542 000103
8241
8242 016652 103007
8243 016654 000404
8244 016656 023727 004542 000117
8245 016664 103002
8246
8247
8248
8249 016666 005037 004542
8250 016672 004037 005352
8251 016676 000004
8252 016700 037714
8253 016702 037724
8254 016704 004010
8255 016706 046000
8256 016710 046000
8257
8258
8259
8260
8261
```

TEST ENABLES LOW CACHE END CAUSES MULTIPLE READS TO LOW
CACHE WHILE KEEPING TRACK OF HOW LONG ITS TAKING TO READ
BY USING THE SYSTEM CLOCK.
IF THE READ LOOP TAKES TO LONG TO COMPLETE IT IS ASSUMED
THAT LOW CACHE DID NOT ENABLE.

TST061: INC TID ;UPDATE TEST ID
JSR R4,RELCTH ;RELOCATE TEST TO HIGH SEGMENT
.WORD TST062
3\$: CLR @#COUNT ;RESET LOOP COUNTER
CLR @#TIME ;RESET CLOCK
MOV #LOWSP,R2 ;LOW CACHE ADDRESS
CLR R1 ;LOOP COUNTER
CLR @#KOOKOO ;RESET KL11W
BIC #BIT02+BIT09,@#CCR ;ENABLE LOW CACHE
4\$: TSTB @#KOOKOO ;LOOK FOR TICK
BEQ 10\$;NO TICK
INC @#TIME ;CLOCK TICK
CLR @#KOOKOO ;RESET TICK
10\$: CMP (R2),(R2) ;READ FROM CACHE
CMP (R2),(R2)
CMP (R2),(R2)
CMP (R2),(R2)
INC R1 ;CHECK PASS COUNTER
BNE 4\$
MOV #OFF,@#CCR ;DISABLE CACHE
1\$: MOV @#TIME,@#ERROR ;SAVE TIME
;REV B
BIT #1,@#CONWRD ;LINE 60HZ OR 50HZ
BEQ 5\$;BIT 0 CLEARED MEANS 60HZ
CMP @#ERROR,#103 ;IT IS 50 HZ
;DID LOOP COMPLETE IN TIME(50HZ)
;NO
BHS 2\$
BR 6\$
5\$: CMP @#ERROR,#117 ;DID LOOP COMPLETE IN TIME(60HZ)
BHS 2\$;NO
;REV B
6\$: CLR @#ERROR ;RESET ERROR FLAG
2\$: JSR R0,@#SETEN ;PRINT LIST OF SENTENCES
.WORD ^D4
.WORD SEN73 ;FORCE MISS TESTS
.WORD SEN74 ;LOW CACHE LOOKS DISABLED WHEN ENABLED
JSR R0,(R0) ;TAKE SELECTED ACTION ON ERROR
.WORD 3\$-TST061-12+HIGHSP ;LOOP ON TEST
.WORD 3\$-TST061-12+HIGHSP ;LOOP ON TEST

```

8262
8263
8264
8265
8266
8267 016712 005267 161730
8268 016716 004467 167220
8269 016722 017100
8270 016724 005037 004704
8271 016730 005037 004702
8272 016734 012702 052000
8273 016740 005001
8274 016742 005037 177546
8275 016746 042737 001004 177746
8276 016754 105737 177546
8277 016760 001404
8278 016762 005237 004702
8279 016766 005037 177546
8280 016772 021212
8281 016774 021212
8282 016776 021212
8283 017000 021212

: TEST ENABLES LOW CACHE AND CAUSES READS TO HIGH CACHE
: HIGH CACHE READS IS TIMED USING THE SYSTEM CLOCK
: IF READ LOOP COMPLETES TO FAST THEN IT IS ASSUMED
: THAT HIGH CACHE IS ENABLED
TST062: INC TID ;UPDATE TEST ID
        JSR R4,RELCTH ;RELOCATE THIS TEST TO HIGH CACHE
        .WORD TST063
3$: CLR @#COUNT ;RESET LOOP COUNTER
    CLR @#TIME ;RESET CLOCK
    MOV #HIGH1,R2 ;HIGH CACHE ADDRESS
    CLR R1 ;LOOP COUNTER
    CLR @#KOOKOO ;RESET TICK
    BIC #BIT02+BIT09,@#CCR ;ENABLE LOW CACHE
4$: TSTB @#KOOKOO ;LOOK FOR TICK
    BEQ 10$ ;NO TICK
    INC @#TIME ;CLOCK TICK
    CLR @#KOOKOO ;RESET TICK
10$: CMP (R2),(R2) ;READ FROM CACHE
     CMP (R2),(R2)
     CMP (R2),(R2)
     CMP (R2),(R2)

```


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CFKKAB.P11 25-JUN-79 13:31 FORCE MISS TESTS

SEQ 0067

8285 017002 005201
8286 017004 001363
8287 017006 012737 001015 177746
8288 017014 013737 004702 004542

INC R1
BNE 4\$
MOV #OFF,@#CCR
MOV @#TIME,@#ERROR

;DISABLE CACHE
;SAVE TIME TO COMPLETE LOOP

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SEQ 0068

8290									
8291									
8292									
8293	017022	032737	000001	000176					
8294	017030	001405							
8295	017032	023727	004542	000103					
8296									
8297	017040	103407							
8298	017042	000404							
8299	017044	023727	004542	000117	5\$:				

;REV B

BIT #1,@#CONWRD
BEQ 5\$
CMP @#ERROR,#103

;LINE 60HZ OR 50HZ
;BIT 0 CLEARED MEANS 60HZ
;IT IS 50 HZ
;DID LOOP COMPLETE IN TIME(50HZ)
;NO

BLO 2\$
BR 6\$
CMP @#ERROR,#117

;DID LOOP COMPLETE IN TIME(60HZ)

CACHE DIAG.
CFKKAB.P11

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FORCE MISS TESTS

E 6

SEQ 0069

8301 017052 103402

BLO 2\$

;NO

8302

;REV B

8303

8304

8305 017054 005037 004542

6\$:

CLR @#ERROR

;RESET ERROR FLAG

8306 017060 004037 005352

2\$:

JSR R0,@#SETEN

;PRINT LIST OF SENTENCES

8307 017064 000004

.WORD ^D4

8308 017066 037714

.WORD SEN73

;FORCE MISS TESTS

8309 017070 037742

.WORD SEN75

;HIGH CACHE LOOKS ENABLED WHEN DISABLED

8310 017072 004010

JSR R0,(R0)

;TAKE SELECTED ACTION ON ERROR

```

8312 017074 046000      .WORD 3$-TST062-12+HIGHSP      ;LOOP ON ERROR
8313 017076 046000      .WORD 3$-TST062-12+HIGHSP      ;LOOP ON TEST
8314      :
8315      :
8316      :
8317      :
8318      :
8319      :
8320      :
8321      :
8322      :
8323      :
8324 017100 005267 161542  TST063: INC TID      ;UPDATE TEST ID
8325 017104 004467 167004      JSR R4,RELCTL      ;RELOCATE TEST TO LOW CACHE
8326 017110 017266      .WORD TST064
8327 017112 005037 004704      3$: CLR @#COUNT      ;RESET COUNTER
8328 017116 005037 004702      CLR @#TIME      ;RESET CLOCK
8329 017122 012702 050000      MOV #LOW1,R2      ;LOW CACHE ADDRESS
8330 017126 005001      CLR R1
8331 017130 005037 177546      CLR @#KOOKOO      ;RESET TICK
8332 017134 042737 001010 177746      BIC #BIT03+BIT09,@#CCR      ;ENABLE HIGH CACHE
8333 017142 105737 177546      4$: TSTB @#KOOKOO      ;LOOK FOR TICK
8334 017146 001404      BEQ 10$      ;NO TICK
8335 017150 005237 004702      INC @#TIME      ;CLOCK TICK
8336 017154 005037 177546      CLR @#KOOKOO      ;RESET TICK
8337 017160 021212      10$: CMP (R2),(R2)      ;READ FROM MEMORY
8338 017162 021212      CMP (R2),(R2)
8339 017164 021212      CMP (R2),(R2)
8340 017166 021212      CMP (R2),(R2)
8341 017170 005201      INC R1
8342 017172 001363      BNE 4$
8343 017174 012737 001015 177746      MOV #OFF,@#CCR      ;DISABLE CACHE
8344 017202 013737 004702 004542      MOV @#TIME,@#ERROR      ;SAVE TIME TO COMPLETE LOOP
8345      :
8346      :REV B
8347      :
8348 017210 032737 000001 000176      BIT #1,@#CONWRD      ;LINE 60HZ OR 50HZ
8349 017216 001405      BEQ 5$      ;BIT 0 CLEARED MEANS 60HZ
8350 017220 023727 004542 000103      CMP @#ERROR,#103      ;IT IS 50 HZ
8351      :
8352 017226 103407      BLO 2$      ;DID LOOP COMPLETE IN TIME(50HZ)
8353 017230 000404      BR 6$      ;NO
8354 017232 023727 004542 000117      5$: CMP @#ERROR,#117      ;DID LOOP COMPLETE IN TIME(60HZ)
8355 017240 103402      BLO 2$      ;NO
8356      :
8357      :REV B
8358      :
8359 017242 005037 004542      6$: CLR @#ERROR      ;RESET ERROR
8360 017246 004037 005352      2$: JSR R0,@#SETEN      ;PRINT LIST OF SENTENCES
8361 017252 000004      .WORD *D4
8362 017254 037714      .WORD SEN73      ;FORCE MISS TESTS
8363 017256 037760      .WORD SEN76      ;LOW CACHE LOOKS ENABLED WHEN DISABLED
8364 017260 004010      JSR R0,(R0)      ;TAKE SELECTED ACTION ON ERROR
8365 017262 044000      .WORD 3$-TST063-12+LOWSP      ;LOOP ON ERROR
8366 017264 044000      .WORD 3$-TST063-12+LOWSP      ;LOOP ON TEST
8367      :

```


TS

```

1$ IS ASSUMED THAT HIGH CACHE DID
INC TID ;UPDATE TEST ID
JSR R4,RELCTL ;RELOCATE TEST TO LOW CACHE
.WORD TST065
3$: CLR @#COUNT ;RESET LOOP COUNTER
CLR @#TIME ;RESET CLOCK
MOV #HIGHSP,R2 ;HIGH CACHE ADDRESS
CLR R1 ;LOOP COUNTER
CLR @#KOOKOO ;RESET KL11W
4$: BIC #BIT03+BIT09,@#CCR ;ENABLE LOW CACHE
TSTB @#KOOKOO ;LOOK FOR TICK
BEQ 10$ ;NO TICK
INC @#TIME ;CLOCK TICK
10$: CLR @#KOOKOO ;LOOK FOR TICK
CMP (R2),(R2) ;READ FROM CACHE
CMP (R2),(R2)
CMP (R2),(R2)
CMP (R2),(R2)
INC R1 ;CHECK PASS COUNTER
BNE 4$ ;LOOP NOT COMPLETE
MOV #OFF,@#CCR ;DISABLE CACHE
1$: MOV @#TIME,@#ERROR ;SAVE LOOP TIME

;REV B

BIT #1,@#CONWRD ;LINE 60HZ OR 50HZ
BEQ 5$ ;BIT 0 CLEARED MEANS 60HZ
CMP @#ERROR,#103 ;IT IS 50 HZ
;DID LOOP COMPLETE IN TIME(50HZ)
BHS 2$ ;NO
BR 6$
5$: CMP @#ERROR,#117 ;DID LOOP COMPLETE IN TIME(60HZ)
BHS 2$ ;NO

;REV B

6$: CLR @#ERROR ;RESET ERROR FLAG
2$: JSR R0,@#SETEN ;PRINT LIST OF SENTENCES
.WORD ^D4
.WORD SEN73 ;FORCE MISS TESTS
.WORD SEN77 ;HIGH CACHE LOOKS DISABLED WHEN ENABLED
JSR R0,(R0) ;TAKE SELECTED ACTION ON ERROR
.WORD 3$-TST064-12+LOWSP ;LOOP ON ERROR
.WORD 3$-TST064-12+LOWSP ;LOOP ON TEST

```

```

: ENABLE WRITE WRONG PARITY TO TAG AND DATA.      ENABLE HIGH
TST065: CACHE.          VERIFY PARITY ERROR TO TAG AND DATA.
        INC TID                      ;UPDATE TEST ID
        JSR R4,RELCTL                ;RELOCATE TEST TO LOW CACHE
        .WORD TST066
        CLR R1                       ;TIME OUT COUNTER
        MOV #OFF+BIT08,@WCCR         ;FLUSH CACHE
10$:    DEC R1                        ;CHECK FOR TIME OUT
        BEQ 1$
        BIT #BIT12,@WCCR             ;WAIT TILL COMPLETE
        BNE 10$
1$:     MOV #HIGHSP,R1               ;WRITE TO HIGH CACHE LOCATIONS
2$:     MOV #2105,@WCCR              ;WRITE WRONG ALL TO HIGH CACHE
        MOV (R1)+,R2                 ;CAUSE WRITES TO 6 HIGH CACHE LOCATIONS
        CMP R1,#HIGHSP+14           ;LOOP
        BNE 2$                      ;NOT COMPLETE
        MOV #BIT02+BIT00,@WCCR       ;ENABLE HIGH CACHE ONLY
        CLR @WCMPPE                  ;RESET PARITY ERRORS
        CLR @WERROR                  ;RESET ERROR FLAG
3$:     MOV -(R1),R5                 ;READ TO CAUSE ERROR
        BIS #215,@WCCR               ;SET ABORT FOR ERROR READ
        BIS @WCMPPE,@WERROR          ;SAVE ERROR INFO
        CLR @WCMPPE                  ;RESET ERROR REGISTER
        MOV #5,@WCCR                ;DISABLE ABORT
CMP R1,#HIGHSP                    ;LOOP SIX TIMES
        BNE 3$
        MOV PC,R2                   ;CORRECT ANY WRONG PARITY TO LOW CACHE
11$:    MOV -(R2),R1                 ;READ LOW CACHE
        CMP R2,#LOWSP               ;CONTINUE TO START OF BLOCK
        BNE 11$
        COM @WERROR                 ;PARITY ERRORS HIGH LOW AND TAG
        BIC #177437,@WERROR         ;RESET ERROR REGISTER
        CLR @WCMPPE                 ;DISABLE CACHE
        MOV #OFF,@WCCR              ;IF NOT SET THEN ERROR
        BIT #BIT06,@WERROR
        BEQ 4$
        JSR R0,@WSETEN              ;PRINT LIST OF SENTENCES
        .WORD ^D6
        .WORD SEN78                 ;WRITE WRONG PARITY TESTS
        .WORD SEN79                 ;WROTE WRONG PARITY TO LOW BYTE HIGH BYTE AND TA
        .WORD SEN80                 ;LOW BYTE PARITY ERROR BIT06 NOT SET IN CMPE
4$:     BIT #BIT07,@WERROR           ;IF NOT SET THEN ERROR
        BEQ 5$
        JSR R0,@WSETEN              ;PRINT LIST OF SENTENCES
        .WORD ^D6
        .WORD SEN78                 ;WRITE WRONG PARITY TESTS
        .WORD SEN79                 ;WROTE WRONG PARITY TO LOW BYTE HIGH BYTE AND TA
        .WORD SEN81                 ;HIGH BYTE PARITY ERROR BIT07 NOT SET IN CMPE
5$:     BIT #BIT05,@WERROR           ;IF NOT SET THEN ERROR

```


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CFKKAB.P11 25-JUN-79 13:31 WRITE WRONG PARITY TESTS

SEQ 0073

8481 017724 001406
8482 017726 004037 005352
8483 017732 000006
8484 017734 040014
8485 017736 040026
8486 017740 040124
8487 017742 004010
8488 017744 044024
8489 017746 044024

6\$:

REQ 6\$
JSR R0, @#SETEN ;PRINT LIST OF SENTENCES
.WORD ^D6
.WORD SEN78 ;WRITE WRONG PARITY TESTS
.WORD SEN79 ;WROTE WRONG PARITY TO LOW BYTE HIGH BYTE AND TA
.WORD SEN82 ;TAG PARITY ERROR BIT05 NOT SET IN CMPE
JSR R0, (R0) ;TAKE SELECTED ACTION ON ERROR
.WORD 1\$-TST065-12+LOWSP ;LOOP ON ERROR
.WORD 1\$-TST065-12+LOWSP ;LOOP ON TEST

```
8491
8492
8493
8494
8495 017750 005267 160672
8496 017754 004467 166134
8497 017760 020046
8498 017762 010701
8499 017764 011121
8500 017766 020127 044032
8501 017772 001374
8502 017774 000240
8503 017776 000240
8504 020000 000240
8505 020002 000240
8506 020004 000240
8507 020006 013737 177752 004542
8508 020014 042737 177700 004542
8509 020022 005237 004560
8510 020026 004037 005352
8511 020032 000004
8512 020034 040146
8513 020036 040156
8514 020040 004010
8515 020042 044000
8516 020044 044000
8517
8518
8519
8520
8521
8522
8523
8524
8525 020046 005267 160574
8526 020052 004467 166036
8527 020056 020160
8528 020060 012737 000005 177746
8529 020066 013702 046000
8530 020072 013702 046000
8531 020076 000240
8532 020100 000240
8533 020102 000240
8534 020104 013737 177752 004542
8535 020112 042737 177737 004542
8536 020120 162737 000040 004542
8537 020126 012737 001015 177746
8538 020134 004037 005352
8539 020140 000010
8540 020142 040146
8541 020144 040174
8542 020146 040204
8543 020150 040222
8544 020152 004010
8545 020154 044000
8546 020156 044000

      .SBTTL HIT REGISTER TESTS
      : CHECK THAT ALL SIX HIT BITS CAN CONTAIN ZEROS

TST066: INC TID ;UPDATE TEST ID
        JSR R4,RELCTL ;RELOCATE TEST TO LOW CACHE
        .WORD TST067
        MOV PC,R1 ; LOW TEST AREA
2$: MOV (R1),(R1)+
    CMP R1,#1$-TST066-12+LOWSP
    BNE 2$
    NOP
    NOP
    NOP
    NOP
    MOV @#CHR,@#ERROR ;READ AND SAVE HIT REGISTER CONTENTS
1$: BIC #177700,@#ERROR ;MASK FOR HIT BITS
    INC @#BITFLG ;BIT PRINT MODE
    JSR R0,@#SETEN ;REPORT ERROR IF ANY
    .WORD ^D4
    .WORD SEN83 ;HIT REGISTER TESTS
    .WORD SEN84 ;CACHE HIT REGISTER BIT(S) STUCK HIGH
    JSR R0,(R0) ;TAKE SELECTED ACTION ON ERROR
    .WORD LOWSP
    .WORD LOWSP

      : CHECK THAT HIT BIT05 CAN CONTAIN A ONE

TST067: INC TID ;UPDATE TEST ID
        JSR R4,RELCTL ;RELOCATE TEST TO LOW CACHE
        .WORD TST070
        MOV #5,@#CCR ;ENABLE HIGH CACHE
        MOV @#HIGHSP,R2 ;CAUSE READ MISS
        MOV @#HIGHSP,R2 ;CAUSE READ HIT
        NOP
        NOP
        NOP
        MOV @#CHR,@#ERROR ;READ AND SAVE HIT REGISTER
        BIC #177737,@#ERROR ;MASK FOR BIT 5
        SUB #40,@#ERROR ;BIT 5 SHOULD BE SET
        MOV #OFF,@#CCR ;DISABLE CACHE
        JSR R0,@#SETEN ;REPORT ERROR IF ANY
        .WORD ^D8
        .WORD SEN83 ;HIT REGISTER TESTS
        .WORD SEN85 ;HIT BIT ERROR
        .WORD SEN86 ;ATTEMPT TO WRITE HIT REGISTER BIT05
        .WORD SEN87 ;TO A ONE . VAI READ HIT . FAILED
        JSR R0,(R0) ;TAKE SELECTED ACTION ON ERROR
        .WORD LOWSP ;LOOP ON ERROR
        .WORD LOWSP ;LOOP ON TEST
```


CACHE DIAG.
CFKKAB.P11MACY11 30A(1052)
25-JUN-79 13:3131-OCT-79 15:29 PAGE 70-5
CACHE DATA WRITE BYTE TEST

SEQ 0075

8548						.SBTTL CACHE DATA WRITE BYTE TEST	
8549	020160	005267	160462		TST070:	INC TID	;UPDATE TEST ID
8550	020164	004467	165724			JSR R4,RELCTL	;RELOCATE TEST TO LOW CACHE
8551	020170	020374				.WORD TST071	
8552	020172	012737	000005	177746		MOV #5,@#CCR	;ENABLE HIGH CACHE
8553	020200	013701	046000			MOV @#HIGHSP,R1	;READ MISS
8554	020204	012737	000000	046000		MOV #0,@#HIGHSP	;WRITE WORD HIT
8555	020212	112737	000023	046000		MOV #23,@#HIGHSP	;WRITE BYTE HIT
8556	020220	112737	000023	046001		MOV #23,@#HIGHSP+1	;WRITE BYTE HIT
8557	020226	005037	177744			CLR @#CMPE	;RESET ERROR REGISTER
8558	020232	013703	046000			MOV @#HIGHSP,R3	;READ AND LOOK FOR ERROR
8559	020236	012737	000215	177746		MOV #215,@#CCR	;SET ABORT FOR ERROR READ
8560	020244	013737	177744	004542		MOV @#CMPE,@#ERROR	;SAVE ERROR
8561	020252	012737	001015	177746		MOV #OFF,@#CCR	;DISABLE CACHE
8562	020260	032737	000100	004542		BIT #BIT06,@#ERROR	;ANY LOW BYTE ERROR
8563	020266	001407				BEQ 1\$	
8564	020270	004037	005352		3\$:	JSR R0,@#SETEN	;REPORT ERROR
8565	020274	000006				.WORD ^D6	
8566	020276	040246				.WORD SEN88	;CACHE DATA WRITE BYTE TEST
8567	020300	040262				.WORD SEN89	;CACHE DATA WRITE BYTE ERROR
8568	020302	040276				.WORD SEN90	;CANT WRITE LOW BYTE
8569	020304	000430				BR 2\$	
8570	020306	032737	000200	004542	1\$:	BIT #BIT07,@#ERROR	;ANY HIGH BYTE ERROR
8571	020314	001407				BEQ 5\$	
8572	020316	004037	005352			JSR R0,@#SETEN	;REPORT ERROR
8573	020322	000006				.WORD ^D6	
8574	020324	040246				.WORD SEN88	;CACHE DATA WRITE BYTE TEST
8575	020326	040262				.WORD SEN89	;CACHE DATA WRITE BYTE ERROR
8576	020330	040310				.WORD SEN91	;CANT WRITE HIGH BYTE
8577	020332	000415				BR 2\$	
8578	020334	010337	004542		5\$:	MOV R3,@#ERROR	;WAS DATA READ BACK OK
8579	020340	012703	011423			MOV #11423,R3	;PREVENT LOOP
8580	020344	162737	011423	004542		SUB #11423,@#ERROR	;DATA THAT SHOULD BE
8581	020352	105737	004542			TSTB @#ERROR	;ANY LOW BYTE ERROR
8582	020356	001344				BNE 3\$	;YES
8583	020360	105737	004543			TSTB @#ERROR+1	;ANY HIGH BYTE ERROR
8584	020364	001350				BNE 1\$	;YES
8585	020366	004010			2\$:	JSR R0,(R0)	;TAKE SELECTED ACTION ON ERROR
8586	020370	044000				.WORD LOWSP	
8587	020372	044000				.WORD LOWSP	

8630				
8631				
8632				
8633				
8634				
8635				
8636				
8637				
8638	020560	005267	160062	
8639	020564	004467	165324	
8640	020570	020746		
8641	020572	005037	177744	
8642	020576	012737	000005	177746
8643	020604	013702	052000	
8644	020610	013702	046000	

8645 020614 052737 000100 177746
8646 020622 112737 000005 046000
8647 020630 042737 000100 177746
8648 020636 013702 046000
8649 020642 052737 000215 177746
8650 020650 013702 177744
8651 020654 012737 001015 177746
8652 020662 005037 004542
8653 020666 010703
8654 020670 014313
8655 020672 020327 044000
8656 020676 001374
8657 020700 032702 000100
8658 020704 001415
8659 020706 010237 004542
8660 020712 100412
8661 020714 004037 005352
8662 020720 000006
8663 020722 040322
8664 020724 040370
8665 020726 040406
8666 020730 004010
8667 020732 044000
8668 020734 044000
8669 020736 000403
8670 020740 005037 004542
8671 020744 000771

5\$:

2\$:

1\$:

BIS #BIT06,@WCCR
MOVB #5,@HIGHSP
BIC #BIT06,@WCCR
MOV @HIGHSP,R2
BIS #215,@WCCR
MOV @CMPE,R2
MOV #OFF,@WCCR
CLR @WERROR
MOV PC,R3
MOV -(R3),(R3)
CMP R3,#LOWSP
BNE 5\$
BIT #BIT06,R2
BEQ 1\$
MOV R2,@WERROR
BMI 1\$
JSR R0,@SETEN
.WORD *D6
.WORD SEN92
.WORD SEN95
.WORD SEN96
JSR R0,(R0)
.WORD LOWSP
.WORD LOWSP
BR TST073
CLR @WERROR
BR 2\$

;ENABLE WRITE WRONG DATA
;WRITE WRONG PARITY LOW BYTE
;DISABLE WRITE WRONG
;READ AND CAUSE LOW BYTE PARITY ERROR
;ENABLE ABORT FOR ERROR READ
;READ AND SAVE ERROR REGISTER
;DISABLE CACHE
;RESET ERROR REGISTER
;UNTAG LOW CACHE PARITY
;CAUSE WRITE IN BYPASS MODE

;ANY LOW BYTE PARITY ERROR
;NO ERROR ABORT TEST
;WAS BIT15 SET AS RESULT OF ERROR
;YES
;REPORT ERROR

;PARITY ERROR REGISTER TESTS
;BIT15 OF CMPE DID NOT SET
;AS RESULT OF LOW BYTE PARITY ERROR
;TAKE SELECTED ACTION ON ERROR
;LOOP ON ERROR
;LOOP ON TEST

;RESET ERROR FLAG

:
: VERIFY PARITY ERROR REGISTER BIT15 SETS AS RESULT
: OF HIGH BYTE PARITY ERROR

TST073:

8680 020746 005267 157674
8681 020752 004467 165136
8682 020756 021134
8683 020760 005037 177744
8684 020764 012737 000005 177746
8685 020772 013702 052000
8686 020776 013702 046000
8687 021002 052737 000100 177746
8688 021010 112737 000005 046001
8689 021016 042737 000100 177746
8690 021024 013702 046000
8691 021030 052737 000215 177746
8692 021036 013702 177744
8693 021042 012737 001015 177746
8694 021050 005037 004542
8695 021054 010703
8696 021056 014313
8697 021060 020327 044000
8698 021064 001374
8699 021066 032702 000200
8700 021072 001415

5\$:

INC TID
JSR R4,RELCTL
.WORD TST074
CLR @CMPE
MOV #5,@WCCR
MOV @HIGH1,R2
MOV @HIGHSP,R2
BIS #BIT06,@WCCR
MOVB #5,@HIGHSP+1
BIC #BIT06,@WCCR
MOV @HIGHSP,R2
BIS #215,@WCCR
MOV @CMPE,R2
MOV #OFF,@WCCR
CLR @WERROR
MOV PC,R3
MOV -(R3),(R3)
CMP R3,#LOWSP
BNE 5\$
BIT #BIT07,R2
BEQ 1\$

;UPDATE TEST ID
;RELOCATE TEST TO LOW CACHE

;RESET PARITY ERROR REGISTER
;ENABLE HIGH CACHE
;TAG HIGH BLOCK #2
;TAG HIGH BLOCK #1
;ENABLE WRITE WRONG PARITY
;WRITE WRONG PARITY HIGH BYTE
;DISABLE WRITE WRONG
;READ TO CAUSE PARITY ERROR
;ENABLE ABORT FOR ERROR READ
;READ ERROR
;DISABLE CACHE
;RESET ERROR
;UNTAG LOW CACHE
;CAUSE WRITE TO CACHE IN BYPASS MODE

;ANY HIGH BYTE PARITY ERROR
;NO ERROR ABORT TEST

8701	021074	010237	004542		MOV R2,@#ERROR	;WAS BIT15 SET AS RESULT OF ERROR
8702	021100	100412			BMI 1\$	;YES
8703	021102	004037	005352		JSR R0,@#SETEN	;REPORT ERROR
8704	021106	000006			.WORD ^D6	
8705	021110	040322			.WORD SEN92	;PARITY ERROR REGISTER TESTS
8706	021112	040426			.WORD SEN97	;BIT15 OF CMPE WAS NOT SET
8707	021114	040444			.WORD SEN98	;AS RESULT OF HIGH BYTE PARITY ERROR
8708	021116	004010		2\$:	JSR R0,(R0)	;TAKE SELECTED ACTION ON ERROR
8709	021120	044000			.WORD LOWSP	;LOOP ON ERROR
8710	021122	044000			.WORD LOWSP	;LOOP ON TEST
8711	021124	000403			BR TST074	
8712	021126	005037	004542	1\$:	CLR @#ERROR	;RESET ERROR FLAG
8713	021132	000771			BR 2\$	
8714						
8715						
8716						
8717						
8718						
8719						
8720	021134	005267	157506		INC TID	;UPDATE TEST ID
8721	021140	004467	164750		JSR R4,RELCTL	;RELOCATE TEST TO LOW CACHE
8722	021144	021276			.WORD TST075	
8723	021146	005037	177744	1\$:	CLR @#CMPE	;RESET ERROR REGISTER
8724	021152	012737	000005	177746	MOV #5,@#CCR	;ENABLE HIGH CACHE
8725	021160	013702	052000		MOV @#HIGH1,R2	;POINT TAG TO HIGH BLOCK #2
8726	021164	012737	002105	177746	MOV #2105,@#CCR	;WRITE WRONG TO HIGH CACHE
8727	021172	013702	046000		MOV @#HIGHSP,R2	;CAUSE WRONG WRITE TO HIGH CACHE
8728	021176	012737	000005	177746	MOV #5,@#CCR	;DISABLE WRITE WRONG
8729	021204	013702	046000		MOV @#HIGHSP,R2	;CAUSE WRONG READ FROM CACHE
8730	021210	005037	177744		CLR @#CMPE	;RESET ERROR REGISTER
8731	021214	012737	001215	177746	MOV #OFF+BIT07,@#CCR	;ENABLE ABORT FOR ERROR READ
8732	021222	013737	177744	004542	MOV @#CMPE,@#ERROR	;SAVE ERROR INFO.
8733	021230	012737	000015	177746	MOV #OFF-BIT09,@#CCR	;DISABLE CACHE
8734	021236	010702			MOV PC,R2	;CORRECT ANY WRONG PARITY IN LOW CACHE
8735	021240	014212			MOV -(R2),(R2)	;CAUSE READ TO LOW CACHE
8736	021242	020227	044000	2\$:	CMP R2,#LOWSP	;FOR ALL LOW CACHE USED
8737	021244	001774			BNE 2\$	
8738	021250	012737	001015	177746	MOV #OFF,@#CCR	;DISABLE CACHE
8739	021256	004037	005352		JSR R0,@#SETEN	;PRINT LIST OF SENTENCES
8740	021262	000004			.WORD ^D4	
8741	021264	040322			.WORD SEN92	;PARITY ERROR REGISTER TESTS
8742	021266	040464			.WORD SEN99	;WRITE TO CMPE FAILED TO CLEAR REGISTER
8743	021270	004010			JSR R0,(R0)	;TAKE SELECTED ACTION ON ERROR
8744	021272	044000			.WORD LOWSP	;LOOP ON ERROR
8745	021274	044000			.WORD LOWSP	;LOOP ON TEST
8746						
8747						
8748						
8749						

.SBTTL PARITY ERROR LOGIC TESTS

```
8751
8752
8753
8754
8755
8756
8757
8758 021276 005267 157344
8759 021302 004467 164606
8760 021306 021546
8761 021310 012737 000005 177746
8762 021316 005037 177744
8763 021322 013702 052000
8764 021326 013702 046000
8765 021332 012737 000006 046000
8766 021340 013702 046000
8767 021344 052737 000215 177746
8768 021352 013737 177744 004542
8769 021360 012737 000005 177746
8770 021366 013702 052000
8771 021372 012737 000004 052000
8772 021400 005037 177744
8773 021404 013702 052000
8774 021410 052737 000215 177746
8775 021416 013702 177744
8776 021422 042737 000200 177746
8777 021430 012737 001015 177746
8778 021436 005102
8779 021440 040237 004542
8780 021444 032737 000100 004542
8781 021452 001406
8782 021454 004037 005352
8783 021460 000006
8784 021462 040504
8785 021464 040516
8786 021466 040530
8787 021470 032737 000200 004542
8788 021476 001406
8789 021500 004037 005352
8790 021504 000006
8791 021506 040504
8792 021510 040546
8793 021512 040530
8794 021514 032737 000040 004542
8795 021522 001406
8796 021524 004037 005352
8797 021530 000006
8798 021532 040504
8799 021534 040560
8800 021536 040530
8801 021540 004010
8802 021542 044000
8803 021544 044000
8804
8805
8806
```

VERIFY PARITY ERROR LOGIC BY EVEN AND ODD DATA INTO CACHE
TAG AND DATA. IF A PARITY ERROR OCCURES ON EVEN DATA
BUT NOT ON ODD THEN LOGIC IS ASSUMED GOOD.
ONLY IF BOTH ODD AND EVEN FAIL IS THE LOGIC ASSUMED BAD.

TST075:

1\$:

2\$:

3\$:

4\$:

INC TID
JSR R4,RELCTL
.WORD TST076
MOV #5,@CCR
CLR @CMPE
MOV @HIGH1,R2
MOV @HIGHSP,R2
MOV #6,@HIGHSP
MOV @HIGHSP,R2
BIS #215,@CCR
MOV @CMPE,@ERROR
MOV #5,@CCR
MOV @HIGH1,R2
MOV #4,@HIGH1
CLR @CMPE
MOV @HIGH1,R2
BIS #215,@CCR
MOV @CMPE,R2
BIC #BIT07,@CCR
MOV #OFF,@CCR
COM R2
BIC R2,@ERROR
BIT #BIT06,@ERROR
BEQ 2\$
JSR R0,@SETEN
.WORD ^D6
.WORD SEN100
.WORD SEN101
.WORD SEN102
BIT #BIT07,@ERROR
BEQ 3\$
JSR R0,@SETEN
.WORD ^D6
.WORD SEN100
.WORD SEN103
.WORD SEN102
BIT #BIT05,@ERROR
BEQ 4\$
JSR R0,@SETEN
.WORD ^D6
.WORD SEN100
.WORD SEN104
.WORD SEN102
JSR R0,(R0)
.WORD LOWSP
.WORD LOWSP

:UPDATE TEST ID
:RELOCATE TEST TO LOW CACHE
:ENABLE HIGH CACHE
:RESET ERROR REGISTER
:POINT TAG TO HIGH BLOCK #2
:POINT TAG TO HIGH BLOCK #1
:WRITE DATA INTO IT
:READ EVEN DATA WITH EVEN TAG
:SET ABORT TO READ ERROR
:SAVE ERROR INFO
:DISABLE ABORT
:POINT TAG TO HIGH BLOCK #2
:WRITE ODD DATA INTO IT
:RESET ERROR REGISTER
:READ ODD DATA AND TAG
:ENABLE ABORT FOR ERROR READ
:READ ERROR REGISTER
:DISABLE ABORT
:DISABLE CACHE
:AND RESULTS OF ODD AND EVEN
:ANY BITS SET = ERROR
:WAS LOW PARITY SET
:PRINT LIST OF SENTENCES
:PARITY ERROR LOGIC TESTS
:LOW BYTE PARITY FAILURE
:FAILED ON ODD AND EVEN READ
:WAS IT HIGH BYTE ERROR
:PRINT LIST OF SENTENCES
:PARITY ERROR LOGIC TESTS
:HIGH BYTE PARITY FAILURE
:FAILED ON ODD AND EVEN READ
:WAS IT TAG PARITY ERROR
:PRINT LIST OF SENTENCES
:PARITY ERROR LOGIC TESTS
:TAG PARITY FAILURE
:FAILED ON ODD AND EVEN READ
:TAKE SELECTED ACTION ON ERROR
:LOOP ON ERROR
:LOOP ON TEST

```
8807  
8808  
8809  
8810  
8811  
8812  
8813  
8814  
8815  
8816 021546 005267 157074  
8817 021552 004467 164336  
8818 021556 022122  
8819 021560 005037 177744  
8820 021564 012737 000005 177746  
8821 021572 013702 052000  
8822 021576 012737 002105 177746  
8823 021604 013702 046000  
8824 021610 012737 000006 046000  
8825 021616 012737 000005 177746  
8826 021624 005037 177744  
8827 021630 013702 046000  
8828 021634 052737 000215 177746  
8829 021642 013737 177744 004542  
8830 021650 012737 000005 177746  
8831 021656 013702 046000  
8832 021662 012737 002105 177746  
8833 021670 013702 052000  
8834 021674 012737 000004 052000  
8835 021702 012737 001015 177746  
8836 021710 005037 177744  
8837 021714 013702 052000  
8838 021720 052737 000215 177746  
8839 021726 053737 177744 004542  
8840 021734 042737 000200 177746  
8841 021742 005037 052000  
8842 021746 010702  
8843 021750 014212  
8844 021752 020227 044000  
8845 021756 001374  
8846 021760 005037 177744  
8847 021764 005137 004542  
8848 021770 042737 177437 004542  
8849 021776 032737 000100 004542  
8850 022004 001407  
8851 022006 004037 005352  
8852 022012 000010  
8853 022014 040504  
8854 022016 040516  
8855 022020 040570  
8856 022022 040612  
8857 022024 032737 000200 004542  
8858 022032 001407  
8859 022034 004037 005352  
8860 022040 000010  
8861 022042 040504  
8862 022044 040546
```

VERIFY PARITY ERROR LOGIC BY WRITING EVEN AND ODD DATA
INTO TAG AND DATA.
IF A PARITY ERROR DOES NOT OCCURE ON EVEN DATA
BUT DOES ON ODD THEN LOGIC IS ASSUMED GOOD.
ONLY IF NEATHER ODD OR EVEN CAUSE PARITY ERROR IS THE
LOGIC ASSUMED BAD.

TST076: INC TID ;UPDATE TEST ID
JSR R4,RELCTL ;RELOCATE TEST TO LOW CACHE
.WORD TST077
1\$: CLR @#CMPE ;RESET ERROR REGISTER
MOV #5,@#CCR ;ENABLE HIGH CACHE
MOV @#HIGH1,R2 ;POINT TAG TO HIGH BLOCK #2
MOV #2105,@#CCR ;ENABLE WRITE WRONG PARITY
MOV @#HIGHSP,R2 ;WRITE WRONG TAG TO HIGH BLOCK #1
MOV #6,@#HIGHSP ;WRITE WRONG PARITY TO DATA
MOV #5,@#CCR ;DISABLE WRITE WRONG
CLR @#CMPE ;RESET ERROR REGISTER
MOV @#HIGHSP,R2 ;CAUSE WRONG READ
BIS #215,@#CCR ;ENABLE ABORT FOR ERROR READ
MOV @#CMPE,@#ERROR ;READ AND SAVE ERROR REGISTER
MOV #5,@#CCR ;DISABLE ABORT
MOV @#HIGHSP,R2 ;READ AND CORRECT DATA AND TAG
MOV #2105,@#CCR ;ENABLE WRITE WRONG
MOV @#HIGH1,R2 ;WRITE WRONG TAG
MOV #4,@#HIGH1 ;WRITE WRONG PARITY TO DATA
MOV #OFF,@#CCR ;DISABLE WRITE WRONG
CLR @#CMPE ;RESET ERROR REGISTER
MOV @#HIGH1,R2 ;CAUSE WRONG READ
BIS #215,@#CCR ;ENABLE ABORT FOR ERROR READ
BIS @#CMPE,@#ERROR ;OR NEW ERRORS WITH LAST
BIC #BIT07,@#CCR ;DISABLE ABORT
CLR @#HIGH1 ;RESET ERROR REGISTER
MOV PC,R2 ;WRITE WRONG TAG CLEAN UP
20\$: MOV -(R2),(R2) ;CAUSE READ TO LOW CACHE
CMP R2,#LOWSP ;READ ALL USED LOW CACHE
BNE 20\$
CLR @#CMPE ;RESET ERROR REGISTER
COM @#ERROR ;ANY BIT NOT SET = ERROR
BIC #-<BIT07+BIT06+BIT05>-1,@#ERROR ;MASK UNWANTED BITS
BIT #BIT06,@#ERROR ;ANY LOW BYTE ERRORS
BEQ 2\$;NO
JSR R0,@#SETEN ;PRINT LIST OF SENTENCES
.WORD *D8
.WORD SEN100 ;PARITY ERROR LOGIC TESTS
.WORD SEN101 ;LOW BYTE PARITY FAILURE
.WORD SEN105 ;PARITY ERROR BIT FAILED TO SET ON WRONG
.WORD SEN106 ;WRITE ODD AND EVEN
2\$: BIT #BIT07,@#ERROR ;ANY HIGH BYTE ERRORS
BEQ 3\$
JSR R0,@#SETEN ;PRINT LIST OF SENTENCES
.WORD *D8
.WORD SEN100 ;PARITY ERROR LOGIC TESTS
.WORD SEN103 ;HIGH BYTE PARITY FAILURE

CACHE DIAG.
CFKKAB.P11

MACY11 30A(1052)
25-JUN-79 13:31

31-OCT-79 15:29 PAGE 70-11
PARITY ERROR LOGIC TESTS

SEQ 0081

8863 022046 040570
8864 022050 040612
8865 022052 032737 000040 004542
8866 022060 001407
8867 022062 004037 005352
8868 022066 000010
8869 022070 040504
8870 022072 040560
8871 022074 040570
8872 022076 040612
8873 022100 042737 000140 177746
8874 022106 052737 001010 177746
8875 022114 004010
8876 022116 044000
8877 022120 044000
8878
8879
8880
8881

.....

3\$:

4\$:

.WORD SEN105
.WORD SEN106
BIT #BIT05,@#ERROR
BEQ 4\$
JSR R0,@#SETEN
.WORD ^D8
.WORD SEN100
.WORD SEN104
.WORD SEN105
.WORD SEN106
BIC #BIT06+BIT05,@#CCR
BIS #BIT03+BIT09,@#CCR
JSR R0,(R0)
.WORD LOWSP
.WORD LOWSP

;PARITY ERROR BIT FAILED TO SET ON WRONG
;WRITE ODD AND EVEN
;ANY TAG ERRORS
;PRINT LIST OF SENTENCES
;PARITY ERROR LOGIC TESTS
;TAG PARITY FAILURE
;PARITY ERROR BIT FAILED TO SET ON WRONG
;WRITE ODD AND EVEN
;DISABLE WRITE WRONG PARITY
;DISABLE CACHE
;TAKE SELECTED ACTION ON ERROR
;LOOP ON ERROR
;LOOP ON TEST

.SBTTL READ WRITE HIT TESTS

```

8883
8884
8885
8886
8887
8888 022122 005267 156520
8889 022126 004467 164010
8890 022132 022262
8891 022134 005037 004542
8892 022140 012701 050000
8893 022144 012737 000011 177746
8894 022152 012102
8895 022154 020127 050014
8896 022160 001371
8897 022162 012701 050000
8898 022166 012721 000000
8899 022172 020127 050014
8900 022176 001373
8901 022200 014102
8902 022202 013703 177752
8903 022206 032703 000004
8904 022212 001402
8905 022214 005237 004542
8906 022220 022701 050000
8907 022224 001365
8908 022226 012737 001015 177746
8909 022234 162737 000006 004542
8910 022242 004037 005352
8911 022246 000004
8912 022250 040624
8913 022252 040636
8914 022254 004010
8915 022256 046000
8916 022260 046000
8917
8918

```

TEST VERIFYS THAT SIX READS INTO TAGGED CACHE LOCATIONS
WILL YEALD SIX HITS.

TST077:

```

      INC TID
      JSR R4,RELCTH
      .WORD TST100
      CLR @#ERROR
      MOV #LOW1,R1
      1$: MOV #11,@#CCR
          MOV (R1)+,R2
          CMP R1,#LOW1+14
          BNE 1$
          MOV #LOW1,R1
      2$: MOV #0,(R1)+
          CMP R1,#LOW1+14
          BNE 2$
      3$: MOV -(R1),R2
          MOV @#CHR,R3
          BIT #BIT02,R3
          BEQ 30$
          INC @#ERROR
      30$: CMP #LOW1,R1
          BNE 3$
          MOV #OFF,@#CCR
          SUB #6,@#ERROR
          JSR R0,@#SETEN
          .WORD ^D4
          .WORD SEN107
          .WORD SEN108
          JSR R0,(R0)
          .WORD HIGHSP
          .WORD HIGHSP

```

;UPDATE TEST ID
;RELOCATE THIS TEST TO HIGH CACHE
;RESET ERROR REGISTER
;POINTER TO LOW BLOCK #2
;ENABLE LOW CACHE
;TAG SIX LOW CACHE LOCATIONS
;RESET LOW CACHE POINTER
;CAUSE WRITES TO 6 LOW CACHE LOCATIONS
;COMPLETE YET
;NO
;READ PREV. WRITTEN LOCATIONS
;SAVE HIT REGISTER
;WAS LAST ACCESS A HIT
;NO
;YES
;LOOP TILL COMPLETE
;DISABLE CACHE
;LESS THEN 6 HITS = ERROR
;PRINT LIST OF SENTENCES
;READ WRITE HIT TESTS
;NO HITS AS RESULT OF READS TO SIX TAGGED LOCATI
;TAKE SELECTED ACTION ON ERROR
;LOOP ON ERROR
;LOOP ON TEST

.SBTTL I/O PAGE TESTS

```

8920
8921
8922
8923
8924 022262 005267 156360
8925 022266 004467 163622
8926 022272 022452
8927 022274 005037 004542
8928 022300 012702 000006
8929 022304 012737 000005 177746
8930 022312 013703 047776
8931 022316 013703 177776
8932 022322 013703 177776
8933 022326 032737 000010 177752
8934 022334 001414
8935 022336 012737 001015 177746
8936 022344 012737 000001 004542
8937 022352 004037 005352
8938 022356 000004
8939 022360 040664
8940 022362 040674
8941 022364 000421
8942 022366 013703 047776
8943 022372 032737 000010 177752
8944 022400 001013
8945 022402 012737 001015 177746
8946 022410 012737 000001 004542
8947 022416 004037 005352
8948 022422 000004
8949 022424 040664
8950 022426 040712
8951 022430 012737 001015 177746
8952 022436 004010
8953 022440 044010
8954 022442 044150
8955 022444 004037 005012
8956 022450 044004
8957
8958
8959
8960
8961
8962
8963 022452 005267 156170
8964 022456 004467 163432
8965 022462 022670
8966 022464 005037 004542

```

VERIFY THAT I/O PAGE CAN NOT BE TAGGED OR CAUSE
A READ HIT.

TST100:

```

INC TID
JSR R4,RELCTL
WORD TST101
CLR @#ERROR
MOV #6,R2
MOV #5,@#CCR
MOV @#HIGHSP+1776,R3
MOV @#PSW,R3
MOV @#PSW,R3
BIT #BIT03,@#CHR
BEQ 1$
MOV #OFF,@#CCR
MOV #1,@#ERROR
JSR R0,@#SETEN
WORD #D4
WORD SEN109
WORD SEN110
BR 2$
MOV @#HIGHSP+1776,R3
BIT #BIT03,@#CHR
BNE 2$
MOV #OFF,@#CCR
MOV #1,@#ERROR
JSR R0,@#SETEN
WORD #D4
WORD SEN109
WORD SEN111
MOV #OFF,@#CCR
JSR R0,(R0)
WORD 3$-TST100-12+LOWSP
WORD 4$-TST100-12+LOWSP
JSR R0,@#LPONTS
WORD 5$-TST100-12+LOWSP

```

:UPDATE TEST ID
:RELOCATE TEST TO LOW CACHE
:RESET ERROR FLAG
:PASS COUNTER
:ENABLE HIGH CACHE
:TAG HIGH CACHE LOCATION
:ATTEMPT TO TAG I/O PAGE
:ATTEMPT HIT FROM I/O PAGE
:CHECK FOR HIT
:NO HIT
:DISABLE CACHE
:SET ERROR FLAG
:REPORT ERROR
:I/O PAGE TESTS
:READ INTO I/O PAGE CAUSED HIT
:READ PREV TAGGED LOCATION
:VERIFY HIT
:THEIR WAS A HIT
:DISABLE CACHE
:SET ERROR FLAG
:REPORT ERROR
:I/O PAGE TESTS
:READ INTO I/O PAGE INVALIDATED TAGGED LOCATION
:DISABLE CACHE
:TAKE SELECTED ACTION ON ERROR
:LOOP ON ERROR
:LOOP ON TEST
:LOOP ON TEST CHECK
:RESTART TEST

VERIFY THAT I/O PAGE CAN NOT BE TAGGED OR CAUSE
A READ HIT . OPERATING IN MAINTENANCE MODE.

TST101:

```

INC TID
JSR R4,RELCTL
WORD TST102
CLR @#ERROR

```

:UPDATE TEST ID
:RELOCATE TEST TO LOW CACHE
:RESET ERROR FLAG

8968	022470	012702	000006		5\$:	MOV #6,R2	:PASS COUNTER
8969	022474	012737	000001	177750	3\$:	MOV #1,@#CMR	:ENABLE MAINT. MODE
8970	022502	012737	000005	177746		MOV #5,@#CCR	:ENABLE HIGH CACHE
8971	022510	013703	047776			MOV @#HIGHSP+1776,R3	:TAG HIGH BLOCK #1
8972	022514	013703	177776			MOV @#PSW,R3	:ATTEMPT TO TAG I/O PAGE
8973	022520	013703	177776			MOV @#PSW,R3	:ATTEMPT HIT FROM I/O PAGE
8974	022524	032737	000010	177752		BIT #BIT03,@#CHR	:VERIFY NO HIT
8975	022532	001417				BEQ 1\$	:NO HIT
8976	022534	012737	000001	004542		MOV #1,@#ERROR	:SET ERROR FLAG
8977	022542	005037	177750			CLR @#CMR	:EXIT MAINT MODE
8978	022546	012737	001015	177746		MOV #OFF,@#CCR	:DISABLE CACHE
8979	022554	004037	005352			JSR R0,@#SETEN	:REPORT ERROR
8980	022560	000006				.WORD ^D6	
8981	022562	040664				.WORD SEN109	:I/O PAGE TESTS
8982	022564	040674				.WORD SEN110	:READ INTO I/O PAGE CAUSED HIT
8983	022566	040732				.WORD SEN112	:WHILE IN MAINTENANCE MODE
8984	022570	000424				BR 2\$	
8985	022572	013703	047776		1\$:	MOV @#HIGHSP+1776,R3	:READ PREV. TAGGED LOCATION
8986	022576	032737	000010	177752		BIT #BIT03,@#CHR	:VERIFY HIT
8987	022604	001016				BNE 2\$	:VALID HIT
8988	022606	005037	177750			CLR @#CMR	:EXIT MAINT. MODE
8989	022612	012737	001015	177746		MOV #OFF,@#CCR	:DISABLE CACHE
8990	022620	012737	000001	004542		MOV #1,@#ERROR	:SET ERROR FLAG
8991	022626	004037	005352			JSR R0,@#SETEN	:REPORT ERROR
8992	022632	000006				.WORD ^D6	
8993	022634	040664				.WORD SEN109	:I/O PAGE TESTS
8994	022636	040712				.WORD SEN111	:READ INTO I/O PAGE INVALIDATED TAGGED LOCATION
8995	022640	040732				.WORD SEN112	:WHILE IN MAINTENANCE MODE
8996	022642	005037	177750		2\$:	CLR @#CMR	:EXIT MAINT MODE
8997	022646	012737	001015	177746		MOV #OFF,@#CCR	:DISABLE CACHE
8998	022654	004010				JSR R0,(R0)	:TAKE SELECTED ACTION ON ERROR
8999	022656	044010				.WORD 3\$-TST101-12+LOWSP	:LOOP ON ERROR
9000	022660	044176				.WORD 4\$-TST101-12+LOWSP	:LOOP ON TEST
9001	022662	004037	005012		4\$:	JSR R0,@#LPONTS	:LOOP ON TEST CHECK
9002	022666	044004				.WORD 5\$-TST101-12+LOWSP	:RESTART TEST
9003							
9004							
9005							
9006							

9008						.SBTTL VALID BIT STORAGE TESTS	
9009						VERIFY ADDRESS LINES TO CACHE MEMORY CHIPS	
9010						BY WRITING AND READING DATA PATTERNS	
9011	022670	005267	155752		TST102:	INC TID	:UPDATE TEST ID
9012	022674	004467	163242			JSR R4,RELCTH	:RELOCATE TEST TO HIGH CACHE
9013	022700	023170				.WORD TST103	
9014	022702	012702	000001			MOV #1,R2	:PATTERN SELECTOR
9015	022706	005037	005064			CLR @#LOPERR	:RESET LOOP ON ERROR FLAG
9016	022712	012703	044000		11\$:	MOV #LOWSP,R3	:TESTING IN LOW CACHE
9017	022716	005037	052000			CLR @#HIGH1	:HIT COUNTER
9018	022722	005037	052002			CLR @#HIGH1+2	:MISS COUNTER
9019	022726	052737	000400	177746	3\$:	BIS #BIT08,@#CCR	:FLUSH CACHE
9020	022734	032737	010000	177746	1\$:	BIT #BIT12,@#CCR	:WAIT TILL COMPLETE
9021	022742	001374				BNE 1\$	
9022	022744	032737	020000	177746		BIT #BIT13,@#CCR	:SELECT VALID BITS SET A
9023	022752	001365				BNE 3\$	
9024	022754	012737	000011	177746		MOV #11,@#CCR	:ENABLE LOW CACHE LOCATION
9025	022762	010201			6\$:	MOV R2,R1	:PASS COUNTER
9026	022764	012305			2\$:	MOV (R3)+,R5	:TAG LOW CACHE LOCATION
9027	022766	005301				DEC R1	:NO. OF HITS TO CAUSE
9028	022770	001375				BNE 2\$	
9029	022772	020327	046000			CMP R3,#LOWSP+2000	:PATTERN COMPLETE
9030	022776	001410				BEQ 7\$	
9031	023000	010201				MOV R2,R1	:PASS COUNTER
9032	023002	062703	000002		5\$:	ADD #2,R3	:MISS LOCATION
9033	023006	005301				DEC R1	:NO. OF MISSES TO CAUSE
9034	023010	001374				BNE 5\$	
9035	023012	020327	046000			CMP R3,#LOWSP+2000	:PATTERN COMPLETE
9036	023016	001361				BNE 6\$	:NO
9037	023020	012703	044000		7\$:	MOV #LOWSP,R3	:CHECK PATTERN
9038	023024	012305			9\$:	MOV (R3)+,R5	:LOOK FOR HIT
9039	023026	032737	000010	177752		BIT #BIT03,@#CHR	:WAS THIS A HIT
9040	023034	001006				BNE 8\$	:YES
9041	023036	005237	052002			INC @#HIGH1+2	:NO
9042	023042	020327	046000			CMP R3,#LOWSP+2000	:COMPLETE YET
9043	023046	001366				BNE 9\$	:NO
9044	023050	000405				BR 10\$	:YES
9045	023052	005237	052000		8\$:	INC @#HIGH1	:HIT COUNTER
9046	023056	020327	046000			CMP R3,#LOWSP+2000	:COMPLETE YET
9047	023062	001360				BNE 9\$	:NO
9048	023064	012737	001015	177746	10\$:	MOV #OFF,@#CCR	:DISABLE CACHE
9049	023072	023737	052000	052002		CMP @#HIGH1,@#HIGH1+2	:IF EQUAL NO ERROR
9050	023100	001406				BEQ 12\$	:NO ERROR
9051	023102	005737	052002			TST @#HIGH1+2	:ERROR IF ZERO
9052	023106	001413				BEQ 13\$	
9053	023110	005737	052000			TST @#HIGH1	:ERROR IF ZERO
9054	023114	001410				BEQ 13\$	
9055	023116	006302			12\$:	ASL R2	:REPAIR FOR NEXT TEST
9056	023120	032702	001000			BIT #BIT09,R2	:TEST COMPLETE YET
9057	023124	001672				BEQ 11\$	:NO
9058	023126	004037	005012			JSR R0,@#LPONTS	:LOOP ON TEST MODE CHECK
9059	023132	046000				.WORD HIGHSP	:RESTART TEST
9060	023134	000415				BR TST103	:NEXT TEST
9061	023136	010237	004542		13\$:	MOV R2,@#ERROR	:SET ERROR FLAG
9062	023142	006337	004542			ASL @#ERROR	:ERRORING ADDRESS LINE
9063	023146	005237	004560			INC @#BITFLG	:BIT PRINT MODE

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VALID BIT STORAGE TESTS

SEQ 0086

9064 023152 004037 005352
9065 023156 000006
9066 023160 040744
9067 023162 040756
9068 023164 041000
9069 023166 000753

JSR R0,@#SETEN
.WORD ^D6
.WORD SEN113
.WORD SEN114
.WORD SEN115
BR 12\$

;REPORT ERROR

;VALID BIT STORAGE TESTS
;OPERATING IN LOW CACHE WITH VALID SET A
;ADDRESS BIT ERROR

9070
9071
9072
9073
9074
9075
9076 023170 005267 155452
9077 023174 004467 162714
9078 023200 023470
9079 023202 012702 000001

:
:
TST103: VERIFY ADDRESS LINES TO CACHE MEMORY CHIPS
BY WRITING AND READING DATA PATTERNS

INC TID
JSR R4,RELCTL
.WORD TST104
MOV #1,R2

;UPDATE TEST ID
;RELOCATE TEST TO LOW CACHE
;PATTERN SELECTOR

9081	023206	005037	005064		CLR @WLOPERR	:RESET LOOP ON TEST FLAG
9082	023212	012703	046000		MOV #HIGHSP,R3	:TESTING IN HIGH CACHE
9083	023216	005037	004550		CLR @WGOOD	:HIT COUNTER
9084	023222	005037	004552		CLR @WBAD	:MISS COUNTER
9085	023226	052737	000400	177746	BIS #BIT08,@WCCR	:FLUSH CACHE
9086	023234	032737	010000	177746	BIT #BIT12,@WCCR	:WAIT TILL COMPLETE
9087	023242	001374			BNE 1\$	
9088	023244	032737	020000	177746	BIT #BIT13,@WCCR	:SELECT VALID BITS SET B
9089	023252	001765			BEQ 3\$	
9090	023254	012737	000005	177746	MOV #5,@WCCR	:ENABLE HIGH CACHE
9091	023262	010201			MOV R2,R1	:PASS COUNTER
9092	023264	012305			MOV (R3)+,R5	:TAG HIGH CACHE LOCATION
9093	023266	005301			DEC R1	:NO. OF HITS TO CAUSE
9094	023270	001375			BNE 2\$	
9095	023272	020327	050000		CMP R3,#HIGHSP+2000	:PATTERN COMPLETE
9096	023276	001410			BEQ 7\$	
9097	023300	010201			MOV R2,R1	:PASS COUNTER
9098	023302	062703	000002		ADD #2,R3	:MISS LOCATION
9099	023306	005301			DEC R1	:NO. OF MISSES TO CAUSE
9100	023310	001374			BNE 5\$	
9101	023312	020327	050000		CMP R3,#HIGHSP+2000	:PATTERN COMPLETE
9102	023316	001361			BNE 6\$	:NO
9103	023320	012703	046000		MOV #HIGHSP,R3	:CHECK PATTERN
9104	023324	012305			MOV (R3)+,R5	:LOOK FOR HIT
9105	023326	032737	000010	177752	BIT #BIT03,@WCHR	:WAS THIS A HIT
9106	023334	001006			BNE 8\$	:YES
9107	023336	005237	004552		INC @WBAD	:NO
9108	023342	020327	050000		CMP R3,#HIGHSP+2000	:COMPLETE YET
9109	023346	001366			BNE 9\$	:YES
9110	023350	000405			BR 10\$	:NO
9111	023352	005237	004550		INC @WGOOD	:HIT COUNTER
9112	023356	020327	050000		CMP R3,#HIGHSP+2000	:COMPLETE YET
9113	023362	001360			BNE 9\$	:NO
9114	023364	012737	001015	177746	MOV #OFF,@WCCR	:DISABLE CACHE
9115	023372	023737	004550	004552	CMP @WGOOD,@WBAD	:IF EQUAL NO ERROR
9116	023400	001406			BEQ 12\$	
9117	023402	005737	004552		TST @WBAD	:ERROR IF ZERO
9118	023406	001413			BEQ 13\$	
9119	023410	005737	004550		TST @WGOOD	:ERROR IF ZERO
9120	023414	001410			BEQ 13\$	
9121	023416	006302			ASL R2	:PREPARE FOR NEXT TEST
9122	023420	032702	001000		BIT #BIT09,R2	:TEST COMPLETE YET
9123	023424	001672			BEQ 11\$	:NO
9124	023426	004037	005012		JSR R0,@WLPONTS	:LOOP ON TEST MODE CHECK
9125	023432	044000			.WORD LOWSP	:NEXT TEST
9126	023434	000415			BR TST104	
9127	023436	010237	004542		MOV R2,@WERROR	:SET ERROR FLAG
9128	023442	006337	004542		ASL @WERROR	:SET ERROR FLAG
9129	023446	005237	004560		INC @WBITFLG	:BIT PRINT MODE
9130	023452	004037	005352		JSR R0,@WSETEN	:REPORT ERROR
9131	023456	000006			.WORD ^D6	
9132	023460	040744			.WORD SEN113	:VALID BIT STORAGE TESTS
9133	023462	041010			.WORD SEN116	:HIGH CACHE ENABLED USING VALID SET B
9134	023464	041000			.WORD SEN115	:ADDRESS BIT ERROR
9135	023466	000753			BR 12\$	
9136						

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VALID BIT STORAGE TESTS

K 7

SEQ 0088

9137
9138
9139


```
9141          .SBTTL BYPASS MODE TESTS
9142          : VERIFY THAT A WRITE TO MEMORY WHILE CACHE IS IN
9143          : BYPASS MODE WILL INVALIDATE THAT LOCATION
9144 023470 005267 155152          TST104: INC TID          ;UPDATE TEST ID
9145 023474 004467 162414          JSR R4,RELCTL        ;RELOCATE TEST TO LOW CACHE
9146 023500 023650          .WORD TST105
9147 023502 032737 020000 177746  BIT #BIT13,#CCR        ;SELECT VALID SET A
9148 023510 001407          BEQ 1$          ;SET A INUSE NOW
9149 023512 052737 000400 177746  BIS #BIT08,#CCR        ;SELECT VALID SET A
9150 023520 032737 010000 177746  2$: BIT #BIT12,#CCR        ;WAIT FOR FLUSH TO COMPLETE
9151 023526 001374          BNE 2$
9152 023530 012737 000005 177746  1$: MOV #5,#CCR        ;ENABLE HIGH CACHE
9153 023536 013703 046000          MOV @HIGHSP,R3        ;TAG HIGH LOCATION
9154 023542 052737 001000 177746  BIS #BIT09,#CCR        ;ENTER BYPASS MODE
9155 023550 010337 046000          MOV R3,@HIGHSP        ;INVALIDATE LOCATION
9156 023554 042737 001000 177746  BIC #BIT09,#CCR        ;EXIT BYPASS MODE
9157 023562 013703 046000          MOV @HIGHSP,R3        ;VERIFY LOCATION INVALIDATED
9158 023566 013703 177752          MOV @CHR,R3
9159 023572 012737 001015 177746  MOV #OFF,#CCR        ;DISABLE CACHE
9160 023600 005037 004542          CLR @ERROR          ;RESET ERROR FLAG
9161 023604 032703 000004          BIT #BIT02,R3        ;READ HIT REGISTER
9162 023610 001411          BEQ 3$          ;NO HIT MEANS NO ERROR
9163 023612 005237 004542          INC @ERROR          ;SET ERROR FLAG
9164 023616 004037 005352          JSR R0,@SETEN        ;REPORT ERROR
9165 023622 000010          .WORD 'D8
9166 023624 041030          .WORD SEN117          ;BYPASS MODE TESTS
9167 023626 041040          .WORD SEN118          ;HIGH CACHE LOCATION NOT INVALIDATED
9168 023630 041054          .WORD SEN119          ;BY WRITE TO LOCATION IN BYPASS MODE
9169 023632 041074          .WORD SEN120          ;TEST RUN WITH VALID BITS SET A
9170 023634 004010          3$: JSR R0,(R0)          ;TAKE SELECTED ACTION ON ERROR
9171 023636 044000          .WORD LOWSP          ;LOOP ON ERROR
9172 023640 044000          .WORD LOWSP          ;LOOP ON TEST
9173 023642 012737 001015 177746  MOV #OFF,#CCR        ;DISABLE CACHE
9174
9175
9176
9177
9178          : VERIFY THAT A WRITE TO MEMORY WHILE CACHE IS IN
9179          : BYPASS MODE WILL INVALIDATE THAT LOCATION
9180 023650 005267 154772          TST105: INC TID          ;UPDATE TEST ID
9181 023654 004467 162234          JSR R4,RELCTL        ;RELOCATE TEST TO LOW CACHE
9182 023660 024030          .WORD TST106
9183 023662 032737 020000 177746  BIT #BIT13,#CCR        ;SELECT VALID BITS SET B
9184 023670 001007          BNE 1$          ;IN USE NOW
9185 023672 052737 000400 177746  BIS #BIT08,#CCR        ;SELECT VALID BITS B
9186 023700 032737 010000 177746  2$: BIT #BIT12,#CCR        ;WAIT TILL COMPLETE
9187 023706 001374          BNE 2$
9188 023710 012737 000005 177746  1$: MOV #5,#CCR        ;ENABLE HIGH CACHE
9189 023716 013703 046000          MOV @HIGHSP,R3        ;TAG HIGH CACHE LOCATION
9190 023722 052737 001000 177746  BIS #BIT09,#CCR        ;ENTER BYPASS MODE
9191 023730 010337 046000          MOV R3,@HIGHSP        ;INVALIDATE HIGH LOCATION
9192 023734 042737 001000 177746  BIC #BIT09,#CCR        ;EXIT BYPASS MODE
9193 023742 013703 046000          MOV @HIGHSP,R3        ;VERIFY LOCATION INVALIDATED
9194 023746 013703 177752          MOV @CHR,R3
9195 023752 012737 001015 177746  MOV #OFF,#CCR        ;DISABLE CACHE
9196 023760 005037 004542          CLR @ERROR          ;RESET ERROR FLAG
```

```

9197 023764 032703 000004
9198 023770 001411
9199 023772 005237 004542
9200 023776 004037 005352
9201 024002 000010
9202 024004 041030
9203 024006 041040
9204 024010 041054
9205 024012 041114
9206 024014 004010
9207 024016 044000
9208 024020 044000
9209 024022 012737 001015 177746
9210
9211
9212
9213
9214
9215
9216 024030 005267 154612
9217 024034 004467 162054
9218 024040 024162
9219 024042 012737 000005 177746
9220 024050 013703 046000
9221 024054 052737 001000 177746
9222 024062 013703 046000
9223 024066 042737 001000 177746
9224 024074 013703 046000
9225 024100 013703 177752
9226 024104 012737 001015 177746
9227 024112 005037 004542
9228 024116 032703 000004
9229 024122 001411
9230 024124 012737 000001 004542
9231 024132 004037 005352
9232 024136 000006
9233 024140 041030
9234 024142 041130
9235 024144 041146
9236 024146 004010
9237 024150 044000
9238 024152 044000
9239 024154 012737 001015 177746
9240
9241
9242
9243

```

3\$:

VERIFY THAT A READ TO MEMORY WHILE IN
BYPASS MODE WILL INVALIDATE CACHE

TST106:

1\$:

```

BIT #BIT02,R3
BEQ 3$
INC @#ERROR
JSR R0,@#SETEN
.WORD ^D8
.WORD SEN117
.WORD SEN118
.WORD SEN119
.WORD SEN121
JSR R0,(R0)
.WORD LOWSP
.WORD LOWSP
MOV #OFF,@#CCR

```

```

;LOOK FOR HIT
;NO HIT MEANS NO ERRORS
;SET ERROR FLAG
;REPORT ERROR

;BYPASS MODE TESTS
;HIGH CACHE LOCATION NOT INVALIDATED
;BY WRITE TO LOCATION IN BYPASS MODE
;USING VALID BITS SET B
;TAKE SELECTED ACTION ON ERROR
;LOOP ON ERROR
;LOOP ON TEST
;DISABLE CACHE

```

```

INC TID
JSR R4,RELCTL
.WORD TST107
MOV #5,@#CCR
MOV @#HIGHSP,R3
BIS #BIT09,@#CCR
MOV @#HIGHSP,R3
BIC #BIT09,@#CCR
MOV @#HIGHSP,R3
MOV @#CHR,R3
MOV #OFF,@#CCR
CLR @#ERROR
BIT #BIT02,R3
BEQ 1$
MOV #1,@#ERROR
JSR R0,@#SETEN
.WORD ^D6
.WORD SEN117
.WORD SEN122
.WORD SEN123
JSR R0,(R0)
.WORD LOWSP
.WORD LOWSP
MOV #OFF,@#CCR

```

```

;UPDATE TEST ID
;RELOCATE TEST TO LOW CACHE

;ENABLE HIGH CACHE
;TAG HIGH LOCATION
;ENTER BYPASS MODE
;INVALIDATE TAGGED LOCATION
;EXIT BYPASS MODE
;LOOK FOR READ MISS

;DISABLE CACHE
;RESET ERROR
;VERIFY MISS
;YES A MISS *YUCK A PUCK*
;SET ERROR FLAG
;REPORT ERROR

;BYPASS MODE TESTS
;READING TAGGED LOCATION IN BYPASS MODE
;CAUSED LOCATION TO INVALIDATE
;TAKE SELECTED ACTION ON ERROR
;LOOP ON ERROR
;LOOP ON TEST
;DISABLE CACHE

```



```

9245
9246
9247 024162 005267 154460
9248 024166 004467 161750
9249 024172 024346
9250 024174 012737 000011 177746
9251 024202 013703 044000
9252 024206 013703 000000
9253 024212 013703 000000
9254 024216 013737 177752 004542
9255 024224 012737 001015 177746
9256 024232 032737 000004 004542
9257 024240 001015
9258 024242 012737 000001 004542
9259 024250 004037 005352
9260 024254 000006
9261 024256 041160
9262 024260 041176
9263 024262 041216
9264 024264 004010
9265 024266 046000
9266 024270 046000
9267 024272 000425
9268 024274 042737 000777 004542
9269 024302 012737 000000 004554
9270 024310 013737 004542 004552
9271 024316 012737 000000 004550
9272 024324 005237 004556
9273 024330 004037 005352
927' 024334 000006
9275 024336 041160
9276 024340 041224
9277 024342 041242
9278 024344 000747
9279
9280
9281
9282
9283
9284
9285 024346 005267 154274
9286 024352 004467 161564
9287 024356 024540
9288 024360 012737 000011 177746
9289 024366 013703 044000
9290 024372 013703 004000
9291 024376 013703 004000
9292 024402 013737 177752 004542
9293 024410 012737 001015 177746
9294 024416 032737 000004 004542
9295 024424 001015
9296 024426 012737 000001 004542
9297 024434 004037 005352
9298 024440 000006
9299 024442 041160
9300 024444 041176

```

```

: SBTTL TAG BIT BASIC READ WRITE TESTS
: TEST WRITES AND READS ZERO FROM TAG STORE CHIPS
TST107: INC TID ;UPDATE TEST ID
JSR R4,RELCTH ;RELOCATE TEST TO HIGH CACHE
:WORD TST110
MOV #11,@CCR ;ENABLE LOW CACHE
MOV @LOWSP,R3 ;TAG LOW CACHE LOCATION
MOV @0,R3 ;TAG LOW 1K
MOV @0,R3 ;READ HIT TO LOW 1K
MOV @CHR,@ERROR ;SAVE HIT REGISTER CONTENTS
MOV #OFF,@CCR ;DISABLE CACHE
BIT #BIT02,@ERROR ;VERIFY HIT
BNE 1$ ;LOCATION WAS HIT
MOV #1,@ERROR ;SET ERROR FLAG
JSR R0,@SETEN ;REPORT ERROR
:WORD ^D6
:WORD SEN124 ;TAG BIT BASIC READ WRITE TESTS
:WORD SEN125 ;NO HIT FROM READ INTO MEMORY LOCATION
:WORD SEN126 ;ADDRESS 000000
2$: JSR R0,(R0) ;TAKE SELECTED ACTION ON ERROR
:WORD HIGHSP ;LOOP ON ERROR
:WORD HIGHSP ;LOOP ON TEST
BR TST110
1$: BIC #777,@ERROR ;MASK OFF HIT BITS
MOV #0,@ADD ;FAILING ADDRESS
MOV @ERROR,@BAD ;BAD DATA
MOV #0,@GOOD ;GOOD DATA
INC @GOODBD ;ERROR PRINT MODE
JSR R0,@SETEN ;REPORT ERROR
:WORD ^D6
:WORD SEN124 ;TAG BIT BASIC READ WRITE TESTS
:WORD SEN127 ;WRONG TAG READ FROM HIT REGISTER
:WORD SEN128 ;AS RESULT OF MEMORY READ
BR 2$

: VERIFY TAG BIT11 CAN BE WRITTEN A ONE
: WITH ALL OTHER TAG BITS WRITTEN ZERO
TST110: INC TID ;UPDATE TEST ID
JSR R4,RELCTH ;RELOCATE TEST TO HIGH CACHE
:WORD TST111
MOV #11,@CCR ;ENABLE LOW CACHE
MOV @LOWSP,R3 ;TAG LOW CACHE LOCATION
MOV @4000,R3 ;TAG LOW 2K
MOV @4000,R3 ;READ HIT TO LOW 2K
MOV @CHR,@ERROR ;SAVE HIT REGISTER CONTENTS
MOV #OFF,@CCR ;DISABLE CACHE
BIT #BIT02,@ERROR ;SAVE HIT REGISTER CONTENTS
BNE 1$
MOV #1,@ERROR ;SET ERROR FLAG
JSR R0,@SETEN ;REPORT ERROR
:WORD ^D6
:WORD SEN124 ;TAG BIT BASIC READ WRITE TESTS
:WORD SEN125 ;NO HIT FROM READ INTO MEMORY LOCATION

```

SEQ 0092

9301	024446	041256		
9302	024450	004010		
9303	024452	046000		
9304	024454	046000		
9305	024456	000430		
9306	024460	042737	000777	004542
9307	024466	012737	004000	004554
9308	024474	013737	004542	004552
9309	024502	012737	001000	004550
9310	024510	162737	001000	004542
9311	024516	005237	004556	
9312	024522	004037	005352	
9313	024526	000006		
9314	024530	041160		
9315	024532	041224		
9316	024534	041264		
9317	024536	000744		
9318				
9319				
9320				
9321				
9322				
9323				
9324	024540	005267	154102	
9325	024544	004467	161372	
9326	024550	024732		
9327	024552	012737	000011	177746
9328	024560	013703	044000	
9329	024564	013703	010000	
9330	024570	013703	010000	
9331	024574	013737	177752	004542
9332	024602	012737	001015	177746
9333	024610	032737	000004	004542
9334	024616	001015		
9335	024620	012737	000001	004542
9336	024626	004037	005352	
9337	024632	000006		
9338	024634	041160		
9339	024636	041176		
9340	024640	041302		
9341	024642	004010		
9342	024644	046000		
9343	024646	046000		
9344	024650	000430		
9345	024652	042737	000777	004542
9346	024660	013737	004542	004552
9347	024666	012737	010000	004554
9348	024674	012737	002000	004550
9349	024702	162737	002000	004542
9350	024710	005237	004556	
9351	024714	004037	005352	
9352	024720	000006		
9353	024722	041160		
9354	024724	041224		
9355	024726	041264		
9356	024730	000744		

```

2$: .WORD SEN129
    JSR R0,(R0)
    .WORD HIGHSP
    .WORD HIGHSP
    BR TST111
1$: BIC #777,2#ERROR
    MOV #4000,2#ADD
    MOV 2#ERROR,2#BAD
    MOV #1700,2#GOOD
    SUB #1000,2#ERROR
    INC 2#GOODBD
    JSR R0,2#SETEN
    .WORD ^D6
    .WORD SEN124
    .WORD SEN127
    .WORD SEN130
    BR 2$

;ADDRESS 004000
;TAKE SELECTED ACTION ON ERROR
;LOOP ON ERROR
;LOOP ON TEST

;MASK OFF HIT BITS
;FAILING ADDRESS
;BAD DATA
;GOOD DATA
;IF ANY BITS LEFT SET THEN ERROR
;BIT PRINT MODE
;REPORT ERROR

;TAG BIT BASIC READ WRITE TESTS
;WRONG TAG READ FROM HIT REGISTER
;MEMORY ADDRESS AND HIT REGISTER DATA

VERIFY TAG BIT12 CAN BE WRITTEN TO A ONE
WITH ALL OTHER TAG BITS WRITTEN TO ZERO
    INC TID
    JSR R4,RELCTH
    .WORD TST112
    MOV #11,2#CCR
    MOV 2#LOWSP,R3
    MOV 2#10000,R3
    MOV 2#10000,R3
    MOV 2#CHR,2#ERROR
    MOV #OFF,2#CCR
    BIT #BIT02,2#ERROR
    BNE 1$
    MOV #1,2#ERROR
    JSR R0,2#SETEN
    .WORD ^D6
    .WORD SEN124
    .WORD SEN125
    .WORD SEN131
2$: JSR R0,(R0)
    .WORD HIGHSP
    .WORD HIGHSP
    BR TST112
1$: BIC #777,2#ERROR
    MOV 2#ERROR,2#BAD
    MOV #10000,2#ADD
    MOV #2000,2#GOOD
    SUB #2000,2#ERROR
    INC 2#GOODBD
    JSR R0,2#SETEN
    .WORD ^D6
    .WORD SEN124
    .WORD SEN127
    .WORD SEN130
    BR 2$

;UPDATE TEST ID
;RELOCATE TEST TO HIGH CACHE

;ENABLE LOW CACHE
;TAG LOW CACHE LOCATION
;TAG LOW 4K
;READ HIT INTO LOW 4K
;SAVE HIT REGISTER CONTENTS
;DISABLE CACHE
;VERIFY HIT

;SET ERROR FLAG
;REPORT ERROR

;TAG BIT BASIC READ WRITE TESTS
;NO HIT FROM READ INTO MEMORY LOCATION
;ADDRESS 010000
;TAKE SELECTED ACTION ON ERROR
;LOOP ON ERROR
;LOOP ON TEST

;MASK OFF HIT BITS
;BAD DATA
;ADDRESS
;GOOD DATA
;IF NAY BITS LEFT SET THEN ERROR
;BIT PRINT MODE
;REPORT ERROR

;TAG BIT BASIC READ WRITE TESTS
;WRONG TAG READ FROM HIT REGISTER
;MEMORY ADDRESS AND HIT REGISTER DATA

```



```

: VERIFY TAG BIT14 CAN BE WRITTEN A ONE
: WITH ALL OTHER TAG BITS WRITTEN TO ZERO
TST113: INC TID ;UPDATE TEST ID
JSR R4,RELCTH ;RELOCATE TEST TO HIGH CACHE
.WORD TST114
MOV #11,@CCR ;ENABLE LOW CACHE
MOV #0,R3 ;TAG LOW CACHE LOCATION
MOV @#40000,R3 ;TAG LOW 8K
MOV @#40000,R3 ;AND HIT TO LOW 8K
MOV @#CHR,@#ERROR ;SAVE HIT REGISTER CONTENTS
MOV #OFF,@#CCR ;DISABLE CACHE
BIT #BIT02,@#ERROR ;VERIFY HIT
BNE 1$

```

CACHE DIAG.
CFKKAB.P11

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TAG BIT BASIC READ WRITE TESTS

D 8

SEQ 0094

9413	025204	012737	000001	004542
9414	025212	004037	005352	
9415	025216	000006		
9416	025220	041160		
9417	025222	041176		
9418	025224	041316		
9419	025226	004010		
9420	025230	046000		

2\$:

MOV #1, @#ERROR
JSR R0, @#SETEN
.WORD ^D6
.WORD SEN124
.WORD SEN125
.WORD SEN133
JSR R0, (R0)
.WORD HIGHSP

;SET ERROR FLAG
;REPORT ERROR

;TAG BIT BASIC READ WRITE TESTS
;NO HIT FROM READ INTO MEMORY LOCATION
;ADDRESS 040000
;TAKE SELECTED ACTION ON ERROR
;LOOP ON ERROR

CACHE DIAG.
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TAG BIT BASIC READ WRITE TESTS

SEQ 0095

9422	025232	046000				.WORD HIGHSP	;LOOP ON TEST
9423	025234	000430				BR TST114	
9424	025236	042737	000777	004542	1\$:	BIC #777,@#ERROR	;MASK OFF HIT BITS
9425	025244	012737	040000	004554		MOV #40000,@#ADD	;MEMORY ADDRESS
9426	025252	013737	004542	004552		MOV @#ERROR,@#BAD	;BAD DATA
9427	025260	012737	010000	004550		MOV #10000,@#GOOD	;GOOD DATA
9428	025266	162737	010000	004542		SUB #10000,@#ERROR	;ANY BITS LEFT SET THEN ERROR
9429	025274	005237	004556			INC @#GOODBD	;BIT PRINT MODE
9430	025300	004037	005352			JSR R0,@#SETEN	;REPORT ERROR
9431	025304	000006				.WORD ^D6	
9432	025306	041160				.WORD SEN124	;TAG BIT BASIC READ WRITE TESTS
9433	025310	041224				.WORD SEN127	;WRONG TAG READ FROM HIT REGISTER
9434	025312	041264				.WORD SEN130	;MEMORY ADDRESS AND HIT REGISTER DATA
9435	025314	000744				BR 2\$	
9436							
9437							
9438							
9439							
9440							
9441							
9442							
9443	025316	005267	153324			INC TID	;UPDATE TEST ID
9444	025322	105767	153334			TSTB \$ENV	;IS THIS APT MODE
9445	025326	001414				BEQ 11\$	;NO
9446	025330	105767	153327			TSTB \$ENV	;IS THIS AUTO SIZE
9447	025334	100011				BPL 11\$	;NO
9448	025336	105767	153330			TSTB \$MAMS1	;MORE THEN 32K ?
9449	025342	001006				BNE 11\$	;YES
9450	025344	026737	153324	100000		CMP \$MADR1,@#100000	;MORE THEN 16K ?
9451	025352	101002				BHI 11\$	;YES
9452	025354	000167	000204			JMP MAGPRE	;CAN'T RUN TEST
9453	025360	005067	157154		11\$:	CLR ITTRAP	;RESET TRAP FLAG
9454	025364	013703	100000			MOV @#100000,R3	;IS MEMORY AVAILABLE
9455	025370	005767	157144			TST ITTRAP	;NO MEMORY IF FLAG SET
9456	025374	001402				BEQ 10\$	
9457	025376	000167	000162			JMP MAGPRE	;NO MEMORY
9458	025402	004467	160534		10\$:	JSR R4,RELCTH	;RELOCATE TEST TO HIGH CACHE
9459	025406	025564				.WORD MAGPRE	
9460	025410	012737	000011	177746		MOV #11,@#CCR	;ENABLE LOW CACHE
9461	025416	013703	044000			MOV @#LOWSP,R3	;TAG LOW CACHE
9462	025422	013703	100000			MOV @#100000,R3	;TAG LOW 16K
9463	025426	013703	100000			MOV @#100000,R3	;READ HIT TO LOW CACHE
9464	025432	013737	177752	004542		MOV @#CHR,@#ERROR	;SAVE HIT REGISTER CONTENTS
9465	025440	012737	001015	177746		MOV #OFF,@#CCR	;DISABLE CACHE
9466	025446	032737	000004	004542		BIT #BIT02,@#ERROR	;VERIFY HIT
9467	025454	001015				BNE 1\$	
9468	025456	012737	000001	004542		MOV #1,@#ERROR	;SET ERROR FLAG
9469	025464	004037	005352			JSR R0,@#SETEN	;REPORT ERROR
9470	025470	000006				.WORD ^D6	
9471	025472	041160				.WORD SEN124	;TAG BIT BASIC READ WRITE TESTS
9472	025474	041176				.WORD SEN125	;NO HIT FROM READ INTO MEMORY LOCATION
9473	025476	041324				.WORD SEN134	;ADDRESS 100000
9474	025500	004010			2\$:	JSR R0,(R0)	;TAKE SELECTED ACTION ON ERROR
9475	025502	046000				.WORD HIGHSP	;LOOP ON ERROR
9476	025504	046000				.WORD HIGHSP	;LOOP ON TEST
9477	025506	000426				BR MAGPRE	

THIS TEST WILL ABORT IF LESS THAN 20K OF MEMORY
 VERIFY TAG BIT15 CAN BE WRITTEN A ONE
 WITH ALL OTHER TAG BIT WRITTEN TO ZERO

TST114:

11\$:

10\$:

2\$:

```

9478 025510 042737 000777 004542      1$: BIC #777,@#ERROR      ;MASK OFF HIT BITS
9479 025516 012737 100000 004554      MOV #100000,@#ADD      ;MEMORY ADDRESS
9480 025524 013737 004542 004552      MOV @#ERROR,@#BAD     ;BAD DATA
9481 025532 012737 020000 004550      MOV #20000,@#GOOD     ;GOOD DATA
9482 025540 162737 020000 004542      SUB #20000,@#ERROR     ;IF ANY BITS LEFT SET THEN ERROR
9483 025546 004037 005352              JSR R0,@#SETEN         ;REPORT ERROR
9484 025552 000006              .WORD #D6
9485 025554 041160              .WORD SEN124
9486 025556 041224              .WORD SEN127
9487 025560 041264              .WORD SEN130
9488 025562 000746              BR 2$
9489
9490
9491
9492
9493 025564 012767 077406 144506      MAGPRE: MOV #77406,KPDR0      ;ALLOW ALL ACCESS TO KERNEL PAGE 0
9494 025572 012767 077406 144502      MOV #77406,KPDR1      ;ALLOW ALL ACCESS TO KERNEL PAGE 1
9495 025600 012767 077406 144476      MOV #77406,KPDR2      ;ALLOW ALL ACCESS TO KERNEL PAGE 2
9496 025606 012767 077406 144472      MOV #77406,KPDR3      ;ALLOW ALL ACCESS TO KERNEL PAGE 3
9497 025614 012767 077406 144466      MOV #77406,KPDR4      ;ALLOW ALL ACCESS TO KERNEL PAGE 4
9498 025622 012767 077406 144462      MOV #77406,KPDR5      ;ALLOW ALL ACCESS TO KERNEL PAGE 5
9499 025630 012767 077406 144456      MOV #77406,KPDR6      ;ALLOW ALL ACCESS TO KERNEL PAGE 6
9500 025636 012767 077406 144452      MOV #77406,KPDR7      ;ALLOW ALL ACCESS TO KERNEL PAGE 7
9501 025644 012767 000000 144466      MOV #0,KPAR0          ;MAP PAGE 0 FOR 0-4K
9502 025652 012767 000200 144462      MOV #200,KPAR1        ;MAP PAGE 1 FOR 4-8K
9503 025660 012767 000400 144456      MOV #400,KPAR2        ;MAP PAGE 2 FOR 8-8K
9504 025666 012767 000600 144452      MOV #600,KPAR3        ;MAP PAGE 3 FOR 12-16K
9505 025674 012767 007600 144454      MOV #7600,KPAR7       ;MAP PAGE 7 FOR 124-128K
9506
9507
9508
9509
9510
9511
9512
9513
9514 025702 005267 152740      TST115: INC TID          ;UPDATE TEST ID
9515 025706 105767 152750      TSTB $ENV            ;IS THIS APT MODE
9516 025712 001410              BEQ 11$               ;NO
9517 025714 105767 152743      TSTB $ENVM           ;IS THIS AUTO SIZE
9518 025720 100005              BPL 11$               ;NO
9519 025722 105767 152744      TSTB $MAMS1          ;MORE THEN 32K
9520 025726 001002              BNE 11$               ;YES
9521 025730 000167 000232      JMP TST116
9522 025734 012767 000001 151630      11$: MOV #1,SRO        ;ENABLE MEMORY MANAGEMENT
9523 025742 012767 002000 144400      MOV #2000,KPAR4      ;MAP PAGE 4 FOR 32-36K
9524 025750 005067 156564      CLR ITTRAP           ;RESET TRAP FLAG
9525 025754 013703 100000      MOV @#100000,R3      ;ANY MEMORY IN THIS LOCATION
9526 025760 005767 156554      TST ITTRAP           ;LOOK FOR TRAP
9527 025764 001404              BEQ 5$               ;NO TRAP
9528 025766 005067 151600      CLR SRO              ;DISABLE MEMORY MANAGEMENT
9529 025772 000167 000170      JMP TST116
9530 025776 004467 160140      5$: JSR R4,RELCTH      ;RELOCATE TEST TO HIGH CACHE
9531 026002 026166              .WORD TST116
9532 026004 012737 000011 177746      MOV #11,@#CCR        ;ENABLE LOW CACHE
9533 026012 013703 044000      MOV @#LOWSP,R3       ;TAG LOW CACHE
```


9534	026016	013703	100000	
9535	026022	013703	100000	
9536	026026	013737	177752	004542
9537	026034	012737	001015	177746
9538	026042	032737	000004	004542
9539	026050	001017		
9540	026052	012737	000001	004542
9541	026060	004037	005352	
9542	026064	000006		
9543	026066	041160		
9544	026070	041176		
9545	026072	041332		
9546	026074	004010		
9547	026076	046000		
9548	026100	046000		
9549	026102	005037	177572	
9550	026106	000427		
9551	026110	042737	000777	004542
9552	026116	012737	000000	004554
9553	026124	013737	004542	004552
9554	026132	012737	040000	004550
9555	026140	162737	040000	004542
9556	026146	004037	005352	
9557	026152	000010		
9558	026154	041160		
9559	026156	041224		
9560	026160	041264		
9561	026162	041332		
9562	026164	000743		
9563				
9564				
9565				
9566				
9567				
9568				
9569				
9570				
9571	026166	005267	152454	
9572	026172	105767	152464	
9573	026176	001411		
9574	026200	105767	152457	
9575	026204	100006		
9576	026206	122767	000002	152456
9577	026214	101002		
9578	026216	000167	000230	
9579	026222	012767	004000	144120
9580	026230	012767	000001	151334
9581	026236	005067	156276	
9582	026242	013703	100000	
9583	026246	005767	156266	
9584	026252	001403		
9585	026254	005067	151312	
9586	026260	000474		
9587	026262	004467	157654	
9588	026266	026452		
9589	026270	012737	000011	177746

```
MOV @#100000,R3      ;TAG LOW 32K
MOV @#100000,R3      ;READ HIT TO LOW 32K
MOV @#CHR,@#ERROR    ;SAVE HIT REGISTER CONTENTS
MOV #OFF,@#CCR       ;DISABLE CACHE
BIT #BIT02,@#ERROR   ;VERIFY HIT
BNE 1$
MOV #1,@#ERROR       ;SET ERROR FLAG
JSR R0,@#SETEN       ;REPORT ERROR
;WORD ^D6
;WORD SEN124
;WORD SEN125
;WORD SEN135
2$: JSR R0,(R0)
;WORD HIGHSP
;WORD HIGHSP
CLR @#SR0
BR TST116
1$: BIC #777,@#ERROR  ;MASK OFF HIT BITS
MOV #0,@#ADD         ;MEMORY ADDRESS
MOV @#ERROR,@#BAD    ;BAD DATA
MOV #40000,@#GOOD    ;GOOD DATA
SUB #40000,@#ERROR   ;IF ANY BITS LEFT SET THEN ERROR
JSR R0,@#SETEN       ;REPORT ERROR
;WORD ^D8
;WORD SEN124
;WORD SEN127
;WORD SEN130
;WORD SEN135
BR 2$
;TAG BIT BASIC READ WRITE TESTS
;NO HIT FROM READ INTO MEMORY LOCATION
;ADDRESS 200000
;TAKE SELECTED ACTION ON ERROR
;LOOP ON ERROR
;LOOP ON TEST
;DISABLE MEMORY MANAGEMENT
;MASK OFF HIT BITS
;MEMORY ADDRESS
;BAD DATA
;GOOD DATA
;IF ANY BITS LEFT SET THEN ERROR
;REPORT ERROR
;TAG BIT BASIC READ WRITE TESTS
;WRONG TAG READ FROM HIT REGISTER
;MEMORY ADDRESS AND HIT REGISTER DATA
;ADDRESS 200000
```

```
THIS TEST USES MEMORY MANAGEMENT
TEST WILL ABORT IF LESS THEN 68K OF MEMORY
VERIFY TAG BIT17 CAN BE WRITTEN TO A ONE
WITH ALL OTHER TAG BITS WRITTEN TO ZERO
TST116: INC TID      ;UPDATE TEST ID
TSTB $ENV      ;IS THIS APT MODE
BEQ 11$        ;NO
TSTB $ENVM     ;IS THIS AUTO SIZE
BPL 11$        ;NO
CMPB #2,$MAMS1 ;MORE THEN 64K ?
BHI 11$        ;YES
JMP TST117
11$: MOV #4000,KPAR4 ;MAP PAGE 4 FOR 64-64K
MOV #1,SR0     ;ENABLE MEMORY MANAGEMENT
CLR ITTRAP    ;RESET TRAP FLAG
MOV @#100000,R3 ;ANY MEMORY IN THIS LOCATION
TST ITTRAP    ;LOOK FOR TRAP
BEQ 5$        ;NO TRAP
CLR SR0       ;DISABLE MEMORY MANAGEMENT
BR TST117
5$: JSR R4,RELCTH ;RELOCATE TEST TO HIGH CACHE
;WORD TST117
MOV #11,@#CCR ;ENABLE LOW CACHE
```

```

9590 026276 013703 044000
9591 026302 013703 100000
9592 026306 013703 100000
9593 026312 013737 177752 004542
9594 026320 012737 001015 177746
9595 026326 032737 000004 004542
9596 026334 001017
9597 026336 012737 000001 004542
9598 026344 004037 005352
9599 026350 000006
9600 026352 041160
9601 026354 041176
9602 026356 041340
9603 026360 004010
9604 026362 046000
9605 026364 046000
9606 026366 005037 177572
9607 026372 000427
9608 026374 042737 000777 004542
9609 026402 012737 000000 004554
9610 026410 013737 004542 004552
9611 026416 012737 100000 004550
9612 026424 162737 100000 004542
9613 026432 004037 005352
9614 026436 000010
9615 026440 041160
9616 026442 041224
9617 026444 041264
9618 026446 041340
9619 026450 000743
9620
9621
9622
9623

```

2\$:

1\$:

```

MOV @#LOWSP,R3
MOV @#100000,R3
MOV @#100000,R3
MOV @#CHR,@#ERROR
MOV #OFF,@#CCR
BIT #BIT02,@#ERROR
BNE 1$
MOV #1,@#ERROR
JSR R0,@#SETEN
.WORD ^D6
.WORD SEN124
.WORD SEN125
.WORD SEN136
JSR R0,(R0)
.WORD HIGHSP
.WORD HIGHSP
CLR @#SR0
BR TST117
BIC #777,@#ERROR
MOV #0,@#ADD
MOV @#ERROR,@#BAD
MOV #100000,@#GOOD
SUB #100000,@#ERROR
JSR R0,@#SETEN
.WORD ^D8
.WORD SEN124
.WORD SEN127
.WORD SEN130
.WORD SEN136
BR 2$

```

```

;TAG LOW CACHE
;TAG LOW 64K
;READ HIT TO LOW 64K
;SAVE HIT REGISTER CONTENTS
;DISABLE CACHE
;VERIFY HIT

;SET ERROR FLAG
;REPORT ERROR

;TAG BIT BASIC READ WRITE TESTS
;NO HIT FROM READ INTO MEMORY LOCATION
;ADDRESS 400000
;TAKE SELECTED ACTION ON ERROR
;LOOP ON ERROR
;LOOP ON TEST
;DISABLE MEMORY MANAGEMENT

;MASK OFF HIT BITS
;MEMORY ADDRESS
;BAD DATA
;GOOD DATA
;IF NAY BITS LEFT SET THEN ERROR
;REPORT ERROR

;TAG BIT BASIC READ WRITE TESTS
;WRONG TAG READ FROM HIT REGISTER
;MEMORY ADDRESS AND HIT REGISTER DATA
;ADDRESS 400000

```


.SBTTL CACHE MEMORY ADDRESS TEST

9625
9626
9627
9628
9629
9630
9631
9632
9633
9634 026452 005267 152170
9635 026456 004467 157432
9636 026462 027204
9637 026464 012701 002000
9638 026470 012702 046000
9639 026474 010122
9640 026476 062701 000002
9641 026502 020227 050000
9642 026506 001372
9643 026510 012737 000005 177746
9644 026516 012702 046000
9645 026522 012203
9646 026524 020227 050000
9647 026530 001374
9648 026532 005037 177744
9649 026536 012701 050000
9650 026542 012702 046000
9651 026546 000413
9652 026550 005037 177744
9653 026554 012203
9654 026556 052737 000210 177746
9655 026564 013721 177744
9656 026570 042737 000200 177746
9657 026576 012705 044064
9658 026602 012737 001015 177746
9659 026610 011525
9660 026612 020527 044124
9661 026616 001374
9662 026620 012737 000005 177746
9663 026626 020227 050000
9664 026632 001346
9665 026634 012701 050000
9666 026640 012703 002000
9667 026644 012702 046000
9668 026650 042711 100000
9669 026654 005711
9670 026656 001012
9671 026660 062701 000002
9672 026664 062702 000002
9673 026670 062703 000002
9674 026674 020227 050000
9675 026700 001363
9676 026702 000450
9677 026704 032711 000040
9678 026710 001411
9679 026712 016205 004000
9680 026716 052737 002000 177746

:
: VERIFY CACHE MEMORY ADDRESS LINES BY WRITING
: CACHE ADDRESS INTO CACHE DATA

TST117: INC TID ;UPDATE TEST ID
JSR R4,RELCTL ;RELOCATE TEST TO LOW CACHE
.WORD TST120
MOV #2000,R1 ;CACHE ADDRESS FOR DATA
MOV #HIGHSP,R2 ;HIGH CACHE PATTERN BLOCK
2\$: MOV R1,(R2)+ ;GENERATE PATTERN
ADD #2,R1
CMP R2,#HIGHSP+2000
BNE 2\$
MOV #5,#CCR ;ENABLE HIGH CACHE
MOV #HIGHSP,R2 ;TAG HIGH BLOCK #2
3\$: MOV (R2)+,R3 ;CAUSE HIGH LOCATION TO TAG
CMP R2,#HIGHSP+2000
BNE 3\$
CLR #CMPE ;RESET CACHE ERROR REGISTER
MOV #LOW1,R1 ;POINTER TO WRITE WRONG FLAG BLOCK
MOV #HIGHSP,R2 ;POINTER TO TAGGED CACHE
BR 22\$
4\$: CLR #CMPE ;RESET ERROR REGISTER
MOV (R2)+,R3 ;CAUSE READ TO CACHE
BIS #BIT07+10,#CCR ;ENABLE ABORT FOR ERROR READ
MOV #CMPE,(R1)+ ;SAVE ERROR INFO
BIC #BIT07,#CCR ;DISABLE ABORT
22\$: MOV #4\$-TST117-12+LOWSP,R5 ;UNTAG LOW CACHE
MOV #OFF,#CCR ;BYPASS MODE TO INVALIDATE
20\$: MOV (R5),(R5)+
CMP R5,#20\$-TST117-12+LOWSP
BNE 20\$
MOV #5,#CCR ;ENABLE HIGH CACHE
CMP R2,#HIGHSP+2000
BNE 4\$
MOV #LOW1,R1 ;POINTER TO WRITE WRONG FLAG
MOV #2000,R3 ;EXPECTED DATA
MOV #HIGHSP,R2 ;POINTER TO TAGGED CACHE
5\$: BIC #BIT15,(R1) ;MASK OFF BIT 15
TST (R1) ;ANY ERROR
BNE 6\$;YES
9\$: ADD #2,R1 ;UPDATE POINTERS
ADD #2,R2
ADD #2,R3
CMP R2,#HIGHSP+2000 ;PASS COMPLETE YET
BNE 5\$;NO
BR 12\$
6\$: BIT #BIT05,(R1) ;ANY TAG PARITY ERROR
BEQ 7\$
MOV 4000(R2),R5 ;UNTAG LOCATION
BIS #BIT10,#CCR ;ENABLE WRITE WRONG TAG

9681	026724	011205			MOV (R2),R5	;TAG LOCATION WRONG PARITY
9682	026726	042737	002000	177746	BIC #BIT10,@#CCR	;DISABLE WRITE WRONG
9683	026734	022711	000300		7\$: CMP #300,(R1)	;IF BOTH BYTES FAILED WRITE WRONG WORD
9684	026740	101010			BHI 8\$	
9685	026742	052737	000100	177746	BIS #BIT06,@#CCR	;ENABLE WRITE WRONG DATA
9686	026750	010312			MOV R3,(R2)	
9687	026752	012737	000005	177746	10\$: MOV #5,@#CCR	;DISABLE WRITE WRONG
9688	026760	000737			BR 9\$	
9689	026762	032711	000100		8\$: BIT #BIT06,(R1)	;ANY LOW BYTE ERROR
9690	026766	001405			BEQ 19\$	;NO
9691	026770	052737	000100	177746	BIS #BIT06,@#CCR	;ENABLE WRITE WRONG DATA
9692	026776	110312			MOVB R3,(R2)	
9693	027000	000764			BR 10\$	
9694	027002	032711	000200		19\$: BIT #BIT07,(R1)	;ANY HIGH BYTE ERROR
9695	027006	001761			BEQ 10\$	
9696	027010	052737	000100	177746	BIS #BIT06,@#CCR	;ENABLE WRITE WRONG DATA
9697	027016	110362	000001		MOVB R3,1(R2)	
9698	027022	000753			BR 10\$	
9699	027024	010703			12\$: MOV PC,R3	;UNTAG LOW CACHE
9700	027026	014313			13\$: MOV -(R3),(R3)	;CAUSE WRITE IN BYPASS MODE
9701	027030	020327	044000		CMP R3,#LOWSP	
9702	027034	001374			BNE 13\$	
9703	027036	012701	050000		MOV #LOW1,R1	;DATA FOR COMPARE
9704	027042	012702	046000		MOV #HIGHSP,R2	;POINTER TO TAGGED CACHE
9705	027046	012737	000005	177746	14\$: MOV #5,@#CCR	;ENABLE HIGH CACHE
9706	027054	005037	177744		CLR @#CMPE	;RESET ERROR REGISTER
9707	027060	012221			30\$: MOV (R2)+,(R1)+	;READ PATTERN FROM CACHE
9708	027062	020227	050000		CMP R2,#HIGHSP+2000	
9709	027066	001374			BNE 30\$	
9710	027070	012737	001015	177746	MOV #OFF,@#CCR	;DISABLE CACHE
9711	027076	012701	050000		MOV #LOW1,R1	;DATA READ
9712	027102	012702	002000		MOV #2000,R2	;DATA WRITTEN
9713	027106	021102			21\$: CMP (R1),R2	
9714	027110	001010			BNE 23\$	
9715	027112	062701	000002		24\$: ADD #2,R1	
9716	027116	062702	000002		ADD #2,R2	
9717	027122	020127	052000		CMP R1,#LOW1+2000	
9718	027126	001367			BNE 21\$	
9719	027130	000422			BR 25\$	
9720	027132	012737	000001	004542	23\$: MOV #1,@#ERROR	;SET ERROR FLAG
9721	027140	010237	004554		MOV R2,@#ADD	;FAILING CACHE ADDRESS
9722	027144	010237	004550		MOV R2,@#GOOD	;EXPECTED DATA
9723	027150	011137	004552		MOV (R1),@#BAD	;DATA READ
9724	027154	005237	004556		INC @#GOODBD	;ENTER DATA PRINT MODE
9725	027160	004037	005352		JSR R0,@#SETEN	;REPORT ERROR
9726	027164	000006			.WORD ^D6	
9727	027166	041346			.WORD SEN137	;CACHE MEMORY ADDRESS TEST
9728	027170	041360			.WORD SEN138	;WRITING CACHE ADDRESS INTO CACHE DATA
9729	027172	041376			.WORD SEN139	;CACHE MEMORY LOCATION AND DATA
9730	027174	000746			BR 24\$	
9731	027176	004010			25\$: JSR R0,(R0)	;TAKE SELECTED ACTION ON ERROR
9732	027200	044362			.WORD 14\$-TST117-12+LOWSP	;LOOP ON ERROR
9733	027202	044362			.WORD 14\$-TST117-12+LOWSP	;LOOP ON TEST
9734						
9735						
9736						

CACHE DIAG.
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UNIBUS EXERCISER DMA TEST

SEQ 0101

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9738      .SBTTL UNIBUS EXERCISER DMA TEST
9739      :      CHECK THAT DMA WRITE INVALIDATES CACHE
9740
9741      027204 005267 151436      TST120:      INC TID      ;UPDATE TEST ID
9742      027210 004467 156700      JSR R4,RELCTL    ;RELOCATE TEST TO HIGH CACHE
9743      027214 027442      .WORD TST121
9744      027216 005037 004540      CLR @#ITTRAP    ;RESET TRAP FLAG
9745      027222 005737 170006      TST @#BECR1      ;LOOK FOR UNIBUS EXERCISER
9746      027226 005737 004540      TST @#ITTRAP    ;LOOK FOR TRAP
9747      027232 001402      BEQ 10$
9748      027234 000167 000202      JMP TST121
9749      027240 005737 000650      10$:      TST @#SPASS    ;PRINT ON FIRST PASS ONLY
9750      027244 001004      BNE 11$
9751      027246 012702 004562      MOV #NOUBE,R2
9752      027252 004737 006064      JSR PC,@#TYPE
9753      027256 012737 000005 177746      11$:      MOV #5,@#CCR      ;ENABLE HIGH CACHE
9754      027264 012701 052000      MOV #HIGH1,R1    ;TAG HIGH CACHE BLOCK #2
9755      027270 012102      1$:      MOV (R1)+,R2      ;CAUSE WRITE TO CACHE
9756      027272 020127 054000      CMP R1,#HIGH1+2000
9757      027276 001374      BNE 1$
9758      027300 012701 046000      MOV #HIGHSP,R1    ;TAG HIGH BLOCK #1
9759      027304 012102      2$:      MOV (R1)+,R2      ;CAUSE WRITE TO CACHE
9760      027306 020127 050000      CMP R1,#HIGHSP+2000
9761      027312 001374      BNE 2$
9762      027314 012737 046000 170004      MOV #HIGHSP,@#BEBA    ;EXER. ADDRESS
9763      027322 012737 177000 170002      MOV #-1000,@#BECC    ;EXER. TRANSFER COUNT
9764      027330 012737 177777 170000      MOV #177777,@#BEDA    ;DATA FOR WRITE
9765      027336 012737 000000 170016      MOV #0,@#BECR2      ;CONTROL REGISTER #2
9766      027344 012737 003045 170006      MOV #3045,@#BECR1    ;CONTROL REGISTER #1
9767      027352 105737 170006      3$:      TSTB @#BECR1    ;WAIT FOR EXER. TO COMPLETE
9768      027356 100375      BPL 3$
9769      027360 012701 046000      MOV #HIGHSP,R1    ;LOOK FOR READ HITS NOW
9770      027364 012102      4$:      MOV (R1)+,R2      ;READ PREV TAGGED LOCATIONS
9771      027366 053737 177752 004542      BIS @#CHR,@#ERROR    ;SAVE HIT REGISTER
9772      027374 020127 050000      CMP R1,#HIGHSP+2000
9773      027400 001371      BNE 4$
9774      027402 042737 177700 004542      BIC #177700,@#ERROR    ;MASK FOR HITS ONLY
9775      027410 012737 001015 177746      MOV #OFF,@#CCR      ;DISABLE CACHE
9776      027416 004037 005352      JSR R0,@#SETEN      ;REPORT ERROR IF ANY
9777      027422 000010      .WORD *D8
9778      027424 041412      .WORD SEN140    ;UNIBUS EXERCISER DMA TEST
9779      027426 041424      .WORD SEN141    ;TAGGED CACHE DID NOT INVALIDATE BY DMA WRITE
9780      027430 037330      .WORD SEN56      ;TESTING IN HIGH CACHE
9781      027432 041446      .WORD SEN142    ;USING UNIBUS EXERCISER MODULE
9782      027434 004010      JSR R0,(R0)      ;TAKE SELECTED ACTION ON ERROR
9783      027436 044000      .WORD LOWSP    ;LOOP ON ERROR
9784      027440 044000      .WORD LOWSP    ;LOOP ON TEST
9785
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9788
9789      .SBTTL DATA BIT MARCH PATTERN TEST
9790      :      TEST OPERATES IN HIGH CACHE FOR TESTING LOW CACHE
9791      :      TEST WRITES BACKGROUND OF ALL ZEROS
9792      :      READ A LOCATION STARTING AT CACHE ADDRESS 0000
9793      :      COMPLEMENTS DATA

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9806 027442 005267 151200
9807 027446 004467 156470
9808 027452 030564
9809 027454 005037 004542
9810 027460 005037 005064
9811 027464 012737 000011 177746
9812 027472 012701 050000
9813 027476 012103
9814 027500 022701 052000
9815 027504 001374
9816 027506 012701 044000
9817 027512 005021
9818 027514 020127 046000
9819 027520 001374
9820 027522 012701 044000
9821 027526 012702 052000
9822 027532 005037 177744
9823 027536 012103
9824 027540 052737 000215 177746
9825 027546 013722 177744
9826 027552 012737 000011 177746
9827 027560 020127 046000
9828 027564 001362
9829 027566 012701 044000
9830 027572 012702 052000
9831 027576 005712
9832 027600 001010
9833 027602 062702 000002
9834 027606 062701 000002
9835 027612 020127 046000
9836 027616 001367
9837 027620 000454
9838 027622 032712 000040
9839 027626 001411
9840 027630 016103 004000
9841 027634 052737 002000 177746
9842 027642 011103
9843 027644 042737 002000 177746
9844 027652 032712 000100
9845 027656 001410
9846 027660 052737 000100 177746
9847 027666 112711 000000
9848 027672 042737 000100 177746
9849 027700 032712 000200

WRITES THE COMPLEMENT TO CACHE
READS COMPLEMENTED DATA AND ERROR CHECKS
PROCEEDS TO NEXT CACHE LOCATION
AFTER ALL HIGH CACHE HAS BIN WRITTEN TO COMPLEMENT
TEST THEN STARTS READING FROM LAST LOCATION
COMPLEMENTS DATA
WRITES COMPLEMENTED DATA TO CACHE
READS AND ERROR CHECKS DATA
PROCEEDS TO NEXT LOWER LOCATION
UNTIL START OF HIGH CACHE

TST121:

INC TID ;UPDATE TEST ID
JSR R4,RELCTH ;RELOCATE TEST TO HIGH CACHE
.WORD TST122
CLR @#ERROR ;RESET ERROR FLAG
CLR @#LOPERR ;RESET LOOP ON TEST FLAG
MOV #11,@#CCR ;ENABLE LOW CACHE
MOV #LOW1,R1 ;TAG LOW BLOCK #1
1\$: MOV (R1)+,R3 ;CAUSE READ TO LOW BLOCK
CMP #LOW1+2000,R1
BNE 1\$
MOV #LOWSP,R1 ;WRITE BACKGROUND TO LOW CACHE
2\$: CLR (R1)+ ;CAUSE READ TO TAG ,THEN WRITE BACKGROUND
CMP R1,#LOWSP+2000
BNE 2\$
MOV #LOWSP,R1 ;ADDRESS OF TEST BLOCK
MOV #HIGH1,R2 ;ADDRESS OF ERROR BLOCK
3\$: CLR @#CMPE ;RESET ERROR REGISTER
MOV (R1)+,R3 ;READ BACKGROUND SAVE ERROR INFO
BIS #215,@#CCR ;SET ABORT FOR ERROR READ
MOV @#CMPE,(R2)+ ;SAVE ERROR INFO.
MOV #11,@#CCR ;DISABLE ABORT
CMP R1,#LOWSP+2000
BNE 3\$
MOV #LOWSP,R1 ;WRITE BACKGROUND
MOV #HIGH1,R2
33\$: TST (R2) ;ANY ERROR FOR LOCATION
BNE 4\$;YES
9\$: ADD #2,R2 ;POINT TO NEXT
ADD #2,R1
CMP R1,#LOWSP+2000
BNE 33\$
BR 10\$
4\$: BIT #BIT05,(R2) ;ANY TAG ERROR
BEQ 5\$
MOV 4000(R1),R3 ;UNTAG LOCATION
BIS #BIT10,@#CCR ;ENABLE WRITE WRONG TAG
MOV (R1),R3 ;TAG LOCATION WRONG
BIC #BIT10,@#CCR ;DISABLE WRITE WRONG TAG
5\$: BIT #BIT06,(R2) ;ANY LOW BYTE FAILURE
BEQ 6\$;NO
BIS #BIT06,@#CCR ;ENABLE WRITE WRONG DATA
MOVB #0,(R1) ;WRITE WRONG DATA LOW BYTE
BIC #BIT06,@#CCR ;DISABLE WRITE WRONG DATA
6\$: BIT #BIT07,(R2) ;ANY HIGH BYTE FAILURE

CACHE DIAG.
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DATA BIT MARCH PATTERN TEST

SEQ 0103

9850	027704	001406				BEQ 7\$	
9851	027706	052737	000100	177746		BIS #BIT06,@#CCR	;WRITE WRONG DATA
9852	027714	112761	000000	000001		MOVB #0,1(R1)	;WRITE WRONG DATA HIGH BYTE
9853	027722	012737	001015	177746	7\$:	MOV #OFF,@#CCR	;DISABLE CACHE
9854	027730	010703				MOV PC,R3	;CORRECT WRONG PARITY HIGH
9855	027732	014313			8\$:	MOV -(R3),(R3)	
9856	027734	020327	046146			CMP R3,#4\$-TST121-12+HIGHSP	
9857	027740	001374				BNE 8\$	
9858	027742	012737	000011	177746		MOV #11,@#CCR	;ENABLE LOW CACHE
9859	027750	000714				BR 9\$	
9860	027752	012701	044000		10\$:	MOV #LOWSP,R1	;START TEST
9861	027756	012702	052000			MOV #HIGH1,R2	
9862	027762	011103			11\$:	MOV (R1),R3	;READ DATA
9863	027764	005103				COM R3	;COMPLEMENT DATA
9864	027766	010311				MOV R3,(R1)	;WRITE DATA
9865	027770	005037	177744			CLR @#CMPE	;RESET ERROR REGISTER
9866	027774	011112				MOV (R1),(R2)	;READ COMP. DATA , SAVE
9867	027776	005737	177744			TST @#CMPE	;ANY ERRORS
9868	030002	001010				BNE 12\$	;YES
9869	030004	062701	000002		16\$:	ADD #2,R1	;ADJ. POINTER
9870	030010	062702	000002			ADD #2,R2	;ADJ. POINTER
9871	030014	020127	046000			CMP R1,#LOWSP+2000	
9872	030020	001360				BNE 11\$	
9873	030022	000453				BR 21\$	
9874	030024	052737	000215	177746	12\$:	BIS #215,@#CCR	;SET ABORT FOR ERROR READ
9875	030032	013705	177744			MOV @#CMPE,R5	;SAVE ERROR
9876	030036	012737	000011	177746		MOV #11,@#CCR	;DISABLE ABORT
9877	030044	032705	000100			BIT #BIT06,R5	;ANY LOW BYTE ERROR
9878	030050	001407				BEQ 13\$	;NO
9879	030052	052737	000100	177746		BIS #BIT06,@#CCR	;ENABLE WRITE WRONG DATA
9880	030060	110311				MOVB R3,(R1)	;WRITE WRONG LOW BYTE
9881	030062	042737	000100	177746		BIC #BIT06,@#CCR	;DISABLE WRITE WRONG
9882	030070	032705	000200		13\$:	BIT #BIT07,R5	;ANY HIGH BYTE ERROR
9883	030074	001411				BEQ 14\$	;NO
9884	030076	000303				SWAB R3	
9885	030100	052737	000100	177746		BIS #BIT06,@#CCR	;ENABLE WRITE WRONG DATA
9886	030106	110361	000001			MOVB R3,1(R1)	;WRITE WRONG DATA HIGH BYTE
9887	030112	042737	000100	177746		BIC #BIT06,@#CCR	;DISABLE WRITE WRONG
9888	030120	012737	001015	177746	14\$:	MOV #OFF,@#CCR	;DISABLE CACHE
9889	030126	010705				MOV PC,R5	;CORRECT WRONG PARITY HIGH CACHE
9890	030130	014515			15\$:	MOV -(R5),(R5)	
9891	030132	020527	046350			CMP R5,#12\$-TST121-12+HIGHSP	
9892	030136	001374				BNE 15\$	
9893	030140	012737	000011	177746		MOV #11,@#CCR	;ENABLE LOW CACHE
9894	030146	011112				MOV (R1),(R2)	;READ DATA
9895	030150	000715				BR 16\$	
9896	030152	012737	001015	177746	21\$:	MOV #OFF,@#CCR	;DISABLE CACHE
9897	030160	012701	052000			MOV #HIGH1,R1	;READ AND REPORT ERROR
9898	030164	012737	177777	004550	17\$:	MOV #177777,@#GOOD	;GOOD DATA
9899	030172	010137	004554			MOV R1,@#ADD	;MEMORY ADDRESS
9900	030176	162737	052000	004554		SUB #HIGH1,@#ADD	;CACHE ADDRESS
9901	030204	012137	004552			MOV (R1)+,@#BAD	;READ DATA
9902	030210	013737	004552	004542		MOV @#BAD,@#ERROR	;ERROR CHECK
9903	030216	005237	004542			INC @#ERROR	;NO ERROR IF ZERO
9904	030222	001004				BNE 18\$	
9905	030224	020127	054000		19\$:	CMP R1,#HIGH1+2000	

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DATA BIT MARCH PATTERN TEST

SEQ 0104

9906	030230	001355				BNE 17\$	
9907	030232	000413				BR 20\$	
9908	030234	005237	004556			18\$: INC @#GOODBD	;DATA PRINT MODE
9909	030240	004037	005352			JSR R0,@#SETEN	;REPORT ERROR
9910	030244	000004				.WORD ^D4	
9911	030246	041460				.WORD SEN143	;DATA BIT MARCH PATTERN TEST
9912	030250	041474				.WORD SEN144	;CACHE ADDRESS , DATA EXPECTED , DATA READ
9913	030252	053737	004542	005064		BIS @#ERROR,@#LOPERR	;SET HAD ERROR FLAG
9914	030260	000761				BR 19\$	
9915	030262	012701	046000			20\$: MOV #LOWSP+2000,R1	
9916	030266	014103				22\$: MOV -(R1),R3	;READ DATA
9917	030270	005103				COM R3	;COMPLEMENT DATA
9918	030272	010311				MOV R3,(R1)	;WRITE COMPLEMENTED DATA
9919	030274	020127	044000			CMP R1,#LOWSP	
9920	030300	001372				BNE 22\$	
9921	030302	012701	046000			MOV #LOWSP+2000,R1	
9922	030306	012702	054000			MOV #HIGH1+2000,R2	
9923	030312	014142				24\$: MOV -(R1),-(R2)	;READ AND SAVE DATA
9924	030314	005737	177744			TST @#CMPE	
9925	030320	001004				BNE 23\$	
9926	030322	020127	044000			27\$: CMP R1,#LOWSP	
9927	030326	001371				BNE 24\$	
9928	030330	000450				BR 28\$	
9929	030332	052737	000215	177746		23\$: BIS #215,@#CCR	;SET ABORT FOR ERROR READ
9930	030340	013705	177744			MOV @#CMPE,R5	;READ ERROR REGISTER
9931	030344	012737	000011	177746		MOV #11,@#CCR	;DISABLE ABORT
9932	030352	032705	000100			BIS #BIT06,R5	;DID HIGH BYTE FAIL
9933	030356	001407				BEQ 25\$	;NO
9934	030360	052737	000100	177746		BIS #BIT06,@#CCR	;SET WRITE WRONG DATA
9935	030366	111211				MOVB (R2),(R1)	;WRITE WRONG LOW BYTE
9936	030370	042737	000100	177746		BIC #BIT06,@#CCR	;DISABLE WRITE WRONG
9937	030376	032705	000200			25\$: BIT #BIT07,R5	;DID HIGH BYTE FAIL
9938	030402	001406				BEQ 46\$	;NO
9939	030404	052737	000100	177746		BIS #BIT06,@#CCR	;ENABLE WRITE WRONG DATA
9940	030412	116261	000001	000001		MOVB 1(R2),1(R1)	;WRITE WRONG HIGH BYTE
9941	030420	012737	001015	177746		46\$: MOV #OFF,@#CCR	;DISABLE CACHE
9942	030426	010703				MOV PC,R3	;CORRECT WRONG PARITY
9943	030430	014313				26\$: MOV -(R3),(R3)	
9944	030432	020327	046656			CMP R3,#23\$-TST121-12+HIGHSP	
9945	030436	001374				BNE 26\$	
9946	030440	012737	000011	177746		MOV #11,@#CCR	;ENABLE CACHE
9947	030446	011112				MOV (R1),(R2)	;READ DATA
9948	030450	000724				BR 27\$	
9949	030452	012737	001015	177746		28\$: MOV #OFF,@#CCR	;DISABLE CACHE
9950	030460	012701	054000			MOV #HIGH1+2000,R1	;CHECK FOR ERRORS
9951	030464	012737	000000	004550		MOV #0,@#GOOD	;GOOD DATA
9952	030472	014137	004542			29\$: MOV -(R1),@#ERROR	;READ DATA
9953	030476	010137	004554			MOV R1,@#ADD	;MEMORY ADDRESS
9954	030502	013737	004542	004552		MOV @#ERROR,@#BAD	;BAD DATA
9955	030510	005237	004556			INC @#GOODBD	;SET DATA PRINT MODE
9956	030514	162737	052000	004554		SUB #HIGH1,@#ADD	;CACHE ADDRESS
9957	030522	004037	005352			JSR R0,@#SETEN	;REPORT ERROR IF ANY
9958	030526	000004				.WORD ^D4	
9959	030530	041460				.WORD SEN143	;DATA BIT MARCH PATTERN TEST
9960	030532	041474				.WORD SEN144	;CACHE ADDRESS , DATA EXPECTED , DATA READ
9961	030534	053737	004542	005064		BIS @#ERROR,@#LOPERR	;DEL ERROR LOCATION

9962	030542	020127	052000	
9963	030546	001351		
9964	030550	013737	005064	004542
9965	030556	004010		
9966	030560	046000		
9967	030562	046000		
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9985	030564	005267	150056	
9986	030570	004467	155320	
9987	030574	031706		
9988	030576	005037	004542	
9989	030602	005037	005064	
9990	030606	012737	000005	177746
9991	030614	012701	052000	
9992	030620	012103		
9993	030622	022701	054000	
9994	030626	001374		
9995	030630	012701	046000	
9996	030634	005021		
9997	030636	020127	050000	
9998	030642	001374		
9999	030644	012701	046000	
10000	030650	012702	050000	
10001	030654	005037	177744	
10002	030660	012103		
10003	030662	052737	000215	177746
10004	030670	013722	177744	
10005	030674	012737	000005	177746
10006	030702	020127	050000	
10007	030706	001362		
10008	030710	012701	046000	
10009	030714	012702	050000	
10010	030720	005712		
10011	030722	001010		
10012	030724	062702	000002	
10013	030730	062701	000002	
10014	030734	020127	052000	
10015	030740	001367		
10016	030742	000454		
10017	030744	032712	000040	

```
CMP R1,#HIGH1
BNE 29$
MOV @WLOPERR,@WERROR
JSR R0,(R0)          ;TAKE SELECTED ACTION ON ERROR
.WORD HIGHSP         ;LOOP ON ERROR
.WORD HIGHSP         ;LOOP ON TEST
.SBTL DATA BIT MARCH PATTERN TEST
TEST OPERATES IN LOW CACHE FOR TESTING HIGH CACHE
TEST WRITES BACKGROUND OF ALL ZEROS
READ A LOCATION STARTING AT CACHE ADDRESS 0000
COMPLEMENTS DATA
WRITES THE COMPLEMENT TO CACHE
READS COMPLEMENTED DATA AND ERROR CHECKS
PROCEEDS TO NEXT CACHE LOCATION
AFTER ALL LOW CACHE HAS BIN WRITTEN TO COMPLEMENT
TEST THEN STARTS READING FROM LAST LOCATION
COMPLEMENTS DATA
WRITES COMPLEMENTED DATA TO CACHE
READS AND ERROR CHECKS DATA
PROCEEDS TO NEXT HIGHER LOCATION
UNTIL START OF LOW CACHE
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TST122:

```
INC TID
JSR R4,RELCTL        ;UPDATE TEST ID
.WORD TST123         ;RELOCATE TEST TO LOW CACHE
CLR @WERROR          ;RESET ERROR FLAG
CLR @WLOPERR         ;RESET LOOP ON TEST FLAG
MOV #5,@WCCR         ;ENABLE HIGH CACHE
MOV #HIGH1,R1        ;TAG HIGH BLOCK #1
1$: MOV (R1)+,R3      ;CAUSE READ TO HIGH BLOCK
CMP #HIGH1+2000,R1
BNE 1$
MOV #HIGHSP,R1
2$: CLR (R1)+        ;WRITE BACKGROUND TO HIGH CACHE
CMP R1,#HIGHSP+2000 ;CAUSE READ TO TAG ,THEN WRITE BACKGROUND
BNE 2$
MOV #HIGHSP,R1
MOV #LOW1,R2
3$: CLR @WCMPE       ;ADDRESS OF TEST BLOCK
MOV (R1)+,R3        ;ADDRESS OF ERROR BLOCK
BIS #215,@WCCR      ;RESET ERROR REGISTER
MOV @WCMPE,(R2)+    ;READ BACKGROUND SAVE ERROR INFO
MOV #5,@WCCR        ;SET ABORT FOR ERROR READ
CMP R1,#HIGHSP+2000 ;SAVE ERROR INFO.
BNE 3$              ;DISABLE ABORT
MOV #HIGHSP,R1
MOV #LOW1,R2
33$: TST (R2)        ;WRITE BACKGROUND
BNE 4$              ;ANY ERROR FOR LOCATION
9$: ADD #2,R2        ;YES
ADD #2,R1            ;POINT TO NEXT
CMP R1,#LOW1+2000
BNE 33$
BR 10$
4$: BIT #BIT05,(R2) ;ANY TAG ERROR
```

10018	030750	001411			BEQ 5\$	
10019	030752	016103	004000		MOV 4000(R1),R3	:UNTAG LOCATION
10020	030756	052737	002000	177746	BIS #BIT10,#CCR	:ENABLE WRITE WRONG TAG
10021	030764	011103			MOV (R1),R3	:TAG LOCATION WRONG
10022	030766	042737	002000	177746	BIC #BIT10,#CCR	:DISABLE WRITE WRONG TAG
10023	030774	032712	000100		BIT #BIT06,(R2)	:ANY LOW BYTE FAILURE
10024	031000	001410			BEQ 6\$	:NO
10025	031002	052737	000100	177746	BIS #BIT06,#CCR	:ENABLE WRITE WRONG DATA
10026	031010	112711	000000		MOVB #0,(R1)	:WRITE WRONG DATA LOW BYTE
10027	031014	042737	000100	177746	BIC #BIT06,#CCR	:DISABLE WRITE WRONG DATA
10028	031022	032712	000200		BIT #BIT07,(R2)	:ANY HIGH BYTE FAILURE
10029	031026	001406			BEQ 7\$	
10030	031030	052737	000100	177746	BIS #BIT06,#CCR	:WRITE WRONG DATA
10031	031036	112761	000000	000001	MOVB #0,1(R1)	:WRITE WRONG DATA HIGH BYTE
10032	031044	012737	001015	177746	MOV #OFF,#CCR	:DISABLE CACHE
10033	031052	010703			MOV PC,R3	:CORRECT WRONG PARITY LOW
10034	031054	014313			MOV -(R3),(R3)	
10035	031056	020327	044146		CMP R3,#4\$-TST122-12+LOWSP	
10036	031062	001374			BNE 8\$	
10037	031064	012737	000005	177746	MOV #5,#CCR	:ENABLE HIGH CACHE
10038	031072	000714			BR 9\$	
10039	031074	012701	046000		MOV #HIGHSP,R1	:START TEST
10040	031100	012702	050000		MOV #LOW1,R2	
10041	031104	011103			MOV (R1),R3	:READ DATA
10042	031106	005103			COM R3	:COMPLEMENT DATA
10043	031110	010311			MOV R3,(R1)	:WRITE DATA
10044	031112	005037	177744		CLR #CMPE	:RESET ERROR REGISTER
10045	031116	011112			MOV (R1),(R2)	:READ COMP. DATA , SAVE
10046	031120	005737	177744		TST #CMPE	:ANY ERRORS
10047	031124	001010			BNE 12\$	:YES
10048	031126	062701	000002		ADD #2,R1	:ADJ. POINTER
10049	031132	062702	000002		ADD #2,R2	:ADJ. POINTER
10050	031136	020127	050000		CMP R1,#HIGHSP+2000	
10051	031142	001360			BNE 11\$	
10052	031144	000453			BR 21\$	
10053	031146	052737	000215	177746	BIS #215,#CCR	:SET ABORT FOR ERROR READ
10054	031154	013705	177744		MOV #CMPE,R5	:SAVE ERROR
10055	031160	012737	000005	177746	MOV #5,#CCR	:DISABLE ABORT
10056	031166	032705	000100		BIT #BIT06,R5	:ANY LOW BYTE ERROR
10057	031172	001407			BEQ 13\$	:NO
10058	031174	052737	000100	177746	BIS #BIT06,#CCR	:ENABLE WRITE WRONG DATA
10059	031202	110311			MOVB R3,(R1)	:WRITE WRONG LOW BYTE
10060	031204	042737	000100	177746	BIC #BIT06,#CCR	:DISABLE WRITE WRONG
10061	031212	032705	000200		BIT #BIT07,R5	:ANY HIGH BYTE ERROR
10062	031216	001411			BEQ 14\$	:NO
10063	031220	000303			SWAB R3	
10064	031222	052737	000100	177746	BIS #BIT06,#CCR	:ENABLE WRITE WRONG DATA
10065	031230	110361	000001		MOVB R3,1(R1)	:WRITE WRONG DATA HIGH BYTE
10066	031234	042737	000100	177746	BIC #BIT06,#CCR	:DISABLE WRITE WRONG
10067	031242	012737	001015	177746	MOV #OFF,#CCR	:DISABLE CACHE
10068	031250	010705			MOV PC,R5	:CORRECT WRONG PARITY LOW CACHE
10069	031252	014515			MOV -(R5),(R5)	
10070	031254	020527	044350		CMP R5,#12\$-TST122-12+LOWSP	
10071	031260	001374			BNE 15\$	
10072	031262	012737	000005	177746	MOV #5,#CCR	:ENABLE HIGH CACHE
10073	031270	011112			MOV (R1),(R2)	:READ DATA

CACHE DIAG.
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DATA BIT MARCH PATTERN TEST

D 9

SEQ 0107

10074 031272 000715
10075 031274 012737 001015 177746
10076 031302 012701 050000

21\$: BR 16\$
MOV #OFF,@CCR
MOV #LOW1,R1

;DISABLE CACHE
;READ AND REPORT ERROR

CACHE DIAG.
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DATA BIT MARCH PATTERN TEST

SEQ 0108

10078	031306	012737	177777	004550	17\$:	MOV #177777, @#GOOD	:GOOD DATA
10079	031314	010137	004554			MOV R1, @#ADD	:MEMORY ADDRESS
10080	031320	162737	052000	004554		SUB #HIGH1, @#ADD	:CACHE ADDRESS
10081	031326	012137	004552			MOV (R1)+, @#BAD	:READ DATA
10082	031332	013737	004552	004542		MOV @#BAD, @#ERROR	:ERROR CHECK
10083	031340	005237	004542			INC @#ERROR	:NO ERROR IF ZERO
10084	031344	001004				BNE 18\$	
10085	031346	020127	052000		19\$:	CMP R1, #LOW1+2000	
10086	031352	001355				BNE 17\$	
10087	031354	000413				BR 20\$	
10088	031356	005237	004556		18\$:	INC @#GOODBD	:DATA PRINT MODE
10089	031362	004037	005352			JSR R0, @#SETEN	:REPORT ERROR
10090	031366	000004				.WORD *D4	
10091	031370	041460				.WORD SEN143	:DATA BIT MARCH PATTERN TEST
10092	031372	041474				.WORD SEN144	:CACHE ADDRESS, DATA EXPECTED, DATA READ
10093	031374	053737	004542	005064		BIS @#ERROR, @#LOPERR	:SET HAD ERROR FLAG
10094	031402	000761				BR 19\$	
10095	031404	012701	050000		20\$:	MOV #HIGHSP+2000, R1	
10096	031410	014103			22\$:	MOV -(R1), R3	:READ DATA
10097	031412	005103				COM R3	:COMPLEMENT DATA
10098	031414	010311				MOV R3, (R1)	:WRITE COMPLEMENTED DATA
10099	031416	020127	046000			CMP R1, #HIGHSP	
10100	031422	001372				BNE 22\$	
10101	031424	012701	050000			MOV #HIGHSP+2000, R1	
10102	031430	012702	052000			MOV #LOW1+2000, R2	
10103	031434	014142			24\$:	MOV -(R1), -(R2)	:READ AND SAVE DATA
10104	031436	005737	177744			TST @#CMPE	
10105	031442	001004				BNE 23\$	
10106	031444	020127	046000		27\$:	CMP R1, #HIGHSP	
10107	031450	001371				BNE 24\$	
10108	031452	000450				BR 28\$	
10109	031454	052737	000215	177746	23\$:	BIS #215, @#CCR	:SET ABORT FOR ERROR READ
10110	031462	013705	177744			MOV @#CMPE, R5	:READ ERROR REGISTER
10111	031466	012737	000005	177746		MOV #5, @#CCR	:DISABLE ABORT
10112	031474	032705	000100			BIT #BIT06, R5	:DID LOW BYTE FAIL
10113	031500	001407				BEQ 25\$	:NO
10114	031502	052737	000100	177746		BIS #BIT06, @#CCR	:SET WRITE WRONG DATA
10115	031510	111211				MOVB (R2), (R1)	:WRITE WRONG LOW BYTE
10116	031512	042737	000100	177746		BIC #BIT06, @#CCR	:DISABLE WRITE WRONG
10117	031520	032705	000200		25\$:	BIT #BIT07, R5	:DID HIGH BYTE FAIL
10118	031524	001406				BEQ 46\$	:NO
10119	031526	052737	000100	177746		BIS #BIT06, @#CCR	:ENABLE WRITE WRONG DATA
10120	031534	116261	000001	000001		MOVB 1(R2), 1(R1)	:WRITE WRONG HIGH BYTE
10121	031542	012737	001015	177746	46\$:	MOV #OFF, @#CCR	:DISABLE CACHE
10122	031550	010703				MOV PC, R3	:CORRECT WRONG PARITY
10123	031552	014313			26\$:	MOV -(R3), (R3)	
10124	031554	020327	044656			CMP R3, #23\$-TST122-12+LOWSP	
10125	031560	001374				BNE 26\$	
10126	031562	012737	000005	177746		MOV #5, @#CCR	:ENABLE CACHE
10127	031570	011112				MOV (R1), (R2)	:READ DATA
10128	031572	000724				BR 27\$	
10129	031574	012737	001015	177746	28\$:	MOV #OFF, @#CCR	:DISABLE CACHE
10130	031602	012701	052000			MOV #LOW1+2000, R1	:CHECK FOR ERRORS
10131	031606	012737	000000	004550		MOV #0, @#GOOD	:GOOD DATA
10132	031614	014137	004542		29\$:	MOV -(R1), @#ERROR	:READ DATA
10133	031620	010137	004554			MOV R1, @#ADD	:MEMORY ADDRESS

10134	031624	013737	004542	004552
10135	031632	005237	004556	
10136	031636	162737	052000	004554
10137	031644	004037	005352	
10138	031650	000004		
10139	031652	041460		
10140	031654	041474		
10141	031656	053737	004542	005064
10142	031664	020127	050000	
10143	031670	001351		
10144	031672	013737	005064	004542
10145	031700	004010		
10146	031702	044000		
10147	031704	044000		

```

MOV @#ERROR,@#BAD
INC @#GOODBD
SUB #HIGH1,@#ADD
JSR R0,@#SETEN
.WORD ^D4
.WORD SEN143
.WORD SEN144
BIS @#ERROR,@#LOPERR
CMP R1,#LOW1
BNE 29$
MOV @#LOPERR,@#ERROR
JSR R0,(R0)
.WORD LOWSP
.WORD LOWSP

```

```

;BAD DATA
;SET DATA PRINT MODE
;CACHE ADDRESS
;REPORT ERROR IF ANY

;DATA BIT MARCH PATTERN TEST
;CACHE ADDRESS , DATA EXPECTED , DATA READ
;DEL ERROR LOCATION

;TAKE SELECTED ACTION ON ERROR
;LOOP ON ERROR
;LOOP ON TEST

```

CACHE DIAG.
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DATA PARITY MARCH PATTERN TEST

SEQ 0110

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10150          .SBTTL DATA PARITY MARCH PATTERN TEST
10151          : PATTERN RUNNING IN LOW CACHE PARITY
10152
10153
10154 031706 005267 146734      TST123:      INC TID          ;UPDATE TEST ID
10155 031712 004467 154224          JSR R4,RELCTH      ;RELOCATE TEST TO HIGH CACHE
10156 031716 032324          .WORD TST124
10157 031720 005037 005064          CLR @WLOPERR
10158 031724 005037 004542          CLR @WERROR          ;RESET ERROR FLAG
10159 031730 012701 044000          MOV #LOWSP,R1      ;FIRST ADDRESS OF TEST BLOCK
10160 031734 012737 000011 177746      MOV #11,@WCCR      ;ENABLE LOW CACHE
10161 031742 012701 044000          MOV #LOWSP,R1      ;TEST BLOCK
10162 031746 005021          1$:      CLR (R1)+        ;WRITE ZERO TO PARITY
10163 031750 020127 046000          CMP R1,#LOWSP+2000
10164 031754 001374          BNE 1$
10165 031756 012701 044000          MOV #LOWSP,R1      ;FIRST ADDRESS OF TEST BLOCK
10166 031762 012703 052000          MOV #HIGH1,R3      ;ERROR BLOCK POINTER
10167 031766 005037 177744          CLR @WCMPE          ;RESET ERROR REGISTER
10168 031772 011102          2$:      MOV (R1),R2      ;READ PARITY
10169 031774 005737 177744          TST @WCMPE          ;ANY ERROR
10170 032000 001052          BNE 3$      ;YES
10171 032002 005013          CLR (R3)
10172 032004 012711 004001          MOV #4001,(R1)      ;WRITE COMP. PARITY
10173 032010 011102          MOV (R1),R2      ;READ COMP
10174 032012 005737 177744          TST @WCMPE          ;ANY ERROR
10175 032016 001043          BNE 3$      ;YES
10176 032020 062701 000002          4$:      ADD #2,R1      ;ADJ. POINTER
10177 032024 062703 000002          ADD #2,R3
10178 032030 012737 001015 177746      MOV #OFF,@WCCR      ;INVALIDATE HIGH CACHE
10179 032036 010702          MOV PC,R2
10180 032040 014212          30$:      MOV -(R2),(R2)
10181 032042 020227 046046          CMP R2,#2$-TST123-12+HIGHSP
10182 032046 001374          BNE 30$
10183 032050 012737 000011 177746      MOV #11,@WCCR
10184 032056 020127 046000          CMP R1,#LOWSP+2000
10185 032062 001341          BNE 2$
10186 032064 012701 044000          MOV #LOWSP,R1      ;DATA ADDRESS
10187 032070 012703 052000          MOV #HIGH1,R3      ;ERROR REGISTER SAVE BLOCK
10188 032074 012737 001015 177746      MOV #OFF,@WCCR      ;DISABLE CACHE
10189 032102 005713          21$:      TST (R3)          ;ANY ERROR FOR LOCATION
10190 032104 001021          BNE 22$      ;YES
10191 032106 062701 000002          23$:      ADD #2,R1      ;UPDATE POINTERS
10192 032112 062703 000002          ADD #2,R3
10193 032116 020127 046000          CMP R1,#LOWSP+2000
10194 032122 001367          BNE 21$
10195 032124 000471          BR 10$
10196 032126 052737 000215 177746          3$:      BIS #215,@WCCR      ;ENABLE ABORT FOR ERROR READ
10197 032134 013713 177744          MOV @WCMPE,(R3)      ;SAVE ERROR
10198 032140 012737 000011 177746      MOV #11,@WCCR      ;DISABLE ABORT
10199 032146 000724          BR 4$
10200 032150 005037 004550          22$:      CLR @WGOOD
10201 032154 005037 004552          CLR @WBAD
10202 032160 005711          TST (R1)
10203 032162 001404          BEQ 5$      ;SHOULD PARITY BIT BE SET
10204 032164 012737 000001 004550      MOV #1,@WGOOD      ;NO
10205 032172 000403          BR 6$      ;PARITY BIT SHOULD HAVE BIN SET

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10206	032174	012737	000001	004552	5\$:	MOV #1,@#BAD	;PARITY BIT SHOULDN'T BE SET
10207	032202	010137	004554		6\$:	MOV R1,@#ADD	;MEMORY ADDRESS
10208	032206	162737	040000	004554		SUB #40000,@#ADD	;CACHE ADDRESS
10209	032214	005237	004542			INC @#ERROR	;SET ERROR FLAG
10210	032220	005237	004556			INC @#GOODBD	;DATA PRINT MODE
10211	032224	032713	000100			BIT #BIT06,(R3)	;WAS IT LOW BYTE ERROR
10212	032230	001015				BNE 7\$	
10213	032232	032713	000200			BIT #BIT07,(R3)	;WAS IT HIGH BYTE
10214	032236	001670				BEQ 4\$	;NO
10215	032240	004037	005352			JSR R0,@#SETEN ;REPORT	ERROR
10216	032244	000006				.WORD *D6	
10217	032246	041516				.WORD SEN145	;DATA PARITY MARCH PATTERN TEST
10218	032250	041532				.WORD SEN146	;HIGH BYTE PARITY ERROR
10219	032252	041544				.WORD SEN147	;CACHE ADDRESS , PARITY WRITTEN , PARITY READ
10220	032254	053737	004542	005064		BIS @#ERROR,@#LOPERR	;HAD ERROR FLAG
10221	032262	000711				BR 23\$	
10222	032264	004037	005352		7\$:	JSR R0,@#SETEN	;REPORT ERROR
10223	032270	000006				.WORD *D6	
10224	032272	041516				.WORD SEN145	;DATA PARITY MARCH PATTERN TEST
10225	032274	041566				.WORD SEN148	;LOW BYTE PARITY ERROR
10226	032276	041544				.WORD SEN147	;CACHE ADDRESS , PARITY WRITTEN , PARITY READ
10227	032300	053737	004542	005064		BIS @#ERROR,@#LOPERR	;HAD ERROR FLAG
10228	032306	000677				BR 23\$	
10229	032310	013737	005064	004542	10\$:	MOV @#LOPERR,@#ERROR	;CHECK HAD ERROR FLAG
10230	032316	004010				JSR R0,(R0)	;TAKE SELECTED ACTION ON ERROR
10231	032320	046000				.WORD HIGHSP	;LOOP ON ERROR
10232	032322	046000				.WORD HIGHSP	;LOOP ON TEST
10233							
10234							
10235							
10236	032324	005267	146316		TST124:	INC TID	;UPDATE TEST ID
10237	032330	004467	153560			JSR R4,RELCTL	;RELOCATE TEST TO LOW CACHE
10238	032334	032742				.WORD TST125	
10239	032336	005037	005064			CLR @#LOPERR	
10240	032342	005037	004542			CLR @#ERROR	;RESET ERROR FLAG
10241	032346	012701	046000			MOV #HIGHSP,R1	;FIRST ADDRESS OF TEST BLOCK
10242	032352	012737	000005	177746		MOV #5,@#CCR	;ENABLE HIGH CACHE
10243	032360	012701	046000			MOV #HIGHSP,R1	;TEST BLOCK
10244	032364	005021			1\$:	CLR (R1)+	;WRITE ZERO TO PARITY
10245	032366	020127	050000			CMP R1,#HIGHSP+2000	
10246	032372	001374				BNE 1\$	
10247	032374	012701	046000			MOV #HIGHSP,R1	;FIRST ADDRESS OF TEST BLOCK
10248	032400	012703	050000			MOV #LOW1,R3	;ERROR BLOCK POINTER
10249	032404	005037	177744		2\$:	CLR @#CMPE	;RESET ERROR REGISTER
10250	032410	011102				MOV (R1),R2	;READ PARITY
10251	032412	005737	177744			TST @#CMPE	;ANY ERROR
10252	032416	001052				BNE 3\$	;YES
10253	032420	005013				CLR (R3)	
10254	032422	012711	004001			MOV #4001,(R1)	;WRITE COMP. PARITY
10255	032426	011102				MOV (R1),R2	;READ COMP.
10256	032430	005737	177744			TST @#CMPE	;ANY ERROR
10257	032434	001043				BNE 3\$	;YES
10258	032436	062701	000002		4\$:	ADD #2,R1	;ADJ. POINTER
10259	032442	062703	000002			ADD #2,R3	
10260	032446	012737	001015	177746		MOV #OFF,@#CCR	;INVALIDATE LOW CACHE
10261	032454	010702				MOV PC,R2	

10262	032456	014212		30\$:	MOV -(R2), (R2)	
10263	032460	020227	044046		CMP R2, #2\$-TST124-12+LOWSP	
10264	032464	001374			BNE 30\$	
10265	032466	012737	000005 177746		MOV #5, @#CCR	
10266	032474	020127	050000		CMP R1, #HIGHSP+2000	
10267	032500	001341			BNE 2\$	
10268	032502	012701	046000		MOV #HIGHSP, R1	:DATA BLOCK
10269	032506	012703	050000		MOV #LOW1, R3	:ERROR BLOCK
10270	032512	012737	001015 177746		MOV #OFF, @#CCR	
10271	032520	005713		21\$:	TST (R3)	
10272	032522	001021			BNE 22\$	
10273	032524	062701	000002	23\$:	ADD #2, R1	:UPDATE POINTERS
10274	032530	062703	000002		ADD #2, R3	
10275	032534	020127	050000		CMP R1, #HIGHSP+2000	
10276	032540	001367			BNE 21\$	
10277	032542	000471			BR 10\$	
10278	032544	052737	000215 177746	3\$:	BIS #215, @#CCR	:ENABLE ABORT FOR ERROR READ
10279	032552	013713	177744		MOV @#CMPE, (R3)	:SAVE ERROR
10280	032556	012737	000005 177746		MOV #5, @#CCR	:DISABLE ABORT
10281	032564	000724			BR 4\$	
10282	032566	005037	004550	22\$:	CLR @#GOOD	:
10283	032572	005037	004552		CLR @#BAD	:
10284	032576	005711			TST (R1)	:SHOULD PARITY BIT BE SET
10285	032600	001404			BEQ 5\$	:NO
10286	032602	012737	000001 004550		MOV #1, @#GOOD	:PARITY BIT SHOULD HAVE BIN SET
10287	032610	000403			BR 6\$	
10288	032612	012737	000001 004552	5\$:	MOV #1, @#BAD	:PARITY BIT SHOULDN'T BE SET
10289	032620	010137	004554	6\$:	MOV R1, @#ADD	:MEMORY ADDRESS
10290	032624	162737	040000 004554		SUB #40000, @#ADD	:CACHE ADDRESS
10291	032632	005237	004542		INC @#ERROR	:SET ERROR FLAG
10292	032636	005237	004556		INC @#GOODBD	:DATA PRINT MODE
10293	032642	032713	000100		BIT #BIT06, (R3)	:WAS IT LOW BYTE ERROR
10294	032646	001015			BNE 7\$	
10295	032650	032713	000200		BIT #BIT07, (R3)	:WAS IT HIGH BYTE
10296	032654	001670			BEQ 4\$	:NO
10297	032656	004037	005352		JSR R0, @#SETEN	:REPORT ERROR
10298	032662	000006			.WORD ^D6	
10299	032664	041516			.WORD SEN145	:DATA PARITY MARCH PATTERN TEST
10300	032666	041532			.WORD SEN146	:HIGH BYTE PARITY ERROR
10301	032670	041544			.WORD SEN147	:CACHE ADDRESS, PARITY WRITTEN, PARITY READ
10302	032672	053737	004542 005064		BIS @#ERROR, @#LOPERR	:HAD ERROR FLAG
10303	032700	000711			BR 23\$	
10304	032702	004037	005352	7\$:	JSR R0, @#SETEN	:REPORT ERROR
10305	032706	000006			.WORD ^D6	
10306	032710	041516			.WORD SEN145	:DATA PARITY MARCH PATTERN TEST
10307	032712	041566			.WORD SEN148	:LOW BYTE PARITY ERROR
10308	032714	041544			.WORD SEN147	:CACHE ADDRESS, PARITY WRITTEN, PARITY READ
10309	032716	053737	004542 005064		BIS @#ERROR, @#LOPERR	:HAD ERROR FLAG
10310	032724	000677			BR 23\$	
10311	032726	013737	005064 004542	10\$:	MOV @#LOPERR, @#ERROR	:CHECK HAD ERROR FLAG
10312	032734	004010			JSR R0, (R0)	:TAKE SELECTED ACTION ON ERROR
10313	032736	044000			.WORD LOWSP	:LOOP ON ERROR
10314	032740	044000			.WORD LOWSP	:LOOP ON TEST


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10316      .SBTTL VALID BIT MARCH PATTERN TEST
10317      :      TESTING LOW CACHE USING BOTH SETS OF VALID BITS
10318
10319
10320      032742 005267 145700      TST125:      INC TID      ;UPDATE TEST ID
10321      032746 004467 153170      JSR R4,RELCTH  ;RELOCATE TEST TO HIGH CACHE
10322      032752 033334      .WORD TST126
10323      032754 005005      CLR R5
10324      032756 005037 005064      20$:      CLR @#LOPERR      ;RESET HAD ERROR FLAG
10325      032762 005037 004542      CLR @#ERROR      ;RESET ERROR FLAG
10326      032766 012701 044000      MOV #LOWSP,R1      ;WRITE VALID BIT TO ZERO
10327      032772 012721 000000      1$:      MOV #0,(R1)+
10328      032776 020127 046000      CMP R1,#LOWSP+2000
10329      033002 001373      BNE 1$
10330      033004 012703 052000      MOV #HIGH1,R3
10331      033010 012701 044000      MOV #LOWSP,R1
10332      033014 012737 000011 177746      2$:      MOV #11,@#CCR      ;ENABLE LOW CACHE
10333      033022 011102      MOV (R1),R2      ;READ VALID WRITE COMP.
10334      033024 032737 000010 177752      BIT #BIT03,@#CHR      ;LOOK FOR HIT
10335      033032 001012      BNE 7$      ;READ DID CAUSE HIT, IT SHOULDN'T HAVE
10336      033034 012102      MOV (R1)+,R2      ;READ COMP
10337      033036 032737 000010 177752      BIT #BIT03,@#CHR      ;IS VALID SET
10338      033044 001414      BEQ 3$      ;NO
10339      033046 005023      CLR (R3)+
10340      033050 020127 046000      5$:      CMP R1,#LOWSP+2000
10341      033054 001357      BNE 2$
10342      033056 000416      BR 11$
10343      033060 113763 177747 000001      7$:      MOVB @#CCR+1,1(R3)      ;SAVE VALID SET INUSE BIT
10344      033066 112713 000000      MOVB #0,(R3)      ;SAVE DATA WRITTEN
10345      033072 005723      TST (R3)+      ;ADJ POINTER
10346      033074 000765      BR 5$      ;CONTINUE
10347      033076 113763 177747 000001      3$:      MOVB @#CCR+1,1(R3)      ;SAVE VALID SET INUSE
10348      033104 112713 000001      MOVB #1,(R3)      ;SAVE DATA WRITTEN
10349      033110 005723      TST (R3)+
10350      033112 000756      BR 5$      ;CONTINUE
10351      033114 012737 001015 177746      11$:      MOV #OFF,@#CCR      ;DISABLE CACHE
10352      033122 012703 052000      MOV #HIGH1,R3      ;ERROR DATA BLOCK
10353      033126 005723      12$:      TST (R3)+      ;ANY ERROR
10354      033130 001004      BNE 13$      ;YES
10355      033132 020327 054000      16$:      CMP R3,#HIGH1+2000
10356      033136 001373      BNE 12$
10357      033140 000455      BR 10$
10358      033142 005037 004550      13$:      CLR @#GOOD      ;FIND WHAT WENT WRONG
10359      033146 005037 004552      CLR @#BAD
10360      033152 105763 177776      TSTB -2(R3)      ;FIND DATA WRITTEN
10361      033156 001004      BNE 14$      ;DATA WRITTEN WAS ONE
10362      033160 012737 000001 004552      MOV #1,@#BAD      ;DATA READ WAS ONE
10363      033166 000403      BR 15$
10364      033170 012737 000001 004550      14$:      MOV #1,@#GOOD      ;DATA READ WAS ZERO
10365      033176 010337 004554      15$:      MOV R3,@#ADD      ;MEMORY ADDRESS
10366      033202 162737 052002 004554      SUB #HIGH1+2,@#ADD      ;CACHE ADDRESS
10367      033210 012737 000001 004542      MOV #1,@#ERROR      ;SET ERROR FLAG
10368      033216 005237 004556      INC @#GOODBD      ;SET DATA PRINT MODE
10369      033222 053737 004542 005064      BIS @#ERROR,@#LOPERR      ;SET DELAY ERROR FLAG
10370      033230 032763 020000 177776      BIT #BIT13,-2(R3)      ;IS THIS VALID SET B
10371      033236 001407      BEQ 4$      ;NO
```

CACHE DIAG.
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VALID BIT MARCH PATTERN TEST

SEQ 0114

10372	033240	004037	005352		JSR R0, @#SETEN	;REPORT ERROR
10373	033244	000006			.WORD ^D6	
10374	033246	041600			.WORD SEN149	;VALID BIT MARCH PATTERN TEST
10375	033250	041614			.WORD SEN150	;VALID BIT SET B INUSE
10376	033252	041630			.WORD SEN151	;CACHE ADDRESS , VALID BIT WRITTEN , VALID BIT R
10377	033254	000726			BR 16\$	
10378	033256	004037	005352	4\$:	JSR R0, @#SETEN	;REPORT ERROR
10379	033262	000006			.WORD ^D6	
10380	033264	041600			.WORD SEN149	;VALID BIT MARCH PATTERN TEST
10381	033266	041656			.WORD SEN152	;VALID BIT SET A INUSE
10382	033270	041672			.WORD SEN153	;CACHE ADDRESS , VALID BIT WRITTEN , VALID BIT RE
10383	033272	000717			BR 16\$	
10384	033274	012737	001015	177746	MOV #OFF, @#CCR	;DISABLE CACHE
10385	033302	013737	005064	004542	MOV @#LOPERR, @#ERROR	
10386	033310	004010			JSR R0, (R0)	;TAKE SELECTED ACTION ON ERROR
10387	033312	046000			.WORD HIGHSP	;LOOP ON ERROR
10388	033314	046000			.WORD HIGHSP	;LOOP ON TEST
10389	033316	005705			TST R5	;IS THIS FIRST PASS
10390	033320	001005			BNE TST126	;NO CONTINUE TO NEXT TEST
10391	033322	052737	000400	177746	BIS #BIT08, @#CCR	;FLUSH CACHE SELECT OTHER VALID SET
10392	033330	005205			INC R5	
10393	033332	000611			BR 20\$	

: TESTING HIGH CACHE USING BOTH SETS OF VALID BITS

10394						
10395						
10396						
10397						
10398						
10399						
10400						
10401						
10402	033334	005267	145306		TST126: INC TID	;UPDATE TEST ID
10403	033340	004467	152550		JSR R4, RELCTL	;RELOCATE TEST TO LOW CACHE
10404	033344	033730			.WORD TST127	
10405	033346	005005			CLR R5	;VALID CHANGE FLAG
10406	033350	005037	005064	20\$:	CLR @#LOPERR	;RESET HAD ERROR FLAG
10407	033354	005037	004542		CLR @#ERROR	;RESET ERROR FLAG
10408	033360	012701	046000		MOV #HIGHSP, R1	;WRITE VALID BIT TO ZERO
10409	033364	012721	000000	1\$:	MOV #0, (R1)+	
10410	033370	020127	050000		CMP R1, #HIGHSP+2000	
10411	033374	001373			BNE 1\$	
10412	033376	012703	050000		MOV #LOW1, R3	
10413	033402	012701	046000		MOV #HIGHSP, R1	
10414	033406	012737	000005	177746	2\$:	
10415	033414	011102			MOV #5, @#CCR	;ENABLE HIGH CACHE
10416	033416	032737	000010	177746	MOV (R1), R2	;READ VALID WRITE COMP.
10417	033424	001012			BIT #BIT03, @#CCR	;SHOULD HAVE NO HIT
10418	033426	012102			BNE 7\$	
10419	033430	032737	000010	177752	MOV (R1)+, R2	;READ COMP
10420	033436	001414			BIT #BIT03, @#CHR	;IS VALID SET
10421	033440	005023			BEQ 3\$	;NO
10422	033442	020127	050000		5\$:	
10423	033446	001357			CLR (R3)+	
10424	033450	000416			CMP R1, #HIGHSP+2000	
10425	033452	113763	177747	000001	7\$:	
10426	033460	112713	000000		MOV @#CCR+1, 1(R3)	;SAVE VALID SET INUSE BIT
					MOV #0, (R3)	;SAVE DATA WRITTEN

10428	033464	005723				TST (R3)+	
10429	033466	000765				BR 5\$	
10430	033470	113763	177747	000001	3\$:	MOVB @#CCR+1,1(R3)	;SAVE VALID SET INUSE BIT
10431	033476	112713	000001			MOVB #1,(R3)	;SAVE DATA WRITTEN
10432	033502	005723				TST (R3)+	
10433	033504	000756				BR 5\$	
10434	033506	012737	001015	177746	11\$:	MOV #OFF,@#CCR	;DISABLE CACHE
10435	033514	012703	050000			MOV #LOW1,R3	;ERROR DATA BLOCK
10436	033520	005723			12\$:	TST (R3)+	;ANY ERROR
10437	033522	001004				BNE 13\$	;YES
10438	033524	020327	052000		16\$:	CMP R3,#LOW1+2000	
10439	033530	001373				BNE 12\$	
10440	033532	000456				BR 10\$	
10441	033534	005037	004550		13\$:	CLR @#GOOD	;FIND WHAT WENT WRONG
10442	033540	005037	004552			CLR @#BAD	
10443	033544	105763	177776			TSTB -2(R3)	;FIND DATA WRITTEN
10444	033550	001004				BNE 14\$	;DATA WRITTEN WAS A ONE
10445	033552	012737	000001	004552		MOV #1,@#BAD	;DATA READ WAS A ONE
10446	033560	000403				BR 15\$	
10447	033562	012737	000001	004550	14\$:	MOV #1,@#GOOD	;DATA READ WAS ZERO
10448	033570	010337	004554		15\$:	MOV R3,@#ADD	;MEMORY ADDRESS
10449	033574	162737	046002	004554		SUB #HIGHSP+2,@#ADD	;CACHE ADDRESS
10450	033602	012737	000001	004542		MOV #1,@#ERROR	;SET ERROR FLAG
10451	033610	005237	004556			INC @#GOODBD	;SET DATA PRINT MODE
10452	033614	053737	004542	005064		BIS @#ERROR,@#LOPERR	;SET DELAY ERROR FLAG
10453	033622	032763	020000	177776		BIT #BIT13,-2(R3)	;IS THIS VALID SET B
10454	033630	001410				BEQ 4\$	;NO
10455	033632	004037	005352			JSR R0,@#SETEN	;REPORT ERROR
10456	033636	000006				.WORD *D6	
10457	033640	041600				.WORD SEN149	;VALID BIT MARCH PATTERN TEST
10458	033642	041614				.WORD SEN150	;VALID BIT SET B INUSE
10459	033644	041630				.WORD SEN151	;CACHE ADDRESS , VALID BIT WRITTEN , VALID BIT R
10460	033646	005205				INC R5	
10461	033650	000725				BR 16\$	
10462	033652	004037	005352		4\$:	JSR R0,@#SETEN	;REPORT ERROR
10463	033656	000006				.WORD *D6	
10464	033660	041600				.WORD SEN149	;VALID BIT MARCH PATTERN TEST
10465	033662	041656				.WORD SEN152	;VALID BIT SET A INUSE
10466	033664	041672				.WORD SEN153	;CACHE ADDRESS , VALID BIT WRITTEN , VALID BIT RE
10467	033666	000716				BR 16\$	
10468	033670	012737	001015	177746	10\$:	MOV #OFF,@#CCR	;DISABLE CACHE
10469	033676	013737	005064	004542		MOV @#LOPERR,@#ERROR	
10470	033704	004010				JSR R0,(R0)	;TAKE SELECTED ACTION ON ERROR
10471	033706	044000				.WORD LOWSP	;LOOP ON ERROR
10472	033710	044000				.WORD LOWSP	;LOOP ON TEST
10473	033712	005705				TST R5	;IS THIS FIRST PASS
10474	033714	001005				BNE TST127	;NO CONTINUE TO NEXT TEST
10475	033716	052737	000400	177746		BIS #BIT08,@#CCR	;FLUSH CACHE SELECT OTHER VALID SET
10476	033724	005205				INC R5	
10477	033726	000610				BR 20\$	

CACHE DIAG.
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TAG MARCH PATTERN TESTS

SEQ 0116

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10479          .SBTTL TAG MARCH PATTERN TESTS
10480          :OPERATING IN HIGH CACHE TESTING LOW CACHE
10481
10482
10483 033730 005267 144712          TST127:      INC TID          ;UPDATE TEST ID
10484 033734 004467 152202          JSR R4,RELCTH      ;RELOCATE TEST TO HIGH CACHE
10485 033740 034330          .WORD TST130
10486 033742 005037 005064          CLR @WLOPERR      ;RESET DELAY ERROR
10487 033746 005037 004542          CLR @WERROR       ;RESET ERROR FLAG
10488 033752 012737 000011 177746      MOV #11,@WCCR      ;ENABLE LOW CACHE
10489 033760 005001          CLR R1          ;TAGGING START ADDRESS
10490 033762 012102          1$:      MOV (R1)+,R2      ;WRITE ZERO TO TAG
10491 033764 020127 002000          CMP R1,#2000      ;FOR ALL LOW LOCATIONS
10492 033770 001374          BNE 1$
10493 033772 005001          CLR R1          ;READ TAG START ADDRESS
10494 033774 011102          2$:      MOV (R1),R2      ;READ BACKGROUND
10495 033776 032737 000010 177752      BIT #BIT03,@WCHR      ;SHOULD HAVE HIT
10496 034004 001422          BEQ 3$          ;NO HIT
10497 034006 012737 000001 177750      MOV #1,@WCMR      ;ENABLE MAINT. MODE
10498 034014 011102          MOV (R1),R2      ;WRITE COMP TAG
10499 034016 011102          MOV (R1),R2      ;READ COMP TAG
10500 034020 032737 000010 177752      BIT #BIT03,@WCHR      ;SHOULD HAVE HIT
10501 034026 001411          BEQ 3$
10502 034030 012737 000000 177750      MOV #0,@WCMR      ;DISABLE MAINT MODE
10503 034036 062701 000002          4$:      ADD #2,R1      ;NEXT ADDRESS
10504 034042 020127 002000          CMP R1,#2000      ;LOOP COMPLETE YET
10505 034046 001352          BNE 2$          ;NO
10506 034050 000435          BR 6$
10507 034052 012737 000000 177750      3$:      MOV #0,@WCMR      ;DISABLE MAINT MODE
10508 034060 012737 001015 177746      MOV #OFF,@WCCR      ;DISABLE CACHE
10509 034066 005037 004552          CLR @WBAD        ;DATA UNKNOWN
10510 034072 005037 004550          CLR @WGOOD
10511 034076 005237 004556          INC @WGOODBD
10512 034102 005237 004542          INC @WERROR
10513 034106 010137 004554          MOV R1,@WADD
10514 034112 004037 005352          JSR R0,@WSETEN
10515 034116 000006          .WORD *D6
10516 034120 041720          .WORD SEN154
10517 034122 041732          .WORD SEN155
10518 034124 041744          .WORD SEN156
10519 034126 053737 004542 005064      BIS @WERROR,@WLOPERR      ;TAG MARCH PATTERN TESTS
10520 034134 012737 000011 177746      MOV #11,@WCCR      ;LOW CACHE TAG FAILURE
10521 034142 000735          BR 4$          ;CACHE ADDRESS, DATA UNKNOWN
10522 034144 012701 002000          6$:      MOV #2000,R1      ;SET DELAYED ERROR FLAG
10523 034150 012737 000001 177750      MOV #1,@WCMR      ;ENABLE CACHE
10524 034156 014102          7$:      MOV -(R1),R2      ;END ADDRESS
10525 034160 032737 000010 177752      BIT #BIT03,@WCHR      ;ENABLE MAINT. MODE
10526 034166 001414          BEQ 8$          ;READ BACKGROUND
10527 034170 012737 000000 177750      MOV #0,@WCMR      ;ANY HIT
10528 034176 011102          MOV (R1),R2      ;NO
10529 034200 011102          MOV (R1),R2      ;DISABLE MAINT. MODE
10530 034202 032737 000010 177752      BIT #BIT03,@WCHR      ;WRITE COMP
10531 034210 001403          BEQ 8$          ;READ COMP
10532 034212 005701          9$:      TST R1          ;SHOULD HAVE HIT
10533 034214 001355          BNE 7$          ;NO HIT
10534 034216 000433          BR 10$         ;LOOP COMPLETE YET
                                         ;NO

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CACHE DIAG.
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TAG MARCH PATTERN TESTS

SEQ 0117

10535	034220	012737	001015	177746	8\$:	MOV #OFF,@#CCR	;DISABLE CACHE
10536	034226	005037	004550			CLR @#GOOD	;DATA UNKNOWN
10537	034232	005037	004552			CLR @#BAD	
10538	034236	010137	004554			MOV R1,@#ADD	;CACHE ADDRESS
10539	034242	012737	000001	004542		MOV #1,@#ERROR	;SET ERROR FLAG
10540	034250	005237	004556			INC @#GOODBD	;SET BIT PRINT MODE
10541	034254	004037	005352			JSR RO,@#SETEN	;REPORT ERROR
10542	034260	000006				.WORD ^D6	
10543	034262	041720				.WORD SEN154	;TAG MARCH PATTERN TESTS
10544	034264	041732				.WORD SEN155	;LOW CACHE TAG FAILURE
10545	034266	041744				.WORD SEN156	;CACHE ADDRESS , DATA UNKNOWN
10546	034270	012737	000011	177746		MOV #11,@#CCR	;ENABLE CACHE
10547	034276	053737	004542	005064		BIS @#ERROR,@#LOPERR	;SET DELAYED ERROR FLAG
10548	034304	000742				BR 9\$	
10549	034306	012737	001015	177746	10\$:	MOV #OFF,@#CCR	;DISABLE CACHE
10550	034314	013737	005064	004542		MOV @#LOPERR,@#ERROR	
10551	034322	004010				JSR RO,(R0)	;TAKE SELECTED ACTION ON ERROR
10552	034324	046000				.WORD HIGHSP	
10553	034326	046000				.WORD HIGHSP	
10554							
10555							
10556							
10557							
10558							
10559							

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10561                                     .SBTTL TAG MARCH PATTERN TESTS
10562                                     ;OPERATING IN LOW CACHE TESTING HIGH CACHE
10563
10564
10565 034330 005267 144312          TST130:      INC TID          ;UPDATE TEST ID
10566 034334 004467 151554          JSR R4,RELCTL      ;RELOCATE TEST TO LOW CACHE
10567 034340 034736                .WORD TST131
10568 034342 005037 005064          CLR @WLOPERR      ;RESET DELAY ERROR
10569 034346 005037 004542          CLR @WERROR       ;RESET ERROR FLAG
10570 034352 012737 000005 177746  MOV #5,@WCCR      ;ENABLE HIGH CACHE
10571 034360 012701 002000          MOV #2000,R1      ;TAGGING START ADDRESS
10572 034364 012102                1$:      MOV (R1)+,R2  ;WRITE ZERO TO TAG
10573 034366 020127 004000          CMP R1,#4000      ;FOR ALL HIGH LOCATIONS
10574 034372 001374                BNE 1$
10575 034374 012701 002000          MOV #2000,R1      ;READ TAG , START ADDRESS
10576 034400 011102                2$:      MOV (R1),R2  ;READ BACKGROUND
10577 034402 032737 000010 177752  BIT #BIT03,@WCHR ;SHOULD HAVE HIT
10578 034410 001422                BEQ 3$           ;NO HIT
10579 034412 012737 000001 177750  MOV #1,@WCMR      ;ENABLE MAINT. MODE
10580 034420 011102                MOV (R1),R2      ;WRITE COMP TAG
10581 034422 011102                MOV (R1),R2      ;READ COMP TAG
10582 034424 032737 000010 177752  BIT #BIT03,@WCHR ;SHOULD HAVE HIT
10583 034432 001411                BEQ 3$
10584 034434 012737 000000 177750  MOV #0,@WCMR      ;DISABLE MAINT MODE
10585 034442 062701 000002          4$:      ADD #2,R1  ;NEXT ADDRESS
10586 034446 020127 004000          CMP R1,#4000      ;LOOP COMPLETE YET
10587 034452 001352                BNE 2$           ;NO
10588 034454 000435                BR 6$
10589 034456 012737 000000 177750  3$:      MOV #0,@WCMR      ;DISABLE MAINT MODE
10590 034464 012737 001015 177746  MOV #OFF,@WCCR   ;DISABLE CACHE
10591 034472 005037 004552          CLR @WBAD        ;DATA UNKNOWN
10592 034476 005037 004550          CLR @WGOOD
10593 034502 005237 004556          INC @WGOODBD
10594 034506 005237 004542          INC @WERROR      ;SET ERROR FLAG
10595 034512 010137 004554          MOV R1,@WADD      ;CACHE ADDRESS
10596 034516 004037 005352          JSR R0,@WSETEN    ;REPORT ERROR
10597 034522 000006                .WORD *D6
10598 034524 041720                .WORD SEN154
10599 034526 041760                .WORD SEN157
10600 034530 041744                .WORD SEN156
10601 034532 053737 004542 005064  BIS @WERROR,@WLOPERR ;TAG MARCH PATTERN TESTS
10602 034540 012737 000005 177746  MOV #5,@WCCR      ;HIGH CACHE TAG FAILURE
10603 034546 000735                BR 4$           ;CACHE ADDRESS , DATA UNKNOWN
10604 034550 012701 004000          6$:      MOV #4000,R1 ;SET DELAYED ERROR FLAG
10605 034554 012737 000001 177750  7$:      MOV #1,@WCMR ;ENABLE CACHE
10606 034562 014102                MOV -(R1),R2     ;END ADDRESS
10607 034564 032737 000010 177752  BIT #BIT03,@WCHR ;ENABLE MAINT. MODE
10608 034572 001415                BEQ 8$           ;READ BACKGROUND
10609 034574 012737 000000 177750  MOV #0,@WCMR      ;ANY HIT
10610 034602 011102                MOV (R1),R2      ;NO
10611 034604 011102                MOV (R1),R2      ;DISABLE MAINT. MODE
10612 034606 032737 000010 177752  BIT #BIT03,@WCHR ;WRITE COMP
10613 034614 001404                BEQ 8$           ;READ COMP
10614 034616 022701 002000          9$:      CMP #2000,R1 ;SHOULD HAVE HIT
10615 034622 001354                BNE 7$           ;NO HIT
10616 034624 000433                BR 10$          ;LOOP COMPLETE YET
                                     ;NO
```


CACHE DIAG.
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TAG MARCH PATTERN TESTS

C 10

SEQ 0119

10617	034626	012737	001015	177746	8\$:	MOV #OFF, @#CCR	;DISABLE CACHE
10618	034634	005037	004550			CLR @#GOOD	;DATA UNKNOWN
10619	034640	005037	004552			CLR @#BAD	
10620	034644	010137	004554			MOV R1, @#ADD	;CACHE ADDRESS
10621	034650	012737	000001	004542		MOV #1, @#ERROR	;SET ERROR FLAG
10622	034656	005237	004556			INC @#GOODBD	;SET BIT PRINT MODE
10623	034662	004037	005352			JSR R0, @#SETEN	;REPORT ERROR
10624	034666	000006				.WORD ^D6	
10625	034670	041720				.WORD SEN154	;TAG MARCH PATTERN TESTS
10626	034672	041760				.WORD SEN157	;HIGH CACHE TAG FAILURE
10627	034674	041744				.WORD SEN156	;CACHE ADDRESS , DATA UNKNOWN
10628	034676	012737	000005	177746		MOV #5, @#CCR	;ENABLE CACHE
10629	034704	053737	004542	005064		BIS @#ERROR, @#LOPERR	;SET DELAYED ERROR FLAG
10630	034712	000741				BR 9\$	
10631	034714	012737	001015	177746	10\$:	MOV #OFF, @#CCR	;DISABLE CACHE
10632	034722	013737	005064	004542		MOV @#LOPERR, @#ERROR	
10633	034730	004010				JSR R0, (R0)	;TAKE SELECTED ACTION ON ERROR
10634	034732	044000				.WORD LOWSP	
10635	034734	044000				.WORD LOWSP	
10636							
10637							
10638							
10639							
10640							
10641							

CACHE DIAG.
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PARITY INTERRUPT TESTS

SEQ 0120

.SBTTL PARITY INTERRUPT TESTS

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10643
10644
10645
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10647
10648
10649
10650
10651
10652
10653 034736 005267 143704 TST131: INC TID ;UPDATE TEST ID
10654 034742 004467 151146 JSR R4,RELCTL ;RELOCATE TEST TO LOW CACHE
10655 034746 035126 .WORD TST132
10656 034750 012737 000000 177776 MOV #0,@#PSW ;LOWER PRIOR.
10657 034756 005037 177744 CLR @#CMPE ;RESET ERROR REGISTER
10658 034762 012737 000005 177746 MOV #5,@#CCR ;ENABLE HIGH CACHE
10659 034770 013702 052000 MOV @#HIGH1,R2 ;TAG HIGH LOCATION BLOCK #2
10660 034774 013702 046000 MOV @#HIGHSP,R2 ;TAG LOCATION
10661 035000 052737 000100 177746 BIS #BIT06,@#CCR ;SET WRITE WRONG DATA MODE
10662 035006 012737 000077 046000 MOV #77,@#HIGHSP ;WRITE WRONG PARITY DATA
10663 035014 012737 001015 177746 MOV #OFF,@#CCR ;DISABLE WRITE WRONG
10664 035022 010702 MOV PC,R2 ;UNTAG LOW CACHE
10665 035024 014212 1$: MOV -(R2),(R2) ;CAUSE WRITE IN BYPASS MODE
10666 035026 020227 044000 CMP R2,#LOWSP
10667 035032 001374 BNE 1$
10668 035034 012737 000005 177746 MOV #5,@#CCR ;ENABLE HIGH CACHE
10669 035042 013702 046000 MOV @#HIGHSP,R2 ;CAUSE PARITY ERROR
10670 035046 042737 000001 177746 BIC #BIT00,@#CCR ;ENABLE PARITY INTERRUPT
10671 035054 013737 177746 004542 MOV @#CCR,@#ERROR
10672 035062 012737 001015 177746 MOV #OFF,@#CCR ;DISABLE CACHE
10673 035070 005137 004542 COM @#ERROR ;FOR BIT00 ERROR CHECK
10674 035074 042737 177776 004542 BIC #177776,@#ERROR ;MASK ALL OTHERS
10675 035102 004037 005352 JSR R0,@#SETEN ;REPORT ERROR IF ANY
10676 035106 000010 .WORD *DB
10677 035110 041772 .WORD SEN158 ;PARITY INTERRUPT TESTS
10678 035112 042002 .WORD SEN159 ;CACHE FAILED TO INTERRUPT ON PARITY ERROR
10679 035114 042022 .WORD SEN160 ;USING CACHE INTERRUPT LOGIC
10680 035116 042034 .WORD SEN161 ;BIT00 OF CCR USED
10681 035120 004010 JSR R0,(R0) ;TAKE SELECTED ACTION ON ERROR
10682 035122 044000 .WORD LOWSP
10683 035124 044000 .WORD LOWSP
10684
10685
10686
10687
10688
10689
10690
10691
10692
10693 035126 005267 143514 TST132: INC TID ;UPDATE TEST ID
10694 035132 004467 150756 JSR R4,RELCTL ;RELOCATE TEST TO LOW CACHE
10695 035136 035276 .WORD TST133
10696 035140 005037 177744 CLR @#CMPE ;RESET ERROR REGISTER
10697 035144 012737 000005 177746 MOV #5,@#CCR ;ENABLE HIGH CACHE
10698 035152 013702 052000 MOV @#HIGH1,R2 ;TAG HIGH LOCATION BLOCK #2

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PARITY INTERRUPT TESTS

SEQ 0121

10699	035156	013702	046000		MOV @HIGHSP,R2	:TAG HIGH LOCATION BLOCK #1
10700	035162	052737	000100	177746	BIS #BIT06,@CCR	:SET WRITE WRONG DATA MODE
10701	035170	012737	000077	046000	MOV #77,@HIGHSP	:WRITE WRONG DATA PARITY
10702	035176	012737	001015	177746	MOV #OFF,@CCR	:UNTAG LOW CACHE
10703	035204	010702			MOV PC,R2	
10704	035206	014212			1\$: MOV -(R2),(R2)	:CAUSE WRITE IN BYPASS MODE
10705	035210	022702	044000		CMP #LOWSP,R2	
10706	035214	001374			BNE 1\$	
10707	035216	012737	000205	177746	MOV #5+BIT07,@CCR	:ENABLE ABORT
10708	035224	013702	046000		MOV @HIGHSP,R2	:CAUSE PARITY ERROR
10709	035230	013737	177746	004542	MOV @CCR,@ERROR	
10710	035236	042737	177577	004542	BIC #-BIT07-1,@ERROR	:VERIFY INTERRUPT
10711	035244	012737	001015	177746	MOV #OFF,@CCR	:DISABLE CACHE
10712	035252	004037	005352		JSR R0,@SETEN	:REPORT ERROR IF ANY
10713	035256	000010			.WORD ^D8	
10714	035260	041772			.WORD SEN158	:PARITY INTERRUPT TESTS
10715	035262	042002			.WORD SEN159	:CACHE FAILED TO INTERRUPT ON PARITY ERROR
10716	035264	042046			.WORD SEN162	:USING CACHE ABORT LOGIC IN HIGH CACHE
10717	035266	042066			.WORD SEN163	:BIT07 IN CCR
10718	035270	004010			JSR R0,(R0)	:TAKE SELECTED ACTION ON ERROR
10719	035272	044000			.WORD LOWSP	:LOOP ON ERROR
10720	035274	044000			.WORD LOWSP	:LOOP ON TEST
10721						
10722						
10723						
10724						
10725						
10726						
10727						
10728						
10729						
10730	035276	005267	143344		TST133: INC TID	:UPDATE TEST ID
10731	035302	004467	150634		JSR R4,RELCTH	:RELOCATE TEST TO HIGH CACHE
10732	035306	035446			.WORD TST134	
10733	035310	005037	177744		CLR @CMPE	:RESET ERROR REGISTER
10734	035314	012737	000011	177746	MOV #11,@CCR	:ENABLE LOW CACHE
10735	035322	013702	050000		MOV @LOW1,R2	:TAG LOW BLOCK #2
10736	035326	013702	044000		MOV @LOWSP,R2	:TAG LOW BLOCK #1
10737	035332	052737	000100	177746	BIS #BIT06,@CCR	:ENABLE WRITE WRONG DATA
10738	035340	012737	000077	044000	MOV #77,@LOWSP	:WRITE WRONG DATA
10739	035346	012737	001015	177746	MOV #OFF,@CCR	:DISABLE CACHE
10740	035354	010702			MOV PC,R2	:UNTAG HIGH CACHE
10741	035356	014212			1\$: MOV -(R2),(R2)	
10742	035360	020227	046000		CMP R2,@HIGHSP	
10743	035364	001374			BNE 1\$	
10744	035366	012737	000211	177746	MOV #11+BIT07,@CCR	:ENABLE ABORT
10745	035374	013702	044000		MOV @LOWSP,R2	:CAUSE PARITY ERROR
10746	035400	013737	177746	004542	MOV @CCR,@ERROR	:SAVE ERROR REGISTER
10747	035406	012737	001015	177746	MOV #OFF,@CCR	:DISABLE CACHE
10748	035414	042737	177577	004542	BIC #-BIT07-1,@ERROR	:REPORT ERROR IF ANY
10749	035422	004037	005352		JSR R0,@SETEN	
10750	035426	000010			.WORD ^D8	
10751	035430	041772			.WORD SEN158	:PARITY INTERRUPT TESTS
10752	035432	042002			.WORD SEN159	:CACHE FAILED TO INTERRUPT ON PARITY ERROR
10753	035434	042076			.WORD SEN164	:USING CACHE ABORT LOGIC IN LOW CACHE
10754	035436	042066			.WORD SEN163	:BIT07 IN CCR

:
: WRITE WRONG PARITY TO CACHE
: ENABLE PARITY ERROR ABORT FOR LOW CACHE
: READ AND CAUSE PARITY ERROR
:

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PARITY INTERRUPT TESTS

SEQ 0122

10755	035440	004010			JSR R0,(R0)	:TAKE SELECTED ACTION ON ERROR
10756	035442	046000			.WORD HIGHSP	:LOOP ON ERROR
10757	035444	046000			.WORD HIGHSP	:LOOP ON TEST
10758						
10759						
10760						
10761						
10762						
10763						
10764						
10765						
10766						
10767	035446	005267	143174		TST134: INC TID	:UPDATE TEST ID
10768	035452	004467	150464		JSR R4,RELCTH	:RELOCATE TEST TO HIGH CACHE
10769	035456	035636			.WORD TST135	
10770	035460	012737	000011	177746	MOV #11,@CCR	:ENABLE LOW CACHE
10771	035466	013702	050000		MOV @LOW1,R2	:TAG LOW LOCATION BLOCK #2
10772	035472	013702	044000		MOV @LOWSP,R2	:TAG LOW LOCATION BLOCK #1
10773	035476	052737	000100	177746	BIS #BIT06,@CCR	:WRITE WRONG DATA MODE
10774	035504	012737	000077	044000	MOV #77,@LOWSP	:WRITE WRONG DATA PARITY
10775	035512	012737	001015	177746	MOV #OFF,@CCR	
10776	035520	010702			MOV PC,R2	:UNTAG HIGH CACHE
10777	035522	014212			1\$: MOV -(R2),(R2)	:CAUSE WRITE WITH BYPASS
10778	035524	020227	046000		CMP R2,#HIGHSP	
10779	035530	001374			BNE 1\$	
10780	035532	005002			CLR R2	:REGISTER FOR ABORT CHECK
10781	035534	005037	177744		CLR @CMPE	:RESET ERROR REGISTER
10782	035540	012737	000210	177746	MOV #210,@CCR	:ENABLE ABORT AND TRAP
10783	035546	013702	044000		MOV @LOWSP,R2	:CAUSE ABORT
10784	035552	013737	177746	004542	MOV @CCR,@ERROR	:DID PARITY ERROR OCCUR
10785	035560	012737	001015	177746	MOV #OFF,@CCR	:DISABLE CACHE
10786	035566	042737	177776	004542	BIC #-BIT00-1,@ERROR	:LOOK AT BIT00 ONLY
10787	035574	001402			BEQ 2\$	:NO PARITY ERROR
10788	035576	005702			TST R2	:DID CACHE ABORT
10789	035600	001006			BNE 3\$	:NO
10790	035602	005037	004542		2\$: CLR @ERROR	:RESET ERROR FLAG
10791	035606	004010			4\$: JSR R0,(R0)	:TAKE SELECTED ACTION ON ERROR
10792	035610	046000			.WORD HIGHSP	:LOOP ON ERROR
10793	035612	046000			.WORD HIGHSP	:LOOP ON TEST
10794	035614	000410			BR TST135	
10795	035616	004037	005352		3\$: JSR R0,@SETEN	:REPORT ERROR
10796	035622	000010			.WORD ^D8	
10797	035624	041772			.WORD SEN158	:PARITY INTERRUPT TESTS
10798	035626	042116			.WORD SEN165	:PARITY ERROR ABORT AND TRAP BOTH ENABLED
10799	035630	042136			.WORD SEN166	:PARITY ERROR OCCURED AND CACHE TRAPPED
10800	035632	042154			.WORD SEN167	:CACHE SHOULD HAVE ABORTED
10801	035634	000764			BR 4\$	
10802						
10803						
10804						
10805						
10806	035636	005267	143006		TST135: INC \$PASS	:UPDATE PASS COUNT
10807	035642	012702	035676		MOV #DEAD,R2	:PRINT END ON PASS
10808	035646	004767	150212		JSR PC,TYPE	
10809	035652	013700	000042		MOV @42,R0	:GIT RETURN ADDRESS
10810	035656	001405			BEQ REST	:RESTART TEST

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PARITY INTERRUPT TESTS

SEQ 0123

10811	035660	000005				RESET	
10812	035662	004710			ENDIT:	JSR PC,(R0)	;GO WHERE YOU GO
10813	035664	000240				NOP	
10814	035666	000240				NOP	
10815	035670	000240				NOP	
10816	035672	000167	143102		REST:	JMP PREPARE	;RESTART DIAG.
10817	035676	040520	051523	041440	DEAD:	.ASCII /PASS COMPLETE/	
10818	035713	015	012	177		.BYTE 15,12,177,177,177,0	
10819		035722				.EVEN	

10821					SEN1:	.SBTTL TEXT SENTENCECES
10822	035722	042210	042216	042227	SEN1:	.WORD DIC1,DIC2,DIC3,DIC4,0
10823	035734	042246	042256	042265	SEN2:	.WORD DIC5,DIC6,DIC7,DIC2,DIC8,DIC9,DIC10,0
10824	035754	042246	042313	042216	SEN3:	.WORD DIC5,DIC11,DIC2,DIC8,DIC9,DIC10,0
10825	035772	042246	042323	042216	SEN4:	.WORD DIC5,DIC12,DIC2,DIC8,DIC9,DIC10,0
10826	036010	042246	042337	042216	SEN5:	.WORD DIC5,DIC13,DIC2,DIC8,DIC9,DIC10,0
10827	036026	042246	042343	042353	SEN6:	.WORD DIC5,DIC14,DIC15,DIC16,DIC17,DIC18,DIC19,DIC9,DIC10,0
10828	036052	042246	042343	042353	SEN7:	.WORD DIC5,DIC14,DIC15,DIC20,DIC17,DIC18,DIC19,DIC9,DIC10,0
10829	036076	042417	042426	042433	SEN8:	.WORD DIC21,DIC22,DIC23,DIC24,DIC25,DIC26,0
10830	036114	042455	042216	042466	SEN9:	.WORD DIC27,DIC2,DIC28,DIC7,0
10831	036126	042501	042451	042507	SEN10:	.WORD DIC29,DIC26,DIC30,DIC31,DIC23,DIC24,DIC32,DIC33,0
10832	036150	042313	042216	042532	SEN11:	.WORD DIC11,DIC2,DIC34,DIC35,0
10833	036162	042501	042525	042507	SEN12:	.WORD DIC29,DIC33,DIC30,DIC31,DIC23,DIC24,DIC32,DIC26,0
10834	036204	042501	042525	042507	SEN13:	.WORD DIC29,DIC33,DIC30,DIC31,DIC36,DIC24,DIC26,0
10835	036224	042501	042451	042507	SEN14:	.WORD DIC29,DIC26,DIC30,DIC31,DIC36,DIC24,DIC33,0
10836	036244	042501	042525	042507	SEN15:	.WORD DIC29,DIC33,DIC30,DIC31,DIC37,DIC24,DIC26,0
10837	036264	042501	042451	042507	SEN16:	.WORD DIC29,DIC26,DIC30,DIC31,DIC37,DIC24,DIC33,0
10838	036304	042501	042525	042507	SEN17:	.WORD DIC29,DIC33,DIC30,DIC31,DIC38,DIC24,DIC26,0
10839	036324	042501	042451	042507	SEN18:	.WORD DIC29,DIC26,DIC30,DIC31,DIC38,DIC24,DIC33,0
10840	036344	042501	042525	042507	SEN19:	.WORD DIC29,DIC33,DIC30,DIC31,DIC39,DIC24,DIC26,0
10841	036364	042501	042451	042507	SEN20:	.WORD DIC29,DIC26,DIC30,DIC31,DIC39,DIC24,DIC33,0
10842	036404	042501	042525	042507	SEN21:	.WORD DIC29,DIC33,DIC30,DIC31,DIC40,DIC24,DIC26,0
10843	036424	042501	042451	042507	SEN22:	.WORD DIC29,DIC26,DIC30,DIC31,DIC40,DIC24,DIC33,0
10844	036444	042501	042525	042507	SEN23:	.WORD DIC29,DIC33,DIC30,DIC31,DIC41,DIC24,DIC26,0
10845	036464	042501	042451	042507	SEN24:	.WORD DIC29,DIC26,DIC30,DIC31,DIC41,DIC24,DIC33,0
10846	036504	042313	042216	042417	SEN25:	.WORD DIC11,DIC2,DIC21,DIC42,DIC35,0
10847	036520	042441	042451	042614	SEN26:	.WORD DIC24,DIC26,DIC43,DIC21,DIC31,DIC44,0
10848	036536	042441	042451	042614	SEN27:	.WORD DIC24,DIC26,DIC43,DIC21,DIC31,DIC45,0
10849	036554	042441	042451	042614	SEN28:	.WORD DIC24,DIC26,DIC43,DIC21,DIC31,DIC46,0
10850	036572	042441	042451	042614	SEN29:	.WORD DIC24,DIC26,DIC43,DIC21,DIC31,DIC47,0
10851	036610	042441	042451	042614	SEN30:	.WORD DIC24,DIC26,DIC43,DIC21,DIC31,DIC48,0
10852	036626	042441	042451	042614	SEN31:	.WORD DIC24,DIC26,DIC43,DIC21,DIC31,DIC49,0
10853	036644	042441	042451	042614	SEN32:	.WORD DIC24,DIC26,DIC43,DIC21,DIC31,DIC50,0
10854	036662	042210	042313	042216	SEN33:	.WORD DIC1,DIC11,DIC2,DIC51,DIC4,0
10855	036676	042501	042525	042507	SEN34:	.WORD DIC29,DIC33,DIC30,DIC52,DIC51,DIC44,0
10856	036714	042501	042451	042507	SEN35:	.WORD DIC29,DIC26,DIC30,DIC53,DIC51,DIC40,0
10857	036732	042441	042525	042614	SEN36:	.WORD DIC24,DIC33,DIC43,DIC40,0
10858	036744	042501	042525	042507	SEN37:	.WORD DIC29,DIC33,DIC30,DIC53,DIC51,DIC41,0
10859	036762	042501	042451	042507	SEN38:	.WORD DIC29,DIC26,DIC30,DIC52,DIC51,DIC36,0
10860	037000	042441	042525	042614	SEN39:	.WORD DIC24,DIC33,DIC43,DIC36,DIC54,DIC24,DIC26,DIC43,DIC41,0
10861	037024	042323	042216	042532	SEN40:	.WORD DIC12,DIC2,DIC34,DIC35,0
10862	037036	042501	042525	042507	SEN41:	.WORD DIC29,DIC33,DIC30,DIC55,DIC24,DIC26,0
10863	037054	042501	042451	042507	SEN42:	.WORD DIC29,DIC26,DIC30,DIC55,DIC24,DIC33,0
10864	037072	042441	042451	042614	SEN43:	.WORD DIC24,DIC26,DIC43,DIC21,DIC55,DIC44,0
10865	037110	042441	042451	042614	SEN44:	.WORD DIC24,DIC26,DIC43,DIC21,DIC55,DIC36,0
10866	037126	042532	042720	042537	SEN45:	.WORD DIC34,DIC56,DIC35,0
10867	037136	042725	042733	042737	SEN46:	.WORD DIC57,DIC58,DIC59,DIC60,DIC53,DIC1,0
10868	037154	042747	042752	042757	SEN47:	.WORD DIC61,DIC62,DIC63,DIC34,DIC24,0
10869	037170	042532	042762	042441	SEN48:	.WORD DIC34,DIC64,DIC24,DIC25,DIC33,0
10870	037204	042725	042733	042771	SEN49:	.WORD DIC57,DIC58,DIC65,DIC60,DIC53,DIC1,0
10871	037222	042532	042762	042441	SEN50:	.WORD DIC34,DIC64,DIC24,DIC25,DIC26,0
10872	037236	042532	042720	042610	SEN51:	.WORD DIC34,DIC56,DIC42,DIC66,DIC35,0
10873	037252	043005	042451	043014	SEN52:	.WORD DIC67,DIC26,DIC68,DIC69,DIC70,DIC65,0
10874	037270	043035	042700	042210	SEN53:	.WORD DIC71,DIC52,DIC1,0
10875	037300	043035	042704	042210	SEN54:	.WORD DIC71,DIC53,DIC1,0
10876	037310	043005	042525	043014	SEN55:	.WORD DIC67,DIC33,DIC68,DIC72,DIC69,DIC70,DIC59,0

Line	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6
10877	037330	043035	043047	042704	SEN56:	.WORD DIC71,DIC73,DIC53,DIC1,0
10878	037342	042210	043052	042240	SEN57:	.WORD DIC1,DIC74,DIC4,0
10879	037352	043052	043047	043060	SEN58:	.WORD DIC74,DIC73,DIC75,DIC42,DIC76,DIC60,DIC77,0
10880	037372	042446	043104	043032	SEN59:	.WORD DIC25,DIC78,DIC70,DIC79,DIC1,DIC74,DIC42,0
10881	037412	043052	043047	043060	SEN60:	.WORD DIC74,DIC73,DIC75,DIC76,DIC60,DIC80,0
10882	037430	042302	043131	043052	SEN61:	.WORD DIC9,DIC81,DIC74,DIC60,DIC82,DIC83,DIC10,0
10883	037450	043152	042610	043047	SEN62:	.WORD DIC84,DIC42,DIC73,DIC85,DIC42,DIC17,DIC18,DIC77,DIC25,0
10884	037474	043104	043032	043052	SEN63:	.WORD DIC78,DIC70,DIC74,0
10885	037504	043152	043100	043164	SEN64:	.WORD DIC84,DIC77,DIC86,DIC42,DIC76,DIC60,DIC80,0
10886	037524	043172	043052	000000	SEN65:	.WORD DIC87,DIC74,0
10887	037532	043052	043071	042744	SEN66:	.WORD DIC74,DIC76,DIC60,DIC88,DIC1,0
10888	037546	043035	042700	042210	SEN67:	.WORD DIC71,DIC52,DIC1,DIC89,DIC84,DIC90,DIC77,DIC72,0
10889	037570	042455	043052	043226	SEN68:	.WORD DIC27,DIC74,DIC91,DIC42,DIC92,0
10890	037604	043035	042704	042210	SEN69:	.WORD DIC71,DIC53,DIC1,DIC89,DIC84,DIC90,DIC77,DIC72,0
10891	037626	043035	042704	042210	SEN70:	.WORD DIC71,DIC53,DIC1,DIC89,DIC93,DIC90,DIC77,DIC72,0
10892	037650	043035	042700	042210	SEN71:	.WORD DIC71,DIC52,DIC1,DIC89,DIC84,DIC90,DIC77,DIC94,0
10893	037672	043035	042704	042210	SEN72:	.WORD DIC71,DIC53,DIC1,DIC89,DIC84,DIC90,DIC77,DIC94,0
10894	037714	043254	043262	042240	SEN73:	.WORD DIC95,DIC96,DIC4,0
10895	037724	042700	042210	043267	SEN74:	.WORD DIC52,DIC1,DIC97,DIC98,DIC99,DIC100,0
10896	037742	042704	042210	043267	SEN75:	.WORD DIC53,DIC1,DIC97,DIC100,DIC99,DIC98,0
10897	037760	042700	042210	043267	SEN76:	.WORD DIC52,DIC1,DIC97,DIC100,DIC99,DIC98,0
10898	037776	042704	042210	043267	SEN77:	.WORD DIC53,DIC1,DIC97,DIC98,DIC99,DIC100,0
10899	040014	042725	043323	042256	SEN78:	.WORD DIC57,DIC101,DIC6,DIC4,0
10900	040026	042501	043323	042256	SEN79:	.WORD DIC29,DIC101,DIC6,DIC60,DIC52,DIC51,DIC53,DIC51,DIC102,DIC103,0
10901	040054	042700	042673	042256	SEN80:	.WORD DIC52,DIC51,DIC6,DIC7,DIC38,DIC18,DIC77,DIC73,DIC22,0
10902	040100	042704	042673	042256	SEN81:	.WORD DIC53,DIC51,DIC6,DIC7,DIC39,DIC18,DIC77,DIC73,DIC22,0
10903	040124	043335	042256	042265	SEN82:	.WORD DIC103,DIC6,DIC7,DIC46,DIC18,DIC77,DIC73,DIC22,0
10904	040146	042337	042216	042240	SEN83:	.WORD DIC13,DIC2,DIC4,0
10905	040156	042210	042337	042216	SEN84:	.WORD DIC1,DIC13,DIC2,DIC64,DIC104,DIC53,0
10906	040174	042337	042610	042265	SEN85:	.WORD DIC13,DIC42,DIC7,0
10907	040204	043347	042744	042725	SEN86:	.WORD DIC105,DIC60,DIC57,DIC13,DIC2,DIC46,0
10908	040222	042744	043045	042451	SEN87:	.WORD DIC60,DIC72,DIC26,DIC106,DIC107,DIC24,DIC13,DIC106,DIC76,0
10909	040246	042210	042532	042725	SEN88:	.WORD DIC1,DIC34,DIC57,DIC51,DIC35,0
10910	040262	042210	042532	042725	SEN89:	.WORD DIC1,DIC34,DIC57,DIC51,DIC7,0
10911	040276	043365	042725	042700	SEN90:	.WORD DIC108,DIC57,DIC52,DIC51,0
10912	040310	043365	042725	042704	SEN91:	.WORD DIC108,DIC57,DIC53,DIC51,0
10913	040322	042256	042265	042216	SEN92:	.WORD DIC6,DIC7,DIC2,DIC4,0
10914	040334	042665	043032	042426	SEN93:	.WORD DIC50,DIC70,DIC22,DIC109,DIC18,DIC77,DIC25,DIC78,0
10915	040356	043032	043335	042256	SEN94:	.WORD DIC70,DIC103,DIC6,DIC7,0
10916	040370	042665	043032	042426	SEN95:	.WORD DIC50,DIC70,DIC22,DIC17,DIC18,DIC77,0
10917	040406	042446	043104	043032	SEN96:	.WORD DIC25,DIC78,DIC70,DIC52,DIC51,DIC6,DIC7,0
10918	040426	042665	043032	042426	SEN97:	.WORD DIC50,DIC70,DIC22,DIC109,DIC18,DIC77,0
10919	040444	042446	043104	043032	SEN98:	.WORD DIC25,DIC78,DIC70,DIC53,DIC51,DIC6,DIC7,0
10920	040464	042725	042744	042426	SEN99:	.WORD DIC57,DIC60,DIC22,DIC76,DIC60,DIC80,DIC2,0
10921	040504	042256	042265	043376	SEN100:	.WORD DIC6,DIC7,DIC110,DIC4,0
10922	040516	042700	042673	042256	SEN101:	.WORD DIC52,DIC51,DIC6,DIC92,0
10923	040530	043071	042757	043404	SEN102:	.WORD DIC76,DIC63,DIC111,DIC102,DIC112,DIC24,0
10924	040546	042704	042673	042256	SEN103:	.WORD DIC53,DIC51,DIC6,DIC92,0
10925	040560	043335	042256	043236	SEN104:	.WORD DIC103,DIC6,DIC92,0
10926	040570	042256	042265	042610	SEN105:	.WORD DIC6,DIC7,DIC42,DIC76,DIC60,DIC77,DIC63,DIC101,0
10927	040612	042725	043404	043331	SEN106:	.WORD DIC57,DIC111,DIC102,DIC112,0
10928	040624	042441	042725	042337	SEN107:	.WORD DIC24,DIC57,DIC13,DIC4,0
10929	040636	042747	042752	042446	SEN108:	.WORD DIC61,DIC62,DIC25,DIC78,DIC70,DIC113,DIC60,DIC114,DIC115,DIC116,0
10930	040664	043450	043454	042240	SEN109:	.WORD DIC117,DIC118,DIC4,0
10931	040674	042441	042507	043450	SEN110:	.WORD DIC24,DIC30,DIC117,DIC118,DIC8,DIC13,0
10932	040712	042441	042507	043450	SEN111:	.WORD DIC24,DIC30,DIC117,DIC118,DIC119,DIC115,DIC120,0

10933	040732	043506	043047	042323	SEN112:	.WORD	DIC121,DIC73,DIC12,DIC122,0
10934	040744	043152	042610	043521	SEN113:	.WORD	DIC84,DIC42,DIC123,DIC4,0
10935	040756	043531	043047	042700	SEN114:	.WORD	DIC124,DIC73,DIC52,DIC1,DIC125,DIC84,DIC77,DIC72,0
10936	041000	042353	042610	042265	SEN115:	.WORD	DIC15,DIC42,DIC7,0
10937	041010	042704	042210	043313	SEN116:	.WORD	DIC53,DIC1,DIC100,DIC89,DIC84,DIC77,DIC94,0
10938	041030	043550	043514	042240	SEN117:	.WORD	DIC126,DIC122,DIC4,0
10939	041040	042704	042210	043475	SEN118:	.WORD	DIC53,DIC1,DIC120,DIC18,DIC119,0
10940	041054	043557	042725	042744	SEN119:	.WORD	DIC127,DIC57,DIC60,DIC120,DIC73,DIC126,DIC122,0
10941	041074	042537	043562	043543	SEN120:	.WORD	DIC35,DIC128,DIC125,DIC84,DIC90,DIC77,DIC72,0
10942	041114	043213	043152	043221	SEN121:	.WORD	DIC89,DIC84,DIC90,DIC77,DIC94,0
10943	041130	042246	043427	043475	SEN122:	.WORD	DIC5,DIC115,DIC120,DIC73,DIC126,DIC122,0
10944	041146	042273	043475	042744	SEN123:	.WORD	DIC8,DIC120,DIC60,DIC88,0
10945	041160	043335	042610	043566	SEN124:	.WORD	DIC103,DIC42,DIC129,DIC24,DIC57,DIC4,0
10946	041176	042747	042337	042614	SEN125:	.WORD	DIC61,DIC13,DIC43,DIC24,DIC30,DIC130,DIC120,0
10947	041216	042353	043603	000000	SEN126:	.WORD	DIC15,DIC131,0
10948	041224	043323	043335	042441	SEN127:	.WORD	DIC101,DIC103,DIC24,DIC43,DIC13,DIC2,0
10949	041242	042446	043104	043032	SEN128:	.WORD	DIC25,DIC78,DIC70,DIC130,DIC24,0
10950	041256	042353	054000	000000	SEN129:	.WORD	DIC15,DIC132,0
10951	041264	043574	042353	043331	SEN130:	.WORD	DIC130,DIC15,DIC102,DIC13,DIC2,DIC34,0
10952	041302	042353	054007	000000	SEN131:	.WORD	DIC15,DIC133,0
10953	041310	042353	054016	000000	SEN132:	.WORD	DIC15,DIC134,0
10954	041316	042353	054025	000000	SEN133:	.WORD	DIC15,DIC135,0
10955	041324	042353	054034	000000	SEN134:	.WORD	DIC15,DIC136,0
10956	041332	042353	054043	000000	SEN135:	.WORD	DIC15,DIC137,0
10957	041340	042353	054052	000000	SEN136:	.WORD	DIC15,DIC138,0
10958	041346	042210	043574	042353	SEN137:	.WORD	DIC1,DIC130,DIC15,DIC35,0
10959	041360	054061	042210	042353	SEN138:	.WORD	DIC139,DIC1,DIC15,DIC30,DIC1,DIC34,0
10960	041376	042210	043574	043475	SEN139:	.WORD	DIC1,DIC130,DIC120,DIC102,DIC34,0
10961	041412	054071	054100	054112	SEN140:	.WORD	DIC140,DIC141,DIC142,DIC35,0
10962	041424	043427	042210	042372	SEN141:	.WORD	DIC115,DIC1,DIC17,DIC18,DIC88,DIC127,DIC142,DIC57,0
10963	041446	043213	054071	054100	SEN142:	.WORD	DIC89,DIC140,DIC141,DIC143,0
10964	041460	042532	042610	054125	SEN143:	.WORD	DIC34,DIC42,DIC144,DIC145,DIC35,0
10965	041474	042210	042353	043357	SEN144:	.WORD	DIC1,DIC15,DIC106,DIC34,DIC146,DIC106,DIC34,DIC24,0
10966	041516	042532	042256	054125	SEN145:	.WORD	DIC34,DIC6,DIC144,DIC145,DIC35,0
10967	041532	042704	042673	042256	SEN146:	.WORD	DIC53,DIC51,DIC6,DIC7,0
10968	041544	042210	042353	043357	SEN147:	.WORD	DIC1,DIC15,DIC106,DIC6,DIC147,DIC106,DIC6,DIC24,0
10969	041566	042700	042673	042256	SEN148:	.WORD	DIC52,DIC51,DIC6,DIC7,0
10970	041600	043152	042610	054125	SEN149:	.WORD	DIC84,DIC42,DIC144,DIC145,DIC35,0
10971	041614	043152	042610	043100	SEN150:	.WORD	DIC84,DIC42,DIC77,DIC94,DIC86,0
10972	041630	042210	042353	043357	SEN151:	.WORD	DIC1,DIC15,DIC106,DIC84,DIC42,DIC147,DIC106,DIC84,DIC42,DIC24,0
10973	041656	043152	042610	043100	SEN152:	.WORD	DIC84,DIC42,DIC77,DIC72,DIC86,0
10974	041672	042210	042353	043357	SEN153:	.WORD	DIC1,DIC15,DIC106,DIC84,DIC42,DIC148,DIC106,DIC84,DIC42,DIC24,0
10975	041720	043335	054125	054133	SEN154:	.WORD	DIC103,DIC144,DIC145,DIC4,0
10976	041732	042700	042210	043335	SEN155:	.WORD	DIC52,DIC1,DIC103,DIC92,0
10977	041744	042210	042353	043357	SEN156:	.WORD	DIC1,DIC15,DIC106,DIC34,DIC149,0
10978	041760	042704	042210	043335	SEN157:	.WORD	DIC53,DIC1,DIC103,DIC92,0
10979	041772	042256	054203	042240	SEN158:	.WORD	DIC6,DIC150,DIC4,0
10980	042002	042210	043071	042744	SEN159:	.WORD	DIC1,DIC76,DIC60,DIC150,DIC63,DIC6,DIC7,0
10981	042022	043213	042210	054203	SEN160:	.WORD	DIC89,DIC1,DIC150,DIC110,0
10982	042034	042433	043032	042514	SEN161:	.WORD	DIC23,DIC70,DIC31,DIC151,0
10983	042046	043213	042210	054222	SEN162:	.WORD	DIC89,DIC1,DIC152,DIC110,DIC73,DIC53,DIC1,0
10984	042066	042566	043047	042514	SEN163:	.WORD	DIC39,DIC73,DIC31,0
10985	042076	043213	042210	054222	SEN164:	.WORD	DIC89,DIC1,DIC152,DIC110,DIC73,DIC52,DIC1,0
10986	042116	042256	042265	054222	SEN165:	.WORD	DIC6,DIC7,DIC152,DIC102,DIC153,DIC154,DIC100,0
10987	042136	042256	042265	054242	SEN166:	.WORD	DIC6,DIC7,DIC155,DIC102,DIC1,DIC156,0
10988	042154	042210	054262	054271	SEN167:	.WORD	DIC1,DIC157,DIC158,DIC159,0

CACHE DIAG.
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TEXT SENTENCECES

K 10

SEQ 0127

10989 042166 042455 043254 043262 SEN168:

.WORD DIC27,DIC95,DIC96,DIC160,DIC161,DIC162,DIC160,DIC163,0

10991						.SBTTL TEXT WORDS
10992	042210	040503	044103	000105	DIC1:	.ASCIZ *CACHE*
10993	042216	042522	044507	052123	DIC2:	.ASCIZ *REGISTER*
10994	042227	122	051505	047520	DIC3:	.ASCIZ *RESPONSE*
10995	042240	042524	052123	000123	DIC4:	.ASCIZ *TESTS*
10996	042246	042522	042101	047111	DIC5:	.ASCIZ *READING*
10997	042256	040520	044522	054524	DIC6:	.ASCIZ *PARITY*
10998	042265	105	051122	051117	DIC7:	.ASCIZ *ERROR*
10999	042273	103	052501	042523	DIC8:	.ASCIZ *CAUSED*
11000	042302	044524	042515	000	DIC9:	.ASCIZ *TIME*
11001	042307	117	052125	000	DIC10:	.ASCIZ *OUT*
11002	042313	103	047117	051124	DIC11:	.ASCIZ *CONTROL*
11003	042323	115	044501	052116	DIC12:	.ASCIZ *MAINTENANCE*
11004	042337	110	052111	000	DIC13:	.ASCIZ *HIT*
11005	042343	111	053116	046101	DIC14:	.ASCIZ *INVALID*
11006	042353	101	042104	042522	DIC15:	.ASCIZ *ADDRESS*
11007	042363	061	033467	032067	DIC16:	.ASCIZ *177740*
11008	042372	044504	000104		DIC17:	.ASCIZ *DID*
11009	042376	047516	000124		DIC18:	.ASCIZ *NOT*
11010	042402	040503	051525	000105	DIC19:	.ASCIZ *CAUSE*
11011	042410	033461	033467	033065	DIC20:	.ASCIZ *177756*
11012	042417	125	052516	042523	DIC21:	.ASCIZ *UNUSED*
11013	042426	046503	042520	000	DIC22:	.ASCIZ *CMPE*
11014	042433	102	052111	030060	DIC23:	.ASCIZ *BIT00*
11015	042441	122	040505	000104	DIC24:	.ASCIZ *READ*
11016	042446	051501	000		DIC25:	.ASCIZ *AS*
11017	042451	117	042516	000	DIC26:	.ASCIZ *ONE*
11018	042455	120	051517	044523	DIC27:	.ASCIZ *POSSIBLE*
11019	042466	042101	051104	051505	DIC28:	.ASCIZ *ADDRESSING*
11020	042501	127	047522	042524	DIC29:	.ASCIZ *WROTE*
11021	042507	111	052116	000117	DIC30:	.ASCIZ *INTO*
11022	042514	041503	000122		DIC31:	.ASCIZ *CCR*
11023	042520	040502	045503	000	DIC32:	.ASCIZ *BACK*
11024	042525	132	051105	000117	DIC33:	.ASCIZ *ZERO*
11025	042532	040504	040524	000	DIC34:	.ASCIZ *DATA*
11026	042537	124	051505	000124	DIC35:	.ASCIZ *TEST*
11027	042544	044502	030124	000062	DIC36:	.ASCIZ *BIT02*
11028	042552	044502	030124	000063	DIC37:	.ASCIZ *BIT03*
11029	042560	044502	030124	000066	DIC38:	.ASCIZ *BIT06*
11030	042566	044502	030124	000067	DIC39:	.ASCIZ *BIT07*
11031	042574	044502	030124	000071	DIC40:	.ASCIZ *BIT09*
11032	042602	044502	030524	000060	DIC41:	.ASCIZ *BIT10*
11033	042610	044502	000124		DIC42:	.ASCIZ *BIT*
11034	042614	051106	046517	000	DIC43:	.ASCIZ *FROM*
11035	042621	102	052111	030460	DIC44:	.ASCIZ *BIT01*
11036	042627	102	052111	032060	DIC45:	.ASCIZ *BIT04*
11037	042635	102	052111	032460	DIC46:	.ASCIZ *BIT05*
11038	042643	102	052111	034060	DIC47:	.ASCIZ *BIT08*
11039	042651	102	052111	030461	DIC48:	.ASCIZ *BIT11*
11040	042657	102	052111	032061	DIC49:	.ASCIZ *BIT14*
11041	042665	102	052111	032461	DIC50:	.ASCIZ *BIT15*
11042	042673	102	052131	000105	DIC51:	.ASCIZ *BYTE*
11043	042700	047514	000127		DIC52:	.ASCIZ *LOW*
11044	042704	044510	044107	000	DIC53:	.ASCIZ *HIGH*
11045	042711	117	000122		DIC54:	.ASCIZ *OR*
11046	042714	046503	000122		DIC55:	.ASCIZ *CMR*

11047	042720	040520	044124	000	DIC56:	.ASCIIZ	*PATH*
11048	042725	127	044522	042524	DIC57:	.ASCIIZ	*WRITE*
11049	042733	101	046114	000	DIC58:	.ASCIIZ	*ALL*
11050	042737	117	042516	000123	DIC59:	.ASCIIZ	*ONES*
11051	042744	047524	000		DIC60:	.ASCIIZ	*TO*
11052	042747	116	000117		DIC61:	.ASCIIZ	*NO*
11053	042752	044510	051524	000	DIC62:	.ASCIIZ	*HITS*
11054	042757	117	000116		DIC63:	.ASCIIZ	*ON*
11055	042762	044502	024124	024523	DIC64:	.ASCIIZ	*BIT(S)*
11056	042771	132	051105	051517	DIC65:	.ASCIIZ	*ZEROS*
11057	042777	123	047510	052122	DIC66:	.ASCIIZ	*SHORT*
11058	043005	122	052117	052101	DIC67:	.ASCIIZ	*ROTATE*
11059	043014	044124	047522	043525	DIC68:	.ASCIIZ	*THROUGH*
11060	043024	044506	046105	000104	DIC69:	.ASCIIZ	*FIELD*
11061	043032	043117	000		DIC70:	.ASCIIZ	*OF*
11062	043035	124	051505	044524	DIC71:	.ASCIIZ	*TESTING*
11063	043045	101	000		DIC72:	.ASCIIZ	*A*
11064	043047	111	000116		DIC73:	.ASCIIZ	*IN*
11065	043052	046106	051525	000110	DIC74:	.ASCIIZ	*FLUSH*
11066	043060	051120	043517	042522	DIC75:	.ASCIIZ	*PROGRESS*
11067	043071	106	044501	042514	DIC76:	.ASCIIZ	*FAILED*
11068	043100	042523	000124		DIC77:	.ASCIIZ	*SET*
11069	043104	042522	052523	052114	DIC78:	.ASCIIZ	*RESULT*
11070	043113	123	052105	044524	DIC79:	.ASCIIZ	*SETTING*
11071	043123	103	042514	051101	DIC80:	.ASCIIZ	*CLEAR*
11072	043131	106	051117	000	DIC81:	.ASCIIZ	*FOR*
11073	043135	103	046517	046120	DIC82:	.ASCIIZ	*COMPLETE*
11074	043146	040522	000116		DIC83:	.ASCIIZ	*RAN*
11075	043152	040526	044514	000104	DIC84:	.ASCIIZ	*VALID*
11076	043160	051525	000105		DIC85:	.ASCIIZ	*USE*
11077	043164	047111	051525	000105	DIC86:	.ASCIIZ	*INUSE*
11078	043172	043101	042524	000122	DIC87:	.ASCIIZ	*AFTER*
11079	043200	047111	040526	044514	DIC88:	.ASCIIZ	*INVALIDATE*
11080	043213	125	044523	043516	DIC89:	.ASCIIZ	*USING*
11081	043221	102	052111	000123	DIC90:	.ASCIIZ	*BITS*
11082	043226	047503	047125	042524	DIC91:	.ASCIIZ	*COUNTER*

11084	043236	040506	046111	051125	DIC92:	.ASCIZ	*FAILURE*
11085	043246	044514	000104		DIC93:	.ASCIZ	*LID*
11086	043252	000102			DIC94:	.ASCIZ	*B*
11087	043254	047506	041522	000105	DIC95:	.ASCIZ	*FORCE*
11088	043262	044515	051523	000	DIC96:	.ASCIZ	*MISS*
11089	043267	114	047517	051513	DIC97:	.ASCIZ	*LOOKS*
11090	043275	104	051511	041101	DIC98:	.ASCIZ	*DISABLED*
11091	043306	044127	047105	000	DIC99:	.ASCIZ	*WHEN*
11092	043313	105	040516	046102	DIC100:	.ASCIZ	*ENABLED*
11093	043323	127	047522	043516	DIC101:	.ASCIZ	*WRONG*
11094	043331	101	042116	000	DIC102:	.ASCIZ	*AND*
11095	043335	124	043501	000	DIC103:	.ASCIZ	*TAG*
11096	043341	123	052524	045503	DIC104:	.ASCIZ	*STUCK*
11097	043347	101	052124	046505	DIC105:	.ASCIZ	*ATTEMPT*
11098	043357	054	000		DIC106:	.ASCIZ	*,*
11099	043361	126	040511	000	DIC107:	.ASCIZ	*VIA*
11100	043365	103	047101	000124	DIC108:	.ASCIZ	*CANT*
11101	043372	040527	000123		DIC109:	.ASCIZ	*WAS*
11102	043376	047514	044507	000103	DIC110:	.ASCIZ	*LOGIC*
11103	043404	042117	000104		DIC111:	.ASCIZ	*ODD*
11104	043410	053105	047105	000	DIC112:	.ASCIZ	*EVEN*
11105	043415	122	040505	051504	DIC113:	.ASCIZ	*READS*
11106	043423	123	054111	000	DIC114:	.ASCIZ	*SIX*
11107	043427	124	043501	042507	DIC115:	.ASCIZ	*TAGGED*
11108	043436	047514	040503	044524	DIC116:	.ASCIZ	*LOCATIONS*
11109	043450	027511	000117		DIC117:	.ASCIZ	*I/O*
11110	043454	040520	042507	000	DIC118:	.ASCIZ	*PAGE*
11111	043461	111	053116	046101	DIC119:	.ASCIZ	*INVALIDATED*
11112	043475	114	041517	052101	DIC120:	.ASCIZ	*LOCATION*
11113	043506	044127	046111	000105	DIC121:	.ASCIZ	*WHILE*
11114	043514	047515	042504	000	DIC122:	.ASCIZ	*MODE*
11115	043521	123	047524	040522	DIC123:	.ASCIZ	*STORAGE*
11116	043531	117	042520	040522	DIC124:	.ASCIZ	*OPERATING*
11117	043543	127	052111	000110	DIC125:	.ASCIZ	*WITH*
11118	043550	054502	040520	051523	DIC126:	.ASCIZ	*BYPASS*
11119	043557	102	000131		DIC127:	.ASCIZ	*BY*
11120	043562	052522	000116		DIC128:	.ASCIZ	*RUN*
11121	043566	040502	044523	000103	DIC129:	.ASCIZ	*BASIC*
11122	043574	042515	047515	054522	DIC130:	.ASCIZ	*MEMORY*
11123	043603	060	030060	030060	DIC131:	.ASCIZ	*000000*
11124							
11125		054000				.=54000	:REV B
11126							
11127							
11128	054000	030060	030064	030060	DIC132:	.ASCIZ	*004000*
11129	054007	060	030061	030060	DIC133:	.ASCIZ	*010000*
11130	054016	031060	030060	030060	DIC134:	.ASCIZ	*020000*
11131	054025	060	030064	030060	DIC135:	.ASCIZ	*040000*
11132	054034	030061	030060	030060	DIC136:	.ASCIZ	*100000*
11133	054043	062	030060	030060	DIC137:	.ASCIZ	*200000*
11134	054052	030064	030060	030060	DIC138:	.ASCIZ	*400000*
11135	054061	127	044522	044524	DIC139:	.ASCIZ	*WRITING*
11136	054071	125	044516	052502	DIC140:	.ASCIZ	*UNIBUS*
11137	054100	054105	051105	044503	DIC141:	.ASCIZ	*EXERCISER*
11138	054112	046504	000101		DIC142:	.ASCIZ	*DMA*
11139	054116	047515	052504	042514	DIC143:	.ASCIZ	*MODULE*

11140	054125	115	051101	044103	DIC144:	.ASCIZ	*MARCH*
11141	054133	120	052101	042524	DIC145:	.ASCIZ	*PATTERN*
11142	054143	105	050130	041505	DIC146:	.ASCIZ	*EXPECTED*
11143	054154	051127	052111	042524	DIC147:	.ASCIZ	*WRITTEN*
11144	054164	051127	052111	047105	DIC148:	.ASCIZ	*WRITEN*
11145	054173	125	045516	047516	DIC149:	.ASCIZ	*UNKNOWN*
11146	054203	111	052116	051105	DIC150:	.ASCIZ	*INTERRUPT*
11147	054215	125	042523	000104	DIC151:	.ASCIZ	*USED*
11148	054222	041101	051117	000124	DIC152:	.ASCIZ	*ABORT*
11149	054230	051124	050101	000	DIC153:	.ASCIZ	*TRAP*
11150	054235	102	052117	000110	DIC154:	.ASCIZ	*BOTH*
11151	054242	041517	052503	042522	DIC155:	.ASCIZ	*OCCURED*
11152	054252	051124	050101	042520	DIC156:	.ASCIZ	*TRAPPED*
11153	054262	044123	052517	042114	DIC157:	.ASCIZ	*SHOULD*
11154	054271	110	053101	000105	DIC158:	.ASCIZ	*HAVE*
11155	054276	041101	051117	042524	DIC159:	.ASCIZ	*ABORTED*
11156	054306	053523	052111	044103	DIC160:	.ASCIZ	*SWITCH*
11157	054315	105	051122	051117	DIC161:	.ASCIZ	*ERROR!!*
11158	054325	126	051105	043111	DIC162:	.ASCIZ	*VERIFY*
11159	054334	047520	044523	044524	DIC163:	.ASCIZ	*POSITIONS*

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TEXT WORDS

C 11

SEQ 0132

11161		044000			.=44000
11162	044000	000000	LOWSP:		.WORD 0
11163		046000			.=46000
11164	046000	000000	HIGHSP:		.WORD 0
11165		050000			.=50000
11166	050000	000000	LOW1:		.WORD 0
11167		052000			.=52000
11168	052000	000000	HIGH1:		.WORD 0
11169		000001			.END

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SEQ 0134

	8032	8088*	8092*	8101	8103	8158*	8162*	8171	8173	9084*	9107*	9115	9117
	9270*	9308*	9346*	9386*	9426*	9480*	9553*	9610*	9723*	9901*	9902	9954*	10081*
	10082	10134*	10201*	10206*	10283*	10288*	10359*	10362*	10442*	10445*	10509*	10537*	10591*
	10619*												
BADST = 006434	6611	6648#											
BEBA = 170004	6076#	9762*											
BECC = 170002	6075#	9763*											
BECR1 = 170006	6078#	9745	9766*	9767									
BECR2 = 170016	6079#	9765*											
BEDA = 170000	6077#	9764*											
BIT = 006556	6656	6678#											
BITFLG = 004560	6351#	6500*	6513	7464*	7512*	7981*	8052*	8123*	8193*	8509*	9063*	9129*	
BITNAM = 006454	6515	6654#											
BIT00 = 000001	6040#	6880	6883	7352	7354	7370	7373	8448	10670	10786			
BIT01 = 000002	6041#	7160	7162	7303	7304	7306	7391	7393					
BIT02 = 000004	6042#	6903	6906	6925	6928	7327	7328	7330	7331	7410	7412	7494	8222
	8275	8448	8903	9161	9197	9228	9256	9294	9333	9372	9411	9466	9538
	9595												
BIT03 = 000010	6043#	6954	6957	6978	6981	7447	7541	7608	7675	7743	7948	8019	8090
	8160	8332	8386	8874	8933	8943	8974	8986	9039	9105	10334	10337	10416
	10419	10495	10500	10525	10530	10577	10582	10607	10612				
BIT04 = 000020	6044#	7180	7182	7202									
BIT05 = 000040	6045#	7200	7552	7619	7688	7756	8480	8615	8794	8848	8865	8873	9677
	9838	10017											
BIT06 = 000100	6046#	7000	7003	7021	7028	7557	7559	7561	7564	7568	7624	7626	7629
	7632	7635	7693	7695	7697	7700	7703	7761	7763	7765	7768	7771	8466
	8562	8645	8647	8657	8687	8689	8780	8848	8849	8873	9685	9689	9691
	9696	9844	9846	9848	9851	9877	9879	9881	9885	9887	9932	9934	9936
	9939	10023	10025	10027	10030	10056	10058	10060	10064	10066	10112	10114	10116
	10119	10211	10293	10661	10700	10737	10773						
BIT07 = 000200	6047#	7047	7050	7068	7071	7549	7551	7562	7630	7685	7687	7698	7766
	8473	8570	8699	8731	8776	8787	8840	8848	8857	9654	9656	9694	9849
	9882	9937	10028	10061	10117	10213	10295	10707	10710	10744	10748		
BIT08 = 000400	6048#	6098	6197	6200	6377	6394	6879	7089	7220	7222	7802	7830	7856
	7861	7892	7911	7929	7937	7940	8000	8008	8011	8071	8079	8082	8141
	8149	8152	8438	9019	9085	9149	9185	10391	10475				
BIT09 = 001000	6049#	6102	6166	6168	7086	7107	7110	7306	8222	8275	8332	8386	8733
	8874	9056	9122	9154	9156	9190	9192	9221	9223				
BIT10 = 002000	6050#	7124	7126	7139	7142	7143	7555	7568	7622	7635	7691	7703	7759
	7771	8603	8605	9680	9682	9841	9843	10020	10022				
BIT11 = 004000	6051#	7240	7242										
BIT12 = 010000	6052#	7803	7831	7857	7863	7893	7913	7930	7938	7941	8001	8009	8012
	8072	8080	8083	8142	8150	8153	8441	9020	9086	9150	9186		
BIT13 = 020000	6053#	6174	6176	6496	7853	7868	7897	7909	7927	7998	8069	8139	9022
	9088	9147	9183	10370	10453								
BIT14 = 040000	6054#	6099	6162	6164	7260	7262							
BIT15 = 100000	5996	6055#	6170	6172	6519	7280	7282	9668					
BUFPNT = 004424	6005*	6012*	6289*	6290*	6291	6294	6302	6304*	6312	6314	6316	6318*	6320
	6322*	6325*	6326*	6338	6340#								
CCR = 177746	5983*	6024#	6098*	6359*	6701*	6724*	6726	6744*	6764*	6784*	6805*	6830*	6854*
	6855*	6856	6879*	6880*	6881	6882*	6903*	6904	6905*	6925*	6926	6927*	6954*
	6955	6956*	6978*	6979	6980*	7000*	7001	7002*	7021*	7022	7023*	7047*	7048
	7049*	7068*	7069	7070*	7086*	7087	7088*	7107*	7108	7109*	7124*	7125	7139*
	7140	7141*	7159*	7160*	7161	7179*	7180*	7181	7199*	7200*	7201	7219*	7220*
	7221	7239*	7240*	7241	7259*	7260*	7261	7279*	7280*	7281	7302*	7303*	7304*
	7305	7326*	7327*	7328*	7329	7351*	7436*	7453*	7483*	7501*	7535*	7547*	7549*

	7551*	7555*	7559*	7561*	7564*	7568*	7576*	7602*	7614*	7616*	7618*	7622*	7626*
	7629*	7632*	7635*	7644*	7669*	7683*	7685*	7687*	7691*	7695*	7697*	7700*	7703*
	7712*	7737*	7751*	7753*	7755*	7759*	7763*	7765*	7768*	7771*	7780*	7802*	7803
	7830*	7831	7853	7856*	7857	7861*	7863	7867	7892*	7893	7897	7909	7911*
	7913	7927	7929*	7930	7932*	7937*	7938	7940*	7941	7958*	7998	8000*	8001
	8003*	8008*	8009	8011*	8012	8029*	8069	8071*	8072	8074*	8079*	8080	8082*
	8083	8100*	8139	8141*	8142*	8144*	8149*	8150	8152*	8153	8170*	8222*	8233*
	8275*	8287*	8332*	8343*	8386*	8397*	8438*	8441	8444*	8448*	8452*	8455*	8465*
	8528*	8537*	8552*	8559*	8561*	8600*	8603*	8605*	8607*	8609*	8642*	8645*	8647*
	8649*	8651*	8684*	8687*	8689*	8691*	8693*	8724*	8726*	8728*	8731*	8733*	8738*
	8761*	8767*	8769*	8774*	8776*	8777*	8820*	8822*	8825*	8828*	8830*	8832*	8835*
	8838*	8840*	8873*	8874*	8893*	8908*	8929*	8935*	8945*	8951*	8970*	8978*	8989*
	8997*	9019*	9020	9022	9024*	9048*	9085*	9086	9088	9090*	9114*	9147	9149*
	9150	9152*	9154*	9156*	9159*	9173*	9183	9185*	9186	9188*	9190*	9192*	9195*
	9209*	9219*	9221*	9223*	9226*	9239*	9250*	9255*	9288*	9293*	9327*	9332*	9366*
	9371*	9405*	9410*	9460*	9465*	9532*	9537*	9589*	9594*	9643*	9654*	9656*	9658*
	9662*	9680*	9682*	9685*	9687*	9691*	9696*	9705*	9710*	9753*	9775*	9811*	9824*
	9826*	9841*	9843*	9846*	9848*	9851*	9853*	9858*	9874*	9876*	9879*	9881*	9885*
	9887*	9888*	9893*	9896*	9929*	9931*	9934*	9936*	9939*	9941*	9946*	9949*	9990*
	10003*	10005*	10020*	10022*	10025*	10027*	10030*	10032*	10037*	10053*	10055*	10058*	10060*
	10064*	10066*	10067*	10072*	10075*	10109*	10111*	10114*	10116*	10119*	10121*	10126*	10129*
	10160*	10178*	10183*	10188*	10196*	10198*	10242*	10260*	10265*	10270*	10278*	10280*	10332*
	10343	10347	10351*	10384*	10391*	10414*	10416	10425	10430	10434*	10468*	10475*	10488*
	10508*	10520*	10535*	10546*	10549*	10570*	10590*	10602*	10617*	10628*	10631*	10658*	10661*
	10663*	10668*	10670*	10671	10672*	10697*	10700*	10702*	10707*	10709	10711*	10734*	10737*
	10739*	10744*	10746	10747*	10770*	10773*	10775*	10782*	10784	10785*			
CHR = 177752	6026#	6766	6807	7447	7541	7608	7675	7743	7948	8019	8090	8160	8507
	8534	8902	8933	8943	8974	8986	9039	9105	9158	9194	9225	9254	9292
	9331	9370	9409	9464	9536	9593	9771	10334	10337	10419	10495	10500	10525
	10530	10577	10582	10607	10612								
CLOCK 004674	6363#												
CMDLST 005224	6413	6440#											
CMDLS1 005316	6412	6462#											
CMPE = 177744	6023#	6360	6361*	6706	6786	6832*	6833	7494	7539*	7550	7606*	7617	7673*
	7686	7741*	7754	8449*	8453	8454*	8464*	8557*	8560	8599*	8608	8641*	8650
	8683*	8692	8723*	8730*	8732	8762*	8768	8772*	8775	8819*	8826*	8829	8836*
	8839	8846*	9648*	9652*	9655	9706*	9822*	9825	9865*	9867	9875	9924	9930
	10001*	10004	10044*	10046	10054	10104	10110	10167*	10169	10174	10197	10249*	10251
	10256	10279	10657*	10696*	10733*	10781*							
CMR = 177750	6025#	6746	7352*	7353	7370*	7371	7372*	7391*	7392	7410*	7411	8969*	8977*
	8988*	8996*	10497*	10502*	10507*	10523*	10527*	10579*	10584*	10589*	10605*	10609*	
CONWRD 000176	5979#	5990*	5996*	6094*	6099	6102	6162*	6164*	6166*	6168*	6170*	6172*	6174*
	6176*	6197*	6198*	6200*	6206*	6208*	6377	6379	6394	6396	6496	6519	8238
	8293	8348	8402										
COUNT 004704	6366#	8217*	8270*	8327*	8381*								
CRLF 005634	6110	6327	6535	6544#	6617								
DEAD 035676	10807	10817#											
DECODE 005066	6329	6410#											
DIC1 042210	10822	10854	10867	10870	10874	10875	10877	10878	10880	10887	10888	10890	10891
	10892	10893	10895	10896	10897	10898	10905	10909	10910	10935	10937	10939	10958
	10959	10960	10962	10965	10968	10972	10974	10976	10977	10978	10980	10981	10983
	10985	10987	10988	10992#									
	10823	10824	10825	10826	10827	10828	10882	11001#					
DIC100 043313	10895	10896	10897	10898	10937	10986	11092#						
DIC101 043323	10899	10900	10926	10948	11093#								
DIC102 043331	10900	10923	10927	10951	10960	10986	10987	11094#					

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SEQ 0136

DIC103	043335	10900	10903	10915	10925	10945	10948	10975	10976	10978	11095#
DIC104	043341	10905	11096#								
DIC105	043347	10907	11097#								
DIC106	043357	10908	10965	10968	10972	10974	10977	11098#			
DIC107	043361	10908	11099#								
DIC108	043365	10911	10912	11100#							
DIC109	043372	10914	10918	11101#							
DIC11	042313	10824	10832	10846	10854	11002#					
DIC110	043376	10921	10981	10983	10985	11102#					
DIC111	043404	10923	10927	11103#							
DIC112	043410	10923	10927	11104#							
DIC113	043415	10929	11105#								
DIC114	043423	10929	11106#								
DIC115	043427	10929	10932	10943	10962	11107#					
DIC116	043436	10929	11108#								
DIC117	043450	10930	10931	10932	11109#						
DIC118	043454	10930	10931	10932	11110#						
DIC119	043461	10932	10939	11111#							
DIC12	042323	10825	10861	10933	11003#						
DIC120	043475	10932	10939	10940	10943	10944	10946	10960	11112#		
DIC121	043506	10933	11113#								
DIC122	043514	10933	10938	10940	10943	11114#					
DIC123	043521	10934	11115#								
DIC124	043531	10935	11116#								
DIC125	043543	10935	10941	11117#							
DIC126	043550	10938	10940	10943	11118#						
DIC127	043557	10940	10962	11119#							
DIC128	043562	10941	11120#								
DIC129	043566	10945	11121#								
DIC13	042337	10826	10904	10905	10906	10907	10908	10928	10931	10946	10948
DIC130	043574	10946	10949	10951	10958	10960	11122#				
DIC131	043603	10947	11123#								
DIC132	054000	10950	11128#								
DIC133	054007	10952	11129#								
DIC134	054016	10953	11130#								
DIC135	054025	10954	11131#								
DIC136	054034	10955	11132#								
DIC137	054043	10956	11133#								
DIC138	054052	10957	11134#								
DIC139	054061	10959	11135#								
DIC14	042343	10827	10828	11005#							
DIC140	054071	10961	10963	11136#							
DIC141	054100	10961	10963	11137#							
DIC142	054112	10961	10962	11138#							
DIC143	054116	10963	11139#								
DIC144	054125	10964	10966	10970	10975	11140#					
DIC145	054133	10964	10966	10970	10975	11141#					
DIC146	054143	10965	11142#								
DIC147	054154	10968	10972	11143#							
DIC148	054164	10974	11144#								
DIC149	054173	10977	11145#								
DIC15	042353	10827	10828	10936	10947	10950	10951	10952	10953	10954	10955
		10959	10965	10968	10972	10974	10977	11006#			
DIC150	054203	10979	10980	10981	11146#						
DIC151	054215	10982	11147#								
DIC152	054222	10983	10985	10986	11148#						

[illegible]

[illegible]

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SEQ 0140

GOODST	006413	6606	6647#											
HELP	002152	6202#	6473											
HIGHSP	046000	6586	6592	6913	6914	7435	7438	7442	7451	7482	7485	7489	7499	7572
		7588	7589	7604	7605*	7607	7623	7627*	7634*	7637	7724	7725	7739	7740*
		7742	7760	7764*	7770*	7773	7970	7971	8004	8006	8015	8023	8112	8113
		8145	8147	8156	8164	8255	8256	8312	8313	8383	8443	8446	8456	8529
		8530	8553	8554*	8555*	8556*	8558	8602	8644	8646*	8648	8686	8688*	8690
		8727	8729	8764	8765*	8766	8823	8824*	8827	8831	8915	8916	8930	8942
		8971	8985	9059	9082	9095	9101	9103	9108	9112	9153	9155*	9157	9189
		9191*	9193	9220	9222	9224	9265	9266	9303	9304	9342	9343	9381	9382
		9420	9422	9475	9476	9547	9548	9604	9605	9638	9641	9644	9646	9650
		9663	9667	9674	9704	9708	9758	9760	9762	9769	9772	9856	9891	9944
		9966	9967	9995	9997	9999	10006	10008	10039	10050	10095	10099	10101	10106
		10181	10231	10232	10241	10243	10245	10247	10266	10268	10275	10387	10388	10408
		10410	10413	10422	10449	10552	10553	10660	10662*	10669	10699	10701*	10708	10742
		10756	10757	10778	10792	10793	11164#							
HIGH1	052000	7603	7621	7738	7758	7943	7973	8085	8115	8272	8601	8604	8606	8643
		8685	8725	8763	8770	8771*	8773	8821	8833	8834*	8837	8841*	9017*	9018*
		9041*	9045*	9049	9051	9053	9754	9756	9821	9830	9861	9897	9900	9905
		9922	9950	9956	9962	9991	9993	10080	10136	10166	10187	10330	10352	10355
		10366	10659	10698	11168#									
HLONER	001154	6107	6115#											
HL1	002004	6170#	6467											
HL2	002014	6172#	6468											
ILL	005174	6432	6437#											
INBUF	004430	6005	6012	6302	6320	6326	6342#	6414						
ITTRAP	004540	6343#	6357*	6705*	6707	6725*	6727	6745*	6747	6765*	6767	6785*	6787	6806*
		6808	6831*	9453*	9455	9524*	9526	9581*	9583	9744*	9746			
		6056#	8221*	8223	8226*	8274*	8276	8279*	8331*	8333	8336*	8385*	8387	8390*
KOOKOO=	177546	6066#	9501*											
KPAR0 =	172340	6067#	9502*											
KPAR1 =	172342	6068#	9503*											
KPAR2 =	172344	6069#	9504*											
KPAR3 =	172346	6070#	9523*	9579*										
KPAR4 =	172350	6071#												
KPAR5 =	172352	6072#												
KPAR6 =	172354	6073#	9505*											
KPAR7 =	172356	6058#	9493*											
KPDR0 =	172300	6059#	9494*											
KPDR1 =	172302	6060#	9495*											
KPDR2 =	172304	6061#	9496*											
KPDR3 =	172306	6062#	9497*											
KPDR4 =	172310	6063#	9498*											
KPDR5 =	172312	6064#	9499*											
KPDR6 =	172314	6065#	9500*											
KPDR7 =	172316	6028#	6289											
KRB =	177562	6027#	6279											
KRS =	177560	6368#	6484*	6485*	6498	6508								
LAST	004710	6517	6525#											
LFLF	005552	6531	6537	6554#	6600	6619	6663	6669						
LINE	005657	6004	6121#											
LINFRQ	001176	6372*	6399*	6403	6407#	7812*	7844*	7881*	9015*	9081*	9810*	9913*	9961*	9964
LOPERR	005064	9989*	10093*	10141*	10144	10157*	10220*	10227*	10229	10239*	10302*	10309*	10311	10324*
		10369*	10385	10406*	10452*	10469	10486*	10519*	10547*	10550	10568*	10601*	10629*	10632
LOST	002210	6202	6211#											
LOWSP	044000	6084	6574	6580	6964	6965	7024	7471	7472	7519	7520	7537	7538*	7540

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CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0141

		7556	7560*	7566*	7569	7640	7656	7657	7671	7672*	7674	7692	7696*	7702*
		7705	7708	7776	7792	7793	7933	7935	7944	7952	8041	8042	8075	8077
		8086	8094	8182	8183	8219	8365	8366	8419	8420	8460	8488	8489	8500
		8515	8516	8545	8546	8586	8587	8613	8625	8626	8655	8667	8668	8697
		8709	8710	8736	8744	8745	8802	8803	8844	8876	8877	8953	8954	8956
		8999	9000	9002	9016	9029	9035	9037	9042	9046	9125	9171	9172	9207
		9208	9237	9238	9251	9289	9328	9367	9461	9533	9590	9657	9660	9701
		9732	9733	9783	9784	9816	9818	9820	9827	9829	9835	9860	9871	9915
		9919	9921	9926	10035	10070	10124	10146	10147	10159	10161	10163	10165	10184
		10186	10193	10263	10313	10314	10326	10328	10331	10340	10471	10472	10634	10635
		10666	10682	10683	10705	10719	10720	10736	10738*	10745	10772	10774*	10783	11162#
LOW1	050000	6086	7026	7536	7554	7670	7690	8014	8044	8155	8185	8329	8892	8895
		8897	8899	8906	9649	9665	9703	9711	9717	9812	9814	10000	10009	10014
		10040	10076	10085	10102	10130	10142	10248	10269	10412	10435	10438	10735	10771
		11166#												
LPONTS	005012	6394#	8955	9001	9058	9124								
LP1	001744	6162#	6463											
LP2	001754	6164#	6464											
LP3	001764	6166#	6465											
LP4	001774	6168#	6466											
LP5	002044	6178#	6471											
LP6	002142	6200#	6472											
MAGPRE	025564	9452	9457	9459	9477	9493#								
MAYBE	007726	6939#												
NAME	001446	6148	6151#											
NOINC	004712	6369#												
NOUBE	004562	6352#	9751											
OCTASC	006310	6605	6610	6615	6624#									
OFF =	001015	5983	6057#	6098	6359	6701	6724	6744	6764	6784	6805	6830	6854	6879
		6882	6905	6927	6956	6980	7002	7023	7049	7070	7088	7109	7141	7159
		7179	7199	7219	7239	7259	7279	7302	7326	7351	7453	7501	7547	7576
		7614	7644	7683	7712	7751	7780	7958	8029	8100	8170	8233	8287	8343
		8397	8438	8465	8537	8561	8609	8651	8693	8731	8733	8738	8777	8835
		8908	8935	8945	8951	8978	8989	8997	9048	9114	9159	9173	9195	9209
		9226	9239	9255	9293	9332	9371	9410	9465	9537	9594	9658	9710	9775
		9853	9888	9896	9941	9949	10032	10067	10075	10121	10129	10178	10188	10260
		10270	10351	10384	10434	10468	10508	10535	10549	10590	10617	10631	10663	10672
		10702	10711	10739	10747	10775	10785							
PARITY	004650	5976	6096	6359#										
PNTNAM	001364	5997	6011	6135#										
PPB =	177566	6030#	6338*	6564*										
PPS =	177564	6029#	6336	6562										
PREPAR	001000	5998	6084#	6462	10816									
PRINT	005564	6507	6530#											
PROM	001730	6145	6159#	6423										
PSW =	177776	6031#	8931	8932	8972	8973	10656*							
PTID	004010	6109	6250#	6504										
QUESHZ	001210	6121	6124#											
RELCTH	006142	6586#	6901	7532	7666	7924	8066	8215	8268	8889	9012	9248	9286	9325
		9364	9403	9458	9530	9587	9807	10155	10321	10484	10731	10768		
RELCTL	006114	6574#	6952	7433	7480	7599	7734	7995	8136	8325	8379	8435	8496	8526
		8550	8597	8639	8681	8721	8759	8817	8925	8964	9077	9145	9181	9217
		9635	9742	9986	10237	10403	10566	10654	10694					
REST	035672	10810	10816#											
SAVTAT	004546	6346#												
SENT	035722	6710	6730	6750	6770	6791	6813	6837	6861	10822#				

[illegible]

[illegible]

[illegible]

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CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0146

TST035	011460	7301#							
TST036	011554	7325#							
TST037	011650	7350#							
TST040	011724	7369#							
TST041	012002	7390#							
TST042	012050	7409#							
TST043	012116	7432#							
TST044	012310	7434	7479#						
TST045	012502	7481	7530#	7572	7588	7589			
TST046	013034	7533	7548	7597#	7640	7656	7657		
TST047	013366	7600	7615	7664#	7708	7724	7725		
TST050	013724	7667	7684	7732#	7776	7792	7793		
TST051	014262	7735	7752	7801#					
TST052	014356	7813	7827#						
TST053	014446	7851#							
TST054	014616	7874	7889#						
TST055	014746	7908	7923#						
TST056	015302	7925	7960	7972	7994#				
TST057	015636	7996	8031	8043	8065#				
TST060	016170	8067	8102	8114	8135#				
TST061	016524	8137	8172	8184	8214#	8255	8256		
TST062	016712	8216	8267#	8312	8313				
TST063	017100	8269	8324#	8365	8366				
TST064	017266	8326	8378#	8419	8420				
TST065	017454	8380	8434#	8488	8489				
TST066	017750	8436	8495#	8500					
TST067	020046	8497	8525#						
TST070	020160	8527	8549#						
TST071	020374	8551	8596#						
TST072	020560	8598	8627	8638#					
TST073	020746	8640	8669	8680#					
TST074	021134	8682	8711	8720#					
TST075	021276	8722	8758#						
TST076	021546	8760	8816#						
TST077	022122	8818	8888#						
TST100	022262	8890	8924#	8953	8954	8956			
TST101	022452	8926	8963#	8999	9000	9002			
TST102	022670	8965	9011#						
TST103	023170	9013	9060	9076#					
TST104	023470	9078	9126	9144#					
TST105	023650	9146	9180#						
TST106	024030	9182	9216#						
TST107	024162	9218	9247#						
TST110	024346	9249	9267	9285#					
TST111	024540	9287	9305	9324#					
TST112	024732	9326	9344	9363#					
TST113	025124	9365	9383	9402#					
TST114	025316	9404	9423	9443#					
TST115	025702	9514#							
TST116	026166	9521	9529	9531	9550	9571#			
TST117	026452	9578	9586	9588	9607	9634#	9657	9660	9732
TST120	027204	9636	9741#						
TST121	027442	9743	9748	9806#	9856	9891	9944		
TST122	030564	9808	9985#	10035	10070	10124			
TST123	031706	9987	10154#	10181					
TST124	032324	10156	10236#	10263					

[illegible]

[illegible]

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CROSS REFERENCE TABLE -- MACRO NAMES

SEQ 0149

COMMEN 1528#
 ENDCOM 1540#
 ESCAPE 1656#
 GETPRI 1270#
 GETSWR 1727#
 MULT 4387#
 NEWTST 1587#
 POP 2105#
 PUSH 2097#
 REPORT 5346#
 SETPRI 1238#
 SETUP 1304#
 SKIP 1690#
 SLASH 1480#
 STARS 1449#
 SWRSU 1418#
 TYPBIN 2041#
 TYPDEC 2011#
 TYPNAM 1781#
 TYPNUM 1978#
 TYPOCS 1931#
 TYPOCT 1894#
 TYPTXT 1848#
 \$\$ESCA 1669#
 \$\$NEWT 1623#
 \$\$SKIP 1703#
 .EQUAT 168#
 .HEADE 42#
 .KT11 311#
 .SETUP 1172#
 .SWRHI 84#
 .SACT1 4955#
 .SAPT8 4999#
 .SAPTH 5255#
 .SAPTY 5430#
 .SASTA 5301#
 .SCATC 897#
 .SCMTA 1008#
 .SDB2D 4585#
 .SDB2O 4708#
 .SDIV 4488#
 .SEOP 2164#
 .SERRO 2644#
 .SERRT 2839#
 .SMULT 4425#
 .SPOWE 4137#
 .SRAND 4212#
 .SRDDE 3815#
 .SRDOC 3724#
 .SREAD 3329#
 .SR2AZ 4852#
 .SSAVE 3890#
 .SSB2D 4669#
 .SSB2O 4770#
 .SSCOP 2398#
 .SSIZE 4265#

5951# 6016 6018

 5951# 6018
 5951# 6016

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SEQ 0150

.\$SUFR 4808#
.\$STRAP 3992#
.\$STYPB 3222#
.\$STYPD 3145#
.\$STYPE 2926#
.\$STYPO 3049#
.\$40CA 936#
.\$1170 490#

. ABS. 054346 000

ERRORS DETECTED: 0

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CORE USED: 33K (65 PAGES)